

OpusFSI

Flight Simulator Interface for Prepar3D

OpusFSI ButtKicker Audio Control



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Installation

The ButtKicker must be wired into the audio. We recommend using a **Sound Blaster X-Fi Go PRO USB sound card** for the ButtKicker control to separate the BK audio control signals from the simulator's sound.

You should configure your normal P3D sound device, which normally has the speakers attached, as the Windows Default sound device in Control Panel. Then you assign P3D to the default sound device.

If you have a separate sound card for the ButtKicker then configure it to its assigned USB device which is NOT assigned as the default and is totally separate to your sim and speaker sounds. Ensure 3rd party addon sound packages do not use this separate sound card, they should use the default speakers instead.

Do NOT plug the ButtKicker into your primary speaker device, it will not work, it MUST be plugged into the dedicated UBS sound card device.

If you use choose to use a shared audio card then you will most likely be able to hear the BK audio since the human ear is sensitive throughout the entire BK frequency range. In this case without a separate sound card for the ButtKicker, you should disable 3rd party addon sound packages since they will conflict with OpusFSI.

Warning

ButtKicker Power Amplifiers have been known to overheat in the past so please take care in adjusting the ButtKicker control options and volume levels. We recommend to keep the volume levels adjusted to give a slight trembling effect with just a subtle hint of motion or vibration even at the maximum volume level setting.

Whilst in use always monitor the power amplifier to make sure the unit is not overheating.

Disclaimer

Opus Software Limited assumes no responsibility or liability for any injury, loss or damage incurred as a result of use of the ButtKicker device or the Opus ButtKicker audio control software.

Introduction

The current software includes audio control during taxiing, engine vibration, flaps movement, general turbulent motions, turbulent bump or jolt effects, spoiler or speed brake movement, landing gear movement, landing, roll out after landing and reverse thrust.

This version also includes frequency mixing to allow the audio signals for up to three effects to be modulated together.

If upgrading from previous version you may need to re-specify your **Master Volume** and reassign all defaults to all the effect options via the individual **Default** buttons. See our SimForum Announcements or \OpusFSI_v6\OpusFSI_Release_Notes.txt for details. The ButtKicker Audio Control is dependent on the **OpusFSI DHM** for its parameters and the OpusFSI DHM must be active or enabled when the FSI SERVER program starts in order to get any ButtKicker audio control output. The ButtKicker audio test will be conducted as normal but you will NOT get any ButtKicker control without the DHM parameters enabled.

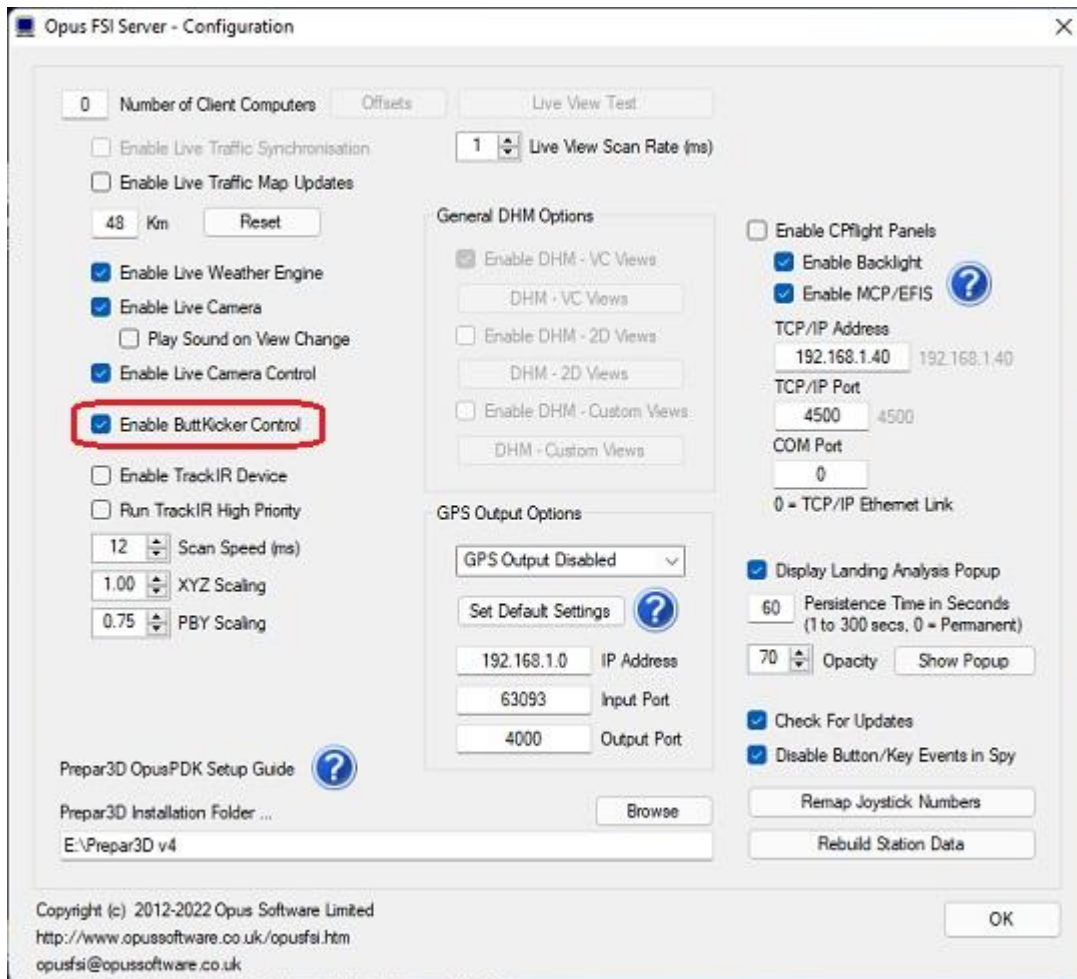
If you are not using Live Camera with DHM enabled in its camera views, then you must enable the General DHM, usually the VC views option. If you enable General DHM you MUST also restart the FSI SERVER program and let the ButtKicker complete its three part test (watch the Spy window) before the ButtKicker control will be active.

Hence,

If you are NOT using the OpusFSI DHM then you will NOT be able to use the OpusFSI ButtKicker Audio Control.

Configuration

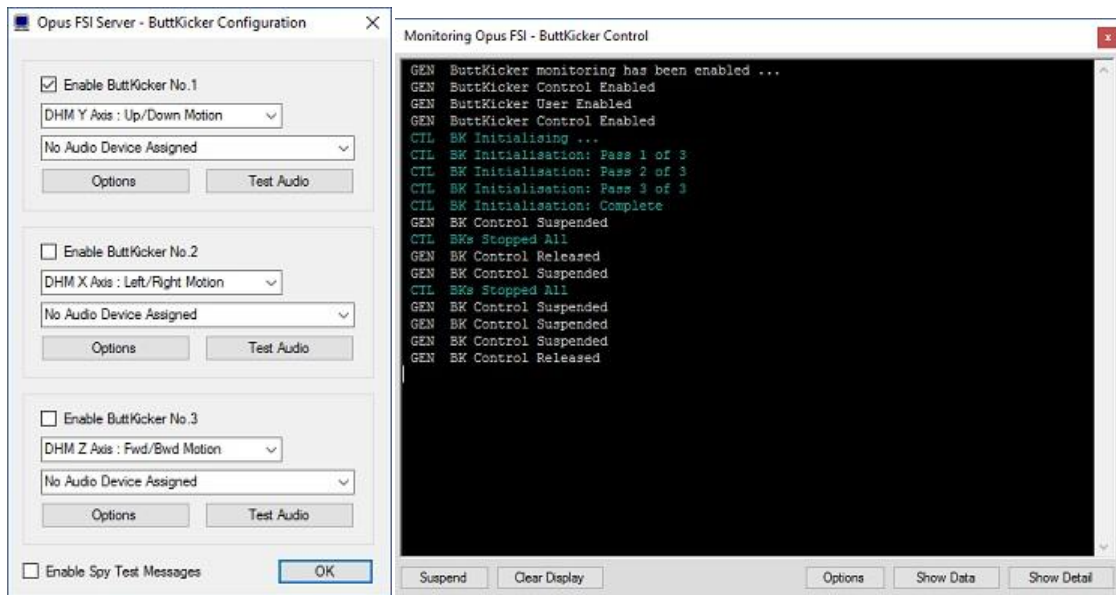
The **ButtKicker** enable option is configured via the **OpusFSI** server's **Configuration** dialog, accessed via the **Configure** button on the server's main form.



FSI SERVER Configuration Dialog

The P3DBKCTRL.EXE program is used on Prepar3D (dotNet 4) systems. This control program is activated automatically by the OpusFSI server. This removes from OpusFSI the burden of audio control.

The state, options, size, and position of the control Spy window is saved on program exit and restored on restart. Different coloured text is used to differentiate between the various control actions and audio channels. The Spy buffer is cleared automatically after 30 minutes.



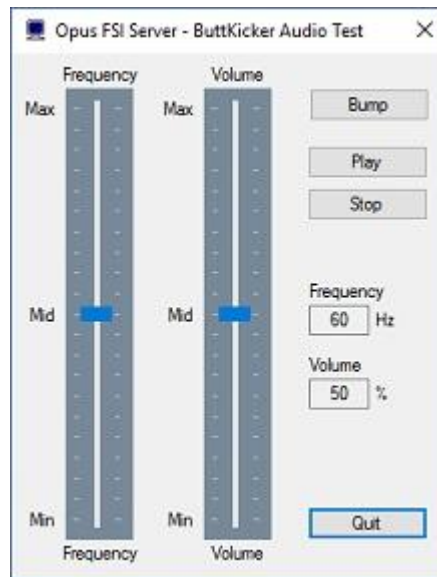
ButtKicker Configuration Dialog

This dialog is used to enable the ButtKicker devices, associate a DHM xyz axis to the device, and assign an audio output to the device. The **Spy** window will display test messages relating to the ButtKicker audio control.

There is a known bug in DirectX where the audio device order can be wrong, so if the obvious device selection does not work then try a different listed output. You can use the Windows Sound monitor (the dialog you use to adjust master volume it also allows you to select audio devices) to see the BK audio output on the desktop.

After enabling a ButtKicker device and assigning an audio output the **Test Audio** button should be used to test the selected audio output. For this you may need to plug in speakers, a headset, or the actual ButtKicker device.

After testing the audio output (which is audible) the **Options** button should be used to tweak the frequency options and set the required Master Volume level and if necessary tweak the individual effect volume levels.

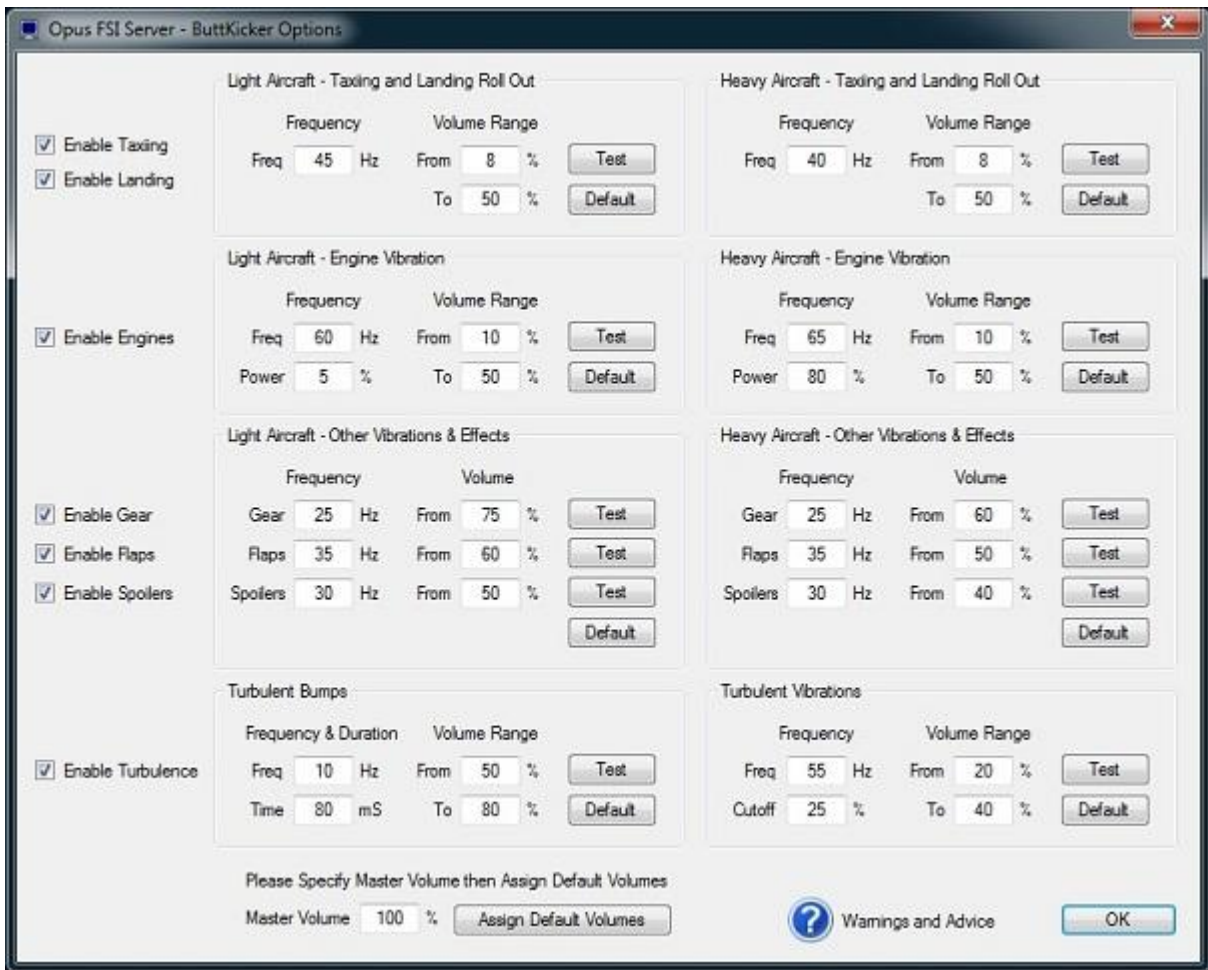


ButtKicker Audio Test Dialog

This dialog can be used to test the audio output for the selected audio device. The synthesized low frequency signals can range from 10Hz to 110Hz, these sounds are audible with the correct volume adjustment in both speakers and headphones.

Use the sliders to adjust the frequency and volume output of the signal. Press the **Play** button to output the audio signal, press the **Stop** button to stop the audio output. The **Bump** option can be used to simulate a Bump signal using the Bump parameters configured in the ButtKicker Options dialog.

This dialog will be found useful when testing the ButtKicker response to certain single frequency audio outputs and volume levels.



ButtKicker Options Dialog

This dialog is used to adjust the ButtKicker options including the **Master Volume** level.

The current **ButtKicker Warnings and Advice** can be displayed using the question mark (?) icon at the bottom of the dialog. The ButtKicker Warnings and Advice is also automatically displayed the first time you click on the OK button to ensure the ButtKicker Warnings are displayed including the **Disclaimer** statement from Opus Software Limited.

There is actually no real need to make great changes to the default settings, just set your **Master Volume** and use the **Assign Default Volumes** to adjust the default volume levels as described below. The BK has a limited range and response so there really isn't any great need to tweak very much at all, the default frequencies should all be pretty close to their ideal settings.

Setting The Master Volume Level

The **Master Volume** level can be specified as a percentage using the box provided. We recommend that all ButtKicker volume levels and ranges are set so that the ButtKicker Power Amplifier does not need to clip the signal at any of the specified volume levels or ranges.

For all but the Turbulent Bump effects, we recommend you set the volume levels to achieve a smooth rumble effect or a smooth trembling of the seat or platform. The ButtKicker effects should provide a subtle hint of motion or vibration rather than sudden and violent jolts.

To aid this we have provided Default volume settings, these can be set individually using the various **Default** buttons, in which case both the recommended frequency and volume levels are set. Alternatively, after specifying a **Master Volume**, all effect volume levels can be adjusted and assigned with appropriate defaults using the **Assign Default Volumes** button.

Normally the **Master Volume** will be set to match the Device and Application Mixer volume sliders displayed either using the Speakers icon on the taskbar or by opening the Volume Mixer dialog in Windows.

All default volume levels and ranges have been set for a typical direct feed from an installed 'internal' sound card and assuming a Mixer Volume setting of 100%. Hence setting the **Master Volume** to 100% will assign the lowest default volume levels and ranges as it assumes your Window's Mixer Volume has been turned up full.

Setting a lower **Master Volume** level and hitting the **Assign Default Volumes** button will result in increased volume levels and ranges being set. You can use this adjustment to match your own preferences keeping in mind the overall goals and recommendations for the ButtKicker effects.

If you are using a USB sound stick, such as the recommended Creative Labs Sound Blaster X-Fi Go PRO USB sound card, then even with the Window's Mixer Volume set to 100% you may need to reduce the **Master Volume** setting to 70% or 80% to correct for the lower volume output of the USB sound stick.

You can use either the **Test** buttons to get an idea of the ButtKicker response to the settings. Alternatively, use the **Test Audio** dialog and **Play** option to get an idea of the ButtKicker's response to a specific frequency and volume level setting.

Engine Vibration Power Level

At present the default Engine Vibration Power level for Light Aircraft has be set at 5% so that a gentle vibration can be felt providing feedback of the current throttle setting whilst

flying light piston aircraft. However, the default power level for Heavy (jet) aircraft has been set at a higher level (currently 80%). This higher power level setting is to ensure no vibration is felt at normal cruise power (N1) settings and hence you will not have the ButtKicker device permanently active on your medium and long haul flights. If you do fly for extended periods in a light piston aircraft you may like to consider increasing the power level setting to 80% for Light Aircraft, this should achieve the same thing and only bring in the ButtKicker vibration for the higher climb power settings.

Turbulent Vibrations Cutoff

The general turbulence threshold or cutoff point can be set by adjusting the 'Cutoff' parameter in the Options dialog. A setting of 0% will result in a threshold equal to the average turbulence deflection for the specified DHM axis. A setting of 50% will set the threshold to the midpoint between the average and maximum DHM deflection. A setting of 100% will disable the general turbulence effects altogether.

Toggling ButtKicker Control Off/On

A Shortcut command has been added to allow the ButtKicker control to be toggled on and off. You can assign a key sequence (e.g. Ctrl-Shift-B) or joystick button to this command in the usual manner via the Shortcuts dialog, accessed via the FSI SERVER program's main form.

If the Windows audio output suddenly stops for an unknown reason you can use the toggle on/off to reset the interface.

Initialisation

A single pass initialisation sequence helps settle the Windows audio out interface and also exercise the ButtKicker devices.

Timed Restarts

Timed restarts of the audio output have had to be introduced to overcome a looping problem within the Windows Audio Out functions which results in secretly silencing the audio output (aborting the audio loop) after short periods. This mostly happens after the program is first started.

Spy Messages

We have left some of the Spy messages in the software for certain Beta versions. These messages can be seen by clicking on the top right-hand **Spy** button on the server's main form. These messages will indicate the current mode, frequency, and volume of the BK audio and are indicated with the following messages.

```
TST BK Initialising ...
TST BK Initialisation Complete

TST BKn.x Timed Restart: xx secs
TST BKn.a <ID> PlaySound: freq Hz, vol
TST BKn.a <ID> Volume: vol
TST BKn.a Stopped

TST BKs Stopped All
```

Where 'n' indicates the ButtKicker device (1..3), 'a' identifies the audio channel (0..2, or x), and <ID> indicates the current mode or origin for the sound,

GND = Ground taxiing or roll out after landing effects.

ENG = Engine vibration effects.

GEAR = Landing gear effects.

FLAPS = Flaps deployment effects.

SPOILERS = Spoilers or speed brake deployment effects.

freq = The audio frequency, ranging from 10 to 110 Hz.

vol = The volume level, ranging from 1 to 100%.

Shutdown ButtKicker

The ButtKicker control program (BKCTRL) is monitored and automatically restarted by the OpusFSI server program should it shutdown for any reason. If you want to shutdown the program you must either disable ButtKicker control in the server program's configuration or shutdown the OpusFSI server program.