

# KENWOOD

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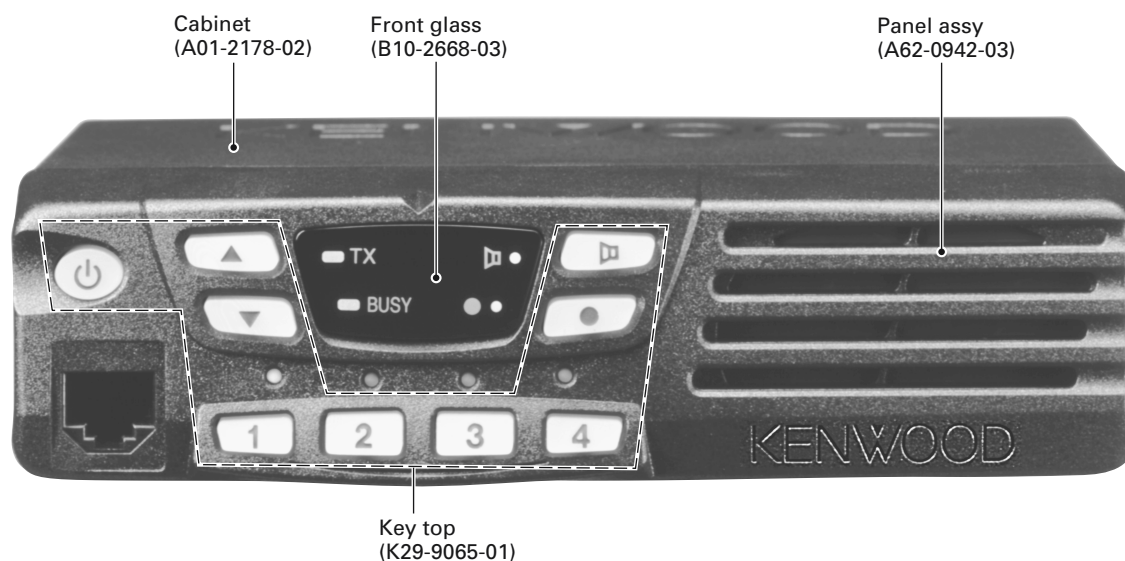
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## GENERAL / 概述

### 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 this publication date. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions, which 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, and chassis. If the part number is not known, include the chassis or kit number of which it is a part and a sufficient description of the required component for proper identification.

### PERSONNEL SAFETY

The following precautions are recommended for personnel safety :

- DO NOT transmit if someone is within two feet (0.6 meter) of the antenna.
- DO NOT transmit until all RF connectors are secure and any open connectors are properly terminated.
- SHUT this equipment when near electrical blasting caps or while in an explosive atmosphere.
- All equipment should be properly grounded before power-up for safe operation.
- This equipment should be serviced by only qualified technicians.

### 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出版日期。在出版后可能发生变动, 如果需要, 可以参照《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资料时, 应注意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:

- 如果有人在天线两英尺 (0.6米) 范围之内时, 不要进行发射。
- 在没有认真核实所有射频插头之前或有任何一个脱开的插头没有连接到相应端口上的情况下均不要发射。
- 在电爆管附近或在易燃性气体环境中, 必须关闭电源, 不要操作本设备。
- 为了操作的安全, 在接通电源之前所有设备应该连接地线。
- 本设备只应该由有资格的技术人员进行维修。

## GENERAL / 概述

### PRE-INSTALLATION CONSIDERATIONS

#### 1. UNPACKING

Unpack the radio from its shipping container and check for accessory items. If any item is missing, please contact KENWOOD immediately.

#### 2. LICENSING REQUIREMENTS

Federal regulations require a station license for each radio installation (mobile or base) be obtained by the equipment owner. The licensee is responsible for ensuring transmitter power, frequency, and deviation are within the limits permitted by the station license.

Transmitter adjustments may be performed only by a licensed technician holding an FCC first, second or general class commercial radiotelephone operator's license. There is no license required to install or operate the radio.

#### 3. PRE-INSTALLATION CHECKOUT

##### 3-1. Introduction

Each radio is adjusted and tested before shipment. However, it is recommended that receiver and transmitter operation be checked for proper operation before installation.

##### 3-2. Testing

The radio should be tested complete with all cabling and accessories as they will be connected in the final installation. Transmitter frequency, deviation, and power output should be checked, as should receiver sensitivity, squelch operation, and audio output. Signalling equipment operation should be verified.

#### 4. PLANNING THE INSTALLATION

##### 4-1. General

Inspect the vehicle and determine how and where the radio antenna and accessories will be mounted.

Plan cable runs for protection against pinching or crushing wiring, and radio installation to prevent overheating.

##### 4-2. Antenna

The favored location for an antenna is in the center of a large, flat conductive area, usually at the roof center. The trunk lid is preferred, bond the trunk lid and vehicle chassis using ground straps to ensure the lid is at chassis ground.

##### 4-3. Radio

The universal mount bracket allows the radio to be mounted in a variety of ways. Be sure the mounting surface is adequate to support the radio's weight. Allow sufficient space around the radio for air cooling. Position the radio close enough to the vehicle operator to permit easy access to the controls when driving.

##### 4-4. DC Power and wiring

1. This radio may be installed in negative ground electrical systems only. Reverse polarity will cause the cable fuse to blow. Check the vehicle ground polarity before installation to prevent wasted time and effort.

### 安装前条件

#### 1. 开箱

从运输包装中取出本无线电设备并检查附件。如果有任何组件遗失，请立即与 KENWOOD 联系。

#### 2. 所需许可证

联邦法规要求设备所有者必须使每一个安装无线电的地点（移动站或基站）获得许可证。持有许可证者必须确保发射功率、频率以及频偏在许可证的有限允许范围之内。

必须只能由经许可的、持有 FCC 一级、二级或高级商业无线电电话机操作者证书的技术人员进行发射调整。安装或操作。本无线电设备无需许可。

#### 3. 安装前检查

##### 3-1. 说明

在运输之前每一台无线电设备均已调整和测试过。但是，在安装之前最好检查接收和发射以便操作正确。

##### 3-2. 测试

无线电设备应该按照电缆和附件最终安装时的连接进行完整的测试。应该检查发射频率、频偏和输出功率，同样应该检查接收灵敏度、静噪和音频输出。应该检验信令操作。

#### 4. 安装的步骤

##### 4-1. 概述

检查车辆并确认如何以及在何处安装无线电天线和附件。

安排好电缆的位置，避免挤压或碾碎布线，同时无线电设备避免过热。

##### 4-2. 天线

天线的最佳位置应该在一个宽阔，平整导电区域的中心，通常在车顶的中心。行李箱的盖子更好，将地线黏结在行李箱的盖子和车辆的外壳上确保行李箱盖子接地。

##### 4-3. 无线电设备

通用安装托架允许以多种方法安装无线电设备。确认安装的表面足以支撑无线电设备的重量。无线电设备的周围留出适当的空间进行散热。将无线电设备尽可能的安装在靠近车辆操作者的位置上，以便在驾驶时易于控制。

##### 4-4. 直流电源和布线

1. 本无线电设备只能被安装在负极接地电子系统中。反向极性将导致电缆保险丝熔断。在安装之前检查车辆的接地极性，避免工作效率低以及浪费时间。

## GENERAL / 概述

2. Connect the positive power lead directly to the vehicle battery positive terminal. Connecting the Positive lead to any other positive voltage source in the vehicle is not recommended.
3. Connect the ground lead directly to the battery negative terminal.
4. The cable provided with the radio is sufficient to handle the maximum radio current demand. If the cable must be extended, be sure the additional wire is sufficient for the current to be carried and length of the added lead.

### 5. INSTALLATION PLANNING – CONTROL STATIONS

#### 5-1. Antenna system

Control station. The antenna system selection depends on many factors and is beyond the scope of this manual. Your KENWOOD dealer can help you select an antenna system that will best serve your particular needs.

#### 5-2. Radio location

Select a convenient location for your control station radio which is as close as practical to the antenna cable entry point. Secondly, use your system's power supply (which supplies the voltage and current required for your system). Make sure sufficient air can flow around the radio and power supply to allow adequate cooling.

### SERVICE

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

### NOTE

If you do not intend to use the 3.5-mm jack for the external speaker, fit the supplied speaker-jack cap to stop dust and sand getting in.

2. 将电源的正极引线直接连接到车载电池的正极端点上。不要将正极引线与其他正极电压连接。
3. 将接地引线直接与电池的负极连接。
4. 与无线电设备一起提供的电缆适用于所需的最大无线电电流。如果电缆必须加长，要确认附加的电线适用于所载的电流和添加引线的长度。

### 5. 安装步骤 - 基站

#### 5-1. 天线系统

基站。天线系统的选择取决于许多因素和本手册的范围。用户的KENWOOD销售商可以帮助用户选择最能满足用户特殊要求的天线系统。

#### 5-2. 无线电位置

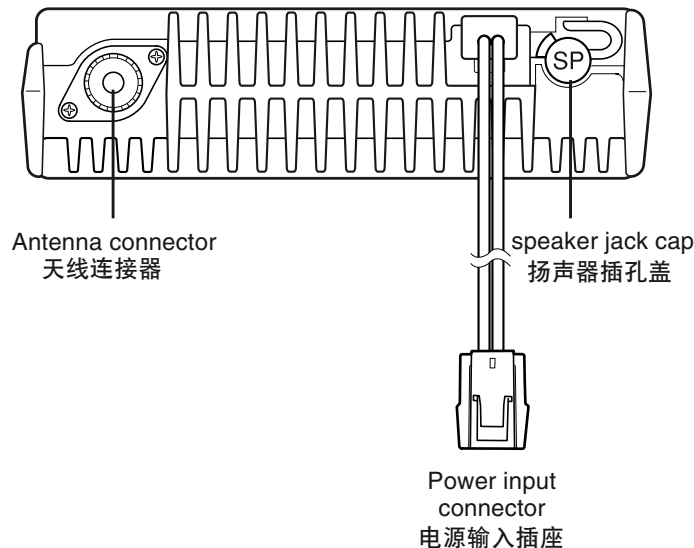
为用户的基站无线电设备选择一个方便的位置，此位置应尽量靠近天线电缆输入点。其次，使用用户系统的电源（为用户的系统提供所需的电压和电流）。确认无线电设备周围的空气流通顺畅并且足以使电源冷却。

### 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、印刷电路板图和调整步骤在内的资料供参考。

### 注意事项

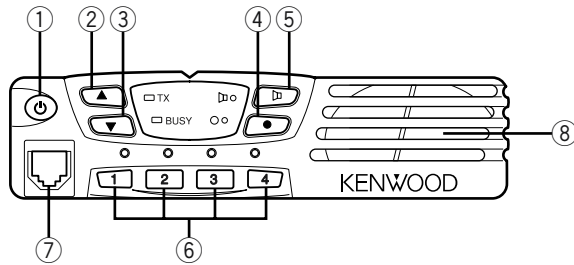
3.5mm 外部扬声器插孔不用时，请用提供的扬声器插孔帽将其盖上，以防止沙尘进入。



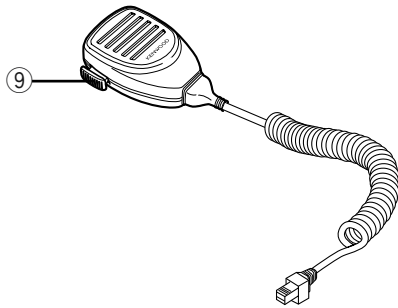
## 操作特性

## 1. 控制和功能

## 1-1. 前面板



## 1-2. 麦克风

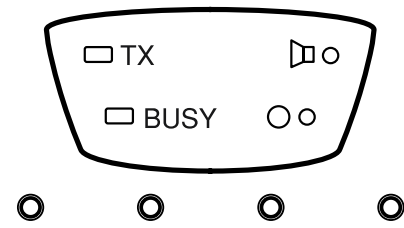


- ① 电源开关  
按此键可以接通对讲机的电源。按下并且保持大约1秒钟，可以切断对讲机的电源。
- ② ▲ 键  
按此键可以升高音量。
- ③ ▼ 键  
按此键可以降低音量。
- ④ ● 键  
PF (可编程功能) 键。该键的原设置为无 (无功能)。该键可使用的可编程功能如下所示。
- ⑤ ▢ 键  
PF (可编程功能) 键。该键的原设置为监听器。该键可使用的其他可编程功能如下所示。
- ⑥ 1/2/3/4 键  
按此键可以从1至4选择频道。使用组功能时，按下后可选择5至8的频道。
- ⑦ 麦克风插孔  
用于插入麦克风插头。
- ⑧ 扬声器  
内置扬声器。
- ⑨ PTT (按下通话) 开关  
按下此开关，然后向麦克风说话，呼叫电台。

## 1-3. 可编程辅助功能：

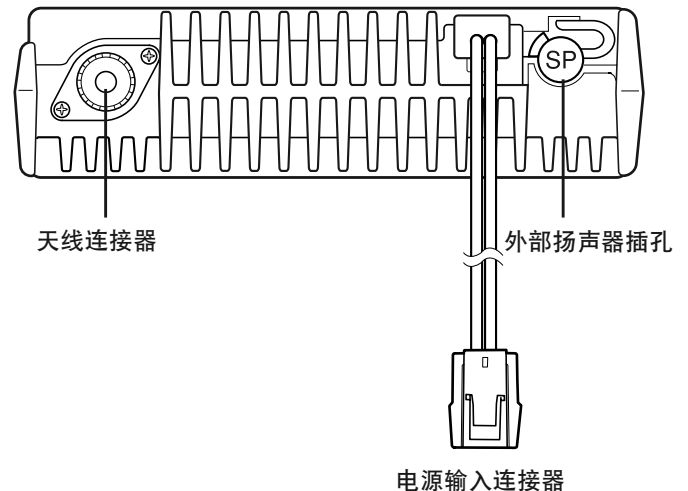
- 紧急
- 键锁
- 监听器
- 无 (无功能)
- 扫描开始 / 停止
- 直接通话
- 暂时删除
- 组

## 1-4. 显示



指示灯	说明
□ TX	发射时点亮。
□ BUSY	在当前选择的频道上检测到信号时点亮。
▢ ○	当编程到对应键的功能开启时点亮。
○ ○	当编程到对应键的功能开启时点亮。
○ ○ ○ ○	点亮显示当前选择的频道 (1~4或5~8)。

## 1-5. 后面板





# OPERATING FEATURES / 操作特性

## 2. Operation Features

The TK-7108 is a VHF FM radio designed to operate in conventional format. The programmable features are summarized.

## 3. Transceiver Controls and Indicators

### 3-1. Front Panel Controls

All the keys on the front panel are momentary-type push buttons. The functions of these keys are explained below.

- **POWER key**

Transceiver POWER key. When the power is switched off, all the parameters are stored in memory. When the power is switched on again, the transceiver returns to the previous conditions.

- **CHANNEL keys**

- **MONITOR key (Programmable)**

- **● key (Programmable)**

- **VOLUME UP/DOWN key**

When the key is pressed, the volume level is increased/decreased and repeats if held for 200ms or longer.

- **BUSY/TX LED**

The BUSY indicator (Green LED) shows that the channel is in use. The TX indicator (Red LED) shows that you are transmitting.

### 3-2. Programmable Keys

The FPU (KPG-70D) enables programmable keys to select the following functions.

- |               |                    |
|---------------|--------------------|
| • Emergency   | • Talk Around      |
| • Key Lock    | • Temporary Delete |
| • Monitor     | • None             |
| • Scan ON/OFF | • Group            |

- **Emergency**

Pressing this key for longer than 1 second causes the transceiver to enter the emergency mode. The transceiver jumps to the programmed "Emergency channel" and transmits for 25\* seconds.

The transceiver disables mic mute while transmitting. After finishing transmission, the transceiver receives for 5\* seconds. The transceiver Mute\* the speaker while receiving. Following the above sequence, the transceiver continues to transmit and receive.

\* Default value.

- **Key lock**

Pressing this key causes the transceiver to accept entry of only the [Vol Up/Down]\*, [Key lock], Microphone [PTT], [Monitor], [Emergency], and [Power] keys.

\* Programmable

- **Monitor**

Used to release signalling (press once) or squelch (press and hold for approximately two seconds) when operating as a conventional. It is also used to reset option signalling.

- **Scan ON/OFF**

Press this key starts scanning. Pressing this key stops scanning.

## 2. 操作特性

TK-7108是一种被设计为在常规格式下进行操作的VHF FM无线电设备。可编程特性摘要如下。

## 3. 车载台控制和指示灯

### 3-1. 前面板控制

前端面板的所有按键均为短瞬型按键。这些按键的功能介绍如下。

- **电源键**

车载台电源按键。当关闭电源时，所有的参数，均被储存在存储器中。当电源再次开启时，车载台回到先前的状态。

- **信道键**

- **监听键 (可编程)**

- **● 键 (可编程)**

- **音量高/低键**

按该键可以增大或减小音量，按下该键并保持200ms以上可连续调节音量。

- **繁忙/发射指示灯**

繁忙指示灯（绿色）表示信道正在使用中。发射指示灯（红色）表示用户正在进行发射。

### 3-2. 可编程按键

FPU (KPG-56D) 可以使可编程按键选择下述功能。

- |             |        |
|-------------|--------|
| • 紧急报警      | • 脱网   |
| • 按键锁定      | • 临时删除 |
| • 监听器       | • 无    |
| • 扫描 ON/OFF | • 组    |

- **紧急报警**

按住此键1秒钟以上将使车载台进入紧急报警模式。车载台将跳到已编程的“紧急报警组和信道”并且发射25\*秒钟。

在发射过程中车载台不能保持话筒静音。发送结束后，车载台接收5\*秒钟。接收时车载台保持扬声器静音\*。按照上述顺序，车载台将连续发射和接收。

\* 初始值

- **按键锁定**

按此键使车载台只接收[音量高/低]\*, [按键锁定], 话筒[通话], [监听器], [紧急报警]和[电源]按键的输入。

\* 可编程

- **监听器**

当以常规方式操作时用于释放信令(按一次)或静噪抑制(按下并保持约两秒钟)。也用于复位可选信令。

- **扫描 ON/OFF**

按此键开始扫描。再按此键停止扫描。

## OPERATING FEATURES / 操作特性

### • Talk around

Press this key, the transceiver uses the receive frequency and the tone for transmission.

The operator can call the other party directly (without repeater). Press this key again, the talk around function goes off.

### • Temporary delete

The "Add" channel contained in the scan sequence, and "Delete" channel is not contained. In the scan mode, this key switches the channel delete temporarily (Press and hold for approximately one second).

When the transceiver is turned off, the transceiver exits the scan or switches the scan function off.

### • None

Sounds error operation beep, and no action will occur. Use this function when the transceiver is required to be more simple operated.

### • Group

If Group has been programmed onto a key, press the Group key to select the second group of channels. While active, the LED beside the key lights. At this time, press a key from 1 to 4 to select a channel from 5 to 8. To return to channels 1 through 4, press the Group key again.

**Note:** You cannot use the Group function while operating in Emergency mode.

## 4. Scan Operating

### ■ SCAN start condition

Two or more channels must be added to all channels that can be scanned. The transceiver must be in normal receive mode (PTT off).

When you activate the key programmed to the scan ON/OFF function, the scan starts. The indicator next to the programmed key LED blinks.

### ■ Scan stop condition

The scan stops temporarily if the following conditions are satisfied.

- 1) A carrier is detected, then QT/DQT matches on channels for which receive the QT/DQT is set by the programming software.
- 2) A carrier is detected on the channels for which receiving QT/DQT is not set by the programming software or when the monitor (signalling cancel) function is activated.

### ■ Revert channel

The revert channel is used to transmit during scanning and set by the programming software (KPG-70D).

- 1) Selected channel  
The transceiver reverts to the channel before scanning or the channel that you changed during scan.
- 2) Selected with talkback  
The transceiver reverts to the selected channel prior to scan initiation.  
However, if a call is received on a channel other than the selected channel and PTT is pressed before scanning resume, the transceiver "talks back" on the current receive channel.

### ■ Scan end

When you press the key programmed to the scan function during scan mode, the scan ends.

The indicator next to the programmed key LED turns off.

### • 脱网

按该键，车载台将使用脱网频率。

使用者可直接呼叫对方（不需要转发器）。再次按该键将关闭脱网功能。

### • 临时删除

“添加”信道包含在扫描序列中，而“消除”信道不包含在扫描序列中。在扫描模式下，该键为信道暂时消除开关（按下并保持约 1 秒钟）。

当车载台关闭时，它将退出扫描或关闭扫描功能。

### • 无

错误操作beep音响起，并且无任何变化。当车载台需要更简单操作时使用此功能。

### • 组

如果组功能已经编程到某一键，按下组键选择频道的第二组。本功能开启后，该键旁的 LED 指示灯点亮。这时，按下 1 至 4 中的键，从 5 至 8 中选择频道。需要返回到频道 1 至 4 时，再次按下组键。

**注释：**在紧急模式下操作时，无法使用组功能。

## 4. 扫描操作

### ■ 扫描开始条件

可扫描信道中必须至少添加两个以上的信道。车载台必须处于一般接收模式 (PTT 关闭)。

当启动扫描 ON/OFF 功能键时开始扫描，该键旁边的指示灯会闪烁。

### ■ 扫描开始条件

如果下述条件具备，则扫描临时停止。

- 1) 检测到载波，QT/DQT 与编程软件设定的接收 QT/DQT 的信道上相匹配。
- 2) 在没有由编程软件设定为接收 QT/DQT 的信道上检测到载波时，或者在启动了监听（信令取消）功能时。

### ■ 回复信道

回复信道用于在扫描过程中发射，并且通过编程软件(KPG-70D)设定。

- 1) 选择信道  
车台机回复到扫描之前的信道或用户在扫描过程中改变的信道。
- 2) 选择带有回应的信道  
在扫描开始之前，车载台回到所选信道上。  
但是，在所选信道之外的信道上收到呼叫并且在继续扫描前按下了 PTT 键时，车载台将在当前接收信道上“回话”。

### ■ 扫描结束

在扫描模式中按扫描功能键时，扫描停止。

该键旁边的指示灯关闭。



### ■ Temporary delete

It is possible to delete channel temporary during scan. When scan stops on unnecessary channel for example by interference of the other party, activate the delete function (for example press and hold the key for approximately one second), then that channel is deleted temporarily and scan re-start immediately.

The temporary deleted channels return to pre-set delete/add channels, when the transceiver is turned off or the scan function is switched off.

## 5. Details of Features

### ■ Time-out timer

The time-out timer can be programmed in 30 seconds increments from 30 seconds to five minutes and off. If the transmitter is transmitted continuously for longer than the programmed time, the transmitter is disabled and a warning tone sounds while the PTT button is held down. The warning tone stops when the PTT button is released.

### ■ PTT ID

PTT ID provides a DTMF ANI to be sent with every time PTT (beginning of transmission, end of transmission, or both).

You can program PTT ID "on" or "off" for each channel. The contents of ID are programmed each Radio.

The timing that the transceiver sends ID is programmable.

BOT : DTMF ID (Beginning of TX) is sent on beginning of transmission.

EOT : DTMF ID (End of TX) is sent on end of transmission.

Both : DTMF ID (Beginning of TX) is sent on beginning of transmission and DTMF ID (End of TX) is sent on end of transmission.

### ■ Off hook decode

If the Off hook decode function has been enabled, removing and replacing the microphone on the hook has no effect for decoding QT/DQT and option signalling.

### ■ "TOT" pre-alert

The transceiver has "TOT" pre-alert timer. This parameter selects the time at which the transceiver generates "TOT" pre-alert tone before "TOT" is expired.

"TOT" will be expired when the selected time passes from a TOT pre-alert tone.

### ■ "TOT" re-key time

The transceiver has "TOT" re-key timer. This timer is the time you can not transmit after "TOT" exceeded. After "TOT" re-key time expired you can transmit again.

### ■ "TOT" reset time

The transceiver has "TOT" reset timer. This timer is the minimum wait time allowed during a transmission that will reset the "TOT" count.

"TOT" reset time causes the "TOT" to continue even after PTT is released unless the "TOT" reset timer has expired.

### ■ 临时删除

可以在扫描进行中暂时消除信道。如果扫描停在不需要的信道(例如对方的干扰)上,则可启动消除键(例如按该键并保持约1秒钟),该信道将被暂时消除并立即重新启动扫描。

当收发机关闭或扫描功能关闭时,暂时删除的信道将返回到预设的消除/添加信道中。

## 5. 详细功能

### ■ 超时计时器

可以以30秒为增量设置超时计时器,可设置范围为30秒到5分钟或关闭。当发射器连续发射时间超过了预设时间时,发射器将被禁用并且在按住PTT键时鸣响警告音。放开PTT键后警告音停止。

### ■ PTT ID码

伴随每一次PTT(发射开始,发射结束,或两者兼有),PTT ID码提供一个被发送的DTMF ANI。

可以将各信道PTT ID设为“开”或“关”。分别编制各收发机的ID内容。

车载机发送ID码的时间是可编制的。

BOT:在发射开始时发送DTMF ID码(发射开始)。

EOT:在发射结束时发送DTMF ID码(发射结束)。

两者兼有:在发射开始时发送DTMF ID码(发射开始)。在发射结束时发送DTMF ID码(发射结束)。

### ■ 挂断解码

如果挂断解码功能生效,则接通时消除和更换话筒对于QT/DQT解码和可选信令无效。

### ■ "TOT" 预先告警

车载台具有一个“TOT”预先告警计时器。在“TOT”终止之前,此参数设定在收发机产生“TOT”预先告警音时的时间。

当TOT预先告警音发出开始时“TOT”将终止。

### ■ “TOT” 再按键时间

车载台具有一个“TOT”再按键定时器。在“TOT”时间超出之前,此定时器是用户不能发射的时间。在“TOT”再按键时间终止后,用户可以再发射。

### ■ “TOT” 复位时间

车载台具有一个“TOT”复位计时器。在复位“TOT”计数的发射过程中,此计时器是最小允许等待时间。

除非“TOT”复位计时器终止,否则即使松开PTT键之后,“TOT”复位时间也使“TOT”继续进行。

## OPERATING FEATURES / 操作特性

### ■ Clear to transpond

The transceiver waits the transpond of DTMF if channel is busy until channel open. This feature prevents the interference to other party.

### 6. Option Signalling (DTMF)

Built-in DTMF decoder is available for option signalling.

It is possible to use individual call, group call, Stun.

If the option signalling matches, a predetermined action will occur.

If option signalling matches on a channel is set up with option signalling, the channel LED will flash and option signalling will be released. The transpond or alert tone will sound.

While option signalling matches (or if option signalling is deactivated when you are transmitting), you can mute or unmute QT/DQT/Carrier.

### ■ SP Unmute

You can select the type of SP Unmute system for each channel. The selection is as follows.

Carrier, QT/DQT:

Channel with this option will not check ID Code in order to open its speaker.

Carrier+DTMF, QT/DQT+DTMF:

Channel that is set with this option will have to check for ID Code in order to open its speaker.

Default:

Carrier, QT/DQT.

SP Unmute	Channel Setting		RX Condition	Speaker Condition
	QT/DQT	DTMF		
Carrier	None	None	Carrier	Sounds
		Yes	Carrier	Sounds
			Carrier+DTMF	Sounds
Carrier+DTMF	None	Yes	Carrier	Not Sounds
			Carrier+DTMF	Sounds
QT/DQT	Yes	None	Carrier	Not Sounds
			Carrier+QT/DQT	Sounds
		Yes	Carrier	Not Sounds
			Carrier+QT/DQT	Sounds
			Carrier+QT/DQT+DTMF	Sounds
			Carrier+DTMF	Not Sounds
QT/DQT+DTMF	Yes	Yes	Carrier	Not Sounds
			Carrier+QT/DQT	Not Sounds
			Carrier+QT/DQT+DTMF	Sounds
			Carrier+DTMF	Not Sounds

Note:

When QT/DQT is not used, QT/DQT and QT/DQT+DTMF can not be selected.

When DTMF is not used, Carrier+DTMF and QT/DQT+DTMF can not be selected.

### ■ Auto Reset

If option signalling matches a group set up with option signalling, option signalling is released. After matching option signalling, option signalling will temporarily reset automatically.

### ■ 加强自动应答

如果信道直到打开均繁忙，车载台将等待DTMF应答。此特性防止干扰到对方。

### 6. 可选信令 (DTMF)

内置DTMF解码器对可选信令有效。

使用单呼，组呼，遥毙。

如果可选信令相匹配，则触发预定的操作。

如果可选信令在使用可选信令设置的信道上相匹配，信道指示灯将闪烁并且可选信令将被取消。应答或告警将发出声音。

当可选信令相匹配时（或如果当用户发射时可选信令被抑制时），用户可以使QT/DQT载波静音或非静音。

### ■ 扬声器监听

可以为各信道选择如下扬声器监听系统类型。

载波，QT/DQT:

设定为该选项的信道打开其扬声器时将不检查 ID 代码。

载波+DTMF, QT/DQT+DTMF:

设定为该选项的信道打开其扬声器时必须检查 ID 代码。

初始值:

载波, QT/DQT.

扬声器监听	信道设置		RX 条件	扬声器状态
	QT/DQT	DTMF		
载波	无	无	载波	噪音
		是	载波	噪音
			载波+DTMF	噪音
载波+DTMF	无	是	载波	无噪音
			载波+DTMF	噪音
QT/DQT	是	无	载波	无噪音
			载波+QT/DQT	噪音
		是	载波	无噪音
			载波+QT/DQT	噪音
			载波+QT/DQT+DTMF	噪音
			载波+DTMF	无噪音
QT/DQT+DTMF	是	是	载波	无噪音
			载波+QT/DQT	无噪音
			载波+QT/DQT+DTMF	噪音
			载波+DTMF	无噪音

注释:

不使用 QT/DQT 时，不能选定 QT/DQT 及 QT/DQT+DTMF。

不使用 DTMF 时，不能选定载波+DTMF 及 QT/DQT+DTMF。

### ■ 自动复位

如果可选信令与使用可选信令设置的组相匹配，可选信令被取消。可选信令匹配之后，可选信令将临时自动复位。

### ■ Stun

If the stun code matches, a predetermined action will occur. Whether option signalling is activated or not, when stun matches on any channel, the transceiver will become TX inhibited or TX/RX inhibited. While stun is active, if the stun code + "#" code is received, stun will deactivate.

When stun matches, transpond will function. Alert will not be output.

## 7. Audible User Feedback Tones

The transceiver outputs various combinations of tones to notify the user of the transceiver operating state.

Refer to the help file on the KPG-70D, regarding the functions that are not listed below.

### ■ Stun on tone

When a stun code is received, transpond tone sounds.

### ■ Stun off tone

When a stun release code is received, transpond tone sounds.

### ■ Group call tone

Sounds when a group call with the correct DTMF option signalling is received, repeats 7 times. You can select yes or no in the Alert tone level setting.

### ■ Individual call tone

Sounds when an individual call with the correct DTMF option signalling is received. You can select yes or no in the Alert tone level setting.

### ■ Key input error tone

Sounds when a key is pressed but that key cannot be used. You can select yes or no for the optional feature's warning tone.

### ■ Transpond tone

Sounds when an individual call with the correct DTMF option signalling is received. For group calls, only the group tone will sound, not the transpond tone.

### ■ Pre alert tone

Sounds prior to the TOT TX inhibit activation. If TOT pre alert is set, the tone sounds at the amount of time programmed, before the TOT expires (TOT time - TOT pre alert time = Pre alert tone sounding time). You can select yes or no for the optional feature's warning tone.

### ■ Transmit protection

The power module is protected against heat while transmitting by making the radio cuts down TX power when the temperature of the power module becomes higher than reference. After that, if the temperature continue to rise, transmission is stopped. The power module is also protected against over voltage by having the radio to check that the voltage of power supply connected to the radio is not higher than about 17V when the radio is turned on, otherwise it can not transmit. In both cases when transmission is stopped, a beep will continue to sound until the PTT key is released.

### ■ 遥毙

遥毙代码匹配时将执行预定操作。当遥毙在任何信道匹配时，无论可选信令启用与否，车台机都将进入发射禁止或发射/接收禁止。当遥毙启用时，收到遥毙代码+“#”代码时将禁用遥毙。

当遥毙匹配时应答功能有效。将不输出告警。

## 7. 用户反馈提示音

车载台发出各种提示音以提示用户车载台的操作状态。

有关以下没有列出的功能，请参考 KPG-70D 上的帮助文件。

### ■ 遥毙开启提示音

当收到了遥毙代码时鸣响应答音。

### ■ 遥毙关闭提示音

当收到了遥毙取消代码时鸣响应答音。

### ■ 组呼提示音

当接收到带有正确的DTMF可选信令的组呼时发出提示音，并重复7次。在告警音电平设定中可以选择是或否。

### ■ 单呼提示音

当接收到带有正确的DTMF可选信令的单呼时发出提示音。在告警音电平设定中可以选择是或否。

### ■ 按键输入错误提示音

当按下下一个按键但不能使用此按键时发出提示音。用户可以选择要或不要此可选特性的警告提示音。

### ■ 应答提示音

当接收到带有正确的DTMF可选信令的单呼时发出提示音。关于组呼，只发出组提示音，不发出应答提示音。

### ■ 预先告警提示音

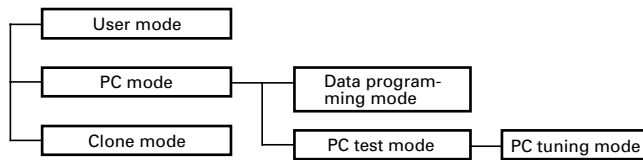
向TOT发射禁止发出优先提示音。如果设定了TOT预先告警，在TOT终止之前，在编制的时间发出提示音（TOT时间-TOT预先告警时间=发出预先告警提示音的时间）。用户可以选择要或不要此可选特性的警告提示音。

### ■ 发射保护

功率模块在发射时具有防热保护。当功率模块的温度高于参考值时，通信机将切断TX电源。此后，如果温度不断上升，发射就会停止。功率模块也具有过电压保护。当电源打开时，通信机将检测与收音机连接的供电电压是否不超过17伏电压，否则的话，功率模块将无法发射。在这两种情况下，当发射停止时，将会有持续的嘟嘟声直到PTT键被断开为止。

## REALIGNMENT / 模式组合

## 1. Modes



Mode	Function
User mode	For normal use.
PC mode	Used for communication between the radio and PC (IBM compatible).
Data programming mode	Used to read and write frequency data and other features to and from the radio.
PC test mode	Used to check the radio using the PC. This feature is included in the FPU.
PC tuning mode	Used to tune the radio using the PC.
Clone mode	Used to transfer programming data from one radio to another.

## 2. How to Enter Each Mode

Mode	Operation
User mode	Power ON
PC mode	Received commands from PC
Clone mode	[1]+Power ON (Two seconds)

## 3. PC Mode

## 3-1. Preface

The TK-7108 transceiver is programmed using a personal computer, a programming interface (KPG-46) and programming software (KPG-70D).

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

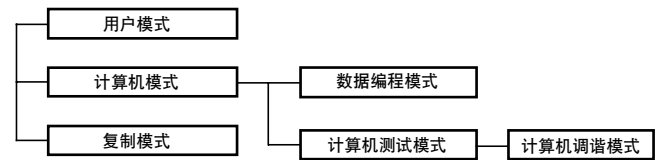
## 3-2. Connection Procedure

1. Connect the TK-7108 to the personal computer with the interface cable.
2. When the Power is switched on, user mode can be entered immediately. When the PC sends a command, the radio enters PC mode.  
When data is transmitted from transceiver, the red LED blink.  
When data is received by the transceiver, the green LED blink.  
In the PC mode, 4CH LEDs, [MON] LED and [●] LED are turned on.

## Notes :

- The data stored in the personal computer must match model type when it is written into the EEPROM.
- Attach the interface cable, then change the TK-7108 to PC mode.

## 1. 模式



模式	功能
用户模式	一般使用。
计算机模式	用于车载台与计算机 (IBM 兼容机) 之间的通信。
数据编程模式	用于阅读和写入频率数据以及其他功能。
计算机测试模式	用于使用计算机检测。此特性包括在FPU内。
计算机调谐模式	用来利用计算机调谐通信机。
复制模式	用于从一个车载台编程数据复制到另一个车载台。

## 2. 如何进入每一种模式

模式	操作
用户模式	接通电源
计算机模式	从计算机接收指令
复制模式	[1]+通电 (2秒钟)

## 3. 计算机模式

## 3-1. 前言

TK-7108车台机使用计算机, 编程电缆 (KPG-46) 和编程软件 (KPG-70D) 进行编程。

IBM计算机或兼容机可以使用编程软件。图1显示IBM计算机编程的设置。

## 3-2. 连接步骤

1. 使用编程电缆将TK-7108与计算机连接。
2. 当接通电源时, 可以立即进入用户模式。当计算机发出一个指令时, 车载台进入计算机编程模式。  
从车载台发射数据时, 红色指示灯闪烁。  
当通过车载台接收数据时, 绿色指示灯闪烁。  
在计算机模式下, 4个信道指示灯、[MON] 指示灯及 [●] 指示灯亮。

## 注释 :

- 存储在计算机中的数据必须与写入 EEPROM 的格式相匹配。
- 连接编程电缆, 然后将TK-7108改变为计算机编程模式。

## REALIGNMENT / 模式组合

**3-3. KPG-46 Description****(PC programming interface cable : Option)**

The KPG-46 is required to interface the TK-7108 to 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-46 connects the modular microphone jack of the TK-7108 to the computers RS-232C serial port.

**3-3. KPG-46说明****(计算机编程电缆：可选件)**

KPG-46用于将TK-7108与计算机连接。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TTL电平。

KPG-46将TK-7108的话筒插座与计算机的RS-232C串行口连接。

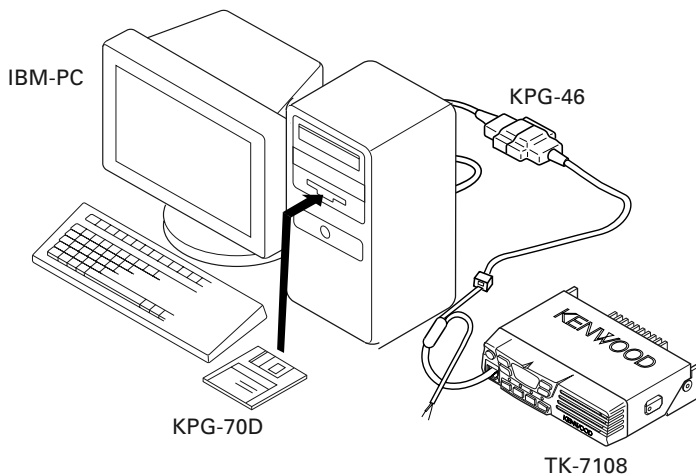


Fig. 1 / 图1

**3-4. Programming Software Description**

The KPG-70D programming disk is supplied in 3-1/2" disk format. The software on this disk allows a user to program TK-7108 radio via a programming interface cable (KPG-46).

**3-4. 编程软件说明**

KPG-70D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电缆(KPG-46)对TK-7108进行编程设定。

**3-5. Programming With IBM PC**

If data is transferred to the transceiver from an IBM PC with the KPG-70D, the destination data (basic radio information) for each set can be modified.

**3-5. 使用IBM计算机编程**

如果使用KPG-70D磁盘的IBM计算机将数据发送到车载台，设定的目的数据(通信机的基本参数)均可被修改。

**4. Clone Mode**

Programming data can be transferred from one radio to another by connecting them via their modular microphone jacks. The operation is as follows (the transmit radio is the master and the receive radio is the slave).

**4. 复制模式**

可以利用标准话筒插孔连接从一台通信机向另一台通信机传送编程数据。按照下述步骤操作(发射方车载台为主机，接收方车载台为子机)。

**NOTE:** Clone mode should enabled.

1. Turn the master TK-7108 power ON with the [1] key held down. The TK-7108 [●] LED is turned on.
2. Power on the slave TK-7108.
3. Connect the cloning cable (No. E30-3382-05) to the modular microphone jacks on the master and slave.
4. Press the [●] key on the master TK-7108 transceiver. The data of the master is sent to the slave. While the master is sending data, [TX] LED blinked. While the slave is receiving the data, 4 LEDs, [MON] LED, [●] LED are turned on and [BUSY] LED blinked. When cloning of data is completed, the master [TX] LED turned off, and the slave automatically operates in the User mode. The slave can then be operated by the same program as the master.
5. The other slave can be continuously cloned. Carry out the operation in step 2 to 4.

**注释:** 启用复制模式。

1. 按住[1]键打开主TK-7108的电源，TK-7108的[●]指示灯亮。
2. 开启子机TK-7108的电源。
3. 将数据复制电缆(No. E30-3382-05)连接到主机及从属机的标准话筒插孔。
4. 按主TK-7108通信机的[●]键。主机的数据将发送到从属机。主机发送数据时[TX]指示灯闪烁。从属机接收数据时4个指示灯、[MON]指示灯及[●]指示灯亮，[BUSY]指示灯闪烁。数据复制完成后，主机的[TX]指示灯关闭，从属机自动运行于用户模式。之后，从属机即可由与主机相同的程序操作。
5. 另一台子机可以继续复制。进行步骤2到4的操作。



## REALIGNMENT / 模式组合

### Adding the data password.

If the data password is set in the optional feature menu, you must enter the password (Master transceiver) to activate a clone mode.

you can use 1, 2, 3, and 4 to configure the password. The maximum length of the password is 10 digits.

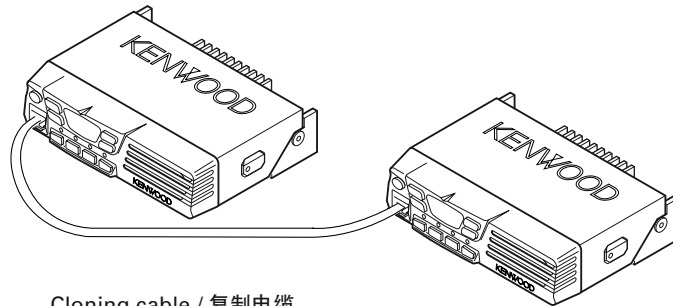
1. [1]+Power ON.
2. [1]~[4] LED, and MON LED are turned ON.
3. Enter the password using [1]~[4] keys.
4. Press [MON] key.
5. If the password matches, the transceiver enters a clone mode. Otherwise, transceiver beeps and returns to the password input mode.

### 添加数据密码。

如果在特性选择菜单中设定了密码，则在启动复制模式时必须输入该密码（主机）。

密码可以使用数字1、2、3、4，密码的最大长度为10个数字。

1. [1]+电源接通。
2. [1]~[4]指示灯、MON 指示灯亮。
3. 使用键[1]~[4]输入密码。
4. 按[MON]键。
5. 如果密码相符，车载台将进入复制模式，否则，车载台将发出蜂鸣音并回到密码输入模式。



Cloning cable / 复制电缆  
(E30-3382-05)

Fig. 2 / 图2



# TK-7108

## DISASSEMBLY FOR REPAIR / 维修时拆卸部件

1. When you remove the panel, turn the transceiver up side down. Detach the panel by lifting the tabs as shown below.

1. 要卸下面板时，请翻转通信机，按下图所示抬起翼片卸除面板。

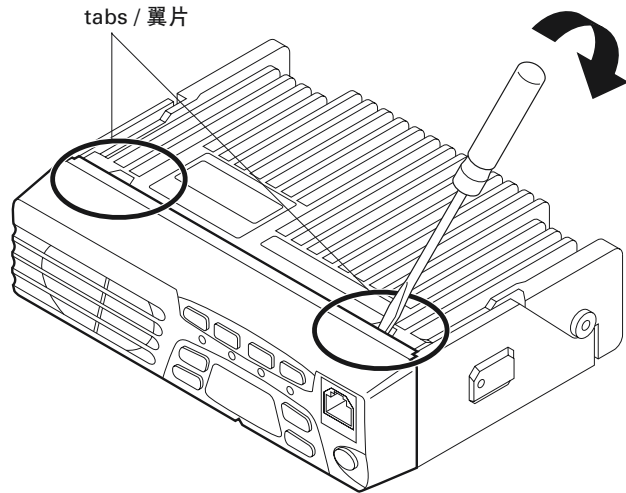


Fig. 1 / 图1

3. To remove the display unit PCB, detach the PCB by lifting at the indents of the PCB as shown below.

3. 要卸下显示单元电路板时，请按下图所示抬起电路板的榫接部卸除电路板。

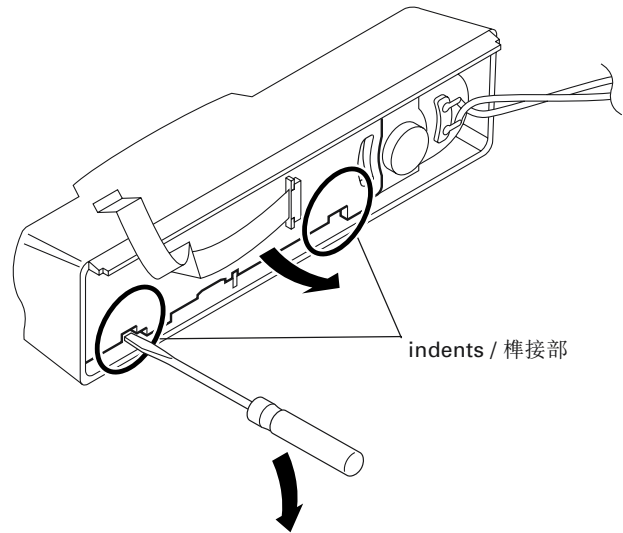


Fig. 3 / 图3

2. To remove the cabinet, first turn the transceiver up side down. Detach the cabinet by prying the tabs as shown below.

2. 要卸下机箱时，请先翻转通信机，按下图所示撬起翼片卸除机箱。

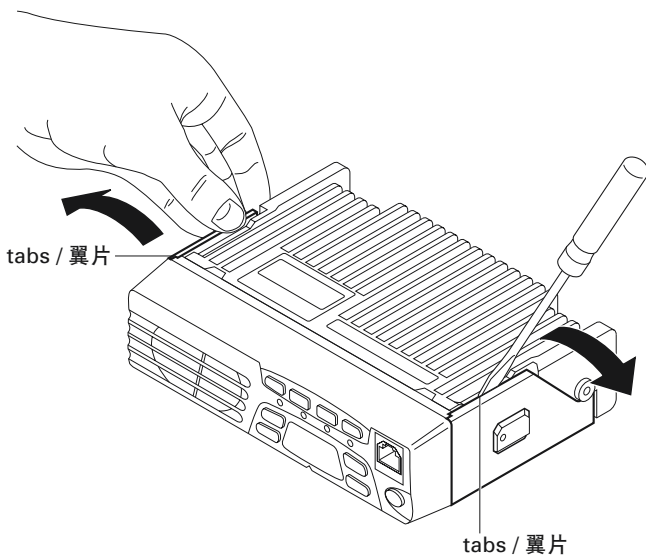


Fig. 2 / 图2

4. When mounting the front panel, match the 4 tabs of the chassis with the panel, being sure they attach securely.

4. 安装前面板时，应将底架的4个翼片与面板接合，并确保其结合紧密。

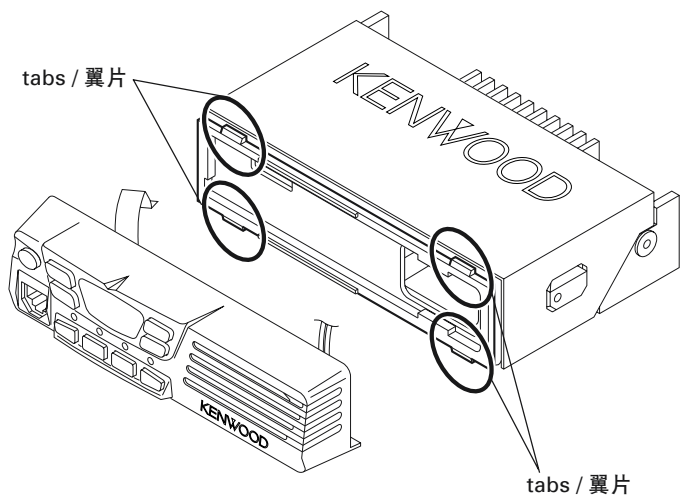


Fig. 4 / 图4

# CIRCUIT DESCRIPTION / 电路说明

## Frequency Configuration

The receiver utilizes double conversion. The first IF is 49.95MHz 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. Figure 1 shows the frequencies.

## 频率构成

接收部采用二次变频超外差方式。第一中频为49.95MHz，第二中频为450kHz。第一本振频率信号由锁相环电路提供。

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。

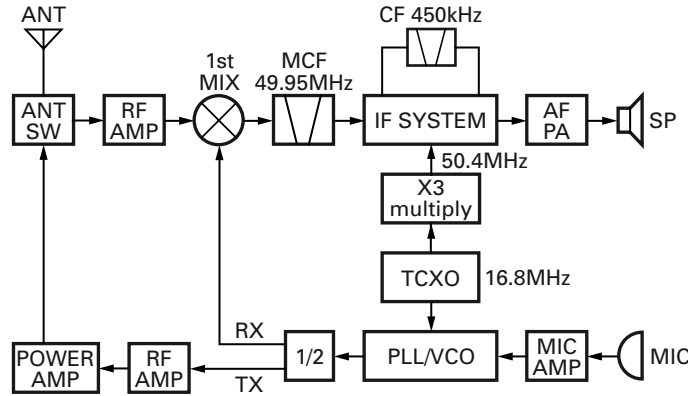


Fig. 1 Frequency configuration / 图1 频率构成

## Receiver System

The receiver is double conversion superheterodyne. The frequency configuration is shown in Figure 1.

### ■ Front-end RF Amplifier

An incoming signal from the antenna is applied to an RF amplifier (Q26) after passing through a transmit/receive switch circuit (D31 is off) and a band pass filter (L36, L38 and varactor diodes: D25, D26). After the signal is amplified (Q26), the signal is filtered through a band pass filter (L30, L32 and varactor diodes: D21, D22) to eliminate unwanted signals before it is passed to the first mixer.

The voltage of these diodes are controlled by tracking the CPU (IC6) center frequency of the band pass filter. (See Fig. 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 (Q21) to create a 49.95MHz first intermediate frequency (1st IF) signal. The first IF signal is then fed through two monolithic crystal filters (MCFs: XF1) to further remove spurious signals.

## 接收部系统

接收部为二次变频超外差方式。频率构成如图1所示。

### ■ 前级射频放大器

从天线进入的信号经过收发转换电路 (D31断开) 和带通滤波器 (L36, L38 和变容二极管: D25, D26) 进入射频放大器 (Q26)。信号被放大 (Q26) 之后, 信号被带通滤波器 (L30, L32 和变容二极管: D21, D22) 滤波, 在进入第一混频器之前消除不需要的信号。

通过跟踪带通滤波器的CPU (IC6) 中心频率来控制这些二极管的电压。(参见图2)

### ■ 第一混频器

来自于射频放大器的信号与来自于第一混频器 (Q21) 的锁相环频率合成器电路的第一本振信号混合后产生49.95MHz的第一中频 (1st IF) 信号。然后, 第一中频信号进入两个单片晶体滤波器 (MCFs: XF1) 进一步消除寄生信号。

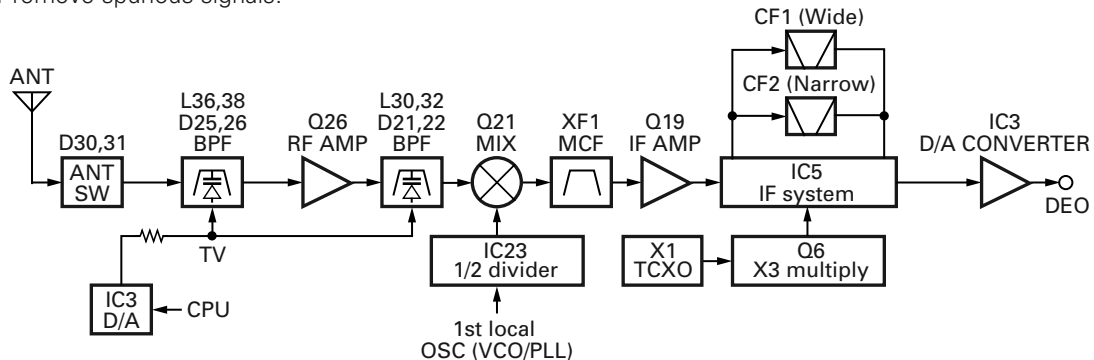


Fig. 2 Receiver system / 图2 接收部系统

## CIRCUIT DESCRIPTION / 电路说明

## ■ IF Amplifier

The first IF signal is amplified by Q19, and the enters IC5 (FM processing IC). The signal is heterodyned again with a second local oscillator signal within IC5 to create a 450kHz second IF signal. The second IF signal is then fed through a 450kHz ceramic filter (Wide : CF1, Narrow : CF2) to further eliminate unwanted signals before it is amplified and FM detected in IC5.

Item	Rating
Nominal center frequency	49.95MHz
Pass bandwidth	±5.0kHz or more at 3dB
35dB stop bandwidth	±20.0kHz or less
Ripple	1.0dB or less
Insertion loss	5.0dB or less
Guaranteed attenuation	80dB or more at $f_o \pm 1\text{MHz}$ Spurious : 40dB or more within $f_o \pm 1\text{MHz}$
Terminal impedance	350 / 5.5pF

Table 1 Crystal filter (L71-0591-05) : XF1

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

Table 2 Ceramic filter (L72-0993-05) : CF1

Item	Rating
Nominal center frequency	450kHz
6dB bandwidth	±4.5kHz or more
50dB bandwidth	±10.0kHz or less
Ripple	2.0dB or less
Insertion loss	6.0dB or less
Guaranteed attenuation	60.0dB or more within $f_o \pm 100\text{kHz}$
Terminal impedance	2.0k

Table 3 Ceramic filter (L72-0999-05) : CF2

## ■ 中频放大器

第一中频信号通过 Q19 被放大，然后进入 IC5 (调频处理芯片)。信号再次与 IC5 中的第二本振信号混合后产生 450kHz 的第二中频信号。第二中频信号在被放大之前进入 450kHz 的陶瓷滤波器 (宽 : CF1, 窄 : CF2) 进一步消除不需要的信号并且在 IC5 中调频检测。

项目	额定值
额定中心频率	49.95MHz
通频带宽	在 3dB 时 ± 5.0kHz 或更大
35dB 停止带宽	± 20.0kHz 或更小
脉动	1.0dB 或更低
插入损耗	5.0dB 或更低
保证衰减	在 $f_o \pm 1\text{MHz}$ 时 80dB 或更大 寄生信号 : 在 $f_o \pm 1\text{MHz}$ 之内 40dB 或更大
端点阻抗	350 / 5.5pF

表1 晶体滤波器 (L71-0591-05) : XF1

项目	额定值
额定中心频率	450kHz
6dB 带宽	± 6.0kHz 或更大
50dB 带宽	± 12.5kHz 或更小
脉动	2.0dB 或更低
插入损耗	6.0dB 或更低
保证衰减	在 $f_o \pm 100\text{kHz}$ 之内 35.0dB 或更大
端点阻抗	2.0k

表2 陶瓷滤波器 (L72-0993-05) : CF1

项目	额定值
额定中心频率	450kHz
6dB 带宽	± 4.5kHz 或更大
50dB 带宽	± 10.0kHz 或更小
脉动	2.0dB 或更低
插入损耗	6.0dB 或更低
保证衰减	在 $f_o \pm 100\text{kHz}$ 之内 60.0dB 或更大
端点阻抗	2.0k

表3 陶瓷滤波器 (L72-0999-05) : CF2

## CIRCUIT DESCRIPTION / 电路说明

### Wide/Narrow Changeover Circuit

The Wide port (pin 92) and Narrow port (pin 91) of the CPU is used to switch between ceramic filters. When the Wide port is high, the ceramic filter SW diodes (D13, D15) cause CF1 to turn on to receive a Wide signal.

When the Narrow port is high, the ceramic filter SW diodes (D13, D15) cause CF2 to turn on to receive a Narrow signal.

### 宽 / 窄转换电路

CPU的宽端口(管脚92)和窄端口(管脚91)用于陶瓷滤波器之间的切换。当宽端口为高电平时,陶瓷滤波器SW二极管(D13, D15)使CF1导通来接收宽带信号。

当窄端口为高电平时,陶瓷滤波器SW二极管(D13, D15)使CF2导通来接收窄带信号。

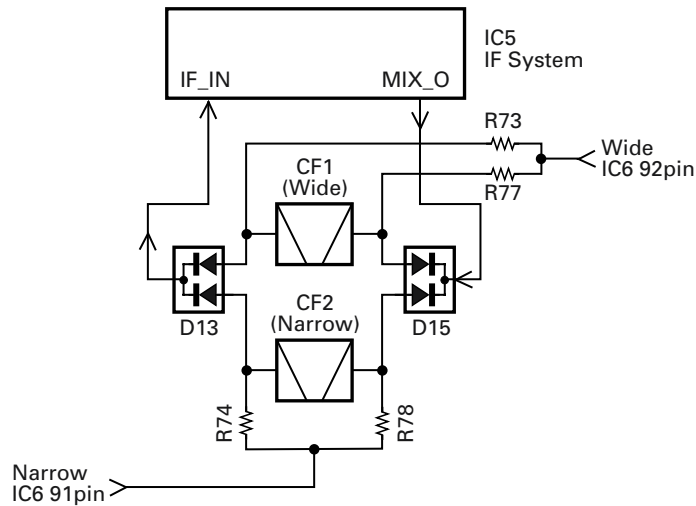


Fig. 3 Wide/Narrow changeover circuit / 图3 宽 / 窄转换电路

### AF Signal System

The detection signal from IF IC (IC5) goes to D/A converter (IC3) to adjust the gain and is output to AF filter (IC10) for characterizing the signal. The AF signal output from IC10 and the DTMF signal, BEEP signal are summed and the resulting signal goes to the D/A converter (IC3). The AFO output level is adjusted by the D/A converter. The signal output from the D/A converter is input to the audio power amplifier (IC102). The AF signal from IC102 switches between the internal speaker and speaker jack (J1) output.

### 音频信号系统

来自于IF IC (IC5)的检测信号进入数/模转换器(IC3),调整增益并输出到AF滤波器(IC10)来表示信号的特征。从IC10输出的AF信号,DTMF信号和BEEP信号被累加,并且将获得的信号送到数/模转换器(IC3)。AFO输出电平被数/模转换器调整。从数/模转换器输出的信号被输入到音频功率放大器(IC102)。来自于IC102的AF信号在内部扬声器和扬声器插口(J1)输出之间变换。

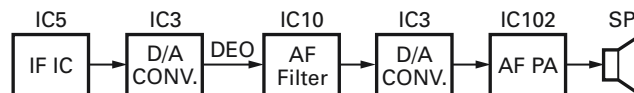


Fig. 4 AF signal system / 图4 音频信号系统

## CIRCUIT DESCRIPTION / 电路说明

## ■ Squelch Circuit

The detection output from the FM IF IC (IC5) passes through a noise amplifier (Q18) to detect noise. A voltage is applied to the CPU (IC6). The CPU controls squelch according to the voltage (SQIN) level. The signal from the RSSI pin of IC5 is monitored. The electric field strength of the receive signal can be known before the SQIN voltage is input to the CPU, and the scan stop speed is improved.

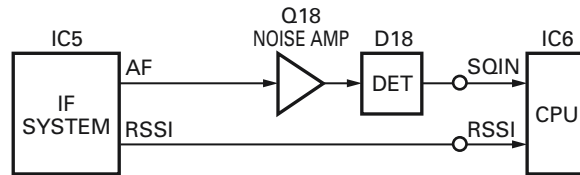


Fig. 5 Squelch circuit / 图5 静噪电路

## PLL Frequency Synthesizer

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

## ■ PLL

The frequency step of the PLL circuit is 5 or 6.25kHz. A 16.8MHz 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 Q15, 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. 6)

## ■ VCO

The operating frequency is generated by Q11 in transmit mode and Q10 in receive mode. The oscillator frequency is controlled by applying the VCO control voltage, obtained from the phase comparator, to the varactor diodes (D10 and D12 in transmit mode and D9 and D11 in receive mode). The TX/RX pin is set low in receive mode causing Q12 and Q7 to turn Q11 off, and turn Q10 on. The TX/RX pin is set high in transmit mode. The outputs from Q10 and Q11 are amplified by Q15 and sent to the RF amplifiers.

## ■ 静噪电路

从调频中频芯片(IC5)输出的检测经过噪音放大器(Q18)检测噪音。向CPU(IC6)输入电压。CPU按照电压(SQIN)电平控制静噪。来自于IC5的RSSI管脚的信号被监听。在SQIN电压被输入到CPU之前可以识别接收信号的电场强度,并且扫描停止速度将增快。

## 锁相环频率合成器

锁相环电路产生接收机的第一本振信号和用于发射的射频载波信号。

## ■ 锁相环电路

锁相环电路的步进频率为5或6.25kHz。16.8MHz的参考振荡器信号通过一个混合计数器在芯片IC1中被分频生成5或6.25kHz参考频率。压控振荡器(VCO)输出信号通过Q15被缓冲放大,然后在芯片IC1中被双模可编程计数器分频。被分频的信号在带有5或6.25kHz参考信号的相位比较器的芯片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,通过压控振荡器控制振荡频率。(参见图6)

## ■ 压控振荡器

在发射模式中通过Q11产生操作频率,在接收模式中通过Q10产生操作频率。控制信号通过相位比较器到变容二极管(在发射中为D10和D12,在接收模式中为D9和D11)。在接收模式中,由于Q12和Q7切断Q11并且导通Q10,所以发射/接收管脚设置为低电平。发射-接收管脚在发射模制内被设置为高电平。来自于Q10和Q11的输出被Q15放大并送至RF放大器。

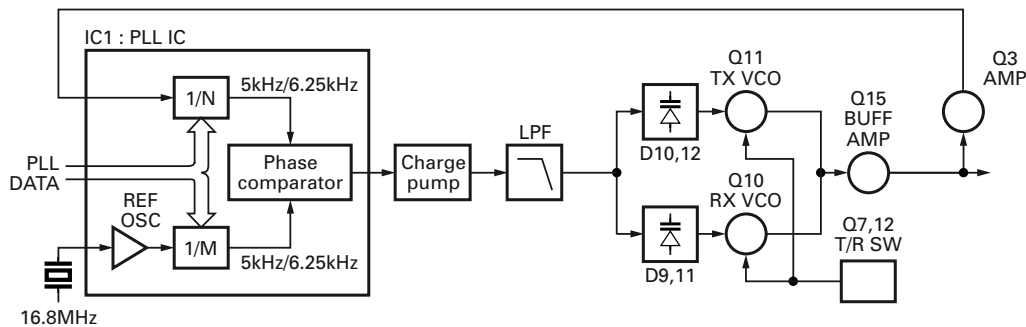


Fig. 6 PLL circuit / 图6 锁相环电路

## CIRCUIT DESCRIPTION / 电路说明

### ■ Unlock Circuit

During reception, the 8RC signal goes high, the 8TC signal goes low, and Q29 turns on. Q31 turns on and a voltage is applied to the collector (8R). During transmission, the 8RC signal goes low, the 8TC signal goes high and Q30 turns on. Q33 turns on and a voltage is applied to 8T.

The CPU in the control unit monitors the PLL (IC1) LD signal directly. When the PLL is unlocked during transmission, the PLL LD signal goes low. The CPU detects this signal and makes the 8TC signal low. When the 8TC signal goes low, no voltage is applied to 8T, and no signal is transmitted.

### ■ 失锁电路

在接收的过程中, 8RC信号为高电平, 8TC信号为低电平, 并且Q29导通。Q31导通并且向集合器(8R)提供电压。在发射过程中, 8RC信号为低电平, 8TC信号为高电平, 并且Q30导通。Q33导通并且向8T提供电压。

控制单元中的CPU直接监听锁相环电路(IC1)LD信号。当发射过程中锁相环电路失锁时, 锁相环电路LD信号为低电平。CPU检测此信号并使8TC信号变为低电平。当8TC信号为低电平时, 不向8T提供电压, 并且不发射任何信号。

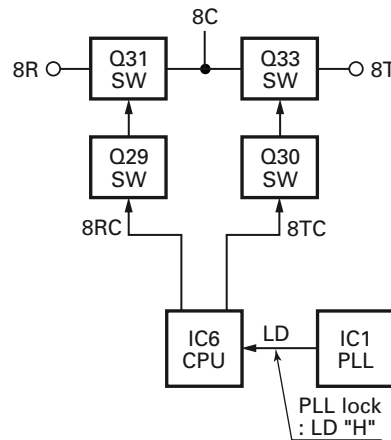


Fig. 7 Unlock circuit / 图7 失锁电路

## Transmitter System

### ■ Outline

The transmitter circuit produces and amplifies the desired frequency directly. It FM-modulates the carrier signal by means of a varicap diode.

### ■ Power Amplifier Circuit

The transmit output signal from the VCO passes through the transmission/reception selection diode (D19) and amplified to a specified level of the power module (IC101) by the drive block (Q23 and Q25). The amplified signal goes to a low-pass filter. The low-pass filter removes unwanted high-frequency harmonic components, and the resulting signal is goes the antenna terminal.

## 发射部系统

### ■ 概要

发射部电路直接产生和放大需要的频率。通过各色二极管的含义对载波信号进行频率调制。

### ■ 功率放大器电路

来自于压控振荡器的发射信号经过发射/接收选择二极管(D19)并通过驱动装置(Q23和Q25)被放大为功率模组(IC101)的一个特定电平。被放大的信号进入一个低通滤波器。此低通滤波器消除不必要的高频谐波成份, 获得的信号进入天线终端。

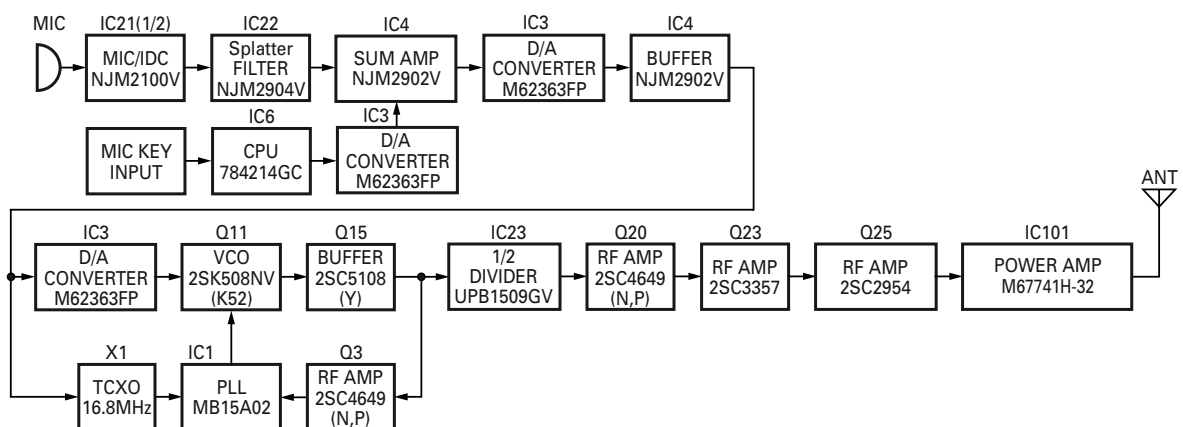


Fig. 8 Transmitter system / 图8 发射部系统



## CIRCUIT DESCRIPTION / 电路说明

### ■ APC Circuit

The automatic transmission power control (APC) circuit detects part of a power module output with a diode (D34, D36) and applies a voltage to IC12. IC12 compares the APC control voltage (PC) generated by the D/A converter (IC3) and DC amplifier (IC4) with the detection output voltage to control Q27 and Q101, generates DB voltage from B voltage, and stabilizes transmission output.

The APC circuit is configured to protect over current of the power module due to fluctuations of the load at the antenna end and to stabilize transmission output at voltage and temperature variations.

### ■ 自动功率控制电路

自动发射功率控制 (APC) 电路使用一个二极管 (D34, D36) 检测功率模组输出的一部分, 并向IC12提供电压。IC12比较通过数/模转换器 (IC3) 生成的自动功率控制电路控制电压 (PC), 带有检测输出电压的直流放大器 (IC4) 控制Q27和Q101, 从B电压生成DB电压, 并使发射输出稳定。

自动功率控制电路的构成用于防止由于天线终端负载的波动而产生的功率模组的过载电流并且使发射输出电压和温度变化稳定。

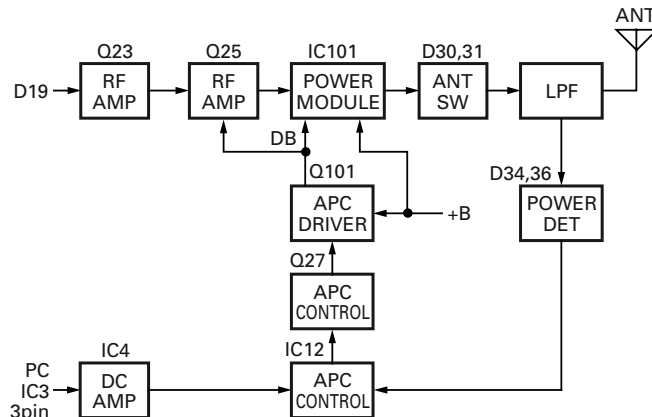


Fig. 9 APC circuit / 图9 自动功率控制电路

### Control Circuit

The CPU carries out the following tasks:

- 1) Controls the WIDE, NARROW, TX/RX outputs.
- 2) Adjusts the AF signal level of the AF filter (IC10) and turns the filter select compounder on or off.
- 3) Controls the DTMF decoder (IC9).
- 4) Controls the display unit.
- 5) Controls the PLL (IC1).
- 6) Controls the D/A converter (IC3) and adjusts the volume, modulation and transmission power.

### 控制电路

CPU 具有下述任务：

- 1) 控制宽、窄、发射 / 接收输出。
- 2) 调整AF滤波器(IC10)的AF信号电平并且开启或关闭滤波器选择混合器。
- 3) 控制DTMF解码器 (IC9)。
- 4) 控制DTMF 解码器 (IC9)。
- 5) 控制锁相环电路 (IC1)。
- 6) 控制数/模转换器 (IC3) 并且调整音量, 调制和发射功率。

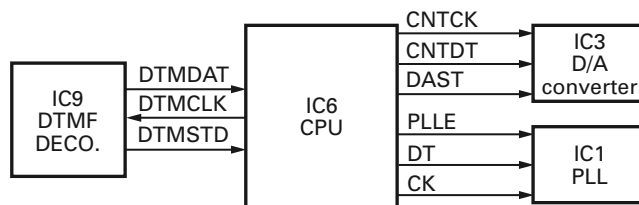


Fig. 10 Control circuit / 图10 控制电路

### ■ Memory Circuit

The transceiver has an 8k-bit EEPROM (IC7). The EEPROM contains adjustment data. The CPU (IC6) controls the EEPROM through three serial data lines.

### ■ 存储器电路

车载台具有一个8k-bit EEPROM (IC7)。EEPROM包含调整数据。CPU (IC6) 经过三条串行数据线控制EEPROM。

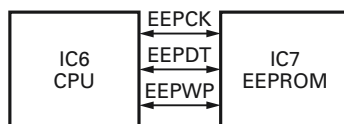


Fig. 11 Memory circuit / 图11 存储器电路

## CIRCUIT DESCRIPTION / 电路说明

### ■ Display Circuit

The CPU (IC6) controls the display LEDs. When the transceiver is busy, the LEDG line goes high, Q4 turns on and the green LED (D11) lights. In transmit mode, the LEDR line goes high, Q8 turns on and the red LED (D12) lights. Backlit LEDs (D1~D4) are provided.

When a function key (MON, PF, C1, C2, C3 or C4) is selected, its respective line goes high (LED MON, LED PF, LED C1, LED C2, LED C3 or LED C4), the switch connected to that line turns on and the amber LED lights.

### ■ 显示电路

CPU (IC6) 控制显示指示灯。当通信机繁忙，LEDG线为高电平时，Q4导通并且绿色指示灯 (D11) 点亮。在发射模式中，LEDR线为高电平，Q8导通并且红色指示灯 (D12) 点亮。提供背景灯光指示灯 (D1至D4)。

当一个功能键 (MON、PF、C1、C2、C3和C4)被选择时，它相应的线路进入高电平(LED MON、LED PF、LED C1、LED C2、LED C3或LED C4)，与该线路相连的开关接通并且琥珀色显示灯点亮。

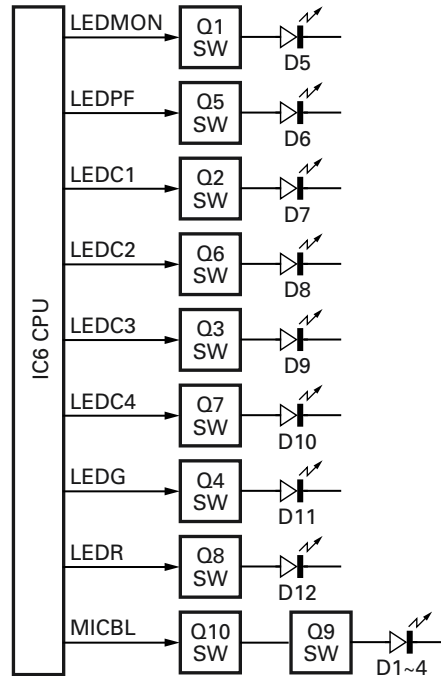


Fig. 12 Display circuit / 图12 显示电路

### ■ Key Matrix Circuit

The TK-7108 front panel has function keys. Each of them is connected to a cross point of a matrix of the KMI1 to KMO2 ports of the microprocessor. The KMO1 to KMO2 ports are always high, while the KMI1 to KMI4 ports are always low.

The microprocessor monitors the status of the KMI1 to KMO2 ports. If the state of one of the ports changes, the microprocessor assumes that the key at the matrix point corresponding to that port has been pressed.

### ■ 按键矩阵电路

TK-7108的前端面板有功能键。每一个按键被连接到微处理器的KMI1到KMO2端口矩阵的一个交叉点。当KMI1到KMI4端口通常为低电平时，KMO1到KMO2端口通常为高电平。

微处理器监听KMI1到KMO2端口的状态。如果其中一个端口的状态发生了变化，微处理器认定对应于此端口的在矩阵点的按键已被按下。

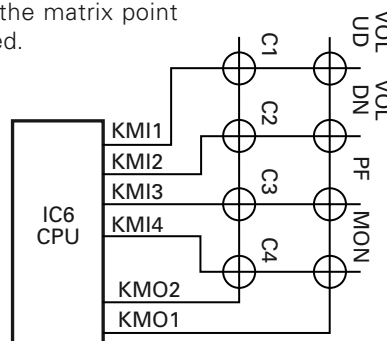


Fig. 13 Key matrix circuit / 图13 按键矩阵电路

## CIRCUIT DESCRIPTION / 电路说明

### ■ Encode

The QT and DQT signals are output from QT/DQT of the CPU (IC6) and summed with the external pin DI line by the summing amplifier (IC4) and the resulting signal goes to the D/A converter (IC3). The DTMF signal is output from DTMF of the CPU and goes to the D/A converter (IC3). The signal is summed with a MIC signal by the summing amplifier (IC4), and the resulting signal goes to the D/A converter (IC3).

The D/A converter (IC3) adjusts the MO level and the balance between the MO and QT/DQT levels. Part of a QT/DQT signal is summed with MO and the resulting signal goes to the VCOMOD pin of the VCO. This signal is applied to a varicap diode in the VCO for direct FM modulation.

### ■ 编码

从CPU (IC6) 的QT/DQT输出的QT和DQT信号通过总和放大器 (IC4) 与外置管脚DI线计算总和。获得的信号进入数/模转换器 (IC3)。从CPU的DTMF输出的DTMF和信号进入数/模转换器 (IC3)。总和放大器 (IC4) 计算信号和MIC信号的总和，获得的信号进入数/模转换器 (IC3)。

数/模转换器 (IC3) 调整MO电平和MO与QT/DQT电平之间的平衡。计算QT/DQT信号的端口和MO的总和，获得的信号进入压控振荡器的VCOMOD管脚。此信号提供给压控振荡器中的各色二极管直接进行调频调制。

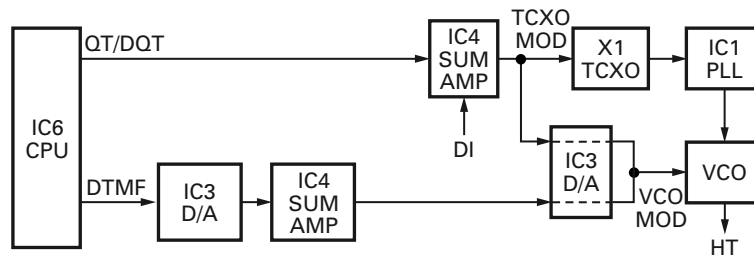


Fig. 14 Encode / 图14 编码

### ■ Decode

#### • QT/DQT/DTMF

The signal (DEO) passes through two low-pass filters of IC11, goes to QTIN of the CPU (IC6) to decode QT, DQT. The DTMF signal is decoded by a dedicated IC (IC9) and the resulting signal is sent to the CPU (IC6) as serial data.

### ■ 解码

#### • QT/DQT/DTMF

信号 (DEO) 经过IC11的两个低通滤波器，进入CPU (IC6) 的QTIN，对QT、DQT进行解码，获得的信号作为串行数据被发送到CPU (IC6)。

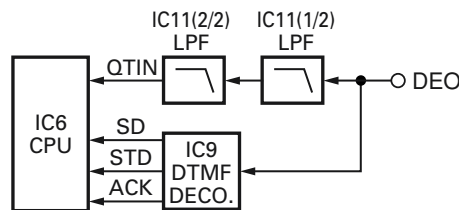


Fig. 15 Decode / 图15 解码

### ■ D/A Converter

The D/A converter (IC3) is used to adjust MO modulation, AF volume, TV voltage, FC reference voltage, and PC POWER CONTROL voltage level.

Adjustment values are sent from the CPU as serial data. The D/A converter has a resolution of 256 and the following relationship is valid:

$$\text{D/A output} = (\text{Vin} - \text{VDaref}) / 256 \times n + \text{VDaref}$$

Vin: Analog input

VDaref: D/A reference voltage

n: Serial data value from the microprocessor (CPU)

### ■ 数/模转换器

数/模转换器 (IC3) 用于调整MO调制、AF音量、TV电压、FC参考电压和PC POWER CONTROL 电压电平。

从CPU以串行数据发送调整数值。数/模转换器的分辨率为256并且下述关系是有效的。

$$\text{数/模输出} = (\text{Vin} - \text{VDaref}) / 256 \times n + \text{VDaref}$$

Vin: 模拟输入

VDaref: 数/模参考电压

n: 来自于微处理器 (CPU) 的串行数据值

## CIRCUIT DESCRIPTION / 电路说明

## Power Supply Circuit

When the POWER switch on the display unit is pressed, the power port on the display unit which is connected to CPU port 18 (POWER), goes low, then CPU port 93 (SBC) goes high, Q34 turns on, SB SW (Q42) turns on and power (SB) is supplied to the radio.

This circuit has an overvoltage protection circuit. If a DC voltage of 18 V or higher is applied to the power cable, D39 turns on and a voltage is applied to the base of Q38. This voltage turns Q38 on and turns Q34 and SB off.

## 电源电路

当按下前面板中的POWER开关时，显示板上与CPU端口18 (POWER) 相连接的电源端口为低电平，然后CPU端口93 (SBC) 为高电平，Q34导通，SB SW (Q42) 导通并向通信机供电 (SB)。

此电路具有过载电压保护电路。如果18V或更高的电压被提供给电源电缆，则D39导通并向Q38的基极提供电压。此电压使Q38导通，使Q34和SB断开。

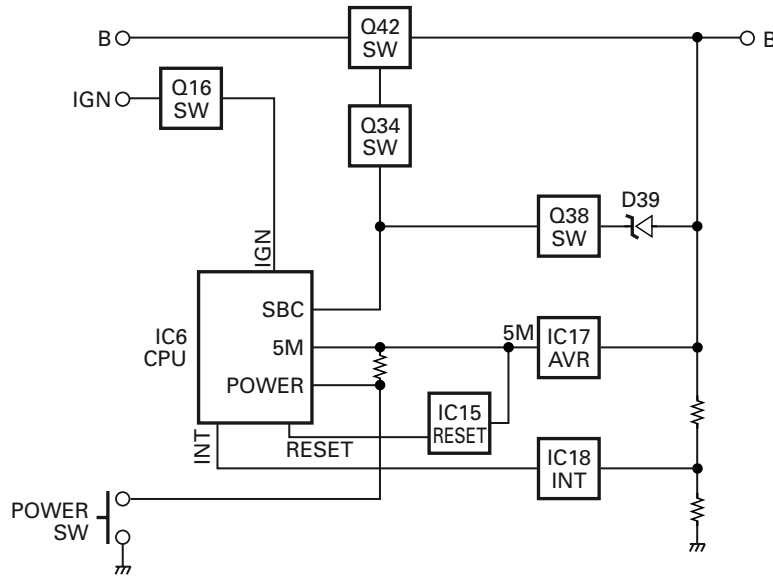


Fig. 16 Power supply circuit / 图16 电源电路

## SEMICONDUCTOR DATA

## Microprocessor : 784214AGC125 (TX-RX Unit IC6)

## ■ Terminal function

Pin No.	Name	I/O	Function	Pin No.	Name	I/O	Function
1	NC	I		48	FNC8	I/O	Function Port8
2	DTMOSC	O	DTMF IC Clock Control	49	NC	I	
3	PLLE	O	PLL IC Chip Select	50	MUTE1	O	AF Mute
4	EVLLD	O	E-Volume LD	51	MUTE2	O	Speaker Mute
5	DTMCK	O	DTMF Dec IC Clock	52	MUTE3	O	AF AMP SW
6	DTMDT	I/O	DTMF Dec IC Data	53	DT	O	Common Data
7	UL	O	Unlock Detect	54	CK	O	Common Clock
8	BSHIFT	O	Clock Shift	55	NC	I	
9	VDD	-		56	EEPCK	O	EEPROM Clock
10	X2	-	X'TAL(7.3728MHz)	57	EEPDT	I/O	EEPROM Data
11	X1	-	X'TAL(7.3728MHz)	58	EEPWT	O	Eep Write Protect
12	VSS	-	GND	59	DST1	I	Destination 1
13	NC	-	OPEN	60	DST2	I	Destination 2
14	NC	-	GND	61	DST3	I	Destination 3 (Open)
15	RESET	-	CPU RESET	62	NC	I	
16	INT	I	uCOM Stop	63	24VDET	I	24V Detect
17	DMTSDT	I	DTMF Dec IC STD	64	NC	I	
18	POWER	I	Power Key Input	65	LEDC1	O	LED for CH1 Key
19	IGN	I	Ignition	66	LEDC2	O	LED for CH2 Key
20	TX/RX	O	TX/RX	67	LEDR	O	TX LED
21	LEDMON	O	LED for MON Key	68	LEDG	O	Busy LED
22	LEDPF	O	LED for PF Key	69	MICBL	O	Mic Back Light
23	AVDD	-	+5V	70	LEDC3	O	LED for CH3 Key
24	AVREF	-	+5V	71	LEDC4	O	LED for CH4 Key
25	QTIN	I	QT/DQT Input	72	VSS	-	GND
26	SQIN	I	Squelch Input	73	MICMT	O	Mic1 Mute
27	RSSI	I	RSSI Input	74	MICEM	O	Mic2 Mute
28	PWRPRCT	I	Power Protect	75	NC	I	
29	BATT	I	Battery Voltage	76	8RC	O	8R Control
30	TEMP1	I	Temperature1	77	8TC	O	8T Control
31	TEMP2	I	Temperature2	78	CM	I/O	Mic Key Check
32	TEMP3	I	Temperature3	79	NC	I	
33	AVSS	-	GND	80	NC	I	
34	DTM/BEEP	O	DTMF/Beep Output	81	VDD5M	-	+5V
35	QT/DQT	O	QT/DQT Output	82~85	NC	I	
36	AVREF	-	+5V	86	KMI1	I	Key Matrix Input1
37	FNC1	I/O	Function Port1	87	KMI2	I	Key Matrix Input2
38	FNC2	I/O	Function Port2	88	KMI3	I	Key Matrix Input3
39	HOOK	I	Hook	89	KMI4	I	Key Matrix Input4
40	RXD	I	From FPU	90	NC	I	
41	TXD	O	To FPU	91	NARROW	O	Wide / Narrow2
42	PTT	I	PTT Key	92	WIDE	O	Wide / Narrow
43	FNC3	I/O	Function Port3	93	SBC	O	Battery Switch
44	FNC4	I/O	Function Port4	94	FLASH	-	Flash Write Port
45	FNC5	I/O	Function Port5	95~98	NC	I	
46	FNC6	I/O	Function Port6	99	KMO1	O	Key Matrix Output1
47	FNC7	I/O	Function Port7	100	KMO2	O	Key Matrix Output2

# 半导体数据

Microprocessor : 784214AGC125 (TX-RX单元 IC6)

## ■ 端子功能

管脚序号	端子名称	I/O	功能	管脚序号	端子名称	I/O	功能
1	NC	I		48	FNC8	I/O	功能端口 8
2	DTMOSC	O	DTMF IC 时钟控制	49	NC	I	
3	PLLE	O	锁相环 IC 芯片选择	50	MUTE1	O	音频静音
4	EVLDD	O	E-音量 LD	51	MUTE2	O	扬声器静音
5	DTMCK	O	DTMF Dec IC 时钟	52	MUTE3	O	音频放大开关
6	DTMDT	I/O	DTMF Dec IC 数据	53	DT	O	公共数据
7	UL	O	解锁检测	54	CK	O	公共时钟
8	BSHIFT	O	时钟偏移	55	NC	I	
9	VDD	-		56	EEPCK	O	EEPROM 时钟
10	X2	-	X AL(7.3728MHz)	57	EEPDT	I/O	EEPROM 数据
11	X1	-	X AL(7.3728MHz)	58	EEPWT	O	EEP 写保护
12	VSS	-	接地	59	DST1	I	目的地 1
13	NC	-	打开	60	DST2	I	目的地 2
14	NC	-	接地	61	DST3	I	目的地 3 (打开)
15	RESET	-	CPU 复位	62	NC	I	
16	INT	I	uCOM 停止	63	24VDET	I	24 V 检测
17	DMTSDT	I	DTMF Dec IC 标准	64	NC	I	
18	POWER	I	电源键输入	65	LEDC1	O	CH1 键指示灯
19	IGN	I	点火	66	LEDC2	O	CH2 键指示灯
20	TX/RX	O	发射/接收	67	LEDR	O	发射指示灯
21	LEDMON	O	MON 键指示灯	68	LEDG	O	繁忙指示灯
22	LEDPF	O	PF 键指示灯	69	MICBL	O	话筒背光
23	AVDD	-	+5V	70	LEDC3	O	CH3 指示灯
24	AVREF	-	+5V	71	LEDC4	O	CH4 指示灯
25	QTIN	I	QT/DQT输入	72	VSS	-	接地
26	SQIN	I	静噪输入	73	MICMT	O	话筒 1 静音
27	RSSI	I	RSSI 输入	74	MICEM	O	话筒 2 静音
28	PWRPRCT	I	电源保护	75	NC	I	
29	BATT	I	电池电压	76	8RC	O	8R 控制
30	TEMP1	I	温度 1	77	8TC	O	8T 控制
31	TEMP2	I	温度 2	78	CM	I/O	话筒键检查
32	TEMP3	I	温度 3	79	NC	I	
33	AVSS	-	接地	80	NC	I	
34	DTM/BEEP	O	DTMF/提示音输出	81	VDD5M	-	+5V
35	QT/DQT	O	QT/DQT 输出	82~85	NC	I	
36	AVREF	-	+5V	86	KMI1	I	键矩阵输入 1
37	FNC1	I/O	功能端口 1	87	KMI2	I	键矩阵输入 2
38	FNC2	I/O	功能端口 2	88	KMI3	I	键矩阵输入 3
39	HOOK	I	挂钩	89	KMI4	I	键矩阵输入 4
40	RXD	I	由 FPU	90	NC	I	
41	TXD	O	到 FPU	91	NARROW	O	宽 / 窄2
42	PTT	I	PTT键	92	WIDE	O	宽 / 窄
43	FNC3	I/O	功能端口 3	93	SBC	O	电池开关
44	FNC4	I/O	功能端口 4	94	FLASH	-	Flash 写端口
45	FNC5	I/O	功能端口 5	95~98	NC	I	
46	FNC6	I/O	功能端口 6	99	KMO1	O	键矩阵输出 1
47	FNC7	I/O	功能端口 7	100	KMO2	O	键矩阵输出 2



## DESCRIPTION OF COMPONENTS / 元件说明

## Display Unit (X54-3340-20)

SYMBOL	PARTS NAME	DISCRIPTION
D1~4	LED	KEY BACKLIT
D5	LED	MONITOR KEY LIGHT
D6	LED	PROGRAMMABLE KEY LIGHT
D7~10	LED	CHANNEL KEY LIGHT
D11	LED	BUSY
D12	LED	TRANSMIT
Q1	TRANSISTOR	MONITOR KEY LIGHT SW
Q2,3	TRANSISTOR	CHANNEL KEY LIGHT SW
Q4	TRANSISTOR	BUSY LIGHT SW
Q5	TRANSISTOR	PROGRAMMABLE KEY LIGHT SW
Q6,7	TRANSISTOR	CHANNEL KEY LIGHT SW
Q8	TRANSISTOR	TRANSMIT LIGHT SW
Q9,10	TRANSISTOR	KEY BACKLIT SW

## 显示单元 (X54-3340-20)

符号	零件名称	说明
D1~4	发光二极管	按键背景灯光
D5	发光二极管	监听键灯光
D6	发光二极管	可编程键灯光
D7~10	发光二极管	信道键灯光
D11	发光二极管	繁忙
D12	发光二极管	发射
Q1	晶体管	监视键灯光开关
Q2,3	晶体管	信道键灯光开关
Q4	晶体管	繁忙灯光开关
Q5	晶体管	可编程键灯光开关
Q6,7	晶体管	信道键灯光开关
Q8	晶体管	发射灯光开关
Q9,10	晶体管	按键背景灯光开关

## TX-RX Unit (X57-6293-XX)

Ref. No.	Use/Function	Operation/Condition
D1	DIODE	SURGE ABSORPTION /PTT
D2	DIODE	SURGE ABSORPTION /HOOK
D3	DIODE	SURGE ABSORPTION /MICBL
D4	DIODE	SURGE ABSORPTION /CM
D6	DIODE	DC SWITCH
D7	DIODE	VOTAGE DROPPED
D9	VARICAP	RX VCO
D10	VARICAP	TX VCO
D11	VARICAP	RX VCO
D12	VARICAP	TX VCO
D13	DIODE	IF SWITCH (WIDE/NARROW)
D14	VARICAP	MODULATION
D15	DIODE	IF SWITCH (WIDE/NARROW)
D16	DIODE	LIPPLE FILTER
D18	DIODE	DETECTION
D19	DIODE	RF SWITCH(TX/RX)
D20	DIODE	TEMPERATURE COMPENSATION
D21	VARICAP	RF BPF TUNING
D22	VARICAP	RF BPF TUNING
D23	DIODE	TEMPERATURE COMPENSATION
D24	DIODE	LIMITTER
D25	VARICAP	RF BPF TUNING
D26	VARICAP	RF BPF TUNING
D27	DIODE	TEMPERATURE COMPENSATION
D30	DIODE	ANT SW
D31	DIODE	ANT SW

## TX-RX单元 (X57-6293-XX)

Ref. No.	使用 / 功能	操作 / 状态
D1	二极管	过压吸收 /PTT
D2	二极管	过压吸收 /HOOK
D3	二极管	过压吸收 /MICBL
D4	二极管	过压吸收 /CM
D6	二极管	直流开关
D7	二极管	电压降低
D9	变容二极管	接收压空振荡器
D10	变容二极管	发射压空振荡器
D11	变容二极管	接收压空振荡器
D12	变容二极管	发射压空振荡器
D13	二极管	中频开关 (宽 / 窄)
D14	变容二极管	调制
D15	二极管	中频开关 (宽 / 窄)
D16	二极管	脉动滤波器
D18	二极管	检测
D19	二极管	射频开关 (发射 / 接收)
D20	二极管	温度补偿
D21	变容二极管	射频BPF调谐
D22	变容二极管	射频BPF调谐
D23	二极管	温度补偿
D24	二极管	限幅器
D25	变容二极管	射频BPF调谐
D26	变容二极管	射频BPF调谐
D27	二极管	温度补偿
D30	二极管	天线开关
D31	二极管	天线开关

## DESCRIPTION OF COMPONENTS / 元件说明

Ref. No.	Use/Function	Operation/Condition	Ref. No.	使用 / 功能	操作 / 状态
D34	DIODE	APC VOLTAGE DETECT	D34	二极管	自动功率控制电压检测
D36	DIODE	APC VOLTAGE DETECT	D36	二极管	自动功率控制电压检测
D38	DIODE	REVERSE CONNECT PROTECTION	D38	二极管	反向电流保护
D39	DIODE	OVER VOLTAGE DETECTION	D39	二极管	过电压检测
D41	POLY SW	CURRENT PROTECTION	D41	保护开关	当前保护
D43	DIODE	OR GATE /Mic Mute, AGC	D43	二极管	或门 / 话筒静音, AGC
D44	DIODE	AGC	D44	二极管	AGC
Q2	FET	Emergency Mic mute /Active while MICEM is H	Q2	场效应管	话筒静音 /当 MICEM为高电平时启动
Q3	TRANSISTOR	RF AMP /PLL Fin	Q3	晶体管	射频放大器 /锁相环散热片
Q4	TRANSISTOR	CHARGE PUMP	Q4	晶体管	负载增压
Q5	TRANSISTOR	CHARGE PUMP	Q5	晶体管	负载增压
Q6	TRANSISTOR	BUFFER AMP /16.8MHz 3rd over tone	Q6	晶体管	缓冲放大器 /16.8MHz 第三完毕提示音
Q7	FET	T/R SW	Q7	场效应管	发射 / 接收开关
Q10	FET	RX VCO	Q10	场效应管	接收压空振荡器
Q11	FET	TX VCO	Q11	场效应管	发射压空振荡器s
Q12	TRANSISTOR	T/R SW	Q12	晶体管	发射 / 接收开关
Q13	TRANSISTOR	BEAT SHIFT /Active while Beat shift is on	Q13	晶体管	拍频偏移 /节拍漂移开启时启动
Q14	TRANSISTOR	LIPPLE FILTER	Q14	晶体管	脉动滤波器
Q15	TRANSISTOR	BUFFER AMP /Output of VCO	Q15	晶体管	缓冲放大器 /VCO输出
Q16	TRANSISTOR	IGNITION /Ignition Sens.	Q16	晶体管	点火 /点火器传感
Q18	TRANSISTOR	NOISE AMP	Q18	晶体管	噪音放大器
Q19	TRANSISTOR	IF AMP	Q19	晶体管	中频放大器
Q20	TRANSISTOR	RF AMP /Output of VCO	Q20	晶体管	射频放大器 /VCO输出
Q21	FET	MIXER	Q21	场效应管	混频器
Q22	FET	AF MUTE /Active while Mute1 is H	Q22	场效应管	音频静音 /当Mute1是H时生效
Q23	TRANSISTOR	RF AMP /Drive stage	Q23	晶体管	射频放大器 /驱动器台
Q24	TRANSISTOR	BUFFER AMP /RX Audio	Q24	晶体管	缓冲放大器 /接收音频
Q25	TRANSISTOR	RF AMP /Drive stage	Q25	晶体管	射频放大器 /驱动器台
Q26	FET	RF AMP /LNA	Q26	场效应管	射频放大器 /低频噪音放大器
Q27	TRANSISTOR	APC CONTROL	Q27	晶体管	APC控制器
Q29	TRANSISTOR	DC SWITCH(8R) /Active while RX	Q29	晶体管	直流开关(8T) /接收生效
Q30	TRANSISTOR	DC SWITCH(8T) /Active while TX	Q30	晶体管	直流开关(8T) /发射生效
Q31	TRANSISTOR	DC SWITCH(8R) /Active while RX	Q31	晶体管	直流开关(8T) /接收生效
Q32	TRANSISTOR	AF MUTE /Active while Mute2 is H	Q32	晶体管	音频静音 /当Mute2是H时生效
Q33	TRANSISTOR	DC SWITCH(8T) /Active while TX	Q33	晶体管	直流开关(8T) /发射生效

## DESCRIPTION OF COMPONENTS / 元件说明

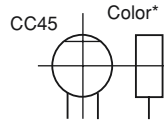
Ref. No.	Use/Function	Operation/Condition	Ref. No.	使用 / 功能	操作 / 状态
Q34	TRANSISTOR	DC SWITCH(SB) /Active when power on	Q34	晶体管	直流开关(SB) /通电时生效
Q35	TRANSISTOR	AF MUTE /Active while Mute3 is H	Q35	晶体管	音频静音 /当Mute3是H时生效
Q37	TRANSISTOR	BEAT SHIFT /Active while Beat shift is on	Q37	晶体管	拍频偏移 /节拍漂移开启时启动
Q38	TRANSISTOR	OVER VOLTAGE DETECTION /Active while PS voltage is more than 18V	Q38	晶体管	过电压检测 /PS 电压大于 18V 时启动
Q41	TRANSISTOR	MIC MUTE /Emergency Mic mute	Q41	晶体管	话筒静音 /紧急话筒静音
Q42	TRANSISTOR	DC SWITCH(SB) /Active when power on	Q42	晶体管	直流开关(SB) /通电时生效
Q43	FET	AF MUTE Active while Mute1 is H	Q43	场效应管	音频静音 当Mute1是H时生效
Q101	TRANSISTOR	APC DRIVER	Q101	晶体管	APC 驱动器
IC1	IC	PLL SYNTHESIZER	IC1	IC	锁相环同步器
IC3	IC	D/A CONVERTER	IC3	IC	数字 / 模拟转换器
IC4	IC	BUFFER AMP / SUM AMP / DC AMP / 1/2Vcc	IC4	IC	缓冲放大器 / 总和放大器 / 直流放大器 / 1/2Vcc
IC5	IC	IF DEMODULATION	IC5	IC	中频检波
IC6	IC	CPU	IC6	IC	微处理器
IC7	IC	EEPROM	IC7	IC	EEPROM
IC9	IC	DTMF DECODE	IC9	IC	DTMF解码器
IC10	IC	AUDIO FILTER	IC10	IC	音频过滤器
IC11	IC	ACTIVE FILTER (QT/DQT)	IC11	IC	有源滤波器 (QT/DQT)
IC12	IC	APC CONTROL	IC12	IC	APC控制器
IC14	IC	VOLTAGE REGULATOR (5C)	IC14	IC	电压调节器 (5C)
IC15	IC	VOLTAGE DETECTOR RESET	IC15	IC	电压检测器复位
IC17	IC	VOLTAGE REGULATOR (5M)	IC17	IC	电压调节器 (5M)
IC18	IC	VOLTAGE DETECTOR INT	IC18	IC	电压检测器 Int
IC19	IC	DIVIDER (7.159MHz)	IC19	IC	分频器 (7.159MHz)
IC20	IC	VOLTAGE REGULATOR (8C)	IC20	IC	电压调节器 (8C)
IC21	IC	MIC AMP / IDC	IC21	IC	扬声器放大 / IDC
IC22	IC	SPLATTER FILTER	IC22	IC	边带干扰消除器
IC23	IC	DIVIDER (Hetero)	IC23	IC	分频器 (其他)
IC101	IC	POWER MODULE	IC101	IC	功率调制
IC102	IC	AF POWER AMP	IC102	IC	音频功率放大器

## PARTS LIST / 部品表

### CAPACITORS

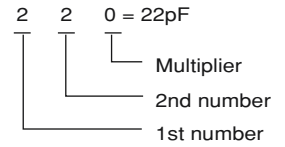
CC 45 TH 1H 220 J  
 1 2 3 4 5 6

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



#### Capacitor value

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



#### 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 -40	+80 -20	+100 -0	More than 10μF -10 ~ +50 Less than 4.7μF -10 ~ +75

#### (Less than 10pF)

Gode	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

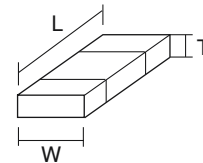
(Chip)(B,F)

#### Carbon resistor (Nomal type)

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

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

#### 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	1/16W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

## PARTS LIST / 部品表

\* New Parts.  $\Delta$  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-7108

TX-RX UNIT (X57-6293-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
<b>TK-7108</b>											
1	1B	*	A01-2178-02	CABINET		C25			CC73GCH1H220J	CHIP C 22PF J	
2	3B	*	A10-4047-01	CHASSIS		C26			CK73GB1C104K	CHIP C 0.10UF K	
3	3A	*	A62-0942-03	PANEL ASSY		C27			C92-0560-05	CHIP-TAN 10UF 6.3WV	
4	3A	*	B10-2668-03	FRONT GLASS		C28			CK73GB1H102K	CHIP C 1000PF K	
5	1C	*	B62-1390-00	INSTRUCTION MANUAL		C29,30			CK73GB1C104K	CHIP C 0.10UF K	
6	3B	*	B72-1912-04	MODEL NAME PLATE	C	C31,32			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
6	3B	*	B72-1913-04	MODEL NAME PLATE	C2	C34			CK73GB1C104K	CHIP C 0.10UF K	
7	3B	*	E04-0167-05	RF COAXIAL PECEPTACLE(M)		C35			C92-0560-05	CHIP-TAN 10UF 6.3WV	
8	3C	*	E30-3448-05	DC CORD(RADIO)		C36			CK73GB1H103K	CHIP C 0.010UF K	
9	2A	*	E37-0961-05	FLAT CABLE		C37			CK73GB1C104K	CHIP C 0.10UF K	
10	3A	*	E37-0962-05	SPEAKER CABLE		C40			C92-0514-05	CHIP-TAN 2.2UF 10WV	
11	2B	*	F10-2405-12	SHIELDING COVER(UPPER)		C42			CK73GB1H102K	CHIP C 1000PF K	
12	3B	*	G13-1468-04	CUSHION(DC CORD)		C44			CK73GB1C273K	CHIP C 0.027UF K	
13	3A	*	G13-1836-04	CUSHION(SPEAKER)		C45			CK73GB1H102K	CHIP C 1000PF K	
14	1B	*	G53-1524-02	PACKING		C48			CK73GB1H102K	CHIP C 1000PF K	
15	3B	*	G53-1525-03	PACKING(PANEL)		C49			CK73GB1H471K	CHIP C 470PF K	
16	2B	*	G53-1542-03	PACKING(PHONE JACK)		C50			CK73GB1C223K	CHIP C 0.022UF K	
17	1D	*	H10-6636-03	POLYSTYRENE FOAMED FIXTURE		C51			CK73GB1C104K	CHIP C 0.10UF K	
18	2C	*	H10-6639-03	POLYSTYRENE FOAMED FIXTURE		C52			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
19	1C	*	H25-2320-04	PROTECTION BAG		C53			CK73GB1C104K	CHIP C 0.10UF K	
20	2C	*	H52-1700-12	ITEM CARTON CASE		C54			C92-0560-05	CHIP-TAN 10UF 6.3WV	
21	2A	*	K29-9065-01	KEY TOP		C55			CK73GB1H102K	CHIP C 1000PF K	
A	2B	*	N67-3008-46	PAN HEAD SEMS SCREW W		C56			C92-0555-05	CHIP-TAN 0.047UF 35WV	
B	2B	*	N87-2606-46	BRAZIER HEAD TAPTITE SCREW		C58			CK73GB1H122K	CHIP C 1200PF K	
C	2B	*	N87-2614-46	BRAZIER HEAD TAPTITE SCREW		C59			CK73GB1E103K	CHIP C 0.010UF K	
SP	3A	*	T07-0727-05	SPEAKER		C60			C92-0004-05	CHIP-TAN 1.0UF 16WV	
<b>DISPLAY UNIT (X54-3340-20)</b>						C61			CK73GB1H821K	CHIP C 820PF K	
D1-4		*	B30-2238-05	LED(Y)		C62			CK73GB1H332K	CHIP C 3300PF K	
D5-10		*	B30-2239-05	LED(SY)		C63			CK73GB1H472K	CHIP C 4700PF K	
D11		*	B30-2237-05	LED(YG)		C64			C92-0560-05	CHIP-TAN 10UF 6.3WV	
D12		*	B30-2240-05	LED(SR)		C65			C92-0001-05	CHIP-C 0.1UF 35WV	
C4		*	CK73GB1H103K	CHIP C 0.010UF K		C66			CC73GCH1H151J	CHIP C 150PF J	
C8-17		*	CK73GB1H103K	CHIP C 0.010UF K		C67			CK73GB1C104K	CHIP C 0.10UF K	
C18		*	CC73GCH1H101J	CHIP C 100PF J		C73			CC73GCH1H040B	CHIP C 4.0PF B	C2
C19		*	CK73GB1H102K	CHIP C 1000PF K		C73			CC73GCH1H080B	CHIP C 8.0PF B	C
CN1		*	E40-6170-05	FLAT CABLE CONNECTOR		C74			CC73GCH1H120J	CHIP C 12PF J	C2
J1		*	E08-0877-05	MODULAR JACK		C74			CC73GCH1H270J	CHIP C 27PF J	C
CP3,4		*	RK75GB1J392J	CHIP-COM 3.9K J 1/16W		C75			CC73GCH1H050B	CHIP C 5.0PF B	C2
R1-6		*	RK73GB1J102J	CHIP R 1.0K J 1/16W		C75			CC73GCH1H100C	CHIP C 10PF C	C
R7-15		*	RK73FB2A272J	CHIP R 2.7K J 1/10W		C77			CC73GCH1H0R5B	CHIP C 0.5PF B	
Q1-8		*	KRC102S	DIGITAL TRANSISTOR		C78			CC73GCH1H330J	CHIP C 33PF J	C2
Q9		*	KRA225S	DIGITAL TRANSISTOR		C78,79			CK73GB1H471K	CHIP C 470PF K	C
Q10		*	KRC102S	DIGITAL TRANSISTOR		C79			CK73GB1H471K	CHIP C 470PF K	C2
<b>TX-RX UNIT (X57-6293-XX) -01:C, -02:C2</b>						C80			CK73GB1H103K	CHIP C 0.010UF K	
C12		*	CK73GB1H102K	CHIP C 1000PF K		C81			CC73GCH1H271J	CHIP C 270PF J	
C14		*	C92-0560-05	CHIP-TAN 10UF 6.3WV		C82			CK73GB1H471K	CHIP C 470PF K	
C22		*	CK73GB1H102K	CHIP C 1000PF K		C84			CK73GB1C104K	CHIP C 0.10UF K	
C24		*	CK73GB1H103K	CHIP C 0.010UF K		C85			CC73GCH1H010B	CHIP C 1.0PF B	
		*				C85,86			CC73GCH1H020B	CHIP C 2.0PF B	C2
		*				C86			CC73GCH1H2R5B	CHIP C 2.5PF B	C
		*				C87			CC73GCH1H560J	CHIP C 56PF J	
		*				C88			CK73GB1C104K	CHIP C 0.10UF K	
		*				C90			CK73GB1H471K	CHIP C 470PF K	

## PARTS LIST / 部品表

TX-RX UNIT (X57-6293-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C94			CC73GCH1H101J	CHIP C 100PF J		C174			CC73GCH1H101J	CHIP C 100PF J	
C95			CC73GCH1H050B	CHIP C 5.0PF B		C176			CK73GB1H102K	CHIP C 1000PF K	
C97			CC73GCH1H060B	CHIP C 6.0PF B		C177			CC73GCH1H220J	CHIP C 22PF J	
C99			CC73GCH1H050B	CHIP C 5.0PF B	C2	C178			CK73GB1C104K	CHIP C 0.10UF K	
C99,100			CC73GCH1H050B	CHIP C 5.0PF B	C	C179			CK73GB1H102K	CHIP C 1000PF K	
C100			CC73GCH1H060B	CHIP C 6.0PF B	C2	C180			CK73GB1H103J	CHIP C 0.010UF J	
C101			CK73GB1H471K	CHIP C 470PF K		C182			CK73GB1C104K	CHIP C 0.10UF K	
C102			CK73GB1C104K	CHIP C 0.10UF K		C184			CK73GB1H102K	CHIP C 1000PF K	
C103			C92-0568-05	CHIP-TAN 22UF 10WV		C185			CK73GB1H103J	CHIP C 0.010UF J	
C104,105			CC73GCH1H0R5B	CHIP C 0.5PF B		C186			CC73GCH1H020B	CHIP C 2.0PF B	
C106			CC73GCH1H180J	CHIP C 18PF J	C	C187,188			CK73GB1H102K	CHIP C 1000PF K	
C106			CC73GCH1H220J	CHIP C 22PF J	C2	C191			CK73GB1C473K	CHIP C 0.047UF K	
C107			CC73GCH1H060B	CHIP C 6.0PF B		C192,193			CK73GB1H103J	CHIP C 0.010UF J	
C108,109			CK73GB1H471K	CHIP C 470PF K		C194			CK73GB1H102K	CHIP C 1000PF K	
C110			CC73GCH1H060B	CHIP C 6.0PF B		C196			CK73GB1C333K	CHIP C 0.033UF K	
C111,112			CC73GCH1H331J	CHIP C 330PF J	C	C197			CK73GB1H102K	CHIP C 1000PF K	
C111,112			CC73GCH1H391J	CHIP C 390PF J	C2	C198			CK73GB1C333K	CHIP C 0.033UF K	
C113			CK73GB1H102K	CHIP C 1000PF K		C199			CC73GCH1H080B	CHIP C 8.0PF B	C
C114			CK73GB1C104K	CHIP C 0.10UF K		C199			CC73GCH1H120J	CHIP C 12PF J	C2
C115			CC73GCH1H060B	CHIP C 6.0PF B		C200,201			CK73GB1H102K	CHIP C 1000PF K	
C116,117			CK73GB1C104K	CHIP C 0.10UF K		C202			CC73GCH1H220J	CHIP C 22PF J	
C118			CC73GCH1H030B	CHIP C 3.0PF B		C206			CC73GCH1H040B	CHIP C 4.0PF B	C
C119			CK73GB1H103K	CHIP C 0.010UF K		C207			CC73GCH1H221J	CHIP C 220PF J	
C120			CK73GB1H472K	CHIP C 4700PF K		C208			CK73GB1H103K	CHIP C 0.010UF K	
C121			CC73GCH1H020B	CHIP C 2.0PF B		C209,210			CK73GB1H102K	CHIP C 1000PF K	
C122			CK73GB1H102K	CHIP C 1000PF K		C211			CK73GB1E183K	CHIP C 0.018UF K	
C123			C92-0662-05	CHIP-TAN 15UF 6.3WV		C212			CK73GB1H822K	CHIP C 8200PF K	
C125,126			CK73GB1H102K	CHIP C 1000PF K		C213			CK73GB1H102K	CHIP C 1000PF K	
C127			CK73GB1H103K	CHIP C 0.010UF K		C214			CK73GB1C683K	CHIP C 0.068UF K	
C128			CK73GB1H102K	CHIP C 1000PF K		C216			CC73GCH1H100C	CHIP C 10PF C	C2
C129			CK73GB1C104K	CHIP C 0.10UF K		C216			CC73GCH1H120J	CHIP C 12PF J	C
C133			CK73GB1H102K	CHIP C 1000PF K		C217			CK73FB1A105K	CHIP C 1.0UF K	
C135			CK73GB1H103K	CHIP C 0.010UF K		C218			CK73GB1C104K	CHIP C 0.10UF K	
C136			CK73GB1H102K	CHIP C 1000PF K		C220			CK73GB1C473K	CHIP C 0.047UF K	
C138			CC73GCH1H330J	CHIP C 33PF J		C221			CK73GB1H102K	CHIP C 1000PF K	
C141			CC73GCH1H180J	CHIP C 18PF J		C222			CK73GB1E123K	CHIP C 0.012UF K	
C142			CK73GB1E223K	CHIP C 0.022UF K		C223			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C143			CK73GB1H102K	CHIP C 1000PF K		C225			CK73GB1H222K	CHIP C 2200PF K	
C144			CK73GB1H392K	CHIP C 3900PF K		C226			CK73GB1C683K	CHIP C 0.068UF K	
C146			CK73GB1H102K	CHIP C 1000PF K		C228			CK73GB1H102K	CHIP C 1000PF K	
C147			CK73GB1E223K	CHIP C 0.022UF K		C230			CK73GB1H102K	CHIP C 1000PF K	
C150			CC73GCH1H150J	CHIP C 15PF J		C232			CK73GB1H102K	CHIP C 1000PF K	
C152			CC73GCH1H100C	CHIP C 10PF C		C233			C92-0719-05	ELECTRO 47UF 25WV	
C154			CK73GB1H102K	CHIP C 1000PF K		C236			CC73GCH1H220J	CHIP C 22PF J	
C155			CK73GB1H103K	CHIP C 0.010UF K		C237			CK73GB1C104K	CHIP C 0.10UF K	
C157			CK73GB1H102K	CHIP C 1000PF K		C239			CK73GB1H102K	CHIP C 1000PF K	
C158			CC73GCH1H220J	CHIP C 22PF J		C242			CK73GB1H102K	CHIP C 1000PF K	
C160			CK73FB1C334K	CHIP C 0.33UF K		C243			CK73GB1C104K	CHIP C 0.10UF K	
C162			CC73GCH1H101J	CHIP C 100PF J		C244			CC73GCH1H010B	CHIP C 1.0PF B	
C163			CC73GCH1H080B	CHIP C 8.0PF B		C246			C92-0719-05	ELECTRO 47UF 25WV	
C165			CK73GB1H103K	CHIP C 0.010UF K		C247			CC73GCH1H240J	CHIP C 24PF J	C
C167			CC73GCH1H100C	CHIP C 10PF C	C	C247			CC73GCH1H270J	CHIP C 27PF J	C2
C167			CC73GCH1H120J	CHIP C 12PF J	C2	C251,252			CK73GB1H102K	CHIP C 1000PF K	
C168			CK73GB1H103K	CHIP C 0.010UF K		C254			C92-0004-05	CHIP-TAN 1.0UF 16WV	
C169-171			CK73GB1H102K	CHIP C 1000PF K		C256			CK73GB1C104K	CHIP C 0.10UF K	
C173			CK73GB1C104K	CHIP C 0.10UF K		C261			C93-0559-05	CHIP C 9.0PF D	C



## PARTS LIST / 部品表

TX-RX UNIT (X57-6293-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C261			C93-0563-05	CHIP C 18PF J	C2	C344-353			CK73GB1H102K	CHIP C 1000PF K	
C262			C92-0568-05	CHIP-TAN 22UF 10WV		C355			CK73GB1C104K	CHIP C 0.10UF K	
C264			CK73GB1H102K	CHIP C 1000PF K		C356			CK73GB1H103K	CHIP C 0.010UF K	
C265			C92-0568-05	CHIP-TAN 22UF 10WV		C358			CK73GB1H102K	CHIP C 1000PF K	
C267			C93-0557-05	CHIP C 7.0PF D	C	C365,366			CK73GB1H102K	CHIP C 1000PF K	
C268			C92-0568-05	CHIP-TAN 22UF 10WV		C367			CC73GCH1H101J	CHIP C 100PF J	C
C269			CK73GB1H103K	CHIP C 0.010UF K		C367			CC73GCH1H151J	CHIP C 150PF J	C2
C270			C93-0556-05	CHIP C 6.0PF D	C	C371,372			CK73GB1H471K	CHIP C 470PF K	
C270			C93-0560-05	CHIP C 10PF D	C2	C374			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C273			CC73GCH1H040B	CHIP C 4.0PF B	C	C375			CK73GB1C104K	CHIP C 0.10UF K	
C273			CC73GCH1H060B	CHIP C 6.0PF B	C2	C376			CK73GB1H102K	CHIP C 1000PF K	
C274			CK73GB1H103K	CHIP C 0.010UF K		C377			C92-0004-05	CHIP-TAN 1.0UF 16WV	
C275			CK73GB1C104K	CHIP C 0.10UF K		C378			CK73GB1H102K	CHIP C 1000PF K	
C277			CK73FB1A105K	CHIP C 1.0UF K		C379			CK73GB1C104K	CHIP C 0.10UF K	
C279			CK73GB1H102K	CHIP C 1000PF K		C508			CK73GB1H102K	CHIP C 1000PF K	
C280			C92-0633-05	CHIP-TAN 22UF 10WV		C511			CK73GB1H102K	CHIP C 1000PF K	
C283			CK73GB1H102K	CHIP C 1000PF K		C512,513			CC73GCH1H101J	CHIP C 100PF J	
C284			CK73FB1C224K	CHIP C 0.22UF K		C514			CC73GCH1H100C	CHIP C 10PF C	
C286			CK73GB1C104K	CHIP C 0.10UF K		C515			CC73GCH1H0R5B	CHIP C 0.5PF B	C2
C288			C92-0721-05	ELECTRO 330UF 25WV		C515			CC73GCH1H040B	CHIP C 4.0PF B	C
C289			C93-0603-05	CHIP C 1000PF K		C518			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C290			CK73GB1H102K	CHIP C 1000PF K		C522			CC73GCH1H120J	CHIP C 12PF J	C
C291,292			CC73GCH1H0R5B	CHIP C 0.5PF B		C522			CC73GCH1H180J	CHIP C 18PF J	C2
C294,295			CK73GB1H102K	CHIP C 1000PF K		C523			CK73GB1H102K	CHIP C 1000PF K	
C296			C93-0565-05	CHIP C 27PF J		C524			CK73GB1H392K	CHIP C 3900PF K	
C297			CK73GB1C104K	CHIP C 0.10UF K		C525			CK73FB1A105K	CHIP C 1.0UF K	
C298,299			CK73GB1H102K	CHIP C 1000PF K		C526,527			CK73GB1H102K	CHIP C 1000PF K	
C301			C93-0554-05	CHIP C 4.0PF C		TC1-3			C05-0245-05	CERAMIC TRIMMER CAP(10PF)	
C302			C92-0040-05	CHIP-ELE 47UF 16WV		TC5		*	C05-0399-05	CERAMIC TRIMMER CAP(6PF)	
C303,304			CK73GB1H102K	CHIP C 1000PF K		CN1			E40-5651-05	FLAT CABLE CONNECTOR	
C305			C93-0565-05	CHIP C 27PF J		CN5			E40-3246-05	PIN ASSY	
C307			CK73GB1H102K	CHIP C 1000PF K		CN6			E23-0486-05	TERMINAL	
C308			C92-0560-05	CHIP-TAN 10UF 6.3WV		J1			E11-0425-05	3.5D PHONE JACK(3P)	
C310			CK73GB1H103K	CHIP C 0.010UF K		CF1		*	L72-0993-05	CERAMIC FILTER	
C312			CC73GCH1H0R5B	CHIP C 0.5PF B		CF2		*	L72-0999-05	CERAMIC FILTER	
C313			CC73GCH1H030B	CHIP C 3.0PF B		L1		*	L92-0140-05	FERRITE CHIP	
C314			CK73GB1C104K	CHIP C 0.10UF K		L2		*	L41-1005-08	SMALL FIXED INDUCTOR	
C315			C92-0004-05	CHIP-TAN 1.0UF 16WV		L3			L92-0138-05	FERRITE CHIP	
C316			C92-0516-05	CHIP-TAN 4.7UF 16WV		L4			L92-0140-05	FERRITE CHIP	
C318			CK73GB1H102K	CHIP C 1000PF K		L5,6			L40-2702-86	SMALL FIXED INDUCTOR(27UH)	C
C320			C92-0722-05	ELECTRO 470UF 16WV		L5,6			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	C2
C321			C93-0557-05	CHIP C 7.0PF D		L7			L92-0140-05	FERRITE CHIP	
C323			C93-0562-05	CHIP C 15PF J		L8			L40-2702-86	SMALL FIXED INDUCTOR(27UH)	C
C324			CK73GB1H102K	CHIP C 1000PF K		L8			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	C2
C326-328			CK73GB1H102K	CHIP C 1000PF K		L9			L40-2778-67	SMALL FIXED INDUCTOR(27NH)	C
C329			CK73GB1H103K	CHIP C 0.010UF K		L9			L40-3978-67	SMALL FIXED INDUCTOR(39NH)	C2
C330-332			CC73GCH1H101J	CHIP C 100PF J		L10			L40-2702-86	SMALL FIXED INDUCTOR(27U)	C
C333			CK73GB1H102K	CHIP C 1000PF K		L10			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	C2
C334			CC73GCH1H180J	CHIP C 18PF J	C	L11			L40-3978-67	SMALL FIXED INDUCTOR(39NH)	C
C334			CC73GCH1H220J	CHIP C 22PF J	C2	L11			L40-6878-67	SMALL FIXED INDUCTOR(68NH)	C2
C335,336			CK73GB1C104K	CHIP C 0.10UF K		L12			L40-3381-86	SMALL FIXED INDUCTOR(0.33UH)	
C337			C92-0507-05	CHIP-TAN 4.7UF 6.3WV		L13			L40-2702-86	SMALL FIXED INDUCTOR(27UH)	C
C338			CK73GB1C104K	CHIP C 0.10UF K		L13			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	C2
C340			C92-0560-05	CHIP-TAN 10UF 6.3WV		L14			L40-3381-86	SMALL FIXED INDUCTOR(0.33UH)	
C341			CK73GB1H102K	CHIP C 1000PF K		L15			L40-2702-86	SMALL FIXED INDUCTOR(27UH)	C
C342			C92-0507-05	CHIP-TAN 4.7UF 6.3WV		L15			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	C2

## PARTS LIST / 部品表

TX-RX UNIT (X57-6293-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L16			L92-0140-05	FERRITE CHIP		R34			RK73GB1J562J	CHIP R 5.6K J 1/16W	
L17			L41-3385-08	SMALL FIXED INDUCTOR		R36			RK73GB1J471J	CHIP R 470 J 1/16W	
L18			L92-0140-05	FERRITE CHIP		R37			RK73GB1J153J	CHIP R 15K J 1/16W	
L19			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	C2	R38			RK73GB1J562J	CHIP R 5.6K J 1/16W	
L19,20			L40-2702-86	SMALL FIXED INDUCTOR(27UH)	C	R39			RK73GB1J103J	CHIP R 10K J 1/16W	
L20			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	C2	R40			RK73GB1J224J	CHIP R 220K J 1/16W	
L21			L40-6875-92	SMALL FIXED INDUCTOR(68NH)	C2	R41			RK73GB1J273J	CHIP R 27K J 1/16W	
L21		*	L41-3375-06	SMALL FIXED INDUCTOR	C	R42			RK73GB1J183J	CHIP R 18K J 1/16W	
L22			L34-4554-05	COIL		R43			RK73GB1J273J	CHIP R 27K J 1/16W	
L23			L92-0140-05	FERRITE CHIP		R44			R92-1252-05	CHIP R 0 OHM	
L24		*	L41-1585-06	SMALL FIXED INDUCTOR		R45			RK73GB1J334J	CHIP R 330K J 1/16W	
L25		*	L41-1085-06	SMALL FIXED INDUCTOR		R46			RK73GB1J681J	CHIP R 680 J 1/16W	
L26		*	L41-8285-08	SMALL FIXED INDUCTOR		R47			RK73GB1J563J	CHIP R 56K J 1/16W	
L27		*	L41-5685-08	SMALL FIXED INDUCTOR		R48			RK73GB1J154J	CHIP R 150K J 1/16W	
L30			L34-4612-05	AIR-CORE COIL	C	R49			RK73GB1J823J	CHIP R 82K J 1/16W	
L30		*	L34-4613-05	AIR-CORE COIL	C2	R50			RK73GB1J473J	CHIP R 47K J 1/16W	
L31		*	L41-6875-08	SMALL FIXED INDUCTOR		R51			RK73GB1J102J	CHIP R 1.0K J 1/16W	
L32			L34-4612-05	AIR-CORE COIL	C	R52			RK73GB1J683J	CHIP R 68K J 1/16W	
L32		*	L34-4613-05	AIR-CORE COIL	C2	R53			RK73GB1J823J	CHIP R 82K J 1/16W	
L33		*	L41-6875-08	SMALL FIXED INDUCTOR		R54			RK73GB1J103J	CHIP R 10K J 1/16W	
L36			L34-4612-05	AIR-CORE COIL	C	R55			RK73GB1J272J	CHIP R 2.7K J 1/16W	
L36		*	L34-4613-05	AIR-CORE COIL	C2	R56			RK73GB1J152J	CHIP R 1.5K J 1/16W	
L38		*	L34-4611-05	AIR-CORE COIL		R57			RK73GB1J683J	CHIP R 68K J 1/16W	
L39		*	L34-4669-05	AIR-CORE COIL		R58			RK73GB1J473J	CHIP R 47K J 1/16W	
L40		*	L34-4667-05	AIR-CORE COIL		R59			RK73GB1J223J	CHIP R 22K J 1/16W	
L42		*	L34-4668-05	AIR-CORE COIL		R60			RK73GB1J103J	CHIP R 10K J 1/16W	
L43,44		*	L34-4670-05	AIR-CORE COIL		R61			RK73GB1J473J	CHIP R 47K J 1/16W	
L45		*	L34-4667-05	AIR-CORE COIL		R62,63			RK73GB1J104J	CHIP R 100K J 1/16W	
L52		*	L41-5675-06	SMALL FIXED INDUCTOR		R64			RK73GB1J154J	CHIP R 150K J 1/16W	
L54		*	L41-1085-06	SMALL FIXED INDUCTOR		R67			RK73GB1J223J	CHIP R 22K J 1/16W	
L55			L92-0140-05	FERRITE CHIP		R70			RK73GB1J473J	CHIP R 47K J 1/16W	
X1		*	L77-1868-15	TCXO(16.8MHZ)		R72			RK73GB1J224J	CHIP R 220K J 1/16W	
X2		*	L77-1867-05	CRYSTAL RESONATOR(7.159MHZ)		R73,74			RK73GB1J103J	CHIP R 10K J 1/16W	
XF1		*	L71-0591-05	MCF(49.95MHZ)		R76			RK73GB1J101J	CHIP R 100 J 1/16W	
						R77,78			RK73GB1J103J	CHIP R 10K J 1/16W	
R1			RK73GB1J332J	CHIP R 3.3K J 1/16W		R80-85			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R2			RK73GB1J102J	CHIP R 1.0K J 1/16W		R86			RK73GB1J101J	CHIP R 100 J 1/16W	
R3			R92-1252-05	CHIP R 0 OHM		R87			RK73GB1J223J	CHIP R 22K J 1/16W	
R4,5			RK73GB1J101J	CHIP R 100 J 1/16W		R88			RK73GB1J101J	CHIP R 100 J 1/16W	
R6,7			R92-1252-05	CHIP R 0 OHM		R89			RK73GB1J104J	CHIP R 100K J 1/16W	
R10,11			RK73GB1J102J	CHIP R 1.0K J 1/16W		R94			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R12			RK73GB1J152J	CHIP R 1.5K J 1/16W		R97			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R13			RK73GB1J102J	CHIP R 1.0K J 1/16W		R98			RK73GB1J331J	CHIP R 330 J 1/16W	C2
R15			RK73GB1J100J	CHIP R 10 J 1/16W		R98,99			RK73GB1J221J	CHIP R 220 J 1/16W	C
R18			RK73GB1J913J	CHIP R 91K J 1/16W		R99			RK73GB1J221J	CHIP R 220 J 1/16W	C2
R19			RK73GB1J683J	CHIP R 68K J 1/16W		R100			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R20			RK73GB1J104J	CHIP R 100K J 1/16W		R101			RK73GB1J124J	CHIP R 120K J 1/16W	
R21			RK73GB1J152J	CHIP R 1.5K J 1/16W		R102			RK73GB1J223J	CHIP R 22K J 1/16W	
R22			RK73GB1J122J	CHIP R 1.2K J 1/16W		R103			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R23			RK73GB1J102J	CHIP R 1.0K J 1/16W		R104			R92-1252-05	CHIP R 0 OHM	
R24			RK73GB1J754J	CHIP R 750K J 1/16W		R106			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R26,27			RK73GH1J153D	CHIP R 15K D 1/16W		R107			RK73GB1J101J	CHIP R 100 J 1/16W	
R28			R92-1252-05	CHIP R 0 OHM		R108			RK73GB1J274J	CHIP R 270K J 1/16W	
R30			RK73GB1J152J	CHIP R 1.5K J 1/16W		R109			R92-1252-05	CHIP R 0 OHM	
R31			RK73GB1J244J	CHIP R 240K J 1/16W		R111			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R32			R92-1252-05	CHIP R 0 OHM		R113			RK73GB1J183J	CHIP R 18K J 1/16W	
R33			RK73GB1J102J	CHIP R 1.0K 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
R115			RK73GB1J102J	CHIP R 1.0K J 1/16W		R185			RK73GB1J103J	CHIP R 10K J 1/16W	
R117			RK73GB1J102J	CHIP R 1.0K J 1/16W		R186			RK73GB1J100J	CHIP R 10 J 1/16W	C
R118			RK73GB1J473J	CHIP R 47K J 1/16W		R186			RK73GB1J330J	CHIP R 33 J 1/16W	C2
R119			RK73GB1J102J	CHIP R 1.0K J 1/16W		R188			RK73GB1J104J	CHIP R 100K J 1/16W	
R120			RK73GB1J473J	CHIP R 47K J 1/16W		R189			RK73GH1J124D	CHIP R 120K D 1/16W	
R122,123			RK73GB1J473J	CHIP R 47K J 1/16W		R190			RK73GB1J123J	CHIP R 12K J 1/16W	
R124			RK73GB1J472J	CHIP R 4.7K J 1/16W		R191			RK73GH1J913D	CHIP R 93K D 1/16W	
R126			RK73GB1J102J	CHIP R 1.0K J 1/16W		R192			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R127			RK73GB1J104J	CHIP R 100K J 1/16W		R193			RK73GB1J470J	CHIP R 47 J 1/16W	
R128			RK73GB1J105J	CHIP R 1.0M J 1/16W		R194			RK73GB1J153J	CHIP R 15K J 1/16W	
R130			RK73GB1J332J	CHIP R 3.3K J 1/16W		R195			RK73GH1J562D	CHIP R 5.6K D 1/16W	
R132			RK73GB1J471J	CHIP R 470 J 1/16W		R196			RK73GB1J471J	CHIP R 470 J 1/16W	
R133			RK73GB1J101J	CHIP R 100 J 1/16W		R197			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R134			R92-1252-05	CHIP R 0 OHM		R198			RK73GB1J220J	CHIP R 22 J 1/16W	
R135-140			RK73GB1J102J	CHIP R 1.0K J 1/16W		R202			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R141			RK73GB1J152J	CHIP R 1.5K J 1/16W		R203			RK73FB2A470J	CHIP R 47 J 1/10W	
R142-144			RK73GB1J102J	CHIP R 1.0K J 1/16W		R204			RK73GB1J104J	CHIP R 100K J 1/16W	
R145			R92-1252-05	CHIP R 0 OHM		R205			RK73FB2A100J	CHIP R 10 J 1/10W	
R146			RK73GB1J334J	CHIP R 330K J 1/16W		R206			R92-1252-05	CHIP R 0 OHM	
R147			RK73GB1J473J	CHIP R 47K J 1/16W		R207			RK73GB1J823J	CHIP R 82K J 1/16W	
R148			RK73GB1J223J	CHIP R 22K J 1/16W		R208			RK73GB1J151J	CHIP R 150 J 1/16W	
R149			RK73GB1J104J	CHIP R 100K J 1/16W		R209			RK73GB1J394J	CHIP R 390K J 1/16W	
R150			RK73GB1J102J	CHIP R 1.0K J 1/16W		R210			RK73GB1J334J	CHIP R 330K J 1/16W	
R151			RK73GB1J103J	CHIP R 10K J 1/16W		R211			RK73GB1J473J	CHIP R 47K J 1/16W	
R152			RK73GB1J473J	CHIP R 47K J 1/16W		R213			R92-0685-05	CHIP R 22 J 1/2W	
R153			RK73GB1J331J	CHIP R 330 J 1/16W		R214			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R154			RK73GB1J471J	CHIP R 470 J 1/16W		R215			RK73GB1J104J	CHIP R 100K J 1/16W	
R155			RK73GB1J472J	CHIP R 4.7K J 1/16W		R216			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R156			RK73GB1J101J	CHIP R 100 J 1/16W		R217			RK73GB1J474J	CHIP R 470K J 1/16W	
R158			RK73GB1J102J	CHIP R 1.0K J 1/16W		R218			RK73GB1J224J	CHIP R 220K J 1/16W	
R159,160			RK73GB1J101J	CHIP R 100 J 1/16W		R219			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R161			RK73GB1J333J	CHIP R 33K J 1/16W		R221			RK73FB2A331J	CHIP R 330 J 1/10W	
R162			RK73GB1J102J	CHIP R 1.0K J 1/16W	C	R224			RK73FB2A150J	CHIP R 15 J 1/10W	
R162,163			RK73GB1J102J	CHIP R 1.0K J 1/16W	C2	R227			RK73GB1J223J	CHIP R 22K J 1/16W	
R163			RK73GB1J471J	CHIP R 470 J 1/16W	C	R228			RK73GB1J184J	CHIP R 180K J 1/16W	
R164,165			RK73GB1J333J	CHIP R 33K J 1/16W		R229			RK73GB1J223J	CHIP R 22K J 1/16W	
R166			RK73GB1J102J	CHIP R 1.0K J 1/16W		R232			RK73GB1J184J	CHIP R 180K J 1/16W	
R167			RK73GB1J470J	CHIP R 47 J 1/16W		R233			RK73FB2A331J	CHIP R 330 J 1/10W	
R168			RK73GB1J333J	CHIP R 33K J 1/16W		R234			RK73GB1J153J	CHIP R 15K J 1/16W	
R169			RK73GB1J222J	CHIP R 2.2K J 1/16W		R236			R92-1213-05	CHIP R 100 J 1/2W	
R172			RK73GB1J102J	CHIP R 1.0K J 1/16W		R237			RK73GB1J104J	CHIP R 100K J 1/16W	
R173			RK73GB1J104J	CHIP R 100K J 1/16W		R238			RK73GB1J153J	CHIP R 15K J 1/16W	
R174			RK73GB1J470J	CHIP R 47 J 1/16W	C	R239			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R174			RK73GB1J560J	CHIP R 56 J 1/16W	C2	R240			RK73FB2A222J	CHIP R 2.2K J 1/10W	
R175			RK73GB1J221J	CHIP R 220 J 1/16W	C2	R241			RK73GB1J334J	CHIP R 330K J 1/16W	
R175			RK73GB1J271J	CHIP R 270 J 1/16W	C	R242			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R176			RK73GB1J823J	CHIP R 82K J 1/16W		R243			RK73GB1J103J	CHIP R 10K J 1/16W	
R177			RK73GB1J102J	CHIP R 1.0K J 1/16W		R244			RK73GB1J682J	CHIP R 6.8K J 1/16W	
R178			RK73GB1J180J	CHIP R 18 J 1/16W	C	R245,246			RK73GB1J104J	CHIP R 100K J 1/16W	
R178			RK73GB1J220J	CHIP R 22 J 1/16W	C2	R247			RK73GB1J103J	CHIP R 10K J 1/16W	
R179			RK73GB1J154J	CHIP R 150K J 1/16W		R248			RK73GB1J473J	CHIP R 47K J 1/16W	
R180			RK73GB1J221J	CHIP R 220 J 1/16W	C2	R249			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R180			RK73GB1J271J	CHIP R 270 J 1/16W	C	R250			RK73GB1J223J	CHIP R 22K J 1/16W	
R181			RK73GB1J102J	CHIP R 1.0K J 1/16W		R251			RK73GB1J273J	CHIP R 27K J 1/16W	
R183			RK73GB1J222J	CHIP R 2.2K J 1/16W		R252			RK73GB1J152J	CHIP R 1.5K J 1/16W	
R184			R92-1252-05	CHIP R 0 OHM		R254,255			RK73GB1J473J	CHIP R 47K 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
R257			R92-1261-05	CHIP R 150 J 1/2W		D14			MA360	VARI CAP	
R258			RK73GB1J104J	CHIP R 100K J 1/16W		D15			DAN222	DIODE	
R260			RK73GB1J473J	CHIP R 47K J 1/16W		D16			MA2S111	DIODE	
R261			RK73GB1J123J	CHIP R 12K J 1/16W		D18			MA742	DIODE	
R262			R92-1215-05	CHIP R 470 J 1/2W		D19			DAN235E	DIODE	
R263			RK73GB1J223J	CHIP R 22K J 1/16W		D20			1SS355	DIODE	
R264			RK73GB1J391J	CHIP R 390 J 1/16W		D21,22			HVC350B	VARI CAP	
R265			RK73GB1J472J	CHIP R 4.7K J 1/16W		D23			DA221	DIODE	
R266			RK73GB1J334J	CHIP R 330K J 1/16W		D24			MA742	DIODE	
R267			RK73GB1J223J	CHIP R 22K J 1/16W		D25,26			HVC350B	VARI CAP	
R268			R92-0670-05	CHIP R 0 OHM		D27			MA2S111	DIODE	
R271			RK73GB1J472J	CHIP R 4.7K J 1/16W		D30			MA4PH633	DIODE	
R272,273			RK73GB1J102J	CHIP R 1.0K J 1/16W		D31			XB15A709	DIODE	C
R274			RK73GB1J223J	CHIP R 22K J 1/16W		D32			MA4PH633	DIODE	C2
R275			RK73GB1J333J	CHIP R 33K J 1/16W		D34			MA742	DIODE	
R276-278			RK73GB1J102J	CHIP R 1.0K J 1/16W		D36			MA742	DIODE	
R279			RK73G1J393D	CHIP R 39K D 1/16W		D38			ZSH5MA27	SURGE ABSORBER	
R280			RK73GH1J274D	CHIP R 270K D 1/16W		D39			02D218(X,Y)	ZENER DIODE	
R281			RK73GB1J102J	CHIP R 1.0K J 1/16W		D41	*		1812L110PR	VARISTOR	
R282			RK73GB1J684J	CHIP R 680K J 1/16W		D43			DAN222	DIODE	
R283			RK73GB1J184J	CHIP R 180K J 1/16W		D44			1SS372	DIODE	
R285			RK73GB1J681J	CHIP R 680 J 1/16W		IC1			MB15A02	MOS IC	
R286			RK73GB1J124J	CHIP R 120K J 1/16W		IC3			M62363FP	MOS IC	
R287			RK73GB1J472J	CHIP R 4.7K J 1/16W		IC4			NJM2902V	MOS IC	
R288			R92-1252-05	CHIP R 0 OHM		IC5			TK14489V	BI-POLAR IC	
R301			RK73GB1J104J	CHIP R 100K J 1/16W		IC6	*		784214AGC125	MPU	
R302			RK73GB1J683J	CHIP R 68K J 1/16W		IC7			24LC08BT-ISN	ROM IC	
R303			RK73GB1J334J	CHIP R 330K J 1/16W		IC9			LC73872M	MOS IC	
R304			RK73GB1J224J	CHIP R 220K J 1/16W		IC10			NJM2902V	MOS IC	
R305			RK73GB1J913J	CHIP R 91K J 1/16W		IC11			NJM2904V	MOS IC	
R306			RK73GB1J224J	CHIP R 220K J 1/16W		IC12			TA75S01F	MOS IC	
R307			RK73GB1J333J	CHIP R 33K J 1/16W		IC14			NJM78L05UA	BI-POLAR IC	
R308			R92-1252-05	CHIP R 0 OHM		IC15			PST9140NR	MOS IC	
R310			RK73GB1J104J	CHIP R 100K J 1/16W		IC17			NJM78L05UA	BI-POLAR IC	
R311			RK73GB1J101J	CHIP R 100 J 1/16W		IC18			PST9140NR	MOS IC	
R313			RK73GB1J821J	CHIP R 820 J 1/16W		IC19			TC7W74FU	MOS IC	
R316			R92-1252-05	CHIP R 0 OHM		IC20	*		KIA7808AF	ANALOG IC	
R319,320			RK73GB1J474J	CHIP R 470K J 1/16W		IC21			NJM2100V	MOS IC	
R321			R92-1252-05	CHIP R 0 OHM		IC22			NJM2904V	MOS IC	
R322			RK73GB1J683J	CHIP R 68K J 1/16W		IC23			UPB1509GV	BI-POLAR IC	
R323			R92-1252-05	CHIP R 0 OHM		IC101			M67741H-32	POWER MODULE	C
R324,325			RK73GB1J102J	CHIP R 1.0K J 1/16W		IC101			M67741L-35	POWER MODULE	C2
R326			RK73GB1J152J	CHIP R 1.5K J 1/16W		IC102			LA4600	AF POWER AMP	
R328			R92-1252-05	CHIP R 0 OHM		Q2			2SJ243	FET	
R329			RK73GB1J473J	CHIP R 47K J 1/16W		Q3			2SC4649(N,P)	TRANSISTOR	
R330			RK73GB1J183J	CHIP R 18K J 1/16W		Q4			2SA1832(GR)	TRANSISTOR	
R331			RK73GB1J102J	CHIP R 1.0K J 1/16W		Q5			2SC4738(GR)	TRANSISTOR	
R332			RK73GB1J474J	CHIP R 470K J 1/16W		Q6			2SC4617(S)	TRANSISTOR	
R333			RK73GB1J394J	CHIP R 390K J 1/16W		Q7			2SJ243	FET	
R334,335			RK73GB1J472J	CHIP R 4.7K J 1/16W		Q10,11			2SK508NV(K52)	FET	
R336			RK73GB1J473J	CHIP R 47K J 1/16W		Q12			KRX102U	TRANSISTOR	
D1-4			DA221	DIODE		Q13	*		KRC404RTK	DIGITAL TRANSISTOR	
D6			MA2S111	DIODE		Q14			2SC4617(S)	TRANSISTOR	
D7			HZU5ALL	DIODE		Q15			2SC5108(Y)	TRANSISTOR	
D9-12			MA2S304	VARI CAP		Q16	*		KRC414RTK	DIGITAL TRANSISTOR	
D13			DAN222	DIODE							

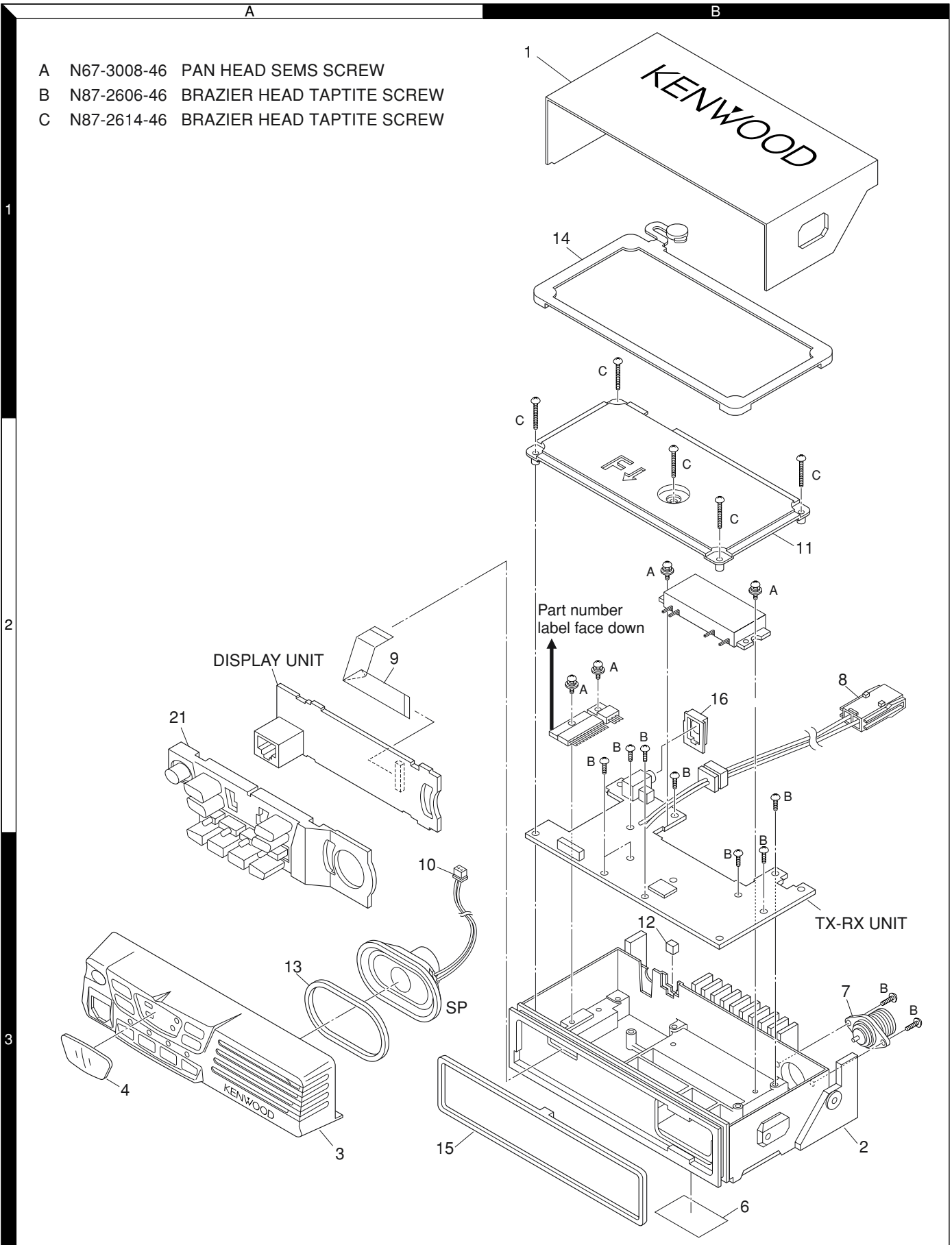
## PARTS LIST / 部品表

TX-RX UNIT (X57-6293-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
Q18			2SC2412K	TRANSISTOR							
Q19,20			2SC4649(N,P)	TRANSISTOR							
Q21		*	3SK255	FET							
Q22			2SK1824	FET							
Q23			2SC3357	TRANSISTOR							
Q24			2SC4617(S)	TRANSISTOR							
Q25			2SC2954	TRANSISTOR							
Q26		*	3SK255	FET							
Q27			2SC2412K	TRANSISTOR							
Q29,30			KRC102S	DIGITAL TRANSISTOR							
Q31			2SA1745(6,7)	TRANSISTOR							
Q32			DTC363EU	DIGITAL TRANSISTOR							
Q33			KTA1664(Y)	TRANSISTOR							
Q34,35			KRC102S	DIGITAL TRANSISTOR							
Q37,38		*	KRC404RTK	DIGITAL TRANSISTOR							
Q41			2SC4919	TRANSISTOR							
Q42			2SA1641(S,T)	TRANSISTOR							
Q43			2SK1824	FET							
Q101			KTA1046(Y)	TRANSISTOR							
TH1-3			S1R104J475H	THERMISTOR							
TH5			S1R104J475H	THERMISTOR							
TH6			157-102-65001	THERMISTOR	C2						

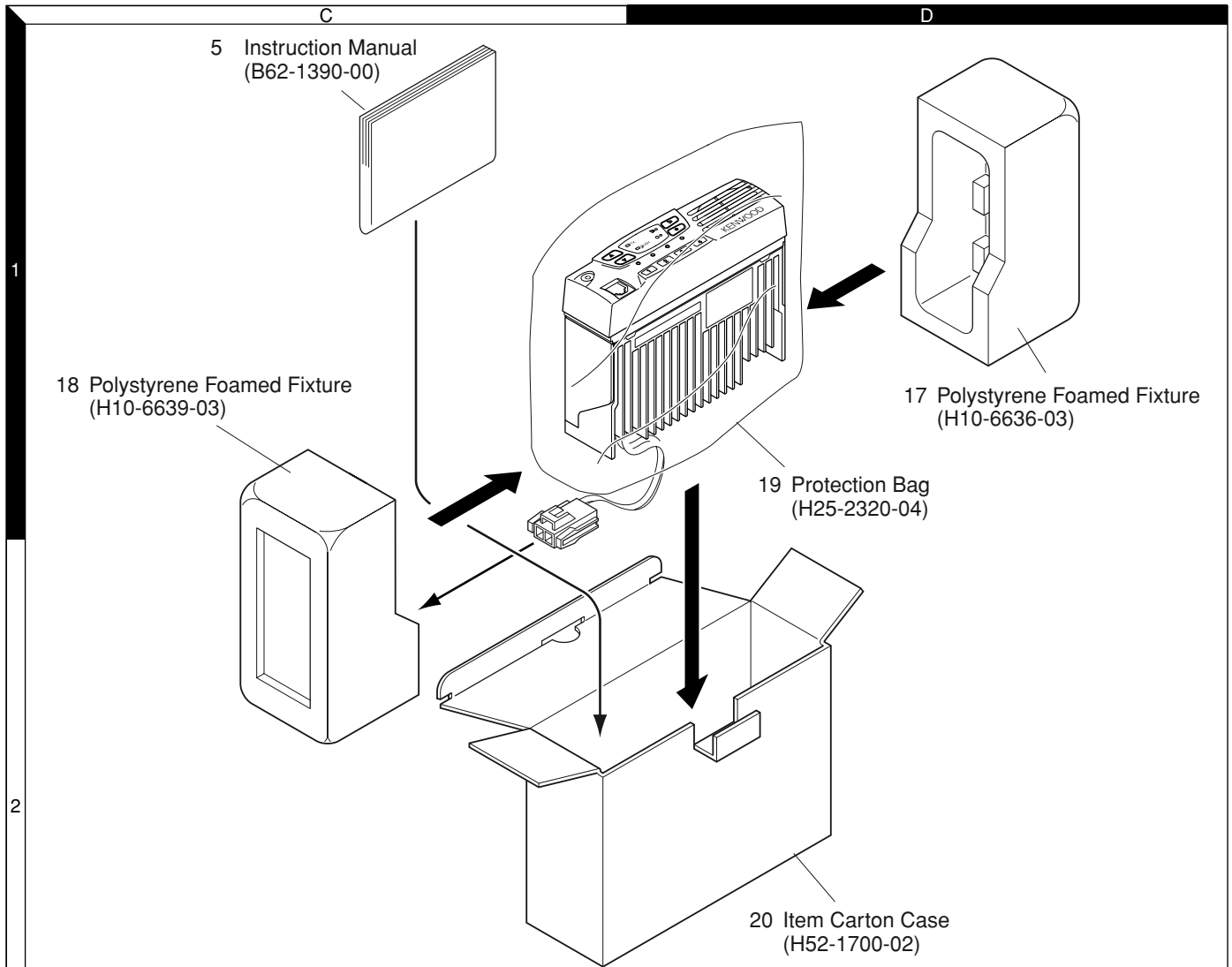
## EXPLODED VIEW / 部件分解图

- A N67-3008-46 PAN HEAD SEMS SCREW
- B N87-2606-46 BRAZIER HEAD TAPTITE SCREW
- C N87-2614-46 BRAZIER HEAD TAPTITE SCREW

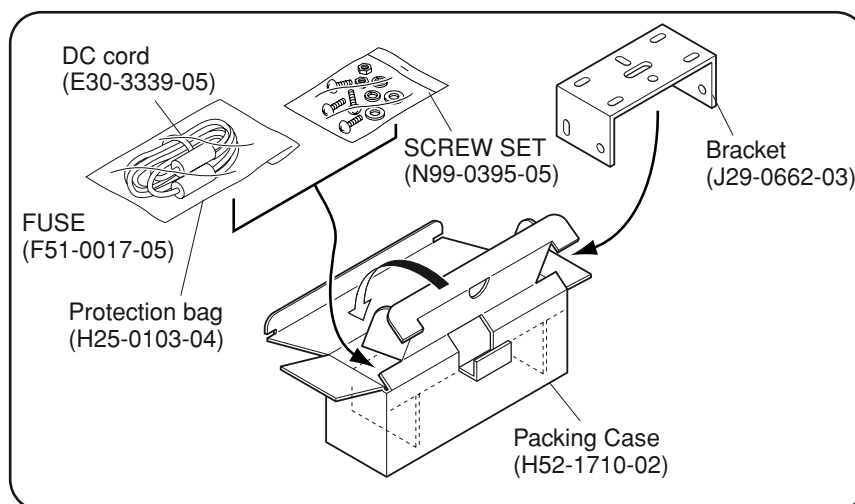




## PACKING / 包装



## KMB-19 (INSTALLATION KIT)



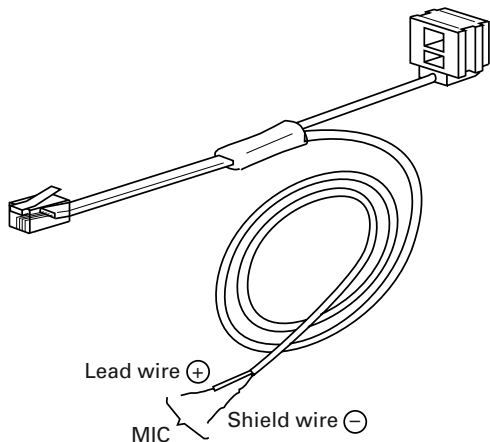
## ADJUSTMENT

### Test Equipment Required for Alignment

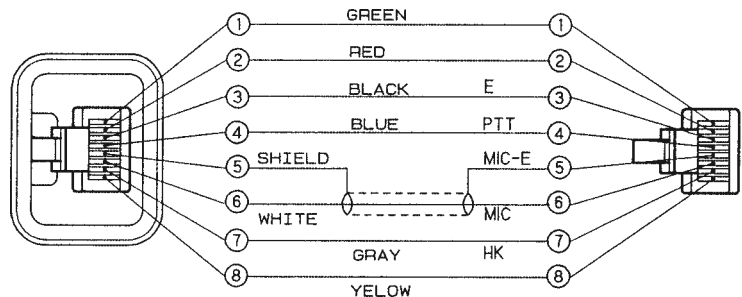
Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output	136 to 175MHz Frequency modulation and external modulation -127dBm/0.1μV to greater than -7dBm/100mV
2. Power Meter	Input Impedance Operation Frequency Measurement Capability	50 136 to 175MHz or more Vicinity of 100W
3. Deviation Meter	Frequency Range	136 to 175MHz
4. Digital Volt Meter (DVM)	Measuring Range Accuracy	1 to 20V DC High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 1000MHz 0.2ppm or less
7. Ammeter		20A
8. AF Volt Meter (AF VTVM)	Frequency Range Voltage Range	50Hz to 10kHz 1mV to 3V
9. Audio Generator (AG)	Frequency Range Output	20Hz to 20kHz or more 0 to 1V
10. Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11. 4 Dummy Load		Approx. 4 , 10W or more
12. Regulated Power Supply		13.6V, approx. 20A (adjustable from 9 to 17V) Useful if ammeter requipped
13. Spectrum Analyzer	Center frequency	50KHz to 600MHz
14. Tracking Generator	Output Voltage	100mV or more

### Tuning cable (E30-3383-05)

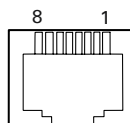
Adapter cable (E30-3383-05) is required for injecting an audio if PC tuning is used. See "PC Mode" section for the connection.



### Test cable for microphone input (E30-3360-08)



### MIC connector (Front view)



- 1 : BLC
- 2 : PSB
- 3 : E
- 4 : PTT
- 5 : ME
- 6 : MIC
- 7 : HOOK
- 8 : CM

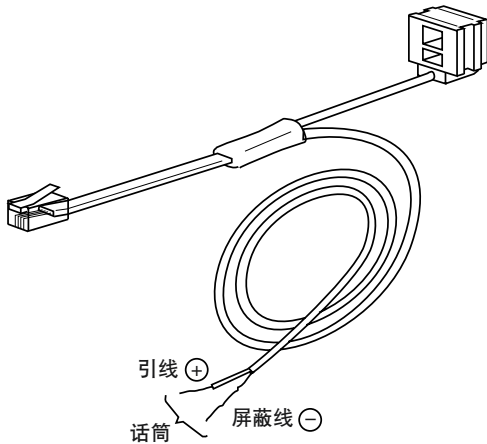
## 调整

### 所需的用于调整的测试设备

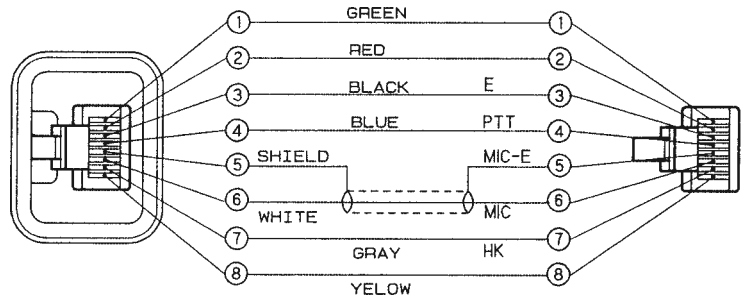
测试设备	主要特性	
1. 标准信号发生器 (SSG)	频率范围 调制 输出	136 到 175MHz 调频和外部调制 -127dBm/0.1μV 到大于 -7dBm/100mV
2. 功率计	输入阻抗 操作频率 测量范围	50 136 到 175MHz 或更高 100W左右
3. 偏差仪	频率范围	136 到 175MHz
4. 数字电压表 (DVM)	测量范围 输入阻抗	直流1到 20V 为最小电路负载高输入阻抗
5. 示波器		直流到30MHz
6. 高灵敏度 频率计数器	频率范围 频率稳定性	10Hz 到 1000MHz 0.2ppm或更低
7. 电流表		20A
8. 音频电压表 (AF VTVM)	频率范围 电压范围	50Hz 到 10kHz 1mV 到 3V
9. 音频发生器 (AG)	频率范围 输出	20Hz 到 20kHz或更高 0 到 1V
10. 失真测试仪	容量 输入电平	在1kHz时3%或更低 50mV 到 10Vrms
11. 4 假负载		大约 4 Ω, 10W或更高
12. 可调电源		13.6V, 大约20A (adjustable from 9 to 17V) 配备了电流表时有用
13. 频谱分析仪	中心频率	50KHz 到 600MHz
14. 轨迹发生器	输出电压	100mV或更高

### 调谐电缆 (E30-3383-05)

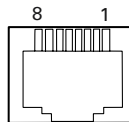
如果使用计算机调协, 接头电缆 (E30-3383-05)  
将用于插入一个音频。  
参见 "计算机模式" 章节有关连接的内容。



### 用于话筒输入的测试电缆 (E30-3360-08)



### 话筒连接器 (前视)

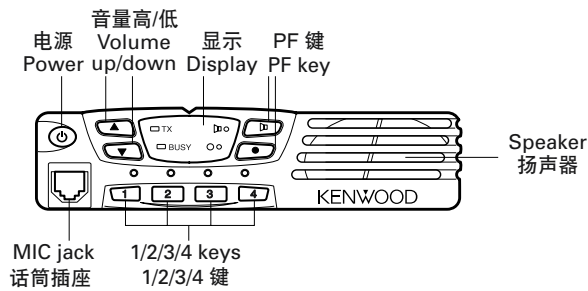


- 1 : BLC
- 2 : PSB
- 3 : E
- 4 : PTT
- 5 : ME
- 6 : MIC
- 7 : HOOK
- 8 : CM

## ADJUSTMENT / 调整

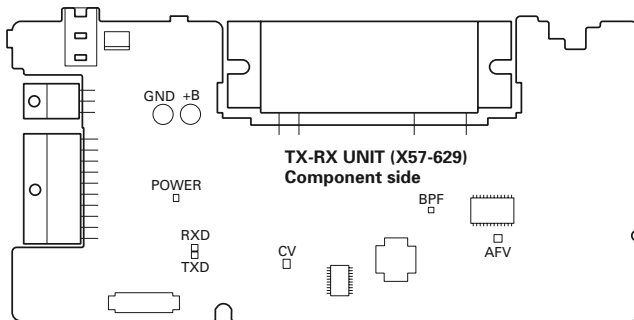
### Adjustment Location / 调整定位

#### ■ Switch / 开关

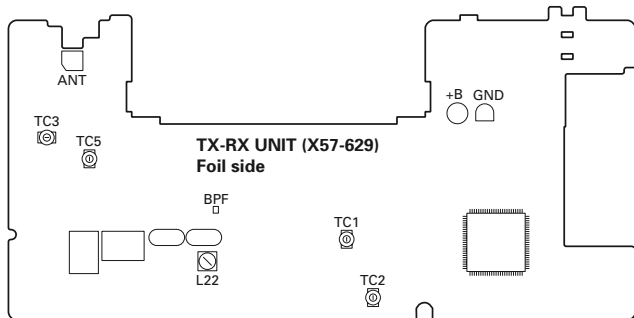


### ■ Adjustment Point / 调整点

#### • Component Side View / 元件侧视图

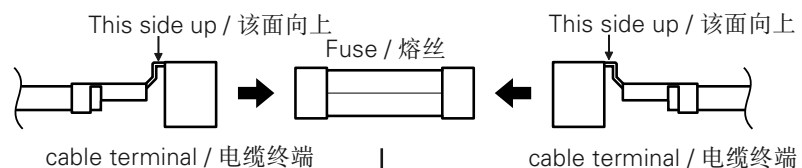
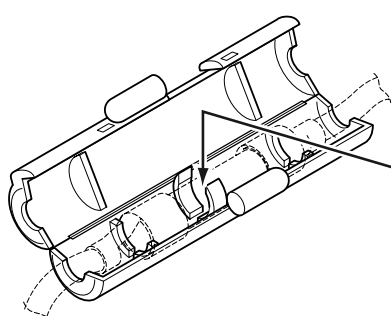


#### • Foil Side View / 锡箔面侧视图



#### • FUSE

To mount the Fuse, the cable terminal direction must be as follows.



### ■ Note / 注释

#### • EEPROM

The tuning data (Deviation, Squelch, etc.) for the EEPROM, is stored in memory. When parts are changed, readjust the transceiver.

#### • EEPROM

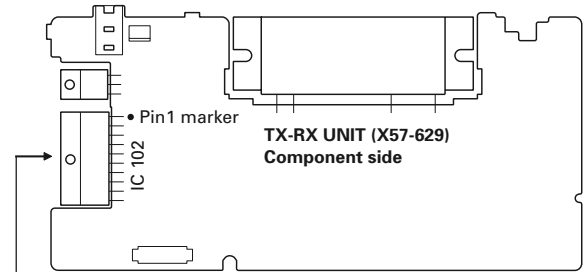
EEPROM的调谐数据(偏差, 静噪等等)被储存在存储器中。当零件被改变时, 调整通信机。

#### • AF PA IC (IC102)

How to mounting the IC102.

#### • AF PA IC (IC102)

IC 102 安装方法。



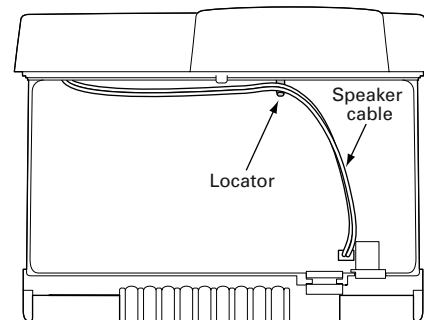
Part name label face down. / 部件名称标签向下。

#### • SPEAKER CABLE

The speaker cable should be formed before mounting the shield cover as below.

#### • 扬声器电缆

安装屏蔽罩前, 按如下所示整理扬声器电缆。



#### • 熔丝

安装熔丝, 电缆端子方向必须为如下所示。

## ADJUSTMENT

Use KPG-70D programming software for adjustment of the next items.

### PCB Section

Item	Condition	Measurement		Adjustment		Specifications/ Remarks
		Test equipment	Terminal	Parts	Method	
1. Setting	1) Power supply voltage DC Power supply terminal:13.6V					
2. VCO lock voltage	1) CH: TX high	Digital voltmeter	CV	TC2	5.5V	±0.1V
	2) CH: RX high			TC1	5.5V	±0.1V
	3) CH: TX low				Check	
	4) CH: RX low					0.8V or more
3. IF Coil	1) CH: RX center wide 2) SSG output: -53dBm(501uV) Mod: 1kHz, Dev: 3kHz	SSG Digital voltmeter	AFV	L22	3.2~3.3V(DC)	
4. RF Band-pass filter	1) CH: RX center wide CH: RX low wide CH: RX high wide 2) Tra generator output: -30dBm Connect the spectrum analyzer to BPF terminal	Tra generator Spectrum analyzer	ANT BPF	TC3 TC5	Adjust the BPF waveform to Fig.1	

### Receiver Section

Item	Condition	Measurement		Adjustment		Specifications/ Remarks
		Test equipment	Terminal	Parts	Method	
1. Sensitivity	1) CH: RX low: Wide/Narrow CH: RX center: Wide/Narrow CH: RX high: Wide/Narrow 2) SSG output: -118dBm(0.28μV): Wide -116dBm(0.35μV): Narrow Mod: 1kHz Dev: ±3.0kHz: Wide Dev: ±1.5kHz: Narrow	SSG Oscilloscope AF. V. M Distortion meter	ANT Ext. SP		Check	SINAD: 12dB or higher
2. Squelch 9	1) CH: RX low: Wide CH: RX center: Wide/Narrow CH: RX high: Wide 2) SSG output: 9dB above to 12dB SINAD level: Wide/Narrow Mod: 1kHz Dev: ±3.0kHz: Wide Dev: ±1.5kHz: Narrow			PC key	Adjust to open the squelch.	
3. Squelch 1	1) CH: RX low: Wide CH: RX center: Wide/Narrow CH: RX high: Wide 2) SSG output: 2dB above to 12dB SINAD level: Wide/Narrow Mod: 1kHz Dev: ±3.0kHz: Wide Dev: ±1.5kHz: Narrow					

### Test frequency(MHz)

#### TK-7108 C

Channel	TX	RX
1: Center	160.100	160.050
2: Low	146.100	146.050
3: High	173.900	173.950
4	160.000	160.000
5	160.200	160.200
6	160.400	160.400

#### TK-7108 C2

Channel	TX	RX
1: Center	149.100	149.050
2: Low	136.100	136.050
3: High	161.900	161.950
4	149.000	149.000
5	149.200	149.200
6	149.400	149.400

## 调整

使用KPG-70D 编程软件调整下记项目。

## PCB 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. 设定	1) 电源电压 直流电源终端:13.6V					
2. 压控振荡器电压	1) CH: 发射高频点	数字电压表	CV	TC2	5.5V	± 0.1V
	2) CH: 接收高频点			TC1	5.5V	± 0.1V
	3) CH: 发射低频点				检查	0.8V或更高
	4) CH: 接收低频点					
3. IF Coil	1) CH:接收中频点 宽 2) 标准信号发生器输出: -53dBm(501uV) 调制: 1kHz, 频偏: 3kHz	SSG 数字电压表	AFV	L22	3.2~3.3V(DC)	
4. RF带电滤波器	1) CH: 接收中频点 宽 CH: 接收低频点 宽 CH: 接收高频点 宽 2) 轨迹发生器输出: -30dBm 连接频率分析仪到BPF终端	轨迹发生器 频谱分析仪	天线 BPF	TC3 TC5	按图1调整BPF波形	

## 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. 灵敏度	1) CH: 接收低频点: 宽/窄 CH: 接收中心频点: 宽/窄 CH: 接收高频点: 宽/窄 2) 标准信号发生器输出: -118dBm(0.28μV): 宽 -116dBm(0.35μV): 窄 Mod: 1kHz Dev: ±3.0kHz: 宽 Dev: ±1.5kHz: 窄	SSG 示波器 AFVM 失真测试仪	天线 外部扬声器		检查	SIND: 12dB或更高
2. 静噪抑制电路9	1) CH: 接收低频点: 宽 CH: 接收中心频点: 宽/窄 CH: 接收高频点: 宽 2) 标准信号发生器输出: 9dBm以上12dB SIND电平: 宽/窄 Mod: 1kHz Dev: ±3.0kHz: 宽 Dev: ±1.5kHz: 窄			PC机键	经调整打开静噪	
3. 静噪抑制电路1	1) CH: 接收低频点: 宽 CH: 接收中心频点: 宽/窄 CH: 接收高频点: 宽 2) 标准信号发生器输出: 2dBm以上12dB SIND电平: 宽/窄 Mod: 1kHz Dev: ±3.0kHz: 宽 Dev: ±1.5kHz: 窄					

## 测试频率(MHz)

## TK-7108 C

信道	发射	接收
1: 中心	160.100	160.050
2: 低	146.100	146.050
3: 高	173.900	173.950
4	160.000	160.000
5	160.200	160.200
6	160.400	160.400


## TK-7108 C2

信道	发射	接收
1: 中心	149.100	149.050
2: 低	136.100	136.050
3: 高	161.900	161.950
4	149.000	149.000
5	149.200	149.200
6	149.400	149.400



## ADJUSTMENT

### Transmitter section

Item	Condition	Measurement		Adjustment		Specifications/ Remarks	
		Test equipment	Terminal	Parts	Method		
1. Frequency	1) CH: TX center 2) Transmit	Frequency counter	ANT	PC key	Adjust to center frequency	within $\pm 100\text{Hz}$	
2. High power	1) CH: TX low CH: TX low' CH: TX center CH: TX high' CH: TX high 2) Transmit	Power meter			25W	$\pm 1.0\text{W}$	
3. Low Power	1) CH: TX low CH: TX low' CH: TX center CH: TX high' CH: TX high 2) Transmit				5W	$\pm 0.5\text{W}$	
4. DQT balance	1) CH: TX low: Wide CH: TX center: Wide/Narrow CH: TX high: Wide 2) Transmit				Modulation analyzer or linear detector(LPF: 3kHz) Oscilloscope	Adjust the waveform as below 	
5. Max deviation	1) CH: TX low: Wide CH: TX center: Wide/Narrow CH: TX high: Wide 2) AG: 1kHz/50mV 3) Transmit	Modulation analyzer or linear detector(LPF: 15kHz) Oscilloscope AG			ANT MIC	$\pm 4.0\text{kHz}$ : Wide $\pm 2.0\text{kHz}$ : Narrow According to the large +,-	$\pm 50\text{Hz}$
6. Mic sensitivity	1) CH: TX center: Wide/Narrow 2) AG: 1kHz/5mV 3) Transmit	AF.V.M				Check	$\pm 3\text{kHz} \pm 0.2\text{kHz}$ : Wide $\pm 1.5\text{kHz} \pm 0.1\text{kHz}$ : Narrow
7. QT deviation	1) CH: TX low: Wide CH: TX center: Wide/Narrow CH: TX high: Wide 2) Transmit	Modulation analyzer or linear detector(LPF: 3kHz) Oscilloscope				$\pm 0.75\text{kHz}$ : Wide $\pm 0.35\text{kHz}$ : Narrow	$\pm 0.05\text{kHz}$
8. QT deviation	1) CH: TX low: Wide CH: TX center: Wide/Narrow CH: TX high: Wide 2) Transmit					$\pm 0.75\text{kHz}$ : Wide $\pm 0.35\text{kHz}$ : Narrow	$\pm 0.05\text{kHz}$
9. DTMF deviation	1) CH: TX center: Wide/Narrow 2) Transmit					$\pm 3.0\text{kHz}$ : Wide $\pm 1.5\text{kHz}$ : Narrow	$\pm 0.2\text{kHz}$

### Test frequency(MHz)

#### TK-7108 C

Channel	TX	RX
1: Center	160.100	160.050
2: Low	146.100	146.050
3: High	173.900	173.950
4	160.000	160.000
5	160.200	160.200
6	160.400	160.400

#### TK-7108 C2

Channel	TX	RX
1: Center	149.100	149.050
2: Low	136.100	136.050
3: High	161.900	161.950
4	149.000	149.000
5	149.200	149.200
6	149.400	149.400

## 调整

## 发射部分

项目	条件	测量		调整		规格/备注
		测试设备	终端	部件	方法	
1. 频率	1) CH: 发射中心频点 2) 发射	频率计数器	天线	PC机键	调整中心频率	±100Hz以内
2. 高功率	1) CH: 发射低频点 CH: 发射低频点' CH: 发射中心频点 CH: 发射高频点' CH: 发射高频点 2) 发射	功率表			25W	±1.0W
3. 低功率	1) CH: 发射低频点 CH: 发射低频点' CH: 发射中心频点 CH: 发射高频点' CH: 发射高频点 2) 发射				5W	±0.5W
4. DQT 平衡	1) CH: 发射低频点: 宽 CH: 发射中心频点: 宽/窄 CH: 发射高频点: 宽 2) 发射				频谱分析仪 线性失真检测 (LPF: 3kHz) 示波器	
5. 最大 DEV	1) CH: 发射低频点: 宽 CH: 发射中心频点: 宽/窄 CH: 发射高频点: 宽 2) AG: 1kHz/50mV 3) 发射	频谱分析仪 线性失真检测 (LPF: 15kHz) 示波器 AG	天线 MIC		±4.0kHz: 宽 ±2.0kHz: 窄 按照较大+,-	±50Hz
6. 调制 灵敏度	1) CH: 发射中心频点: 宽/窄 2) AG: 1kHz/5mV 3) 发射	AFV.M			检查	±3kHz±0.2kHz: 宽 ±1.5kHz±0.1kHz: 窄
7. QT DEV	1) CH: 发射低频点: 宽 CH: 发射中心频点: 宽/窄 CH: 发射高频点: 宽 2) 发射	频谱分析仪 线性失真检测 (LPF: 3kHz) 示波器			±0.75kHz: 宽 ±0.35kHz: 窄	±0.05kHz
8. QT DEV	1) CH: 发射低频点: 宽 CH: 发射中心频点: 宽/窄 CH: 发射高频点: 宽 2) 发射				±0.75kHz: 宽 ±0.35kHz: 窄	±0.05kHz
9. DTMF DEV	1) CH: 发射中心频点: 宽/窄 2) 发射				±3.0kHz: 宽 ±1.5kHz: 窄	±0.2kHz

## 测试频率(MHz)

## TK-7108 C

信道	发射	接收
1: 中心	160.100	160.050
2: 低	146.100	146.050
3: 高	173.900	173.950
4	160.000	160.000
5	160.200	160.200
6	160.400	160.400

## TK-7108 C2

信道	发射	接收
1: 中心	149.100	149.050
2: 低	136.100	136.050
3: 高	161.900	161.950
4	149.000	149.000
5	149.200	149.200
6	149.400	149.400

## ADJUSTMENT / 调整

### BPF-Wave

- TK-7108 C

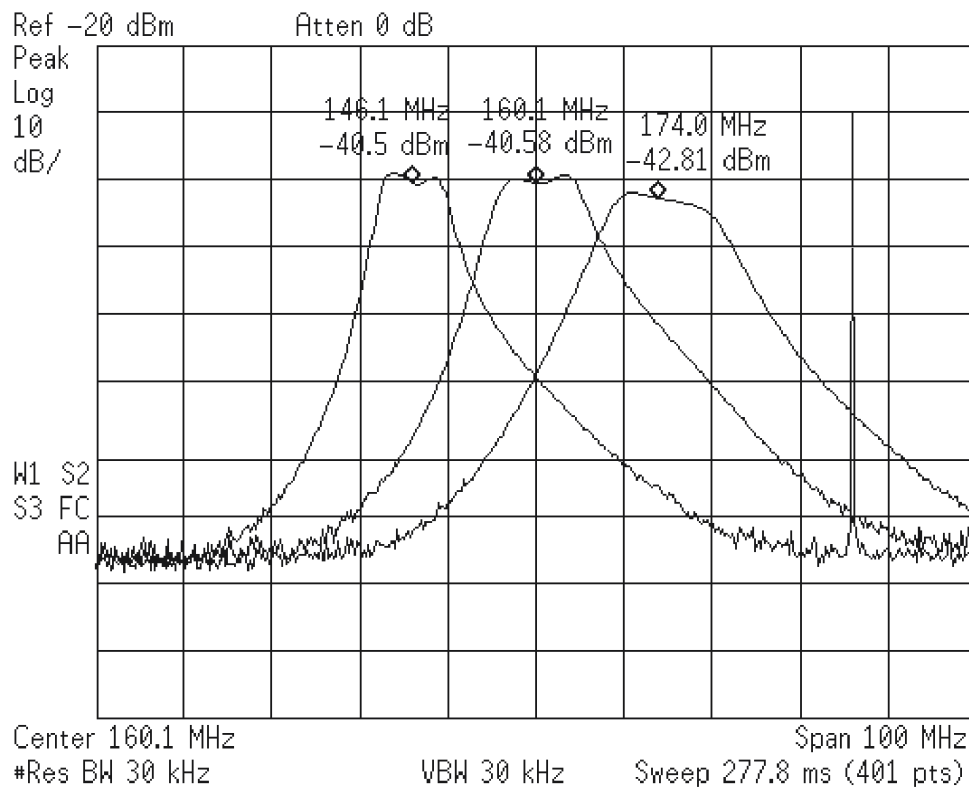


Fig. 1 / 图1

- TK-7108 C2

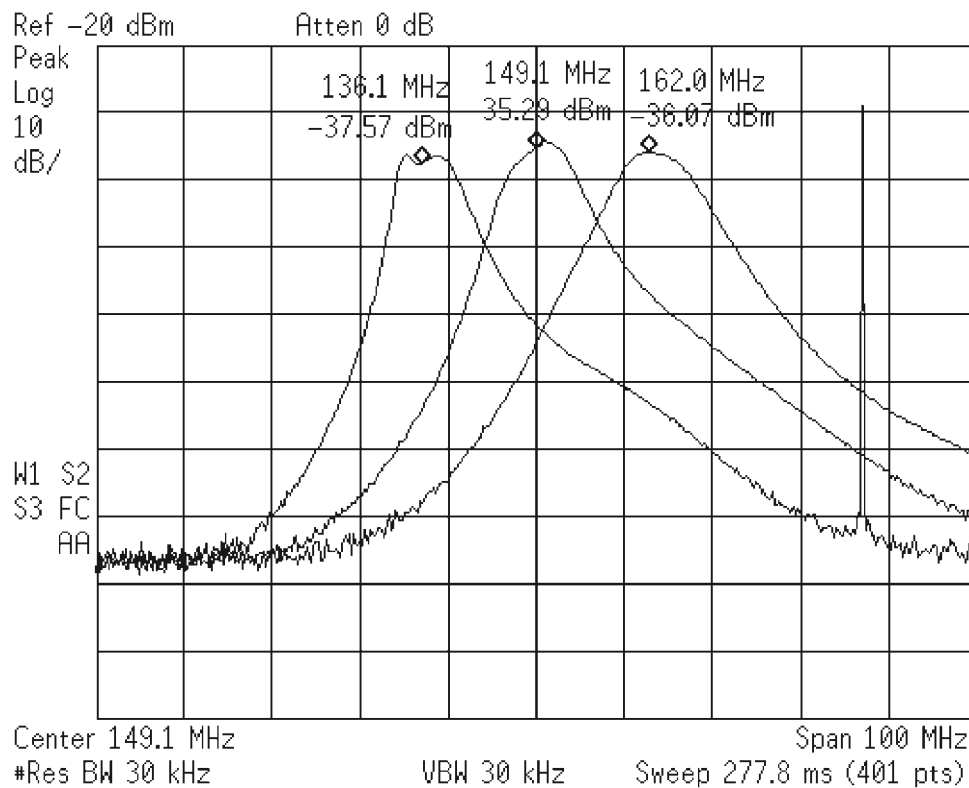
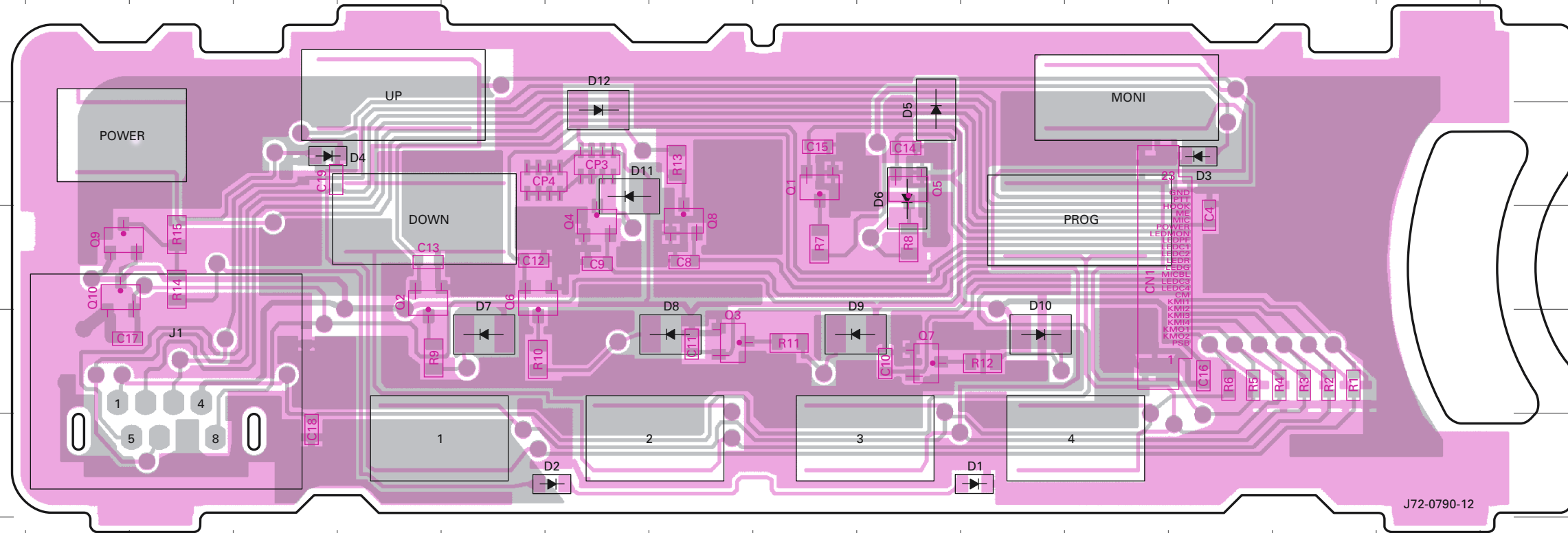


Fig. 2 / 图2

# PC BOARD VIEW / PC 板视图 TK-7108

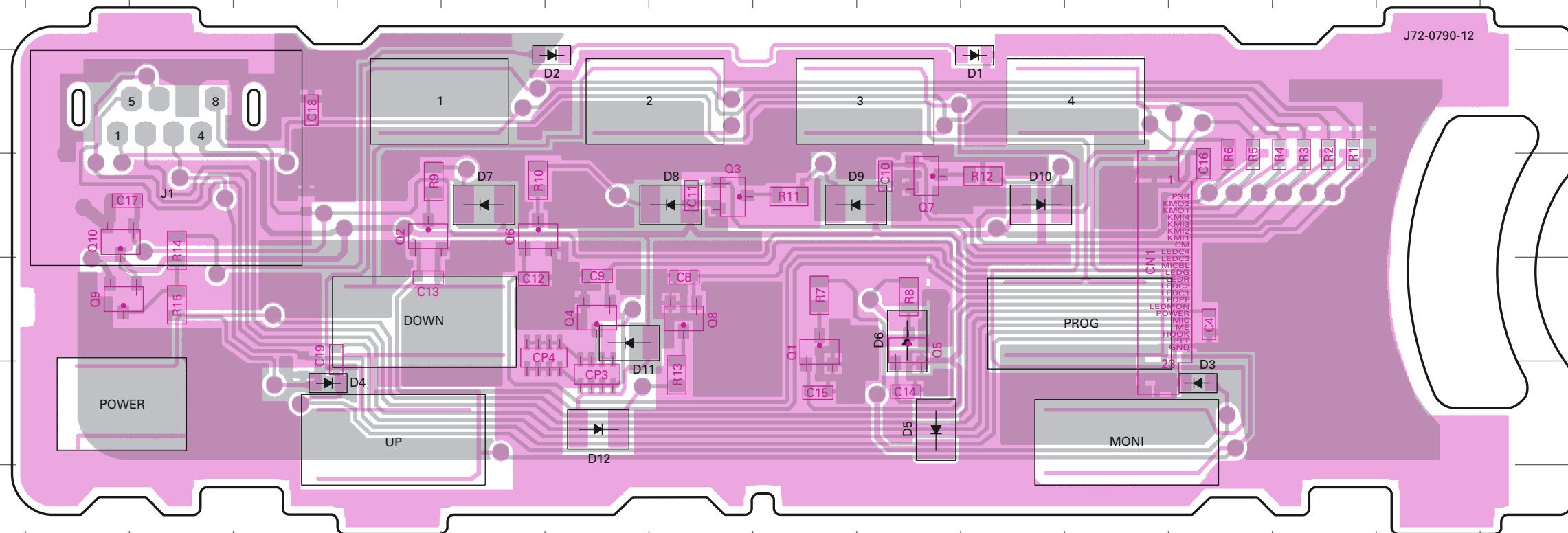
DISPLAY UNIT (X54-3340-20) Component side view + Foil side view



DISPLAY UNIT (X57-3340-20) Component side view

Ref. No.	Address
Q1	4J
Q2	5F
Q3	6I
Q4	5H
Q5	4K
Q6	5G
Q7	6K
Q8	5I
Q9	5C
Q10	5C
D1	7L
D2	7H
D3	4N
D4	4E
D5	4K
D6	4K
D7	6G
D8	6I
D9	6J
D10	6L
D11	4H
D12	4H

Component side  
Foil side



DISPLAY UNIT (X54-3340-20) Foil side view

Ref. No.	Address
Q1	11J
Q2	10F
Q3	10I
Q4	11H
Q5	11K
Q6	10G
Q7	10K
Q8	11I
Q9	11C
Q10	10C
D1	9L
D2	9H
D3	12N
D4	12E
D5	12K
D6	11K
D7	10G
D8	10I
D9	10J
D10	10L
D11	11H
D12	12H

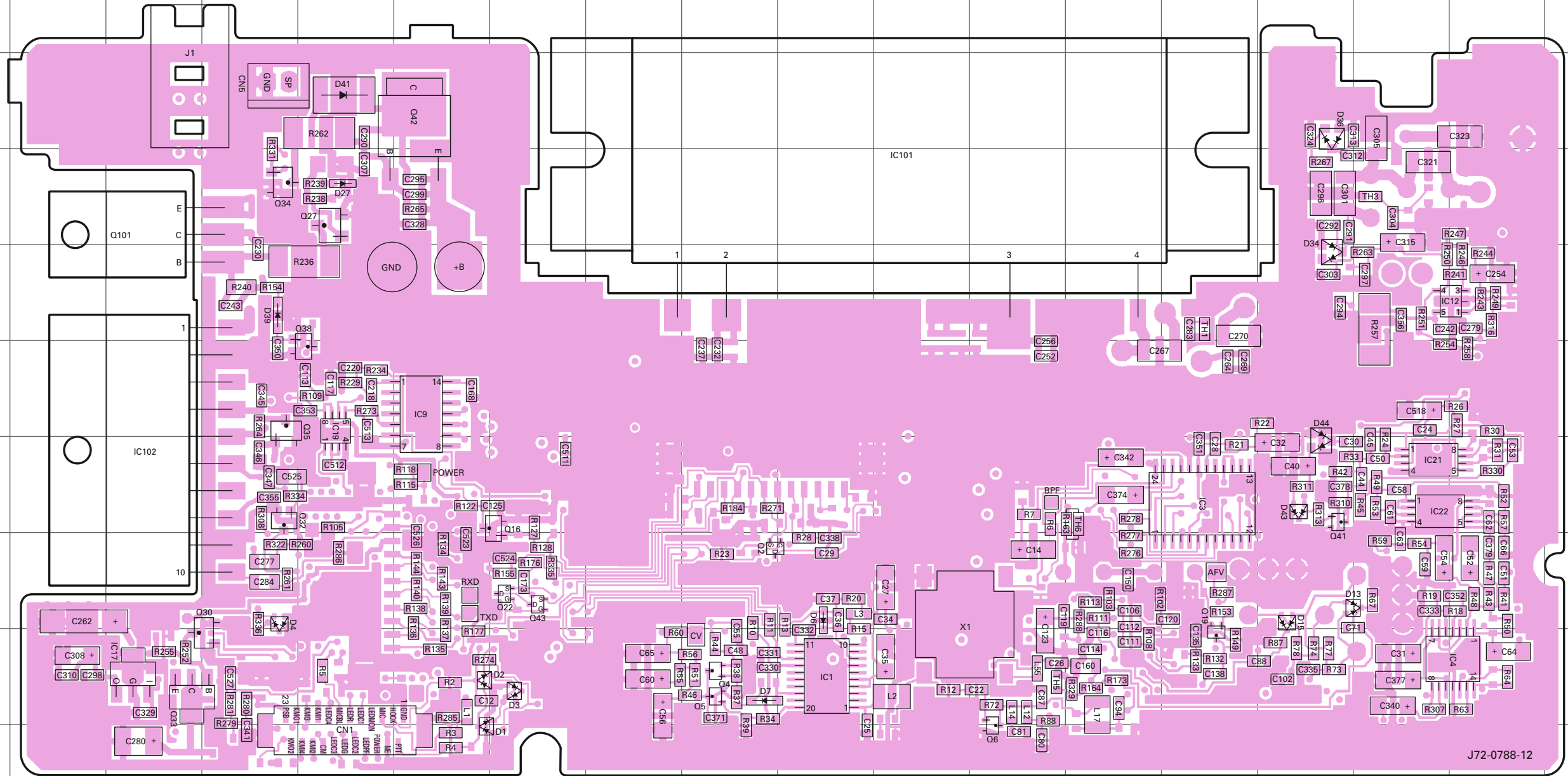
Component side  
Foil side

# TK-7108 PC BOARD VIEW / PC 板视图

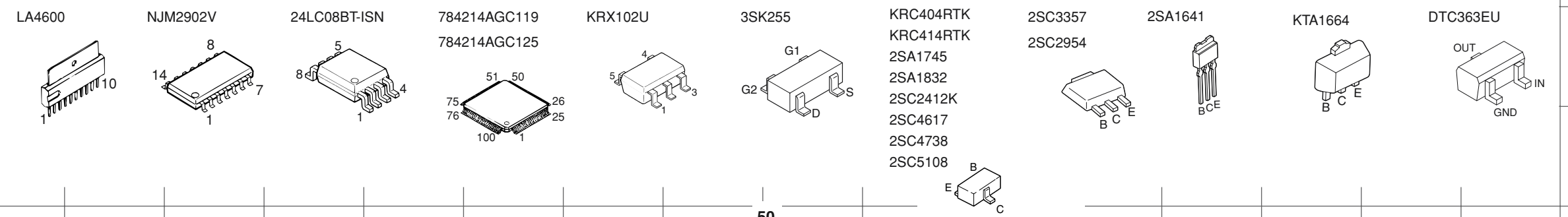
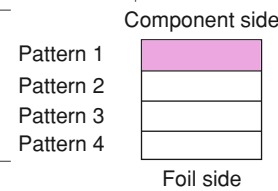
TX-RX UNIT (X57-6293-XX) Component side view -01:C, -02:C2

TX-RX UNIT (X57-6293-XX)  
Component side view

Ref. No.	Address
IC1	10K
IC3	8O
IC4	10R
IC9	7G
IC12	6R
IC17	10D
IC19	7F
IC21	8Q
IC22	8Q
IC101	5L
IC102	8D
Q2	9J
Q4	10J
Q5	10J
Q6	11M
Q16	8H
Q19	10O
Q22	9H
Q27	5F
Q30	10E
Q32	8E
Q33	10D
Q34	5E
Q38	7E
Q38	7F
Q41	8P
Q42	4G
Q43	9H
Q101	5D
D1	11G
D2	10G
D3	10H
D4	9E
D6	9K
D7	10J
D13	9P
D15	9P
D27	5F
D34	6P
D39	6E
D41	4F
D43	8P
D44	8P

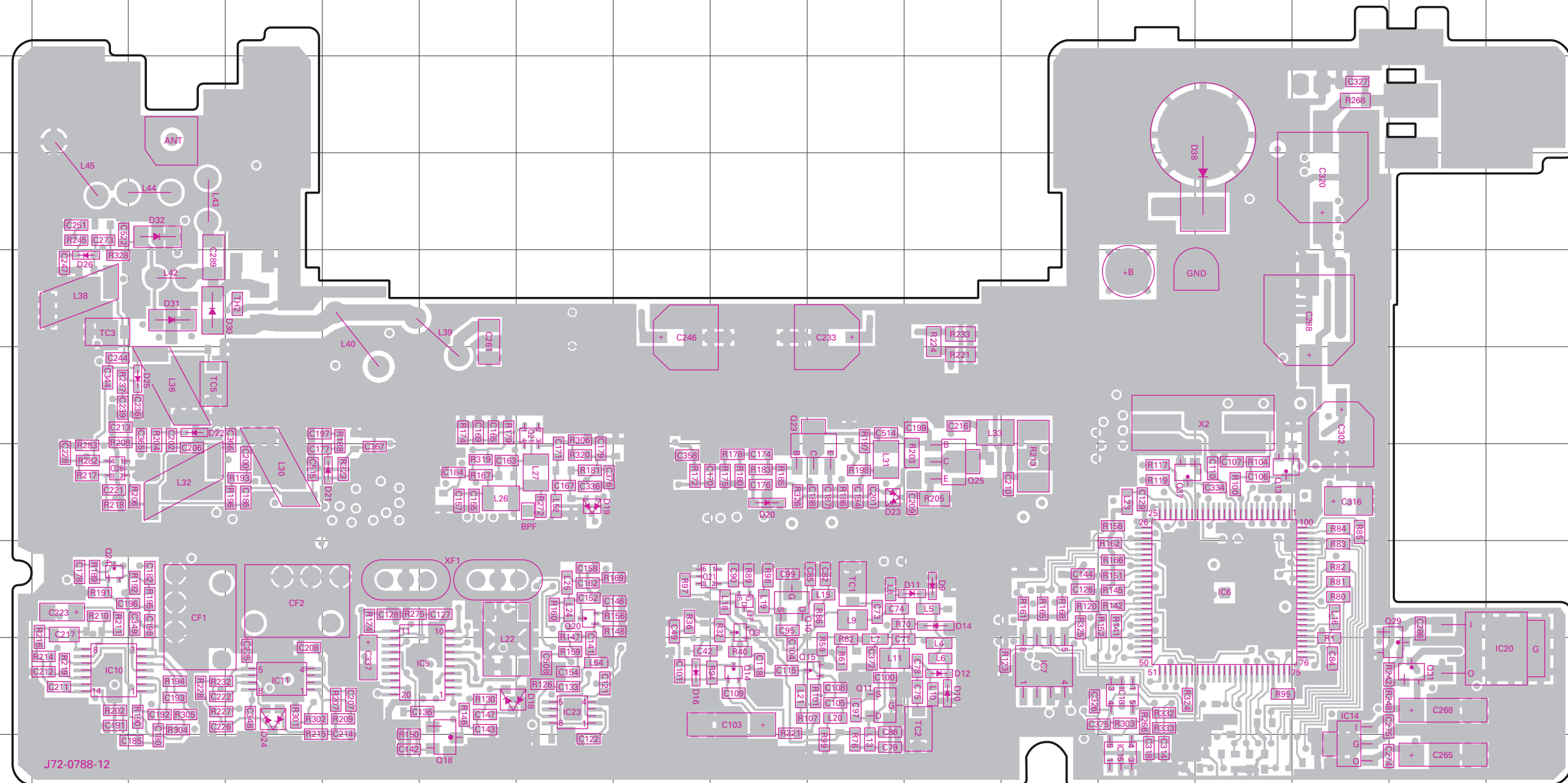


J72-0788-12



# PC BOARD VIEW / PC 板视图 TK-7108

TX-RX UNIT (X57-6293-XX) Foil side view -01:C, -02:C2

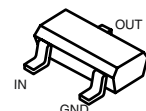


TX-RX UNIT (X57-6293-XX)

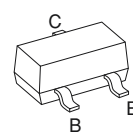
Foil side view

Ref. No.	Address
IC5	10F
IC6	9N
IC7	10L
IC10	10B
IC11	10D
IC14	10O
IC15	11M
IC18	10M
IC20	10Q
IC23	10G
Q3	9I
Q7	9I
Q10	9I
Q11	10J
Q12	9H
Q13	8N
Q14	10I
Q15	10J
Q18	11F
Q20	9G
Q21	7G
Q23	7J
Q24	9B
Q25	8K
Q26	8B
Q29	10P
Q31	10P
Q37	8M
D9	9K
D10	10K
D11	9K
D12	10K
D14	9K
D16	10H
D18	10F
D19	8G
D20	8I
D21	8E
D22	7C
D23	8J
D24	10D
D25	7C
D26	6B
D30	6C
D31	6C
D32	5C
D38	4N

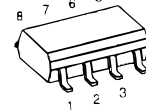
KRA225S  
KRC102S



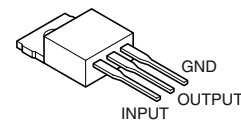
2SC4649  
2SC4919



TC7W74FU



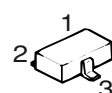
KTA1046



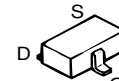
DA221



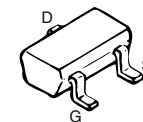
MA742



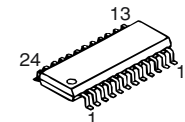
2SK508NV



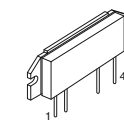
2SJ243



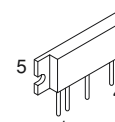
M62363FP



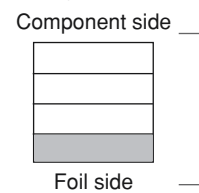
M67741L-35



M67741H-32



Pattern 1  
Pattern 2  
Pattern 3  
Pattern 4





# TK-7108 PC BOARD VIEW / PC 板视图

TX-RX UNIT (X57-6293-XX) Component side view + Foil side view -01:C, -02:C2

TX-RX UNIT (X57-6293-XX)  
Component side + Foil side view

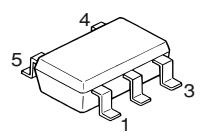
Ref. No.	Address
IC1	10K
IC3	8O
IC4	10R
IC5	10N
IC6	9F
IC7	10H
IC9	7G
IC10	10R
IC11	10R
IC12	6R
IC14	11E
IC15	11G
IC17	10D
IC18	10G
IC19	7F
IC20	10C
IC21	8Q
IC22	8Q
IC101	5L
IC102	8D
Q2	9J
Q3	9K
Q4	10J
Q5	10J
Q6	11M
Q7	9K
Q10	9K
Q11	10J
Q12	9L
Q13	8F
Q14	10K
Q15	10J
Q16	8H
Q18	11N
Q19	10O
Q20	9M
Q21	7M
Q22	9H
Q23	8J
Q24	9R
Q25	8I
Q26	8R
Q27	5F
Q29	10D
Q30	10E
Q31	10D
Q32	8E
Q33	10D
Q34	5E
Q35	7E
Q37	8G
Q38	7F
Q41	8P
Q42	4G
Q43	9H
Q101	5D
D1	11G
D2	10G
D3	10H
D4	9E
D6	9K
D7	10J
D9	9I
D10	10I

Ref. No.	Address
D11	9I
D12	10I
D13	9P
D14	9I
D15	9P
D16	10L
D18	10N
D19	8M
D20	8K
D21	8O
D22	7Q
D23	8J
D24	10J

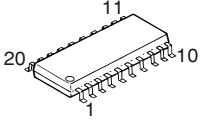
Ref. No.	Address
D25	7Q
D26	6R
D27	5F
D30	6Q
D31	6Q
D32	5Q
D34	6P
D36	4P
D38	4F
D39	6E
D41	4F
D43	8P
D44	8P



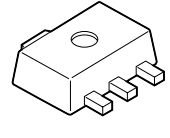
PST9140NR



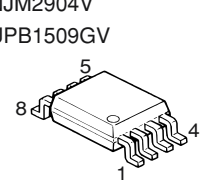
MB15A02



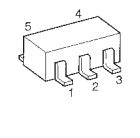
NJM78L05UA



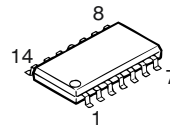
NJM2100V  
NJM2904V  
UPB1509GV



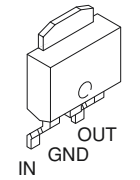
TA75SO1F



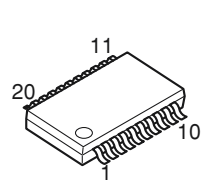
LC73872M



KIA7808AF



TA14489V



● Connect 1 and 4.

Component side

Pattern 1

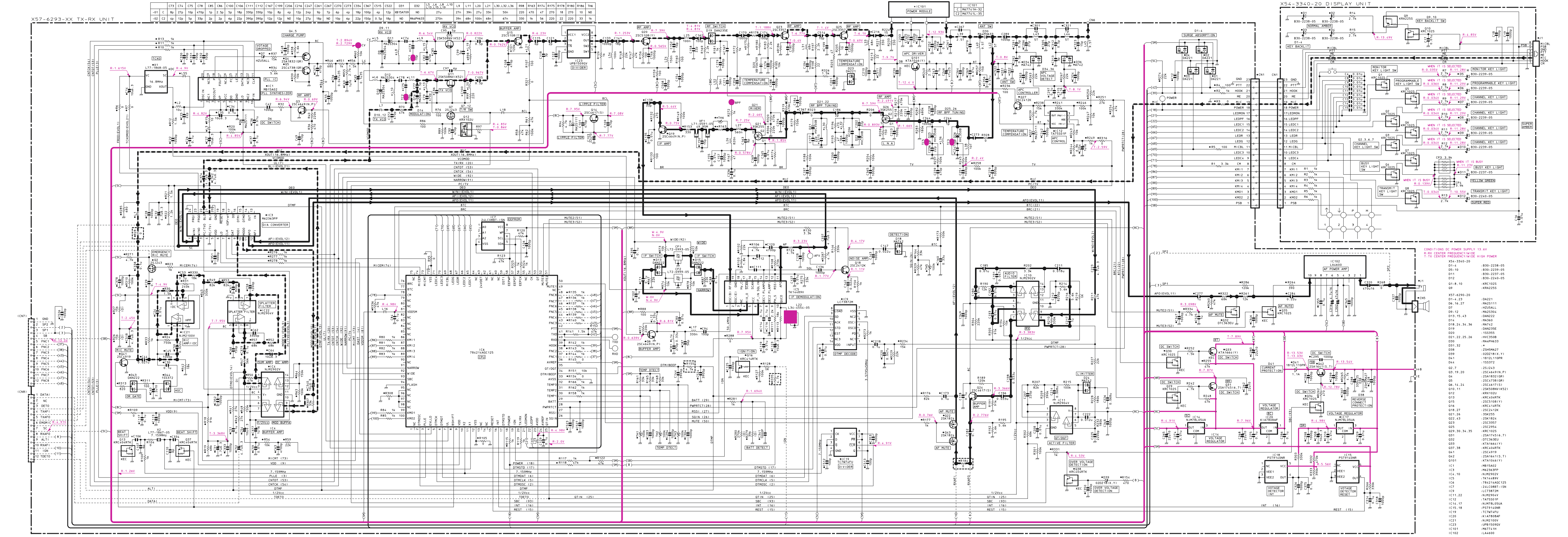
Pattern 2

Pattern 3

Pattern 4

Foil side

# SCHEMATIC DIAGRAM / 原理图 TK-7108



REF	SYM	VAL	UNIT	LOC
-01	C	470	pF	L15
-02	C	100	nF	L16
-03	C	1000	nF	L17
-04	C	100	nF	L18
-05	C	10000	nF	L19
-06	C	100	nF	L20
-07	C	100	nF	L21
-08	C	100	nF	L22
-09	C	100	nF	L23
-10	C	100	nF	L24
-11	C	100	nF	L25
-12	C	100	nF	L26
-13	C	100	nF	L27
-14	C	100	nF	L28
-15	C	100	nF	L29
-16	C	100	nF	L30
-17	C	100	nF	L31
-18	C	100	nF	L32
-19	C	100	nF	L33
-20	C	100	nF	L34
-21	C	100	nF	L35
-22	C	100	nF	L36
-23	C	100	nF	L37
-24	C	100	nF	L38
-25	C	100	nF	L39
-26	C	100	nF	L40
-27	C	100	nF	L41
-28	C	100	nF	L42
-29	C	100	nF	L43
-30	C	100	nF	L44
-31	C	100	nF	L45
-32	C	100	nF	L46
-33	C	100	nF	L47
-34	C	100	nF	L48
-35	C	100	nF	L49
-36	C	100	nF	L50
-37	C	100	nF	L51
-38	C	100	nF	L52
-39	C	100	nF	L53
-40	C	100	nF	L54
-41	C	100	nF	L55
-42	C	100	nF	L56
-43	C	100	nF	L57
-44	C	100	nF	L58
-45	C	100	nF	L59
-46	C	100	nF	L60
-47	C	100	nF	L61
-48	C	100	nF	L62
-49	C	100	nF	L63
-50	C	100	nF	L64
-51	C	100	nF	L65
-52	C	100	nF	L66
-53	C	100	nF	L67
-54	C	100	nF	L68
-55	C	100	nF	L69
-56	C	100	nF	L70
-57	C	100	nF	L71
-58	C	100	nF	L72
-59	C	100	nF	L73
-60	C	100	nF	L74
-61	C	100	nF	L75
-62	C	100	nF	L76
-63	C	100	nF	L77
-64	C	100	nF	L78
-65	C	100	nF	L79
-66	C	100	nF	L80
-67	C	100	nF	L81
-68	C	100	nF	L82
-69	C	100	nF	L83
-70	C	100	nF	L84
-71	C	100	nF	L85
-72	C	100	nF	L86
-73	C	100	nF	L87
-74	C	100	nF	L88
-75	C	100	nF	L89
-76	C	100	nF	L90
-77	C	100	nF	L91
-78	C	100	nF	L92
-79	C	100	nF	L93
-80	C	100	nF	L94
-81	C	100	nF	L95
-82	C	100	nF	L96
-83	C	100	nF	L97
-84	C	100	nF	L98
-85	C	100	nF	L99
-86	C	100	nF	L100
-87	C	100	nF	L101
-88	C	100	nF	L102
-89	C	100	nF	L103
-90	C	100	nF	L104
-91	C	100	nF	L105
-92	C	100	nF	L106
-93	C	100	nF	L107
-94	C	100	nF	L108
-95	C	100	nF	L109
-96	C	100	nF	L110
-97	C	100	nF	L111
-98	C	100	nF	L112
-99	C	100	nF	L113
-100	C	100	nF	L114
-101	C	100	nF	L115
-102	C	100	nF	L116
-103	C	100	nF	L117
-104	C	100	nF	L118
-105	C	100	nF	L119
-106	C	100	nF	L120
-107	C	100	nF	L121
-108	C	100	nF	L122
-109	C	100	nF	L123
-110	C	100	nF	L124
-111	C	100	nF	L125
-112	C	100	nF	L126
-113	C	100	nF	L127
-114	C	100	nF	L128
-115	C	100	nF	L129
-116	C	100	nF	L130
-117	C	100	nF	L131
-118	C	100	nF	L132
-119	C	100	nF	L133
-120	C	100	nF	L134
-121	C	100	nF	L135
-122	C	100	nF	L136
-123	C	100	nF	L137
-124	C	100	nF	L138
-125	C	100	nF	L139
-126	C	100	nF	L140
-127	C	100	nF	L141
-128	C	100	nF	L142
-129	C	100	nF	L143
-130	C	100	nF	L144
-131	C	100	nF	L145
-132	C	100	nF	L146
-133	C	100	nF	L147
-134	C	100	nF	L148
-135	C	100	nF	L149
-136	C	100	nF	L150
-137	C	100	nF	L151
-138	C	100	nF	L152
-139	C	100	nF	L153
-140	C	100	nF	L154
-141	C	100	nF	L155
-142	C	100	nF	L156
-143	C	100	nF	L157
-144	C	100	nF	L158
-145	C	100	nF	L159
-146	C	100	nF	L160
-147	C	100	nF	L161
-148	C	100	nF	L162
-149	C	100	nF	L163
-150	C	100	nF	L164
-151	C	100	nF	L165
-152	C	100	nF	L166
-153	C	100	nF	L167
-154	C	100	nF	L168
-155	C	100	nF	L169
-156	C	100	nF	L170
-157	C	100	nF	L171
-158	C	100	nF	L172
-159	C	100	nF	L173
-160	C	100	nF	L174
-161	C	100	nF	L175
-162	C	100	nF	L176
-163	C	100	nF	L177
-164	C	100	nF	L178
-165	C	100	nF	L179
-166	C	100	nF	L180
-167	C	100	nF	L181
-168	C	100	nF	L182
-169	C	100	nF	L183
-170	C	100	nF	L184
-171	C	100	nF	L185
-172	C	100	nF	L186
-173	C	100	nF	L187
-174	C	100	nF	L188
-175	C	100	nF	L189
-176	C	100	nF	L190
-177	C	100	nF	L191
-178	C	100	nF	L192
-179	C	100	nF	L193
-180	C	100	nF	L194
-181	C	100	nF	L195
-182	C	100	nF	L196
-183	C	100	nF	L197
-184	C	100	nF	L198
-185	C	100	nF	L199
-186	C	100	nF	L200
-187	C	100	nF	L201
-188	C	100	nF	L202
-189	C	100	nF	L203
-190	C	100	nF	L204
-191	C	100	nF	L205
-192	C	100	nF	L206
-193	C	100	nF	L207
-194	C	100	nF	L208
-195	C	100	nF	L209
-196	C	100	nF	L210
-197	C	100	nF	L211
-198	C	100	nF	L212
-199	C	100	nF	L213
-200	C	100	nF	L214

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

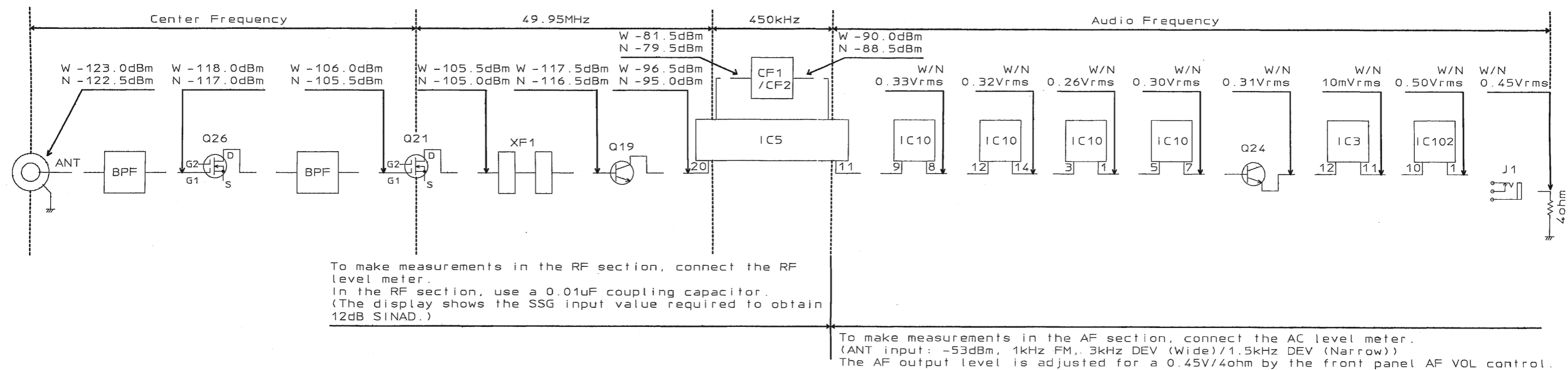




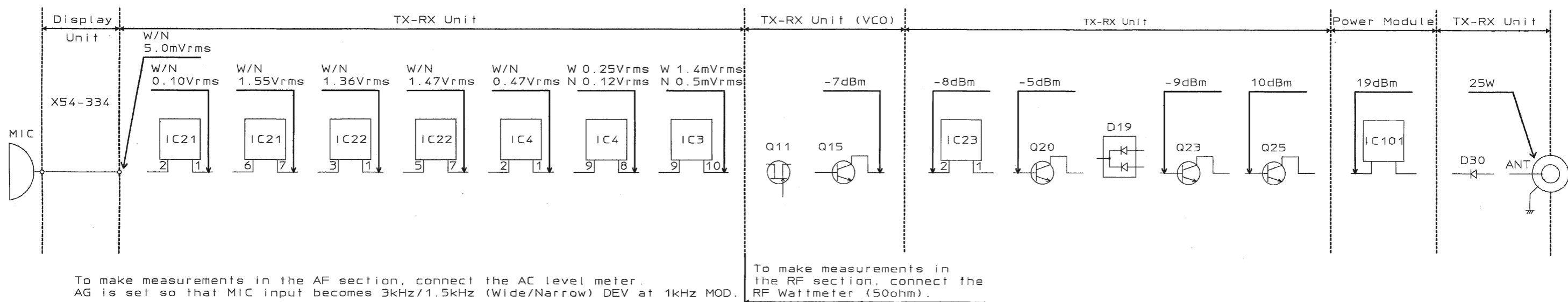
# TK-7108 TK-7108

## LEVEL DIAGRAM / 电平图

### RX section / 接收部



### TX section / 发射部



# TERMINAL FUNCTION / 端子功能

## CN1 (TX-RX Unit)

Pin No.	Name	Function
1	GND	Ground
2	PTT	PTT/TXD
3	HOOK	Hook detection/RXD
4	ME	Mic ground
5	MIC	Mic signal input
6	POWER	Power switch
7	LED MON	Signal of MON Key control
8	LED PF	Signal of PF Key control
9	LED C1	Signal of channel1 control
10	LED C2	Signal of channel2 control
11	LED R	Signal of TX control
12	LED G	Signal of Busy control
13	MICBL	Mic backlight control
14	LED C3	Signal of channel3 control
15	LED C4	Signal of channel4 control
16	CM	Mic data detection
17	KM11	Key matrix input 11
18	KM12	Key matrix input 22
19	KM13	Key matrix input 33
20	KM14	Key matrix input 44
21	KM01	Key matrix input 01
22	KM02	Key matrix input 02
23	PSB	Switched B

## CN1 (发射-接收单元)

管脚序号	名称	功能
1	GND	接地
2	PTT	PTT/TXD
3	HOOK	接通检测/RXD
4	ME	话筒接地
5	MIC	话筒信号输入
6	POWER	电源开关
7	LED MON	MON键信号控制
8	LED PF	PF键信号控制
9	LED C1	信道1信号控制
10	LED C2	信道2信号控制
11	LED R	TX信号控制
12	LED G	繁忙信号控制
13	MICBL	话筒背景灯光控制
14	LED C3	信道3信号控制
15	LED C4	信道4信号控制
16	CM	话筒数据检测
17	KM11	键矩阵输入 11
18	KM12	键矩阵输入 22
19	KM13	键矩阵输入 33
20	KM14	键矩阵输入 44
21	KM01	键矩阵输入 01
22	KM02	键矩阵输入 02
23	PSB	转换的B

## J1 (TX-RX Unit)

Pin No.	Name	Function
1	SP	Audio signal output to internal/external speaker.
2	E	Ground

## J1 (发射-接收单元)

管脚序号	名称	功能
1	SP	音频信号输出到内置/外置扬声器
2	E	接地

## J1 (Display Unit)

Pin No.	Name	Function
1	MBL	MIC backlight control.
2	PSB	13.6V.
3	GND	Ground.
4	PTT/TXD	PTT.
5	ME	MIC ground.
6	MIC	MIC signal input.
7	HOOK/RXD	Hook detection
8	CM	MIC data detection.

## J1 (显示单元)

管脚序号	名称	功能
1	MBL	话筒背景灯光控制
2	PSB	13.6V
3	GND	接地
4	PTT/TXD	通话
5	ME	话筒接地
6	MIC	话筒信号输入
7	HOOK/RXD	接通检测
8	CM	话筒数据检测

## SPECIFICATIONS / 规格

### GENERAL

Frequency Range .....	C : 146 to 174MHz C2 : 136 to 162MHz
Number of Channels .....	8 channels
Channel Spacing .....	Wide : 25kHz Narrow : 12.5kHz
PLL Channel Stepping .....	2.5, 5, 6.25, 7.5kHz
Operating Voltage .....	13.6V DC $\pm$ 15%
Current Drain .....	Less than 0.4A on standby Less than 1.0A on receive Less than 8.0A on transmit
Operating Temperature Range .....	-30°C to +60°C
Dimensions & Weight .....	160 (W) x 43 (H) x 107 (D) mm, Approx 1.0kg
Channel Frequency Spread .....	C : 28MHz C2 : 26MHz

### RECEIVER

(Measurements made per EIA standard EIA/TIA-603)

Sensitivity (12dB SINAD) .....	Wide : 0.28 $\mu$ V Narrow : 0.35 $\mu$ V
Selectivity .....	Wide : 75dB Narrow : 65dB
Intermodulation .....	Wide : 70dB Narrow : 60dB
Spurious Response .....	75dB
Audio Power Output .....	4.0W
Frequency Stability .....	$\pm$ 2.5ppm

### TRANSMITTER

(Measurements made per EIA standard EIA/TIA-603)

RF Power Output .....	25W
Spurious and Harmonics .....	70dB
Modulation .....	Wide : 16K0F3E Narrow : 11K0F3E
FM Noise .....	Wide : 45dB Narrow : 40dB
Audio Distortion .....	Less than 3%
Frequency Stability .....	$\pm$ 2.5ppm

### 概述

频率范围 .....	C : 146 ~ 174MHz C2 : 136 ~ 162MHz
信道数量 .....	8 信道
信道间距 .....	宽 : 25kHz 窄 : 12.5kHz
锁相环电路步进频率 .....	2.5, 5, 6.25, 7.5kHz
工作电压 .....	13.6V 直流 $\pm$ 15%
电流消耗 .....	备用时 : 低于0.4A 接收时 : 低于1.0A 接收时 : 低于8.0A
工作温度范围 .....	-30°C 到 +60°C
尺寸和重量 .....	160 (宽) x 43 (高) x 107 (长) 毫米, 约1.0kg
信道频率扩展 .....	C : 28MHz C2 : 26MHz

### 接收部

(以每EIA标准EIA/TIA-603进行测量)

灵敏度 (12dB SINAD) .....	宽 : 0.28 $\mu$ V	窄 : 0.35 $\mu$ V
选择性 .....	宽 : 75dB	窄 : 65dB
互调 .....	宽 : 70dB	窄 : 60dB
假信号响应 .....	75dB	
音频功率输出 .....	4.0W	
频率稳定性 .....	$\pm$ 2.5ppm	

### 发射部

(以每EIA标准EIA/TIA-603进行测量)

射频功率输出 .....	25W	
寄生和谐波 .....	70dB	
调制 .....	宽 : 16K0F3E	窄 : 11K0F3E
频率调制噪音 .....	宽 : 45dB	窄 : 40dB
音频失真 .....	低于 3%	
频率稳定性 .....	$\pm$ 2.5ppm	

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