OpusMSFS

Flight Simulator Interface for MSFS

MSFS ButtKicker Audio Control

Contents

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 MSFS sound device, which normally has the speakers attached, as the Windows Default sound device in Control Panel. Then you assign MSFS 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 USB 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 MSFS.

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 a 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 \OpusMSFS\MSFS_Release_Notes.txt for details.

FSIAIRCRAFT.log

The generated c:\OpusMSFS\FSIAIRCRAFT.log file identifies each path searched and the total number of aircraft types identified in those paths. The head of the log file will read something similar to the following,

Path D:\FS2020\Official\OneStore
Path D:\FS2020\Community

Total 114 Aircraft Types Identified

Asobo_208B_GRAND_CARAVAN_EX
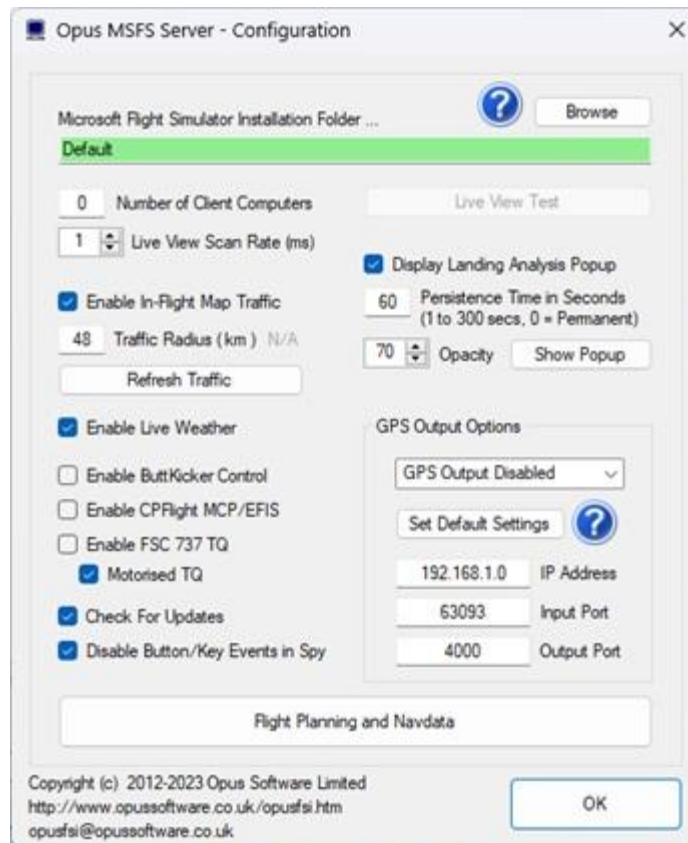Asobo_208B_GRAND_CARAVAN_EX_LiveryAviators
Asobo_208B_GRAND_CARAVAN_EX_Livery_Emerald
Asobo_208B_GRAND_CARAVAN_EX_Livery_Global
Asobo_208B_GRAND_CARAVAN_EX_Livery_Kenmore

Configuration

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

SERVER Configuration Dialog

The FSIBKCTRL.EXE program is used on MSFS (dotNet 4) systems. This control program is activated automatically by the OpusMSFS server. This removes from MSFS 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.
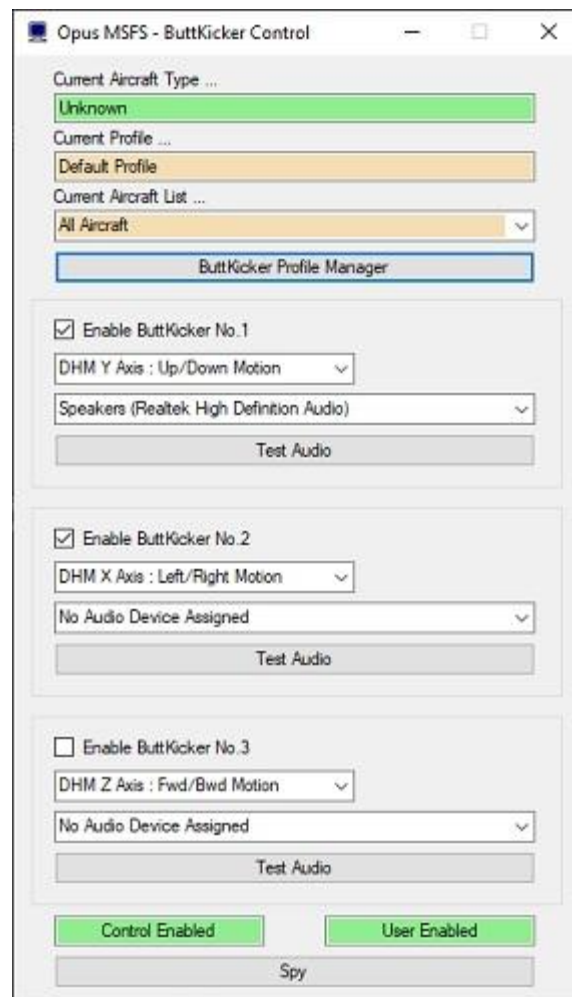
The **ButtKicker Control** dialog is used to enable the ButtKicker devices, associate a DHM xyz axis to the device, assign an audio output to the device and invoke the **ButtKicker Profile Manager**. The **Spy** window will display test messages relating to the ButtKicker audio control.

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.
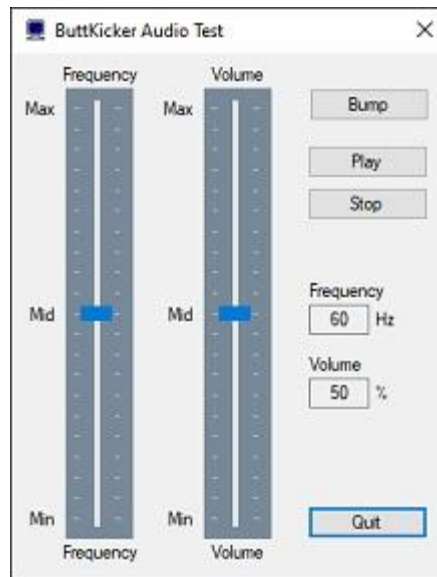
ButtKicker Audio Test Dialog

The **ButtKicker Audio Test** dialog is 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 (accessed via the **ButtKicker Control's** dialog's **Edit BK No.x** button).

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

After testing the audio output (which is audible) the **ButtKicker Profile Manager** button should be used to display the **ButtKicker Profile Manager** dialog in order to manage the ButtKicker profiles.

ButtKicker Profiles

When an aircraft type is selected in the simulator the program will search for a matching profile from profile number 001 onwards. The first profile with a matching aircraft type will be selected. If no match is found then the Default Profile (000) is selected. The Default Profile is always the first profile in the list and it's assigned to All Aircraft types.

Each ButtKicker Profile consists of a profile name, an assigned aircraft list, and the setting options for up to three ButtKicker devices (labelled BK No.1, BK No.2, and BK No.3).

Named profiles 001 onwards are user specified and always assigned to at least one aircraft type. These profiles are never global, they can never be assigned to 'All Aircraft'.

All current profiles are displayed in the Management dialog's list using the following display format,

XXX Profile_Name NN First_Aircraft_Type_in_Assigned_List

Where 'XXX' is the profile number (000 onwards) and 'NN' identifies the number of assigned aircraft. The Default Profile is always listed as '00 All Aircraft'.
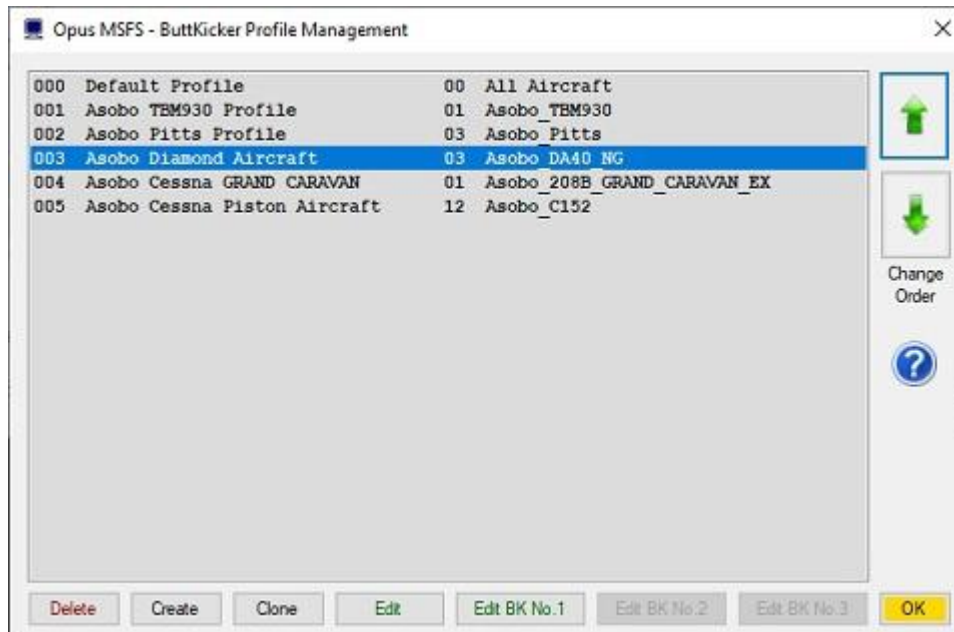
Creating a New Profile

Use the **Create** button to create a new ButtKicker profile. After clicking the button you will be presented with a list of currently available aircraft types.
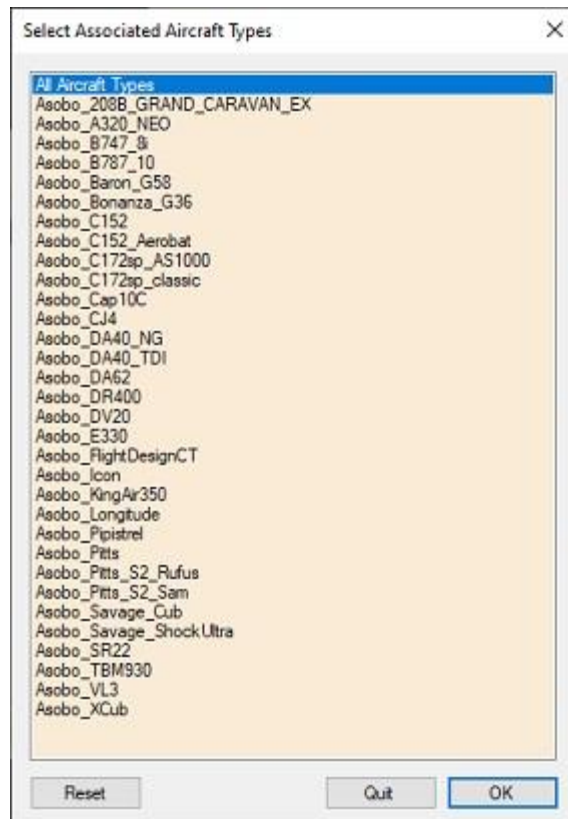
Highlight one or more of the listed aircraft using the normal Windows mouse selection methods. Hold down the **Ctrl** key to add/remove individual aircraft types. Hold down the **Shift** key to select consecutive groups of aircraft types. Once all aircraft types have been highlighted click on the **OK** button to create your new profile.

Once created, the new profile will be initialised with all default settings and automatically named <first_aircraft_type> Profile. If needed, you can edit the profile's name using the **Edit** button.

Cloning an Existing Profile

Use the **Clone** button to clone a highlighted ButtKicker profile. After clicking the button you will be presented with a list of currently available aircraft types. Highlight one or more of the listed aircraft using the normal Windows mouse selection methods. Hold down the **Ctrl** key to add/remove individual aircraft types. Hold down the **Shift** key to select consecutive groups of aircraft types. Once all aircraft types have been highlighted click on the **OK** button to create your new cloned profile.

Once cloned, the new profile will be initialised with all source profile's settings and automatically named <first_aircraft_type> Profile. If needed, you can edit the profile's name using the **Edit** button.
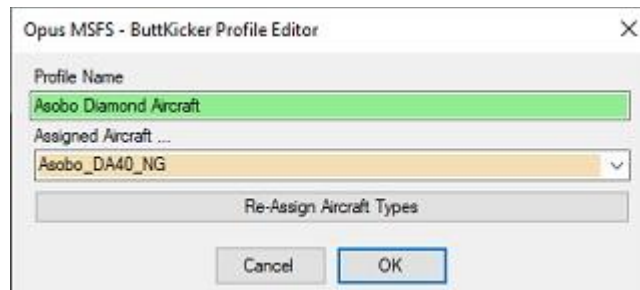
Editing a Profile

To edit a profile simply highlight the profile using the mouse and click on the **Edit** button. The Default Profile (000) cannot be edited. After clicking the Edit button the **ButtKicker Profile Editor** dialog will be displayed.

Edit the profile's name in the text box or examine the aircraft list using the dropdown arrow. Use the **Re-assign Aircraft Types** button to make changes to the aircraft list and enter **OK** or **Quit**.
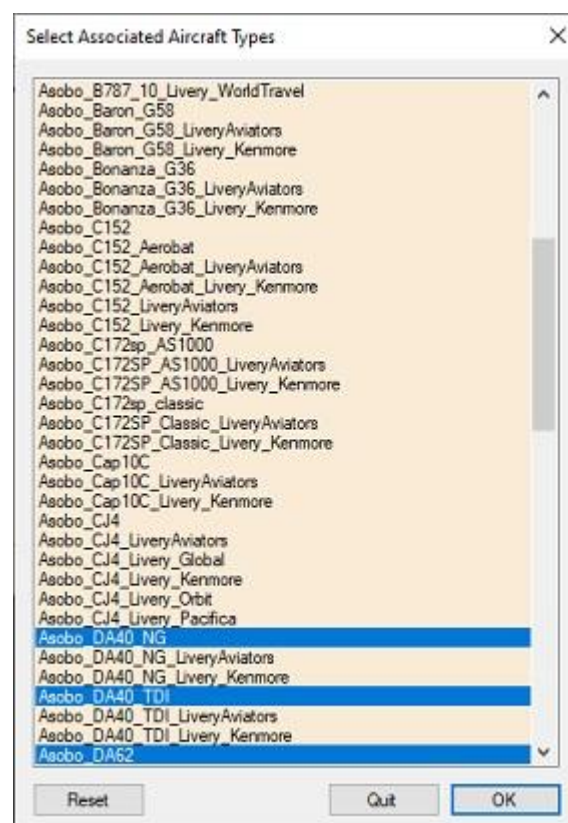
Use the **OK** button to action the changes. Use the **Cancel** button to abort the operation.

Deleting a Profile

To delete a profile simply highlight the profile using the mouse and click on the **Delete**

button. The Default Profile (000) cannot be deleted. After clicking the Delete button you will be prompted to confirm the operation before the profile is deleted.

Modifying a Profile's Assigned Aircraft Types

The assigned aircraft types cannot be edited directly. If you want to modify the assigned aircraft types for a profile you must **Clone** the profile to assign the new aircraft list then **Delete** the original profile.

Moving a Profile Up and Down the List

Profiles within the displayed list can be moved up and down the list using the green Up and Down Arrow buttons. The Default Profile cannot be moved and always will be listed as profile 000.

Editing a Profile's Options

A profile's settings (options) can be altered using one of the **Edit BK No...** buttons. Use the Edit BK No.1,Edit BK No.2, or Edit BK No.3 buttons to alter the settings for configured ButtKicker Devices 1 to 3 respectively. Tweak the frequency options and set the required **Master Volume** level and if necessary tweak the individual effect volume levels.

ButtKicker Options Dialog

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.

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 Piston Aircraft has be set at 2% 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 Jet (Heavy) 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 Piston 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.

Copy Settings to Other Devices

If you have more than one ButtKicker device then this option can be used to copy the settings to all other devices.

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.

The Timed Restart settings for each ButtKicker device can be changed via the **Timed Restarts** buttons within the main ButtKicker Control dialog.

The timed restarts are also applied to all 'Test Audio' sounds. Three durations are employed, namely the 'Initial', 'Minimum', and 'Maximum' durations. After the 'Initial' delayed restart the 'Minimum' duration is applied and doubled after each restart until the configured 'Maximum' duration is reached. Each setting may range from 5 seconds up to maximum duration of 3600 seconds (60 minutes). The 'Default' button can be used to revert back to the pre-beta default of 5, 15, and 300 seconds.
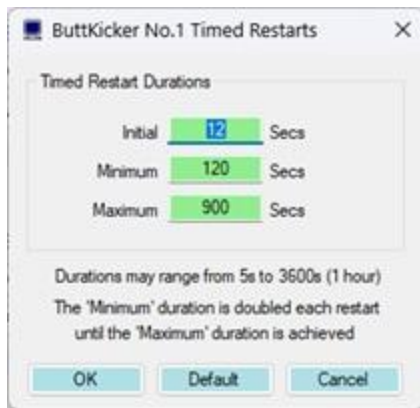
Spy Messages

These messages can be seen by clicking on the right-hand **Spy** button on the ButtKicker Control main dialog. 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 OpusMSFS 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 OpusMSFS server program.