



TK-2107 (16 channels)

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GENERAL/REALIGNMENT

INTRODUCTION

SCOPE OF THIS MANUAL

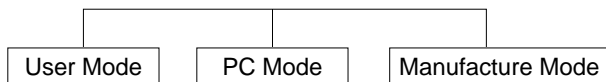
This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information for the equipment and is current as of the publication data. Changes which may occur after publication are covered by either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

REALIGNMENT

1 Modes



MODE	FUNCTION
User Mode	Use this mode for normal operation.
PC Mode	Use this mode, to make various settings by means of the FPU through the RS-232C port.
Manufacture Mode	Use this mode, to realign the various settings through the RS-232C port during manufacture work.

2 How to enter each mode

MODE	PROCEDURE
User Mode	Power ON
PC Mode	Connect to the IBM PC compatible machine and controled by the FPU.

PERSONAL SAFETY

The following precautions are recommended for personal 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.

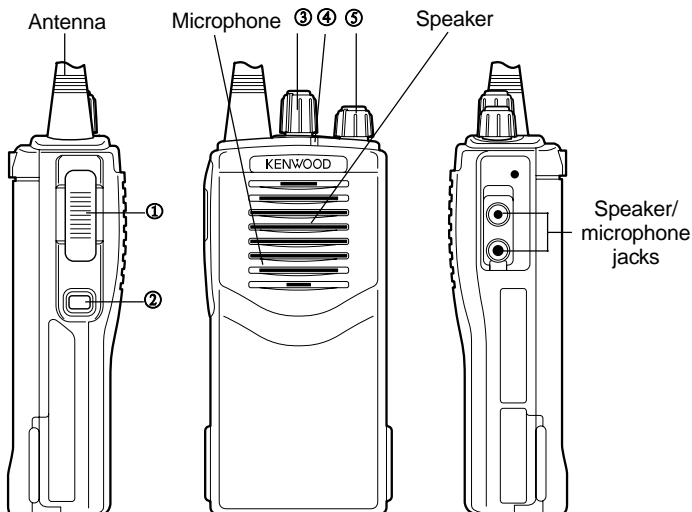
SERVICE

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

Destnation	Number of CH	RF power output
M3	16	5W

3 Getting acquainted

- ① **PTT (Push-To-Talk) switch**
Press this switch, then speak into the microphone to call a station. Release the switch to receive.
- ② **Monitor key**
Press and hold to monitor how busy the current channel is and to monitor signals being received that do not contain the matched QT/DQT code.
- ③ **Channel selector**
Rotate to select channels 1 ~ 16.
- ④ **LED indicator**
Lights red while transmitting, green while receiving a signal. Flashes red when the battery voltage is low while transmitting.
- ⑤ **Power switch/ Volume control**
Turn clockwise to switch the transceiver ON. Turn counterclockwise until a click sounds, to switch the transceiver OFF. Rotate to adjust the volume level.



REALIGNMENT

PC MODE

Preface

The transceiver is programmed by using a personal computer, programming interface (KPG-22) and programming software (KPG-55D).

The programming software can be used with an IBM PC or compatible. Figure 1 shows the setup of an IBM PC for programming.

Connention procedure

1. Connect the TK-2107 to the personal computer with the interface cable.
2. When data is transmitting from the transceiver the red LED lights.
When data is receiving by the transceiver the green LED lights.

Notes:

- The data stored in the personal computer must match the Model Name when it is written into the EEPROM.
- Do not press the [PTT] key during data transmission or reception.

• KPG-22 description

(PC programming interface cable: Option)

The KPG-22 is required to interface the TK-2107 with the computer. It has a circuit in its D-subconnector (25-pin) case that converts the RS-232C logic level to the TTL level. The KPG-22 connects the side panel jacks of the TK-2107 to the computer's RS-232C serial port.

• Programming software description

The KPG-55D Programming Disk is supplied in 3-1/2" the disk format. The Software on this disk allows a user to program TK-2107 radios via a Programming interface cable (KPG-22).

• Programming with IBM PC

If data is transferred to the transceiver from an IBM PC with the KPG-55D, the destination data (basic radio information) for each set can be modified. Normally, it is not necessary to modify the destination data because their values are determined automatically when the frequency range (frequency type) is set.

The values should be modified only if necessary.

Data can be programmed into the EEPROM in RS-232C format via the SP MIC plug.

In this mode the PTT line operates as TXD and RXD data lines respectively.

* M3 type has wide mode only.

All narrow data should be not available, even though data would be modified in test mode.

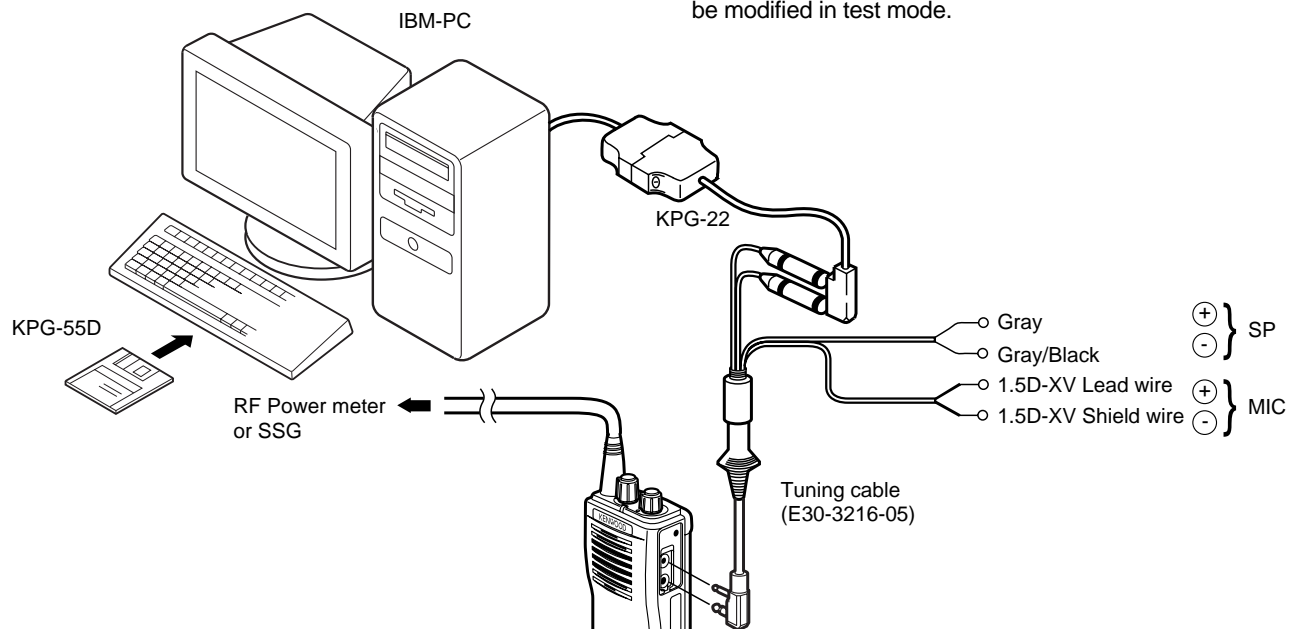
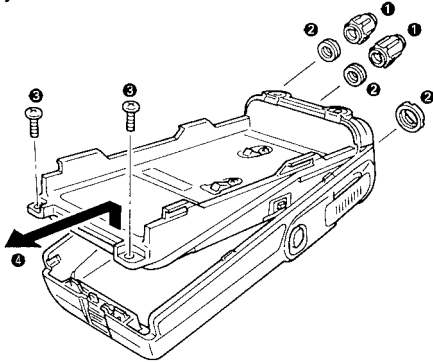


Fig. 1

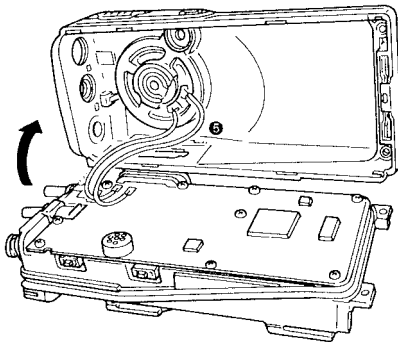
DISASSEMBLY FOR REPAIR

Separating the case assembly from the chassis

1. Remove the two knobs ① and three round nuts ② .
2. Remove the two screws ③ .
3. Expand the right and left sides of the bottom of the case assembly, lift the chassis, and remove it from the case assembly ④ .



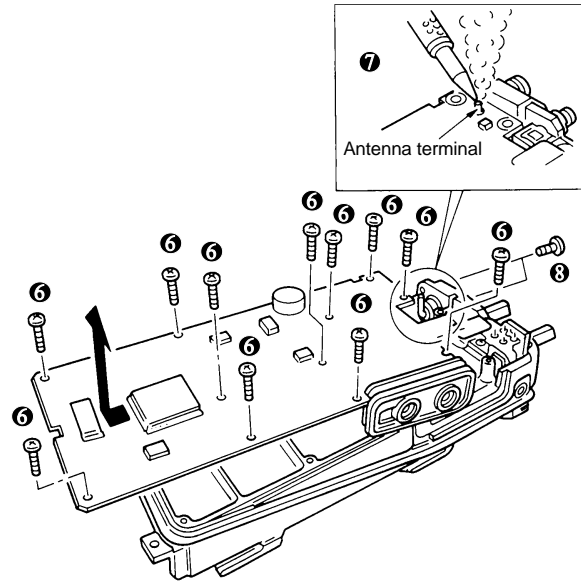
4. Taking care not to cut the speaker lead ⑤, open the chassis and case assembly.



Separating the chassis from the unit

1. Remove the eleven screws ⑥ .
2. Remove the solder from the antenna terminal using a soldering iron then lift the unit off ⑦ .
3. Remove the two screws ⑧ and remove the antenna connector.

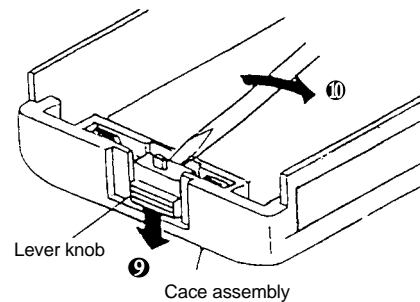
Note : When reassembling the unit in the chassis, be sure to solder the antenna terminal.



Removing the lever

1. Raise the lever on the lower case ⑨, insert a small flat screwdriver into the space between the case and lever, open the case carefully ⑩ and lift the lever off.

Note : Do not force to separate the case from the lever.



CIRCUIT DESCRIPTION

1. Frequency configuration

The receiver utilizes double conversion. The first IF is 38.85MHz and the second IF is 450kHz. The first local oscillator signal is supplied from the PLL circuit.

The PLL circuit in the transmitter generates the necessary frequencies. Fig. 1 shows the frequencies.

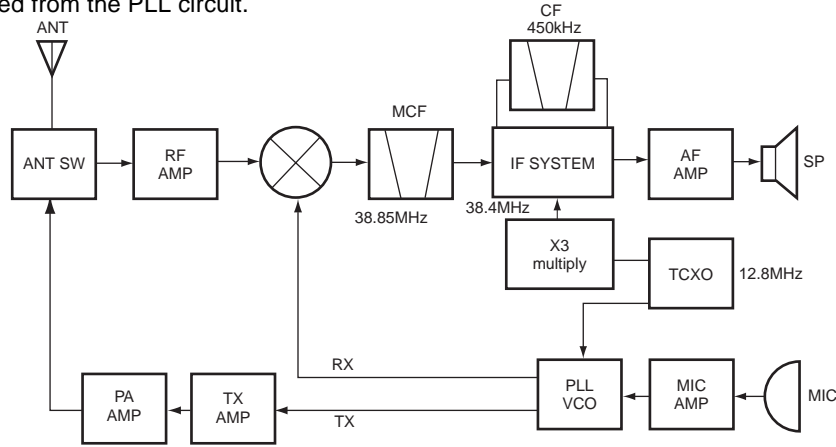


Fig. 1 Frequency configuration

2. Receiver

The receiver is double conversion superheterodyne, designed to operate in the frequency range of 216 to 223MHz (M3 type).

The frequency configuration is shown in Fig. 1.

1) Front - end RF amplifier

An incoming signal from the antenna is applied to an RF amplifier (Q203) after passing through a transmit/receive switch circuit (D102 and D103 are off) and a band pass filter (L208, L209 and L210). After the signal is amplified (Q203),

the signal is filtered through a band pass filter (L203 and L214) to eliminate unwanted signals before it is passed to the first mixer. (See Fig. 2)

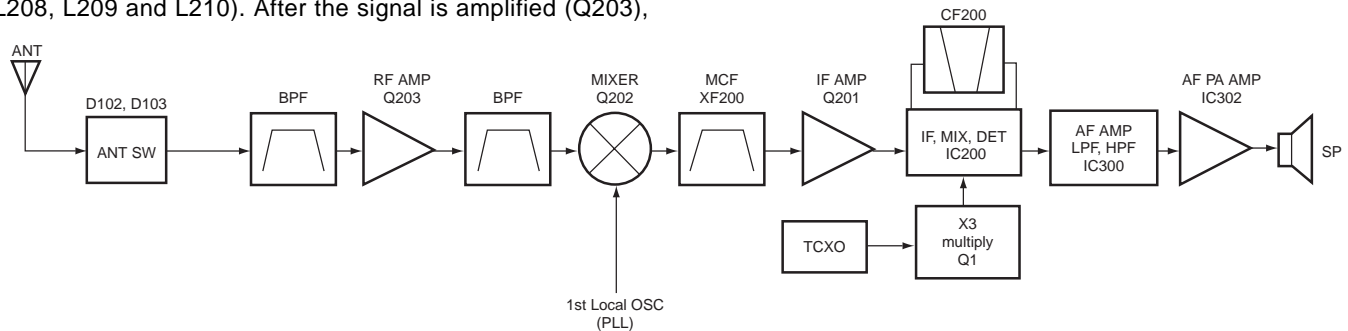


Fig. 2 Receiver section configuration

2) First Mixer

The signal from the RF amplifier is heterodyned with the first local oscillator signal from the PLL frequency synthesizer circuit at the first mixer (Q202) to create a 38.85MHz first intermediate frequency (1st IF) signal. The first IF signal is then fed through two monolithic crystal filters (MCFs : XF200) to further remove spurious signals.

3) IF amplifier

The first IF signal is amplified by Q201, and then enters IC200 (FM processing IC). The signal is heterodyned again with a second local oscillator signal within IC200 to create a 450kHz second IF signal. The second IF signal is then fed through a 450kHz ceramic filter (CF200) to further eliminate unwanted signals before it is amplified and FM detected in IC200.

4) AF amplifier

The recovered AF signal obtained from IC200 is amplified by IC300 (1/4), filtered by the IC300 low-pass filter (2/4) and IC300 high-pass filter (3/4) and (4/4), and de-emphasized by R303 and C306. The processed AF signal passes through an AF volume control and is amplified to a sufficient level to drive a loud speaker by an AF power amplifier (IC302).

CIRCUIT DESCRIPTION

XF200:L71-0535-05

Item	Rating
Nominal center frequency	38.850MHz
Pass band width	±7.5kHz or more at 3dB
40dB stop band width	±40.0kHz or less
Ripple	1.0dB or less
Insertion loss	3.0dB or less
Guaranteed attenuation	80dB or more at fo -1000kHz
Terminal impedance	1200Ω / 1.4PF

CF200:L72-0979-05

Item	Rating
Nominal center frequency	450kHz
6dB band width	±7.5kHz or more
50dB band width	±15kHz or less
Ripple	2.0dB or less at fo ±5kHz
Insertion loss	6.0dB or less
Guaranteed attenuation	35.0dB or more at fo ±100kHz
Terminal impedance	1.5 kΩ

5) Squelch

Part of the AF signal from the IC enters the FM IC again, and the noise component is amplified and rectified by a filter and an amplifier to produce a DC voltage corresponding to the noise level.

The DC signal from the FM IC goes to the analog port of the microprocessor (IC403). IC403 determines whether to output

sounds from the speaker by checking whether the input voltage is higher or lower than the preset value.

To output sounds from the speaker, IC403 sends a high signal to the MUTE and AFCO lines and turns IC302 on through Q302, Q304, Q305, Q306 and Q307. (See Fig. 3)

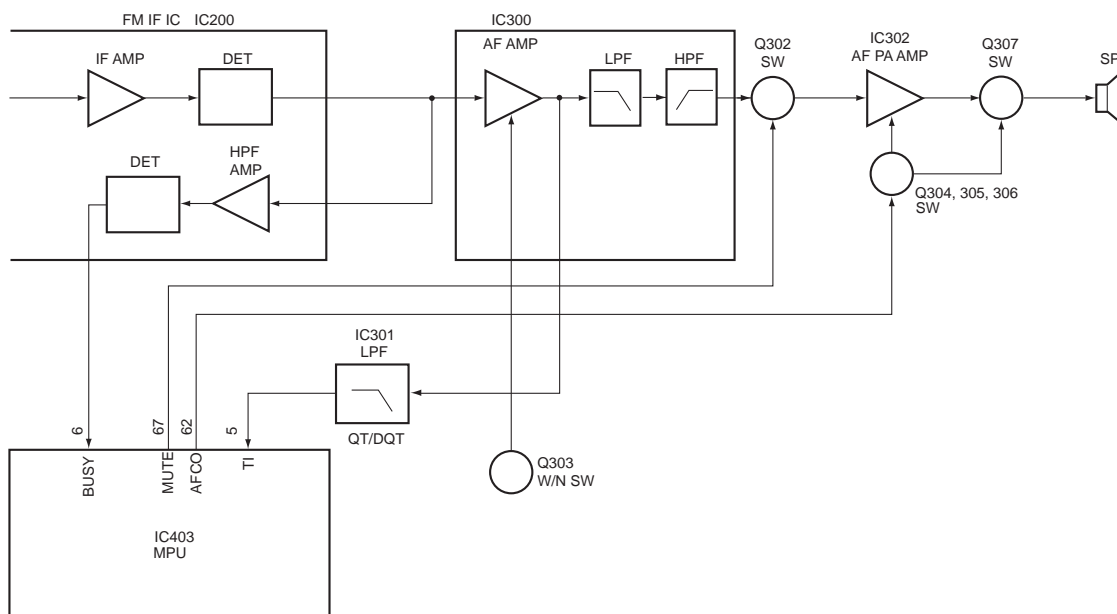


Fig. 3 AF Amplifier and squelch

6) Receive signaling

QT/DQT

300 Hz and higher audio frequencies of the output signal from IF IC are cut by a low-pass filter (IC301). The resulting signal enters the microprocessor (IC403). IC403 determines whether the QT or DQT matches the preset value, and controls the MUTE and AFCO and the speaker output sounds according to the squelch results.

3. PLL frequency synthesizer

The PLL circuit generates the first local oscillator signal for reception and the RF signal for transmission.

1) PLL

The frequency step of the PLL circuit is 5 or 6.25kHz. A 12.8MHz reference oscillator signal is divided at IC1 by a fixed counter to produce the 5 or 6.25kHz reference frequency. The voltage controlled oscillator (VCO) output signal is buffer amplified by Q6, then divided in IC1 by a dual-module programmable counter. The divided signal is compared in phase with the 5 or 6.25kHz reference signal in the phase comparator in IC1. The output signal from the phase comparator is filtered through a low-pass filter and passed to the VCO to control the oscillator frequency. (See Fig.4)

CIRCUIT DESCRIPTION

2) VCO

The operating frequency is generated by Q4 in transmit mode and Q3 in receive mode. The oscillator frequency is controlled by applying the VCO control voltage, obtained from the phase comparator, to the varactor diodes (D2 and D4 in transmit mode and D1 and D3 in receive mode). The T/R pin is

set high in receive mode causing Q5 and Q7 to turn Q4 off, and turn Q3 on. The T/R pin is set low in transmit mode. The outputs from Q3 and Q4 are amplified by Q6 and sent to the buffer amplifiers.

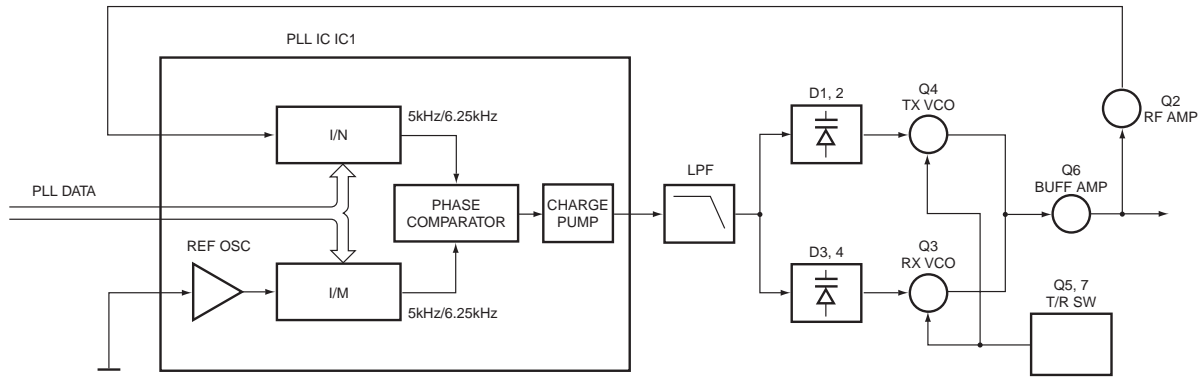


Fig. 4 PLL circuit

3) UNLOCK DETECTOR

If a pulse signal appears at the LD pin of IC1, an unlock condition occurs, and the DC voltage obtained from D7, R6, and C1 causes the voltage applied to the UL pin of the microprocessor to go low. When the microprocessor detects this condition, the transmitter is disabled, ignoring the push-to-talk switch input signal. (See Fig.5)

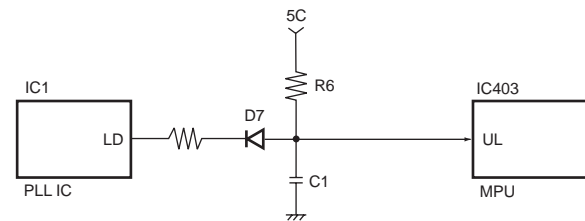


Fig. 5 Unlock detector circuit

4. Transmitter

1) Transmit audio

The modulation signal from the microphone is amplified by IC500 (1/2), passes through a preemphasis circuit, and amplified by the other IC500 (1/2) to perform IDC operation. The signal then passes through a low-pass filter (splatter filter) (Q501 and Q502) and cuts 3kHz and higher frequencies. The resulting signal goes to the VCO through the VCO modulation terminal for direct FM modulation. (See Fig. 6)

2) QT/DQT encoder

A necessary signal for QT/DQT encoding is generated by IC403 and FM-modulated to the PLL reference signal. Since the reference OSC does not modulate the loop characteristic frequency or higher, modulation is performed at the VCO side by adjusting the balance. (See Fig. 6)

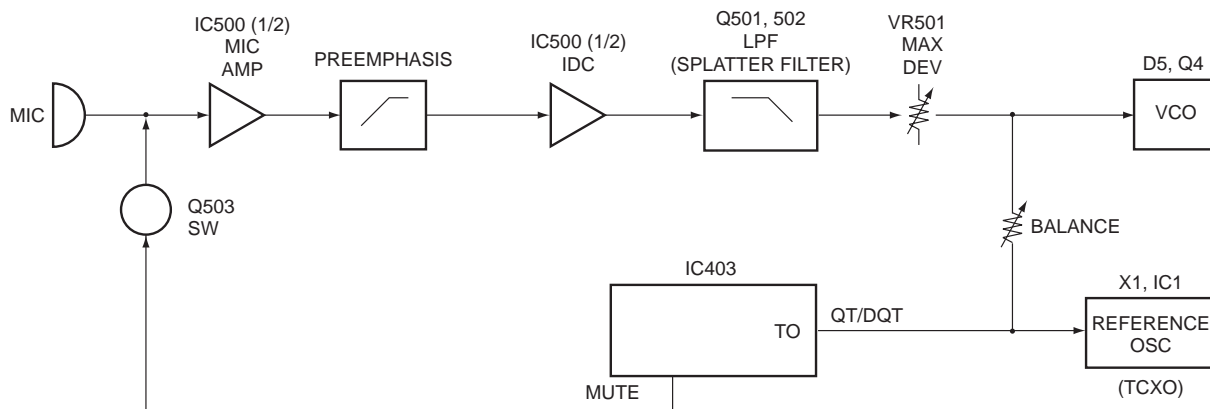


Fig. 6 Transmit audio QT/DQT

CIRCUIT DESCRIPTION

3) VCO and RF amplifier

The transmit signal obtained from the VCO buffer amplifier Q100, is amplified by Q101. This amplified signal is passed to the power amplifier, Q102 and Q105, which consists of a 2-stage FET amplifier and is capable of producing up to 5W of RF power. (See Fig.7)

4) ANT switch and LPF

The RF amplifier output signal is passed through a low-pass filter network and a transmit/receive switching circuit before it is passed to the antenna terminal. The transmit/receive switching circuit is comprised of D101, D102 and D103. D102 and D103 turned on (conductive) in transmit mode and off (isolated) in receive mode.

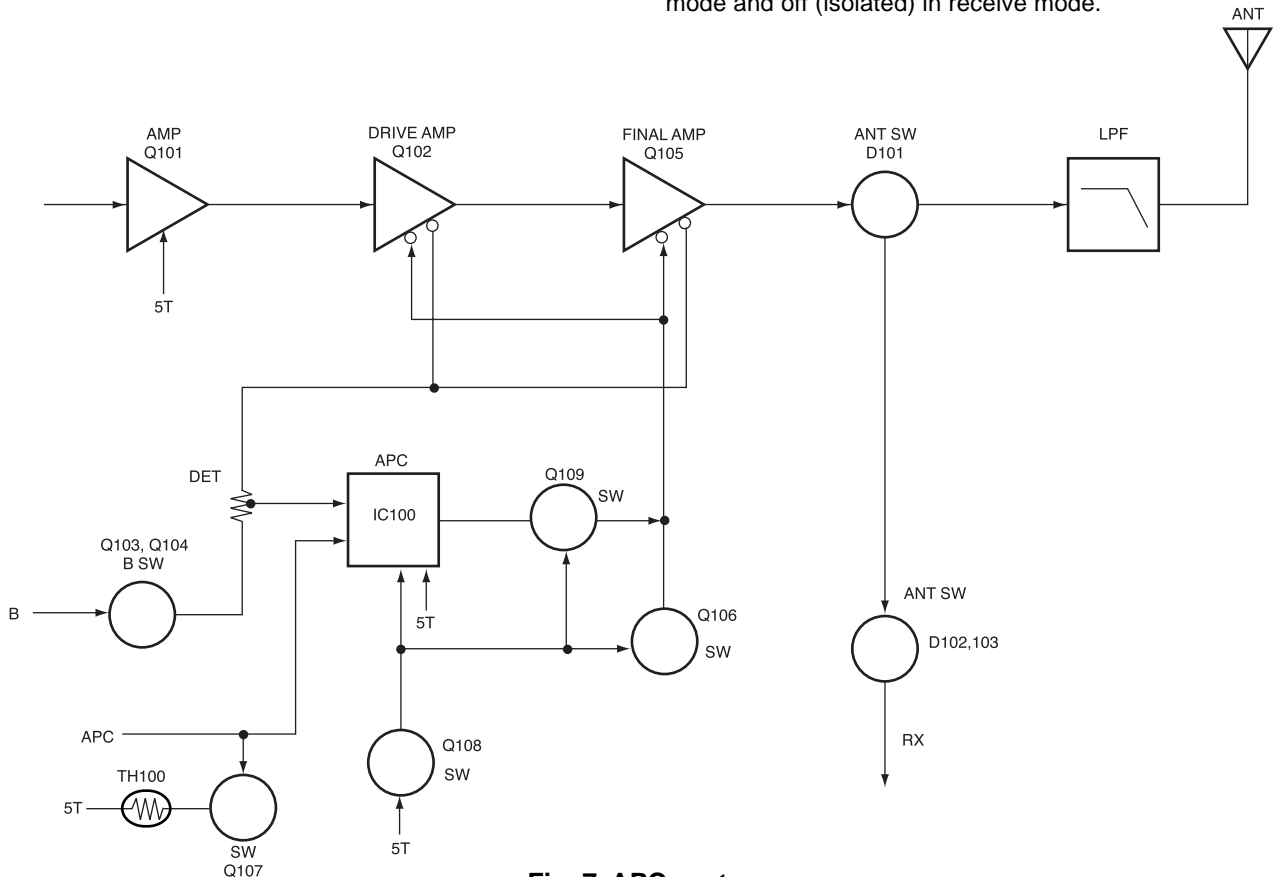


Fig. 7 APC system

5) APC

The automatic power control (APC) circuit stabilizes the transmitter output power at a predetermined level by sensing the drain current of the final amplifier Field Effect Transistor (FET). The voltage comparator, IC100 (2/2), compares the voltage obtained from the above drain current with a reference voltage which is set using the microprocessor. An APC voltage proportional to the difference between the sensed voltage and the reference voltage appears at the output of IC100 (1/2). This output voltage controls the gate of the FET power amplifier, which keeps the transmitter output power constant. The transmitter output power can be varied by the microprocessor which in turn changes the reference voltage and hence, the output power.

5. Power supply

A 5V reference power supply [5M] for the control circuit is derived from an internal battery. This reference is used to provide a 5V supply in transmit mode [5T], a 5V supply in receive mode [5R], and a 5V supply common in both modes [5C] based on the control signal sent from the microprocessor.

6. Control system

The IC403 CPU operates at 7.37MHz. This oscillator has a circuit that shifts the frequency according to the EEPROM data.

6) Terminal protection circuit

When the thermistor (TH100) reaches about 80°C, the protection circuit turns on Q107 to protect transmitting final amplifier (Q105) from the over heating.

SEMICONDUCTOR DATA

Microprocessor: M38267M8L241GP (IC403)

Pin No.	I/O	Port Name	Function
1	O	VC1	Variable capacity tune control
2	O	VC2	Variable capacity tune control
3	I	NC	NC
4	I	TIBI	QT/DQT external circuit center point input
5	I	TI	QT/DQT signal input
6	I	BUSY	Busy input
7	I	BATT	Battery voltage detection
8	I	NC	NC
9	O	VCCN	Frequency regulation output
10	O	APC	TX : Auto power control D/A output RX : BPF tuning D/A output
11	I	NC	NC
12	I	NC	NC
13	I	NC	NC
14	I	NC	NC
15	O	BEEP	Beep output
16	O	TO	QT/DQT output
17	I	NC	NC
18	I	PTT	[PTT] key input Connected to RXD
19	O	TXD	RS-232C output Connected to SP/ MIC test(REM)
20	I	RXD	RS-232C input Connected to [PTT] line
21	I	NC	NC
22	I	SELF	Self program L : disable
23	I	MONI	[MONI] key input
24	I	NC	NC
25	I	NC	NC
26	I	NC	NC
27	I	NC	NC
28	I	ENC3	Encode input (channel select)
29	I	ENC2	Encode input (channel select)
30	I	ENC1	Encode input (channel select)
31	I	ENC0	Encode input (channel select)
32	I	INTO	Power detection control
33	I	RST	Reset input
34	I	NC	NC
35	O	NC	NC
36	I	XIN	7.3728MHz oscillator
37	O	XOUT	7.3728MHz oscillator
38	I	VSS	GND
39	O	SHIFT	Beat shift H : shift on
40	O	PABC	Final supply H : on
41	O	WNRC	Audio reference sensitivity L : narrow
42	O	WNTC	MAX Dev. Control Narrow: H
43	I	NC	NC
44	I	NC	NC
45	I	NC	NC
46	I	NC	NC
47	I/O	SDA	EEPROM data line
48	O	SCL	EEPROM clock line
49	I	UL	PLL unlock detection pin L : unlock
50	I	NC	NC
51	I	NC	NC
52	I	NC	NC
53	I	NC	NC
54	I	NC	NC
55	O	DT	Common data output
56	O	CK	Common clock output
57	O	NC	NC
58	O	LE	PLL IC enable H : latches

Pin No.	I/O	Port Name	Function
59	O	NC	NC
60	O	NC	NC
61	O	5MC	Control of power supply (5M) for everything except the microcomputer and EEPROM L : Power supply ON
62	O	AFCO	AF amp power supply H : ON
63	O	RX	TX/RX VCO select H : RX
64	O	GLED	Green LED control H : Lit
65	O	RLED	RED LED control H : Lit
66	O	SAVE	Save control H : Save off
67	O	MUTE	Mute control H : Mic mute L : AF mute
68	O	5RC	Reception power supply control L : on
69	O	5TC	Transmission power supply control H : on
70	O	NC	NC
71	O	NC	NC
72	O	NC	NC
73	O	NC	NC
74	O	NC	NC
75	O	NC	NC
76	O	NC	NC
77	O	NC	NC
78	O	NC	NC
79	O	NC	NC
80	O	NC	NC
81	O	NC	NC
82	O	NC	NC
83	O	NC	NC
84	O	NC	NC
85	O	NC	NC
86	O	NC	NC
87	O	NC	NC
88	O	NC	NC
89	I	VCC	Microcomputer power supply, 5V input
90	I	VREF	A/D conversion reference voltage ; connected to Vcc
91	I	AVSS	A/D converter power supply ; connected to Vss
92	O	NC	NC
93	O	NC	NC
94	O	NC	NC
95	O	NC	NC
96	I	NC	NC
97	I	NC	NC
98	I	NC	NC
99	I	NC	NC
100	I	NC	NC

FET : 2SK2596(Q102)

Absolute Maximum Ratings (Ta=25°C)						
Item	V _{BSS}	V _{CSS}	I _D	P _{ch} *	T _{ch}	T _{stg}
Rating	17V	±10V	0.4A	3W	150°C	-45~+150°C
				*T _C =25°C		

FET : 2SK2595(Q105)

Absolute Maximum Ratings (Ta=25°C)						
Item	V _{DS}	V _{CSS}	I _D	P _{ch} *	T _{ch}	T _{stg}
Rating	17V	±10V	1.1A	20W	150°C	-45~+150°C
				*T _C =25°C		

DESCRIPTION OF COMPONENTS

TK-2107

Ref No.	Semiconductor	Description
IC1	IC	PHASE LOCKED LOOP SYSTEM
IC100	IC	AUTOMATIC POWER CONTROL
IC200	IC	IF SYSTEM
IC300	IC	AUDIO AMP ACTIVE FILTER
IC301	IC	ACTIVE FILTER
IC302	IC	AUDIO POWER AMP
IC400	IC	RESET SWITCH
IC401	IC	EEPROM
IC402	IC	VOLTAGE DETECT
IC403	IC	MICRO PROCESSOR
IC404	IC	VOLTAGE REGULATER
IC500	IC	MIC AMP/LIMITER
Q1	TRANSISTOR	TRIPLER
Q2	TRANSISTOR	RF AMP
Q3	FET	VCO RX
Q4	FET	VCO TX
Q5	FET	DC SWITCH
Q6	TRANSISTOR	RF BUFFER AMP
Q7	TRANSISTOR	DC SWITCH
Q8	TRANSISTOR	RIPPLE FILTER
Q100	TRANSISTOR	RF AMP
Q101	TRANSISTOR	TX PRE-DRIVE
Q102	FET	TX DRIVE
Q103	FET	DC SWITCH
Q104	TRANSISTOR	DC SWITCH
Q105	FET	TX FINAL
Q106	FET	DC SWITCH
Q107	TRANSISTOR	TEMPERATURE PROTECTION SWITCH
Q108-200	TRANSISTOR	DC SWITCH
Q201	TRANSISTOR	IF AMP
Q202	FET	MIXER
Q203	FET	MIXER RF AMP
Q300	TRANSISTOR	ACTIVE FILTER
Q302	FET	AUDIO MUTE SWITCH
Q304-306	TRANSISTOR	DC SWITCH
Q307	FET	AUDIO MUTE SWITCH
Q400-402	TRANSISTOR	DC SWITCH
Q403	TRANSISTOR	BEAT SHIFT SWITCH
Q404	TRANSISTOR	DC SWITCH
Q405	FET	DC SWITCH
Q406-408	TRANSISTOR	DC SWITCH
Q500	FET	DC SWITCH
Q501,502	TRANSISTOR	ACTIVE FILTER
Q503	TRANSISTOR	MIC MUTE/ AGC
Q504	TRANSISTOR	DC SWITCH
D1-4	VARIABLE CAPACITANCE DIODE	FREQ. CONTROL
D5	VARIABLE CAPACITANCE DIODE	TX MODULATION
D6	DIODE	CURRENT STEERING
D7	DIODE	UNLOCK DETECT
D100	DIODE	RF SWITCH
D101-103	DIODE	ANTENNA SWITCH
D200	DIODE	RF SWITCH
D300	DIODE	LIMITER
D400	LED	TX
D401	LED	BUSY
D500	DIODE	AGC DETECT
D501	DIODE	MIC MUTE/AGC SWITCH
D502	DIODE	REVERSE PROTECTION

PARTS LIST

* New Parts. Δ 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.
 TK-2107

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-2107											
1	1A	*	A02-2448-13	CABINET ASSY		C7			CK73GB1H102K	CHIP C	1000PF K
2	3B		A82-0034-03	REAR PANEL		C8			CK73FB1C224K	CHIP C	0.22UF K
3	3D		B09-0351-03	CAP		C9			CC73GCH1H100D	CHIP C	10PF D
5		*	B72-1847-04	MODEL NAME PLATE		C10			CC73GCH1H470J	CHIP C	47PF J
6	2B		E04-0413-05	RF COAXIAL RECEPTACLE(SMA)		C12			CK73FB1C224K	CHIP C	0.22UF K
7	3B		E23-1006-04	RELAY TERMINAL(BATT -)		C14			CC73GCH1H100D	CHIP C	10PF D
8	1A		G01-0881-04	COIL SPRING(BATT RELEASE)		C15			C92-0565-05	CHIP-TAN	6.8UF 10WV
9	2B		G11-2583-04	SHEET		C16			CC73GCH1H680J	CHIP C	68PF J
10	2B		G11-2588-04	RUBBER SHEET(CHASSIS)		C17			CK73GB1H331K	CHIP C	330PF K
		*	G13-1709-04	CUSHION(VOL)		C18			C92-0504-05	CHIP-TAN	0.68UF 20WV
			G13-1763-04	CUSHION(CHASSIS-BATT)		C19,20			CK73GB1H103K	CHIP C	0.010UF K
11	2B		G53-0791-03	PACKING(SP/MIC PLUG)		C23			C92-0560-05	CHIP-TAN	10UF 6.3WV
12	2A		G53-0842-13	PACKING(SPEAKER)		C24			CK73GB1H681K	CHIP C	680PF K
13	2A		G53-0860-04	PACKING(SIDE)		C25			CK73GB1H471K	CHIP C	470PF K
14	1C		H12-3037-02	PACKING FIXTURE		C26			CC73GCH1H121J	CHIP C	120PF J
15	1C		H25-0085-04	PROTECTION BAG (100/200/0.07)		C27			CK73GB1H102K	CHIP C	1000PF K
16	2D		H25-2012-04	PROTECTION BAG (75/100/0.08)		C28			CC73GCH1H330J	CHIP C	33PF J
17	3C		H52-1522-02	ITEM CARTON CASE		C29-31			CK73GB1H102K	CHIP C	1000PF K
18	1A		J19-1572-04	HOLDER(BATT RELEASE)		C32			CC73GCH1H180J	CHIP C	18PF J
19	2B		J19-5344-03	HOLDER(VOL/CH S.W)		C33			CC73GCH1H120J	CHIP C	12PF J
20	3D		J21-4493-04	SP/MIC HOLDER		C34			CC73GCH1HR75B	CHIP C	0.75PF B
21	3B		J29-0624-03	BELT HOOK		C35			CC73GCH1H060D	CHIP C	6.0PF D
			J82-0059-05	FPC		C36			CC73GCH1H120J	CHIP C	12PF J
22	1B		K29-5255-03	KNOB(VOL)		C37			CC73GCH1H050B	CHIP C	5.0PF B
23	1A		K29-5274-03	BUTTON KNOB(MONI)		C38			CC73GCH1H150J	CHIP C	15PF J
24	1A		K29-5275-13	BUTTON KNOB(PTT)		C39			CK73GB1H103K	CHIP C	0.010UF K
25	1B		K29-5278-03	KNOB(CH S.W)		C40,41			CK73GB1H102K	CHIP C	1000PF K
26	1A		K29-5337-03	LEVER KNOB(BATT RELEASE)		C42			CK73GB1H103K	CHIP C	0.010UF K
A	2B		N09-2319-05	BINDING HEAD SCREW(SMA)		C43,44			CC73GCH1HOR5B	CHIP C	0.5PF B
B	1B		N14-0581-04	CIRCULAR NUT(VOL/CH S.W)		C45,46			CK73GB1H102K	CHIP C	1000PF K
C	1B		N14-0582-14	CIRCULAR NUT(SMA)		C47			CC73GCH1H330J	CHIP C	33PF J
D	3A		N30-2606-46	PAN HEAD MACHINE SCREW		C48			CC73GCH1H100D	CHIP C	10PF D
E	3B		N79-2035-46	PAN HEAD TAPTITE SCREW		C49			CK73GB1H102K	CHIP C	1000PF K
F	2A,2B		N83-2005-46	PAN HEAD TAPTITE SCREW		C50			C92-0507-05	CHIP-TAN	4.7UF 6.3WV
G	3D		N99-0396-05	SCREW SET		C51			CC73GCH1H680J	CHIP C	68PF J
			R31-0624-05	VARIABLE RESISTOR		C100			CC73GCH1H150J	CHIP C	15PF J
			S60-0410-05	ROTARY SWITCH		C101,102			CK73GB1H102K	CHIP C	1000PF K
SP	1A		T07-0369-05	SPEAKER		C103			CC73GCH1H220J	CHIP C	22PF J
ANT	2C		T90-0733-05	HELICAL ANTENNA		C104-107			CK73GB1H102K	CHIP C	1000PF K
TX-RX UNIT (X57-6020-21)											
D400			B30-2156-05	LED(RED)		C108			CC73GCH1H120J	CHIP C	12PF J
D401			B30-2157-05	LED(YELLOW)		C109			CK73GB1H102K	CHIP C	1000PF K
C1			CK73GB1C104K	CHIP C	0.10UF K	C110			CK73GB1C104K	CHIP C	0.10UF K
C2,3			CC73GCH1H101J	CHIP C	100PF J	C111,112			CK73GB1H102K	CHIP C	1000PF K
C4			CK73GB1C104K	CHIP C	0.10UF K	C113			CC73GCH1H390J	CHIP C	39PF J
C5			C92-0507-05	CHIP-TAN	4.7UF 6.3WV	C114-116			CK73GB1H102K	CHIP C	1000PF K
C6			CC73GCH1H101J	CHIP C	100PF J	C118-120			CK73GB1H102K	CHIP C	1000PF K
						C121			CK73EB1C105K	CHIP C	1.0UF K
						C122			CC73GCH1H050C	CHIP C	5.0PF C
						C123			CK73GB1H103K	CHIP C	0.010UF K
						C124			CK73GB1H102K	CHIP C	1000PF K
						C125			CK73GB1C104K	CHIP C	0.10UF K
						C126			CC73GCH1H330J	CHIP C	33PF J
						C127			C92-0565-05	CHIP-TAN	6.8UF 10WV

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C128			CC73GCH1H030C	CHIP C 3.0PF C		C304			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C129			CC73GCH1H4R5B	CHIP C 4.5PF B		C305			CK73GB1H103J	CHIP C 0.010UF J	
C130,131			CK73GB1H102K	CHIP C 1000PF K		C306			CK73GB1C473K	CHIP C 0.047UF K	
C132			CK73GB1H471K	CHIP C 470PF K		C307			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C133			CK73GB1H102K	CHIP C 1000PF K		C308			CK73GB1H562K	CHIP C 5600PF K	
C134			CC73GCH1H101J	CHIP C 100PF J		C309			CK73GB1H103J	CHIP C 0.010UF J	
C135			CC73GCH1H270J	CHIP C 27PF J		C311			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C136			CC73GCH1H070D	CHIP C 7.0PF D		C312			CK73GB1H103J	CHIP C 0.010UF J	
C137			CK73GB1H102K	CHIP C 1000PF K		C313			CK73FB1A105K	CHIP C 1.0UF K	
C138			CC73GCH1H050C	CHIP C 5.0PF C		C314			CK73GB1H102K	CHIP C 1000PF K	
C139			CK73GB1H102K	CHIP C 1000PF K		C316			CK73GB1H103J	CHIP C 0.010UF J	
C140			CC73GCH1H050C	CHIP C 5.0PF C		C318			CK73GB1C333K	CHIP C 0.033UF K	
C141			CK73GB1H471K	CHIP C 470PF K		C319			CK73GB1C473K	CHIP C 0.047UF K	
C142			CC73GCH1H130J	CHIP C 13PF J		C320,321			CK73GB1C333J	CHIP C 0.033UF J	
C143			CC73GCH1H060D	CHIP C 6.0PF D		C322			CK73FB1E104K	CHIP C 0.10UF K	
C144			CC73GCH1H040C	CHIP C 4.0PF C		C327			CK73GB1C104K	CHIP C 0.10UF K	
C146			CC73GCH1H130J	CHIP C 13PF J		C330			CC73GCH1H101J	CHIP C 100PF J	
C147			CC73GCH1H050C	CHIP C 5.0PF C		C331			CK73FB1C474K	CHIP C 0.47UF K	
C148			CC73GCH1H030C	CHIP C 3.0PF C		C332			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C200			C92-0560-05	CHIP-TAN 10UF 6.3WV		C333			CK73GB1A474K	CHIP C 0.47UF K	
C201			CK73GB1H103K	CHIP C 0.010UF K		C334			CC73GCH1H221J	CHIP C 220PF J	
C202			CC73GCH1H100D	CHIP C 10PF D		C335			CK73GB1C473K	CHIP C 0.047UF K	
C203			CK73GB1H471K	CHIP C 470PF K		C336			CK73GB1H103K	CHIP C 0.010UF K	
C204			CK73GB1H472K	CHIP C 4700PFK		C337			C92-0665-05	TANTAL 100UF 6.3WV	
C205,206			CC73GCH1H221J	CHIP C 220PF J		C338			CC73GCH1H560J	CHIP C 56PF J	
C207			CK73GB1C104K	CHIP C 0.10UF K		C400			CK73GB1C104K	CHIP C 0.10UF K	
C208			CC73GCH1H270J	CHIP C 27PF J		C402-404			CK73GB1H102K	CHIP C 1000PF K	
C209			CK73GB1C104K	CHIP C 0.10UF K		C406,407			CK73GB1H102K	CHIP C 1000PF K	
C210			CK73GB1H103K	CHIP C 0.010UF K		C408			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C211			CK73GB1C104K	CHIP C 0.10UF K		C409			CC73GCH1H030C	CHIP C 3.0PF C	
C212			CC73GCH1H150J	CHIP C 15PF J		C410			CK73GB1H102K	CHIP C 1000PF K	
C213			CK73GB1C104K	CHIP C 0.10UF K		C411			CK73GB1H471K	CHIP C 470PF K	
C214			CK73GB1H103K	CHIP C 0.010UF K		C412			CC73GCH1H100D	CHIP C 10PF D	
C215			CC73GCH1H3R5B	CHIP C 3.5PF B		C413,414			CK73GB1H102K	CHIP C 1000PF K	
C217			CK73GB1H103K	CHIP C 0.010UF K		C415			CC73GCH1H100D	CHIP C 10PF D	
C218			CK73GB1H102K	CHIP C 1000PF K		C416			CK73GB1H102K	CHIP C 1000PF K	
C219			CC73GCH1H120J	CHIP C 12PF J		C417			CK73EF1C105Z	CHIP C 1.0UF Z	
C220			CK73GB1H102K	CHIP C 1000PF K		C418			CK73GB1H103K	CHIP C 0.010UF K	
C221			CK73GB1H103K	CHIP C 0.010UF K		C420-422			CK73GB1H103K	CHIP C 0.010UF K	
C222			CC73GCH1H040C	CHIP C 4.0PF C		C423			CK73GB1C104K	CHIP C 0.10UF K	
C224,225			CK73GB1C104K	CHIP C 0.10UF K		C424			CK73FB1A105K	CHIP C 1.0UF K	
C235			CK73GB1C104K	CHIP C 0.10UF K		C425			CK73GB1H103K	CHIP C 0.010UF K	
C236			CK73GB1H102K	CHIP C 1000PF K		C427			CK73GB1H102K	CHIP C 1000PF K	
C237			CC73GCH1H120G	CHIP C 12PF G		C429,430			CK73FB1A105K	CHIP C 1.0UF K	
C241			CC73GCH1H120G	CHIP C 12PF G		C500,501			CK73GB1C273K	CHIP C 0.027UF K	
C243			CC73GCH1H020C	CHIP C 2.0PF C		C502			CK73GB1H392K	CHIP C 3900PF K	
C245,246			CK73GB1H102K	CHIP C 1000PF K		C503			CK73GB1C333K	CHIP C 0.033UF K	
C248			CC73GCH1H130J	CHIP C 13PF J		C504			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C250,251			CK73GB1H102K	CHIP C 1000PF K		C505			CK73FB1A105K	CHIP C 1.0UF K	
C254			CC73GCH1H010C	CHIP C 1.0PF C		C507			C92-0587-05	CHIP-TAN 2.2UF 4WV	
C257			CC73GCH1H1R5C	CHIP C 1.5PF C		C508			CK73GB1H103K	CHIP C 0.010UF K	
C258			CC73GCH1H180J	CHIP C 18PF J		C509			CK73GB1H332K	CHIP C 3300PF K	
C261			CC73GCH1H390J	CHIP C 39PF J		C510			CC73GCH1E821J	CHIP C 820PF J	
C300			CK73GB1H822K	CHIP C 8200PF K		C511			CK73GB1C473K	CHIP C 0.047UF K	
C301			CK73GB1E183K	CHIP C 0.018UF K		C512			CK73GB1H332K	CHIP C 3300PF K	
C302,303			CK73GB1C104K	CHIP C 0.10UF K		C513			CC73GCH1E681J	CHIP C 680PF J	

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C514			CK73GB1C473K	CHIP C 0.047UF K		L115			L34-4549-05	AIR-CORE COIL	
C515			CK73GB1H103K	CHIP C 0.010UF K		L117			L34-4548-05	AIR-CORE COIL	
C516			CC73GCH1H100D	CHIP C 10PF D		L118			L40-1092-81	SMALL FIXED INDUCTOR	
C517			CK73GB1H102K	CHIP C 1000PF K		L200			L40-8285-85	SMALL FIXED INDUCTOR(0.82U)	
C518			CK73GB1E223J	CHIP C 0.022UF J		L201			L40-1085-85	SMALL FIXED INDUCTOR(0.10U)	
C519			C92-0507-05	CHIP-TAN 4.7UF 6.3WV		L202			L40-2285-38	SMALL FIXED INDUCTOR(220NH)	
C520			CK73GB1E223J	CHIP C 0.022UF J		L203			L41-3378-03	SMALL FIXED INDUCTOR	
C521			CK73GB1H102K	CHIP C 1000PF K		L204			L40-3988-76	SMALL FIXED INDUCTOR(0.39UH)	
C522			CK73FB1E104K	CHIP C 0.10UF K		L208-210			L41-3378-03	SMALL FIXED INDUCTOR	
C523			C92-0587-05	CHIP-TAN 2.2UF 4WV		L212			L34-4554-05	COIL	
C524			CK73GB1C273K	CHIP C 0.027UF K		L212			L34-4585-05	COIL	
C525			CK73GB1C104K	CHIP C 0.10UF K		L214			L41-3378-03	SMALL FIXED INDUCTOR	
C526			CK73GB1H471K	CHIP C 470PF K		L400			L40-2281-86	SMALL FIXED INDUCTOR(0.22U)	
C527			C92-0560-05	CHIP-TAN 10UF 6.3WV		L401			L92-0140-05	FERRITE CHIP	
C528			CK73GB1H102K	CHIP C 1000PF K		L402,403			L40-2281-86	SMALL FIXED INDUCTOR(0.22U)	
C529			CK73FB1H102K	CHIP C 1000PF K		L500			L92-0140-05	FERRITE CHIP	
C530,531			CC73GCH1H221J	CHIP C 220PF J		L501,502			L92-0149-05	FERRITE CHIP	
C532			CK73GB1H471K	CHIP C 470PF K		X1			L77-1756-05	TCXO (12.8MHZ)	
C533			CK73GB1C104K	CHIP C 0.10UF K		X400			L77-1761-05	CRYSTAL RESONATOR(7.3728MHZ)	
TC1,2			C05-0383-05	CERAMIC TRIMMER CAP(6P)		XF200			L71-0535-05	MCF (38.85MHZ)	
TC201			C05-0370-05	CERAMIC TRIMMER CAP					N78-2640-46	PAN HEAD TAPTITE SCREW	
CN400			E23-1005-04	RELAY TERMINAL		CP1			R90-0724-05	MULTI-COMP 1K X4	
J500			E40-5998-05	PIN ASSY		R1			RK73GB1J154J	CHIP R 150K J 1/16W	
F500			E11-0457-05	PHONE JACK (2.5/3.5D)		R2			RK73GB1J102J	CHIP R 1.0K J 1/16W	
			F53-0130-05	FUSE		R3			RK73GB1J100J	CHIP R 10 J 1/16W	
34	2B		G53-0862-04	PACKING		R4			RK73GB1J102J	CHIP R 1.0K J 1/16W	
			J19-1571-04	HOLDER							
			J30-1249-04	SPACER		R5			R92-1252-05	CHIP R 0 OHM	
CF200			L72-0979-05	CERAMIC FILTER		R6			RK73GB1J102J	CHIP R 1.0K J 1/16W	
L1			L92-0140-05	FERRITE CHIP		R7			R92-1252-05	CHIP R 0 OHM	
L2			L40-1005-85	SMALL FIXED INDUCTOR(10U)		R8			RK73GB1J334J	CHIP R 330K J 1/16W	
L4			L40-4781-86	SMALL FIXED INDUCTOR(0.47U)		R9			RK73GB1J102J	CHIP R 1.0K J 1/16W	
L5			L40-5681-86	SMALL FIXED INDUCTOR(0.56U)		R10			RK73GB1J151J	CHIP R 150 J 1/16W	
L6			L40-6891-86	SMALL FIXED INDUCTOR(6.8U)		R11			RK73GB1J473J	CHIP R 47K J 1/16W	
L7			L92-0140-05	FERRITE CHIP		R12			RK73GB1J274J	CHIP R 270K J 1/16W	
L8,9			L40-6891-86	SMALL FIXED INDUCTOR(6.8U)		R13			RK73GB1J151J	CHIP R 150 J 1/16W	
L10			L33-0750-05	SMALL FIXED INDUCTOR		R14			RK73GB1J101J	CHIP R 100 J 1/16W	
L11			L33-0744-05	SMALL FIXED INDUCTOR		R15			RK73GB1J103J	CHIP R 10K J 1/16W	
L12			L40-8275-77	SMALL FIXED INDUCTOR(82NH)		R16			RK73GB1J683J	CHIP R 68K J 1/16W	
L14			L92-0140-05	FERRITE CHIP		R17			RK73GB1J104J	CHIP R 100K J 1/16W	
L15			L40-6891-86	SMALL FIXED INDUCTOR(6.8U)		R18			RK73GB1J271J	CHIP R 270 J 1/16W	
L16,17			L40-2285-38	SMALL FIXED INDUCTOR(220NH)		R19			RK73GB1J473J	CHIP R 47K J 1/16W	
L100			L40-1085-77	SMALL FIXED INDUCTOR(100NH)		R20			RK73GB1J102J	CHIP R 1.0K J 1/16W	
L101			L40-6875-77	SMALL FIXED INDUCTOR(68NH)		R21			RK73GB1J104J	CHIP R 100K J 1/16W	
L102			L92-0140-05	FERRITE CHIP		R22			RK73GB1J271J	CHIP R 270 J 1/16W	
L103			L40-1875-77	SMALL FIXED INDUCTOR(18NH)		R23			RK73GB1J124J	CHIP R 120K J 1/16W	
L104			L40-1098-76	SMALL FIXED INDUCTOR(1UH)		R24			RK73GB1J104J	CHIP R 100K J 1/16W	
L105			L92-0149-05	FERRITE CHIP		R25			RK73GB1J681J	CHIP R 680 J 1/16W	
L106			L40-3363-77	SMALL FIXED INDUCTOR(3.3NH)		R26			RK73GB1J472J	CHIP R 4.7K J 1/16W	
L107			L40-1575-54	SMALL FIXED INDUCTOR(15NH)		R27			RK73GB1J102J	CHIP R 1.0K J 1/16W	
L108			L34-4548-05	AIR-CORE COIL		R28,29			R92-1252-05	CHIP R 0 OHM	
L109			L92-0149-05	FERRITE CHIP		R100			RK73GB1J332J	CHIP R 3.3K J 1/16W	
L110,111			L34-4650-05	AIR-CORE COIL		R101			RK73GB1J123J	CHIP R 12K J 1/16W	
L112			L40-1095-85	SMALL FIXED INDUCTOR(1.0U)		R102			RK73GB1J221J	CHIP R 220 J 1/16W	
L113			L34-4550-05	AIR-CORE COIL		R103			RK73GB1J102J	CHIP R 1.0K J 1/16W	
L114			L34-4548-05	AIR-CORE COIL		R104			RK73GB1J101J	CHIP R 100 J 1/16W	
						R105,106			RK73GB1J332J	CHIP R 3.3K J 1/16W	

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R107			RK73GB1J392J	CHIP R 3.9K J 1/16W		R303			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R108			RK73GB1J152J	CHIP R 1.5K J 1/16W		R304			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R109			RK73GB1J100J	CHIP R 10 J 1/16W		R305			RK73GB1J183J	CHIP R 18K J 1/16W	
R110			RK73GB1J331J	CHIP R 330 J 1/16W		R306			RK73GB1J124J	CHIP R 120K J 1/16W	
R112			RK73GB1J180J	CHIP R 18 J 1/16W		R307			RK73GB1J473J	CHIP R 47K J 1/16W	
R114,115			RK73GB1J473J	CHIP R 47K J 1/16W		R308			RK73GB1J103J	CHIP R 10K J 1/16W	
R116,117			RK73GB1J470J	CHIP R 47 J 1/16W		R309			RK73GB1J474J	CHIP R 470K J 1/16W	
R119			RK73GB1J472J	CHIP R 4.7K J 1/16W		R310,311			R92-0670-05	CHIP R 0 OHM	
R120			RK73GB1J153J	CHIP R 15K J 1/16W		R312			RK73GB1J123J	CHIP R 12K J 1/16W	
R121			RK73GB1J473J	CHIP R 47K J 1/16W		R313			RK73GB1J104J	CHIP R 100K J 1/16W	
R122			RK73GB1J681J	CHIP R 680 J 1/16W		R314			RK73GH1J474D	CHIP R 470K D 1/16W	
R123			R92-1252-05	CHIP R 0 OHM		R315			RK73GH1J394D	CHIP R 390K D 1/16W	
R124			RK73GB1J561J	CHIP R 560 J 1/16W		R316			RK73GB1J274J	CHIP R 270K J 1/16W	
R125			RK73GB1J332J	CHIP R 3.3K J 1/16W		R317			RK73GH1J274D	CHIP R 270K D 1/16W	
R126			RK73GB1J681J	CHIP R 680 J 1/16W		R318			RK73GB1J184J	CHIP R 180K J 1/16W	
R127,128			RK73GB1J271J	CHIP R 270 J 1/16W		R320			RK73GB1J473J	CHIP R 47K J 1/16W	
R130-132			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R321			RK73GB1J223J	CHIP R 22K J 1/16W	
R133-138			RK73GH1J154D	CHIP R 150K D 1/16W		R322			RK73GH1J224D	CHIP R 220K J 1/16W	
R140			RK73GB1J103J	CHIP R 10K J 1/16W		R323			RK73GB1J104J	CHIP R 100K J 1/16W	
R141			RK73GB1J473J	CHIP R 47K J 1/16W		R324			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R142			RK73GB1J105J	CHIP R 1.0M J 1/16W		R325			RK73GB1J104J	CHIP R 100K J 1/16W	
R143			R92-1252-05	CHIP R 0 OHM		R326			RK73GH1J562D	CHIP R 5.6K D 1/16W	
R144			RK73GB1J331J	CHIP R 330 J 1/16W		R327			R92-1252-05	CHIP R 0 OHM	
R145			RK73GB1J184J	CHIP R 180K J 1/16W		R328			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R146			RK73GB1J104J	CHIP R 100K J 1/16W		R330			RK73GB1J473J	CHIP R 47K J 1/16W	
R147,148			RK73GB1J331J	CHIP R 330 J 1/16W		R331			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R200			RK73GB1J100J	CHIP R 10 J 1/16W		R332			RK73GB1J151J	CHIP R 150 J 1/16W	
R201			RK73GB1J392J	CHIP R 3.9K J 1/16W		R333			RK73GB1J474J	CHIP R 470K J 1/16W	
R202			RK73GB1J184J	CHIP R 180K J 1/16W		R334			RK73GB1J100J	CHIP R 10 J 1/16W	
R203,204			RK73GB1J332J	CHIP R 3.3K J 1/16W		R335			RK73GB1J563J	CHIP R 56K J 1/16W	
R205			RK73GB1J153J	CHIP R 15K J 1/16W		R336			RK73GB1J333J	CHIP R 33K J 1/16W	
R206			RK73GB1J184J	CHIP R 180K J 1/16W		R338			RK73GB1J473J	CHIP R 47K J 1/16W	
R207			RK73GB1J104J	CHIP R 100K J 1/16W		R339			RK73GB1J822J	CHIP R 8.2K J 1/16W	
R208			RK73GB1J684J	CHIP R 680K J 1/16W		R340			RK73GH1J124D	CHIP R 120K D 1/16W	
R209			RK73GB1J272J	CHIP R 2.7K J 1/16W		R400			RK73GB1J334J	CHIP R 330K J 1/16W	
R210,211			RK73GB1J821J	CHIP R 820 J 1/16W		R401			RK73GB1J104J	CHIP R 100K J 1/16W	
R212			RK73GB1J330J	CHIP R 33 J 1/16W		R402			RK73GB1J221J	CHIP R 220 J 1/16W	
R213			R92-1252-05	CHIP R 0 OHM		R403			RK73GB1J181J	CHIP R 180 J 1/16W	
R214			RK73GB1J103J	CHIP R 10K J 1/16W		R404			R92-1252-05	CHIP R 0 OHM	
R215			RK73GB1J271J	CHIP R 270 J 1/16W		R405			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R216			RK73GB1J222J	CHIP R 2.2K J 1/16W		R406			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R217			R92-1252-05	CHIP R 0 OHM		R407			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R220			RK73GB1J122J	CHIP R 1.2K J 1/16W		R408			RK73GB1J104J	CHIP R 100K J 1/16W	
R222			R92-1252-05	CHIP R 0 OHM		R409			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R223			RK73GB1J101J	CHIP R 100 J 1/16W		R410			RK73GB1J822J	CHIP R 8.2K J 1/16W	
R225			RK73GB1J102J	CHIP R 1.0K J 1/16W		R411			RK73GB1J224J	CHIP R 220K J 1/16W	
R228			RK73GB1J470J	CHIP R 47 J 1/16W		R412			RK73GB1J100J	CHIP R 10 J 1/16W	
R229			RK73GB1J471J	CHIP R 470 J 1/16W		R413			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R231			RK73GB1J101J	CHIP R 100 J 1/16W		R414,415			RK73GB1J473J	CHIP R 47K J 1/16W	
R232			R92-1252-05	CHIP R 0 OHM		R416			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R233			RK73GB1J224J	CHIP R 220K J 1/16W		R417			RK73GB1J100J	CHIP R 10 J 1/16W	
R234			R92-1252-05	CHIP R 0 OHM		R418			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R235			RK73GB1J104J	CHIP R 100K J 1/16W		R419			R92-1252-05	CHIP R 0 OHM	
R240			R92-1252-05	CHIP R 0 OHM		R420			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R300			RK73GH1J913D	CHIP R 91K D 1/16W		R421			RK73GB1J473J	CHIP R 47K J 1/16W	
R301,302			RK73GB1J562J	CHIP R 5.6K J 1/16W		R422			RK73GB1J272J	CHIP R 2.7K J 1/16W	

PARTS LIST

TX-RX UNIT (X57-6020-21)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R423			RK73GB1J473J	CHIP R 47K J 1/16W		D5			1SV214	VARIABLE CAPACITANCE DIODE	
R424,425			RK73GB1J332J	CHIP R 3.3K J 1/16W		D6,7			MA2S111	DIODE	
R426			RK73GB1J822J	CHIP R 8.2K J 1/16W		D100			HSC277	DIODE	
R427			RK73GB1J102J	CHIP R 1.0K J 1/16W		D101		*	HSK277	DIODE	
R428			RK73GB1J272J	CHIP R 2.7K J 1/16W		D102,103			HSC277	DIODE	
R429			RK73GB1J821J	CHIP R 820 J 1/16W		D200			HSC277	DIODE	
R430			RK73GB1J101J	CHIP R 100 J 1/16W		D300			DA221	DIODE	
R431			R92-1252-05	CHIP R 0 OHM		D500			1SS372	DIODE	
R432			RK73GB1J103J	CHIP R 10K J 1/16W		D501			DAN222	DIODE	
R433,434			RK73GB1J153J	CHIP R 15K J 1/16W		D502			1SR154-400	DIODE	
R435			RK73GB1J103J	CHIP R 10K J 1/16W		IC1			MB15A02	IC	
R500,501			RK73GB1J472J	CHIP R 4.7K J 1/16W		IC100			NJM2904V	IC(APC)	
R502			RK73GB1J823J	CHIP R 82K J 1/16W		IC200			TA31136FN	IC(FM IF DETECTOR)	
R503			RK73GB1J682J	CHIP R 6.8K J 1/16W		IC300			NJM2902V	IC	
R504			RK73GB1J223J	CHIP R 22K J 1/16W		IC301			NJM2904V	IC(APC)	
R505			RK73GB1J682J	CHIP R 6.8K J 1/16W		IC302			TA7368F	IC(AF POWER AMP)	
R506			RK73GB1J821J	CHIP R 820 J 1/16W		IC400			PST9140NR	IC(RESET SW)	
R507			RK73GB1J472J	CHIP R 4.7K J 1/16W		IC401			AT2408N10SI2.5	IC(8bit SERIAL EEPROM)	
R508			RK73GB1J102J	CHIP R 1.0K J 1/16W		IC402			RN5VL45C	IC(REGULATOR)	
R509			RK73GB1J124J	CHIP R 120K J 1/16W		IC403			M38267M8L241GP	IC(MPU)	
R510			RK73GB1J332J	CHIP R 3.3K J 1/16W		IC404			S-81350HG-KD	IC(VOLTAGE REGULATOR)	
R511			RK73GB1J103J	CHIP R 10K J 1/16W		IC500			NJM2100V	IC(AUDIO AMP)	
R512			RK73GB1J185J	CHIP R 1.8M J 1/16W		Q1			2SC4649(N,P)	TRANSISTOR	
R513			RK73GB1J153J	CHIP R 15K J 1/16W		Q2			2SC5108(Y)	TRANSISTOR	
R514,515			RK73GB1J333J	CHIP R 33K J 1/16W		Q3,4			2SK1875(V)	FET	
R516			RK73GB1J103J	CHIP R 10K J 1/16W		Q5			2SJ243	FET	
R517			RK73GB1J185J	CHIP R 1.8M J 1/16W		Q6			2SC5108(Y)	TRANSISTOR	
R518			RK73GB1J154J	CHIP R 150K J 1/16W		Q7			UMC4	TRANSISTOR	
R519,520			RK73GB1J333J	CHIP R 33K J 1/16W		Q8			2SC4617(S)	TRANSISTOR	
R521			RK73GB1J332J	CHIP R 3.3K J 1/16W		Q100			2SC5108(Y)	TRANSISTOR	
R522			RK73GB1J182J	CHIP R 1.8K J 1/16W		Q101			2SC4988	TRANSISTOR	
R523			RK73GB1J682J	CHIP R 6.8K J 1/16W		Q102			2SK2596	FET	
R524			RK73GB1J513J	CHIP R 51K J 1/16W		Q103			2SK1824	FET	
R525			RK73GB1J152J	CHIP R 1.5K J 1/16W		Q104			FMMT717	TRANSISTOR	
R526,527			RK73GH1J153D	CHIP R 15K D 1/16W		Q105			2SK2595	FET	
R528			RK73GB1J754J	CHIP R 750K J 1/16W		Q106			2SK1824	FET	
R529			RK73GB1J183J	CHIP R 18K J 1/16W		Q107			DTC114TE	DIGITAL TRANSISTOR	
R530			RK73GB1J101J	CHIP R 100 J 1/16W		Q108			DTC114EE	DIGITAL TRANSISTOR	
R531			R92-1252-05	CHIP R 0 OHM		Q109			DTA1144EE	DIGITAL TRANSISTOR	
R532			RK73GB1J821J	CHIP R 820 J 1/16W		Q200			DTA114EE	DIGITAL TRANSISTOR	
R533			RK73GB1J104J	CHIP R 100K J 1/16W		Q201			2SC4649(N,P)	TRANSISTOR	
R534			RK73GB1J182J	CHIP R 1.8K J 1/16W		Q202,203			3SK228	FET	
R535			RK73GB1J471J	CHIP R 470 J 1/16W		Q300			2SC4617(S)	TRANSISTOR	
R536			RK73GB1J102J	CHIP R 1.0K J 1/16W		Q302			2SK1824	FET	
R537,538			RK73GB1J101J	CHIP R 100 J 1/16W		Q304			DTC1144EE	DIGITAL TRANSISTOR	
R539			R92-1252-05	CHIP R 0 OHM		Q305			2SA1362(GR)	TRANSISTOR	
R540			R92-0670-05	CHIP R 0 OHM		Q306			DTC1144EE	DIGITAL TRANSISTOR	
R541			RK73GB1J472J	CHIP R 4.7K J 1/16W		Q307			2SK1588	FET	
R542			R92-1252-05	CHIP R 0 OHM		Q400,401			DTC114EE	DIGITAL TRANSISTOR	
R548			RK73GB1J332J	CHIP R 3.3K J 1/16W		Q402			DTA114YE	DIGITAL TRANSISTOR	
VR1			R12-7491-05	TRIMMING POT.(68K)		Q403			DTC1144EE	DIGITAL TRANSISTOR	
VR500			R12-7491-05	TRIMMING POT.(68K)		Q404			UMG3N	TRANSISTOR	
VR501			R12-7487-05	TRIMMING POT.(15K)		Q405			UPA672T	FET	
S402,403			S70-0414-05	TACT SWITCH		Q406			FP210	TRANSISTOR	
MIC50	2B		T91-0543-05	MIC ELEMENT		Q407			UMG3N	TRANSISTOR	
D1-4			1SV283	VARIABLE CAPACITANCE DIODE		Q408			DTA123JE	DIGITAL TRANSISTOR	

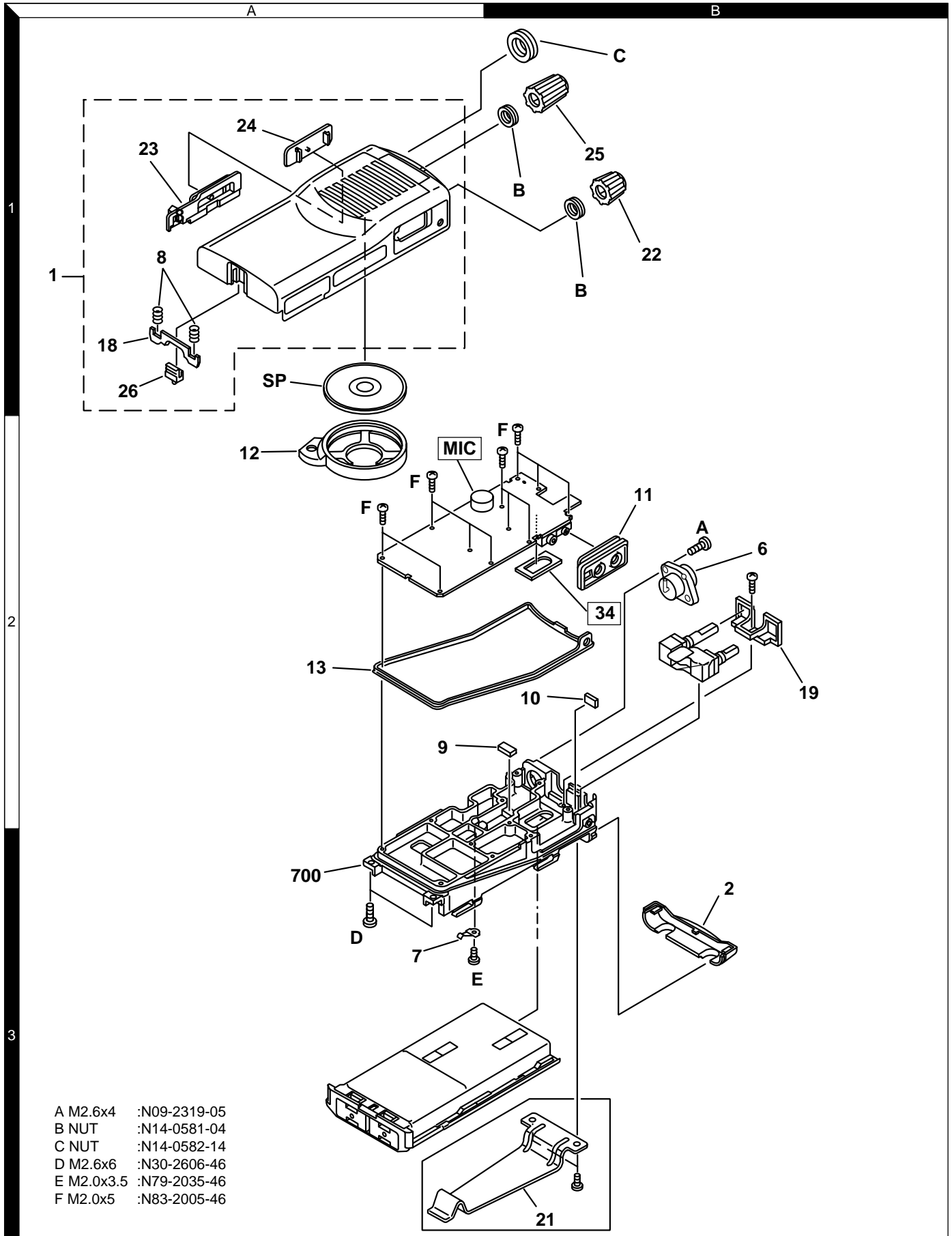
TK-2107

PARTS LIST

TX-RX UNIT (X57-6020-21)

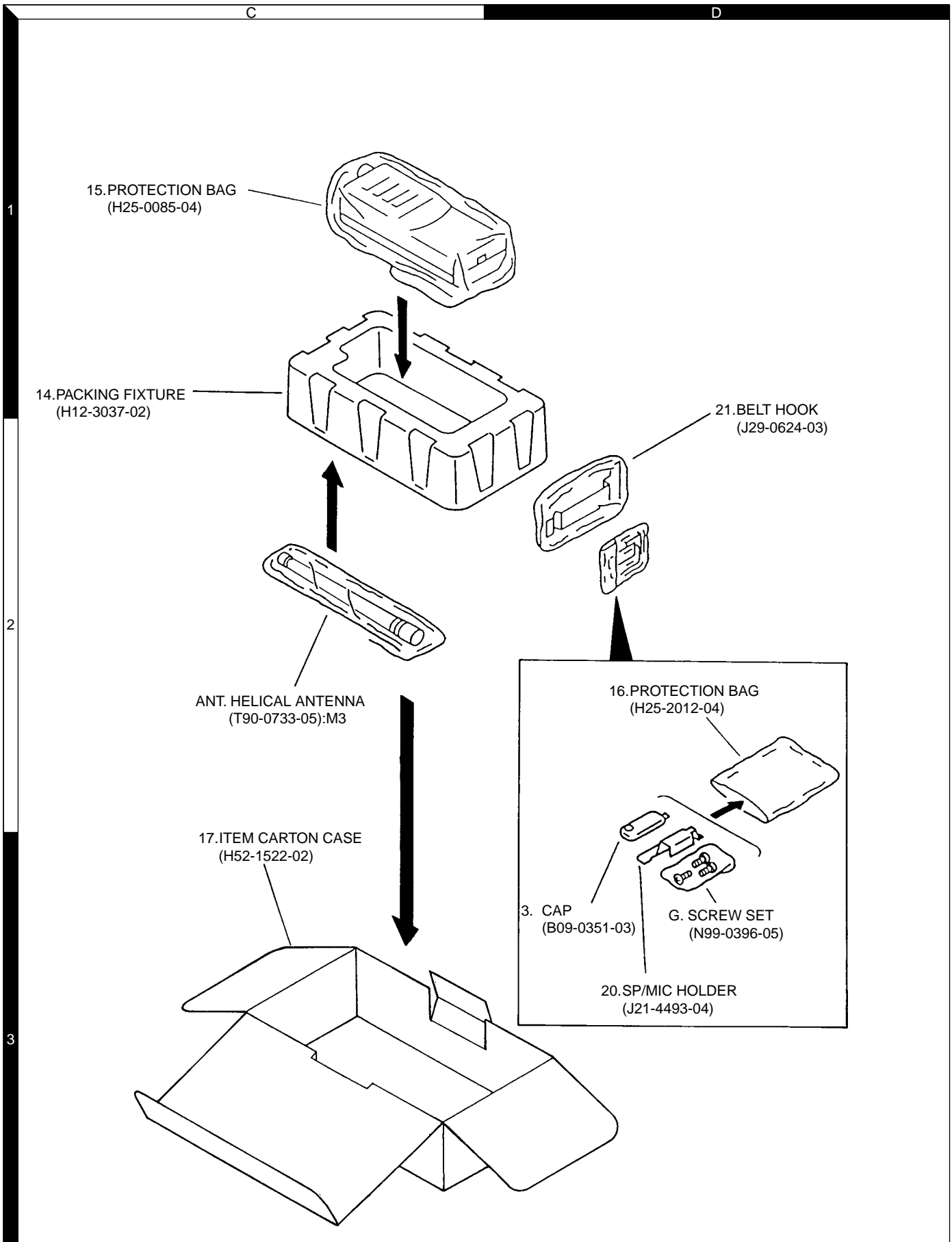
Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
Q501.502			2SC4617(S)	TRANSISTOR							
Q503			2SC4919	TRANSISTOR							
Q504			DTA143ZE	DIGITAL TRANSISTOR							
TH100			157-503-65001	THERMISTOR							
TH500			157-302-65801	THERMISTOR							

EXPLODED VIEW



- A M2.6x4 :N09-2319-05
- B NUT :N14-0581-04
- C NUT :N14-0582-14
- D M2.6x6 :N30-2606-46
- E M2.0x3.5 :N79-2035-46
- F M2.0x5 :N83-2005-46

PACKING



ADJUSTMENT

Required Test Equipment

1. Stabilized Power supply

1. The supply voltage can be changed between 5V and 18V, and the current is 3A or more.
2. The standard voltage is 7.5V.

2. DC Ammeter

1. Class 1 ammeter (17 ranges and other features).
2. The full scale can be set to either 300mA or 3A.
3. A cable of less internal loss must be used.

3. Frequency Counter (f. counter)

1. Frequencies of up to 1GHz or so can be measured.
2. The sensitivity can be changed to 500MHz or below, and measurements are highly stable and accurate (0.2ppm or so).

4. Power Meter

1. Measurable frequency : Up to 500MHz
2. Impedance : 50Ω, unbalanced
3. Measuring range : Full scale of 10W or so
4. A standard cable (5D2W 1m) must be used.

5. RF Voltmeter(RF V.M)

1. Measurable frequency : Up to 500MHz or so.

6. Linear Detector

1. Measurable frequency : Up to 500MHz or so
2. Characteristics are flat, and CN is 60dB or more.

7. Digital Voltmeter

1. Voltage range : FS=18V or so
2. Input resistance : 1MΩ or more

8. Oscilloscope

1. Measuring range : DC to 30MHz
2. Provides highly accurate measurements for 5 to 25MHz.

9. AF Voltmeter (AF V.M)

1. Measurable frequency : 50Hz to 1MHz
2. Maximum sensitivity : 1mV or more

10. Spectrum Analyzer

1. Measuring range : DC to 1GHz or more

11. Standard Signal Generator (SSG)

1. Maximum frequency : 500MHz or more
2. Output : -133dBm/0.05μV to 7dBm/501mV
3. Output impedance : 50Ω

12. Tracking Generator

1. Center frequency : 50kHz to 500MHz
2. Frequency deviation : ±35MHz
3. Output voltage : 100mV or more

13. Dummy Load

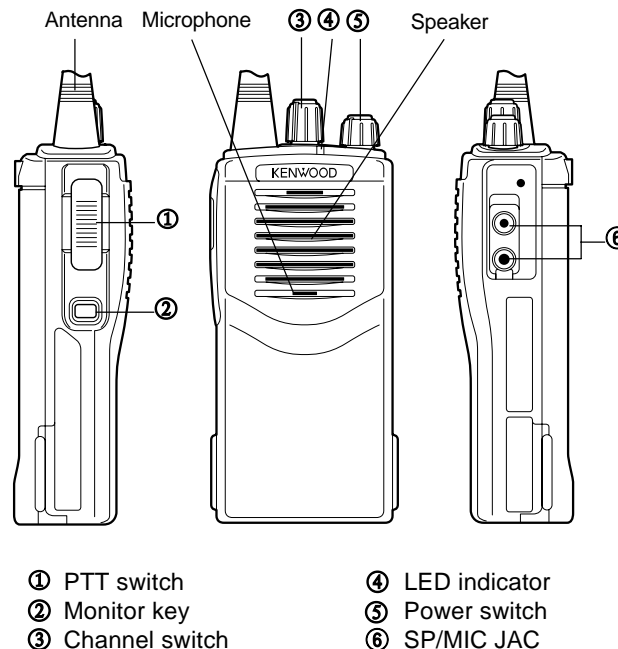
1. 8Ω, 3W or more

14. AF Generator(AG)

1. Frequency range : 100Hz to 100kHz
2. Output : 0.5mV to 1V

15. Distortion Meter

1. Measurable frequency : 30Hz to 100kHz
2. Input level : 50mV to 10Vrms



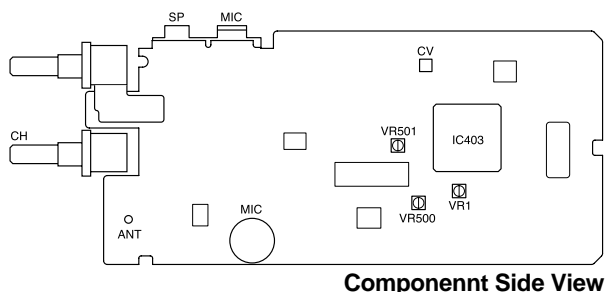
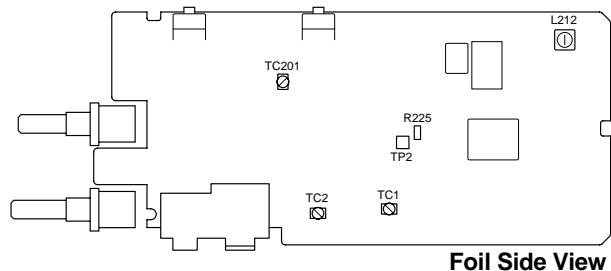
- ① PTT switch
- ② Monitor key
- ③ Channel switch

- ④ LED indicator
- ⑤ Power switch
- ⑥ SP/MIC JAC

- Use a non-conductive rod such as a Ceramic rod for adjustment (especially of trimmers and coils).
Kenwood order No. A-0910 (0.4X0.9mm)
Kenwood order No. A-1310 (0.4X1.3mm)
- To protect the SSG, do not send out signals while adjusting the receiving unit.
- The indicated SSG output levels are for maximum output.

ADJUSTMENT

Adjustment point



- TC201:** Band-pass filter waveform adjustment
- L212:** AF level adjustment
- TC1:** Transmit lock voltage adjustment
- TC2:** Receive lock voltage adjustment
- TP2:** Band-pass filter test point

- ANT:** Antenna connector
- CH:** Channel selector
- SP:** Speaker jack
- MIC:** Microphone jack
- CV:** Lock voltage adjustment terminal
- VR500:** DQT waveform adjustment
- VR501:** DEV adjustment

Note : To fine tune the frequency when not using a computer, adjust VR1.

ADJUSTMENT FREQUENCY LIST

Destination	M3	
	TX f (MHz)	RX f (MHz)
Center		220.00
Low		216.05
Hi		222.95

Remarks

- Connect the transceiver to the PC
- Send the channel data to the transceiver, then backup the data.
- Program the adjustment frequencies which are in the list, into the transceiver.

Note : Remember to reload the channel data you backed up after making the adjustments.

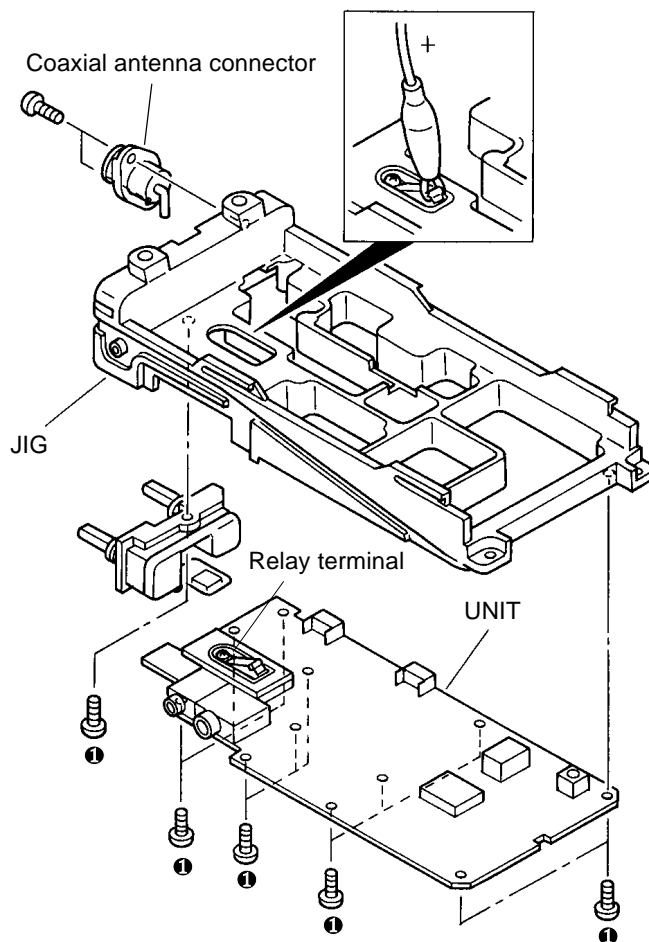
1. Jig (chassis) for adjustment (part number A10-1392-03)

2. Use the jig as follows:

1. Insert the coaxial antenna connector into the jig.
2. Place the unit on the jig and fix it with 12 screws. ①
3. Solder the antenna terminal to the terminal of the unit.

Notes: Supply power from an external power supply.

(Relay terminal: +
jig (chassis) : -)



ADJUSTMENT

Use the KPG-55D programming software for adjustment of the next item in PC MODE (see page 3).

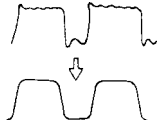
Squelch Level, Transmit frequency, DQT Balance, RF Power, QT Deviation, DQT Deviation, Battery Level
Section common to the transmitter and receiver (VCO)

Item	Condition	Measurement		Adjustment		Specifications/ Remarks	
		Test equipment	Terminal	Parts	Method		
1. Setting	1) Power supply voltage Battery terminal: 7.5V						
2. VCO lock voltage	1) CH: TX high	Digital voltmeter	CV	TC1	3.8V	±0.1V	
	2) CH: RX high			TC2	3.8V	±0.1V	
	3) CH: TX low						
	4) CH: RX low				Check	more than 0.7V	

Receiver Section

Item	Condition	Measurement		Adjustment		Specifications/ Remarks
		Test equipment	Terminal	Parts	Method	
1. Band- pass filter	1) CH: RX center 2) Tra generator output -40dBm Connect the spectrum analyzer to TP2 terminal.	Tra generator Spectrum analyzer	ANT TP2	TC201	Adjust the frequency so that it becomes the spectrum waveform shown in Fig.1.	
2. AF level	1) CH: RX center SSG output: -53dBm (501μV) MOD: 1kHz DEV: ±3.0kHz (Wide)	SSG Oscilloscope AF. V. M Distortion meter	ANT SP	L212	Adjust to the MAX AF level	
3. Sensitivity	1) CH: RX center CH: RX LO CH: RX Hi SSG output: -116dBm (0.35μV) MOD: 1kHz DEV: ±3.0kHz (Wide)				Check	SINAD: 12dB or higher
4. Squelch Level (PC MODE)	1) CH: RX center MONI: ON			PC key	Level 9 Adjust to close the squelch.	The squelch must be closed.
	2) Level 9 SSG output: -117dBm (0.32μV)					
	3) Level 3 SSG output: -125dBm (0.126μV)		Level 3 Adjust to close the squelch.	The squelch must be closed.		

Transmitter section

Item	Condition	Measurement		Adjustment		Specifications/ Remarks
		Test equipment	Terminal	Parts	Method	
1. Transmit frequency (PC MODE)	1) CH: TX center PTT: ON	Frequency counter	ANT	PC key	Adjust to center frequency	within ± 100Hz
2. DQT/QT Balance (PC MODE)	1) CH: TX center	Modulation analyzer or linear detector (LPF: 3kHz) Oscilloscope		VR500	Rectify the waveform to square wave	
3. Power (PC MODE)	1) CH: TX center Battery terminal: 7.5V PTT: ON				Adjust it to 4.8W	±0.1W
4. MAX DEV	1) CH: TX center AG: 1kHz/120mV PTT: ON			ANT MIC	VR501	Adjust it to ± 4.2kHz
5. MIC SENS	1) CH: TX center AG: 1kHz/12mV	AG AF. V. M		Check (+, - Peak whichever is Maximum)	±2.2kHz~3.6kHz: (Wide)	
6. QT DEV (PC MODE)	1) CH: TX center QT: 67.0Hz	Modulation analyzer or linear detector (LPF: 3kHz) Oscilloscope AG AF. V. M	ANT	PC key	Adjust it to ± 0.75kHz	±50Hz
7. DQT DEV (PC MODE)	1) CH: TX center			PC key	Adjust it to ± 0.75kHz	±50Hz
8. Battery Level (PC MODE)	1) Battery terminal: 5.8V	Digital voltmeter	BATT	PC key	Adjust so that the LED flashes.	The LED must flash.

ADJUSTMENT

M3 BPF-Wave

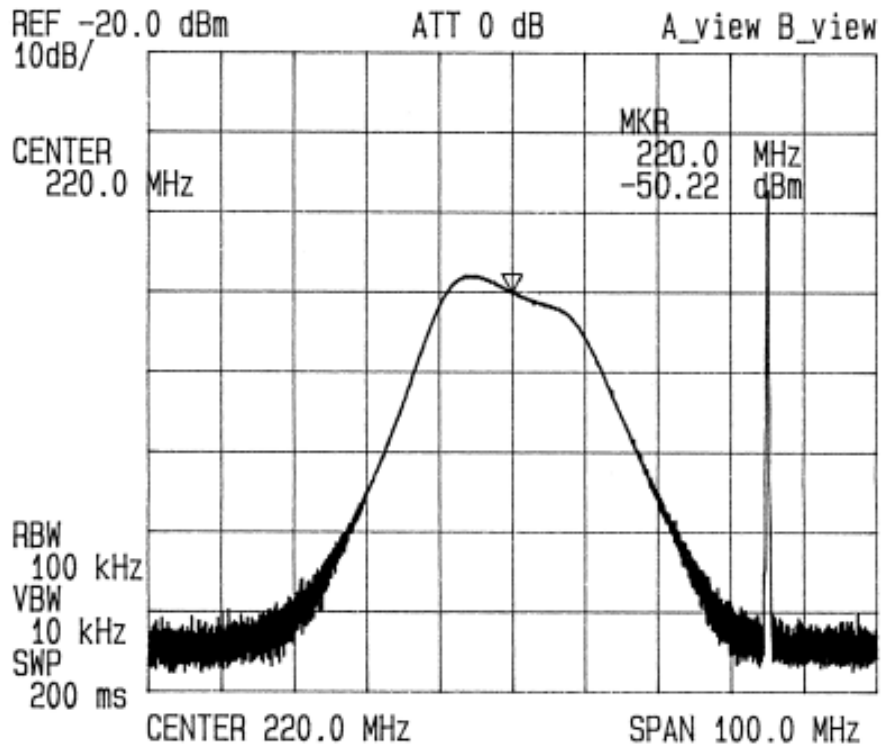
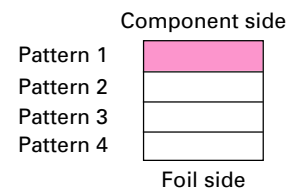
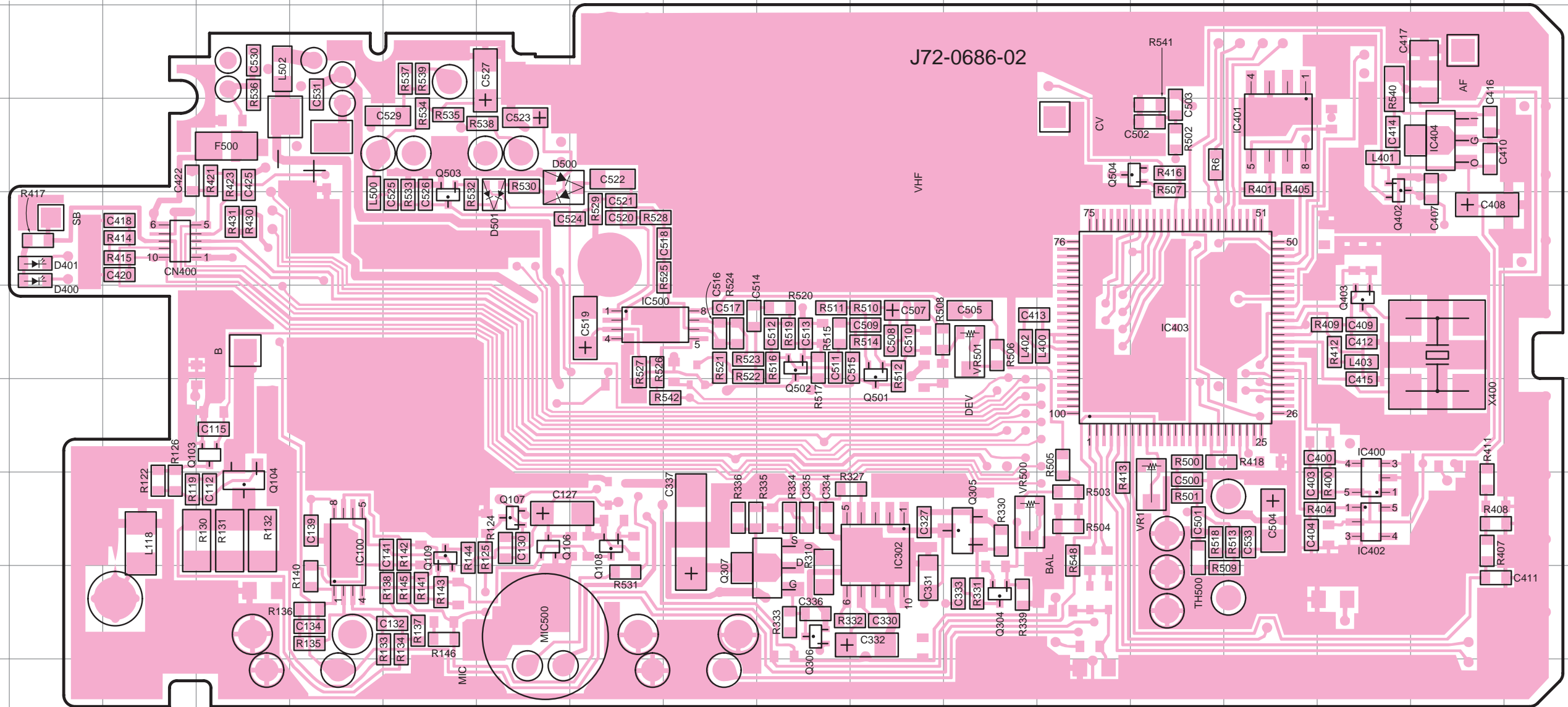


Fig. 1

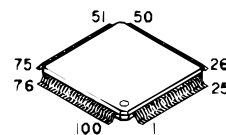
TX-RX UNIT (X57-6020-21) Component Side View

TX-RX UNIT (X57-6020-21)
Component Side View

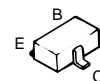
Ref. NO.	Address
IC100	8F
IC302	8L
IC400	7Q
IC401	4P
IC402	8Q
IC403	6O
IC404	4R
IC500	6I
Q103	7E
Q104	8E
Q106	8H
Q107	8H
Q108	8I
Q109	8G
Q304	9M
Q305	8M
Q306	9K
Q307	9K
Q402	5Q
Q403	6Q
Q501	6L
Q502	6K
Q503	5G
Q504	4O
D400	5C
D401	5C
D500	4H
D501	5H



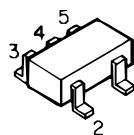
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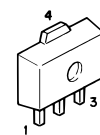
- DTA114EE
- DTA114YE
- DTA123JE
- DTA143ZE
- DTA144EE
- DTC114EE
- DTC114TE
- DTC144EE
- 2SA1362
- 2SC4617
- 2SC5108



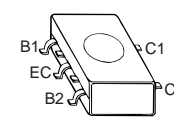
UMC4



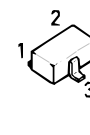
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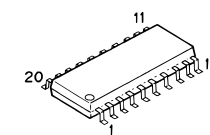
FP210



DA221



MB15A02

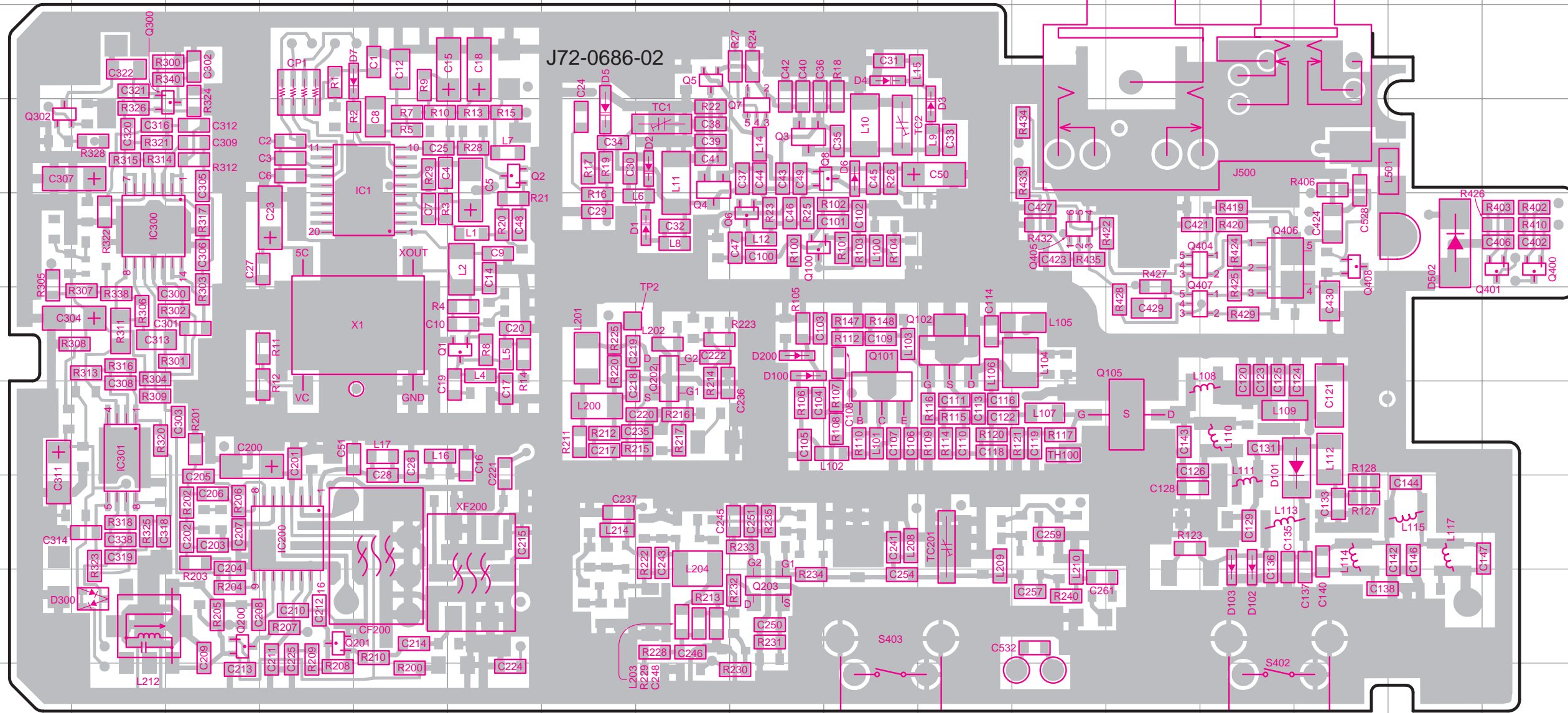


TK-2107

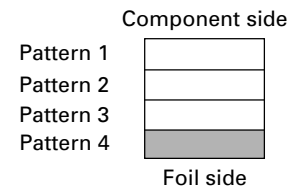
PC BOARD VIEW

TX-RX UNIT (X57-6020-21) Foil Side View

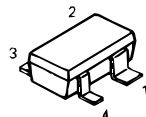
TX-RX UNIT (X57-6020-21) Foil Side View



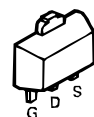
Ref. NO.	Address
IC1	4E
IC200	8D
IC300	5B
IC301	7B
Q1	6F
Q2	4F
Q3	4I
Q4	4H
Q5	3H
Q6	5I
Q7	4I
Q8	4I
Q100	5I
Q101	6J
Q102	6K
Q105	7M
Q200	9C
Q201	9D
Q202	6H
Q203	9I
Q300	4B
Q302	4A
Q400	5Q
Q401	5Q
Q404	5M
Q405	5L
Q406	5N
Q407	6M
Q408	5O
D1	5H
D2	4H
D3	4K
D4	3J
D5	4G
D6	4J
D7	3D
D100	6I
D101	7N
D102	8N
D103	8N
D200	6I
D300	9B
D502	5P



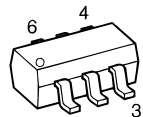
3SK228



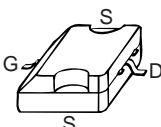
2SK1588
2SK2596



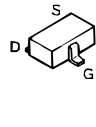
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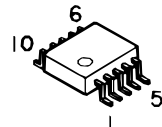
2SK2595



2SK1875



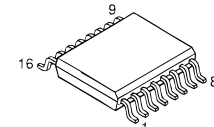
TA7368F



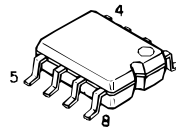
S-81350HG-KD



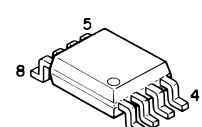
TA31136FN



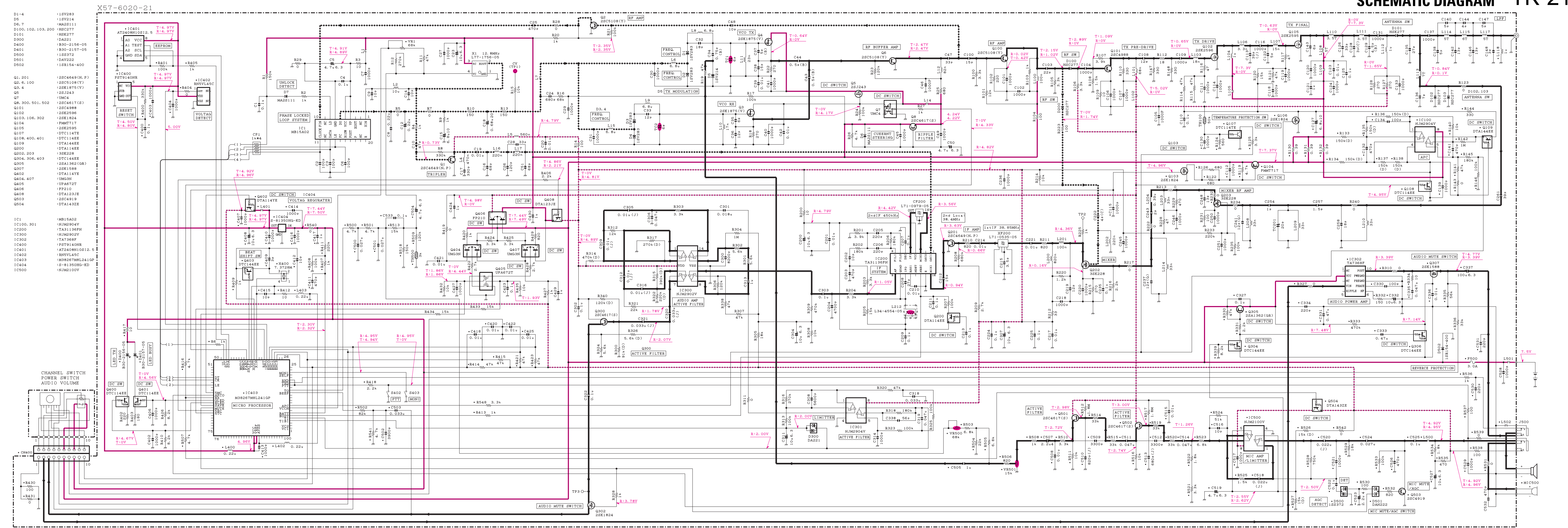
AT2408N10SI2.5



NJM2100V
NJM2904V

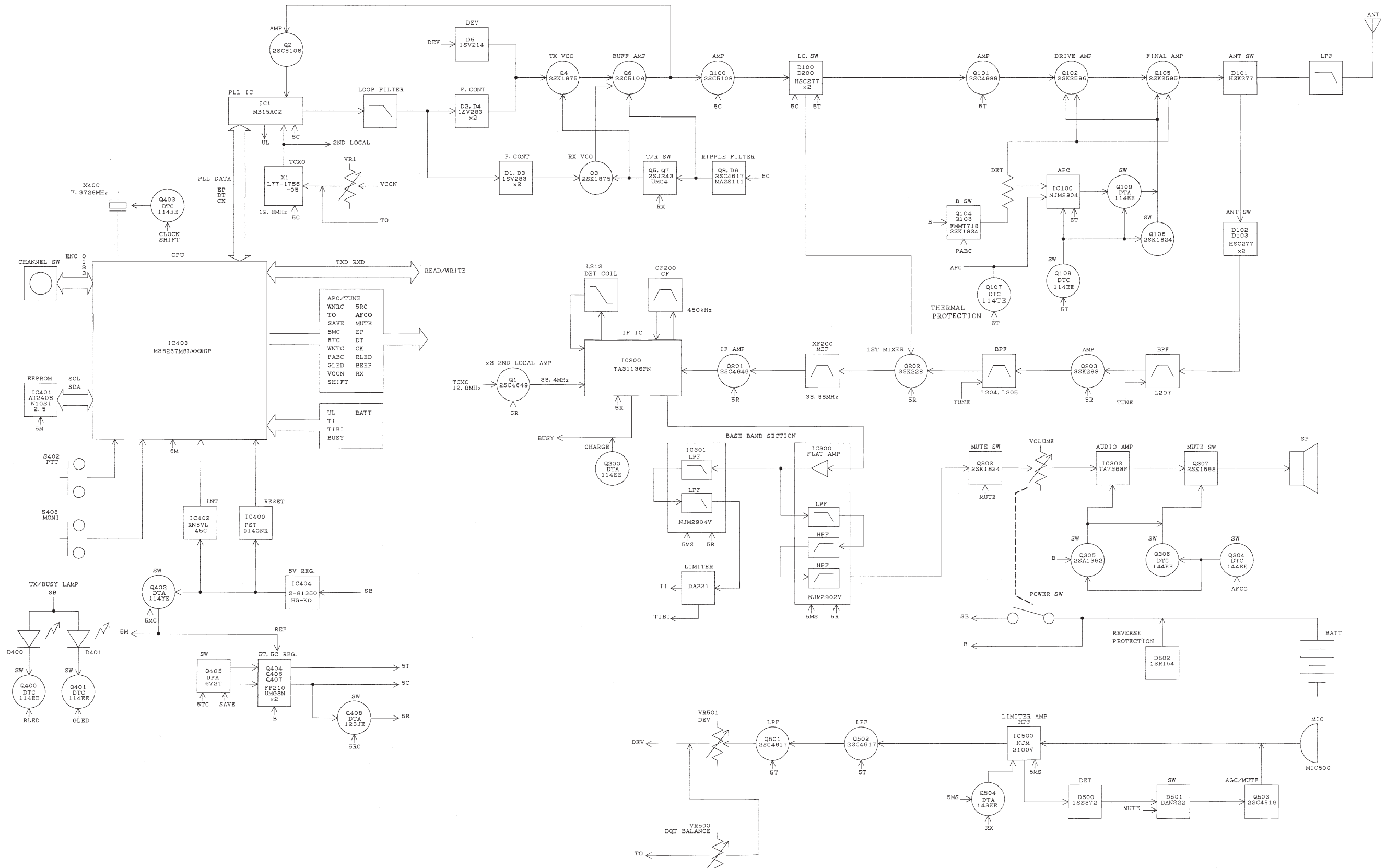


SCHEMATIC DIAGRAM TK-2107



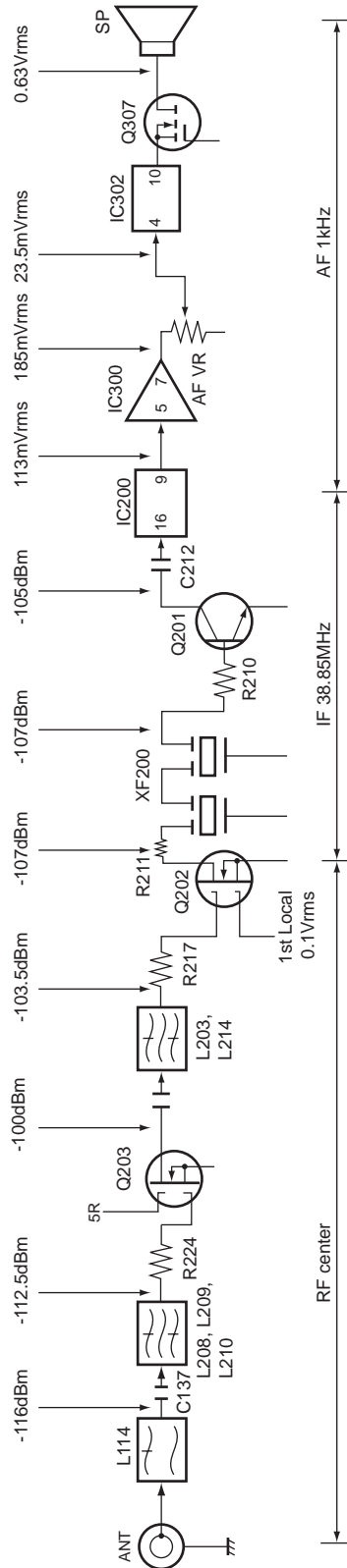
Note : Component marked with a dot (●) are parts of pattern1.

TK-2107 TK-2107 BLOCK DIAGRAM



LEVEL DIAGRAM

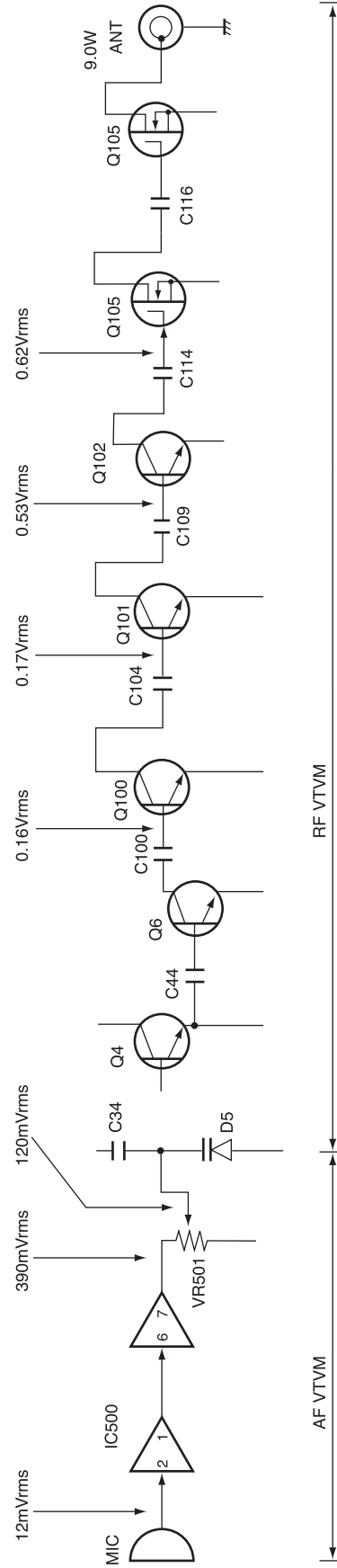
RX section



SG output level for obtaining 12dB / SINAD when injected to each point through a 470pF coupling capacitor. Measure the 1st Local level on a RF VTVM.

Modulate the AF level with a frequency of 1kHz and deviation of 1.5kHz (Narrow), 3kHz (Wide). Then take the signal from the signal generator output when set to -53dBm and obtain the level shown on an AF VTVM when the AF output has been adjusted to 0.63Vrms with the AF vol.

TX section



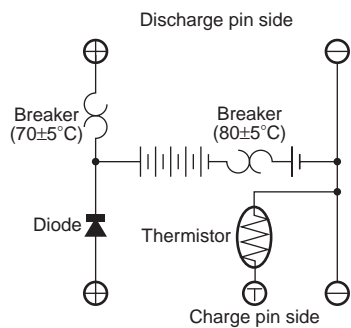
Measure the audio frequency on an AF VTVM and radio frequency on a RF VTVM at high impedance. Set the MIC input obtain a modulation factor of 60% with the transmit frequency at center and a modulation frequency of 1kHz.

KNB-15A (Ni-Cd Battery)

KNB-15A



CIRCUIT DIAGRAM



SPECIFICATIONS

Voltage	: 7.2V (1.2V x 6)
Charging current	: 1100mAh
Dimensions	: 60.8W x 110.8H x 20.3D (mm) (projections included)
Charger and charging time:	KSC-15 (normal charger), approximately 8 hours
Weight	: 210g

TK-2107

SPECIFICATIONS

GENERAL

Frequency Range.....	216 to 223 MHz : M3
RF power output.....	4.8W
Number of channels	16CH
Operating Voltage	7.5 VDC \pm 20 %
Temperature Range	-30 °C to + 60 °C (-22 °F to + 140 °F)
Dimensions and Weight	
with KNB-15A (7.2V 1100mAh battery)	58 (2-5/16) W X 125.5 (4-15/16) H X 35 (1-3/8) D mm (inches) 380g (0.83lbs)

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