# Instructions for Installing the Mixture Controller

**Requirements:**

This package includes controllers for the following three aircraft:

- Robert Young's Turbo-Normalized G36 Bonanza (https://github.com/roblenvic/Bonanza-Turbo)
- Just Flight Turbo Arrow III/IV (https://www.justflight.com/product/pa-28r-turbo-arrow-iii-iv-microsoft-flight-simulator)
- Carenado Seneca V (https://www.carenado.com/sitecarenado/product/pa34t-seneca-v-msfs2020/)

## Installation Instructions:

**Overview:**

For each aircraft, the mixture controller acts as an invisible WebAssembly (WASM) gauge in the cockpit which detects the mixture setting from a hardware controller (throttle quadrant, HOTAS with mixture axis, etc.) and sets a corresponding core-sim mixture setting which will produce realistic fuel/air mixture. To properly install the mixture controller, you will need to add the WASM gauge to the aircraft's "panel" folder, update the panel.cfg file to include a reference to the new WASM gauge, and update the layout.json for the aircraft so that the sim will load the new WASM gauge when the aircraft loads. Here are detailed instructions for how to accomplish this for each aircraft:

**Robert Young's Turbonormalized G36 Bonanza Mod:**

1. Backup the existing panel.cfg and layout.json files from Robert Young's mod in case anything goes wrong with the installation. To do this:
    a. Navigate to your community folder. If you need help finding it, use the instructions provided by Just Flight here: https://support.justflight.com/support/solutions/articles/17000113722-where-is-the-community-folder-msfs2020
    b. Enter the "Bonanza-Turbo-V3" directory and copy the layout.json file. Paste it to another folder outside the MSFS directory.
    c. Enter the SimObjects\Airplanes\Asobo_Bonanza_G36\panel folder. Copy "panel.cfg" and paste it to another folder outside the MSFS directory.
2. Extract the included TurboEngineMixtureController-main.zip file anywhere on your PC.
3. Inside the extracted file, navigate to the folder named "Turbo Bonanza"
4. Select both "Bonanza_Mixture_Controller.wasm" and "panel.cfg" and copy them.
5. Navigate to your MSFS community folder. Then navigate to the panel folder as follows: Bonanza-Turbo-V3\SimObjects\Airplanes\Asobo_Bonanza_G36\panel
6. Paste "Bonanza_Mixture_Controller.wasm" and "panel.cfg" inside the panel folder. When prompted, confirm that you would like to overwrite the existing panel.cfg file.

7. Go back to the extracted mixture_controller\Turbo Bonanza folder. Copy layout.json.
8. Return to your community folder and navigate to "Bonanza-Turbo-V3"
9. Paste layout.json inside "Bonanza-Turbo-V3." When prompted, confirm that you would like to overwrite the existing layout.json file.
10. Start Microsoft Flight Simulator (or restart it if it was already running). Select the Turbo Bonanza and begin a flight. If the mixture controller is working, you should see the virtual cockpit mixture lever gradually reduce during the climb from 0 - 10,000 ft.

**Just Flight Turbo Arrow III/IV:**

1. Backup the existing layout.json and panel.cfg files from the Turbo Arrow in case anything goes wrong with the installation. To do this:
    a. Navigate to your community folder. If you need help finding it, use the instructions provided by Just Flight here: https://support.justflight.com/support/solutions/articles/17000113722-where-is-the-community-folder-msfs2020
    b. Enter the "justflight-aircraft-pa28-turboarrow" directory and copy the layout.json file. Paste it to another folder outside the MSFS directory.
    c. Enter the SimObjects\Airplanes\JF_PA28_TurboArrow_III\panel folder. Copy "panel.cfg" and paste it to another folder outside the MSFS directory. This will create a backup for the Turbo Arrow III's panel config file. The "panel.cfg" file for the Turbo Arrow IV is identical, so there is no need to create a separate backup for the Turbo Arrow IV.
2. Extract the included TurboEngineMixtureController-main.zip file anywhere on your PC.
3. Inside the extracted file, navigate to the folder named "Turbo Arrow"
4. Select both "JFTurboArrow_Mixture_Controller.wasm" and "panel.cfg" and copy them.
5. Navigate to your MSFS community folder. Then navigate to each of the panel folders for the Arrow III and Arrow IV as follows:

    justflight-aircraft-pa28-turboarrow\SimObjects\Airplanes\JF_PA28_TurboArrow_III\panel
    justflight-aircraft-pa28-turboarrow\SimObjects\Airplanes\JF_PA28_TurboArrow_IV\panel

6. Paste JFTurboArrow_Mixture_Controller.wasm" and "panel.cfg" in each of the panel folders listed above. When prompted, confirm that you would like to overwrite the existing panel.cfg files.
7. Go back to the extracted mixture_controller\Turbo Arrow folder. Copy layout.json.
8. Return to your community folder and navigate to "justflight-aircraft-pa28-turboarrow"
9. Paste layout.json inside "justflight-aircraft-pa28-turboarrow" When prompted, confirm that you would like to overwrite the existing layout.json file.
10. Start Microsoft Flight Simulator (or restart it if it was already running). Select either the Turbo Arrow III or the Turbo Arrow IV and begin a flight. If the mixture controller is working, you should see the virtual cockpit mixture lever gradually reduce during the climb from 0 – 10,000 ft.

**Carenado Seneca V:**

1. Backup the existing layout.json and panel.cfg files from the Seneca V in case anything goes wrong with the installation. To do this:
    a. Navigate to your official packages folder. You can find it by moving one level up from your community folder. If you need help finding the community folder, use the instructions provided by Just Flight here: https://support.justflight.com/support/solutions/articles/17000113722-where-is-the-community-folder-msfs2020
    b. Enter the Official directory. If you've purchased MSFS from the Microsoft Store, there is a subdirectory inside Official called "OneStore." Enter the OneStore directory and then enter the "carenado-aircraft-pa34-senecav" directory and copy the layout.json file. Paste it to another folder outside the MSFS directory.
    c. Enter the SimObjects\Airplanes\Carenado_PA34_Seneca_V\panel folder. Copy "panel.cfg" and paste it to another folder outside the MSFS directory.
2. Extract the included TurboEngineMixtureController-main.zip file anywhere on your PC.
3. Inside the extracted file, navigate to the folder named "Seneca V"
4. Copy "SenecaV_Mixture_Controller.wasm".
5. Navigate to your "Official\OneStore" folder as described in 1b above. Then navigate to the panel folder for the Seneca V as follows:

    carenado-aircraft-pa34-senecav\SimObjects\Airplanes\Carenado_PA34_Seneca_V\panel

6. Paste SenecaV_Mixture_Controller.wasm".
7. The "panel.cfg" file from Carenado is copyrighted, so I will not provide a drag-and-drop version here. Open panel.cfg in Notepad (or a text editor of your choice) and add the following lines after the [Vcockpit10] section and before the [Color] section:

```
[Vcockpit11]
size_mm=0,0
pixel_size=0,0
texture=$PFD
background_color=0,0,0
htmlgauge00=WasmInstrument/WasmInstrument.html?wasm_module=
SenecaV_Mixture_Controller.wasm&wasm_gauge=FdGauge,0,0,1,1
```

    (The line beginning with htmlgauge00 should be one continuous line with no breaks or spaces. It doesn't fit on one line in this document.)

8. Go back to the extracted mixture_controller\Seneca V folder. Copy layout.json.
9. Return to your Official\OneStore folder and navigate to "carenado-aircraft-pa34-senecav"
10. Paste layout.json inside "carenado-aircraft-pa34-senecav" When prompted, confirm that you would like to overwrite the existing layout.json file.

11. Start Microsoft Flight Simulator (or restart it if it was already running). Select the Seneca V and begin a flight. If the mixture controller is working, you should see the virtual cockpit mixture levers gradually reduce during the climb from 0 – 10,000 ft.