



VIRTUAL REAL COCKPIT



USER MANUAL

Your sim rig in VR: setup, dashboards, your wheel,
passthrough, hands and the VR menu.

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CHAPTER

01

WELCOME AND REQUIREMENTS

What Virtual Real Cockpit does, what you need, and how this manual is laid out.

IN THIS CHAPTER

- › What you get
- › Requirements
- › How to read this manual

Virtual Real Cockpit puts your real cockpit into VR. It adds your SimHub dashboards, your own steering wheel, windows to your real keyboard and drink, and your tracked hands to the sim you already drive. Everything is placed once per car and comes back the next time you drive that car.

It has two parts:

- **The app.** A Windows program where you set things up: dashboards, wheel, passthrough, settings.
- **The VR add-on.** A small part that loads into the sim and draws everything in the headset. You never start it yourself. The app registers it during setup.

WHAT YOU GET

FEATURE	WHAT IT DOES	CHAPTER
Dashboards	Any SimHub dashboard, or any window, floating in the car.	5
Your wheel	A 3D model of your wheel that turns with the sim, with a live dashboard on its screen.	6
Passthrough	Windows to the real world: your keyboard, button box, drink.	7
Hands and arms	Tracked hands that grip the wheel.	8
Lighting and cockpit shake	The game's light on your wheel, and the cockpit's bounce over kerbs.	9
VR menu	Change and place everything without taking the headset off.	10
Car presets	One setup per car, switched for you when the car changes.	4

REQUIREMENTS

PART	WHAT YOU NEED
Windows	Windows 10 or 11, 64-bit
VR runtime	An OpenXR runtime: Virtual Desktop (VDXR), Meta Quest Link, SteamVR, Pimax and others
Headset	Tested with a Meta Quest 3 on Virtual Desktop.
Sim	A sim that runs in VR through OpenXR and draws with DirectX 11
SimHub	Optional, for dashboards. Its web server must be on (port 8888).



NOTE

Some features depend on the headset. Chroma-key passthrough needs Virtual Desktop. Full-colour passthrough needs a headset with colour cameras, like the Quest 3. Hands need hand tracking.

SIMS

Telemetry (the wheel turns, presets switch by car, cockpit shake) comes straight from:

- iRacing
- Le Mans Ultimate
- Automobilista 2

These sims have a built-in preset and run through OpenXR or OpenComposite:

- Assetto Corsa
- Assetto Corsa Competizione
- Assetto Corsa EVO
- BeamNG.drive
- EA Sports WRC
- rFactor 2
- DiRT Rally 2.0
- RaceRoom Racing Experience
- F1 25

You can add any other OpenXR game yourself (chapter 2). Sims that only run on SteamVR (OpenVR) need OpenComposite, which makes them use OpenXR.



WARNING

Sims that draw with DirectX 12 or Vulkan load the add-on but show nothing.

HOW TO READ THIS MANUAL

- **BUTTONS**, **TABS** and switch names are written the way the app shows them.
- **F9**, **X** and other keys and controller buttons look the same.
- **Tip**, **Note** and **Warning** boxes look like the strips in the app.
- Chapter 11 lists every setting. Chapter 12 is troubleshooting. Chapter 14 explains the words.

CHAPTER

02

INSTALL AND FIRST-RUN SETUP

Unzip, start the app, start the trial and walk through the six setup steps.

IN THIS CHAPTER

- › Install
- › The license screen
- › The six setup steps
- › Check that it works

/ INSTALL

- 01 Download the zip from the website's Download page.
- 02 Unzip it to a folder you keep, for example `Documents\Virtual Real Cockpit`. Do not run it from inside the zip.
- 03 Start `Virtual Real Cockpit.exe`.
- 04 Follow the setup. It registers the VR add-on for you. No administrator rights are needed.



NOTE

Windows may show a SmartScreen warning the first time. Choose `More info`, then `Run anyway`.



TIP

Keep the folder where it is. The VR add-on is registered from that folder. If you move it, run the app once from the new place and choose `REGISTER` in Settings > System.

/ THE LICENSE SCREEN

The first start opens `ENTER YOUR LICENSE KEY`.

- No key yet: choose `START 7-DAY TRIAL`. Everything works for 7 days. No sign-up, no email.
- You have a key: paste it and choose `ACTIVATE`.

Chapter 3 explains the trial, Lite mode and the license.

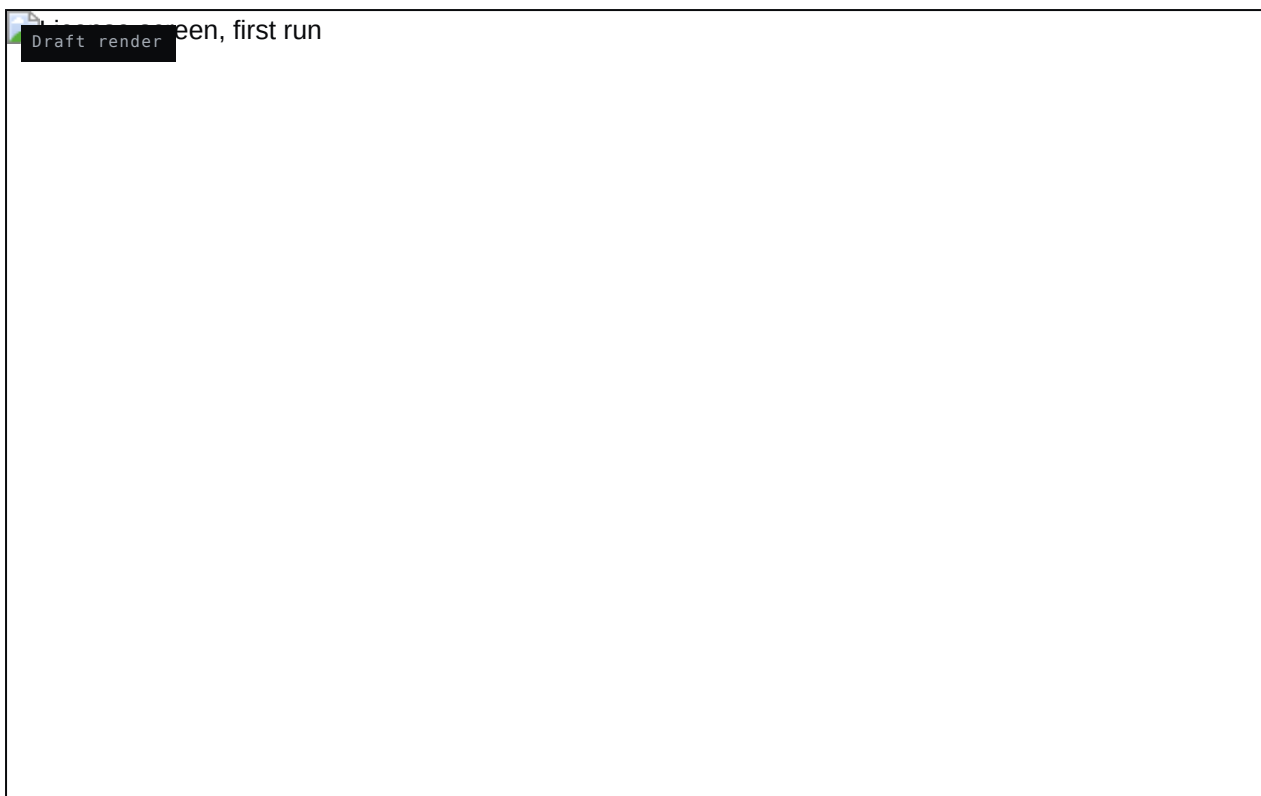


FIG 2.1 License screen, first run

/ THE SIX SETUP STEPS

The bars at the top show where you are, for example **03 / 06**. **BACK** returns to the step before. You can run the setup again at any time from Settings > General > **RUN SETUP**.

1. CHOOSE YOUR SIM



FIG 2.2 Setup 01, Choose your sim

- 01 Pick the sim you drive most. You can change it later from Home.
- 02 A **FOUND** tag means the app found the game on this PC.
- 03 Not in the list? Choose **ADD CUSTOM GAME**, give it a **Name**, choose its **Game file** with **BROWSE**, then **ADD**.
- 04 Choose **CONTINUE**.

Type in **Search games** to filter the list. Short names work too: **ams2**, **lmu**.

2. FIND THE GAME FILE

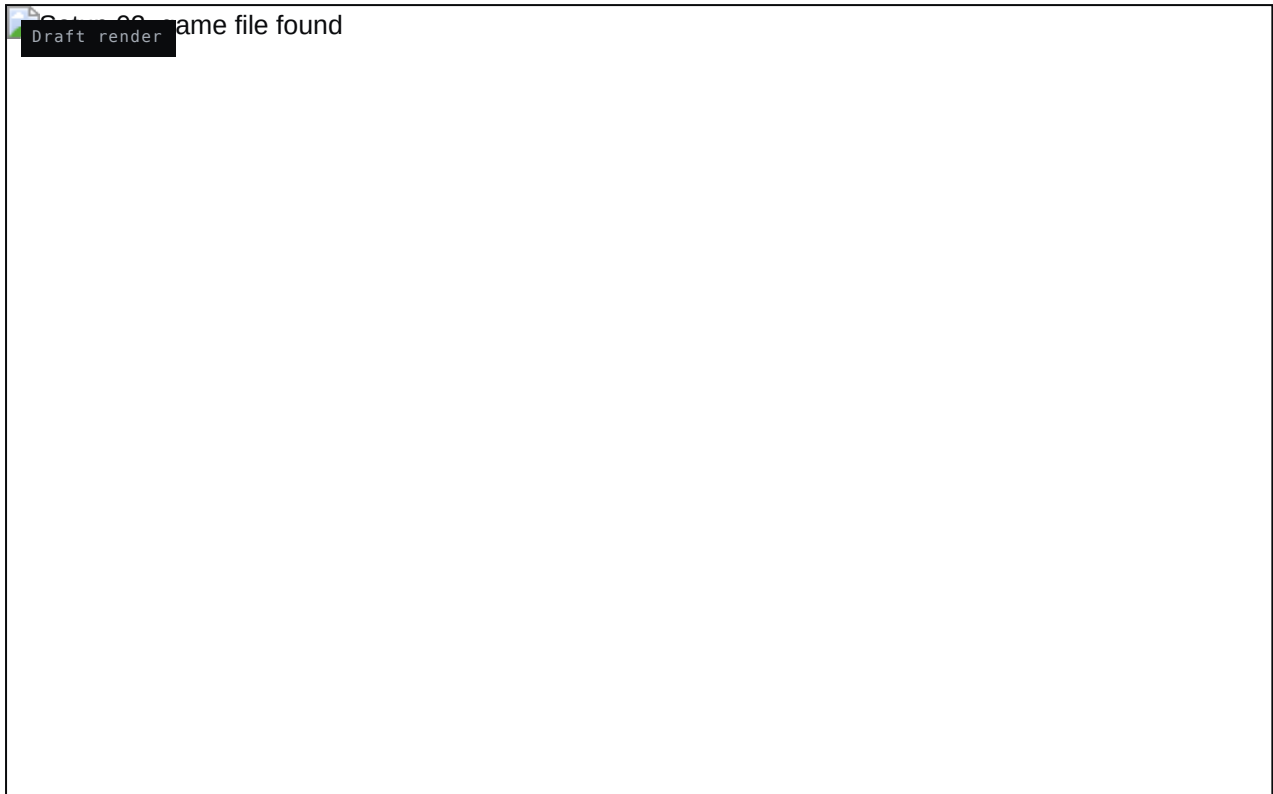


FIG 2.3 Setup 02, game file found

The app looks in your Steam libraries for the game's program file. When it finds it, the row says **FOUND**.

- **NOT FOUND**: choose **BROWSE** and pick the game's **.exe**.
- Wrong file: choose **CHANGE**.



NOTE

Your cockpit appears in VR only while this game is running. Other VR apps never show it.

3. USE OPENXR

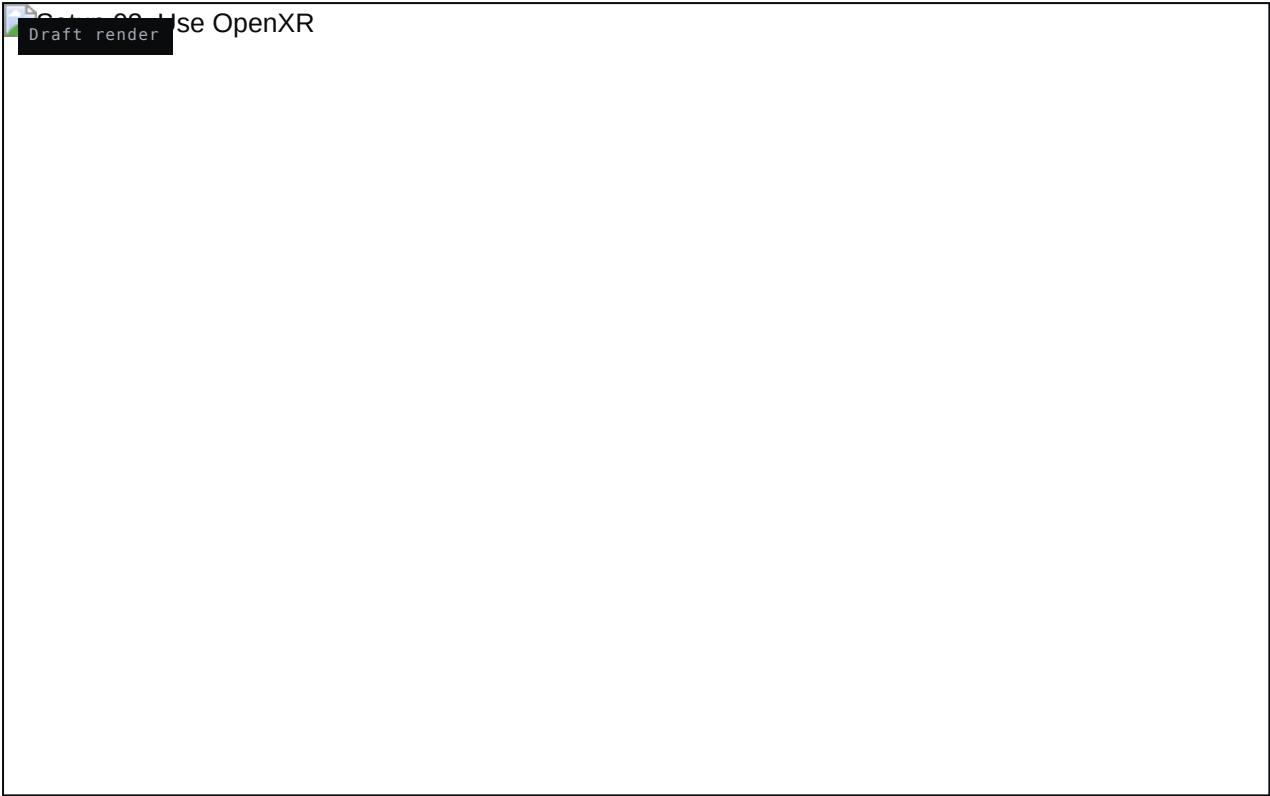


FIG 2.4 Setup 03, Use OpenXR

ROW	WHAT IT TELLS YOU
OpenXR runtime	The runtime your PC uses, for example VIRTUAL DESKTOP. NONE means no VR runtime is set.
Your sim	NATIVE OPENXR: ready. OPENVR ONLY: install OpenComposite. CHECK THE GAME: a custom game; check its VR settings.

For OPENVR ONLY sims, OPENCOMPOSITE opens the OpenComposite page. Install it for that game, then come back.

4. PASSTHROUGH

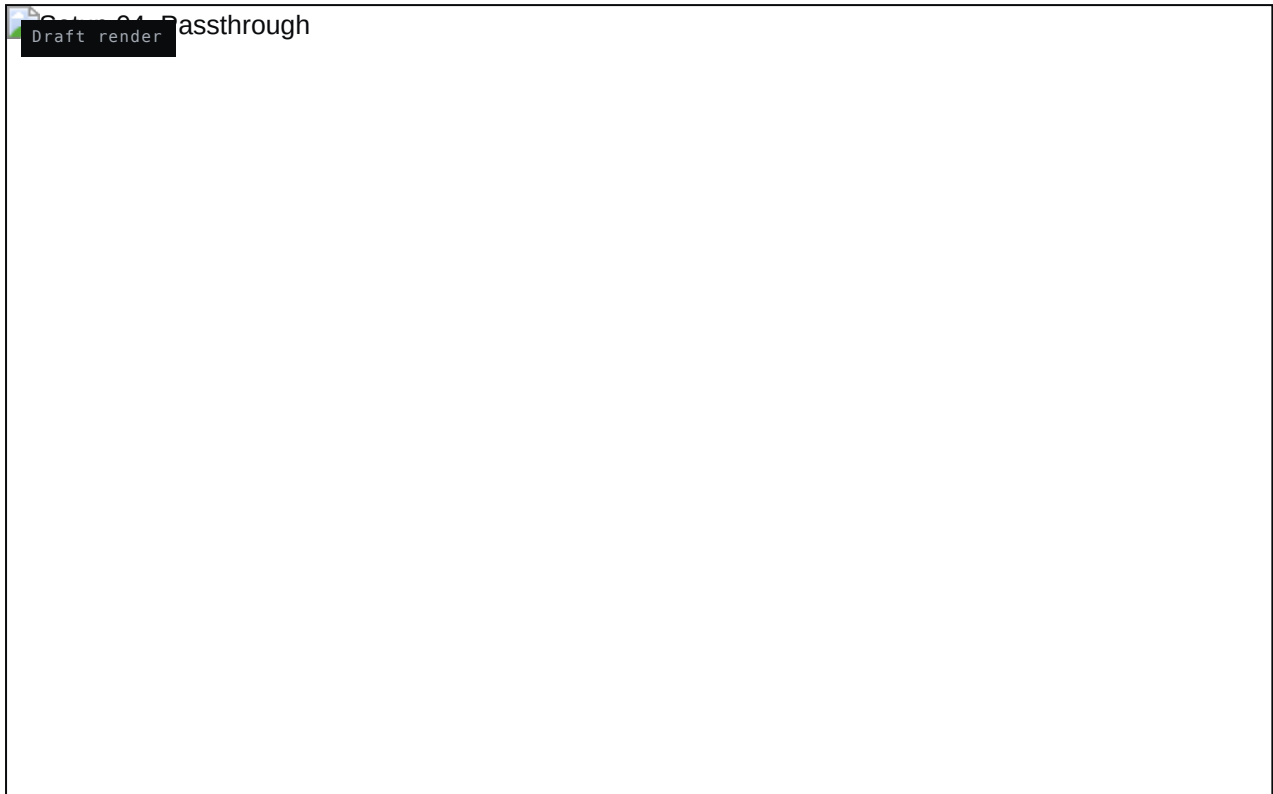


FIG 2.5 Setup 04, Passthrough

This step tells you which passthrough your setup can use.

- **VIRTUAL DESKTOP**: chroma-key passthrough works.
- **NOT AVAILABLE**: your runtime has no chroma key. Passthrough is tested with a Meta Quest 3 on Virtual Desktop (chapter 7).

5. PAIR RECENTRE BUTTON

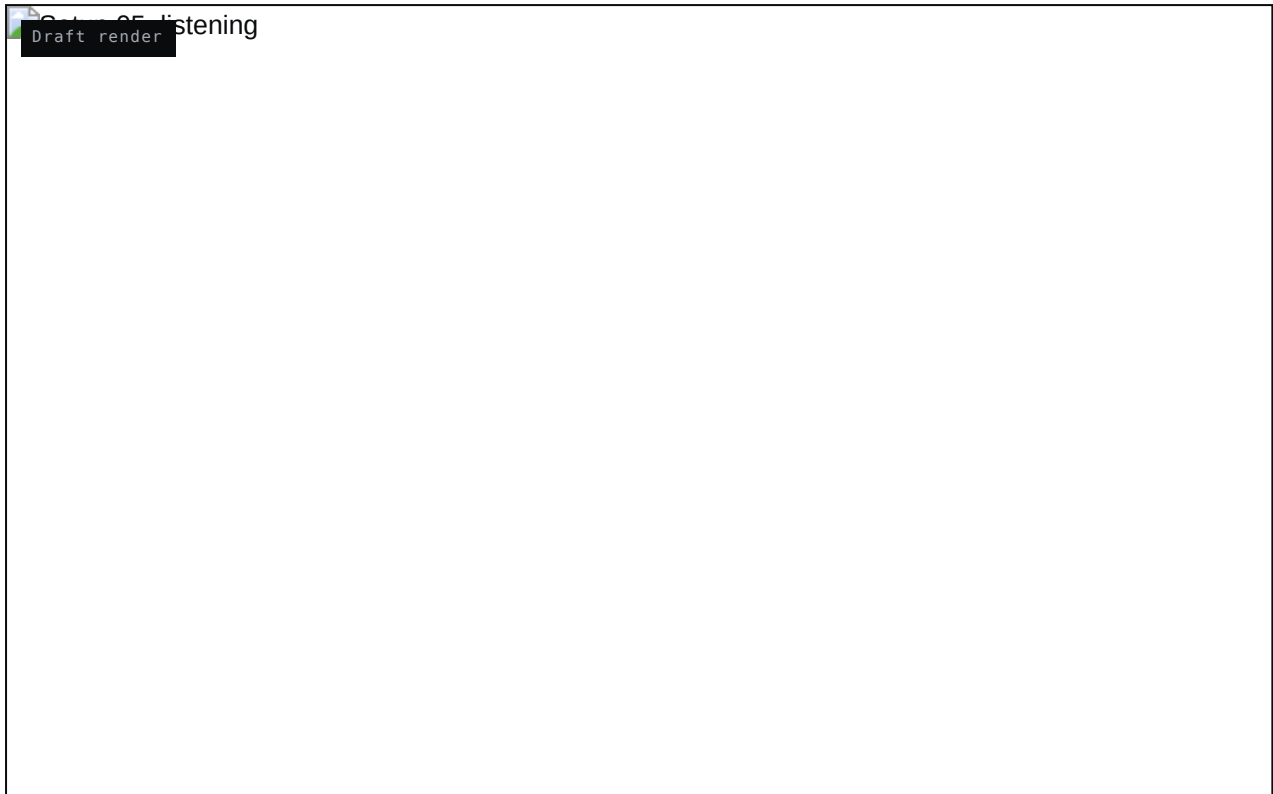


FIG 2.6 Setup 05, listening

- 01 The panel shows **LISTENING**.
- 02 Press the key or wheel button you use for the sim's own VR recentre.
- 03 The panel shows the button, for example **BTN 12**, the device name and **PAIRED**.
- 04 Choose **CONTINUE**. **RE-PAIR** listens again.



TIP

Use the same button as your in-game recentre. Both then recentre together, and your wheel, dash and passthrough stay lined up with the game.

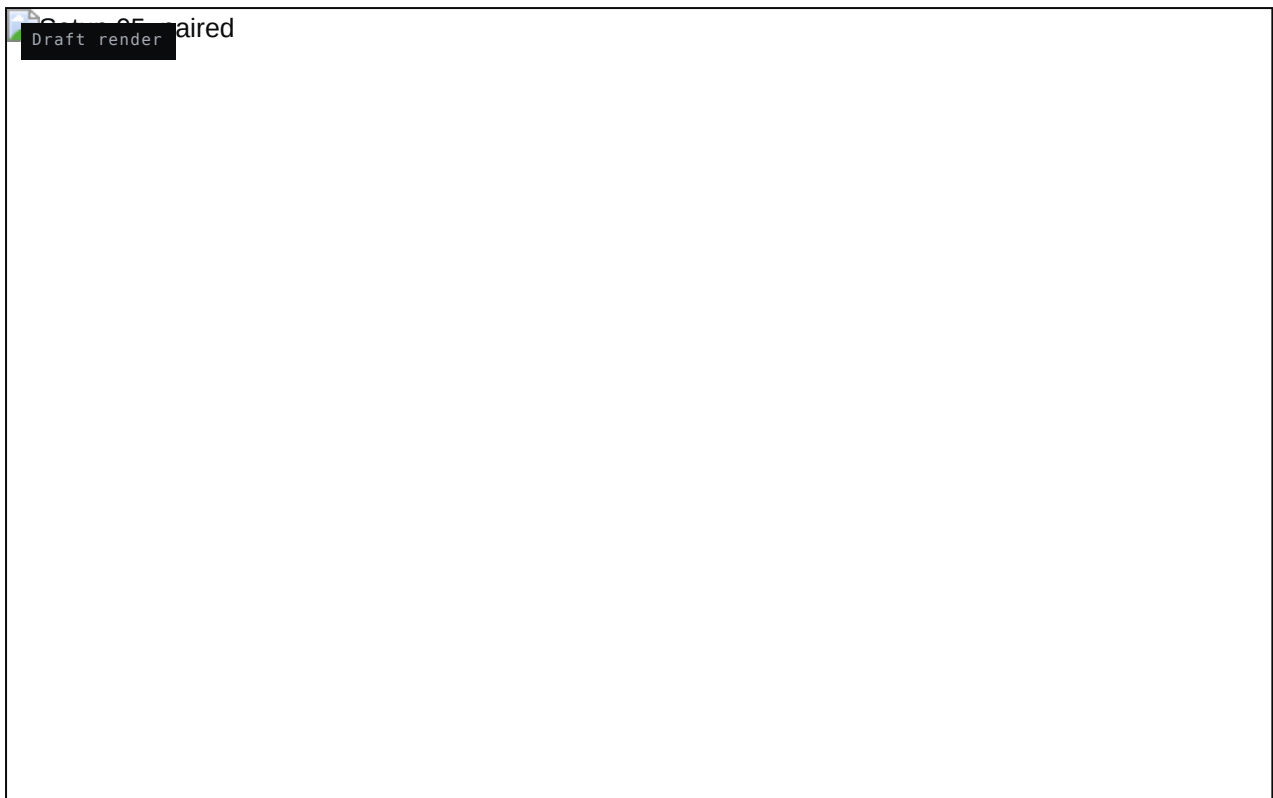


FIG 2.7 Setup 05, paired

6. VR CONTROLS

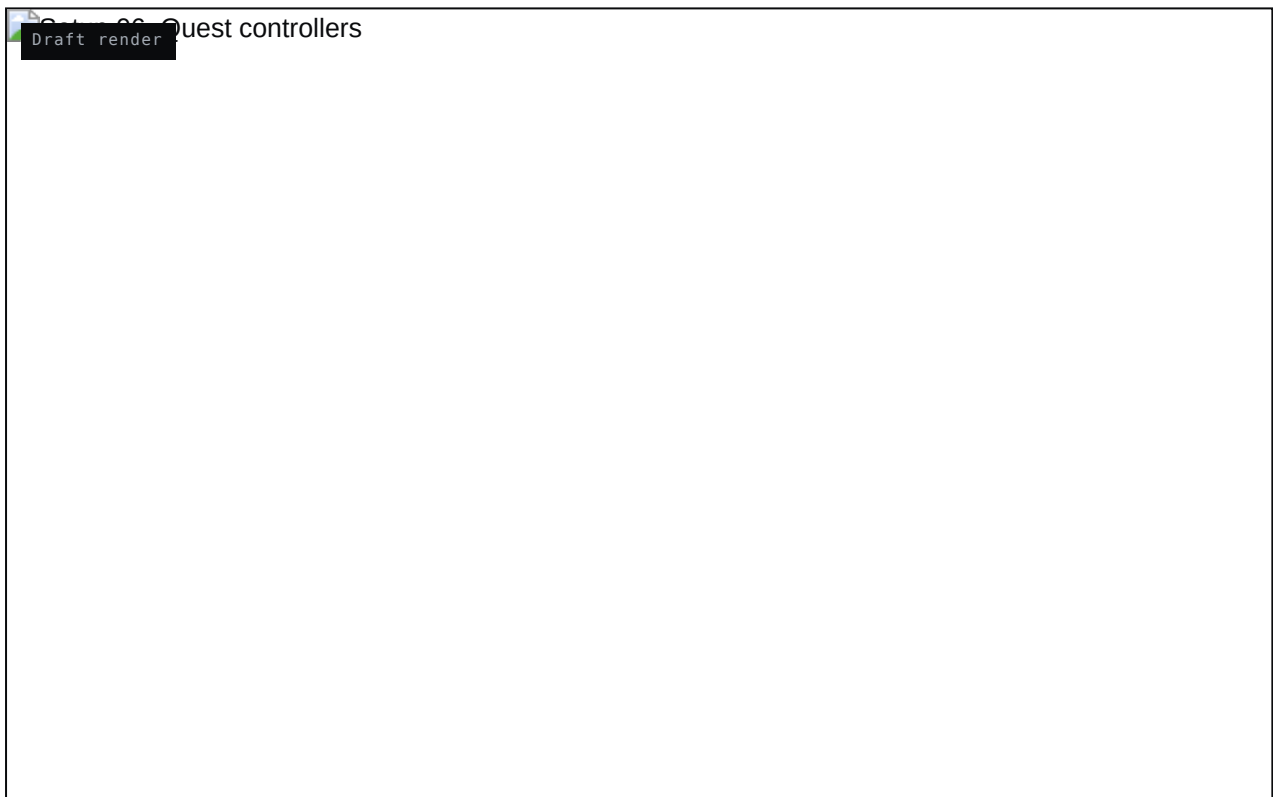


FIG 2.8 Setup 06, Quest controllers

This page shows the controls in the headset. Pick your tab: **QUEST CONTROLLERS**, **VALVE INDEX** or **HAND TRACKING**. Chapter 10 has the full list. Choose **FINISH** to go to Home.

/ CHECK THAT IT WORKS

- 01** Start your sim in VR.
- 02** Press **X** on the left controller. The VR menu opens in front of you.
- 03** If nothing shows, see chapter 12, "The cockpit does not show".

CHAPTER

03

FREE TRIAL, LITE MODE AND YOUR LICENSE

Seven days of everything, Lite mode for free after that, and what a license key adds.

IN THIS CHAPTER

- › The free trial
- › Lite mode
- › Buy a license
- › Enter your key
- › How the key is checked
- › Move the key to another PC

THE FREE TRIAL

START 7-DAY TRIAL on the license screen starts it. Everything works for 7 days. There is no sign-up and no email.

Settings > License shows the days left, for example **TRIAL · 5 DAYS LEFT**, and the **Trial ends** date.

The trial runs once per PC. A new Windows account does not start a new one.

LITE MODE

When the trial ends, the app keeps working in Lite mode. It stays free.

WORKS IN LITE MODE	NEEDS A LICENSE
The VR menu	The wheel model and its screen
Recentre	Every dashboard after the first
Hands and arms	Passthrough boxes and canvases
The first dashboard	Cockpit shake

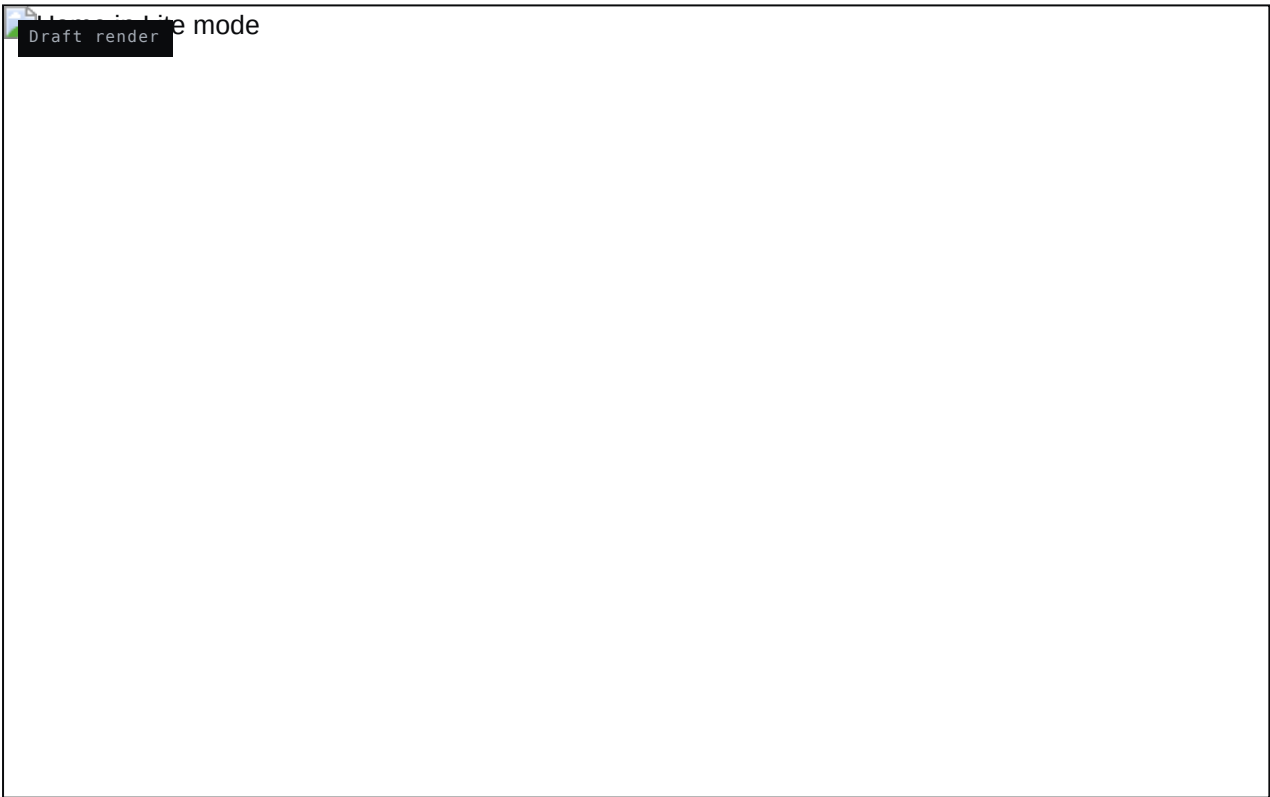


FIG 3.1 Home in Lite mode

In Lite mode:

- Home shows **Free trial ended · Lite mode keeps the VR menu, the hands and one dashboard.**
- The Wheel, Passthrough and Dashboards pages show a strip that says what is not shown in the headset. You can still set everything up.
- The VR menu bar shows **TRIAL ENDED**.
- **ENTER KEY** on any of these strips opens the license screen.

/ BUY A LICENSE

- 01** On the website, open Pricing and choose **Buy license**.
- 02** Pay in the checkout window.
- 03** Your key arrives by email within a minute.

The key starts with **VRC-**. It is sent once and cannot be sent again or reissued, so keep the email.

/ ENTER YOUR KEY

- 01** Open Settings > License and choose **ENTER KEY** (or **ENTER KEY** on a Lite mode strip).
- 02** Paste the key. Case and dashes do not matter.
- 03** Choose **ACTIVATE**.



FIG 3.2 Settings > License, active key

Incomplete license key	Part of the key is missing. Paste it again.
Invalid license key	The key is wrong. Check for a missing character.
This key was refunded	The order was refunded. The app stays in Lite mode.

Settings › License then shows:

- **Status** · **ACTIVE**
- **Updates** · **ALL VERSIONS** (a license covers every future version)
- **License key** · the key, partly hidden

/ HOW THE KEY IS CHECKED

The app checks the key when it starts and once a day. It sends only the key's ID, never the key, your name or your email. It needs the internet once a week.

- No internet for more than 7 days: the app drops to Lite mode and Settings › License shows **Connect to the internet to check your key** with **CHECK NOW**. Everything comes back after the next check.
- A refunded order: Settings › License shows **This key was refunded** with **BUY LICENSE**, and the app stays in Lite mode.

/ MOVE THE KEY TO ANOTHER PC

A key works on one PC at a time.

- 01 On the old PC, open Settings › License.
- 02 Choose **REMOVE KEY** and confirm. This PC goes back to the trial if it has days left, otherwise to Lite mode.
- 03 On the new PC, enter the key.



NOTE

The key is checked on your PC. The app does not need the internet to use it.

CHAPTER

04

/ *CAR PRESETS*

Home, one preset per car, the template for new cars, and switching when the car changes.

IN THIS CHAPTER

- › Home
- › Add a preset
- › Open a preset
- › The preset menu
- › Switch automatically
- › Change sim
- › Strips on Home
- › Where presets are saved

A car preset holds everything for one car: its dashboards, its wheel placement and its passthrough. When you drive that car, its preset loads.

Settings that are the same for every car (hands, lighting, controls) live in Settings, not in a preset.

HOME

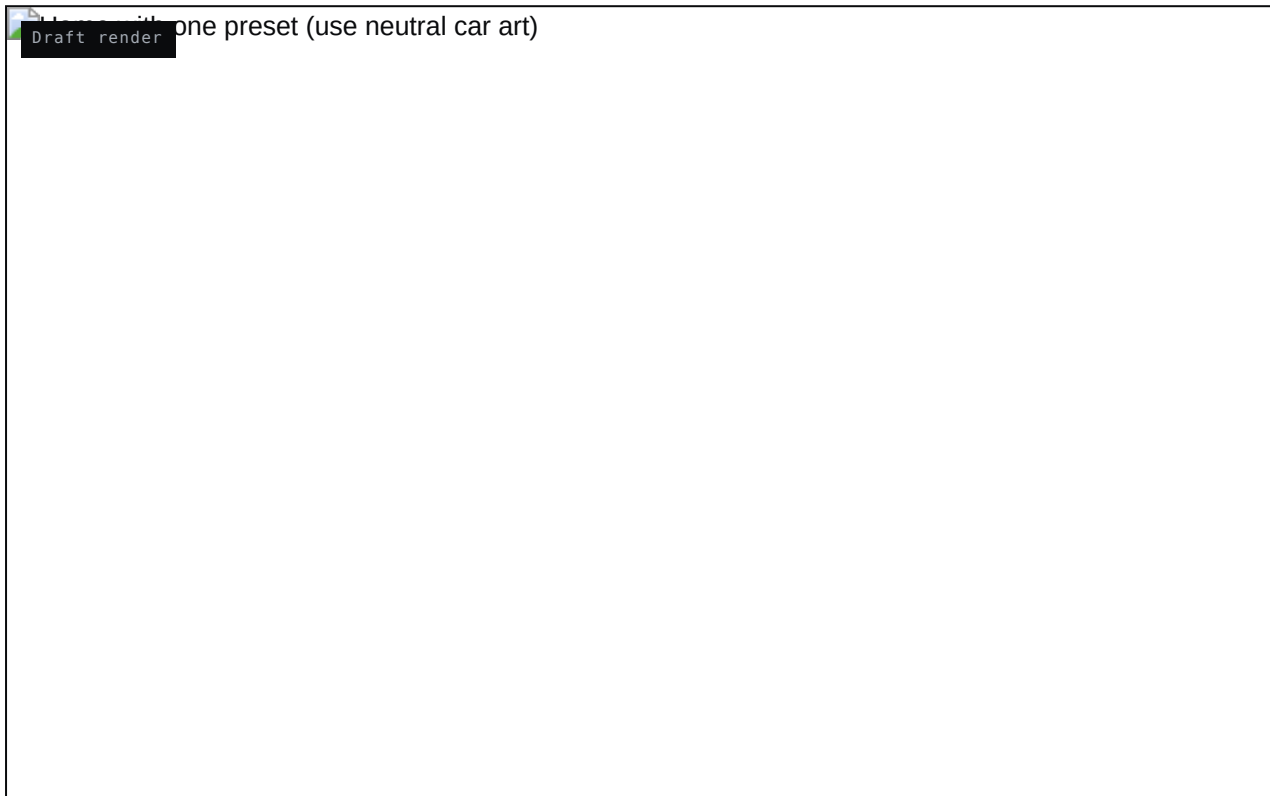


FIG 4.1 Home with one preset (use neutral car art)

Home shows:

- **The active sim banner.** The sim, its state (`NOT RUNNING`, `RUNNING`, `IN CAR`) and `CHANGE SIM`.
- **Strips** when something needs you (see below).
- `CAR PRESETS`. The presets of the active sim, newest first. `LAST DRIVEN` marks the last one you drove.

Each preset card shows what it holds, for example `1 DASH`, `1 PASSTHROUGH`, `WHEEL`.

ADD A PRESET

Two ways:

- **Drive.** Start a session in a car that has no preset. A preset is made from the template the moment the sim reports the car.
- **By hand.** Choose `ADD CAR PRESET`, type the `Car ID` and a `Display name`, then `CREATE`.

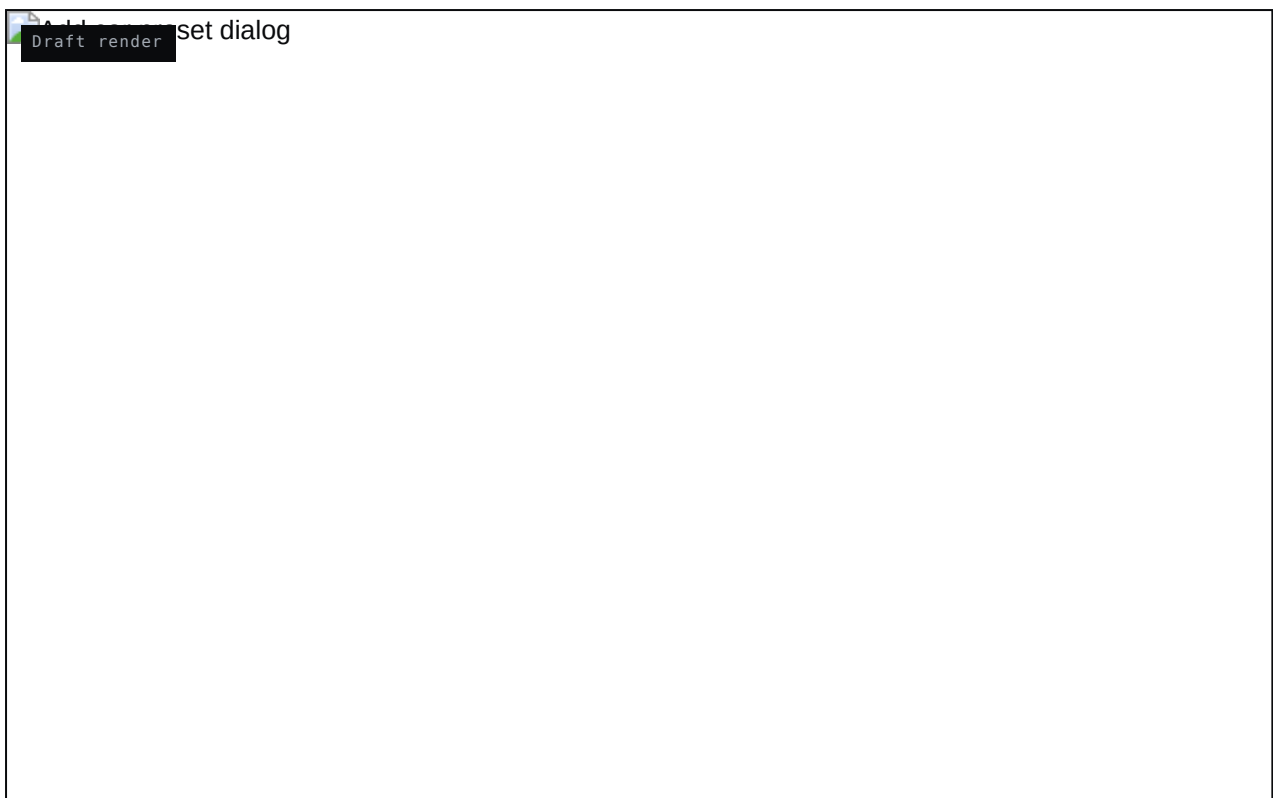


FIG 4.2 Add car preset dialog



TIP

The easiest way to get the **Car ID** right is to drive the car once. The preset then gets the ID the sim uses.

OPEN A PRESET

Click a preset card. The preset opens on **DASHBOARDS**. The sidebar has **DASHBOARDS**, **WHEEL** and **PASSTHROUGH**. **ALL PRESETS** returns to Home.

THE PRESET MENU

The **...** button on the car card in the sidebar opens:

ITEM	WHAT IT DOES
Rename	Change the name shown on the card.
Use as template for new cars	New presets start as a copy of this one.
Reset to template	Replace this preset with the template. Asks first.
Delete preset	Remove the preset. Asks first.

/ SWITCH AUTOMATICALLY

Settings > General > **Switch preset when the car changes** is on by default. When the sim reports another car, that car's preset loads, in the headset too. Turn it off to keep one preset loaded.

/ CHANGE SIM

CHANGE SIM on the banner shows all sims. Click one to make it active. Home then shows that sim's presets. When a sim starts sending telemetry, it becomes the active sim by itself.

/ STRIPS ON HOME

STRIP	MEANING	BUTTON
Le Mans Ultimate is running in VR, not iRacing.	Another sim is running. The cockpit does not show in it.	SWITCH GAME makes it the active sim.
iRacing's game file was not found.	The app does not know which program is the game.	LOCATE lets you pick it.
VR add-on not registered	The sim cannot load the add-on.	REGISTER
Version 0.2.0 is available.	An update is out (chapter 13).	CHANGE LOG , DOWNLOAD
Free trial ended · Lite mode ...	See chapter 3.	ENTER KEY



FIG 4.3 Home with the other-game info strip

/ WHERE PRESETS ARE SAVED

Every change saves by itself after a second and a half. Presets are files in

`%APPDATA%\CockpitXR\profiles\<game>\<car>.json`. Settings > General > Presets and settings folder
> **OPEN FOLDER** opens the folder. Copy it to back up your setup.

CHAPTER

05

DASHBOARDS

Add SimHub dashboards or any window, place them in the car and tune how they look.

IN THIS CHAPTER

- › Before you start: SimHub
- › Add a dashboard
- › Dashboard cards
- › Place it
- › Settings in the inspector
- › Window or web?

A dashboard is a flat panel in the car that shows a SimHub dashboard or any window from your desktop. A preset holds up to 8 (7 while your wheel has a screen, chapter 6).

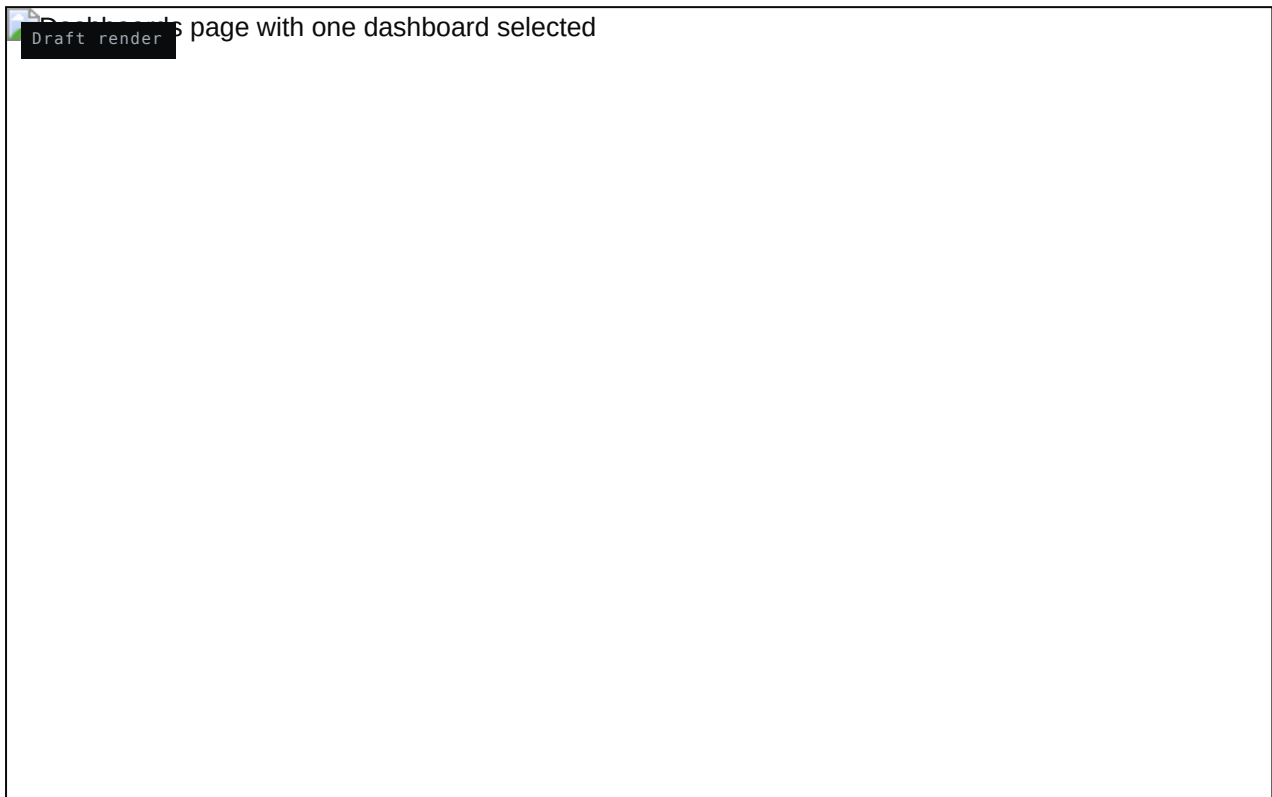


FIG 5.1 Dashboards page with one dashboard selected

/ BEFORE YOU START: SIMHUB

The app reads your dashboards from SimHub's web server.

- 01 In SimHub, open Settings and turn on the web server. It uses port **8888**.
- 02 Keep SimHub running while you drive.

You do not need to open any SimHub dash window. The app draws the dashboard itself, in the background.

/ ADD A DASHBOARD

- 01 Open a preset and choose **DASHBOARDS**.
- 02 Choose **ADD DASHBOARD**.
- 03 Pick one of three sources:
 - **FROM SIMHUB**. Your dashboards are listed. Choose **ADD** next to one. **ADDED** means it is already in this preset. The refresh icon reloads the list.
 - **A URL**. Paste a dashboard address in **Paste a dashboard URL**, then **ADD**.
 - **Capture a window**. Pick any open window from the list.

04 The new dashboard is selected and the inspector opens on the right.



NOTE

SimHub web server not reachable on port 8888 means SimHub is closed or its web server is off.

DASHBOARD CARDS

Each card shows a live preview, a name, the source and a switch to show or hide it.

BADGE	MEANING
LIVE	Frames are arriving.
WAITING	No frames yet. See chapter 12.
ERROR	The source failed. Hover the badge for the reason.

PLACE IT

Two ways:

- **In VR.** Choose **MOVE IN VR**. In the headset, point at the dashboard and hold grip to move it. Push the stick up or down to resize it, left or right to turn it.
- **By numbers.** Type **X**, **Y**, **Z** and **YAW**, **PIT**, **ROL** under **PLACEMENT**.

IN FRONT puts the dashboard in front of you. Start there, then move it onto the car's own dash.

FOLLOW THE WHEEL

Turn on **Follow the wheel** to put the dashboard on the wheel's hub. It then turns with the wheel. For a dashboard on the wheel's own screen, use the wheel screen instead (chapter 6).

GAME WORLD OR REAL WORLD

ANCHOR	USE IT FOR
Game world	Almost everything. The dashboard stays in the same place in the car every session.
Real world	Things fixed to your room that must never move when you recentre.

SETTINGS IN THE INSPECTOR

SECTION	ROW	WHAT IT DOES
SOURCE	SimHub / Window	Where the picture comes from.

SECTION	ROW	WHAT IT DOES
	Resolution	The size the dashboard is drawn at, for example 1440 × 600. Higher is sharper and costs more.
LOOK	Width	Size in the car, in metres.
	Opacity	How see-through it is.
	Matte screen	A soft grey veil, like a real screen.
	Edge feather	Soft edges, in metres.
	Night dimming	How much it dims when the scene gets dark.
PLACEMENT	Follow the wheel, anchor, position, rotation	See above.
ADVANCED	Depth-sorted with the wheel	Sorts it with the wheel model, so hands and wheel can pass in front. Off: always on top and sharpest.
	Height	Leave empty for Auto.
	Real world origin	Room or Local, for real-world anchors only.

REMOVE DASHBOARD deletes it from this preset.

WINDOW OR WEB?

COMPARED	SIMHUB (WEB)	WINDOW
Needs a window on screen	No	Yes, it must stay open
Size	Any resolution	The window's size
Transparency	Yes	No
Looks exactly like SimHub's own window	Nearly	Yes



TIP

Use the SimHub source unless a dashboard looks wrong in it.

CHAPTER

06

YOUR WHEEL

Pick or import a wheel model, set its pivot, align it in VR and put a live dashboard on its screen.

IN THIS CHAPTER

- › Pick a model
- › The viewport
- › MODEL
- › Align it in VR
- › ROTATION
- › The wheel screen
- › MATERIAL
- › COCKPIT SHAKE

The wheel page puts a 3D model of your steering wheel in the car. It turns with the sim's steering. A model with a display can show a SimHub dashboard on it.

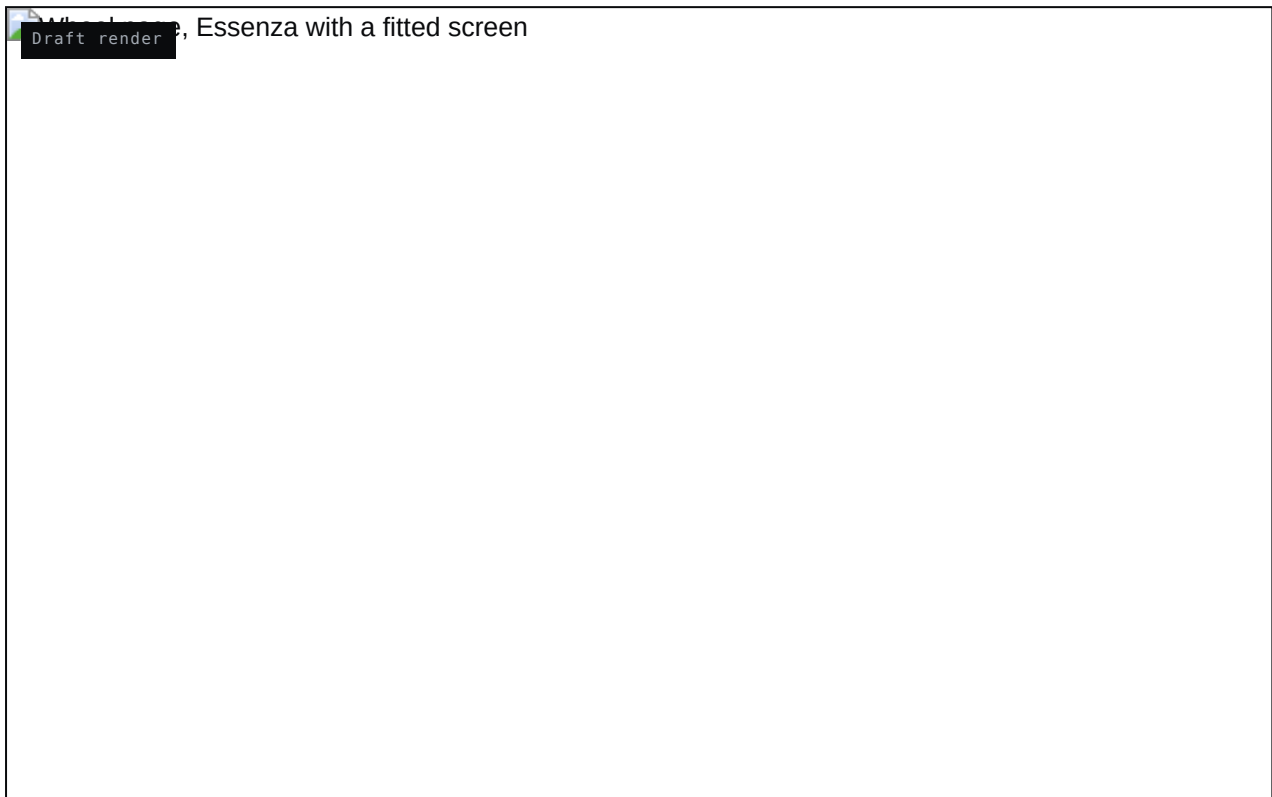


FIG 6.1 Wheel page, Essenza with a fitted screen

NOTE

Hide the sim's own steering wheel if it has that option. Otherwise both wheels show.

PICK A MODEL

The select above the viewport lists:

- The bundled models: `Lamborghini Essenza SCV12` and `Racing Steering Wheel`.
- Models you loaded before.
- `Load your own model...`

The model you pick is used for every car.

LOAD YOUR OWN MODEL

- 01 Choose `Load your own model...`.
- 02 Pick a `.glb`, `.gltf`, `.fbx`, `.obj` or a downloaded `.zip`.

03 `.glb` and `.gltf` are used where they are. The others are converted once. The select reads `Importing <file>...` meanwhile.

04 The toast says `Model imported`, or `Model imported, scaled to 32 cm` when the model was far too small or large.



WARNING

Blender files (`.blend`) cannot be read. In Blender, use File > Export > glTF 2.0 (.glb) and load that.



TIP

Lighter models run faster. A rim of 50 000 triangles looks the same at arm's length as one of 300 000.

/ THE VIEWPORT

Drag to orbit, scroll to zoom. The papaya dot and rod show the pivot and the spin axis. `STEERING` shows the angle.

`Test steering` under the viewport turns the wheel without a sim running. Use the slider to check the direction.

/ MODEL

ROW	WHAT IT DOES
Switch	Show or hide the wheel for this car.
<code>Pivot</code>	The point the model turns about: the centre of the steering shaft, in metres. Shared by every car using the model.
<code>CENTRE</code>	Puts the pivot at the centre of the model.
<code>RESET</code>	Puts the pivot at the model's origin.
<code>By</code>	The author and licence of a bundled model.

/ ALIGN IT IN VR

This puts the model exactly where your real wheel is.

01 Sit in your rig with the headset on, the sim running.

02 On the Wheel page, choose `ALIGN IN VR`. A pink marker appears in front of you and edit mode turns on.

03 In VR, hold grip on the marker and drop it on the centre of your steering shaft.

- 04 Choose **SET HUB HERE**, on the desktop or in the VR wheel window.
- 05 The model moves there, facing you.

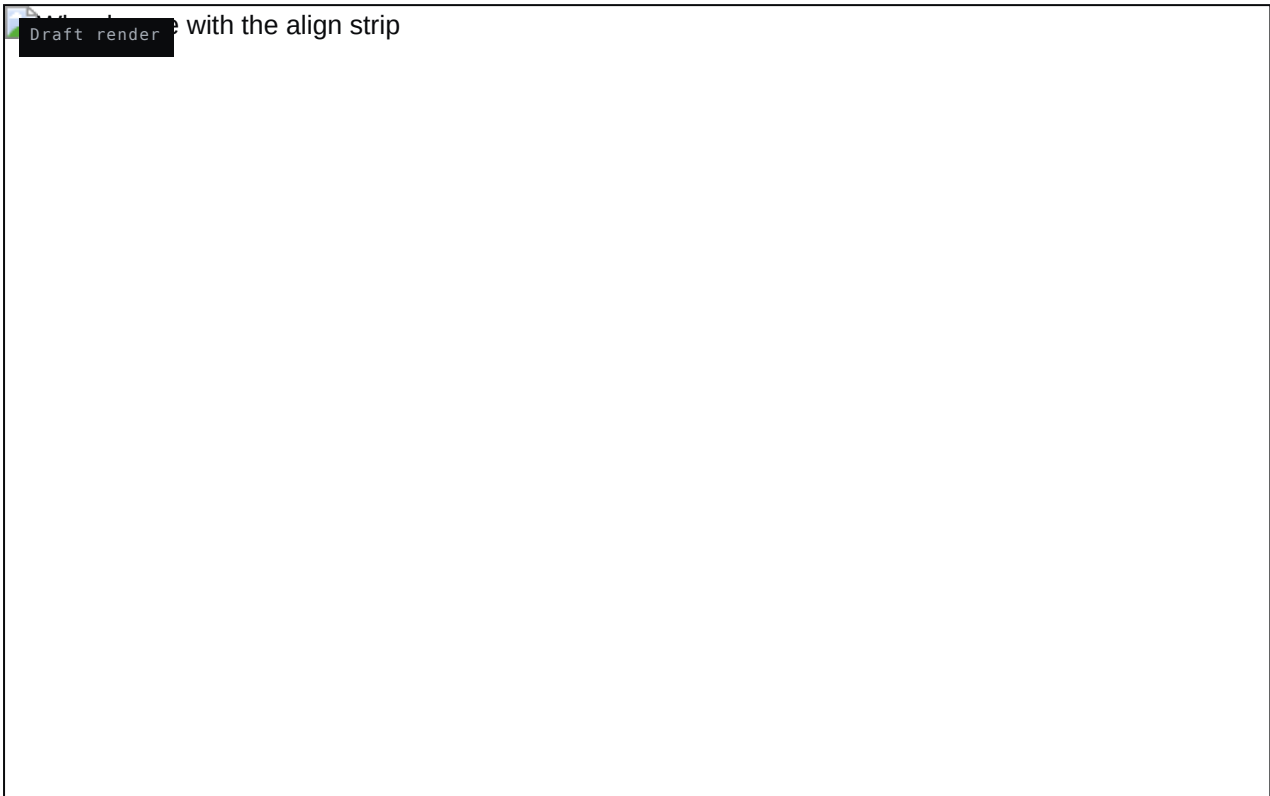


FIG 6.2 Wheel page with the align strip

Fine-tune with **Scale** and the **PLACEMENT** fields. **FACE ME** turns it upright and towards you.

ROTATION

ROW	WHAT IT DOES
Scale	Size of the model.
Spin axis	X , Y or Z : the axis the model turns about. Bundled models use Z .
Flip spin direction	Turn the other way about the axis.
Invert steering	Swap left and right.
Steering range	Lock to lock in degrees. Empty: From game . Automobilista 2 does not report it, so set it here.

THE WHEEL SCREEN

Turn on **SCREEN** > **This wheel has a screen** to show a SimHub dashboard on the wheel's display. It turns with the wheel.

The screen's shape, fit and depth belong to the model: every car using the model shares them. The dashboard and how it looks belong to the car (**THIS CAR**).



NOTE

The bundled Lamborghini Essenza comes fitted. Pick a dashboard and it works.

PICK THE DASHBOARD

- 01 Under **Dashboard**, pick a SimHub dashboard from the list.
- 02 Set **Resolution**, for example **800 × 480**. Match your dashboard's design size.
- 03 Set **Scale**:
 - **FIT** shows the whole dashboard, as large as it fits inside the screen and its rounded corners. The space around it is black.
 - **FILL** fills the screen. The edges that do not fit are cut off.

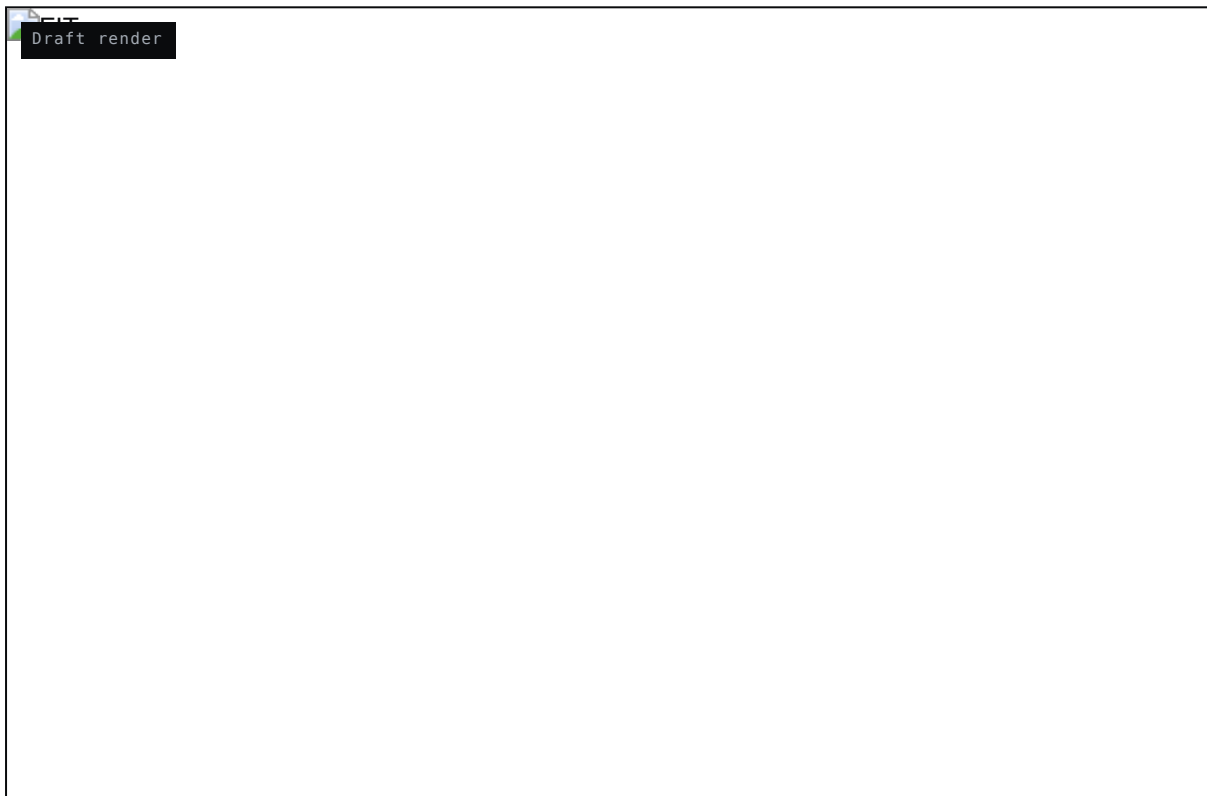


FIG 6.3 FIT



NOTE

The screen uses one dashboard slot, so a car with a wheel screen holds 7 other dashboards. With 8 already, the toast says **No room for another dashboard**.

FIT THE SCREEN TO THE MODEL

- 01 Choose **FIT** on the **Fit** row. Fit mode opens: a grid, handles and a tool panel.

- 02 With **CORNERS**, drag each corner onto the corner of the wheel's display. Shift keeps the ratio.
- 03 Keep **Snap to surface** on so the corners slide over the model.
- 04 With **MOVE**, drag inside the screen to move all of it.
- 05 Choose **DONE** (or press **Esc**). **RESET** starts over.



FIG 6.4 Fit mode, CORNERS

Right-drag orbits, scroll zooms. The readout under the screen shows its size, for example **0.100 × 0.060 M**.

ROUNDED CORNERS

Most wheel displays have rounded corners.

- In fit mode, choose **RADIUS** and drag a corner's dot inward. The readout shows **R 6.0 MM**.
- Or type the four values under **Corner radius**. The link icon sets all four together. With it on, Alt-drag changes one corner.

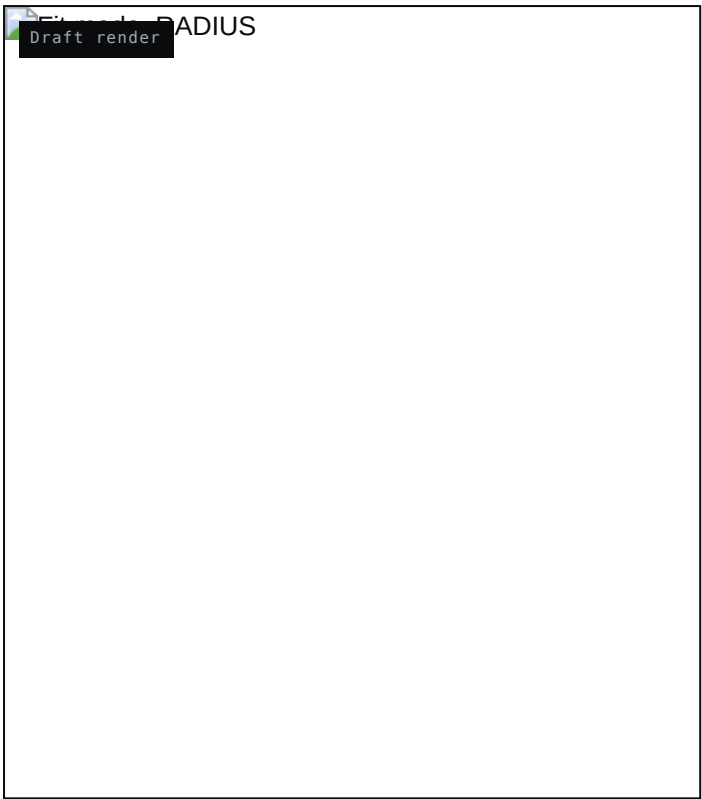


FIG 6.5 Fit mode, RADIUS

SCREEN DEPTH

If the screen sits inside the model or floats above it, use **Screen depth**: plus moves it out towards you, minus into the wheel, from -10.0 to +10.0 mm. In fit mode, Alt + scroll nudges it. Double-click the slider to go back to 0.

LOOK

ROW	WHAT IT DOES
Brightness	10 to 150 %.
Lit by the cockpit	How much the game's light and shadow reach the screen.
Matte screen	A soft veil, like a real display.
Edge softness	Soft edges, 0 to 4 mm.
Black is transparent	Black pixels become see-through. For dashboards drawn on black.

MATERIAL

These change the model for every car using it.

ROW	WHAT IT DOES
Brightness	0.2 to 2.0×.

ROW

WHAT IT DOES

Matte

Glossy (0) to matte (1). Shows the model's own value until you move it; the reset icon returns it.

Reflections

0 to 1.5×.

Follow the game's lighting

Off: a neutral studio light, to check the model.

COCKPIT SHAKE

See chapter 9.

CHAPTER

07

PASSTHROUGH

Cut windows to the real world with canvases and boxes, and set up Virtual Desktop or Meta Link.

IN THIS CHAPTER

- › Pick the method
- › Draw a canvas in VR
- › Add a box
- › Settings in the inspector

Passthrough cuts a window through the game to the real world, so you can see your keyboard, button box or drink without taking the headset off.

There are two kinds:

- **Canvas.** A flat panel you paint shapes on, in VR. Good for a keyboard or a screen.
- **Box.** A 3D box. Anything inside it shows. Good for a shifter or a cup holder.

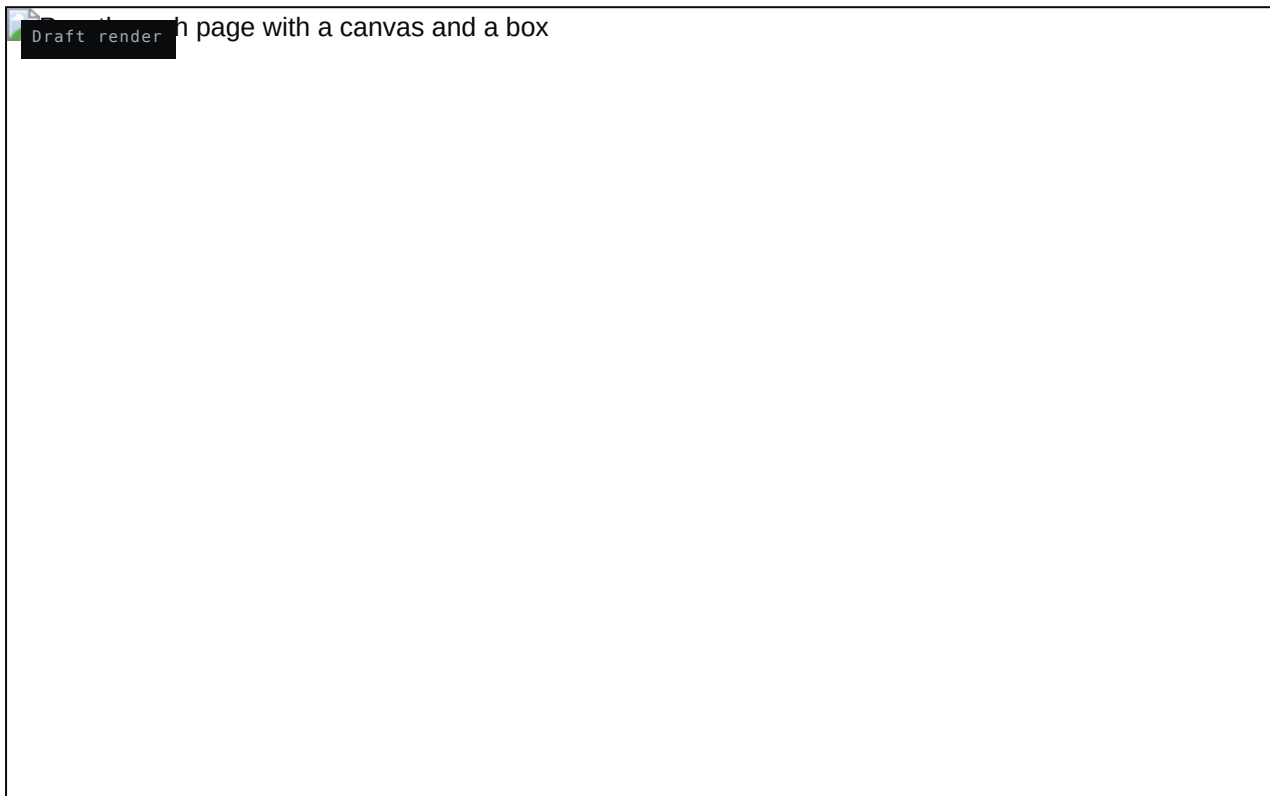


FIG 7.1 Passthrough page with a canvas and a box

/ PICK THE METHOD

Settings > Passthrough > **Method**:

METHOD	NEEDS
Auto	Picks the right one for your runtime. Start here.
Chroma key	Virtual Desktop. The app paints a key colour where passthrough should show and Virtual Desktop swaps it for the camera image.
Meta Link	Meta Quest Link and a Quest 3-class headset (full-colour cameras).
Off	No passthrough.

VIRTUAL DESKTOP SETTINGS

- 01 In Virtual Desktop, open Streaming and turn on **Passthrough**.
- 02 Set its chroma key colour to the **Key colour** in Settings > Passthrough (magenta by default).
- 03 For clean edges: **Similarity** 15 to 25 %, **Smoothness** up, **Sharpening** off, and a higher bitrate (HEVC 10-bit or AV1 if you can).



TIP

If the game itself shows a lot of the key colour, pick another **Key colour** and set the same one in Virtual Desktop.

/ DRAW A CANVAS IN VR

- 01 On the Passthrough page, choose **NEW CANVAS**. Or open the VR menu's passthrough window and choose **Create new**.
- 02 Choose **DRAW IN VR**. A canvas appears in front of you with a white border.
- 03 Hold grip on the canvas to move and tilt it. Push the stick to resize it.
- 04 Pick a tool and draw with the pointer:
 - **Points**. Trigger adds a point. Click the first point, or press **B**, to close the shape.
 - **Rectangle** and **Ellipse**. Hold trigger and drag.
- 05 **Undo** removes the last shape. **Clear** removes all of them.
- 06 Close the VR menu. Only the passthrough stays.

Screenshot to come

FIG 7.2 capture in the headset

/ ADD A BOX

- 01 Choose **ADD BOX**.
- 02 Set its size with **W**, **H** and **D** under **SIZE**.
- 03 Choose **MOVE IN VR** and place it around the real object, or type its position.

/ SETTINGS IN THE INSPECTOR

SECTION	ROW	WHAT IT DOES
SHAPES	DRAW IN VR , UNDO , CLEAR	Canvas only.
SIZE	W , H , D	Box only, in metres.
VISIBILITY	Only when I look at it	Shows it only while you look at it. Then set the gaze angle and the fade time.
	Opacity	How much of the real world shows.
	Edge feather	Soft edges, in metres.
PLACEMENT	Follow the wheel	Canvas rides on the wheel and turns with it. Use it to cut out your real wheel. The card shows ON WHEEL .
	Anchor, W , H , position, rotation	As for dashboards. IN FRONT brings it in front of you.

REMOVE CANVAS and **REMOVE BOX** delete it.



NOTE

Passthrough does not shake with the cockpit. It stays fixed to your seat, like the real objects it shows.

CHAPTER

08

HANDS AND ARMS

Tracked gloved hands and arms that grip the wheel, and how to fit them to your body.

IN THIS CHAPTER

- › What you need
- › Fit them to you
- › Grip the wheel
- › Look
- › Hands as controls

With hand tracking on, the add-on draws gloved hands and sleeves that copy yours. Near the wheel they snap onto the rim and hold it.

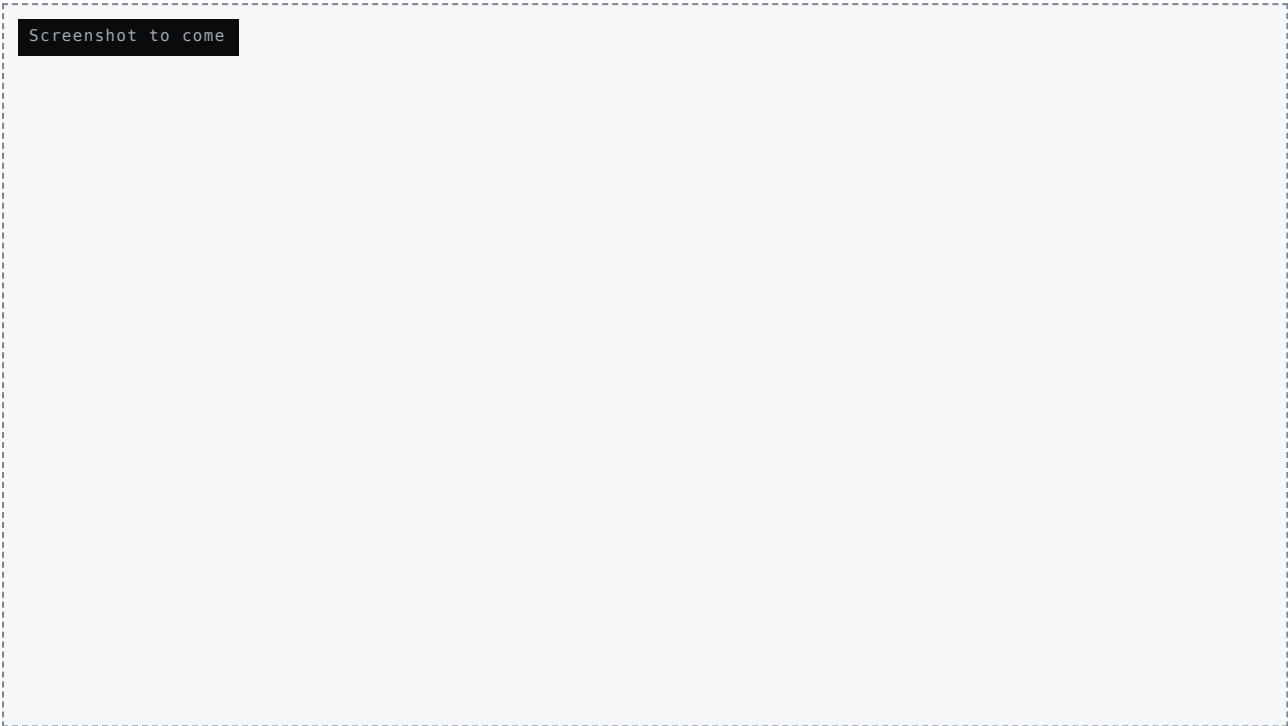


FIG 8.1 capture in the headset

WHAT YOU NEED

- A headset with hand tracking, like the Quest 3, with hand tracking turned on.
- Virtual Desktop, which passes hand tracking to the sim. Tested with a Meta Quest 3.
- Settings > Arms > **Show hands and arms** on.

Put the controllers down. Hands show when the headset sees your hands.

FIT THEM TO YOU

Settings > Arms > **BODY**:

ROW	DEFAULT	WHAT IT DOES
Glove thickness	1.00×	Fatter or thinner gloves.
Forearm length	0.270 m	Wrist to elbow.
Upper arm length	0.300 m	Elbow to shoulder.
Shoulder width	0.380 m	Between your shoulders.
Shoulders below eyes	0.200 m	

ROW	DEFAULT	WHAT IT DOES
Shoulders behind eyes	0.060 m	



NOTE

Elbows and shoulders are estimated. The headset tracks only the hands, so the arms look right but are not exact.

GRIP THE WHEEL

Your real wheel and the model are rarely in exactly the same place. A hand near the rim is pulled onto it.

ROW	WHAT IT DOES
Snap hands onto the rim	Turns the pull on.
Snap range	How close a hand must be to snap, default 0.15 m.
Grip alignment	How much the hand turns into a grip.
Grip depth	How far the fingers wrap over the rim.
Elbow flare	How far the elbows point out.
Hold the wheel when tracking drops	When the headset loses a hand, it goes to the rim at 9 or 3 o'clock and turns with the wheel until tracking returns.



TIP

The rim hides your hands from the cameras a lot. Keep **Hold the wheel when tracking drops** on.

LOOK

ROW	WHAT IT DOES
Show sleeves	Shows the suit sleeves on the arms.
Model	hands_gloves.glb by default. CHANGE loads another hand model.
Colours	Glove and sleeve colour. Only for models without textures.

HANDS AS CONTROLS

With **Hand tracking controls** on (Settings > Controls), your hands also drive the VR menu. See chapter 10.

CHAPTER

09

LIGHTING AND COCKPIT SHAKE

How the game's light reaches your wheel, hands and dashboards, and how the cockpit bounces with the car.

IN THIS CHAPTER

› Lighting

› Cockpit shake

/ LIGHTING

The app lights your wheel, hands and dashboards with the game's own light, so they get dark in a tunnel and warm at sunset.

- **Light from the game image.** The game's picture sets the ambient light and the reflections.
- **Sun from telemetry.** iRacing reports where the sun is. The lit side of the wheel then matches the sim. Le Mans Ultimate and Automobilista 2 do not, so they use a fixed light direction.
- **Shadows.** Your hands shadow the wheel, and both shadow the dashboards and the sim's cockpit.

Settings > Lighting:

ROW	WHAT IT DOES
Light objects from the game image	Turns the lighting on.
Sun from telemetry	Uses the sim's sun.
Shadows	On or off, and Low, Med or High quality.
Sun, Ambient, Reflections, Shadows (Strength)	How strong each part is.
Tint	The sun's colour.
Direction offset	Turns the sun if it looks wrong.
Mirror left and right	Flips the sun to the other side.

NO SUN DATA means the sim does not report the sun.



TIP

Need more frames? Set Shadows to Low or off first.

Dashboards act like backlit screens: in daylight they keep their look, at night they dim by their Night dimming amount.

/ COCKPIT SHAKE

In the sim the cockpit bounces over bumps and kerbs and dives under braking. A wheel and dashboards that stay still would float. Cockpit shake moves them with the car.

Turn it on per car: Wheel > COCKPIT SHAKE, or the SHAKE tile in the VR menu.

ROW	WHAT IT DOES
Amount	How much they move.

Fine-tune > **Heave**, **Roll**,
Pitch

On by default: up and down, side to side over a kerb, nose up and down.

Fine-tune > **Sway**, **Surge**,
Yaw

Off by default. Your head follows the car in these.

Stiffness

How quickly it springs back, in Hz.

Damping

How quickly the bounce settles.

Max travel, **Max tilt**

Limits, 4 cm and 4° by default.

NEEDS LIVE TELEMETRY means the sim is not sending motion data yet.



NOTE

The shake is worked out from the car's motion. The sim does not share its own camera, so the shake matches in feel and timing, not to the millimetre. Passthrough and the VR menu never shake. The hands do, because they hold the rim.

CHAPTER

10

THE VR MENU AND VR CONTROLS

Open the VR menu with a controller or the wrist button, use edit mode, and recentre.

IN THIS CHAPTER

- › Open the VR menu
- › The menu bar
- › Controllers
- › Hand tracking
- › Edit mode
- › Type a value in VR
- › Recentre
- › Keyboard keys

The VR menu lets you change and place everything while seated in the car, with the headset on.

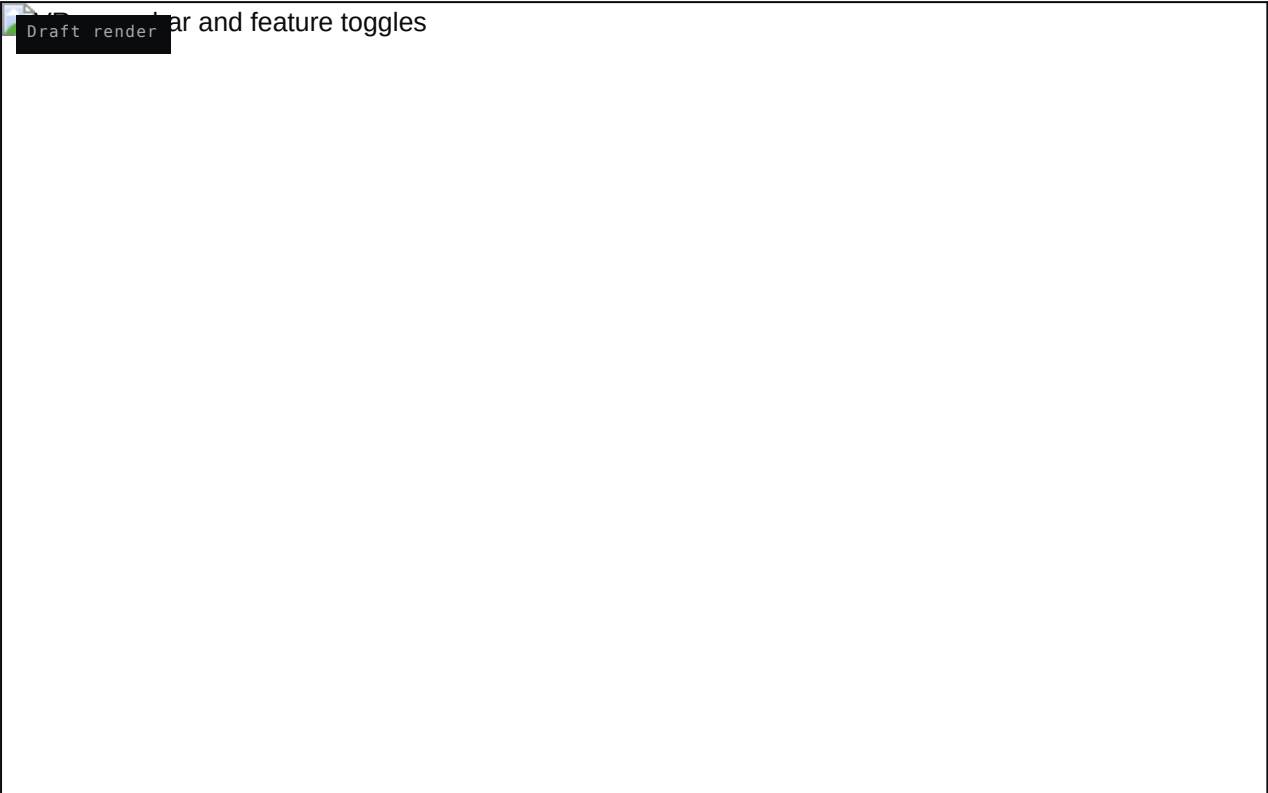


FIG 10.1 VR menu bar and feature toggles

OPEN THE VR MENU

WITH	DO THIS
Quest controllers	Press X on the left controller.
Valve Index	Press LEFT A .
Hand tracking	Hold your right index fingertip in the round button on the back of your left wrist until the ring fills (0.8 s).
Keyboard	F9

The same again closes it.



NOTE

The controller's **Menu** button is not used. Virtual Desktop and SteamVR already use it.

THE MENU BAR

From left to right:

- **Grab handle.** Hold grip on it to move the whole menu.
- **Four tool windows.** Passthrough, wheel, dashboards, settings. Each opens a window next to the bar.
- **EDIT.** Edit mode on or off.
- **Recentre.**
- **Close.**

Under the bar, the feature tiles turn features on and off for this car:

TILE	TURNS ON OR OFF
ALL	Everything. Off hides all of it; the others then read HIDDEN .
DASHBOARDS	All dashboards. 1 OF 2 means some are on.
WHEEL	The wheel model.
PASSTHROUGH	All canvases and boxes.
ARMS	Hands and arms.
SHAKE	Cockpit shake.

NONE means the car has nothing of that kind yet.

/ CONTROLLERS

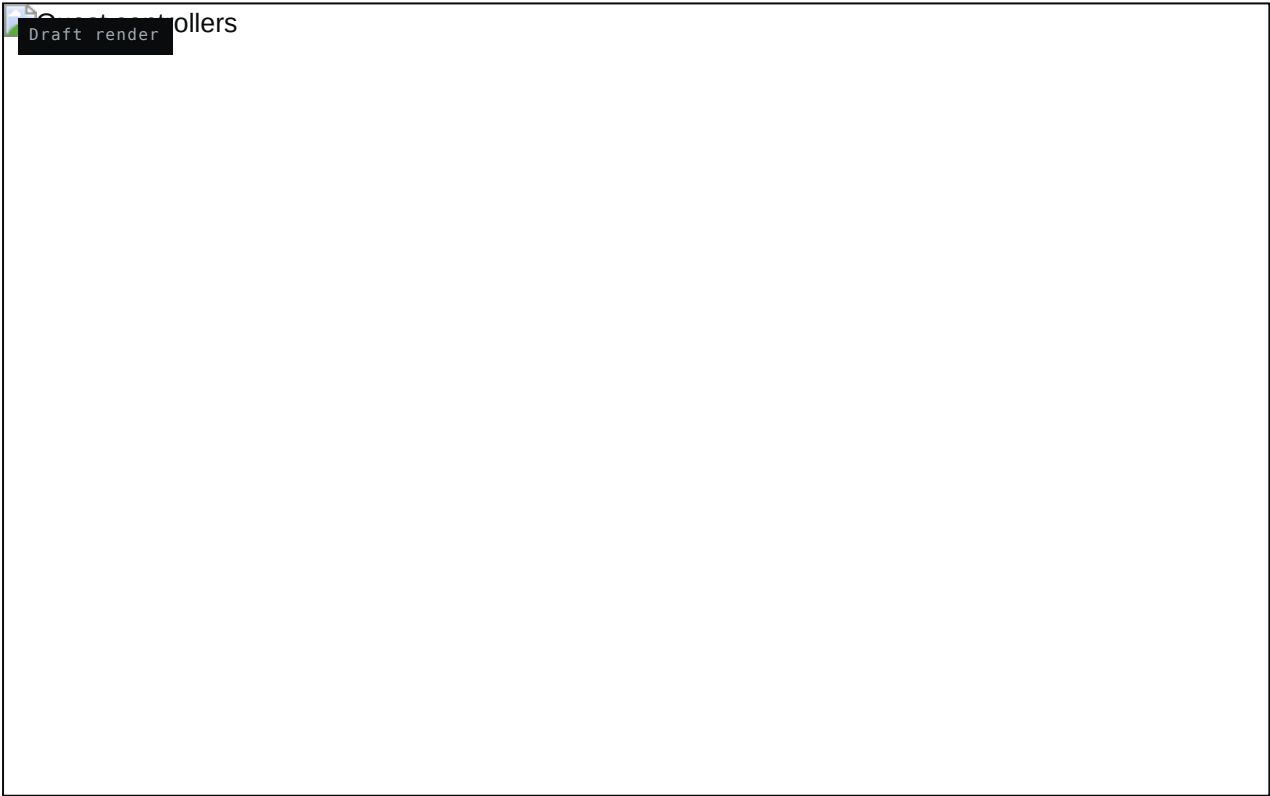


FIG 10.2 Quest controllers

QUEST CONTROLLERS	VALVE INDEX	WHAT IT DOES
TRIGGER	TRIGGER	Click. It only ever clicks.
GRIP	SQUEEZE	Hold to grab: move a window, or in edit mode, an item.
STICK	STICK	While grabbing: up and down resizes, left and right turns.
A	A (right)	Edit mode (with the menu open).
B	B	Cycle selection.
X	LEFT A	VR menu.

The Quest layout covers Quest 2, 3, 3S, Pro, Rift S and Pico 4 controllers.

HAND TRACKING

Turn on Settings > Controls > Hand tracking controls.

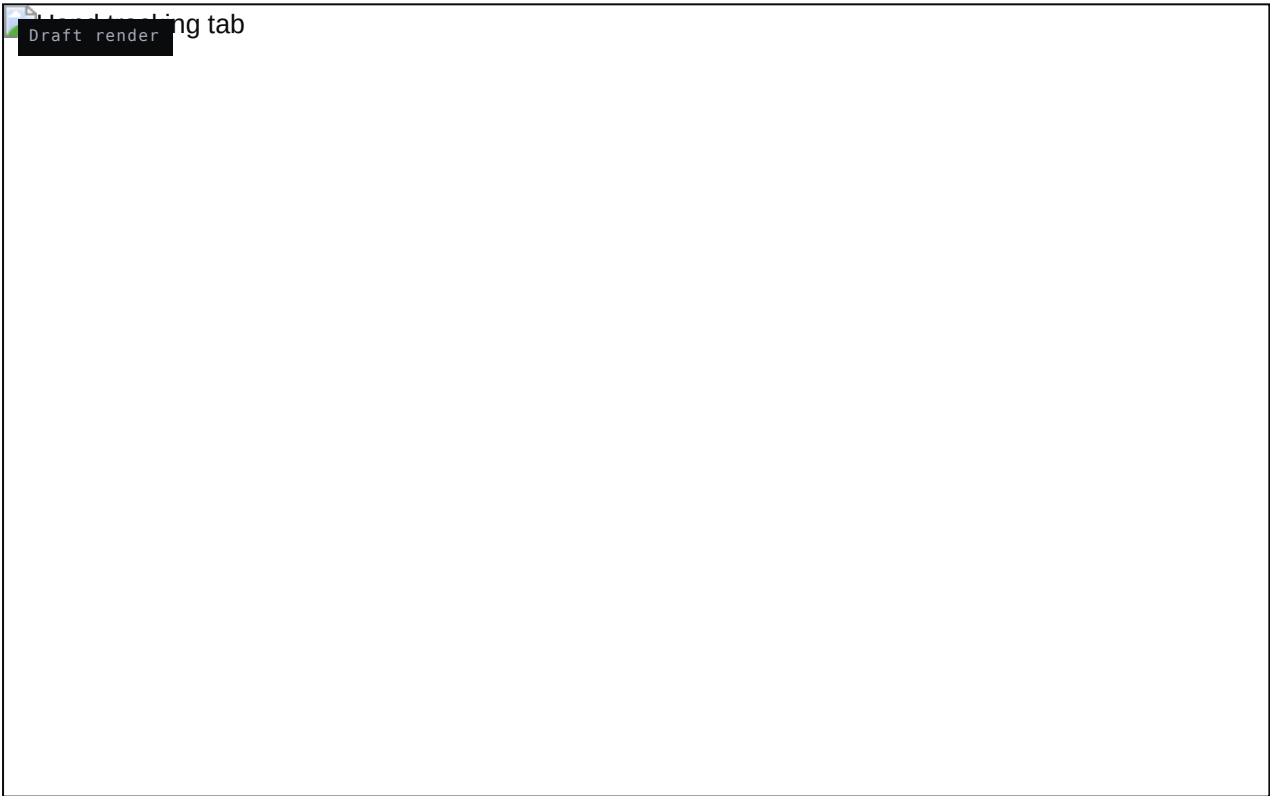


FIG 10.3 Hand tracking tab

GESTURE	WHEN	WHAT IT DOES
WRIST BUTTON · HOLD	Any time	Opens or closes the VR menu (0.8 s).
PINCH	Menu open	Click.
PINCH · HOLD	Menu open	Grab and move.

MENU CLOSED

Menu closed

Hands only show. No gesture does anything.

The wrist button is dim until your finger comes near. A pinch the headset uses for itself never counts.

**TIP**

Nothing you do with your hands during a race can open the menu by accident: only the wrist button does.

/ EDIT MODE

Edit mode is the only time the wheel, dashboards, canvases, boxes and the hub marker can be moved. That way nothing moves by accident during a race.

- 01** Open the VR menu.
- 02** Flip **EDIT** (or press **A**, or **F10**).
- 03** Point at an item and hold grip to move it. Push the stick to resize or turn it.
- 04** Close the menu. Edit mode ends and everything locks.

MOVE IN VR, **DRAW IN VR** and **ALIGN IN VR** on the desktop turn edit mode on for you.

/ TYPE A VALUE IN VR

Double-click a slider (two quick trigger pulls, or two pinches) to type its value. **Enter** applies, **Esc** cancels. While you type, the keys do not reach the sim.

/ RECENTRE

Recentre moves everything placed in the game world to your current seat position.

- Your paired recentre button (chapter 2). It works only while the sim has focus.
- The recentre button on the VR menu bar.
- **RECENTRE** on the Wheel page.

**TIP**

Pair the same button as the sim's own recentre, so both happen together. The sim's own recentre cannot be seen by the app.

/ KEYBOARD KEYS

Settings > Controls > **KEYBOARD**. **CHANGE** sets a new key.

ACTION	DEFAULT
VR menu	F9
Edit mode	F10
Grab selected (hold)	F11
Cycle selection	F12
VR click	not set

VR controller buttons cannot be changed.

CHAPTER

11

SETTINGS REFERENCE

Every row of every Settings section, in the order the app shows them.

IN THIS CHAPTER

- › GENERAL
- › CONTROLS
- › ARMS
- › LIGHTING
- › PASSTHROUGH
- › LICENSE
- › SYSTEM

Settings apply to every car. Open them with the gear in the title bar. **BACK** returns to the page you came from. The VR menu's settings window has the same sections, except **LICENSE**.

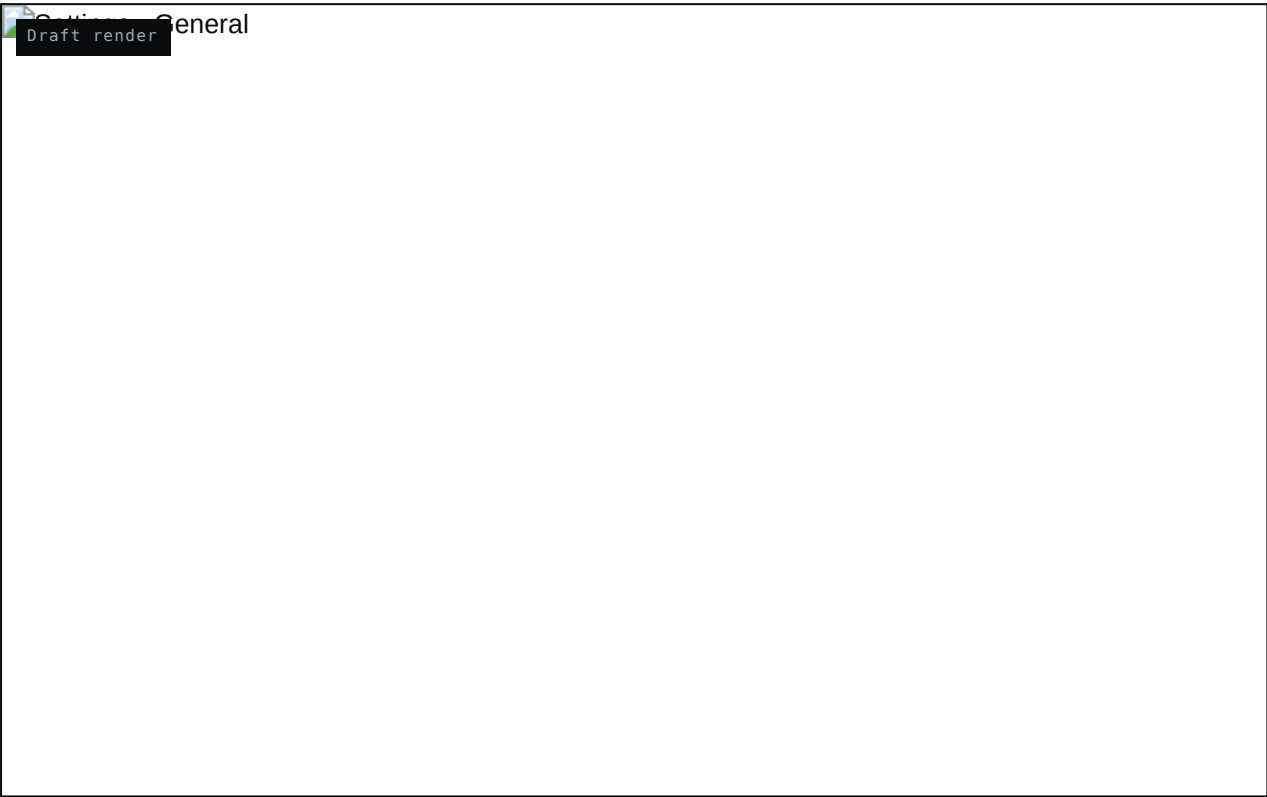


FIG 11.1 Settings > General

/ GENERAL

ROW	WHAT IT DOES
Switch preset when the car changes	Loads the preset of the car you drive. On by default.
Show everything in the headset	Master switch, same as the ALL tile.
One instance at a time	A second start brings the running app to the front.
Default steering range	Lock to lock for cars without their own, in degrees.
App scale	Size of the app window's contents. Applies after a restart.
Check for updates once a day	See chapter 13.
Presets and settings folder	OPEN FOLDER
SETUP	RUN SETUP runs the six setup steps again. Nothing is lost.

CONTROLS

ROW

WHAT IT DOES

VR controls	The controls for each controller type (chapter 10). Read only.
Hand tracking controls	Your hands drive the VR menu.
WHEEL > Recentre	Your paired button and its device. Pair again listens for a new one.
Recentre only while the sim has focus	Stops the recentre key firing while you type elsewhere.
KEYBOARD	VR menu , Edit mode , Grab selected (hold) , Cycle selection , VR click , CHANGE or SET takes a new key.
Pointer	Auto , Controllers or Head gaze .
Motion controllers in the sim	Lets the add-on use your controllers inside the sim.
VR menu > Size	How large the VR menu is, in px/m.
VR menu > Anchor	Game world or Real world .
VR menu > IN FRONT	Brings the VR menu in front of you.

ARMS

ROW

WHAT IT DOES

Show hands and arms	Draws your tracked hands.
Show sleeves	Draws the suit sleeves.
Model	The hand model. CHANGE loads another.
Colours	Glove and sleeve colour (untextured models).
BODY	Glove thickness , Forearm length , Upper arm length , Shoulder width , Shoulders below eyes , Shoulders behind eyes .
GRIP	Snap hands onto the rim , Hold the wheel when tracking drops , Snap range , Grip alignment , Grip depth , Elbow flare .

Details in chapter 8.

/ LIGHTING

ROW

WHAT IT DOES

Light objects from the game image	The game's light reaches your objects.
Sun from telemetry	Uses the sim's sun (iRacing).
Shadows	On or off; Low, Med, High.
STRENGTH	Sun, Ambient, Reflections, Shadows.
SUN	Tint, Direction offset, Mirror left and right.

Details in chapter 9.

/ PASSTHROUGH

ROW

WHAT IT DOES

Method	Off, Auto, Chroma key, Meta Link.
Key colour	Magenta, VD blue or your own. Must match Virtual Desktop.
Edge	Soft (a soft ramp, best with Virtual Desktop's Smoothness), Dither or Hard.

Details in chapter 7.

/ LICENSE

ROW

WHAT IT DOES

Status	ACTIVE, TRIAL · N DAYS LEFT, LITE · TRIAL ENDED, LITE · KEY REFUNDED, LITE · KEY NOT CHECKED, INVALID KEY or NO KEY.
Updates	ALL VERSIONS. On a trial: Trial ends.
License key	ENTER KEY or CHANGE KEY.
REMOVE KEY	Frees this PC so the key can be used on another one.

Details in chapter 3.

/ SYSTEM

ROW

WHAT IT DOES

Version	The app version. CHECK NOW looks for an update.
VR add-on	READY or NOT REGISTERED , with REGISTER or UNREGISTER .
VR runtime	The OpenXR runtime in use.
Running in	The VR game the add-on runs in, or WAITING FOR A VR GAME .
GPU cost per frame	How long the add-on takes per frame, in ms, by part.
Passthrough path	The passthrough in use.
Controllers	The controllers the add-on sees.
Play space	Your play area.
Telemetry	The sim, car and track being reported.
Let the sim's cockpit hide the wheel and dashboards	The sim's own cockpit can cover them. Off by default; hide the sim's own wheel first.
Separate VR layer for the wheel and dashboards	Off by default. Virtual Desktop does not show it.
Show VR menu preview	A desktop window showing the VR menu. For checks.
Add SimHub dash windows automatically	Adds open SimHub dash windows as dashboards.
Show hidden browser windows	Shows the background windows that draw SimHub dashboards. For checks.
Other layers	Other VR add-ons on this PC. Only shown when there are some.

CHAPTER

12

/ ***TROUBLESHOOTING***

The add-on not loading, a dashboard on WAITING, the cockpit not showing, passthrough edges.

IN THIS CHAPTER

- › The VR add-on does not load
- › A dashboard shows WAITING
- › The cockpit does not show
- › The wheel turns the wrong way or too far
- › Passthrough has coloured edges
- › The hands do not show
- › Low frame rate
- › Still stuck?

Each problem lists what to check, in order. Most answers are in Settings > System.

/ THE VR ADD-ON DOES NOT LOAD

You see: nothing in the headset, and Settings > System > **Running in** stays on **WAITING FOR A VR GAME** while the sim runs.

CHECK	FIX
☐ VR add-on reads NOT REGISTERED	Choose REGISTER .
☐ You moved the app's folder	Start the app from the new folder, then REGISTER .
☐ VR runtime reads NONE	Set your headset's OpenXR runtime as the active one (in Virtual Desktop, Meta Quest Link or SteamVR).
☐ The sim runs on SteamVR only	Install OpenComposite for that sim (setup step 3).
☐ The sim draws with DirectX 12 or Vulkan	Switch the sim to DirectX 11. Other renderers are not supported.
☐ Other layers lists other add-ons	Turn them off one at a time to find a clash.

/ A DASHBOARD SHOWS WAITING

You see: the card's badge stays on **WAITING**, and the panel in VR is empty.

CHECK	FIX
☐ SimHub is closed	Start SimHub.
☐ SimHub's web server is off	Turn it on in SimHub's settings (port 8888).
☐ Source is Window and the window is closed or minimised	Open the window and leave it open, or switch the source to SimHub .
☐ The URL was typed by hand	Re-add it from FROM SIMHUB .
☐ Lite mode	Only the first dashboard shows in the headset (chapter 3).

/ THE COCKPIT DOES NOT SHOW

You see: the sim runs in VR, but no wheel, dashboards or passthrough.

CHECK	FIX
☐ Home shows ... is running in VR, not ...	Choose SWITCH GAME .
☐ Home shows ...'s game file was not found.	Choose LOCATE and pick the game's .exe .
☐ The ALL tile is off	Open the VR menu and turn ALL on.
☐ The feature's own tile is off	Turn on WHEEL , DASHBOARDS or PASSTHROUGH .
☐ The trial has ended	The wheel, passthrough and extra dashboards wait for a key (chapter 3).
☐ Things appear far away or behind you	Recentre (chapter 10).

/ THE WHEEL TURNS THE WRONG WAY OR TOO FAR

CHECK	FIX
☐ Turns the opposite way	Turn on Invert steering .
☐ Spins about the wrong axis	Change Spin axis , or Flip spin direction .
☐ Turns too far or not far enough	Set Steering range to your wheel's lock (Automobilista 2 needs this).
☐ Turns about the wrong point	Set the Pivot , then ALIGN IN VR again.

/ PASSTHROUGH HAS COLOURED EDGES

You see: a pink or blue rim around passthrough windows.

The rim comes from video compression at the edge of the key colour. Every chroma-key app has it. To shrink it:

- 01** In Virtual Desktop: **Similarity** 15 to 25 %, **Smoothness** up, **Sharpening** off.
- 02** Raise the bitrate, or use HEVC 10-bit or AV1.
- 03** In the app, raise the window's **Edge feather** and keep Settings > Passthrough > **Edge** on **Soft**.



NOTE

Passthrough shows nothing at all? Check that Virtual Desktop's passthrough is on and its key colour matches **Key colour** exactly.

/ THE HANDS DO NOT SHOW

CHECK

FIX

- | | |
|--|---|
| ☐ Hand tracking is off on the headset | Turn it on in the headset's settings. |
| ☐ The controllers are in your hands | Put them down. |
| ☐ Show hands and arms is off | Turn it on in Settings > Arms, or the ARMS tile. |
| ☐ The runtime does not pass hand tracking | Use Virtual Desktop. |

/ LOW FRAME RATE

- 01 Settings > Lighting > **Shadows** to **Low** or off.
- 02 Lower dashboard **Resolution**.
- 03 Use a lighter wheel model.
- 04 Settings > System > **GPU cost per frame** shows what costs most.

/ STILL STUCK?

Write to the support address on the website. Add the app version (Settings > System > **Version**) and the log files from **%APPDATA%\CockpitXR\logs** (**cockpitxr_app.log**, and **cockpitxr_layer.log** from the sim).

CHAPTER

13

UPDATES AND THE CHANGE LOG

How the app tells you about a new version and how to install it.

IN THIS CHAPTER

- › How you hear about an update
- › Which updates your key covers
- › Install an update
- › The change log

/ HOW YOU HEAR ABOUT AN UPDATE

Once a day the app asks the website for the latest version number. When a newer one is out:

- Home shows **Version 0.2.0 is available.** with **CHANGE LOG** and **DOWNLOAD**.
- Settings > System > **Version** reads **0.1.0 • UPDATE 0.2.0 AVAILABLE**.

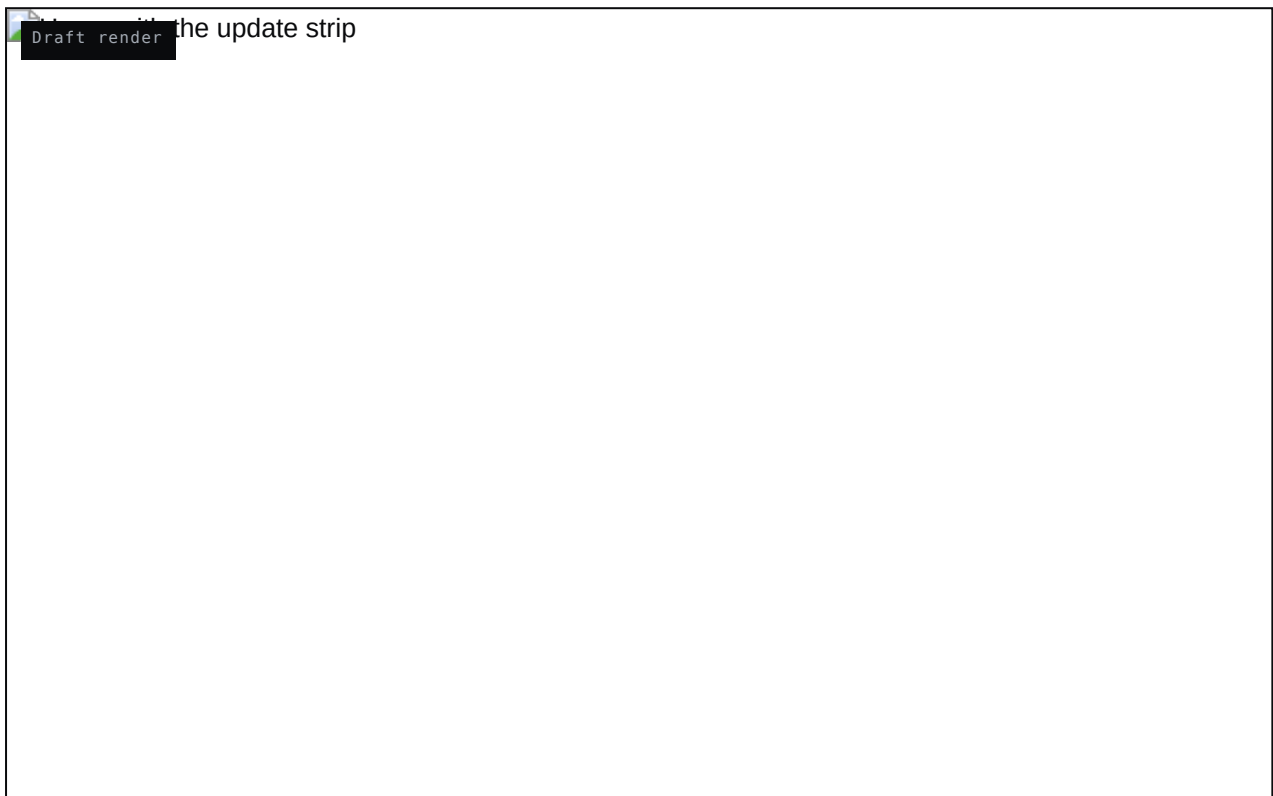


FIG 13.1 Home with the update strip

CHANGE LOG shows what is new. **DOWNLOAD** opens the download page in your browser.

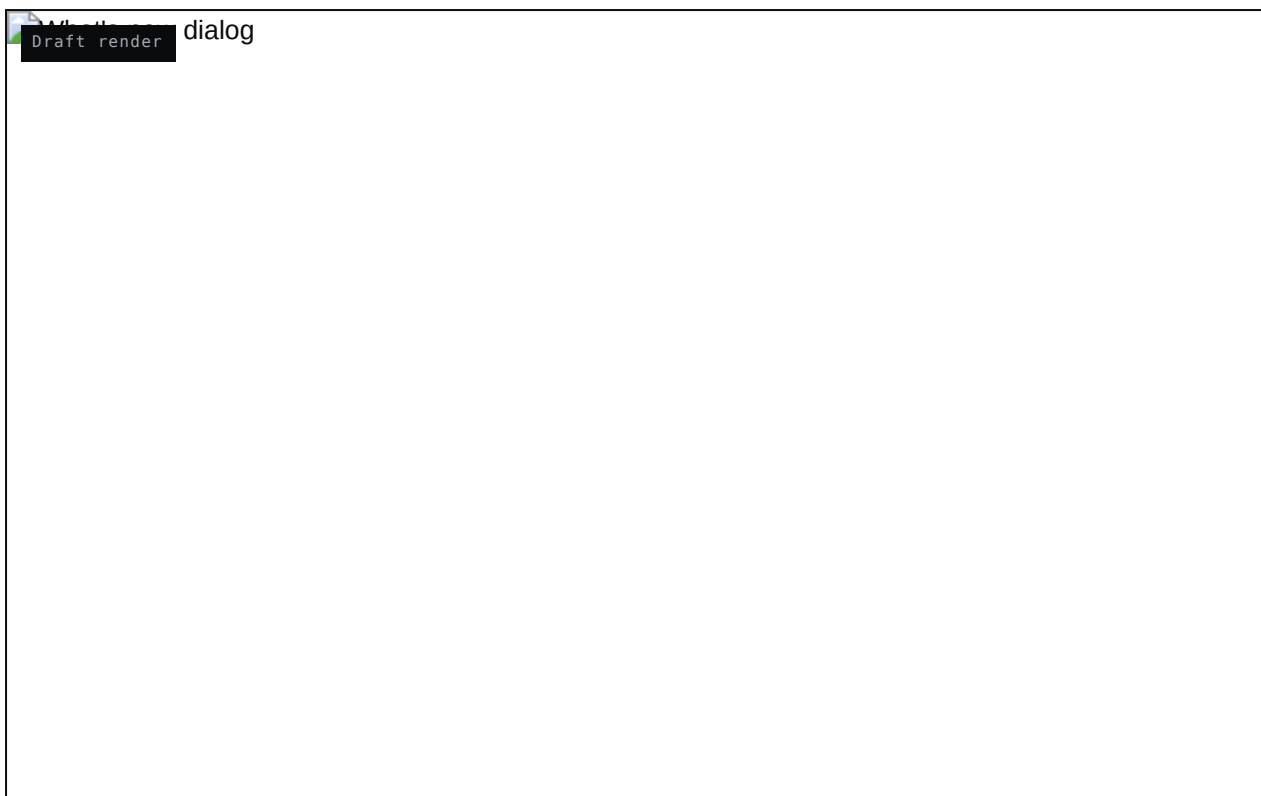


FIG 13.2 What's new dialog



NOTE

The check sends only the app's version number. The app never downloads or installs anything by itself.

To check now: Settings > System > **CHECK NOW**. To turn the check off: Settings > General > **Check for updates once a day**.

/ INSTALL AN UPDATE

- 01 Close the app and the sim.
- 02 Download the new zip.
- 03 Unzip it over the old folder, replacing the files.
- 04 Start the app.

Your presets, settings and license are kept. They live in **%APPDATA%\CockpitXR**, not in the app's folder.



TIP

Unzipped to a new folder instead? Start the app from there once, then Settings > System > **REGISTER**, so the sim loads the new add-on.

WHICH UPDATES YOUR KEY COVERS

Every version. A license includes lifetime updates: Settings > License > **Updates** shows **ALL VERSIONS**.

THE CHANGE LOG

The website's Change log page lists every version, newest first, with its date.

CHAPTER

14

GLOSSARY

The words this manual and the app use, in one place.

ANCHOR

Where an item's position is measured from:

Game world (your seat) or **Real world** (your room).

CAR ID

The name the sim uses for a car. Presets are matched to cars by it.

CANVAS

A flat passthrough panel you paint shapes on in VR.

BOX

A 3D passthrough shape. Anything inside it shows the real world.

CHROMA KEY

Passthrough by colour. The app paints a key colour, and Virtual Desktop replaces it with the camera image.

COCKPIT SHAKE

The wheel and dashboards moving with the car's bumps, worked out from telemetry.

DASHBOARD

A flat panel in the car showing a SimHub dashboard or a window.

EDIT MODE

The only state in which items in VR can be moved. Turned on with **EDIT**.

FEATHER

A soft edge, set in metres or millimetres.

FIT MODE

The Wheel page tool that places the wheel screen on the model.

FIT / FILL

How the wheel screen scales a dashboard: all of it inside the screen, or covering the screen with the edges cut.

GAME FILE

The sim's program (**.exe**). The cockpit shows only while it runs.

LITE MODE

The free mode after the trial: VR menu, recentre, hands and one dashboard.

OPENCOMPOSITE

A free tool that lets SteamVR-only sims run through OpenXR.

OPENXR

The standard way PC games talk to VR headsets. The add-on needs it.

OPENXR RUNTIME

The program that connects OpenXR games to your headset, for example Virtual Desktop.

PASSTHROUGH

Seeing the real world through the headset's cameras.

PIVOT

The point a wheel model turns about: the centre of the steering shaft.

PRESET

Everything set up for one car.

RECENTRE

Moving everything placed in the game world to your current seat position.

SIMHUB

A program that draws dashboards from telemetry. The app shows its dashboards.

TELEMETRY

Live data from the sim: car, steering, speed, motion.

TEMPLATE

The preset new cars start from.

VR ADD-ON

The part of Virtual Real Cockpit that loads into the sim and draws in the headset.

VR MENU

The menu in the headset, opened with  or the wrist button.

WHEEL SCREEN

A SimHub dashboard shown on your wheel model's display.

WRIST BUTTON

The round button on the back of your left wrist that opens the VR menu with hand tracking.