KENWOOD

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VHF FM TRANSCEIVER / VHF 调频对讲机
TK-782
SERVICE MANUAL / 维修手册

KENWOOD

Panel assy
(A62-0642-03)

Cabinet (Upper)
(A01-2165-23)

Key top
(K29-9105-22)

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A   B   ◄C   D►   CALL

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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 the publication data. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions. These are issued as required.

ORDERING REPLACEMENT PARTS

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

PERSONNEL SAFETY

The following precautions are recommended for personnel safety :

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

PRE-INSTALLATION CONSIDERNATIONS

1. UNPACKING

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

2. PRE-INSTALLATION CHECKOUT

2-1. 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.

2-2. 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. QT equipment operation should be verified.

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。在出版后如果发生变动，则根据需要使用《维修通报》或《手册修订本》进行补充。

替换零件的订购

当订购替换零件或设备资料时，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：

● 如果有人在距离天线两英尺（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正确地接地。
● 本设备只应该由有资格的技术人员进行维修。

安装前事项

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. 安装前检查

2-1. 说明

在出厂之前每一个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部和发射部以保证能够正常使用。

2-2. 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QT亚音频的操作。

GENERAL / 概述

3. PLANNING THE INSTALLATION
3-1. 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.

3-2. 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.

3-3. 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.

3-4. 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.
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.

4. INSTALLATION PLANNING - CONTROL STATIONS
4-1. 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.

4-2. 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.

3. 安装的步骤
3-1. 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,同时避免无线电设备过热。

3-2. 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,将地线连接在行李箱的盖子和车辆的外壳上确保行李箱盖子接地。

3-3. 车载台

通用安装托架允许以多种方法安装车载台。确认安装的表面足以支撑车载台设备的重量。车载台设备的周围留出适当的空间进行散热。将车载台尽可能地安装在靠近车辆操作者的位置上,以便在驾驶时易于控制。

3-4. 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。反向极性将导致电源线上的保险丝熔断。在安装之前检查车辆的接地极性,避免浪费时间和精力。
2. 将电源的正极引线直接连接到车载电池的正极端点上。不要将正极引线与车辆上的其他正极电压连接。
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源线充分满足最大电流的要求。如果电缆必须加长,要确认附加的电线是否能够承载所需电流和添加引线的长度。

4. 安装步骤-基地站
4-1. 天线系统

作为基地台使用。天线系统的选择取决于许多因素,已超出本手册的范围。用户的KENWOOD销售商可以帮助用户选择最能满足用户相应要求的天线系统。

4-2. 电台位置

为用户的基地站电台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设备散热。

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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

When you modify your radio as described in system setup, take the following precaution.

The rating of pin 7 (SB) of the accessory connector cable (KCT-19) on the rear of the radio is 13.6V (0.75A). Insert a 1A fuse if you use the SB pin for external equipment.

Accessory connector cable (KCT-19)
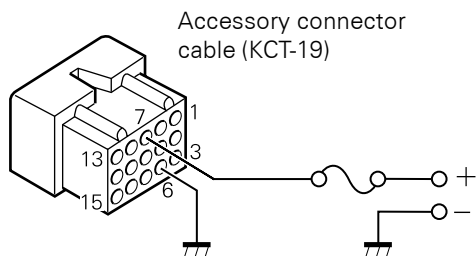
If you do not intend to use the 3.5-mm jack for the external speaker, fit the supplied speaker-jack cap (B09-0235-05) to stop dust and sand getting in.

Speaker-jack cap
(B09-0235-05)
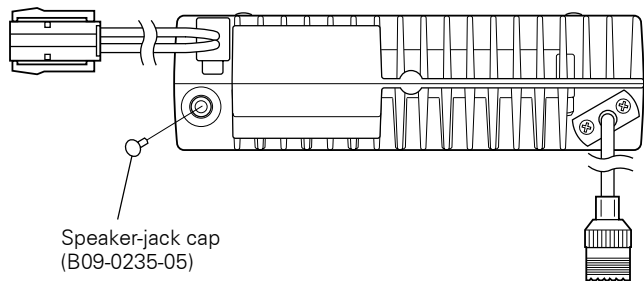
维修服务

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

当用户按照系统设置改装无线电设备时，请注意下述情况。

在无线电设备后部附加的连接器电缆 (KCT-19) 的管脚7 (SB) 为13.6V (0.75A)。如果用户将SB管脚用于外接设备，请插入1A保险丝。

附加连接器电缆
(KCT-19)
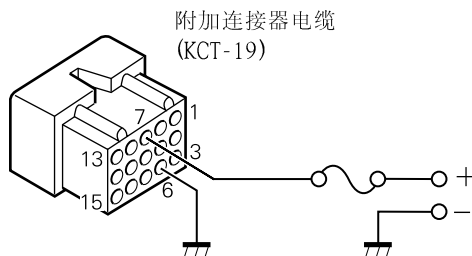
如果用户不需要使用外置扬声器的3.5-mm插头，请将扬声器插孔盖帽 (B09-0235-05) 插好以避免灰尘和沙粒侵入。

扬声器插头
(B09-0235-05)
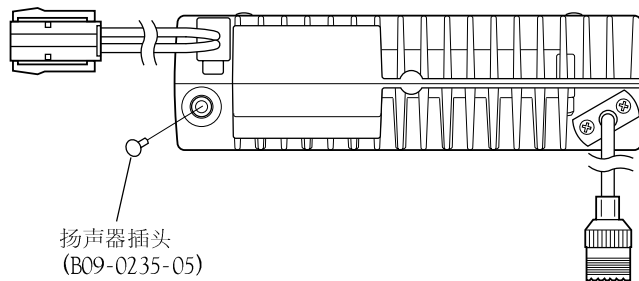
OPERATING FEATURES / 操作特性

1. Operation Features

The TK-782 is a VHF FM radio designed in DTMF/DMS model.

This transceiver can handle up to 250 groups with 250 channels in each group.

You can use option signalling which is DTMF or DMS (Digital Message System-FFSK signalling) for every channel.

2. Transceiver Controls and Indicators (Fig. 1)

2-1. 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, such as the group and channel, are stored in memory. When the power is switched on again, the transceiver returns to the previous conditions.

● **CHANNEL UP/DOWN key**

● **CALL key (Programmable)**

● **■ key (Programmable)**

● **A, B, C and D key (Programmable)**

● **VOLUME UP/DOWN key (Programmable)**

● **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.

2-2. Programmable Keys

The FPU (KPG-77D) enables programmable keys to select the following functions.

■ Auto Dial

To transmit the stored DTMF code automatically. When you select DTMF encode in the "Auto dial mode" menu, Auto dial, Redial, Dial ID and Store & Send modes are available.

Press the [Auto dial] key to enter the "Auto dial mode". Select the desired number to send. It is use the [Channel up] and [Channel down] keys, or the [2] and [8] keys on the microphone to select. Press the [✳] key to transmit the numbers.

1. 操作特性

TK-782是一种设计为在DTMF/DMS模式下进行操作的VHF FM无线电设备。

这种无线电设备可以处理250组，每组250个频道。

每个频道都可以使用DTMF或DMS(数据信息系统-FFSK信令)选项信号。

2. 车载台控制和指示灯(图1)

2-1. 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，例如组和信道等，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。

● 信道升／降键

● 呼叫键(可编程)

● ■键(可编程)

● A，B，C，D键(可编程)

● 音量高／低键(可编程)

● 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。

2-2. 可编程按键

FPU(KPG-77D)可以使可编程键选择下述功能。

■ 自动拨号

自动发出贮存的DTMF代码。当用户在自动拨号模式(Auto dial mode)菜单中选择DTMF编码时，自动拨号(Auto dial)，重拨号(Redial)，拨号(Dial)ID和贮存与发送(Store & Send)模式被设置成有效。

按压[自动拨号]键进入自动拨号模式。使用[信道升]或[信道降]键，或话筒上[2]和[8]键选择想要发送的序号，然后按[✳]键发送。

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■ Auto Dial Programming

You can store the DTMF code and name, or erase it at the transceiver.

● To store a DTMF code

Press the [Auto dial programming] key to enter "Auto dial programming mode". Select the desired memory number you wish to store.

Press the [∗] key to select the desired memory number (Enter auto dial memory name).

Press the [∗] key to store the memory name. Now, enter the DTMF codes you want to store.

Press the [∗] key to store the numbers. A beep sound confirms that the numbers are stored in the memory.

● To erase the stored DTMF code

Press the [Auto dial programming] key to enter "Auto dial programming mode".

Press the [#] key to enter "Auto dial clear mode". Select the memory number you want to erase.

Press the [∗] key to erase the stored numbers and exit "Auto dial clear mode".

■ AUX A

If this key is pressed, "AUX" icon lights on the LCD and Horn alert port which is inside of the transceiver turns to the high level. If pressed again, the "AUX" icon goes off and the Horn alert ports turns to the lower level.

■ AUX B

This function can be programmed when the voice scrambler board is not installed.

If this key is pressed, an underscore ("_") appears at the extreme right of the LCD and OPT port which is inside of the transceiver turns to the active level (low). If pressed again, the underscore disappears and the OPT ports turns to the deactive level (high).

■ Channel Name

Press this key to switch between the "Channel name" and "Grp #/Ch #" for the display. If no channel name is programmed, the transceiver automatically displays the group #/channel #.

■ Channel Up/Down

When this key is pressed each time, the channel number to be selected is increased/decreased and repeats if held for one second or longer.

■ Channel Entry

You can directly recall the channel using the numeric keypad without using the [Channel up], [Channel down].

To access the channel directly, enter 1 to 3 digit numbers, depending on the number of the programmed channels.

For example, if the radio has 199 programmed channels (the maximum channel number is a 3-digit number) and you would like to recall channel 5, you must enter [0],[0],[5]. If the radio has 99 channels (2-digit number), you must enter [0],[5] to access channel 5.

■ 自动拨号编程

用户可以在车载台上保存DTMF代码或名称，也可以删除DTMF代码或名称。

● 存储DTMF编码

按[自动拨号编程]键进入"自动拨号编程模式"，选择要想保存的助记序号。

按[∗]键选择所需的助记序号(即输入自动拨号助记名称)。

按[∗]键保存助记名称。这样就输入了用户想要保存的DTMF代码。

按[∗]键保存序号。这时会发出一声蜂鸣声确定序号已被记下。

● 删除存储的DTMF编码

按[自动拨号编程]键进入"自动拨号编程模式"。

按[#]键进入"自动拨号清除模式"，选择想要删除的助记序号。

按[∗]键删除保存的序号并退出"自动拨号清除模式"。

■ AUX A

按下该键时，LCD上的"AUX"图标点亮，车载台内部的喇叭报警端口变为高电平，再次按下该键时，"AUX"图标消失，同时变成低电平。

■ AUX B

当没有安装声音扰频器板时，该功能是可编程的。按下该键后，在LCD的最右端上会出现一个下划线"_"，同时车载台内部的OPT端口变为有效电平(低电平)。再次按下该键时，下划线消失，OPT端口变为无效电平(高电平)。

■ 信道名称

按压该键，在显示"信道名称"和"组号／信道号"之间转换。如果没有编程信道名称，车载台自动显示"组号／信道号"

■ 信道升／降

每按一次该键，选择的信道序号就会增加／降低，按住保持1秒以上时则重复增加／降低。

■ 信道输入

可以使用数字键盘直接重呼信道，而无需[信道升]／[信道降]键。

要直接达到重呼信道的目的，需输入1至3位数的序号，这依赖于已被编程的信道个数。

例如，如果电台有199个已编程信道(最大的信道序号是3位数)，用户如果想重呼第5个信道，必须输入[0][0][5]。如果电台有99个已编程信道(2位数序号)，那么要重呼第5个信道，就要输入[0][5]。

OPERATING FEATURES / 操作特性

■ Display

Press the this key toggle the display function on/off. The function backups when the transceiver turns on/off.

■ Emergency Call

Pressing this key causes the transceiver to enter the emergency mode. The transceiver jumps to the programmed "Emergency group/channel" and transmits for programmed "Duration of transmission time".

The transceiver disables microphone mute while transmitting. After finishing transmission, the transceiver receivers for programmed "Duration of receiving". The transceiver mutes the speaker while receiving. Following the above sequence, the transceiver continues to transmit and receive.

You can select whether or not the emergency ID is transmitted in the emergency mode.

■ Fixed Volume

This function is used for changing the volume level, it is power on tone, control tone, warning tone, alert tone, AF volume type.

If these tone is set up in "Fixed", the tone level can be changed when [Fixed volume] key is pressed. When [Fixed volume] key is pressed, tone level changes in turn to low (tone volume low), high (tone volume high) and off.

■ Group Up/Down

When this key is pressed each time, the group number to be selected is increased/decreased and repeats if held for one second or longer.

■ Home Channel

Press this key once, the channel switches to the preprogrammed home channel.

■ Key Lock

Key lock prevents accidental operation of the transceiver. When key lock is activated, all keys other that PTT, Emergency, Monitor, Monitor momentary, Shift, Squelch momentary and Volume up/down, are locked.

"LOCKED" appears momentarily when the [Key lock] key is pressed.

■ Monitor

When this key pressed once, "MON" icon lights and squelch unmutes if a carrier is present, regardless of the specified signalling (including option signalling).

If press again, "MON" icon goes off and squelch mutes.

■ Monitor Momentary

While pressing this key, "MON" appears and the squelch unmutes if a carrier is present, regardless of the specified signalling (including option signalling).

If released, "MON" disappears, and the squelch mutes.

■ 显示

按压该键切换显示功能的开／关状态，当车载台开或关时，该功能备份。

■ 紧急呼叫

按压该键使车载台进入紧急呼叫模式。车载台将跳到已编程的"紧急呼叫组／信道"，同时按照已设定的"发送时段"发射。

在发射过程中车载台不能保持话筒静音。发射完成之后车载台变为"接收时段"模式。当接收时，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。

用户可以选择是否在紧急模式中发射紧急ID。

■ 固定音量

该功能用来改变音量大小，包括电源开启音，控制音，告警音，变换音，AF音量类型。

如果在"固定"模式下设置上述音调，按[固定音量]键就可以改变音调高低。按[固定音量]键时，音调电平可以在高(音调音量高)，低(音调音量低)和关闭三种状态中转换。

■ 组上／下

每次按该键时，所选组号码将增加／降低，如果按住一秒钟以上，所选组号码将重复增加／降低。

■ 主信道

按该键后，信道将切换到预编程的主信道。

■ 按键锁定

按键锁定防止对车载台的意外操作。激活按键锁定后，除PTT，紧急，监听，瞬间监听，换档键瞬间静噪之外的所有键都被锁住。

按[按键锁定]时瞬间会显示"已锁定"。

■ 监听器

按该键后，如果有载波，则无论什么特定信号(包括选项信号)"MON"图标都会显亮，同时进行静噪监听。

再次按下后，"MON"图标消失，同时进行非静噪监听。

■ 监听器瞬时

按该键时，如果有载波，则无论什么特定信号(包括选项信号)"MON"图标都会显亮，同时进行静噪监听。

再次按下后，"MON"图标消失，同时进行非静噪监听。

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OPERATING FEATURES / 操作特性

■ Operator Selectable Tone

When this key is pressed, the "OST" appears and encode/decode QT/DQT is switched to the OST tone pair. If pressed again, the "OST" display goes off and encode/decode QT/DQT returns to transceivers preset.

When this key is held down for one second, the transceiver enters "OST select mode". In this mode, the display shows OST No. or OST name which is set to the channel and operator can select one of OST tone pair using [Channel up], [Channel down] key.

If pressed this key again, the displayed OST code is memorized to the channel, the transceiver exits from the OST select mode, returns to normal channel display and "OST" display.

16 kinds of OST tone pairs can be programmed in the operator selectable tone window. While in the OST select mode, the transceiver does not look back at the priority channel in the scan resume mode.

■ Queue

Press [Queue] key to toggle Queue mode on or off. When it is on, you will see the contents of the queue buffer. You can scroll the queue buffer using the [Channel up], [Channel down] or [2]/[8] keys on the microphone.

When you are in Queue mode, [D] or [6] key to toggle the Selcall and Status displays. When you are in Queue mode, press the [C] or [4] key to toggle the Code and Selcall/Status displays.

Hold down the [D] or [6] key to delete the top stack of the Queue buffer. Hold down the [C] or [4] key to cancel Queue mode and return to normal operation.

■ Radio Password

Backup is done even if the power supply is cut off. A lock is not canceled unless a proper password is inputted. The character which can be inputted is to 6 digits with the number of 0 to 9. A lock is canceled if it is the same as code set up at "Optional feature - Radio password".

If the entered radio password is incorrect, the "Key input error tone" sounds and the transceiver remains in "LOCK1" screen.

■ Scan

Press the [Scan] key to toggle scanning the channels on and off. When the transceiver is scanning, "Revert channel display" is temporary disabled and the SCN icon and "－SCAN－" appear.

■ Scan Delete/Add

Press the [Scan del/add] key to temporarily delete or add each channel from/to the scan list. When a channel is added to the scan list, "▼" appears on LCD.

When the transceiver exits Scan mode, the added or deleted channels are erased from the scan list. The original scan list is restored.

■ 操作可选信令

按该键时，会显示"OST"，同时QT/DQT编码/解码被转换为"OST"信令。再次按下时，"OST"显示消失，同时QT/DQT编码/解码转换为先前的状态。

按下该键达1秒时，车载台进入"OST选择模式"。在该模式中，显示器显示被设置为信道的OST序号或OST名称，同时操作者可以使用"信道增"，"信道减"键选择一个OST信令。再次按下后，显示的OST代码就被作为信道记下来，车载台从OST选择模式中退出，返回正常信道显示和"OST"显示状态。

在操作可选信令窗口中可以编程16种OST信令。当处于OST选择模式时，车载台并不返回寻找扫描模式的优先信道。

■ 队列

按[队列]键开关队列模式。当队列模式打开时，用[队列上]／[队列下]，用户将看到队列缓冲器中的内容。键盘或话筒上的[2]／[8]键可以卷动队列缓冲器。

当处于队列模式时，[D]／[6]键用来在选呼和状态显示之间转换。当处于队列模式下时，按[C]或[4]键可以在代码和选呼／状态显示之间转换。

按住[D]或[6]键删除队列缓冲器的顶端堆栈，按住[C]或[4]键可中断队列模式并返回正常操作状态。

■ 开机密码

即使供电中止也要做好备份。除非输入正确的口令，否则锁定将无法中断。能够输入的字符为由0到9组成的6位数。如果与在"选择功能-开机密码"中设置的代码相同，锁定才可以被中断。如果输入的开机密码不正确，就会发出"键输入错误提示音"，同时车载台将保持"LOCK1"屏幕显示。

■ 扫描

按[扫描]键可切换信道扫描模式开关。车载台扫描时，[回复信道显示]临时被禁止，同时显示"－SCN－"图标和[扫描]。

■ 扫描删除／添加

按[扫描删除／添加]键可临时在扫描列表中删除或添加信道。当信道被添加到扫描列表中时，在LCD上会显示"▼"。

当车载台退出扫描模式时，被添加或删除的信道将从扫描列表中被擦除。原始扫描列表被恢复。

OPERATING FEATURES / 操作特性

■ Selcall Entry

Press [Selcall entry] key to enter the desired Selcall code you want to call.

A transceivers unit ID is defined by a combination of 3-digit fleet and 4-digit ID numbers.

To enter Selcall number, use the keypad (keypad model) or use the [Channel up], [Channel down] keys to select a number. Then press [C] key to enter the selected number. The selected digit will shift left to enter the next digit.

Press [D] key to move the cursor 1 position right. Hold down [D] key ([6] key on a keypad) to clear the entered number.

■ Selcall List

Press [Selcall list] key to enter Selcall list mode.
The ID list code of DMS will appear on LCD.
To select the Selcall list, use [Channel up]/[Channel down] key or [2]/[8] key on the microphone keypad.

■ Selcall + Status Entry

Select the selcall number you wish to call. Press [Selcall + Status entry] key to enter "Selcall entry mode". It works as "Selcall entry mode" mode. If you press [CALL] or [∗] key again, it works as "Status entry mode".

■ Selcall + Status List

Select the selcall number you wish to call. Press [Selcall + Status list] key to enter "Selcall list select mode". It works as "Status list" mode. If you press [Selcall + Status list] key again, it works as "Status list select mode".

■ Send GPS

You can send the GPS location data manually. To perform the operation, you have to install a GPS receiver with NMEA-0183 output. (GPS receiver must be installed.)

■ Shift

It allows you to enable [Shift + Function] key access. When [Shift] key is pressed, SFT appears on LCD.

■ Squelch Momentary

Press [Squelch momentary] key to force the squelch unmute. "MON" icon appears on LCD and BUSY LED (Green) lights. If released, the squelch unmutes and "MON" disappears. Also, BUSY LED (Green) goes off.

■ Squelch Off

Press [Squelch off] key to force the squelch unmute. "MON" icon appears on LCD and BUSY LED (Green) lights. If the key is pressed again, the squelch unmutes and "MON" disappears. Also, BUSY LED (Green) goes off.

■ Talk Around

When Talk around function is activated, "TA" appears and the transceiver transmits on the receive frequency, using receiver's QT/DQT code.

The operator can call the other party directly (without repeater).

■ 选呼输入

按选呼输入键可输入想要呼叫的选呼代码。
车载台设备ID由3位快速数码和4位ID数码组成。
使用键盘(键盘模式)或使用[信道上]，[信道下]键选择数码可以输入选呼数码。然后按[C]键输入所选数码。被选的数位将左移以便输入下一位。
按[D]键可使光标向右移一位。按住键盘中[D]键可清除所选数字。

■ 选呼列表

按[选呼列表]键可进入选呼列表模式。
DMS的ID列表将出现在LCD上。
要输入选呼列表，可使用[信道上]，[信道下]键或话筒键区上的[2]／[8]键。

■ 选呼＋状态输入

选择要呼叫的选呼数码。按[选呼＋状态输入]键输入"选呼输入模式"。它作为"选呼输入模式"模式。如果再次按[呼叫]或[∗]键，它就作为"状态输入模式"。

■ 选呼＋状态列表

选择要呼叫的选呼数码。按[选呼＋状态列表]键输入"选呼列表选择模式"。它作为"状态列表"模式。如果再次按[选呼＋状态列表]键，它就作为"状态列表选择模式"。

■ 发送GPS

可以手动发送GPS位置数据。需要安装带有NMEA-0183输出的GPS接收设备才能执行这种操作。(GPS接收设备必须安装)

■ 换档键

允许启用[换档＋功能]键。按[换档]键后，LCD上显示SFT。

■ 短瞬静噪

按[瞬间静噪]键可强制执行静噪监听。LCD上显示"MON"图标，繁忙指示灯(绿色)亮。如果再次按该键，静噪监听和"MON"消失，同时繁忙指示灯(绿色)熄灭。

■ 静噪关闭

按[静噪关闭]键可强制静噪监听。LCD上显示"MON"图标，繁忙指示灯(绿色)亮。如果再次按该键，静噪监听和"MON"消失，同时繁忙指示灯(绿色)灭。

■ 脱网

脱网功能被激活后，显示"TA"并且车载台将使用接收设备的QT/DQT模式，并以接收频率发射。
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。

OPERATING FEATURES / 操作特性

■ None

When you press this key, the transceiver emits the "Key input error tone" (no function is performed).

■ Volume Up/Down

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

2-3. Front Panel Displays and Indicators
■ Front Panel

■ 无

按该键后，车载台发射"按键输入错误音"（这时不能执行任何功能）。

■ 音量上／下

按该键后，调节音量大小，如果按住200毫秒以上，音量将重复增加／降低。

2-3. 前面板显示和指示
■ 前面板
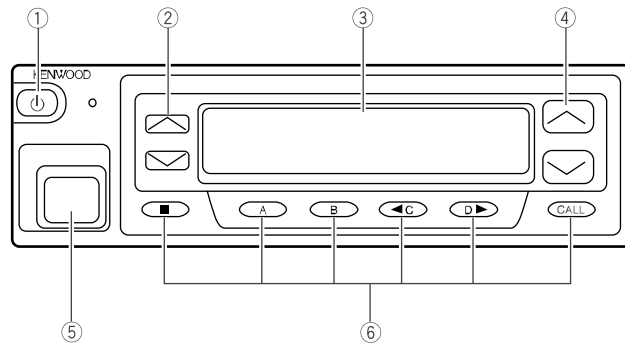
① ⏻ (Power) switch

Press to switch the transceiver ON (or OFF).

② ⌃ / ⌄ keys

Press these keys to activate their programmable auxiliary functions (page 11).

③ Display

See page 10 for more information.

④ ⌃ / ⌄ keys

Press these keys to activate their programmable auxiliary functions (page 11).

⑤ Microphone jack

Insert the microphone plug into this connector.

⑥ ■, A, B, ◀ C, D ▶, and CALL keys

Press these keys to activate their programmable auxiliary functions (page 11).

■ Display

① ⏻ （Power）电源开关

按此键可以接通（或者关闭）对讲机。

② ⌃ ／ ⌄ 键

按这些键可以开启它们的可编程辅助功能（参照第11页）。

③ 显示屏

详细内容请参照第10页。

④ ⌃ ／ ⌄ 键

按这些键可以开启它们的可编程辅助功能（参照第11页）。

⑤ 麦克风插孔

用于插入麦克风插头。

⑥ ■, A, B, ◀ C, D ▶ 和CALL键

按这些键可以开启它们的可编程辅助功能（参照第11页）。

■ 显示
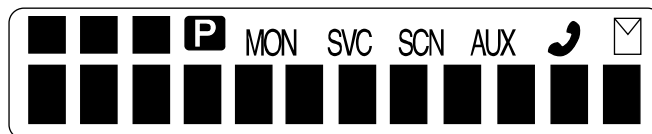
Indicator	Description
■■■	Displays the group and channel numbers as well as various dealer programmable functions.
P	Appears when the selected channel is a priority channel.

图 标	说 明
■■■	显示小组和信道号码以及各种经销商可编程功能。
P	当选择的信道是优先信道时出现。

OPERATING FEATURES / 操作特性

Indicator	Description
MON	Appears when you press key programmed as Monitor.
SVC	This icon is not used on this transceiver.
SCN	Appears while you are in Scan mode.
AUX	Appears when you activate the auxiliary function.
☎	This icon is not used on this transceiver.
✉	Appears when a message is stored in the queue memory. Flashes when you receive a new message.
■■■■■■■■■■■	Displays the group and channel number or name (which your dealer can program with up to 10 characters) as well as received messages when using DMS. The left most display is used as an add indicator (▼) and the right most display is used for Selective Call (✳). The add indicator shows the channels that are not locked out of the scanning sequence. Selective Call is a dealer programmable optional function.

图　标	说　　　明
MON	当按下设定为监听的按键时出现。
SVC	本对讲机不使用该图标。
SCN	在扫描模式下时出现。
AUX	当开启了辅助功能时出现。
☎	本对讲机不使用该图标。
✉	当消息存储在队列存储器中时出现。 当接收新消息时闪烁。
■■■■■■■■■■■	显示小组和信道号码或者名称(当地的经销商可以设定达10个字符)，以及当使用DMS时所接收的消息。最左侧的显示用于表示附加图标(▼)，最右侧的显示用于表示选择呼叫(✳)。附加图标表示信道没有排除在扫描序列之外。选择呼叫是由经销商设定的可选功能。

■ Rear Panel ■ 后面板

Power input connector
电源输入连接插头

External speaker jack
外部扬声器插孔

Antenna connector
天线连接插头
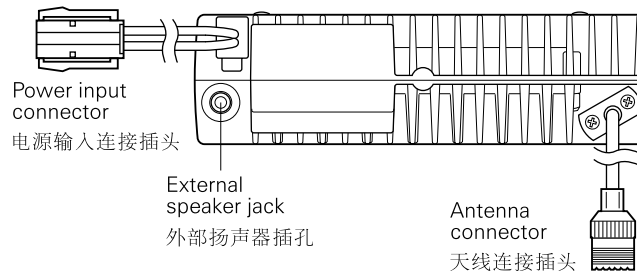
■ Programmable Auxiliary Functions

Keys ②, ④, and ⑥ (page 10) can be programmed with the auxiliary functions listed below. Please contact you dealer for further details on these functions.

- Auto Dial
- Autodial Programming
- AUX A
- AUX B
- Channel Down
- Channel Entry
- Channel Name
- Channel Up
- Display
- Emergency Call*
- Group Down
- Group Up
- Home Channel
- Key Lock
- Monitor
- Monitor Momentary
- None
- Operator Sel Tone
- Queue
- Scan
- Scan Delete/Add
- Scan Entry
- Selcall List
- Selcall + Status Entry
- Selcall + Status List
- Send GPS
- Shift
- Squelch Momentary
- Squelch Off
- Talk Around
- Volume Down
- Volume Up

* : This key can be assigned only to a foot switch.

■ 可编程辅助功能

②,④以及⑥按键(参照第10页)可以设定为下列辅助功能。有关这些功能的详细内容，请向当地的经销商咨询。

- 自动拨号
- 自动拨号设定
- AUX A
- AUX B
- 信道降低
- 信道输入
- 信道名称
- 信道升高
- 显示
- 紧急呼叫✳
- 小组降低
- 小组升高
- 主信道
- 键盘锁定
- 监听
- 瞬间监听
- 无
- 操作员选择音调
- 队列
- 扫描
- 扫描删除／增加
- 选择呼叫进入
- 选择呼叫目录
- 选择呼叫＋状态输入
- 选择呼叫＋状态目录
- 传送GPS
- 位移
- 瞬间静噪
- 静噪关闭
- 脱网
- 音量降低
- 音量升高

✳该按键只能用于脚踏开关。

OPERATING FEATURES / 操作特性

3. Scan Operating

■ Scan types

● Single group scan

You can scan all valid (ADD) channels in the displayed group that can be selected with the group up/down key.

● Multiple group scan

You can scan all valid (ADD) channels in the all valid (ADD) group.

■ SCAN start condition

One or more non-priority 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 function, the scan starts. The scan icon "SCN" lights and "−SCAN−" or revert channel (programmable) is indicated on alphanumeric display.

■ Scan stop condition

The scan stops temporarily if the following conditions are satisfied.
1) A carrier is detected, then signalling matches on channels for which receive the signalling is set by the programming software.
2) A carrier is detected on the channels for which receiving signalling is not set by the programming software or when the monitor (signalling cancel) function is activated.

■ Scan channel types

1) Priority channel is the most important channel for the scan, and always detects a signal during scan and when the scan stops temporarily.
2) Non-priority channels detects a signal during scan. For the channels that can be selected with the group or channel up/down key when the scan does not occur, adds an indicator "▼" lights.

■ Priority channel setting

A priority channel can be set as follows with the programming software.
1) Specify a priority channel as a fixed priority channel.
2) Make a selected channel, a priority channel.

■ Scan type according to the priority channel

1) When no priority channel is set : Only the non-priority channels are scanned.
If a non-priority channel stops temporarily, it stops until there is no signal on the channel.
2) When priority channel is set : Either priority channel is scanned.
If a non-priority channel stops temporarily, a priority channel signal is detected at certain intervals.
If a priority channel stops temporarily, it stops until there is no signal on the priority channel.

3. 扫描操作

■ 扫描类型

● 单组扫描

用户可以扫描所显示的组中的全部有效 (ADD)信道，该组能用组升／降键选择。

● 多组扫描

用户可以扫描全部有效组(ADD)中的全部有效 (ADD)信道。

■ 扫描开始条件

可扫描的信道中必须添加一个或多个非优先信道。车载台必须处于一般接收模式(PTT关闭)。

当用户激活可编程扫描功能键时，扫描开始。扫描指示图标"SCN"点亮，同时字符显示区上显示"− SCAN−"或复位信道(可编程的)。

■ 扫描停止条件

如果下列条件满足，扫描临时停止：
1) 探测到一个载波信号，同时信令与接收由编程软件设置的信令的信道相匹配。
2) 在接收由编程软件设置的信令的信道上探测到载波信号，或者监听功能有效时(信令终止功能)。

■ 扫描信道类型

1) 对于扫描来说，优先信道是最重要的信道，同时在扫描期间和扫描暂停时优先信道会随时探测信号。
2) 非优先信道在扫描期间探测信号。对于那些在不发生扫描时能通过组或信道升/降键来选择的信道，将增加一指示灯"▼"。

■ 优先信道设置

可以通过编程软件按下述设置优先信道。
1) 指定一个优先信道作为固定优先信道。
2) 选择一个信道，即优先信道。

■ 依赖于优先信道的扫描类型

1) 没有设置优先信道时：只扫描非优先信道。
如果非优先信道暂停，将一直停止到该信道的信号消失为止。
2) 设置优先信道时：可以扫描任何优先信道。
如果非优先信道暂停，则将以一定的间隔探测优先信道信号。
如果优先信道暂停，则将一直停止到该信道的信号消失为止。

OPERATING FEATURES / 操作特性

■ Revert channel

The revert channel is used to transmit during scanning and set by the programming software.

1) Priority

The transceiver reverts to the priority channel.

2) Priority with talkback

The transceiver reverts to the priority channel.

If you press PTT during a resume timer (dropout delay time, TX dwell time) or calling, you can transmit on current channel to answer to the call however revert channel is set to priority channel.

After resume time, scan re-starts and transmission channel is return to priority channel.

3) Selected channel

The transceiver reverts to the channel before scanning or the channel that you changed during scan.

4) Last called channel

The transceiver reverts to the last called channel during the scan.

5) Last used channel

The transceiver reverts to the last used (transmitted) channel during scan. "Last used" revert channel includes talkback function.

6) Selected with talkback

The transceiver reverts to the channel before scanning or the channel that you changed during scan.

■ Scan end

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

The scan icon "SCN" and "－SCAN－" or revert channel (programmable) display goes off.

■ Temporarily delete/add

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

When you would like to add the deleted channel temporarily to scan sequence, select the desired (deleted) channel during scan, activate the delete/add function (for example press the key) before scan re-start.

That channel is added temporarily to scan sequence. The temporary deleted or added channels are returns to pre-set delete/add, when the transceiver exits from scan mode.

■ Keypad operation

This parameter selects the default use of the numerical field of the keypad. You can select from "DTMF", "Selcall entry", "Status entry" and "OST".

In the case of "OST"; Enter to use the keypad to recall OST directly. To recall OST memory 1 to 9, press the OST number directly for 1 second. To recall OST memory 10 to 16, press [∗] for 1 second, then press [0] to [6].

Example; Recall OST memory 15 : [∗] [5]

When OST memory is recalled by keypad [1] to [9], the "OST" display lights and OST is turned on. If the keypad [#] is pressed, OST is turned off, and the "OST" display goes off.

■ 回复信道

回复信道用于在扫描过程中发射，通过编程软件设置。

1）优先级

车载台回复到优先信道。

2）带有回应的优先级

车载台回复到优先信道。

如果在复位时间（退出延时期间，TX闭锁期间）或呼叫期间按下PTT，用户可以在当前信道上发射应答呼叫，而回复信道被设置为优先信道。

超过复位时间之后，扫描重新开始，发射信道转为优先信道。

3）选择的信道

车载台回复到扫描之前的信道或用户在扫描过程中改变的信道。

4）上一次被呼信道

车载台回复到扫描过程中最后被呼的信道。

5）上一次使用信道

车载台回复到扫描过程中最后被使用（发射）的信道。"上一次被使用"回复信道包括回应功能。

6）选择带有回应的信道

车载台回复到扫描之前的信道或用户在扫描过程中改变的信道。

■ 扫描结束

在扫描模式期间，当用户把可编程键重新激活到扫描功能时，扫描结束。

扫描图标"SCN"和"－SCAN－"或回复信道（可编程）显示消失。

■ 临时删除／添加

扫描期间可以暂时删除或增加信道。当扫描停止在不需要的信道上时，例如被其它台干扰的信道，激活删除／增加功能（例如按该键），然后该信道被临时删除，扫描立即重新开始。

扫描过程中当用户想临时增加一个被删除的信道时，选择所需的（已被删除的）信道，在扫描重新开始前激活删除／增加功能（例如按该键）。

扫描过程中该信道被临时删除。当车载台退出扫描模式时，临时删除或增加的信道转为预设删除／增加信道。

■ 键盘操作

该参数选择键盘上的数字区默认功能。用户可以在"DTMF"，"选呼输入"，"状态输入"和"OST"之间选择。

在"OST"的情况下；使用键盘输入直接重呼OST，重呼从1至9的记忆序号，直接按住OST序号1秒钟，重呼从10到16的记忆序号，按住[∗]键1秒钟再按[0]至[6]键。

例如：重呼OST记忆序号15：[∗][5]。

当通过键盘[1]至[9]重呼OST记忆序号时，"OST"显示灯和OST点亮。如果按下键盘[#]，OST熄灭，同时"OST"显示消失。

■ Squelch logic signal

This signal is useful for external radio control units which require a signal at the time of carrier operate relay or tone operate relay.

■ TX sense

Select one of the following three output functions for data communication.

● MIC PTT

Indicates the state of the microphone PTT.
MIC PTT on = Low, MIC PTT off = High

● Ext PTT

Indicates the state of the Acc PTT input.
Ext PTT on = Low, Ext PTT off = High

● TX line

Indicates the actual transmitter activity.
TX on = Low, TX off = High

■ MIC hook logic signal

The MIC hook logic signal is on the CODE 2 terminal. The MIC hook logic signal type is the type of active low or high for the MIC hook logic signal.

■ Unlock logic signal

The PLL unlock logic signal is on the CODE 1 terminal. The unlock logic signal type is the type of active low or high for the PLL unlock logic signal.

■ Com port
● Com 0

This function selects the external serila port function at the microphone jack (TXD/RXD). PC programming is accepted, regardless of this setting.

● Com 1

This function selects the external COM1 pin serial port function on the KCT-19 accessory jack. If the transceiver is installed GPS unit, this function must be set up in "GPS".

● Com 2

This function selects the external COM2 pin serial port function on the KCT-19 accessory (RXD2 (AHK)/TXD2 (PTT)) and the external serial port function (TXD2/RXD2).

4. Details of Features
■ Time-out timer

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

■ 静噪逻辑信号

该信号用于在载波操作延时或调频延时期间要求信号的外部无线电控制单元。

■ TX传感器

对于数据通讯可选择以下三种功能之一。

● MIC PTT

指示话筒PTT的状态。
MIC PTT on＝低，MIC PTT off＝高

● Ext PTT

指示Acc PTT输入的状态。
Ext PTT on＝低，Ext PTT off＝高

● TX线

指示发射线的状态。
TX on＝低，TX off＝高

■ 话筒挂断逻辑信号

话筒挂断的逻辑信号在CODE2终端上。话筒挂断的逻辑信号类型是话筒挂断逻辑信号的电平低或高。

■ 锁定解除逻辑信号

PLL锁定解除逻辑信号在CODE1终端上。锁定解除逻辑信号类型是PLL锁定解除逻辑信号的电平低或高。

■ Com端口
● Com 0

该功能在话筒插座(TXD/RXD)上的外部串行端口部件之间进行选择。不管是否设置了该功能，总是接受PC编程。

● Com 1

该功能在KCT-19附属设备插座上的外部COM1针式串行端口之间进行选择。如果车载台安装了GPS设备，则该功能必须设置为"GPS"。

● Com 2

该功能在KCT-19附属设备(RXD2(AHK)/TXD2(PTT))上的外部COM2针式串行端口和外部串行端口(TXD2/RXD2)之间进行选择。

4．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。

OPERATING FEATURES / 操作特性

■ Sub LCD display

You can use 3-digit the display to display the channel number or group number. It is useful when the main (12-digit) display indicates group or channel name or other functions.

■ Selective call alert LED

You can select whether or not the LED on the transceiver flashes in an orange color when selective call was occurred.

■ PTT ID

PTT ID provides a DTMF or FFSK (DMS : Fleet-ID) 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 for each transceiver.

The timing that the transceiver sends ID is programmable.
BOT : DTMF ID (BOT)/FFSK ID is sent on beginning of transmission.
EOT : DTMF ID (EOT)/FFSK ID is sent on end of transmission.
Both : DTMF ID (BOT)/FFSK ID is sent on beginning of transmission and DTMF ID (EOT)/FFSK ID is sent on end of transmission.

■ Radio password

When the password is set in the transceiver, user can not use the transceiver unless enter the correct password.

This code can be up to 6 digits from 0 to 9 and input with the key, and [CALL] key.

■ 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.

■ Timed power off

This function works as "Automatic Power Switch Off".

Timed power off timer starts from the ignition-off. After the timer expires, the radio will automatically turn off. The timer will be reset if the ignition is turned on and off.

This function requires ignition-sense. Connect the ignition-line to the 9-pin connector which is located at the rear of the radio.

After the timer expires, press the power switch to turn on the radio.

■ "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.

■ 副LCD显示区

用户可以使用3位数字组成的显示区显示信道号或组号。当12数字组成的主显示区指示组名或信道名或其它功能时，就会用到该显示区。

■ 选择呼叫提示LED

用户可以选择设置当选择呼叫发生时是否使车载台上的LED以橙色光闪烁。

■ 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DTMF ANI或FFSK(DMS：Fleet-ID)ANI。

用户可以将各信道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(BOT)/FFSK ID码(发射开始)。
EOT：在发射结束时发送DTMF ID码(EOT)/FFSK ID码(发射结束)。
两者兼有：在发射开始时发送DTMF ID码(BOT)/FFSK ID码(发射开始)，同时在发射结束时发送DTMF ID码(EOT)/FFSK ID码(发射结束)。

■ 通信机密码

当车载台设置了密码时，用户除非输入正确的密码，否则不能使用车载台。

该代码是"0"至"9"组成的数字，最多可达6位，用相应的数字键和[呼叫]键输入。

■ 摘机解码

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

■ 定时关机

该功能用来执行"自动关机"操作。

定时关机计时器从点火装置关闭时开始计时。计时器终止后，收发机自动关闭。开关点火装置时，计时器将复位。

该功能需要点火传感器。将点火线连接到安装在收发机后面的9针连接器上即可。

计时器终止后，按电源开关以便关闭收发机。

■ "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，该参数设定车载台发出"TOT"预先告警音的时间。

当TOT开始发出预先告警音时"TOT"将终止。

■ "TOT"再按键时间

车载台具有一个"TOT"再按键定时器。在超过"TOT"时间之前，该定时器定义的时间是用户不能发射的时间。在"TOT"再按键时间终止后，用户可以再次发射。

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OPERATING FEATURES / 操作特性

■ **"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.

■ **OST (Operator Selectable Tone)**

The transceiver is capable to have "OST" function and 16 tone pair (QT/DQT) with max 10-digit name for each tone pair.

● **"OST" back up**

The transceiver is programmable the selected "OST" code is memorized or not. If you set to Disable (no memorized), the "OST" function always starts at "off".

■ **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.

5. Option Signalling (DTMF)

Built-in DTMF decoder is available for option signalling.

It is possible to use individual call, group call, stun, kill. Stun and kill are used with DTMF.

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

If option signalling matches on a group/channel which is set up with option signalling, the option signalling indicator (∗) will flash and option signalling will be released. The transpond or alert tone will sound.

If the selective call alert LED is set up, the orange LED will flash.

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

■ **AND/OR**

Option signalling match conditions can be selected with AND/OR logic.

	Alert/Transpond
AND	Triggers at match with QT/DQT/ID+DTMF; Both
OR	Triggers only for match with DTMF; Option
	AF mute open
AND	Triggers at match with QT/DQT/ID+DTMF; Both
OR	Triggers only for match with QT/DQT/ID; Signalling

Even if set for OR, AF mute cannot be canceled just by a match with DTMF.

In channels not set with QT/DQT, signalling is a match just by rceiving the carrier.

■ "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，该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。

■ OST（操作可选信令）

车载台具有OST功能和16对信令（QT/DQT），每对信令至多可有10位数字名称。

● "OST"备份

如果车载台是可编程的，那么所选择的"OST"代码就被记忆下来，反之则否。如果用户设置为无效（不能被记忆），那么"OST"功能总是开始于关的状态。

■ 加强自动应答

如果信道直到打开均为繁忙，车载台将等待DTMF应答。该特性用来防止干扰到对方。

5.可选信令（DTMF）

内置DTMF解码器对可选信令有效。

可以使用单呼，组呼，遥毙，抑制。遥毙和删除用于DTMF模式。

如果可选信令匹配，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（∗）闪烁并取消可选信令。将发出应答或告警声。

如果设置了选择呼叫提示LED，则橙色的LED将闪烁。

当可选信令相匹配时（或者因用户发射而抑制可选信令时），用户可以使QT/DQT载波静音或非静音。

■ 与／或运算

可以用与／或逻辑运算选择可选信令匹配条件。

	告警／应答
与运算	当匹配QT/DQT/ID+DTMF时触发：二者都可。
或运算	只要匹配DTMF时触发：任意一个。
	AF静音打开
与运算	当匹配QT/DQT/ID+DTMF时触发：二者都可。
或运算	只要匹配QT/DQT/ID时触发：信令。

只要匹配DTMF，即使设置为或，AF静音也不能被终止。

信道中没有设置QT/DQT时，只要接收载波信号，信令就是一个匹配。

OPERATING FEATURES / 操作特性

■ 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.

■ Stun/Kill

If the stun code matches, a predetermined action will occur. Whether option signalling is activated or not, when stun code matches on any channel, the transceiver will become stun or kill.

While stun is active ("LOCK2" appears), if the stun code + "#" code is received, stun will disactive. While kill is active ("ERROR" appears), the transceiver will be disable all functions. The transceiver must be reprogrammed by the FPU (KPG-77D) to operation again.

6. Alphanumeric Two-way Paging Function (Digital Message System : DMS)

■ General

The Alphanumeric Two-way Paging Function (DMS) is a Kenwood proprietary protocol. It enables a variety of paging functions.

■ ID Construction

A radio unit ID is defined by a combination of 3-digit Fleet and 4-digit ID numbers. Each radio unit must be assigned its own Fleet and ID numbers.

■ PTT ID

A pre-programmed unique ID can be sent at the beginning of transmission and/or the end of transmission to identify which radio unit is on air.

■ Selective Call (SELCALL)

This is a voice call to a particular individual or group of stations.

● Example of call types;

[100][ALL] : <Fleet Call>
All the units whose fleet number is "100" are called.
[100][1000] : <Individual Call>
The unit, whose the fleet number is "100" and ID number is "1000", is called.
[ALL][ALL] : <Broadcast Call>
All the units are called.
[ALL][1000] : <Supervisor Call>
All ID "1000" are called regardless of their fleet number.

● Unit ID Encode Block

Encode ID Block can be set to limit manual dial ID. The radio unit will not accept an ID other than these IDs which are entered from the keypad. If Inter-fleet Call is enabled, block ID setting affects each fleet group.

■ 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。

■ 遥毙／删除

遥毙代码匹配时将执行预定操作。当遥毙代码匹配任何一个信道时，无论可选信令启用与否，车载台都将进入遥毙或抑制状态。

当遥毙处于激活状态时（"LOCK2"出现），如果接收到遥毙代码＋"#"代码，遥毙变为非激活状态。当删除处于激活状态时（"ERROR"出现），车载台将使所有功能都失效，这时必须再使用FPU(KPG-77D)操作将车载台重新编程。

6. 字符双向呼叫功能 （数字信息系统：DMS）

■ 概述

信息双向呼叫功能(DMS)是一个Kenwood私人协议，它启用各种呼叫功能。

■ ID码组成

收发机单元ID码由3位数字的队列号与4位数字的ID码序号的组合来定义。每一个收发机单元必须分配一个独有的队列号和ID码序号。

■ PTT ID码

在发射开始并且／或者发射结束时，可以发送一个唯一的预编程ID码以识别哪一个收发机单元正在呼叫。

■ 选择呼叫（选呼）

这是一种针对特殊个体或组对像的呼叫。

● 呼叫类型举例

[100][ALL]：＜队列呼叫＞
呼叫所有队列序号为"100"的单元。
[100][1000]：＜个体呼叫＞
呼叫队列序号为"100"而且指针号为"1000"的单元。
[ALL][ALL]：＜广播呼叫＞
呼叫全部单元。
[ALL][1000]：＜管理员呼叫＞
呼叫队所有指针号为"1000"的单元，而不管这些单元的队列序号如何。

● 单元ID编码块

用户可以设置编码ID块以限制手工拨号ID。收发机单元只接受由键盘输入的这些ID，而不接受其它ID。如果启用队列内呼叫，设置的块ID将影响每一个队列组。

OPERATING FEATURES / 操作特性

■ Status Message

Using a 2-digit number, you can send and receive a Status message which may be decided in your talk group. Each Status may be displayed with 16 alphanumeric characters if programmed in the radio. A maximum of 15 received messages can be stored in the stack memory, and it can be reviewed after reception. If the message memory becomes full, the oldest one will be erased. The stack memory will be cleared by turning radio power off.

● Status 80~99 (Special)

Status numbers from 80 to 99 are reserved for special purposes. Entering these statuses from the DTMF keypad can be inhibited.

Please notice that the following status numbers are used for special purposes;

80~89 : Reserved for future use.
90 : Remote kill on. Disable all transceiver functions.
91 : Remote stun on. The transceiver cannot operate.
92 : Turns stun off.
93 : Spare.
94 : Acknowledgement status sent when the radio unit is in stun mode.
95~98 : Reserved for future use.
99 : Emergency Status.

Note : Remote stun works with DTMF stun function also.

● Automatic Status Response

If you pre-select a status number and leave the radio in the Status Mode, it can automatically respond with the selected status number upon request from the base station. (The request function is initiated by serial control on the base station (Optional).)

■ Short Messase (Optional)

A maximum of 48 characters can be sent (External equipment is required). Received Short Messages will be displayed in the same manner as a Status Message. A maximum of 15 received messages can be stored in the stack memory. In the Stack Mode, 3-digit LCD indicates the received Short Message as "Q1"~"Q15".

■ Long Message

A maximum of 4096 characters can be sent (External equipment is required). Received Long Message will not be displayed or stacked in the radio memory but is output through the COM (Data) port.

■ Emergency Function

Emergency status 99 will be sent at the beginning of each emergency transmission.

● Emergency Status response

Either "Horn" or "Alert" can be selected for the called radio unit's response to reception of status 99 which is used as an emergency status.

■ 状态信息

使用一个2位数序号，用户可以发送或接收用户应答组所决定的状态信息。每个状态可以显示为16位的字符，这些字符可由收发机编程。最多可以将15个接收的信息保存在堆栈内存区，之后还可以调出查看。如果堆栈内存区已满，则最早的信息被删除。关闭车载台的电源，堆栈区将被清空。

● 状态80~99（特定信息）

80~99的状态序号被保留用于特殊目的。禁止从DTMF键盘输入这些状态序号。

请注意下列用作特殊目的的状态序号：

80~89：保留为未来之用；
90：遥控抑制为打开状态时，禁用车载台的所有功能；
91：远程遥毙为打开状态时，车载台进入禁止操作状态；
92：关闭遥毙；
93：备用；
94：当收发机单元处于遥毙模式时，发送应答状态信息；
95~98：保留为未来之用；
99：应急状态。

注意：远程遥毙也可和DTMF遥毙一起工作。

● 自动状态应答

如果用户预先选择了一个状态序号并将收发机设在状态模式下，则机器可以自动应答来自基站的与所选状态序号相对应的信号请求（该请求功能由基站上的串行控制器启动（可选））。

■ 短信息（可选）

可以发送最多由48个字符组成的信息（必须有外部设备）。接收短信息的显示方式与状态信息的显示方式相同。堆栈内存区最多可贮存15条所接收的信息。在堆栈模式下，3位的LCD将接收的短信息依次表示为"Q1"~"Q15"。

■ 长信息

可以发送最多由4096个字符组成的信息（必须有外部设备）。接收的长信息不能显示或贮存在堆栈内存区，但可以通过COM（数据）端口输出。

■ 应急功能

应急状态信息99将在每个应急发射的开始时发出。

● 应急状态应答

为了回应应急状态信息99的请求，可以为被呼叫收发机单元的应答选择设置"喇叭"，也可以设置"告警"。

OPERATING FEATURES / 操作特性

■ Other Functions

● Manual Dial

Fleet, ID and Status numbers can be entered from DTMF keypad. (DTMF microphopne is required.)

● Data TX with QT/DQT

Whether programmed QT/DQT is modulated or not with a data transmission except for Selcall. A radio unit can receive a data message regardless of QT/DQT if the receiving unit is not scanning.

● DMS Baud Rate

FFSK data baud rate setting. The same rate must be set as a communication partner.

1200bps :
Data communication is made in 1200bps. The communication area is much wider than 2400bps. Recommended for repeater operation.

2400bps :
Data communication is made in 2400bps. The communication area is narrower than 1200bps, but it will decrease the data traffic. Data rate 2400bps may not work properly depending on the repeater's characteristic.

● Inter-Fleet Call

Inter-fleet calls allow a radio of one fleet number to call a radio with a different fleet number (radio users can manually dial a unit ID with a different fleet number).

● Status/Short/Long Message on Data Group/Channel

Status/Short/Long Message transmission is made whether on the Data Group/Channel.

● Status/Short/Unit ID Message Serial Output

Whether a received Status/Short message or PTT ID is outputed or not to serial port.

■ GPS Report

A NMEA-0183 GPS unit must be installed.

● GPS Report Mode

GPS data can be sent automatically or upon request. Manually sending GPS data works regardless of this setting.

Auto : GPS data is sent both automatically and by request. GPS Auto TX Interval and GPS Time Mark must be adjusted if required.
Poll : GPS data is sent upon request from dispatcher.

● GPS Report Interval

Interval time between automatic GPS data transmissions.

● GPS Time Mark (Per Mobile)

The amount of time from the 0 (zero) minute of the standardized GPS UTC time to starting the first transmission of GPS data. It must be set to a different value for each radio unit to avoid a transmission crash.

■ 其它功能

● 手工拨号

可以从DTMF键盘输入队列，ID和状态序号(需要DTMF话筒)。

● QT/DQT的数据TX

不论是否将已编程的QT/DQT与除选呼外的数据发射进行了调制。如果接收单元不是正在扫描，则不管是否设置了QT/DQT，收发机单元都能接收数据信息。

● DMS波特率

FFSK数据的波特率设置。互相通讯的两台机器必须设置为相同的速率。

1200bps：
数据通讯以1200bps工作。通讯区比2400bps要宽。对于转发器操作，推荐使用该速率。

2400bps：
数据通讯以2400bps工作。通讯区比1200bps要窄，但是可以减少数据堵塞现象。由于2400数据速率的工作性能依赖于转发器性能，所以这种情况可能会发生工作异常。

● 队列内呼叫

队列内呼叫允许有一个队列序号的收发机呼叫另一台具有不同队列序号的收发机(收发机用户可以手工拨号不同于队列序号的单元ID)。

● 数据组／信道上的状态信息／短信息／长信息

状态信息／短信息／长信息的发射可以在数据组／信道上完成。

● 状态信息／短信息／单元ID信息串行输出

将接收的状态／短信息或PTT ID输出到串行端口。

■ GPS报告

必须安装一套NMEA-0183 GPS设备。

● GPS报告模式

GPS数据可以自动地或应要求而发送。不论设置如何，都可以手工发送GPS数据。

自动：可以自动发送GPS数据，也可以手工发送。如果有要求，必须调整GPS自动TX时间间隔和GPS时间标志。
轮询：应调度台的要求发送GPS数据。

● GPS报告时间间隔

两次自动发送GPS数据之间的间隔时间。

● GPS时间标志(每个移动台)

从标准GPS UTC时的0分到首次发送GPS数据时的时间量。为避免发射事故，必须为每个收发机单元设置不同的GPS时间标志值。

TK-782

OPERATING FEATURES / 操作特性

● **Send GPS**

Pressing this key causes the transceiver to send a single GPS data.

● **GPS Report On Data Group/Channel**

GPS data transmission is made on the Data Group/Channel in conventional format.

● **Received GPS Data Output**

Any selected sentence can be output through the radio serial port (COM1).

1) MAP HEADER NMEA1 ($GPGGA), NMEA2 ($GPGLL), NMEA3 ($GPRMC)
   NMEA-0183 standard command. This should be set according to your PC application.

2) MAP HEADER KW1 ($PKLDS)
   This is a Kenwood original sentence which consists of "$GPGLL + Fleet + ID + Status". This item should be set according to your PC application.

3) MAP HEADER KW2 ($PKLID)
   This is a Kenwood original sentence which consists of "Fleet + ID". This should be set according to your PC application.

■ **Parameters**

● **GTC Count**

Number of "Go To data Channel" messages to be sent before transmitting a data message if it is being made on Data Group/Channel. If a radio unit receives a GTC message, it will move to the Data Group/Channel of the current group. Increase this item to make sure the called radio unit moves to the Data Group/Channel.

● **Random Access (Contention)**

When a channel is busy, radio unit will not transmit (depending on its Busy Channel Lockout setting). As soon as a channel is cleared, some transmissions may crash. Random access is used to avoid this by employing a random transmission sequence.

● **Number of Retries**

Number of Retries is the maximum number of retry transmission when no acknowledgement is received in the Maximum ACK Wait Time. Increase this item to improve data communication reliability.

● **TX Busy Wait Time**

TX Busy Wait Time is the maximum amount of time before giving up the data transmission when the channel is busy. Also, this timer affects if it expires during Random Access period.

● 发送GPS

按压该键使发射机发送一个单一的GPS数据。

● 数据组／信道上的GPS报告

GPS数据在数据组／信道上以正常格式完成发送。

● 接收GPS数据产品

任何选定的句子都可以通过收发机串行端口（COM1）输出。

1) MAP HEADER NMEA1($GPGGA)，NMEA2($GPGLL)，NMEA3($GPRMC)
   NMEA-0183标准指令：应根据用户的PC应用设置该条目。

2) MAP HEADER KW1($PKLDS)
   这是Kenwood原文句型，其结构为："$GPGLL＋队列＋ID＋状态"。应根据用户的PC应用设置该条目。

3) MAP HEADER KW2($PKLID)
   这是Kenwood原文句型，其结构为："队列＋ID"。应根据用户的PC应用设置该条目。

■ 参数

● GTC计数

如果工作模式处于数据组／信道，则发送数据信息之前要计数所要发送的"数据信道就位"信息的个数。如果收发机单元接收到一个GTC（数据信道计数）信息，则该机就会转向当前组的数据组／信道。增加该条目以确保被呼叫的收发机单元转向数据组／信道。

● 随机访问（抢线情况）

当信道处于繁忙状态时，收发机单元不能发射（依赖于其繁忙信道锁定的设置）。如果出现发射事故，信道立即会被清空。启用随机发射次序，进行随机访问可以避免上述情况。

● 重试次数

重试次数指在最大ACK等待时间内没有接收到应答信号而重试发射的次数。增加该条目以保证数据通讯的可靠性。

● TX繁忙等待时间

TX繁忙等待时间指因信道繁忙放弃数据发射而需要等待的最大时间值。同时，随机访问期间如果等待时间到期，该计时器就发挥作用。

OPERATING FEATURES / 操作特性

- **Maximum ACK Wait Time**

  Maximum ACK Wait Time is the maximum amount of time to wait for an acknowledgement from the called radio unit. It is used as an interval time of retries. It must be set greater than the ACK Delay Time of the called radio unit.

- **ACK Delay Time**

  ACK Delay Time is the amount of time from the end of receiving a data to the beginning of sending an acknowledgement. It should be adjusted as the repeater's hang-up delay time. Also, it must be set less than the Maximum ACK Wait Time of the calling radio unit.

- **TX Delay Time (RX Capture)**

  TX Delay Time is the amount of unmodulated transmission to let the called unit stop scanning or exit its battery save mode. It is used only when starting a data communication sequence.

- **Data TX Modulation Delay Time**

  Data TX Modulation Delay Time is the amount of time from the beginning of transmission to the beginning of a data modulation. It is used every time data is transmitted.

7. Audible User Feedback Tones

The transceiver outputs various combinations of tones to notify the user of the transceiver operating state. The main tones are listed below.

■ **Power on tone**

This tone is output when the transceiver is turned on. (The high tone is output for 500ms.)

■ **Alert tone**

This tone is output when the transceiver is TX inhibition for TOT, battery warning and PLL unlocked. It is output until the PTT button is released.

■ **Group call tone**

Sounds when a group call with the correct DTMF option signalling is received.

■ **DMS signalling alert tone**

Sounds when an individual call with the correct DMS signalling is received.

■ **Individual call tone**

Sounds when an individual call with the correct DTMF option signalling is received.

■ **Key press tone [A]**

Sounds when a key is pressed. For toggle keys, sounds when toggle function is turned on (key press tone [B] sounds when it is turned off).

- 最大ACK等待时间

  最大ACK等待时间指等待被呼叫的收发机的应答所需的时间，用作重试间隔时间。该时间的设置值必须比被呼叫收发机的ACK延时时间所设置的时间大。

- ACK延时

  ACK延时指从结束接收数据到开始发送应答信号之间的时间量。应将ACK延时调整到与转发器挂起延时相同，并且还须小于正在呼叫的收发机单元的最大ACK等待时。

- TX延时（RX捕获）

  TX延时指未调制发射的数量以便被呼叫的收发机单元停止扫描或退出节电模式，仅用于启动数据通讯次序。

- 数据TX调制延时

  数据TX调制延时指从开始发射到开始数据调制之间的时间量，用于每次数据发射。

7. 用户提示音

车载台发出各种组合提示音以提示用户车载台的操作状态。其主要声音如下：

■ 开机提示音

车载台开机时发出该提示音（发音持续时间500ms）

■ 告警提示音

车载台因TOT而禁止TX时，或电池告警和PLL锁定解除时发出该提示音，直到释放PTT按钮为止。

■ 组呼叫提示音

接收到带有正确的DTMF可选信令的组呼叫时鸣响。

■ DMS信令告警提示音

接收到带有正确的DMS信令的单独呼叫时鸣响。

■ 单独呼叫提示音

接收到带有正确的DTMF可选信令的单独呼叫时鸣响。

■ 按键提示音［A］

按键时鸣响。对于切换键来说，当开启切换功能时鸣响（关闭时则鸣响按键提示音［B］）。

TK-782

OPERATING FEATURES / 操作特性

■ **Key press tone [B]**

Sounds when a key is pressed. For toggle keys, sounds when the toggle function is turned off (key press tone [A] sounds when it is turned on).

■ **Key press tone [C]**

Sounds when a key is pressed. Also sounds when storing data, adding a DTMF code to memory, and when changing test mode settings.

■ **Key input error tone**

Sounds when a key is pressed but that key cannot be used.

■ **Roll over tone**

Sounds at the smallest group/channel.

■ **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).

■ 按键提示音 [B]

按键时鸣响。对于切换键来说，当关闭切换功能时鸣响（开启时则鸣响按键提示音 [A]）。

■ 按键提示音 [C]

按键时鸣响。当贮存数据，向内存区添加DTMF代码和改变测试模式设置时也会鸣响。

■ 按键输入错误提示音

当按下一个键但不能使用该键时鸣响。

■ 卷动结束提示音

卷动到最后的组／信道时鸣响。

■ 应答提示音

当接收到带有正确的DTMF可选信令的单独呼叫时鸣响。对于组呼叫，则只发出组呼叫提示音，而不发出应答提示音。

■ 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，在编制的时刻发出该提示音(TOT时间－TOT预先告警时间＝鸣响预先告警提示音的时间)。

REALIGNMENT / 模式组合

1. Modes
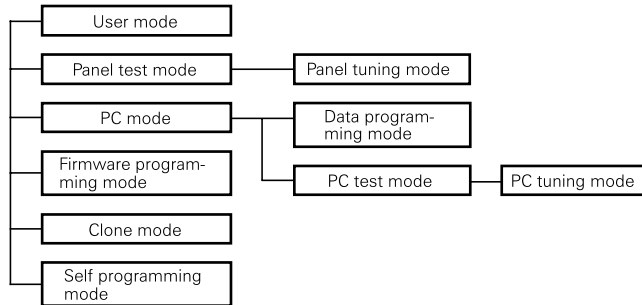
Mode	Function
User mode	For normal use.
Panel test mode	Used by the dealer to check the fundament characteristics.
Panel tuning mode	Used by the dealer to tune the radio.
PC mode	Used for communication between the radio and PC (IBM compatible).
Data programming mode	Used to read and write frequency data 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. See panel tuning.
Firmware programming mode	Used when changing the main program of the flash memory.
Clone mode	Used to transfer programming data from one radio to another.
Self programming mode	Frequency, signalling and features write to the radio.

2. How to Enter Each Mode

Mode	Operation
User mode	Power ON
Panel test mode	[B]+Power ON
PC mode	Received commands from PC
Panel tuning mode	[Panel test mode]+[A]
Firmware programming mode	[A]+Power ON
Clone mode	[D ▶]+Power ON
Self programming mode	[CALL]+Power ON

3. Panel Test Mode

Setting method refer to ADJUSTMENT.

4. Panel Tuning Mode

Setting method refer to ADJUSTMENT.

1. 模式
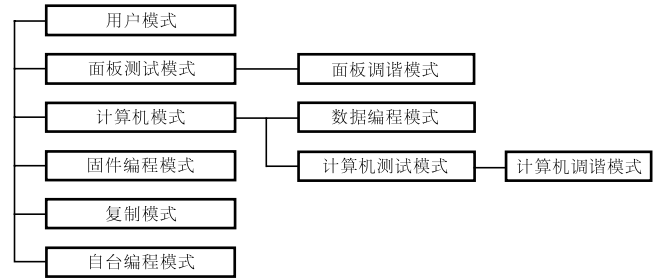
模 式	功 能
用户模式	一般使用。
面板测试模式	用于经销商检查基本功能。
面板调谐模式	用于经销商调整车台机指标。
计算机模式	用于车台机与计算机(IBM兼容机)之间的通信。
数据编程模式	用于阅读和写入频率数据以及其他功能。
计算机测试模式	用于使用计算机检测。此特性包括在FPU内。参见面板调谐。
固件编程模式	当改变Flash Rom中操作主程序时使用。
复制模式	用于从一个车台机编程数据复制到另一个车台机。
自台编程模式	频率, 信令和特性写入无线电设备。

2. 如何进入每一种模式

模 式	操 作
用户模式	接通电源
面板测试模式	[B]＋接通电源
计算机模式	从计算机接收指令
面板调谐模式	[面板测试模式]＋[A]
固件编程模式	[A]＋接通电源
复制模式	[D ▶]＋接通电源
自台编程模式	[CALL]＋接通电源

3. 关于面板测试模式

关于设定方式, 参见调整。

4. 关于面板调谐模式

关于设定方式, 参见调整。

REALIGNMENT / 模式组合

5. PC Mode

5-1. Preface

The TK-782 transceiver is programmed by using a personal computer, a programming interface (KPG-46) and programming software (KPG-77D).

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

5-2. Connection Procedure

1. Connect the TK-782 to the personal computer with the interface cable.
2. When the Power switch on, user mode can be entered immediately. When PC sends command the radio enter PC mode, and "PROGRAM" is dispalyed on the LCD.
   When data transmitting from transceiver, the red LED is blinking.
   When data receiving to transceiver, the green LED is blinking.

Notes :

● The data stored in the personal computer must match model type when it is written into the flash memory.
● Change the TK-782 to PC mode, then attach the interface cable.

5-3. KPG-46 Description
(PC programming interface cable : Option)

The KPG-46 is required to interface the TK-782 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-782 to the computers RS-232C serial port.

5-4. Programming Software KPG-77D Description

The KPG-77D is the programming software for the transceiver supplied on two 3.5" floppy disks. This software runs under MS-Windows 95 or 98 on an IBM-PC or compatible machine.

The data can be input to or read from the transceiver and edited on the screen. The programmed or edited data can be printed out. It is also possible to tune the transceiver.

We recommend that install the KPG-77D for example to hard disk first then use it.

5-5. Programming With IBM PC

If data is transferred to the transceiver from an IBM PC with the KPG-77D, the destination data (basic radio information) for each set can be modified. Normally, it is not necessary to modify the destination data because their values are determined automatically when the frequency range (frequency type) is set.

The values should be modified only if necessary.

Data can be programmed into the flash memory in RS-232C format via the modular microphone jack.

5. 计算机模式

5-1. 前言

TK-782车台使用计算机、编程电缆(KPG-46)和编程软件(KPG-77D)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。

5-2. 连接步骤

1. 使用编程电缆将TK-782与计算机连接。
2. 当接通电源时，立即进入用户模式。当PC机发出指令使车载台进入PC机模式时，"PROGRAM"出现在显示器上。
   当车载台发送数据时，红色指示灯闪动。
   当车载台接收数据时，绿色指示灯闪动。

注释：

● 储存在计算机内的数据在写入车载台的存储器中时必须与车载台的型号相匹配。
● 将TK-782改变为计算机编程模式，然后连接编程电缆。

5-3. KPG-46说明(计算机编程电缆：可选件)

KPG-46用于将TK-782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-782的话筒插座与计算机的RS-232C串行口连接。

5-4. 编程软件KPG-77D说明

KPG-77D是车载台的编程软件，共3张3.5"软盘。此软件的运行环境为IBM-PC机或兼容机的MS-Windows 95/98。

数据可以被写入到车载台或从车载台中读取数据，并且在屏幕上进行编辑。已被编程或编辑的数据可以打印出来。也可以调整车载台的指标。

建议用户在使用之前将KPG-77D安装到硬盘上。

5-5. 使用IBM计算机编程

如果从使用KPG-77D软件的IBM计算机将数据发送到车台，设定的通信机型号数据(通信机的基本信息)均可被修改。由于设定频率范围(频率型式)时，型号数据就确定了，所以一般不需要修改型号数据。

只有在必要的情况下才修改型号数据。RS-232C格式的数据经由话筒插座输入到通信机的Flash Rom中。

IBM-PC
IBM计算机

KPG-46

KPG-77D

Tuning cable
调谐电缆
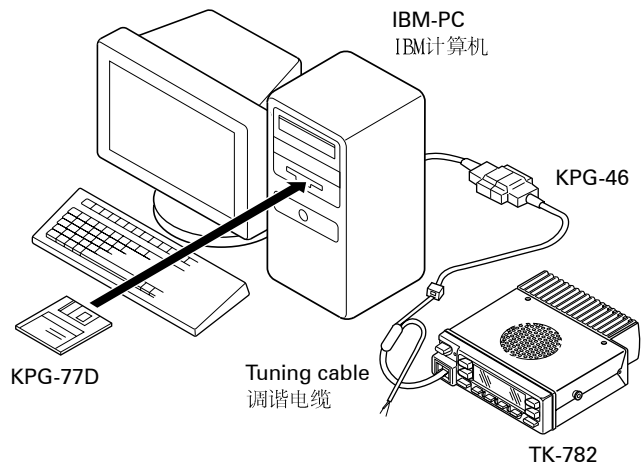
TK-782

Fig. 1 / 图 1

6. Firmware Programming Mode

6-1. Preface

Flash memory is mounted on the TK-782. This allows the TK-782 to be upgraded when new features are released in the future. (For details on how to obtain the firmware, contact Customer Service.)

6-2. Connection Procedure

Connect the TK-782 to the personal computer (IBM PC or compatible) with the interface cable (KPG-46). (Connection is the same as in the PC Mode.)

6-3. Programming

1. Start up the programming software (Fpro. exe).
2. Set the communications speed (normally, 57600 bps) and communications port in the configuration item.
3. Set the firmware to be updated by File name item.
4. Turn the TK-782 Power ON with the [A] switch held down. Hold the switch down until the display changes to "PROG 57600". When "PROG 57600" appears, release your finger from the switch.
5. Check the connection between the TK-782 and the personal computer, and make sure that the TK-782 is in the Program mode.
6. Press write button in the window. A window opens on the display to indicate progress of writing. When the TK-782 starts to receive data, the **P** icon is blinking.
7. If writing ends successfully, the LED on the TK-782 lights and the checksum is displayed.
8. If you want to continue programming other TK-782, repeat steps 4 to 7.

Notes :

● This mode cannot be entered if the Firmware programming mode is set to Disable in the Programming software (KPG-77D).
● When programming the firmware, it is recommend to copy the data from the floppy disk to your hard disk before update the radio firmware.
 Directly copying from the floppy disk to the radio may not work because the access speed is too slow.

6-4. Function

1. If you press the [■] switch while "PROG 57600" is displayed, the version is displayed. If you press the [■] switch again while the version is displayed, "PROG 57600" is redisplayed.
2. If you press the [D ▶] switch while "PROG 57600" is displayed, the display changes to "PROG 19200" to indicate that the write speed is low speed (19200 bps). If you press the [D ▶] switch again while "PROG 19200" is displayed, the display changes to "PROG 38400", and the write speed becomes the middle speed (38400 bps). If you press the [D ▶] switch again while "PROG 38400" is displayed, the display returns to "PROG 57600".
3. If you press the [D ▶] switch while the version is displayed, the checksum is displayed. If you press the [D ▶] switch again while the checksum is displayed, the version is redisplayed.

Note :

Normally, write in the high-speed mode.

6. 固件编程模式

6-1. 前言

Flash Rom被安装在TK-782上。当将来出现新功能时，允许TK-782升级。（要了解如何获得固件的详细情况，请与供应商联系。）

6-2. 连接步骤

使用编程电缆(KPG-46)将TK-782与计算机(IBM计算机或兼容机)连接。（与计算机编程模式中的连接方法一样。）

6-3. 编程

1. 启动固件编程软件(FPRO. exe)。
2. 在配置项中设定通信速率(通常为57600bps)和通信端口。
3. 在文件名称项中选定新固件。
4. 向下按动[A]键并接通TK-782的电源。向下按住键直到显示器出现"PROG 57600"为止。当"PROG 57600"出现时，松开按键。
5. 检查TK-782与个人电脑之间的连接是否正确，并且确认TK-782是否处于编程模式。
6. 按下视窗上的写入键。显示器上开启一个视窗显示写入的过程。当TK-782开始接收数据时，**P** 图标开始闪动。
7. 写入完成后，TK-782上的指示灯发光，并且显示校验码。
8. 如果用户需要继续编程其他的TK-782，重复步骤4到7。

注释 :

● 如果在编程软件(KPG-77D)中固件编程模式设定为禁用，则不能进入此模式。
● 当固件编程时，在用户更新通信机固件之前，建议先把数据从软盘拷贝到硬盘上。
 由于读取速率太低，所以直接从软盘写入到通信机可能无效。

6-4. 功能

1. 当显示"PROG 57600"时，如果用户按下[■]键，则显示版本。
 如果显示版本时再次按下[■]键，则显示"PROG 57600"。
2. 当显示"PROG 57600"时，如果用户按下[D ▶]键(位于左侧的底部)，则显示变为"PROG 19200"，表示写入速率为低速(19200bps)。当显示"PROG 19200"时，如果用户再次按下[D ▶]键，则显示变为"PROG 38400"，表示写入速率为中速(38400bps)。当显示"PROG 38400"时，如果用户再次按下[D ▶]键，则显示返回到"PROG 57600"。
3. 当显示版本时，如果用户按下[D ▶]键，则显示校验码。当显示校验码时，如果用户再次按下[D ▶]键，则显示版本。

注释 :

通常情况下在高速率模式中写入数据。

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REALIGNMENT / 模式组合

7. Self Programming Mode

Write mode for frequency data and signalling etc. Mainly used by the person maintaining the user equipment.

7-1. Channel Setting Mode

Each channel can be setup in its action mode by using the panel keys.

- Pressing [■] while "SELF PROG" is diaplyed will change to channel setting mode.
- Press [D ▶] to select a setup item, then press [Channel up/down] to change the selection.
- By pressing [◀ C], the displayed information is stored in memory, and the next item appears. By pressing [D ▶], the displayed information is not stored in memory, and the next item appears.
- Press[■] to return to the original display ("SELF PROG").

The setup items for channel setting mode are listed below.

Setup function	Display (3 character)	Remarks
Channel selection	CH or GRP	
RX frequency	RXF	[CALL] : Switches frequency on/off
		[B] : Changes the step value between 5kHz, 6.25kHz, and 1MHz
RX signalling	RXS	[CALL] : Switches between off, QT, and DQT.
		[B] : Switches between 1 step and standard
		[A] : Switches between DQT normal and invert
TX frequency	TXF	Same as RX frequency
TX signalling	TXS	Same as RX signalling
Scan del/add	SCN	DEL/ADD
RF power	PWR	HIGH/LOW
Beat shift	SFT	YES/NO
Wide/Narrow	W/N	WIDE/NARROW
Compander	CMP	ON/OFF

7. 自台编程模式

频率数据和信令等的写入模式。主要用于维护用户设备。

7-1. 信道设置模式

使用面板键可以为每个信道设置其活动模式。

- 当显示"SELF PROG"时，按[■]键将改变信道的设置模式；
- 按[D ▶]键选择设置条目，再按[信道升/降]键改变选项；
- 按[◀ C]键，将显示信息贮存进内存，下一条目出现。按[D ▶]键时显示信息则不贮存进内存，但下一条目出现；
- 按[■]键返回最初的显示状态("SELF PROG")。

信道设置模式的设置条目列在下表中。

设 置 功 能	显 示 (3个字符)	备 注
信道选择	CH或GRP	
RX频率	RXF	[CALL]：切换频率的开/关
		[B]：在5kHz，6.25kHz和1MHz 步骤值之间切换
RX信令	RXS	[CALL]：在关, QT, DQT之间切换
		[B]：在逐步和标准之间切换
		[A]：在DQT, 正常和反转之间切换
TX频率	TXF	与RX频率相同
TX信令	TXS	发RX信令相同
扫描删除／添加	SCN	删除／添加
RF电源	PWR	高／低
击移位键	SFT	是／否
宽／窄	W/N	宽／窄
压缩	CMP	开／关

REALIGNMENT / 模式组合

7-2. Flow Chart

7-2. 流程图

```
┌─────────────────────┐
│ Self programming mode│
│      自台编程模式      │
└─────────────────────┘
          │ [■]
┌─────────────────────┐        ┌──────────────────┐        ┌──────────────────┐
│ Channel setting mode│ ────── │ Channel selection│ ────── │  Group selection │
│      信道设定模式      │        │     信道选择       │  [D]   │      组选择        │
└─────────────────────┘        └──────────────────┘        └──────────────────┘
          │ [C]
┌─────────────────────┐    [CALL]   ┌──────┐
│    RX frequency     │ ─────────── │ OFF  │
│       RX频率         │              └──────┘
└─────────────────────┘
          │ [C]/[D]                                    [CALL]
┌─────────────────────┐    [CALL]   ┌──────┐  [CALL]  ┌──────┐  [CALL]  ┌───────┐      ┌───────┐
│    RX signalling    │ ─────────── │ OFF  │ ──────── │  QT  │ ──────── │ DQT N │ ──── │ DQT I │
│       RX信令         │              └──────┘          └──────┘          └───────┘ [A]  └───────┘
└─────────────────────┘
          │ [C]/[D]
┌─────────────────────┐    [CALL]   ┌──────┐
│    TX freuency      │ ─────────── │ OFF  │
│       TX频率         │              └──────┘
└─────────────────────┘
          │ [C]/[D]                                    [CALL]
┌─────────────────────┐    [CALL]   ┌──────┐  [CALL]  ┌──────┐  [CALL]  ┌───────┐      ┌───────┐
│    TX signalling    │ ─────────── │ OFF  │ ──────── │  QT  │ ──────── │ DQT N │ ──── │ DQT I │
│       TX信令         │              └──────┘          └──────┘          └───────┘ [A]  └───────┘
└─────────────────────┘
          │ [C]/[D]
┌─────────────────────┐
│   Scan delete/add   │
│      扫描删除／添加     │
└─────────────────────┘
          │ [C]/[D]
┌─────────────────────┐
│   RF power high/low │
│       RF电源         │
└─────────────────────┘
          │ [C]/[D]
┌─────────────────────┐
│   Beat shift yes/no │
│       击移位键        │
└─────────────────────┘
          │ [C]/[D]
┌─────────────────────┐
│     Wide/Narrow     │
│        宽／窄         │
└─────────────────────┘
          │ [C]/[D]
┌─────────────────────┐
│   Compander yes/no  │
│         压缩          │
└─────────────────────┘
          │ [C]/[D]
```

7-3. Memory Reset Mode

You can clear all settings you made in self programming mode, or you can return to the original display.

- Press [A] while "SELF PROG" is displayed will change the display to "CLEAR NO?".
- Press [Channel up/down] to change the display between "CLEAR NO?" and "CLEAR YES?".
- When "CLEAR YES?" is displayed, pressing [A] will set all data to default, and "ALL CLEAR" will appear on the display. Press [A] again to display "SELF PROG".
- When "CLEAR NO?" is displayed, pressing [A] will cancel the reset, and "SELF PROG" will be displayed.

7-3. 存储器复位模式

用户可以在自我编程模式中清除所有设定，或用户可以返回到最初的显示。

- 当显示 "SELF PROG" 时按 [A] 键将使显示改变为 "CLEAR NO?"。
- 按 [CH⌃/⌄] 键交替显示 "CLEAR NO?" 和 "CLEAR YES?"。
- 当显示 "CLEAR YES?" 时，按 [A] 键将所有数据设定为出厂值，并且 "ALL CLEAR" 将出现在显示器上。再按 [A] 键显示 "SELF PROG"。
- 当显示 "CLEAR NO?" 时，按 [A] 键将取消复位，并且显示 "SELF PROG"。

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INSTALLATION / 安装

1. Accessory Connection Cable
(KCT-19 : Option)

The KCT-19 is an accessory connection cable for connecting external equipment. The connector has 15 pins and the necessary signal lines are selected for use.

1-1. Installing the KCT-19 in the transceiver

1. Remove the upper and lower half of the transceiver case, and lift the DC cord bushing (❶) from the chassis.
2. Remove the pad as shown in Figure 1 (❷).
3. Insert the KCT-19 cable (❸) into the chassis (❹).
   The wire harness band (❺) must be inside the chassis.
4. Replace the DC cord bushing (❻).
5. Connect the KCT-19 to the TX-RX unit (A/2) as shown in Figure 2 (❼).
6. Connect the KCT-19 to the external accessory by inserting the crimp terminal (❽) into the square plug (❾), both of which are supplied with the KCT-19.
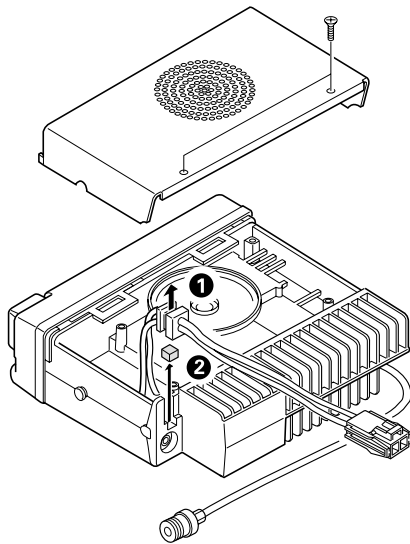
1. 附加连接电缆
（KCT-19：可选件）

KCT-19是用于连接外置设备的附加电缆。 此电缆有15芯并根据使用情况选择所需的信号线。

1-1. 在车台上安装 KCT-19

1. 取下车台的上部分机壳， 从机架的凹槽上卸下直流电线卡套(❶)。
2. 按图1所示取下垫片(❷)。
3. 将KCT-19电缆(❸)放入机架的凹槽(❹)。
   固定电缆的金属卡子(❺)必须在机架的内侧。
4. 重新放入直流电线卡套(❻)。
5. 按照图2(❼)所示将KCT-19连接到发射-接收单元上(A/2)。
6. 通过将压接件(❽)插入方形插头(❾)来将KCT-19连接到外置附加设备上， 两者均与KCT-19一起提供。

Fig. 1 / 图 1
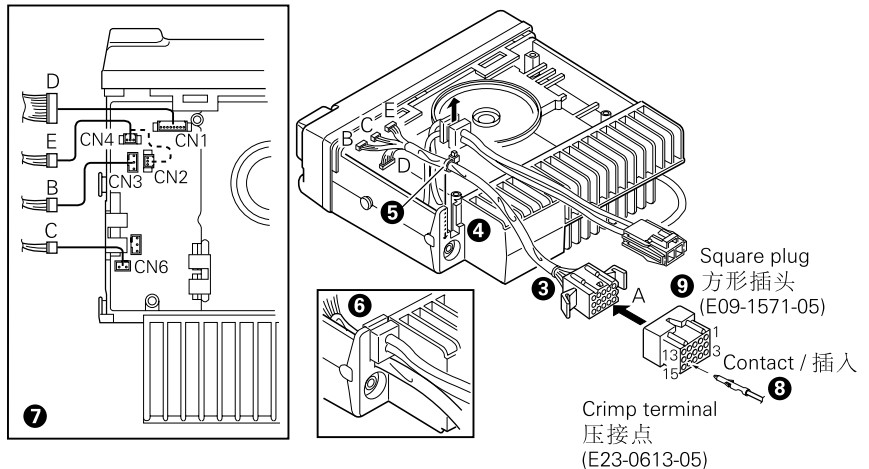
Fig. 2 / 图 2

INSTALLATION / 安装

1-2. KCT-19 Accessory Port Function

No. (A)	No. (B,C,D,E)		Name	Function	Note
1	D-2		AHK	External hook input.	
2	D-5		ME	Microphone ground.	*1
			AM	Speaker audio mute input.	
3	D-3		IGN	Ignition sense input.	
4	D-1		DEO	Receiver detector output.	
5	D-6		MI	External microphone input.	*1
			TXS	Transmitter sense output.	
6	B-2		E	Ground.	
7	B-3		SB	Switched B+, DC 13.6V output. Maximum 0.75A	
8	D-7		PTT	External PTT input, active low. During DTC is low, it works as DATA PTT.	
9	D-4		DI	Data modulation input.	
10	B-1		HOR	Horn alert/call output.	
11	D-8		SQ	Squelch detect output, active low.	
12	C-1		SP	Speaker audio output.	
13	E-1	CN2 and CN4	LOK	TX logic signal output, active low.	*1 *2
		CN2	AM	Speaker mute input.	
14	E-2	CN4	RXD	Serial control data input.	*2
		CN2	MM	MIC mute input, active high.	
15	E-3	CN4	TXD	Serial control data output.	*2
		CN2 *1	DTC	Data control channel signal input, Data channel : Low	
			LOK	TX logic signal output, active low.	
			TXS	Transmitter sense output, Active high.	
			FSW	Foot switch input, active low.	

Note

*1 : The functions of A-2, A-5, A-13 (when connector E is connected to CN2), and A-15 (when connector E is connected to CN2) are changed as described in the jumper chart.

*2 : The functions of A-13, A-14 and A-15 are changed if the connector E is connected to CN2 or CN4 of the radio.

No.	CN2	CN4
E-1	LOK/AM	LOK
E-2	MM	RXD
E-3	LOK/DTC/TXS/FSW	TXD

· Connect CN6 of the radio to connector C of the KCT-19 instead of to the internal speaker connector, if use external speaker.

1-2. KCT-19附加端子功能

号码(A)	号码(B,C,D,E)		名 称	功 能	注释
1	D-2		AHK	外置接通输入。	
2	D-5		ME	话筒接地。	*1
			AM	扬声器音频静音输入。	
3	D-3		IGN	点火器传感输入。	
4	D-1		DEO	接收部检测器输出。	
5	D-6		MI	外置话筒输入。	*1
			TXS	发射部传感输出。	
6	B-2		E	接地。	
7	B-3		SB	转换开关B+，直流13.6V输出。 最大电流0.75A。	
8	D-7		PTT	外部PTT输入，低电平有效。 在DTC低电平期间，以DATA PTT模式工作。	
9	D-4		DI	数据调制输入。	
10	B-1		HOR	喇叭告警／呼叫输出。	
11	D-8		SQ	静噪检测输出，低电平有效。	
12	C-1		SP	扬声器音频输出。	
13	E-1	CN2 和 CN4	LOK	TX逻辑信号输出，低电平有效。	*1 *2
		CN2	AM	扬声器静音输入。	
14	E-2	CN4	RXD	串行控制数据输入。	*2
		CN2	MM	话筒静音输入，高电平有效。	
15	E-3	CN4	TXD	串行控制数据输出。	*2
		CN2 *1	DTC	数据控制信道信号输入，数据信道：低电平。	
			LOK	TX逻辑信号输出，低电平有效。	
			TXS	发射部传感输出，高电平有效。	
			FSW	脚踏开关输入，低电平有效。	

注释

*1 ：A-2，A-5，A-13（当连接器E与CN2连接时）和A-15（当连接器E与CN2连接时）的功能按照跳线表的说明改变。

*2 ：如果连接器E与车载台的CN2或CN4连接，则A-13，A-14和A-15的功能改变。

号码	CN2	CN4
E-1	LOK/AM	LOK
E-2	MM	RXD
E-3	LOK/DTC/TXS/FSW	TXD

· 如果使用外置扬声器，车载台的CN6不与内置扬声器连接，而与KCT-19的连接器C连接。

INSTALLATION / 安装

1-3. Data Equipment Connection

The jumpers must be set to either one for each function. Otherwise, the radio will not work properly.

ME/AM

R12 (0Ω)	R167 (0Ω)	Function / Default	
Yes	No	AM	
No	Yes	ME	Default

MI/TXS

R94 (0Ω)	R24 (0Ω)	Function / Default	
Yes	No	TXS	
No	Yes	MI	Default

LOK/AM

R5 (0Ω)	R6 (0Ω)	Function / Default	
Yes	No	AM	Default
No	Yes	LOK	

DTC/LOK/TXS/FSW

R168 (0Ω)	R84 (0Ω)	R51 (0Ω)	R13 (0Ω)	Function / Default	
No	No	No	Yes	LOK	
Yes	No	No	No	DTC	Default
No	No	Yes	No	TXS	
No	Yes	No	No	FSW	

Note : The following parts are not installed at the time of shipping; R6,R12,R13,R51,R84, and R94.

1-3. 数据设备连接

必须设定跳线来选定其中一种功能。否则，车载台不能正常工作。

ME / AM

R12(0Ω)	R167(0Ω)	功能/出厂设定	
使用	不使用	AM	
不使用	使用	ME	出厂设定

MI / TXS

R94(0Ω)	R24(0Ω)	功能/出厂设定	
使用	不使用	TXS	
不使用	使用	MI	出厂设定

LOK / AM

R5(0Ω)	R6(0Ω)	功能/出厂设定	
使用	不使用	AM	出厂设定
不使用	使用	LOK	

DTC / LOK / TXS / FSW

R168 (0Ω)	R84 (0Ω)	R51 (0Ω)	R13 (0Ω)	功能/出厂设定	
不使用	不使用	不使用	使用	LOK	
使用	不使用	不使用	不使用	DTC	出厂设定
不使用	不使用	使用	不使用	TXS	
不使用	使用	不使用	不使用	FSW	

注释：下述元件在出厂时没有安装：R6，R12，R13，R51，R84和R94。

TX-RX unit (A/2)
Foil side view

TX-RX unit (A/2)
Component side view
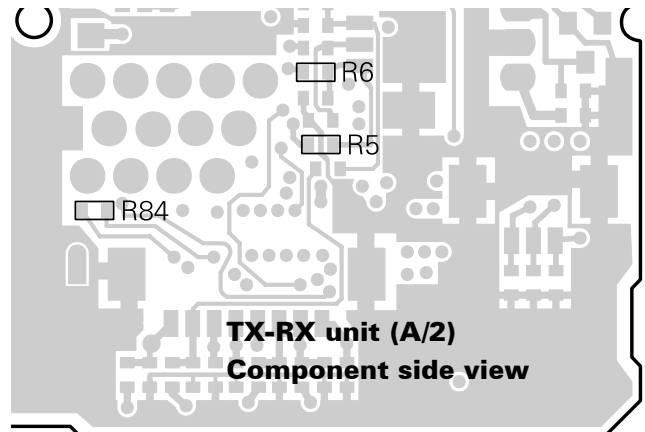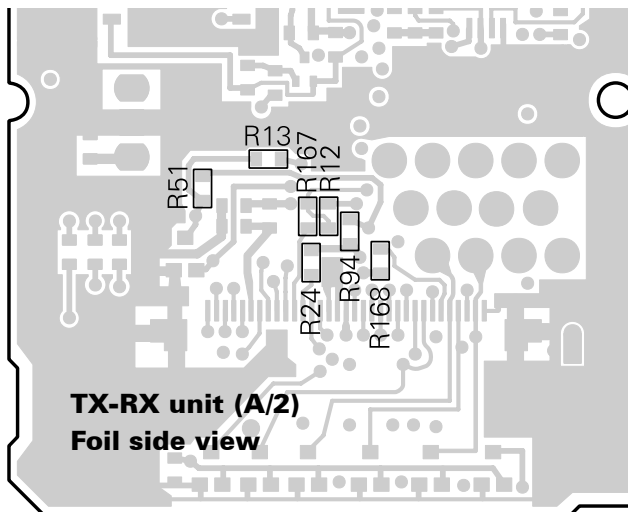
Fig. 3 / 图 3

INSTALLATION / 安装

2. Accessory Terminal (TX-RX Unit A/2)
2-1. External Connector Accessory Terminal Method

Connector No.	Pin No.	Pin name	I/O	Function
CN1	1	DEO	O	Detect signal output. (Output level : 250mVrms; standard modulation)
	2	AHK	I	External hook signal input. On hook : L, Off hook : H
	3	IGN	I	Ignition sense input.
	4	DI	I	External modulation signal input. (Input level : 100mVrms)
	5	ME	-	MIC earth.
		AM	I	Audio mute signal input.
	6	MI	I	Internal MIC input.
		TXS	O	Signal indicating whether the transceiver is transmitting or not. TX : H
	7	PTT	I	External PTT signal input. TX : L
	8	SQ	O	Squelch signal output. Signal logic type can select "Carrier operate relay" or "Tone operate relay". Active logic level or type can select in the KPG-77D.
CN2	1	AM	I	Audio mute signal input.
		LOK	O	TX logic signal output. Active logic level is low. Active type can be selectable in the KPG-77D.
	2	MM	I	MIC mute input.
	3	DTC	I	Data control channel signal input. Data channel : L, Normal channel : H
		TXS	O	Signal indicating whether the transceiver is transmitting or not. TX : H
		FSW	I	Foot switch signal input. Foot sw on : L, Foot sw off : H
		LOK	O	TX logic signal output. Active logic level is low. Active type can be selectable in the KPG-77D.
CN3	1	HOR	O	Horn alert signal output. Signal output for horn relay drive (open collector). L level during horn drive : Max. sink current 100mA. L level when AUX A is on.
	2	E	-	Earth.
	3	SB	O	Power output after power switch (DC 13.6V±15%, 0.75A max.).

2. 附加端子(发射-接收A/2单元)
2-1.外置连接器附加终端方法

连接器号码	管脚序号	管脚名称	输入/输出	功 能
CN1	1	DEO	输出	检测信号输出。电平：250mVrms(标准调制)
	2	AHK	输入	外部挂断信号输入。挂断开启：低电平，挂断关闭：高电平。
	3	IGN	输入	点火器传感输入。
	4	DI	输入	外置调制信号输入。（电平：100mVrms）
	5	ME	-	外置话筒接地。
		AM	输入	音频静音输入。
	6	MI	输入	内置话筒输入。
		TXS	输出	无论车载台是否正在发射时的信号指示。TX：高电平。
	7	PTT	输入	外部PTT信号输入。TX：低电平。
	8	SQ	输出	静噪信号输出。信号逻辑类型可以选择为"载波操作转发"或"声音操作转发"。有效逻辑电平或类型在KPG-77D中选择。
CN2	1	AM	输入	音频静音输入。
		LOK	输出	TX逻辑信号输出。有效逻辑电平为低电平，可以在KPG-77D中选择。
	2	MM	输入	话筒静音输入。
	3	DTC	输入	数据控制信道信号输入。数据信道：低电平，正常信道：高电平。
		TXS	输出	无论车载台是否正在发射时的信号指示。TX：高电平。
		FSW	输入	脚踏开关输入。低电平有效
		LOK	输出	TX逻辑信号输出。有效逻辑电平为低电平，可以在KPG-77D中选择。
CN3	1	HOR	输出	叭告警信号输出。喇叭继电器驱动(开集电极)信号输出。喇叭驱动过程时L电平：最大吸引电流为100mA。当AUX A开启时为L电平。
	2	E	-	接地。
	3	SB	输出	开启电源后供电输出(最大直流13.6V±15%，0.75A)。

INSTALLATION / 安装

Connector No.	Pin No.	Pin name	I/O	Function
CN4	1	LOK	O	TX logic signal output. Active logic level is low. Active type can be selectable in the KPG-77D.
	2	RXD	I	Serial data input 1. "Com1" port must be select "DATA"/"GPS" function in the KPG-77D.
	3	TXD	O	Serial data output 1. "Com1" port must be select "DATA"/"GPS" function in the KPG-77D.
CN6	1	SP	O	Output for internal/external speaker.
	2	E	-	Earth.

连接器 号码	管脚 序号	管脚 名称	输入 /输出	功　能
CN4	1	LOK	输出	TX逻辑信号输出。有效逻辑电平为低电平。可以在KPG-77D中选择。
	2	RXD	输入	串行数据输入1："Com1"端口必须在KPG-77D中设置为"数据"/"GPS"功能
	3	TXD	输出	串行数据输出1："Com1"端口必须在KPG-77D中设置为"数据"/"GPS"功能
CN6	1	SP	输出	内置／外置扬声器的输出。
	2	E	-	接地。

3. Optional Board Terminal

Terminal is for mounting the option board are provided at the TX-RX unit (A/2) and TX-RX unit (B/2); Control section. The table below shows the correspondence between the board and terminals. Disconnect R529 and R571 in control unit when the scrambler board is attached.

The table below shown the differences between the schematic terminals and the PC board terminals.

3. 可选电路板端子

发射-接收(A/2)单元和发射-接收(B/2)单元；控制部提供了安装可选电路板的端子。下表给出了电路板和接头之间的对应关系。当附带扰频器电路板时，将控制单元上的R529和R571断开。

下述表格表示原理图接头和PC机接头之间的不同。

Schematic diagram			PC board view	
Name	I/O	Function	Name	Unit
SB	O	Switched B+ (13.6V, 0.75A)	SB	TX-RX (A/2)
5C	O	5C	5C	TX-RX (A/2)
GND	-	Earth	E	TX-RX (A/2)
DEO	O	Detect signal output (Output level : 250mVrms; standard modulation)	DEO	TX-RX (A/2)
RXAI	I	RX audio input	RXAI	TX-RX (B/2)
RXAO	O	RX audio output	RXAO	TX-RX (B/2)
TXAI	I	TX audio input	TXAI	TX-RX (B/2)
TXAO	O	TX audio output	TXAO	TX-RX (B/2)
LOK	O	TX logic signal output. Active type can be selectable in the KPG-77D.	LOK	TX-RX (A/2)
OPT (EMG)	-	Auxiliary B output.	OP	TX-RX (A/2)
CODE1	O	PLL unlock signal output. Active type can be selectable in the KPG-77D.	C1	TX-RX (A/2)
CODE2	O	MIC hook logic signal output. Active type can be selectable in the KPG-77D.	C2	TX-RX (A/2)

原　理　图			PC板视图	
名 称	输入/输出	功　能	名 称	单 元
SB	输出	转换开关B+(13.6V, 0.75A)。	SB	TX-RX(A/2)
5C	输出	直流5V输出。	5C	TX-RX(A/2)
GND	-	接地。	E	TX-RX(A/2)
DEO	输出	检测信号输出。 电平：250mVrms(标准调制)	DEO	TX-RX(A/2)
RXAI	输入	接收部音频信号输入。	RXAI	TX-RX(B/2)
RXAO	输出	接收部音频信号输出。	RXAO	TX-RX(B/2)
TXAI	输入	发射部音频信号输入。	TXAI	TX-RX(B/2)
TXAO	输出	发射部音频信号输出。	TXAO	TX-RX(B/2)
LOK	输出	TX逻辑信号输出。 有效类型可以在KPG-77D中选择。	LOK	TX-RX(A/2)
OPT (EMG)	-	辅助B。	OP	TX-RX(A/2)
CODE1	输出	PLL锁定解除信号输出。 有效类型可以在KPG-77D中设置。	C1	TX-RX(A/2)
CODE2	输出	话筒挂断逻辑信号输出。 有效类型可以在KPG-77D中设置。	C2	TX-RX(A/2)

INSTALLATION / 安装

Schematic diagram			PC board view	
Name	I/O	Function	Name	Unit
CODE3	-	Not used.	C3	TX-RX (A/2)
CODE4	-	Not used.	C4	TX-RX (A/2)
SQ	O	Squelch signal output. Signal logic type can select "Carrier operate relay" or "Tone operate relay". Active logic level or type can select in the KPG-77D.	SQ	TX-RX (A/2)
TXD1	O	Serial data output 1	TD1	TX-RX (A/2)
RXD1	I	Serial data input 1	RD1	TX-RX (A/2)
TXD2	O	Serial data output 2	TD2	TX-RX (A/2)
RXD2	I	Serial data input 2	RD2	TX-RX (A/2)
RSSI	O	Receive signal strength indication.	RSSI	TX-RX (A/2)
PTT	I	PTT	PTT	TX-RX (B/2)
MPTT	I	MIC PTT	MPTT	TX-RX (B/2)
FSW	I	Foot switch input.	FW	TX-RX (A/2)

原 理 图			PC板视图	
名 称	输入/输出	功 能	名 称	单 元
CODE3	输出	不使用。	C3	TX-RX (A/2)
CODE4	输出	不使用。	C4	TX-RX (A/2)
SQ	输出	静噪信号输出。信号逻辑类型可以选择为"载波操作转发"或"声音操作转发"。有效逻辑电平或类型在KPG-77D中选择。	SQ	TX-RX (A/2)
TXD1	输出	串行数据输出1。	TD1	TX-RX (A/2)
RXD1	输入	串行数据输入1。	RD1	TX-RX (A/2)
TXD2	输出	串行数据输出2。	TD2	TX-RX (A/2)
RXD2	输入	串行数据输入2。	RD2	TX-RX (A/2)
RSSI	输出	接收信号强度提示。	RSSI	TX-RX (A/2)
PTT	输入	PTT。	PTT	TX-RX (B/2)
MPTT	输入	MIC PTT。	MPTT	TX-RX (B/2)
FSW	输入	脚踏开关输入。	FW	TX-RX (A/2)

TX-RX unit (A/2)
Foil side view

TX-RX unit (B/2) : Control section
Foil side view
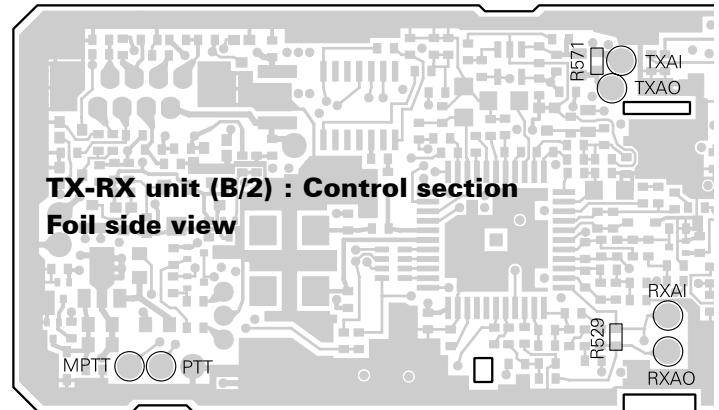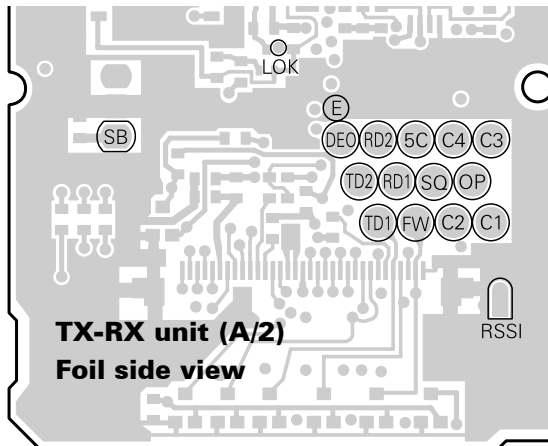
Fig. 4 / 图 4

TK-782

4. Fitting the Control Panel Upside Down

The TK-782 control panel can be fitted upside down, so the transceiver can be mounted with its internal speaker (in the upper half of the case) facing down in your car.

1. Remove the control panel and the TX-RX unit (B/2) control section. (Fig. 5)

4. 将控制面板倒转安装

TK-782的控制面板可以被倒转，以便在用户的车辆上车台可以在其内置扬声器(在机壳的上部)面向下的情况下被装配。

1. 取下控制面板和发射-接收(B/2)单元控制部。（图5）
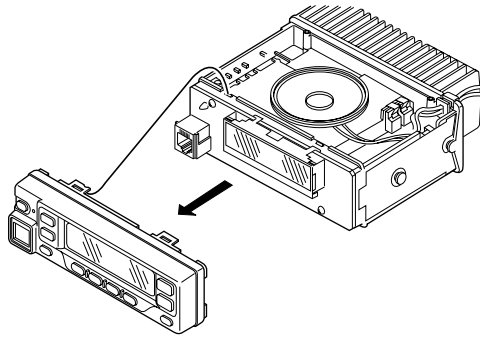
Fig. 5 / 图 5

2. Fold the flat cable (❶) in the opposite direction (❷).
3. Rotate the control section (❸) 180 degrees (❹).
4. Insert the flat cable into the control section connector, CN502 (❺).
5. Mount the control section on the transceiver (❻).

2. 将扁平电缆(❶)对折(❷)。
3. 将控制部(❸)旋转180度(❹)。
4. 将扁平电缆插入控制部连接器，CN502(❺)。
5. 将控制部装配在车台上(❻)。
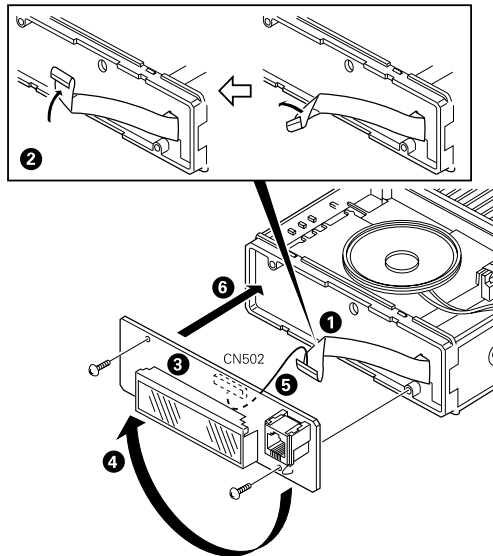
Fig. 6 / 图 6

6. Rotate the control panel 180 degrees and mount it on the transceiver. Refit the two halves of the case to complete installation. (Fig. 7)

6. 将控制面板旋转180度并且装配在车台机上。重新将两部分机壳装好并完成安装。（图7）
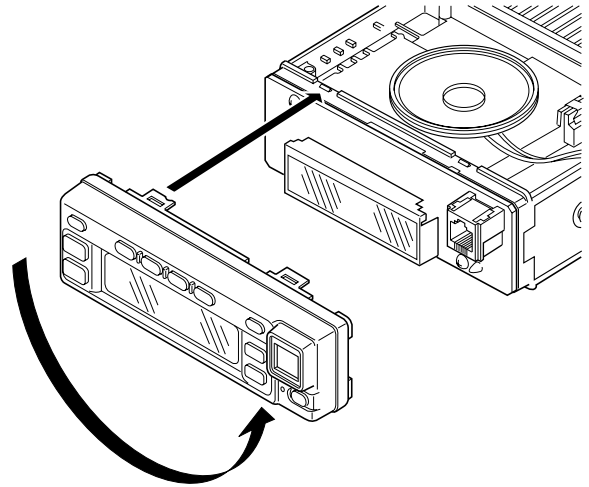
Fig. 7 / 图 7

CIRCUIT DESCRIPTION / 电路说明

Frequency Configuration

The TX-RX unit (A/2) incorporates a VCO, based on a fractional N type PLL synthesizer system, that allows a channel step of 12.5kHz to be selected. The incoming signal from the antenna is mixed with a first local oscillation frequency to produce a first intermediate frequency of 44.85MHz.

The signal is then mixed with a second local oscillation frequency of 44.395MHz to produce a second intermediate frequency of 455kHz. This is called a double-conversion system. The TX-RX unit (A/2) contains a wide/narrow MCF and CFs. The transmit signal is produced by the PLL circuit for direction oscillation and division. The signal output from the VCO is amplified by a straight amplifier and transmitted.

频率构成

TX-RX(A/2)单元具有一个基于分级N型PLL合成器系统的VCO，允许选择12.5kHz的信道步进值。从天线进入的信号与第一本振频率混频生成44.85MHz的第一中频。

然后此信号与44.395MHz的第二本振频率混频生成455kHz的第二中频信号。这叫二次变频系统。TX-RX(A/2)单元包括一个宽/窄MCF，一个宽带和一个窄带。PLL电路产生的发射信号直接振荡和分离。VCO输出的信号被直接放大并发射。
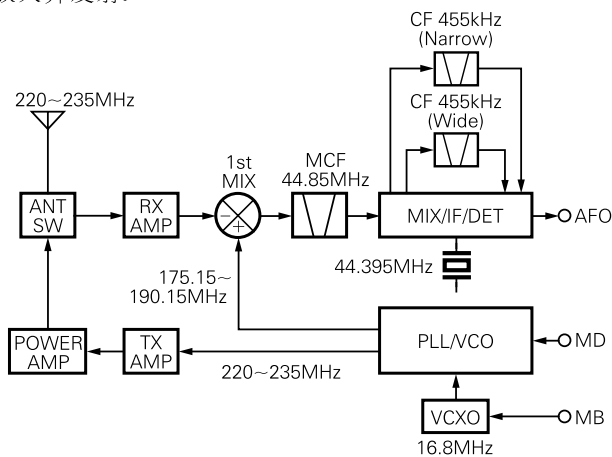
Fig. 1　Frequency configuration
图1　频率构成

Receiver System

■ Outline

The incoming signal from the antenna passes through a low-pass filter and a transmission/reception selection diode switch (D211,D212) and goes to the front end of the receiver. The front-end filter is a variable BPF consisting of three coils and three varicap diodes (D206, D207, D208) to eliminate unwanted out-of-band signal components. The low-noise amplifier (LNA) (Q202) uses a bipolar transistor to achieve wide-band and low-distortion amplification.
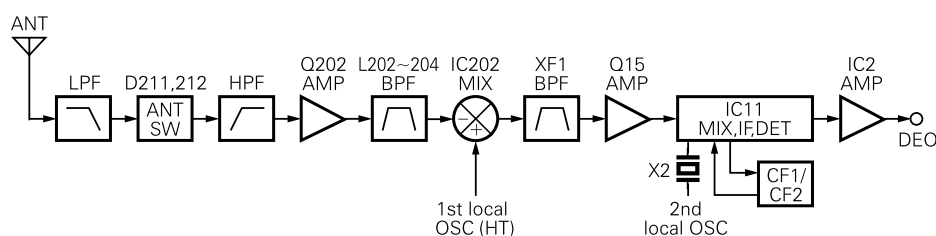
The signal passes through the BPF and is down-converted with the first local signal by IC202 to produce the first IF signal of 44.85 MHz. The first local signal passes through an LPF and an attenuator to eliminate unwanted harmonics components and implement the optimum input level to the mixer, then enters IC202. A DBM is used as a mixer to achieve a high potential.

The signal output from the mixer passes through two MCFs (XF1). The signal is amplified by an intermediate frequency amplifier and input to the FM IF IC (IC11).

The first intermediate frequency signal is mixed with the second local signal of 44.395MHz to produce the second IF signal of 455kHz.

The unwanted near-by signal components are then eliminated by a wide ceramic filter (CF1) or a narrow ceramic filter (CF2) and the resulting signal goes back to the FM IF IC. The signal is quadrature-detected in the IC to produce an audio signal, which is amplified by a DET amplifier (IC2) and output to the TX-RX unit (B/2).

接收部系统

■ 概述

从天线进入的信号通过低通滤波器和发送/接收选择二极管开关(D211, D212)进入接收部的前端。前级滤波器是一个通过可变电容(D206, D207, D208)调整的BPF。

此信号被Q202放大并通过BPF消除不需要的带外信号成份。低噪声放大器(LNA)(Q202)使用双级晶体管获得宽带和低失真放大。

信号通过BPF并被IC202的第一本振信号下变频，然后转换为44.85MHz的第一中频信号。第一本振信号通过一个LPF和一个衰减器消除不需要的谐波成份并向混频器提供恰当的输入电平，然后进入IC202。DBM作为混频器使用以获得一个高电位。

混频器输出的信号被中频放大器放大，并且输入到一对MCFs(XF1)。此信号被另一个中频放大器放大，并进入FM中频芯片(IC11)。第一中频信号与44.395MHz的第二本振信号混频生成455kHz的第二中频信号。

不需要的邻近信号成份被一个宽带陶瓷滤波器(CF1)或一个窄带陶瓷滤波器(CF2)消除，得到的信号回到FM中频芯片。此信号在芯片中被正交检测并生成音频信号，然后被DET放大器(IC2)放大并输出到TX-RX(B/2)单元。

Fig. 2　Receiver system / 图2　接收部系统

TK-782

CIRCUIT DESCRIPTION / 电路说明

■ Wide/Narrow Changeover Circuit

The W/N port (pin 11) of the shift register (IC7) is used to switch between ceramic filters. When the W/N port is high, Q24 turns on and the ceramic filter SW diode (D22, D23) CF1 turns on to receive a Wide signal. At the same time, Q16 turns on and one of the filters is selected so that the wide and narrow audio output levels are equal.

When the W/N port is low, Q23 turns on and the ceramic filter SW diode (D22, D23) CF2 turns on to receive a Narrow signal.

■ 宽/窄带转换电路

位移寄存器（IC7）的宽/窄带端口（引脚11）用于切换陶瓷滤波器。当宽/窄带端口为高电平时，Q24接通且陶瓷滤波器SW二极管（D22, D23）CF1开启并接收宽信号。同时，Q16接通且其中一个滤波器被选定以便宽和窄音频输出电平保持平衡。

当宽/窄带端口为低电平时，Q23接通且陶瓷滤波器SW二极管（D22, D23）CF2开启并接收窄信号。
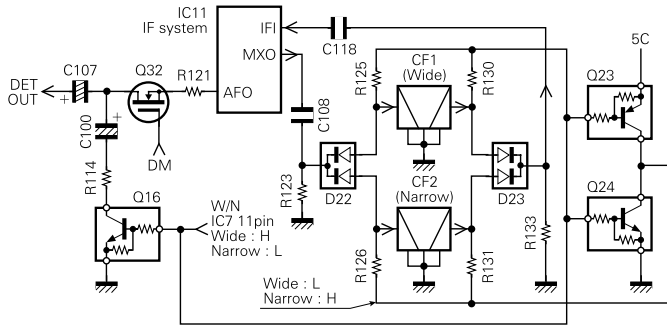
Fig. 3　Wide/Narrow changeover circuit
图 3　宽/窄转带换电路

■ AF Signal System

The detection signal (DEO) from the TX-RX unit (A/2) goes to the audio processor (IC504) of the TX-RX unit (B/2). The signal passes through a filter in the audio processor to adjust the gain, and is output to IC502. IC502 sums the AF signal and the DTMF signal and returns the resulting signal to the TX-RX unit (A/2). The signal (AFO) sent to the TX-RX unit (A/2) is input to the D/A converter (IC5). The AFO output level is adjusted by the D/A converter. The signal output from the D/A converter is added with the BEEP signal (BPO) and the resulting signal is input to the audio power amplifier (IC10). The AF signal from IC10 switches between the internal speaker and speaker jack (J1) output.

■ 音频信号系统

来自于TX-RX（A/2）单元的检测信号进入TX-RX（B/2）单元的音频处理器（IC504）。信号通过音频处理器中的滤波器进行增益调整，并且被输出到IC502。IC502将音频信号和DTMF信号合成并且将得到的信号返回到TX-RX（A/2）单元。发送到TX-RX（A/2）单元的信号（AFO）被输入到数/模转换器（IC5）。数/模转换器调整AFO输出电平。从数/模转换器输出的信号与BEEP信号（BPO）相加后得到的信号被输入到音频功率放大器（IC10）。来自于IC10的音频信号在内置扬声器和扬声器插口（J1）输出之间切换。
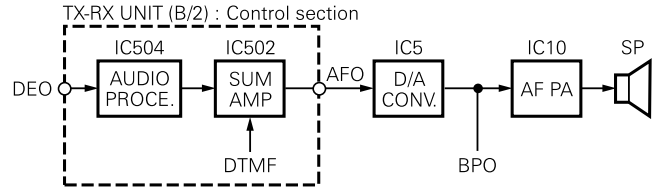
Fig. 4　AF signal system / 图 4　音频信号系统

■ Squelch Circuit

The detection output from the FM IF IC (IC11) is amplified by IC2 and the signal (DEO) is sent to the TX-RX unit (B/2). The signal passes through a high-pass filter and a noise amplifier (Q503) in the TX-RX unit (B/2) to detect noise. A voltage is applied to the CPU (IC511). The CPU controls squelch according to the voltage (ASQ) level. The signal from the RSSI pin of IC11 is monitored. The electric field strength of the receive signal can be known before the ASQ voltage is input to the CPU, and the scan stop speed is improved.

■ 静噪电路

来自于FM中频芯片（IC11）的检测输出被IC2放大，信号（DEO）被发送到TX-RX（B/2）单元。此信号通过高通滤波器和TX-RX（B/2）单元中的噪音放大器（Q503）检测噪音。向CPU（IC511）提供电压。CPU根据电压（ASQ）电平控制静噪。来自于IC11 RSSI引脚的信号被监测。在ASQ电压被输入到CPU之前可以了解接收信号的电场强度，扫描停止速率被提高。
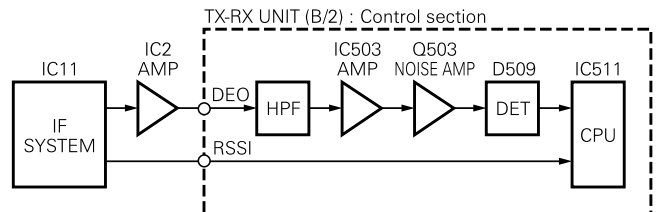
Fig. 5　Squelch circuit / 图 5　静噪电路

CIRCUIT DESCRIPTION / 电路说明

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.

■ VCO/PLL Circuit

The TK-782 has a VCO for the transmitter and a VCO for the receiver in a sub-unit (A1). They are housed in a solid shielded case and connected to the TX-RX unit (A/2) through CN101. One of the VCOs is selected with an ST signal. A filtered low-noise power supply is used for the VCOs and varicap diodes.

The VCO for the transmitter is described below. It is designed so that Q103 turns on with a prescribed frequency when a reverse bias is applied to D102 and D107 by using the control voltage (CV) through CN101. The control voltage is changed by turning the trimmer capacitor (IC102). The output from Q103 is applied to the buffer amplifier (Q106) to generate a VCO output signal. This signal is used as a drive input signal or a local signal of the first mixer. Since a signal output from Q160 is input to the PLL IC, it passes through CN101 and buffer amplifier (Q300) and goes to the PLL IC (IC300). The modulation signal from CN101 is applied to D109 and passes through C125 and C126 to modulate the carrier.

The PLL IC uses a fractional N type synthesizer to improve the C/N ratio and lock-up speed. The VCO output signal input to the pin 5 of the PLL IC is divided to produce a comparison frequency according to a channel step. This signal is compared with the reference frequency which is output from the VCXO (X1). VCXO provides 16.8MHz, 2.5ppm (−30 to +60°C) and guarantees stable performance when the temperature changes. The output signal from the phase comparator passes through a charge pump and an external active LPF (Q301, Q302) in the PLL IC to generate a DC VCO control voltage CV. Serial data (DT, CK, EP) are output from the CPU (IC511) and shift register (IC8) in the TX-RX unit (B/2) to control the PLL IC. The PLL lock status is always monitored by the CPU.

发射部系统

■ 概述

发射部电路产生并直接放大所需的频率。其采用变容二极管的方式FM-调制载波信号。

■ VCO/PLL电路

TK-782在子单元(A1)中有一个用于发射部的VCO和一个用于接收部的VCO。他们被放置在固体屏蔽机身中，并且通过CN101与TX-RX(A/2)单元连接。ST信号用来选定哪一个VCO工作。经滤波的低噪电源提供给VCOs和变容二极管。

发射部VCO的说明如下。当通过CN101使用控制电压(CV)提供给D102和D107一个反向偏压时，VCO被指定以便Q103以规定的频率工作。通过调谐微调电容(IC102)来改变控制电压。来自于Q103的输出提供给缓冲放大器(Q106)生成VCO输出信号。此信号作为驱动输入信号或第一混频器的本振信号使用。来自于Q160的信号输出被输入到PLL IC，它通过CN101和缓冲放大器(Q300)进入PLL IC(IC300)。来自于CN101的调制信号提供给D109并通过C125和C126调制载波。

PLL IC使用分级N型合成器提高C/N比和锁定速度。输入到PLL IC引脚5的VCO输出信号被分频并且按照信道步进值生成比较频率。此信号与VCXO(X1)输出的参考频率进行比较。VCXO提供16.8ppm，2.5ppm(−30到+60℃)以在温度变化时保证性能的稳定。来自于相位比较器的输出信号通过负载增压和PLL IC中的外置有源LPF(Q301,Q302)生成一个直流VCO控制电压CV。CPU(IC511)输出串行数据(DT, CK, EP)，并且控制单元中的位移寄存器(IC8)控制PLL IC。PLL锁定状态始终被CPU监测。
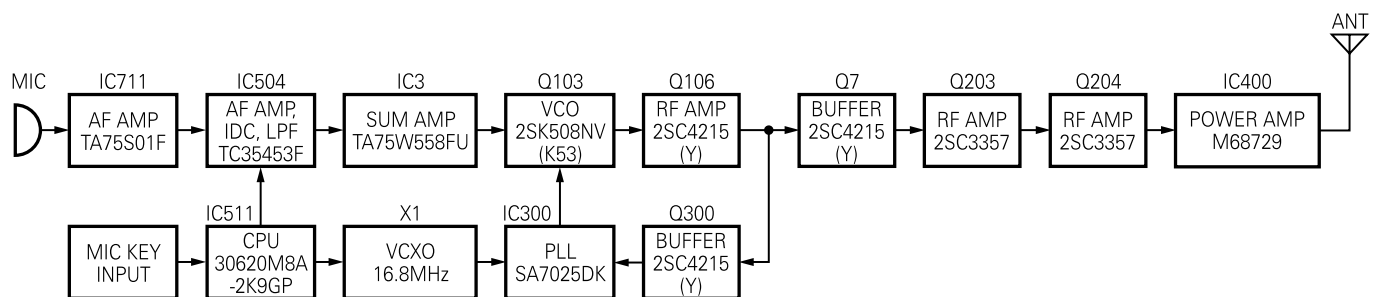
Fig. 6   Transmitter system / 图 6   发射部系统

TK-782

CIRCUIT DESCRIPTION / 电路说明

■ Unlock Circuit

During reception, the TR signal goes high, the KEY signal goes low, and Q10 turns on. Q11 turns on and a voltage is applied to the collector (8R). During transmission, the TR signal goes low, the KEY signal goes high and Q13 turns on. Q12 turns on and a voltage is applied to 8T.

The CPU in the TX-RX unit (B/2) monitors the PLL (IC300) LD signal directly. When the PLL is unlocked during transmission, the PLL LD signal goes low. The CPU detects this signal and makes the KEY signal low. When the KEY signal goes low, no voltage is applied to 8T, and no signal is transmitted.

■ 失锁电路

在接收过程中，TR信号为高电平，KEY信号为低电平，并且Q10接通。Q11接通并且提供给集电极（8R）电压。在发送过程中，TR信号为低电平，KEY信号为高电平，并且Q13接通。Q12接通并且提供给8T电压。

TX-RX（B/2）单元中的CPU直接监测PLL（IC300）LD信号。当发送过程中PLL失锁时，PLL LD信号为低电平。CPU监测到此信号并且使KEY信号为高电平。当KEY信号为高电平时，不向8T提供电压，并且不发送信号。
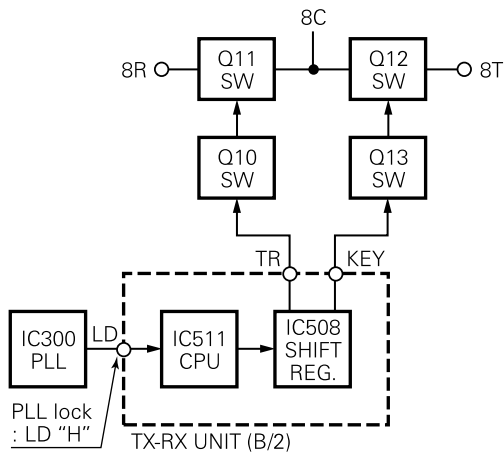
Fig. 7   Unlock circuit / 图 7   失锁电路

■ Power Amplifier Circuit

The transmit output signal from the VCO is amplified to a specified level of the power module (IC400) by the drive block (Q203, Q204). The amplified signal passes through the transmission/reception selection diode (D211) and 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.

■ 功率放大器电路

来自于VCO的发送输出信号通过驱动部分（Q203, Q204）被放大到功率模块（IC400）的特定电平。经放大的信号通过发送/接收选择二极管（D211）进入低通滤波器。低通滤波器消除不需要的高频谐波元素，得到的信号进入天线末端。

■ APC Circuit

The automatic transmission power control (APC) circuit detects part of a power module output with a diode (D27, D30) and applies a voltage to Q21. Q21 compares the APC control voltage (PC) generated by the D/A converter (IC5) and DC amplifier (IC6) with the detection output voltage to control Q19 and Q20, generates DB voltage from B voltage, and stabilizes transmission output.

Q17 turns the PC signal on or off using 8T so that the circuit works only during transmission. With stability at low power in mind, Q29 turns off to optimize the detection voltage.

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

■ APC电路

自动发送功率控制（APC）电路通过二极管（D27, D30）检测功率模块的部分输出，并且向 Q21 提供电压。Q21将数/模转换器（IC5）和直流放大器（IC6）生成的APC控制电压（PC）与检测输出电压进行比较以控制Q19和Q20，生成来自于B电压的DB电压，并且使发送输出保持稳定。

Q17使用8T接通或断开PC信号以便电路只在发送过程中工作。为了保证低功率时的稳定性，Q29断开以优化检测电压。

APC电路的构成用于防止由于天线终端的负载变化造成的功率模块的过流，并且使发送输出在电压和温度的变化中保持稳定。
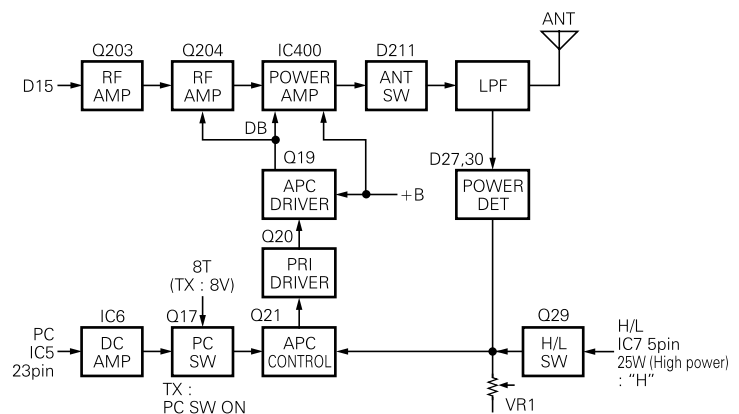
Fig. 8   APC circuit / 图 8   APC 电路

CIRCUIT DESCRIPTION / 电路说明

Control Circuit

The CPU carries out the following tasks:

1) Controls the shift register (IC7, IC8, IC508) AF MUTE, WIDE/NARROW, T/R KEY outputs.
2) Adjusts the AF signal level of the audio processor (IC504) and turns the filter select compounder on or off.
3) Controls the DTMF decoder (IC507).
4) Controls the LCD assembly display data.
5) Controls the PLL (IC300).
6) Controls the D/A converter (IC5) and adjusts the volume, modulation and transmission power.

控制电路

CPU执行下述工作：

1) 控制位移寄存器(IC7, IC8, IC508)AF MUTE, WIDE/NARROW, T/R KEY输出。
2) 调整音频处理器(IC504)的音频信号电平和接通或断开滤波器选择混合器。
3) 控制DTMF解码器(IC507)。
4) 控制LCD汇编显示数据。
5) 控制PLL(IC300)。
6) 控制数/模转换器(IC5)和调整音量，调制和发送功率。
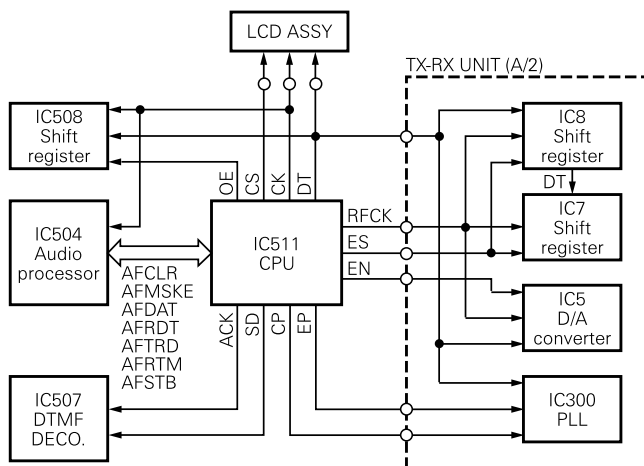
Fig. 9   Control circuit / 图 9　控制电路

■ Memory Circuit

The transceiver has a 2M-bit (256k x 8) flash ROM (IC510) and an 16k-bit EEPROM (IC512). The flash ROM contains firmware programs, data and user data which is programmed with the FPU. The EEPROM contains adjustment data. The CPU (IC511) controls the flash ROM through an external address bus and an external data bus. The CPU controls the EEPROM through two serial data lines.

■ 存储器电路

通信机具有2M(256k×8)闪存ROM(IC510)和16k EEPROM(IC512)。闪存ROM包含固件程序，数据和使用FPU编程时的用户数据。EEPROM包含调整数据。CPU(IC511)通过外置地址总线和外置数据总线控制闪存ROM。CPU通过两条串行数据线控制EEPROM。
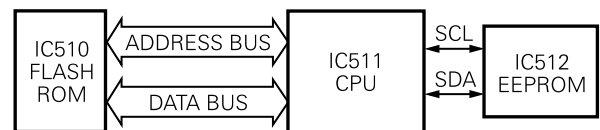
Fig. 10   Momory circuit / 图 10　存储器电路

■ Display Circuit

The CPU (IC511) controls the shift register (IC508) and display LEDs. When the LG line goes high when the transceiver is busy, Q508 turns on and the green LED on D511 lights. In transmit mode, the LR line goes high, Q509 turns on and the red light lights. Backlighting LEDs for the key operation unit (D512~D517) and LCD are provided.

When the KBLC line goes high, Q512 turns on, then Q513 turns on, and the key illumination LED lights. A voltage is applied to the LEDA line to turn on the LCD backlight.

■ 显示电路

CPU控制位移寄存器(IC508)和发光二极管。当接收部工作LG线为高电平时，Q508接通且D511上的绿色指示灯发光。在发送模式中，LR线为高电平，Q509接通且红色指示灯发光。按键操作单元(D512~D517)和LCD具有背景灯光指示灯。

当KBLC线为高电平时，Q512接通，然后Q513接通，并且按键照明指示灯发光。向LEDA线提供电压以开启LCD背景灯光。
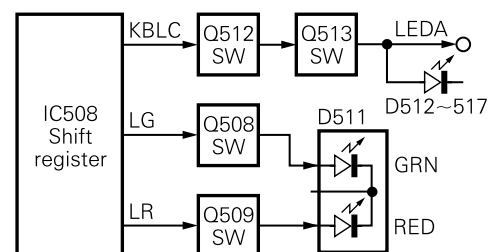
Fig. 11   Display circuit / 图 11　显示电路

TK-782

CIRCUIT DESCRIPTION / 电路说明

■ Key Matrix Circuit

The TK-782 front panel has ten keys. Each of them is connected to a cross point of a matrix of the KEY1 to KEY7 ports of the microprocessor. The KEY5 to KEY7 ports are always high, while the KEY1 to KEY4 ports are always low.

The microprocessor monitors the status of the KEY1 to KEY7 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. Unused points (KEY1 to KEY7) are also used for foot switch (FSW) input.

■ 按键矩阵电路

TK-782前端面板有十个按键。每一个按键与微处理器的按键1到按键7端口的矩阵交叉点连接。按键5到按键7端口通常为高电平，同时按键1到按键4端口通常为低电平。

微处理器监测按键1到按键7端口的状态。如果某一个端口的状态发生了变化，微处理器假定对应于此端口的矩阵点上的按键已被按下。不使用的端点(按键1到按键7)也用于脚踏开关(FSW)输入。
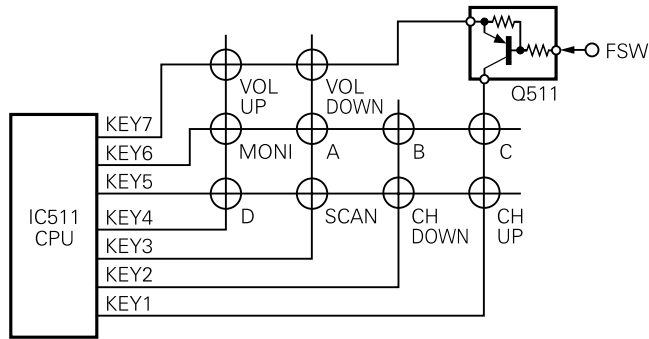
Fig. 12　Key matrix circuit / 图 12　按键矩阵电路

■ Encode

The QT, DQT signals are output from LSDO of the CPU (IC511) and go to the D/A converter (IC5) of the TX-RX unit (A/2). The DTMF and single/5-tone signals are output from HSDO of the CPU and goes to the audio processor (IC504). An MSK signal is output from the audio processor according to the data (AFDAT) from the CPU. The signal is summed with a MIC/MSK signal by the audio processor (IC504), and the resulting signal passes through an analog switch (IC506) and goes to the TX-RX unit (A/2) (MO).

MO is summed with the external pin DI line by the summing amplifier (IC3) and the resulting signal goes to the D/A converter (IC5). The D/A converter (IC5) adjusts the MO level and the balance between the MO and TO levels. Part of a TO signal is summed with an output signal from pin 3 (MO) of IC5 and the resulting signal goes to the MD pin of the VCO. This signal is applied to a varicap diode in the VCO for direct FM modulation.

■ 编码

CPU的LSDO输出QT, DQT信号，并且进入TX-RX(A/2)单元的数/模转换器(IC5)。CPU的HSDO输出DTMF和单音/5音信号，并且进入音频处理器(IC504)。音频处理器按照来自于CPU的数据(AFDAT)输出MSK信号。此信号通过音频处理器(IC504)与MIC/MSK信号合成，得到的信号通过模拟开关(IC506)进入TX-RX(A/2)单元(MO)。

MO通过总和放大器(IC3)与外置引脚DI线信号合成，得到的信号进入数/模转换器(IC5)。数/模转换器(IC5)调整MO电平以及MO和TO电平之间的平衡。部分TO信号与来自于IC5引脚3(MO)的输出信号合成，得到的信号进入VCO的MD引脚。此信号被提供给VCO中的变容二极管直接进行FM调制。
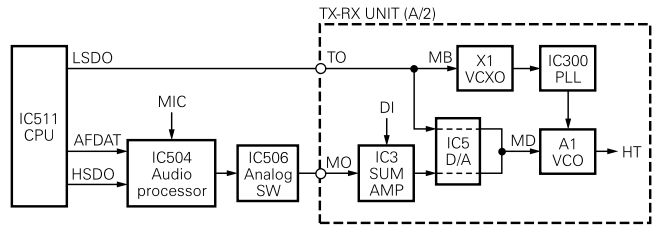
Fig. 13　Encode / 图 13　编码

■ Decode

The signal (DEO) detected by the TX-RX unit (A/2) passes through two low-pass filters of IC501, goes to LSDI of the CPU (IC511) to decode QT, DQT. The DTMF signal is decoded by a dedicated IC (IC507) and the resulting signal is sent to the CPU (IC511) as serial data (STD).

■ 解码

TX-RX(A/2)单元检测到的信号(DEO)通过IC501的两个低通滤波器进入CPU的LSDI对QT, DQT进行解码。DTMF信号被专用芯片(IC507)解码，得到的信号作为串行数据(STD)被发送到CPU(IC511)。
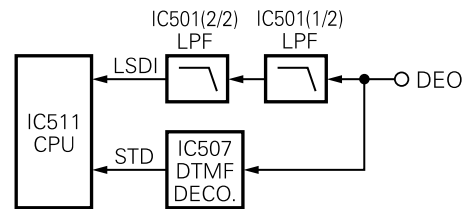
Fig. 14　Decode / 图 14　解码

CIRCUIT DESCRIPTION / 电路说明

■ D/A Converter

The D/A converter (IC5) is used to adjust TONE and MO modulation, beep, 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:

D/A output = (Vin − VDAref) / 256 x n + 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 (IC5) 用于调整 TONE 和 MO 调制，beep，音频音量，TV 电压，FC 参考电压和 PC POWER CONTROL 电压电平。

CPU 将调整数值作为串行数据发送。数／模转换器的精度为 256，并且有下述对应关系：

数／模输出＝ (Vin−VDAref)/256×n＋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

■ Horn Control

The horn switch, consisting of Q4, Q5, and Q6, controls the horn relay. It is supplied by the dealer to provide the external horn alert function.

Q5 disables horn alert, turning on when its base is high, to inhibit the function. Normally, the output from IC7 is low, and Q6 is off; the base of Q4 is about 0V and Q4 is off. When horn alert is enabled, the output from IC7 goes high and Q6 turns on. The base current flows through R58 to Q4 to turn Q4 on. Q4 can sink a maximum of 100mA.

■ 喇叭控制

包括 Q4，Q5 和 Q6 的喇叭开关控制喇叭继电器。由经销商提供外置喇叭告警功能。Q5 使喇叭告警失效，当其基极为高电平时开启，用于禁止此功能。通常情况下，IC7 的输出为低电平且 Q6 断开；Q4 的基极大约为 0V 且 Q4 断开。当喇叭告警有效时，IC7 的输出为高电平且 Q6 接通。基极电流通过 R58 到 Q4 并且接通 Q4。Q4 可以吸取最大 100mA 的电流。
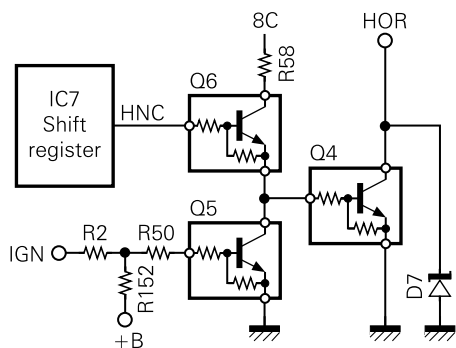
Fig. 15   Horn control / 图 15   喇叭控制

Power Supply Circuit

When the POWER switch on the control unit is pressed, the PSW signal goes low. This signal is inverted by Q26 and sent to a flip-flop IC (IC15). This IC outputs a control signal when the PSW goes low. When the power turns on, pin 1 of IC15 outputs a low signal and Q30 turns on. The base of Q28 goes high, Q28 turns on, SB SW (Q27) turns on and power (SB) is supplied to the set.

This circuit has an over-voltage protection circuit. If a DC voltage of 20V or higher is applied to the power cable, D34 turns on and a voltage is applied to the base of Q31. This voltage turns Q31 on and turns Q28 and SBSW off. This circuit has a TIMED POWER OFF (TOF) function which can be programmed by software.

It is controlled through pin 6 of IC7. When the TOF line goes high, Q22 turns on and then Q25 turns on. Pin 6 of IC15 goes high, then pin 1 goes high to turn Q27 off.

电源电路

当按下控制单元上的电源开关时，PSW 信号变为低电平。此信号被 Q26 反相并且被发送到触发电路 IC (IC15)。当 PSW 变为低电平时，此 IC 输出控制信号。当电源开启时，IC15 的引脚 1 输出低电平信号并且 Q30 接通。Q28 的基极变为高电平，Q28 接通，SB SW (Q27) 接通并且向装置提供电源 (SB)。此电路具有过压保护电路。如果 20V 的直流电压或更高的电压提供给电源线，则 D34 接通并且向 Q31 的基极提供电压。此电压接通 Q31 并且断开 Q28 和 SBSW。此电路具有一个可以通过软件编程的定时关机 (TOF) 功能。

通过 IC7 的引脚 6 进行控制。当 TOF 线变为高电平时，Q22 接通，然后 Q25 接通。IC15 的引脚 6 变为高电平，然后引脚 1 变为高电平，使 Q27 断开。
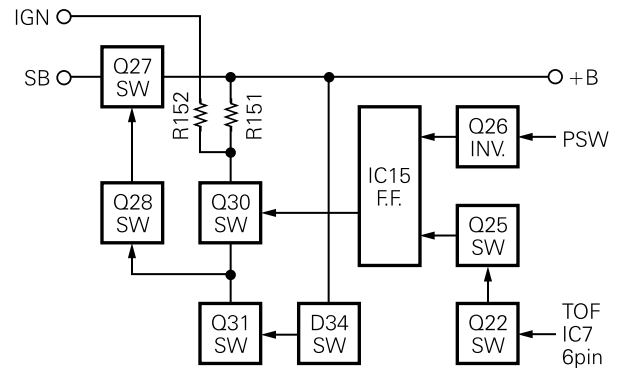
Fig. 16   Power supply circuit / 图 16   电源电路

TK-782

SEMICONDUCTOR DATA / 半导体数据

Microprocessor : 30620M8A-2K9GP   微处理器：30620M8A-2K9GP

(TX-RX Unit B/2 : Control Section IC511) （TX-RX B/2单元：控制部IC511）

■ **Terminal function**

Pin No.	Name	I/O	Function
1	LSDOUT	O	Low speed data output.
2	HSDOUT	O	High speed data output.
3	HSDIN	I	High speed data input.
4	DTMSTD	I	DTMF decode IC data detect input.
5	SELF	I	Self programming mode input.
6	BYTE	I	+5V.
7	CNVSS	I	GND.
8	SFTOE	O	Shift register output enable.
9	LCDCS	O	LCD driver chip select output.
10	RESET	I	Microcomputer reset input.
11	XOUT	-	9.8304MHz (System clock).
12	VSS	-	GND.
13	XIN	-	9.8304MHz (System clock).
14	VCC	-	+5V.
15	IGN	I	Ignition input.
16	AFTRD	I	FFSK modulation data output timing pulse input.
17	AFRTM	I	FFSK demodulation data input timing pulse input.
18	MICDAT	O	MIC key data output.
19	CP	O	PLL IC clock output.
20	BEEP	O	Beep data output.
21	AFRDT	I	FFSK demodulation data input.
22	AFREG1	O	AF IC register switching data output 1.
23	AFREG2	O	AF IC register switching data output 2.
24	EEPDAT	O	EEPROM data output.
25	EN	O	D/A converter IC data strobe output.
26	AFCLR	O	FFSK flame reset output.
27	RXCOM2	I	External hook input / External serial interface input.
28	TXCOM2	I/O	External PTT input / External serial interface output.
29	TXCOM1	O	External serial interface output.
30	RXCOM1	I	External serial interface input.
31	LD	I	PLL unlock detect input.
32	AFMSKE	O	FFSK modulation enable. (Enable active "H")
33	TXD	O	Serial interface output.
34	HOOK	I	Hook input / Serial interface input.

■ **端子功能**

管脚号	端口名称	输入/输出	功 能
1	LSDOUT	输出	低速率数据输出。
2	HSDOUT	输出	高速率数据输出。
3	HSDIN	输入	高速率数据输入。
4	DTMSTD	输入	DTMF解码芯片数据检测输入。
5	SELF	输入	自台编程模式输入。
6	BYTE	输入	＋5V。
7	CNVSS	输入	接地。
8	SFTOE	输出	位移寄存器输出有效。
9	LCDCS	输出	LCD驱动芯片选择输出。
10	RESET	输入	微电脑复位输入。
11	XOUT	-	9.8304MHz（系统时钟）。
12	VSS	-	接地。
13	XIN	-	9.8304MHz（系统时钟）。
14	VCC	-	＋5V。
15	IGN	输入	点火传感输入。
16	AFTRD	输入	FFSK调制数据输出计时脉冲输入。
17	AFRTM	输入	FFSK调制数据输入计时脉冲输入。
18	MICDAT	输出	MIC按键数据输出。
19	CP	输出	PLL IC时钟输出。
20	BEEP	输出	Beep数据输出。
21	AFRDT	输入	FFSK解调数据输入。
22	AFREG1	输出	音频芯片位移开关数据输出1。
23	AFREG2	输出	音频芯片位移开关数据输出2。
24	EEPDAT	输出	EEPROM数据输出。
25	EN	输出	数/模转换器芯片数据选通输出。
26	AFCLR	输出	FFSK复位输出。
27	RXCOM2	输入	外置挂机输入/外置串行接口输入。
28	TXCOM2	输入/输出	外置PTT输入/外置串行接口输出。
29	TXCOM1	输出	外置串口输出。
30	RXCOM1	输入	外置串口输入。
31	LD	输入	PLL失锁检测输入。
32	AFMSKE	输出	FFSK调制有效。（有效激活"高电平"）
33	TXD	输出	串口输出。
34	HOOK	输入	PTT输入/串行接口输出。

SEMICONDUCTOR DATA / 半导体数据

Pin No.	Name	I/O	Function
35	AFDAT	O	FFSK data output.
36	RFCLK	O	Common clock output. (TX-RX unit A/2)
37	RDY	-	Not used.
38	ALE	-	Not used.
39	HOLD	-	Not used.
40	HLDA	-	Not used.
41	BLCK	-	Not used.
42	RD	-	Flash memory RD bus.
43	BHE	-	Not used.
44	WR	-	Flash memory WR bus.
45	DTMCLK	O	DTMF decode IC clock output.
46	CNTCLK	O	Common clock output. (TX-RX unit B/2)
47	EP	O	PLL IC data strobe output.
48	CS0	O	Flash memory chip enable.
49	A19	-	Not used.
50~59	A18~A9	-	Flash memory address bus.
60	VCC	-	+5V.
61	A8	-	Flash memory address bus.
62	VSS	-	GND.
63~70	A7~A0	-	Flash memory address bus.
71~74	KEY1~KEY4	I/O	Key matrix data input/output 1~4.
75	MINDAT	O	Common data output.
76~78	KEY5~KEY7	I	Key matrix data input 5~7.
79~86	D7~D0	-	Flash memory data bus.
87	DTMDAT	I	DTMF decode IC data input.
88	AUXDTC	I	External DTC input.
89	MICBLC	O	MIC back light control output.
90	POWSW	I	Power switch input.
91	ANLSQL	I	Squelch level input.
92	PTT	I	PTT switch input.
93	RSSI	I	Received signal strength indicator input.
94	AVSS	-	GND.
95	LSDIN	I	Low speed data input.
96	VREF	-	+5V.
97	AVCC	-	+5V.
98	ES1	O	Shift register data strobe output. (TX-RX unit B/2)
99	ES2	O	Shift register data strobe output. (TX-RX unit A/2)
100	AFSTB	O	AF IC data strobe output.

管脚号	端口名称	输入/输出	功　　能
35	AFDAT	输出	FFSK数据输出。
36	RFCLK	输出	共用时钟输出(TX-RX A/2单元)。
37	RDY	–	不使用。
38	ALE	–	不使用。
39	HOLD	–	不使用。
40	HLDA	–	不使用。
41	BLCK	–	不使用。
42	RD	–	闪存RD总线。
43	BHE	–	不使用。
44	WR	–	闪存WR总线。
45	DTMCLK	输出	DTMF解码芯片时钟输出。
46	CNTCLK	输出	共用时钟输出(TX-RX B/2单元)。
47	EP	输出	PLL芯片数据选通输出。
48	CS0	输出	闪存芯片有效。
49	A19	–	不使用。
50~59	A18~A9	–	闪存地址总线。
60	VCC	–	＋5V。
61	A8	–	闪存地址总线。
62	VSS	–	接地。
63~70	A7~A0	–	闪存地址总线。
71~74	KEY1~KEY4	输入/输出	按键矩阵数据输入/输出1~4。
75	MINDAT	输出	共用数据输出。
76~78	KEY5~KEY7	输入	按键矩阵数据输入5~7。
79~86	D7~D0	–	闪存数据总线。
87	DTMDAT	输入	DTMF解码IC数据输入。
88	AUXDTC	输入	外置DTC输入。
89	MICBLC	输出	MIC背景灯光控制输出。
90	POWSW	输入	电源开关输入。
91	ANLSQL	输入	静噪电平输入。
92	PTT	输入	PTT开关输入。
93	RSSI	输入	接收信号强度指示输入。
94	AVSS	–	接地。
95	LSDIN	输入	低速率数据输入。
96	VREF	–	＋5V。
97	AVCC	–	＋5V。
98	ES1	输出	位移寄存器数据选通输出。(TX-RX B/2单元)
99	ES2	输出	位移寄存器数据选通输出。(TX-RX A/2单元)
100	AFSTB	输出	音频芯片数据选通输出。

TK-782

SEMICONDUCTOR DATA / 半导体数据

Shift Register : BU4094BCFV

■ **Terminal function (TX-RX unit B/2 IC508)**

Pin No.	Port	Name	Function
1	ES	ES1	Strobe
2	DT	DT	Data
3	CK		Clock
4	Q1	LR	Red LED. H : ON, L : OFF
5	Q2	LG	Green LED. H : ON, L : OFF
6	Q3	KBLC	Key back light. H : ON, L : OFF
7	Q4	MM1	MIC mute. H: Mute, L : Unmute
8	VSS		GND
9			NC
10			NC
11	Q8	PA2	Public address control 2. H : ON, L : OFF
12	Q7	BSHIFT	Beat shift. H : ON, L : OFF
13	Q6	KEY	TX power switching. H : TX, L : RX
14	Q5	T/R	TX/RX switching. H : RX, L : TX
15	OE		Output enable
16	VDC		+5V

位移寄存器：BU4094BCFV

■ **端子功能（TX-RX B/2单元IC508）**

管脚号	端口	名　称	功　　能
1	ES	ES1	选通。
2	DT	DT	数据。
3	CK		时钟。
4	Q1	LR	红色指示灯。 高电平：开启，低电平：关闭
5	Q2	LG	绿色指示灯。 高电平：开启，低电平：关闭
6	Q3	KBLC	按键背景灯光。 高电平：开启，低电平：关闭
7	Q4	MM1	MIC静音。 高电平：静音，低电平：不静音
8	VSS		接地。
9			不使用。
10			不使用。
11	Q8	PA2	扩音功能控制2。 高电平：开启，低电平：关闭
12	Q7	BSHIFT	拍频偏移。高电平：开启，低电平：关闭
13	Q6	KEY	TX电源转换开关。 高电平：TX，低电平：RX
14	Q5	T/R	TX/RX转换开关。 高电平：RX，低电平：TX
15	OE		输出有效。
16	VDC		+5V。

■ **Terminal function (TX-RX unit A/2 IC7)**

Pin No.	Port	Name	Function
1	STB	ES	Strobe
2	SI	DT	Data
3	CLK	CK	Clock
4	Q1	HORN	Horn alert. H : ON, L : OFF / Auxiliary A. H : ON, L : OFF
5	Q2	HL	RF power switching. H : High, L : Low
6	Q3	TIMOFF	Timed power off. H : Power off
7	Q4		NC
8	VSS		GND
9			NC
10			NC
11	Q8	W/N	Wide/Narrow switching. H : Wide, L : Narrow
12	Q7		NC
13	Q6	PA1	Public address 1. H : ON, L : OFF
14	Q5		NC
15	OE		Output enable
16	VDC		+5V

■ **端子功能（TX-RX A/2单元IC7）**

管脚号	端口	名　称	功　　能
1	STB	ES	选通。
2	SI	DT	数据。
3	CLK	CK	时钟。
4	Q1	HORN	喇叭告警。 高电平：开启，低电平：关闭/ 辅助A。高电平：开启，低电平：关闭
5	Q2	HL	射频功率转换开关。 H：高电平，L：低电平
6	Q3	TIMOFF	定时电源关闭。高电平：电源关闭
7	Q4		不使用。
8	VSS		接地。
9			不使用。
10			不使用。
11	Q8	W/N	宽/窄转换开关。 高电平：宽，低电平：窄
12	Q7		不使用。
13	Q6	PA1	扩音功能1。 高电平：开启，低电平：关闭
14	Q5		不使用。
15	OE		输出有效。
16	VDC		＋5V。

■ Terminal function (TX-RX unit A/2 IC8)

Pin No.	Port	Name	Function
1	STB	ES	Strobe
2	SI	DT	DATA
3	CLK	CK	Clock
4	Q1	AM1	Audio mute 1. H : Mute, L : Unmute
5	Q2	LOK	Link complete. (Programmable active H/L)
6	Q3	STR	VCO shift switching. H : TX, L : RX
7	Q4	DM	DET mute. H : RX, L : TX
8	VSS		GND
9	QS		IC7 data output
10			NC
11	Q8	SQ	External squelch. (Programmable active H/L)
12	Q7	CODE2	MIC hook logic signal. (Programmable active H/L)
13	Q6	CODE1	PLL unlock signal. (Programmable active H/L)
14	Q5	OPT	Auxiliary B.
15	OE		Output
16	VDC		+5V.

■ 端子功能（TX-RX A/2单元IC8）

管脚号	端口	名 称	功 能
1	STB	ES	选通。
2	SI	DT	数据。
3	CLK	CK	时钟。
4	Q1	AM1	音频静音1。 高电平：静音，低电平：不静音
5	Q2	LOK	链接完成。（可编程的活动高/低电平）
6	Q3	STR	VCO位移转换开关。 高电平：TX，低电平：RX
7	Q4	DM	DET静音。 高电平：RX，低电平：TX
8	VSS		接地。
9	QS		IC7数据输出。
10			不连接。
11	Q8	SQ	外部静噪。（可编程的活动高/低电平）
12	Q7	CODE2	话筒挂断逻辑信号。（可编程的活动高/低电平）
13	Q6	CODE1	PLL锁定解除信号。（可编程的活动高/低电平）
14	Q5	OPT	辅助B。
15	OE		输出有效。
16	VDC		＋5V。

DESCRIPTION OF COMPONENTS

元件说明

TX-RX Unit (X57-6143-01) (A/2)

Ref. No.	Use / Function	Operation / Condition
IC1	DC amp	FC, TCXO control
IC2	DET amp	External DEO, internal DEO
IC3	Amp/Summing amp	DI / DI and MO addtion
IC4	Analog switch	DI switch
IC5	A/D converter	PC, TV, FC, AFO, BEEP, TO, MO control
IC6	DC amp	PC
IC7	Shift register	HNC, H/L, TOF, PA, W/N control
IC8	Shift register	AM, LOK, STR, DM, OPT, CODE1, CODE2, SQ control
IC9	5V AVR	External 5C
IC10	AF power amp	
IC11	FM IF DET	Quadrature detector, 2nd mixer, OSC, IF amplifier, RSSI
IC12	5V AVR	5C
IC13	9V AVR	9C

TX-RX单元（X57-6143-01）（A/2）

有关号码	使用/功能	操 作/条 件
IC1	直流放大器	FC, TCXO控制
IC2	DTE放大器	外置DEO，内置DEO
IC3	放大器/总和放大器	DI/DI和MO附加
IC4	模拟开关	DI开关
IC5	数/模转换器	PC, TV, FC, AFO, BEEP, TO, MO控制
IC6	直流放大器	PC
IC7	位移寄存器	HNC, H/L, TOF, PA, W/N控制
IC8	位移寄存器	AM, LOK, STR, DM, OPT, CODE1, CODE2, SQ控制
IC9	5V AVR	外置5C
IC10	音频功率放大器	
IC11	FM IF DET	正交检测器，第二混频器，OSC，中频放大器，RSSI
IC12	5V AVR	5C
IC13	9V AVR	9C

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DESCRIPTION OF COMPONENTS / 元件说明

Ref. No.	Use / Function	Operation / Condition
IC14	8V AVR	8C
IC15	Flip-flop	Power on/off control
IC201	DC amp	TV
IC202	Mixer	DBM
IC300	PLL	Reference 16.8MHz. PLL lock : LD "H"
IC400	Power module	RF power 25W
IC401	Short protection	
Q1	DC switch	R17 connection and, PTT "H" time DI off
Q2	Ripple filter	8CL
Q3	Ripple filter	9CL
Q4	HOR switch	IGN
Q5	HOR SW control	IGN
Q6	HOR SW control	HNC "H" time on
Q7	Buffer amp	HT
Q8	AF mute	AM "H" time on
Q9	AF mute	Power off time on
Q10	8R SW control	TR "H" time on
Q11	8R switch	Q10 on time on
Q12	8T switch	Q13 on time on
Q13	8T SW control	KEY "H" time on
Q15	IF amp	44.85MHz
Q16	DET output level switch	Wide time on
Q17	PC switch	TX (8T) time on
Q18	DET mute	KEY "H" time on
Q19	APC	APC driver
Q20	APC	APC pre-driver
Q21	APC control	
Q22	TOF switch	TOF "H" time on
Q23	W/N switch	Wide time off
Q24	W/N switch	Wide time on
Q25	TOF switch	Q22 on time on
Q26	Inverter	Power switch "L" time on
Q27	SB switch	Q28 on time on
Q28	SB SW control	Q30 on and Q31 off time on
Q29	H/L switch	High power time "H"
Q30	SB SW control	Power on time on
Q31	SB SW control	DC 20V and over time on
Q32	DET mute	TX time on
Q202	LNA	
Q203	RF amp	TX drive first
Q204	RF amp	TX drive last
Q300	Buffer amp	PLL
Q301,302	Active filter	
Q401	Short protection	IC400 out short time on

有关号码	使用 / 功能	操 作 / 条 件
IC14	8V AVR	8C
IC15	触发电路	电源开启/关闭控制
IC201	直流放大器	TV
IC202	混频器	DBM
IC300	PLL	参考频率16.8MHz PLL锁定：LD"高电平"
IC400	功率模块	射频功率25W
IC401	短路保护	
Q1	直流开关	当CN1上的PTT为"高电平"，CN1上的DI为静音。
Q2	脉冲滤波器	8CL
Q3	脉冲滤波器	9CL
Q4	HOR开关	启动
Q5	HOR开关控制	启动
Q6	HOR开关控制	当HNC为"高电平"时被激活
Q7	缓冲放大器	HT
Q8	音频静音	当AM为"高电平"时被激活
Q9	音频静音	当电源关闭时被激活
Q10	8R SW控制	当T/R为"高电平"时被激活
Q11	8R开关	当Q10有效时被激活
Q12	8T开关	当Q13有效时被激活
Q13	8T SW开关	当KEY为"高电平"时被激活
Q15	中频放大器	44.85MHz
Q16	DET电平输出开关	当宽带时被激活
Q17	PC开关	发送时被激活
Q18	DET静音	当KEY为"高电平"时被激活
Q19	APC	APC驱动器
Q20	APC	APC前驱动器
Q21	APC控制	
Q22	TOF开关	当TOF为"高电平"时被激活
Q23	宽/窄带开关	当窄带时被激活
Q24	宽/窄带开关	当宽带时被激活
Q25	TOF开关	当Q22接通时被激活
Q26	反相器	当功率开关为"低电平"时被激活
Q27	SB开关	当Q28接通时被激活
Q28	SB SW控制	当Q30接通，Q31断开时被激活
Q29	H/L开关	当射频功率为高电平时被激活
Q30	SB SW控制	当电源开关开启时被激活
Q31	SB SW控制	当电源电压高于20V时被激活
Q32	DET静音	当TX时被激活
Q202	LNA	
Q203	射频放大器	功率模块前驱动
Q204	射频放大器	功率模块驱动
Q300	缓冲放大器	PLL
Q301, 302	活性滤波器	
Q401	短路保护	功率模块保护

DESCRIPTION OF COMPONENTS / 元件说明

Ref. No.	Use / Function	Operation / Condition
Q402	W/N switch	Wide time off
Q403	W/N switch	Wide time on
D1~6	Protection	
D7	HOR protection	
D8,9	Protection	
D11	OR gate	AF mute
D12~14	Protection	
D15	HT switch	
D16	Reverse protection	
D17	Protection	
D20	Reverse protection	IGN
D21	Protection	5V (IGN)
D22,23	W/N CF change	
D24	Over current protection	
D26	Reverse protection	
D27	Power detection	
D28	Protection	
D30	Power detection	
D31	Reverse protection	
D32	Surge absorption	B
D34	Protection	DC 20V and over time on
D35	Charge	DEO
D37	Reverse protection	
D40,41	Charge	Ripple filter
D206~208	BPF tune	
D209,210	Usable temperature range	
D211	ANT swtich	TX time on
D212	ANT switch	

有关号码	使用 / 功能	操 作 / 条 件
Q402	W/N开关	当窄时被激活
Q403	W/N开关	当宽时被激活
D1~6	保护	
D7	HOR保护	
D8, 9	保护	
D11	OR门	音频静音
D12~14	保护	
D15	HT开关	
D16	反向保护	
D17	保护	
D20	反向保护	启动
D21	保护	5V(启动)
D22, 23	W/N开关	
D24	过流保护	
D26	反向保护	
D27	功率检测	
D28	保护	
D30	功率检测	
D31	反向保护	
D32	浪涌吸收	B
D34	保护	当电源电压高于20V时被激活
D35	充电	DEO
D37	反向保护	
D40, 41	充电	脉冲滤波器
D206~208	BPF调谐	
D209, 210	有效温度范围	
D211	ANT开关	发送时被激活
D212	ANT开关	

TX-RX Unit (X57-6143-01) (B/2)
: Control Section

Ref. No.	Use / Function	Operation / Condition
IC501	LPF, amplification	LSD
IC502	Amplification	AF, HSD
IC503	Base voltage/ Buffer amp	ASQ
IC504	Audio processor	Compander, MIC amplifier, ALC, Modem, AF filter, IDC
IC506	Analog switch	MO, DEO, EMG, MI switch
IC507	DTMF decoder	DTMF detection
IC508	Shift register	LR, LG, KBLC, MM1, T/R, KEY, BSFT, PA2 output
IC509	Reset	Power on time "L" output
IC510	Flash ROM	

TX-RX单元(X57-6143-01)(B/2)
:控制部

有关号码	使用 / 功能	操 作 / 条 件
IC501	LPF, 放大	LSD
IC502	放大	AF, HSD
IC503	参考电压/ 缓冲放大器	ASQ
IC504	音频处理器	压扩器，MIC放大器，ALC, 调制解调器，音频滤波器，IDC
IC506	模拟开关	MO, DEO, EMG, MI开关
IC507	DTMF解码器	无功能
IC508	位移寄存器	LR, LG, KBLC, MM1, T/R, KEY, BSFT, PA2输出
IC509	复位	当功率加大时低电压输出
IC510	闪存ROM	

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DESCRIPTION OF COMPONENTS / 元件说明

Ref. No.	Use / Function	Operation / Condition
IC511	CPU	
IC512	EEPROM	
IC513	5V AVR	5C (Control unit)
IC710	Buffer amp	HSD
IC711	Buffer amp	MIC
Q501	MIC mute	MM "H" and MM1 "H" time mute on
Q502	AF mute	KEY "H" time mute on
Q503	Noise amp	
Q507	Inverter	PA2 H/L switch
Q508	LED switch	LG "H" time on, Busy time green on
Q509	LED switch	LR "H" time on, TX time red on
Q510	Clock switch shift	BSFT "H" time clock shift on
Q511	FSW swtich	FSW "L" time foot switch on
Q512	Key backlight switch	KBLC "H" time on
Q513	Key backlight switch	KBLC "H" time key backlight on
Q515	Key backlight switch	
D501	Surge absorption	BLC
D502	Over current protection	PSB
D503	Surge absorption	CM
D504	Surge absorption	PTT/TXD
D505	Surge absorption	HOOK/RXD
D507	OR gate (MIC mute)	MM/MM1
D508	Limiter	MIC
D509	Limiter	ASQ
D510	Reverse current protection	C575 charge
D511	BUSY/TX LED (Green/Red)	Busy time green on, TX time red on
D512~517	Key backlight	KBLC "H" time on
D518	Current regulation	Key backlight
D520	Discharge	Reset pulse

有关号码	使用 / 功能	操 作 / 条 件
IC511	CPU	
IC512	EEPROM	
IC513	5V ARV	5C（控制单元）
IC710	缓冲放大器	HSD
IC711	缓冲放大器	MIC
Q501	MIC静音	当MM为"高电平"和MM1为"高电平"时被激活
Q502	音频静音	当KEY为"高电平"时被激活
Q503	噪音放大器	
Q507	反相器	PA2 H/L开关
Q508	LED开关（绿色）	当LG为"高电平"时被激活，当RX时被激活
Q509	LED开关（红色）	当LR为"高电平"时被激活，当TX时被激活
Q510	时钟开关变换	当BSFT为"高电平"时时钟变换开启
Q511	FSW开关	当FSW为"低电平"时脚踏开关开启
Q512	按键背景灯光开关	当KBLC为"高电平"时被激活
Q513	按键背景灯光开关	当KBLC为"低电平"时被激活
Q515	按键背景灯光开关	
D501	浪涌吸收	BLC
D502	过流保护	PSB
D503	浪涌吸收	CM
D504	浪涌吸收	PTT/TXD
D505	浪涌吸收	HOOK/RXD
D507	MIC静音	MM/MM1
D508	限幅器	MIC
D509	限幅器	ASQ
D510	反向电流保护	C575充电
D511	BUSY/TX LED	信道忙时绿灯发光，TX时红灯发光
D512~517	按键背景灯光	当KBLC为"高电平"时被激活
D518	电流调节	按键背景灯光
D520	放电	速率升高

PLL/VCO Unit (X58-4712-71)

Ref. No.	Use / Function	Operation / Condition
Q101	Inverter	TX (ST "H") time on
Q102	Oscillator	RX
Q103	Oscillator	TX
Q104	TX/RX switch	TX (ST "H") time on
Q105	TX/RX switch	Q101 off time on
Q106	Buffer amp	
D101	RX VCO	
D102	TX VCO	
D104	RX VCO	
D107	TX VCO	
D109	Modulation	

PLL/VCO单元（X58-4712-71）

有关号码	使用 / 功能	操 作 / 条 件
Q101	反相器	当ST为"高电平"时被激活，当TX时被激活
Q102	振荡器	RX
Q103	振荡器	TX
Q104	TX/RX开关	当ST为"高电平"时被激活，当TX时被激活
Q105	TX/RX开关	当Q101断开时被激活
Q106	缓冲放大器	
D101	RX VCO	
D102	TX VCO	
D103	RX VCO	
D104	TX VCO	
D105	调制	

PARTS LIST / 零件表

✱ New Parts. ⚠ indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

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

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TX-RX UNIT (X57-6143-01)

Ref. No.	Address	New parts	Parts No.	Description			Desti-nation
				TK-782			
1	1A		A01-2165-23	CABINET	UPPER		
2	2A		A01-2166-23	CABINET	LOWER		
3	2A		A62-0642-03	PANEL ASSY			
6	2B		B38-0835-05	LCD ASSY			
7	2D	✱	B62-1659-00	INSTRUCTION MANUAL			
8	1C	✱	B72-2091-04	MODEL NAME PLATE			
12	1C		E30-2145-15	ANTENNA CABLE			
11	1C		E30-3340-05	DC CORD	RADIO		
13	2B		E37-0789-05	FLAT CABLE	CONT-TX/RX		
14	1B		E37-0790-25	LEAD WIRE WITH CONNECTOR (SP)			
16	2B		F10-2234-04	SHIELDING COVER	APC, AVR		
15	2B		F10-2280-12	SHIELDING COVER			
17	1C		F10-2354-03	SHIELDING PLATE	LOWER PM		
18	2C		F10-2355-04	SHIELDING COVER	UPPER PM		
20	2B		F20-1192-04	INSULATING SHEET	CONT		
23	1B,1C		G02-0791-04	FLAT SPRING	AF,APC,AVR		
25	2B		G02-0862-14	EARTH SPRING	ANT		
26	1B,1C		G10-1221-04	FIBROUS SHEET	SIDE		
27	1B,1C		G10-1222-14	FIBROUS SHEET	UP, DOWN		
28	1A,2A,2B		G10-1223-14	FIBROUS SHEET	SHIELD CASE		
32	2B		G11-4068-04	SHEET	CONT		
29	1C		G13-1468-04	CUSHION	DC CODE		
30	1B		G13-1873-04	CUSHION	SP		
31	2C		G53-0796-04	PACKING	PHONE JACK		
33	3D		H10-6618-12	POLYSTYRENE FOAMED FIXTURE (F)			
34	2E		H10-6619-12	POLYSTYRENE FOAMED FIXTURE (R)			
37	2E		H25-0720-04	PROTECTION BAG (200X350)			
38	3E	✱	H52-1930-02	ITEM CARTON CASE			
42	2B		K29-9105-02	KEY TOP			
A	1A,2A		N33-2606-45	OVAL HEAD MACHINE SCREW			
B	2C		N67-3008-46	PAN HEAD SEMS SCREW W			
C	1A,2B,1C		N87-2606-46	BRAZIER HEAD TAPTITE SCREW			
D	2B		N87-2612-46	BRAZIER HEAD TAPTITE SCREW			
46	1B		T07-0246-05	SPEAKER			
				TX-RX UNIT (X57-6143-01)			
D511			B30-2151-05	LED (RED/GREEN)			
D512-517			B30-2171-05	LED (D)			
C1-15			CK73GB1H102K	CHIP C	1000PF	K	
C17			CK73GB1C104K	CHIP C	0.10UF	K	
C18			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C19			CC73GCH1H100D	CHIP C	10PF	D	
C20			CK73GB1E103K	CHIP C	0.010UF	K	
C21,22			CK73GB1H102K	CHIP C	1000PF	K	
C23			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C24			CK73GB1H102K	CHIP C	1000PF	K	
C25			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C27			CK73GB1H102K	CHIP C	1000PF	K	
C28			CC73GCH1H470J	CHIP C	47PF	J	

Ref. No.	Address	New parts	Parts No.	Description			Desti-nation
C29			C92-0628-05	CHIP-TAN	10UF	10WV	
C30			CK73GB1H102K	CHIP C	1000PF	K	
C31			C92-0628-05	CHIP-TAN	10UF	10WV	
C32			CC73GCH1H220J	CHIP C	22PF	J	
C33			CK73GB1E103K	CHIP C	0.010UF	K	
C34			C92-0505-05	CHIP-TAN	10UF	16WV	
C35			CK73GB1E103K	CHIP C	0.010UF	K	
C36			C92-0628-05	CHIP-TAN	10UF	10WV	
C37			C92-1341-05	ELECTRO	100UF	16WV	
C38			C92-0505-05	CHIP-TAN	10UF	16WV	
C39			CK73GB1E103K	CHIP C	0.010UF	K	
C40			CK73GB1H102K	CHIP C	1000PF	K	
C41			C92-1341-05	ELECTRO	100UF	16WV	
C42			C92-0546-05	CHIP-TAN	68UF	6.3WV	
C43			CK73GB1E103K	CHIP C	0.010UF	K	
C44			CK73GB1H102K	CHIP C	1000PF	K	
C45			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C46			C92-0004-05	CHIP-TAN	1.0UF	16WV	
C47			CK73GB1H102K	CHIP C	1000PF	K	
C48			CK73FF1C105Z	CHIP C	1.0UF	Z	
C49			CK73GB1H102K	CHIP C	1000PF	K	
C51,52			CK73GB1H102K	CHIP C	1000PF	K	
C54			CK73GB1C104K	CHIP C	0.10UF	K	
C55			CC73GCH1H180J	CHIP C	18PF	J	
C56			CK73GB1H102K	CHIP C	1000PF	K	
C57			CK73GB1E103K	CHIP C	0.010UF	K	
C58-60			CK73GB1H102K	CHIP C	1000PF	K	
C61			CK73GB1E103K	CHIP C	0.010UF	K	
C62			CC73GCH1H100D	CHIP C	10PF	D	
C63			CK73FB1C105K	CHIP C	1.0UF	K	
C64			CK73GB1E103K	CHIP C	0.010UF	K	
C65			CK73GB1C104K	CHIP C	0.10UF	K	
C66			CK73GB1H102K	CHIP C	1000PF	K	
C68			CK73GB1C104K	CHIP C	0.10UF	K	
C69			CC73GCH1H151J	CHIP C	150PF	J	
C70			C92-0719-05	ELECTRO	47UF	25WV	
C71			CK73GB1C104K	CHIP C	0.10UF	K	
C72,73			CK73GB1H102K	CHIP C	1000PF	K	
C74			C92-0719-05	ELECTRO	47UF	25WV	
C75			C92-0044-05	CHIP-ELE	47UF	10WV	
C76			CK73GB1H102K	CHIP C	1000PF	K	
C77			C92-0719-05	ELECTRO	47UF	25WV	
C78			CK73GB1E103K	CHIP C	0.010UF	K	
C79			C92-0722-05	ELECTRO	470UF	16WV	
C80			CK73GB1C104K	CHIP C	0.10UF	K	
C84			CC73GCH1H080D	CHIP C	8.0PF	D	
C87			CK73GB1H471K	CHIP C	470PF	K	
C88			CK73GB1E103K	CHIP C	0.010UF	K	
C89			CK73GB1H471K	CHIP C	470PF	K	
C90			CK73GB1H102K	CHIP C	1000PF	K	
C91,92			CK73GB1E103K	CHIP C	0.010UF	K	
C93			CK73GB1H102K	CHIP C	1000PF	K	
C94			CK73GB1H471K	CHIP C	470PF	K	
C96			CC73GCH1H180J	CHIP C	18PF	J	
C97			CK73GB1H102K	CHIP C	1000PF	K	

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Ref. No.	Address	New parts	Parts No.	Description			Desti-nation
C98			CC73GCH1H150J	CHIP C	15PF	J	
C99			CK73GB1H102K	CHIP C	1000PF	K	
C100			C92-0628-05	CHIP-TAN	10UF	10WV	
C101			CK73GB1H102K	CHIP C	1000PF	K	
C102			CC73GCH1H270J	CHIP C	27PF	J	
C103			CK73GB1C104K	CHIP C	0.10UF	K	
C104			CK73GB1E103K	CHIP C	0.010UF	K	
C105,106			C92-0516-05	CHIP-TAN	4.7UF	16WV	
C107			C92-0628-05	CHIP-TAN	10UF	10WV	
C108			CK73GB1C104K	CHIP C	0.10UF	K	
C109			CK73GB1H471K	CHIP C	470PF	K	
C111,112			CK73GB1H471K	CHIP C	470PF	K	
C113			CK73GB1E103K	CHIP C	0.010UF	K	
C114			C92-0543-05	CHIP-TAN	3.3UF	10WV	
C115			CC73GCH1H270J	CHIP C	27PF	J	
C116			C92-0712-05	CHIP-TAN	22UF	6.3WV	
C117			CK73GB1E103K	CHIP C	0.010UF	K	
C118			CK73GB1C104K	CHIP C	0.10UF	K	
C119			C92-0543-05	CHIP-TAN	3.3UF	10WV	
C120			CK73GB1H102K	CHIP C	1000PF	K	
C121			C92-0628-05	CHIP-TAN	10UF	10WV	
C123			CK73GB1C104K	CHIP C	0.10UF	K	
C124			CK73GB1E103K	CHIP C	0.010UF	K	
C125			CK73GB1H471K	CHIP C	470PF	K	
C126			CK73GB1C104K	CHIP C	0.10UF	K	
C127			CK73GB1E103K	CHIP C	0.010UF	K	
C128			CK73GB1H471K	CHIP C	470PF	K	
C129			CK73GB1E103K	CHIP C	0.010UF	K	
C130			CK73GB1H102K	CHIP C	1000PF	K	
C131			CK73GB1H471K	CHIP C	470PF	K	
C132			CK73GB1C104K	CHIP C	0.10UF	K	
C134			CK73FB1E224K	CHIP C	0.22UF	K	
C135			CK73GB1H102K	CHIP C	1000PF	K	
C136			CK73FB1E224K	CHIP C	0.22UF	K	
C137			CK73GB1H471K	CHIP C	470PF	K	
C138			CC73FCH1H0R5B	CHIP C	0.5PF	B	
C139			CC73FCH1H030B	CHIP C	3.0PF	B	
C140-143			CK73GB1H471K	CHIP C	470PF	K	
C144			CK73GB1H102K	CHIP C	1000PF	K	
C145,146			CK73GB1H471K	CHIP C	470PF	K	
C147			CC73FCH1H0R5B	CHIP C	0.5PF	B	
C148			CK73GB1H102K	CHIP C	1000PF	K	
C149			CC73FCH1H020B	CHIP C	2.0PF	B	
C150			CK73GB1H221K	CHIP C	220PF	K	
C151			CC73GCH1H820J	CHIP C	82PF	J	
C153			CC73GCH1H080D	CHIP C	8.0PF	D	
C154,155			CK73GB1E103K	CHIP C	0.010UF	K	
C156			CK73GB1C104K	CHIP C	0.10UF	K	
C157			CK73GB1E103K	CHIP C	0.010UF	K	
C161			CC73GCH1H101J	CHIP C	100PF	J	
C163			CC73GCH1H221J	CHIP C	220PF	J	
C167			CC73GCH1H100D	CHIP C	10PF	D	
C168			C92-0585-05	CHIP-TAN	4.7UF	16WV	
C173			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C175			CK73GB1H102K	CHIP C	1000PF	K	
C176,177			CC73GCH1H470J	CHIP C	47PF	J	
C181			CK73GB1H102K	CHIP C	1000PF	K	
C182			C92-0565-05	CHIP-TAN	6.8UF	10WV	
C188			CK73GB1H102K	CHIP C	1000PF	K	
C196-198			CK73GB1H102K	CHIP C	1000PF	K	
C199			CC73GCH1H080D	CHIP C	8.0PF	D	
C201			CK73GB1H102K	CHIP C	1000PF	K	
C202			C93-0550-05	CHIP C	1.0PF	C	
C204			CK73GB1E103K	CHIP C	0.010UF	K	
C207,208			CK73GB1H102K	CHIP C	1000PF	K	
C209			CK73GB1C104K	CHIP C	0.10UF	K	
C210			CK73GB1E103K	CHIP C	0.010UF	K	
C211			CC73GCH1H120J	CHIP C	12PF	J	
C212			CC73GCH1H1R5B	CHIP C	1.5PF	B	
C213			CK73GB1H102K	CHIP C	1000PF	K	
C214			CC73GCH1H120J	CHIP C	12PF	J	
C215			CC73GCH1H010B	CHIP C	1.0PF	B	
C216			CC73GCH1H120J	CHIP C	12PF	J	
C217			CC73GCH1H060D	CHIP C	6.0PF	D	
C222			CK73GB1H471K	CHIP C	470PF	K	
C224			CK73GB1H471K	CHIP C	470PF	K	
C225,226			CK73GB1C104K	CHIP C	0.10UF	K	
C228			CK73GB1C104K	CHIP C	0.10UF	K	
C229			CK73GB1H471K	CHIP C	470PF	K	
C230			CK73GB1H102K	CHIP C	1000PF	K	
C231			CC73GCH1H101J	CHIP C	100PF	J	
C232			CK73GB1E103K	CHIP C	0.010UF	K	
C233-236			CK73GB1H102K	CHIP C	1000PF	K	
C237			CC73GCH1H100D	CHIP C	10PF	D	
C238			CK73GB1H102K	CHIP C	1000PF	K	
C239			CC73GCH1H090D	CHIP C	9.0PF	D	
C240			CK73GB1H471K	CHIP C	470PF	K	
C241			CC73GCH1H470J	CHIP C	47PF	J	
C242			CC73FCH1H150J	CHIP C	15PF	J	
C243			CC73GCH1H470J	CHIP C	47PF	J	
C245			CK73GB1H102K	CHIP C	1000PF	K	
C246			CK73GB1E103K	CHIP C	0.010UF	K	
C247			C92-0719-05	ELECTRO	47UF	25WV	
C250			C92-0719-05	ELECTRO	47UF	25WV	
C251			C93-0561-05	CHIP C	12PF	J	
C252			C93-0556-05	CHIP C	6.0PF	D	
C253			C93-0603-05	CHIP C	1000PF	K	
C255			CC73FCH1H040C	CHIP C	4.0PF	C	
C257			C93-0690-05	CERAMIC	13PF	500WV	
C258			C93-0565-05	CHIP C	27PF	J	
C259			C93-0690-05	CERAMIC	13PF	500WV	
C261			CC73GCH1H221J	CHIP C	220PF	J	
C262-264			CC73GCH1H820J	CHIP C	82PF	J	
C265			C93-0690-05	CERAMIC	13PF	500WV	
C266			CC73GCH1H150J	CHIP C	15PF	J	
C267			CC73GCH1H220J	CHIP C	22PF	J	
C271			CC73GCH1H820J	CHIP C	82PF	J	
C272			CC73GCH1H470J	CHIP C	47PF	J	
C273			CC73GCH1H820J	CHIP C	82PF	J	
C274			CC73GCH1H470J	CHIP C	47PF	J	
C277-282			CC73GCH1H470J	CHIP C	47PF	J	
C286			CC73GCH1H470J	CHIP C	47PF	J	
C288			CC73GCH1H270J	CHIP C	27PF	J	
C289			CC73GCH1H101J	CHIP C	100PF	J	
C290			CC73GCH1H270J	CHIP C	27PF	J	
C292-296			CC73GCH1H820J	CHIP C	82PF	J	
C297			CC73GCH1H150J	CHIP C	15PF	J	
C298			CC73GCH1H100D	CHIP C	10PF	D	
C299			CC73GCH1H150J	CHIP C	15PF	J	
C303			C92-0565-05	CHIP-TAN	6.8UF	10WV	

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Ref. No.	Address	New parts	Parts No.	Description			Desti-nation	Ref. No.	Address	New parts	Parts No.	Description			Desti-nation
C304-306			CK73GB1H102K	CHIP C	1000PF	K		C545			CK73GB1H102K	CHIP C	1000PF	K	
C307			CC73GCH1H180J	CHIP C	18PF	J		C546			CK73GB1H122K	CHIP C	1200PF	K	
C309			CC73GCH1H270J	CHIP C	27PF	J		C547			CK73GB1H102K	CHIP C	1000PF	K	
C311			CC73GCH1H180J	CHIP C	18PF	J		C548			C92-0560-05	CHIP-TAN	10UF	6.3WV	
C312			CC73GCH1H150J	CHIP C	15PF	J		C549			CK73GB1C104K	CHIP C	0.10UF	K	
C313			CK73GB1H103K	CHIP C	0.010UF	K		C550			CC73GCH1H101J	CHIP C	100PF	J	
C314			C92-0001-05	CHIP C	0.1UF	35WV		C552			CK73GB1C333K	CHIP C	0.033UF	K	
C315,316			CK73GB1C104K	CHIP C	0.10UF	K		C553			CK73GB1H472K	CHIP C	4700PF	K	
C317			CK73GB1H102K	CHIP C	1000PF	K		C554-558			CK73GB1C104K	CHIP C	0.10UF	K	
C318,319			CK73GB1C104K	CHIP C	0.10UF	K		C559			CK73GB1H102K	CHIP C	1000PF	K	
C320			C92-0501-05	CHIP-TAN	1.5UF	10WV		C560			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C321			CC73GCH1H150J	CHIP C	15PF	J		C561			CK73GB1H102K	CHIP C	1000PF	K	
C322			C92-0501-05	CHIP-TAN	1.5UF	10WV		C562,563			CK73GB1H682K	CHIP C	6800PF	K	
C324			CK73FB1E104K	CHIP C	0.10UF	K		C564			CK73GB1E223K	CHIP C	0.022UF	K	
C325			C92-0002-05	CHIP-TAN	0.22UF	35WV		C565			CK73GB1H102K	CHIP C	1000PF	K	
C326			CK73FF1C105Z	CHIP C	1.0UF	Z		C566			CC73GCH1H101J	CHIP C	100PF	J	
C327			CK73FB1E104K	CHIP C	0.10UF	K		C567			CK73GB1C563K	CHIP C	0.056UF	K	
C401			CK73GB1H102K	CHIP C	1000PF	K		C568			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C402			C92-0628-05	CHIP-TAN	10UF	10WV		C569			CC73GCH1H470J	CHIP C	47PF	J	
C406			CC73FCH1H102J	CHIP C	1000PF	J		C570			CK73GB1C104K	CHIP C	0.10UF	K	
C407			CC73FCH1H221J	CHIP C	220PF	J		C571			CK73GB1H102K	CHIP C	1000PF	K	
C408			C92-0628-05	CHIP-TAN	10UF	10WV		C572			CK73FB1H563K	CHIP C	0.056UF	K	
C409			CC73GCH1H050C	CHIP C	5.0PF	C		C574			CK73GB1C104K	CHIP C	0.10UF	K	
C410			CC73GCH1H100D	CHIP C	10PF	D		C575			CK73FB1C334K	CHIP C	0.33UF	K	
C501			CK73GB1H471K	CHIP C	470PF	K		C576			CK73GB1C473K	CHIP C	0.047UF	K	
C502			CC73GCH1H221J	CHIP C	220PF	J		C577			CK73GB1C104K	CHIP C	0.10UF	K	
C503,504			CK73GB1H471K	CHIP C	470PF	K		C578			CK73GB1H103K	CHIP C	0.010UF	K	
C505			CK73GB1C683K	CHIP C	0.068UF	K		C579			CK73GB1H472K	CHIP C	4700PF	K	
C506			CK73GB1E123K	CHIP C	0.012UF	K		C580			CK73GB1H102K	CHIP C	1000PF	K	
C508			CK73GB1C104K	CHIP C	0.10UF	K		C581,582			CK73GB1H103K	CHIP C	0.010UF	K	
C509			CK73GB1H222K	CHIP C	2200PF	K		C583			CK73GB1H102K	CHIP C	1000PF	K	
C510			C92-0507-05	CHIP-TAN	4.7UF	6.3WV		C584			CK73GB1H471K	CHIP C	470PF	K	
C511			CK73GB1H103K	CHIP C	0.010UF	K		C592			CK73GB1H102K	CHIP C	1000PF	K	
C512			CK73GB1H471K	CHIP C	470PF	K		C593			CK73GB1H103K	CHIP C	0.010UF	K	
C513			CK73GB1H102K	CHIP C	1000PF	K		C594,595			CC73GCH1H270J	CHIP C	27PF	J	
C514			CK73GB1H152K	CHIP C	1500PF	K		C596			CC73GCH1H680J	CHIP C	68PF	J	
C515			CK73GB1C104K	CHIP C	0.10UF	K		C597			CK73GB1H103K	CHIP C	0.010UF	K	
C516,517			CK73GB1H103K	CHIP C	0.010UF	K		C598,599			CC73GCH1H101J	CHIP C	100PF	J	
C518			CK73GB1H102K	CHIP C	1000PF	K		C600,601			CK73GB1H102K	CHIP C	1000PF	K	
C519			C92-0507-05	CHIP-TAN	4.7UF	6.3WV		C602			CK73GB1H103K	CHIP C	0.010UF	K	
C520			CC73GCH1H221J	CHIP C	220PF	J		C603			CK73GB1C104K	CHIP C	0.10UF	K	
C521,522			CK73GB1C104K	CHIP C	0.10UF	K		C604			C92-0560-05	CHIP-TAN	10UF	6.3WV	
C523			CK73GB1H103K	CHIP C	0.010UF	K		C605			CK73GB1H102K	CHIP C	1000PF	K	
C524			CK73GB1C104K	CHIP C	0.10UF	K		C606			CK73GB1H122K	CHIP C	1200PF	K	
C525			CK73GB1H103K	CHIP C	0.010UF	K		C607			CK73GB1H103K	CHIP C	0.010UF	K	
C526			CK73GB1C104K	CHIP C	0.10UF	K		C608			CK73GB1H392K	CHIP C	3900PF	K	
C527			CK73GB1C683K	CHIP C	0.068UF	K		C609,610			CK73GB1H103K	CHIP C	0.010UF	K	
C528			CK73GB1H102K	CHIP C	1000PF	K		C613			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C529			CK73GB1H562J	CHIP C	5600PF	J		C614			CK73GB1H102K	CHIP C	1000PF	K	
C531			CK73GB1H562J	CHIP C	5600PF	J		C616			CK73GB1H102K	CHIP C	1000PF	K	
C533			CK73GB1H562J	CHIP C	5600PF	J		C617			CC73GCH1H101J	CHIP C	100PF	J	
C535			CK73GB1H102K	CHIP C	1000PF	K		C620			CC73GCH1H101J	CHIP C	100PF	J	
C536			CC73GCH1H030C	CHIP C	3.0PF	C		C622,623			CK73GB1H102K	CHIP C	1000PF	K	
C537			CK73GB1H272K	CHIP C	2700PF	K		C624			CC73GCH1H101J	CHIP C	100PF	J	
C539			CK73GB1H272K	CHIP C	2700PF	K		C625			CK73GB1H102K	CHIP C	1000PF	K	
C540			CC73GCH1H391J	CHIP C	390PF	J		C626			CC73GCH1H101J	CHIP C	100PF	J	
C541			CC73GCH1H100D	CHIP C	10PF	D		C627			CK73GB1H102K	CHIP C	1000PF	K	
C542			CC73GCH1H391J	CHIP C	390PF	J		C628			CC73GCH1H101J	CHIP C	100PF	J	
C543			CK73GB1H272K	CHIP C	2700PF	K		C630			CK73GB1H102K	CHIP C	1000PF	K	
C544			CC73GCH1H030C	CHIP C	3.0PF	C		C631-634			CC73GCH1H101J	CHIP C	100PF	J	

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Ref. No.	Address	New parts	Parts No.	Description			Desti-nation
C710			CK73GB1C104K	CHIP C	0.10UF	K	
C711,712			CK73GB1H222K	CHIP C	2200PF	K	
C713			CK73GB1H102K	CHIP C	1000PF	K	
C714			CC73GCH1H331J	CHIP C	330PF	J	
C715			CK73GB1H102K	CHIP C	1000PF	K	
C718			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C720			CC73GCH1H470J	CHIP C	47PF	J	
C721-723			CC73GCH1H221J	CHIP C	220PF	J	
C724			CK73GB1H682K	CHIP C	6800PF	K	
C726			CK73GB1C104K	CHIP C	0.10UF	K	
C728			C92-0772-05	TANTALUM CAPACITOR			
CN1			E40-5737-05	PIN ASSY			
CN2			E40-5738-05	PIN ASSY			
CN3			E40-3247-05	PIN ASSY			
CN4			E40-5738-05	PIN ASSY			
CN5			E40-3247-05	PIN ASSY			
CN6			E40-3246-05	PIN ASSY			
CN7			E40-5982-05	FLAT CABLE CONNECTOR			
CN501			E40-5823-05	FLAT CABLE CONNECTOR			
CN502			E40-5982-05	FLAT CABLE CONNECTOR			
J1	2C		E11-0442-05	3.5D PHONE JACK (3P)			
J501	1B		E08-0877-05	MODULAR JACK			
-			J31-0543-05	COLLAR (LH-5-1.5)			
CF1			L72-0372-05	CERAMIC FILTER			
CF1		*	L72-0998-05	CERAMIC FILTER			
CF2			L72-0376-05	CERAMIC FILTER			
CF2			L72-0986-05	CERAMIC FILTER			
L1			L40-1005-34	SMALL FIXED INDUCTOR (10UH)			
L2			L92-0138-05	FERRITE CHIP			
L3			L40-8275-44	SMALL FIXED INDUCTOR (82.0NH)			
L4			L40-8272-37	SMALL FIXED INDUCTOR (0.082UH)			
L5			L40-1092-34	SMALL FIXED INDUCTOR			
L6			L34-4459-05	COIL			
L7			L40-3975-92	SMALL FIXED INDUCTOR (39NH)			
L10			L40-1091-37	SMALL FIXED INDUCTOR (1.000UH)			
L14			L92-0191-05	FERRITE CHIP			
L202-204			L34-4640-05	COIL			
L207-209			L39-1272-05	TOROIDAL COIL			
L211,212			L40-3971-34	SMALL FIXED INDUCTOR (39NH)			
L213			L34-4478-05	AIR-CORE COIL			
L214			L34-4480-05	AIR-CORE COIL			
L215			L34-0499-05	AIR-CORE COIL			
L216			L34-4482-05	AIR-CORE COIL			
L217,218			L34-0499-05	AIR-CORE COIL			
L219			L40-2778-67	SMALL FIXED INDUCTOR (27NH)			
L220			L40-1888-67	SMALL FIXED INDUCTOR (180NH)			
L221			L40-2278-67	SMALL FIXED INDUCTOR (22NH)			
L222			L40-6878-67	SMALL FIXED INDUCTOR (68NH)			
L223			L40-3378-67	SMALL FIXED INDUCTOR (33NH)			
L225			L92-0193-05	FERRITE CHIP			
L226			L92-0155-05	FERRITE CHIP			
L227			L40-1878-67	SMALL FIXED INDUCTOR (18NH)			
L230			L40-4775-92	SMALL FIXED INDUCTOR (47NH)			
L300,301			L40-3371-36	SMALL FIXED INDUCTOR (33NH)			
L302			L40-1005-34	SMALL FIXED INDUCTOR (10UH)			
L303			L40-4775-34	SMALL FIXED INDUCTOR (47NH)			
L501-508			L92-0138-05	FERRITE CHIP			
X1			L77-1766-15	VCXO (16.8MHZ)			

Ref. No.	Address	New parts	Parts No.	Description			Desti-nation
X2			L77-1762-05	CRYSTAL RESONATOR (44.395MHZ)			
X501			L77-1708-05	CRYSTAL RESONATOR (3.579545MHZ)			
X502			L78-0462-05	RESONATOR (9.8304M)			
XF1			L71-0572-05	MCF (44.85MHZ)			
CP501			R90-0724-05	MULTI-COMP	1K X4		
R1			RK73GB1J102J	CHIP R	1.0K	J	1/16W
R2			R92-1252-05	CHIP R	0 OHM	J	1/16W
R3,4			RK73GB1J102J	CHIP R	1.0K	J	1/16W
R5			R92-1252-05	CHIP R	0 OHM	J	1/16W
R7			R92-1252-05	CHIP R	0 OHM	J	1/16W
R8			RK73GB1J102J	CHIP R	1.0K	J	1/16W
R9			R92-1252-05	CHIP R	0 OHM	J	1/16W
R10,11			RK73GB1J102J	CHIP R	1.0K	J	1/16W
R14			RK73GB1J473J	CHIP R	47K	J	1/16W
R15			RK73GB1J103J	CHIP R	10K	J	1/16W
R16			RK73GB1J104J	CHIP R	100K	J	1/16W
R17,18			R92-1252-05	CHIP R	0 OHM	J	1/16W
R19			RK73GB1J153J	CHIP R	15K	J	1/16W
R20			RK73GB1J473J	CHIP R	47K	J	1/16W
R21			RK73GB1J563J	CHIP R	56K	J	1/16W
R22			RK73GB1J104J	CHIP R	100K	J	1/16W
R23			RK73GB1J684J	CHIP R	680K	J	1/16W
R24			R92-1252-05	CHIP R	0 OHM	J	1/16W
R25			RK73GB1J394J	CHIP R	390K	J	1/16W
R26			RK73GB1J104J	CHIP R	100K	J	1/16W
R27			RK73GB1J473J	CHIP R	47K	J	1/16W
R28			R92-1252-05	CHIP R	0 OHM	J	1/16W
R29			RK73GB1J220J	CHIP R	22	J	1/16W
R30,31			RK73GB1J104J	CHIP R	100K	J	1/16W
R32			RK73GB1J474J	CHIP R	470K	J	1/16W
R33			RK73GB1J563J	CHIP R	56K	J	1/16W
R34			R92-1252-05	CHIP R	0 OHM	J	1/16W
R35			RK73GB1J223J	CHIP R	22K	J	1/16W
R36			RK73GB1J103J	CHIP R	10K	J	1/16W
R37			R92-1252-05	CHIP R	0 OHM	J	1/16W
R39			RK73GB1J101J	CHIP R	100	J	1/16W
R40			RK73GB1J103J	CHIP R	10K	J	1/16W
R41			RK73GB1J122J	CHIP R	1.2K	J	1/16W
R42			RK73GB1J104J	CHIP R	100K	J	1/16W
R44			RK73GB1J473J	CHIP R	47K	J	1/16W
R45			RK73GB1J104J	CHIP R	100K	J	1/16W
R46			RK73GB1J103J	CHIP R	10K	J	1/16W
R47			RK73GB1J473J	CHIP R	47K	J	1/16W
R48			RK73GB1J122J	CHIP R	1.2K	J	1/16W
R49			RK73GB1J102J	CHIP R	1.0K	J	1/16W
R50			RK73GB1J103J	CHIP R	10K	J	1/16W
R52			R92-1252-05	CHIP R	0 OHM	J	1/16W
R55			RK73GB1J153J	CHIP R	15K	J	1/16W
R56			RK73GB1J103J	CHIP R	10K	J	1/16W
R57			RK73GB1J473J	CHIP R	47K	J	1/16W
R58			RK73GB1J102J	CHIP R	1.0K	J	1/16W
R59			R92-1252-05	CHIP R	0 OHM	J	1/16W
R60			RK73GB1J472J	CHIP R	4.7K	J	1/16W
R61			RK73GB1J223J	CHIP R	22K	J	1/16W
R62			RK73GB1J101J	CHIP R	100	J	1/16W
R63			R92-1252-05	CHIP R	0 OHM	J	1/16W
R65			R92-1252-05	CHIP R	0 OHM	J	1/16W
R66			RK73GB1J103J	CHIP R	10K	J	1/16W
R67			RK73GB1J101J	CHIP R	100	J	1/16W

PARTS LIST / 零件表

Ref. No.	Address	New parts	Parts No.	Description				Desti-nation
R68			RK73GB1J390J	CHIP R	39	J	1/16W	
R69			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R70-73			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R74			RK73GB1J473J	CHIP R	47K	J	1/16W	
R75			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R76			RK73GB1J153J	CHIP R	15K	J	1/16W	
R77			RK73GB1J333J	CHIP R	33K	J	1/16W	
R78			RK73GB1J561J	CHIP R	560	J	1/16W	
R80			RK73GB1J473J	CHIP R	47K	J	1/16W	
R85			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R86			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R89			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R90			RK73GB1J2R2J	CHIP R	2.2	J	1/16W	
R91			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R96			RK73GB1J181J	CHIP R	180	J	1/16W	
R97,98			RK73GB1J473J	CHIP R	47K	J	1/16W	
R99			RK73GB1J152J	CHIP R	1.5K	J	1/16W	
R104			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R106			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R107			RK73GB1J473J	CHIP R	47K	J	1/16W	
R109			R92-0670-05	CHIP R	0 OHM			
R110			RK73GB1J470J	CHIP R	47	J	1/16W	
R111			RK73GB1J331J	CHIP R	330	J	1/16W	
R112			RK73GB1J473J	CHIP R	47K	J	1/16W	
R113			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R114			RK73GB1J392J	CHIP R	3.9K	J	1/16W	
R116			RK73GB1J473J	CHIP R	47K	J	1/16W	
R119			RK73GB1J103J	CHIP R	10K	J	1/16W	
R120,121			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R122			RK73GB1J392J	CHIP R	3.9K	J	1/16W	
R123			RK73GB1J153J	CHIP R	15K	J	1/16W	
R124-126			RK73GB1J223J	CHIP R	22K	J	1/16W	
R127			RK73FB2A153J	CHIP R	15K	J	1/10W	
R128			RK73GB1J223J	CHIP R	22K	J	1/16W	
R129			RK73GB1J220J	CHIP R	22	J	1/16W	
R130,131			RK73GB1J223J	CHIP R	22K	J	1/16W	
R132			RK73GB1J104J	CHIP R	100K	J	1/16W	
R133			RK73GB1J153J	CHIP R	15K	J	1/16W	
R134			RK73GB1J473J	CHIP R	47K	J	1/16W	
R135			R92-1261-05	CHIP R	150	J	1/2W	
R137			RK73GB1J473J	CHIP R	47K	J	1/16W	
R138			RK73FB2A100J	CHIP R	10	J	1/10W	
R139			R92-0670-05	CHIP R	0 OHM			
R140			R92-1252-05	CHIP R	0 OHM		1/16W	
R141			RK73GB1J104J	CHIP R	100K	J	1/16W	
R142			R92-0699-05	CHIP R	10	J	1/2W	
R143			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R144			RK73GB1J223J	CHIP R	22K	J	1/16W	
R145			RK73GB1J104J	CHIP R	100K	J	1/16W	
R146			R92-1215-05	CHIP R	470	J	1/2W	
R147			RK73FB2A563J	CHIP R	56K	J	1/10W	
R148			RK73FB2A472J	CHIP R	4.7K	J	1/10W	
R149			RK73FB2A183J	CHIP R	18K	J	1/10W	
R150			R92-0670-05	CHIP R	0 OHM			
R151-153			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R154			RK73GB1J103J	CHIP R	10K	J	1/16W	
R155			RK73GB1J333J	CHIP R	33K	J	1/16W	
R156			RK73GB1J471J	CHIP R	470	J	1/16W	
R157			RK73GB1J101J	CHIP R	100	J	1/16W	
R158			RK73GB1J473J	CHIP R	47K	J	1/16W	
R161			RK73GB1J474J	CHIP R	470K	J	1/16W	
R162,163			RK73FB2A103J	CHIP R	10K	J	1/10W	
R164			RK73GB1J122J	CHIP R	1.2K	J	1/16W	
R165			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R167,168			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R169			RK73GB1J154J	CHIP R	150K	J	1/16W	
R170			R92-0670-05	CHIP R	0 OHM			
R171			RK73GB1J3R3J	CHIP R	3.3	J	1/16W	
R172			RK73GB1J561J	CHIP R	560	J	1/16W	
R173			RK73GB1J181J	CHIP R	180	J	1/16W	
R174			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R176			R92-0670-05	CHIP R	0 OHM			
R179,180			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R190			R92-0670-05	CHIP R	0 OHM			
R201			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R209			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R211			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R212			RK73GB1J272J	CHIP R	2.7K	J	1/16W	
R213			RK73GB1J101J	CHIP R	100	J	1/16W	
R214			RK73GB1J272J	CHIP R	2.7K	J	1/16W	
R215			RK73GB1J104J	CHIP R	100K	J	1/16W	
R217			RK73GB1J470J	CHIP R	47	J	1/16W	
R218-220			RK73GB1J104J	CHIP R	100K	J	1/16W	
R221			RK73GB1J274J	CHIP R	270K	J	1/16W	
R222			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R223			RK73GB1J104J	CHIP R	100K	J	1/16W	
R224			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R225			RK73GB1J470J	CHIP R	47	J	1/16W	
R226			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R228			RK73GB1J271J	CHIP R	270	J	1/16W	
R229			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R230			RK73GB1J180J	CHIP R	18	J	1/16W	
R231			RK73GB1J271J	CHIP R	270	J	1/16W	
R232			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R233			RK73GB1J103J	CHIP R	10K	J	1/16W	
R234			RK73GB1J100J	CHIP R	10	J	1/16W	
R236			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R237			RK73GB1J101J	CHIP R	100	J	1/16W	
R238			RK73GB1J152J	CHIP R	1.5K	J	1/16W	
R239			RK73FB2A100J	CHIP R	10	J	1/10W	
R240			R92-0685-05	CHIP R	22	J	1/2W	
R246			RK73GB1J182J	CHIP R	1.8K	J	1/16W	
R247			RK73GB1J2R7J	CHIP R	2.7	J	1/16W	
R248			RK73GB1J182J	CHIP R	1.8K	J	1/16W	
R249			RK73FB2A561J	CHIP R	560	J	1/10W	
R250			RK73FB2A100J	CHIP R	10	J	1/10W	
R251			RK73FB2A561J	CHIP R	560	J	1/10W	
R300-303			RK73GB1J470J	CHIP R	47	J	1/16W	
R304			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R305			RK73GB1J103J	CHIP R	10K	J	1/16W	
R306			RK73GB1J271J	CHIP R	270	J	1/16W	
R307			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R308			RK73GB1J101J	CHIP R	100	J	1/16W	
R309			RK73GB1J563J	CHIP R	56K	J	1/16W	
R310			RK73GB1J103J	CHIP R	10K	J	1/16W	
R311			RK73GB1J271J	CHIP R	270	J	1/16W	
R312			RK73GB1J152J	CHIP R	1.5K	J	1/16W	
R313			RK73GB1J103J	CHIP R	10K	J	1/16W	
R314			RK73GB1J273J	CHIP R	27K	J	1/16W	
R315			RK73GB1J472J	CHIP R	4.7K	J	1/16W	

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PARTS LIST / 零件表

TX-RX UNIT (X57-6143-01)

Ref. No.	Address	New parts	Parts No.	Description				Desti-nation
R316,317			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R318			RK73GB1J271J	CHIP R	270	J	1/16W	
R319			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R320			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R323,324			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R401			RK73GB1J103J	CHIP R	10K	J	1/16W	
R402			RK73GB1J153J	CHIP R	15K	J	1/16W	
R403			RK73GB1J122J	CHIP R	1.2K	J	1/16W	
R404			RK73GB1J473J	CHIP R	47K	J	1/16W	
R405			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R406			RK73GB1J124J	CHIP R	120K	J	1/16W	
R408			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R411			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R413			RK73GB1J473J	CHIP R	47K	J	1/16W	
R414			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R420			RK73GB1J470J	CHIP R	47	J	1/16W	
R501			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R502			RK73GB1J184J	CHIP R	180K	J	1/16W	
R503			RK73GB1J223J	CHIP R	22K	J	1/16W	
R504			RK73GB1J184J	CHIP R	180K	J	1/16W	
R505			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R506			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R507,508			RK73GB1J154J	CHIP R	150K	J	1/16W	
R509			RK73GB1J103J	CHIP R	10K	J	1/16W	
R510			RK73GB1J105J	CHIP R	1.0M	J	1/16W	
R511			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R512			RK73GB1J681J	CHIP R	680	J	1/16W	
R513			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R514			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R515			RN73GH1J913D	CHIP R	91K	D	1/16W	
R516			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R517			RK73GB1J103J	CHIP R	10K	J	1/16W	
R518			RN73GH1J333D	CHIP R	33K	D	1/16W	
R519			RN73GH1J913D	CHIP R	91K	D	1/16W	
R520			RN73GH1J683D	CHIP R	68K	D	1/16W	
R521			RK73GB1J105J	CHIP R	1.0M	J	1/16W	
R522			RN73GH1J913D	CHIP R	91K	D	1/16W	
R523			RK73GB1J154J	CHIP R	150K	J	1/16W	
R524			RN73GH1J274D	CHIP R	270K	D	1/16W	
R525			RK73GB1J823J	CHIP R	82K	J	1/16W	
R526			RK73GB1J104J	CHIP R	100K	J	1/16W	
R527			RK73GB1J103J	CHIP R	10K	J	1/16W	
R528			RK73GB1J153J	CHIP R	15K	J	1/16W	
R529			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R530			RK73GB1J394J	CHIP R	390K	J	1/16W	
R531			RK73GB1J473J	CHIP R	47K	J	1/16W	
R532			RK73GB1J394J	CHIP R	390K	J	1/16W	
R533			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R535			RK73GB1J155J	CHIP R	1.5M	J	1/16W	
R536			RN73GH1J682D	CHIP R	6.8K	D	1/16W	
R537,538			RK73GB1J473J	CHIP R	47K	J	1/16W	
R540			RK73GB1J474J	CHIP R	470K	J	1/16W	
R541			RK73GB1J274J	CHIP R	270K	J	1/16W	
R542			RN73GH1J683D	CHIP R	68K	D	1/16W	
R544			RK73GB1J101J	CHIP R	100	J	1/16W	
R545			RK73GB1J182J	CHIP R	1.8K	J	1/16W	
R546			RK73GB1J224J	CHIP R	220K	J	1/16W	
R547			RK73GB1J103J	CHIP R	10K	J	1/16W	
R548			RK73GB1J183J	CHIP R	18K	J	1/16W	
R550			RN73GH1J682D	CHIP R	6.8K	D	1/16W	
R551			RK73GB1J223J	CHIP R	22K	J	1/16W	
R552			RK73GB1J334J	CHIP R	330K	J	1/16W	
R553			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R554			RK73GB1J332J	CHIP R	3.3K	J	1/16W	
R555			RK73GB1J474J	CHIP R	470K	J	1/16W	
R556			RK73GB1J223J	CHIP R	22K	J	1/16W	
R558			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R562			RK73GB1J273J	CHIP R	27K	J	1/16W	
R564			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R566			RK73GB1J470J	CHIP R	47	J	1/16W	
R567			RK73GB1J220J	CHIP R	22	J	1/16W	
R568			RK73GB1J473J	CHIP R	47K	J	1/16W	
R569			RK73GB1J333J	CHIP R	33K	J	1/16W	
R571,572			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R573			RK73GB1J104J	CHIP R	100K	J	1/16W	
R574			RK73GB1J473J	CHIP R	47K	J	1/16W	
R575			RK73GB1J103J	CHIP R	10K	J	1/16W	
R576			RK73GB1J473J	CHIP R	47K	J	1/16W	
R577			RK73GB1J153J	CHIP R	15K	J	1/16W	
R579			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R580			RK73GB1J103J	CHIP R	10K	J	1/16W	
R581			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R582			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R584			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R585,586			RK73GB1J473J	CHIP R	47K	J	1/16W	
R587			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R588			RK73GB1J473J	CHIP R	47K	J	1/16W	
R589			R92-1368-05	CHIP R	0 OHM			
R590-600			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R601-603			R92-1368-05	CHIP R	0 OHM			
R608-610			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R611			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R612			RK73GB1J224J	CHIP R	220K	J	1/16W	
R613			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R615			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R616			RK73GB1J473J	CHIP R	47K	J	1/16W	
R617,618			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R619			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R620			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R621			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R622,623			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R624			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R625-627			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R628,629			R92-1368-05	CHIP R	0 OHM			
R630			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R631			R92-1368-05	CHIP R	0 OHM			
R632			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R633			R92-1368-05	CHIP R	0 OHM			
R634			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R635			R92-1368-05	CHIP R	0 OHM			
R636,637			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R638			R92-1368-05	CHIP R	0 OHM			
R639			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R640			R92-1368-05	CHIP R	0 OHM			
R641			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R642			R92-1368-05	CHIP R	0 OHM			
R643			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R644			R92-1368-05	CHIP R	0 OHM			
R645			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R646,647			RK73HB1J102J	CHIP R	1.0K	J	1/16W	

PARTS LIST / 零件表

Ref. No.	Address	New parts	Parts No.	Description				Desti-nation
R649			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R650-652			R92-1368-05	CHIP R	0 OHM			
R653,654			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R655-657			R92-1368-05	CHIP R	0 OHM			
R658			RK73HB1J472J	CHIP R	4.7K	J	1/16W	
R659-666			R92-1368-05	CHIP R	0 OHM			
R667,668			RK73GB1J181J	CHIP R	180	J	1/16W	
R670			RK73GB1J473J	CHIP R	47K	J	1/16W	
R672,673			RK73GB1J473J	CHIP R	47K	J	1/16W	
R674			RK73FB2A222J	CHIP R	2.2K	J	1/10W	
R675			RK73GB1J473J	CHIP R	47K	J	1/16W	
R676			RK73GB1J103J	CHIP R	10K	J	1/16W	
R677			RK73GB1J223J	CHIP R	22K	J	1/16W	
R678			RK73GB1J103J	CHIP R	10K	J	1/16W	
R679			RK73FB2A390J	CHIP R	39	J	1/10W	
R680			RK73FB2A222J	CHIP R	2.2K	J	1/10W	
R682			RK73GB1J473J	CHIP R	47K	J	1/16W	
R683			RK73GB1J103J	CHIP R	10K	J	1/16W	
R701			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R702			RK73GB1J101J	CHIP R	100	J	1/16W	
R705,706			RK73GB1J473J	CHIP R	47K	J	1/16W	
R710,711			RK73GB1J104J	CHIP R	100K	J	1/16W	
R712,713			RK73GB1J473J	CHIP R	47K	J	1/16W	
R714			RK73GB1J103J	CHIP R	10K	J	1/16W	
R716			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R718			RK73GB1J154J	CHIP R	150K	J	1/16W	
R719			RK73GB1J103J	CHIP R	10K	J	1/16W	
R720			RK73GB1J683J	CHIP R	68K	J	1/16W	
R721			RK73GB1J334J	CHIP R	330K	J	1/16W	
R722			RK73FB2A680J	CHIP R	68	J	1/10W	
R723			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R724			RK73GB1J562J	CHIP R	5.6K	J	1/16W	
R725			RK73GB1J392J	CHIP R	3.9K	J	1/16W	
R726			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R727			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R730			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
VR1			R32-0658-05	SEMI FIXED VARIABLE RESISTOR				
D1-6			DA204U	DIODE				
D1-6			HSB123	DIODE				
D7			02DZ20(Y,Z)	ZENER DIODE				
D8,9			DA204U	DIODE				
D8,9			HSB123	DIODE				
D11			DAN202U	DIODE				
D12-14			DA204U	DIODE				
D12-14			HSB123	DIODE				
D15			DAN235E	DIODE				
D16			1SS355	DIODE				
D17			DA204U	DIODE				
D17			HSB123	DIODE				
D20			1SS355	DIODE				
D21			02DZ5.6(X,Y)	ZENER DIODE				
D22,23			DAN235E	DIODE				
D24			MINISMDC075-02	VARISTOR				
D26			1SS355	DIODE				
D27			HSM88AS	DIODE				
D28			02DZ15(X,Y)	ZENER DIODE				
D30			HSM88AS	DIODE				
D31			1SS355	DIODE				
D32			22ZR-10D	SURGE ABSORBER				

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
D34			02DZ18(X,Y)	ZENER DIODE	
D35			MA742	DIODE	
D37			DSA3A1	DIODE	
D40,41			1SS368	DIODE	
D206-208			1SV282	VARIABLE CAPACITANCE DIODE	
D209,210			HSB123	DIODE	
D211			MA4PH633	DIODE	
D212			XB15A709	DIODE	
D501			DA204U	DIODE	
D501			HSB123	DIODE	
D502			MINISMDC075-02	VARISTOR	
D503-505			DA204U	DIODE	
D503-505			HSB123	DIODE	
D507			DAN202U	DIODE	
D508,509			MA742	DIODE	
D510			HSC119	DIODE	
D518			02DZ9.1(X,Y)	ZENER DIODE	
D520			MA2S111	DIODE	
IC1			TA75W01FU	MOS IC	
IC2,3			TA75W558FU	MOS IC	
IC4			TC4S66F	MOS IC	
IC5			M62363FP	MOS IC	
IC6			TA75W01FU	MOS IC	
IC7,8			BU4094BCFV	MOS IC	
IC9			TA78L05F	MOS IC	
IC10			LA4422	BI-POLAR IC	
IC11			TA31136FN	MOS IC	
IC12			TA78L05F	MOS IC	
IC13			AN8009M	MOS IC	
IC14			TA7808S	MOS IC	
IC15			TC4013BF(N)	MOS IC	
IC201			LMC7101BIM5	MOS IC	
IC202			GN2011(Q)	MOS IC	
IC300			SA7025DK	MOS IC	
IC400	1C		M68729	HYBRID IC	
IC401			NJM2904V	MOS IC	
IC501			TA75W558FU	MOS IC	
IC502			TC75W51FU	MOS IC	
IC503			TA75W558FU	MOS IC	
IC504			TC35453F	MOS IC	
IC506			BU4066BCFV	MOS IC	
IC507			LC73872M	MOS IC	
IC508			BU4094BCFV	MOS IC	
IC509			RH5VL42C	MOS IC	
IC510			AT29C020-90TI	ROM IC	
IC510			W29C020C90	SRAM IC	
IC511		*	30620M8A-2K9GP	MPU	
IC512			AT2416N10SI2.5	ROM IC	
IC513			TA78L05F	MOS IC	
IC710,711			TA75S01F	MOS IC	
Q1			2SK1824	FET	
Q2,3			2SC2412K(S)	TRANSISTOR	
Q4			DTD114EK	DIGITAL TRANSISTOR	
Q5,6			DTC114EE	DIGITAL TRANSISTOR	
Q7			2SC4215(Y)	TRANSISTOR	
Q8			DTC363EU	DIGITAL TRANSISTOR	
Q9			DTA114YUA	DIGITAL TRANSISTOR	
Q10			DTC114EE	DIGITAL TRANSISTOR	
Q11			2SA1362(Y)	TRANSISTOR	
Q12			2SB1132(Q,R)	TRANSISTOR	

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TX-RX UNIT (X57-6143-01)
PLL/VCO (X58-4712-71)

Ref. No.	Address	New parts	Parts No.	Description				Desti-nation
Q13			DTC114EE	DIGITAL TRANSISTOR				
Q15			2SC2059K(P)	TRANSISTOR				
Q16			DTC144EE	DIGITAL TRANSISTOR				
Q17			2SC2412K(S)	TRANSISTOR				
Q18			2SK1824	FET				
Q19			2SD2394	TRANSISTOR				
Q20			2SB1188(Q)	TRANSISTOR				
Q21			FMW1	TRANSISTOR				
Q22			DTC114EE	DIGITAL TRANSISTOR				
Q23			DTA114EE	DIGITAL TRANSISTOR				
Q24			DTC144EE	DIGITAL TRANSISTOR				
Q25,26			DTA114EE	DIGITAL TRANSISTOR				
Q27			2SA1641(S,T)	TRANSISTOR				
Q28,29			DTC114EE	DIGITAL TRANSISTOR				
Q30			DTA114EE	DIGITAL TRANSISTOR				
Q31			DTC114EE	DIGITAL TRANSISTOR				
Q32			2SK1824	FET				
Q202-204			2SC3357	TRANSISTOR				
Q300			2SC4215(Y)	TRANSISTOR				
Q301,302			2SC3722K(S)	TRANSISTOR				
Q401-403			DTC114EE	DIGITAL TRANSISTOR				
Q501			DTC314TU	DIGITAL TRANSISTOR				
Q502			DTC144EE	DIGITAL TRANSISTOR				
Q503			2SC4617(S)	TRANSISTOR				
Q507			DTC144EE	DIGITAL TRANSISTOR				
Q508,509			2SC4617(S)	TRANSISTOR				
Q510			2SC4619	TRANSISTOR				
Q511			DTA144WE	DIGITAL TRANSISTOR				
Q512			DTC114EE	DIGITAL TRANSISTOR				
Q513			2SC2873(Y)	TRANSISTOR				
Q515			DTC114EE	DIGITAL TRANSISTOR				

PLL/VCO (X58-4712-71)

Ref. No.	Address	New parts	Parts No.	Description				Desti-nation
C102,103			CK73GB1H102K	CHIP C	1000PF	K		
C104			CC73GCH1H470J	CHIP C	47PF	J		
C105			CK73GB1H102K	CHIP C	1000PF	K		
C106			CC73GCH1H090B	CHIP C	9.0PF	B		
C107			CC73GCH1H220J	CHIP C	22PF	J		
C108			CC73GCH1H080B	CHIP C	8.0PF	B		
C109			CK73GB1C104K	CHIP C	0.10UF	K		
C110			CK73GB1H102K	CHIP C	1000PF	K		
C111			CK73FB1C474K	CHIP C	0.47UF	K		
C113			CC73GCH1H3R5B	CHIP C	3.5PF	B		
C114			CK73GB1H471K	CHIP C	470PF	K		
C115			CK73GB1H102K	CHIP C	1000PF	K		
C117			CC73GCH1H120J	CHIP C	12PF	J		
C119			CK73GB1H102K	CHIP C	1000PF	K		
C120			CC73GCH1HR75B	CHIP C	0.75PF	B		
C121			CK73GB1H102K	CHIP C	1000PF	K		
C122			CC73GCH1H070B	CHIP C	7.0PF	B		
C125			CC73GCH1H1R5B	CHIP C	1.5PF	B		
C126			CC73GCH1H020B	CHIP C	2.0PF	B		
C127			CK73GB1H102K	CHIP C	1000PF	K		
C129			CK73GB1H102K	CHIP C	1000PF	K		
C130			CC73GCH1H100D	CHIP C	10PF	D		
C131			CC73GCH1H050B	CHIP C	5.0PF	B		
C132			CC73GCH1H150J	CHIP C	15PF	J		

Ref. No.	Address	New parts	Parts No.	Description				Desti-nation
C133,134			CK73GB1H102K	CHIP C	1000PF	K		
C135,136			CC73GCH1H020B	CHIP C	2.0PF	B		
C138			CC73GCH1H150J	CHIP C	15PF	J		
C139			CK73GB1H102K	CHIP C	1000PF	K		
C142			CK73GB1H102K	CHIP C	1000PF	K		
C143			CC73GCH1H150J	CHIP C	15PF	J		
TC101,102			C05-0384-05	CERAMIC TRIMMER CAP (10P)				
CN101			E40-5699-05	PIN ASSY				
-			F10-2279-04	SHIELDING CASE				
L101-104			L40-1005-34	SMALL FIXED INDUCTOR (10UH)				
L105			L40-6878-67	SMALL FIXED INDUCTOR (68NH)				
L106			L40-1005-34	SMALL FIXED INDUCTOR (10UH)				
L107			L40-3378-67	SMALL FIXED INDUCTOR (33NH)				
L109,110			L40-1005-34	SMALL FIXED INDUCTOR (10UH)				
L111			L40-8278-67	SMALL FIXED INDUCTOR (82NH)				
R101			RK73GB1J101J	CHIP R	100	J	1/16W	
R102			RK73GB1J221J	CHIP R	220	J	1/16W	
R103			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R104			RK73GB1J154J	CHIP R	150K	J	1/16W	
R105			RK73GB1J221J	CHIP R	220	J	1/16W	
R106-110			RK73GB1J103J	CHIP R	10K	J	1/16W	
R111			RK73GB1J331J	CHIP R	330	J	1/16W	
R113,114			RK73GB1J221J	CHIP R	220	J	1/16W	
R115,116			RK73GB1J470J	CHIP R	47	J	1/16W	
R117			RK73GB1J473J	CHIP R	47K	J	1/16W	
R118			RK73GB1J103J	CHIP R	10K	J	1/16W	
R119			RK73GB1J101J	CHIP R	100	J	1/16W	
R120			RK73GB1J180J	CHIP R	18	J	1/16W	
R121			R92-1252-05	CHIP R	0 OHM	J	1/16W	
D101,102			1SV283	VARIABLE CAPACITANCE DIODE				
D104			1SV283	VARIABLE CAPACITANCE DIODE				
D107			1SV283	VARIABLE CAPACITANCE DIODE				
D109			1SV214	VARIABLE CAPACITANCE DIODE				
Q101			DTC114EUA	DIGITAL TRANSISTOR				
Q102			2SK508NV(K52)	FET				
Q103			2SK508NV(K53)	FET				
Q104,105			2SC4081	TRANSISTOR				
Q106			2SC4215(Y)	TRANSISTOR				

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

1

2

57

EXPLODED VIEW / 部件分解图

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703

A

A

703

1

28

46

704

30

14

Cx2

12

23x2

29

11

8

701

702

26

27x2

J501

C

TX-RX
unit (B/2)

26

17

IC400

16x2

18

3

6

20 32

42

28

B

B

31

J1

TX-RX unit (A/2)

2

Ax2

13

25

Cx2

15

Dx11

28

A	M2.6 x 6 (OC) BLK	: N32-2606-45
B	M3 x 8	: N67-3008-46
C	M2.6 X 6 (Br-Tap)	: N87-2606-46
D	M2.6 x 12 (Br-Tap)	: N87-2612-46

TK-782

PACKING / 包装

34 Polystyrene foamed fixture (R)
(H10-6619-12)

37 Protection bag
(H25-0720-04)

7 Instruction manual
(B62-1659-00)

33 Polystyrene foamed fixture (F)
(H10-6618-12)

38 Item carton case
(H52-1930-02)

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

ADJUSTMENT / 调整

Test Mode

■ Test Mode Operating Features

This transceiver has a test mode. **To enter test mode, press [B] key and turn power on. Hold [B] key until test channel No. and test signalling No. appears on LCD.** Test mode can be inhibited by programming. To exit test mode, switch the power on again. The following functions are available in test mode.

● **Controls ("SFT" appears)**

[PTT]	Used when making a transmission.
[■]	Shift off.
[A]	FFSK 1200 bps and 2400 bps.
[B]	Shift off.
[◀ C]	Compander function on and off.
[D ▶]	Beat shift on and off.
[CALL]	Shift off.
[Channel Up/Down]	Shift off.
[Volume Up/Down]	Shift off.

● **Controls ("SFT" not appears)**

[PTT]	Used when making a transmission.
[■]	Monitor on and off.
[A]	Sets to the tuning mode.
[B]	Shift on.
[◀ C]	RF power high and low.
[D ▶]	Changes signalling.
[CALL]	Changes wide and narrow.
[Channel Up/Down]	Changes channel.
[Volume Up/Down]	Volume up/down.

Note : If a [A], [B], [◀ C], [D ▶] key is pressed during transmission, the DTMF corresponding to the key that was pressed is sent.

● **LCD indicator**

"SCN"	Unused.
"☎"	Lights at compander on.
"AUX"	Unused.
"🄿"	Lights at RF power low.
"MON"	Lights at monitor on.
"SVC"	Unused.
"▱"	Lights at FFSK 2400 bps.

● **LED indicator**

Red LED	Lights during transmission.
Green LED	Lights when there is a carrier.

● **Sub LCD indicator**

"SFT"	Appears at shift on.

测试模式

■ 测试模式操作功能

本车台具有测试模式。*要进入测试模式，按下[B]键并接通电源。按住[B]键直到测试信道号码和测试信令号码出现在LCD上为止。*测试模式可以通过编程被禁止。要退出测试模式，再一次开启电源。下述功能在测试模式中有效。

● **控制("SFT"出现)**

[PTT]	进行发射时使用。
[■]	取消位移。
[A]	FFSK 1200 bps和2400 bps。
[B]	取消位移。
[◀ C]	语音压扩功能开启和关闭。
[D ▶]	拍频偏移功能开启和关闭。
[CALL]	取消位移。
[信道高/低]	取消位移。
[音量高/低]	取消位移。

● **控制("SFT"不出现)**

[PTT]	进行发射时使用。
[■]	监听开启和关闭。
[A]	设定到调谐模式。
[B]	开启位移。
[◀ C]	射频高和低功率。
[D ▶]	改变信令。
[CALL]	改变宽带和窄带。
[信道高/低]	改变信道。
[音量高/低]	音量高/低。

注：如果正在发射时按下[A], [B], [◀ C]或[D ▶]键，将发送与按下键相对应的DTMF。

● **LCD指示器**

"SNC"	不使用。
"☎"	语音压扩开启时显示。
"AUX"	不使用。
"🄿"	低发射功率时显示。
"MON"	开启监听时显示。
"SVC"	不使用。
"▱"	FFSK 2400 bps时显示。

● **LED指示器**

红色LED	发射过程中发光。
绿色LED	有载波时发光。

● **子LCD指示器**

"SFT"	位移开启时出现。

ADJUSTMENT / 调整

■ Frequency and Signalling

The set has been adjusted for the frequencies shown in the following table. When required, re-adjust them following the adjustment procedure to obtain the frequencies you want in actual operation.

● Frequency (MHz)

Channel No.	RX	TX
1	226.05000	226.10000
2	217.05000	218.10000
3	234.95000	234.90000
4	227.00000	227.00000
5	227.20000	227.20000
6	227.40000	227.40000
7~16	-	-

● Signalling

Signalling No.	RX	TX
1	None	None
2	None	100Hz square
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 250.3Hz	QT 250.3Hz
7	DQT 023N	DQT 023N
8	DQT 754I	DQT 754I
9	DTMF DEC. (159D)	DTMF ENC. (159D)
10	None	DTMF tone 9
11	None	Single tone 1200Hz
12	None	FFSK
13	FFSK code	FFSK code

■ Preparations for tuning the transceiver

Before attempting to tune the transceiver, connect the unit to a suitable power supply.

Whenever the transmitter is turned, the unit must be connected to a suitable dummy load (i.e. power meter).

The speaker output connector must be terminated with a 4Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

■ Transceiver tuning

(To place transceiver in tuning mode)

Channel appears on LCD. Set channel according to tuning requirements.

LCD display (Test mode)

$$n \sqcup \sqcup 1 \sqcup - \sqcup \sqcup 1$$

| W/N | Channel No. | Signalling No. |
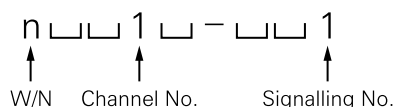
■ 频率和信令

设备已经按下表中的频率进行了调整。需要时，按照调整步骤重新调整以获得用户在实际操作中想要的频率。

● 频率(MHz)

信道号码	接收频率	发射频率
1	226.05000	226.10000
2	217.05000	218.10000
3	234.95000	234.90000
4	227.00000	227.00000
5	227.20000	227.20000
6	227.40000	227.40000
7~16	-	-

● 信令

信令号码	接　收	发　射
1	无	无
2	无	100Hz方波
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 250.3Hz	QT 250.3Hz
7	DQT 023N	DQT 023N
8	DQT 754I	DQT 754I
9	DTMF DEC. (159D)	DTMF ENC. (159D)
10	无	DTMF音频9
11	无	单音频1200Hz
12	无	FFSK
13	FFSK编码	FFSK编码

■ 调整车台的准备

在进行调整车台之前，将主机与电源连接。

无论何时调整发射部分，主机必须连接到合适的假负载(或功率仪)。

在整个调整过程中，扬声器输出必须经过4Ω假负载并被连接到一个交流电压表和一个音频失真测试仪或一个SINAD测量仪。

■ 车台调整

(将车台置于调整模式)

信道显示在LCD上。按照调整所需设定信道。

LCD显示(测试模式)

$$n \sqcup \sqcup 1 \sqcup - \sqcup \sqcup 1$$

| 宽带／窄带 | 信道号码 | 信令号码 |

ADJUSTMENT / 调整

Press [A], now in tuning mode. Use [◄ C] button to write tuning data through tuning modes, and [Channel Up/Down] to adjust tuning requirements (1 to 256 appears on LCD).

Use [D ►] button to select the adjustment item through tuning modes. Use [B] button to adjust 3 or 5-point tuning, and use [CALL] button to switch between wide/narrow.

LCD display (Tuning mode)

F R E Q ␣ ␣ ␣ 1

↑ Adjustment item   ↑ Adjustment (1~256)

● Panel Tuning Mode (MHz)

Test channel	RX frequency	TX frequency
L (Low)	217.05000	218.10000
L2 (Low')	221.05000	222.10000
C (Center)	226.05000	226.10000
H2 (High')	230.05000	230.10000
H (High)	234.95000	234.90000

按[A]键进入调谐模式。使用[◄ C]按键通过调谐模式写入调谐数据，并使用[信道高／低]键调整调谐要求（1到256出现在LCD上）。

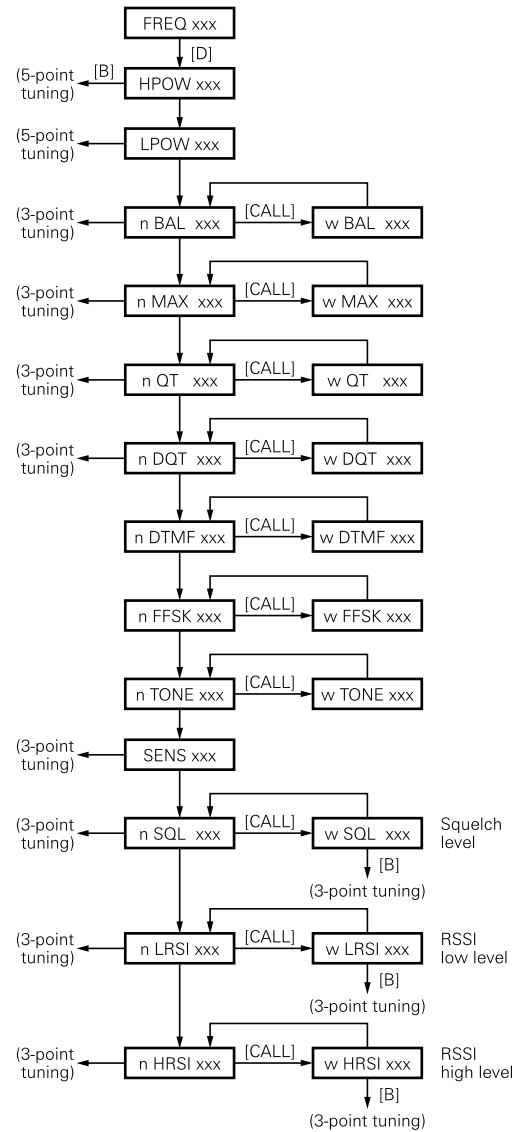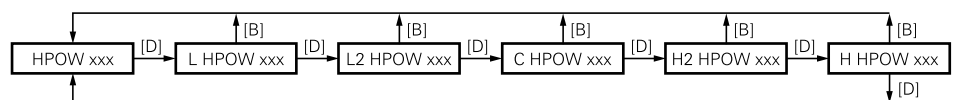使用[D ►]按键通过调谐模式选择调整项。使用[B]键调整3点或5点调谐，并使用[CALL]键转换宽／窄。

LCD显示（调谐模式）

F R E Q ␣ ␣ ␣ 1

↑ 调整项目   ↑ 调整（1~256）

● 面板调谐模式（MHz）

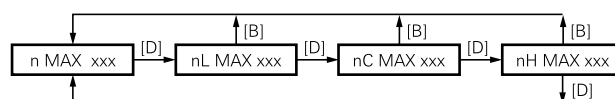| 测试信道	接收频率	发射频率
L（低）	217.05000	218.10000
L2（低'）	221.05000	222.10000
C（中心）	226.05000	226.10000
H2（高'）	230.05000	230.10000
H（高）	234.95000	234.90000

● Tuning Mode Flow Chart / 调谐模式流程图

● 5-point tuning (ex. RF power high)

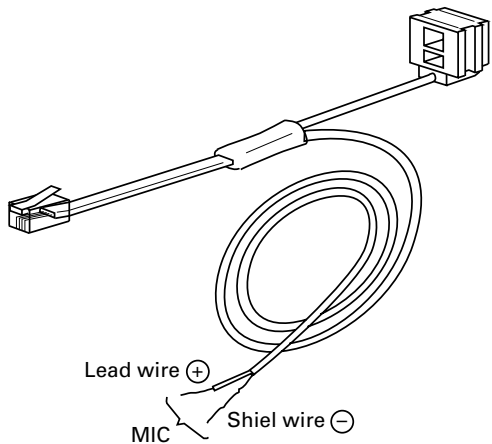## ● 3-point tuning (ex. Maximum deviation (Narrow))
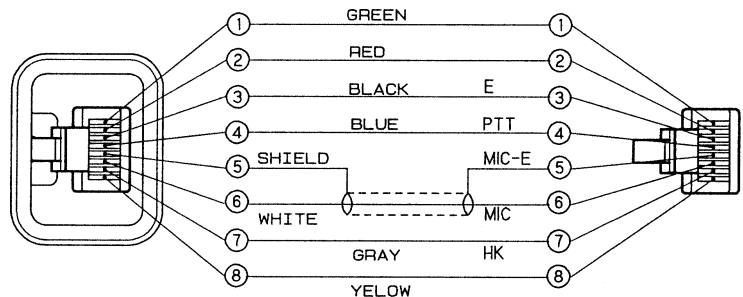
ADJUSTMENT

Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range	217 to 235MHz
	Modulation	Frequency modulation and external modulation
	Output	−127dBm/0.1µV to greater than −7dBm/100mV
2. Power Meter	Input Impedance	50Ω
	Operation Frequency	218 to 235MHz or more
	Measurement Capability	Vicinity of 100W
3. Deviation Meter	Frequency Range	218 to 235MHz
4. Digital Volt Meter (DVM)	Measuring Range	1 to 20V DC
	Accuracy	High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range	10Hz to 1000MHz
	Frequency Stability	0.2ppm or less
7. Ammeter		20A
8. AF Volt Meter (AF VTVM)	Frequency Range	50Hz to 10kHz
	Voltage Range	1mV to 10V
9. Audio Generator (AG)	Frequency Range	20Hz to 20kHz or more
	Output	0 to 1V
10. Distortion Meter	Capability	3% or less at 1kHz
	Input Level	50mV to 10Vrms
11. 4Ω Dummy Load		Approx. 4Ω, 10W or more
12. Regulated Power Supply		13.6V, approx. 20A (adjustable from 9 to 20V)
		Useful if ammeter requipped

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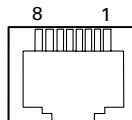
Adapter cable (E30-3383-05) is required for injecting an audio if PC tuning is used.
See "PC Mode" section for the connection.

Lead wire ⊕
MIC
Shiel wire ⊖

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

GREEN
RED
BLACK   E
BLUE   PTT
SHIELD   MIC-E
WHITE   MIC
GRAY   HK
YELOW

MIC connector (Front view)

8   1

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	217到235MHz
	调制	调频和外部调制
	输出	-127dBm/0.1μV到大于-7dBm/100mV
2. 功率计	输入阻抗	50Ω
	工作频率	218到235MHz或更高
	测量范围	50W左右
3. 频偏仪	频率范围	218到235MHz
4. 数字电压表(DVM)	测量范围	直流1V到20V
	输入阻抗	最小电路负载时为高输入阻抗
5. 示波器		直流到30MHz
6. 高灵敏度频率计数器	频率范围	10Hz到1000MHz
	频率稳定性	0.2ppm或更低
7. 电流表		20A
8. 音频电压表(AF VTVM)	频率范围	50Hz到10kHz
	电压范围	1mV到3V
9. 音频发生器(AG)	频率范围	20Hz到20kHz或更高
	输出	0到1V
10. 失真测试仪	测量能力	在1kHz时3%或更低
	输入电平	50mV到10Vrms
11. 4Ω假负载		大约4Ω,10W或更高
12. 可调电源		13.6V,大约20A
		最好具备电流表

调谐电缆(E30-3383-05)

如果使用计算机调谐,接头电缆(E30-3383-05)将用于接入音频信号。
参见"计算机模式"章节有关连接的内容。

引线 ⊕
麦克风　　屏蔽线 ⊖
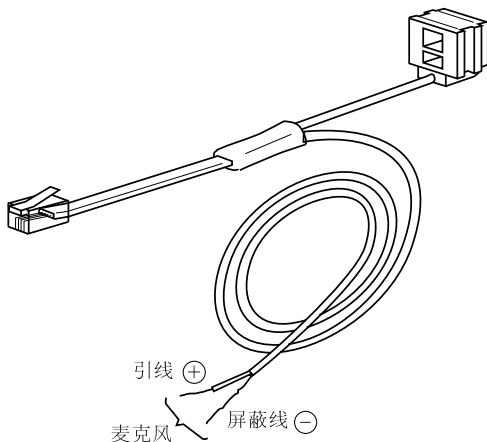
用于麦克风输入的测试电缆(E30-3360-08)
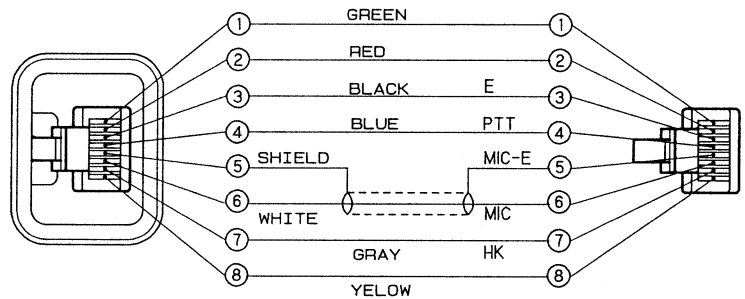
麦克风连接器(前视)
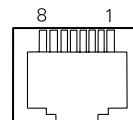
1：BLC
2：PSB
3：E
4：PTT
5：ME
6：MIC
7：HOOK
8：CM

ADJUSTMENT

## Adjustment Location

■ Switch
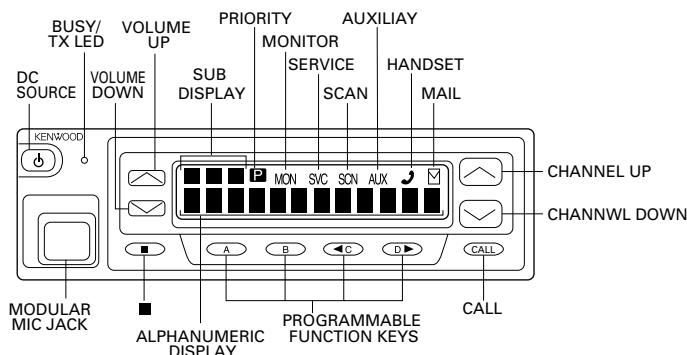
■ Note

• **Flash memory**

The firmware program (User mode, Test mode, Tuning mode, etc.) and the data programmed by the FPU (KPG-77D) for the flash memory, is stored in memory. When parts are changed, program the data again.

• **EEPROM**

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

■ Adjustment Point
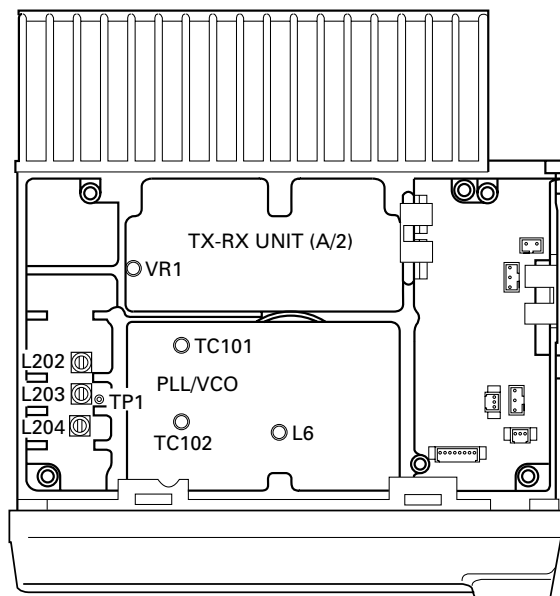
■ Repair Jig (Chassis)

Use jig (Part No. : A10-4010-02) for repairing the TK-782. The jig facilitates the voltage check when the voltage on the component side TX-RX unit (A/2) is checked during repairs.

Common Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. PLL lock voltage	1) Set test mode CH : CH3 - Sig1 PTT : OFF (Receive) PTT : ON (Transmit)	DVM Power meter	TX-RX (A/2)	TP1	PLL	TC101	1.5V (Receive)	±0.1V
						TC102	1.5V (Transmit)	
	2) CH : CH2 - Sig1 PTT : OFF (Receive) PTT : ON (Transmit)						Check	8.0V or less

调　　整

调整位置

■ 开关

BUSY/TX LED
VOLUME UP
PRIORITY
AUXILIAY
MONITOR
DC SOURCE
VOLUME DOWN
SUB DISPLAY
SERVICE
SCAN
HANDSET
MAIL

CHANNEL UP
CHANNWL DOWN

MODULAR MIC JACK
ALPHANUMERIC DISPLAY
PROGRAMMABLE FUNCTION KEYS
CALL
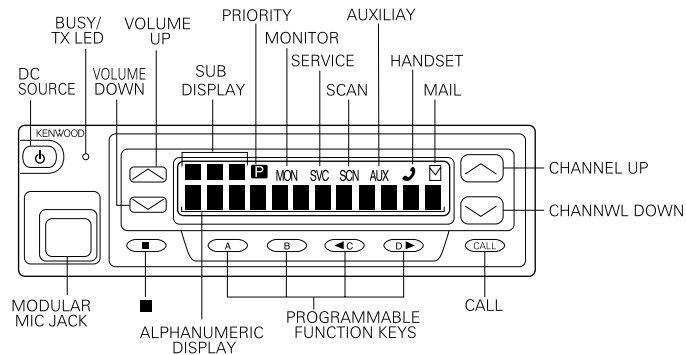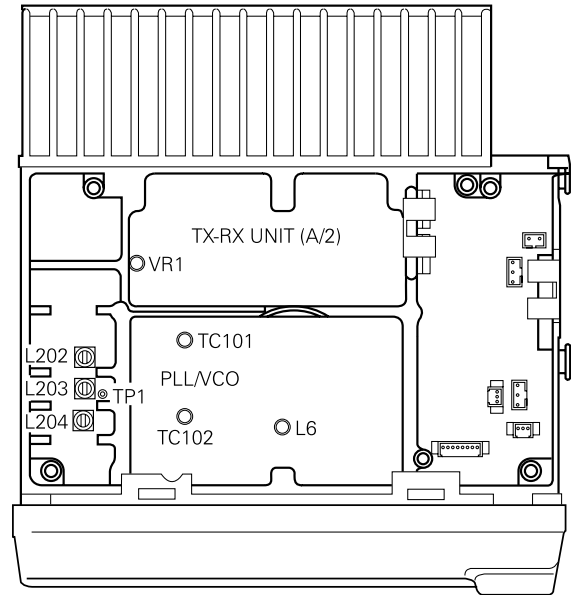
■ 注释

● 闪存

固件程序(用户模式，测试模式，调谐模式等)，和由 FPU (KPG-77D)处理的可编程数据保存在存储器中。当更换闪存时，重新对数据进行编程。

● EEPROM

EEPROM的调谐数据(频偏，静噪，等等)被储存在存储器中。当零件被更换时，需要重新调整车台。

■ 调整点

TX-RX UNIT (A/2)
VR1
L202
L203
L204
TP1
PLL/VCO
TC101
TC102
L6

■ 维修用具(底座)

使用维修用具(零件号码：A10-4010-02)修理TK-782。维修用具能够在修理时方便地检测发射-接收(A/2)单元电路板元器件面上的电压。

公用部分

项　目	条　　件	测　　量			调　　整			规　格／备　注
		测量装置	单元	端子	单元	部件	方　法	
1.PLL锁定电压	1) [测试模式] CH：CH3-Sig1 PTT：关闭(接收) PTT：开启(发射)	DVM 功率计	TX-RX (A/2)	TP1	PLL	TC101	1.5V(接收)	±0.1V
						TC102	1.5V(发射)	
	2) CH：CH2-Sig1 PTT：关闭(接收) PTT：开启(发射)						检查	8.0V或更低

TK-782

ADJUSTMENT

Receiver Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Discriminator	1) Set test mode CH : CH1 - Sig1 SSG output : –53dBm AF : 1.4V/4Ω	SSG AF VTVM Oscilloscope	Rear panel	ANT ACC (EXT.SP)	TX-RX (A/2)	L6	AF output voltage maximum.	
2. Sensitivity	1) Set test mode Select "SENS" in tuning mode. "L SENS" SSG freq' : 217.050MHz SSG output : –118dBm/0.31µV SSG MOD : 1.5kHz AF output : 1V/4Ω	SSG AF VTVM Distortion meter Oscilloscope AG		ANT ACC (EXT.SP)			Adjust for maximum SINAD.	
	2) "C SENS" SSG freq' : 226.050MHz							
	3) "H SENS" SSG freq' : 234.950MHz							
3. Squelch	1) Set test mode Select "nL SQL" in tuning mode. SSG freq' : 217.050MHz SSG output : Sensitivity value of 12dB SINAD. SSG MOD : 1.5kHz (Narrow)						Squelch must be closed once. Then adjust for squelch open point.	
	2) "nC SQL" SSG freq' : 226.050MHz							
	3) "nH SQL" SSG freq' : 234.950MHz							
	4) "wL SQL", "wC SQL", "wH SQL" SSG freq' : Same as narrow adjustment. SSG output : Sensitivity value of 12dB SINAD. SSG MOD : 3.0kHz (Wide)							
4. RSSI (Low)	1) Set test mode Select "nL LRSI" in tuning mode. SSG freq' : 217.050MHz SSG output : Sensitivity value of 12dB SINAD. SSG MOD : 1.5kHz (Narrow)						Writing values only.	
	2) "nC LRSI" SSG freq' : 226.050MHz							

调　　整

接收部分

项　目	条　件	测　量			调　整			规　格／备　注
		测量装置	单元	端子	单元	部件	方　法	
1. 鉴频器	1)［测试模式］ 　CH：CH1-Sig1 　标准信号发生器输出 　　：－53dBm/501μV 　AF：1.4V/4Ω	SSG AF VTVM 示波器	背面板	ANT ACC (EXT.SP)	TX-RX (A/2)	L6	最大音频输出	
2. 灵敏度	1)［测试模式］ 　在调谐模式中选择 "SENS" 　 "L SENS" 　标准信号发生器频率 　　：217.050MHz 　标准信号发生器输出 　　：－118dBm/0.31μV 　标准信号发生器调制：1.5kHz 　AF：1V/4Ω	SSG AF VTVM 失真测试仪 示波器 AG		ANT ACC (EXT.SP)			调整到最大SINAD	
	2) "C SENS" 　标准信号发生器频率 　　：226.050MHz							
	3) "H SENS" 　标准信号发生器频率 　　：234.950MHz							
3. 静噪	1)［测试模式］ 　在调谐模式中选择 "nL SQL" 　标准信号发生器频率 　　：217.050MHz 　标准信号发生器输出 　　：12dB SINAD的灵敏度 　标准信号发生器调制 　　：1.5kHz(窄)						静噪必须关闭。 然后调整静噪打 开点。	
	2) "nC SQL" 　标准信号发生器频率 　　：226.050MHz							
	3) "nH SQL" 　标准信号发生器频率 　　：234.950MHz							
	4) "wL SQL", "wC SQL", "wH SQL" 　标准信号发生器频率 　　：与窄调整相同 　标准信号发生器输出 　　：12dB SINAD的灵敏度 　标准信号发生器调制 　　：3.0kHz(宽)							
4. RSSI(低)	1)［测试模式］ 　在调谐模式中选择 "nL LRSI" 　标准信号发生器频率 　　：217.050MHz 　标准信号发生器输出 　　：12dB SINAD的灵敏度 　标准信号发生器调制 　　：1.5kHz(窄)						只写入数值。	
	2) "nC LRSI" 　标准信号发生器频率 　　：226.050MHz							

TK-782

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
	3) "nH LRSI" SSG freq' : 234.950MHz	SSG AF VTVM Distortion meter Oscilloscope AG		ANT ACC (EXT.SP)			Writing values only.	
	4) "wL LRSI", "wC LRSI", "wH LRSI" SSG freq' : Same as narrow adjustment. SSG output : Sensitivity value of 12dB SINAD. SSG MOD : 3.0kHz (Wide)							
5. RSSI (High)	1) Set test mode Select "nL HRSI" in tuning mode. SSG freq' : 217.050MHz SSG output : –70dBm SSG MOD : 1.5kHz (Narrow)						Writing values only.	
	2) "nC HRSI" SSG freq' : 226.050MHz							
	3) "nH HRSI" SSG freq' : 234.950MHz							
	4) "wL HRSI", "wC HRSI", "wH HRSI" SSG freq' : –70dBm SSG output : Sensitivity value of 12dB SINAD. SSG MOD : 3.0kHz (Wide)							
6. Squelch check	1) Set test mode CH : CH1 - Sig1 SSG freq' : 226.050MHz SSG output : 15dB SINAD level						Check	Squelch must be opened. (Wide/Narrow)
	2) SSG output : OFF							Squelch must be closed. (Wide/Narrow)
7. QT check	1) Set test mode CH : CH1 - Sig5 SSG freq' : 226.050MHz SSG MOD INT : 1kHz EXT : 151.4Hz SSG system MOD DEV : ±3.75kHz (Wide) : ±1.85kHz (Narrow) SSG output : 12dB SINAD level						Check	Squelch must be opened. (Wide/Narrow)
	2) CH : CH1 - Sig4 CH1 - Sig6 CH1 - Sig7							Squelch must be closed.

调　　整

项　目	条　　件	测　量			调　整			规　格／备　注
		测量装置	单元	端子	单元	部件	方　法	
	3）"nH LRSI" 标准信号发生器频率 　：234.950MHz	SSG AF VTVM 失真测试仪 示波器 AG	背面板	ANT ACC （EXT.SP）			只写入数值。	
	4）"wL LRSI"，"wC LRSI"，"wH LRSI" 标准信号发生器频率 　：与窄调整相同 标准信号发生器输出 　：12dB SINAD的灵敏度 标准信号发生器调制 　：3.0kHz（宽）							
5.RSSI（高）	1）[测试模式] 在调谐模式中选择 "nL HRSI" 标准信号发生器频率 　：217.050MHz 标准信号发生器输出 　：－70dBm 标准信号发生器调制 　：1.5kHz（窄）						只写入数值。	
	2）"nC HRSI" 标准信号发生器频率 　：226.050MHz							
	3）"nH HRSI" 标准信号发生器频率 　：234.950MHz							
	4）"wL HRSI"，"wC HRSI"，"wH HRSI" 标准信号发生器频率 　：－70dBm 标准信号发生器输出 　：12dB SINAD的灵敏度 标准信号发生器调制 　：3.0kHz（宽）							
6.静噪检查	1）[测试模式] CH：CH1-Sig1 标准信号发生器频率 　：226.050MHz 标准信号发生器输出 　：15dB SINAD电平						检查	静噪必须被打开（宽/窄带）
	2）标准信号发生器输出：关闭							静噪必须被关闭（宽/窄带）
7.QT检查	1）[测试模式] CH：CH1-Sig5 标准信号发生器频率 　：226.050MHz 标准信号发生器调制 　INT：1kHz 　EXT：151.4Hz 标准信号发生器系统MOD DEV 　：±1.85kHz（窄） 　　±3.75kHz（宽） 标准信号发生器输出 　：12dB SINAD电平						检查	静噪必须被打开（宽/窄带）
	2）CH：CH1-Sig4 　　CH1-Sig6 　　CH1-Sig7							静噪必须被关闭

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ADJUSTMENT

Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency	1) Set test mode Select "FREQ" in tuning mode. PTT : ON	Power meter F. counter	Rear panel	ANT			Check	226.100MHz±100Hz
2. Power output	1) Maximum power Set test mode Select "HPOW" in tuning mode. "L HPOW 256" PTT : ON				TX-RX (A/2)	VR1	26.0W	±0.5W
3. High power	1) Set test mode Select "HPOW" in tuning mode. "L HPOW" PTT : ON						25.0W	±1.0W
	2) "L2 HPOW" PTT : ON							
	3) "C HPOW" PTT : ON							
	4) "H2 HPOW" PTT : ON							
	5) "H HPOW" PTT : ON							
4. Low power	1) Set test mode Select "LPOW" in tuning mode. "L LPOW" PTT : ON	Power meter					5.0W	±0.5W
	2) "L2 LPOW" PTT : ON							
	3) "C LPOW" PTT : ON							
	4) "H2 LPOW" PTT : ON							
	5) "H LPOW" PTT : ON							
5. Power check	1) Set test mode CH : CH1 - Sig1 CH2 - Sig1 CH3 - Sig1 PTT : ON	Power meter Ammeter		ANT DC IN			Check	25W±1W, 8A or less
6. Modulation balance	1) Set test mode MIC input : OFF Select "BAL" in tuning mode. "nL BAL" Deviation meter filter LPF : 15kHz HPF : OFF De-emphasis : OFF	Power meter Deviation meter Oscilloscope AF VTVM AG	Rear panel Front panel	ANT MIC			Make the de-modulation waveform near.	(Wide/Narrow)
	2) "nC BAL" PTT : ON							
	3) "nH BAL" PTT : ON							
	4) "w BAL" PTT : ON							

调　　整

发射部分

项　目	条　　件	测　　量			调　　整			规　格 / 备　注
		测量装置	单元	端子	单元	部件	方　法	
1.频率	1）[测试模式] 　　在调谐模式中选择 ˝FREQ˝ 　　PTT：开启	功率计 频率计	背面板	ANT			检查	226.100MHz±100Hz
2.功率输出	1）最大功率 　　[测试模式] 　　在调谐模式中选择 ˝HPOW˝ 　　˝L HPOW 256˝ 　　PTT：开启				TX-RX （A/2）	VR1	26.0W	±0.5W
3.高功率	1）[测试模式] 　　在调谐模式中选择 ˝HPOW˝ 　　˝L HPOW˝ 　　PTT：开启						25.0W	±1.0W
	2）˝L2 HPOW˝ 　　PTT：开启							
	3）˝C HPOW˝ 　　PTT：开启							
	4）˝H2 HPOW˝ 　　PTT：开启							
	5）˝H HPOW˝ 　　PTT：开启							
4.低功率	1）[测试模式] 　　在调谐模式中选择 ˝LPOW˝ 　　˝L LPOW˝ 　　PTT：开启	功率计					5.0W	±0.5W
	2）˝L2 LPOW˝ 　　PTT：开启							
	3）˝C LPOW˝ 　　PTT：开启							
	4）˝H2 LPOW˝ 　　PTT：开启							
	5）˝H LPOW˝ 　　PTT：开启							
5.功率检查	1）[测试模式] 　　CH：CH1-Sig1 　　　　CH2-Sig1 　　　　CH3-Sig1 　　PTT:开启	功率计 电流表	背面板	ANT DC IN			检查	25W±1W 8A或更低
6.调制平衡	1）[测试模式] 　　话筒输入：关闭 　　在调谐模式中选择 ˝BAL˝ 　　˝nL BAL˝ 　　频偏仪滤波器 　　　LPF：15kHz 　　　HPF：关闭 　　　去加重：关闭	功率计 频偏仪 示波器 AF VTVM AG	背面板 前面板	ANT MIC			使解调波形为 方形波	(宽/窄带) ⊓_⊓_⊓
	2）˝nC BAL˝ 　　PTT：开启							
	3）˝nH BAL˝ 　　PTT：开启							
	4）˝w BAL˝ 　　PTT：开启							

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ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. Maximum deviation	1) Set test mode Connect AG to the MIC terminal. Select "MAX" in tuning mode. "nL MAX" AG : 1kHz/40mV Deviation meter filter 　LPF : 15kHz 　HPF : OFF 　De-emphasis : OFF PTT : ON	Power meter Deviation meter Oscilloscope AF VTVM AG	Rear panel Front panel	ANT MIC			4.1kHz (Wide) 2.05kHz (Narrow) (According to the larger +, –)	+0Hz/–50Hz (Wide/Narrow)
	2) "nC MAX" PTT : ON							
	3) "nH MAX" PTT : ON							
	4) "w MAX" PTT : ON							
8. MIC seisitivity check	1) Set test mode CH : CH1 - Sig1 AG : 1kHz/4mV PTT : ON						Check	±3kHz±0.2kHz (Wide) ±1.5kHz±0.05kHz (Narrow)
9. QT deviation	1) Set test mode Select "QT" in tuning mode. "nL QT" Deviation meter filter 　LPF : 3kHz 　HPF : OFF PTT : ON						0.75kHz (Wide) 0.35kHz (Narrow)	±50Hz (Wide/Narrow)
	2) "nC QT" PTT : ON							
	3) "nH QT" PTT : ON							
	4) "w QT" PTT : ON							
10. DQT deviation	1) Set test mode Select "DQT" in tuning mode. "nL DQT" Deviation meter filter 　LPF : 3kHz 　HPF : OFF PTT : ON						0.75kHz (Wide) 0.35kHz (Narrow)	±50Hz (Wide/Narrow)
	2) "nC DQT" PTT : ON							
	3) "nH DQT" PTT : ON							
	4) "w DQT" PTT : ON							

调　　整

项　目	条　　件	测　　量			调　　整			规　格 / 备　注
		测量装置	单元	端子	单元	部件	方　法	
7. 最大频偏	1）[测试模式] 将音频发生器连接到话筒终 端在调谐模式中选择 "MAX" 　　"nL MAX" AG：1kHz／40mV 频偏仪滤波器 　　LPF：15kHz 　　HPF：关闭 　　去加重：关闭 　　PTT：开启	功率计 频偏仪 示波器 AF VTVM AG	背面板 前面板	ANT MIC			4.1kHz（宽带） 2.05kHz（窄带） （按照最大＋，－）	＋0Hz，－50Hz（宽/窄带）
	2）"nC MAX" 　PTT：开启							
	3）"nH MAX" 　PTT：开启							
	4）"w MAX" 　PTT：开启							
8. 麦克风灵敏 度检查	1）[测试模式] CH：CH1-Sig1 AG：1kHz／4mV PTT：开启						检查	±3.0kHz±0.2kHz（宽带） ±1.5kHz±0.05kHz（窄带）
9. QT频偏	1）[测试模式] 在调谐模式中选择 "QT" 　　"nL QT" 频偏仪滤波器 　　LPF：3kHz 　　HPF：关闭 　　PTT：开启						0.75kHz（宽带） 0.35kHz（窄带）	±50Hz（宽/窄带）
	2）"nC QT" 　PTT：开启							
	3）"nH QT" 　PTT：开启							
	4）"w QT" 　PTT：开启							
10. DQT频偏	1）[测试模式] 在调谐模式中选择 "DQT" 　　"nL DQT" 频偏仪滤波器 　　LPF：3kHz 　　HPF：关闭 　　PTT：开启						0.75kHz（宽带） 0.35kHz（窄带）	±50Hz（宽/窄带）
	2）"nC DQT" 　PTT：开启							
	3）"nH DQT" 　PTT：开启							
	4）"w DQT" 　PTT：开启							

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ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	

11. DTMF deviation	1) Set test mode
	  Select "n DTMF" in tuning mode.
	  Deviation meter filter
	    LPF : 15kHz
	    HPF : OFF
	  PTT : ON
		Power meter
		Deviation meter
		Oscilloscope
		
		AF VTVM
		AG
			Rear panel
			
			Front panel
				ANT
				
				MIC
							3.0kHz (Wide)
							1.5kHz (Narrow)
								±0.2kHz (Wide)
								±0.1kHz (Narrow)

	2) "w DTMF" PTT : ON							

12. FFSK deviation	1) Set test mode
	  Select "n FFSK" in tuning mode.
	  Deviation meter filter
	    LPF : 15kHz
	    HPF : OFF
	  PTT : ON
							3.0kHz (Wide)
							1.5kHz (Narrow)
								±0.1kHz (Wide/Narrow)

	2) "w FFSK" PTT : ON							

13. TONE deviation	1) Set test mode
	  Select "n TONE" in tuning mode.
	  Deviation meter filter
	    LPF : 15kHz
	    HPF : OFF
	  PTT : ON
							3.0kHz (Wide)
							1.5kHz (Narrow)
								±0.1kHz (Wide/Narrow)

	2) "w TONE" PTT : ON							

调　整

项　目	条　件	测　量			调　整			规　格／备　注
		测量装置	单元	端子	单元	部件	方　法	
11. DTMF频偏	1）[测试模式] 在调谐模式中选择 "nDTMF" 频偏仪滤波器 　　LPF：15kHz 　　HPF：关闭 　　PTT：开启 2）"w DTMF" 　　PTT：开启	功率计 频偏仪 示波器 AF VTVM AG	背面板 前面板	ANT MIC			3.0kHz（宽带） 1.5kHz（窄带）	±0.2kHz（宽带） ±0.1kHz（窄带）
12. FFSK频偏	1）[测试模式] 在调谐模式中选择 "nFFSK" 频偏仪滤波器 　　LPF：15kHz 　　HPF：关闭 　　PTT：开启 2）"w FFSK" 　　PTT：开启						3.0kHz（宽带） 1.5kHz（窄带）	±0.1kHz（宽/窄带）
13. TONE频偏	1）[测试模式] 在调谐模式中选择 "nTONE" 频偏仪滤波器 　　LPF：15kHz 　　HPF：关闭 　　PTT：开启 2）"w TONE" 　　PTT：开启						3.0kHz（宽带） 1.5kHz（窄带）	±0.1kHz（宽/窄带）

TK-782

TERMINAL FUNCTION

CN7 (TX-RX Unit A/2) ⟷ CN502 (TX-RX Unit B/2)

Pin No.	Name	Function
1	W/N	Wide/Narrow. H : Wide
2	T/R	TX/RX switch. H : Receive
3	MO	Modulation signal.
4	TO	Low speed data signal.
5	BEEP	Beep.
6	8R	NC (8V).
7	PSW	Power switch.
8	DEO	Receive signal to control unit.
9	MM	MIC mute. H : MIC mute
10	AFO	Receive signal from control unit.
11	ME	MIC ground.
12	MI	External MIC.
13	AHK	Hook signal. H : Off hook
14	IGN	Ignition signal.
15	SB	13.6V.
16	SB	13.6V.
17	8C	8V.
18	KEY	TX signal.
19	CK	Shift register clock.
20	DT	PLL/Shift register/DA converter data.
21	RSSI	RSSI.
22	LD	PLL unlock detection.
23	ES	Shift register enable.
24	EP	PLL enable.
25	EN	DA converter enable.
26	APTT	External PTT.
27	CP	PLL clock.
28	DTC	Data control.
29	TXD	Serial data.
30	RXD	Serial data.
31	OE	Serial data.
32	FSW	Foot switch.
33	E	Ground.

CN101 (PLL/VCO) ⟷ TX-RX Unit A/2

Pin No.	Name	Function
1	ST	Switched transmit input. H : Transmit
2	HT	RF output.
3	E	Ground.
4	9CL	9V input.
5	8CL	8V input.
6	MD	Modulation input.
7	CV	Control voltage input.

CN501 (TX-RX Unit B/2)

Pin No.	Name	Function
1	E	Ground.
2	5C	Logic power (5V).
3	CS	Chip selector signal. L : Option
4	CK	Serial clock signal.
5	SID	Serial data input.
6	(NC)	Unused terminal.
7	(NC)	Unused terminal.
8	LED(A)	LED anode terminal.
9	LED(K)	LED cathode terminal.
10	NC	Unused terminal.

J501 (TX-RX Unit B/2)

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

端子功能

CN7(TX-RX A/2单元)←→CN502(TX-RX B/2单元)

引脚号码	名 称	功 能
1	W/N	宽/窄开关，高电平：宽。
2	T/R	TX/RX开关，高电平：接收。
3	MO	调制信号。
4	TO	低速率数据信号。
5	BEEP	Beep。
6	8R	无用(8V)。
7	PSW	电源开关。
8	DEO	接收信号到控制单元。
9	MM	MIC静音，高电平：MIC静音。
10	AFO	从控制单元接收信号。
11	ME	话筒接地。
12	MI	外置MIC。
13	AHK	挂机信号，高电平：摘机。
14	IGN	点火信号。
15	SB	13.6V。
16	SB	13.6V。
17	8C	8V。
18	KEY	TX信号。
19	CK	位移存储器时钟。
20	DT	PLL/位移存储器/DA转换器数据。
21	RSSI	RSSI信号。
22	LD	PLL失锁检测。
23	ES	位移存储器有效。
24	EP	PLL有效信号。
25	EN	DA转换器有效信号。
26	APTT	外置PTT信号。
27	CP	PLL时钟。
28	DTC	数据信道控制。
29	TXD	串行数据。
30	RXD	串行数据。
31	OE	串行数据。
32	FSW	脚踏开关信号。
33	E	接地。

CN101(PLL/VCO)←→TX-RX A/2单元

引脚号码	名 称	功 能
1	ST	切换发送输入，高电平：发送。
2	HT	射频输出。
3	E	接地。
4	9CL	9V输入。
5	8CL	8V输入。
6	MD	调制输入。
7	CV	控制电压输入。

CN501(TX-RX B/2单元)

引脚号码	名 称	功 能
1	E	接地。
2	5C	逻辑功率(5V)。
3	CS	芯片选择器信号，低电平：可选。
4	CK	串行时钟信号。
5	SID	串行数据输入。
6	(NC)	不使用端点。
7	(NC)	不使用端点。
8	LED(A)	指示灯正极端点。
9	LED(K)	指示灯负极端点。
10	NC	不使用端点。

J501(TX-RX B/2单元)

引脚号码	名 称	功 能
1	BLC	MIC按键背景灯光控制。
2	PSB	13.6V。
3	E	接地。
4	PTT/TXD	PTT。
5	ME	MIC接地。
6	MIC	MIC信号输入。
7	HOOK/RXD	挂机检测。
8	CM	MIC数据检测。

PC BOARD VIEWS / PC板视图　TK-782

PLL/VCO (X58-4712-71)　Component side view（J72-0732-02）
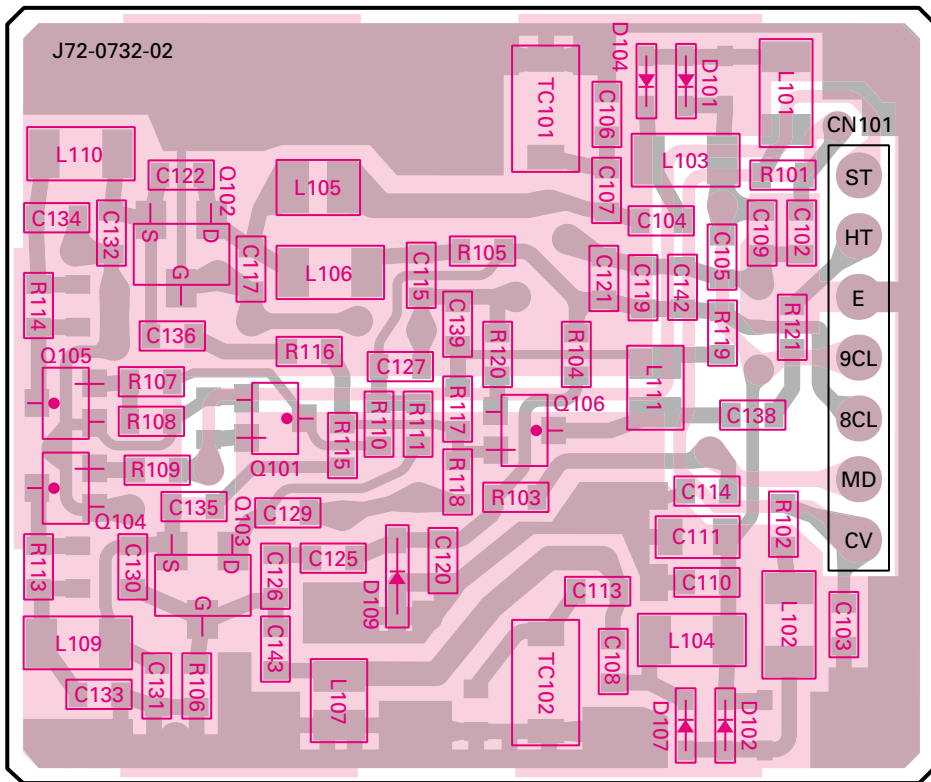
PLL/VCO (X58-4712-71)　Foil side view（J72-0732-02）
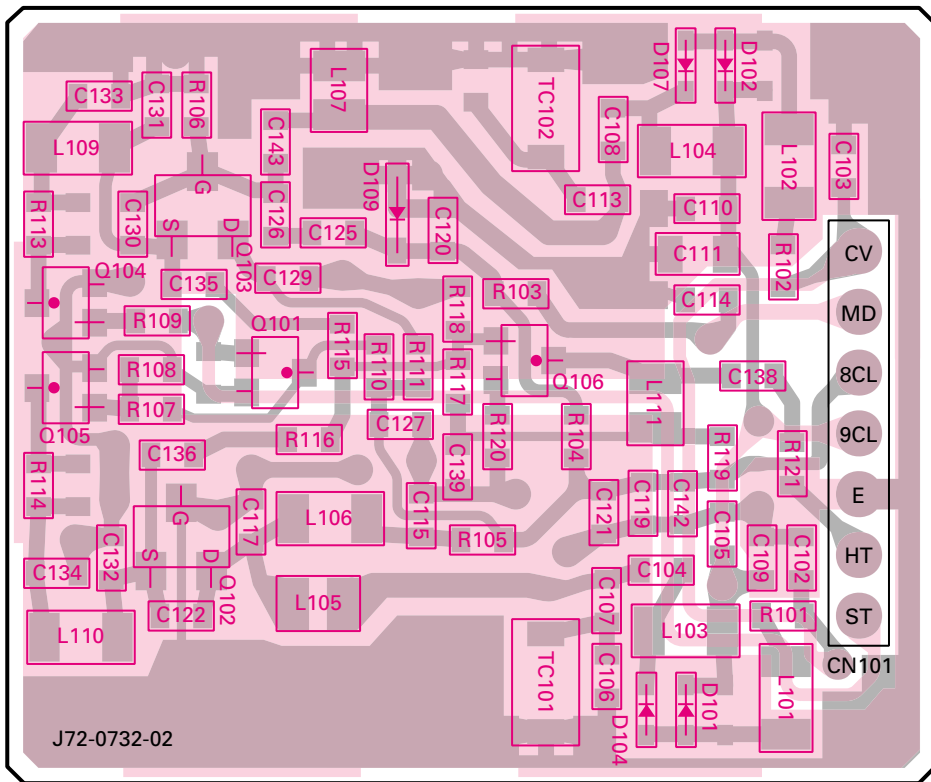
■ Component side
■ Foil side

TK-782 PC BOARD VIEW / PC板视图

TX-RX UNIT (X57-6143-01) (A/2) Component side view
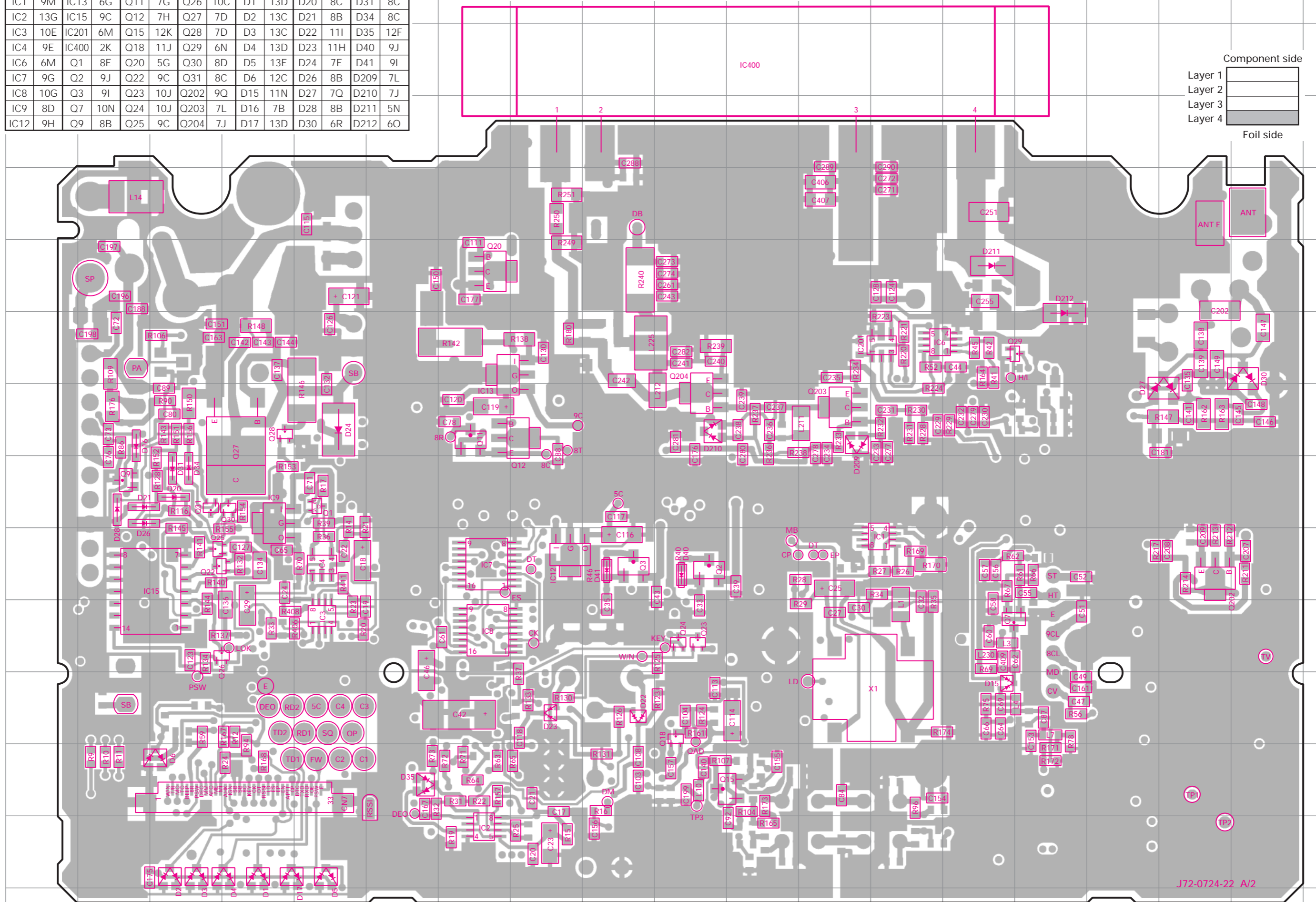(J72-0724-22 A/2)

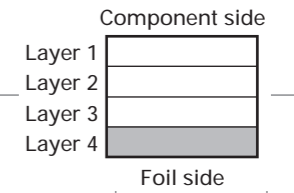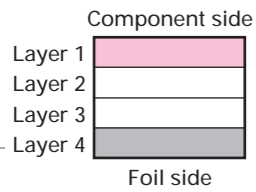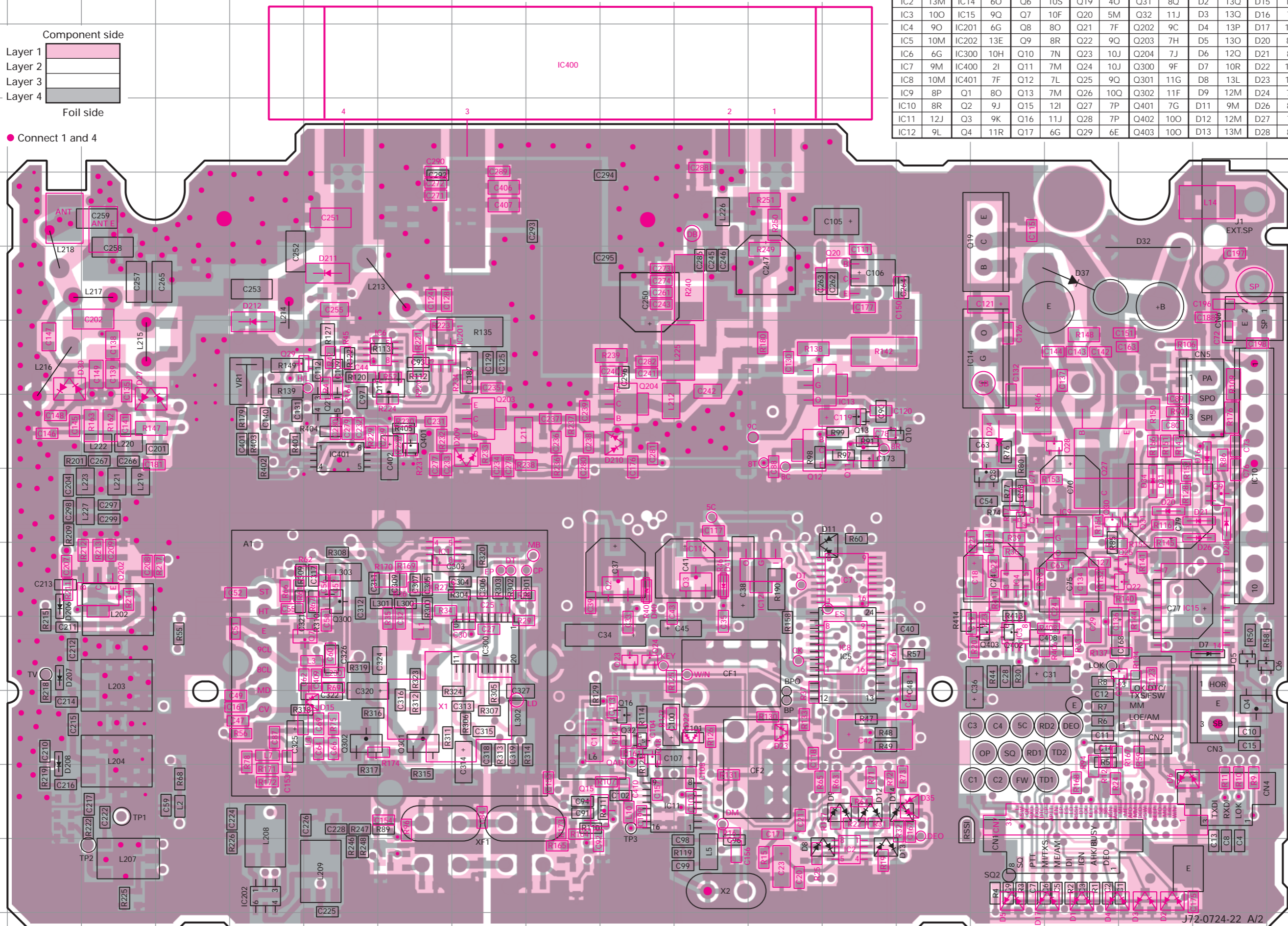| Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC5	10M	Q4	11R	Q19	4O	Q403	10O	D32	4Q
IC10	8R	Q5	10R	Q21	7F	D7	10R	D37	5P
IC11	12J	Q6	10S	Q32	11J	D8	13L	D206	9B
IC14	6O	Q8	8O	Q300	9F	D9	12M	D207	10B
IC202	13E	Q10	7N	Q301	11G	D11	9M	D208	11B
IC300	10H	Q13	7M	Q302	11F	D12	12M		
IC400	2I	Q16	11J	Q401	7G	D13	13M		
IC401	7F	Q17	6G	Q402	10O	D14	12N		
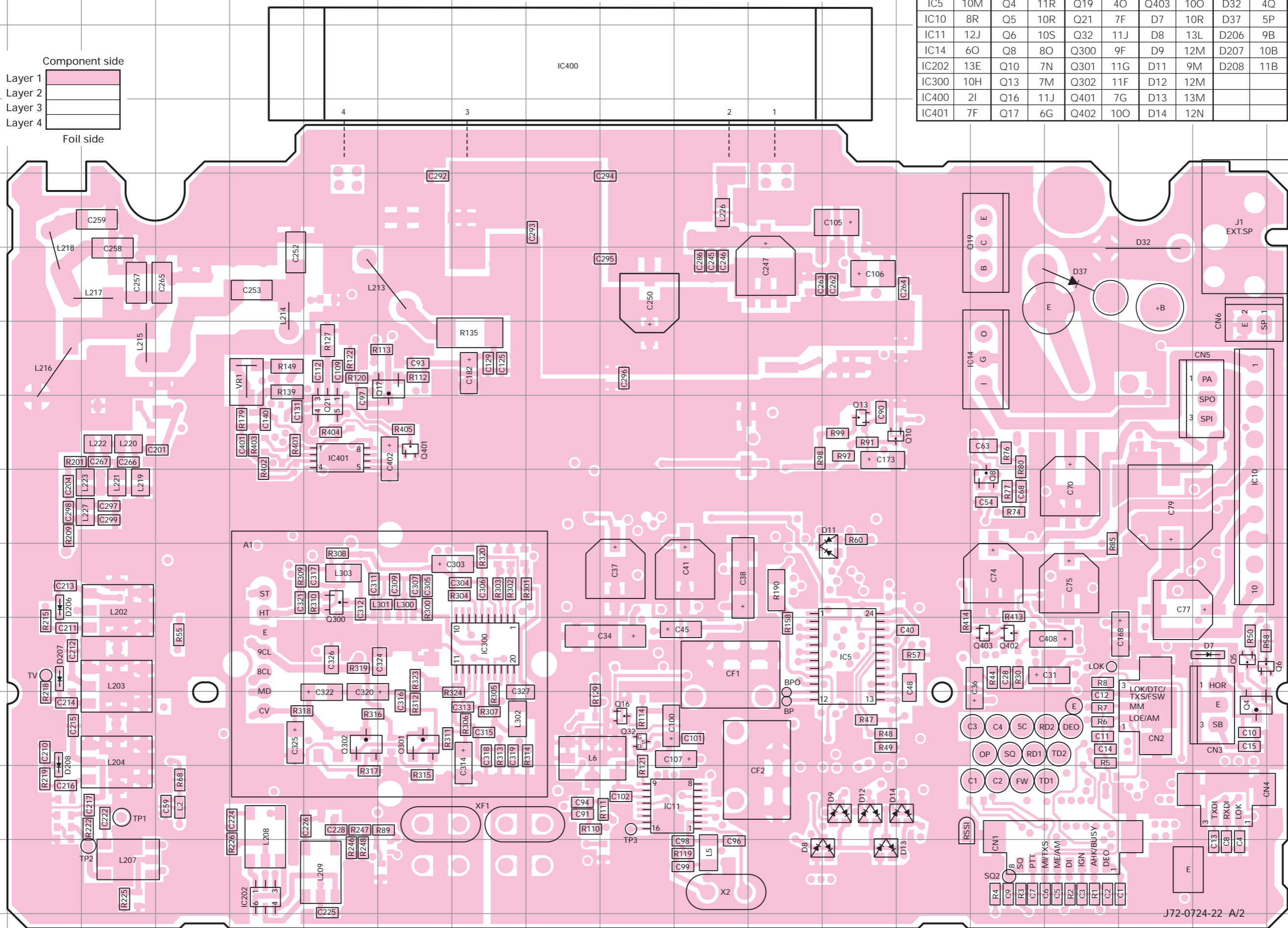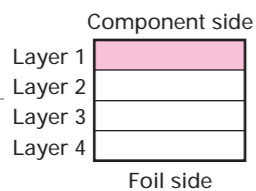
Component side
Layer 1
Layer 2
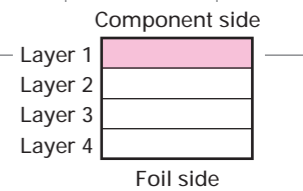Layer 3
Layer 4
Foil side

IC400

J1 EXT.SP

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J72-0724-22 A/2

TX-RX UNIT (X57-6143-01) (A/2)　Foil side view
(J72-0724-22 A/2)

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	9M	IC13	6G	Q11	7G	Q26	10C	D1	13D	D20	8C	D31	8C
IC2	13G	IC15	9C	Q12	7H	Q27	7D	D2	13C	D21	8B	D34	8C
IC3	10E	IC201	6M	Q15	12K	Q28	7D	D3	13C	D22	11I	D35	12F
IC4	9E	IC400	2K	Q18	11J	Q29	6N	D4	13D	D23	11H	D40	9J
IC6	6M	Q1	8E	Q20	5G	Q30	8D	D5	13E	D24	7E	D41	9I
IC7	9G	Q2	9J	Q22	9C	Q31	8C	D6	12C	D26	8B	D209	7L
IC8	10G	Q3	9I	Q23	10J	Q202	9Q	D15	11N	D27	7Q	D210	7J
IC9	8D	Q7	10N	Q24	10J	Q203	7L	D16	7B	D28	8B	D211	5N
IC12	9H	Q9	8B	Q25	9C	Q204	7J	D17	13D	D30	6R	D212	6O

IC400

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

J72-0724-22 A/2

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TK-782 PC BOARD VIEW / PC板视图

TX-RX UNIT (X57-6143-01) (A/2)
Component side view + Foil side (J72-0724-22 A/2)

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	9G	IC13	6M	Q5	10R	Q18	11J	Q30	8P	D1	13P	D14	12N	D30	6B
IC2	13M	IC14	6O	Q6	10S	Q19	4O	Q31	8Q	D2	13Q	D15	11F	D31	8Q
IC3	10O	IC15	9Q	Q7	10F	Q20	5M	Q32	11J	D3	13Q	D16	7R	D32	4Q
IC4	9O	IC201	6G	Q8	8O	Q21	7F	Q202	9C	D4	13P	D17	13P	D34	8Q
IC5	10M	IC202	13E	Q9	8R	Q22	9Q	Q203	7H	D5	13O	D20	8Q	D35	12N
IC6	6G	IC300	10H	Q10	7N	Q23	10J	Q204	7J	D6	12Q	D21	8R	D37	5P
IC7	9M	IC400	2I	Q11	7M	Q24	10J	Q300	9F	D7	10R	D22	11K	D40	9J
IC8	10M	IC401	7F	Q12	7L	Q25	9Q	Q301	11G	D8	13L	D23	11L	D41	9K
IC9	8P	Q1	8O	Q13	7M	Q26	10Q	Q302	11F	D9	12M	D24	7O	D206	9B
IC10	8R	Q2	9J	Q15	12I	Q27	7P	Q401	7G	D11	9M	D26	8R	D207	10B
IC11	12J	Q3	9K	Q16	11J	Q28	7P	Q402	10O	D12	12M	D27	7C	D208	11B
IC12	9L	Q4	11R	Q17	6G	Q29	6E	Q403	10O	D13	13M	D28	8R	D209	7H
														D210	7J
														D211	5F
														D212	6E

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

● Connect 1 and 4

J72-0724-22 A/2

TX-RX UNIT (X57-6143-01) (B/2) Component side view (J72-0724-22 B/2)
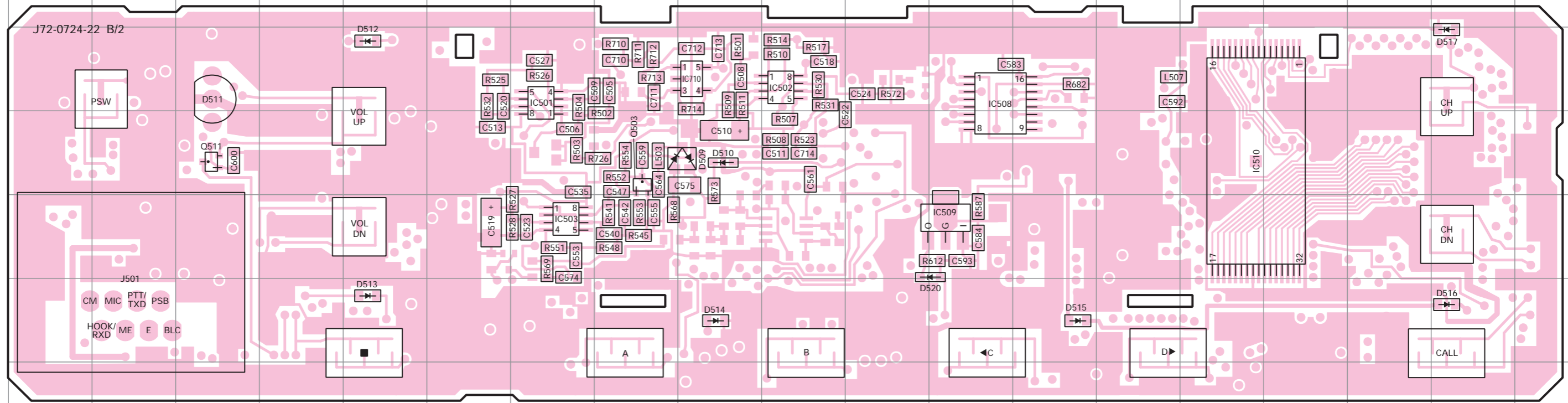
J72-0724-22 B/2

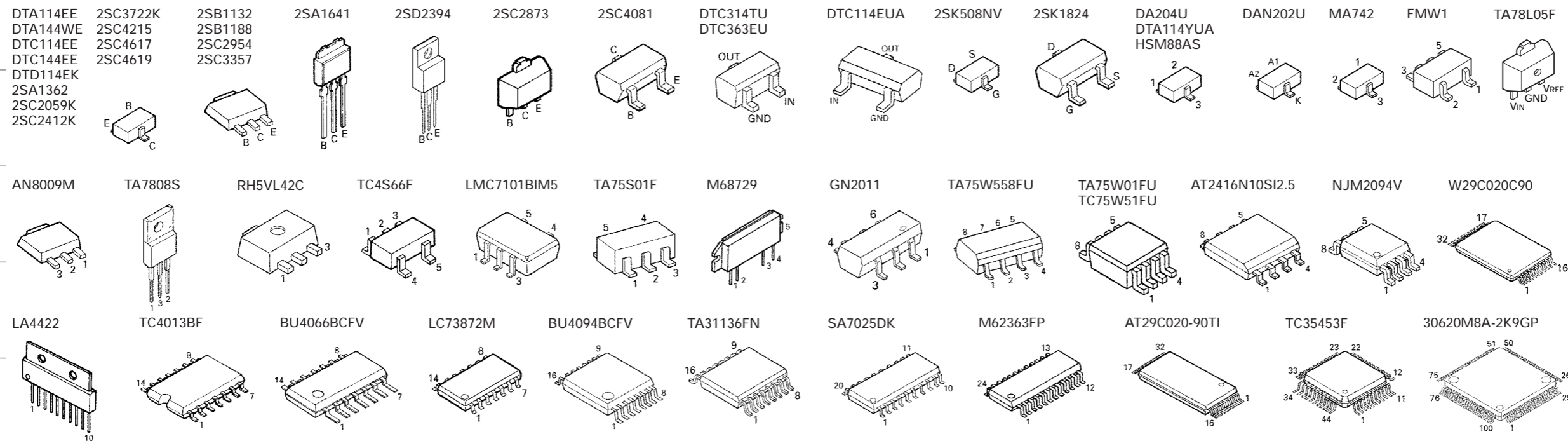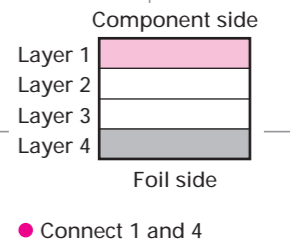| Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC501	2G	IC508	2L	IC710	2I	D509	3I	D512	2E	D515	5M	D520	4L
IC502	2J	IC509	4L	Q503	3H	D510	3I	D513	5E	D516	5R
IC503	4G	IC510	3O	Q511	3C	D511	2C	D514	5I	D517	2R

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

TX-RX UNIT (X57-6143-01) (B/2) Foil side view (J72-0724-22 B/2)
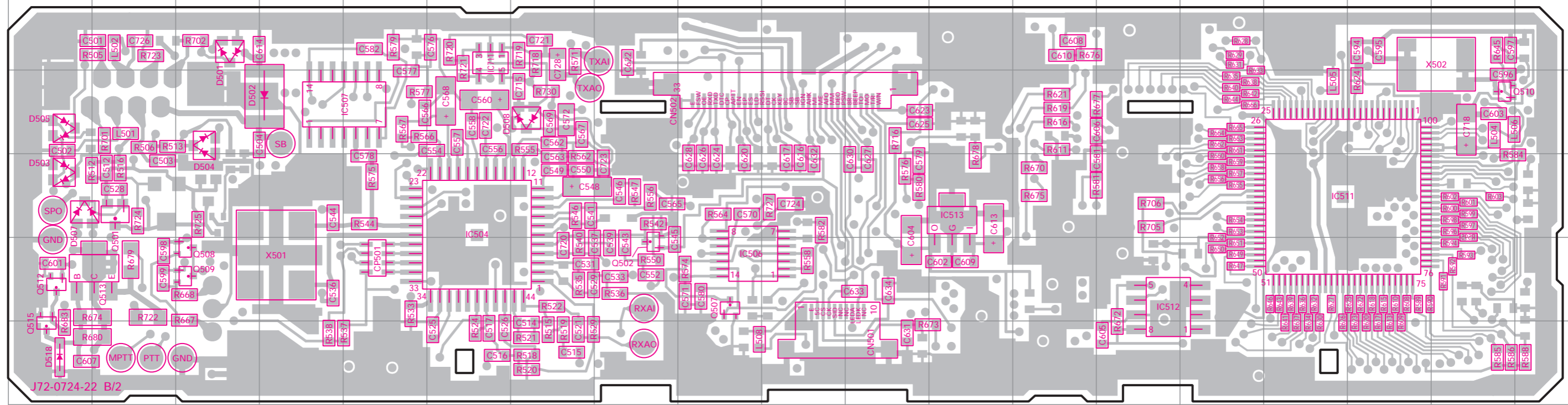
J72-0724-22 B/2

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC504	10F	IC511	10P	IC711	8F	Q507	11I	Q510	9R	Q515	12A	D503	10A	D507	10A
IC506	11I	IC512	11N	Q501	10B	Q508	11C	Q512	11A	D501	8C	D504	9C	D508	9G
IC507	9E	IC513	10L	Q502	11H	Q509	11C	Q513	11B	D502	9D	D505	9A	D518	12A

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side
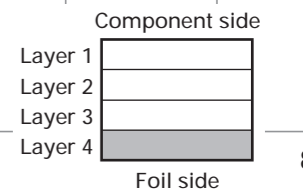
TK-782 PC BOARD VIEW / PC板视图

TX-RX UNIT (X57-6143-01) (B/2)   Component side view + Foil side (J72-0724-22 B/2)

J72-0724-22 B/2
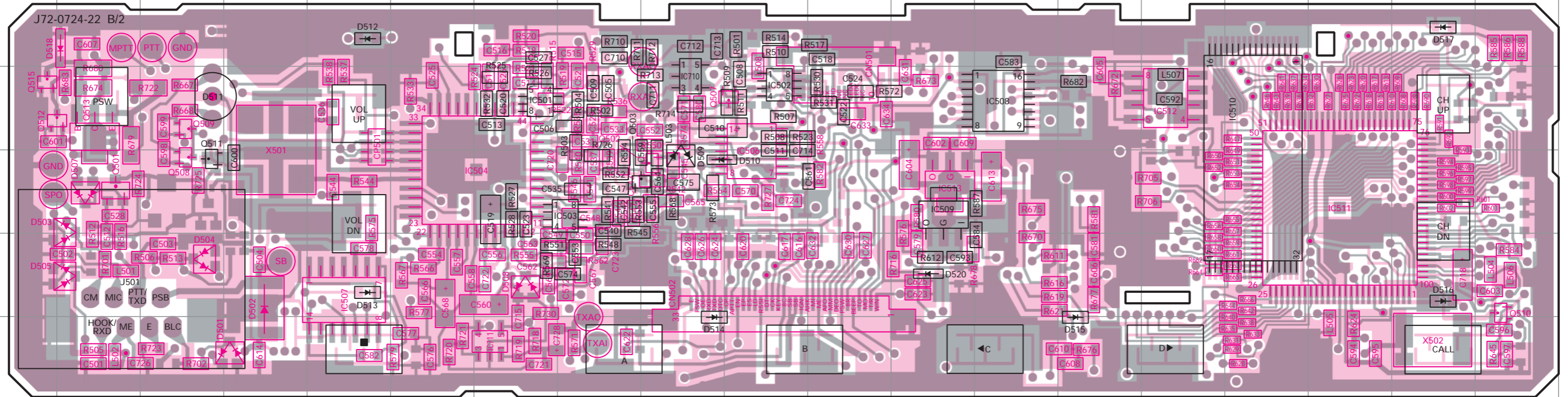
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC501	3G	IC509	4L	Q501	4B	Q511	4C	D504	5C	D512	2E	D520	5L
IC502	3J	IC510	3P	Q502	4I	Q512	3A	D505	5B	D513	5E		
IC503	4H	IC511	4Q	Q503	4H	Q513	3B	D507	4B	D514	6I		
IC504	4G	IC512	3O	Q507	3J	Q515	3A	D508	5G	D515	6N		
IC506	4J	IC513	4L	Q508	4C	D501	6D	D509	4I	D516	5R		
IC507	5E	IC710	3I	Q509	3C	D502	5D	D510	4J	D517	2R		
IC508	3M	IC711	6G	Q510	5S	D503	4B	D511	3C	D518	2B		

Component side
- Layer 1
- Layer 2
- Layer 3
- Layer 4

Foil side

● Connect 1 and 4

DTA114EE 2SC3722K 2SB1132 2SA1641 2SD2394 2SC2873 2SC4081 DTC314TU DTC114EUA 2SK508NV 2SK1824 DA204U DAN202U MA742 FMW1 TA78L05F
DTA144WE 2SC4215 2SB1188 DTC363EU DTA114YUA
DTC114EE 2SC4617 2SC2954 HSM88AS
DTC144EE 2SC4619 2SC3357
DTD114EK
2SA1362
2SC2059K
2SC2412K

AN8009M TA7808S RH5VL42C TC4S66F LMC7101BIM5 TA75S01F M68729 GN2011 TA75W558FU TA75W01FU AT2416N10SI2.5 NJM2094V W29C020C90
TC75W51FU

LA4422 TC4013BF BU4066BCFV LC73872M BU4094BCFV TA31136FN SA7025DK M62363FP AT29C020-90TI TC35453F 30620M8A-2K9GP

Note : Components marked with a dot (·) are parts of layer 1.

TK-782 SCHEMATIC DIAGRAM / 原理图

Note : Components marked with a dot (·) are parts of layer 1.

BLOCK DIAGRAM / 方块图
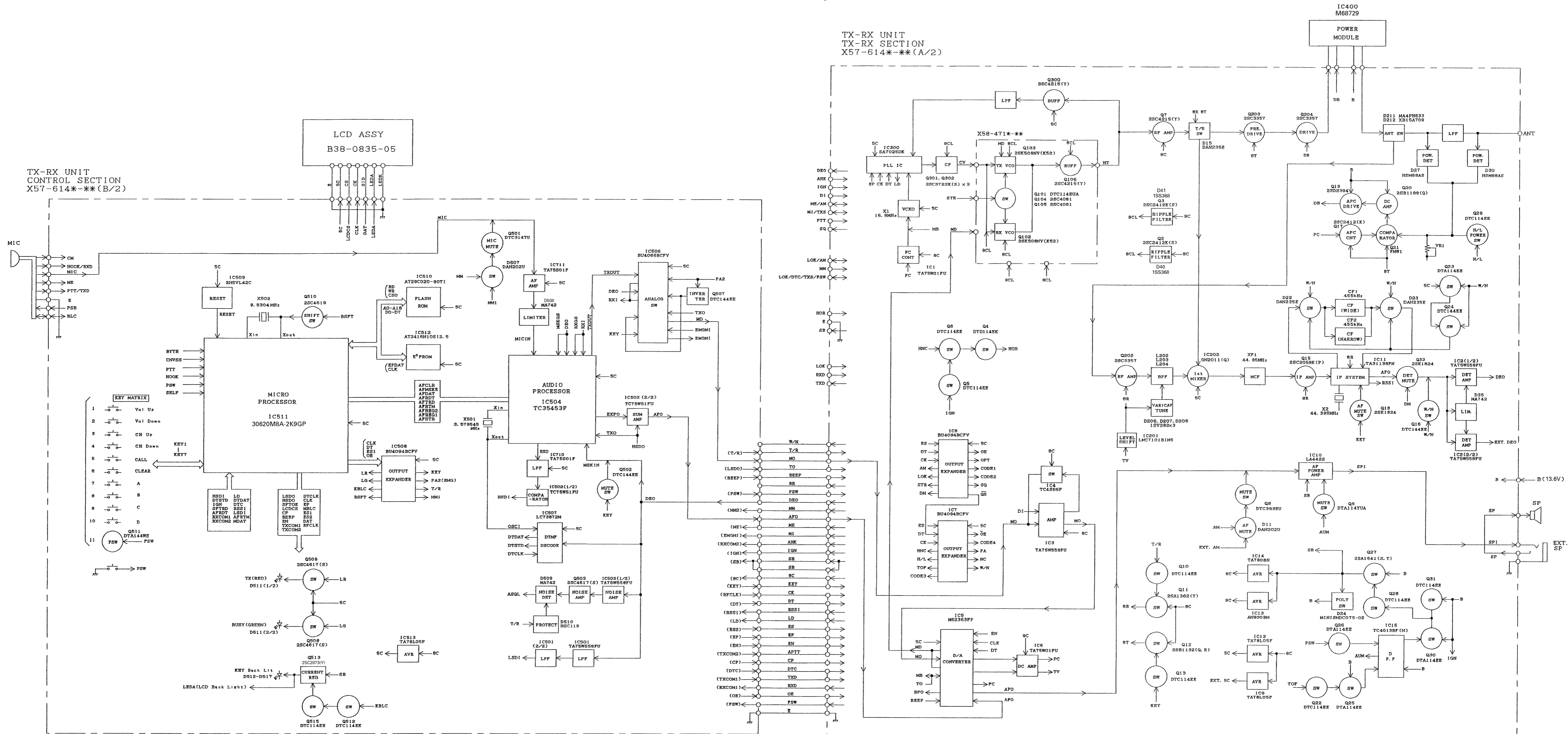
TK-782   TK-782
LEVEL DIAGRAM / 电平图

Receiver Section / 接收部

Radio Frequency | 44.85MHz | 455kHz | Audio Frequency

| W | −95.0dBm | W | −99.5dBm |
| N | −88.0dBm | N | −94.5dBm |

−118.0dBm
−121.0dBm
−109.0dBm
−106.5dBm
−120.5dBm
−110.0dBm

CF1 /CF2

W/N 62mVrms
W/N 30mVrms
W/N 820mVrms
W/N 820mVrms
W/N 16mVrms
0.45Vrms

ANT
L227
Q202
L202 L203 L204
L207 IC202 L209
XF1
Q15
3 IC11 5
16   9
IC2 2 1
IC504 5 41
IC502 6 7
IC5 13 14
IC10 2 10
J1
4Ω

SG input level for 12dB SINAD are obtained measured by connecting SG to each point via a 0.01µF capacitor.

通过将SG经由0.1µF电容与每一点连接获得12dB SINAD SG输入电平。

AF VTVM

AF level obtained when the AF output level is adjusted for 0.45V/4Ω with the front panel AF VOL control. Measured with AF voltmeter connected to the external speaker jack, receiving a −53dBm SSG signal modulated at 1kHz, DEV. 3kHz (Wide), 1.5kHz (Narrow).

AF电平的测量要在通过调整前面板上的音量旋钮使音频输出为0.45V/4Ω的条件下进行。使用连接到外置扬声器接口上的音频电压计测量。接收调制为1KHz,DEV.3KHz(宽带),1.5KHz(窄带)的−53dBm SSG信号。

Transmitter Section / 发射部

CONTROL UNIT | TX-RX UNIT | VCO UNIT | TX-RX UNIT | POWER MODULE | TX-RX UNIT

W/N 4.0mVrms
W/N 7.0mVrms
W/N 33mVrms
W/N 370mVrms
W/N 430mVrms
W/N 460mVrms
W/N 80mVrms
1.5dBm
3.5dBm
18dBm
25dBm
25W

MIC
IC711 1 4
IC504 13 6
IC506 11 10
IC3 2 1
IC5 3
A1 VCO 6 2
(X58-4712-71)
Q7
Q203
Q204
IC400 4
ANT

1. AG is set so that MIC input becomes 3kHz (Wide), 1.5kHz (Narrow) DEV. at 1kHz MOD.
2. Transmitting frequency : Center frequency.

1. 设定AG使MIC输入在1kHz MOD时变为3kHz(宽),1.5kHz(窄)DEV。
2. 发送频率：中心频率。

Wattmeter by 50Ω

TK-782

SPECIFICATIONS

GENERAL

Frequency Range .... 220 to 235MHz

Number of Channels .... Maximum 250 channels

Channel Spacing 25kHz/12.5kHz

PLL Channel Stepping 12.5kHz

Input Voltage .... 13.6V DC±15% negative ground

Current Drain .... Standby : Less than 260mA (w/back light off)

Receive : Less than 700mA (4W @ 4Ω)

Transmit : Less than 5.5A (@ 25W)

Temperature Range .... –30°C to +60°C (–22°F to +140°F)

Frequency Stability .... ±2.5ppm (–30°C to +60°C)

Dimensions & Weight .... 140 W x 40 H x 145 D mm, 0.94kg

RECEIVER (Measured by TIA/EIA-603)

Antenna Impedance 50Ω

Sensitivity (EIA 12dB SINAD) 0.25μV

Selectivity .... Wide : 80dB   Narrow : 70dB

Intermodulation .... Wide : 75dB   Narrow : 65dB

Spurious and Image Rejection 80dB

Audio Output .... 4W at 4Ω less than 10% distortion

Channel Frequency Spread 15MHz

RX Switching Time .... ≤ 25ms

TRANSMITTER (Measured by TIA/EIA-603)

RF Power Output .... 5W~25W

Spurious Emission .... –36dBm ≤ 1GHz   –30dBm > 1GHz

Modulation Limitting .... ±5kHz at 25kHz   ±2.5kHz at 12.5kHz

FM Hum and Noise .... Wide : 45dB   Narrow : 40dB

Microphone Impedance 600Ω

Audio Distortion .... Less than 3% at 1000Hz

Channel Frequency Spread 15MHz

TX Switching Time (Standby → TX) .... ≤ 30ms

规　　格

概　述

频率范围 .... 220～235MHz

信道数量 最多250个信道

信道间隔 25kHz/12.5kHz

PLL步进值 12.5kHz

输入电压 .... 13.6V±15%负极接地

电流消耗 .... 待机为小于260mA(背景照明关闭)

　　　　　　　　　　　　　　接收为小于700mA(4W于4Ω)

　　　　　　　　　　　　　　发送为小于5.5A(于25W)

温度范围 .... −30℃到＋60℃(−22°F到＋140°F)

频率稳定性 .... 从−30℃到＋60℃为2.5ppm

体积和重量 .... 140(5.51)宽×40(1.58)高×145(5.73)长 mm(英寸),940g(2.071bs)

接收部(按照TIA/EIA-603标准测试)

射频输入阻抗 50Ω

灵敏度(12dB SINAD) 0.25μV

邻道选择性 .... 80dB/70dB(宽带/窄带)

互调抑制 .... 75dB/65dB(宽带/窄带)

寄生和镜像抑制 80dB

音频功率输出 4Ω时为4W, 失真小于10%

信道频率扩展 15MHz

建立时间(发射→接收) .... ≦25ms

发射部(按照TIA/EIA-603标准测试)

射频功率输出 .... 5W～25W

寄生和谐波 .... −36dBm≦1GHz　　　−30dBm＞1GHz

调制限制 在12.5kHz时2.5kHz, 在25kHz时5.0kHz

FM噪声 .... 40dB/45dB(窄带/宽带)

麦克风阻抗 600Ω

音频失真 在1000Hz时小于3%

信道频率扩展 15MHz

建立时间(守候→发射) .... ≦30ms

如需使用此机二次开发, 请联络建伍公司或建伍经销商, 商讨提供专用插头及电缆事宜
零件号码：E37-0854-15, E37-0855-15

(CN1)　　E37-0854-15　　导线没有接插头

1 : DEO	DEO (褐)
2 : AHK	AHK (红)
3 : (NC)	(NC) (橙)
4 : DI	DI (黄)
5 : ME	ME (绿)
6 : MI	MI (蓝)
7 : PTT	PTT (紫)
8 : SQ	SQ (灰)

(CN2)　　E37-0855-15　　导线没有接插头

1 : AM	AM (褐)
2 : MM	MM (红)
3 : DTC	DTC (橙)

(CN4)

1 : LOK	LOK (褐)
2 : RXD1	RXD1 (红)
3 : TXD1	TXD1 (橙)

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