

CowanSim Replay Studio

User Guide

for Microsoft Flight Simulator 2024

Version 1.0 • November 2026

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CowanSim Replay Studio — User Guide for Microsoft Flight Simulator 2024

Version 1.0 — November 2026. For the CowanSim Replay Studio add-on on PC and on console (version 1.0.0), and the CowanSim Replay Studio Companion app for Windows.

For flight simulation only

This guide describes software for Microsoft Flight Simulator 2024. Nothing in it is for real-world flight.

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Open-source software

The Companion app contains open-source software. Its notices and license texts are installed with it: open **Licenses** in the CowanSim Replay Studio folder of the Start menu. The add-on contains RapidJSON (Copyright © 2015 THL A29 Limited, a Tencent company, and Milo Yip; MIT License, opensource.org/licenses/MIT).

Revision record

Revision	Date	Changes
1.0	November 2026	First edition.

How this guide is written

Buttons are shown in bold, like **Play**. Keys are shown like `Ctrl+Shift+Space`. Numbered steps are done in order. Where PC and console differ, a box says so:

> **ON A PC** Something that is only on a PC, or works differently there. Most of these are about the free Companion app.

> **ON A CONSOLE** Something to know on a console.

> **TIP** A quicker way, or a habit that makes Replay Studio nicer to use.

> **CAUTION** Something that can spoil a flight if you are not expecting it.

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1 Welcome

CowanSim Replay Studio is an instant replay, a flight recorder and a camera crew for Microsoft Flight Simulator 2024, and it works with any aircraft. It's always recording. When something happens that deserves a second look, open it, drag the slider back and watch it again from any camera, at any speed. Then press Fly and keep flying from the moment on screen.

1.1 Three things to know

1. **It's always recording.** From the moment a flight loads, the last 15 minutes are kept for you (up to 60 if you like). There's nothing to switch on, and you won't notice it in your frame rate.
2. **One button opens it.** It's the **CowanSim Replay Studio** button in the simulator's toolbar. Press it again to put it away.
3. **Play to watch, Fly to take over. Play** shows you what just happened. **Fly** hands the aircraft back to you from the moment on screen.

1.2 What you can do with it

- **Instant replay.** Go back in time, then play, pause, step, slow down to quarter speed or run at 8 times speed. A timeline bar along the bottom of the screen keeps it one click away.
- **Fly from any moment.** Take the controls anywhere in a replay. Missed the approach? Go back and fly it again.
- **Record a whole flight** with one button, or **save a clip** of the last few minutes after it happened.
- **Smart Camera.** Choose from 39 ready-made camera shots, from a simple chase or orbit to fly-bys, slow motion and cinematic moves. Stand on the ground and watch the aircraft come past, or press **Auto** and let it pick the shots for you.
- **Make a film. Auto edit** cuts a whole flight into a film with one press. You can also set your own cuts and build your own camera moves.
- **Time of day.** Set the light for a shot with a slider.
- **Ghost.** A flight you saved flies again as a second aircraft while you fly beside it or race it.
- **Video and screenshots.** On a PC with the free Companion app, one button for each.
- **Any aircraft.** Airplanes, helicopters, balloons and ground vehicles, default or add-on. Switches, doors and cockpit animations are found and recorded automatically.

1.3 PC and console

Replay Studio works on PC and on console, and it sets itself up for whichever one it's running on. On a PC, a free Companion app adds to it. It's optional. Chapter 2 covers the differences.

1.4 Finding your way in this guide

Chapters 2 to 4 are all you need to get started. After that, each chapter covers one job: replay, record, cameras, film, ghost, video. Settings, troubleshooting and a one-page quick card are at the back. **This guide is also inside the simulator:** open the tablet (the EFB) and choose **Replay Studio Manual**.

2 PC or console

Replay Studio is one product for PC and console, and it works as soon as it's installed. On a PC, the free Companion app makes it better. Whether you add it is up to you.

2.1 How it knows

When a flight loads, Replay Studio asks the simulator what it's running on. The simulator answers *PC* or *console*, and Replay Studio sets itself up to match. On a PC it also checks whether the Companion app is running. There's no setting for any of this and nothing you can get wrong.

2.2 What is the same

Everything that matters. On PC and console, with or without the Companion app, you get the same instant replay, the same **Fly**, **Record** and clips, the same Smart Camera shots and **Auto**, the same cuts, **Auto edit** and Custom moves, the same Time of day, the same Ghost and the same timeline bar. The buttons have the same names and do the same things.

2.3 What is different

	PC with the Companion app	PC without it	Console
Where Replay Studio opens	In its own window on your desktop.	In a panel inside the simulator.	In a panel inside the simulator.
Smart Camera	The Companion app's camera: the aircraft in full detail, with your pilot in the seat.	The basic built-in camera: less aircraft detail from far away, and no pilot in the seat.	The built-in camera, the same as on a PC without the app.
Sound during a Smart Camera shot	The sound from outside the aircraft.	The cockpit's sound. Everything else sounds as normal.	The cockpit's sound, the same as on a PC without the app.
Video and screenshots	One button each: **Record & export MP4** and **Screenshot**.	No buttons. Windows' own recorder still works (Chapter 10).	Use your console's own capture button.
Clips as files	**Export** and **Import clip...**, to share a clip with a friend.	Clips stay inside the simulator.	Clips stay inside the simulator.
Anything to download?	The Companion app, once. It's free.	Nothing.	Nothing. There's no Companion app for console.

ON A PC You don't have to download anything to use Replay Studio. When you want your pilot in the seat, the aircraft in full detail, MP4 video and screenshots, get the free Companion app (Chapter 3). Once installed, it starts and closes with the simulator, so there's nothing to manage.

> **ON A CONSOLE** There's no Companion app for console, and you don't need one. Everything is in the panel, and you'll never be asked to download anything. In this guide, skip the boxes marked ON A PC.



Figure 2-1 A PC without the Companion app: the panel inside the simulator, with the gold notice at the bottom of it

In Figure 2-1 the basic built-in camera is flying the **Side** shot. A console looks the same, without the gold notice.

> **TIP** **Which one am I looking at?** The panel inside the simulator has the simulator's own header, COWANSIM REPLAY STUDIO, with three blue buttons. The Companion app's window has a Windows title bar (Figure 4-1).

2.4 On a PC: the Companion app is your choice

Without the Companion app, Replay Studio runs in the panel and the basic built-in camera flies the shots. Everything in section 2.2 works. A gold notice, **USING THE BASIC CAMERA**, stays at the bottom of every page of the panel. It tells you what the free app adds and how the shots sound without it. Its button, **Get the Companion app**, opens the download page in your web browser. The address is beside it if you'd rather type it.

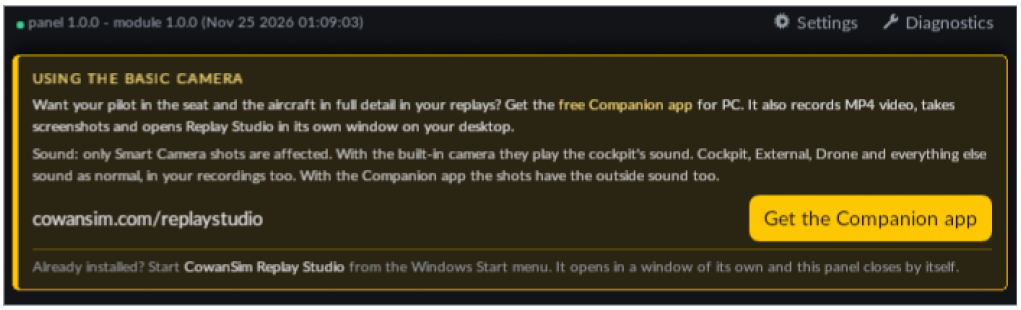


Figure 2-2 The notice at the bottom of the panel, on a PC without the Companion app

Once the Companion app is installed and running, it takes over by itself. Replay Studio opens in its own window, the panel inside the simulator closes, the app's camera flies the shots, and the notice is gone. Close the app, and the panel and the basic built-in camera take over again.

The app is free, but it does nothing on its own. It needs the add-on in the simulator. Without the add-on, the app's window says *Replay Studio is not in your simulator* (Figure 2-3). Get **CowanSim Replay Studio** in the simulator's Marketplace or, if you already have it, check that it's installed and restart the simulator. The card goes away by itself.

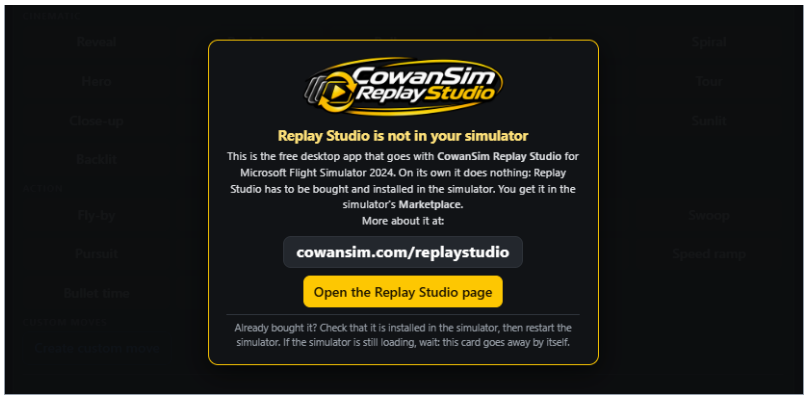


Figure 2-3 The Companion app's window when Replay Studio is not in the simulator

2.5 The basic built-in camera

The basic built-in camera is the simulator's own camera, flown by Replay Studio. It's what a console uses, and what a PC uses while the Companion app isn't running. The same shots, **Auto**, cuts and Custom moves work with it.

> **NOTE** **What it leaves out.** The simulator draws the aircraft in less detail when it's small in the picture, and it doesn't show your pilot in the seat. MP4 video, **Screenshot** and clip **Export** and **Import** come with the Companion app, so they aren't there without it.

> **NOTE** **Sound: this is about Smart Camera shots only.** With the basic built-in camera, a shot plays the cockpit's sound. **Cockpit**, **External**, **Drone** and everything else sound as normal, in your recordings too. With the Companion app, the shots have the outside sound as well.

On a PC, **Settings > Basic built-in camera** decides which camera flies the shots:

- **Off**, as it starts. The Companion app's camera flies the shots whenever the app is running. When it isn't, the basic built-in camera does.
- **On.** The basic built-in camera always flies the shots, even with the Companion app running. Use it if the app's camera doesn't work on your PC. The app's window, MP4 video, **Screenshot** and clip files all keep working. Only the camera changes.

With the switch **On** and the Companion app running, a line marked **BASIC CAMERA** stays at the bottom of Replay Studio. Its button, **Switch it off**, brings the full picture back.

3 Getting started

Two minutes from here to your first replay.

3.1 Install and open

1. Get **CowanSim Replay Studio** from the simulator's Marketplace.
2. Load a flight.
3. Open the simulator's toolbar and choose the **CowanSim Replay Studio** button (Figure 3-2).

That's it, on a console and on a PC. Replay Studio opens in a panel inside the simulator, and the timeline bar comes up along the bottom of the screen (section 5.6). There's nothing else you have to install.



This guide is in the simulator too. Open the simulator's tablet (the EFB) and choose **Replay Studio Manual**. It's the whole guide, page for page, so you can look something up without leaving the cockpit.

The arrows at the top turn the pages, the list button at the top left opens the contents, and the magnifying glasses make the page larger or smaller.

Figure 3-1 This guide on the simulator's tablet

3.2 On a PC: add the free Companion app

You can stop at 3.1. To get the most out of Replay Studio on a PC, add the free **Companion app** for Windows. It flies the Smart Camera with the aircraft in full detail and your pilot in the seat, records MP4 video, takes screenshots, and gives Replay Studio its own window on your desktop.

1. Press **Get the Companion app** in the gold notice at the bottom of the panel (Figure 2-2), or go to **cowansim.com/replaystudio**. Download **CowanSimReplayStudioCompanionSetup.exe**.
2. Run it. Windows asks for permission once. The simulator can stay running.
3. Leave **Open CowanSim Replay Studio now** checked on the last page. Within a few seconds Replay Studio opens in its own window, and the panel inside the simulator closes by itself.

From then on the Companion app starts and closes with the simulator. You never have to start it yourself.

> **NOTE** Windows may say it doesn't recognize the program the first time. Choose *More info*, then *Run anyway*.

3.3 Your first replay

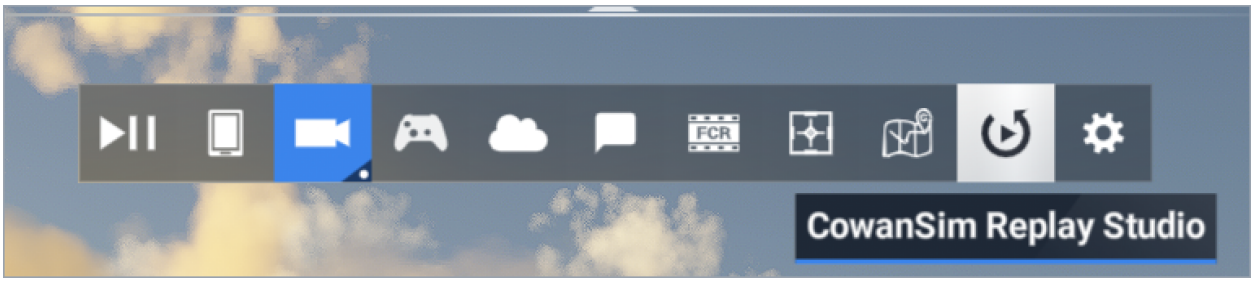


Figure 3-2 The simulator's toolbar. Point at a button and its name shows.

1. Load a flight and fly for a minute.
2. Open the simulator's toolbar (on a PC, move the mouse to the top of the screen) and press the **CowanSim Replay Studio** button. Replay Studio opens. On a PC with the Companion app it's a window over the simulator. Everywhere else it's a panel inside the simulator.
3. Press **Play**. Your aircraft freezes, and the last 30 seconds play back.
4. Drag the slider to go further back. Try the speeds, **0.25x** to **8x**.
5. For a better view, press **Auto** on Smart Camera, or try any shot that catches your eye.
6. Press **Fly**. You're flying again, from the moment on screen.

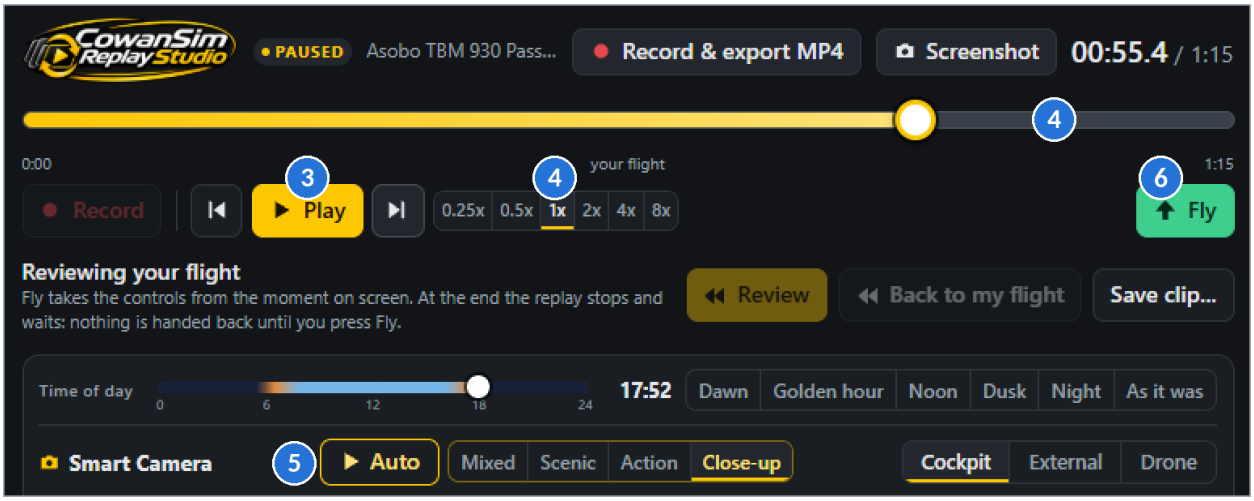


Figure 3-3 Replay Studio during the replay. The numbers are the steps above.

To keep what you just watched, press **Save clip...** and then **Save**. You'll find it in the **Clips** list.

> **CAUTION** Have your hands on the controls when you press **Fly**. You get the aircraft back exactly as it was moving at that moment.

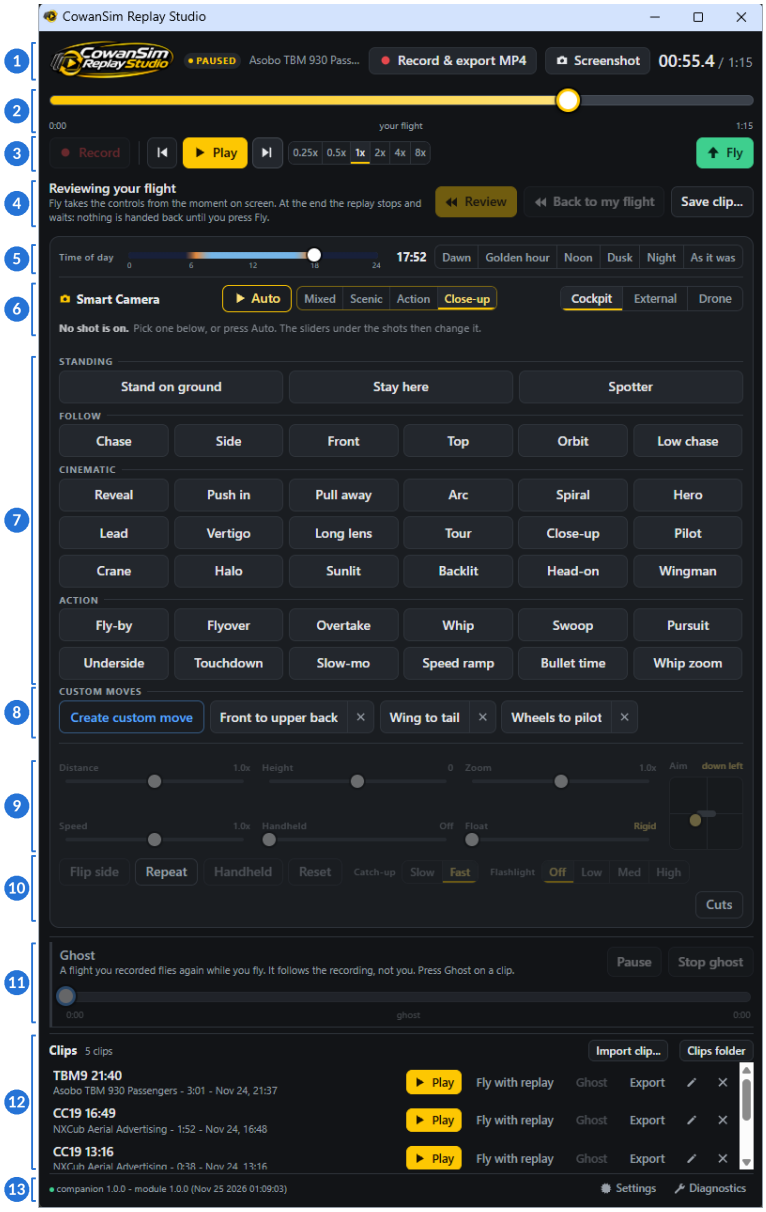
> **TIP** Press the toolbar button again to put Replay Studio away. The replay keeps running, and the timeline bar at the bottom of the screen still has **Play** and **Fly**.

4 Replay Studio at a glance

A tour of every page of Replay Studio, so you know what you're looking at. The chapters after this one go through the parts one at a time.

4.1 On a PC with the Companion app: its window

Everything is on one page. Anything you can't use right now is grayed out instead of hidden, so the buttons never move around.



1 **Status.** What is happening (LIVE, RECORDING, REPLAY or PAUSED), the aircraft, the video and screenshot buttons, and the clock.

2 **Timeline.** Your flight. Drag the knob to go back in time.

3 **Controls.** Record, back 5 seconds, Play, forward 5 seconds, the speeds, and Fly.

4 **Review row.** Tells you what's going on, with Review, Back to my flight and Save clip.

5 **Time of day.** Sets the light.

6 **Smart Camera.** Auto with its four styles, the simulator's own views, and under them the line that says which shot is on.

7 **The shots.** Standing, Follow, Cinematic and Action.

8 **Custom moves.** Camera moves you made yourself.

9 **Sliders.** Adjust the shot that's on.

10 **Buttons.** More ways to change the shot. **Cuts**, at the end of the row, opens the film tools.

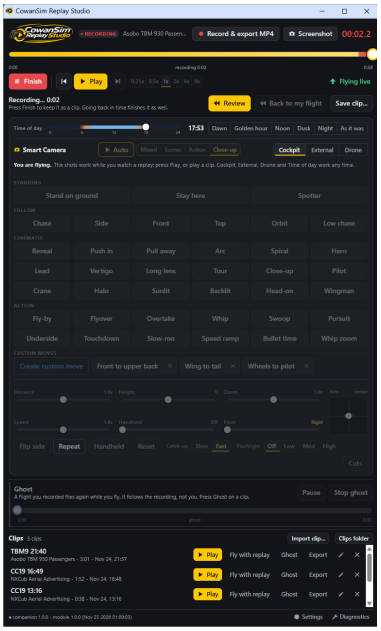
11 **Ghost.** A saved flight, flying beside you.

12 **Clips.** Everything you have saved.

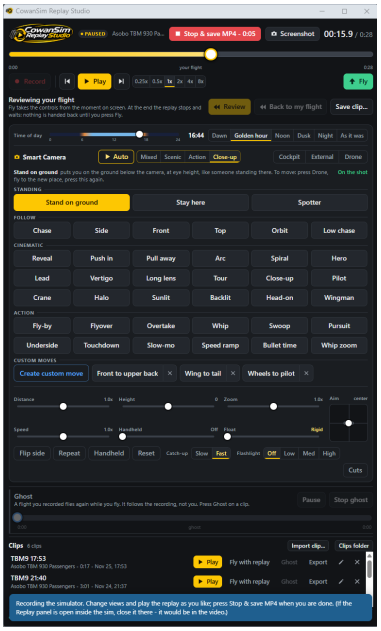
13 **Settings** and **Diagnostics.**

Figure 4-1 The Companion app's window during a replay, top to bottom

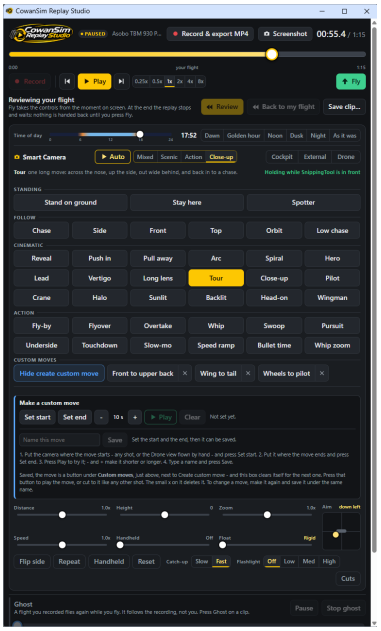
4.2 The same window at work



Recording. The button reads Finish, and the recorded part of the timeline is red.



A shot is on. Stand on ground is lit, and its sliders are live. A video is being recorded too.

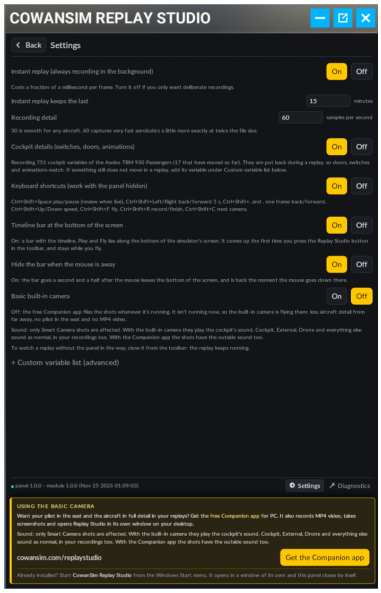


Making a custom move. Tour is on, and the box is open under the shots.

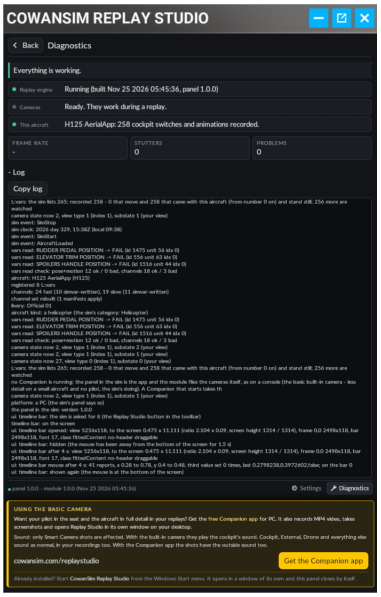
Figure 4-2 Recording a flight, a camera shot, and a custom move being made

4.3 Settings and Diagnostics

Both open from the bottom of Replay Studio, each on its own page. **Back** takes you back. They're the same in the Companion app's window and in the panel inside the simulator. These two are the panel's.



Settings (Chapter 12).

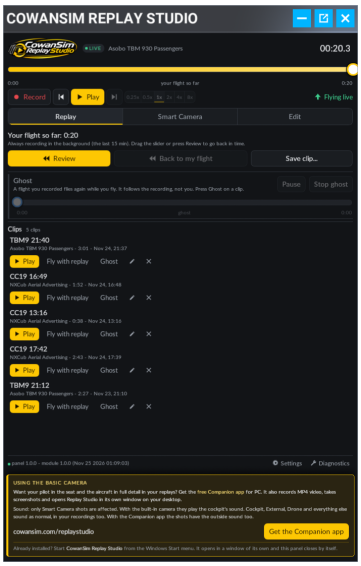


Diagnostics (Chapter 14), with its log open.

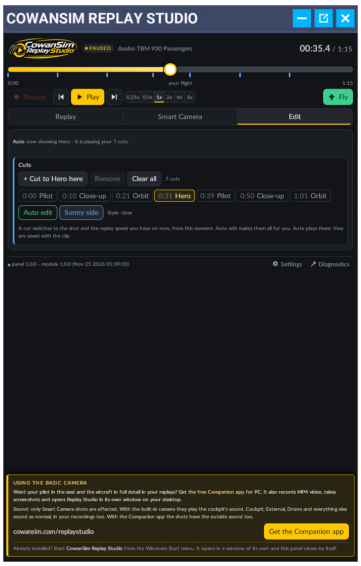
Figure 4-3 The Settings page and the Diagnostics page

4.4 In the simulator: the panel

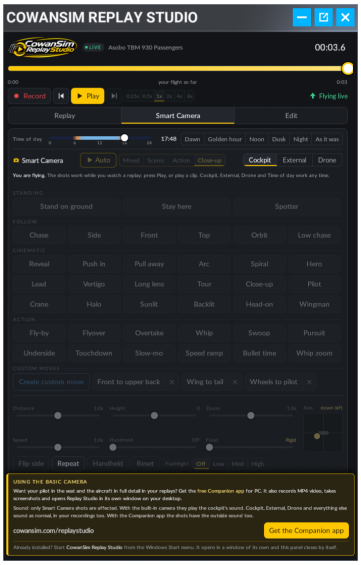
On a console, and on a PC without the Companion app, Replay Studio is a panel inside the simulator. It's the same page, split across three tabs so it fits: **Replay**, **Smart Camera** and **Edit**. The top of the panel (status, timeline, controls) stays on every tab. These pictures are from a PC without the Companion app, so the gold notice of section 2.4 is at the bottom of each. A console never shows it.



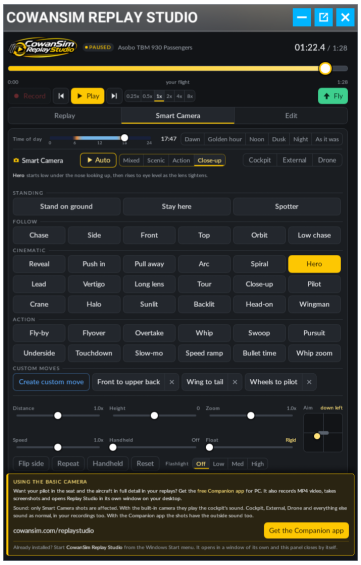
Replay. Review, Save clip, the Ghost and your clips.



Edit. Cuts and Auto edit, here with seven cuts made.



Smart Camera while you fly. The shots wait for a replay.



Smart Camera with a shot on. Hero is lit, and its sliders are live.

Figure 4-4 The three tabs of the panel inside the simulator

The rest of this guide shows the Companion app's window, because it has everything on one page. In the panel, look for the same button on the tab named above. The timeline bar along the bottom of the screen is covered in section 5.6.

5 Replay: going back in time

IN SHORT Drag the slider back. Press **Play** to watch. Press **Fly** to take over.

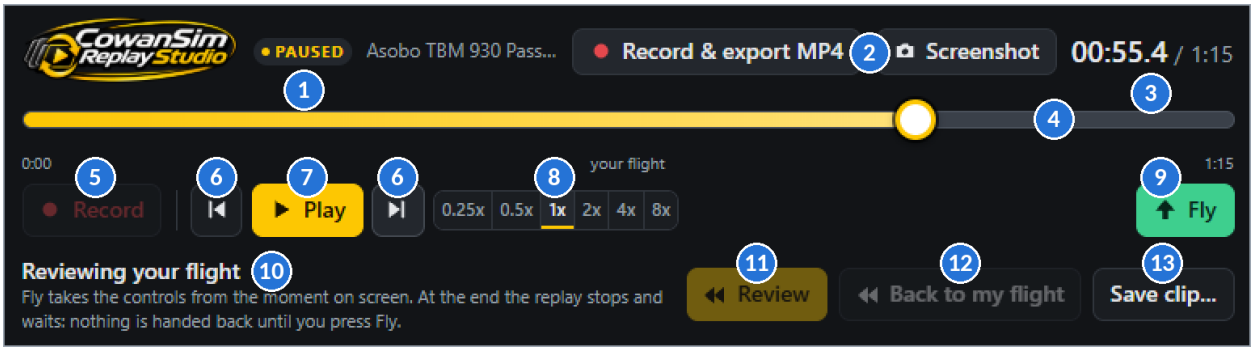


Figure 5-1 The replay controls, at the top of Replay Studio

	What it is	What it does
1	Status	**LIVE**: you're flying. **RECORDING**: a recording is running. **REPLAY** or **PAUSED**: a replay is on screen. Next to it is the aircraft's name.
2	Record & export MP4, Screenshot	Video and pictures of the replay. On a PC with the Companion app (Chapter 10).
3	Clock	Where you are in the replay, and how long it is.
4	Timeline	The gold bar is your flight. Drag the white knob to any moment.
5	Record	Records a whole flight (Chapter 6). Grayed out during a replay.
6	Step	Back or forward 5 seconds.
7	Play / Pause	Plays or pauses the replay. While you're flying, it plays the last 30 seconds.
8	Speed	From quarter speed to 8 times speed. **1x** is real time.
9	Fly	Hands you the aircraft from the moment on screen. While you're flying it reads **Flying live**.
10	Review row	Tells you in plain words what's going on.
11	Review	Opens a replay 30 seconds back, paused.
12	Back to my flight	After a clip, puts you back where you were before you played it.
13	Save clip...	Keeps part of your flight (Chapter 6).

5.1 Three ways to start a replay

- **Drag the slider.** The quickest way. Pull the knob to the left and the aircraft freezes. Wherever you let go is the moment on screen.
- **Play.** Goes back 30 seconds and plays. Think of it as *show me what just happened*.
- **Review.** Goes back 30 seconds and waits, paused.

5.2 Watching

Play, pause, step, change the speed, or drag the slider anywhere in the last 15 minutes. The view is yours. Use any of the simulator's cameras, or Smart Camera (Chapter 7). The aircraft, its controls, lights, doors and cockpit switches all follow the recording, and the engine sound rises and falls with the power you used. You can even climb out and watch on foot (section 5.7).

5.3 Fly: taking the controls

Fly hands you the aircraft at the moment on screen, moving the way it was moving, with the controls where they were. Recording carries on from there without a gap, so a minute later you can watch your new attempt too.

> **CAUTION** Be on the controls when you press **Fly**. The aircraft is released exactly as it was. If it was descending at 500 feet a minute, it still is.

> **TIP** To get back to *now* without re-flying anything, drag the slider all the way to the right and press **Fly**. The end of the timeline is where you left off.

5.4 At the end of a replay

When a replay reaches its end, it stops and waits, holding the aircraft at the last moment. You don't get the controls back until you ask for them. **Fly** takes over from that moment. After a clip, **Back to my flight** puts you back where you were before you played it.

5.5 Keyboard shortcuts

These work even with Replay Studio put away, so nothing blocks the view. You can switch them off in Settings.

Keys	What it does
`Ctrl+Shift+Space`	Play / pause. While flying: plays the last 30 seconds.
`Ctrl+Shift+Left` / `Ctrl+Shift+Right`	Back / forward 5 seconds.
`Ctrl+Shift+Up` / `Ctrl+Shift+Down`	Faster (up to 8x) / slower (down to 0.25x).
`Ctrl+Shift+F`	Fly.
`Ctrl+Shift+R`	Record / Finish.
`Ctrl+Shift+C`	Next camera shot (during a replay).
`Ctrl+Shift+,` / `Ctrl+Shift+.`	One frame back / forward, paused (during a replay).

> **NOTE** The shortcuts use the left Ctrl and left Shift keys, and they need a flight to be loaded. They do nothing in the simulator's menus.

5.6 The timeline bar

The timeline bar puts the replay controls along the bottom of the simulator's screen, like the bar of a video player. It comes up the first time you press the Replay Studio button in the toolbar, and it's there while you fly, with Replay Studio put away. It's the same on PC and console.



Figure 5-2 The timeline bar while you fly: Record and Play are ready, and the bar reads Flying live



Figure 5-3 The timeline bar during a replay, with Replay Studio put away

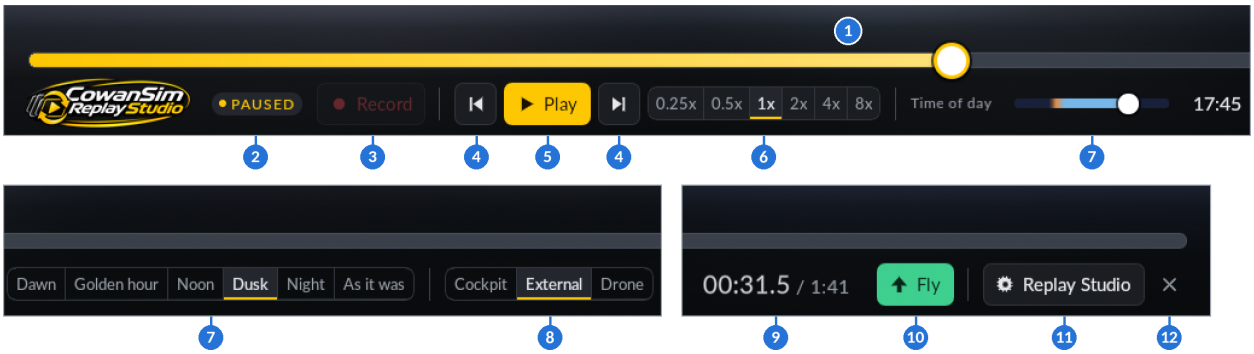


Figure 5-4 The bar close up, in two rows: its left end, and under it the rest

	What it is	What it does
1	Timeline	Your flight. Drag the white knob to any moment.
2	Status	**LIVE**, **RECORDING**, **REPLAY** or **PAUSED**.
3	Record	Records a whole flight (Chapter 6). Grayed out during a replay.
4	Step	Back or forward 5 seconds.
5	Play / Pause	Plays or pauses the replay. While you're flying, it plays the last 30 seconds.
6	Speed	From quarter speed to 8 times speed.
7	Time of day	Sets the light: the slider with its clock, and the moments of the day from **Dawn** to **Night**. **As it was** puts the clock back (section 7.5).
8	Cockpit, External, Drone	The simulator's own views (section 7.4). They work while you fly too.
9	Clock	Where you are in the replay, and how long it is.
10	Fly	Hands you the aircraft from the moment on screen. While you're flying it reads **Flying live**.
11	Replay Studio	Opens Replay Studio: its window on a PC with the Companion app, the panel everywhere else.
12	The cross	Puts the bar away. The next press of the toolbar button brings it back.

- **The bar hides while the mouse is away.** It goes a second and a half after the mouse leaves the bottom of the screen, and it's back the moment the mouse goes down there. To keep it on the screen all the time, set **Settings > Hide the bar when the mouse is away** to **Off**.
- While a clip plays, the bar also has **Back to my flight**.
- On a narrow screen the bar leaves out what doesn't fit, the moments of the day first. Everything on it is in Replay Studio too.
- To turn the bar off for good, set **Settings > Timeline bar at the bottom of the screen** to **Off**. The bar isn't shown in VR.

> **ON A PC** While the Companion app records a video or takes a screenshot, the bar hides, so it's never in the picture.

5.7 Watching on foot

In Microsoft Flight Simulator 2024 you can climb out of your aircraft and walk (`Shift+C` by default). A replay keeps playing while you do. Start one, step out, and watch your own flight from the ground, walking wherever you like. You can also start a replay when you're already standing outside.



Figure 5-5 A replay seen on foot. (The pad is CowanSim HelipadGo, a separate product.)

- **The replay controls work as usual.** Play, pause, the slider and the speeds, from the timeline bar or from Replay Studio.
- **Smart Camera needs you in the cockpit.** On foot the view stays with your pilot, and the shot buttons do nothing.
- **Getting back in.** The simulator lets you back into the cockpit (`Shift+C` again) only when the flight is live again and the aircraft is on the ground. So end the replay first: drag the slider all the way to the right and press **Fly** (the end of the timeline is where you left the aircraft), or press **Back to my flight** after a clip. Then press `Shift+C`.
- **On foot, press Fly only with the aircraft on the ground. Fly** hands over the aircraft at the moment on screen (section 5.3). In the air, nobody would be at the controls.

> **NOTE** While you're on foot, the aircraft's doors, its parking brake and a helicopter's collective lever stay as they are. They follow the recording again once you're back in the cockpit.

6 Record and clips

IN SHORT Instant replay forgets after 15 minutes. A clip is kept for good. **Record** keeps a whole flight, and **Save clip...** keeps what just happened.

6.1 Record a whole flight

1. Press **Record** before the flight you want to keep. The button turns red and reads **Finish**.
2. Fly for as long as you like. A recording isn't limited to 15 minutes. It can run for up to three hours.
3. Press **Finish**. The flight is saved as a clip and named for you with the aircraft and the time, for example *H125 15:03*.

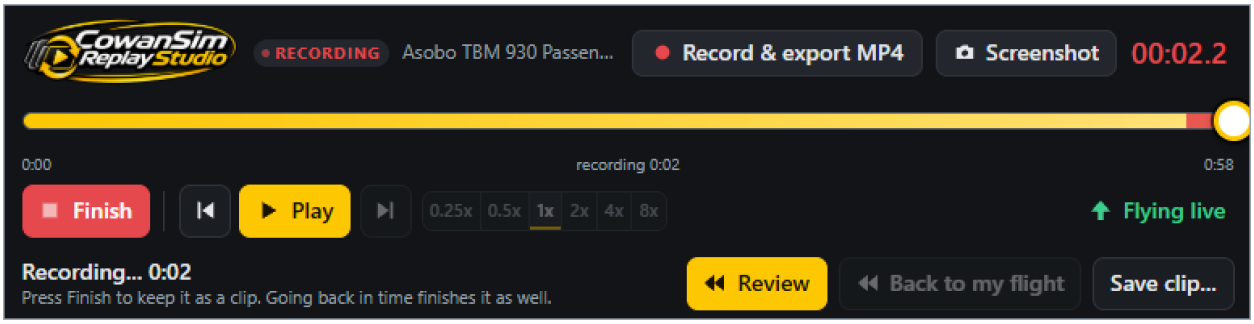


Figure 6-1 Recording: the badge says RECORDING, the clock counts in red, and the recorded part of the timeline is red

NOTE If you go back in time while a recording is running, the recording is finished and saved first. Nothing is lost.

Flying with a ghost? It's recorded too. The clip holds both aircraft, and its replay shows both (Chapter 9).

6.2 Save a clip after it happened

For the moment you didn't know you'd want to keep.

1. Press **Save clip...**
2. Choose how much to keep: **Last 2 min**, **Last 5 min**, **Last 15 min** or **Everything**. During a replay there's also **From here to the end**.
3. Press **Save**. The name is filled in for you, and you can change it first if you like.

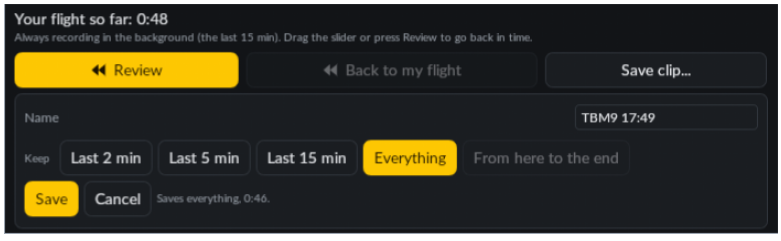


Figure 6-2 Save clip: pick how much to keep, then Save

6.3 The Clips list

Every clip you have saved, newest first, with the aircraft, the length and when it was flown.

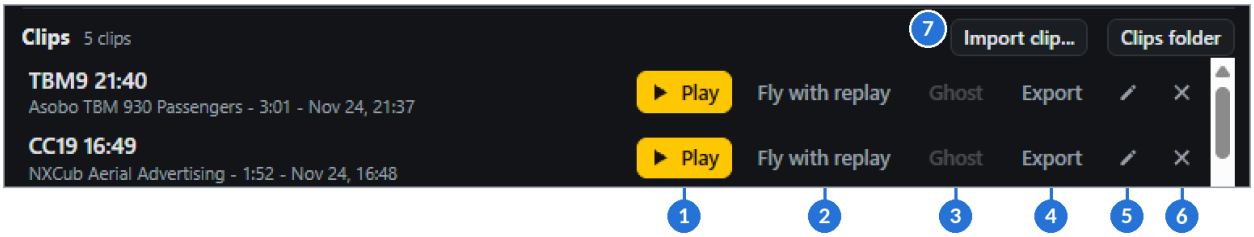


Figure 6-3 The Clips list, here during a replay

	Button	What it does
1	Play	Plays the clip from its start.
2	Fly with replay	Fly that flight again, with the first one in the air beside you (Chapter 9).
3	Ghost	The clip flies as a second aircraft while you fly (Chapter 9). Grayed out during a replay.
4	Export	Saves the clip as a file to share. On a PC with the Companion app (Chapter 11).
5	Pencil	Renames the clip.
6	x	Deletes the clip. It takes two presses. The first one asks *Delete?*, so you can't delete a clip by accident.
7	Import clip..., Clips folder	Add a clip file someone sent you, or open the folder of clip files. On a PC with the Companion app (Chapter 11).

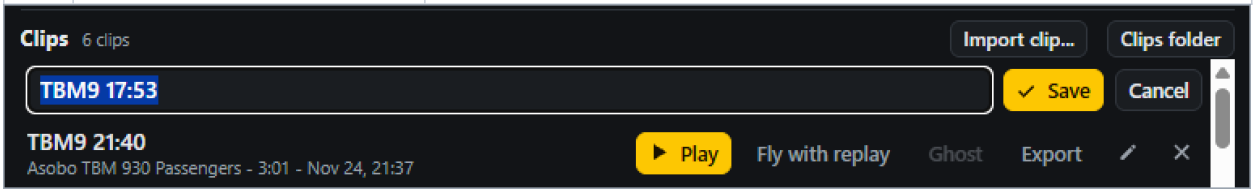


Figure 6-4 Renaming a clip: press the pencil, type the new name, then Save

6.4 Playing a clip

Press **Play** on a clip. Your aircraft freezes where it is and the clip plays from its start. Everything from Chapter 5 works: the speeds, the slider, the cameras. There are two ways out:

- **Fly** takes the controls from the moment on screen. You're now where the clip was.
- **Back to my flight** puts you back where you were before you played the clip.

> **TIP** A clip plays in any aircraft. It stores the flight, not the aircraft, so whatever you're sitting in follows the clip's path. Load the aircraft it was flown in if you want the cockpit to match.

> **ON A CONSOLE** Selecting a name box (in Save clip, or when renaming) brings up the console's on-screen keyboard.

7 Smart Camera

IN SHORT Start a replay, then press **Auto** and watch. Or press any shot and the camera goes there.

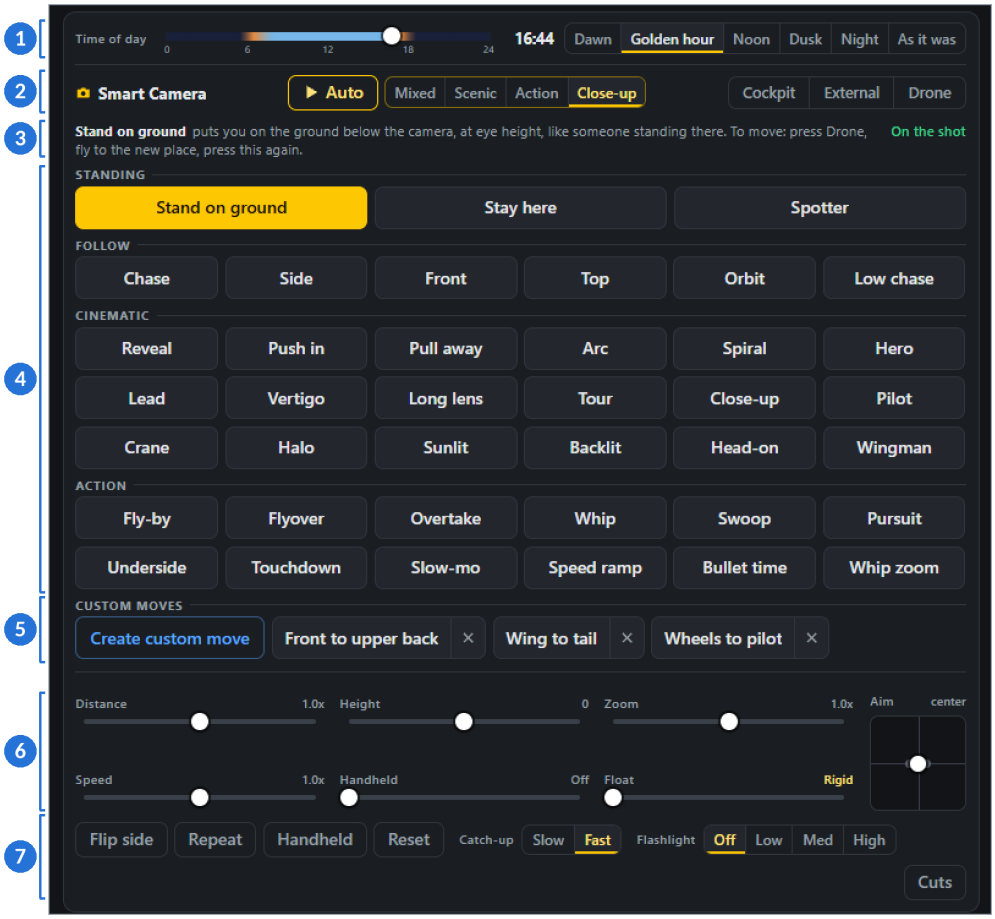


Figure 7-1 The Smart Camera card, with the Stand on ground shot on

	What it is	What it does
1	Time of day	Sets the light: drag the slider, or press a moment of the day (section 7.5).
2	Auto, its styles, and the views	**Auto** plays the shots for you in the style picked next to it. **Cockpit**, **External** and **Drone** are the simulator's own views.
3	The shot line	Tells you what the shot does and, on the right, what the camera is doing: *gliding to the shot*, *on the shot*.
4	The shots	Press one. It stays lit while it's on.
5	Custom moves	Camera moves you made yourself (Chapter 8).
6	Sliders and Aim	Adjust the shot that's on (section 7.3).
7	Buttons	Flip side, Repeat, Handheld, Reset, Catch-up and Flashlight (section 7.3). **Cuts**, at the end of the row, opens the film tools (Chapter 8).

7.1 The easy way: Auto

Press **Auto**. The camera runs through the shots one after another, letting each move finish, until you press Auto again or choose a shot. The four buttons next to it set the style:

- **Mixed**: a bit of everything.
- **Scenic**: long, calm moves and wide views.
- **Action**: passes, whips and slow motion.
- **Close-up**: the aircraft and its pilot.

7.2 Pick a shot

The shots work while a replay is on screen. While you're flying, they're grayed out. Press one and the camera flies there in a second or two, a little longer around a large aircraft. There are 39 shots in four groups.



Figure 7-2 A shot at work: Hero, on a turboprop at dusk. On the left is the panel inside the simulator.

Standing: the camera stays where it is

Shot	What it does
Stand on ground	Puts you on the ground at eye height, watching like someone standing there (section 8.4).
Stay here	The camera stops exactly where it is, in the air or on the ground, and watches from there.
Spotter	A camera standing where the aircraft is *going to be*. The replay already knows. It watches the aircraft come in, pass and leave. That's one pass. Press **Spotter** again for another, or switch **Repeat** on.

Follow: the camera keeps a place beside the aircraft

Shot	What it does
Chase	Behind and above, swinging around lazily when the aircraft turns.
Side	Alongside, level with the aircraft.
Front	Ahead of the aircraft, looking back at it.
Top	Above, looking down. Great for turns and for watching the ground go by.
Orbit	A circle around the aircraft. **Speed** sets how fast, **Flip side** which way.
Low chase	Down at ground level looking up, moving along like a camera car. Best for a hover or a low pass.

Cinematic: the camera travels

Shot	What it does
Reveal	Starts tight on the tail, then rises and pulls back until the landscape ahead fills the frame.
Push in	Comes in from far ahead of the nose and ends close and low beneath it.
Pull away	Starts tight on the cabin, then climbs and backs away until the aircraft is small. The shot you end a film on.
Arc	Sweeps from the rear quarter around the side to the front.
Spiral	Starts close off the nose and winds out and up around the aircraft.
Hero	Low under the nose looking up, then up to eye level as the lens tightens.
Lead	Just ahead and low, drifting across the nose from one side to the other.
Vertigo	Closes in from behind as the lens widens. The aircraft stays the same size while the world stretches.
Long lens	Far out to the side on a long lens. The aircraft holds still while the background slides by.
Tour	One long move: across the nose, up the side, out wide behind, and back in to a chase.
Close-up	Tight on the cabin from the front quarter, drifting around toward the side.
Pilot	As close as the aircraft allows, on a portrait lens, aimed at the cabin.
Crane	Starts low just behind the aircraft and rises straight up until it's looking down on it.
Halo	A slow circle high above, looking down.
Sunlit	Positioned by the sun, on the sunny side of the aircraft, with the light over the camera's shoulder.
Backlit	Positioned by the sun, on the far side, looking into the light with the sun just above the aircraft.
Head-on	Far out dead ahead on a long lens, the aircraft coming straight at the camera.
Wingman	Off the rear quarter and a little above, like a second aircraft flying in formation.

Action: passes, and time

Shot	What it does
Fly-by	The aircraft passes close to the camera and flies on.
Flyover	The same pass from underneath, looking up as the aircraft goes over.
Overtake	The camera comes up from behind, passes close by and ends up ahead, looking back.
Whip	A fast swing from the rear quarter all the way around the nose.
Swoop	Dives from high behind, down past the side, and ends low off the nose looking back up.
Pursuit	Tight on the tail and low, swinging from side to side like something chasing the aircraft.
Underside	Passes right underneath from behind to ahead, looking up at the belly against the sky.
Touchdown	Close in by the wheels or skids, at half speed. Made for a landing or a takeoff.
Slow-mo	The replay runs at quarter speed while the shot is on, the camera drifting close along the side.
Speed ramp	The aircraft comes at the camera and goes by in slow motion, then time snaps back.
Bullet time	The replay drops to an eighth of its speed while the camera swings all the way around the nose.
Whip zoom	Starts well back on a normal lens, then snaps in tight on the cabin.

7.3 Change the shot

The sliders and buttons under the shots adjust the shot that's on. They're grayed out when no shot is on.

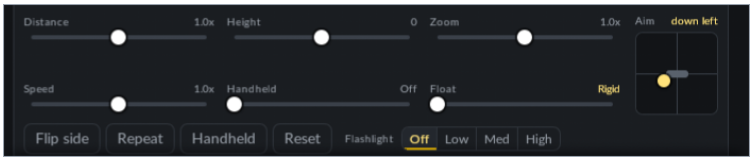


Figure 7-3 The controls under the shots, here in the panel with Hero on: Aim is down and to the left, and Float is all the way left

Control	What it does
Distance, **Height**, **Zoom**, **Speed**	How far away the camera is, how high, how tight the lens is, and how fast a move runs. The middle of each slider is the shot as it was designed.
Handheld	How much the camera wanders, as if hand-held. The button switches it on and off.
Float	How loosely the camera rides with the aircraft. All the way left is rigid.
Aim	The pad on the right. The dot is where the camera looks. Drag it to put a rotor head or a wheel in the center of the picture, and double-click to center it again.
Flip side	Mirrors the shot to the other side and reverses the direction of the circles.
Repeat	A switch. **On**: a move or a pass begins again each time it ends. **Off**: it plays once.
Reset	Puts the sliders and the aim back to normal.
Flashlight	A light on the camera for dusk and night: **Low**, **Med** or **High**.
Catch-up (PC, with the Companion app)	What the camera does when a shot begins a long way from the aircraft. **Fast** brings it straight in. **Slow** flies it in on one long, gentle curve.

7.4 The simulator's own views

Cockpit and **External** go to the simulator's own views, and **Drone** hands you its drone camera to fly by hand. Each one turns the Smart Camera shot off. All three also work while you're flying, and the same three buttons are on the timeline bar (section 5.6).

7.5 Time of day

The first row of the card sets the light, flying or in a replay. Drag the slider to the hour you want. It shows local time where the aircraft is, and the sky follows as you drag. Or press **Dawn**, **Golden hour**, **Noon**, **Dusk** or **Night**, which are worked out for the place and the date. **As it was** puts the clock back. The same slider and buttons are on the timeline bar (section 5.6).

- A change made while you fly stays until you change it again.
- A change made during a replay is undone when the replay stops. **Fly** keeps the new time.
- **Sunlit** and **Backlit** use the sun's position at the time you set.

> **NOTE** Only the clock changes, not the weather. If the simulator's time is set to follow the real world (Live), it may set the clock right back. Switch that off in its Weather and Time window first.

7.6 Good to know

> **ON A PC** The Companion app flies the shots by steering the simulator's own drone camera, so you get the simulator's full picture: every detail of the aircraft, with your pilot in the seat.
>
> While you're using the mouse inside the simulator, the camera waits and carries on as soon as the mouse stops. In the Companion app's window it never has to wait.
>
> Without the Companion app, the basic built-in camera flies the shots (section 2.5).

> **ON A CONSOLE** The camera is built into Replay Studio, so there's nothing else to install. To watch without the panel in the way, close it from the toolbar. The replay and the shot keep running.

8 Making a film

IN SHORT Press **Cuts**, then **Auto edit**, then **Auto** and **Play**. That's a film of your flight.

A cut says *from this moment, show this shot at this speed*. String a few cuts together and you have a film. Replay Studio can write the cuts for you, or you can set each one yourself.

8.1 Auto edit: a film in one press

1. Play a clip, or start a replay of your flight.
2. Press **Cuts** at the bottom of the Smart Camera card. In the panel inside the simulator, open the **Edit** tab instead.
3. Press **Auto edit**.
4. Press **Auto**, go to the start and press **Play**. Watch your film.

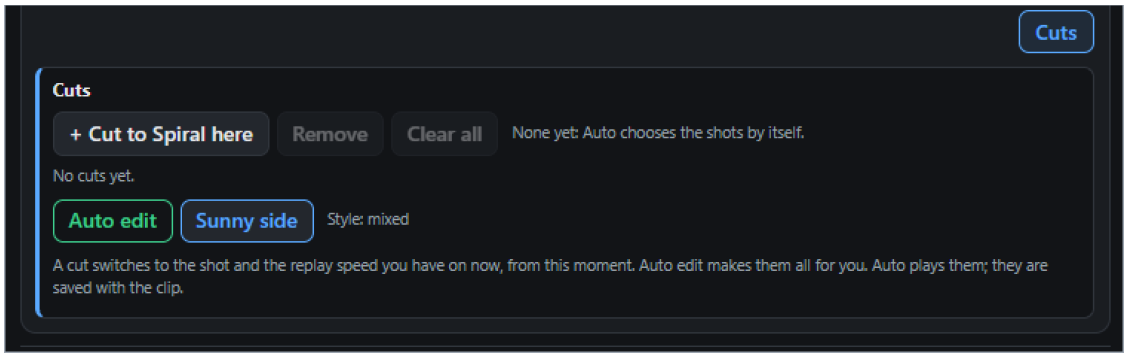


Figure 8-1 The Cuts box

Auto edit looks at what the aircraft did and builds the film around it: a camera on the ground for the takeoff and again for the landing, a circle around a hover, a sweep through a turn, wide moves in cruise, and slow motion where it counts. It follows the style picked next to **Auto**. Scenic gives you long, calm cuts. Action cuts faster and uses more slow motion. What you get is a normal list of cuts. Play it as is, or change any part of it.

8.2 Your own cuts

1. Go to the moment where you want the cut.
2. Choose the shot, and the speed (**0.25x** to **8x**).
3. Press **+ Cut to … here**. The button names the shot it will cut to. A mark appears on the timeline, and the cut is added to the list in the box.

Whenever **Auto** is on, it plays your cuts, holding each shot until the next cut. Cuts are saved with the clip as soon as you set them.

- **To go to a cut**, press it in the list.
- **To change a cut**, go to it, choose another shot or speed and press **+ Cut** again.
- **Remove** takes out the cut at the moment on screen. **Clear all** takes out every cut.

- **Sunny side** tells Auto to keep the camera on the sunlit side of the aircraft whenever a shot can be flown from either side.

8.3 Custom moves: a camera move of your own

A custom move is two camera positions: where it starts and where it ends. Make it once, give it a name, and from then on it has its own button under **Custom moves**. You can keep up to sixteen.

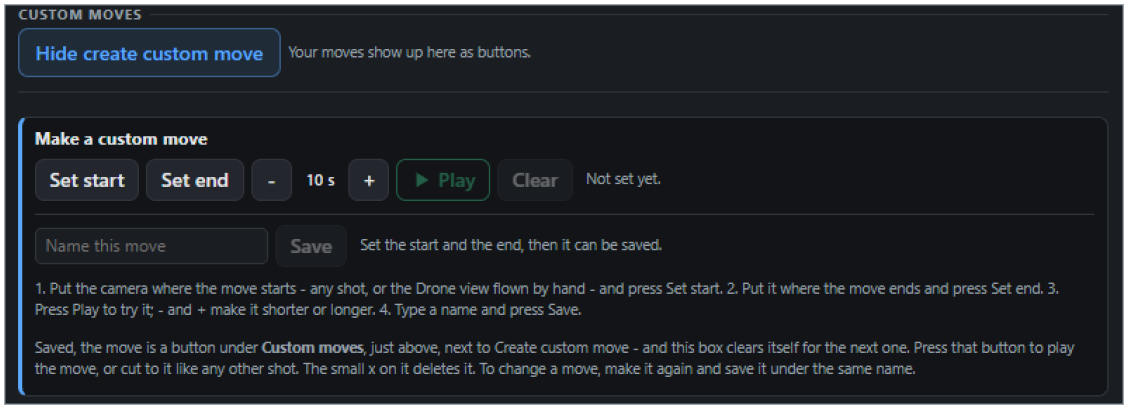


Figure 8-2 Making a custom move: the box as it opens

1. Press **Create custom move**. The box opens.
2. Put the camera where you want the move to start. Use any shot and adjust it with the sliders, or press **Drone** and fly the camera there by hand. Press **Set start**.
3. Put the camera where you want the move to end. Press **Set end**.
4. Press **Play** to try it. **-** and **+** make it shorter or longer.
5. Type a name and press **Save**.

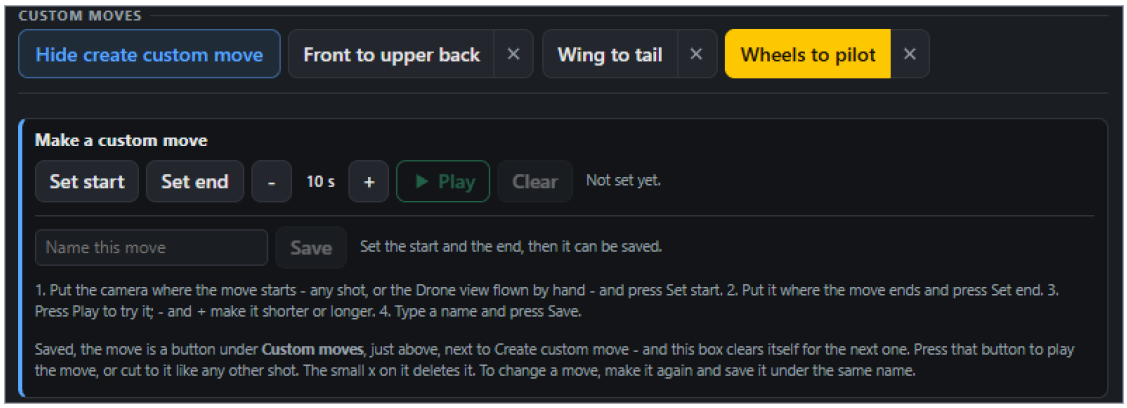


Figure 8-3 Three moves saved. Each has its own button, and Wheels to pilot is playing.

- **To play a move**, press its button. With **Repeat** on (section 7.3), it begins again each time it ends. **To cut to one**, play it and press **+ Cut to … here**.
- **To change a move**, make it again and save it under the same name.
- **To delete a move**, press the small **x** on its button, and press again when it asks *Delete?*

A move is stored relative to the aircraft, so it works around any aircraft. Your moves are saved with Replay Studio, not with a single clip, so they're there on every flight.

8.4 Stand on the ground

To watch a takeoff, a landing or a low pass the way someone standing there would see it, use **Stand on ground**.

1. During a replay, press **Stand on ground**. You're put on the ground directly below the camera, at eye height, turning to watch the aircraft.
2. To stand somewhere else, press **Drone** and fly over the place you want. There's no need to descend.
3. Press **Stand on ground** again. Now you're standing there.
4. Step the replay back and watch the aircraft come past you.

- If you press it from the cockpit, or with the camera directly over the aircraft, it puts you beside the aircraft's path, a little ahead and off to the side.
- **Zoom** is your binoculars. **Height** raises you up, as if onto a hill, a roof or a tower. **Handheld** adds the small movements of a hand-held camera.
- You stand at the height of the ground under the aircraft. At an airport that's exact. On a slope, use **Height** if you end up too low.

Stay here stops the camera exactly where it is, even in midair, and zooms to keep up as the aircraft moves away. **Spotter** picks a spot on the ground for you, for one pass.



Figure 8-4 From the ground beside the runway, at dusk

9 Ghost: fly with yourself

IN SHORT While you fly, press **Ghost** on a clip. That flight flies again as a second aircraft, and you fly beside it.

A ghost is a flight you saved, flying again while you fly. It follows its recording, not you, so you're free to fly beside it, race it, or go your own way.

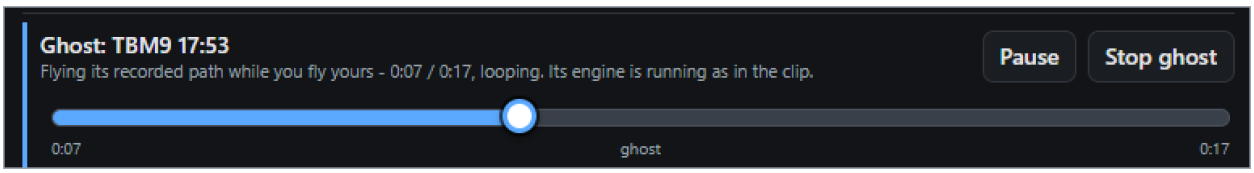


Figure 9-1 A ghost in the air. Its line shows which clip it's flying and how it's doing

9.1 Start a ghost

1. While you're flying, press **Ghost** on a clip in the list.
2. A second copy of your aircraft appears and flies the clip. When the clip ends it starts again.
3. **Pause** holds the ghost where it is, and the button then reads **Resume**. Drag the ghost's own slider to move it to another moment in its clip. **Stop ghost** removes it.

9.2 Fly with replay: the whole flight again, side by side

To fly a flight again with the original in the air beside you, you have to be where it began at the moment its ghost starts. One button takes care of that.

1. Press **Record** before the flight, fly it, and press **Finish**. The flight is now a clip.
2. Press **Fly with replay** on that clip. Your aircraft is put back at the start of the flight and held there while the ghost gets ready on the same spot.
3. It counts **3 - 2 - 1**. Get your hands on the controls. At zero they're yours, and the ghost flies on from the same moment.

- While it's getting ready or counting down, the clip's button reads **Cancel**.
- **To start somewhere else** (the top of an approach, for example), press **Play** on the clip, drag the slider to that moment, then press **Fly with replay**.

9.3 Things to try

- **Practice one part over and over.** An approach, a landing, an autorotation. Save it as a clip and use **Fly with replay** from where it begins, as many times as you like.
- **Patterns and laps.** A clip that ends where it began makes a ghost that flies lap after lap. Join in on any lap.
- **Race it.** The ghost's line shows its clock. Start together and try to beat it to the finish.
- **Formation.** A ghost is the steadiest lead you'll ever fly with. It flies the exact same line every time.

- **Keep the new flight too.** Press **Record** after the countdown, and the second flight becomes a clip as well. The ghost is in it, so its replay shows both of you.



From outside. You and the flight you saved, on the way to the same runway.



From your seat. The ghost is ahead of you, flying the clip.

Figure 9-2 Flying with a ghost

9.4 Good to know

- **It starts its engine first.** A ghost won't take off with a stopped rotor or propeller. Its line reads *Getting ready* and shows how long it needs, and **Go now** sends it off right away. On most aircraft that's a few seconds. On some it takes as long as that aircraft's normal engine start.
- **One at a time.** Only one ghost can fly at a time. Starting a replay ends the ghost, and so does ending the flight.
- **The ghost is recorded with you.** While a ghost flies, **Record**, **Save clip...** and the instant replay keep it too. The clip holds both aircraft, and its replay flies both. When you press **Play** on such a clip, it waits a few seconds for the second aircraft to start its engine.
- **Two aircraft at the most.** A clip holds you and one ghost. Use that clip as a ghost and it flies your part of it. The older ghost isn't flown again.
- **The ghost is a copy of the aircraft you're in.** A clip from a different aircraft type still works. Your aircraft type flies its path.
- **The light.** A clip doesn't store the time of day. Use Time of day (section 7.5) if you want the flight to look the way it did.
- **It never touches the aircraft you're flying.** Everything Replay Studio does for the ghost goes to the copy only. If the simulator ever reports otherwise, the ghost is stopped right away and its line tells you why.

> **CAUTION** The ghost is a real object to the simulator. If the simulator is set to end a flight on a collision, flying into the ghost counts as one, and with **Fly with replay** the two of you start on the same spot. Switch that setting off for this, in the simulator's assistance options.

10 Video and screenshots

IN SHORT With the Companion app: **Record & export MP4** records a video. **Screenshot** takes a picture.

ON A CONSOLE Record video and take screenshots with your console's own capture button. Close the panel from the toolbar first so it's not in the picture. The replay keeps running.

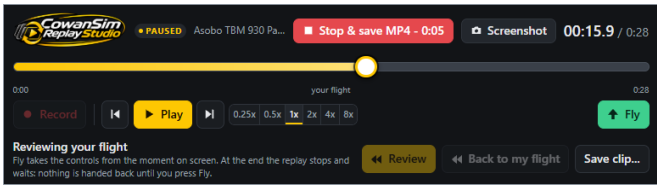


Figure 10-1 While a video is being recorded, the button reads Stop & save MP4 and shows the time

10.1 Record a video

1. Get the replay ready: the clip, the moment, the shot or your cuts.
2. Press **Record & export MP4**. The simulator comes to the front. Leave the mouse alone until the button reads **Stop & save MP4**. That takes a few seconds: Windows' own recorder needs that long to start.
3. Play the replay. Change shots, or run **Auto** or your cuts, however you like. You stay in full control while it records.
4. Press **Stop & save MP4**. The video is saved in `Documents\CowanSim Replay Studio\Exports` under the clip's name, and the folder opens.

10.2 Take a screenshot

Press **Screenshot**. A picture of the simulator, without the Companion app's window in it, is saved as a PNG in the same folder. The picture is taken two to five seconds after you press, so for an exact moment, pause the replay on it first.

10.3 A clean picture

- **Close the simulator's own windows first** (Camera, ATC, Weather and the like), or they'll be in the picture.
- **Keep the mouse out of the simulator** while a video records, or the pointer will be in the picture. Windows can leave the pointer out for you: Settings > Gaming > Captures > *Capture mouse cursor when recording a game*.

NOTE The recorder is Windows' own Game Bar (**Win+Alt+R**, **Win+Alt+PrtScn**). Picture quality, frame rate and sound are set in Windows: Settings > Gaming > Captures. **Without the Companion app**, those two keys still work.

11 The Companion app

> **ON A PC** This chapter is for PC. There's no Companion app for console, and you don't need one.

The Companion app is a free, optional Windows program. It gives Replay Studio its own window and handles the jobs only a Windows program can do.

11.1 What it does for you

- **Its own window.** Everything on one page, on top of the simulator or on a second monitor.
- **Flies the Smart Camera.** The aircraft in full detail, with your pilot in the seat.
- **Video and screenshots.** One button each (Chapter 10).
- **Clip files.** Export a clip to share, import one from a friend.
- **A remote control.** Open the same page on a phone or tablet (section 11.4).

> **NOTE** To fly the camera, the Companion app plugs in a controller of its own. The simulator lists it in **Settings > Controls** as a controller, next to your own if you have one. Leave its bindings as they are.

11.2 Opening and closing

There's nothing to start. The Companion app starts with the simulator and closes with it, window and all.

- **The toolbar button in the simulator shows and hides its window.** One press brings it up in front of the simulator, and the next sends it down to the Windows taskbar.
- The window opens where you last left it, at the same size. Drag it to a second monitor if you have one.
- **Settings > Desktop window when the simulator starts** chooses whether the window comes up by itself: **Open**, **Minimized** or **Hidden** (Chapter 12).
- The Windows Start menu has **CowanSim Replay Studio**, which opens the window, this User Guide, the license texts, and two entries that turn *Start with the simulator* off and on.
- In VR you can't see the desktop, so the panel inside the simulator is used instead.

If the Companion app isn't running, the toolbar button opens the panel inside the simulator, and the basic built-in camera flies the shots (section 2.5). To get the app back, start **CowanSim Replay Studio** from the Start menu. Its window opens, and the panel inside the simulator closes by itself. If it's the add-on that's missing, see section 2.4.

11.3 Clip files: Export and Import

- **Export**, on a clip's line, saves the clip as a `.crpl` file in `Documents\CowanSim Replay Studio\Exports`, with its cuts inside, and its ghost if it has one, and opens the folder.
- **Import clip...**, above the list, takes a `.crpl` file a friend sent you and adds it to your clips.
- **Clips folder** opens the folder where the simulator keeps your clips.

11.4 On a phone or tablet

You can open the same page on a phone or tablet on your home network and use it as a remote:

1. Open `companion.json` (section 11.5) in Notepad, change `"lan": false` to `"lan": true`, and save. Restart the simulator.
2. Windows Firewall asks whether to allow it on your network: allow it on private networks.
3. On the phone or tablet (same Wi-Fi as the PC), open your PC's address with `:27117` on the end, for example `http://192.168.1.20:27117/`. Windows shows the PC's address under Settings > Network & internet, as *IPv4 address*.

> **CAUTION** With `"lan": true` anyone on your network can open the page and control the replay. On a home network that's just you. In a shared house or a hotel, leave it off.

11.5 companion.json

A small settings file for the few things that don't have a button. It's in `%LOCALAPPDATA%\CowanSim Replay Studio`. Most people never need it. If the file isn't there yet, create a text file with that name. The settings go between braces, for example `{ "lan": true }`.

Setting	Default	Meaning
`port`	`27117`	The local port the window uses. Change it if another program uses 27117.
`lan`	`false`	`true` makes the page reachable from other devices on your network (section 11.4).
`onTop`	`true`	Keeps the window in front of the simulator while it's up. `false` makes it a normal window.
`exportFolder`	`""`	Where videos, screenshots and exported clips go, if not `Documents\CowanSim Replay Studio\Exports`: the full path to a folder.
`clipsFolder`	`""`	Only if the Companion app can't find the simulator's clips folder (section 11.6): the full path to it.

11.6 Where things are kept

The simulator keeps your clips with its other add-on data:

Microsoft Store	`%LOCALAPPDATA%\Packages\Microsoft.Limitless_8wekyb3d8bbwe\LocalState\WASM\MSFS2024\cowansim-replay-studio\work\`
Steam	`%APPDATA%\Microsoft Flight Simulator 2024\WASM\MSFS2024\cowansim-replay-studio\work\`

Each clip is one `.crpl` file there. A clip with a ghost in it has a second file beside it, ending in `.crp2`. **Export** puts both into one file. The same folder holds your Custom moves and a log, `cowanreplay.log`. The **Clips folder** button opens it. To remove the Companion app, use *Add or remove programs* in Windows. The add-on itself is removed in the simulator, under **My Library**.

12 Settings

Settings opens from the bottom of Replay Studio. Every setting takes effect right away, and most people never need to change one.

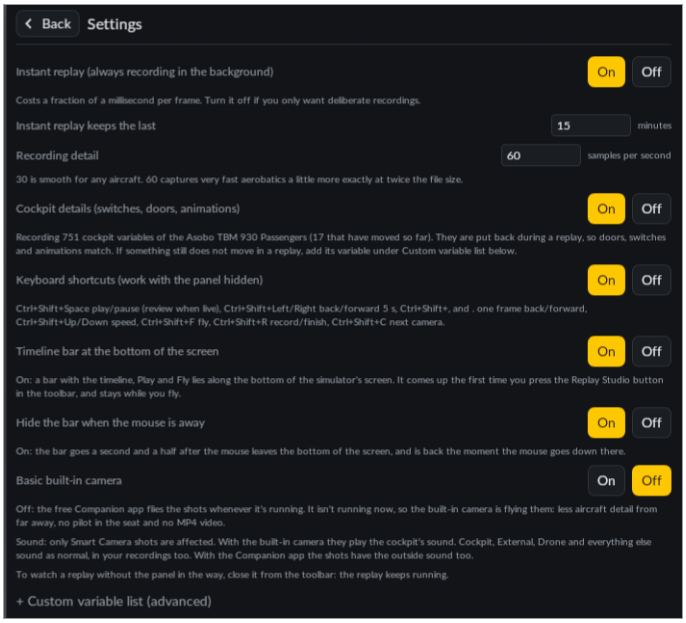


Figure 12-1 The Settings page, here in the panel on a PC without the Companion app

Setting	What it does	Starts as
Instant replay	Always recording in the background. With it **Off**, nothing is kept until you press **Record**, and the slider, Review and Save clip aren't available.	On
Instant replay keeps the last	How far back you can go: 1 to 60 minutes. Longer uses a little more memory.	15 minutes
Recording detail	Samples per second, 5 to 60. 30 is smooth for any aircraft. 60 captures very fast aerobatics a bit more precisely, at twice the clip size.	30
Cockpit details	Records the aircraft's own switches, doors and animations so they match in a replay. The line underneath shows how many were found on the aircraft you're in.	On
Keyboard shortcuts	The shortcuts in section 5.5.	On
Timeline bar at the bottom of the screen	The bar with the timeline, **Play** and **Fly** along the bottom of the simulator's screen (section 5.6). **Off**: no bar.	On
Hide the bar when the mouse is away	**On**: the bar goes a second and a half after the mouse leaves the bottom of the screen, and it's back the moment the mouse goes down there. **Off**: the bar stays on the screen. Grayed out while the bar itself is off.	On

Setting	What it does	Starts as
Desktop window when the simulator starts (PC, with the Companion app)	**Open**: the Companion app's window comes up when the simulator starts. **Minimized**: it waits in the Windows taskbar. **Hidden**: no window opens. The toolbar button brings the window up either way.	Open
Basic built-in camera (PC)	Which camera flies the shots (section 2.5). **Off**: the Companion app's whenever the app is running, the basic built-in camera when it isn't. **On**: always the basic built-in camera.	Off
Custom variable list (advanced)	For an aircraft part that still doesn't move in a replay (section 12.1). Not needed for normal use.	Empty

12.1 The custom variable list (advanced)

Replay Studio records the flight controls, engine, gear, flaps, lights and doors automatically, and it finds an aircraft's own cockpit variables automatically too. The list is for whatever is left: something on one aircraft that still doesn't move in a replay. Open **Custom variable list (advanced)** at the bottom of Settings, type the variables, one per line, and press **Apply list**.

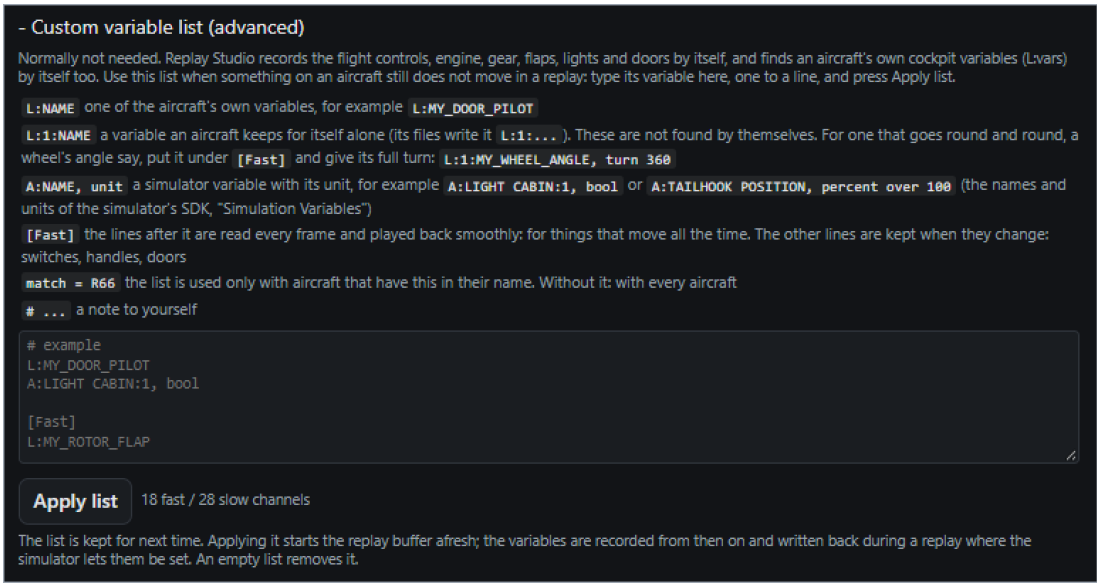


Figure 12-2 The custom variable list

A line	What it is
`L:NAME`	One of the aircraft's own variables, for example `L:MY_DOOR_PILOT`.
`L:1:NAME`	A variable that belongs to one aircraft only (its files write it as `L:1:...`). These aren't found automatically. For one that keeps turning, such as a wheel's angle, put it under `[Fast]` and give its full turn: `L:1:MY_WHEEL_ANGLE, turn 360`.
`A:NAME, unit`	A simulator variable with its unit, for example `A:LIGHT CABIN:1, bool`. The names and units are those of the simulator's SDK, under *Simulation Variables*.
`[Fast]`	The lines after it are read every frame and played back smoothly. Use it for things that move all the time. The other lines are recorded whenever they change, which suits switches, handles and doors.

A line	What it is
`match = R66`	The list is used only for aircraft with this in their name. Without it, the list applies to every aircraft.
`# ...`	A note to yourself.

There's one list, and it's saved for next time. The line under the box tells you what happened: how many variables are in use, or which line couldn't be read. Applying a list restarts instant replay. The variables are recorded from that moment on and set again during a replay wherever the simulator allows it. To remove the list, empty the box and press **Apply list**.

13 What is recorded

Knowing what a recording holds tells you what a replay can show.

13.1 Recorded, and put back in a replay

- **Where the aircraft is and how it sits:** position, altitude, pitch, bank and heading, every frame.
- **How it moves:** its speeds and rotation, so the instruments, the animations and the handoff on **Fly** are right.
- **Flight controls:** cyclic or yoke, pedals, collective, throttle, mixture, propeller, trim and brakes.
- **Aircraft state:** gear, flaps, spoilers, engines, lights, doors and exits.
- **Cockpit details:** the switches, levers and animations an aircraft defines for itself. Replay Studio watches them and records the ones that move, so a door you opened or a switch you flipped does the same thing in the replay.
- **A hot air balloon:** its burner, pilot lights, vent and envelope.
- **Spraying and water drops:** the spray is switched on and off as it was, and the simulator sprays again from the tank as it is now. A replay uses up liquid, so a tank that has run dry has nothing left to spray.

13.2 Not recorded, but still there in a replay

A replay isn't silent, and the world around the aircraft isn't empty. Everything in this list still works while you watch, but it isn't part of the recording. The simulator makes it fresh as the replay plays, so it may not be exactly as it was.

- **Sound.** You hear the aircraft and everything around it. Engine sound rises and falls with the power you flew, because the replay moves the throttle and collective as you did. With the basic built-in camera, a Smart Camera shot plays the cockpit's sound (section 2.5).
- **Other aircraft, cars, boats and people.** They're there, and they keep moving. They're whatever the simulator has around you at the time of the replay, not the ones from the flight.
- **Weather and time of day.** Both are whatever the simulator has at the time of the replay. A sunset landing replayed an hour later is a night landing, unless you move the clock back with Time of day (section 7.5).
- **An engine that is off.** A running engine answers the replayed controls. A replay can't start an engine that's off, so watch the replay before you shut down.
- **The camera.** A replay moves the aircraft, never the view. That's the whole point: you can watch from anywhere.

13.3 How much is kept

Instant replay keeps the last 15 minutes at 30 samples a second. You can change both in Settings. A clip takes about a third of a megabyte per minute, so a full 15 minutes saved as one clip is about five megabytes. Recording costs a fraction of a millisecond per frame. You won't see it on the frame counter.

14 If something isn't right

Start with Diagnostics. It tells you in plain words how Replay Studio is doing. Then look up what you're seeing in the tables in section 14.3.

14.1 Diagnostics

Diagnostics opens from the bottom of Replay Studio, on its own page.

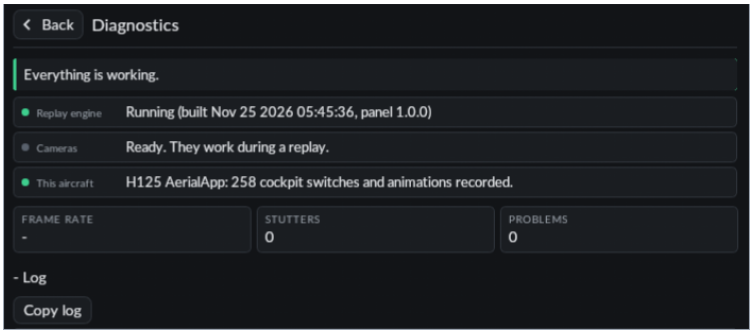


Figure 14-1 The Diagnostics page, with everything working

The sentence at the top sums it up. Below it are the checks, each with a dot: green when everything is fine, gray when it's waiting (the cameras, until a replay is on):

Check	What it tells you
Replay engine	That the part inside the simulator is running, with its version numbers. Quote those numbers if you contact us.
Companion (PC)	That the Companion app is connected. The line is there while the app is running.
Cameras	What the camera is doing right now, or what's stopping it.
This aircraft	How many of its cockpit switches and animations are being recorded. Controls the aircraft doesn't have are skipped, which is normal.

Then come three numbers: **Frame rate** (frames per second while replaying), **Stutters** (moments in a replay that took much longer than normal; 0 is good) and **Problems** (things the simulator refused, listed underneath in plain words; 0 is good).

14.2 The log

Log, at the bottom of the Diagnostics page, opens a list of what Replay Studio has done: aircraft loaded, replay started, clip saved, problems. If you report a problem, tell us what you were doing and send the log. On a PC, **Copy log** copies all of it, ready to paste into a message.

> **ON A PC** The same lines are written to `cowanreplay.log` in the clips folder (section 11.6), and the Companion app keeps its own in `%LOCALAPPDATA%\CowanSim Replay Studio\logs`. Send both.

14.3 What you see, and what to do

Replay and recording

What you see	What it means and what to do
Play, Review and the slider are grayed out.	Nothing has been recorded yet, or instant replay is off. Fly for a few seconds, or switch **Instant replay** on in Settings.
Nothing happens when I press Record.	A replay is on screen. Press **Fly** first, then **Record**.
A line says *The simulator is paused*.	Nothing is recorded while the simulator is paused, and a replay stops with it. Unpause the simulator. To hold a replay, use Replay Studio's own **Pause**. If the simulator is clearly running and the line is still there, press the simulator's pause key twice.
A line says *The simulator is in its menu*.	There's no flight in the menus, so nothing is recorded. Start a flight and recording begins by itself. Leaving a flight ends a replay or a ghost, and a recording in progress is finished and saved as a clip.
The rotor or propeller isn't turning in a replay, and a line says *The engine is off*.	A replay can't start an engine that's off. Start the engine and it will turn in the replay too, or watch the replay before you shut down.
The aircraft drifts or spins after Fly.	Have your hands on the controls when you press **Fly**. The aircraft is released just as it was moving.
A clip plays in the wrong aircraft.	A clip stores the flight, not the aircraft, so whatever you're sitting in follows its path. Load the aircraft it was flown in.
A door, a switch or another part doesn't move in the replay.	That aircraft handles it in a way Replay Studio didn't pick up. Switch **Cockpit details** off and on once the aircraft has fully loaded. If it still doesn't move, add its variable to the custom variable list (section 12.1), or send us the log.
The wheels of a ground vehicle don't turn in a replay.	The vehicle calculates its own wheel rotation. Add the wheels' variables to the custom variable list as `L:1:NAME, turn 360` under `[Fast]` (section 12.1) and record again. The CowanSim SxS works without a list.
The keyboard shortcuts do nothing.	They need a loaded flight and use the left Ctrl and left Shift keys. Check that they're on in Settings, and that nothing else in your control bindings uses the same keys.
The dot at the bottom left is red.	The page is open, but the part inside the simulator hasn't answered yet. Give it a few seconds after a flight loads. If it's still red after you restart the simulator, send us the log.
The timeline bar isn't at the bottom of the screen.	Press the Replay Studio button in the toolbar. Check that **Settings > Timeline bar at the bottom of the screen** is **On**.
The replay stutters.	Open Diagnostics. *Stutters* counts the moments the simulator's own frame rate dipped during the replay, and *Problems* lists anything the simulator refused.
Time of day didn't change the time.	If the simulator's time is set to Live, it sets the clock right back. Switch that off in the simulator's Weather and Time window and set the time again.

Smart Camera

What you see	What it means and what to do
The shots are grayed out.	The shots are for replays, so press **Play** first.
The shots do nothing while I'm on foot.	On foot the view stays with your pilot. Smart Camera works from the cockpit: end the replay with the aircraft on the ground, press `Shift+C` to get in, and start the replay again (section 5.7).
Sunlit and Backlit sit off to the side instead of lining up with the sun.	The sun has set. Change the clock with **Time of day**.
Auto edit didn't pick out the takeoff or the landing.	The clip has no height above ground recorded in it. Auto edit still cuts it, using speed and turns.
PC: the camera stops whenever I use the mouse in the simulator.	The Companion app steers the simulator's camera, and the simulator lets either the mouse or the camera move, not both at once. The camera carries on when the mouse stops. In the Companion app's window it never stops.
PC: I press a shot on the panel inside the simulator and the camera does nothing.	Hold the mouse still. The Companion app's camera goes there about half a second later.
PC: the camera line says *Start the Companion: it moves the camera*.	It can show for a few seconds while Replay Studio checks whether the app is running. Then the basic built-in camera takes over by itself. For the app's camera, start **CowanSim Replay Studio** from the Windows Start menu.
PC: the Companion app says *no virtual gamepad*.	The small driver that steers the camera isn't set up. Restart the Companion app and answer **Yes** when Windows asks for permission. If it can't be set up on your PC, turn on **Settings > Basic built-in camera** (section 2.5).
PC: the shots don't move, and the camera line says *The simulator isn't answering the camera's controller*.	The simulator has stopped listening to the controller the Companion app flies the camera with (section 11.1). Restart your PC to bring the shots back. To keep filming until then, turn on **Settings > Basic built-in camera** (section 2.5).
PC: the Companion app says *An update for this app is available*.	Replay Studio in the simulator was updated and the app is older, so the newest features don't work in the app yet. Press **Open the download page** and install the new app over the old one.
PC: the Companion app says *Replay Studio is not in your simulator*.	The app is running, but the add-on isn't installed in the simulator. Get **CowanSim Replay Studio** in the simulator's Marketplace, check that it's installed, and restart the simulator. The card (Figure 2-3) goes away by itself.
PC: the camera line says *Waiting for the simulator's drone camera*.	Replay Studio has asked the simulator for its drone camera and keeps asking until it gets it. If the shot doesn't start after a few seconds, press **Drone** above the shots, then the shot again.
PC: the camera line says *Another add-on has the camera*.	Another camera add-on is showing a view of its own. Close that view. The shot starts by itself.
PC: the camera is a long way from the aircraft and slow to come back.	Set **Catch-up** to **Fast**.
PC: around an airliner a change of shot takes a few seconds, and a fast move runs longer.	The Companion app's camera is the simulator's drone, and it has to fly to each position. Around a large aircraft that's a long way, so it's given the time it needs.
PC: the camera is tilted.	Press `Shift+Space` in the simulator (reset drone roll).

What you see	What it means and what to do
Console, or a PC with the basic built-in camera: my pilot isn't in the picture during a shot.	There the Smart Camera is the basic built-in camera, and the simulator doesn't draw your pilot for it (section 2.5). **Cockpit** and **External** are the simulator's own views, and they show the pilot. On a PC, the free Companion app's shots show the pilot too (Chapter 3).
Console, or a PC with the basic built-in camera: a Smart Camera shot sounds like the cockpit.	With the basic built-in camera a shot plays the cockpit's sound (section 2.5). **Cockpit**, **External**, **Drone** and everything else sound as normal. On a PC, the Companion app's shots have the outside sound.

Ghost

What you see	What it means and what to do
It sits at the start of its clip and doesn't fly.	It's starting its engine. Its line shows how much longer it needs. **Go now** sends it off right away.
Its rotor takes a long time to spin up.	Some aircraft run their own engine start on the copy, which takes as long as a normal start in that aircraft. After a minute and a half the ghost goes anyway.
Its gear, flaps or lights don't match the clip.	They're set again every few seconds. Give it a moment.
Its line says *The sim did not create the ghost*.	The simulator didn't make the copy this time. Press **Ghost** again. If it keeps happening, send us the log (section 14.2).
A part of the ghost doesn't move the way it did in the clip.	That part is driven by a variable the simulator shares between all aircraft, so it shows the way it is on your own aircraft.

The Companion app, video and screenshots (PC)

What you see	What it means and what to do
A gold notice, *USING THE BASIC CAMERA*, is at the bottom of the panel.	Nothing is wrong. The Companion app isn't running, so the basic built-in camera is flying the shots (section 2.4). Get the free app (Chapter 3) or, if it's installed, start **CowanSim Replay Studio** from the Windows Start menu. The notice goes away by itself.
I can't install the Companion app on this PC.	You don't need it. Replay Studio works in the panel with the basic built-in camera, in less detail from far away and without your pilot (section 2.5).
A line marked *BASIC CAMERA* shows at the bottom of the Companion app's window.	**Settings > Basic built-in camera** is **On**, so the built-in camera is flying the shots in place of the app's (section 2.5). For the full picture, press **Switch it off**.
The toolbar button brings up a window, not the panel inside the simulator.	That's how it works on a PC. While the Companion app is running, its window is Replay Studio. The next press puts it away.
The window says *waiting for the sim*.	Start the simulator and load a flight. The Companion app connects by itself.
The window doesn't open.	Start **CowanSim Replay Studio** from the Windows Start menu.
The sim's clips folder was not found.	Open Replay Studio in the simulator once, then restart the simulator.
Import says the clip is damaged.	The file didn't arrive intact. An email or chat program changed it. Ask for it again as a zip file.

What you see	What it means and what to do
Record & export MP4 takes a few seconds to start.	That's Windows' own recorder starting up, not Replay Studio. Wait until the button reads **Stop & save MP4**, then play the replay. Nothing is missed.
Record & export MP4 goes back to Record by itself.	Windows didn't start recording, and the line at the bottom of the window tells you why. Check that Game Bar is installed and that recording is allowed: Windows Settings > Gaming > Captures.
Screenshot says *Windows did not take a screenshot*.	Same check as above. Pressing **Win+Alt+PrtScn** with the simulator in front should save a picture on its own.

Support: join the CowanSim Discord, where you'll find the community and the developers. The invite link is on www.CowanSim.com.

Appendix A Quick card

Replay

Drag the slider left..... **go back in time**
Play..... **plays the last 30 seconds**
Fly..... **take the controls from the moment on screen**
The toolbar button again..... **put Replay Studio away; the replay and the timeline bar stay**

Keep it

Record ... Finish..... **a whole flight, saved and named for you**
Save clip..... **the last 2, 5 or 15 minutes, everything, or from here**
Play on a clip..... **plays it from the start; Back to my flight returns**

Smart Camera (during a replay)

Auto..... **plays the shots for you, or your cuts**
Any shot..... **the camera goes there**
Stand on ground..... **you watch from the ground, like someone standing there**
Distance / Height / Zoom / Speed / Aim..... **adjust the shot**
Cockpit / External / Drone..... **the simulator's own views, also while flying**
Time of day..... **the light, also while flying**

Make a film

Cuts > Auto edit..... **the film, cut for you**
+ Cut to ... here..... **this shot at this speed, from this moment**
Create custom move > Set start, Set end, Save..... **a camera move of your own**

Ghost

Ghost on a clip (while flying)..... **that flight flies again beside you**
Fly with replay on a clip..... **the flight again from its start: 3 - 2 - 1, go**

On a PC with the Companion app

Record & export MP4..... **starts a video; press again to stop and save**
Screenshot..... **a picture of the simulator, in the Exports folder**
Export / Import clip..... **clips as files, to share**

Keys

Ctrl+Shift+Space..... **play / pause**
Ctrl+Shift+Left / Right..... **back / forward 5 seconds**
Ctrl+Shift+Up / Down..... **faster / slower**
Ctrl+Shift+F..... **Fly**
Ctrl+Shift+R..... **Record / Finish**
Ctrl+Shift+C..... **next camera shot**

Appendix B Words used in this guide

Word	Meaning
Instant replay	The last 15 minutes of your flight (or however long you set), always being recorded in the background.
Replay	Watching a recording: of your flight so far, or of a clip.
Fly	Taking the controls from the moment on screen.
Clip	A saved recording, kept in the Clips list.
Record / Finish	A recording you start and stop yourself, up to three hours long. It's saved as a clip.
Smart Camera	The camera shots, framed for you from the replayed flight.
Shot	One way of filming the aircraft: Chase, Orbit, Fly-by, Stand on ground and so on.
Auto	The camera plays the shots for you in the style picked next to it, or plays your cuts.
Cut	A moment from which a given shot is shown, at a given speed.
Auto edit	The cuts written for you from what the aircraft did.
Custom move	A camera move of your own, from one camera position to another.
Ghost	A saved flight flying again as a second aircraft while you fly your own.
Panel	Replay Studio inside the simulator: on a console always, on a PC when the Companion app isn't running.
Timeline bar	The bar along the bottom of the simulator's screen with the timeline, Play and Fly (section 5.6).
Companion app	The free, optional Windows program for a PC: Replay Studio in its own window, the camera that shows the aircraft in full detail with your pilot, MP4 video and screenshots. Also called the desktop app.
Basic built-in camera	The simulator's own camera, flown by Replay Studio. It flies the shots on a console, and on a PC while the Companion app isn't running: less aircraft detail from far away, and no pilot (section 2.5).
Cockpit details	The switches, doors and animations an aircraft defines for itself, found and recorded automatically.