

TK-3107

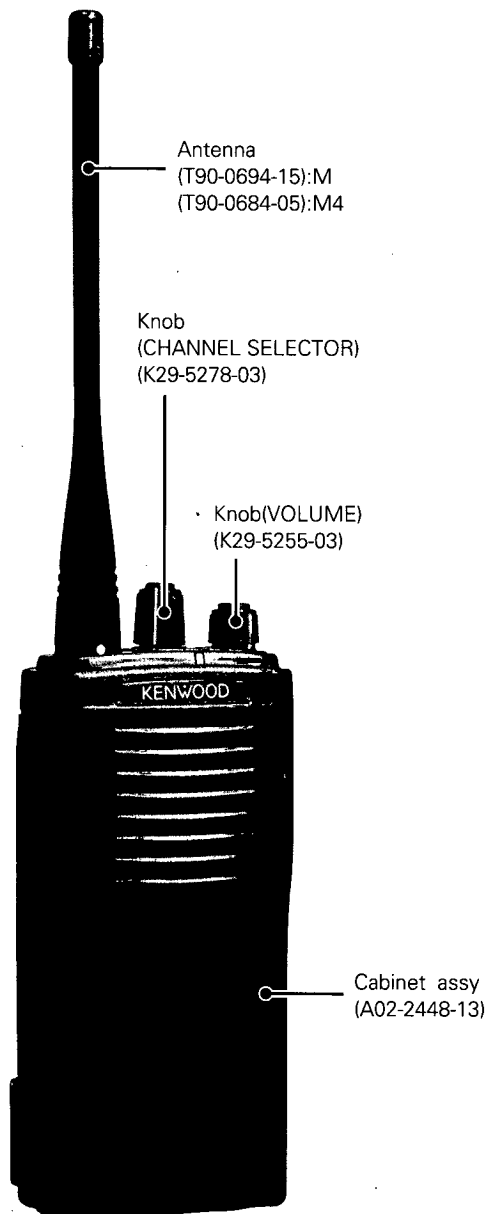
SERVICE MANUAL / 维修手册

REVISED / 修订版

KENWOOD

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This service manual is same as the TK-3107 (B51-8489-00) service manual with destination M with the exception of new destination M4.



TK-3107 (16 channels)

CONTENTS

GENERAL	2
REALIGNMENT	3
DISASSEMBLY FOR REPAIR	5
CIRCUIT DESCRIPTION	7
SEMICONDUCTOR DATA	13
DESCRIPTION OF COMPONENTS	15
PARTS LIST	16
EXPLODED VIEW	23
PACKING	24
ADJUSTMENT	25
PC BOARD VIEWS	
TX-RX UNIT (X57-6030-XX).....	31
SCHEMATIC DIAGRAM	37
BLOCK DIAGRAM	41
LEVEL DIAGRAM	43
KNB-15A (Ni-Cd BATTERY)	44
SPECIFICATIONS	BACK COVER

概述	2	调整	25
模式组合	3	PC板视图	
维修时拆卸部分	5	发射 - 接收单元 (X57-6030-XX)	31
电路说明	7	原理图	37
半导体数据	14	方块图	41
元件说明	15	电平图	43
零件表	16	KNB - 15A (镍 - 铬电池)	44
部件分解图	23	规格	背面
包装	24		

GENERAL / 概述

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.

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.

Destination	Number of CH	RF power output
M	16	4W
M4	16	4W

引言

本手册的范围

本手册是提供给熟悉通信专业并且具有维修经验的技术人员使用的。它包括了维修该设备所需要的全部资料和现行公布的数据。在出版后可能发生变动, 如果需要, 可以使用《维修通报》或《手册修订本》进行补充。

替换零件的订购

当订购替换零件或设备信息时, 应注明完整的零件识别号码。所有的零件均有识别号码: 元件、组件或机壳。如果不知道零件的号码, 为了正确地识别, 必须注明此元件所属的机壳或组件的号码, 并对元件进行充分的说明。

个人安全

为了个人的安全, 请注意下列事项:

- 在没有认真核实所有射频插头之前或有任何一个打开的插头没有连接到相应端子上的情况下, 均不要发射。
- 在电焊管附近或在易燃性气体环境中, 必须关掉电源, 不要操作本设备。
- 本设备只应该由有资格的技术人员来维修。

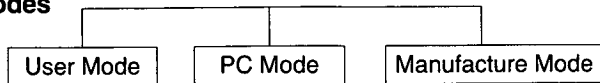
维修服务

为了便于维修本设备, 建立了完整的维修服务体系, 提供了包括原理图、印刷线路板图和调整步骤在内的资料供参考。

型式	信道号码	射频功率输出
M	16	4W
M4	16	4W

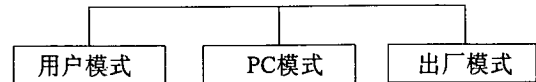
REALIGNMENT / 模式组合

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.

1模式



模式类型	功能
用户模式	使用此模式用于一般操作。
PC模式	使用此模式，通过RS-232C端口使用外部写频器对通信机进行各种设置。
出厂模式	使用此模式在生产过程中通过RS-232C端口组合各种设置。

2 How to enter each mode

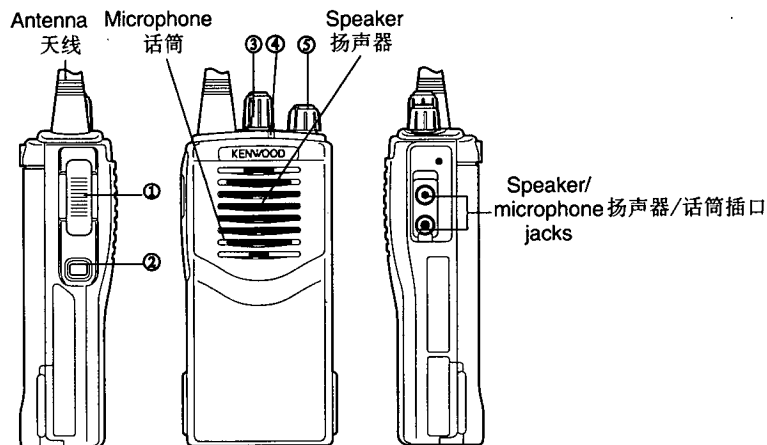
MODE	PROCEDURE
User Mode	Power ON
PC Mode	Connect to the IBM PC compatible machine and controlled by the FPU.

2 如何进入每一种模式

模式类型	操作步骤
用户模式	打开电源开关
PC模式	与IBM PC兼容机连接并使用FPU控制。

3 Getting acquainted

3各部分介绍



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.

① PTT (通话) 转换开关

按下此开关，然后通过话筒呼叫对方。松开此开关进行接听。

② 监听键

按住此键打开静噪。用户可以听到背景噪音。松开此键重新开启噪音抑制电路。关闭静噪。

③ 信道转换开关

拨动此转换开关选择信道1到信道16。

④ 发光二极管指示灯

发射时为红色灯，接收信号时为绿色灯。在发射过程中，当电池电压不足时红色灯闪烁。

⑤ 电源开关/音量控制

顺时针旋转接通手持机。逆时针旋转听到“卡嗒”一声后关闭手持机。旋转此开关调整音量大小。

REALIGNMENT / 模式组合

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-3107 to the personal computer with the interface cable.
2. When data is transmitting from the transceiver the red LED lights.
When data is received 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.

计算机模式

前言

通过个人电脑，使用编程电缆（KPG-22）和编程软件（KPG-55D），对通信机进行编程设置。图1表示一台IBM计算机的编程设置过程。

连接步骤

1. 使用接口电缆将TK-3107与个人电脑连接。
2. 当手持机发送数据时，红色灯亮。当手持机接收数据时，绿色灯亮。

注意：

- 将数据写入EEPROM中时，存储在个人电脑中的数据必须与通信机型号相符合。
- 在数据发送或接收过程中，不要按[PTT]键。

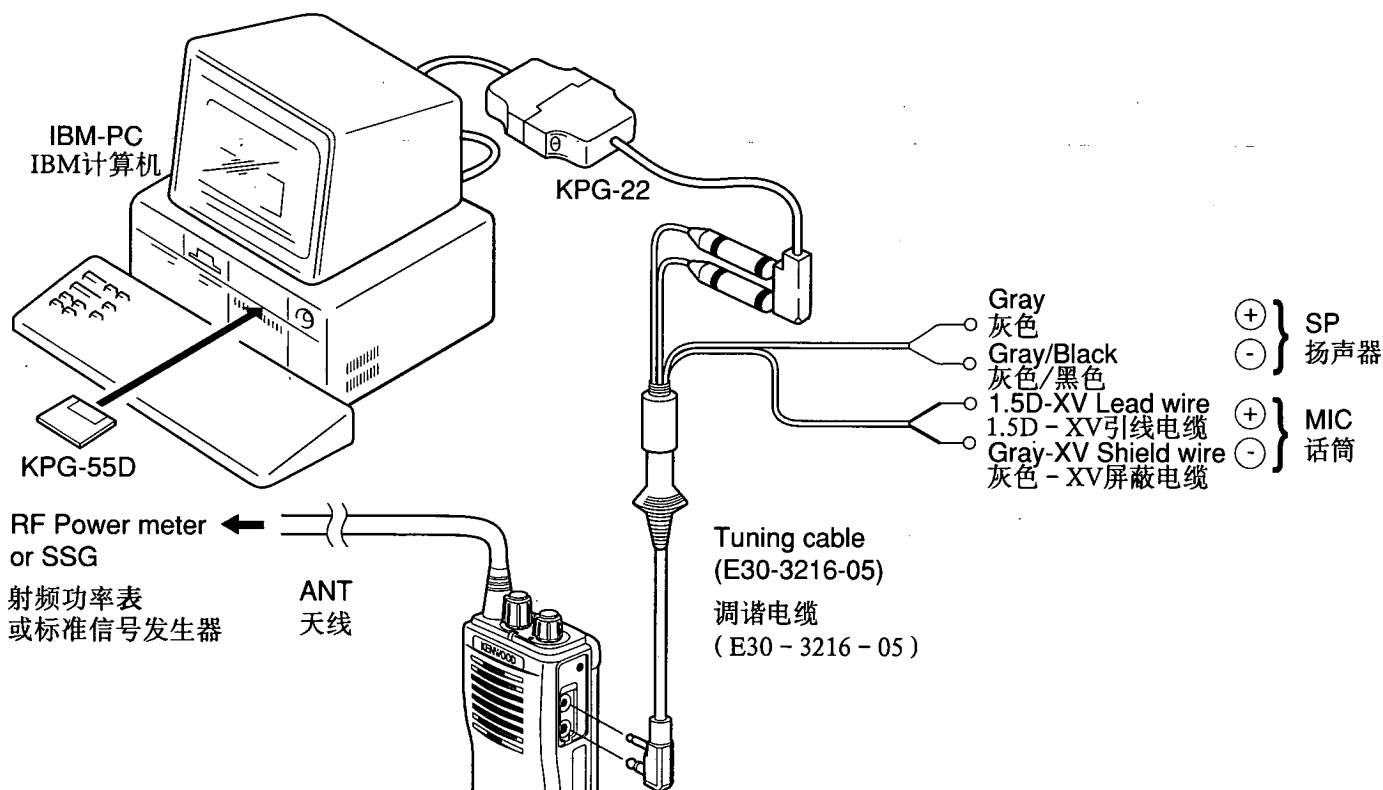


Fig. 1 / 图1

REALIGNMENT / 模式组合

• KPG-22 description

(PC programming interface cable: Option)

The KPG-22 is required to interface the TK-3107 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-3107 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 the TK-3107 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.

• KPG - 22说明

(计算机编程接口电缆：可选件)

KPG-22用于将TK-3107与电脑连接。在其D型副插座(25芯)中有一个电平转换电路，此电路可以把RS-232C逻辑电平转换为晶体管逻辑电平。KPG-22将TK-3107侧面插口与电脑的RS-232C串行端口连接。

• 编程软件说明

KPG-55D编程软盘是一张3-1/2"软盘。软盘内的软件允许用户经由编程接口电缆(KPG-22)对TK-3107进行编程设定。

• 使用IBM计算机编程

如果从使用KPG-55D磁盘的IBM计算机将数据发送到手持机，设定的目的数据(基本通信参数)均可被修改。由于在设定频率范围(频率类型)时自动生成数值，所以一般不需要修改目的数据。

只有在必要的情况下才修改数值。

RS-232C格式的数据经由扬声器/话筒插头输入到EEPROM中。在此模式中，PTT线的作用相当于发送数据和接收数据线。

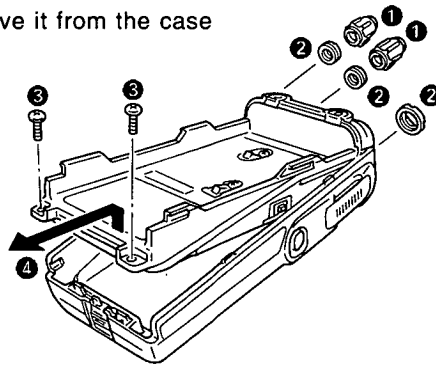
DISASSEMBLY FOR REPAIR / 维修时拆卸部分

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.

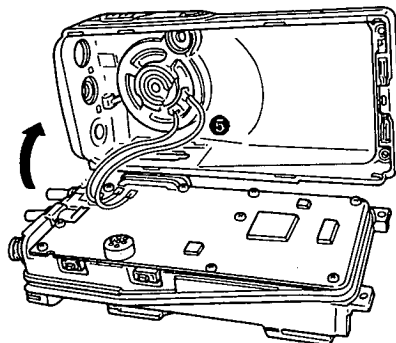
从底座上分离外壳

1. 取下旋钮①和两个环形螺母②。
2. 取下两颗螺钉③。
3. 掀开外壳底部的左右两侧，取下底座，并外壳中取出④。



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

4. 小心不要折断扬声器引线⑤，拆下底座和外壳。



DISASSEMBLY FOR REPAIR / 维修时拆卸部分

Separating the chassis from the unit

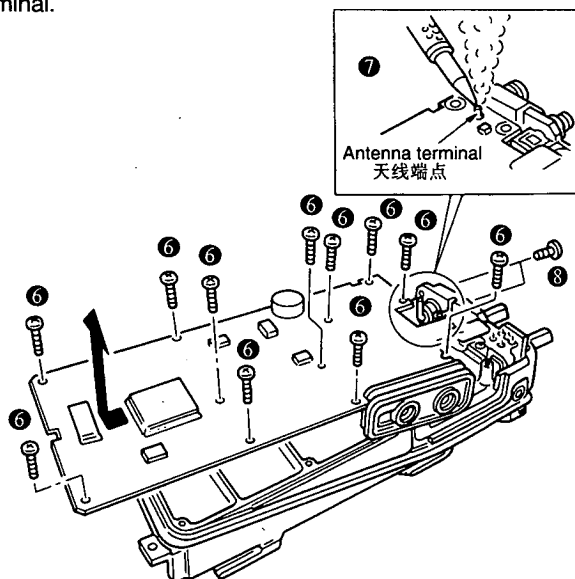
1. Remove the eleven screws ⑥.
2. Remove the solder from the antenna terminal using a soldering iron then lift the unit off ⑦.
3. Remove the two screws ⑧ and remove the antenna connector.

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

底座从主板上分离

1. 取下11颗螺钉 ⑥。
2. 用电烙铁将天线端点焊开，然后取下主板 ⑦。
3. 取下两颗螺钉 ⑧并取下天线连接器。

注意：当重新将主板安装到底座上时，确保将天线端点焊好。



Removing the lever

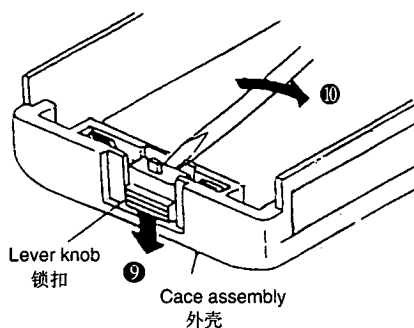
1. Raise the lever on the lower case ⑨, insert a small flat screwdriver into the space between the case and lever, open the case carefully ⑩ and lift the lever off.

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

取下夹扭

1. 提起在外壳下部 ⑨ 上的锁扣，在外壳和锁扣之间插入一个小头平头改锥，小心地打开外壳 (⑩) 并卸下锁扣。

注意：不要用力拆卸锁扣和外壳。



CIRCUIT DESCRIPTION / 电路说明

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.

1. 频率构成

接收部采用二次变频超外差方式。第一中频为38.85MHz，第二中频为450kHz。第一本振频率信号由锁相环电路（PLL）提供。发射部由锁相环电路直接产生所需要的频率。图1显示各种频率。

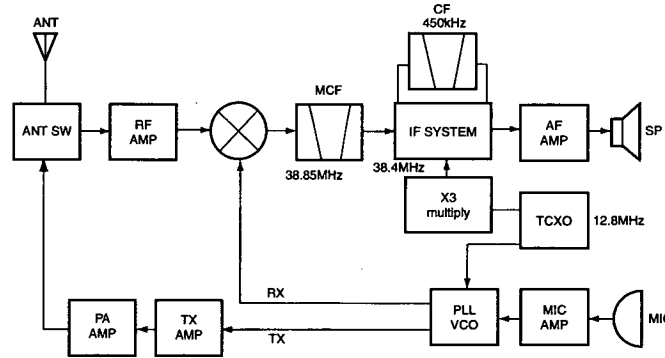


Fig. 1 Frequency configuration / 图1 电路构成

2. Receiver

The receiver is double conversion superheterodyne, designed to operate in the frequency range of 450 to 470MHz (M type), 400 to 420MHz (M4 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 3-pole LC filter. After the signal is amplified (Q203), the signal is filtered by a band pass filter (a 3-pole LC filter) to eliminate unwanted signals before it is passed to the first mixer.

The voltage of these diodes are controlled by to track the MPU

2. 接收部

接收部为二次变频超外差方式，设计操作的频率范围是450 - 470MHz (M), 400 - 420MHz (M4)。

1) 前端射频放大器

从天线输入的信号经过收发转换电路（D102和D103断开）和三极管LC通滤波器后，在射频放大器（Q203）处放大。信号被放大后（Q203），在通过第一混频器之前，经过带通滤波器（一个三极管LC滤波器）滤波来消除不要的信号。

这些变容二极管的电压由带通滤波器的MPU（IC403）中心频率控制。（参见图2）

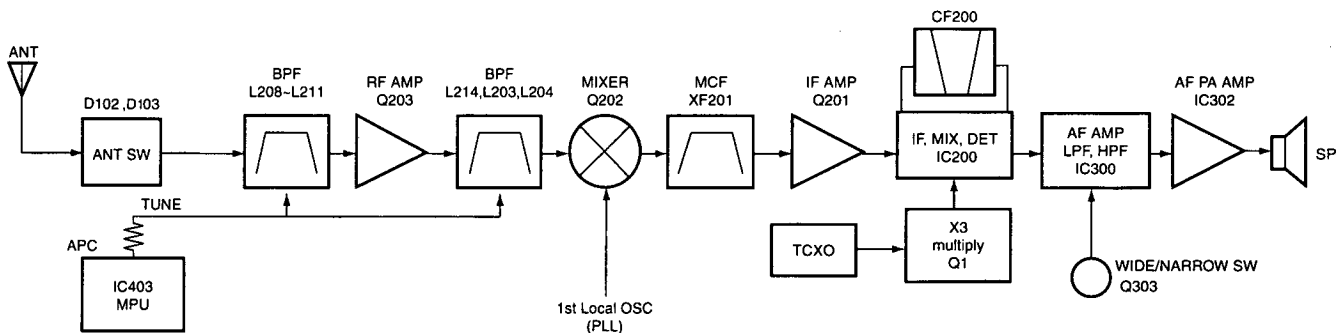


Fig. 2 Receiver section configuration / 图2 接收部构成

CIRCUIT DESCRIPTION / 电路说明

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 : XF201) 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.

XF201:L71-0522-05

Item	Rating
Nominal center frequency	38.850MHz
Pass band width	$\pm 5.0\text{kHz}$ or more at 3dB
40dB stop band width	$\pm 20.0\text{kHz}$ or less
Ripple	1.0dB or less
Insertion loss	4.0dB or less
Guaranteed attenuation	80dB or more at $f_o - 910\text{kHz}$
Terminal impedance	610 Ω /3PF

CF200:L72-0958-05

Item	Rating
Nominal center frequency	450kHz
6dB band width	$\pm 6.0\text{kHz}$ or more
50dB band width	$\pm 12.5\text{kHz}$ or less
Ripple	2.0dB or less at $f_o \pm 4\text{kHz}$
Insertion loss	6.0dB or less
Guaranteed attenuation	35.0dB or more at $f_o \pm 100\text{kHz}$
Terminal impedance	2.0 k Ω

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 AF signal is then passed through a WIDE/NARROW switch (Q303). 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).

2)第一混频器

来自射频放大器的信号与来自锁相环频率合成器电路的第一本振信号在第一混频器 (Q202) 处混频并生成38.85MHz的第一中频 (1st IF) 信号。第一中频信号通过两个单片晶体滤波器 (MCFs : XF201) 进一步消除邻道的杂波信号。

3)中频放大器

第一中频信号通过Q201放大, 然后进入芯片IC200 (调频处理芯片)。信号在IC200中与第二本振信号再次混频生成一个450kHz的第二中频信号。在芯片IC200中第二本振信号被放大和鉴频之前, 通过一个450kHz陶瓷滤波器 (CF200) 滤除无用杂散信号。

XF201 : L71 - 0522 - 05

项目	额定值
标称中心频率	38.850MHz
通频带宽	$\pm 5.0\text{kHz}$ 或更大 在3dB内
40dB止频带宽	$\pm 20.0\text{kHz}$ 或更小
脉动	1.0dB或更小
插入损耗	4.0dB或更小
保证衰减	80dB或更大 在 $f_o - 910\text{kHz}$
终端阻抗	610 Ω /3PF

CF200 : L72 - 0958 - 05

项目	额定值
标称中心频率	450kHz
6dB频带宽度	$\pm 6.0\text{kHz}$ 或更大
50dB频带宽度	$\pm 12.5\text{kHz}$ 或更小
脉动	2.0 dB或更小 在 $f_o \pm 4\text{kHz}$
插入损耗	6.0dB或更小
保证衰减	35.0dB或更大 在 $f_o \pm 100\text{kHz}$
终端阻抗	2.0k Ω

4)音频放大器

在IC200中鉴频解调出的音频信号通过IC300 (1/4) 放大, 通过IC300低通滤波器 (2/4) 以及IC300高通滤波器 (3/4) 和 (4/4) 滤波, 并且通过R303和C306去加重。然后音频信号通过一个宽/窄转换开关 (Q303)。经过处理的音频信号通过音量控制电路再经过音频功率放大器 (IC302) 放大后、驱动扬声器。

CIRCUIT DESCRIPTION / 电路说明

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 AF CO lines and turns IC302 on through Q302, Q304, Q305, Q306 and Q307. (See Fig. 3)

5) 噪音抑制电路

从IC200输出的音频信号的一部分重新进入IC200，通过滤波器和放大器将噪音放大和整流并生成一个对应于噪音电平的直流电压。直流信号进入微处理器的模拟端口（IC403）。IC403通过检测输入电压是否高于或低于预设值来决定是否通过扬声器输出声音。

要通过扬声器输出声音，IC403向静音和自动频率控制振荡器连线发送一个高电平信号并开启IC302通过Q302, Q304, Q305, Q306和Q307。（参见图3）

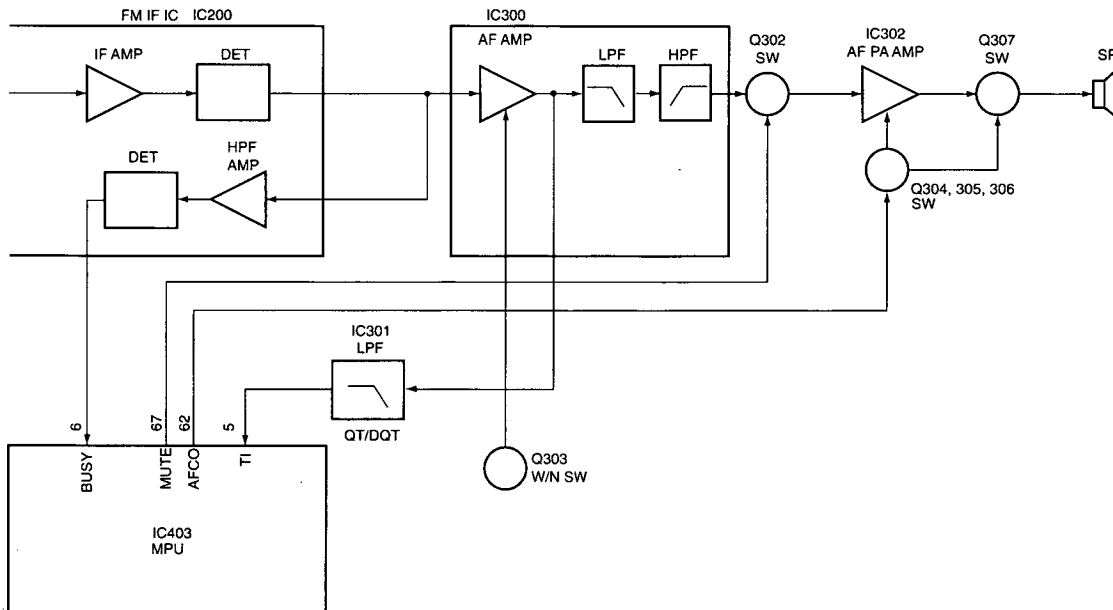


Fig. 3 AF Amplifier and squelch / 图3 音频放大器和噪音抑制电路

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 AF CO and the speaker output sounds according to the squelch results.

6) 接收信令

QT/DQT

来自于中频芯片输出信号的300Hz和更高的音频被低频滤波器（IC301）截断。所得到的信号输入微处理器（IC403）。IC403确定QT或DQT是否匹配预设置，并且根据噪声抑制电路的结果控制MUTE和AF CO以及扬声器输出声音。

3. PLL frequency synthesizer

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

3. 锁相环频率合成器

锁相环电路生成用于接收的第一本振信号和用于发送的射频载波信号。

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)

1) 锁相环电路

锁相环电路的步进频率为5或6.25kHz。12.8MHz的参考振荡器信号通过一个混合计数器在IC1中被分频并生成5或6.25kHz的参考频率。压控振荡器（VCO）输出的信号通过Q6缓冲放大器，然后在IC1中被可编程脉冲吞除计数器分频。被分频的信号在带有5或6.25kHz参考信号的相位比较器的IC1中被比较。从相位比较器输出的信号进入一个低通滤波器后，并通过压控振荡器来控制振荡频率。（参见图4）

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.

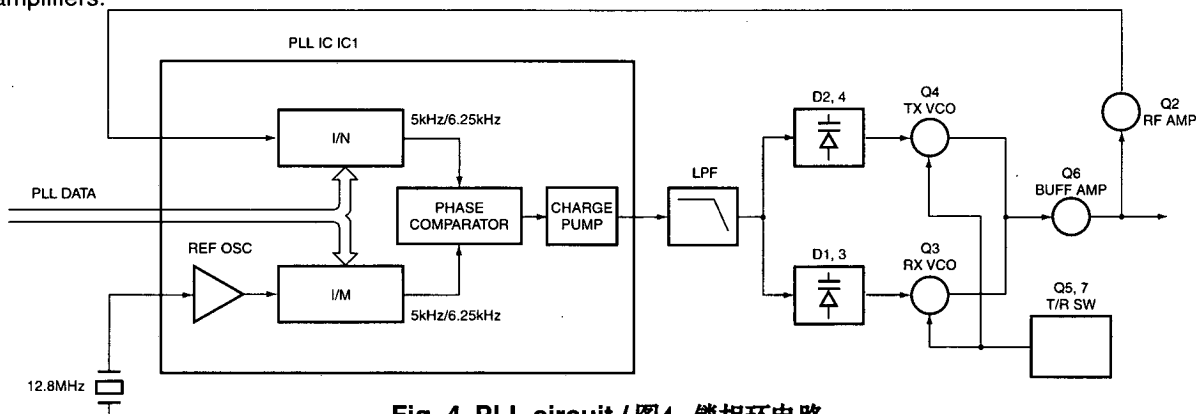


Fig. 4 PLL circuit / 图4 锁相环电路

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)

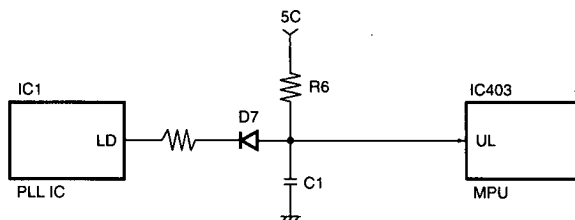


Fig. 5 Unlock detector circuit / 图5 失锁检测器电路

2) 压控振荡器

在发射模式中通过Q4产生操作频率，在接收模式中通过Q3产生操作频率。通过相位比较器到变容二极管（在发射模式中为D2和D4，在接收模式中为D1和D3）采用压控振荡器控制电压来控制振荡频率。在接收模式中，由于Q5和Q7切断Q4并且导通Q3，所以发射/接收管脚设置为高电平。在发射模式中，发射/接收管脚设置为低电平。Q3和Q4的输出通过Q6被放大并被发送到缓冲放大器。

3) 失锁检测器

如果IC1的LD管脚上出现高电平，则产生失锁状态，并从D7, R6获得直流电压，且C1产生的提供给微处理器UL管脚的电压降低。当微处理器检测到此情况时，不能进行发射，无视通话转换开关输入信号。（参见图5）

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)

4. 发射部

1) 发射音频

来自于话筒的调制信号通过IC500 (1/2) 被放大，经过一个预加重电路，并通过另一个IC500 (1/2) 放大后进行IDC处理。然后信号通过一个低通滤波器（分离滤波器）（Q501和Q502）并滤除比3kHz频率更高的部分。得到的信号进入压控振荡器直接进行调频调制。（参见图6）

2) QT/DQT编码器

QT/DQT编码所需的信号通过IC403产生，被锁相环电路的基准频率调整。由于基准振荡器不能对频率环路特性外的频率进行调制，因此通过分配器在压控振荡器一侧进行调制。（参见图6）

CIRCUIT DESCRIPTION / 电路说明

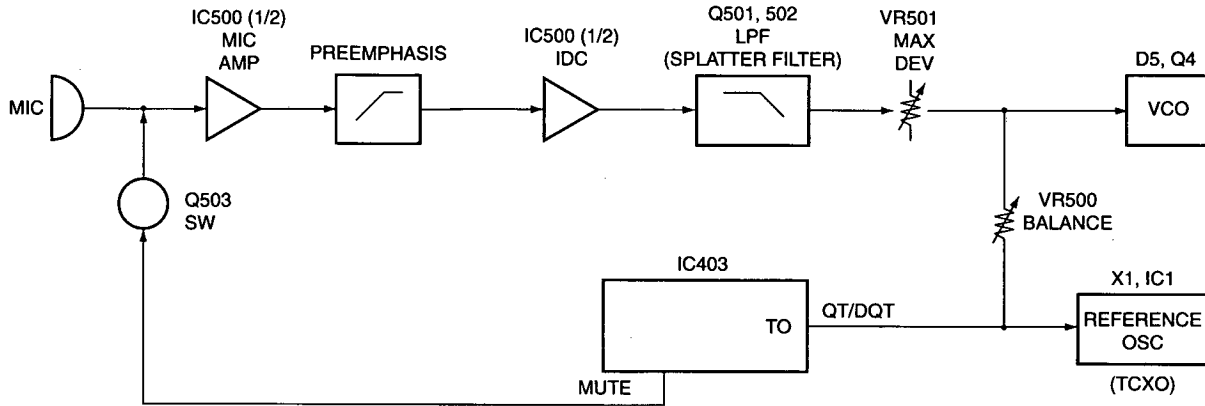


Fig. 6 Transmit audio QT/DQT / 图6 发射音频QT/DQT

3) VCO and RF amplifier

The transmit signal obtained from the VCO buffer amplifier Q100, is amplified by Q101 and Q102. This amplified signal is passed to the power amplifier, Q105 and Q107, which consists of a 2-stage FET amplifier and is capable of producing up to 4W of RF power. (See Fig.7)

3) 压控振荡器和射频放大器

从压控振荡缓冲放大器(Q100)接收到的发送信号通过Q101和Q102被放大。这个放大信号通过功率放大器,Q105和Q107(包括一个二级场效应管放大器),并能产生4W射频功率。(参见图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 are turned on (conductive) in transmit mode and off (isolated) in receive mode.

4) 天线转换开关和LPF

在其到达天线终端之前, 射频放大器输出信号通过一个低通滤波器网络和一个发射/接收转换电路。发射/接收转换电路由D101, D102和D103构成。D102和D103在发射模式下开启(通导), 在接收模式下关闭(隔离)。

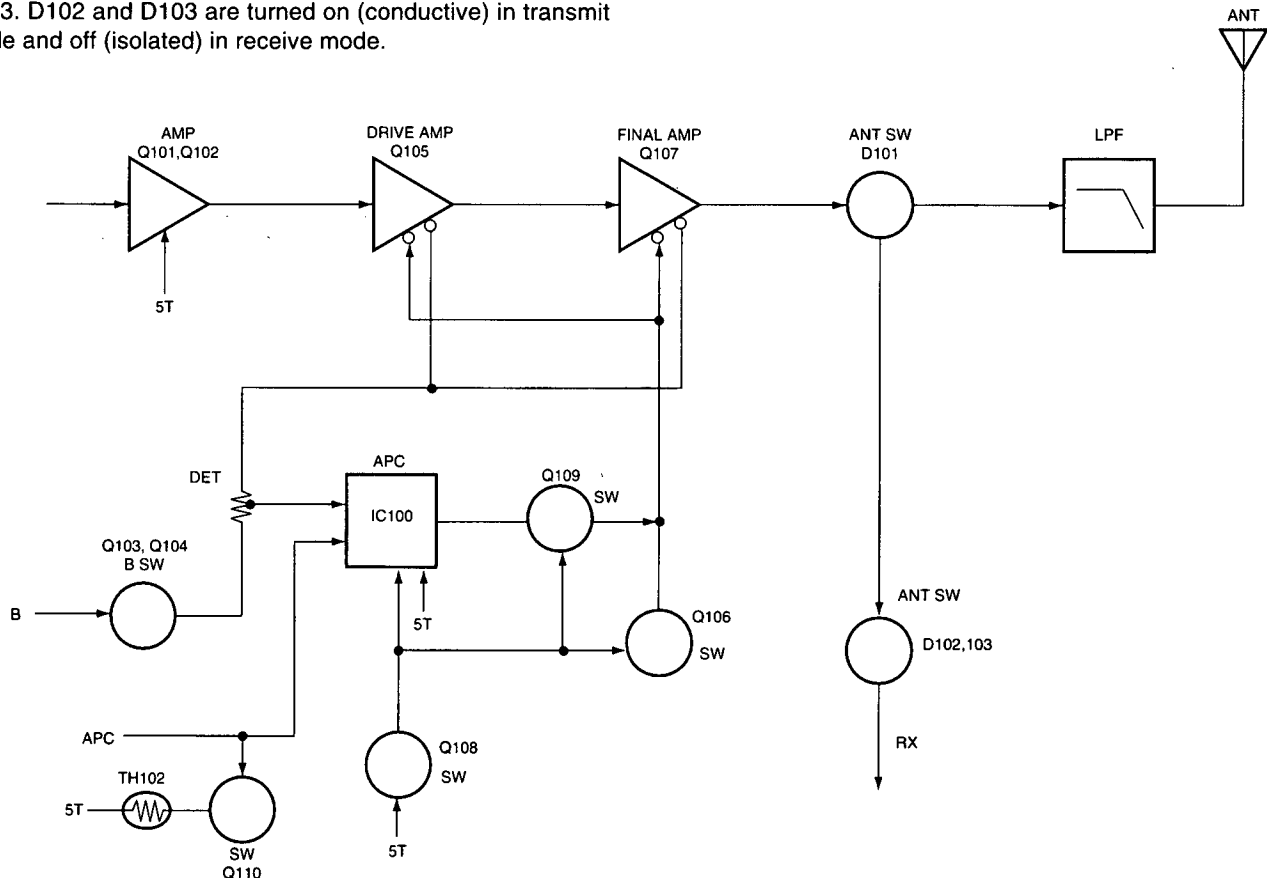


Fig. 7 APC system / 图7 自动功率控制系统

CIRCUIT DESCRIPTION / 电路说明

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.

6) Terminal protection circuit

When the thermistor (TH102) reaches about 80°C, the protection circuit turns on Q110 to protect transmitting final amplifier (Q107) from the over heating.

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.

5)自动功率控制

自动功率控制 (APC) 电路,通过检测末级放大器场效应管的漏极电流来稳定发射的输出功率。电压比较电路, IC100 (2/2) 用微处理器设定的参考电压来比较从未级电流所获得的电压。自动功率控制电压与IC100 (1/2) 输出的自动检测电压和参考电压之间的差值成正比。此输出电压控制场效应管功率放大器, 保持发射部输出功率常数。发射部输出功率可以通过微处理器进行改变, 在微处理器中改变参考电压来控制输出功率。

6)温度保护电路

当热敏电阻 (TH102) 的温度达到80°C时, 保护电路开启 Q110来保护末级放大器 (Q107) 避免过热。

5.电源

为控制电路提供的5V参考电源[5M]源于一个内部电池。此参考电源通常在发射模式中[5T]提供一个5V电源, 在接收模式中[5R]提供一个5V电源, 并且在发源于微处理器的控制信号的基础上, 在两种模式中[5C]提供一个共用的5V电源。

6.控制系统

IC403中央处理器在7.37MHz的情况下运行。此振荡器有一个按照EEPROM的数据转移频率的电路。

SEMICONDUCTOR DATA

Microprocessor: M38267M8L241GP (IC403)

Pin No.	I/O	Port Name	Function
1	O	VC1	NC
2	O	VC2	NC
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/TUNE	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	GLD	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(Q105)

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

FET : 2SK2595(Q107)

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

微处理器：M38267M8L241GP (IC403)

Pin No.	I/O	端口名称	功能
1	O	VC1	NC
2	O	VC2	NC
3	I	NC	NC
4	I	TIBI	QT/DQT外部电路中心点控制
5	I	TI	QT/DQT信号输入
6	I	BUSY	繁忙信号输入
7	I	BATT	电池电压检测
8	I	NC	NC
9	O	VCCN	频率稳压输出
10	O	APC/TUNE	发射：自动功率控制数字/模拟输出 接收：BPF调谐数字/模拟输出
11	I	NC	NC
12	I	NC	NC
13	I	NC	NC
14	I	NC	NC
15	O	BEEP	Beep输出
16	O	TO	QT/DQT输出
17	I	NC	NC
18	I	PTT	[PTT]键输入与RXD连接
19	O	TXD	RS-232C输出与扬声器/话筒测试连接 (REM)
20	I	RXD	RS-232C输入与[PTT]线连接
21	I	NC	NC
22	I	SELF	自台编程 L：禁用
23	I	MONI	[监听]键输入
24	I	NC	NC
25	I	NC	NC
26	I	NC	NC
27	I	NC	NC
28	I	ENC3	编码输入 (信道选择)
29	I	ENC2	编码输入 (信道选择)
30	I	ENC1	编码输入 (信道选择)
31	I	ENC0	编码输入 (信道选择)
32	I	INT0	功率检测控制
33	I	RST	复位输入
34	I	NC	NC
35	O	NC	NC
36	I	XIN	7.3728MHz振荡器
37	O	XOUT	7.3728MHz振荡器
38	I	VSS	接地
39	O	SHIFT	拍频偏移 H：开启转移
40	O	PABC	末级提供 H：开启
41	O	WNRC	音频参考灵敏度 L：窄
42	O	WNTC	最大Dev.控制 H：窄
43	I	NC	NC
44	I	NC	NC
45	I	NC	NC
46	I	NC	NC
47	I/O	SDA	EEPROM数据线
48	O	SCL	EEPROM时钟线
49	I	UL	锁相环电路开锁检测管脚 L：开锁
50	I	NC	NC
51	I	NC	NC
52	I	NC	NC
53	I	NC	NC
54	I	NC	NC
55	O	DT	共用数据输出
56	O	CK	共用时钟输出
57	O	NC	NC
58	O	LE	锁相环电路芯片生效 H：锁存

Pin No.	I/O	端口名称	功能
59	O	NC	NC
60	O	NC	NC
61	O	5MC	除了CPU和EEPROM以外电源控制 L：电源开启
62	O	AFCO	音频放大电源 H：开启
63	O	RX	发射/接收压控振荡器选择 H：接收
64	O	GLED	绿色指示灯控制 H：点亮
65	O	RLED	红色指示灯控制 H：点亮
66	O	SAVE	电池省电控制 H：省电OFF
67	O	MUTE	静音控制 H：扬声器静音 L：音频静音
68	O	5RC	接收电源控制 L：开启
69	O	5TC	发射电源控制 L：开启
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	CPU电源5V输入
90	I	VREF	模拟/数字转换参考电压；与Vcc连接
91	I	AVSS	模拟/数字转换器电源；与Vss连接
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(Q105)

绝对最大定额 (Ta=25°C)						
Item	V _{oss}	V _{gss}	I _b	P _{ch} *	T _{ch}	T _{stg}
Rating	17V	±10V	0.4A	3W	150°C	-45~+150°C
				*T _c =25°C		

FET：2SK2595(Q107)

绝对最大定额 (Ta=25°C)						
Item	V _{os}	V _{gss}	I _b	P _{ch} *	T _{ch}	T _{stg}
Rating	17V	±10V	1.1A	20W	150°C	-45~+150°C
				*T _c =25°C		

DESCRIPTION OF COMPONENTS / 元件说明

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 REGULATOR
IC500	IC	MIC AMP/LIMITER
Q1	TRANSISTOR	TRIPLER
Q2	TRANSISTOR	RF AMP
Q3	FET	VCO RX
Q4	TRANSISTOR	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 DRIVE
Q106	FET	DC SWITCH
Q107	FET	TX FINAL
Q108,109	TRANSISTOR	DC SWITCH
Q110	TRANSISTOR	TEMPERATURE PROTECTION SWITCH
Q200	TRANSISTOR	DC SWITCH
Q201	TRANSISTOR	IF AMP
Q202	FET	MIXER
Q203	FET	MIXER RF AMP
Q300	TRANSISTOR	ACTIVE FILTER
Q302	FET	AUDIO MUTE SWITCH
Q303-306	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
D201-205	VARIABLE CAPACITANCE DIODE	BPF TUNING
D300	DIODE	LIMITER
D400	LED	TX
D401	LED	BUSY
D500	DIODE	AGC DETECT
D501	DIODE	MIC MUTE/AGC SWITCH
D502	DIODE	REVERSE PROTECTION

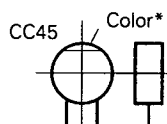
Ref No.	半导体	说明
IC1	IC	锁相环路系统
IC100	IC	自动功率控制
IC200	IC	中频系统
IC300	IC	音频放大器有源滤波器
IC301	IC	有源滤波器
IC302	IC	音频功率放大器
IC400	IC	复位开关
IC401	IC	EEPROM
IC402	IC	电压检测
IC403	IC	微处理器
IC404	IC	电压E调节器
IC500	IC	音频放大/限幅器
Q1	晶体管	三倍频
Q2	晶体管	射频放大器
Q3	场效应管	压控振荡器接收
Q4	晶体管	压控振荡器发射
Q5	场效应管	直流开关
Q6	晶体管	射频缓冲放大器
Q7	晶体管	直流开关
Q8	晶体管	脉动滤波器
Q100	晶体管	射频放大器
Q101	晶体管	预放大器
Q102	场效应管	驱动放大器
Q103	场效应管	直流开关
Q104	晶体管	直流开关
Q105	场效应管	驱动放大器
Q106	场效应管	直流开关
Q107	场效应管	末级射频功率放大器
Q108,109	晶体管	直流开关
Q110	晶体管	温度保护开关
Q200	晶体管	直流开关
Q201	晶体管	中频放大器
Q202	场效应管	混频器
Q203	场效应管	混频器射频放大器
Q300	晶体管	有源滤波器
Q302	场效应管	音频静音控制开关
Q303-306	晶体管	直流开关
Q307	场效应管	音频静音控制开关
Q400-402	晶体管	直流开关
Q403	晶体管	差拍移动开关
Q404	晶体管	直流开关
Q405	场效应管	直流开关
Q406-408	晶体管	直流开关
Q500	场效应管	直流开关
Q501,502	晶体管	有源滤波器
Q503	晶体管	扬声器静音/自动增益控制
Q504	晶体管	直流开关
D1-4	变容二极管	频率控制
D5	变容二极管	调制发射
D6	二极管	电流方向
D7	二极管	失锁检测
D100	二极管	射频开关
D101-103	二极管	天线开关
D200	二极管	射频开关
D201-205	变容二极管	BPF调谐
D300	二极管	限幅器
D400	发光二极管	发送
D401	发光二极管	繁忙
D500	二极管	自动增益控制检测
D501	二极管	扬声器静音/自动增益控制开关
D502	二极管	反向保护

PARTS LIST / 零件表

CAPACITORS

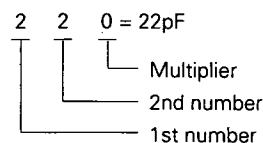
CC	45	TH	1H	220	J
1	2	3	4	5	6

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



• Capacitor value

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



• Temperature coefficient

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

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

Example : CC45TH = -470 ± 60ppm/°C

• Tolerance (More than 10pF)

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

(Less than 10pF)

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

• Voltage rating

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

• Chip capacitors

- (EX) C C 7 3 F S L 1 H 0 0 0 J
 1 2 3 4 5 6 7
 (Chip) (CH, RH, UJ, SL)
- (EX) C K 7 3 F F 1 H 0 0 0 Z
 1 2 3 4 5 6 7
 (Chip) (B, F)
- Refer to the table above.
- 1 = Type
 2 = Shape
 3 = Dimension
 4 = Temp. coefficient
 5 = Voltage rating
 6 = Value
 7 = Tolerance

Dimension (Chip capacitors)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.0 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0
H	1.0 ± 0.05	0.5 ± 0.05	0.5 ± 0.05

RESISTORS

• Chip resistor (Carbon)

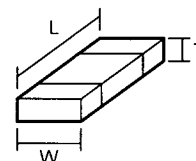
- (EX) R K 7 3 E B 2 B 0 0 0 J
 1 2 3 4 5 6 7
 (Chip) (B, F)

• Carbon resistor (Normal type)

- (EX) R D 1 4 B B 2 C 0 0 0 J
 1 2 3 4 5 6 7

- 1 = Type 5 = Rating wattage
 2 = Shape 6 = Value
 3 = Dimension 7 = Tolerance
 4 = Temp. coefficient

Dimension



Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6 ± 0.2	0.8 ± 0.2	0.5 ± 0.1
H	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

PARTS LIST / 零件表

* New Parts. △ indicates safety critical components.

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

TK-3107

TX-RX UNIT (X57-6030-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-3107											
1	1A		A02-2448-13	CABINET ASSY		C5			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
2	3B		A82-0034-03	REAR PANEL		C6			CC73GCH1H101J	CHIP C 100PF J	
3	-		B09-0351-03	CAP		C7			CK73GB1H471K	CHIP C 470PF K	
4	-	*	B62-1164-10	INSTRUCTION MANUAL		C9			CC73GCH1H100D	CHIP C 10PF D	
5	-	*	B72-1656-04	MODEL NAME PLATE	M	C10			CC73GCH1H470J	CHIP C 47PF J	
5	-	*	B72-1749-04	MODEL NAME PLATE	M4	C12			C92-0001-05	CHIP-C 0.1UF 35WV	
6	2B		E04-0413-05	RF COAXIAL RECEPTACLE(SMA)		C14			CC73GCH1H100D	CHIP C 10PF D	
7	3B		E23-1006-04	RELAY TERMINAL		C15			C92-0004-05	CHIP-TAN 1.0UF 16WV	
8	1A		G01-0881-04	COIL SPRING(BATT RELEASE)		C16			CC73GCH1H680J	CHIP C 68PF J	
-	-		G11-2583-04	SHEET		C17			CK73GB1H331K	CHIP C 330PF K	
9	2B		G11-2588-04	RUBBER SHEET(CHASSIS)		C18			C92-0001-05	CHIP-C 0.1UF 35WV	
10	2B		G13-1709-04	CUSHION(VOL)		C19,20			CK73GB1H103K	CHIP C 0.010UF K	
-	-		G13-1763-04	CUSHION(CHASSIS-BATT)		C23			C92-0560-05	CHIP-TAN 10UF 6.3WV	
11	2B		G53-0791-03	PACKING(SP/MIC PLUG)		C24			CK73GB1H103K	CHIP C 0.010UF K	
12	2A		G53-0842-13	PACKING(SPEAKER)		C25			CK73GB1H471K	CHIP C 470PF K	
13	2A		G53-0860-04	PACKING(SIDE)		C26			CC73GCH1H121J	CHIP C 120PF J	
14	-		H12-3037-02	PACKING FIXTURE		C27			CK73GB1H471K	CHIP C 470PF K	
15	-		H25-0085-04	PROTECTION BAG (100/200/0.07)		C28			CC73GCH1H330J	CHIP C 33PF J	
16	-		H25-2012-04	PROTECTION BAG (75/100/0.08)		C29			CC73GCH1H020C	CHIP C 2.0PF C	
17	-	*	H52-1560-02	ITEM CARTON CASE		C30			CK73GB1H102K	CHIP C 1000PF K	
18	1A		J19-1572-04	HOLDER(BATT RELEASE)		C31			CC73GCH1H101J	CHIP C 100PF J	
19	2B		J19-5344-03	HOLDER(VOL/ENC)		C34			CC73GCH1H180J	CHIP C 18PF J	
20	-		J21-4493-04	SP/MIC HOLDER		C35			CC73GCH1H070B	CHIP C 7.0PF B	M
21	3B		J29-0624-03	BELT HOOK		C35			CC73GCH1H100C	CHIP C 10PF C	M4
-	-		J82-0059-05	FPC		C36			CC73GCH1H080B	CHIP C 8.0PF B	M
22	1B		K29-5255-03	KNOB(VOL)		C36			CC73GCH1H070B	CHIP C 7.0PF B	M4
23	1A		K29-5274-03	BUTTON KNOB(MONI)		C37			CC73GCH1H330J	CHIP C 33PF J	M
24	1A		K29-5275-03	BUTTON KNOB(PTT)		C37			CC73GCH1H300J	CHIP C 30PF J	M4
25	1B		K29-5278-03	KNOB(ENC)		C38			CC73GCH1H050C	CHIP C 5.0PF C	M
26	1A		K29-5337-03	LEVER KNOB(BATT RELEASE)		C38			CC73GCH1H060B	CHIP C 6.0PF B	M4
A	2B		N09-2319-05	BINDING HEAD SCREW(SMA)		C39			CC73GCH1H080D	CHIP C 8.0PF D	M
B	1B		N14-0581-04	CIRCULAR NUT(VOL)		C39			CC73GCH1H100C	CHIP C 10PF C	M4
C	1B		N14-0582-14	CIRCULAR NUT(SMA)		C40			CC73GCH1H0R5B	CHIP C 0.5PF B	M
D	3A		N30-2606-46	PAN HEAD MACHINE SCREW		C41			CC73GCH1H040B	CHIP C 4.0PF B	M
E	3B		N79-2035-46	PAN HEAD TAPTITE SCREW		C41			CC73GCH1H070B	CHIP C 7.0PF B	M4
F	2A,2B		N83-2005-46	PAN HEAD TAPTITE SCREW		C42			CC73GCH1H100D	CHIP C 10PF D	M
G	-		N99-0396-05	SCREW SET		C42			CC73GCH1H120G	CHIP C 12PF G	M4
-	-		R31-0624-05	VARIABLE RESISTOR		C43			CK73GB1H102K	CHIP C 1000PF K	
-	-		S60-0410-05	ROTARY SWITCH		C44			CC73GCH1H060B	CHIP C 6.0PF B	M
SP	1A		T07-0369-05	SPEAKER		C44			CC73GCH1H070B	CHIP C 7.0PF B	M4
ANT			T90-0694-15	WHIP ANTENNA	M	C45			CC73GCH1H100C	CHIP C 10PF C	
ANT			T90-0684-05	WHIP ANTENNA	M4	C46			CK73GB1H471K	CHIP C 470PF K	
TX-RX UNIT (X57-6030-XX) -10:M, -25:M4						C47			CC73GCH1H010B	CHIP C 1.0PF B	
D400			B30-2156-05	LED(RED)		C48			CK73GB1H471K	CHIP C 470PF K	
D401			B30-2157-05	LED(YELLOW)		C49			CC73GCH1H0R5B	CHIP C 0.5PF B	
C1			CK73GB1C104K	CHIP C 0.10UF K		C51			CC73GCH1H680J	CHIP C 68PF J	
C2,3			CC73GCH1H101J	CHIP C 100PF J		C52			CK73GB1H471K	CHIP C 470PF K	
C4			CK73GB1C104K	CHIP C 0.10UF K		C53			CC73GCH1H060D	CHIP C 6.0PF D	
						C54			CC73GCH1H030B	CHIP C 3.0PF B	
						C55			CK73GB1H471K	CHIP C 470PF K	
						C56			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
						C100			CC73GCH1H220J	CHIP C 22PF J	
						C101-103			CK73GB1H471K	CHIP C 470PF K	

PARTS LIST / 零件表

TX-RX UNIT (X57-6030-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C104			CK73GB1C104K	CHIP C 0.10UF K		C205,206			CC73GCH1H221J	CHIP C 220PF J	
C105			CC73GCH1H060D	CHIP C 6.0PF D		C207			CK73GB1C104K	CHIP C 0.10UF K	
C106,107			CK73GB1H471K	CHIP C 470PF K		C208			CC73GCH1H270J	CHIP C 27PF J	
C108			CC73GCH1H070D	CHIP C 7.0PF D		C209			CK73GB1C104K	CHIP C 0.10UF K	
C109,110			CK73GB1H471K	CHIP C 470PF K		C210			CK73GB1H103K	CHIP C 0.010UF K	
C111			CC73GCH1H060D	CHIP C 6.0PF D		C211			CK73GB1C104K	CHIP C 0.10UF K	
C112			CK73GB1H471K	CHIP C 470PF K		C212			CC73GCH1H330J	CHIP C 33PF J	
C113			CK73GB1C104K	CHIP C 0.10UF K		C213			CK73GB1C104K	CHIP C 0.10UF K	
C114,115			CK73GB1H471K	CHIP C 470PF K		C214			CK73GB1H103K	CHIP C 0.010UF K	
C116			CK73GB1H102K	CHIP C 1000PF K		C215			CC73GCH1H130J	CHIP C 13PF J	
C118			CC73GCH1H270J	CHIP C 27PF J		C217			CK73GB1H103K	CHIP C 0.010UF K	
C119			CK73GB1H102K	CHIP C 1000PF K		C218			CK73GB1H471K	CHIP C 470PF K	
C120,121			CK73GB1H471K	CHIP C 470PF K		C219			CC73GCH1H150J	CHIP C 15PF J	
C123			CK73GB1H102K	CHIP C 1000PF K		C220,221			CK73GB1H103K	CHIP C 0.010UF K	
C125			CK73GB1H471K	CHIP C 470PF K		C222			CC73GCH1H050B	CHIP C 5.0PF B	M
C126			CK73FB1A105K	CHIP C 1.0UF K		C222			CC73GCH1H060B	CHIP C 6.0PF B	M4
C127			C92-0565-05	CHIP-TAN 6.8UF 10WV		C223			CC73GCH1H020C	CHIP C 2.0PF C	
C128			CK73GB1H103K	CHIP C 0.010UF K		C224			CK73GB1H471K	CHIP C 470PF K	
C129			CK73GB1H471K	CHIP C 470PF K		C226			CC73GCH1H0R5B	CHIP C 0.5PF B	
C130			CC73GCH1H220G	CHIP C 22PF G		C227			CC73GCH1H100C	CHIP C 10PF C	M
C131			CK73GB1C104K	CHIP C 0.10UF K		C227			CC73GCH1H150G	CHIP C 15PF G	M4
C132			CK73GB1H471K	CHIP C 470PF K		C228			CC73GCH1H080B	CHIP C 8.0PF B	
C134			CC73GCH1H101J	CHIP C 100PF J		C229			CK73GB1H471K	CHIP C 470PF K	
C135			CC73GCH1H010C	CHIP C 1.0PF C		C231,232			CK73GB1H471K	CHIP C 470PF K	
C136			CC73GCH1H070B	CHIP C 7.0PF B		C233,234			CC73GCH1H0R3B	CHIP C 0.3PF B	
C138			CC73GCH1H101J	CHIP C 100PF J	M	C235			CC73GCH1H030B	CHIP C 3.0PF B	M
C138			CK73GB1H471K	CHIP C 470PF K	M4	C235			CC73GCH1H3R5B	CHIP C 3.5PF B	M4
C139			CK73GB1H471K	CHIP C 470PF K		C236			CC73GCH1H030B	CHIP C 3.0PF B	M
C140			CC73GCH1H040B	CHIP C 4.0PF B	M4	C236			CC73GCH1H010B	CHIP C 1.0PF B	M4
C141			CK73GB1H471K	CHIP C 470PF K		C237			CK73GB1H471K	CHIP C 470PF K	
C142			CC73GCH1H030B	CHIP C 3.0PF B	M	C238			CC73GCH1H0R5B	CHIP C 0.5PF B	
C142			CC73GCH1H050B	CHIP C 5.0PF B	M4	C239			CC73GCH1H040B	CHIP C 4.0PF B	M
C143			CK73GB1H471K	CHIP C 470PF K		C239			CC73GCH1H070B	CHIP C 7.0PF B	M4
C144			CC73GCH1H020B	CHIP C 2.0PF B		C241			CC73GCH1H060B	CHIP C 6.0PF B	M
C145			CK73GB1H471K	CHIP C 470PF K		C241			CC73GCH1H1R5B	CHIP C 1.5PF B	M4
C147			CC73GCH1H010B	CHIP C 1.0PF B	M	C252			CC73GCH1H4R5B	CHIP C 4.5PF B	M
C147			CC73GCH1H1R5B	CHIP C 1.5PF B	M4	C252			CC73GCH1H070B	CHIP C 7.0PF B	M4
C148			CC73GCH1H010B	CHIP C 1.0PF B	M	C253,254			CK73GB1H471K	CHIP C 470PF K	
C149			CC73GCH1H010B	CHIP C 1.0PF B		C255			CC73GCH1H3R5B	CHIP C 3.5PF B	M
C150			CC73GCH1H050B	CHIP C 5.0PF B	M	C255			CC73GCH1H060B	CHIP C 6.0PF B	M4
C150			CC73GCH1H040B	CHIP C 4.0PF B	M4	C256			CK73GB1C104K	CHIP C 0.10UF K	
C151			CC73GCH1H1R5B	CHIP C 1.5PF B	M	C257			CK73GB1H471K	CHIP C 470PF K	
C151			CC73GCH1H020B	CHIP C 2.0PF B	M4	C258			CK73GB1C104K	CHIP C 0.10UF K	
C153			CC73GCH1H030B	CHIP C 3.0PF B	M	C259			CC73GCH1H040B	CHIP C 4.0PF B	M
C153			CC73GCH1H040B	CHIP C 4.0PF B	M4	C259			CC73GCH1H070B	CHIP C 7.0PF B	M4
C154			CC73GCH1H010B	CHIP C 1.0PF B	M	C260			CC73GCH1H030B	CHIP C 3.0PF B	M4
C154			CC73GCH1H020B	CHIP C 2.0PF B	M4	C300			CK73GB1H822K	CHIP C 8200PF K	
C155			CC73GCH1H1R5B	CHIP C 1.5PF B	M	C301			CK73GB1E183K	CHIP C 0.018UF K	
C156			CK73GB1C104K	CHIP C 0.10UF K		C302,303			CK73GB1C104K	CHIP C 0.10UF K	
C157			CK73GB1H471K	CHIP C 470PF K		C304			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C165			CK73GB1H471K	CHIP C 470PF K		C305			CK73GB1H103J	CHIP C 0.010UF J	
C200			C92-0560-05	CHIP-TAN 10UF 6.3WV		C306			CK73GB1C473K	CHIP C 0.047UF K	
C201			CK73GB1H103K	CHIP C 0.010UF K		C307			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C202			CC73GCH1H100D	CHIP C 10PF D		C308			CK73GB1H562K	CHIP C 5600PF K	
C203			CK73GB1H471K	CHIP C 470PF K		C309			CK73GB1H103J	CHIP C 0.010UF J	
C204			CK73GB1H472K	CHIP C 4700PF K		C311			C92-0560-05	CHIP-TAN 10UF 6.3WV	

PARTS LIST / 零件表

TX-RX UNIT (X57-6030-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C312			CK73GB1H103J	CHIP C 0.010UF J		C519			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C313			CK73FB1A105K	CHIP C 1.0UF K		C520			CK73GB1E223J	CHIP C 0.022UF J	
C314			CK73GB1H102K	CHIP C 1000PF K		C521			CK73GB1H102K	CHIP C 1000PF K	
C316			CK73GB1H103J	CHIP C 0.010UF J		C522			CK73FB1E104K	CHIP C 0.10UF K	
C318			CK73GB1C333J	CHIP C 0.033UF J		C523			C92-0587-05	CHIP-TAN 2.2UF 4WV	
C319			CK73GB1C473J	CHIP C 0.047UF J		C524			CK73GB1C273K	CHIP C 0.027UF K	
C320,321			CK73GB1C333J	CHIP C 0.033UF J		C525			CK73GB1C104K	CHIP C 0.10UF K	
C322			CK73FB1E104K	CHIP C 0.10UF K		C526			CK73GB1H471K	CHIP C 470PF K	
C327			CK73GB1C104K	CHIP C 0.10UF K		C527			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C330			CC73GCH1H101J	CHIP C 100PF J		C528			CK73GB1H471K	CHIP C 470PF K	
C331			CK73FB1C474K	CHIP C 0.47UF K		C529			CK73FB1H471K	CHIP C 470PF K	
C332			C92-0560-05	CHIP-TAN 10UF 6.3WV		C530,531			CC73GCH1H221J	CHIP C 220PF J	
C333			CK73GB1A474K	CHIP C 0.47UF K		C532			CK73GB1H471K	CHIP C 470PF K	
C334			CC73GCH1H221J	CHIP C 220PF J		TC1			C05-0383-05	CERAMIC TRIMMER CAP(6PF)	M
C335			CK73GB1C473K	CHIP C 0.047UF K		TC1			C05-0384-05	CERAMIC TRIMMER CAP(10PF)	M4
C336			CK73GB1H103K	CHIP C 0.010UF K		TC2			C05-0384-05	CERAMIC TRIMMER CAP(10PF)	
C337			C92-0665-05	TANTAL 100UF 6.3WV		TC201			C05-0383-05	CERAMIC TRIMMER CAP(6PF)	
C338			CC73GCH1H560J	CHIP C 56PF J		TC202,203			C05-0389-05	CERAMIC TRIMMER CAP	
C400			CK73GB1C104K	CHIP C 0.10UF K					E23-1005-04	RELAY TERMINAL	
C402-404			CK73GB1H471K	CHIP C 470PF K		CN400			E40-5998-05	PIN ASSY	
C406			CK73GB1H471K	CHIP C 470PF K		J500			E11-0457-05	PHONE JACK	
C407			CK73GB1H102K	CHIP C 1000PF K		F500			F53-0130-05	FUSE	
C408			C92-0560-05	CHIP-TAN 10UF 6.3WV		34	2B		G53-0862-04	PACKING	
C409			CC73GCH1H030B	CHIP C 3.0PF B					J19-1571-04	HOLDER	
C410,411			CK73GB1H471K	CHIP C 470PF K					J30-1249-04	SPACER	
C412			CC73GCH1H100D	CHIP C 10PF D		CF200			L72-0958-05	CERAMIC FILTER	
C413			CK73GB1H102K	CHIP C 1000PF K		L1			L92-0140-05	FERRITE CHIP	
C414			CK73GB1H471K	CHIP C 470PF K		L2			L40-1005-85	SMALL FIXED INDUCTOR(10UH)	
C415			CC73GCH1H100D	CHIP C 10PF D		L4			L40-4781-86	SMALL FIXED INDUCTOR(0.47UH)	
C416			CK73GB1H471K	CHIP C 470PF K		L5			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)	
C417			CK73EF1C105Z	CHIP C 1.0UF Z		L6			L40-1875-77	SMALL FIXED INDUCTOR(18NH)	
C418			CK73GB1H103K	CHIP C 0.010UF K		L7			L92-0140-05	FERRITE CHIP	
C420-422			CK73GB1H103K	CHIP C 0.010UF K		L8			L40-1085-77	SMALL FIXED INDUCTOR(100NH)	
C423			CK73GB1C333K	CHIP C 0.033UF K		L9			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	
C424			CK73FB1A105K	CHIP C 1.0UF K		L10			L92-0140-05	FERRITE CHIP	
C425			CK73GB1H103K	CHIP C 0.010UF K		L11			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	
C427			CK73GB1H471K	CHIP C 470PF K		L12			L40-1085-77	SMALL FIXED INDUCTOR(100NH)	
C429,430			CK73FB1A105K	CHIP C 1.0UF K		L13,14			L33-0744-05	SMALL FIXED INDUCTOR(23NH)	M
C500,501			CK73GB1C273K	CHIP C 0.027UF K		L13,14			L33-1267-05	SMALL FIXED INDUCTOR(27NH)	M4
C502			CK73GB1H392K	CHIP C 3900PF K		L15			L40-1085-77	SMALL FIXED INDUCTOR(100NH)	
C503			CK73GB1C333K	CHIP C 0.033UF K		L16,17			L40-2285-38	SMALL FIXED INDUCTOR(220NH)	
C504			C92-0507-05	CHIP-TAN 4.7UF 6.3WV		L18			L40-4775-77	SMALL FIXED INDUCTOR(47NH)	M
C505			CK73FB1A105K	CHIP C 1.0UF K		L19			L92-0140-05	FERRITE CHIP	
C506			CK73GB1H471K	CHIP C 470PF K		L20			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	
C507			C92-0587-05	CHIP-TAN 2.2UF 4WV		L21			L40-2275-77	SMALL FIXED INDUCTOR(22NH)	
C508			CK73GB1H103K	CHIP C 0.010UF K		L100			L40-2275-77	SMALL FIXED INDUCTOR(22NH)	
C509			CK73GB1H332K	CHIP C 3300PF K		L101			L40-1875-77	SMALL FIXED INDUCTOR(18NH)	
C510			CC73GCH1E681J	CHIP C 680PF J		L102			L40-1575-77	SMALL FIXED INDUCTOR(15NH)	
C511			CK73GB1C473K	CHIP C 0.047UF K		L103			L92-0140-05	FERRITE CHIP	
C512			CK73GB1H332K	CHIP C 3300PF K		L104			L40-1098-76	SMALL FIXED INDUCTOR(1UH)	
C513			CC73GCH1E681J	CHIP C 680PF J		L105			L92-0149-05	FERRITE CHIP	
C514			CK73GB1C473K	CHIP C 0.047UF K		L106			L34-4551-05	AIR-CORE COIL	
C515			CK73GB1H103K	CHIP C 0.010UF K		L107			L92-0149-05	FERRITE CHIP	
C516			CC73GCH1H100D	CHIP C 10PF D		L109			L40-2285-54	SMALL FIXED INDUCTOR(220NH)	
C517			CK73GB1H471K	CHIP C 470PF K		L110			L34-4547-05	AIR-CORE COIL	
C518			CK73GB1E223J	CHIP C 0.022UF J		L112			L34-4547-05	AIR-CORE COIL	

PARTS LIST / 零件表

TX-RX UNIT (X57-6030-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L113			L34-4547-05	AIR-CORE COIL	M	R27			RK73GB1J331J	CHIP R 330 J 1/16W	M
L113			L34-4548-05	AIR-CORE COIL	M4	R27			RK73GB1J271J	CHIP R 270 J 1/16W	M4
L114			L34-4546-05	AIR-CORE COIL	M	R28			RK73GB1J220J	CHIP R 22 J 1/16W	
L114			L34-4547-05	AIR-CORE COIL	M4	R29			R92-1252-05	CHIP R 0 OHM	
L118			L40-1092-81	SMALL FIXED INDUCTOR		R30			RK73GB1J124J	CHIP R 120K J 1/16W	
L119			L40-2263-77	SMALL FIXED INDUCTOR(2.2NH)	M	R31			RK73GB1J101J	CHIP R 100 J 1/16W	
L119			L40-3363-77	SMALL FIXED INDUCTOR(3.3NH)	M4	R32			RK73GB1J472J	CHIP R 4.7K J 1/16W	
L120			L33-1273-05	SMALL FIXED INDUCTOR(2.7NH)	M4	R33			RK73GB1J102J	CHIP R 1.0K J 1/16W	
L200			L40-3385-85	SMALL FIXED INDUCTOR(0.33UH)		R34			RK73GB1J104J	CHIP R 100K J 1/16W	
L201			L40-5685-85	SMALL FIXED INDUCTOR(0.56UH)		R100			RK73GB1J332J	CHIP R 3.3K J 1/16W	
L202			L40-2275-77	SMALL FIXED INDUCTOR(22NH)		R101			RK73GB1J562J	CHIP R 5.6K J 1/16W	
L203,204			L34-4546-05	AIR-CORE COIL		R102			RK73GB1J271J	CHIP R 270 J 1/16W	
L206			L40-1875-77	SMALL FIXED INDUCTOR(18NH)		R103			RK73GB1J332J	CHIP R 3.3K J 1/16W	
L207			L40-3975-77	SMALL FIXED INDUCTOR(39NH)		R104			RK73GB1J100J	CHIP R 10 J 1/16W	
L208-211			L34-4546-05	AIR-CORE COIL		R105,106			RK73GB1J332J	CHIP R 3.3K J 1/16W	
L212			L34-4554-05	COIL		R107			RK73GB1J473J	CHIP R 47K J 1/16W	
L212			L34-4585-05	COIL		R108			RK73GB1J331J	CHIP R 330 J 1/16W	
L214			L34-4546-05	AIR-CORE COIL		R109			RK73GB1J220J	CHIP R 22 J 1/16W	
L400			L40-2281-86	SMALL FIXED INDUCTOR(0.22UH)		R110			RK73GB1J681J	CHIP R 680 J 1/16W	
L401			L92-0140-05	FERRITE CHIP		R111			RK73GB1J220J	CHIP R 22 J 1/16W	
L402,403			L40-2281-86	SMALL FIXED INDUCTOR(0.22UH)		R112			RK73GB1J152J	CHIP R 1.5K J 1/16W	
L500			L92-0140-05	FERRITE CHIP		R113			RK73GB1J331J	CHIP R 330 J 1/16W	
L501,502			L92-0149-05	FERRITE CHIP		R115			RK73GB1J100J	CHIP R 10 J 1/16W	
X1			L77-1756-05	TCXO(12.8MHZ)		R117			RK73GB1J124J	CHIP R 120K J 1/16W	M
X400			L77-1761-05	CRYSTAL RESONATOR(7.3728MHZ)		R117			RK73GB1J473J	CHIP R 47K J 1/16W	M4
XF201			L71-0522-05	MCF(38.85MHZ)		R118			RK73GB1J473J	CHIP R 47K J 1/16W	
			N78-2640-46	PAN HEAD TAPTITE SCREW		R119			RK73GB1J472J	CHIP R 4.7K J 1/16W	
CP1			R90-0724-05	MULTI-COMP1KX4		R120			R92-1252-05	CHIP R 0 OHM	
R1,2			RK73GB1J102J	CHIP R 1.0K J 1/16W		R121			RK73GB1J470J	CHIP R 47 J 1/16W	
R3			RK73GB1J100J	CHIP R 10 J 1/16W		R122			RK73GB1J681J	CHIP R 680 J 1/16W	
R4			RK73GB1J102J	CHIP R 1.0K J 1/16W		R123			R92-0670-05	CHIP R 0 OHM	
R5			RK73GB1J561J	CHIP R 560 J 1/16W		R124			RK73GB1J681J	CHIP R 680 J 1/16W	
R6			RK73GB1J154J	CHIP R 150K J 1/16W		R125			RK73GB1J473J	CHIP R 47K J 1/16W	M
R7			RK73GB1J561J	CHIP R 560 J 1/16W		R125			RK73GB1J183J	CHIP R 18K J 1/16W	M4
R8			RK73GB1J334J	CHIP R 330K J 1/16W		R126			RK73GB1J473J	CHIP R 47K J 1/16W	
R9			RK73GB1J272J	CHIP R 2.7K J 1/16W		R127			R92-0670-05	CHIP R 0 OHM	M
R10			RK73GB1J222J	CHIP R 2.2K J 1/16W		R128			RK73GB1J470J	CHIP R 47 J 1/16W	
R11			RK73GB1J473J	CHIP R 47K J 1/16W		R130-132			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R12			RK73GB1J274J	CHIP R 270K J 1/16W		R133-138			RK73GB1J154D	CHIP R 150K D 1/16W	
R13			R92-1252-05	CHIP R 0 OHM		R139			RK73GB1J271J	CHIP R 270 J 1/16W	
R14			RK73GB1J101J	CHIP R 100 J 1/16W		R140			RK73GB1J103J	CHIP R 10K J 1/16W	
R15			RK73GB1J103J	CHIP R 10K J 1/16W		R141			RK73GB1J473J	CHIP R 47K J 1/16W	
R16			RK73GB1J473J	CHIP R 47K J 1/16W		R142			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R18			RK73GB1J104J	CHIP R 100K J 1/16W		R143			R92-1252-05	CHIP R 0 OHM	
R19			RK73GB1J101J	CHIP R 100 J 1/16W		R144			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R20			RK73GB1J102J	CHIP R 1.0K J 1/16W		R145			RK73GB1J184J	CHIP R 180K J 1/16W	
R21			RK73GB1J104J	CHIP R 100K J 1/16W		R146			RK73GB1J104J	CHIP R 100K J 1/16W	
R22			RK73GB1J473J	CHIP R 47K J 1/16W		R147			R92-1252-05	CHIP R 0 OHM	
R23			RK73GB1J682J	CHIP R 6.8K J 1/16W	M	R152			RK73GB1J391J	CHIP R 390 J 1/16W	
R23			RK73GB1J392J	CHIP R 3.9K J 1/16W	M4	R153			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R24			RK73GB1J822J	CHIP R 8.2K J 1/16W	M	R154			RK73GB1J271J	CHIP R 270 J 1/16W	
R24			RK73GB1J472J	CHIP R 4.7K J 1/16W	M4	R200			RK73GB1J100J	CHIP R 10 J 1/16W	
R25			RK73GB1J101J	CHIP R 100 J 1/16W	M	R201			RK73GB1J392J	CHIP R 3.9K J 1/16W	
R25			RK73GB1J151J	CHIP R 150 J 1/16W	M4	R202			RK73GB1J184J	CHIP R 180K J 1/16W	
R26			RK73GB1J101J	CHIP R 100 J 1/16W		R203,204			RK73GB1J332J	CHIP R 3.3K J 1/16W	
						R205			RK73GB1J153J	CHIP R 15K J 1/16W	

PARTS LIST / 零件表

TX-RX UNIT (X57-6030-XX)

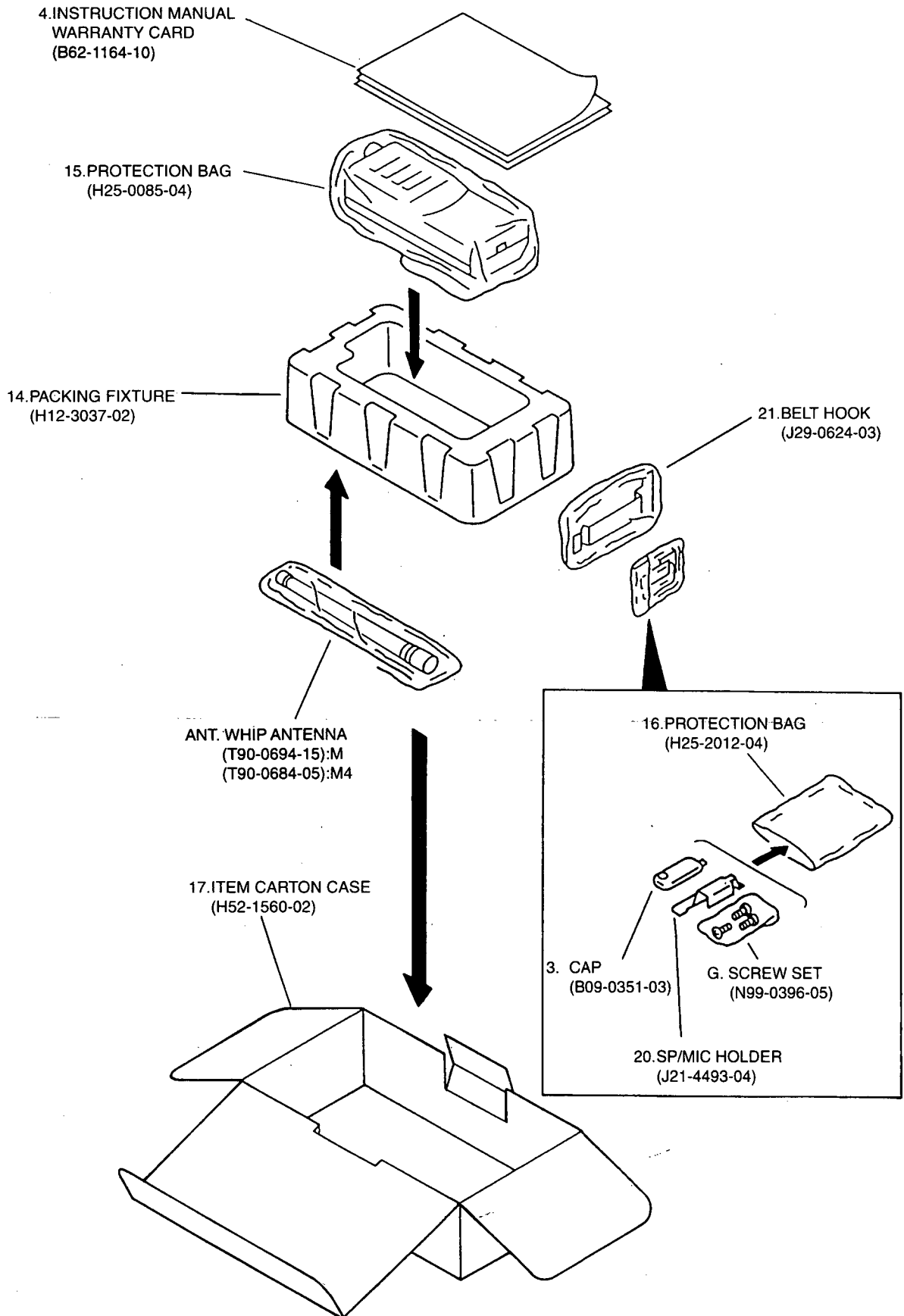
Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R206			RK73GB1J184J	CHIP R 180K J 1/16W		R334			RK73GB1J100J	CHIP R 10 J 1/16W	
R207			RK73GB1J104J	CHIP R 100K J 1/16W		R335			RK73GB1J563J	CHIP R 56K J 1/16W	
R208			RK73GB1J684J	CHIP R 680K J 1/16W		R336			RK73GB1J333J	CHIP R 33K J 1/16W	
R209			RK73GB1J272J	CHIP R 2.7K J 1/16W		R338			RK73GB1J473J	CHIP R 47K J 1/16W	
R210,211			RK73GB1J471J	CHIP R 470 J 1/16W		R339			RK73GB1J822J	CHIP R 8.2K J 1/16W	
R212			RK73GB1J470J	CHIP R 47 J 1/16W		R340			RK73GH1J124D	CHIP R 120K D 1/16W	
R213			R92-1252-05	CHIP R 0 OHM		R341			RK73GB1J104J	CHIP R 100K J 1/16W	
R214			RK73GB1J103J	CHIP R 10K J 1/16W		R342			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R215			RK73GB1J221J	CHIP R 220 J 1/16W		R400			RK73GB1J334J	CHIP R 330K J 1/16W	
R216			RK73GB1J102J	CHIP R 1.0K J 1/16W	M	R401			RK73GB1J104J	CHIP R 100K J 1/16W	
R216			RK73GB1J222J	CHIP R 2.2K J 1/16W	M4	R402			RK73GB1J221J	CHIP R 220 J 1/16W	
R217			R92-1252-05	CHIP R 0 OHM		R403			RK73GB1J181J	CHIP R 180 J 1/16W	
R218			RK73GB1J101J	CHIP R 100 J 1/16W		R404			R92-1252-05	CHIP R 0 OHM	
R219			RK73GB1J332J	CHIP R 3.3K J 1/16W		R405			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R220			RK73GB1J221J	CHIP R 220 J 1/16W	M	R406			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R220			RK73GB1J151J	CHIP R 150 J 1/16W	M4	R407			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R221			RK73GB1J224J	CHIP R 220K J 1/16W		R408			RK73GB1J104J	CHIP R 100K J 1/16W	
R222			RK73GB1J102J	CHIP R 1.0K J 1/16W		R409			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R223			RK73GB1J104J	CHIP R 100K J 1/16W		R410			RK73GB1J822J	CHIP R 8.2K J 1/16W	
R224,225			R92-1252-05	CHIP R 0 OHM		R411			RK73GB1J224J	CHIP R 220K J 1/16W	
R226			RK73GB1J222J	CHIP R 2.2K J 1/16W		R412			RK73GB1J100J	CHIP R 10 J 1/16W	
R227			R92-1252-05	CHIP R 0 OHM		R413			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R228			RK73GB1J104J	CHIP R 100K J 1/16W		R414,415			RK73GB1J473J	CHIP R 47K J 1/16W	
R230,231			RK73GB1J104J	CHIP R 100K J 1/16W		R416			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R232			RK73GB1J104J	CHIP R 100K J 1/16W	M4	R417			RK73GB1J100J	CHIP R 10 J 1/16W	
R300			RK73GH1J913D	CHIP R 91K D 1/16W		R418			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R301,302			RK73GB1J562J	CHIP R 5.6K J 1/16W		R419			R92-1252-05	CHIP R 0 OHM	
R303			RK73GB1J332J	CHIP R 3.3K J 1/16W		R420			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R304			RK73GB1J105J	CHIP R 1.0M J 1/16W		R421			RK73GB1J473J	CHIP R 47K J 1/16W	
R305			RK73GB1J183J	CHIP R 18K J 1/16W		R422			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R306			RK73GB1J124J	CHIP R 120K J 1/16W		R423			RK73GB1J473J	CHIP R 47K J 1/16W	
R307			RK73GB1J473J	CHIP R 47K J 1/16W		R424,425			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R308			RK73GB1J103J	CHIP R 10K J 1/16W		R426			RK73GB1J822J	CHIP R 8.2K J 1/16W	
R309			RK73GB1J474J	CHIP R 470K J 1/16W		R427			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R310,311			R92-0670-05	CHIP R 0 OHM		R428			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R312			RK73GB1J123J	CHIP R 12K J 1/16W		R429			RK73GB1J821J	CHIP R 820 J 1/16W	
R313			RK73GB1J104J	CHIP R 100K J 1/16W		R430			RK73GB1J101J	CHIP R 100 J 1/16W	
R314			RK73GH1J474D	CHIP R 470K D 1/16W		R431			R92-1252-05	CHIP R 0 OHM	
R315			RK73GH1J394D	CHIP R 390K D 1/16W		R432			RK73GB1J103J	CHIP R 10K J 1/16W	
R316			RK73GB1J274J	CHIP R 270K J 1/16W		R433,434			RK73GB1J153J	CHIP R 15K J 1/16W	
R317			RK73GH1J274D	CHIP R 270K D 1/16W		R435			RK73GB1J103J	CHIP R 10K J 1/16W	
R318			RK73GB1J184J	CHIP R 180K J 1/16W		R500,501			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R320			RK73GB1J473J	CHIP R 47K J 1/16W		R502			RK73GB1J823J	CHIP R 82K J 1/16W	
R321			RK73GB1J223J	CHIP R 22K J 1/16W		R503			RK73GB1J683J	CHIP R 68K J 1/16W	M
R322			RK73GH1J224D	CHIP R 220K D 1/16W		R503			RK73GB1J123J	CHIP R 12K J 1/16W	M4
R323			RK73GB1J104J	CHIP R 100K J 1/16W		R504			RK73GB1J333J	CHIP R 33K J 1/16W	M
R324			RK73GB1J562J	CHIP R 5.6K J 1/16W		R504			RK73GB1J683J	CHIP R 68K J 1/16W	M4
R325			RK73GB1J104J	CHIP R 100K J 1/16W		R505			RK73GB1J154J	CHIP R 150K J 1/16W	M
R326			RK73GH1J562D	CHIP R 5.6K D 1/16W		R505			RK73GB1J124J	CHIP R 120K J 1/16W	M4
R327			R92-1252-05	CHIP R 0 OHM		R506			RK73GB1J223J	CHIP R 22K J 1/16W	M
R328			RK73GB1J102J	CHIP R 1.0K J 1/16W		R506			RK73GB1J103J	CHIP R 10K J 1/16W	M4
R329			R92-1252-05	CHIP R 0 OHM		R507			RK73GB1J473J	CHIP R 47K J 1/16W	
R330			RK73GB1J473J	CHIP R 47K J 1/16W		R508			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R331			RK73GB1J222J	CHIP R 2.2K J 1/16W		R509			RK73GB1J124J	CHIP R 120K J 1/16W	
R332			RK73GB1J151J	CHIP R 150 J 1/16W		R510			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R333			RK73GB1J474J	CHIP R 470K J 1/16W		R511			RK73GB1J103J	CHIP R 10K J 1/16W	

PARTS LIST / 零件表

TX-RX UNIT (X57-6030-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R512			RK73GB1J185J	CHIP R 1.8M J 1/16W		IC400			PST9140NR	IC(RESET SW)	
R513			RK73GB1J333J	CHIP R 33K J 1/16W	M	IC401			AT2408N10SI2.5	IC(8kbit SERIAL EEPROM)	
R513			RK73GB1J473J	CHIP R 47K J 1/16W	M4	IC402			RN5VL45C	IC(REGULATOR)	
R514,515			RK73GB1J333J	CHIP R 33K J 1/16W		IC403			M38267M8L241GP	IC	
R516			RK73GB1J103J	CHIP R 10K J 1/16W		IC404			S-81350HG-KD	IC(VOLTAGE REGULATOR)	
R517			RK73GB1J185J	CHIP R 1.8M J 1/16W		IC500			NJM2100V	IC(AUDIO AMP)	
R518			RK73GB1J682J	CHIP R 6.8K J 1/16W	M	Q1			2SC4649(N,P)	TRANSISTOR	
R518			RK73GB1J103J	CHIP R 10K J 1/16W	M4	Q2			2SC5108(Y)	TRANSISTOR	
R519,520			RK73GB1J333J	CHIP R 33K J 1/16W		Q3			2SK508NV(K52)	FET	
R521			RK73GB1J332J	CHIP R 3.3K J 1/16W		Q4			2SC4228(R44)	TRANSISTOR	
R522			RK73GB1J182J	CHIP R 1.8K J 1/16W		Q5			2SJ243	FET	
R523			RK73GB1J682J	CHIP R 6.8K J 1/16W		Q6			2SC5108(Y)	TRANSISTOR	
R524			RK73GB1J513J	CHIP R 51K J 1/16W		Q7			UMC4	TRANSISTOR	
R525			RK73GB1J152J	CHIP R 1.5K J 1/16W		Q8			2SC4617(S)	TRANSISTOR	
R526,527			RK73GB1J153D	CHIP R 15K D 1/16W		Q100,101			2SC5108(Y)	TRANSISTOR	
R528			RK73GB1J754J	CHIP R 750K J 1/16W		Q102			2SC4988	TRANSISTOR	
R529			RK73GB1J183J	CHIP R 18K J 1/16W		Q103			2SK1824	FET	
R530			RK73GB1J101J	CHIP R 100 J 1/16W		Q104			FMMT717	TRANSISTOR	
R531			R92-1252-05	CHIP R 0 OHM		Q105			2SK2596	FET	
R532			RK73GB1J821J	CHIP R 820 J 1/16W		Q106			2SK1824	FET	
R533			RK73GB1J104J	CHIP R 100K J 1/16W		Q107			2SK2595	FET	
R534			RK73GB1J182J	CHIP R 1.8K J 1/16W		Q108			DTC114EE	DIGITAL TRANSISTOR	
R535			RK73GB1J471J	CHIP R 470 J 1/16W		Q109			DTA144EE	DIGITAL TRANSISTOR	
R536			RK73GB1J102J	CHIP R 1.0K J 1/16W		Q110			DTC114TE	DIGITAL TRANSISTOR	
R537,538			RK73GB1J101J	CHIP R 100 J 1/16W		Q200			DTA114EE	DIGITAL TRANSISTOR	
R539			R92-1252-05	CHIP R 0 OHM		Q201			2SC4649(N,P)	TRANSISTOR	
R540			R92-0670-05	CHIP R 0 OHM		Q202,203			3SK228	FET	
R541			RK73GB1J472J	CHIP R 4.7K J 1/16W		Q300			2SC4617(S)	TRANSISTOR	
R542,543			R92-1252-05	CHIP R 0 OHM		Q302			2SK1824	FET	
R548			RK73GB1J332J	CHIP R 3.3K J 1/16W		Q303			DTA144EE	DIGITAL TRANSISTOR	
VR1			R12-7491-05	TRIMMING POT.(68K)		Q304			DTC144EE	DIGITAL TRANSISTOR	
VR500			R12-7494-05	TRIMMING POT.(220K)		Q305			2SA1362(GR)	TRANSISTOR	
VR501			R12-7490-05	TRIMMING POT.(47K)		Q306			DTC144EE	DIGITAL TRANSISTOR	
S402,403			S70-0414-05	TACT SWITCH		Q307			2SK1588	FET	
MIC500			T91-0543-05	MIC ELEMENT		Q400,401			DTC114EE	DIGITAL TRANSISTOR	
D1-4			MA2S376	VARIABLE CAPACITANCE DIODE		Q402			DTA114YE	DIGITAL TRANSISTOR	
D5			MA360	VARIABLE CAPACITANCE DIODE	M	Q403			DTC144EE	DIGITAL TRANSISTOR	
D5			1SV214	VARIABLE CAPACITANCE DIODE	M4	Q404			UMG3N	TRANSISTOR	
D6,7			MA2S111	DIODE		Q405			UPA672T	FET	
D100			HSC277	DIODE		Q406			FP210	TRANSISTOR	
D101			HVU131	DIODE		Q407			UMG3N	TRANSISTOR	
D102,103			HSC277	DIODE		Q408			DTA123JE	DIGITAL TRANSISTOR	
D200			HSC277	DIODE		Q500			2SK1824	FET	
D201-203			HVC350B	VARIABLE CAPACITANCE DIODE		Q501,502			2SC4617(S)	TRANSISTOR	
D204			HVC350B	VARIABLE CAPACITANCE DIODE	M4	Q503			2SC4919	TRANSISTOR	
D300			DA221	DIODE		Q504			DTA143ZE	DIGITAL TRANSISTOR	
D500			1SS372	DIODE		TH102			157-503-65001	THERMISTOR	
D501			DAN222	DIODE		TH500,501			157-302-65801	THERMISTOR	
D502			1SR154-400	DIODE							
IC1			MB15A02	IC							
IC100			NJM2904V	IC(APC)							
IC200			TA31136FN	IC(FM IF DETECTOR)							
IC300			NJM2902V	IC							
IC301			NJM2904V	IC(APC)							
IC302			TA7368F	IC(AF POWER AMP)							

PACKING / 包装



ADJUSTMENT / 调整

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

所需的测试设备

1. 稳定电源

1. 输出电源在5V和18V之间可调, 并且电流为3A或更大。
2. 标准电压为7.5V。

2. 电流表

1. 高级电流表 (17档和其他功能)。
2. 满刻度可设定为300mA也可设定为3A。
3. 必须使用低损耗电缆。

3. 频率计数器 (f.counter)

1. 可以测量到最大量程大约为1GHz的频率。
2. 灵敏度可调到500MHz或更低, 测量为高稳定性和高准确度 (大约为0.2ppm)。

4. 功率表

1. 可测量的频率: 最高到500MHz
2. 阻抗: 50Ω, 不稳定
3. 测量范围: 满刻度大约为10W。
4. 必须使用标准电缆 (5D2W 1m)。

5. 射频电压表 (RF V.M)

1. 频率范围: 最高大约到500MHz。

6. 线性检测器

1. 频率范围: 最高大约到500MHz。
2. 特征函数是平展的, CN为60dB或更大。

7. 数字电压表

1. 电压范围: 大约FS = 18V。
2. 输入阻抗值: 1MΩ或更大。

8. 示波器

1. 测量范围: 直流到30MHz
2. 5到25MHz间提供高准确度测量。

9. 音频电压表 (AF V.M)

1. 频率范围: 50Hz到1MHz
2. 最高灵敏度: 1mV或更高

10. 频谱分析仪

1. 测量范围: 直流到1GHz或更大

11. 标准信号发射器 (SSG)

1. 最高频率: 500MHz或更高
2. 输出: -133dBm/0.05μV到7dBm/501mV
3. 输出阻抗: 50Ω

12. 轨迹发生器

1. 中心频率: 50kHz到500MHz
2. 频偏: ±35MHz
3. 输出电压: 100mV或更高

13. 假负载

1. 8Ω, 3W或更高

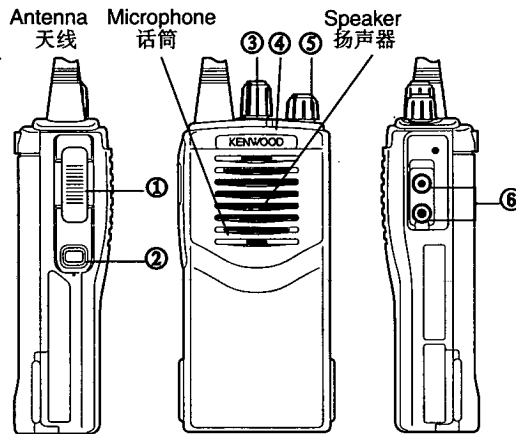
14. 音频发生器 (AG)

1. 频率范围: 100Hz到100kHz
2. 输出: 0.5mV到1V

15. 失真测试仪

1. 频率范围: 30Hz到100kHz
2. 输入电平: 50mV到10Vrms

ADJUSTMENT / 调整



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

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

- ① PTT转换开关
- ② 监听键
- ③ 信道转换开关

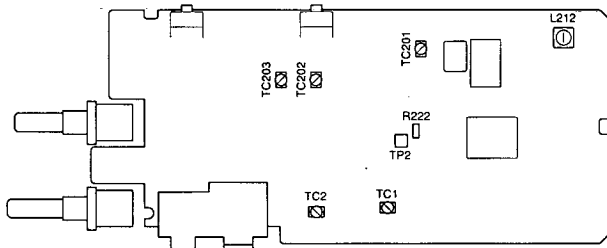
- ④ 发光二极管指示灯
- ⑤ 电源开关
- ⑥ 扬声器/话筒插口

- 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.

- 使用一个专用调整棒进行调整（特别是微调电容器和线圈）。
建伍订货单号码 A-0910 (0.4×0.9mm)
建伍订货单号码 A-1310 (0.4×1.3mm)
- 为了保护标准信号发生器，在调整接收部分时通信机不要发射。
- 显示的标准信号发生器输出电平为最大输出值。

Adjustment point

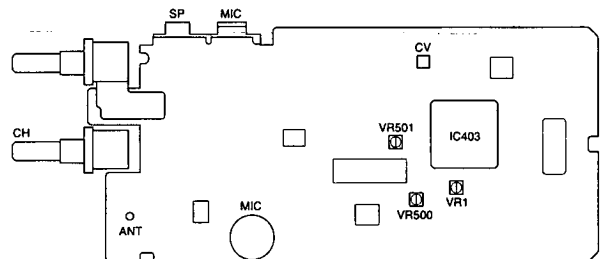
Foil Side View



- TC201: } Band-pass filter waveform adjustment
- TC202: }
- TC203: }
- L212: AF level adjustment
- TC1: Transmit lock voltage adjustment
- TC2: Receive lock voltage adjustment
- TP2: Band-pass filter test point

- TC201: } 带通滤波器波形调整
- TC202: }
- TC203: }
- L212: 音频电平调整
- TC1: 发射锁定电压调整
- TC2: 接收锁定电压调整
- TP2: 带通滤波器测试点

Component Side View



- 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.

- ANT: 天线连接器
- CH: 信道选择器
- SP: 扬声器插座
- MIC: 话筒插座
- CV: 锁定电压调整终端
- VR500: DQT波形调整
- VR501: DEV调整

注意：当不使用电脑微调频率时，可调整VR1。

ADJUSTMENT / 调整

ADJUSTMENT FREQUENCY LIST

Destination	M		M4	
	TX f (MHz)	RX f (MHz)	TX f (MHz)	RX f (MHz)
Center	460.050		410.05	
Low	450.050		400.05	
Hi	469.950		419.95	

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. ❶
3. Solder the antenna terminal to the terminal of the unit.

Notes: Supply power from an external power supply.

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

调整频率清单

型式	M		M4	
	发射频率 (MHz)	接收频率 (MHz)	发射频率 (MHz)	接收频率 (MHz)
信道				
中心	460.050		410.05	
低	450.050		400.05	
高	469.950		419.95	

备注

- 将手持机与计算机连接。
 - 向手持机发送信道数据，然后备份数据。
 - 将清单中的调整频率编程，输入手持机。
- 注意：**在进行调整后，重新载入备份的信道数据。

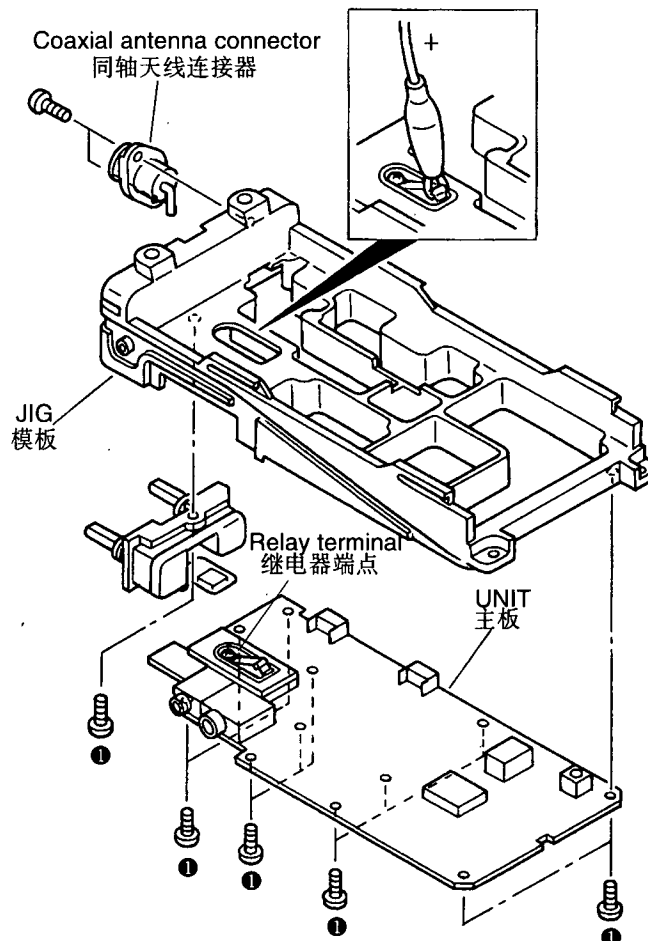
1.用于调整的模板（机架）（部件号码A10-1392-03）

2.按照下述方法使用模板：

- 1.将同轴天线连接器插入模板。
- 2.将主板放置在模板上，然后用12颗螺钉拧紧。❶
- 3.将天线的端点与主板的焊点焊接。

注意：供电来自于外部电源。

(继电器端点 : +
模板（机架） : -)



ADJUSTMENT

Use the KPG-55D programming software for adjustment of the next item in PC MODE (see page 4).

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	3.7V	±0.1V
	2) CH: RX high			TC2	3.7V	±0.1V
	3) CH: TX low					
	4) CH: RX low				Check	more than 1.0V

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 TC202 TC203	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) ±1.5kHz (Narrow)	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) ±1.5kHz (Narrow)				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					
	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 LOW Battery terminal: 7.5V PTT: ON	Power meter Ammeter			Adjust it to 4.1W	±0.1W
4. MAX DEV	1) CH: TX center AG: 1kHz/120mV PTT: ON	Modulation analyzer or linear detector (LPF: 15kHz) Oscilloscope	ANT MIC	VR501	Adjust it to ± 4.2kHz (Wide) Narrow check (+, - Peak whichever is Maximum)	±100Hz ±1.8kHz~2.2kHz
5. MIC SENS	1) CH: TX center AG: 1kHz/12mV	AG AF. V. M			Check (+, - Peak whichever is Maximum)	±2.2kHz~3.6kHz: (Wide) ±1.1kHz~1.8kHz: (Narrow)
6. QT DEV (PC MODE)	1) CH: TX high QT: 67.0Hz	Modulation analyzer or linear detector (LPF: 3kHz) Oscilloscope AG AF. V. M	ANT	PC key	Adjust it to ± 0.75kHz (Wide) Adjust it to ± 0.35kHz (Narrow)	±50Hz ±50Hz
7. DQT DEV (PC MODE)	1) DQT: 023N center	Modulation analyzer or linear detector (LPF: 3kHz) Oscilloscope		PC key	Adjust it to ± 0.75kHz (Wide) Adjust it to ± 0.35kHz (Narrow)	±50Hz ±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.

调整

在计算机模式下使用KPG-55D编程软件调整下记项目（参见第4页）。
噪音抑制电路电平发射频率DQT均衡射频功率QT偏差DQT偏差电池电平

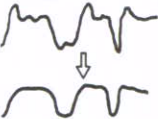
发射部和接收部共用部分（压控振荡器）

项目	条件	测量		调整		规格/备注
		测试设备	终端	部件	方法	
1.设定	1)电源电压电池终端：7.5V					
2.压控振荡器	1)CH：发射高端频点	数字电压表	CV	TC1	3.7V	±0.1V
	2)CH：接收高端频点			TC2	3.7V	±0.1V
	3)CH：发射低端频点				检查	高于1.0V
	4)CH：接收低端频点					

接收部分

项目	条件	测量		调整		规格/备注
		测试设备	终端	部件	方法	
1.带通滤波器	1)CH：接收中心频点 2)Tra发生器输出-40dBm 将频谱分析仪连接到TP2端点。	Tra发生器 频谱分析仪	ANT TP2	TC201 TC202 TC203	调整频率使其成为图1所示的频谱波形。	
2.音频电平	1)CH：接收中心频点 SSG输出：-53dBm (501μV) MOD：1kHz DEV：±3.0kHz(宽) ±1.5kHz(窄)	标准信号发射器 示波器 音频电压表 失真测试仪	天线 扬声器	L212	调整到最大音频电平	
3.灵敏度	1)CH：接收中心频点 CH：接收低端频点 CH：接收高端频点 SSG输出：-116dBm (0.35μV) MOD：1kHz DEV：±3.0kHz(宽) ±1.5kHz(窄)				检查	SINAD：12dB或更高
4.噪音抑制电路电平 (计算机模式)	1)CH：接收中心频点 MONI：开启			PC机键	第9级 经调整关闭静噪。	必须关闭静噪。
	2)第9级 SSG输出：-117dBm					
	3)第3级 SSG输出：-125dBm (0.126μV)				第3级 经调整关闭静噪。	必须关闭静噪。

发射部

项目	条件	测量		调整		规格/备注
		测试设备	终端	部件	方法	
1.发射频率 (计算机模式)	1)CH：发射中心频点 PTT：开启	频率计数器	天线	PC机按键	调整到中心频率	±100Hz以内
2.DQT/QT 平衡	1)CH：发射中心频点	频谱分析仪或线性检测器（LPF：3kHz） 示波器		VR500	将波形整流为方形波	
3.功率 (计算机模式)	1)CH：发射低端频点 电池终端：7.5V PTT：开启	功率表 电流表			调整到4.1W	±0.1W
4.最大DEV	1)CH：发射中心频点 AG：1kHz/120mV PTT：开启	频谱分析仪或线性检测器（LPF：15kHz） 示波器	天线 扬声器	VR501	调整到±4.2kHz（宽） 窄频带检查（+、-极端值）	±100Hz ±1.8kHz~2.2kHz
5.调制灵敏度	1)CH：发射中心频点 AG：1kHz/12mV	音频发生器 音频电压表			检查 （+、-极端值）	±2.2kHz~3.6kHz：（宽） ±1.1kHz~1.8kHz：（窄）
6.QT DEV (计算机模式)	1)CH：发射高端频点 QT：67.0Hz	频谱分析仪或线性检测器（LPF：3kHz） 示波器 音频发生器 音频电压表	天线	PC机按键	调整到±0.75kHz（宽） 调整到±0.35kHz（窄）	±50Hz ±50Hz
7.DQT DEV (计算机模式)	1)DQT：023N 中心频点	频谱分析仪或线性检测器（LPF：3kHz） 示波器		PC机按键	调整到±0.75kHz（宽） 调整到±0.35kHz（窄）	±50Hz ±50Hz
8.电池电平 (计算机模式)	1)电池终端：5.8V	数字电压表		PC机按键	经调整使指示灯闪烁	指示灯必须闪烁

ADJUSTMENT / 调整

BPF-Wave

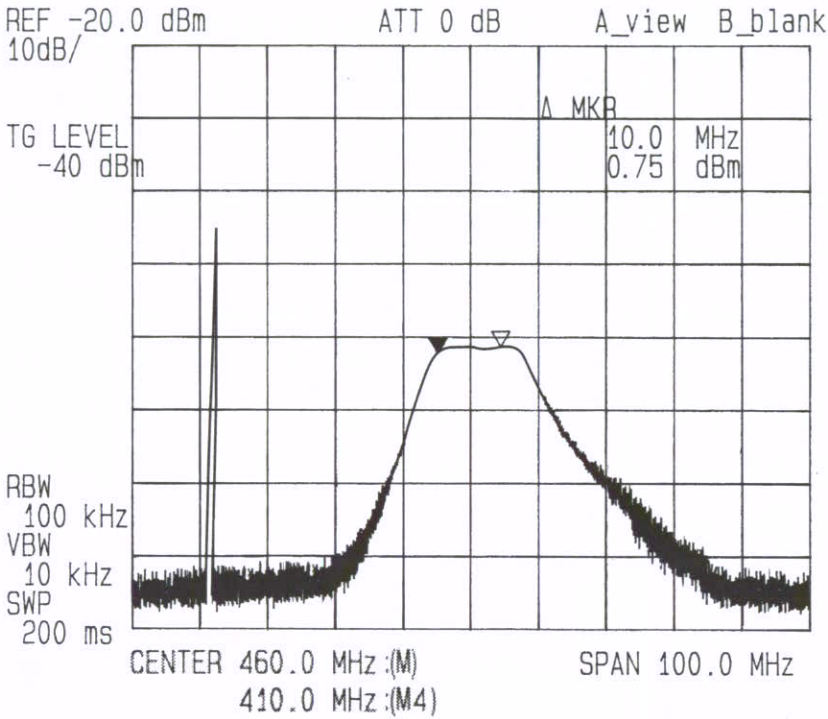
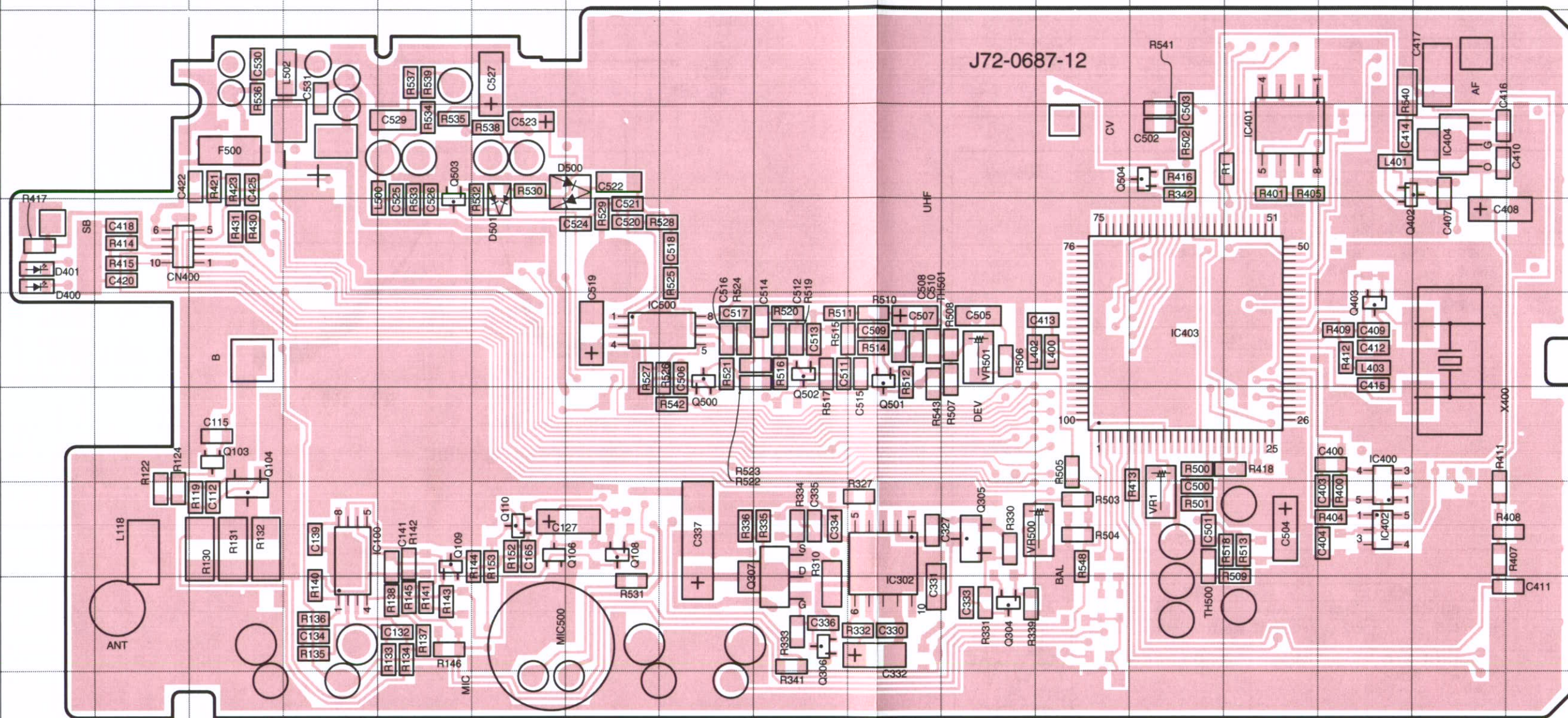


Fig. 1 / 图1

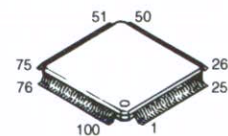
PC BOAD VIEW / PC 板视图 TK-3107

TX-RX UNIT (X57-6030-XX) -10:M, -25:M4 Component side view

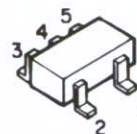


TX-RX UNIT (X57-6030-XX)
Component side view

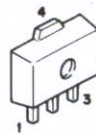
Ref. NO.	Address
IC100	8D
IC302	8J
IC400	8O
IC401	4N
IC402	8O
IC403	6M
IC404	4P
IC500	6G
Q103	7C
Q104	8C
Q106	8F
Q108	8G
Q109	8E
Q110	8F
Q304	9K
Q305	8K
Q306	9I
Q307	8I
Q402	4O
Q403	6O
Q500	6H
Q501	6J
Q502	6I
Q503	5E
Q504	4M
D400	5A
D401	5A
D500	4G
D501	5F



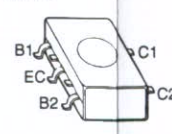
DTA114EE
DTA114YE
DTA123JE
DTA143ZE
DTA144EE
DTC114EE
DTC114TE
DTC144EE
2SA1362
2SC4617
2SC5108
FMMT717
2SC4649
2SC4919



2SC4988



FP210



DA221



MB15A02

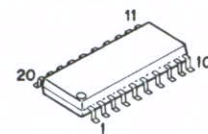


Diagram illustrating the structure of a four-layered composite material. The layers are labeled Pattern 1, Pattern 2, Pattern 3, and Pattern 4. The top surface is labeled "Component side" and the bottom surface is labeled "Foil side". Pattern 1 is shaded pink, while Patterns 2, 3, and 4 are white.

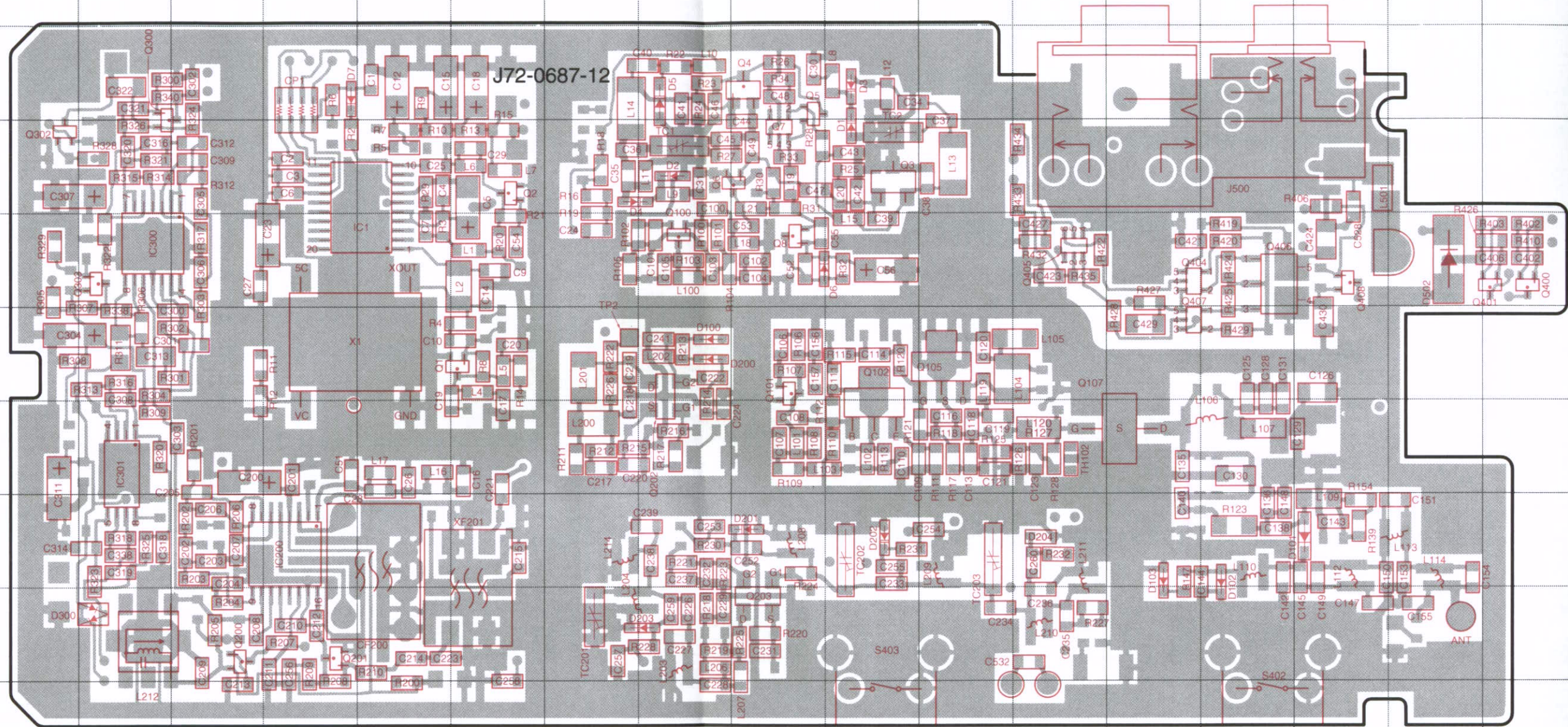
TK-3107 PC BOARD VIEW / PC 板视图

TX-RX UNIT (X57-6030-XX) -10:M, -25:M4 Foil side view

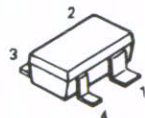
TX-RX UNIT (X57-6030-XX)

Foil side view

Ref. NO.	Address
IC1	4G
IC200	8F
IC300	5D
IC301	7D
Q1	6H
Q2	4H
Q3	4L
Q4	3K
Q5	3K
Q6	4K
Q7	4K
Q8	5K
Q100	5J
Q101	6K
Q102	6L
Q105	6M
Q200	9E
Q201	9F
Q202	6J
Q203	9K
Q300	4D
Q302	4C
Q303	5D
Q400	5S
Q401	5S
Q404	5O
Q405	5N
Q406	5P
Q407	6O
Q408	5Q
D1	4L
D2	4J
D3	3L
D4	4I
D5	3J
D6	5K
D7	3F
D100	6J
D101	8Q
D102	8P
D103	8O
D200	6J
D201	8K
D202	8L
D203	9J
D300	9D
D502	5R



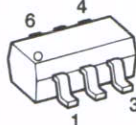
3SK228



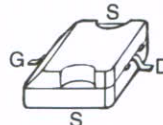
2SK1588
2SK2596



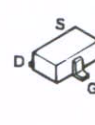
UPA672T



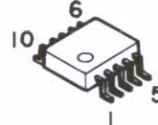
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2SK508NV



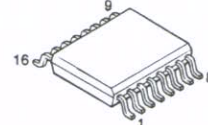
TA7368F



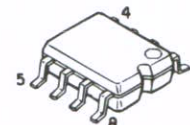
S-81350HG-KD



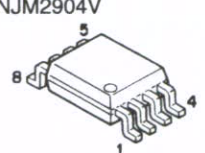
TA31136FN



AT2408N10SI2.5



NJM2100V
NJM2904V



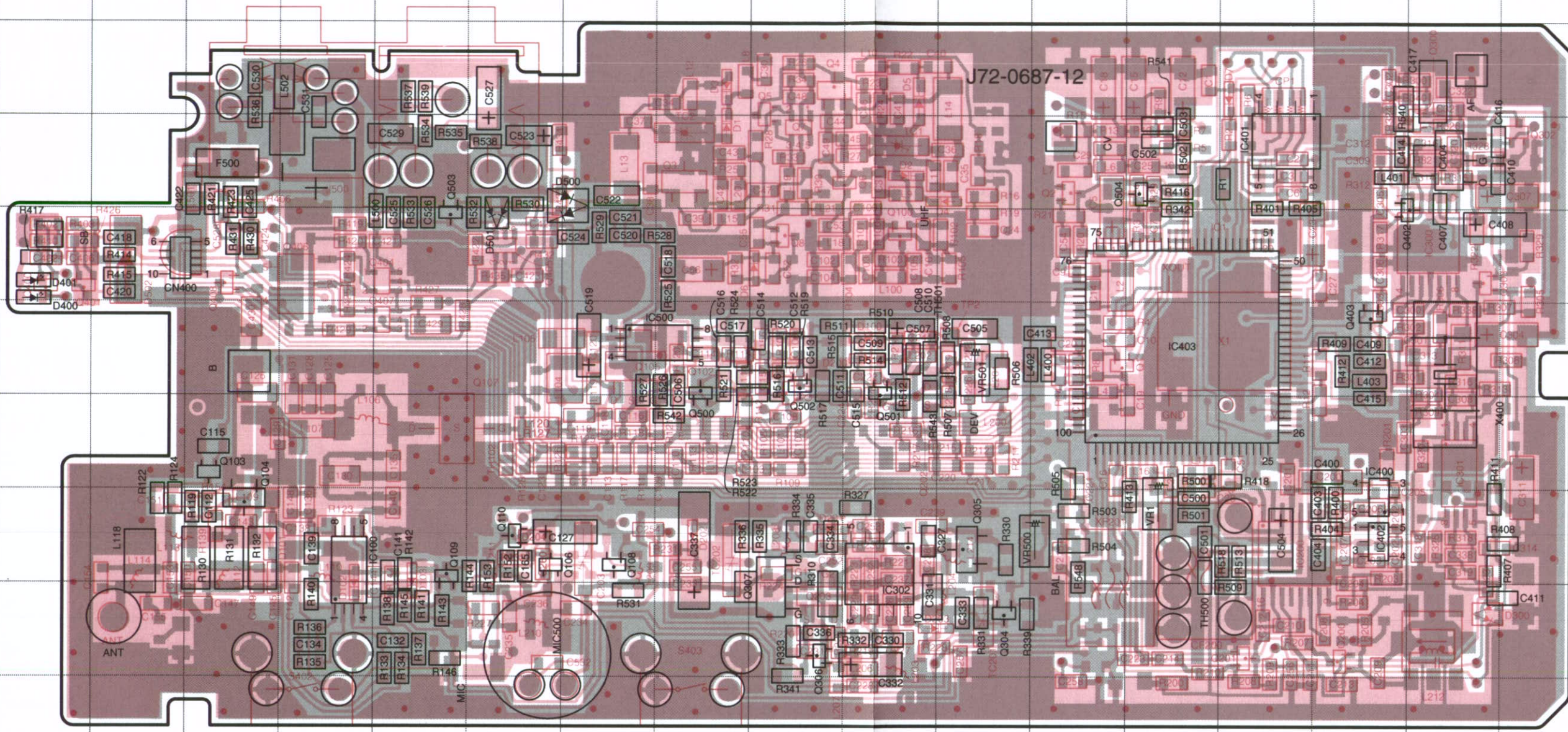
Component side

- Pattern 1
- Pattern 2
- Pattern 3
- Pattern 4

Foil side

PC BOARD VIEW / PC 板视图 TK-3107

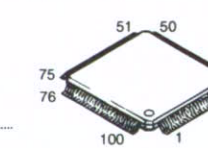
TX-RX UNIT (X57-6030-XX) -10:M, -25:M4 Component side view + Foil side view



TX-RX UNIT (X57-6030-XX)
Component side view +
Foil side view

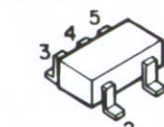
Ref. NO.	Address
IC1	4M
IC100	8D
IC200	8N
IC300	5P
IC301	7P
IC302	8J
IC400	8O
IC401	4N
IC402	8O
IC403	6M
IC404	4P
IC500	6G
Q1	6L
Q2	4L
Q3	4H
Q4	3I
Q5	3I
Q6	4I
Q7	4I
Q8	5I
Q100	5J
Q101	6I
Q102	6H
Q103	7C
Q104	8C
Q105	6G
Q106	8F
Q107	7E
Q108	8G
Q109	8E
Q110	8F
Q200	9O
Q201	9N
Q202	6J
Q203	9I
Q300	4P
Q302	4Q
Q303	5P
Q304	9K
Q305	8K
Q306	9I
Q307	8I
Q400	5A
Q401	5A
Q402	4O
Q403	6O
Q404	5E
Q405	5F
Q406	5D
Q407	6E
Q408	5C
Q500	6H
Q501	6J
Q502	6I
Q503	5E
Q504	4M
D1	4L
D2	4J
D3	3H
D4	4K
D5	3J

M38267M8L241GP

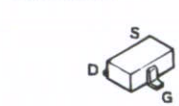


DTA114EE
DTA114YE
DTA123JE
DTA143ZE
DTA144EE
DTC114EE
DTC114TE
DTC144EE
2SA1362
2SC4617
2SC5108
FMMT717
2SC4649
2SC4919

UMC4



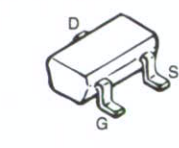
2SK508NV



2SK1588
2SK2596



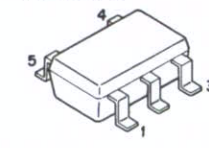
2SJ243
2SK1824



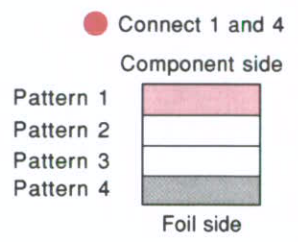
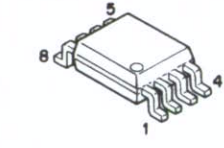
S-81350HG-KD



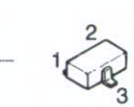
PST9140NR
RN5VL45C



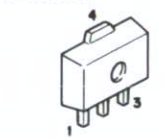
NJM2100V
NJM2904V



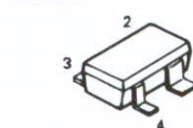
DA221



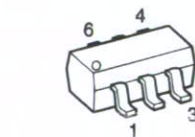
2SC4988



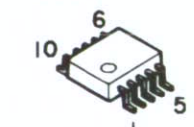
3SK228



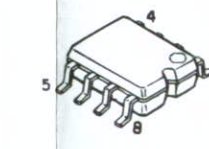
UPA672T



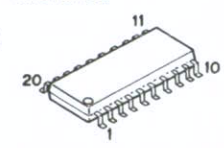
TA7368F



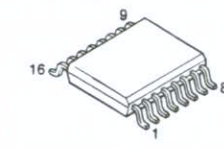
AT2408N10SI2.5



MB15A02



TA31136FN



A

B

C

D

E

F

G

H

I

J

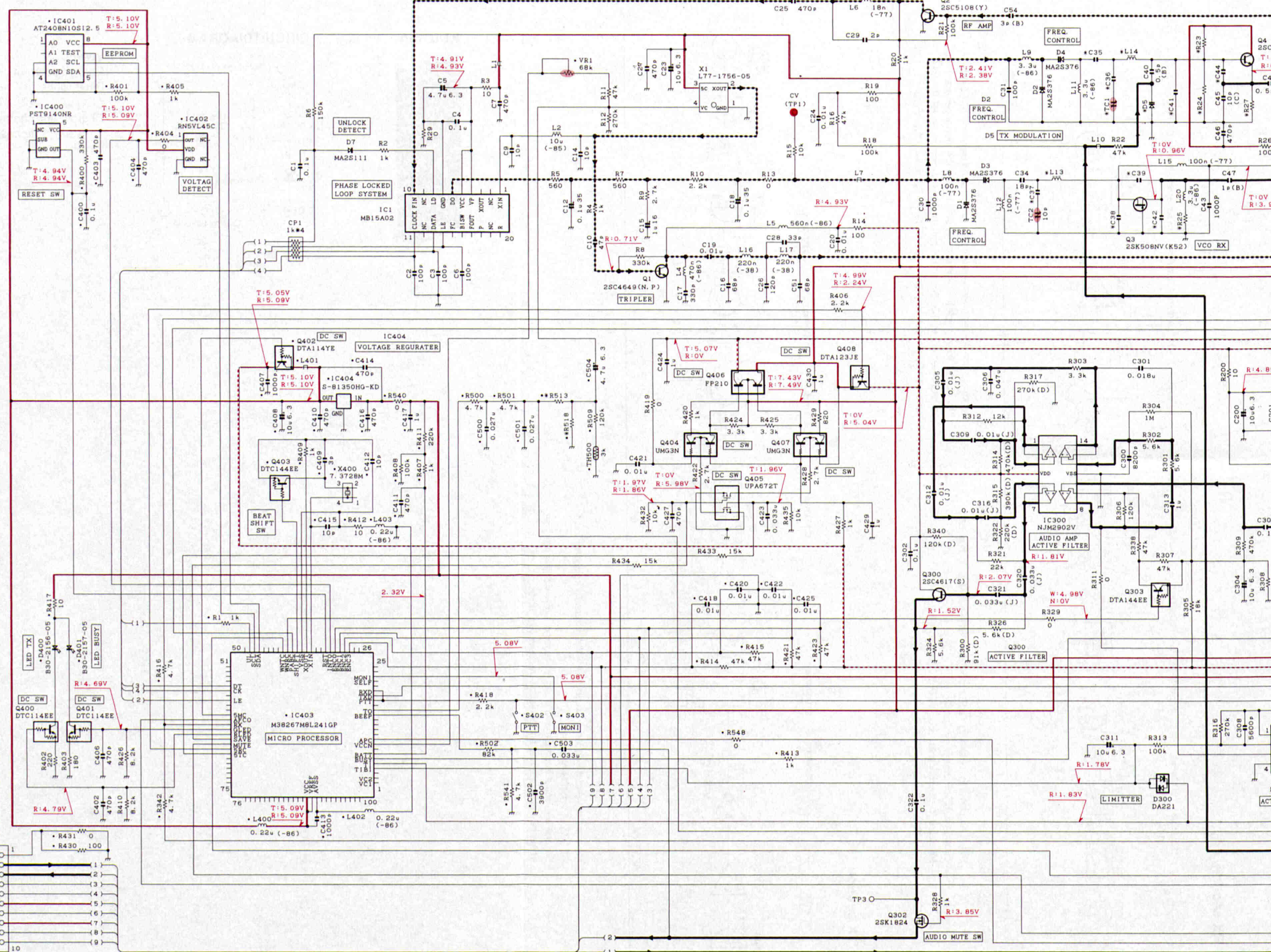
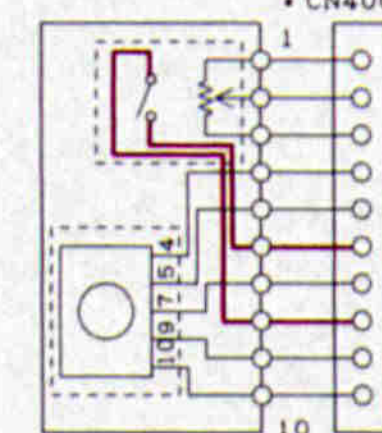
TX-RX UNIT (X57-6030-XX)

IC1 : MB15A02
IC100 : NJM2904V
IC200 : TA31136FN
IC300 : NJM2902V
IC301 : NJM2904V
IC302 : TA7368F
IC400 : PST9140NR
IC401 : AT2408N10S12.5
IC402 : RN5VL45C
IC403 : M38267M8L241GP
IC404 : S-81350HG-KD
IC500 : NJM2100V

Q1.201 : 2SC4649(N.P.)
Q2.6 : 2SC5108(Y)
Q3 : 2SK508NV(K52)
Q4 : 2SC4228(R44)
Q5 : 2SJ243
Q6.100.101 : 2SC5108(Y)
Q7 : UMC4
Q8.300.501.502 : 2SC4617(S)
Q102 : 2SC4988
Q103.106.302.500 : 2SK1824
Q104 : FMNT717
Q105 : 2SK2596
Q107 : 2SK2595
Q108.400.401 : DTC114EE
Q109.303 : DTA114EE
Q110 : DTC114TE
Q200 : DTA114EE
Q202.203 : 3SK228
Q304.306.403 : DTC114EE
Q305 : 2SA1362(GR)
Q307 : 2SK1588
Q402 : DTA114YE
Q404.407 : UMG3N
Q405 : UPA672T
Q406 : FP210
Q408 : DTA123JE
Q503 : 2SC4919
Q504 : DTA143ZE

D1-4 : MA2S376
D5 : MA360
D6.7 : MA2S111
D100 : HSC277
D101 : HVU131
D102.103.200 : HSC277
D201-203 : HVC350B
D300 : DA221
D400 : B30-2156-05
D401 : B30-2157-05
D500 : 1SS372
D501 : DAN222
D502 : 1SR154-400

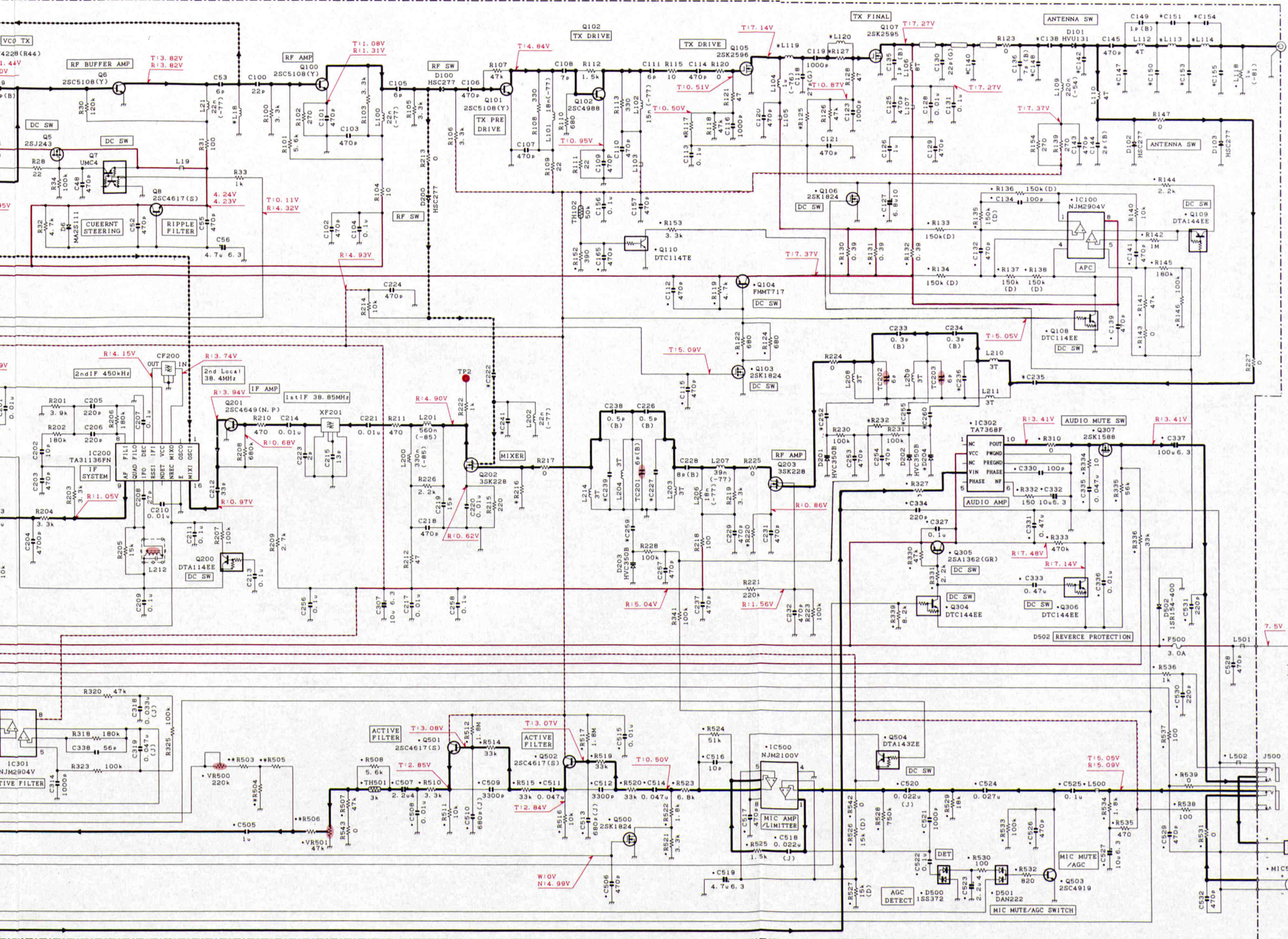
CHANNEL SWITCH
POWER SWITCH
AUDIO VOLUME



		C35	C36	C37	C38	C39	C41	C42	C44	C138	C140	C142	C147	C148	C150	C151	C153	C154	C155	C222	C227	C235	C236	C239	C241	C252	C255	C259	C260	R23	R24	R25	R27
TK-3107 M	0-10	7p	8p	33p	5p	8p	4p	10p(D)	6p	100p	NO	3p	1p	1p	5p	1.5p	3p	1p	1.5p	5p	10p	3p	3p	4p	6p	4.5p	3.5p	4p	NO	6.8k	8.2k	100	330
TK-3107 M4	0-25	10p(C)	7p(B)	30p(J)	6p(B)	10p(C)	7p	12p(G)	7p	470p	4p	5p(B)	1.5p(B)	NO	4p(B)	2p(B)	4p(B)	2p(B)	NO	6p(B)	15p(G)	3.5p(B)	1p(B)	7p(B)	1.5p(B)	7p	6p(B)	7p(B)	3p	3.9k	4.7k	150	270

R117	R125	R127	R216	R220	R232	R503	R504	R505	R506	R513	R518	D5	D204	L13	L14	L18	L113	L114	L119	L120	TC1
120k	47k	0	1k	220	NO	68k	33k	150k	22k	33k	6.8k	MA360	NO	23n	23n	47n	4T	3T	2.2n	NO	6p
47k	18k	NO	2.2k	150	100k	12k	68k	120k	10k	47k	10k	1SV214	HVC350B	27n	27n	NO	5T	4T	3.3n	2.7n	10p

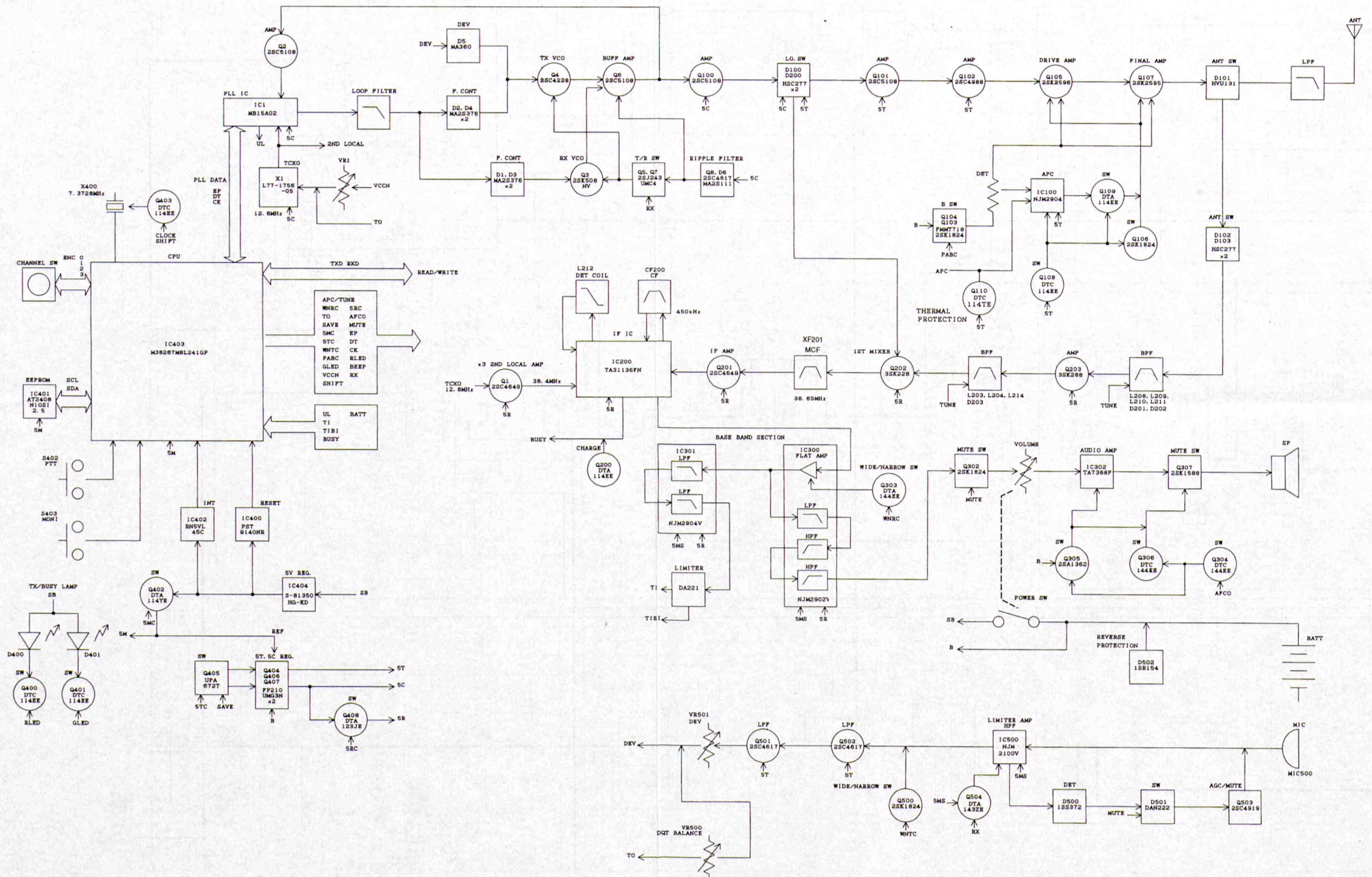
SCHEMATIC DIAGRAM / 原理图 TK-3107



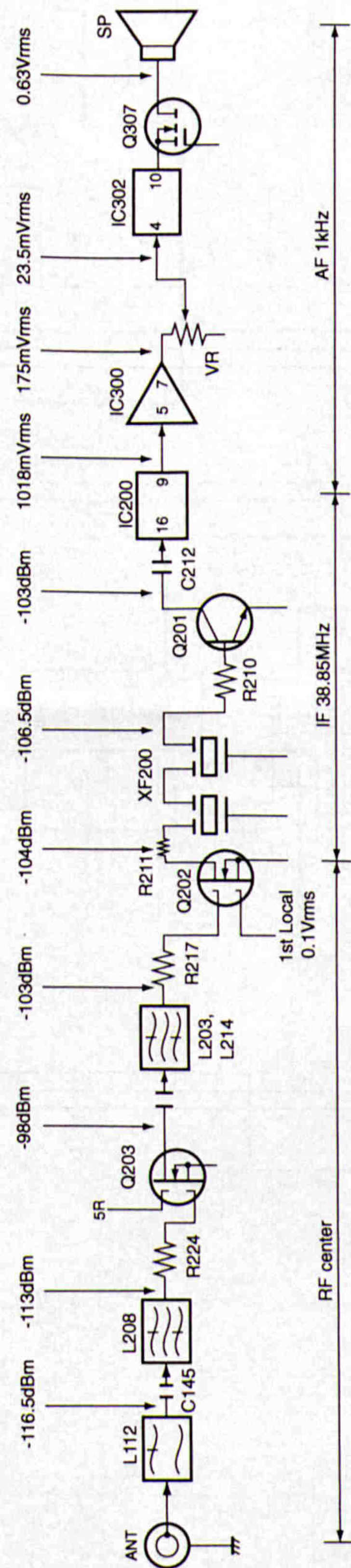
Note : Component marked with a dot (●) are parts of pattern1.

TK-3107 TK-3107

BLOCK DIAGRAM / 方块图



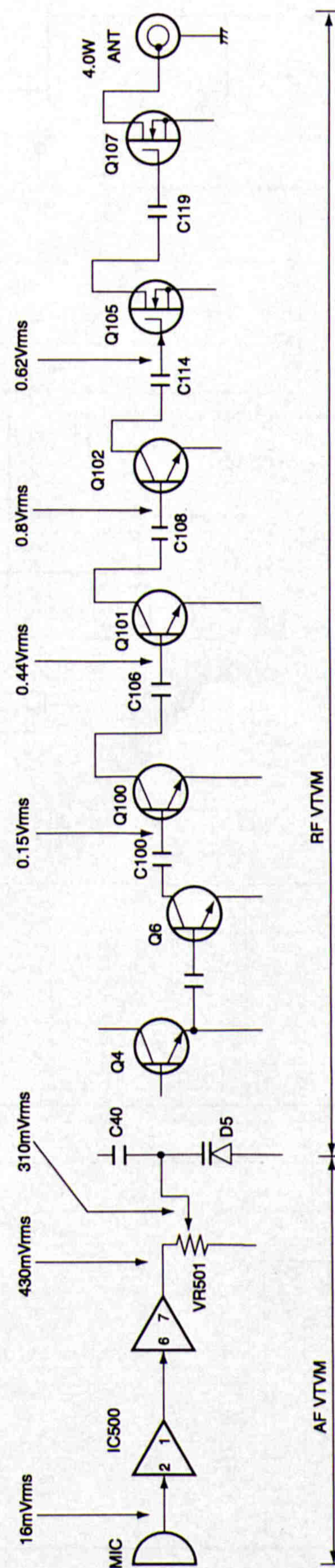
RX section



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.

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.

TX section



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

TK-3107

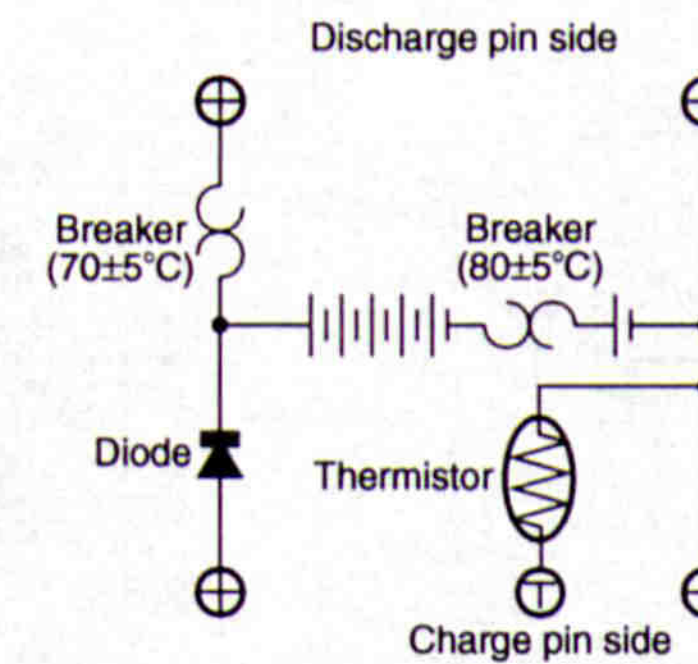
TK-3107

KNB-15A (Ni-Cd Battery)

KNB-15A



CIRCUITDIAGRAM



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

MEMO

SPECIFICATIONS / 规格

GENERAL

Frequency Range.....	450 to 470 MHz:M
	400 to 420 MHz:M4
RF power output.....	4W
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)

概述

频率范围.....	450-470MHz:M
	400-420MHz:M4
射频功率输出.....	4W
信道数量.....	16信道
工作电压.....	7.5V直流 $\pm$ 20 %
温度范围.....	- 30°C到 + 60°C (- 22°F到 + 140°F)
带有KNB - 15A(7.2V 1100mAh电池) 的	
尺寸和重量.....	58 (2-5/16) 宽 $\times$ 125.5 (4-15/16) 高 $\times$ 35 (1-3/8) 长毫米 (英寸)
	380g (0.83lbs)

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KENWOOD ELECTRONICS (HONG KONG) LTD.

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