# F-104G/S Starfighter

# Quick-Start guide

1. Welcome and some words what to expect

Welcome to the quick-start guide for the VSN F-104G/S MOD. We, the VSN-Team, are happy that you like the F-104 so much, that you are willing to give our MOD a try. A few words and may be “warnings” to start things off:

This mod was brought to life first as a VSN SFM/F15C MOD and underwent a series of alterations and additions to become what you are now able to use and enjoy. Of course, it was made by people that are passionate about aviation and who bring a certain amount of knowledge about DCS-MODs to the table, but everybody who worked on the mod did that in his free time and may have spent their own money to make the mod better. BUT we are not specialized in making mods, nor is it our day-to-day business. We, more or less, did it for fun and may be because we like the F-104 that much, that we wanted to have a halfway decent mod in the game. If you expect „heatblurresque“ or „razbamian“ quality, well than you expect quite a lot from a few guys who just got taught or taught themselves the „art“ of DCS-modding…in order to do yourself a favour, take a step back, relax and give the mod a chance…after all, we would like to bring you a mod which is enjoyable but neither 100% perfect or „on-par“ with the big-players of DCS or even those quite talented bigger modding-groups like the ones from the A4-community-mod.

Regarding the cockpit: it is NOT 100% that of a F-104G, since we took the liberty to move certain things around for better usability (e.g. the “SLOW!” Indicator). It just did not make that much sense to keep certain aspects, that are not supported by FC3-avionics,

the way they are in reality, since that would have meant to keep certain things blank. That wouldn't look right, so we changed things a bit.

We also know that the cockpit is lacking this or that and that it would be nicer looking with better texturing and we would love to do all this, but 1. we have restrictions due to the use of FC3-avionics and 2. we do not have a pure texture guy or gal. The textures needed to be made were made by our 3d-animations guy, who is pretty darn good in that business but, as he says himself, texturing is not his „cup of tea".

Regarding the flight model, we did our best to make it feel like the real deal. Of course there are shortcomings which you might find out, or might not find out, but believe us, they are there. We hope that it brings you joy never the less, but please don't expect everything modelled into the last detail. We think we got pretty close (and may be another evolution of the flightmodel will be made, eventually) and that it feels quite alright.

But now, without further ado, let's get into it!

## 2. Getting started

Well, it is pretty straight forward. When you downloaded the *.zip file, extract it to your /saved games/DCS/mods/aircraft/ folder. If you use open beta, it is of course /saved games/DCS open beta/mods/aircraft/ .

After this, the VSN-F104 Icon should appear and you are ready to go.

We advise you to enter the setup-tab on your DCS start-menu first and set the controls, which are found under VSN_F104G or VSN_F104S. If you find those control-pages quite familiar, well it uses a lot of the F15C controls.

Please bear in mind that you have to **reverse the throttle-axis** and that a slight curve in those rudder and pitch-axis is of use, since it is not a fly-by-wire plane but pretty analogue…e.g. every bit of stick pull is translated into elevator-movement.

## 3. Flight envelope of the F-104G/S

The flight-envelope is to be found in fig.1. Please take a look at it, since there are limitations to the aircraft which are to be taken serious. If you exceed those limits you might find yourself without working flaps, gear or engine, which might make the experience not at all that pleasant. In-flight, just take a look at the left side of the canopy, there is everything written down for you…stick to those limits and everything is honky-dory.

Take special care regarding those speed limits for flaps and gear:

gear = 295 kts CAS

flaps stage „1" = Mach 0.85

flaps stage „2“ = 240 kts CAS

If you exceed those limitations (well, a bit is o.k., but too much is too much), you might experience the flaps or the gear getting stuck in a certain position. This will be indicated by „Flaps-MF“ or „Gear-MF“ indicator in the indicator „box“ at the right side of the front of the cockpit (see picture 1 and 5 „indicator-box“). Be aware, that the flaps or the gear will not move another inch if they got stuck. If you overspeed even more, excessive drag from damaged flaps will occur.

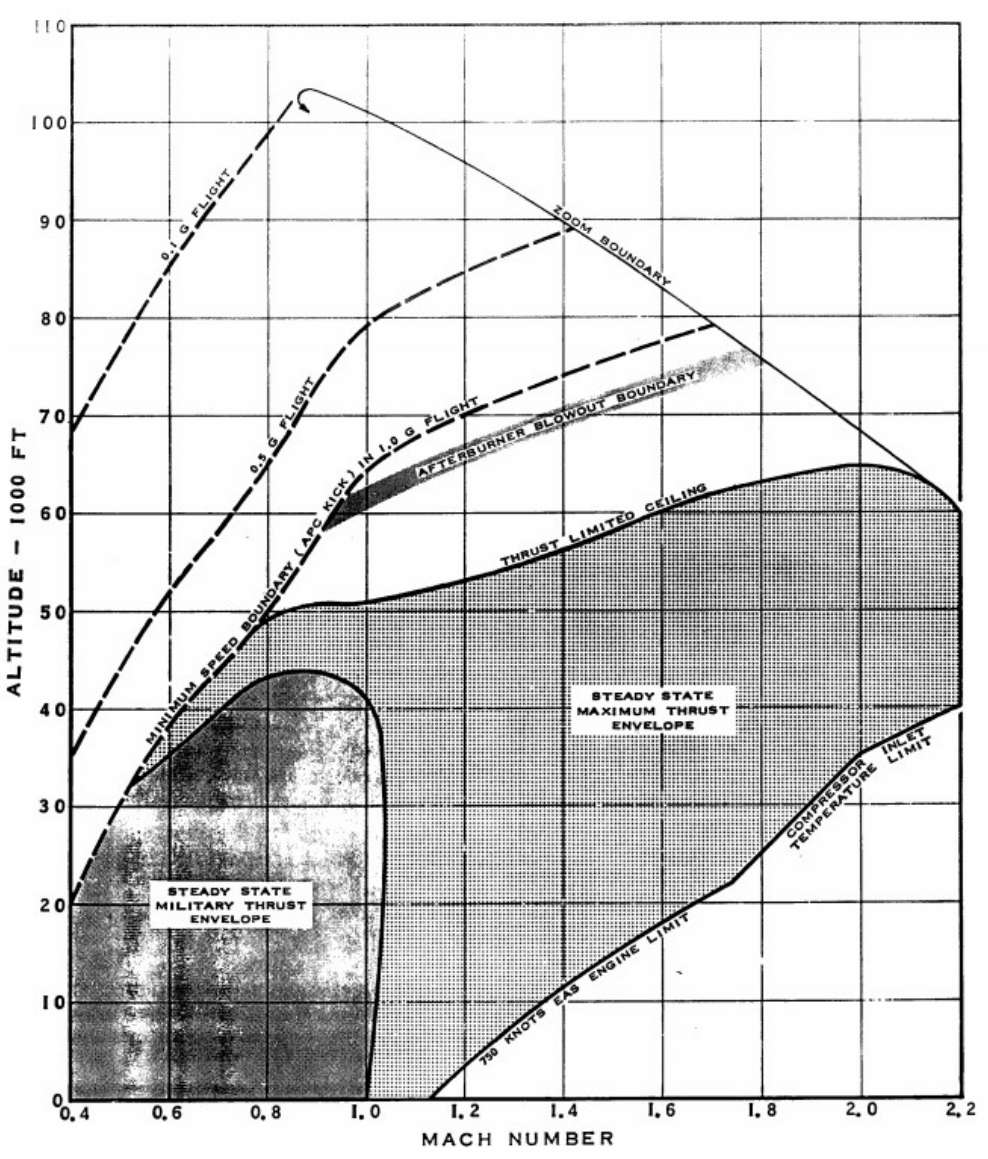



Fig.1: flight envelope

As you can see above, certain speeds should not be exceeded, since it may damage the engine. When you get to fast, there will be a “SLOW!” indicator in the upper left-center of the cockpit, which is quite prominent. You should slow down, when this indicator lights up. After this, there will be a “overheat” indicator in the indicator-box. If you still don’t slow down, the rising temperature (take a look at that temp. gauge) will lead to an engine failure, which will be indicated through the “fuel-boost-pump-failure”. At this point you will be a glider...

| | |
|---|---|
| FUEL BOOST PUMPS FAIL | |
| FUEL LOW LEVEL | BINGO FUEL |
| PITCH RATIO | ROLL RATIO |
| HYDRAULIC SYSTEM OUT | Flap-MF |
| OVERHEAT | DRAG CHUTE |
| Gear-MF | HOOK |
| AUTO PILOT ENGAGED | SPD BK OUT |

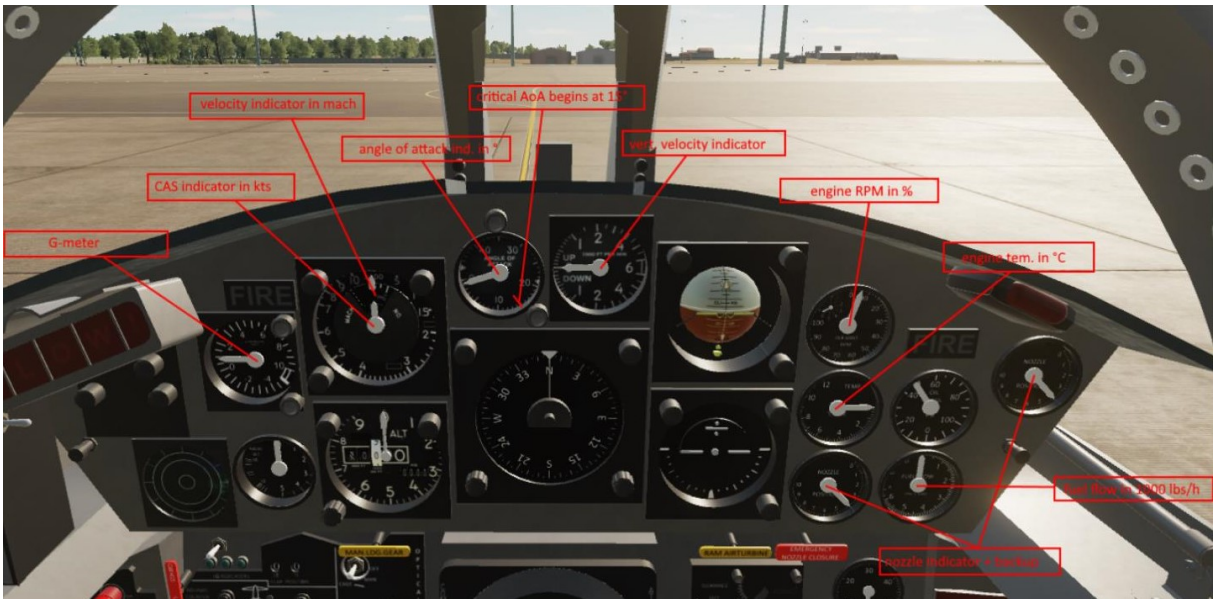
Pic.1: indicator box

As you can see on the left, there is the indicator box. Fuel Boost Pumps Fail will light up, when the engine is overheated and has failed. OVERHEAT will light up, when the engine in running while overheated and engine-failure is imminent. Bingo fuel will light up at less than 2000 lbs of fuel, Fuel Low Level below 500 lbs fuel. Roll/Pitch Ratio will light up, when the ratio is limited e.g. due to damage. Flap-MF and Gear-MF when the flaps/gear is jammed due to overspeed. Drag Chute, Hook and Spd BK Out indicate, that the Hook/chute or speed brakes are lowered/extended. Auto-Pilot engaged needs no explaning.

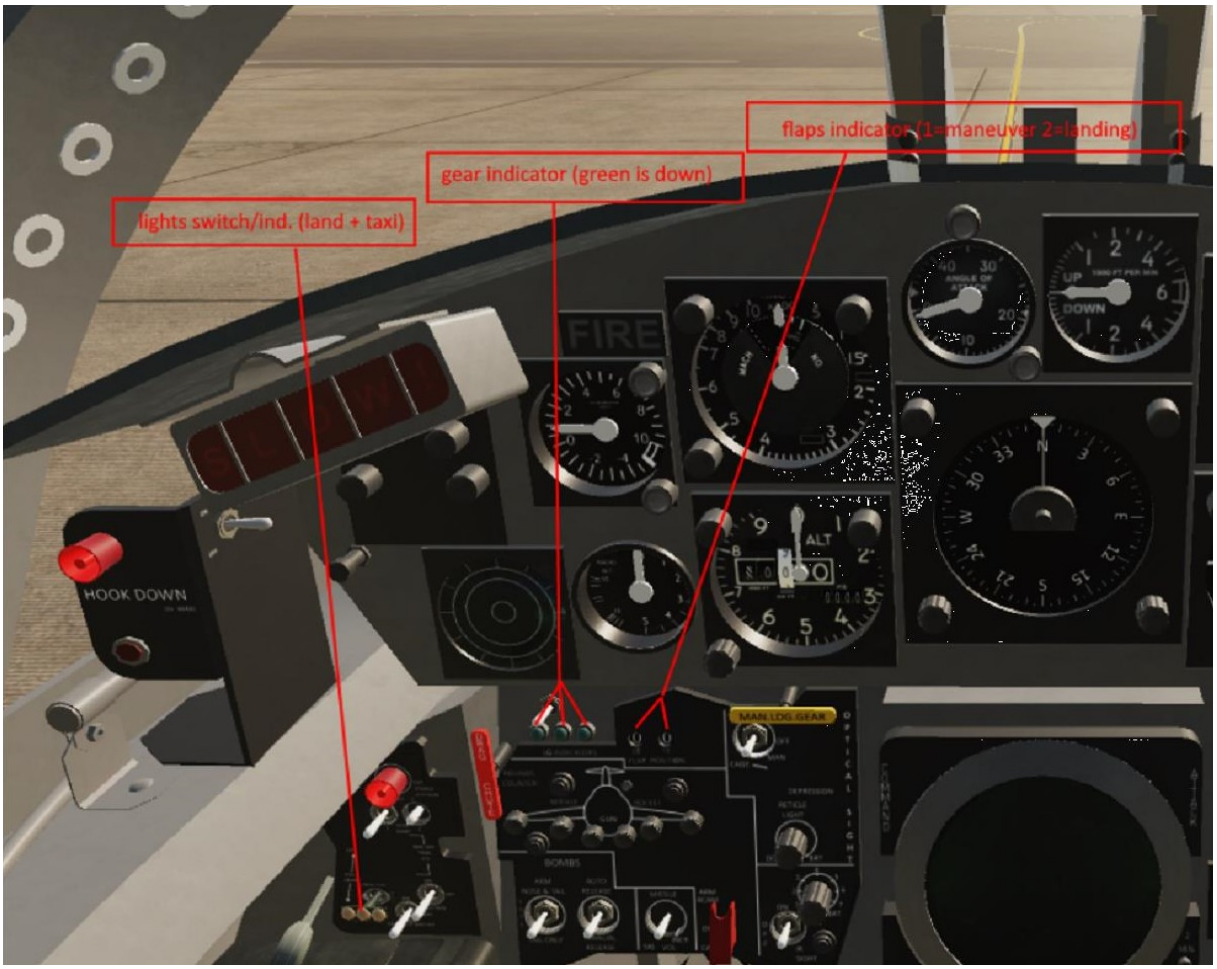
4. Cockpit familiarization

And now to your new „working place“. Since we are using F15C avionics there is the F15C HUD displayed, which is a bit annoying, but it is just this way. Some wise guy on the internet would now say something like „suck it up“ ;-) But on the other hand, we need the HUD for weapons deployment later on. For this please refer to the F15C weapons deployment. For AtoG there will be a short sections later on.

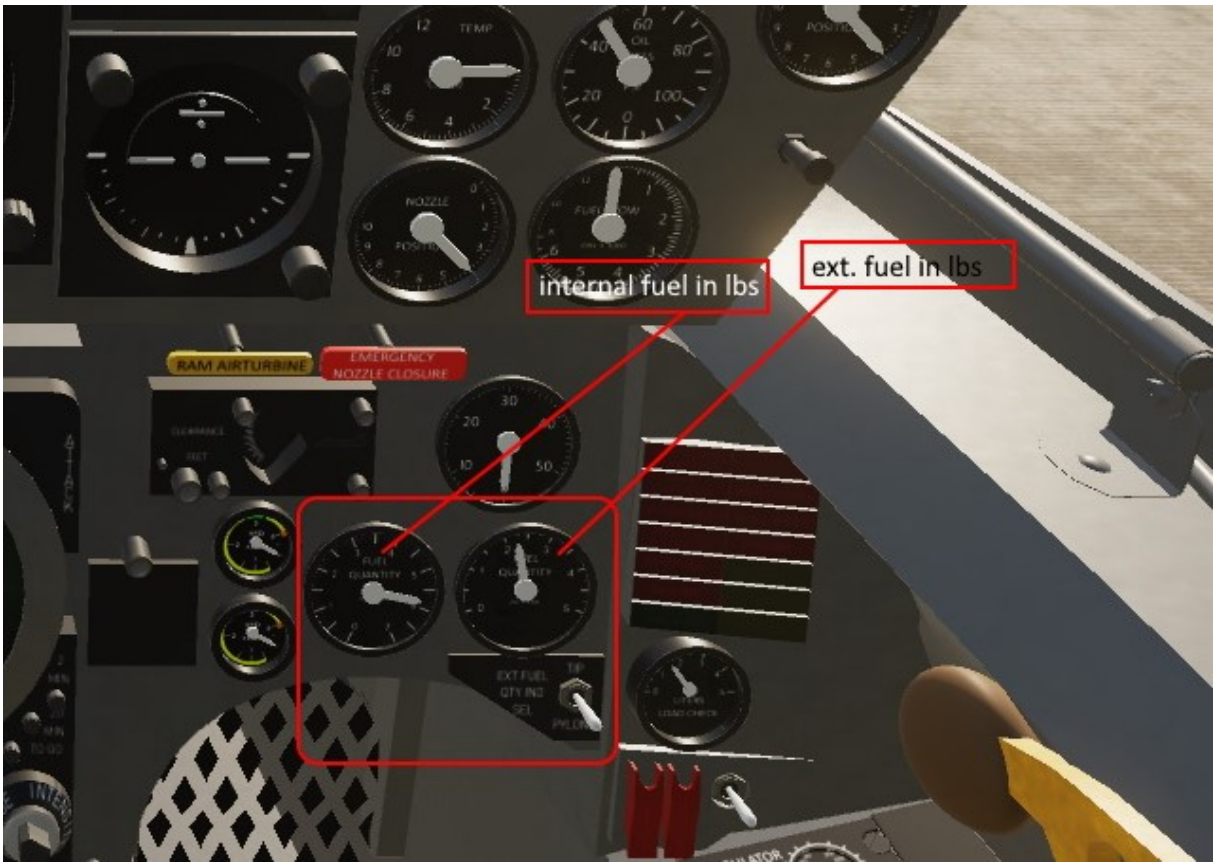
Since the F-104 was build in the 1950s almost everything is analogue, so take a good look at those gauges:



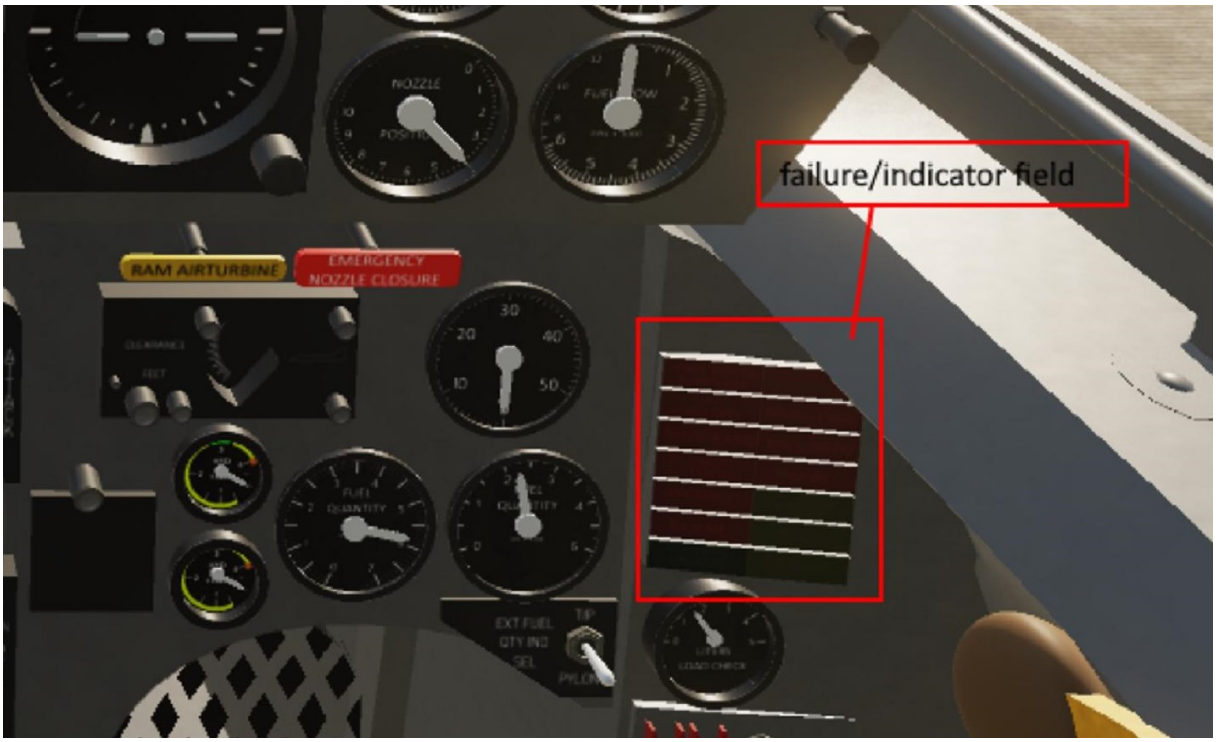

pic.2 cockpit front up




Pic.3: cockpit left down




Pic.4: cockpit right down




Pic.5: indicator box

5. Taxiing

Well, before you can taxi, you need to start the electric-system and the engine. Please refer to F15C documentation. It is just like in every other FC3-plane.

Once the electric-system is running and the engine has reached idle-rpm (at about 67% rpm) you can start to taxi. Here you'll need that NWS-Button. Like the F5 you need to press and hold it to move the nosewheel. When you release the button, the nosewheel stays in the direction it was last. So make sure to hold that button until you go straight again.

6. Take-Off

Not that much special here either. Flaps should be at Stage "1" (maneuver/take-off; use the "flaps-toggle-button since it toggles the flaps from "0" to "1" to "2" and back to "0"), brakes on, spool up to about 90%,release brakes and watch the "speed-o-meter" rise. Depending on your load-out, rotate at 200/205/210/215 kts. When you lift off, raise that gear before you exceed the gear-speed-limit. At 400-450 kts you can retract the flaps.

Please be aware, that AoA really slows the plane down. So when you force the nose up earlier, it might take longer to reach lift-off-speed.

7. In-flight

Once you've reached a comfortable flight level, you should think about trimming the plane. On slower speeds you will need a lot of nose-up-trim...as you get faster and faster, less nose-up-trim is needed. Please be aware, that the trim is very "soft". You'll need a lot of "clicks" to feel any change. Don't let up and hit that trim-button ☺.

8. Auto-Pilot

There is just an altitude-hold autopilot, which is quite basic. When you engage it, the plane might start to bobb slightly. You'll need to trim nose-up a bit, and the bobbing will end. Trim might again be needed when you change your speed. The autopilot is engaged and disengaged with the same button "autopilot engage".

9. Air-to-Air Weapons + HUD-Modes+AtoA Radar

Please refer to F15C documentation. It is the same deal here. The AtoA-Radar is a lot less efficient than that of the F15C. You will have a smaller beam and therefore will need to slew it up/down more often. You will see bomber-sized targets at aprox 40 nm. You can lock them at about 20 miles. Please bear in mind that the Aim-9B is really old and not good at all. You need to wait for the second "tone" to fire it with aprox. 50% chance of a

hit. 9L and 9m are way better, but the G should have gotten the L in the end. The S should have gotten the M, but we are not sure if that ever happened.

10. Air-to-Ground Mode

In Air to Ground mode the first weapon which is selected is the one at the wing-pylons. If it is rockets, you'll see a little circle with a dot in the middle which is where your unguided rockets will hit. If you see a vertical line, the lower end of that line is where your bombs will hit.

Please be aware, that you **can not** change AtoG Weapons. First off the underwing-stations will be used, after this the center-line station. If your loadout is just the same kind of bombs, the plane will drop all bombs at once. If you have different types off ammunition under the wings and on the center-line, first the underwing station will be emptied, after this, the center-line station will be automatically selected.

11. GUN-Modes

If you choose the GUN, you need to first select AtoG or AtoA Mode to set the gun in either mode. So if you want to go AtoA first switch into an AtoA-Mode and then into the gun-mode.

As a little heads-up at this time: "release weapon" is for everything but the gun. To fire the gun you need to use "fire weapon".

12. Landing

Stay at about 200 kts or slightly below when light, use full flaps ("2") and gently set her down. At 85% RPM the BLC (boundary-layer-controlsystem) will kick in, which starts to blow air above the flaps and increases the lift. The more throttle, the higher the lift. But beware, that below 85% this system does not work, since there is not enough air-flow generated by the engine to send it over the wings. Since you have a F15C-HUD with a flight-path-marker, you'll quite clearly see what the BLC brings to the table ☺. If you have problems setting everything right, we advise to extend airbrakes. It is easier to reach 85% RPM and have a nice smooth decent that way. You can "trim" your decent with throttle that way more effectively.

Once down, you can use the chute immediately, since there is no speed-limit programmed. When you use the chute and push the chute-button a second time, the chute is cut. You'll need to get repairs or rearm/refuel to get the chute reinstalled. After this, push the chute button another time. The chute-handle will move in it's "armed" position, the chute-indicator will darken and you are good to go.

13. AoA-problems/pitch-up and stall

Since the F-104 has a T-Tail, it gets problematic if you pull to much AoA. At 15° the turbulence from the wing starts hitting the horizontal stabilizer, which than starts losing its effectiveness. You will feel the plane shaking at about 13° AoA which gets heavier the more AoA you pull. If you exceed 15° there will be a pitch-up behaviour, where the nose violently pitches up and you will loose speed due to a lot of AoA. Normally, the plane will get itself in a stable position again, but if you are slow, those pitch-ups can lead to a stall into a flat spin. Same thing happens when you yank at that stick to quickly and to strong, that might lead to a pitch-up-Stall-to-flat-spin quite immediately. When in a stall/spin, lower Flaps to Stage "1" and put rudder against the rotation and stick-forward...and hope for the best ;-).

14. Liveries and custom Args

The 3d-modell is equipped with "custom-args". Meaning, certain things can be shown or hidden in the 3d-modell. It makes sense to use those custom args in the description.lua of each liverie that is used.

Custom_args =

{

[70] = 0, --F104G 0 0 // CF-104 early = 0.45 // CF-104 late = 0.5 // F-a04S = 1

[801] = 0.0-- MartinBaker Seat // C-2 Seat = 1.0

}

Just set it the way you feel fits best to your liverie.

15. Credits and final remarks

We hope that you enjoy our F104G/S as much as we do. If you have ideas, what could be made better or if you happen to be somebody who likes working with textures, we would like to welcome you to our Discord-Server "F-104G_Testpilot's Lounge".

Finally, there are always people to thank, because without them, the mod would not have been possible the way it is now. First off, a big thank-you goes out to JNelson and the A4-Community-Mod-Crew for persuading us to try our hands at an EFM (almost with zero knowledge in either discipline needed for it). It was great to see that you really like to help, even if it takes some time (how many hours did you help us? We guess, a lot...). We really appreciate it. And, if the A4 EFM wasn't more or less free to use, this mod would have been not as complete as it is now, since a few (or a few more) lines of code come from it in one form or the other, since they are really the "benchmark" for DCS-EFM modelling in our opinion. So, if you enjoy this mod, may be think about the A4 as well and give it a try. It is miles further down the road of a complex and fully functional mod than this one and you will enjoy it a lot as well. And might we say it fits the time-frame of the F-104 perfectly? ;-)

Another big thank you goes out to TheRealHarold who endured stupid questions from our EFM-guy like a elementary-school teacher endures questions from his pupils, why 1+1 equals 2 and not 11, since there are two "1". It must have been hard to keep your

calm and sometimes answer the same question over and over. And he helped a lot with getting the EFM to a new level, which will hopefully be made public in an upcoming update.

Finally there is this one guy from the germanTaktLwG66 community who helped out with the C++ stuff as well and really got us going when we reached a point where we almost thought: “Well, that’s it. EFM was a nice idea, but it will not be finished.” So thanks a lot for your patience and help Firebird.

Last but not least, thanks goes out to Tolis (or HellasPilot as he is known in CG-Trader) who made the 3d cockpit and licensed it to us. Thanks buddy for that nice cockpit and it was a pleasure to work with you. We hope to have another go at it with our next project :-).

Now, between the PreRelease and the public-release we had the luck that a few very nice guys started helping us with Flight-Testing and texturing. Big thank you to Gvad, Talo and Niclas who really put the plane to the test and helped us make it even better.

Another really big thank you to Global Hawk and VB6, who took it upon them to throw some ideas around and put some nice textures together, which make the cockpit look way more real than before. What was done in a few weeks is just really cool.

And a big thanks to Yogi, who made some really top-notch pictures for us to use as wallpaper, loading-screen and briefing-screen...now that looks the part too ☺ (and he did that on such a short notice, that some “extra thanks” is due).

If we did forget anybody, which will definitely be the case, here is a thank-you for you as well. Every bit of help is appreciated and made the mod in its version right now possible.

## 16. Licensing

Now the “unhappy” side of modding. The EFM falls under the license found in the EFM-files which can be downloaded from our above mentioned discord server. Please keep in mind that commercial use is not allowed and if you use files or lines of the code, you need to give credit to the copyright owner and release the finished work under the same license as this one.

Cheers,

The VSN Team.