



KENWOOD

TS-590S KENWOOD NETWORK COMMAND SYSTEM Setting Manual

Kenwood Corporation
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1. Relevant Models

This user guide is for the TS-590S.

Using the TS-590S and KENWOOD NETWORK COMMAND SYSTEM (hereinafter called "KNS") enables transceiver operations by remote control using a domestic LAN or the internet. (See Note.)

KNS is a system configured using PCs, network environments, ARCP-590 (a Radio Control Program) (hereinafter called "ARCP-590"), and ARHP-590 (a Radio Host Program) (hereinafter called "ARHP-590") for remote control of the TS-590S.

Note: To transmit and receive audio, separate VoIP software is required.

Important

- To configure the system, knowledge not only of transceivers but also of PCs and networks is required. Kenwood does not offer support for customer computers and Networks. Furthermore, for operations relating to actual transmitting, note that procedures according to the Radio Act are also required.
- Operations via networks may be delayed due to unavoidable principles. Consequently, do not perform operations (such as contests or pile-ups requiring quick responses) for which delays are likely to be a problem.
- Refer to Chapter 5 for other limitations.
- Kenwood Corporation shall bear no responsibility for related damage such as damage caused by missed communications and dialog opportunities due to incorrect customer settings, nonconformances, or misoperations as a result of using this document or the ARCP-590 or ARHP-590 software.

2. Objectives of this document

To supply information to configure a remote control system via an internal LAN or internet using the TS-590S ARCP-590 and ARHP-590.

The following describes the main elements.

	Via Internet	Internal LAN
Programs Used	ARCP-590 (Operates transceiver remotely.) ARHP-590 (Operates via the ARCP-590 and transceiver.) VoIP software (transmits and receives audio)	ARCP-590 (Operates transceiver remotely.) ARHP-590 (Performs operations via the ARCP-590 and transceiver.) VoIP software (transmits and receives audio)
Network	Connections via the internet (To use the internet, a contract with a provider is necessary.)	Connection using internal LAN
IP address used	Global IP address	Local IP address
Application based on the Radio Act	Application using the internet	Application using internal LAN

3. Outline

3.1. Overall Configuration

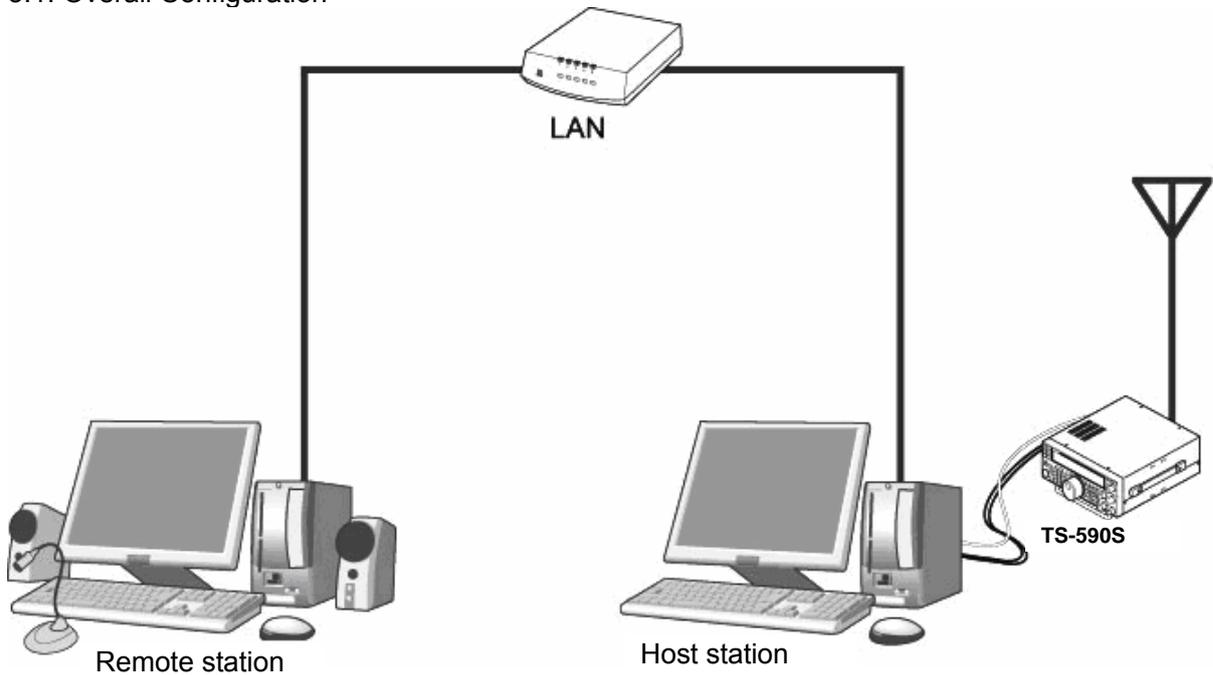


Fig. 3.1.1: Example of internal LAN configuration
(In this diagram, the modem, router, and hub have been omitted.)

As shown in the diagram, the configuration uses a host station (where the transceiver is installed; this is called the "transmitter" in the Radio Act) and a remote station (which performs the remote operations; this is called the "operator" in the Radio Act). A PC is connected to both, and the PCs are connected to each other via the network.

The transceiver connected to the PC to which the ARHP-590 has been installed on the host station is operated using the ARCP-590, which has been installed on the remote station PC. Furthermore, transmitted and received audio for the transceiver on the host station can be transmitted using the mike and speaker connected to the PC sound device on the remote station. (See Note.)

Note: To transmit and receive audio, separate VoIP software is required.

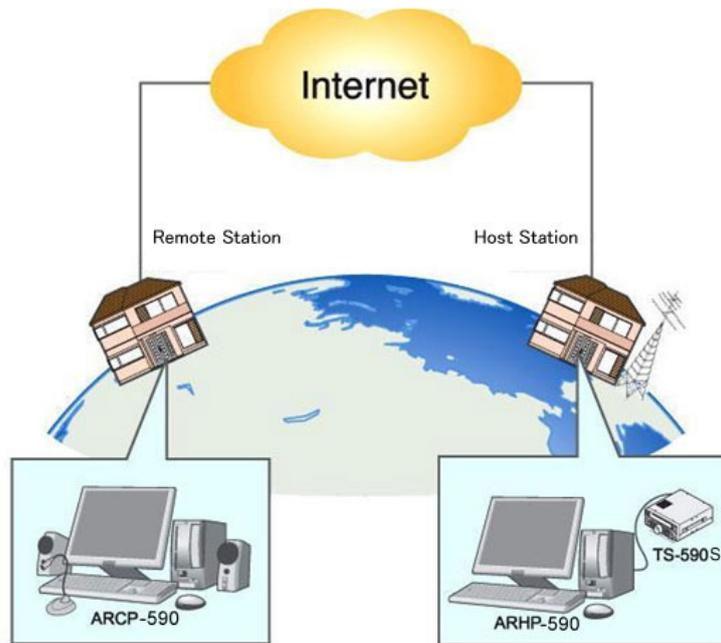


Fig. 3.1.2: Example of KNS configuration via the internet

The host station and remote station can be installed in any location with an internet connection.

3.2. Outline of Host Station (Transmitter) Operations

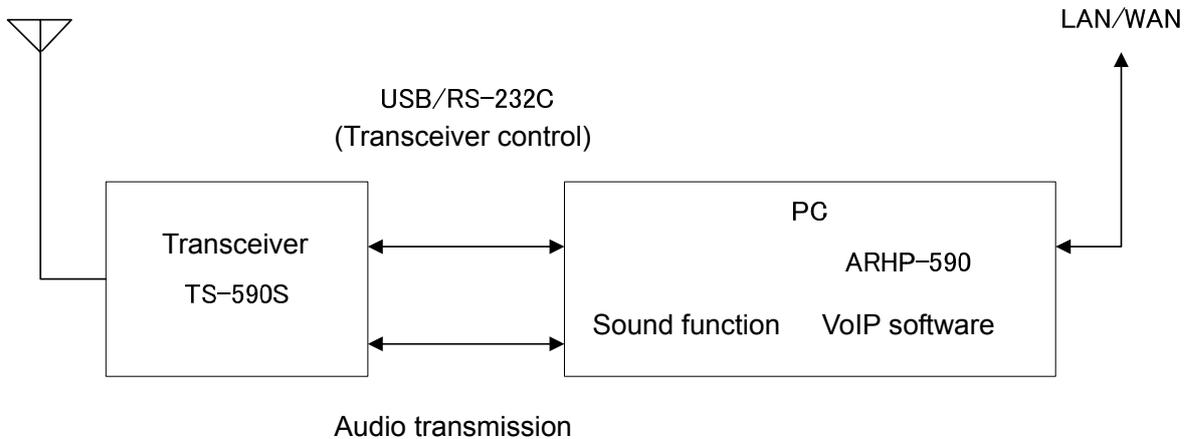
The host station is configured using a transceiver and a PC connected to the network. Data signals that control the transceiver are connected to the PC using either RS-232C or USB. The computer uses its sound function to input and output audio transmitted and received by the transceiver, and converts them between digital and analog signals.

The ARHP-590 is installed on the computer and exchanges transceiver control data signals with the network.

The PCs are connected to the network, and trade transceiver control data signals and transmit and receive audio with the "Remote station (operator)" on the network.

Note: To transmit and receive audio, separate VoIP software is required.

3.3. Host Station (Transmitter) Configuration



Transceiver	TS-590S	The TS-590S transceiver is supported. The ARCP-590 and ARHP-590 are specialized for the TS-590S, and so other transceivers cannot be used to configure the system.
Connection	USB or RS-232C	Controls that change the frequency or mode are performed by connecting the transceiver and PC using either a USB cable or RS-232C cable. (The transceiver has only one RS-232C terminal, so if using the RS-232C terminal for KNS operations, another device cannot be connected.)
	Audio	Created by the customer. To transmit and receive audio, connect the wireless ACC2 terminal to the PC sound I/O terminal. For the transceiver terminal specifications, refer to the device user manual, and for the cable creation and connection methods, refer to "4.2. Connecting Audio Cables".
PC	Specifications	CPU and memory: Minimum values recommended by the operating system. HDD: To install the ARHP-590, a minimum of approx. 100 MB of free disk space is required. If storing connection logs, additional memory space is required.
	Sound function	To transmit and receive audio, a sound function is required.
	Network function	Connects to the internal LAN. To perform KNS operations via the internet, connect to a network that is connected to the internet. A cable network is recommended.
Software	OS	Use Windows XP (SP3 or later), Windows Vista (SP1 or later, 32-bit version only), or Windows 7 (32-bit or 64-bit version). Other operating systems are not compatible.

	Run-time	To use KNS on Windows XP, Microsoft .NET Framework 2.0 or later is required. If it is not installed, install it when installing ARHP-590.
	ARHP-590	This software controls the transceivers. Refer to the software help for the settings and operation methods. Download the software from the download page, and install on the PC. http://www.kenwood.com/i/products/info/amateur/software_download.html
	VoIP software	To transmit and receive audio, VoIP software is required. (See Note 1.)
LAN environment	Router	To implement KNS operations via the internet, a model on which port forwarding settings are possible using the following protocol is required to transmit the data signals that control the transceiver. (See Note 2.) Protocol: TCP; port No.: 50000 (KNS default value)
	Modem	Not specified.
	Other	To implement KNS operations via the internet, firewall environments configured using in-house company networks cannot be used. Use a domestic network environment.
Internet environment	Provider	To implement KNS operations via the internet: <ul style="list-style-type: none"> • A high-speed cable broadband environment using xDSL, FTTH, or CATV network is required. (1Mbps min. recommended.) • A global IP address is required. (See Note 3.) • The ability to use protocols and ports to transmit the data signals that control the transceiver is required. <p>Protocol: TCP Port No.: 50000 (KNS default value)</p> <p>For details, contact your internet service provider.</p>
	Proxy	Proxy servers cannot be used.

Note 1: Support for selecting, installing, and operating VoIP software is not available from Kenwood Corporation.

Note 2: Make sure to refer to the user manual for the broadband router to be used before performing the settings.

Note 3: KNS operations are possible even if the global IP address is variable, but the IP address may change with uncertain timing. In such cases, it is necessary to check and change the IP address of the connected host when connected from a remote station, which reduces user-friendliness. Consequently, using an environment in which the host station global IP address is fixed is recommended. Furthermore, if the global IP address cannot be fixed, using a dynamic DNS service enables operations in the same way as an environment with a fixed global IP address.

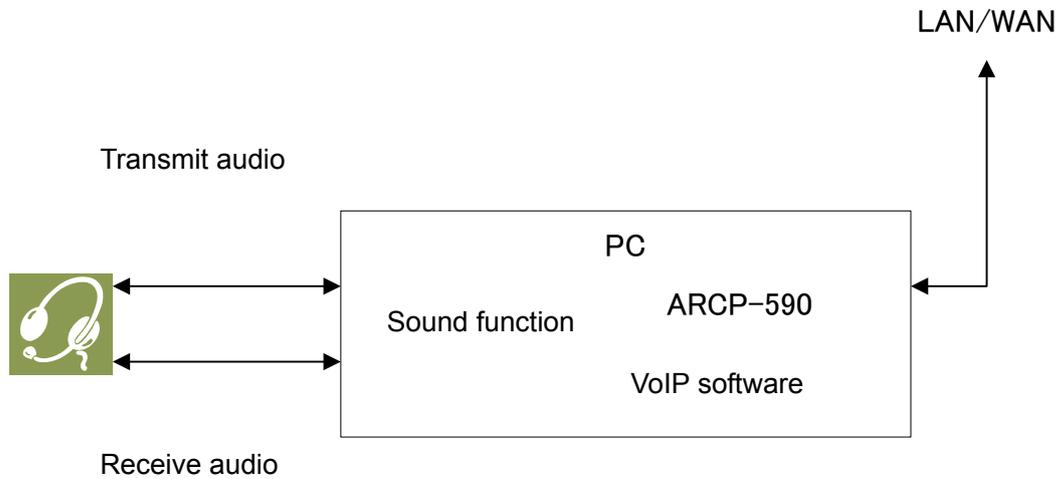
3.4. Overview of Remote Station (Operator) Operations

The remote station is configured using a PC connected to the network, and a microphone and speaker connected to the PC sound function. The audio transmissions for the host station transceiver are input and output using the microphone and speaker connected to the sound function of the remote station PC via the network.

The ARCP-590 is installed in the PC. The host station transceiver connected via the network is controlled by remote station ARCP-590 operations. (See Note.)

Note: To transmit and receive audio, separate VoIP software is required.

3.5. Remote Station (Operator) Configuration



Connection	Audio	To exchange audio transmissions, connect the microphone and speaker or a headset to the PC sound function. Use products compatible with the sound function used.
PC	Specifications	CPU and memory: Minimum values recommended by the operating system. HDD: To install the ARCP-590, a minimum of approx. 100 MB of free disk space is required. If saving transceiver settings to data files, or saving keystroke logs, additional memory space is required.
	Sound function	To exchange audio transmissions, a sound function is required.
	Network function	A cable network is recommended. Connect to a hub or router.
Software	OS	Use Windows XP (SP3 or later), Windows Vista (SP1 or later, 32-bit version only), or Windows 7 (32-bit or 64-bit version). Other operating systems are not compatible.
	Run-time	To use KNS operations on Windows XP, Microsoft .NET Framework 2.0 or later is required. If it is not installed, install it when installing ARCP-590.
	ARCP-590	This software remote controls the transceivers. Refer to the software help for the settings and operation methods. Download the software from the download page, and install on the PC. http://www.kenwood.com/i/products/info/amateur/software_download.html
	VoIP software	To transmit and receive audio, VoIP telephone software is required. (See Note 1.)

LAN environment	Router	Same as host station.
	Modem	Same as host station.
	Firewall	Same as host station.
Internet environment	Provider	Same as host station.
	Proxy	Same as host station.

Note 1: Support for selecting, installing, and operating VoIP software is not available from Kenwood Corporation.

4. Settings

4.1. Connecting Communications Cables

Connect the host station PC and TS-590S using an RS-232C or USB cable.

Note: RS-232C cables and USB cables are sold separately. Purchase them from a commercial outlet.

- If connecting using an RS-232 cable, ensure that it is a straight cable (9 pin to 9 pin).
- If connecting using a USB cable
 - (1) Download the installer for the virtual COM port driver from the Kenwood homepage http://www.kenwood.com/ii/products/info/amateur/software_download.html, then install it according to the procedures.
 - (2) Connect the PC and TS-590S using the USB cable.

4.2. Connecting Audio Cables

To transmit and receive audio, an audio cable is required. Create an audio cable using the 13-pin DIN plug enclosed with the TS-590S with reference to the following diagram. For details of the terminal specifications, refer to the TS-590S user manual.

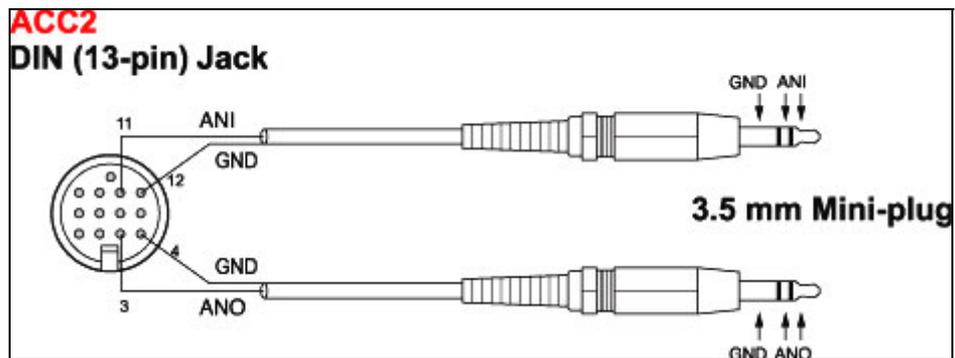


Fig. 4.2.1: Creating an audio cable

Connect sound functions and audio cables with reference to the following diagram.

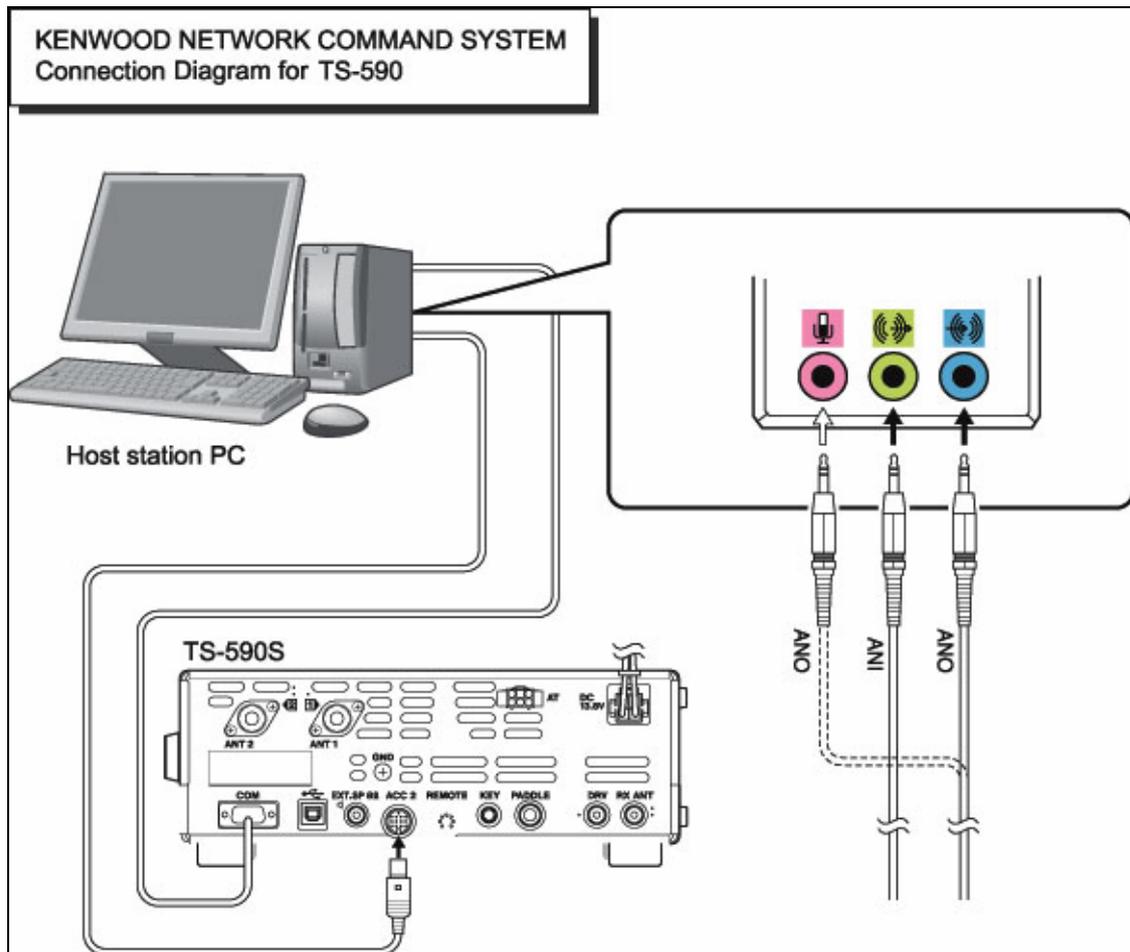


Fig. 4.2.2: Connecting audio cables

Reference:

If the TS-590S is connected to the PC using a USB cable, audio transmission input and output are possible using the USB audio function, but the many signal conversions cause inherently unavoidable delays. Furthermore, during KNS operations, network delays will occur. To minimize delays as much as possible, connections using audio cables are recommended.

Delays also depend on the PC load and network traffic.

4.3. Transceiver Settings

Make the settings required to implement KNS operations using transceivers.

- Set the audio path settings

With KNS operations, normally transmitted audio is input from an ACC2 connector. Input is also possible using USB audio functions from a USB connector, but as the delays are great, this is not recommended.

Make the following menu settings to transmit audio input from the ACC2 connector.

Menu No.	Function	Set value
63	Audio input line selection for data communications	ACC2

The default setting is ACC2.

Reference:

Set the menu described above to USB to transmit USB audio signals input to the USB connector.

Set the (existing) device connected to the TS-590S to the playback and recording devices using the PC sound settings on the host station.

- Data VOX settings

With the TS-590S, VOX functions can be implemented using either audio input to the ACC2 connector or USB audio signals input to the USB connector, but to prevent unintentional transmission during KNS operations, turn OFF the function using the menu settings.

Menu No.	Function	Set value
69	Data VOX	OFF

The default setting is OFF.

Caution:

- There is a risk that sounds other than those produced by the computer may be transmitted unintentionally over the network, so we recommend that you turn off this function.
- When this function is ON, all sounds created by the computer other than the intended audio transmissions are also transmitted, so be careful.
- When using this function for the first time, we recommend connecting a dummy load to the TS-590S to perform checks and adjustments.

- Audio I/O level settings

Use the following menu to adjust audio transmission input levels from the PC, and receive audio output levels to the PC.

Menu No.	Function	Setting range
64	Audio level of USB input for data communications	0~9
65	Audio level of USB output for data communications	0~9
66	Audio level of ACC2 input for data communications	0~9
67	Audio level of ACC2 output for data communications	0~9

The default value for all settings is 4.

Reference:

Adjust the PC sound function volume as necessary.

- Mixed beep setting to external audio outputs

With the TS-590S default mode, only received audio signals that do not include beeps or side tones are output as audio signals from the ACC2 connector and the USB connector as USB audio signals.

Make the following menu settings to output the same audio as the audio output from the wireless speaker, including beeps and side tones, externally.

Menu No.	Function	Set value
68	Mixing beep tones for ACC2/USB audio output	ON

The default setting is OFF.

Reference:

To implement data communications, turn this function OFF.

- Timeout timer settings

During KNS operations, control data signals are transmitted using the network. Consequently, if normal network operations are disabled for any reason, control of the transceiver will also be disabled. Use the following menu to set the functions to stop transmitting automatically after a fixed period if control should be disabled while transmitting.

Menu No.	Function	Set value
49	Time-out timer	except OFF (See Note)

The default setting is OFF.

Note: Select from 3/ 5/ 10/ 20/ 30(minutes) excepting OFF, depending on the situation to use.

- Prohibit transmission setting

If using the host station as a receive-only station, set to transmission inhibited. Make the settings using the following menu.

Menu No.	Function	Set value
60	TX inhibit	ON

The default setting is OFF.

- Allocating DATA SEND functions to PF keys

Set the DATA SEND functions to the PF keys to test the transmission of audio input from the rear terminal. In this example, the [PF A] key has been set.

Menu No.	Function	Set value
79	Front panel PF A key assignment	205

The default value is 200 (VOICE1).

Using the [PF] keys, which set the DATA SEND functions, enables switching between transmit and receive modes for audio input from the rear terminal.

4.4. Setting Transmission Methods for Audio Input to the Rear Terminal

The [SEND] keys on the PTT of the microphone connected to the TS-590S, and on the TS-590S control panel, are the method for transmitting audio input to the microphone connected to the TS-590S, so even if these operations are implemented, audio entered as audio signals from ACC2 cannot be transmitted.

To transmit audio input as audio signals from the ACC2, select one of the following methods.

- Transmitting using the ARCP-590

With the ARCP-590, settings must be done to transmit audio input through the rear terminal to use the on-screen [SEND] key.

Select "Set transmit control" from the ARCP-590 "Tools" menu. The "Transmit control settings" window is displayed.

In this window, select "ACC2/USB" in the "modulation line", and then select "ACC2".

For details, refer to the ARCP-590 help.

- Transmitting using the PKS terminal in the ACC2 connector.

Audio input to the rear terminal can be transmitted by setting the PKS terminal in the ACC2 connector on the rear of the TS-590S to low.

For details of the connector and terminal specifications, refer to the TS-590S user manual.

- Transmitting using the PF keys allocated to the DATA SEND functions.

If the DATA SEND functions have been allocated to the PF keys, operating the PF keys enables audio input to the rear terminal to be transmitted.

For details, refer to "Allocating DATA SEND Functions to PF Keys".

4.5. Setting Broadband Routers

If implementing KNS operations via the internet, it is necessary to set the broadband router connected to the host station.

Make the settings to transmit control data signals transmitted via the internet from the broadband router to the host station PC.

This setting depends on the call method of the broadband router manufacturer, and may be "Port forwarding", "IP masquerade", "Port conversion", "NAT address conversion", etc. Refer to the user manual for the broadband router used.

The settings are described below.

Item (Example)	Setting Details
Open IP address	IP address of the PC used in the host station
Protocol	TCP
Port Number	50000 (default value)
Direction	Two-way

Caution:

- For the broadband router settings, refer to the broadband router user manual.
- Incorrect broadband router settings may stop the network or enable illegal external access to the network. Take thorough precautions when changing the settings.
- Kenwood does not offer support for customer computers and networks.

4.6. Software Installation and Settings

Install the software required for KNS operations on the host station PC and the remote station PC, then perform the required settings.

- Host station PC

Download and install the ARHP-590 onto the PC from the Kenwood website:
http://www.kenwood.com/i/products/info/amateur/software_download.html.

Make the COM settings, network settings, optional settings, and user settings used to connect to the TS-590S by selecting the "Tools" menu and then "Settings" in the ARHP-590. For the settings methods, refer to the ARHP-590 help file.

To transmit and receive audio, download and install separate VoIP software.

- Remote station PC

Download and install the ARCP-590 onto the PC from the Kenwood website:
http://www.kenwood.com/i/products/info/amateur/software_download.html.

In the ARCP-590, select the "Tools" menu and then "Settings", and set the connection to "Network". Click the "Settings" button to make the "KNS connection settings". For the settings methods, refer to the ARCP-590 help file.

To transmit and receive audio, download and install separate VoIP software.

Caution:

- Support for selecting, installing, and operating VoIP software is not available from Kenwood Corporation.

4.7. Windows Firewall Settings

With the host station PC, receiving connections from networks and the internet using the ARHP-590 are blocked by the Windows firewall. When blocked, KNS operations are disabled, so remove the block.

Reference:

Add the ARHP-590 to "exceptions" using the Windows firewall settings to release the block.

4.8. Comprehensive Security Software Settings

If using comprehensive security software, it is necessary to adjust the settings so that ARHP-590 and ARCP-590 communications are not blocked. Perform the settings with reference to the user manual for the comprehensive security software used.

4.9. Setting the Host Station Wait Mode

Click the "Connections" button in the main window of the ARHP-590 on the host station. The indicator will light yellow and the remote station will enter connection request wait mode.

If the audio transmission is speech, set the VoIP software to standby mode.

4.10. Connecting to the Host Station from the Remote Station

Click the "Connections" button in the main window of the ARCP-590 on the remote station. If the connection to the host station is successful, the indicator will light green.

If the audio transmission is speech, connect the host station with the VoIP software too.

5. Limitations Caution!

5.1. PC Environment Limitations

Check that the ARCP-590 and ARHP-590 operations use Windows XP SP3 or later, Windows Vista SP1 or later, or Windows 7. Earlier versions, and other operating systems, cannot be used. Use the operating systems described above for both the host and remote stations.

For KNS operations, it is necessary to set and change the open broadband router port, OS firewall functions, and comprehensive security software. Furthermore, it is the customer's responsibility to handle security when using this system. If you do not have confidence in the settings, we recommended you stop using the system.

5.2. Network Environment Limitations

During KNS operations via the internet, it is necessary to set the global IP address on the host station. For your global IP address, consult your contracted provider.

Only registered people can access the host station using their ID and password. Make sure that the ID and password settings cannot be guessed easily by unauthorized people.

On this system, signals are exchanged via the network. Consequently, smooth operations may be disabled compared to normal transceiver operations as delays (during analog/digital conversions) and data loss (which is greatly dependant on traffic) are unavoidable. This is the principle operation of the system.

Examples are cited below.

Audio may be cut off, meter deflection may not be smooth, standby time may be delayed (in particular, it is not suitable for contests or quick operations such as pile-ups). VFO variability may not be smooth, audio may differ from the actual transceiver audio, and digital mode communications such as image communications with SSTV and AFSK, PSK-31, etc., may be disabled, etc.

Broadband is recommended for the internet line used. As a benchmark, use a minimum of 1 Mbps. The speed of analog modems that use telephone lines will greatly reduce sound quality, and may destabilize control, and so cannot be used.

5.3. Program Limitations

CW operations are possible, but keying using normal e-keys is not possible. Strings entered using the keyboard are collated for transmit operations.

5.4. Limitations if Using USB Audio Functions

If the PC and TS-590S are connected via a USB cable, audio transmissions can be transmitted using the USB audio function. In principle, however, there is a delay with USB audio, so sound may be lost depending on the PC performance and load status. If using a USB connection for transmitting audio on the host station, the delay due to network traffic to the remote station is also added, so the delay is further increased.

If audio transmissions are connected via USB terminals, and if playing warning sounds from the OS or music and video on the PC, the sounds may not emit from the speakers. Furthermore, depending on the OS sound and properties, the transceiver DATA VOX function settings, and the modulation path, the audio may be modulated from the transceiver, so be careful during PC operations and when playing these files.

Depending on the combination of PC and sound functions, normal operations may be disabled.

Kenwood does not offer support for customer computers.

We recommend using audio cables without using USB audio functions for KNS operations. (See "4.2. Connecting Audio Cables".)

6. Frequently Asked Questions

This section introduces questions that have been asked to date, and subjects verified by Kenwood Corporation.

	Question	Answer
Installation	With internet routing, is KNS disabled unless I obtain a global IP address?	With internet routing, a global IP address is required.
	I have a variable global IP address. Can I still use it?	Variable IP addresses can also be used, but each time the IP address changes, it is necessary to reset the settings, which is inconvenient. We recommend using a fixed IP address. Even with a variable IP address, the inconvenience of resetting the settings can be eliminated by using a dynamic DNS service, which can be used in the same way as a fixed IP address.
	I use CATV internet. Can I use KNS via the internet?	If you can obtain a global IP address, yes. If using a type with the broadband router built into the cable model, it is possible if port forwarding settings can be made.
	Can I use environments with both host stations or remote stations, or with a proxy and firewall?	Proxy and firewall environments cannot be used. Both host stations/remote stations can be used only on general home network environments.
	Can I use a wireless LAN or BWA (broadband wireless access)?	We do not recommend this, as line speeds are not fixed for best effort-type wireless.

	Question	Answer
Installation	I want to use headsets, USB headsets, and Bluetooth headsets on the remote station PC. Will there be any problems?	<p>You can use them, but in principle, USB headsets and Bluetooth headsets have unavoidable delays, so entering standby will take considerable time. If the delays are a problem, it is better to avoid using them.</p> <p>After connecting USB headsets or Bluetooth headsets, it is necessary to set the existing recording and playback devices using the OS sound properties. For details, refer to the USB headset or Bluetooth headset user manual.</p>
Internet	Cannot use transceiver operations. Cannot connect to the host station.	<p>Check that connections to websites and the internet mail server are possible. Check the host station address, ID, and password.</p> <p>If there are no problems, check the following.</p> <ul style="list-style-type: none"> • Check that the port used for wireless control (TCP/default setting: 50000) is set to open on the host station broadband router. • Check that there are not two or more broadband routers (hereafter called "BBR") on the host station network. If there are two or more BBRs, either open the port required by KNS for either of the BBRs, or stop one of the BBRs and make sure that only one BBR exists on the network, and then set the required KNS port to open on the BBR. (See Page 28.)
OS	When attempting a KNS connection, a warning message may be displayed, depending on the OS.	Add ARHP-590 to the Windows firewall exceptions.

	Question	Answer
Operations	Why can't I use the ARCP-480?	The ARCP-480 is for the TS-480 only. Use the ARCP-590 with the TS-590S.
	Why can't I use the ARHP-10?	The ARHP-10 is for the TS-480 only. Use the ARHP-590 with the TS-590S.
	Reception quality depends on the device.	Audio via a network is affected by the audio encoding and data bandwidth, and so sound quality may differ from the actual received quality. These are VoIP specifications, and cannot be improved.
	I want to control peripheral devices other than the antenna and transceivers.	The current system is compatible only with transceiver control.
	There are so many limitations, can this system operate?	Although different from normal operations, considerably practical operations are possible in ordinary communications. There may be some initial confusion over the standby timing until you are familiar with the specific delays via the network. We recommend first becoming familiar with the transceiver operations from the PC using a single ARCP-590, and then attempting operations on a network environment as the next step. When attempting actual operations, unless there are no communications to a partner, remote internet operations can be misunderstood.

	Question	Answer
Operations	There is static in the audio transmissions or audio transmissions are faint. Where should I check and adjust them?	If using the sound functions in comprehensive chipsets, try an independent sound card or USB sound.
		Adjust the ACC2 audio level in menus 66 and 67.
		Try changing the sound function driver version.
	I can hear the beeping and voice guidance audio from the transceiver on the nearby PC. Alternatively, I want to be able to hear them, but can't.	Set using the "Mix beeps with external audio device" in menu 68.
	Can I set the PC to sleep mode while I'm not using the host station? When a fixed time has elapsed without the host station being used, the station PC screen turns OFF, and responses to connection requests from the station cannot be made.	Recovery from sleep mode takes time. During sleep mode recovery, responses to the remote station cannot be returned until there is a time out. Therefore, we recommend you do not set the station to sleep mode.
	If there is a connection request from the remote station while the host station is not being used, a message is displayed and connections to the host station are disabled.	Is the OS energy save mode operating, and has the power supply to the host station HDD been disabled? When the HDD power supply is turned OFF, the HDD power supply is turned ON to respond, but at this time nothing can be returned until the response to the remote station has timed out. Consequently, set the OS power supply function settings so that the HDD power supply does not turn OFF.
	Audio I/O between the host station PC and transceiver cannot be performed correctly.	Check that an existing device is specified as the device connected to the TS-590S using the host station PC sound settings.
Modulation is not performed even when the ARCP-590 "SEND" button is pressed.	Check that the same path as the modulation path wired between the transceiver and the PC has been selected using the ARCP-590 "Transmit control settings".	

	Question	Answer
Operations	Cannot transmit audio correctly between the remote station and host station.	Refer to the VoIP software user manual, and check the settings.
		Check that an existing device has been specified for the PC speakers, microphone, and headset currently in use, using the remote station PC OS sound settings.
		Check whether the PC microphone and headset have been muted or are at low volume.
		Check that the PC, speakers, microphone, and headset are connected correctly.
	The audio transmissions keep varying in volume and are not constant.	Has AGC been turned ON using the VoIP software input audio settings? For details, refer to the VoIP software user manual, and check the settings.
	The final part of the audio transmitted from the host station transceiver is missing.	<p>If you return to receiving operations immediately after the conversation has finished using the remote station, you may switch to receiving before all the audio has been transmitted due to the audio transmission delay.</p> <p>In such cases, use the ARCP-590 pulldown menu to select "Tools" and then "Transmit control settings", and set a slightly longer time in "Switching delay from transmit to receive during network connections".</p>
	When implementing synchronous steps other than "Preset", reaction may be delayed during KNS operations.	When set to other than "Preset", the network is more easily delayed than when using "Preset" due to the difference in the internal commands. In such cases, either select "Preset" and perform synchronization, or change the frequency using the "MULTI/CH" operation.

	Question	Answer
Comprehensive security software, etc.	I'm using comprehensive security software, but when I try a KNS connection, the warning "Software is attempting to connect to the internet" is displayed. Can I press the "Block" button?	Refer to the user manual for the comprehensive security software being used, and set it so that the communications of the port used by ARCP-590 and ARHP-590 are not blocked.
Other	After implementing KNS operations on the PC used as the host station, the sound has vanished from the PC during audio and video playback on the PC.	It is possible that the device connected to the TS-590S has been selected as the existing device using the PC sound functions. Use the PC sound functions to check whether the PC speakers have been selected as the playback device.
	When playing audio and video when implementing KNS operations on the PC used as the host device, the audio is transmitted from the TS-590S.	During KNS operations, all audio output from the PC is input to the TS-590S as transmitted audio. During KNS operations, do not play audio or video. Furthermore, we recommend waiting until other programs have ended.
	Loud sounds are suddenly output from the host station transceiver.	The cause is the remote station user operating the volume control. You can use the ARHP-590 to prohibit volume operations from the remote station. Select the "Tools" menu and the "Settings", and enable the "Prohibit AF gain control from ARCP-590" checkbox.
	After restarting the host station for any reason, are there any settings to enable standby mode automatically?	In the ARHP-590 "Tools" menu, select "Settings", and then enable the "Implement automatically during Windows startup" checkbox. When the PC is restarted, it will automatically enter standby mode.

(Supplement): FAQ: Explaining the Internet "Cannot operate transceiver"

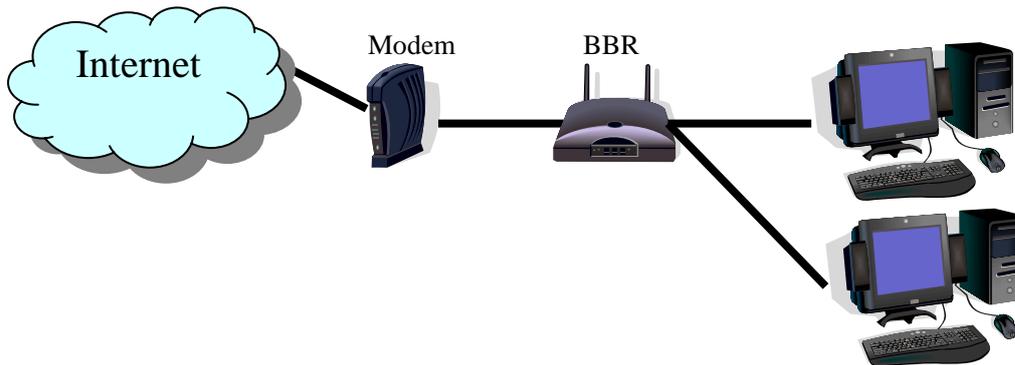


Fig. 1

As shown in Fig. 1, even though only one broadband router (BBR) is visible on the network, in reality there are two. (Duplex router phenomenon.)

There are multiple modem modes with built-in BBR functions, so when connecting such a modem as described above, there must not be two BBR paths connecting the PC to the internet.

Consequently, even if the open port has been set for one BBR only, the required KNS packets will not flow. For this reason, either set the required KNS port to open for two BBRs, or stop one BBR function, and set the network so that there is only one BBR on the network.

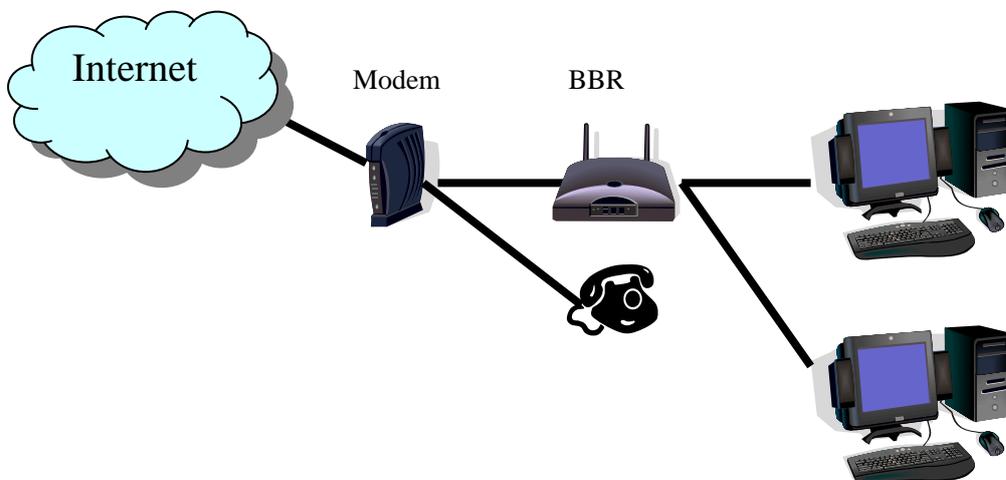


Fig. 2

As shown in Fig. 2, in cases where the telephone is connected directly under the model, nearly all modem models have a built-in BBR. In such cases, stopping the BBR built into the modem stops the VoIP telephone functions connected to the modem, so VoIP telephony use is disabled.

To prevent the VoIP telephone functions from stopping, stop the functions of the BBR connected to the front of the PC, and set the port required by KNS to open in the BBR built into the modem.

Caution:

Change any settings such as open BBR ports at your own risk.

If you do not have confidence in the settings, we recommend you stop using the system.