

KENWOOD

TS-990S

USB Audio Setting Manual

JVCKENWOOD Corporation

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1. About the TS-990S USB Audio Function

This guide is a document for the ARUA-10 software which connects the TS-990S and the PC with a USB cable and makes it possible to use the speaker and microphone of the PC instead of the speaker and microphone of the transceiver body.

When the TS-990S is connected to the computer using a USB cable, the USB audio function can be used to play incoming audio over the computer speakers and transmit audio from the computer microphone.

This guide explains how to set up the TS-990S to use its USB audio function and how to use the ARUA-10 software to control input/output routes of the USB audio signals from a computer.

Important

- USB audio 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, "Limitations", for other limitations.
- To use the USB audio function, knowledge not only of transceivers but also of computers is required. JVC KENWOOD does not offer support for purchasing computers or for customer's computers.
- JVC 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 ARUA-10 software.

2. Operation Using the USB Audio Function

Operation using the USB audio function is explained using the diagram below.

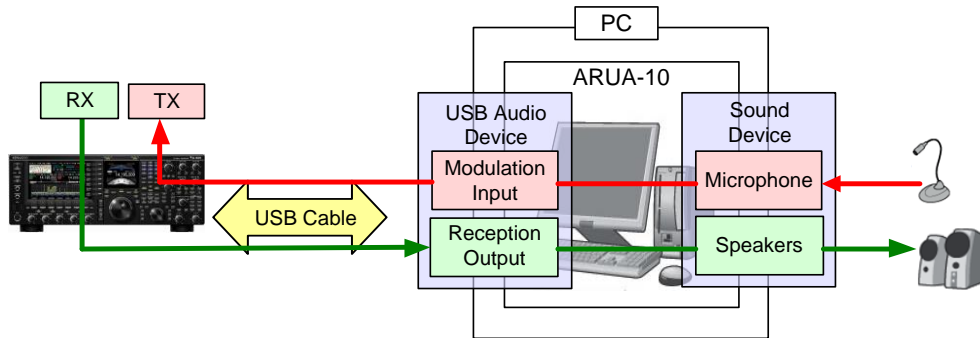


Diagram 1: Operation Using the USB Audio Function

The left side of the diagram shows the TS-990S unit while the area in the square on the right side indicates the computer. The TS-990S and the computer are connected using a USB cable. The microphone and speakers connected to the computer are shown on the far right.

Audio reception is explained first. Incoming audio from the TS-990S is sent to the computer via the USB cable and played over the speakers connected to the computer.

A signal pathway on the computer to connect the USB audio device input signals and output from the audio device connected to the speaker is necessary.

Audio transmission is explained next. Audio input from the microphone connected to the computer passes through the USB cable and is transmitted by the TS-990S unit.

A signal pathway on the computer between input signals from the audio device connected to the microphone and output from the USB audio device is necessary.

The ARUA-10 software serves as a bridge for these signal paths within the computer.

The ARUA-10 software lets you select which speaker and microphone are used for transceiver operations when there are multiple speakers and microphones connected to the computer.

3. Installing the ARUA-10 Software

3.1 System Requirements

In order to use the ARUA-10 software, your computer must meet the following requirements.

Chart 1 - Computer Requirements

Category	Specifications
Operating System (OS)	Windows 10 (version 1703 (OS Build 15063.0) or later, 32-bit or 64-bit version) Windows 8.1 (RTM or later, 32-bit or 64-bit version) Windows 7 (Service Pack 1 or later, 32-bit or 64-bit version)
Processor	Faster than the recommended CPU for OS on which you are operating
System Memory (RAM)	RAM having the System Memory recommended by the respective OS used in your PC or larger
Free Hard Disk Space	100 MB or more of free hard disk space
Software	Microsoft .NET Framework 4.7 (including .NET Framework 4.0)
Peripheral Devices	Displays with resolutions higher than SXGA (1280 x 1024) Keyboard, mouse or other pointing devices USB 2.0 port Sound function and audio input / output device (microphone and speaker, or headset)

* Applicable operating systems are subject to change without notice due to the end of the technical support by Microsoft Corporation or change of the product specifications.

3.2 Installation

Download and install the ARUA-10 software from the following KENWOOD website:
http://www.kenwood.com/i/products/info/amateur/software_download.html

When connecting the TS-990S to a computer using a USB cable for the first time, drivers required for the USB Audio Function are automatically installed.

If you are using an ARCP-990 and Computer Control Command, you must install the "Virtual COM port driver" to connect the TS-990S with a USB cable.

Download and install the driver from the following KENWOOD website:
http://www.kenwood.com/i/products/info/amateur/software_download.html

3.3 About the Virtual COM Port Driver

When connecting the TS-990S to a computer with a USB cable for the first time, the “New Hardware Detected Wizard” message appears. This is the install prompt for the Virtual COM Port.

If you are not using an ARCP-990 or Computer Control Command, there is no need to install the Virtual COM Port. However, if it is not installed, the Wizard message will appear every time the USB cable is connected, so we recommend installation.

When the “New Hardware Detected Wizard” message appears and you have not yet installed the Virtual COM Port, click “Cancel” and install the Virtual COM Port before continuing.

For details on how to install the Virtual COM Port please visit the download page noted above.

4. Settings

4.1 Transceiver Settings

Complete the necessary transceiver (TS-990S) settings before using the USB audio function. (Refer to the user manual for details on how to use the TS-990S.)

4.1.1 Setting up an Audio Input Route from the Rear Terminal

Select the USB Audio to the audio source line to transmit audio that is input by the USB audio function. By default, when in DATA mode (DATA 1, DATA 2, and DATA 3), the USB audio is selected to input audio for transmission by DATA SEND. (Refer to the chapter entitled “SELECTING THE AUDIO SOURCE FOR TRANSMISSION BY DATA SEND”, in the user manual.)

4.1.2 Audio I/O Level Settings

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

Menu No.	Function	Setting range (Default)
7-05	Input level of the USB audio	0 to 100 (50)
7-08	The main band USB audio output level	0 to 100 (100)
7-09	The sub-band USB audio output level	0 to 100 (100)

4.1.3 Mixed Beep Settings to External Audio Outputs

With the TS-990S default setting, the USB audio output signals include beeps and side tones.

Use the following menu settings to not include beeps and side tones in the USB audio output.

Menu No.	Function	Setting range (Default)
7-14	Audio output from the rear panel connectors	All, Received Audio Only (All)

Reference:

To implement data communications, set this function to “Received Audio Only”.

4.1.4 DATA VOX Settings

If you use the VOX function keyed by the sound from the USB audio input, select "USB Audio" as the audio source for DATA VOX. (Refer to the chapter entitled "SELECTING OR DISABLING THE AUDIO SOURCE FOR DATA VOX", in the user manual.)

Caution:

- When this function is ON, all sounds created by the computer are transmitted along with the intended audio transmissions.
- When using this function for the first time, we recommend connecting a dummy load to the TS-990S to perform checks and adjustments.

4.1.5 Other settings for the DATA VOX

If necessary, adjust the following settings for the DATA VOX.

- VOX gain for USB audio input
- ANTI VOX level for USB audio input
- VOX delay time for USB audio input

(Refer to the chapters entitled "ADJUSTING THE VOX GAIN", "ADJUSTING THE VOX DELAY TIME" and "ADJUSTING THE ANTI VOX GAIN LEVEL", in the user manual.)

4.1.6 Allocating the DATA SEND Function to the PF Keys

Set the DATA SEND function 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
0-15	Assignment of the programmable function to [PF A]	DATA SEND

Using the [PF] keys to which the DATA SEND function has been set, you can switch between transmit and receive mode for audio input from the rear terminal.

4.2 Setting the Transmission Method for Audio Input to the Rear Terminal

The [SEND] keys on the PTT switch of the microphone connected to the TS-990S and on the TS-990S control panel are the method for transmitting audio input to the microphone connected to the TS-990S. When transmitting by these methods, audio entered as audio signals from USB cannot be transmitted.

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

- Transmitting using the ARCP-990
With the ARCP-990, you must perform settings to transmit audio input through the rear terminal to use the on-screen [Send] key.

Select "Setup TX control" from the ARCP-990 "Tool" menu. The "Setup TX control" window is displayed.

In the window above, select "ACC2/USB" in the "Modulation line" setting, and then select "USB".

For further details refer to the ARCP-990 help. (ARCP-990 details are downloadable from the KENWOOD website.)

- Use the ACC2 Connector's PKS port to transmit.
This setting allows you to transmit audio received by the rear terminal by setting the PKS port in the ACC2 Connector on the back of the TS-990S to "Low."

For details on the connector and terminal specifications, refer to the TS-990S instruction manual.

- Use the PF key assigned to the DATA SEND function to transmit.
By assigning the DATA SEND function to a PF key, the PF key can be used to transmit audio received by the rear terminal

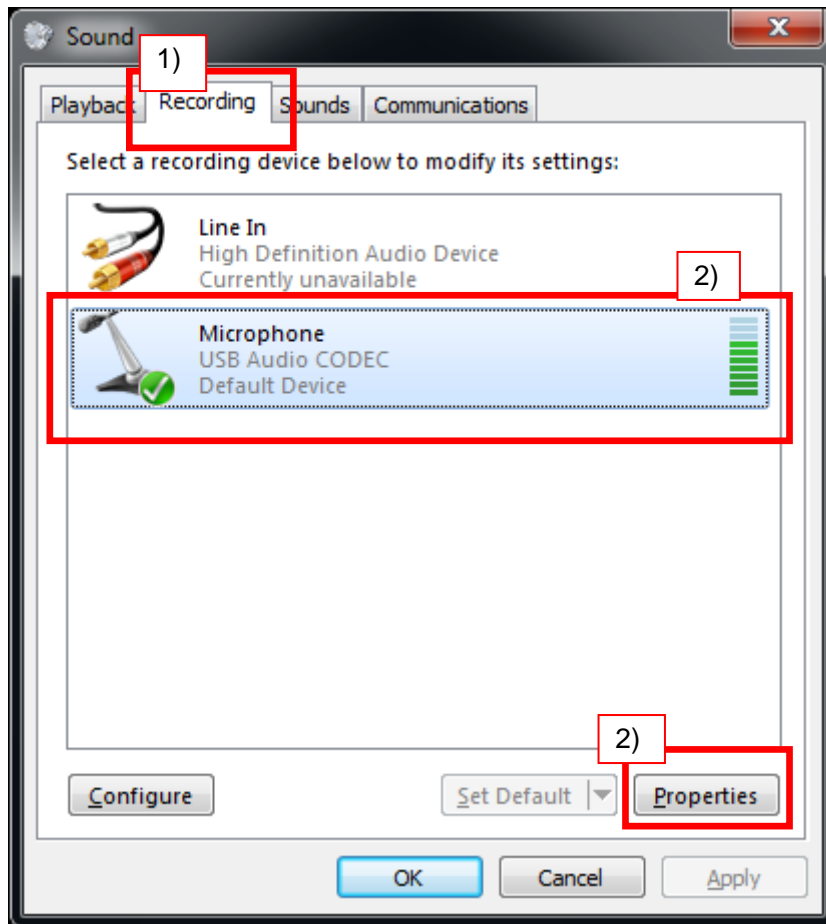
For details, refer to "4.1.6 Allocating the DATA SEND Function to the PF Keys".

4.3 Sound Settings on the PC

If you are using Windows Vista or later, by setting the sound properties of the PC, you will be able to hear the sound of the main and sub-bands.

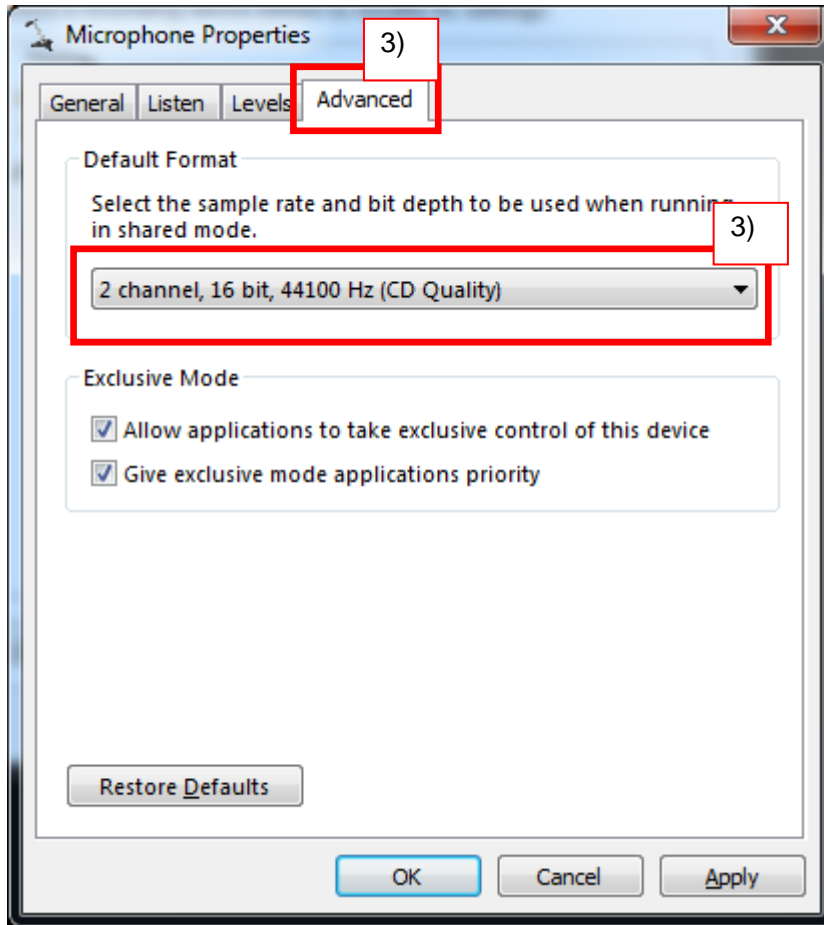
Connect the USB cable to the PC and the TS-990, and after turning ON the TS-990, follow the steps below.

- 1) Select the Start button > Control Panel > Hardware and Sound > Sound > Recording tab.
- 2) Select the microphone (USB Audio CODEC), and click the Properties.



3) The Microphone Properties screen appears. Select the Advanced tab, set the "2 channel, 16-bit * to the default device.

* In here, the sample rate is displayed; choose the one you want to use. The sample rate that is displayed in the choices depends on the environment of the PC.




4) Click OK to close the dialog.

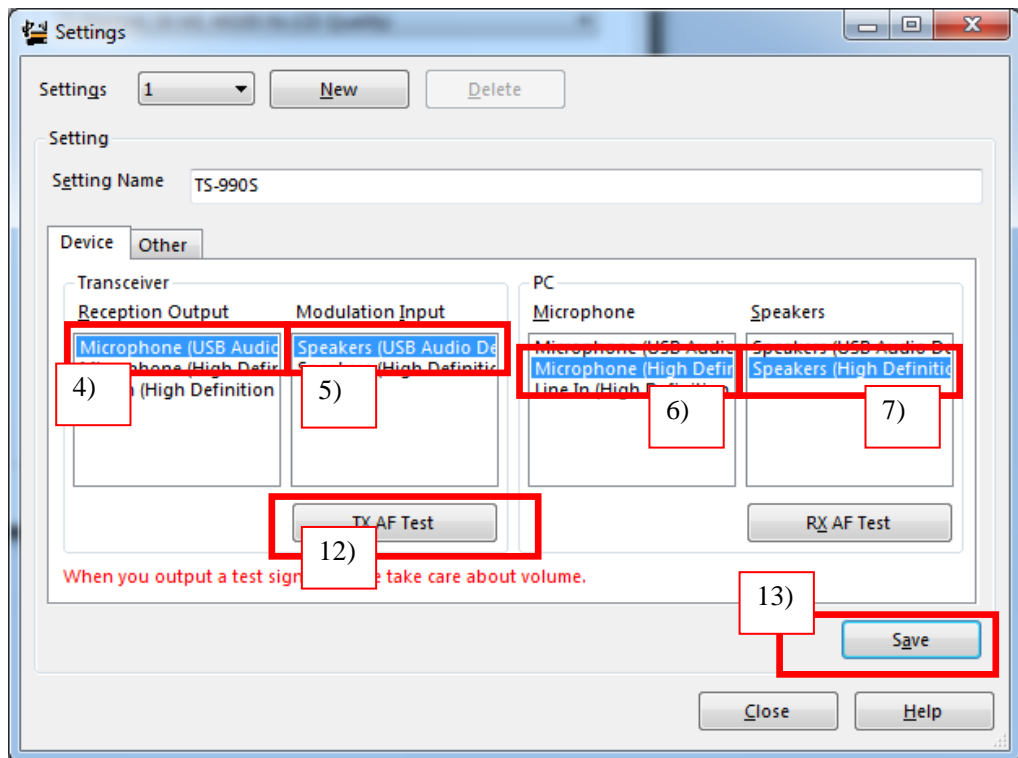
Note

- Device names vary depending on your PC or sound device.

4.4 ARUA-10 Settings

Follow the steps below to set up the ARUA-10

- 1) Connect the TS-990S and computer using a USB cable.
- 2) To launch the software, select Start Button > Programs > Kenwood > ARUA-10.
- 3) After launching the ARUA-10, a “Task Tray” icon  appears. Right click this icon and select “Device Settings” from the menu. The window shown below appears.



In this window you can specify sound devices for the transceiver's audio reception output and modulated audio input. You can also specify which microphones and speakers connected to the computer to use.

In the above example, the computer has recognized four types of input sound devices.

- Microphone (USB Audio Codec)
- Microphone (High Definition Audio)
- Line In (High Definition Audio)

There are two types of output sound devices.

- Speakers (USB Audio Codec)
 - Speakers (High Definition Audio)
- * The items listed depend on your operating system and sound devices used.

- 4) On the far left of the window, in the "Transceiver" section, set the "Reception Output". This is where the input is set for audio received from the transceiver. As audio reception comes into the computer as USB audio, select "Microphone (USB Audio Codec)".
- 5) In the second list, in the "Transceiver" section of the window, set the "Modulated Input". This is where the output is set for sending audio transmissions to the transceiver. As transmissions are sent to the transceiver as USB audio, select "Speakers (USB Audio Codec)".



- 6) In the third list, in the "PC" section of the window, set the "Microphone". This is where the computer microphone used for audio input to be transmitted is set. In the above example, "Microphone (High Definition Audio)" is selected.
- 7) In the fourth list, in the "PC" section of the window, set the "Speakers" device. This is where the computer speakers used for playing incoming audio are specified.

Clicking the "RX AF Test" button plays a test signal from the selected speaker.

Next, continue to follow the steps below to confirm that the intended audio transmission route is configured.

- 8) Connect a dummy load to the TS-990S.
- 9) If the TS-990S is in Split mode, switch to Simplex mode, with the mode set to SSB (USB or LSB).
- 10) Enable the transmission monitor function.
- 11) Press the PF key set as DATA SEND to transmit.
- 12) From the ARUA-10 window shown above, click the "TX AF Test" button. If test signals are played from the internal TS-990S speakers, the system is set up correctly. Press the PF key set as DATA SEND to return to audio reception mode.

If the test signal does not play, check the settings and try the test again.

- 13) From the ARUA-10 window, click the "Save" button to complete the setup.
- 14) From the ARUA-10 window, click the "Close" button to close the window.
- 15) Right-click on the  icon in the task tray to display the menu. From the menu, select "Start". The icon in the task tray changes to  and the ARUA-10 starts.

5. Limitations **IMPORTANT !**

5.1 USB Port Connectivity Limitations

If the PC and TS-990S 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 signals. Additionally, sound may be delayed or lost depending on the PC performance and load status. As such, do not perform operations for which delays are likely to be a problem (such as contests or communications requiring quick responses).

Also, when connected with a USB cable, alert sounds from other software or audio from music or videos may not play over the computer speakers.

Furthermore, when the DATA VOX function of the transceiver is “ON” and the computer and transceiver are connected with a USB cable, the transceiver may send sounds emitted by the computer. To avoid unintended transmissions when the computer and transceiver are left connected via USB, set the DATA VOX function to “OFF.”

Depending on the combination of OS, PC and sound functions, the USB audio function may not operate correctly. JVC KENWOOD does not offer support for customer computers.

6. Frequently Asked Questions

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

	Question	Answer
Installation	Where can I get the USB audio drivers?	You do not need to download the drivers. When the computer and TS-990S are connected via USB for the first time, the standard driver for your operating system is automatically installed.
	There appears to be many limitations. Is it actually possible to operate using the USB Audio Function?	Although it may not run exactly the same, when you get used to it, general communication on a practical level is possible. The point is to become accustomed to the delays particular to USB audio. You may have some initial confusion with issues like the standby timing.
	Can I use a USB or Bluetooth headset?	You can use a USB or Bluetooth headset. However, due to unavoidable delays using these devices it takes time for spoken audio to be transmitted. Also, time is required for received audio to reach the headphones. We do not recommend use of these devices when such delays can cause problems.

	Question	Answer
Operation	I cannot hear audio from the transceiver over the computer speakers.	<p>It is possible that the USB audio output level from the TS-990S is too low. Try adjusting the Menu items:-.</p> <p>No. 7-08: The main band USB audio output level</p> <p>No. 7-09: The sub-band USB audio output level</p>
		<p>If there is a mistake in the ARUA-10 settings, audio reception sent by USB audio to the computer is not played from the computer speakers.</p> <p>Refer to “4.4 ARUA-10 Settings” and check the settings.</p>
		<p>The volume setting of the computer speakers or headset may be too low. Try adjusting the volume settings.</p>

	Question	Answer
Operation	There is static in the audio transmissions. Audio transmission and reception levels are low.	<p>The USB audio input/output levels are not appropriately set. Adjust the settings via the TS-990S Menu items:- No. 7-05: Input level of the USB audio No. 7-08: The main band USB audio output level No. 7-09: The sub-band USB audio output level</p> <p>This may also depend on the specifications of the sound device used in your computer. Try using another sound card or USB sound device.</p> <p>The sound device driver may need to be upgraded. Try checking for new versions and upgrade the driver.</p>

	Question	Answer
Operation	Even though the transceiver is in transmission mode, I cannot transmit voice input from the computer microphone.	<p>If USB audio is not set to the audio source line for transmission, audio input of the USB audio is not sent. Refer to “4.1.1 Setting Up an Audio Input Route from the Rear Terminal” and check the settings.</p> <p>When transmitting using the TS-990S microphone PTT or “SEND” key, USB audio received by the TS-990S is not transmitted. When using the ARCP-990, the “Transmission Controls Settings” are required. Refer to “4.2 Setting the Transmission Method for Audio Input to the Rear Terminal” and check the settings.</p> <p>If there is a mistake in the ARUA-10 settings, USB audio input to the TS-990S is not transmitted. Refer to “4.4 ARUA-10 Settings” and check the settings.</p> <p>If the computer microphone or headset is muted, audio is not sent from the computer. Please check your computer’s sound function settings.</p>
	The transceiver does not transmit VOX when audio is input from the computer microphone.	<p>In order to transmit VOX when voice data input is received through the rear terminal, specific menu settings are required. Refer to “4.1.4 Data VOX Settings” and “4.1.5 Other settings for the DATA VOX” and check the settings.</p>

	Question	Answer
Operation	The end of audio transmissions are cut off. The system switches back to audio reception before sending all of an audio transmission.	<p>When using the ARCP-990, if you quickly switch to receive mode after using the computer's microphone to transmit, you may have switched before the audio is transmitted because of the delay in transmitting an audio signal via USB.</p> <p>If this happens, it may be possible to avoid such delays by slightly changing the method of operation, as described below.</p> <ul style="list-style-type: none"> • After transmission, watch the power and ALC meters and wait until the audio input to the transceiver finishes before switching back to reception mode. • Use the DATA VOX function. • Use a regular stereo jack instead of a USB or Bluetooth headset. • Set the delay time to reception transition. (TX/RX menu > Select Modulation Line... >Delay by TX to RX Transition)

	Question	Answer
Operation	<p>The transceiver transmits, even with no voice is input from the microphone, when the DATA VOX function is set to ON.</p> <p>Turning the DATA VOX function to ON causes the transceiver to transmit, even when the microphone is not connected.</p> <p>The transceiver transmits without my knowledge.</p>	<p>When the DATA VOX function is ON, for laptop computers with internal microphones, sounds near the computer that are loud enough to trigger the VOX are sent to the transceiver and are transmitted by VOX. Sounds from other software may also be sent to the transceiver and transmitted by VOX.</p> <p>Please try the following.</p> <ul style="list-style-type: none"> • Refer to “4.1.5 Other settings for the DATA VOX” and adjust the VOX Gain. • Use a headset. • While operating the transceiver, do not use other software. <p>If the above methods do not work, turn OFF the DATA VOX function.</p> <p>Also, when the computer is left connected to the transceiver using a USB cable, sounds from other software, such as alerts, music and video are transmitted to the transceiver and sent by VOX unintentionally.</p> <p>If you leave the computer and transceiver connected using a USB cable, turn OFF the DATA VOX function before using your computer.</p>
	<p>Reception quality depends on the device.</p>	<p>Voice audio is affected by voice encoding and the quality may differ from the original voice reception quality. This is part of the USB sound function specifications and is unavoidable.</p>
	<p>I can hear the beeping and voice guidance audio from the transceiver on the computer. Alternatively, I want to be able to hear them, but can't.</p>	<p>This can be configured in the transceiver menu.</p> <p>Please refer to “4.1.3 Mixed Beep Settings to External Audio Outputs”.</p>

	Question	Answer
Other	Is the ARUA-10 required when using KNS (remote operation over a network)?	The ARUA-10 cannot be used with KNS (remote operation over a network).
	Using the USB Audio Function while operating the TS-990S, the computer's standard audio can no longer be heard.	When operating the ARUA-10, audio reception from the transceiver is played over the computer speakers. If you want to stop audio reception, stop the ARUA-10 operation. Also, when not using the TS-990S, we recommend you disconnect the USB cable from the computer.

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