

Broadcom Bluetooth® Software BTW6.X Audio Switch Function

This document describes the audio output switching mechanism of BTW software.

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Background

Broadcom Vista Profile Pack (VPP) installs two new virtual audio adapters on the operating system as shown on Figure 1:

- Bluetooth Hands-free Audio
- Bluetooth Stereo Audio

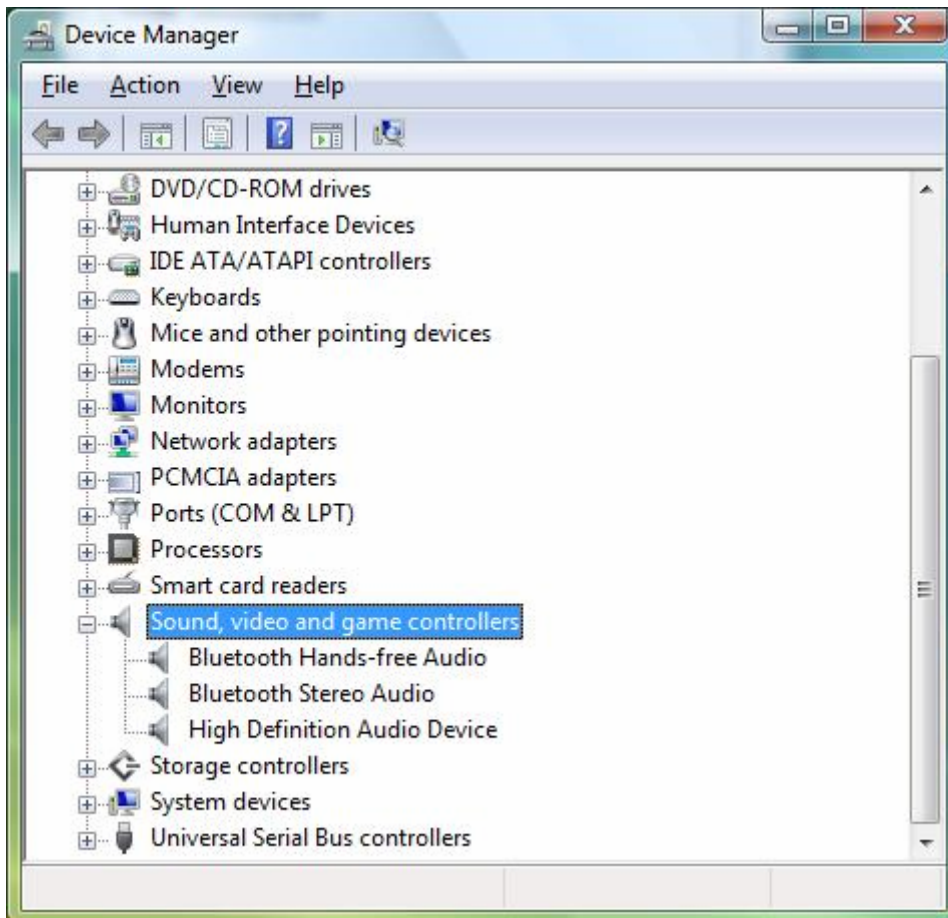


Figure 1: Virtual Bluetooth Audio Devices Listed in Device Manager

Each adapter hosts up to one audio device. When a Bluetooth® audio connection with the remote device is established, audio is routed through the virtual Bluetooth Hands-free Audio device for mono (SCO/eSCO) connections or through the virtual Bluetooth Stereo Audio device for stereo (A/V) connections, depending on the audio services available on the Bluetooth audio device.

Windows Default Audio Device

If the Bluetooth radio device that is attached to or embedded in the computer is not enabled, virtual Bluetooth devices, including audio devices, are unplugged. Figure 2 illustrates the available playback and recording devices that are listed in Control Panel when the Bluetooth radio device is not present.

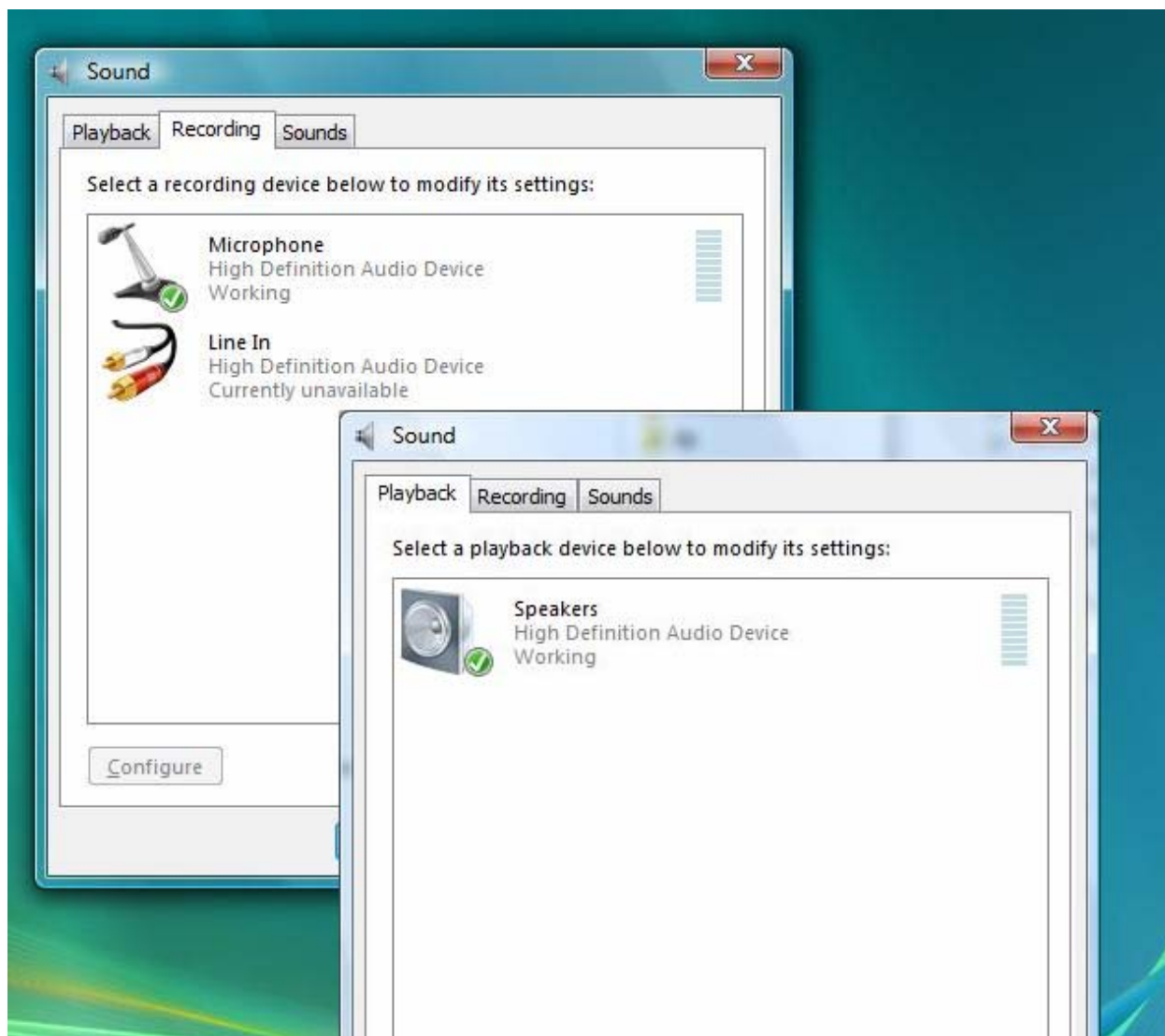


Figure 2: Windows® Default Playback and Recording Devices

Bluetooth Hands-Free Audio Device

When the Bluetooth radio is present and operational, the Bluetooth Hand-free device is available and can be used for playback and recording. A Bluetooth Hands-free device, however, should normally not be set as the default device. In accordance with Bluetooth specifications, the audio for a Hands-free device is set to 8 kHz, one-channel mono. This setting is adequate for telephony type applications but does not provide a rich Windows® media experience.

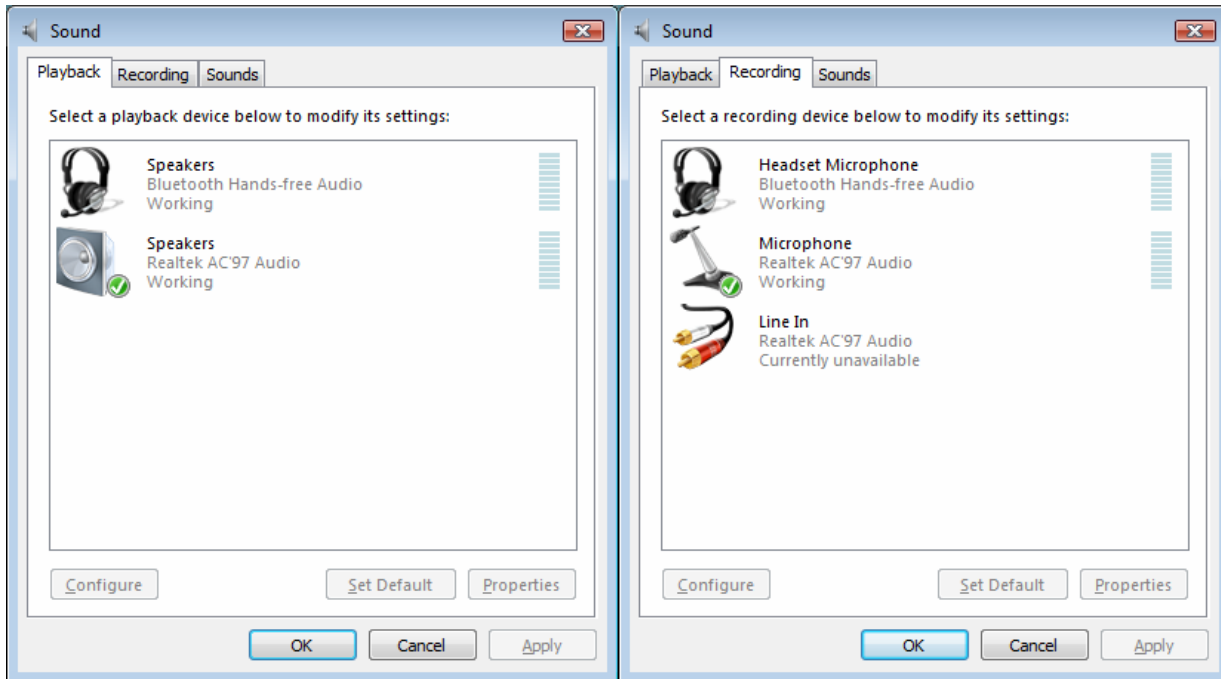


Figure 3: All Audio Devices Available for Playback and Recording

As illustrated on Figure 3, the internal Speakers and Microphone are set as the default playback and recording devices, respectively. Even if the Hands-free playback and recording devices are present, the internal devices are left as the default audio devices.

When using applications that require audio support, such as Google Talk, Yahoo Messenger, or speech recognition software, the user can configure the specific application to use the Bluetooth Hands-free Audio device.

If an application tries to use Bluetooth Hands-Free Audio but the connection has not been yet established, the user is notified to configure the hands-free device (see Figure 4 and Figure 5).



Figure 4: Bluetooth Hands-Free Not Connected Message



Figure 5: Bluetooth Hands-Free Not Connected Message

Bluetooth Stereo Audio Device

When the Bluetooth radio is enabled, the Bluetooth Stereo Audio device is not available as a playback device until the Bluetooth stereo headset is actually connected. A connection to Bluetooth stereo headset can be established either by selecting the Bluetooth Stereo Headset device on the Audio tab in Bluetooth Devices, and then clicking **Connect** (see Figure 6), or by pressing the Connect button on the headset.

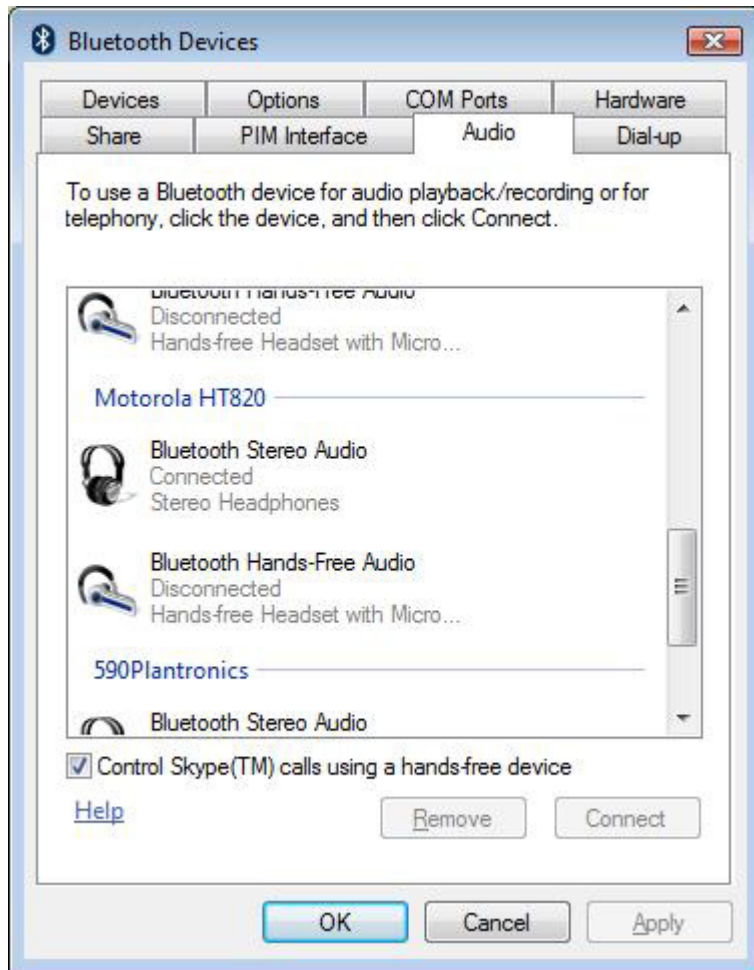


Figure 6: Establishing a Connection to a Bluetooth Stereo Audio Device in Bluetooth Devices

As soon as the connection to the Bluetooth stereo audio device is established, the device is available as a playback device in Control Panel (see Figure 7).

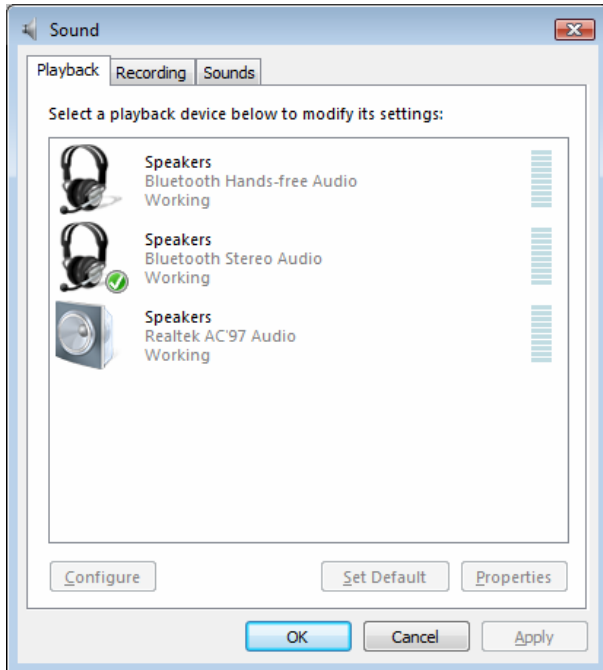


Figure 7: Bluetooth Stereo Audio Available as a Playback Device in Control Panel

The Bluetooth Stereo Audio device is configured as a preferred playback device. Therefore, whenever the computer establishes a connection with a Bluetooth headset Bluetooth Stereo Audio becomes the Windows default playback device. When a media player starts streaming audio after the Bluetooth stereo audio device is connected, the audio is redirected to the Bluetooth stereo audio device.

Automatic Skype™ Operation

BTW supports full hands-free operation with the Skype™ soft phone. Such hands-free operation includes answering incoming calls, redialing the last number, switching to a waiting call, placing a call on hold, and joining a call on hold. To enable hands-free operation, the user must allow BTW to use Skype by selecting **Allow this program to use Skype**, and then clicking **OK** (see Figure 8).

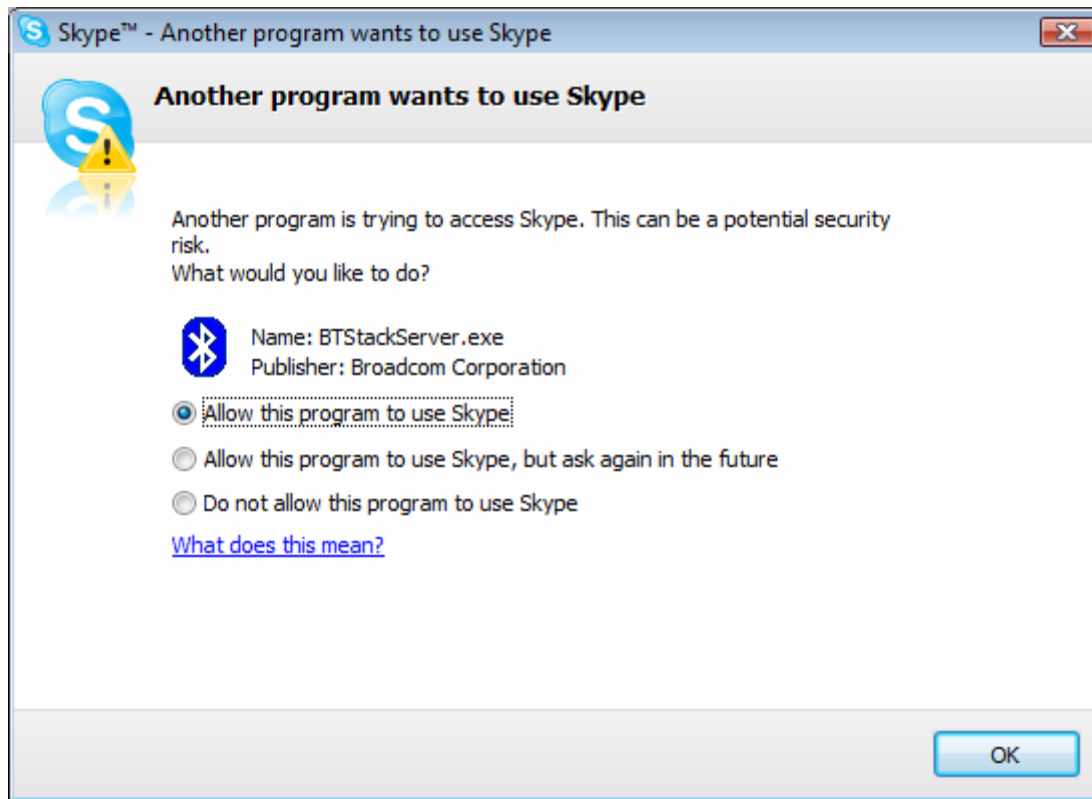


Figure 8: Skype Message

When a Skype call is active, BTW automatically switches Skype sound devices from the Windows default devices to Bluetooth Hands-free, as shown on Figure 9. This action is done automatically and does not require user intervention.

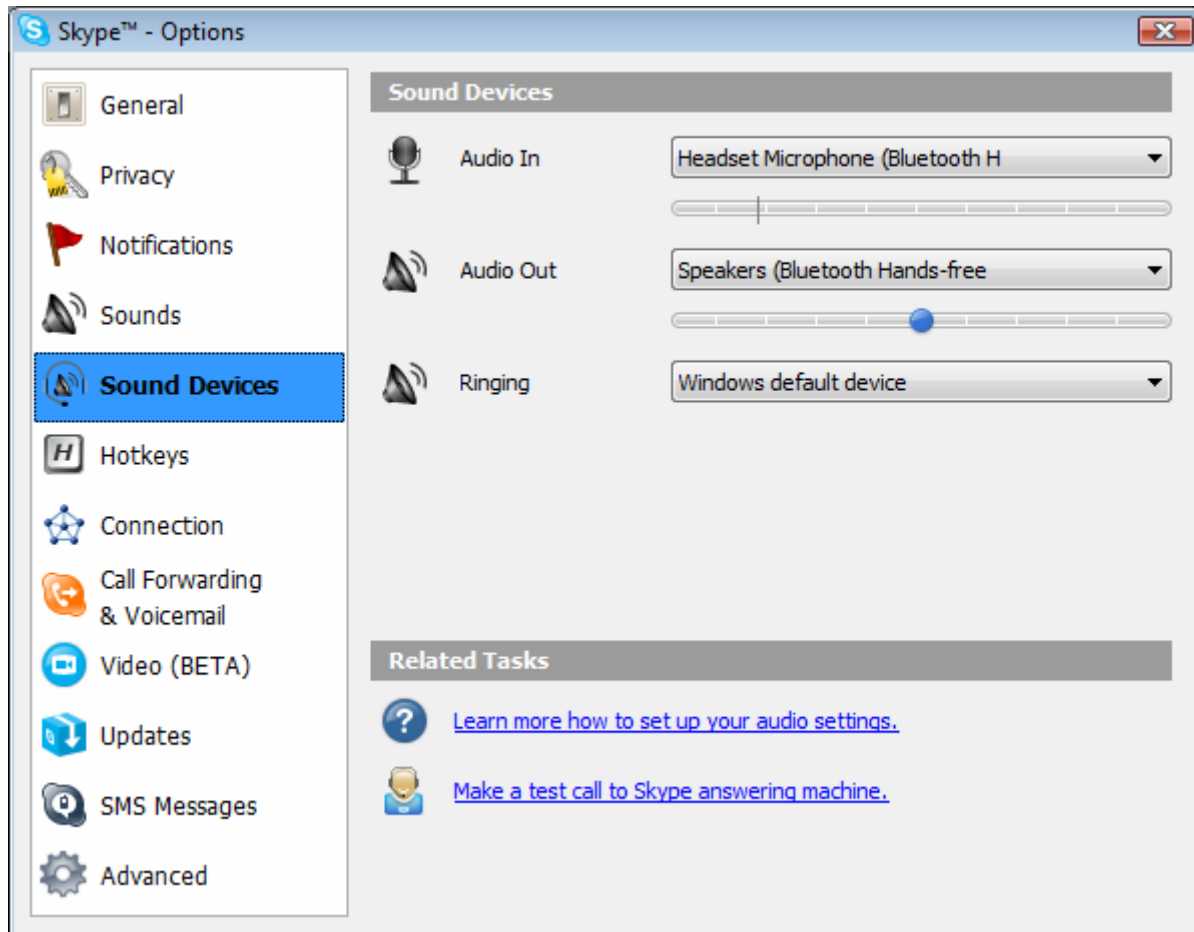


Figure 9: Skype Options → Sound Devices Settings

Automatic Audio Switch (AV/HFP) Operation

Some headsets support both audio functions: Bluetooth Stereo Audio for listening to high-quality audio, and Bluetooth Hands-free Audio for voice communications (see Figure 10). Both functions can be connected at the same time.

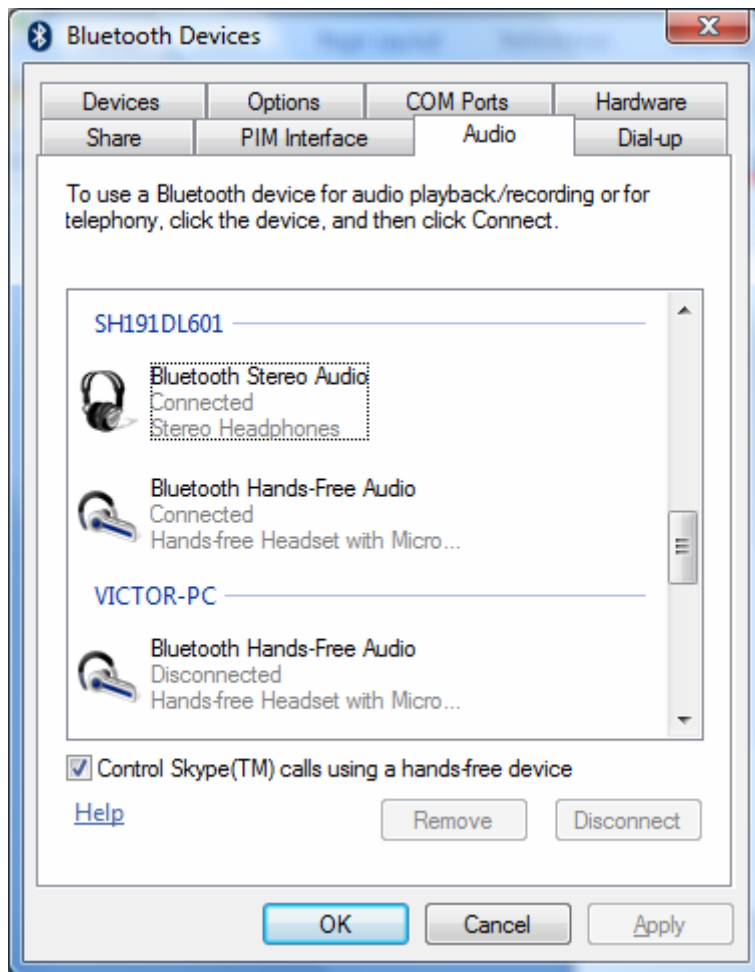


Figure 10: Bluetooth Devices → Audio

BTW supports automatic audio switching between Bluetooth stereo audio and Bluetooth hands-free audio devices. By default, Bluetooth Stereo Audio is set as the default audio device, with all sounds being automatically routed through the stereo device. When an application that is configured to use Bluetooth Hands-free Audio opens an audio device, the stereo audio stream is suspended until the application using the hands-free audio device stops using hands-free audio. An example of this feature is when the user receives an incoming Skype call while listening to stereo audio. When BTW detects the incoming call, the stereo stream is suspended while the user talks on the phone (using the Hands-free Audio functionality of the device). When the call is completed, the stereo stream automatically resumes.



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