# KENWOOD

# TS-890S

## USB Audio Setting Manual

## Contents

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# 1. About the TS-890S USB Audio Function

This guide is a document for the ARUA-10 software which connects the TS-890S 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-890S is connected to the PC using a USB cable, the USB audio function can be used to play incoming audio over the PC speakers and transmit audio from the PC microphone.

This guide explains how to setup the TS-890S 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 PC.

## 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.

➢ To use the USB audio function, knowledge not only of transceivers but also of PCs is required. JVC KENWOOD Corporation does not offer support for purchasing PCs or for customer's PCs.

➢ 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.

➢ Depending on the OS installed in your PC, the status of Windows Update, sound device and driver, the function may not operate properly even if you setup it according to the procedure described in this document.

➢ Refer to Chapter "5.1 Limitations when using the USB audio function", for other limitations.

## 2. Operation Using the USB Audio Function

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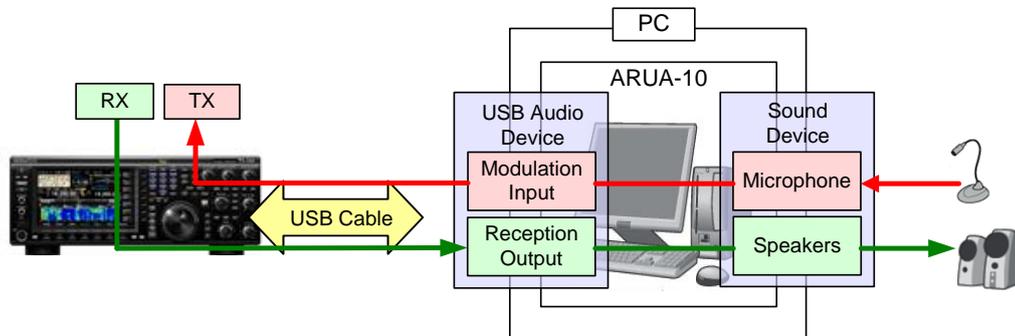


**Diagram 2.1 : Operation Using the USB Audio Function**

The left side of the diagram shows the TS-890S while the area in the square on the right side indicates the PC.
The TS-890S and the PC are connected using a USB cable. The microphone and speakers connected to the PC are shown on the far right.

Audio reception is explained first.
Incoming audio from the TS-890S is sent to the PC via the USB cable and played over the speakers connected to the PC.
A signal pathway on the PC 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 PC passes through the USB cable and is transmitted by the TS-890S.
A signal pathway on the PC 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 PC.

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 PC.

# 3. Installing the ARUA-10 Software

## 3.1 System Requirements

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

**Chart 3.1: System Requirements**

| Operating System (OS) | Windows 10 (version 1703 (OS Build 15063.0) or later, 32-bit or 64-bit version) <br> Windows 8.1 (RTM or later, 32-bit or 64-bit version) <br> 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) <br> Keyboard, mouse or other pointing devices <br> USB 2.0 port <br> 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 JVC KENWOOD Corporation website:
http://www.kenwood.com/i/products/info/amateur/software_download.html
For the installation method, refer to the guide on the download page above.

When connecting the TS-890S to a PC using a USB cable for the first time, driver required for the USB audio function are automatically installed.

If you are using the ARCP-890 and PC Control Command, you must install the "Virtual COM port driver" to connect the TS-890S with a USB cable.
Download and install the driver from the following JVC KENWOOD Corporation website:
http://www.kenwood.com/i/products/info/amateur/software_download.html
For the installation method, refer to the guide on the download page above.

## 3.3 About the Virtual COM Port Driver

When connecting the TS-890S to a PC 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 driver.

If you are not using an ARCP-890 or PC Control Command, there is no need to install the Virtual COM port driver. However, if it is not installed, this 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 driver, click "Cancel" and install the Virtual COM port driver before continuing.

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

# 4. Settings

## 4.1 Transceiver Settings

Complete the necessary transceiver settings before using the USB audio function. (Refer to the user manual for details on how to use the TS-890S.)

### 4.1.1 Setting up an Audio Input Route from the Rear Connector

Select the "USB Audio" to the audio source line to transmit audio that is input by the USB audio function. By default, when DATA mode is "ON", the USB audio is selected to input audio for transmission by DATA SEND. (Refer to the chapter entitled "Configuration of the Input Path of TX Audio", in the user manual.)

### 4.1.2 Audio I/O Level Settings

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

**Chart 4.1: Audio I/O Level Settings**

| Menu No. | Function |
|---|---|
| 7-08 | USB: Audio Output Level |
| 7-06 | USB: Audio Input Level |

### 4.1.3 Mixed Beep Settings to External Audio Outputs

With the TS-890S 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.

**Chart 4.2: Mixed Beep Settings to External Audio Outputs**

| Menu No. | Function |
|---|---|
| 7-11 | Audio Output Type (Rear Connectors) |

Reference:
To implement data communications such as SSTV, JT65 and FT7, set this function to "Received Audio Only".

### 4.1.4 DATA VOX Settings

If you use the DATA 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 Audio Source Input for Data VOX", in the user manual.)

Caution:
➢ When this function is "ON", all sounds created by the PC 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-890S 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 VOX Gain", "Adjusting the Anti VOX Gain Level" and "Adjusting VOX Delay Time", 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 connector. In this example, the [PF A] key has been set.

**Chart 4.3: Allocating the DATA SEND Function to the PF Keys**

| Menu No. | Function |
|----------|----------|
| 0-15 | PF A: Key Assignment |

Reference:

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 connector.

## 4.2 Setting the Transmission Method for Audio Input from the Rear Connector

The PTT switch of the microphone connected to the TS-890S and [SEND] keys on the TS-890S control panel are the method for transmitting audio input to the microphone connected to the TS-890S. 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-890
   With the ARCP-890, you must perform settings to transmit audio input through the rear connector to use the [Send] key in main window.
   Select "Select Modulation Line" from the ARCP-890 "TX/RX" menu. The "Select Modulation Line" window is displayed.

   In the window above, select "DATA SEND" in the "TX Operation for use in ARCP-890" setting

   For further details refer to the ARCP-890 help. (ARCP-890 details are downloadable from the JVC KENWOOD Corporation website.)

● Use the ACC 2 Connector's PKS terminal to transmit
   This setting allows you to transmit audio received by the rear connector by setting the PKS terminal in the ACC 2 Connector on the back of the TS-890S to "Low."
   For details on the connector and terminal specifications, refer to the TS-890S 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 connector
   For details, refer to "4.1.6 Allocating the DATA SEND Function to the PF Keys".

Reference:
You can also transmit audio received by the rear connector with PTT switch of the microphone and [SEND] key on the TS-890S control panel.
(Refer to the chapters entitled "Configuration of the Input Path of TX Audio", in the user manual.)

## 4.3 Sound Settings on the PC

Connect the USB cable to the PC and the TS-890S, and after turning ON the TS-890S, follow the steps below.

1) Select the Start button > Control Panel > Hardware and Sound > Sound > Recording tab.

2) Select the Line (USB AUDIO CODEC), and click the Properties.
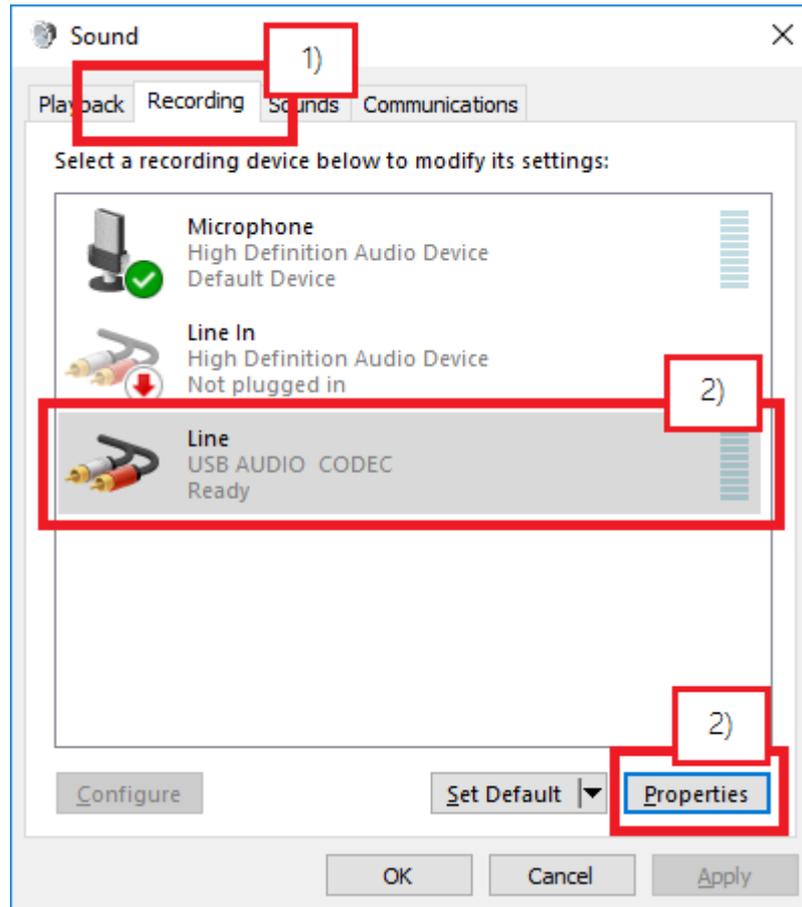


**Diagram 4.1 : Sound Function (Recording) window**

3) The Line Properties dialog appears. Select the Advanced tab, set the "2 channel, 16-bit *" to the default device. * In here, the sampling rate is displayed; choose the one you want to use. The sampling rate that is displayed in the choices depends on the environment of the PC.
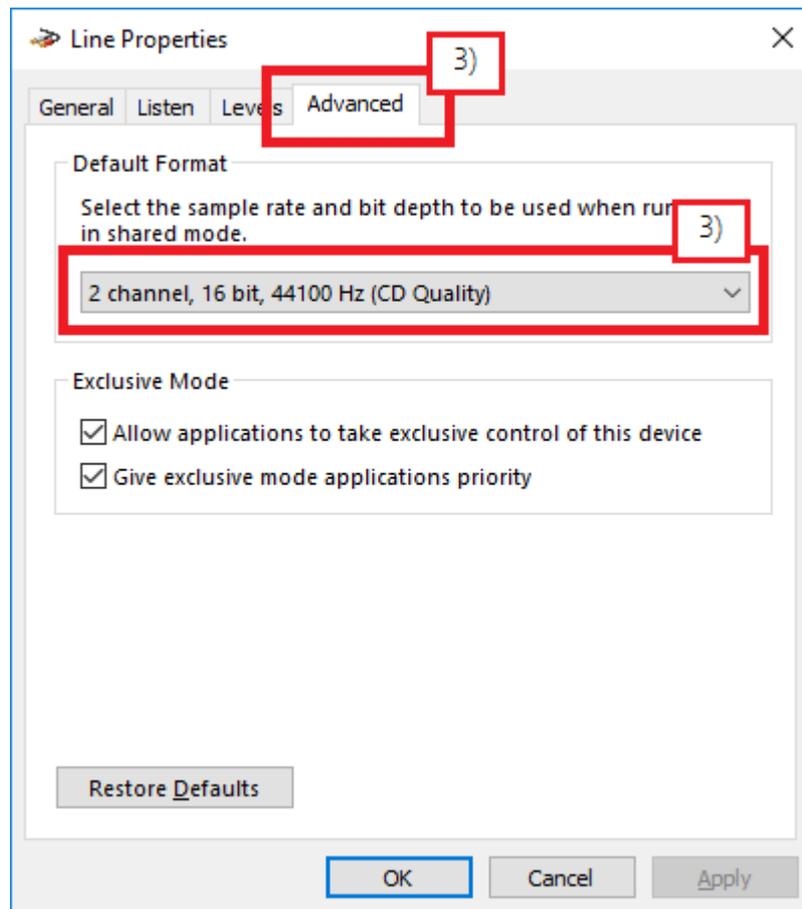
**Diagram 4.2 : Line Property (Advanced) dialog**

4)  Click OK to close the Line Property dialog.

Note:
Device names vary depending on your PC or sound device.

## 4.4 ARUA-10 Settings

Follow the steps below to setup the ARUA-10.

1) Connect the TS-890S and PC using a USB cable, and after turning ON the TS-890S.

2) To launch the ARUA-10, select Start Button > All 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.
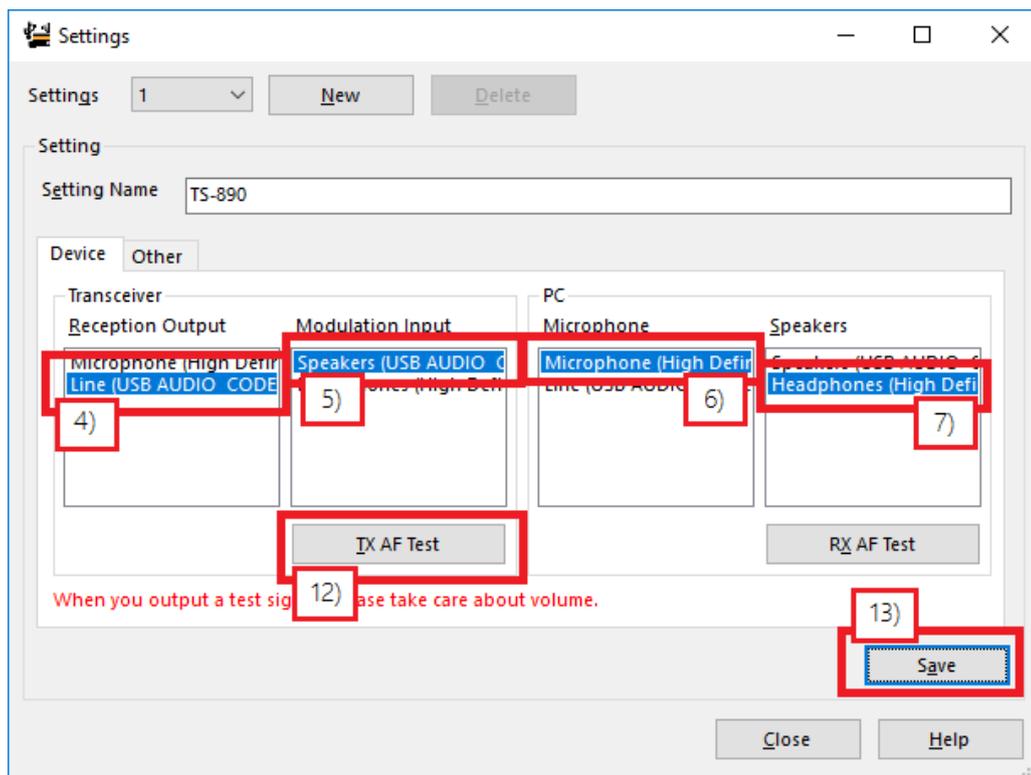


**Diagram 4.3 : ARUA-10 Settings window**

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

In the above example, the PC has recognized three types of input sound devices.
・ Microphone (High Definition Audio) *
・ Line (USB AUDIO CODEC) *

There are two types of output sound devices.
・ Speakers (USB AUDIO CODEC) *
・ Headphones (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 PC as USB audio, select "Line (USB AUDIO CODEC)".

5) In the second list, in the "Transceiver" section of the window, set the "Modulation 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 PC 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". This is where the PC speakers used for playing incoming audio is set. In the above example, "Headphones (High Definition Audio)" is selected.

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-890S.

9) If the TS-890S 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-890S speaker, 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) 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.

Reference:
You can adjust the modulation input volume and the speaker volume by right-clicking the icon in the task tray and selecting "Volume" from the menu displayed.

# 5.  Limitations

## 5.1 Limitations when using the USB audio function

If the PC and TS-890S 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 pile-ups 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 PC speakers.

Furthermore, when the DATA VOX function of the transceiver is "ON" and the PC and transceiver are connected with a USB cable, the transceiver may send sounds emitted by the PC. To avoid unintended transmissions when the PC 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 Corporation does not offer support for customer PCs.

# 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 driver? | You do not need to download the driver. When the PC and TS-890S are connected via USB for the first time, the standard driver for your operating system is automatically installed.<br><br>Supplementary:<br>There is no need to install the USB audio driver. However, we recommend install the Virtual COM port driver.<br>Refer to "3.3 About the Virtual COM Port Driver". |
| General | 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 headset or Bluetooth headset? | You can use a USB headset 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 the sound of the transceiver from the PC speakers. | It is possible that the USB audio output level from the TS-890S is too low. Adjust the settings via the TS-890S Menu items:- No. 7-08: USB: Audio Output Level |
| | | If there is a mistake in the ARUA-10 settings, audio reception sent by USB audio to the PC is not played from the PC speakers. Refer to "4.4 ARUA-10 Settings" and check the settings. |
| | | The volume setting of the PC speakers or headset may be too low. Try adjusting the volume settings. Also check that the speakers and headset are properly connected. |
| | Noise is mixed in the transmitted and received sound. Or, the transmitted / received sound is small, where should I check and adjust? | The USB audio input/output levels are not appropriately set. Adjust the settings via the TS-890S Menu items:- No. 7-06: USB: Audio Input Level No. 7-08: USB: Audio Output Level |
| | | The sound device driver may need to be upgraded. Try checking for new versions and upgrade the driver. |
| | | This may also depend on the specifications of the sound device used in your PC. Try using another sound card or USB sound device. |

| | Question | Answer |
|---|---|---|
| Operation | Even though the transceiver is in transmission mode, I cannot transmit voice input from the PC microphone. | If USB audio is not set to the audio source line for transmission, audio input of the USB audio is not sent.<br>Refer to "4.1.1 Setting Up an Audio Input Route from the Rear Connector" and check the settings. |
| | | When transmitting using the PTT switch of the microphone and [SEND] key on the TS-890S control panel, USB audio received by the TS-890S is not transmitted. When using the ARCP-890, the "TX Operation for use in ARCP-890" setting is required.<br>Refer to "4.2 Setting the Transmission Method for Audio Input from the Rear Connector" and check the settings. |
| | | If there is a mistake in the ARUA-10 settings, USB audio input to the TS-890S is not transmitted.<br>Refer to "4.4 ARUA-10 Settings" and check the settings. |
| | | If the PC microphone or headset is muted, audio is not sent from the PC.<br>Please check your PC's sound function settings. |
| | The transceiver does not transmit VOX when audio is input from the PC microphone. | In order to transmit VOX when voice data input is received through the rear connector, menu settings are required.<br>Refer to "4.1.4 DATA VOX Settings" and "4.1.5 Other settings for the DATA VOX" and check the settings. |

| | Question | Answer |
|---|---|---|
| Operation | The end of audio transmissions are cut off.<br>The system switches back to audio reception before sending all of an audio transmission. | When using the ARCP-890, if you quickly switch to receive mode after using the PC's microphone to transmit, you may have switched before the audio is transmitted because of the delay in transmitting an audio signal via USB.<br>If this happens, it may be possible to avoid such delays by slightly changing the method of operation, as described below.<br>・ After transmission, watch the power and ALC meters and wait until the audio input to the transceiver finishes before switching back to reception mode.<br>・ Use the DATA VOX function.<br>・ Use a regular stereo jack headset instead of a USB headset or Bluetooth headset.<br>・ Set the delay time to reception transition. (TX/RX menu > Select Modulation Line >Delay by TX to RX Transition) |

| | Question | Answer |
|---|---|---|
| Operation | The transceiver transmits, even with no voice is input from the microphone, when the DATA VOX function is set to "ON".<br><br>Turning the DATA VOX function to "ON" causes the transceiver to transmit, even when the microphone is not connected.<br><br>The transceiver transmits without my knowledge. | When the DATA VOX function is other than "OFF", for laptop PCs with internal microphones, sounds near the PC that are loud enough to trigger the VOX are sent to the transceiver and are transmitted by VOX.<br>Sounds from other software may also be sent to the transceiver and transmitted by VOX.<br><br>Please try the following.<br>・ Refer to "4.1.5 Other settings for the DATA VOX" and adjust the VOX Gain.<br>・ Use a headset.<br>・ While operating the transceiver, do not use other software.<br><br>If the above methods do not work, turn OFF the DATA VOX function.<br><br>Also, when the PC 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.<br><br>If you leave the PC and transceiver connected using a USB cable, turn OFF the DATA VOX function before using your PC. |
| | Reception quality depends on the device. | Voice audio is affected by voice encoding and the quality may differ from the original voice reception quality.<br>This is part of the USB sound function specifications. |
| | I want to stop the beeps and voice guidance emitted by the transceiver in order to make the PC decode in data communication. | This can be configured in the transceiver menu. Please refer to "4.1.3 Mixed Beep Settings to External Audio Outputs". |

| | 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-890S, the PC's standard audio can no longer be heard. | When the ARUA-10 is operating, audio reception from the transceiver output to the speaker of the PC. If you want to stop audio reception, stop the ARUA-10 operation.<br><br>Also, when not using the TS-890S, we recommend you disconnect the USB cable from the PC. |

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