Flying Fries Gabriel

Blackshape — BK160-TR, Gabriél

USER MANUAL

Version 1.0

A word from Lord Frites

Thank you very much for buying this latest add-on from Flying Fries. It's the third aircraft from a very small company (it's still just only me!) and your purchase, your help, means a lot.

The philosophy of Flying Fries hasn't changed since I created the company in 2023; I want to craft great products for Flight Simulator. Products that I will have fun with and that I will be proud of. My main goal is to create the best possible experience. I'm not looking at this from a business perspective. So, if it takes me a year to build a small GA aircraft, so be it! As long as the end product is fantastic, that's fine.

You may have also noticed that I am constantly updating my previous products. I will apply the same principle to the Gabriel. New features, implementations of your best ideas, this is not over!

But if you want something to be added/fixed, don't hesitate, join the Flying Fries Discord and share your ideas.

Let's close this introductory text with a big thank you to the brilliant people who still stick with me, and offer their expertise in testing and tuning my aircraft. If Flying Fries can compete with bigger companies in terms of bugs or overall quality, it's also thanks to Steiny, who is my personal flight model genius, but also 1L2P, Pseud, VisualDarkness, Newtonius, Maximus, Chrisdu22, and a few other people who make laser-sharp observations and reports during the alpha and beta tests. The quality of their feedback, their brilliant suggestions, I really think it all shows in the final product.

One last time before I start writing this user manual, thank you all for your trust and I really hope you will enjoy this Gabriel, and all the future (and epic) aircraft I'm planning to create next 😉

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Revision table

2025-03-08 — Initial version of the user manual.

The Gabriel

Let's unravel the story that led to the Gabriel, to better understand its origins, its philosophy and why there are a few other aircraft with almost the same look...

Blackshape

Blackshape Aircraft is an Italian company, based in Monopoli and founded in 2009 by Luciano Belviso, 25 years old at that time, an engineer who was born about two months after me. — It really makes me wonder what the hell I have done with my life so far?

I won't copy whole Wikipedia articles, but Blackshape's first project started after they bought the plans and design of the Millennium Master, a carbon fiber modernized remake of the Asso X, a beautiful, tandem-seat ultralight made of wood.

A few years later, Tarragon will also start their own remake of the same ultralight... But let's focus on our own story: **Asso X → Millenium Master → Blackshape Prime.**

Prime

So, the Blackshape Prime, BS100. A high performance carbon fiber ultralight with a 100 hp Rotax engine is introduced to the world in 2009 (the year the company was founded, yes).

It looks like a (small) PC-21 but does not perform like one! Although, thanks to its exceptional aerodynamics, it really is a great aircraft, capable of cruising at 150 knots.

What about General Aviation?

A good ultralight is a great thing, but could there be more to it?

Looking at all the GA flight schools around the world and seeing that everyone is still learning aviation aboard old Cessnas 150/152, Blackshape thought that there might be an opportunity...

Maybe the PPL world would like to embrace the new century. With carbon fiber, with a glass cockpit, and with the same training philosophy as military aviation: tandem seating, so the student can really experience being "alone" in the cockpit, while the instructor is still very much there, looking over his shoulder.

What would it take? They already have the perfect design with the Gabriel... It just needs a little bit more muscle to be certified as a GA aircraft.

No problemo!

Gabriél

In 2017, Blackshape unveils the Gabriél. Powered by a Lycoming IO-320, with an empty weight of 530 kg, it has the same smooth, thin and exceptionally efficient design as the prime (and the few other ultralights before it and since).

It features the most advanced avionics you can put in a GA aircraft: Full Garmin touchscreen (G3X) + Garmin backup displays (G5) and other Garmin autopilot (GFC 500), audio panel (GMA 350) and secondary COM/NAV device (GNC 255).

Today, in 2025, we are still at the beginning of the adventure for this Gabriel. Who knows if it will succeed in finding a place next to the good old and reliable Cessnas in our flight schools? But what we can say for sure is that it is a really sexy aircraft!

Before anything

I'm sorry but I have to write a heavy topic before I start with the fun stuff…

Flight simulation is a great hobby. It is technical, it is relaxing, it is rewarding, and group flights are always incredibly fun. But, for those of us who have been lucky enough to try it, or live by it, real life aviation is even more fantastic.

The ability to lift off the ground and navigate in the open air, lightweight, thanks to human engineering, is almost a miracle. Every minute spent hanging from your wings, in your little cockpit, looking at the sky, the weather, the landmarks, is a gift.

Unfortunately, this gift comes at a cost. Worldwide, general aviation, as much as we all love it, causes about 200 deaths per year.

On June 28, 2022, the two occupants of the Gabriel PH-TRC (included in this package) have unfortunately entered these statistics: A 63-year-old instructor from the "*Zelf Vliegen*" flight school and a 24-year-old pilot in training for Transavia.

We have decided to include this livery and aircraft identifier with this add-on as a living memorial to all these unfortunate people the world loses every year.

Please fly safely, always be cautious, never overestimate your skills or your luck, and live to appreciate another day.

Performance

Altitude and speed

The following numbers were **measured in a standard atmosphere with no wind and no clouds.**

Cruise altitude	**8,500 feet**
Cruise speed (ground speed)	**150 knots**
Maximum rated altitude	**11,500 feet**
Maximum reachable altitude	**23,500 feet**
Max range	**400 NM ***
Max endurance	**2.5 hours ***

** Does not take into account the descent, landing, taxi and 30 minutes of reserve fuel.*

These reference speeds can also be found directly from your EFB while in flight. **They are given in knots (KIAS):**

V_{FE} (max speed flaps extended)	**115**
V_{LE} (max speed landing gear extended)	**115**
V_{NO} (normal operation speed)	**155**
V_{NE} (never exceed speed)	**180**
V_{S0} (stall speed no flaps)	**49**
V_{S1} (stall speed flaps extended)	**44**
V_X (Best angle of climb)	**60**
V_Y (Best rate of climb)	**80**

Weight distribution

There is one major rule to follow in the Gabriel:

if there is only one person aboard, this person has to be in the front seat.

In other words, if you have someone in the rear seat, you must also have someone in the front seat. Otherwise, the aircraft will just sit on its tail, if on the ground. And it will not be able to fly properly either.

You are alone aboard	Two people aboard
 You are in the front seat. Before takeoff, **make sure your elevator trim is set to neutral**: if the orange lights on the trim indicator are OFF, you're all good.	 You can sit in either the front or the rear seat — **you must use the EFB to select your seat.** Before takeoff, make sure your **elevator trim is set to "*slightly DOWN*", next to the "*TO*" arrow** on the trim indicator.

Cockpit overview

The cockpit will be split into four panels: "**left**", "**top**", "**center**" and "**right**".

Both seats have exactly the same layout, so these layouts will only be described once. The only differences between the front and rear seats are:

- The canopy lock mechanism
- The circuit breakers, only present at the front

Left panel

The left panel includes a first group of three switches, where you can find:

the Auxiliary Fuel Pump toggle. This pump is required to start the engine. You can turn it off once the engine is running because the second pump, driven by the engine itself, should keep the fuel flowing. However, it is recommended to activate this auxiliary pump for takeoffs and landings.

The **Landing Light** and **Taxi Light** toggles. These two lights are located on the front landing gear strut, inside a unique hybrid light.

These lights cannot be activated when the landing gear is retracted. They will also automatically turn off when the landing gear retract.

Then you have the usual three levers to control your throttle, your propeller pitch and your engine mixture.

The fourth lever on the left, labeled "*Alternate Air*" controls your cowl flaps, which can provide an alternate, unfiltered intake and increase cooling air flow to the cylinder heads.

To the right of these levers is the elevator trim wheel.

The indicator for this trim position is on the front console (screenshots on previous page).

There is also a white indicator light on the center panel that illuminates when the elevator trim is not neutral.

Below the power levers, you have:

- The flaps control + indicator
- Map lights color and intensity (the ON/OFF control is on the top panel)
- AC temperature and intensity

And tucked away on the side, you have the Gabriel's custom EFB. Bring it and stow it with its power button.

Top panel

From left to right:

- Your landing gear controls, including the test button to check the four light indicators and the *horn silence* option to disable the sound notification when the aircraft would suggest you to extend your landing gear.
- Magnetic compass

- Elevator trim indicator
- **Garmin G5** backup PFD/MFD display
- Flaps indicator
- **Garmin G3X** main avionics/touchscreen
- Master Warning and Master Caution indicators and acquit buttons
- AC/Ventilation
- Two, two-way test buttons for audible alerts and LED indicators
- Panel light on/off switch + intensity knob
- Map light on/off switch
- Displays/Indicators intensity knob
- **Autopilot module** (GMC 307 for now, but GFC 500 in the future)

Center panel

From top to bottom:

- Garmin GMA 350 audio panel
- **Garmin GNC 255 COM/NAV panel connected to COM2/NAV2**
- Lots of indicators: **These are not switches/toggles.** You can't interact with them. They are divided into two colors:
  - **White** indicator → simple information/status
  - **Amber** indicator → warning or not nominal situation
- ***"Panel Light"* test button: when pressed and held, all center panel indicators turn ON (if the aircraft and the corresponding circuits are powered).**
- Parking brake handle
- Rudder pedal depth adjustment
- Emergency landing gear extension handle

The operation of the emergency landing gear extension is described on a label on the right side of the handle. We will also go through it later in this document.

Right panel

The right panel starts with the **annunciator panel: a group of 12 indicators of different colors:**

- **Green** → information. The only green indicator is "*Trainee*" when you are in a fully occupied aircraft and you are operating it from the rear seat. **Use the EFB to get into this configuration.**
- **Amber** → Warning. You should check the status but there is no immediate danger.
- **Red** → Caution. Real problem that you need to fix immediately.

Below this display, and from forward to aft:

- The engine starter button secured under its cage
- Magnetos 1 and 2 toggles.
- Battery and alternator toggles.
- Fuel tank selector (left / both / right and all closed [red light])
- Exterior lights: Anticol (beacon) / Nav / Strobes
- Avionics
- Pitot heat
- Emergency Elect Bus (displayed as "E.P.U." on the annunciator panel): If your main battery is dead or your alternator is not working and you have no electrical power on board, you can activate this backup battery.
- Alternate static port
- ELT toggle (auto/forced)
- Circuit breakers (front seat only)
- Headphone jack connectors

Focus on...

Rear seat flying

You can fly from the rear seat at any time. You must go through your EFB, on the "Aboard" page and select the third configuration: Trainee sitting in front and you in rear seat.

Click on the highlighted arrow.

This will actively change your camera position, take the EFB with you, and swap the "fake" instruments that were in the rear seat with the real instruments in the front seat. So you still have working instruments and this plane won't ruin your FPS by running some code twice.

Notice the green "Trainer" indicator on the annunciator panel.

If you don't go through the EFB, the rear G3X, rear AP module and many other instruments and controls will not work.

Canopy interactions

You can open and close the canopy from either seat. The canopy opens with the red metal lever on your left side and closes with the same lever or with the handles integrated in the canopy itself (above your head, when the canopy is open).

To open the canopy, you must first unlock it. And after closing it, it's important to lock it. The actual lock/unlock system is only accessible from the front seat, next to the front red metal canopy lever.

But to make it more convenient for anyone who wants to fly from the rear seat, we have added a tag on the canopy frame, with a lock icon. Clicking on this tag will also allow you to lock/unlock the canopy.

Noise reduction

This add-on uses a custom noise reduction system.

You should first disable Flight Simulator's default "headphone simulation" in your game settings.

Then you can enable/disable the noise reduction at any time during the flight by either:

- Clicking on the headphones command (if the purple light is on, noise reduction is on).
- Toggling the option from the EFB/Options page.

Static items

There are static items present on the Gabriel: access steps, chocks on the front wheel and pitot covers under left and right wings.

These items can be **added and removed according to the FS2020 rules: from the cockpit view, move outside of the aircraft** and you can click on the chocks rope, the left wing leading edge or the pitot covers to add/remove these items.

At the moment it doesn't work with the FS2024 walkaround mode since this package is compiled with FS2020 SDK. But you can still do the same interactions in FS2024 as in FS2020.

You can also set/remove these items on the EFB/Options page.

Finally, when you release the parking brake and start moving, all these static items are automatically removed, if you don't want to deal with them.

EFB

A custom EFB has been created for the Gabriel. **From there, you can (and should) set your fuel and payload settings. Regardless of which sim you are using (2020 or 2024), this custom EFB is the best way to set this information.**

You can also choose which 3D model to display as your character and as your passenger/trainee. There are several options, including some fun ones 😉

Be sure to check out the options page to enable/disable damage and VFX and to show/hide static items or engine panels:

Finally, you can check your reference speeds at any time, or scan 2 QR codes to access some quick tips and the latest version of this PDF from your phone.

G3X

This is a "standard" Garmin touchscreen unit. It is actually quite sophisticated, created by Working Title and included by default in FS2020 and 2024. There are still some limitations in FS2024 as I write this manual, but I have no doubt that Working Title will continue to improve this instrument.

G5

Another standard instrument created by Asobo. It is simple, has two display modes, and allows you to set some autopilot targets (altitude/heading).

GNC 255

This instrument was been created from scratch by Flying Fries. It is as close as possible to the real Garmin counterpart. You can set your COM2 and NAV2 frequencies and get a lot of information about your stations. It is also possible to navigate a VOR/DME and get all your position and orientation information from and to this VOR.

GMA 350

Based on a standard Asobo instrument but with enhanced user interactivity.

GMC 307

This is the standard instrument by Asobo. But since the Gabriel is supposed to be equipped with a more modern GFC 500, you can expect an update of this add-on with a completely custom AP module. I just don't want to rush it, because autopilot is a really complex topic. But you will get it!

EPU

"*Emergency Power Unit*" or "*Emergency Elect Bus*". It's your airplane's backup battery when your main battery is completely discharged and your engine or alternator is not running or not working properly. Actionable with a simple toggle switch.

Note: If you use the "Set Battery Master" bind in your sim, it will trigger the main battery and the EPU together.

Emergency LDG Gear extension

If your aircraft loses electrical power while you're flying, you are still safe: all of your flight controls will still operate, except for the flaps. Your engine will continue to run thanks to its mechanical fuel pump and you can fly to the nearest airport, if you can see one through your beautiful canopy!

The only thing that will be a problem (the flaps are not really a problem, you can easily land with flaps up) is the landing gear.

So…

1/ Lower the regular landing gear handle to unlock the system. The undercarriage will not move as it is electrically operated.

2/ Pull on LDG emergency extension lever and your gear will extend slowly.

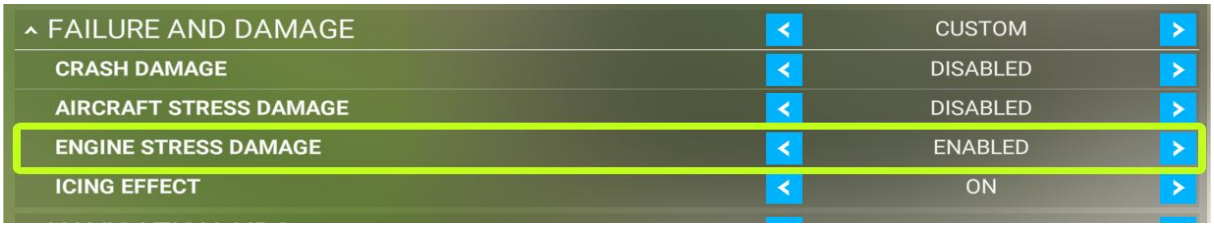
Breaking propeller

This can happen **if you have activated damage on the EFB** and hit an obstacle with the tip of the propeller. If the propeller breaks, your engine will immediately die as well.

You can repair your propeller and engine with the EFB.

One thing to note: **In order for this damage to work, you must have the "engine stress damage" option enabled in your simulator:**

FS2020:



FS2024:

Breaking canopy

The canopy can also break/explode if your damage option is enabled and under two conditions:

- You leave it open and are flying above 80 knots.
- You leave it unlocked (but closed), you are flying, and you make a hard roll to the left.

Once the canopy is gone, there is no more ice (this is a great trick if you were struggling for visibility, as the Gabriel does not have a windshield defroster 😊). But if you want to fix it and reinstall your canopy (even in flight), you can do so from the EFB/Options page.

Checklists

You can find all these checklists in the game, with custom cameras and switches highlighted.

Before starting engines

Canopy	**Unlocked and open**
Landing gear lever	**Down**
Parking brake	**Set**
Rear trunk door and oil trap	**Closed**
Pitot covers	**Removed**
Chocks	**Removed**
Access stairs	**Removed**
Flight Control Surfaces	**Free and responsive**
Circuit breakers	**All in**
Emergency Power Unit	**OFF**

Magnetos	**OFF**
Alternator	**OFF**
Battery	**ON**
Nav lights	**ON**
Beacon / anticollision lights	**OFF**
Strobe lights	**OFF**
Landing lights	**OFF**
Taxi lights	**OFF**
Interior lights	**As desired**
Emergency Power Unit	**ON**
Battery	**OFF**
Check power	**Aircraft powered**
Battery	**ON**
Emergency Power Unit	**OFF**

Starting engines

Fuel tank selector	**As desired**
Beacon lights	**ON**
Mixture	**Rich**
Propeller pitch	**Max**
Throttle	**Idle**
Auxiliary fuel pump	**ON**
Magnetos	**ON**
Alternator	**ON**
Starter	**Press and hold**
Mixture	**Best setting**

After starting engines

Avionics	**ON**
Pitot heat	**ON**
Central panel lights	**Press test**
Annunciator panel	**Test**
Fuel selector	**Test**
Landing gear horn	**Test**
Stall horn	**Test**
Landing gear lights	**Test**
Canopy	**Closed and locked**

Taxi

Elevator trim	**Neutral**
Taxi lights	**ON**
Parking brake	**Released**
Annunciator panel	**Dark**
Throttle	**Moderate**
Toe brakes	**Test**
Propeller	**Max**
Mixture	**Best**
Speed	**Taxi (20 KIAS)**

Take-off

Strobe lights	**ON**
Transponder	**Alt**
Auxiliary fuel pump	**ON**
Landing lights	**ON**
Parking brake	**Released**
Flaps	**Take-off**
Elevator trim	**Neutral or take-off**
Annunciator panel	**Dark**
Propeller	**Max**
Mixture	**Best**
Throttle	**Max**
Speed	**Take-off (80 KIAS)**
Take-off	
Landing gear	**Up**
Flaps	**Up**

Cruise

Throttle	**Managed**
Propeller	**Managed**
Mixture	**Best**
Landing gear	**Up**
Flaps	**Up**
Auxiliary fuel pump	**OFF**
Annunciator panel	**Dark**

Approach

Auxiliary fuel pump	**ON**

Propeller	**Max**
Mixture	**Best**
Throttle	**Managed**
Landing gear	**Down**
Landing lights	**ON**
Flaps	**Take-off**
Speed	**Approach (85 KIAS)**

Landing

Auxiliary fuel pump	**ON**
Flaps	**Down**
Speed	**Landing (70 KIAS)**
Touchdown	
Throttle	**Idle**
Elevator trim	**Neutral**
Flaps Up	

Engine stop

Runway	**Cleared**
Taxi lights	**ON**
Landing lights	**OFF**
Strobe lights	**OFF**
Transponder	**Standby**
Speed	**Taxi to gate (20 KIAS)**
Throttle	**Idle**
Parking brake	**Set**
Canopy	**Unlocked and open**
Auxiliary fuel pump	**OFF**
Pitot heat	**OFF**
Mixture	**Leanest**
Magnetos	**OFF**
Alternator	**OFF**
Fuel	**Closed**
Avionics	**OFF**
Battery	**OFF**
Access stairs	**Set**
Pitot covers	**Set**
Chocks	**Set**

Easter Eggs

Why isn't there anything about Easter eggs in this PDF? Did I forget them? … No, but it's up to you to find them all. Some are much better hidden than the French fries! 😉

Local Variables

Here is the list of the local variables defined/used by the Gabriel that you can address directly with Spad, AAO, etc.

Description	Name	Range	Persistent
Levers vibrations OFF/ON	**Gaby_Vibrations**	0-1	YES
Levers vibration intensity	**Gaby_Vibrations_Intensity**	1-2	YES
Custom VFX OFF/ON	**Gaby_VFX**	0-1	YES
Custom damage OFF/ON	**Gaby_Fail**	0-1	YES
Map light color FRONT	**Gaby_MapLight_Color_1**	0-3	YES
Map light color REAR	**Gaby_MapLight_Color_2**	0-3	YES
*3D mesh for *YOU**	**Gaby_Pilot_Mesh ***	0-4	YES
3D mesh for Passenger/Trainee	**Gaby_Passenger_Mesh ***	0-4	YES
	**: The values for pilot and passengers mesh can't be identical*		
Noise reduction OFF/ON	**FRIES_Headphones**	0-1	NO
Headphone visibility, front seat	**Headphone_1_Visible**	0-1	NO
Headphone visibility, rear seat	**Headphone_2_Visible**	0-1	NO
Stick visibility	**Gaby_Stick_Hidden**	0-1	NO
EFB Stowed/Deployed	**Gaby_EFB**	0-1	NO
EFB Page to display	**FFEFB_Page**	0-5	NO
Top engine panel/hood visibility	**Gaby_Engine_Hood_Top**	0-1	NO
Bottom engine panel/hood visibility	**Gaby_Engine_Hood_Bottom**	0-1	NO
Engine metal shield visibility	**Gaby_Engine_Shield**	0-1	NO
Number of fries remaining	**Gaby_Fries**	0-4	NO
Nose wheel chocks visibility	**Gaby_Chocks**	0-1	NO
Access stairs visibility	**Gaby_Stairs**	0-1	NO
Pitot covers visibility	**Gaby_Pitot_Covers**	0-1	NO

Known bugs

Unfortunately, there are some known bugs at this stage. Or is it so unfortunate, now that I think about it? Maybe it's good that they are known. It means we could do something about them. Or someone could… Here is the list:

FS2020 and FS2024, G3X/Autopilot → "Direct To" path cannot be used with AutoPilot NAV.

This will probably be solved when I remove the old GMC 307 autopilot module and code my own GFC 500.

FS2020 and FS2024 → when spawning from the runway, the aircraft will sometimes have some elevator trim up instead of neutral (reminder: when flying with two people aboard, you should aim for trim down)

This is probably due to the physical engine pushing on the wings/tail/whatever during loading, and the simulation forcing a trim value that seems right… but it's not.

We will look more into, this but It's not guaranteed that we will find a solution. So **always check your trim status before takeoff!**

FS2024, G3X → The "NRST" (Nearest) menu never shows anything within a 200 NM radius.

This is not something we can fix. It's in the Working Title code. I assume they are aware of it, it's a pretty obvious bug of this very young version of the G3X for this very young version of the simulator. We can be confident that it should be fixed soon.

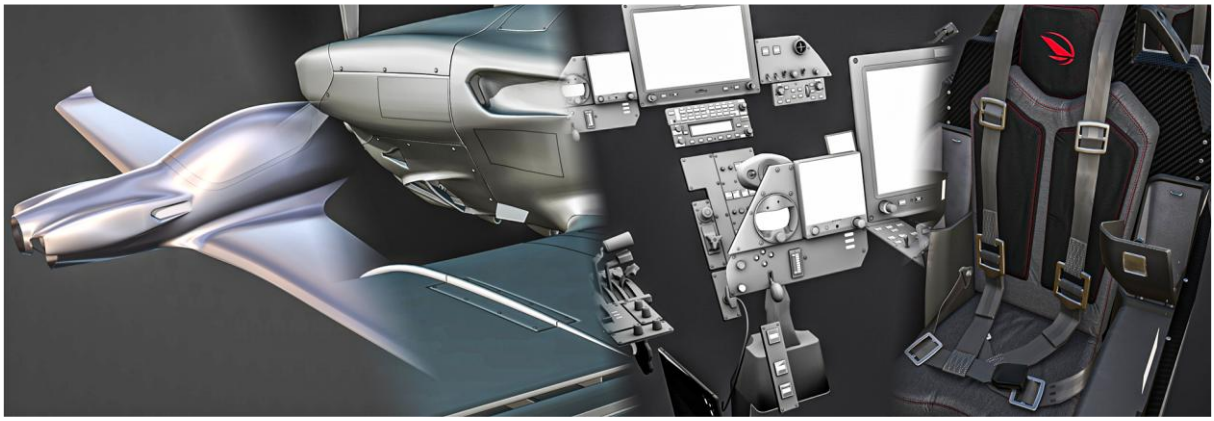
FS2024 → If you "land" with the gears retracted, the plane will slide indefinitely, one way then the other, then it will turn around and keep going on

Well… I talked to a legend of flight model tuning about this and his answer was that this is clearly an Asobo problem and we should definitely wait for them to fix it. I don't have the tools to do it for them. **Don't forget your landing gear then** 😊

Stay in touch!

If you want to get involved with any new updates for this Gabriel or regarding the Scrapyard Monster, the XF-11, and whatever else is coming next from Flying Fries, the best way is to join our Discord server and explore the various channels.

Unlike most developers (and I'm not judging when I say this), Flying Fries communicates about its projects throughout the entire development process. With comments and lot of work in progress pictures (you can find all the history of the Gabriel and XF-11, for instance).



And you can react and make suggestions at any time.

Don't be too shy, come and say hi!

Join us on **Discord**: **https://discord.gg/VNdrSgTWYZ**
Join us on **YouTube**: **https://www.youtube.com/@flyingfries1027**