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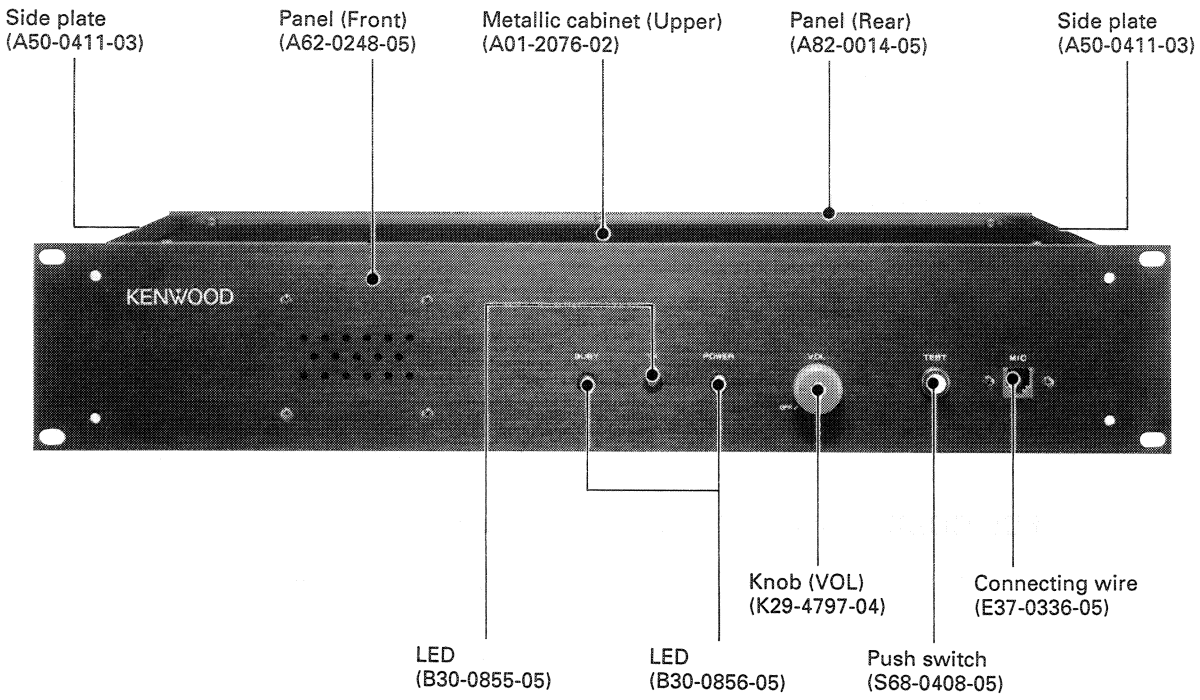
800MHz TRUNKED REPEATER UNIT

TKR-900

SERVICE MANUAL

KENWOOD

B51-8210-00(O)443



CONTENTS

GENERAL

INTRODUCTION

SCOPE OF THIS MANUAL

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information for the equipment and is current as of the publication data. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions. These are issued as required.

ORDERING REPLACEMENT PARTS

When ordering replacement parts or equipment information, the full part identification number should be included. This applies to all parts : components, kits, or chassis. If the part number is not known, include the chassis or kit number of which it is a part, and a sufficient description of the required component for proper identification.

PERSONNEL SAFETY

The following precautions are recommended for personnel safety :

- DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- This equipment should be serviced by a qualified technician only.

SERVICE

This radio is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained within.

NOTE

WE CANNOT guarantee oscillator stability when using channel element manufactured by other than KENWOOD or its authorized agents.

FCC COMPLIANCE AND TYPE NUMBERS

Type acceptance number	Frequency range	Compliance
ALHTKR-900-1	851~866MHz	Part 90

1. Overview

The TKR-900 is an 800-MHz-band trunking repeater system radio unit.

2. Main Features

- LTR® repeater system can be used by connecting the TKR-900 to the trunking logic controller.
- LTR® is registered trademark of E.F Johnson Co.
- 19-inch rack size fits into any 19-inch cabinet.
- Use of the frequency synthesizer and setting of FCC channels (1 to 600 channels) makes it easy to set frequencies.
- The transmit and receive frequencies can be shifted (transmit or receive frequency –12.5 kHz) by simple modification.

OPERATING FEATURES

1. Controls and Functions

1-1. Front panel

① Speaker
Used to output and monitor receive signals.

② BUSY indicator
Lights when the receiver channel is in use. It blinks if a receiver failure occurs.

③ TX indicator
Lights during transmission. It blinks if a transmitter failure occurs.

④ POWER indicator
Lights while the repeater unit is energized. It blinks if an error occurs in repeater operation.

⑤ Volume control
Used to adjust the output level of the monitor speaker.
Normally set the control to the "off" position.

⑥ TEST switch
Used as a transmission test switch.

⑦ MIC connector
Used to connect with a **dynamic microphone** (use the optional microphone KMC-14). This connector is not used during repeater operation.

1-2. Rear panel

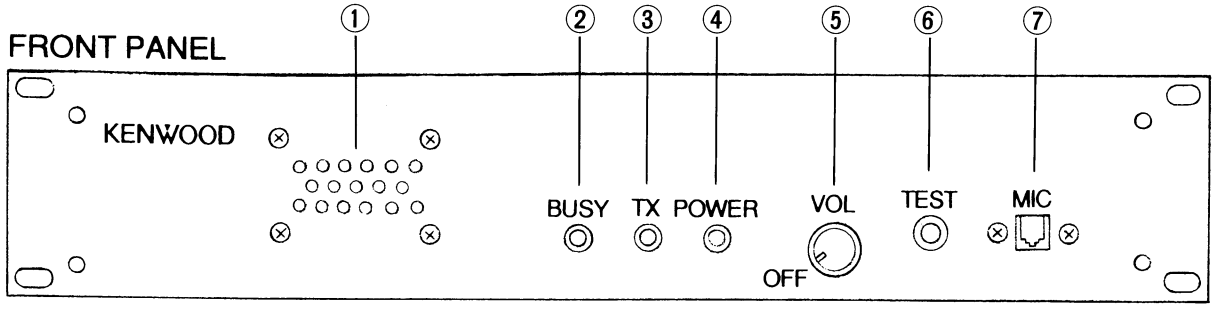
⑧ TX OUT connector
Used to output transmitter drive signals to the external RF amplifier.

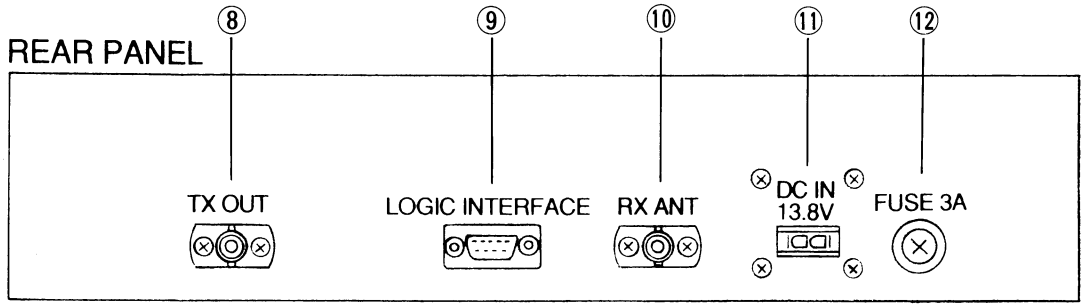
⑨ LOGIC INTERFACE connector
Used to connect the external logic control section.

⑩ RX ANT connector
Used to connect the external RX ANT unit.

⑪ DC input connector
Used to input 13.8V DC.

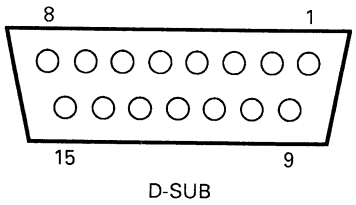
⑫ FUSE holder
This holds a 3-A fuse.





OPERATING FEATURES

2. Logic Interface Connector (J304) Pins



① NC
Not used
② NC
Not used
③ E
Earth
④ NC
Not used
⑤ RA (RX Audio Signal Output)
This port outputs the AF signal passing through the AF band-pass filter in the receiver. The port can be used to check the receiver performance.
The output level is about 500mVrms. (High impedance)
⑥ NC
Not used
⑦ TA (TX Modulation Signal Input)
This port inputs the modulation signal for repeater operation.
The input level is 280mVrms (600Ω) and a 1-kHz AF signal causes 3-kHz deviation.
⑧ MN (Monitor Switch)
This port is used for the monitor switch. When it goes low, the preset squelch opens.
⑨ E (RX Earth)
RX ground
This ground is used when the RA pin (pin 5) and RD pin (pin 15) are used.
⑩ SQ (Squelch Signal)
This signal indicates whether the unit is busy or not.
High : Busy
⑪ PT1 (PTT Signal Input)
This port is a PTT switch for repeater operation. When it goes low, the PTT turns on and transmission mode is entered.
⑫ T12 (10 voltage output)
Transmission voltage (about 9.5V) is output during transmission.
⑬ TD (TX Tone Signal Input)
This port inputs the sub-audio signal (DC to 300Hz) to operate the repeater. The input level is 0.5Vp-p (600Ω) and the AF signal (100Hz) causes a 0.75-kHz deviation.
⑭ E (TX Earth)
TX ground
This ground is used when the TA pin (pin 7) and TD pin (pin 13) are used.
⑮ RD (RX Detector Signal Output)
This port is for the receive detection output signal to operate the repeater. The output level is 80mVrms (50kΩ).

3. Repeater Operation

Repeater operation is possible by supplying 13.8V DC to the power supply of the main unit and connecting the logic controller to the logic interface connector. (LTR® trunking system) When repeater operation is performed (link), the Busy LED (receive mode) and TX LED (transmit mode) light. If you want to monitor during repeater operation, turn the volume control clockwise.

4. Transceiver Operation

4-1. Reception

13.8V is applied to DC IN.

When an incoming signal from the RX ANT matches the desired signal, the Busy LED lights. If the Busy LED flashes, something is wrong with receiver operation.

4-2. Transmission

13.8V is applied to DC IN.

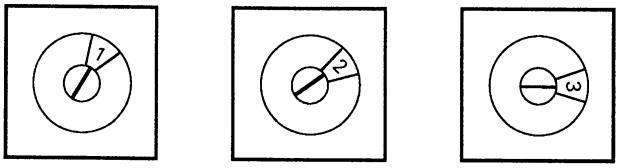
Transmit mode is entered and the TX LED lights when the PTT signal is output from the logic interface or the TEST pin is pressed. If the TX LED flashes, something is wrong with transmitter operation.

OPERATING FEATURES

5. Setting FCC Channels

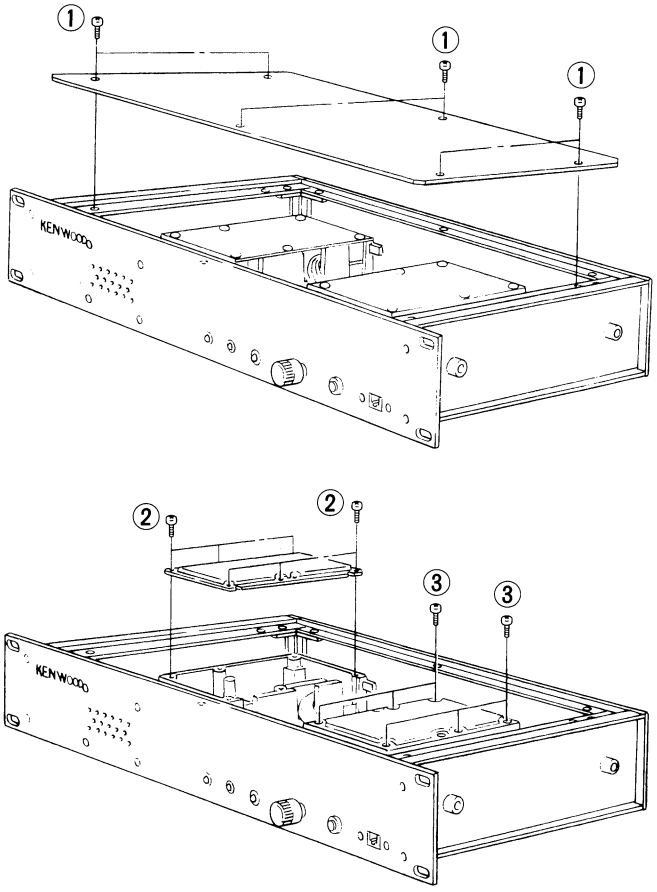
Note : The receive channel must be the same as the transmit channel. Switch the power off before performing steps 1 to 3.

1. Remove the six screws (①) holding the top part of the radio case, and remove the top part of the case.
2. Remove the six screws (②) holding the top part of the RX unit (X55-3020-10) case, and remove the top part of the case.
3. Remove the top part of the TX unit (X56-3020-10) case (③).
4. Apply 13.8V DC to the DC IN socket on the rear panel.
5. Turn S201 (100th digit), S202 (10th digit), and S203 (1st digit) in the RX unit and the TX unit with a screwdriver to set the desired channel. The channel operation for FCC repeater operation are listed in "Adjustment".
6. For example, to set channel 123, set S201, S202, and S203 as follows:

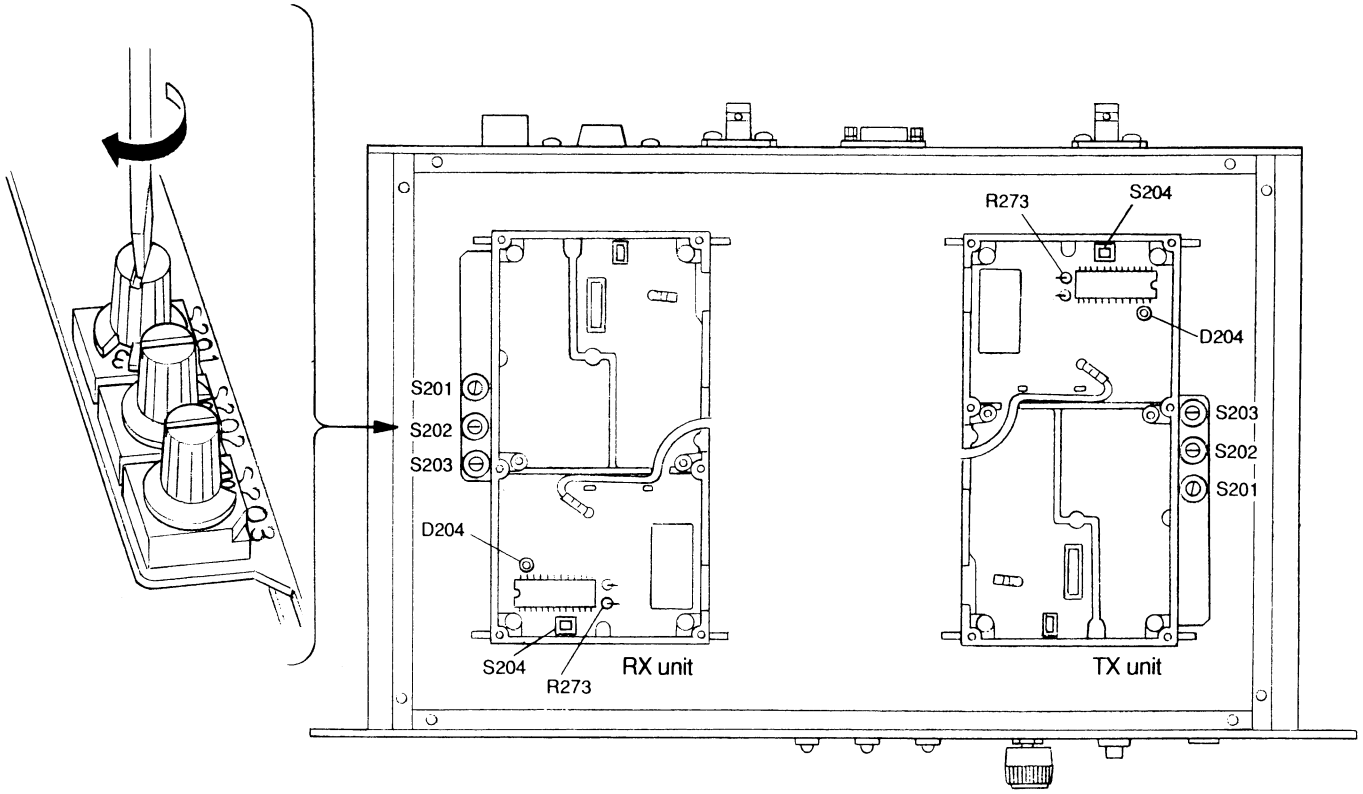


S201 (100th digit) | S202 (10th digit) | S203 (1st digit)

7. Check the LED (D204) in the RX unit and the LED (D204) in the TX unit go off. (If they do not, the PLL is unlocked. See the PLL voltage in the adjustment procedure.)
8. Press S204 (non-locking switch) in the RX unit once. D204 in the RX unit lights, and after a while, goes off.
9. Press S204 (non-locking switch) in the TX unit once. D204 in the TX unit lights, and after a while, goes off.



OPERATING FEATURES / INSTALLATION



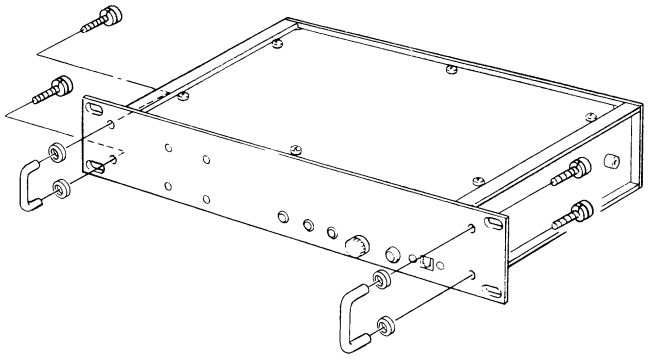
6. FCC Channel –12.5-kHz Channel Setting

The –12.5-kHz channel is set basically in the same way as in 5. FCC Channel Setting. Modify as follows before turning the power on :

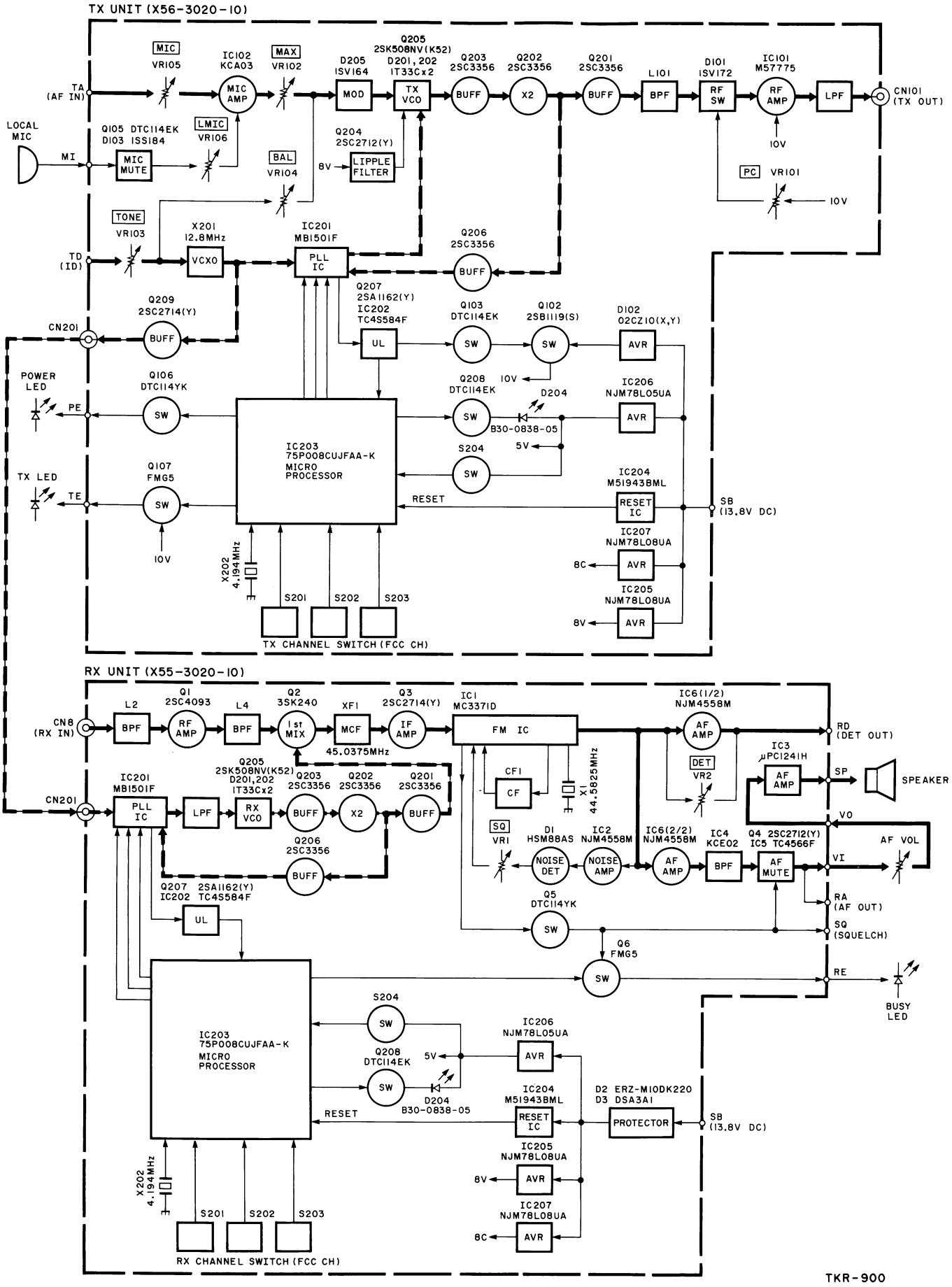
1. Cut off jumper resistor R273 in the RX unit.
2. Cut off jumper resistor R273 in the TX unit.
3. Perform step 4 and subsequent steps for FCC channel setting.

1. Installing the Handles (Accessories)

Install the handles with screws and washers.



BLOCK DIAGRAM



CIRCUIT DESCRIPTION

1. Overview

The TKR-900 is an 800-MHz-band trunking repeater system radio unit, consisting of an RX unit and a TX unit. The RX unit consists of a control section, a frequency synthesizer section (PLL), receive RF and IF sections, and a receiver audio amplifier unit. The TX unit consists of a control section, a frequency synthesizer (PLL), a transmitter microphone amplifier, and a transmitter drive amplifier section.

2. Receiver System

2-1. RF and IF units

The receiver is a double-conversion superheterodyne designed to operate in the frequency range 806.0125 to 820.9875MHz. The RF and IF units of the receiver section consists of an RF amplifier (Q1), a first mixer (Q2), a first IF amplifier (Q3) and a second IF system IC (IC1).

An incoming RF signal through the antenna connector (CN201) is applied to a band-pass filter (L2). The signal is then amplified by the RF amplifier (Q1) and filtered by another band-pass filter (L4). The resulting signal goes to the mixer (Q2), where it is mixed with the first local signal of the frequency synthesizer to generate the first IF signal of 45.0375MHz. The first IF signal is filtered by a four-pole crystal filter (XF1) and amplified by the first IF amplifier (Q3). The resulting signal is then applied to the second IF section.

The second IF section mainly uses on IF system IC (IC1), and consists of a second mixer, a second local oscillator, a second IF amplifier, a second IF filter, an FM detector, and a noise amplifier. The first IF signal is mixed with the second local oscillator signal (X1) of 44.5825MHz to generate the second IF signal of 455kHz. The output passes through the 455k-Hz ceramic filter (CF1), and is demodulated by the quadrature- type FM detector in the limiting amplifier section in IC1. The signal is split into two: one signal is output to the receive audio amplifier section and the other is output to noise amplifier IC2 and noise detected to control the squelch signal.

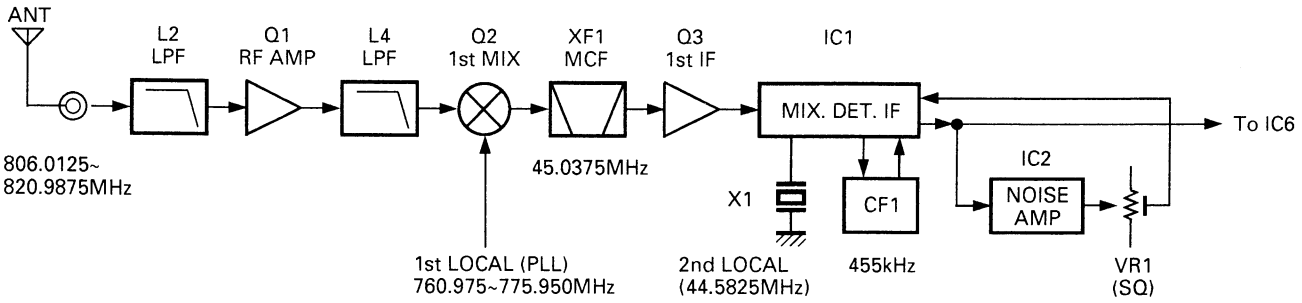


Fig. 1 Receiver system

2-2. Receive audio amplifier section

One of the demodulated signals is amplified by IC6 (1/2) and output to the RD pin (CN4) as the detection output. The other signal is amplified by IC6 (2/2), and is applied to IC4. IC4 consists of a deemphasis circuit and a band-pass filter. One audio signal output from IC4 is output to the RA pin (CN4). The other passes through the volume adjustment variable resistor, and is applied to the audio power amplifier (IC3). Here the signal is amplified to a sufficient level to drive a speaker. The audio signal output from IC4 inverts the SQ signal generated by IC1 to effect AF muting.

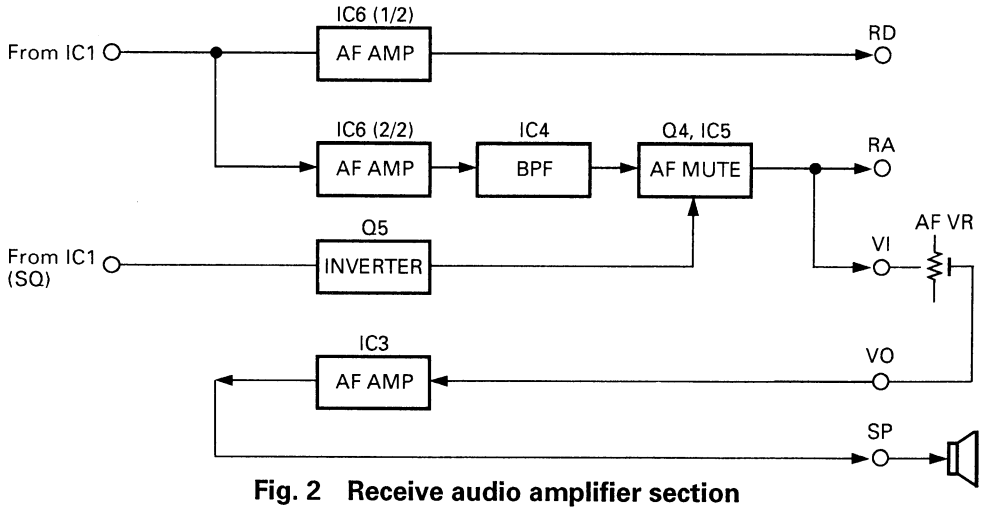


Fig. 2 Receive audio amplifier section

CIRCUIT DESCRIPTION

2-3. Control section

The microprocessor sends frequency program data to the frequency synthesizer according to the receive channel data from the DIP switch (S201, S202, and S203).

The microprocessor determines whether the frequency synthesizer is locked (high). When it is locked, D204 turns off. When it is unlocked, D204 turns on, and a constant pulse signal is output to Q6 to turn it on or off. (UL indicator)

When switch S204 (non-locking type) is pressed, the microprocessor is reset, and sends frequency program data to the frequency synthesizer.

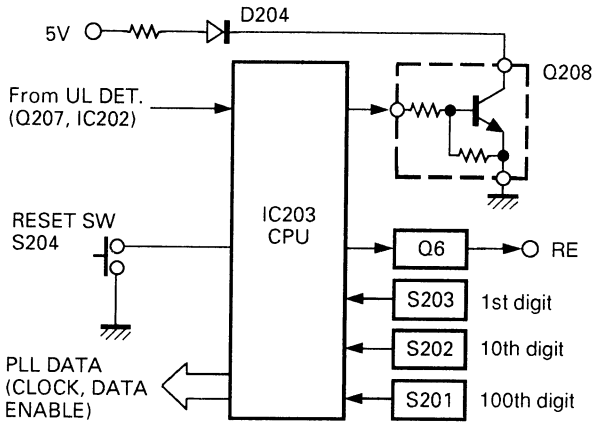


Fig. 3 RX control section

2-4. Frequency synthesizer section (PLL)

The frequency synthesizer section (PLL) consists of a VCO circuit, a phase-locked loop (PLL) circuit, and an unlock detection circuit. The PLL generates the first local oscillator signal for the receiver. The PLL reference signal of 12.8-MHz is supplied from the TX unit via CN201, its frequency being maintained within ±1.5 ppm in the range –30 to +60°C. This signal goes to the PLL IC (IC201), and is divided by 1024 by IC201 to generate the 12.5-kHz reference signal.

The VCO is produced by Q205. The output signal from the VCO passes through the buffer amplifier (Q203) and is doubled by Q202. The RF signal is sent to two buffer amplifiers (Q201 and Q206). The output from Q201 is directed to the first mixer of the receiver circuit as the PLL output signal, and the output from Q206 goes to the PLL IC (IC201).

The VCO signal and VCXO signal are divided according to the divide ratio data sent from the control section to generate the 12.5-kHz signal. The phase of the signal is compared with the reference signal. The phase difference signal is output from the phase comparator, passes through the charge pump and lug-reed low-pass filter, and is applied to D201 and D202 as the VCO control voltage to control the VCO frequency.

If the PLL is unlocked, the IC201 lock detect signal is converted to a DC signal by Q207 and IC202, and sent to the microprocessor in the control section. The microprocessor outputs the UL signal to Q208 and Q6. Q208 controls the LED (D204), and a pulse signal is sent to Q6 to control the external pin.

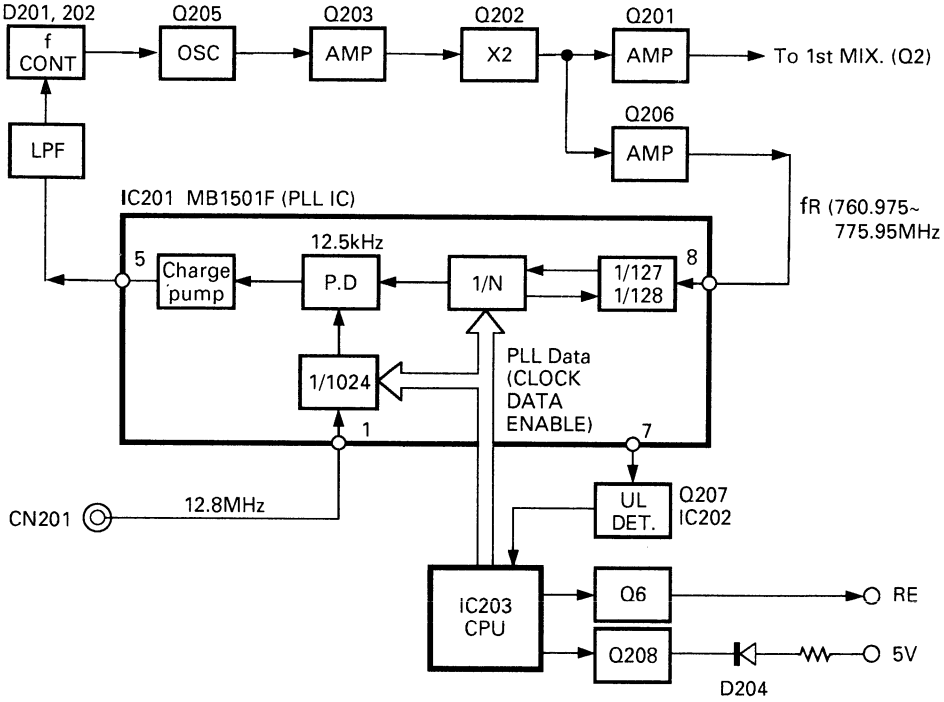


Fig. 4 RX PLL section

CIRCUIT DESCRIPTION

3. Transmitter System

3-1. Microphone Amplifier

The AF signal from the TA pin (CN104) goes through the microphone gain level potentiometer (VR105). The AF signal from at the microphone passes through the microphone gain level potentiometer (VR106). The AF signal then goes to the microphone amplifier (IC102). IC102 consists of an amplifier, a preemphasis circuit, and a splatter filter circuit, which has 24dB/octave characteristic. The output from IC102 is summed with the tone encode signal input from the TD pin (CN104). The signal is applied to the modulation input of the modulator (D205) of the frequency synthesizer and the VCXO (X201).

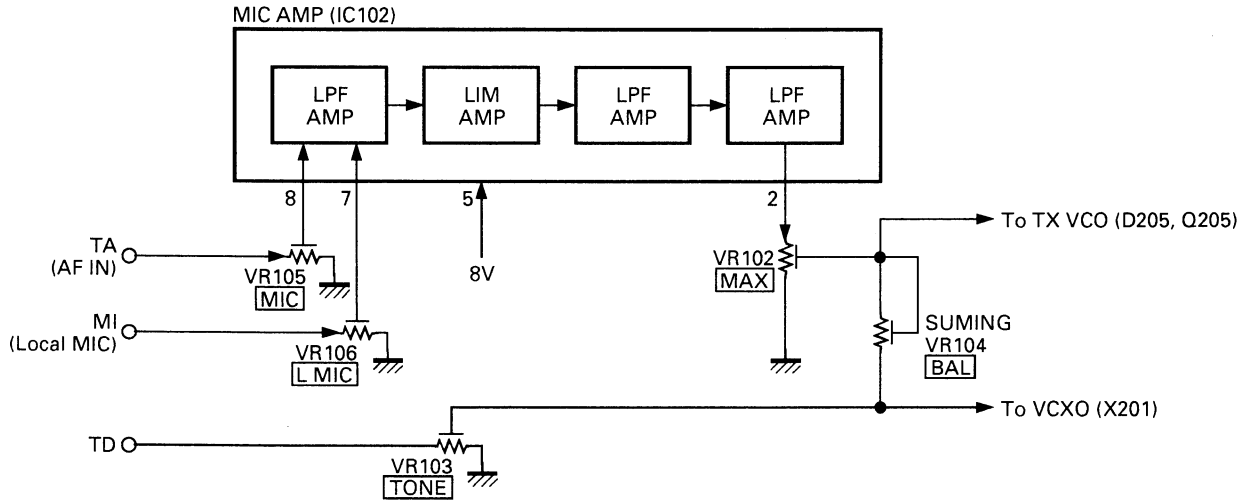


Fig. 5 Microphone amplifier

3-2. Frequency synthesizer (PLL)

The frequency synthesizer section (PLL) consists of a VCXO (X201), a VCO circuit, a phase-locked loop (PLL) circuit, and a UL detection circuit. The VCXO operates at 12.8 MHz, its frequency being maintained within ±1.5 ppm from –30 to +60°C. One signal output from the VCXO is routed to the PLL IC (IC201), and is divided by 1024 by IC201 to generate the 12.5-kHz reference signal. The other signal is amplified by Q209 and output from CN201.

The VCO is produced by Q205. The signal output from the VCO passes through a buffer amplifier (Q203) and is doubled by Q202. The RF signal is sent to two buffer amplifiers (Q201 and Q206). The output from Q201 is directed to the drive module of the transmitter circuit as the PLL output signal. The output from Q206 goes to the PLL IC (IC201).

The VCO signal and VCXO signal are divided according to the divide ratio data sent from the control section to generate the 12.5-kHz signal. The phase of the signal is compared with the reference signal. The phase difference signal is output from the phase comparator, passes through the charge pump and lug-reed low-pass filter, and is applied to D201 and D202 as the VCO control voltage to control the VCO frequency.

If the PLL is unlocked, the IC201 lock detect signal is converted to a DC signal by Q207 and IC202. One signal cuts off the power to the transmitter stage by Q102 and Q103 to stop unnecessary transmission. The other signal is sent to the microprocessor in the control section. The microprocessor outputs one UL signal to Q208 to control the LED (D204), and the other to Q106 and Q107 to control the external pin.

The modulation signal from the microphone amplifier goes to D205 to modulate the frequency.

CIRCUIT DESCRIPTION

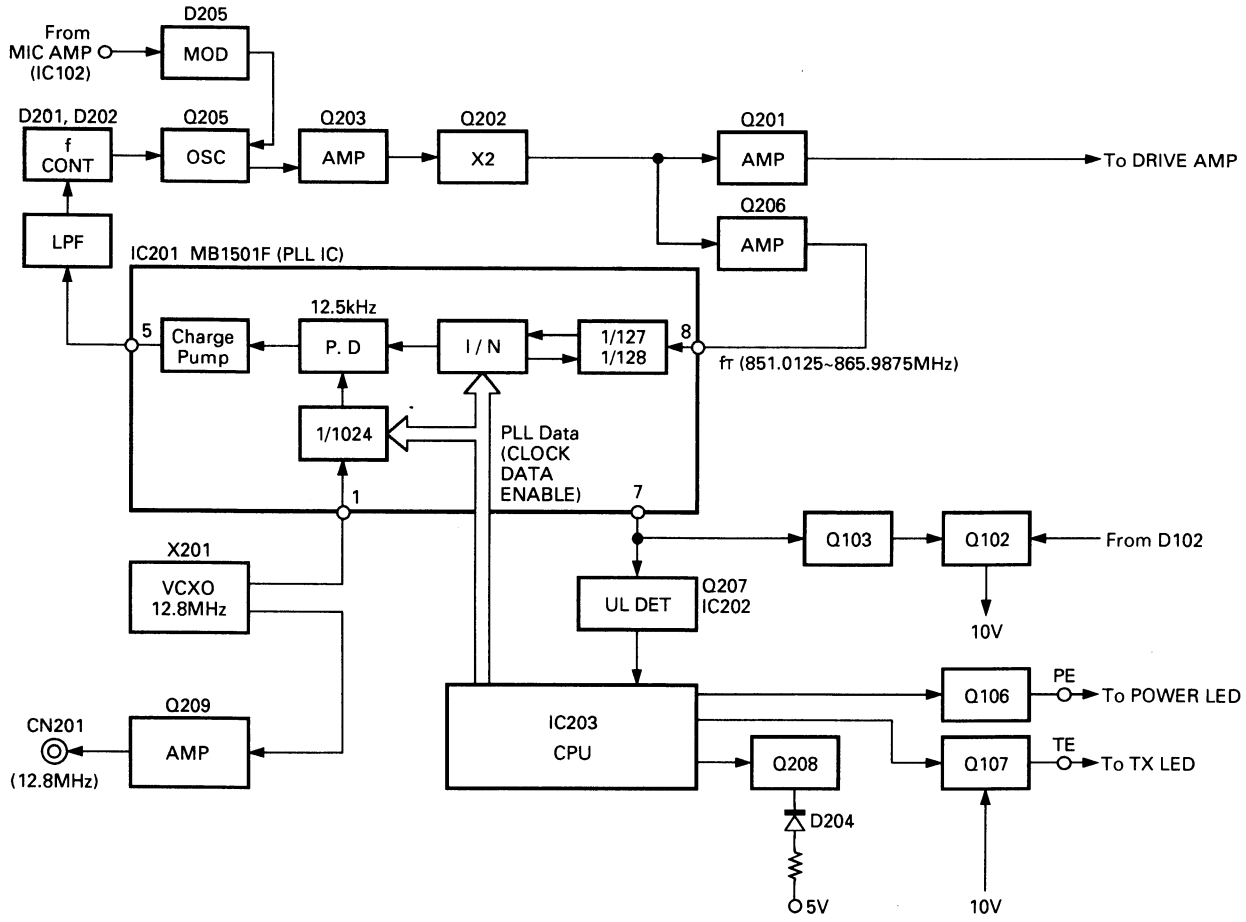


Fig. 6 TX PLL section

3-3. Drive amplifier

The RF signal output from the frequency synthesizer section (PLL) passes through band-pass filter L101, goes to high-frequency amplifier module IC101, and a 350-mW signal is output from CN101. The amplified signal is adjusted by the level potentiometer (VR101, D101). The high-frequency filter is a low-pass filter to attenuate the secondary harmonics to 30dB or less

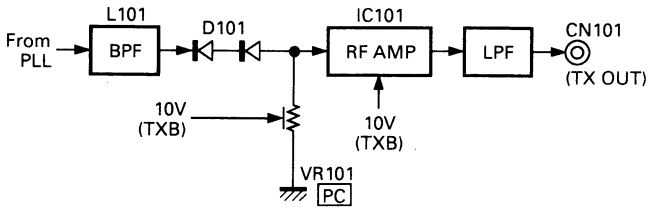


Fig. 7 Drive amplifier

3-4. Control section

The microprocessor sends frequency program data to the frequency synthesizer (PLL) according to the transmit channel data from the DIP switch (S201, S202, and S203).

The microprocessor determines whether the frequency synthesizer is locked (high). When it is locked, D204 turns off. When it is unlocked, D204 turns on, and a pulse signal is output to Q106 and Q107 to turn them on or off. (UL indicator)

When switch S204 (non-locking type) is pressed, the microprocessor is reset, and sends frequency program data to the frequency synthesizer.

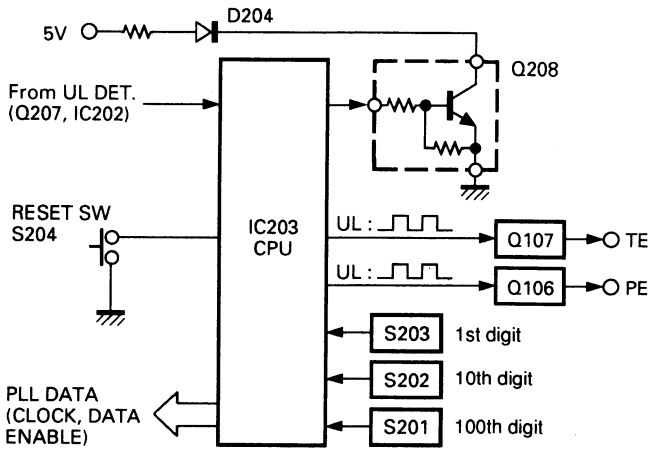
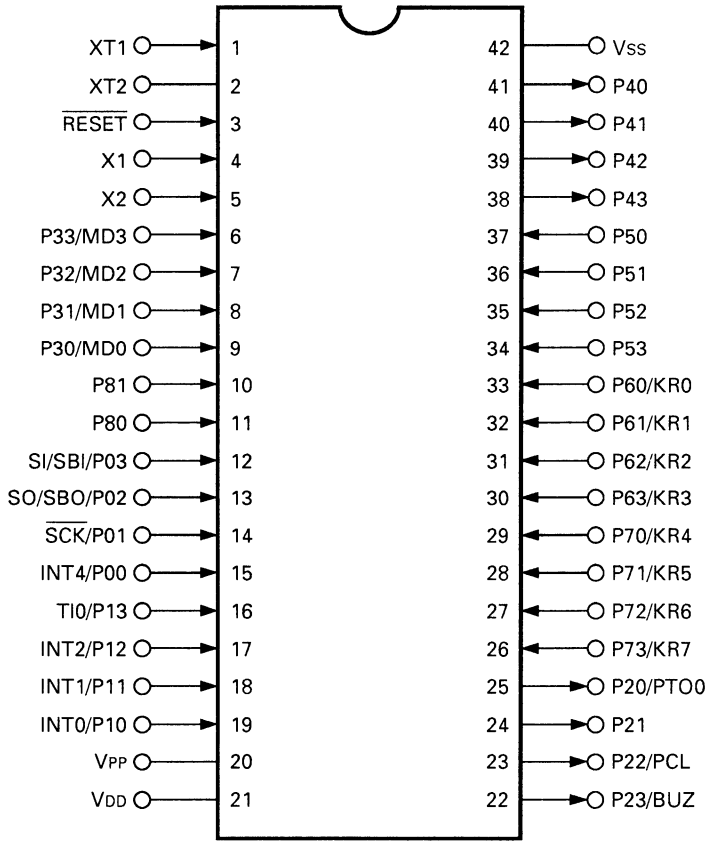


Fig. 8 TX control section

SEMICONDUCTOR DATA

Microprocessor : 75P008CUJFAA-K (IC203)

- **Terminal connection diagram**



- **Terminal function**

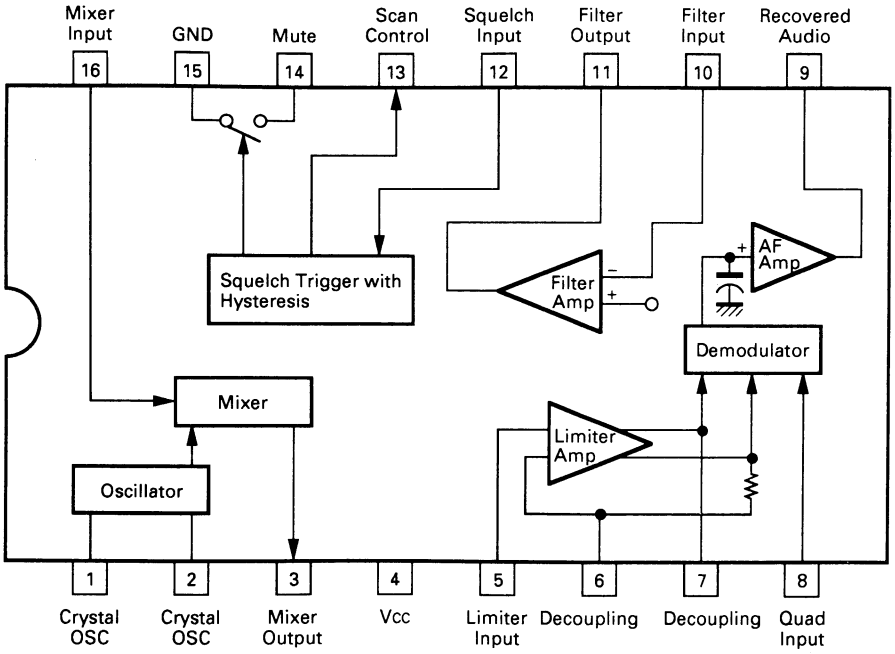
Pin No.	Pin name	I/O	Function
1	XT1	I	Sub clock (not use).
2	XT2	–	
3	RESET	I	System reset input.
4	X1	I	System clock oscillator port.
5	X2	I	
6	P33/MD3	I	1st-digit channel setting.
7	P32/MD2	I	
8	P31/MD1	I	
9	P30/MD0	I	
10	P81	I	Not use.
11	P80	I	
12	SI/SBI/P03	I	
13	SO/SBO/P02	I	
14	SCK/P01	I	
15	INT4/P00	I	Wake up input.
16	TIO/P13	I	Open (not use).
17	INT2/P12	I	
18	INT1/P11	I	Unlock signal input.
19	INT0/P10	I	Open (not use).
20	VPP	–	+5V.
21	VDD	–	

Pin No.	Pin name	I/O	Function
22	P23/BUZ	O	RX enable output.
23	P22/PCL	O	TX enable output.
24	P21	O	Data output.
25	P20/PTO0	O	Clock output.
26	P73/KR7	I	100th-digit channel setting.
27	P72/KR6	I	
28	P71/KR5	I	
29	P70/KR4	I	
30	P63/KR3	I	10th-digit channel setting.
31	P62/KR2	I	
32	P61/KR1	I	
33	P60/KR0	I	
34	P53	I	Pull down.
35	P52	I	RX : "L", TX : "H"
36	P51	I	–12.5kHz when cut the R273.
37	P50	I	Pull up.
38	P43	O	Power LED control.
39	P42	O	TX LED control.
40	P41	O	BUSY LED control.
41	P40	O	PILOT LED control.
42	Vss	–	GND.

SEMICONDUCTOR DATA

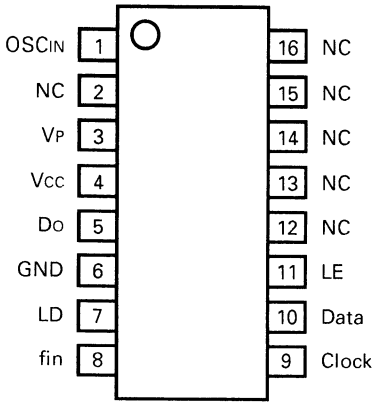
IF System : MC3371D (RX Unit IC1)

- **Terminal connection diagram**



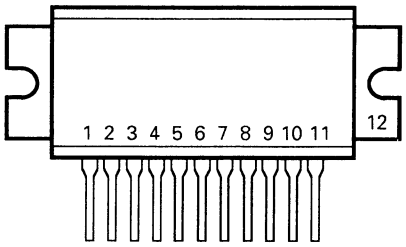
PLL System : MB1501F (IC201)

- **Terminal connection diagram**



TX Power Amplifier : M57775 (TX Unit IC101)

- **Terminal connection diagram**



1 : Input
2~4 : GND
5 : First DC supply voltage
6~8 : GND
9 : Final DC supply voltage
10 : GND
11 : Output
12 : Fin (GND)

- **Terminal function**

Pin No.	Pin name	I/O	Function
1	OSCIN	I	VCXO input.
3	VP	–	Power supply pin for charge pump input.
4	Vcc	–	Power supply pin.
5	Do	O	Charge pump output pin.
6	GND	–	GND.
7	LD	O	Phase detector output. "H" when lock.
8	fin	I	VCO input.
9	Clock	I	PLL data input (Clock).
10	Data	I	PLL data input (Data).
11	LE	I	PLL data input (LE).

- **Maximum rating** Flange temperature = 25°C

Item	Symbol	Rating	Unit
First DC supply voltage	V_{CC1}	11	Vdc
Final DC supply voltage	V_{CC2}	15	Vdc
RF input power	Pin (max)	10	mW
RF output power	Po (max)	0.8	W
Operating case temperature range	Tc (op)	–30 to +110	°C
Storage temperature range	Tstg	–40 to +110	°C
Frequency range		806 to 866	MHz

DESCRIPTION OF COMPONENTS

RX UNIT (X55-3020-10)

Ref. No.	Parts No.	Use/Function	Operation/Condition
IC1	MC3371D	IF system	See SEMICONDUCTOR DATA.
IC2	NJM4558M	Noise amplifier	
IC3	μPC1241H	AF amplifier	
IC4	KCE02	AF band pass filter	
IC5	TC4S66F	AF MUTE	OFF when busy ON.
IC6	NJM4558M	AF amplifier	
IC201	MB1501F	PLL system	See SEMICONDUCTOR DATA.
IC202	TC4S584F	Lock detector switch	"H" when lock.
IC203	75P008CUJFAA-K	Microprocessor	See SEMICONDUCTOR DATA.
IC204	M51943BML	Reset IC	
IC205	NJM78L08UA	Voltage regulator	8V
IC206	NJM78L05UA	Voltage regulator	5V
IC207	NJM78L08UA	Voltage regulator	8V
Q1	2SC4093	RF amplifier	
Q2	3SK240	RX 1st mixer	
Q3	2SC2714(Y)	RX 1st IF amplifier	45.0375MHz
Q4	2SC2712(Y)	Audio mute switch	
Q5	DTC114YK	Inverter	$\overline{\text{BUSY}}$
Q6	FMG5	DC switch	ON when Busy and unlock.
Q201	2SC3356	RF amplifier	
Q202	2SC3356	Doubler	
Q203	2SC3356	Buffer amplifier	
Q204	2SC2712(Y)	Ripple filter	7.2V
Q205	2SK508NV(K52)	Oscillator	(760.975~775.95MHz)
Q206	2SC3356	Buffer amplifier	
Q207	2SA1162(Y)	Lock detector switch	"H" when lock.
Q208	DTC114EK	DC switch	"H" when lock.
D1	HSM88AS	Noise detector	
D2	ERZ-M10DK220	Surge absorber	
D3	DSA3A1	Reverse polarity protection	
D201,202	1T33C	Tuning	
D204	B30-0838-05	LED	Light when unlock.

DESCRIPTION OF COMPONENTS

TX UNIT (X56-3020-10)

Ref. No.	Parts No.	Use/Function	Operation/Condition
IC101	M57775	TX Power amplifier	See SEMICONDUCTOR DATA.
IC102	KCA03	MIC amplifier	2 : AF OUT 7, 8 : AF IN
IC201	MB1501F	PLL system	See SEMICONDUCTOR DATA.
IC202	TS4S584F	Lock detector switch	"H" when dock.
IC203	75P008CUJFAA-K	Microprocessor	See SEMICONDUCTOR DATA.
IC204	M5193BML	Reset IC	
IC205	NJM78L08UA	Voltage regulator	8V
IC206	NJM78L05UA	Voltage regulator	5V
IC207	NJM78L08UA	Voltage regulator	8V
Q101	2SD1682(R,S)	DC switch	
Q102	2SB1119(S)	DC switch	ON when lock and PTT ON.
Q103	DTC114EK	DC switch	ON when lock.
Q104	DTA114EK	DC switch	ON when PTT ON.
Q105	DTC114EK	AF MUTE	ON when MIC PTT.
Q106	DTC114YK	DC switch	ON when lock.
Q107	FMG5	DC switch	ON when lock and PTT ON.
Q201	2SC3356	RF amplifier	
Q202	2SC3356	Doubler	
Q203	2SC3356	Buffer amplifier	
Q204	2SC2712(Y)	Ripple filter	7.2V
Q205	2SK508NV(K52)	Oscillator	(851.0125~865.9875MHz)
Q206	2SC3356	Buffer amplifier	
Q207	2SA1162(Y)	Lock detector switch	"H" when lock.
Q208	DTC114EK	DC switch	"H" when lock.
Q209	2SC2714(Y)	Buffer amplifier	(12.8MHz)
D101	1SV172	RF switch	ON when TX.
D102	02CZ10(X,Y)	Voltage reference	9.5V
D103	1SS184	Current steering	
D201,202	1T33C	Tuning	
D204	B30-0838-05	LED	Light when unlock.
D205	1SV164	Modulator	

PARTS LIST

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TKR-900

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
			TKR-900			
1	1A	*	A01-2076-02	METALLIC CABINET(UPPER)		
2	3B	*	A10-1333-02	CHASSIS		
3	1A,2B	*	A13-1604-05	FRAME(UPPER)		
4	2A,3B	*	A13-1605-05	FRAME(BOTTOM)		
5	3B	*	A40-0639-02	BOTTOM PLATE		
6	1A,3B	*	A50-0411-03	SIDE PLATE		
7	3A	*	A62-0248-05	PANEL(FRONT)		
8	1B	*	A82-0014-05	PANEL(REAR)		
10	3A		B30-0855-05	LED(TX)		
11	3A		B30-0856-05	LED(BUSY/POWER)		
12	2A,1B		B42-2437-04	S/NO LABEL(UNIT)		
13	1B		B42-3343-04	S/NO LABEL(RADIO)		
14	1B	*	B72-0537-04	MODEL NAME PLATE		
16	1B	*	E37-0334-05	CONNECTING WIRE(TX OUT)		
17	1B	*	E37-0335-05	CONNECTING WIRE(RX ANT)		
18	3A	*	E37-0336-05	CONNECTING WIRE(6P)		
-		*	E37-0337-05	CONNECTING WIRE(2P/LED)		
-		*	E37-0338-05	CONNECTING WIRE(3P/VOL)		
21	1B	*	E37-0339-15	CONNECTING WIRE(2P/DC)		
-		*	E37-0340-05	CONNECTING WIRE(2P/SP)		
-		*	E37-0342-05	CONNECTING WIRE(2P/TEST)		
24	1B	*	E37-0343-05	CONNECTING WIRE(15P/D-SUB)		
-		*	E37-0346-05	CONNECTING WIRE(1P-1P)		
-		*	E37-0378-05	CONNECTING WIRE(4P/LED)		
28	1B,1D		F06-3023-05	FUSE(3A)		
29	1A,1B		F11-1057-03	SHIELDING COVER(FRAME)		
31	3A		G09-0405-05	SPRING(VOL KNOB)		
32	3A		G10-0651-04	SHEET(SP)		
34	2C,1D	*	H10-2770-02	POLYSTYRENE FOAMED FIXTURE		
35	2D	*	H12-1453-02	PACKING FIXTURE		
36	2D		H25-0361-04	PROTECTION BAG		
37	1D		H25-0029-04	PROTECTION BAG		
38	1C		H25-0761-04	PROTECTION BAG		
39	3D	*	H52-0407-04	ITEM CARTON BOX		
41	2A,2B	*	J11-0149-05	CLAMPER		
42	1B		J13-0033-15	FUSE HOLDER		
43	3A		J19-1423-05	HOLDER(LED)		
44	3A		J21-2717-14	MOUNTING HARDWARE(SP)		
45	2A,2B		J21-4244-04	MOUNTING HARDWARE(FRAME)		
46	1B		J21-4341-04	MOUNTING HARDWARE(DC/2P)		
47	3B	*	J21-4431-04	MOUNTING HARDWARE		
48	2A,2B	*	J21-4432-05	MOUNTING HARDWARE(FRAME)		
49	1B	*	J32-0921-05	STUD & BOSS(D-SUB)		
51	1D	*	K01-0418-05	HANDLE & KNOB(ACS)		
52	3A	*	K29-4797-04	KNOB (VOL)		
A	2A,2B		N09-2084-05	SCREW		
B	1D		N16-0030-41	SPRING WASHER(D-SUB)		
C	3A,2B		N32-3006-46	FLAT HEAD MACHIN SCREW		
D	3A		N33-2606-45	OVAL HEAD MACHIN SCREW		
E	1A,3B		N35-3006-45	BINDING HEAD MACHINE SCREW		

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TKR-900
RX UNIT (X55-3020-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
F	1B		N35-3006-46	BINDING HEAD MACHINE SCREW		
G	2A,2B		N35-4006-46	BINDING HEAD MACHINE SCREW		
H	1A,1B		N87-2608-46	BRAZIER HEAD TAPTITE SCREW		
J	1B		N89-4008-45	BINDING HEAD TAPTITE SCREW		
54	3A	*	R05-3467-05	POTENTIOMETER (10K/A)		
-			R92-0150-05	JUMPER REST 0 OHM		
57	3A	*	S68-0408-05	PUSH SWITCH (TEST)		
59	3A		T07-0246-05	LOUDSPEAKER(FULLRANGE)		
61	2A	*	X55-3020-10	RX UNIT		
62	2B	*	X56-3020-10	TX UNIT		
-			212-3702-05	PLASTIC TUBE		
RX UNIT (X55-3020-10)						
101	2A		A13-0684-11	FRAME		
C1			CC73FCH1H060D	CHIP C 6PF D		
C2			CC73FCH1H010C	CHIP C 1PF C		
C3			CC73FCH1H020C	CHIP C 2.0PF C		
C4			CC73FCH1H030C	CHIP C 3PF C		
C5 ,6			CC73FCH1H1R5C	CHIP C 1.5PF C		
C7			CK73FB1H102K	CHIP C 1000PF K		
C8 ,9			CK73FB1H471K	CHIP C 470PF K		
C10 ,11			CC73FSL1H101J	CHIP C 100PF J		
C12 ,13			CK73FB1H102K	CHIP C 1000PF K		
C14			CC73FCH1H080D	CHIP C 8PF D		
C15 ,16			CK73FB1H102K	CHIP C 1000PF K		
C17			CK73FB1E104K	CHIP C 0.10UF K		
C18			C92-0009-05	CHIP TAN 4.7UF 10WV		
C19 ,20			CK73FB1E104K	CHIP C 0.10UF K		
C21			CC73FCH1H330J	CHIP C 33PF J		
C22			CK73FB1H102K	CHIP C 1000PF K		
C23			CC73FCH1H100D	CHIP C 10PF D		
C24			CK73FB1H102K	CHIP C 1000PF K		
C25 ,26			CC73FCH1H680J	CHIP C 68PF J		
C27 ,28			CC73FCH1H470J	CHIP C 47PF J		
C29			CK73FB1E223K	CHIP C 0.022UF K		
C30			CE04EW1C470M	ELECTRO 47UF 16WV		
C32			CE04EW1C470M	ELECTRO 47UF 16WV		
C33			CK73FB1H102K	CHIP C 1000PF K		
C34			CK73FB1E103K	CHIP C 0.01UF K		
C35 -37			CE04EW1C470M	ELECTRO 47UF 16WV		
C38			CK73FB1E103K	CHIP C 0.01UF K		
C39 ,40			CE04EW1C470M	ELECTRO 47UF 16WV		
C41			CE04EW1E470M	ELECTRO 47UF 25WV		
C42			CK73FB1E103K	CHIP C 0.01UF K		
C43			CQ92M1H104K	MYLAR 0.10UF K		
C44			CE04EW1E471M	ELECTRO 470UF 25WV		
C45			CK73FB1H102K	CHIP C 1000PF K		
C46 ,47			CK73FB1H471K	CHIP C 470PF K		
C48			CE04EW1C470M	ELECTRO 47UF 16WV		
C49			CK73FB1E104K	CHIP C 0.10UF K		
C50			CE04EW1C470M	ELECTRO 47UF 16WV		
C51			CK73FB1H103K	CHIP C 0.010UF K		

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RX UNIT (X55-3020-10)

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C52 -58			CC73FSL1H101J	CHIP C 100PF J		
C201			CC73FCH1H030C	CHIP C 3PF C		
C204			CK73FB1H103K	CHIP C 0.010UF K		
C205			CC73FCH1H010C	CHIP C 1PF C		
C206,207			CK73FB1H471K	CHIP C 470PF K		
C208			CC73FCH1H030C	CHIP C 3PF C		
C209			CC73FCH1H020C	CHIP C 2.0PF C		
C210			CC73FCH1H470J	CHIP C 47PF J		
C211			CC73FCH1H030C	CHIP C 3PF C		
C212			CC73FCH1H040C	CHIP C 4PF C		
C213,214			CK73FB1H102K	CHIP C 1000PF K		
C215			CC73FCH1H010C	CHIP C 1PF C		
C216			CC73FCH1H180J	CHIP C 18PF J		
C217			CK73FB1H471K	CHIP C 470PF K		
C218			CC73FCH1H100D	CHIP C 10PF D		
C219			CC73FCH1H090D	CHIP C 9PF D		
C220			CC73FCH1H150J	CHIP C 15PF J		
C221			CC73FCH1H070D	CHIP C 7PF D		
C222			CK73FB1H471K	CHIP C 470PF K		
C223			CK73FB1H102K	CHIP C 1000PF K		
C224,225			C92-0514-05	CHIP TAN 2.2UF 10WV		
C226			CE04EW1C470M	ELECTRO 47UF 16WV		
C228			CC73FCH1H010C	CHIP C 1PF C		
C229			CK73FB1H102K	CHIP C 1000PF K		
C230			CC73FCH1H100D	CHIP C 10PF D		
C231			CC73FCH1H020C	CHIP C 2.0PF C		
C232,233			C92-0543-05	ELECTROLYTIC C.(LEADLESS)		
C234			CK73FB1H102K	CHIP C 1000PF K		
C235			C92-0004-05	ELECTRO 1.0UF 16WV		
C236			CK73FB1H102K	CHIP C 1000PF K		
C237			C92-0004-05	ELECTRO 1.0UF 16WV		
C238			CC73FSL1H101J	CHIP C 100PF J		
C239,240			CC73FCH1H100D	CHIP C 10PF D		
C241-245			CC73FSL1H101J	CHIP C 100PF J		
C246			CK73FB1H102K	CHIP C 1000PF K		
C255			CK73FB1H102K	CHIP C 1000PF K		
C260,261			CK73FB1H102K	CHIP C 1000PF K		
C262			CE04EW1C101M	ELECTRO 100UF 16WV		
C263,264			CK73FB1H102K	CHIP C 1000PF K		
C265			CE04EW1C101M	ELECTRO 100UF 16WV		
C266			CK73FB1H102K	CHIP C 1000PF K		
C267			CE04EW1C101M	ELECTRO 100UF 16WV		
C268			CK73FB1H102K	CHIP C 1000PF K		
C269			CE04EW1A221M	ELECTRO 220UF 10WV		
C272			CK73FB1E333K	CHIP C 0.033UF K		
C273			CK73FB1H102K	CHIP C 1000PF K		
CN2			E40-3237-05	PIN ASSY(2P)		
CN3			E40-3239-05	PIN ASSY(4P)		
CN4			E40-3243-05	PIN ASSY(8P)		
CN6			E40-3238-05	PIN ASSY(3P)		
CN7			E40-3237-05	PIN ASSY(2P)		
CN8			E04-0174-05	RF COAXIAL CABLE RECEPTACLE		
CN201			E04-0174-05	RF COAXIAL CABLE RECEPTACLE		
CN202			E23-0467-05	TERMINAL (TEST)		

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102	2A	*	F10-2081-04	SHIELDING PLATE(PLL)		
-		*	F10-2082-04	SHIELDING PLATE(VCO)		
104	1A		G02-0570-04	LEAF SPRING (AF)		
105	2A	*	G02-0741-04	LEAF SPRING (FRONT)		
-			J30-0545-05	SPACER (X1)		
106	2A	*	K23-0901-05	KNOB (CH SW)		
CF1			L72-0342-05	CERAMIC FILTER(455KHZ)		
L1			L34-1306-15	COIL		
L2		*	L79-1062-05	FILTER(2R-815MHZ)		
L3			L40-1072-48	SMALL FIXED INDUCTOR(10NH)		
L4		*	L79-1063-05	FILTER(3R-815MHZ)		
L6			L34-4241-05	COIL		
L7			L30-0503-05	IFT		
L8			L40-6882-48	SMALL FIXED INDUCTOR(680NH)		
L201			L40-1072-48	SMALL FIXED INDUCTOR(10NH)		
L202			L40-1572-48	SMALL FIXED INDUCTOR(15NH)		
L203			L40-3372-48	SMALL FIXED INDUCTOR(33NH)		
L204			L40-1092-48	SMALL FIXED INDUCTOR(1UH)		
L205			L40-2292-48	SMALL FIXED INDUCTOR(2.2UH)		
L206,207			L40-1092-48	SMALL FIXED INDUCTOR(1UH)		
L208			L40-1072-48	SMALL FIXED INDUCTOR(10NH)		
L209			L34-4240-05	COIL		
L210			L92-0130-05	CORE		
X1			L77-1431-05	CRYSTAL RESONATOR(44.5825MHZ)		
X202			L78-0017-05	RESONATOR (4.194MHZ)		
XF1			L71-0429-05	CRYSTAL FILTER(45.0375MHZ)		
K	2A		N87-2608-46	BRAZIER HEAD TAPTITE SCREW		
R1			R92-0670-05	CHIP R 0 OHM		
R2			RK73FB2A470J	CHIP R 47 J 1/10W		
R3			RK73FB2A473J	CHIP R 47K J 1/10W		
R4			RK73FB2A271J	CHIP R 270 J 1/10W		
R5			RK73FB2A471J	CHIP R 470 J 1/10W		
R6			RK73FB2A103J	CHIP R 10K J 1/10W		
R7			RK73FB2A101J	CHIP R 100 J 1/10W		
R8			RK73FB2A681J	CHIP R 680 J 1/10W		
R9			RK73FB2A684J	CHIP R 680K J 1/10W		
R10 ,11			RK73FB2A223J	CHIP R 22K J 1/10W		
R12			RK73FB2A331J	CHIP R 330 J 1/10W		
R13			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R14			RK73FB2A334J	CHIP R 330K J 1/10W		
R15			RK73FB2A474J	CHIP R 470K J 1/10W		
R16			RK73FB2A103J	CHIP R 10K J 1/10W		
R17			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R18			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R21			RK73FB2A101J	CHIP R 100 J 1/10W		
R22			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R23			RK73FB2A103J	CHIP R 10K J 1/10W		
R24			RK73FB2A393J	CHIP R 39K J 1/10W		
R25			RK73FB2A331J	CHIP R 330 J 1/10W		
R26			RK73FB2A2R2J	CHIP R 2.2 J 1/10W		
R27			RK73FB2A103J	CHIP R 10K J 1/10W		
R28 ,29			R92-0699-05	SOLID 10 1/2W		

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RX UNIT (X55-3020-10)

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R30			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R31			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R32			RK73FB2A473J	CHIP R 47K J 1/10W		
R34			RK73FB2A273J	CHIP R 27K J 1/10W		
R35 ,36			RK73FB2A103J	CHIP R 10K J 1/10W		
R37 ,38			RK73FB2A104J	CHIP R 100K J 1/10W		
R39 ,40			RK73FB2A103J	CHIP R 10K J 1/10W		
R41			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R42			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R43 ,44			RK73FB2A104J	CHIP R 100K J 1/10W		
R45 ,46			RK73FB2A103J	CHIP R 10K J 1/10W		
R47			R92-0670-05	CHIP R 0 ΩHM		
R49 ,50			R92-0670-05	CHIP R 0 ΩHM		
R201			RK73FB2A180J	CHIP R 18 J 1/10W		
R202,203			RK73FB2A271J	CHIP R 270 J 1/10W		
R204			RK73FB2A181J	CHIP R 180 J 1/10W		
R205			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R206			RK73FB2A183J	CHIP R 18K J 1/10W		
R207			RK73FB2A101J	CHIP R 100 J 1/10W		
R208			RK73FB2A473J	CHIP R 47K J 1/10W		
R209,210			RK73FB2A101J	CHIP R 100 J 1/10W		
R211			RK73FB2A103J	CHIP R 10K J 1/10W		
R212			RK73FB2A223J	CHIP R 22K J 1/10W		
R213			RK73FB2A101J	CHIP R 100 J 1/10W		
R214			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R215			RK73FB2A101J	CHIP R 100 J 1/10W		
R216			RK73FB2A181J	CHIP R 180 J 1/10W		
R217			RK73FB2A221J	CHIP R 220 J 1/10W		
R218-220			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R221			RK73FB2A561J	CHIP R 560 J 1/10W		
R222			RK73FB2A473J	CHIP R 47K J 1/10W		
R223			RK73FB2A104J	CHIP R 100K J 1/10W		
R224			RK73FB2A103J	CHIP R 10K J 1/10W		
R225			RK73FB2A223J	CHIP R 22K J 1/10W		
R226			RK73FB2A470J	CHIP R 47 J 1/10W		
R227			RK73FB2A101J	CHIP R 100 J 1/10W		
R228,229			RK73FB2A100J	CHIP R 10 J 1/10W		
R230			R92-0670-05	CHIP R 0 ΩHM		
R231			RK73FB2A333J	CHIP R 33K J 1/10W		
R232			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R233			RK73FB2A123J	CHIP R 12K J 1/10W		
R234			RK73FB2A473J	CHIP R 47K J 1/10W		
R239			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R240			RK73FB2A473J	CHIP R 47K J 1/10W		
R241			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R244			R92-0670-05	CHIP R 0 ΩHM		
R245			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R246			R92-0670-05	CHIP R 0 ΩHM		
R247,248			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R249-255			RK73FB2A473J	CHIP R 47K J 1/10W		
R256			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R257			RK73FB2A473J	CHIP R 47K J 1/10W		
R260			RK73FB2A473J	CHIP R 47K J 1/10W		
R272,273			R92-0150-05	JUMPER REST 0 ΩHM		
R274			R92-0670-05	CHIP R 0 ΩHM		

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RX UNIT (X55-3020-10)
TX UNIT (X56-3020-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R276			RK73FB2A473J	CHIP R 47K J 1/10W		
R277			R92-0670-05	CHIP R 0 ΩHM		
R278			R92-0670-05	CHIP R 0 ΩHM		
R279-281			R92-0670-05	CHIP R 0 ΩHM		
VR1 ,2			R12-3132-05	TRIM PΩT. 47K		
S201-203		*	S79-0408-05	SWITCH(CH)		
S204			S40-2446-05	PUSH SWITCH		
D1			HSM88AS	DIΩDE		
D2			ERZ-M10DK220	SURGE ABSΩRBER		
D3			DSA3A1	DIΩDE		
D201,202			1T33C	DIΩDE		
D204			B30-0838-05	LED		
IC1			MC3371D	IC(FM IF)		
IC2			NJM4558M	IC(ΩP AMP X2)		
IC3			UPC1241H	IC		
IC4			KCE02	IC(AF BPF)		
IC5			TC4S66F	IC(BILATERAL SWITCH)		
IC6			NJM4558M	IC(ΩP AMP X2)		
IC201			MB1501F	IC(PLL FREΩ SYNTHESIZER)		
IC202			TC4S584F	IC(SCHMITT TRIGGER)		
IC203		*	75P008CUJFAA-K	IC (CPU)		
IC204			M51943BML	IC(SYSTEM RESET)		
IC205			NJM78L08UA	IC(VΩLTAGE REGULATΩR/ +8V)		
IC206			NJM78L05UA	IC(VΩLTAGE REGULATΩR/ +5V)		
IC207			NJM78L08UA	IC(VΩLTAGE REGULATΩR/ +8V)		
Q1			2SC4093	TRANSISTΩR		
Q2			3SK240	FET		
Q3			2SC2714(Y)	TRANSISTΩR		
Q4			2SC2712(Y)	TRANSISTΩR		
Q5			DTC114YK	DIGITAL TRANSISTΩR		
Q6			FMG5	TRANSISTΩR		
Q201-203			2SC3356	TRANSISTΩR		
Q204			2SC2712(Y)	TRANSISTΩR		
Q205			2SK508NV(K52)	FET		
Q206			2SC3356	TRANSISTΩR		
Q207			2SA1162(Y)	TRANSISTΩR		
Q208			DTC114EK	DIGITAL TRANSISTΩR		
TH1			157-102-55008	THERMISTER(1K)		
TX UNIT (X56-3020-10)						
201	2B		A13-0684-11	FRAME		
C44			CE04EW1E471M	ELECTRΩ 470UF 25WV		
C101-103			CK73FB1H471K	CHIP C 470PF K		
C104,105			CC73FCH1H1R5C	CHIP C 1.5PF C		
C106			CK73FB1H102K	CHIP C 1000PF K		
C107			CK73FB1E103K	CHIP C 0.01UF K		
C108			CK73FB1H471K	CHIP C 470PF K		
C109			CK73FB1H102K	CHIP C 1000PF K		
C111			CK73FB1H102K	CHIP C 1000PF K		
C112-118			CK73FB1H471K	CHIP C 470PF K		
C119			CC73FCH1H470J	CHIP C 47PF J		
C120			CK73FB1E183K	CHIP C 0.018UF K		
C121-124			CC73FSL1H101J	CHIP C 100PF J		
C201,202			CK73FB1H102K	CHIP C 1000PF K		

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C203			CC73FCH1H020C	CHIP C 2.0PF C		
C204			CC73FCH1H470J	CHIP C 47PF J		
C205			CC73FCH1H040C	CHIP C 4PF C		
C206			CC73FCH1H100D	CHIP C 10PF D		
C207			CK73FB1H471K	CHIP C 470PF K		
C208,209			CC73FCH1H030C	CHIP C 3PF C		
C210			CK73FB1H471K	CHIP C 470PF K		
C211			CC73FCH1H030C	CHIP C 3PF C		
C212			CC73FCH1H040C	CHIP C 4PF C		
C213,214			CK73FB1H102K	CHIP C 1000PF K		
C215			CC73FCH1H010C	CHIP C 1PF C		
C216			CC73FCH1H150J	CHIP C 15PF J		
C217			CK73FB1H471K	CHIP C 470PF K		
C218			CC73FCH1H100D	CHIP C 10PF D		
C219			CC73FCH1H080D	CHIP C 8PF D		
C220			CC73FCH1H110J	CHIP C 11PF J		
C221			CC73FCH1H030C	CHIP C 3PF C		
C222			CK73FB1H471K	CHIP C 470PF K		
C223			CK73FB1H102K	CHIP C 1000PF K		
C224,225			C92-0001-05	CHIP TAN 0.1UF 35WV		
C228			CC73FCH1H010C	CHIP C 1PF C		
C229			CK73FB1H102K	CHIP C 1000PF K		
C230			CC73FCH1H100D	CHIP C 10PF D		
C231			CC73FCH1H020C	CHIP C 2.0PF C		
C232,233			C92-0543-05	ELECTROLYTIC C.(LEADLESS)		
C234			CK73FB1H102K	CHIP C 1000PF K		
C235			C92-0004-05	ELECTRO 1.0UF 16WV		
C236			CK73FB1H102K	CHIP C 1000PF K		
C237			C92-0004-05	ELECTRO 1.0UF 16WV		
C238			CC73FSL1H101J	CHIP C 100PF J		
C239,240			CC73FCH1H100D	CHIP C 10PF D		
C241-245			CC73FSL1H101J	CHIP C 100PF J		
C246			CK73FB1H102K	CHIP C 1000PF K		
C248-251			CK73FB1H102K	CHIP C 1000PF K		
C252			CC73FCH1H220J	CHIP C 22PF J		
C253			CC73FCH1H060D	CHIP C 6PF D		
C254			C92-0009-05	CHIP TAN 4.7UF 10WV		
C255			CK73FB1H102K	CHIP C 1000PF K		
C256			C92-0543-05	ELECTROLYTIC C.(LEADLESS)		
C257			CC73FCH1H0R5C	CHIP C 0.5PF C		
C260,261			CK73FB1H102K	CHIP C 1000PF K		
C262			CE04EW1C101M	ELECTRO 100UF 16WV		
C263,264			CK73FB1H102K	CHIP C 1000PF K		
C265			CE04EW1C101M	ELECTRO 100UF 16WV		
C266			CK73FB1H102K	CHIP C 1000PF K		
C267			CE04EW1C101M	ELECTRO 100UF 16WV		
C268			CK73FB1H102K	CHIP C 1000PF K		
C269			CE04EW1A221M	ELECTRO 220UF 10WV		
C270			CK73FB1H102K	CHIP C 1000PF K		
C271			CE04EW1C100M	ELECTRO 10UF 16WV		
C272			CK73FB1H333K	CHIP C 0.033UF K		
C273			CK73FB1H102K	CHIP C 1000PF K		
CN101			E04-0174-05	RF COAXIAL CABLE RECEPTACLE		
CN102			E40-3237-05	PIN ASSY(2P)		

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CN103			E40-3239-05	PIN ASSY(4P)		
CN104			E40-3240-05	PIN ASSY(5P)		
CN105			E40-3237-05	PIN ASSY(2P)		
CN106			E40-3239-05	PIN ASSY(4P)		
CN201			E04-0174-05	RF COAXIAL CABLE RECEPTACLE		
CN202			E23-0467-05	TERMINAL (TEST)		
202	2B	*	F10-2081-04	SHIELDING PLATE(PLL)		
-		*	F10-2082-04	SHIELDING PLATE(PLL)		
203	1B		G02-0597-04	LEAF SPRING (MODULE)		
204	1B		G02-0711-04	LEAF SPRING (AVR)		
205	2B	*	G02-0741-04	LEAF SPRING (FINAL)		
206	2B	*	K23-0901-05	KNOB (CH SW)		
L101		*	L79-1061-05	FILTER(2R-860MHZ)		
L201			L40-1072-48	SMALL FIXED INDUCTOR(10NH)		
L202			L40-1572-48	SMALL FIXED INDUCTOR(15NH)		
L203			L40-3372-48	SMALL FIXED INDUCTOR(33NH)		
L204			L40-1092-48	SMALL FIXED INDUCTOR(1UH)		
L205			L40-2292-48	SMALL FIXED INDUCTOR(2.2UH)		
L206,207			L40-1092-48	SMALL FIXED INDUCTOR(1UH)		
L208			L40-1072-48	SMALL FIXED INDUCTOR(10NH)		
L209			L34-4240-05	COIL		
L210			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L211			L40-1072-48	SMALL FIXED INDUCTOR(10NH)		
L212			L92-0130-05	CORE		
X201			L77-1529-05	CRYSTAL RESONATOR(12.8MHZ)		
X202			L78-0017-05	RESONATOR(4.194MHZ)		
L	2B		N87-2608-46	BRAZIER HEAD TAPTITE SCREW		
R101,102			RK73FB2A271J	CHIP R 270 J 1/10W		
R103,104			R92-0699-05	SOLID 10 1/2W		
R105			R92-0679-05	CHIP R 0 OHM		
R106-108			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R109			R92-0670-05	CHIP R 0 OHM		
R110,111			RK73FB2A223J	CHIP R 22K J 1/10W		
R112			RK73FB2A104J	CHIP R 100K J 1/10W		
R113,114			RK73FB2A223J	CHIP R 22K J 1/10W		
R115			RK73FB2A561J	CHIP R 560 J 1/10W		
R116			RK73FB2A103J	CHIP R 10K J 1/10W		
R117			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R118			R92-0670-05	CHIP R 0 OHM		
R119			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R120			R92-0670-05	CHIP R 0 OHM		
R121			RK73FB2A473J	CHIP R 47K J 1/10W		
R201			R92-0670-05	CHIP R 0 OHM		
R204			RK73FB2A470J	CHIP R 47 J 1/10W		
R205			RK73FB2A103J	CHIP R 10K J 1/10W		
R206			RK73FB2A333J	CHIP R 33K J 1/10W		
R207			RK73FB2A101J	CHIP R 100 J 1/10W		
R208			RK73FB2A473J	CHIP R 47K J 1/10W		
R209			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R210			RK73FB2A101J	CHIP R 100 J 1/10W		
R211			RK73FB2A103J	CHIP R 10K J 1/10W		
R212			RK73FB2A223J	CHIP R 22K J 1/10W		

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R213			RK73FB2A101J	CHIP R 100 J 1/10W		
R214			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R215			RK73FB2A101J	CHIP R 100 J 1/10W		
R216			RK73FB2A181J	CHIP R 180 J 1/10W		
R217			RK73FB2A221J	CHIP R 220 J 1/10W		
R218-220			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R221			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R222			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R223			RK73FB2A104J	CHIP R 100K J 1/10W		
R224			RK73FB2A103J	CHIP R 10K J 1/10W		
R225			RK73FB2A223J	CHIP R 22K J 1/10W		
R226			RK73FB2A101J	CHIP R 100 J 1/10W		
R227			RK73FB2A471J	CHIP R 470 J 1/10W		
R228,229			RK73FB2A100J	CHIP R 10 J 1/10W		
R230			R92-0670-05	CHIP R 0 ØHM		
R231			RK73FB2A333J	CHIP R 33K J 1/10W		
R232			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R233			RK73FB2A123J	CHIP R 12K J 1/10W		
R234			RK73FB2A473J	CHIP R 47K J 1/10W		
R239			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R240			RK73FB2A473J	CHIP R 47K J 1/10W		
R241			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R242,243			R92-0670-05	CHIP R 0 ØHM		
R246-248			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R249			RK73FB2A473J	CHIP R 47K J 1/10W		
R251-255			RK73FB2A473J	CHIP R 47K J 1/10W		
R256			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R257-262			RK73FB2A473J	CHIP R 47K J 1/10W		
R264			RK73FB2A473J	CHIP R 47K J 1/10W		
R265			RK73FB2A391J	CHIP R 390 J 1/10W		
R266			RK73FB2A683J	CHIP R 68K J 1/10W		
R268			RK73FB2A101J	CHIP R 100 J 1/10W		
R269			RK73FB2A563J	CHIP R 56K J 1/10W		
R270			RK73FB2A101J	CHIP R 100 J 1/10W		
R271			RK73FB2A103J	CHIP R 10K J 1/10W		
R272,273			R92-0150-05	JUMPER REST 0 ØHM		
R276,277			R92-0670-05	CHIP R 0 ØHM		
R279-281			R92-0670-05	CHIP R 0 ØHM		
VR101-103			R12-3132-05	TRIM PØT. 47K		
VR104			R12-5058-05	TRIM PØT. 100K		
VR105,106			R12-3132-05	TRIM PØT. 47K		
S201-203		*	S79-0408-05	SWITCH (CH)		
S204			S40-2446-05	PUSH SWITCH		
D101			1SV172	DIØDE		
D102			02CZ10(X,Y)	DIØDE		
D103			1SS184	DIØDE		
D201,202			1T33C	DIØDE		
D204			B30-0838-05	LED		
D205			1SV164	DIØDE		
IC101			M57775	IC(PØWER MØDULE)		
IC102			KCA03	IC(MIC AMP)		
IC201			MB1501F	IC(PLL FREQ SYNTHESIZER)		
IC202			TC4S584F	IC(SCHMITT TRIGGER)		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
IC203		*	75P008CUJFAA-K	IC(CPU)		
IC204			M51943BML	IC(SYSTEM RESET)		
IC205			NJM78L08UA	IC(VOLTAGE REGULATOR/ +8V)		
IC206			NJM78L05UA	IC(VOLTAGE REGULATOR/ +5V)		
IC207			NJM78L08UA	IC(VOLTAGE REGULATOR/ +8V)		
Q101			2SD1682(R,S)	TRANSISTOR		
Q102			2SB1119(S)	TRANSISTOR		
Q103			DTC114EK	DIGITAL TRANSISTOR		
Q104			DTA114EK	DIGITAL TRANSISTOR		
Q105			DTC114EK	DIGITAL TRANSISTOR		
Q106			DTC114YK	DIGITAL TRANSISTOR		
Q107			FMG5	TRANSISTOR		
Q201-203			2SC3356	TRANSISTOR		
Q204			2SC2712(Y)	TRANSISTOR		
Q205			2SK508NV(K52)	FET		
Q206			2SC3356	TRANSISTOR		
Q207			2SA1162(Y)	TRANSISTOR		
Q208			DTC114EK	DIGITAL TRANSISTOR		
Q209			2SC2714(Y)	TRANSISTOR		
TH101			157-502-55007	THERMISTER(5K)		
TH201			157-502-55007	THERMISTER(5K)		

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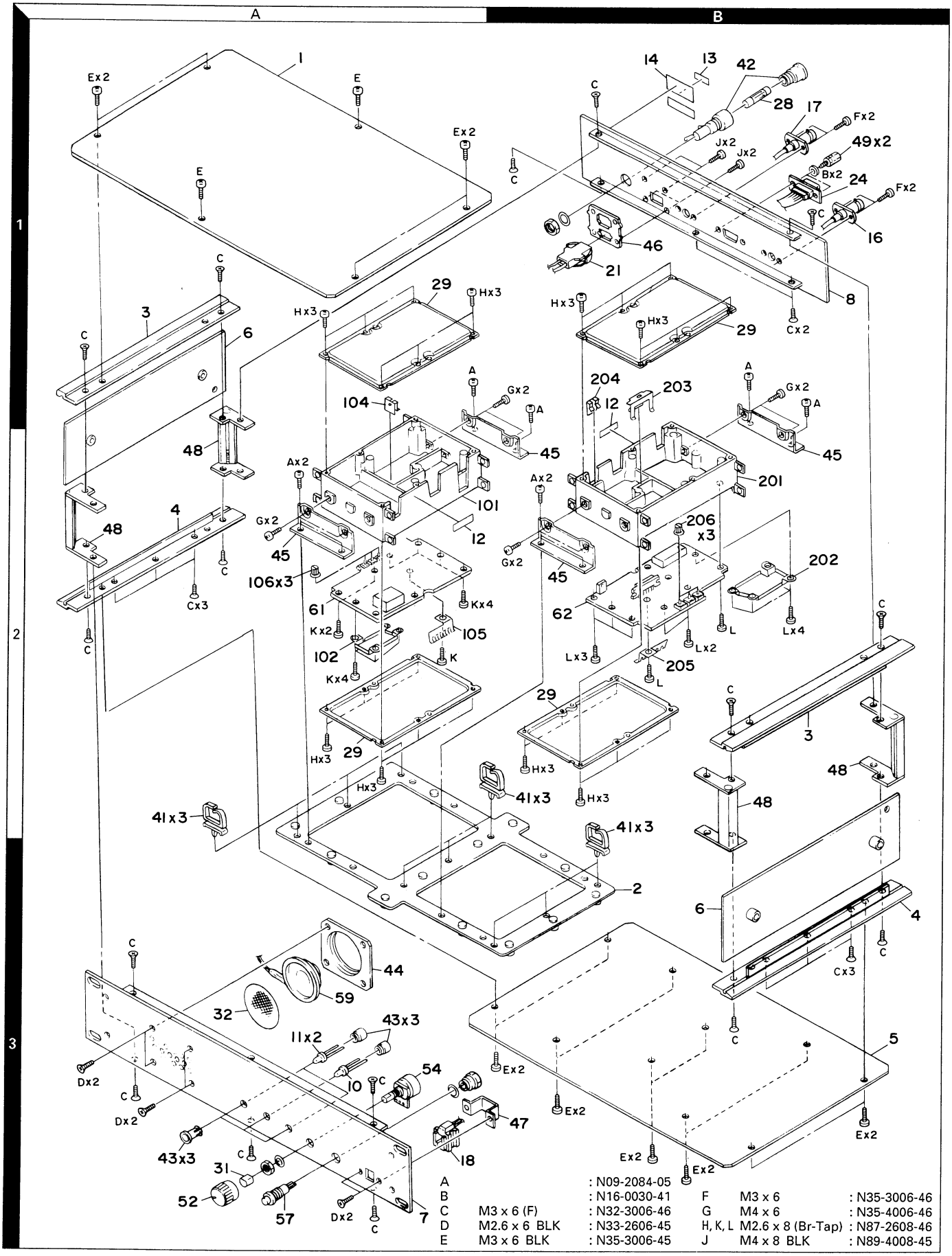
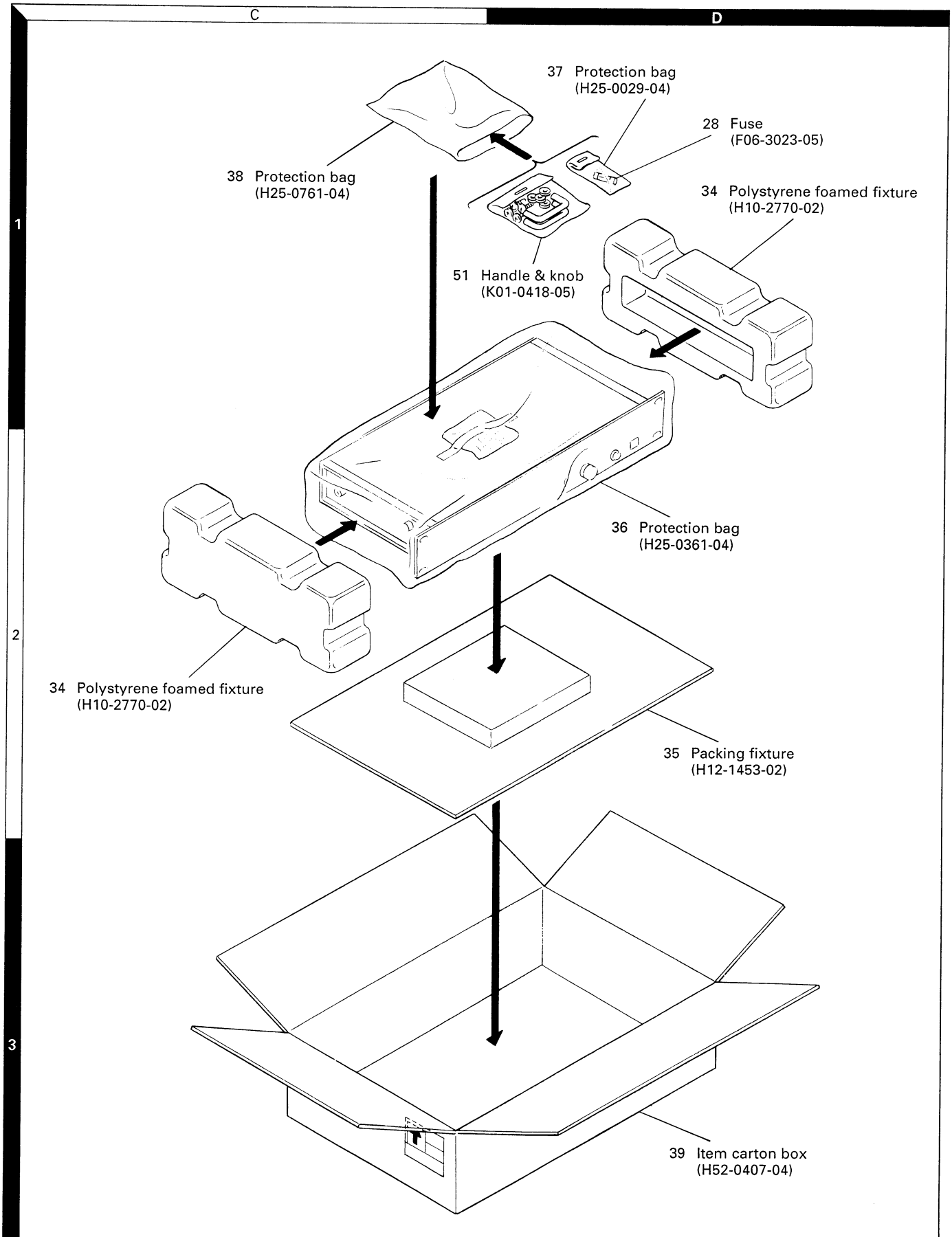
TKR-900

EXPLODED VIEW



A		: N09-2084-05	F	M3 x 6	: N35-3006-46		
B		: N16-0030-41	G	M4 x 6	: N35-4006-46		
C	M3 x 6 (F)	: N32-3006-46	H, K, L	M2.6 x 8 (Br-Tap)	: N87-2608-46		
D	M2.6 x 6 BLK	: N33-2606-45	J	M4 x 8 BLK	: N89-4008-45		
E	M3 x 6 BLK	: N35-3006-45					

PACKING


C
D
1
2
3
37 Protection bag
(H25-0029-04)
28 Fuse
(F06-3023-05)
38 Protection bag
(H25-0761-04)
34 Polystyrene foamed fixture
(H10-2770-02)
51 Handle & knob
(K01-0418-05)
36 Protection bag
(H25-0361-04)
34 Polystyrene foamed fixture
(H10-2770-02)
35 Packing fixture
(H12-1453-02)
39 Item carton box
(H52-0407-04)

ADJUSTMENT

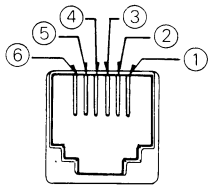
Test Equipment Required for Alignment

No.	Test Equipment	Major Specifications	
1	Standard Signal Generator (SSG)	Frequency Range Modulation Output	800 to 900MHz. Frequency modulation and external modulation. 0.1μV to greater than 1mV.
2	Power Meter	Input Impedance Operation Frequency Measurement Capability	50Ω. 800 to 900MHz or more. Vicinity of 1W.
3	Deviation Meter	Frequency Range	800 to 900MHz.
4	Digital Volt Meter (DVM)	Measuring Range Accuracy	1 to 20V DC. High input impedance for minimum circuit loading.
5	Oscilloscope		DC through 30MHz.
6	High Sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 1GHz. 0.2ppm or less.
7	Ammeter		3A.
8	AF Volt Meter (AFVTVM)	Frequency Range Voltage Range	50Hz to 10kHz. 3mV to 3V.
9	Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz or more. 0 to 1V.
10	Distortion Meter	Capability Input Level	3% or less at 1kHz. 50mV to 10Vrms.
11	Voltmeter	Measuring Range Input Impedance	20 to 1.5V DC or less. 50kΩ/V or greater.

The Following Parts are Required for Adjustment

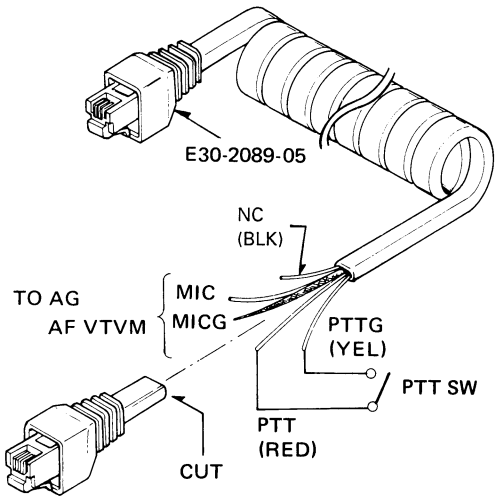
- **Test cable for local microphone**

MIC connector front view



① NC
② PTTG
③ PTT
④ MICG
⑤ MIC
⑥ NC

- The following test cables are recommended.



Test cable for Microphone input

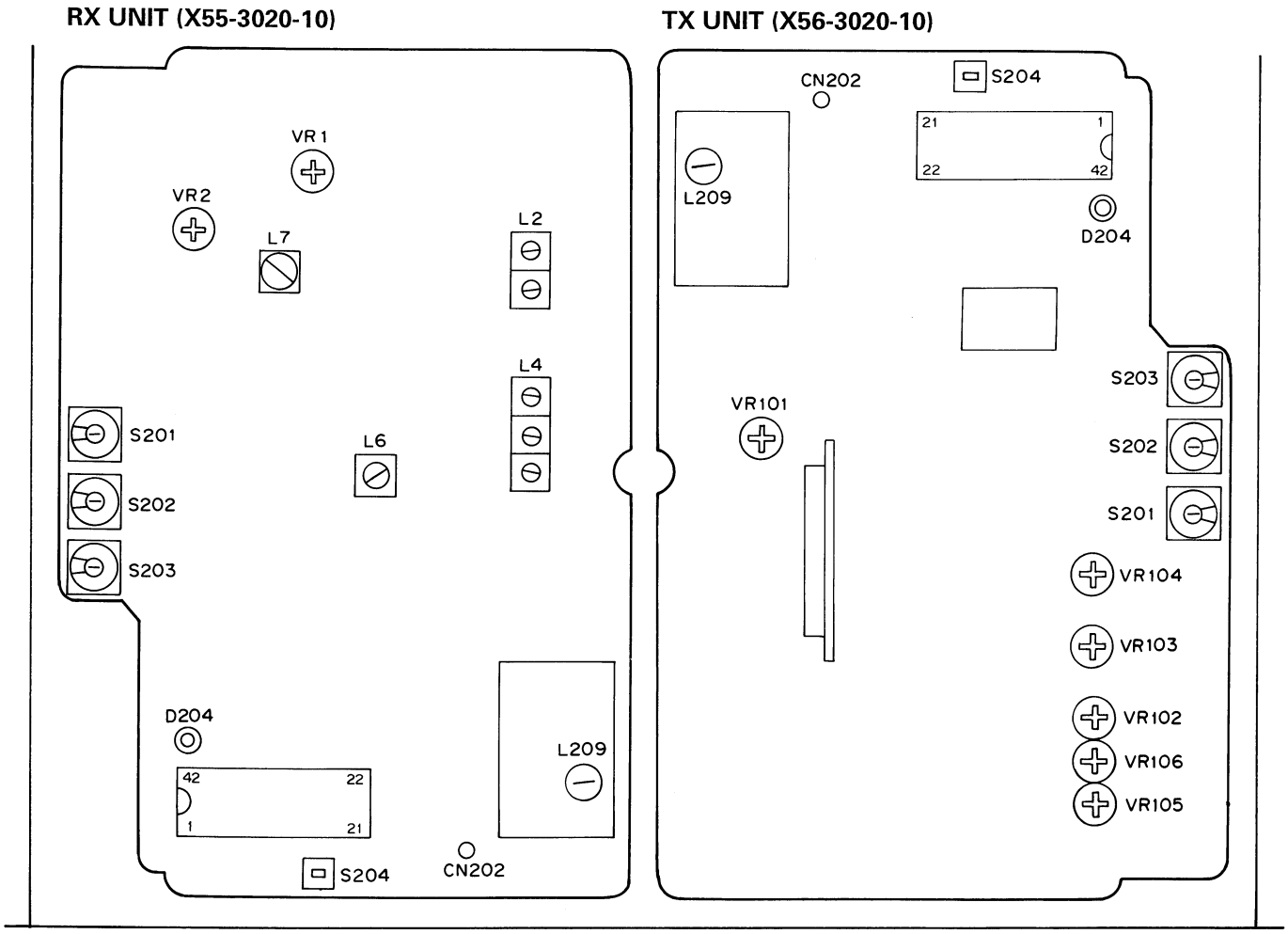
- **DC cable**
  Use the E30-2076-15 (DC cable assembly).

- **D-SUB connector adapter (15-pin)**
  The connector is not provided as an option, so buy a commercially available one.
  The TKR-900 is adjusted by applying input/output signals to each pin of the D-SUB connector. For details of pin functions, see the description of the logic interface connector (J304) in "Operating Features".

ADJUSTMENT

Adjustment Location

- **Top view**

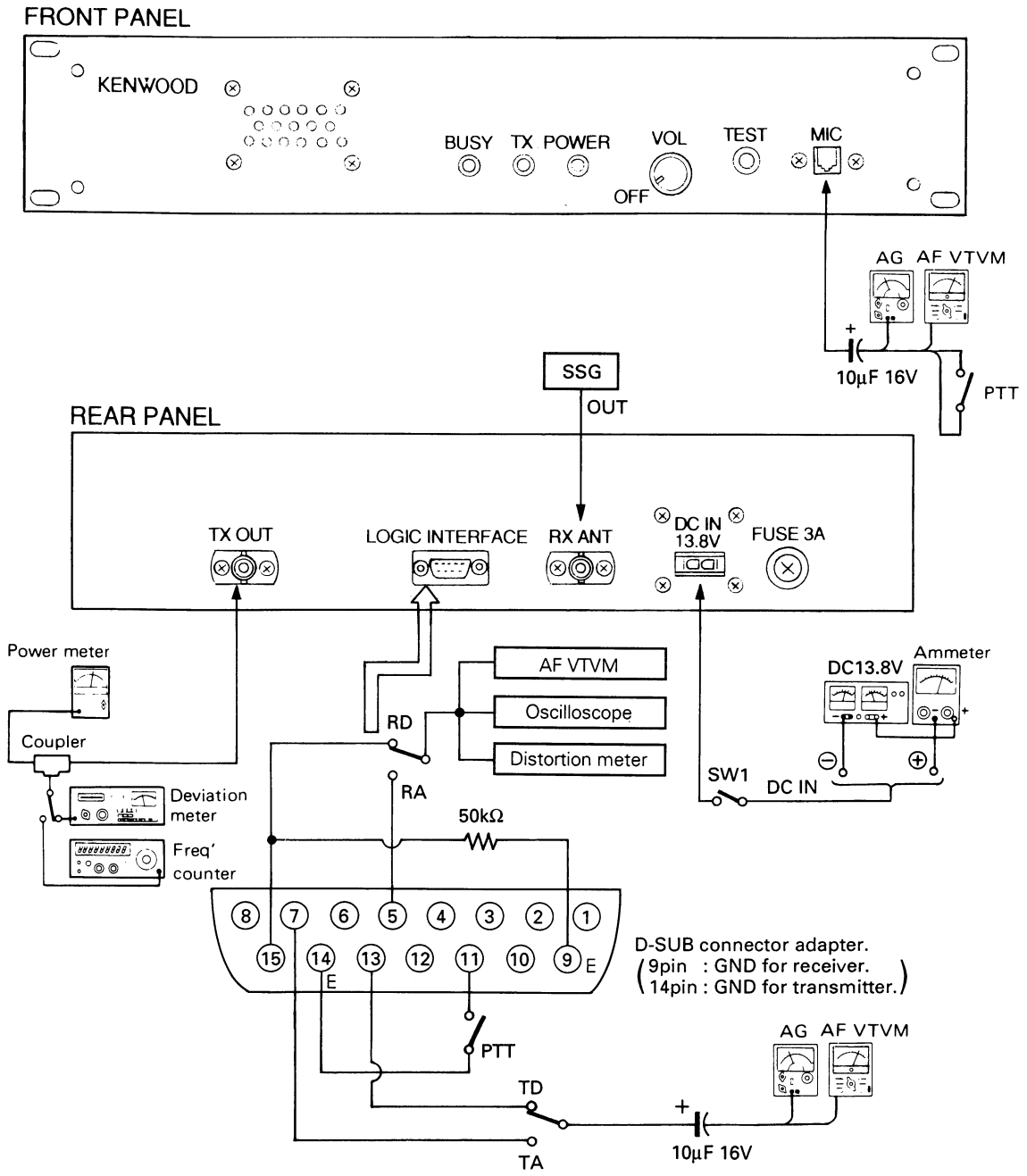


Front panel

VR1 : Squelch
VR2 : RX detector signal level
S201~203 : FCC channel (RX CH)
S204 : Reset switch
L2, 4 : BPF
L6, 7 : Distortion
L209 : RX PLL voltage
CN202 : RX PLL voltage output

VR101 : Power
VR102 : Maximum deviation
VR103 : Tone deviation
VR104 : Tone waveform
VR105 : System MIC sensitivity
VR106 : Local MIC sensitivity
S201~203 : FCC channel (TX CH)
S204 : Reset switch
L209 : TX PLL voltage
CN202 : TX PLL voltage output

ADJUSTMENT



Alignment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) VOL : OFF 2) Connect the test equipment. 3) Channel setting for used CH. (transmit and receive) 4) POWER SW (SW1) : ON							
2. TX PLL voltage	1) TEST SW : ON	DVM	TX	CN202	TX	L209	4.0V If 4.0V can not adjust, PLL voltage is adjust 2.0~4.0V (Low CH) or 4.0~6.0V (High CH).	±0.1V
3. Transmit frequency check	1) TEST SW : ON	Power meter f. counter					Check	fTX ± 858Hz

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Power	1) Logic interface (11-PTT)	Power meter Ammeter	Rear panel (D-SUB)	TX OUT	TX	VR101	360mW	±10mW, 1.5A or less.
5. TONE deviation	1) AG : 50Hz/0.5Vp-p square wave at logic interface (13-TD). Deviation meter filter HPF : OFF LPF : 3kHz Logic interface (11-PTT)	Power Deviation meter Oscilloscope				VR104	Make the demodulation waveform neat.	
	2) AG : 100Hz/0.5Vp-p sine wave at logic interface (13-TD). Deviation meter filter HPF : 50Hz LPF : 3kHz Logic interface (11-PTT)					VR103	±0.75kHz	±0.05kHz
6. Local MIC sensitivity	1) AG : 1kHz/50mV sine wave at MIC connector. Deviation meter filter HPF : OFF LPF : 15kHz PTT : ON (MIC connector PTT)		Rear panel Front panel			VR102	±4.2kHz Adjust one more than the other by switching between –P and +P.	±0.1kHz
	2) AG : 1khz/5mV sine wave at MIC connector. Deviation meter filter HPF : OFF LPF : 15kHz PTT : ON (MIC connector PTT)					VR106	±3.0kHz	±0.1kHz
7. System MIC sensitivity	1) AG : 1kHz/280mV sine wave at logic interface (7-TA). Logic interface (11-PTT)					VR105	±3.0kHz	±0.1kHz
8. RX PLL voltage		DVM	RX	CN202	RX	L209	4.0V If 4.0V can not adjust, PLL voltage is adjust 2.0~4.0V (Low CH) or 4.0~6.0V (High CH).	±0.1V
9. Distortion	1) SSG output : 500µV/54dBµ/–53dBm (MOD : 1kHz, DEV : ±3kHz)	SSG AF VTVM Distortion meter Oscilloscope	Rear panel (D-SUB)	RX ANT Logic interface (5-RA)		L7	Adjust for maximum AF output.	
						L6	Adjust for minimum distortion.	Distortion : 2% or less
10. BPF	1) SSG output : 1.58µV/4dBµ/–103dBm (MOD : 1kHz, DEV : ±3kHz)					L2, 4	Adjust for maximum SINAD.	
11. Sensitivity	1) SSG output : 0.3µV/–10.5dBµ/–117.5dBm (MOD : 1kHz, DEV : ±3kHz)						Check	SINAD 12dB or more.
12. Squelch	1) SSG output : Value when 5dB is subtracted from the sensitivity value of 12dB SINAD. (MOD : 1kHz, DEV : ±3kHz)				RX	VR1	Set to threshold point.	Squelch close.
	2) SSG output : 8dB SINAD						Check	Squelch open.
	3) SSG output : OFF							squelch close.
13. RX detector signal output	1) SSG output : 500µV/54dBµ/–53dBm (MOD : 1kHz, DEV : ±3kHz)	SSG AF VTVM Oscilloscope 50kΩ dummy load	Rear panel	RX ANT Logic interface (15-RD)	RX	VR2	80mV/50kΩ	±5mV
14. Power consumption	1) SSG output : OFF	SSG Ammeter					Check	Power consumption 0.5A or less.

CHANNEL FREQUENCY CHART

FCC Chan.	Transmit (MHz)	Receive (MHz)
1	851.0125	806.0125
2	851.0375	806.0375
3	851.0625	806.0625
4	851.0875	806.0875
5	851.1125	806.1125
6	851.1375	806.1375
7	851.1625	806.1625
8	851.1875	806.1875
9	851.2125	806.2125
10	851.2375	806.2375
11	851.2625	806.2625
12	851.2875	806.2875
13	851.3125	806.3125
14	851.3375	806.3375
15	851.3625	806.3625
16	851.3875	806.3875
17	851.4125	806.4125
18	851.4375	806.4375
19	851.4625	806.4625
20	851.4875	806.4875
21	851.5125	806.5125
22	851.5375	806.5375
23	851.5625	806.5625
24	851.5875	806.5875
25	851.6125	806.6125
26	851.6375	806.6375
27	851.6625	806.6625
28	851.6875	806.6875
29	851.7125	806.7125
30	851.7375	806.7375
31	851.7625	806.7625
32	851.7875	806.7875
33	851.8125	806.8125
34	851.8375	806.8375
35	851.8625	806.8625
36	851.8875	806.8875
37	851.9125	806.9125
38	851.9375	806.9375
39	851.9625	806.9625
40	851.9875	806.9875
41	852.0125	807.0125
42	852.0375	807.0375
43	852.0625	807.0625
44	852.0875	807.0875
45	852.1125	807.1125
46	852.1375	807.1375
47	852.1625	807.1625
48	852.1875	807.1875
49	852.2125	807.2125
50	852.2375	807.2375
51	852.2625	807.2625
52	852.2875	807.2875
53	852.3125	807.3125
54	852.3375	807.3375
55	852.3625	807.3625
56	852.3875	807.3875
57	852.4125	807.4125
58	852.4375	807.4375
59	852.4625	807.4625
60	852.4875	807.4875
61	852.5125	807.5125
62	852.5375	807.5375
63	852.5625	807.5625
64	852.5875	807.5875

FCC Chan.	Transmit (MHz)	Receive (MHz)
65	852.6125	807.6125
66	852.6375	807.6375
67	852.6625	807.6625
68	852.6875	807.6875
69	852.7125	807.7125
70	852.7375	807.7375
71	852.7625	807.7625
72	852.7875	807.7875
73	852.8125	807.8125
74	852.8375	807.8375
75	852.8625	807.8625
76	852.8875	807.8875
77	852.9125	807.9125
78	852.9375	807.9375
79	852.9625	807.9625
80	852.9875	807.9875
81	853.0125	808.0125
82	853.0375	808.0375
83	853.0625	808.0625
84	853.0875	808.0875
85	853.1125	808.1125
86	853.1375	808.1375
87	853.1625	808.1625
88	853.1875	808.1875
89	853.2125	808.2125
90	853.2375	808.2375
91	853.2625	808.2625
92	853.2875	808.2875
93	853.3125	808.3125
94	853.3375	808.3375
95	853.3625	808.3625
96	853.3875	808.3875
97	853.4125	808.4125
98	853.4375	808.4375
99	853.4625	808.4625
100	853.4875	808.4875
101	853.5125	808.5125
102	853.5375	808.5375
103	853.5625	808.5625
104	853.5875	808.5875
105	853.6125	808.6125
106	853.6375	808.6375
107	853.6625	808.6625
108	853.6875	808.6875
109	853.7125	808.7125
110	853.7375	808.7375
111	853.7625	808.7625
112	853.7875	808.7875
113	853.8125	808.8125
114	853.8375	808.8375
115	853.8625	808.8625
116	853.8875	808.8875
117	853.9125	808.9125
118	853.9375	808.9375
119	853.9625	808.9625
120	853.9875	808.9875
121	854.0125	809.0125
122	854.0375	809.0375
123	854.0625	809.0625
124	854.0875	809.0875
125	854.1125	809.1125
126	854.1375	809.1375
127	854.1625	809.1625
128	854.1875	809.1875

CHANNEL FREQUENCY CHART

FCC Chan.	Transmit (MHz)	Receive (MHz)
129	854.2125	809.2125
130	854.2375	809.2375
131	854.2625	809.2625
132	854.2875	809.2875
133	854.3125	809.3125
134	854.3375	809.3375
135	854.3625	809.3625
136	854.3875	809.3875
137	854.4125	809.4125
138	854.4375	809.4375
139	854.4625	809.4625
140	854.4875	809.4875
141	854.5125	809.5125
142	854.5375	809.5375
143	854.5625	809.5625
144	854.5875	809.5875
145	854.6125	809.6125
146	854.6375	809.6375
147	854.6625	809.6625
148	854.6875	809.6875
149	854.7125	809.7125
150	854.7375	809.7375
151	854.7625	809.7625
152	854.7875	809.7875
153	854.8125	809.8125
154	854.8375	809.8375
155	854.8625	809.8625
156	854.8875	809.8875
157	854.9125	809.9125
158	854.9375	809.9375
159	854.9625	809.9625
160	854.9875	809.9875
161	855.0125	810.0125
162	855.0375	810.0375
163	855.0625	810.0625
164	855.0875	810.0875
165	855.1125	810.1125
166	855.1375	810.1375
167	855.1625	810.1625
168	855.1875	810.1875
169	855.2125	810.2125
170	855.2375	810.2375
171	855.2625	810.2625
172	855.2875	810.2875
173	855.3125	810.3125
174	855.3375	810.3375
175	855.3625	810.3625
176	855.3875	810.3875
177	855.4125	810.4125
178	855.4375	810.4375
179	855.4625	810.4625
180	855.4875	810.4875
181	855.5125	810.5125
182	855.5375	810.5375
183	855.5625	810.5625
184	855.5875	810.5875
185	855.6125	810.6125
186	855.6375	810.6375
187	855.6625	810.6625
188	855.6875	810.6875
189	855.7125	810.7125
190	855.7375	810.7375
191	855.7625	810.7625
192	855.7875	810.7875

FCC Chan.	Transmit (MHz)	Receive (MHz)
193	855.8125	810.8125
194	855.8375	810.8375
195	855.8625	810.8625
196	855.8875	810.8875
197	855.9125	810.9125
198	855.9375	810.9375
199	855.9625	810.9625
200	855.9875	810.9875
201	856.0125	811.0125
202	856.0375	811.0375
203	856.0625	811.0625
204	856.0875	811.0875
205	856.1125	811.1125
206	856.1375	811.1375
207	856.1625	811.1625
208	856.1875	811.1875
209	856.2125	811.2125
210	856.2375	811.2375
211	856.2625	811.2625
212	856.2875	811.2875
213	856.3125	811.3125
214	856.3375	811.3375
215	856.3625	811.3625
216	856.3875	811.3875
217	856.4125	811.4125
218	856.4375	811.4375
219	856.4625	811.4625
220	856.4875	811.4875
221	856.5125	811.5125
222	856.5375	811.5375
223	856.5625	811.5625
224	856.5875	811.5875
225	856.6125	811.6125
226	856.6375	811.6375
227	856.6625	811.6625
228	856.6875	811.6875
229	856.7125	811.7125
230	856.7375	811.7375
231	856.7625	811.7625
232	856.7875	811.7875
233	856.8125	811.8125
234	856.8375	811.8375
235	856.8625	811.8625
236	856.8875	811.8875
237	856.9125	811.9125
238	856.9375	811.9375
239	856.9625	811.9625
240	856.9875	811.9875
241	857.0125	812.0125
242	857.0375	812.0375
243	857.0625	812.0625
244	857.0875	812.0875
245	857.1125	812.1125
246	857.1375	812.1375
247	857.1625	812.1625
248	857.1875	812.1875
249	857.2125	812.2125
250	857.2375	812.2375
251	857.2625	812.2625
252	857.2875	812.2875
253	857.3125	812.3125
254	857.3375	812.3375
255	857.3625	812.3625
256	857.3875	812.3875

CHANNEL FREQUENCY CHART

FCC Chan.	Transmit (MHz)	Receive (MHz)
257	857.4125	812.4125
258	857.4375	812.4375
259	857.4625	812.4625
260	857.4875	812.4875
261	857.5125	812.5125
262	857.5375	812.5375
263	857.5625	812.5625
264	857.5875	812.5875
265	857.6125	812.6125
266	857.6375	812.6375
267	857.6625	812.6625
268	857.6875	812.6875
269	857.7125	812.7125
270	857.7375	812.7375
271	857.7625	812.7625
272	857.7875	812.7875
273	857.8125	812.8125
274	857.8375	812.8375
275	857.8625	812.8625
276	857.8875	812.8875
277	857.9125	812.9125
278	857.9375	812.9375
279	857.9625	812.9625
280	857.9875	812.9875
281	858.0125	813.0125
282	858.0375	813.0375
283	858.0625	813.0625
284	858.0875	813.0875
285	858.1125	813.1125
286	858.1375	813.1375
287	858.1625	813.1625
288	858.1875	813.1875
289	858.2125	813.2125
290	858.2375	813.2375
291	858.2625	813.2625
292	858.2875	813.2875
293	858.3125	813.3125
294	858.3375	813.3375
295	858.3625	813.3625
296	858.3875	813.3875
297	858.4125	813.4125
298	858.4375	813.4375
299	858.4625	813.4625
300	858.4875	813.4875
301	858.5125	813.5125
302	858.5375	813.5375
303	858.5625	813.5625
304	858.5875	813.5875
305	858.6125	813.6125
306	858.6375	813.6375
307	858.6625	813.6625
308	858.6875	813.6875
309	858.7125	813.7125
310	858.7375	813.7375
311	858.7625	813.7625
312	858.7875	813.7875
313	858.8125	813.8125
314	858.8375	813.8375
315	858.8625	813.8625
316	858.8875	813.8875
317	858.9125	813.9125
318	858.9375	813.9375
319	858.9625	813.9625
320	858.9875	813.9875

FCC Chan.	Transmit (MHz)	Receive (MHz)
321	859.0125	814.0125
322	859.0375	814.0375
323	859.0625	814.0625
324	859.0875	814.0875
325	859.1125	814.1125
326	859.1375	814.1375
327	859.1625	814.1625
328	859.1875	814.1875
329	859.2125	814.2125
330	859.2375	814.2375
331	859.2625	814.2625
332	859.2875	814.2875
333	859.3125	814.3125
334	859.3375	814.3375
335	859.3625	814.3625
336	859.3875	814.3875
337	859.4125	814.4125
338	859.4375	814.4375
339	859.4625	814.4625
340	859.4875	814.4875
341	859.5125	814.5125
342	859.5375	814.5375
343	859.5625	814.5625
344	859.5875	814.5875
345	859.6125	814.6125
346	859.6375	814.6375
347	859.6625	814.6625
348	859.6875	814.6875
349	859.7125	814.7125
350	859.7375	814.7375
351	859.7625	814.7625
352	859.7875	814.7875
353	859.8125	814.8125
354	859.8375	814.8375
355	859.8625	814.8625
356	859.8875	814.8875
357	859.9125	814.9125
358	859.9375	814.9375
359	859.9625	814.9625
360	859.9875	814.9875
361	860.0125	815.0125
362	860.0375	815.0375
363	860.0625	815.0625
364	860.0875	815.0875
365	860.1125	815.1125
366	860.1375	815.1375
367	860.1625	815.1625
368	860.1875	815.1875
369	860.2125	815.2125
370	860.2375	815.2375
371	860.2625	815.2625
372	860.2875	815.2875
373	860.3125	815.3125
374	860.3375	815.3375
375	860.3625	815.3625
376	860.3875	815.3875
377	860.4125	815.4125
378	860.4375	815.4375
379	860.4625	815.4625
380	860.4875	815.4875
381	860.5125	815.5125
382	860.5375	815.5375
383	860.5625	815.5625
384	860.5875	815.5875

CHANNEL FREQUENCY CHART

FCC Chan.	Transmit (MHz)	Receive (MHz)
385	860.6125	815.6125
386	860.6375	815.6375
387	860.6625	815.6625
388	860.6875	815.6875
389	860.7125	815.7125
390	860.7375	815.7375
391	860.7625	815.7625
392	860.7875	815.7875
393	860.8125	815.8125
394	860.8375	815.8375
395	860.8625	815.8625
396	860.8875	815.8875
397	860.9125	815.9125
398	860.9375	815.9375
399	860.9625	815.9625
400	860.9875	815.9875
401	861.0125	816.0125
402	861.0375	816.0375
403	861.0625	816.0625
404	861.0875	816.0875
405	861.1125	816.1125
406	861.1375	816.1375
407	861.1625	816.1625
408	861.1875	816.1875
409	861.2125	816.2125
410	861.2375	816.2375
411	861.2625	816.2625
412	861.2875	816.2875
413	861.3125	816.3125
414	861.3375	816.3375
415	861.3625	816.3625
416	861.3875	816.3875
417	861.4125	816.4125
418	861.4375	816.4375
419	861.4625	816.4625
420	861.4875	816.4875
421	861.5125	816.5125
422	861.5375	816.5375
423	861.5625	816.5625
424	861.5875	816.5875
425	861.6125	816.6125
426	861.6375	816.6375
427	861.6625	816.6625
428	861.6875	816.6875
429	861.7125	816.7125
430	861.7375	816.7375
431	861.7625	816.7625
432	861.7875	816.7875
433	861.8125	816.8125
434	861.8375	816.8375
435	861.8625	816.8625
436	861.8875	816.8875
437	861.9125	816.9125
438	861.9375	816.9375
439	861.9625	816.9625
440	861.9875	816.9875
441	862.0125	817.0125
442	862.0375	817.0375
443	862.0625	817.0625
444	862.0875	817.0875
445	862.1125	817.1125
446	862.1375	817.1375
447	862.1625	817.1625
448	862.1875	817.1875

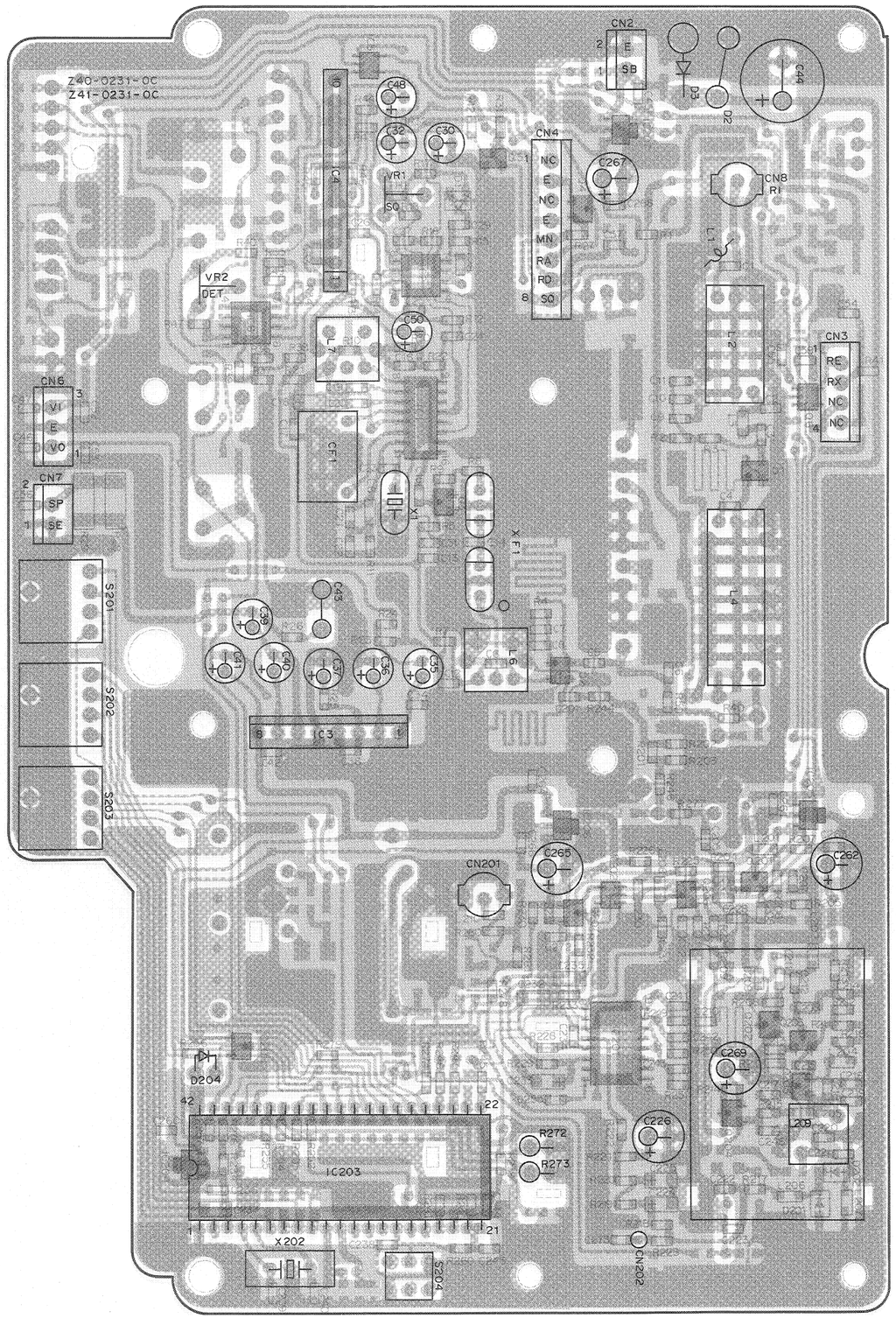
FCC Chan.	Transmit (MHz)	Receive (MHz)
449	862.2125	817.2125
450	862.2375	817.2375
451	862.2625	817.2625
452	862.2875	817.2875
453	862.3125	817.3125
454	862.3375	817.3375
455	862.3625	817.3625
456	862.3875	817.3875
457	862.4125	817.4125
458	862.4375	817.4375
459	862.4625	817.4625
460	862.4875	817.4875
461	862.5125	817.5125
462	862.5375	817.5375
463	862.5625	817.5625
464	862.5875	817.5875
465	862.6125	817.6125
466	862.6375	817.6375
467	862.6625	817.6625
468	862.6875	817.6875
469	862.7125	817.7125
470	862.7375	817.7375
471	862.7625	817.7625
472	862.7875	817.7875
473	862.8125	817.8125
474	862.8375	817.8375
475	862.8625	817.8625
476	862.8875	817.8875
477	862.9125	817.9125
478	862.9375	817.9375
479	862.9625	817.9625
480	862.9875	817.9875
481	863.0125	818.0125
482	863.0375	818.0375
483	863.0625	818.0625
484	863.0875	818.0875
485	863.1125	818.1125
486	863.1375	818.1375
487	863.1625	818.1625
488	863.1875	818.1875
489	863.2125	818.2125
490	863.2375	818.2375
491	863.2625	818.2625
492	863.2875	818.2875
493	863.3125	818.3125
494	863.3375	818.3375
495	863.3625	818.3625
496	863.3875	818.3875
497	863.4125	818.4125
498	863.4375	818.4375
499	863.4625	818.4625
500	863.4875	818.4875
501	863.5125	818.5125
502	863.5375	818.5375
503	863.5625	818.5625
504	863.5875	818.5875
505	863.6125	818.6125
506	863.6375	818.6375
507	863.6625	818.6625
508	863.6875	818.6875
509	863.7125	818.7125
510	863.7375	818.7375
511	863.7625	818.7625
512	863.7875	818.7875

CHANNEL FREQUENCY CHART

FCC Chan.	Transmit (MHz)	Receive (MHz)
513	863.8125	818.8125
514	863.8375	818.8375
515	863.8625	818.8625
516	863.8875	818.8875
517	863.9125	818.9125
518	863.9375	818.9375
519	863.9625	818.9625
520	863.9875	818.9875
521	864.0125	819.0125
522	864.0375	819.0375
523	864.0625	819.0625
524	864.0875	819.0875
525	864.1125	819.1125
526	864.1375	819.1375
527	864.1625	819.1625
528	864.1875	819.1875
529	864.2125	819.2125
530	864.2375	819.2375
531	864.2625	819.2625
532	864.2875	819.2875
533	864.3125	819.3125
534	864.3375	819.3375
535	864.3625	819.3625
536	864.3875	819.3875
537	864.4125	819.4125
538	864.4375	819.4375
539	864.4625	819.4625
540	864.4875	819.4875
541	864.5125	819.5125
542	864.5375	819.5375
543	864.5625	819.5625
544	864.5875	819.5875
545	864.6125	819.6125
546	864.6375	819.6375
547	864.6625	819.6625
548	864.6875	819.6875
549	864.7125	819.7125
550	864.7375	819.7375
551	864.7625	819.7625
552	864.7875	819.7875
553	864.8125	819.8125
554	864.8375	819.8375
555	864.8625	819.8625
556	864.8875	819.8875

FCC Chan.	Transmit (MHz)	Receive (MHz)
557	864.9125	819.9125
558	864.9375	819.9375
559	864.9625	819.9625
560	864.9875	819.9875
561	865.0125	820.0125
562	865.0375	820.0375
563	865.0625	820.0625
564	865.0875	820.0875
565	865.1125	820.1125
566	865.1375	820.1375
567	865.1625	820.1625
568	865.1875	820.1875
569	865.2125	820.2125
570	865.2375	820.2375
571	865.2625	820.2625
572	865.2875	820.2875
573	865.3125	820.3125
574	865.3375	820.3375
575	865.3625	820.3625
576	865.3875	820.3875
577	865.4125	820.4125
578	865.4375	820.4375
579	865.4625	820.4625
580	865.4875	820.4875
581	865.5125	820.5125
582	865.5375	820.5375
583	865.5625	820.5625
584	865.5875	820.5875
585	865.6125	820.6125
586	865.6375	820.6375
587	865.6625	820.6625
588	865.6875	820.6875
589	865.7125	820.7125
590	865.7375	820.7375
591	865.7625	820.7625
592	865.7875	820.7875
593	865.8125	820.8125
594	865.8375	820.8375
595	865.8625	820.8625
596	865.8875	820.8875
597	865.9125	820.9125
598	865.9375	820.9375
599	865.9625	820.9625
600	865.9875	820.9875

RX UNIT (X55-3020-10) Component side view



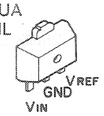
2SA1162
2SC2712
2SC2714
2SC3356
DTC114EK
DTC114YK

2SC4093
3SK240

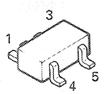
2SK508NV

FMG5

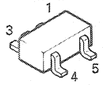
NJM78L05UA
NJM78L08UA
M51943BML



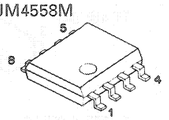
TC4S66F



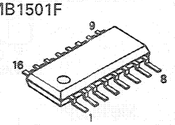
TC4S584F



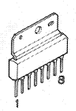
NJM4558M



MC3371D
MB1501F



µPC1241H



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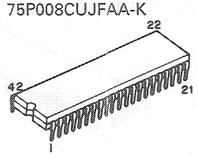
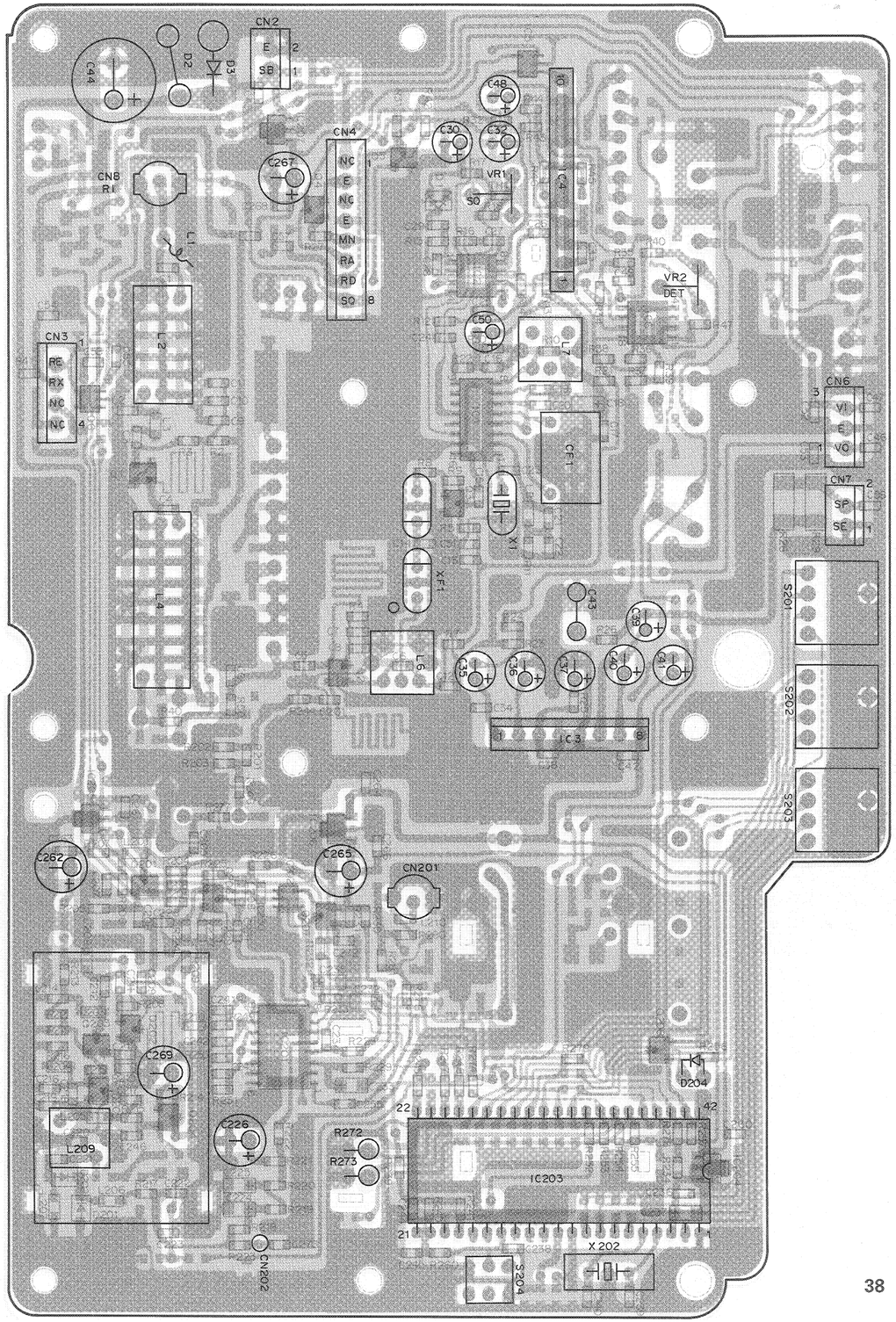


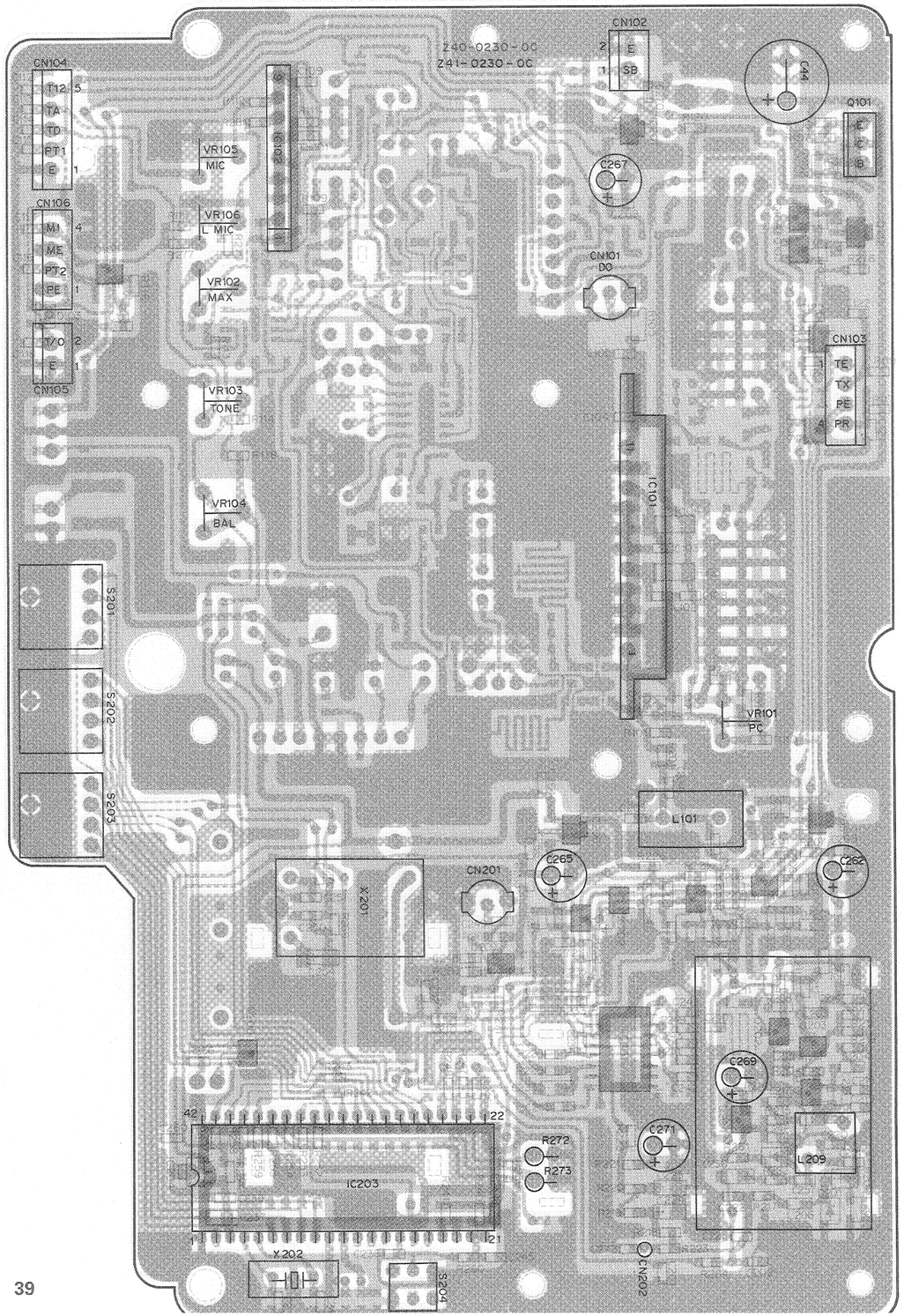
: Component side
: Foil side

RX UNIT (X55-3020-10) Foil side view

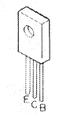


TKR-900 PC BOARD VIEWS

TX UNIT (X56-3020-10) Component side view



2SD1682



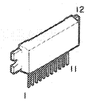
2SA1162
2SC2712
2SC2714
2SC3356
DTA114EK
DTC114EK
DTC114YK

2SB1119

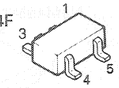
2SK508NV

FMG5

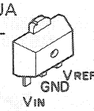
M57775



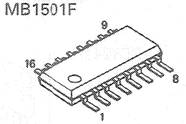
TC4S584F



NJM78L05UA
NJM78L08UA
M51943BML



MB1501F



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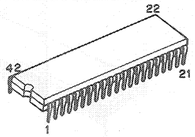
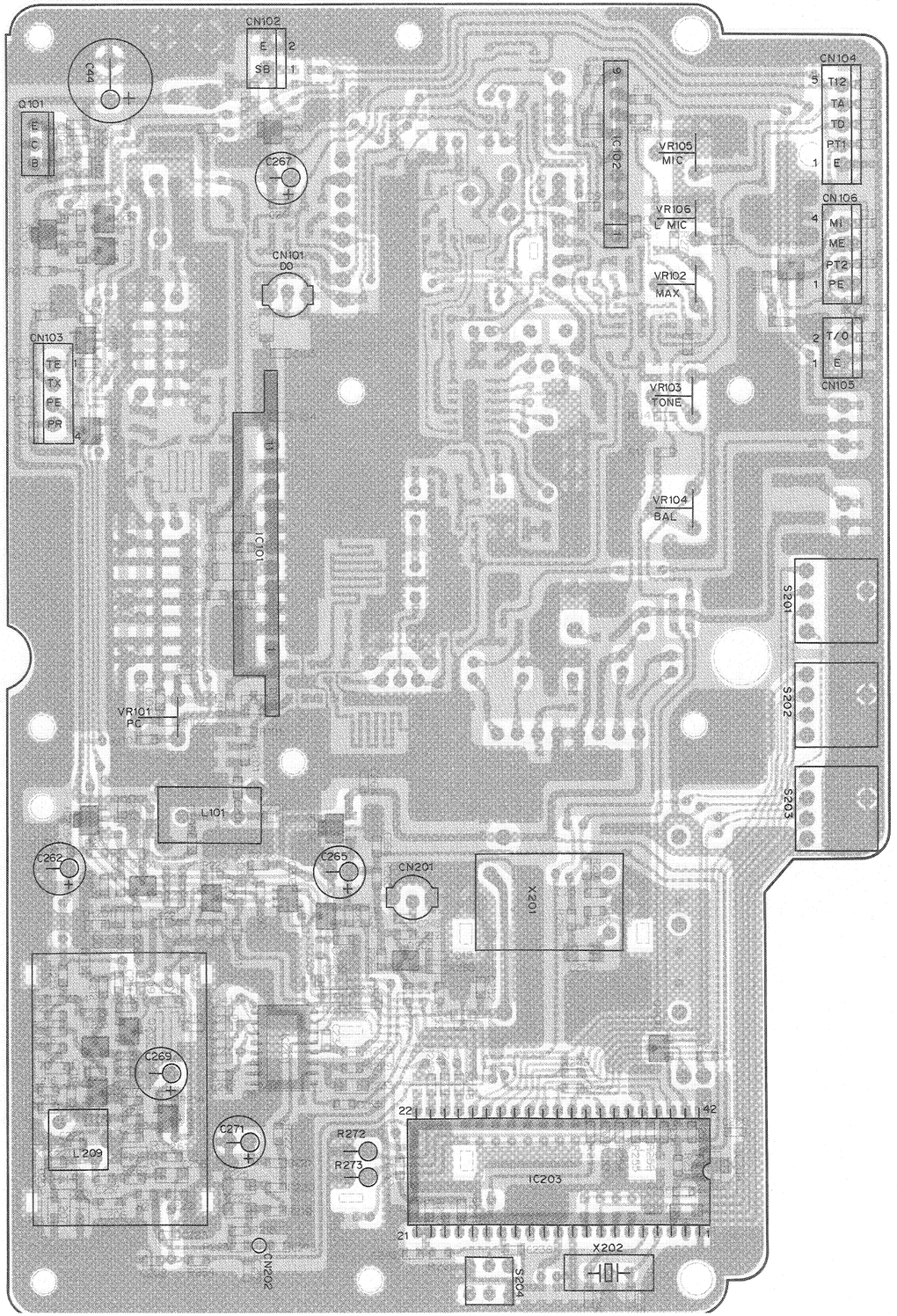
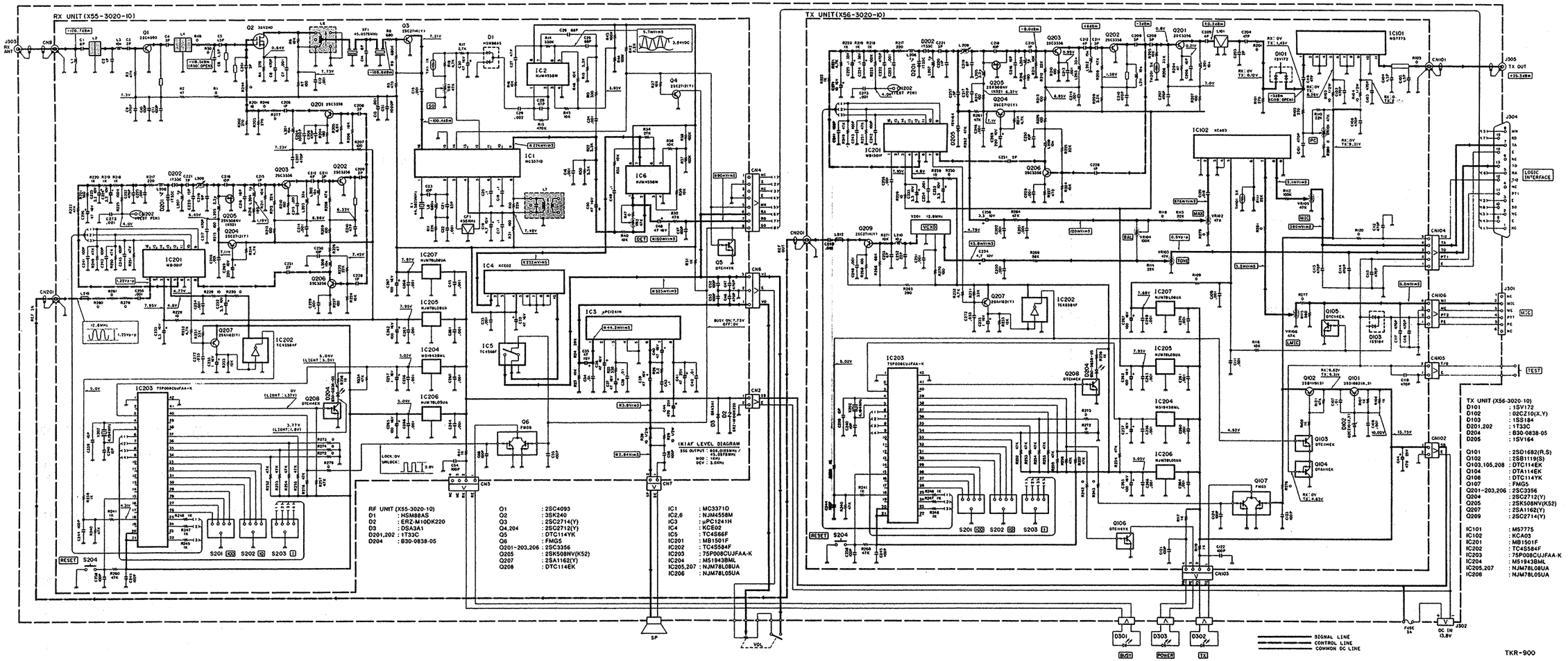


: Component side
: Foil side

TX UNIT (X56-3020-10) Foil side view




RX UNIT (X55-3020-10)
TX UNIT (X56-3020-10)
RF UNIT (X55-3020-10)
D1 : MSM88AS
D2 : ERZ-M100K220
D3 : DSA3A1
D201,202 : 1T33C
D204 : B30-0838-05
Q1 : 2SC4093
Q2 : 3SK240
Q3 : 2SC2714(Y)
Q4,204 : 2SC2712(Y)
Q5 : DTC114YK
Q6 : FMG5
Q201-203,206 : 2SC3356
Q205 : 2SK508NV(K52)
Q207 : 2SA1162(Y)
Q208 : DTC114EK
IC1 : MC3371D
IC2,6 : NJM4558M
IC3 : μPC1241H
IC4 : KCE02
IC5 : TC4S66F
IC201 : MB1501F
IC202 : TC4S584F
IC203 : 7SP008CUJFAA-K
IC204 : MS1943BML
IC205,207 : NJM78L08UA
IC206 : NJM78L05UA
(K)AF LEVEL DIAGRAM
TX UNIT (X56-3020-10)
D101 : 1SV172
D102 : 02CZ10(X,Y)
D103 : 1SS184
D201,202 : 1T33C
D204 : B30-0838-05
D205 : 1SV164
Q101 : 2SD1682(R,S)
Q102 : 2SB1119(S)
Q103,105,208 : DTC114EK
Q104 : DTA114EK
Q106 : DTC114YK
Q107 : FMG5
Q201-203,206 : 2SC3356
Q204 : 2SC2712(Y)
Q205 : 2SK508NV(K52)
Q207 : 2SA1162(Y)
Q209 : 2SC2714(Y)
IC101 : M57775
IC102 : KCA03
IC201 : MB1501F
IC202 : TC4S584F
IC203 : 7SP008CUJFAA-K
IC204 : MS1943BML
IC205,207 : NJM78L08UA
IC206 : NJM78L05UA
SIGNAL LINE
CONTROL LINE
COMMON DC LINE
TKR-900

TERMINAL FUNCTION

Connector No.	Terminal No.	Terminal Name	I/O	Terminal function
RX UNIT (X55-3020-10)				
CN2	1	SB	I	Power supply input (13.8V ± 20%).
For fuse	2	E	–	GND.
CN3	1	RE	I	ON when RX.
For LED	2	RX	O	13.8V.
	3	NC	–	Not use.
	4	NC	–	Not use.
CN4	1	NC	–	Not use.
For	2	E	–	GND.
LOGIC	3	NC	–	Not use.
INTERFACE	4	E	–	GND.
	5	MN	I	Monitor switch (ON when monitor).
	6	RA	O	RX audio signal output (500mV at hight impedance).
	7	RD	O	RX detector signal output (800mV/50kΩ).
	8	SQ	O	Squelch signal output (open when "L").
CN6	1	VO	O	Audio signal output (500mV at hight impedance).
For VOL	2	E	–	GND.
	3	VI	I	Audio signal input.
CN7	1	SE	–	GND.
	2	SP	O	Audio signal output (VOL ON).
CN8	1	RI	I	Receiver signal input (0.35μV).
CN201	1	REF	I	Reference signal input (12.8MHz).
CN202	1	TP	O	Lock test port (4.0V).
TX UNIT (X56-3020-10)				
CN101	1	TX OUT	O	Transmission RF output (360mW).
CN102	1	SB	I	Power supply input (13.8V ± 20%).
	2	E	–	GND.
CN103	1	TE	I	TX LED (ON when TX).
	2	TX	O	13.8V.
	3	PE	I	Power LED (ON when DC connected).
	4	PR	O	13.8V.
CN104	1	E	–	GND.
	2	PT1	I	PTT signal input.
	3	TD	I	TX tone signal input (0.5Vp-p).
	4	TA	I	TX modulation signal input (3kHz/280mV).
	5	T12	O	10V.
CN105	1	E	–	GND.
	2	T/O	I	PTT signal input (TX when push ON).
CN106	1	PE	–	GND.
For	2	PT2	I	PTT signal input.
MIC	3	ME	–	GND.
JACK	4	MI	I	Modulation signal input (3kHz/5mV).
CN201	1	REF	O	Reference signal output (12.8MHz).
CN202	1	TP	O	Lock test port (4.0V).

TKR-900

SPECIFICATIONS

GENERAL

Frequency range	RX : 806.0125 ~ 820.9875MHz
	TX : 851.0125 ~ 865.9875MHz
Input volta	13.8V DC negative ground
Temperature range	32°F to 122°F (0°C to 50°C)
Frequency stability	±0.00015%
Antenna impedance	50Ω
Channel spacing	25kHz (PLL channel step 12.5kHz)
Duty cycle	100%
Dimensions (not including protursions)	19.00" (482.6mm) W x 3.46" (88mm) H x 10.24" (260mm) D

RECEIVER

Sensitivity (EIA 12dB SINAD)	0.3μV
Selectivity	–75dB
Modulation acceptance	±7kHz
Spurious and image rejection	–85dB
Intermodulation	–70dB
Freguency stability	±0.00015%

TRANSMITTER

RF power output	340 ~ 380mW
Modulation	16KOF1D, 16KOF3E
Audio distortion	Less than 2%

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Bolivia, 239-08020 Barcelona, Spain

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P.O. Box 504, 8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140, Australia

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