HoneycombOnArm64MacOS

User Guide

Honeycomb Bravo configuration plugin

Native Apple Silicon

For X-Plane 12

OpenSource

Run X-Plane 12 Apple Silicon compatible aircraft with Honeycomb Bravo controls, without needing Rosetta

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Features

Assign commands for all rotary controls
Assign commands for all autopilot buttons
Assign datarefs for all annunciator lights
Assign datarefs for all autopilot button lights
Use Bravo switches to modify rotary and button behaviour

Built-in configs for all Laminar Research supplied aircraft

Uses JSON files to read/modify/create configs

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Creating JSON configuration files

Ensure the plugin is installed and configured as shown in the installation guide
Ensure this aircraft has been configured to use the plugin as shown in the installation guide.

- Each time a new flight is started the plugin checks for a json configuration file for that specific aircraft
- If the json file exists the plugin reads the X-Plane commands and datarefs then assigns them to the bravo controls
- If no json file exists the plugin creates a default configuration and writes this to a new json file for that aircraft
- Default configurations are built-in for all Laminar Research supplied aircraft and for some 3rd party aircraft (currently only Zibo 737, more may be added in future)

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Using the rotary controls – basic configuration

The left-hand rotary selects between ALT, VS, HDG, CRS, IAS
The right-hand rotary increments or decrements the chosen parameter

The json file configures a particular command to each of the five left-hand options

For example, the ALT selection may increase or decrease the Altitude setting
The VS selection may increase or decrease the vertical speed rate etc.

The specific commands to achieve this within X-Plane can vary between aircraft and these are the commands held in the json file

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Using the rotary controls – advanced configuration

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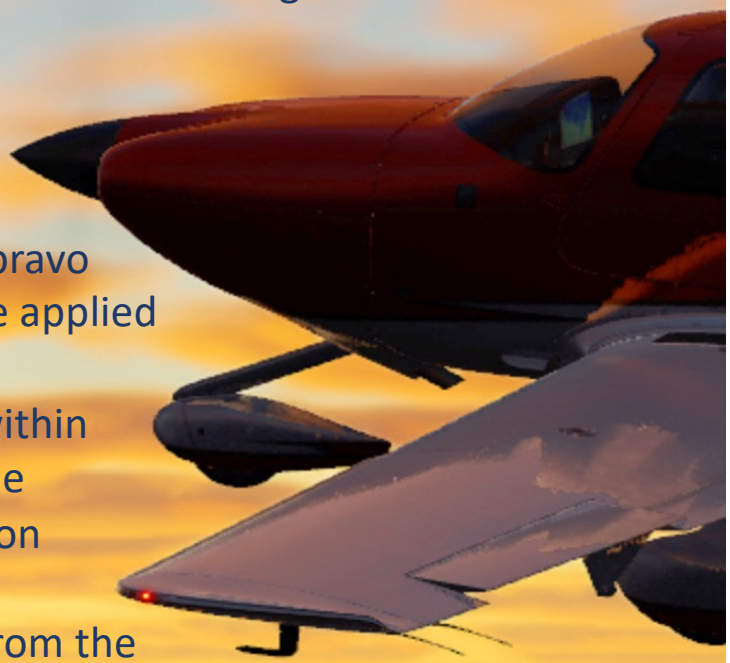
Within a single aircraft, more than one feature can be assigned to each rotary selection
For example, the ALT selection might also be used to adjust the QNH, or the CRS feature might be used to separately adjust the pilot CRS setting and the co-pilot CRS setting

The bravo switches are used to select between these different options

In effect, multiple profiles can be created for each rotary option, with each bravo rocker switch (see next slide) selecting a different profile of commands to be applied

Setting or unsetting the different rocker switches during flight (referred to within the plug-in as Toggles) dynamically modifies the flight control adjusted by the Increment/decrement rotary control for the ALT, VS, HDG, CRS or IAS selection

This enables a significant number of flight controls to be managed directly from the Bravo device



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Using the rotary controls – advanced example

The plug-in uses the 7 bravo switches as on/off toggles, numbered 1-7 from left to right (see previous page for details)
The table below shows an example configuration (a subset of the default Cessna Skyhawk config)

Active Toggle	ALT	VS	HDG	CRS	IAS
None active	Barometer up/down	Vertical speed up/down	Heading bug up/down	obs_1 Up/down	-
Toggle 7	Explained later	Explained later	Explained later	Explained later	Explained later
Toggle 6	-	-	obs_1 Up/down	-	-
Toggle 5	-	-	Co-pilot obs2 Up/down	-	-
Toggle 4	-	-	adf1_card Up/down	-	-

When all 7 toggles are in the 'off' position, the incr/decr rotary control will affect the flight controls in the 'none active' row (aka default command), depending on the feature selected by the left-hand rotary

If toggle 6 is Active (i.e., in the on position) then obs1 will be adjusted when HDG is selected. Alt, VS CRS and IAS are unaffected by toggle 6 being active as they do not have any parameter defined for this combination, so they continue to be Barometer, vertical speed etc. Similarly, if toggle 5 is active, the HDG option will adjust obs2.

The toggles are read from left to right, so if multiple toggles are active, the lowest numbered toggle is used

Where possible the default configurations try to align with cockpit workflows. For example, using the Toggle 6 profile to complete one phase of flight setup, then moving to Toggle 5 for the next setup phase and so-on. The default commands (no active toggles) are generally the ones most frequently used in flight.

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Using the rotary controls – moving quickly or precisely

Toggle 7 (directly under the incr/decr rotary) is reserved for controlling rotary resolution

Some flight controls such as altitude and heading can require large changes in value, but also need to adjust to a precise value.

Toggle 7 controls whether the incr/decr rotary jumps quickly through the scale, missing out intermediate values for rapid movement, or whether it moves through every single value to ensure a precise setting. This enables for example, changing the altitude setting from 10,000 to 30,000 feet to skip quickly to approximately 30,000 then slow down to precisely select the required value. This usage quickly becomes intuitive.

Where a parameter doesn't require rapid movement, for example setting vertical speed, this feature is disabled and the rotary is always set for precision.

In principle, when not required, toggle 7 could (and can) be configured with any other command. However, this could lead to confusion and the default configs all assume toggle 7 is reserved.

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Using the autopilot buttons – basic configuration

The 8 autopilot buttons* (HDG, NAV, APR, REV, ALT, VS, IAS, AP) can all be configured to trigger specific commands

Similar to the rotary controls, these command assignments are held within the json file for that aircraft

Default configurations are built-in to the plug-in for all Laminar Research Aircraft

The table below shows an example configuration (a subset of the default Laminar 737 config)

Toggle	HDG	NAV	APR	REV	ALT	VS	IAS	AP
None	Heading select press	LNAV press	VORLOC press	-	ALT HLD Press	VS Press	SPEED Press	CMD A press

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*These are the labels on my bravo control, I have seen images suggesting other variants exist

Using the autopilot buttons – advanced configuration

Similar to the rotary controls, more than one command can be assigned to each autopilot button, with the bravo toggles used to select between the different profiles

For the autopilot buttons, the toggles are read from right to left, so if multiple toggles are active, the highest numbered toggle is used. This is opposite to the way rotary controls scan the toggles and allows for button settings and rotary settings to be active simultaneously and independently, e.g., Toggle 1 and Toggle 6 both active, 1 changing button behaviour and 6 changing rotary behaviour (see later topic on aligned configurations)

The table below shows an example button configuration (the full default Laminar 737 config)

Toggle	HDG	NAV	APR	REV	ALT	VS	IAS	AP
None	Heading select	LNAV	VORLOC press	-	ALT HLD	VS	SPEED	CMD A
Toggle 4					FO RST			
Toggle 3					FO STD			CWS B
Toggle 2	EFIS Captain TFC				Captain RST			CWS A
Toggle 1	EFIS Captain CTR	VNAV	APP		Captain STD	Level Change		CMD B

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Controlling Garmin 430/530 (aligned configuration)

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By configuring an aligned set of commands for the rotary controls and the autopilot buttons, it is possible to adjust most features of the G430/G530 flight management devices directly from the Bravo control. (See also a later section on G1000 which follows a similar approach)

The bravo controls are mapped to the flight management device controls. The Toggles select different flight management functions and/or different Flight management devices where an aircraft has more than one.

The example below is an extract from the default Laminar Cessna Skyhawk configuration, which has a G530 and a G430. Moving the rotary selector between CRS and IAS switches the Gx30 between fine control and coarse control*.

When using aligned configurations like this, only one toggle should be active. Unexpected behavior may occur if multiple toggles are active.

Device	Toggle	Rotary CRS	Rotary IAS	Button HDG	Button NAV	Button APR	Button REV	Button ALT	Button VS	Button IAS	Button AP
G530	Toggle 6	COM/VLOC Coarse up/down	COM/VLOC Fine Up/down	COM-VLOC toggle	VLOC flip active	COM flip active					
	Toggle 5	FPL chapter up/down	FPL page up/down	CDI	FPL	PROC	Direct	MENU	CLR	CURSOR	ENT
G430	Toggle 4	COM/VLOC Coarse up/down	COM/VLOC Fine Up/down	COM-VLOC toggle	VLOC flip active	COM flip active					
	Toggle 3	FPL chapter up/down	FPL page up/down	CDI	FPL	PROC	Direct	MENU	CLR	CURSOR	ENT

*See the Aircraft default configuration guide for more information on how to use this

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Controlling Garmin G1000 (aligned configuration)

The example below is an extract from the default Laminar Lancair evolution configuration, which has two G1000 devices (PFD and MFD).

When using aligned configurations like this, only one toggle should be active. Unexpected behavior may occur if multiple toggles are active.

Device	Toggle	Rotary HDG	Rotary CRS	Rotary IAS	Button HDG	Button NAV	Button APR	Button REV	Button ALT	Button VS	Button IAS	Button AP
PFD	Toggle 6	-	NAV Coarse up/down	NAV Fine Up/down	NAV 1-2 toggle	NAV flip active						
	Toggle 5	-	COM Coarse up/down	COM Fine up/down	COM 1-2 toggle	COM flip active						
MFD	Toggle 4	Range Up/down	FMS Coarse up/down	FMS Fine Up/down	CDI	FPL	PROC	Direct	MENU	CLR	CURSOR	ENT

Using the controls in this way may be a little confusing to start with, but quickly becomes second nature with use. As far as possible, this same layout is used across all the default configurations, so familiarity gained via one aircraft transfers to other aircraft with similar flight management devices.

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Configuring annunciators and autopilot button LEDs

The plugin allows you to specify datarefs to control the lighting for the annunciator panel and for the autopilot buttons. These are configured in the json file.

The majority of the Laminar Research aircraft use a common set of annunciators, but some do add custom annunciators. Default configurations are provided for all the Laminar Research aircraft (see next 2 pages for details).

Note, not all aircraft support all annunciators. For example, some of the smaller aircraft do not have any hydraulic systems or an APU.

To control a light the dataref must have value zero when inactive (light off) and be non-zero when active (light on).

You can attach multiple datarefs to a single annunciator or button, in which case the light is off when all its associated datarefs are zero, or the light is on if any one of its datarefs is non-zero

The plugin supports integer, boolean and float datarefs, plus arrays.

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Default annunciator datarefs

Annunciator	Dataref
Master Warning	sim/cockpit2/annunciators/master_warning
Engine Fire	sim/cockpit/warnings/annunciators/engine_fire
Low Oil Pressure	sim/cockpit/warnings/annunciators/oil_pressure
Low Fuel Pressure	sim/cockpit/warnings/annunciators/fuel_pressure
Anti Ice	sim/cockpit/warnings/annunciators/ice
Starter Engaged	sim/cockpit2/engine/actuators/starter_hit
APU	sim/cockpit/engine/APU_running
Master Caution	sim/cockpit/warnings/annunciators/master_caution
Vacuum	sim/cockpit/warnings/annunciators/low_vacuum
Low Hyd Pressure	sim/cockpit2/annunciators/hydraulic_pressure
Aux Fuel Pump	sim/cockpit2/fuel/showing_aux
Parking Brake	sim/cockpit2/controls/parking_brake_ratio
Low Volts	sim/cockpit/warnings/annunciators/low_voltage
Door Light	sim/cockpit/warnings/annunciators/cabin_door_open

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Default autopilot button datarefs

Button LED	Dataref
HDG	sim/cockpit2/autopilot/heading_status
NAV	sim/cockpit2/autopilot/nav_status
APR	sim/cockpit2/autopilot/approach_status
REV	sim/cockpit2/autopilot/backcourse_status
ALT	sim/cockpit2/autopilot/altitude_hold_status
VS	sim/cockpit2/autopilot/vvi_status
IAS	sim/cockpit2/autopilot/speed_status
AP	sim/cockpit2/autopilot/servos_on

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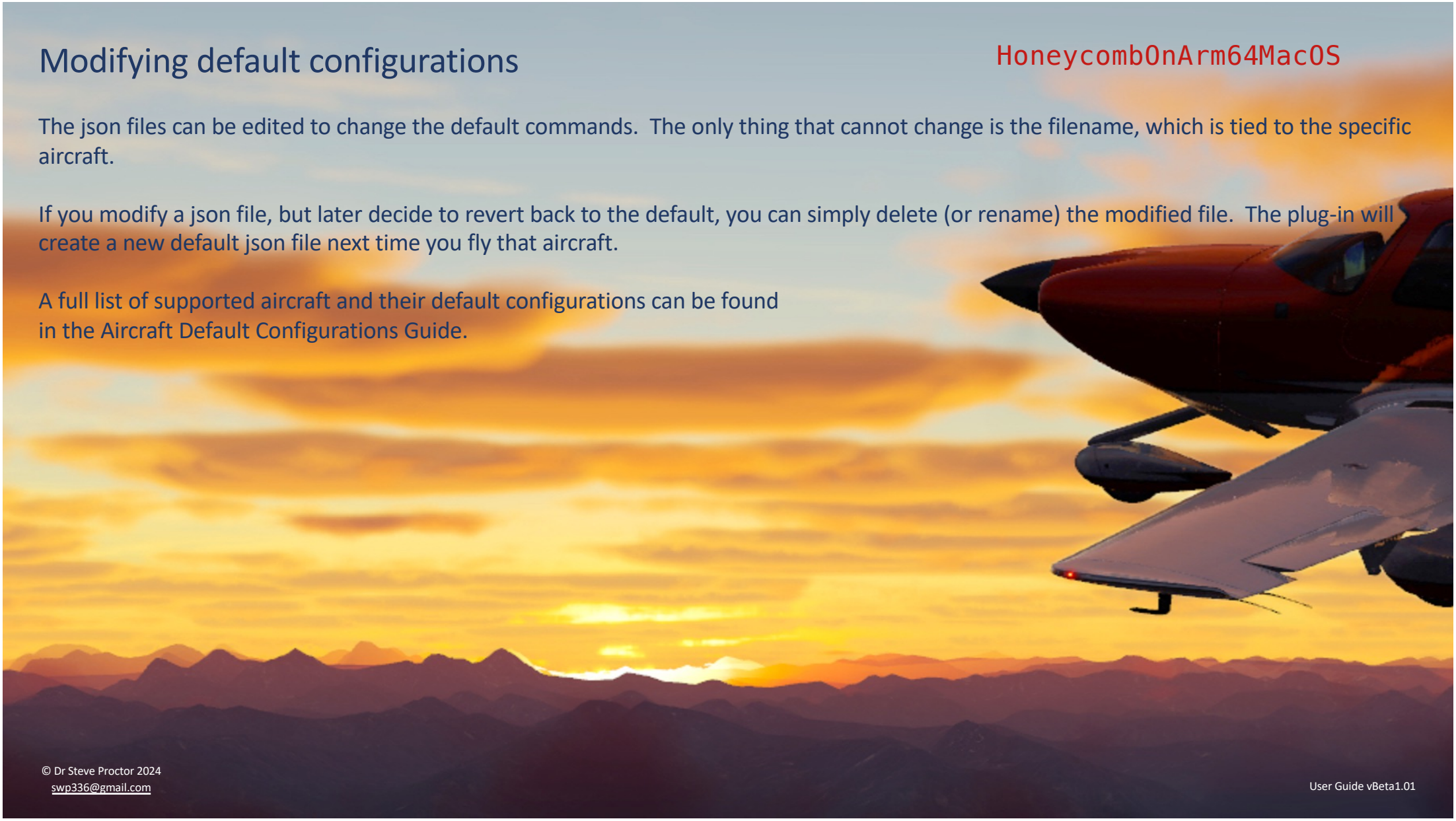
Modifying default configurations

The json files can be edited to change the default commands. The only thing that cannot change is the filename, which is tied to the specific aircraft.

If you modify a json file, but later decide to revert back to the default, you can simply delete (or rename) the modified file. The plug-in will create a new default json file next time you fly that aircraft.

A full list of supported aircraft and their default configurations can be found in the Aircraft Default Configurations Guide.



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Configuring unsupported aircraft

If you fly an aircraft the plugin doesn't know, it will create a basic default configuration. This will have the correct filename for the aircraft and a best guess at likely commands and datarefs. Depending on your aircraft, this basic default may have only partial functionality or possibly no functionality at all.

You then have two options:

1. Edit the default json file to the configuration you require, or
2. Copy an existing configuration that's closer to your requirements and rename it to the correct filename for the aircraft. Starting from a similar aircraft may be easier to edit than starting from the basic default

Note: using the DataRefTool plugin is a great way to interactively discover the commands and datarefs used by your aircraft. It proved invaluable when developing the default configs for the supported aircraft.

You can find it at https://datareftool.com

Instructions for editing the json file are beyond the scope of this guide. Hopefully a lot of the format is clear if you study the default files.

Note, the first release of the HoneycombForMac plugin has limited error detection when reading json files. It is tolerant of typos in command names and dataref names (they are interpreted as 'no action'), but syntax errors may crash the plugin.

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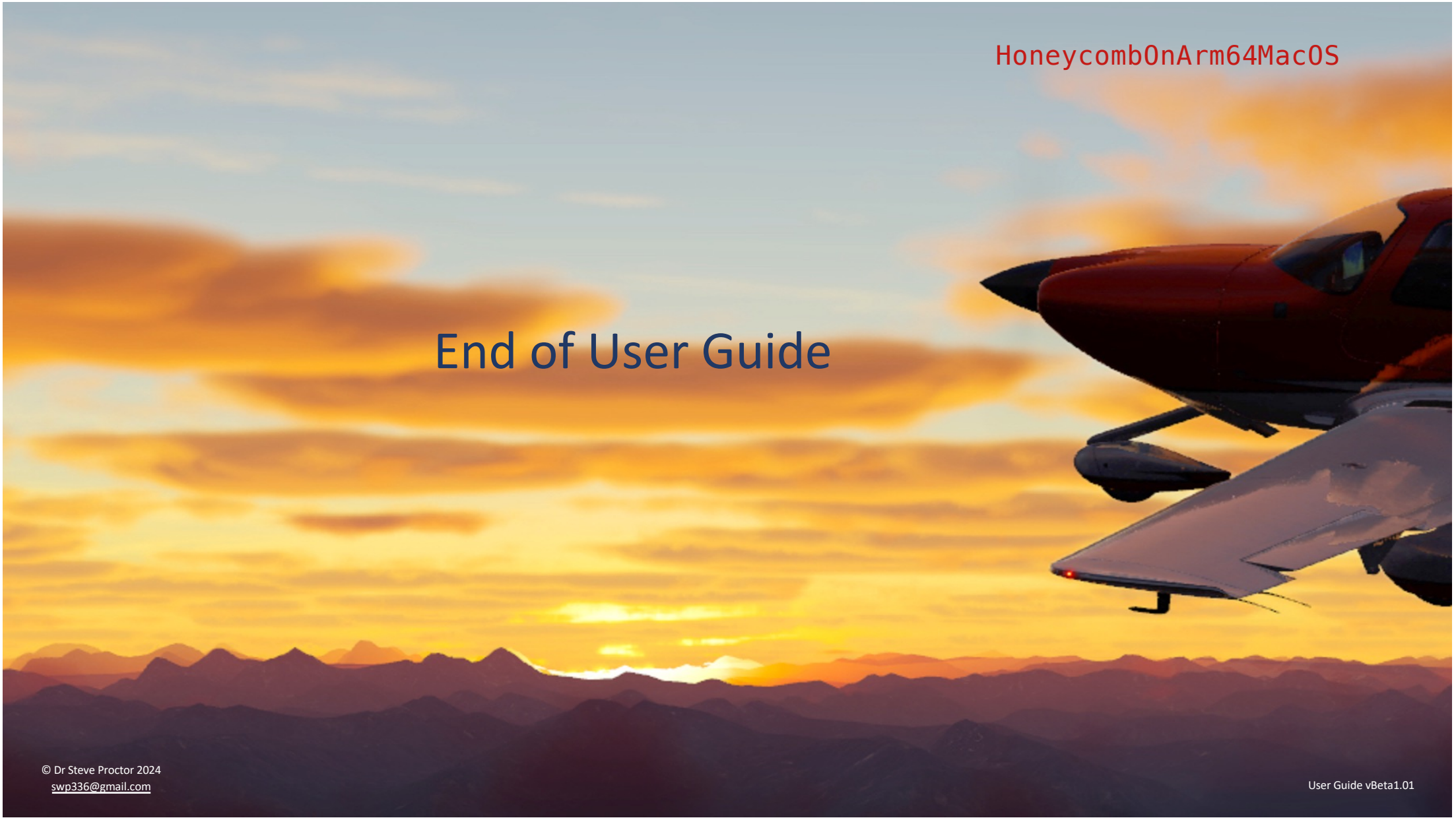

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