FSKneeboard: A powerful VR-Cockpit Manager for Microsoft Flight Simulator

This project (formerly known as VFR Map For VR) adds a helpful ingame panel to your flight simulator which brings

- Several different Maps, Waypoint* and Tracks*,
- a Charts Viewer* and
- a Notepad*

right into your cockpit! This is is especially helpful for those of us who like to fly in VR (and thus not being able to look on a physical kneeboard, tablet, or second screen).

Additionally, FSKneeboard adds a very helpful fully automated and configurable Autosave Feature*.

I made this mod for myself and for now, it does exactly what I want. And since the latest release, it does even more stuff that you guys, the community, asked for!

If you like it, please let me know and share it with other VR pilots 😃 Also, consider yourself invited to join me and the community on the FSKneeboard Discord Server at https://discord.fskneeboard.com

(*) indicates "premium"-features that are available in FSKneeboard PRO, which is available for a Pay-What-You-Want-Price at https://fskneeboard.com/buy-now

Table of Contents

Screenshots
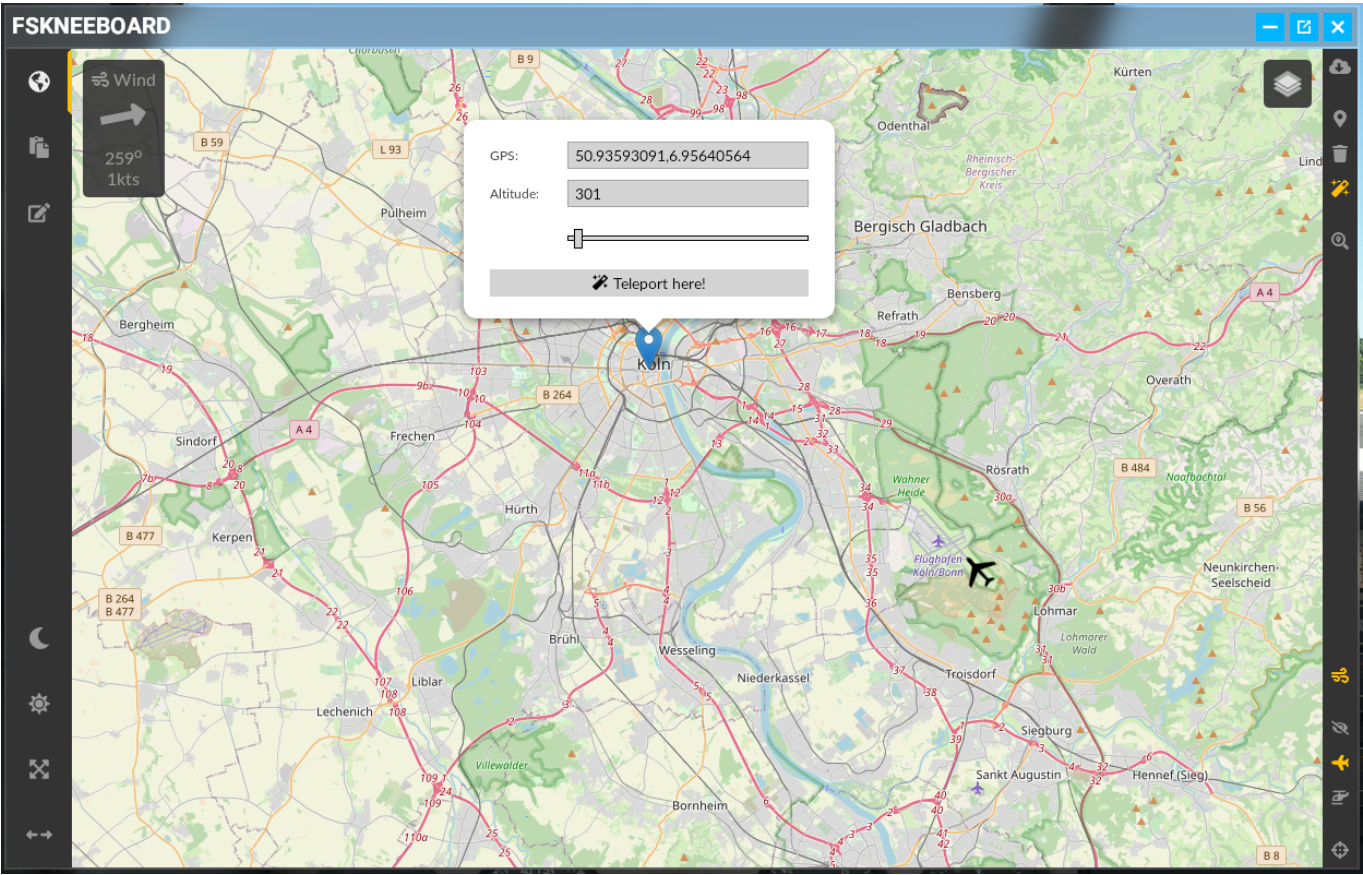

Toolbar Icon
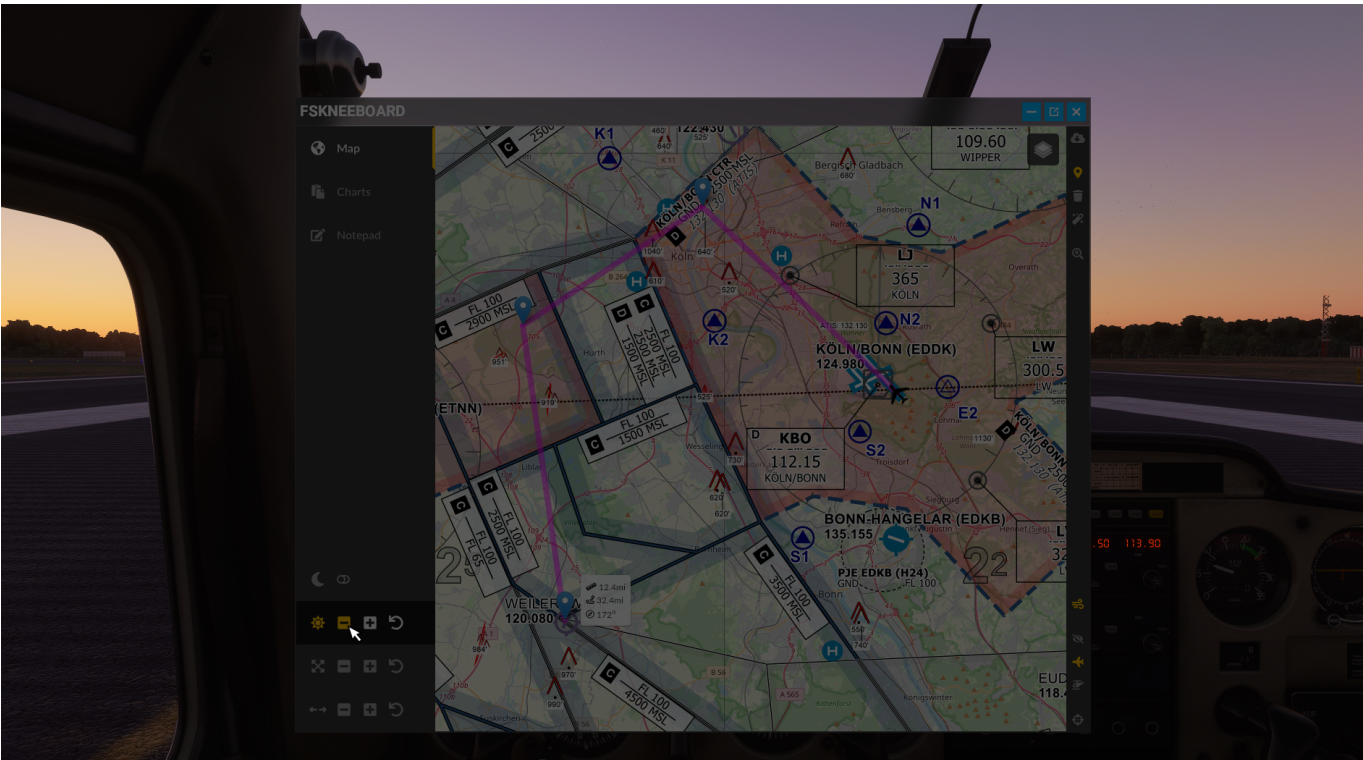

Navigational Data Enabled

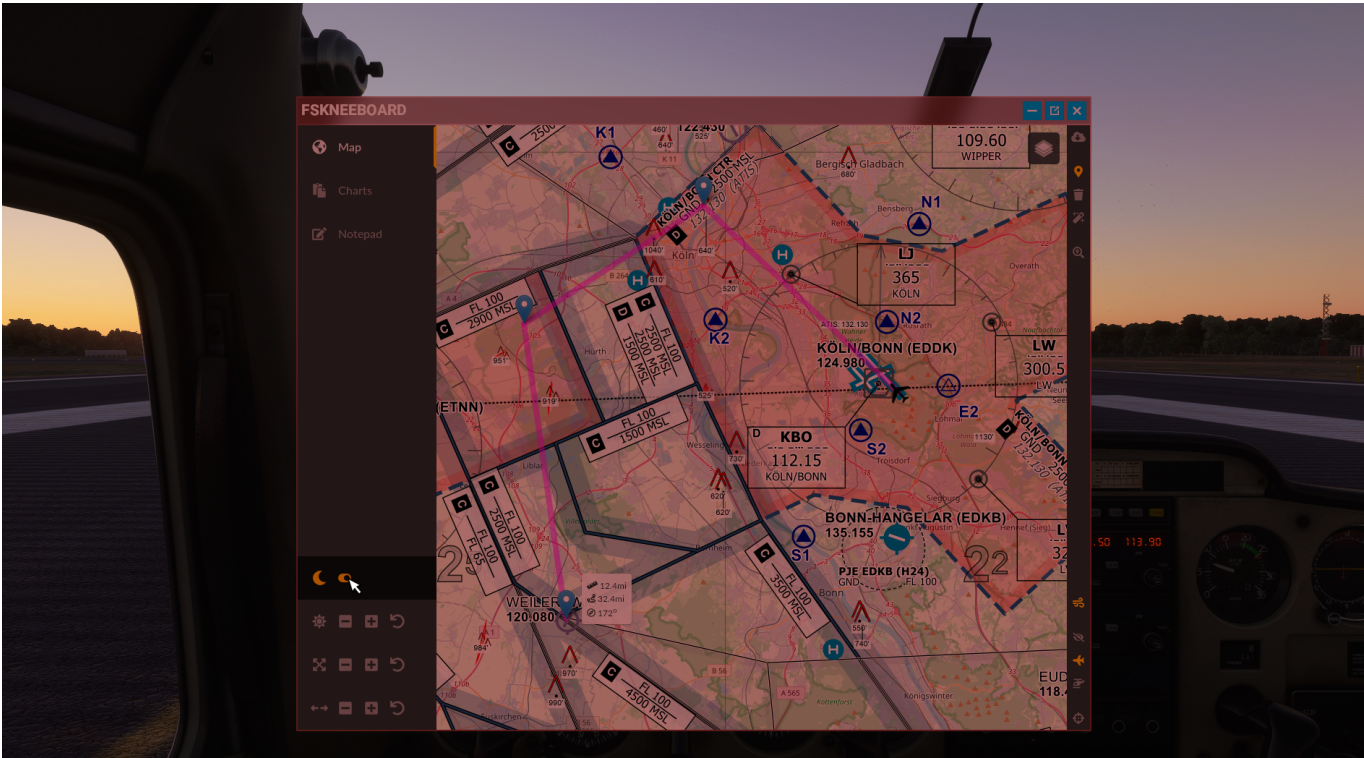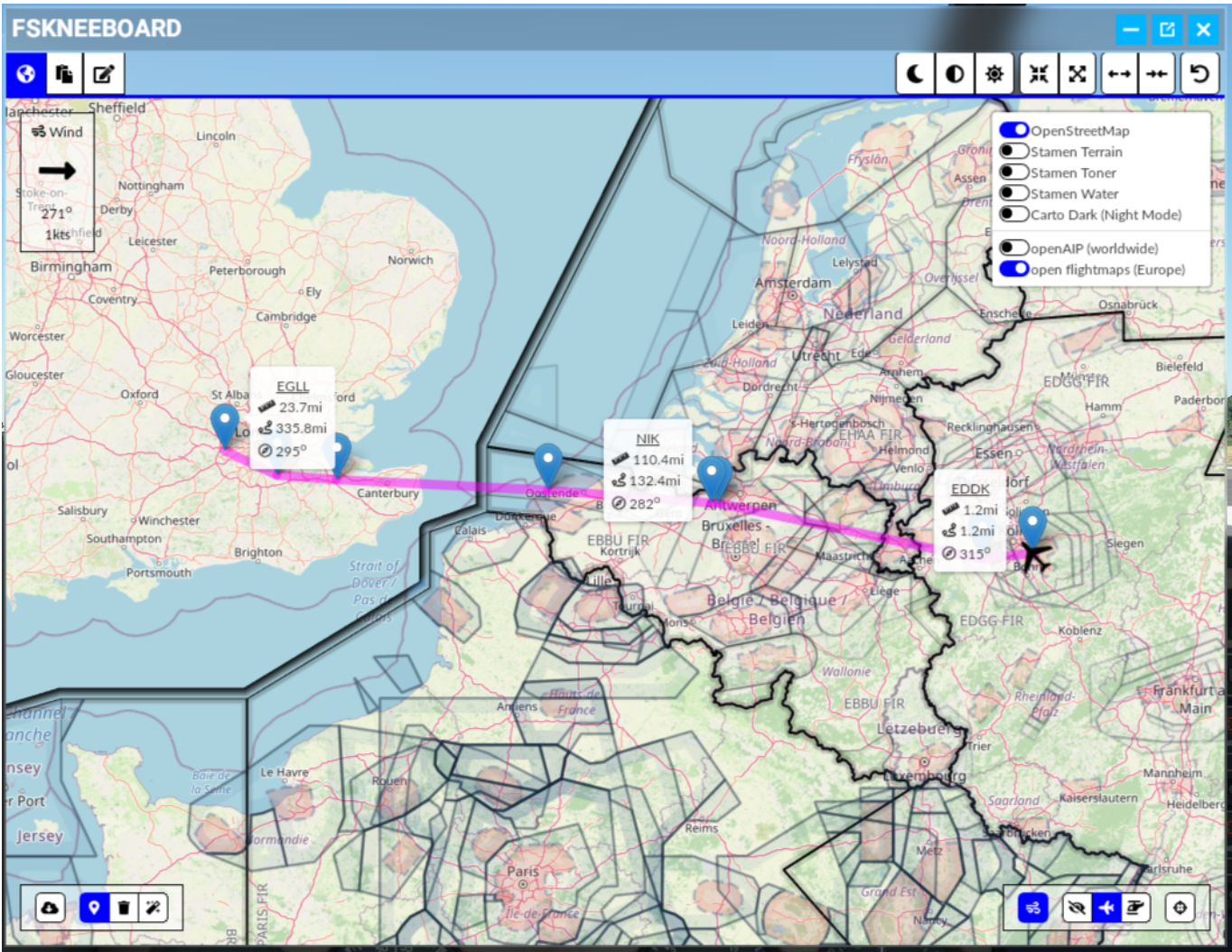*Charts Viewer*

Notepad

Teleport UI

Dark Mode

Dark Mode (Red Flashlight)

Waypoints with ICAO Identifiers (Old UI)

TL;DR

The Mod consists of **TWO PARTS(!)**: a *server* and an *ingame-panel* that you need to install and run **BOTH**!

Please take the time to at least read the Installation and Usage sections below!!!

It's dead simple! But if you only install the panel to the community folder and ignore the server this mod won't run and may appear "broken" to you!

Some malware- and virus scanners detect FSKneeboard.exe as a virus! This is a false positive and known issue. Please read below "HELP!!! Why Does My Virus-Scanning Software Think This Program Is Infected?" to learn more!

Support Your Modders 😃

If you enjoy this project, please consider buying me a coffee and/or donating to the guys I mentioned in the Attribution section. It allows us to keep developing addons and mods like these ones and making them available for free. Any amount is welcome! Thank you.

Go PRO

Alternatively, you may decide to "go pro" at a Pay-What-You-Want-Price! It's really your call! You'll unlock all features of FSKneeboard plus you support the mod development. Also, you'll make a 1-year-old and a 5-year-old very, very happy, as I can buy them more ice cream 😃

Getting Support

If you have any problems, questions or would like to get in touch and stay involved with an active community of like-minded VR enthusiasts, then don't miss out on yoining our community Discord over at https://discord.fskneeboard.com!

Features

- The VFR-Map is a separate panel inside the sim: No fiddling around with virtual desktop browser windows etc.
- Map resolution etc. is optimized for VR use, and fully customizable while ingame
- Hide your own airplane on the map for a fully-fledged "paper map on kneeboard"-VFR navigation feeling
- Toggle to show and automatically follow your airplane on the map for a more "GPS"-ish style of navigation
- Five different map types
- Several different navigation data overlays, including open flightmaps and openAIP
- Dark Mode (adjustable brightness + "red flashlight mode")
- Configurable hotkey to show/hide the FSKneeboard panel while ingame
- Windows Installer for simple installation and configuration
- Add, remove and modify waypoints and tracks on the map[*]
- Pull the currently loaded flightplan from MSFS into your kneeboard map, including ICAO identifiers[*]
- Search for any address or POI worldwide right from FSKneeboard and add it as waypoint or even teleport there[*]
- Watch charts and checklists inside the integrated charts viewer[*]
- Organize approach charts, checklists, weather charts etc. in separate subfolders[*]
- Take notes inflight with your mouse on the integrated notepad[*]
- Automatically create snapshots/savegames from your flights every few minutes so you're able to recover Flight Simulator instabilities and crashes (fully configurable, see Advanced Usage Section for details)[*]

(*) indicates "premium"-features that are available in FSKneeboard PRO, which is available for a Pay-What-You-Want-Price at https://fskneeboard.com/buy-now

Components

The mod project consists of two components:

Server

`fskneeboard-server` is the webserver that connects to your flight simulator and communicates with it to receive location data etc.

Client

`fskneeboard-panel` is the actual ingame panel.

Installation

There are two ways to install FSKneeboard on your system: With a fully automated installer (recommended) or doing everything manually...

Windows Installer (Recommended)

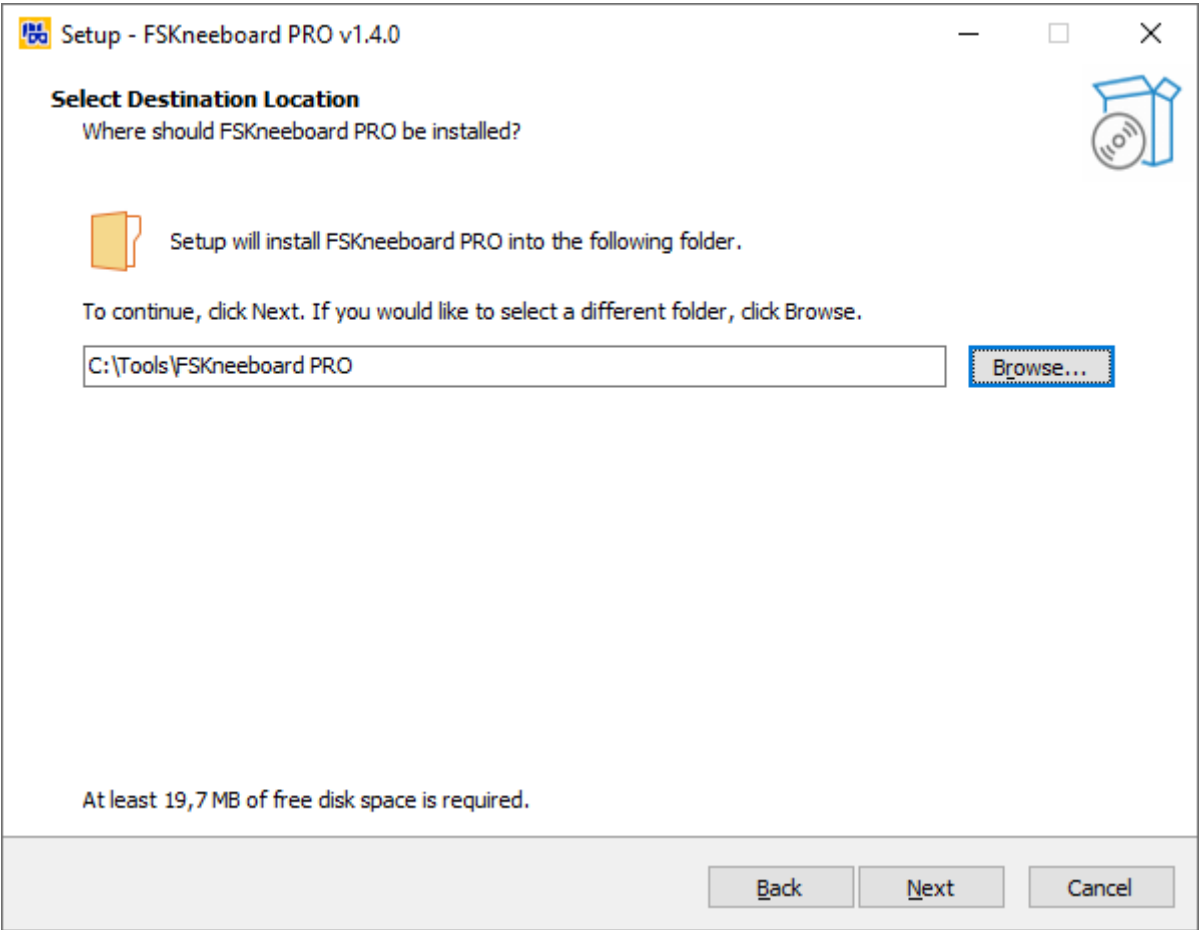Download the Installer-Executable (`Install-FSKneeboard-FREE-vX.Z.Y.exe`) from the release section.

> PLEASE NOTE: PRO users will receive a separate download link upon purchasing their license to download the PRO-Version Installer!

Step 1: Launch the Installer

Once the download is finished, run the installer from the download directory. Administrator privileges are NOT required!!!

Step 2: Pick a Server Directory

Select a directory where you want to install the FSKneeboard server. The suggested default location is in
`%LOCALAPPDATA%\Programs\FSKneeboard`, but you can change it to whatever you deem fit (like
`C:\Tools\fskneeboard\` for example). Click `Next`!

```
Setup - FSKneeboard PRO v1.4.0                              —    □    ✕

Select Destination Location
Where should FSKneeboard PRO be installed?

        Setup will install FSKneeboard PRO into the following folder.

To continue, click Next. If you would like to select a different folder, click Browse.

C:\Tools\FSKneeboard PRO                                       Browse...

At least 19,7 MB of free disk space is required.

                                    Back        Next        Cancel
```

Select a Server Directory

Step 3: Select your MSFS Community Folder

Next, the FSKneeboard Installer tries to locate your MSFS Community Folder, where the ingame panel must be installed to. The automatic location mechanism "should work" (TM) for both the Windows Store as well as the Steam versions of the game and the installer will tell you if it did succeed. Otherwise you will have to locate your Community Folder by hand. Then click Next!

IMPORTANT: Just pick the community folder! Do not add any subfolders. Otherwise the panel will NOT work!
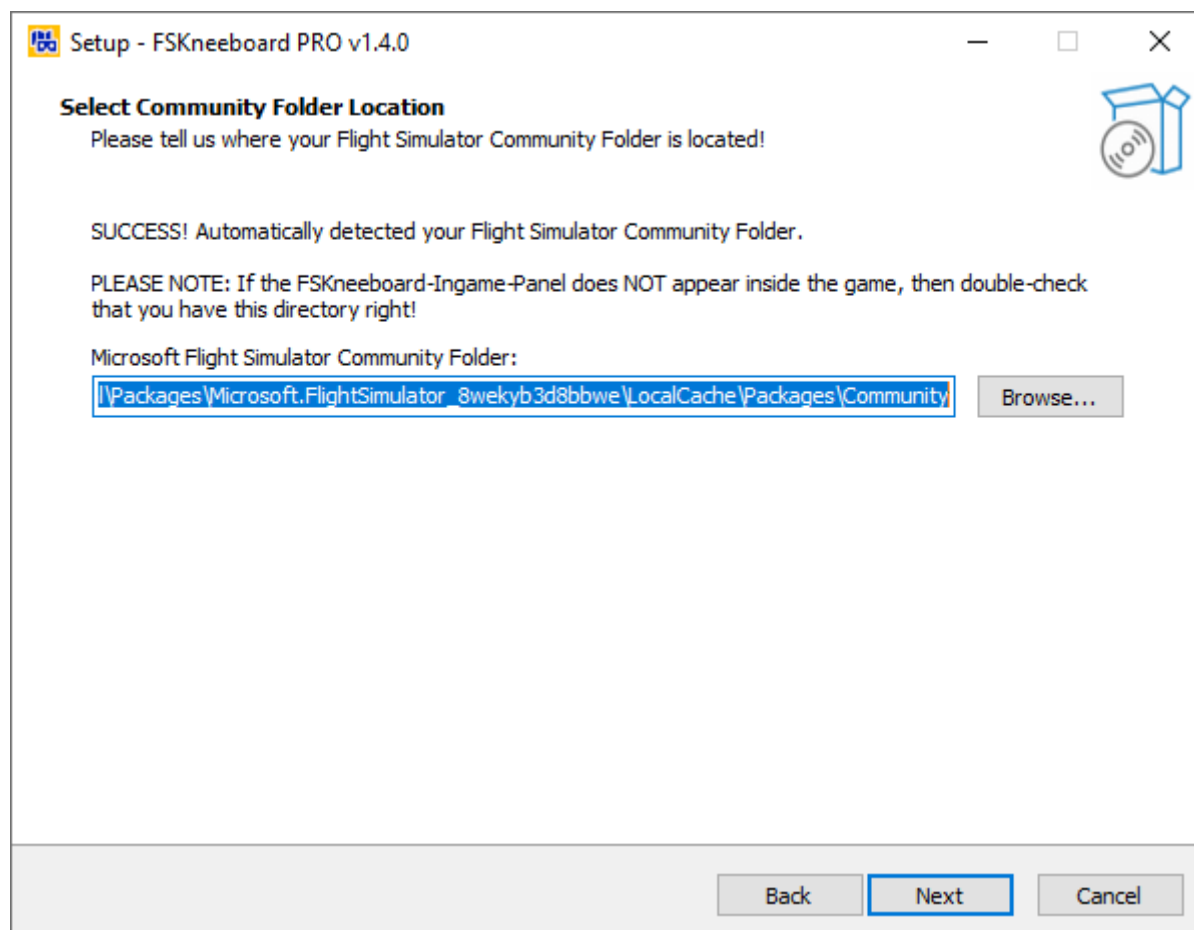
Locate your MSFS Community Folder

Step 4: PRO-Users only!!! Download your license and tell the Installer where to find it

At that stage, PRO supporters should have their license ready (usually somewhere in your Downloads folder). Click Browse and select it. Then click Next!
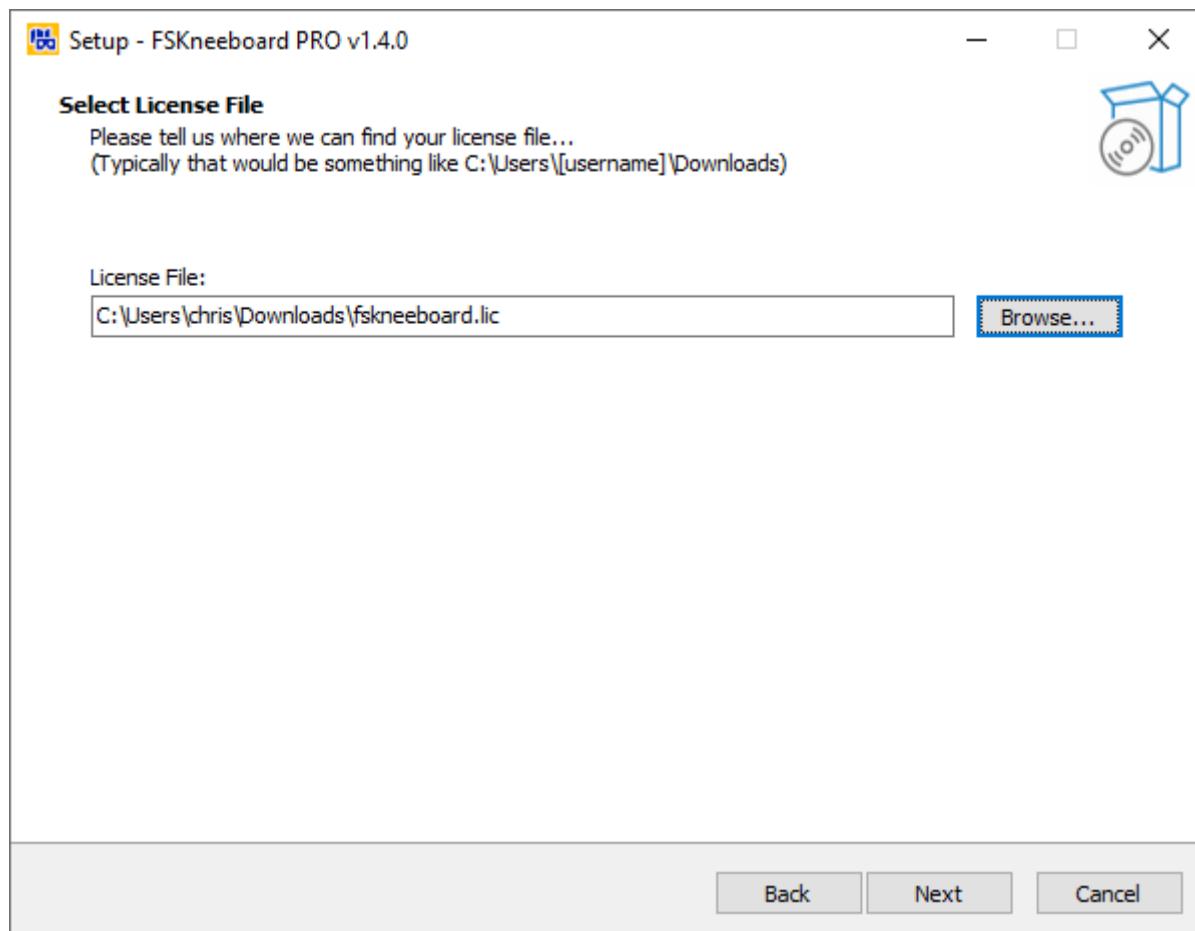
Locate your FSKneeboard PRO license file

Step 5: Proceed

You should now see a summary of what the installer will copy to what folders. Click Next and the installation will begin. At the end, you will find everything you need to start FSKneeboard in your windows start menu.
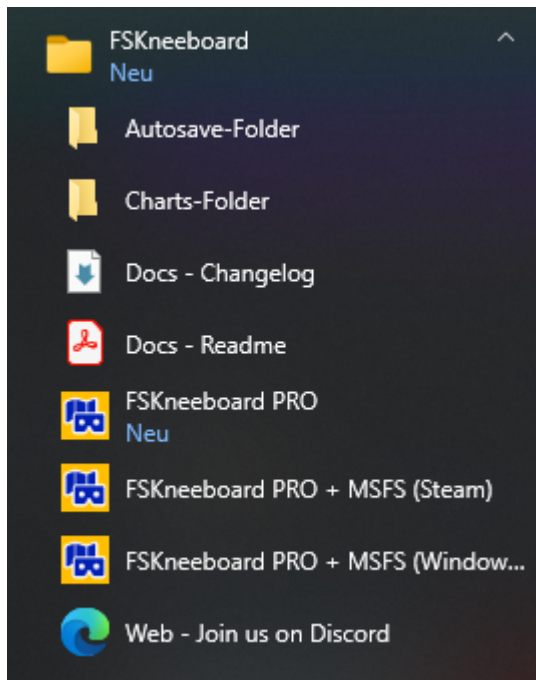
FSKneeboard Start Menu Items

Upgrading to a New Version

When upgrading to a new version, you should unistall the old one. You are free to try to simply "update" what you already have, but I don't recommend it. Old files may interfere with new ones and break the mod. Therefore, in case you encounter bugs after upgrading, properly uninstall FSKneeboard and go for a fresh install!

Make sure to backup your license file and your charts folder, though, just to be save 😃
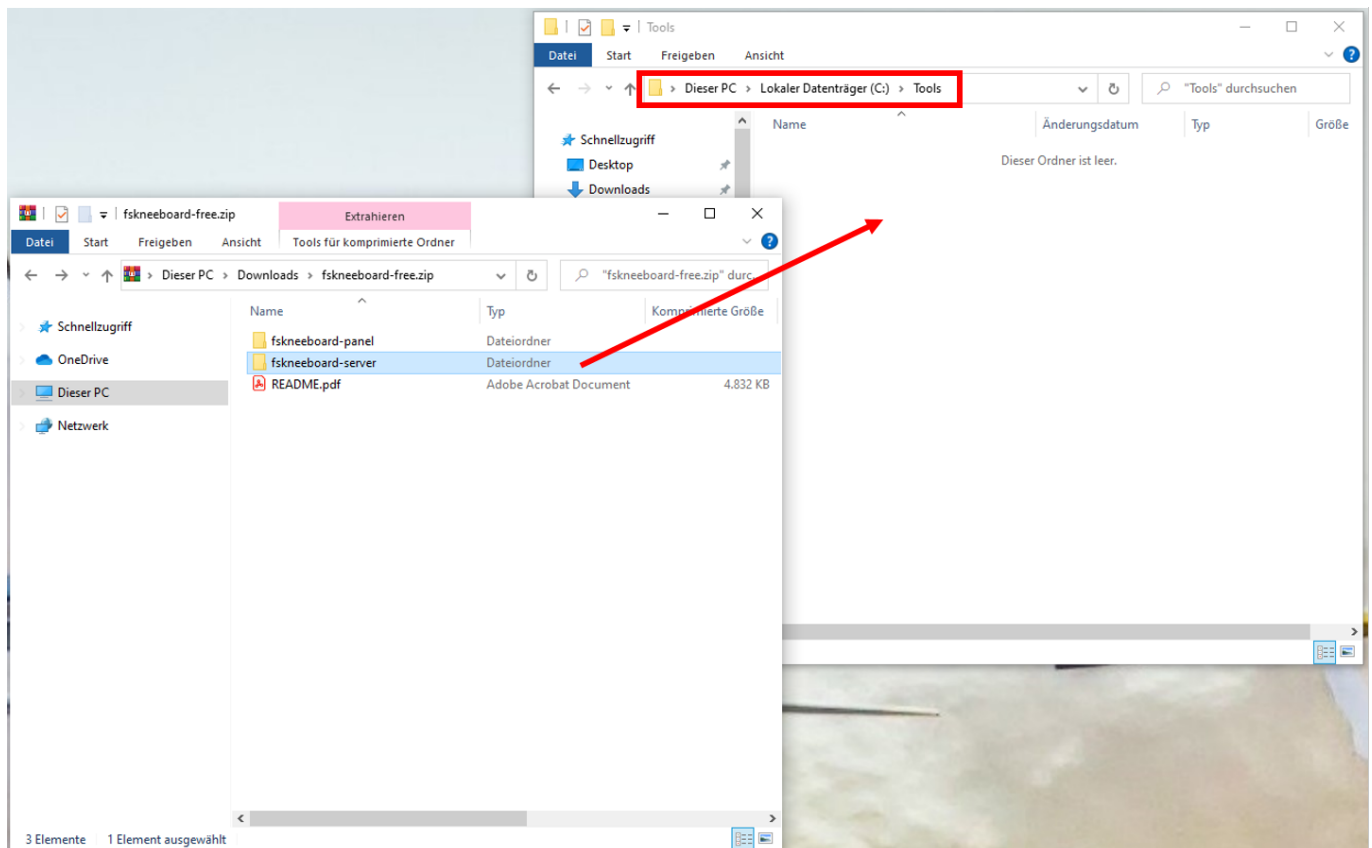
Manual Installation (For those who don't trust the installer or need a "portable" version...)

Download the zip from here.

> PLEASE NOTE: PRO users will receive a separate download link upon purchasing their license to download the PRO-Version!
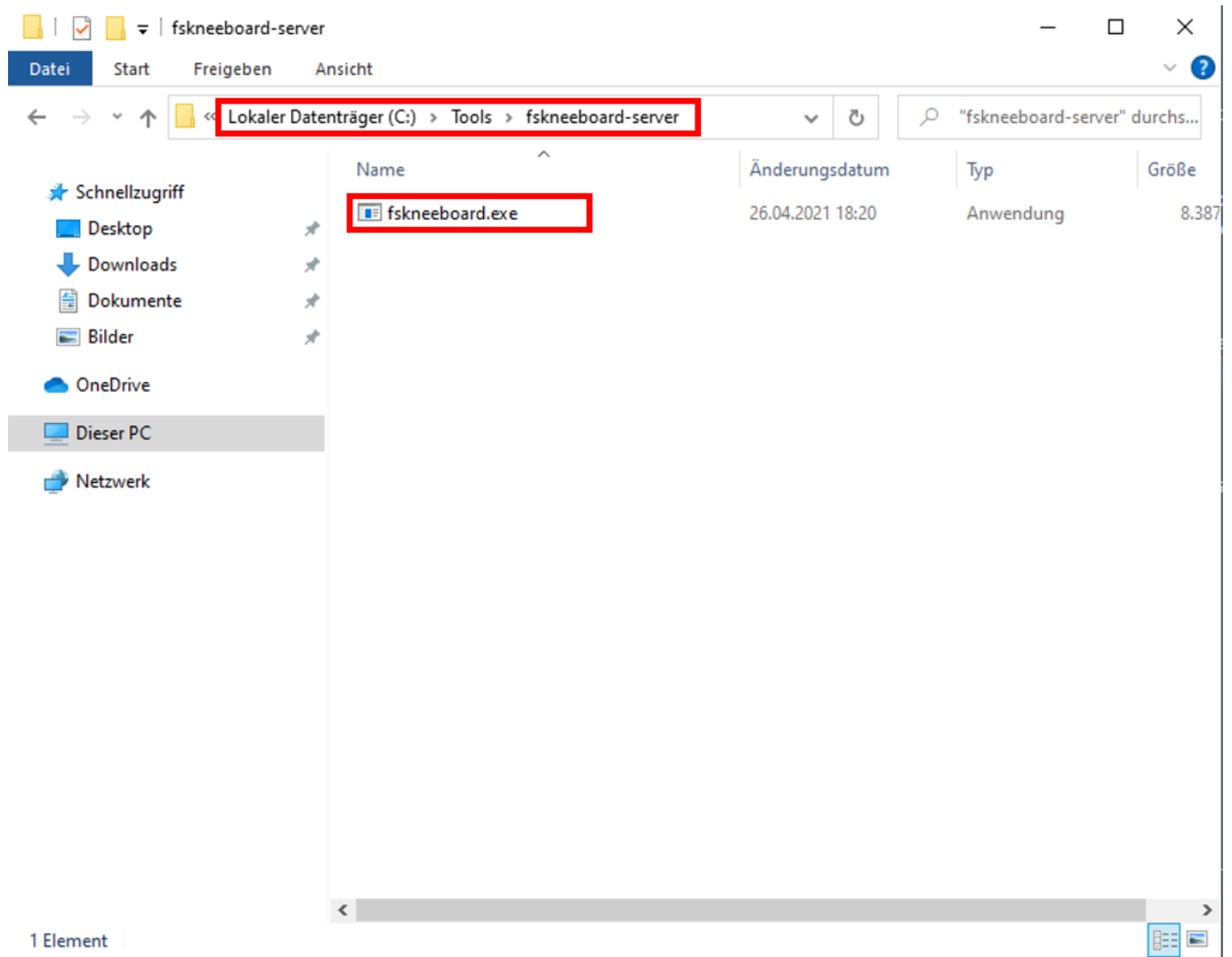
Manually Installing the Server Component

Place the contents of `fskneeboard-server` file somewhere convenient (like `C:\Tools\fskneeboard\`).
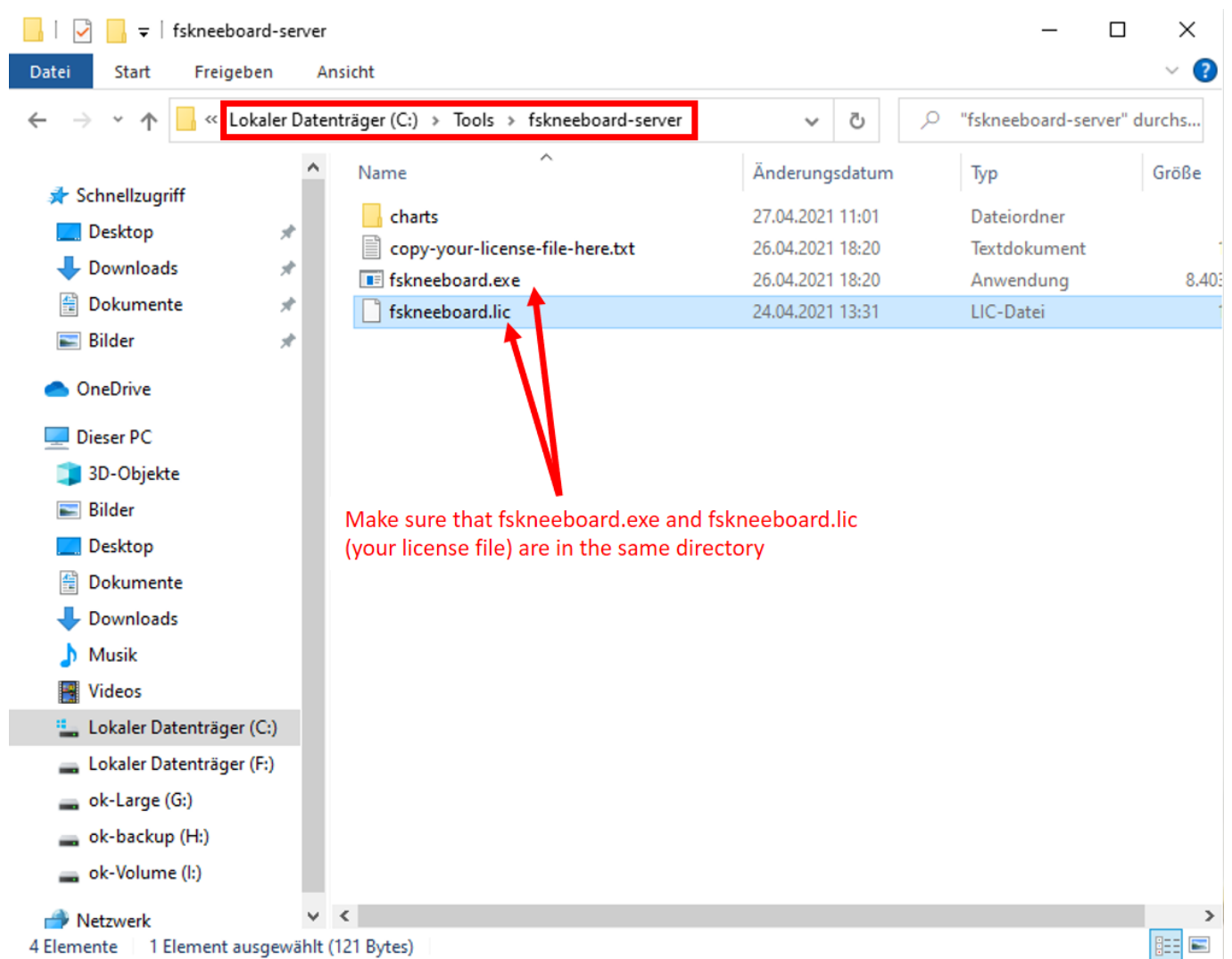

Server Installation

Afterward, your `fskneeboard-server` folder should look like this:
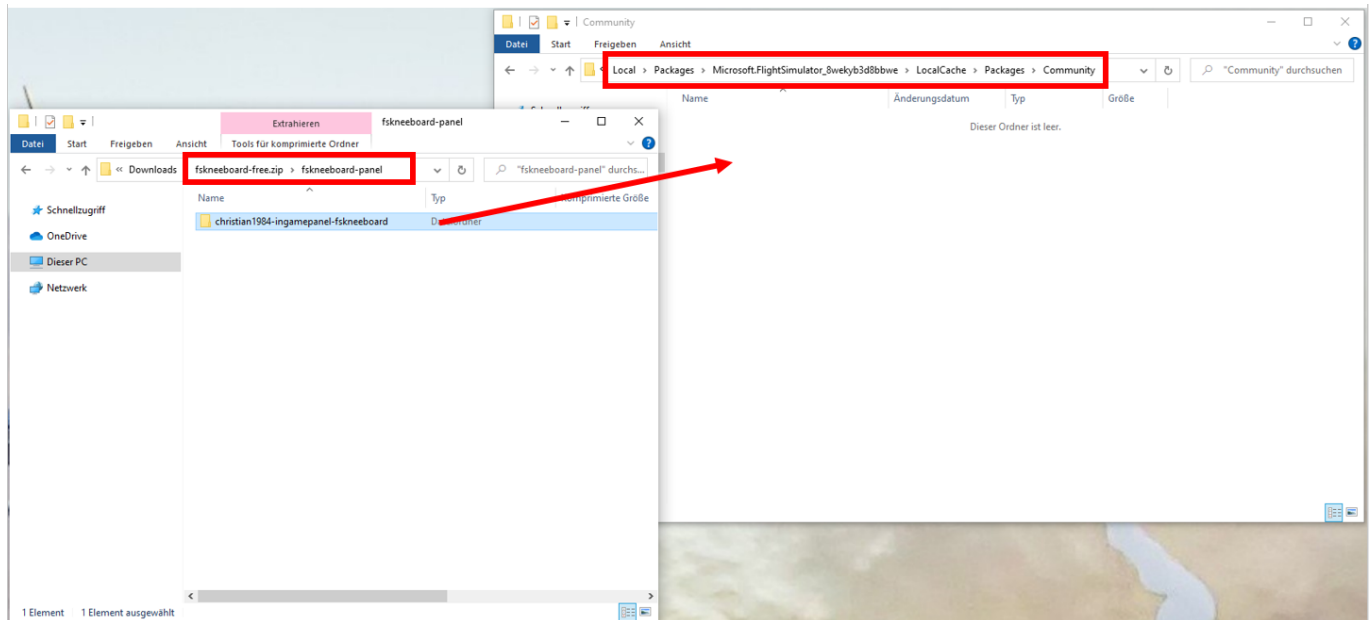

Server Installation - Done

If you have purchased FSKneeboard PRO make sure to also place your fskneeboard.lic-License file here! Your finished PRO-installation should look like this:
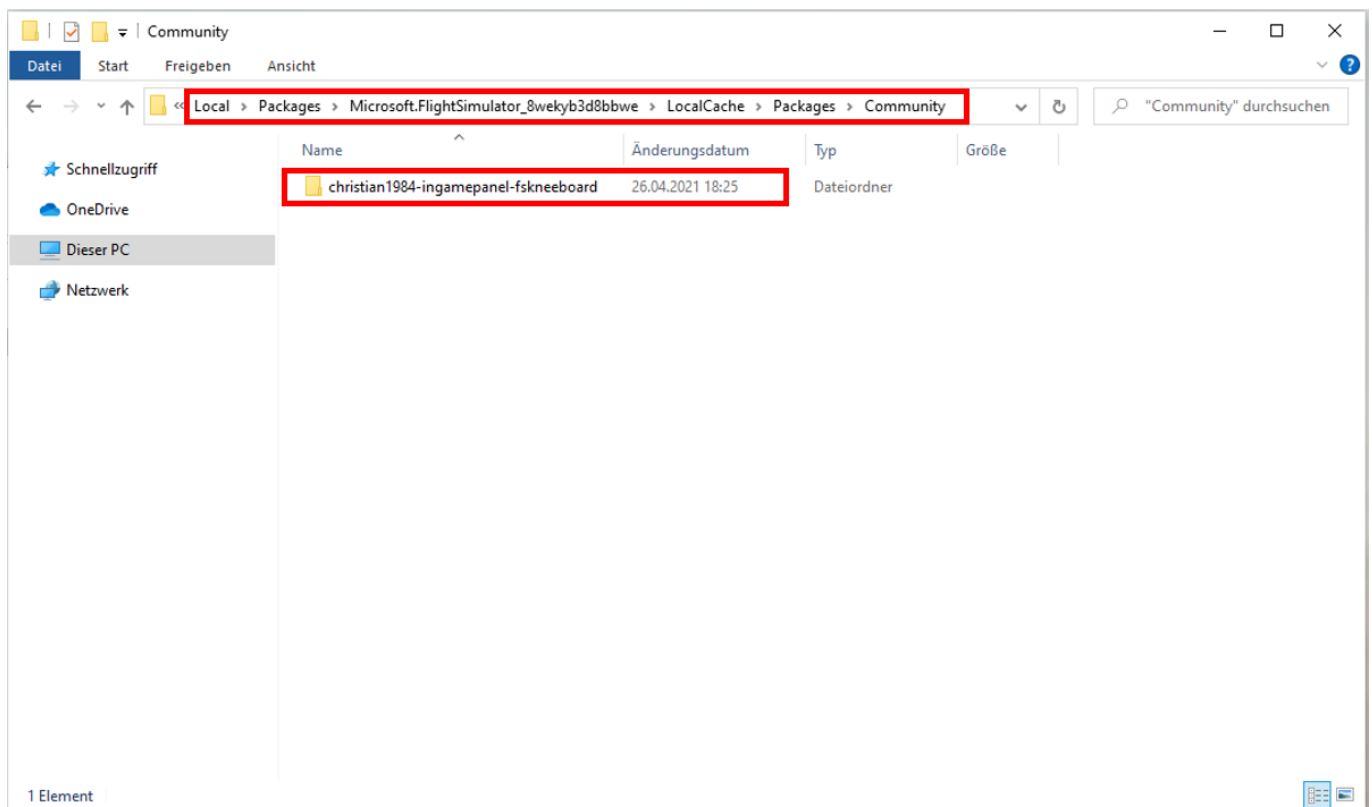

Server Installation - FSKneeboard PRO - Done

Manually Installing the Client Component

Place the folder `christian1984-ingamepanel-fskneeboard` in your MSFS community folder (typically
`C:\Users\`
`[username]\AppData\Local\Packages\Microsoft.FlightSimulator_8wekyb3d8bbwe\LocalCache\Pac`
`kages\Community`)

Panel Installation

When finished, your Community folder should look like this (though there may be more than one extension installed, obviously).

Panel Installation - Done

Manually Upgrading to a New Version

Please remove **all files** from the server directory and `christian1984-ingamepanel-fskneeboard` from your community folder, before installing a new version. Do not "copy over". No excuses! Old files may interfere with new ones and break the mod. Just do it, but keep your license file 😃


First Launch

In order to launch FSKneeboard, you need to do two things:

1. Launch the FSKneeboard local server application by clicking the FSKneeboard icon on your desktop or launch fskneeboard.exe from your command line and...
2. ... open the actual FSKneeboard ingame panel inside MSFS.

Launching the FSKneeboard Server and Automatically Run MSFS

- Depending on where you have purchased Microsoft Flight Simulator, you may use launch FSKneeboard's starting:
  - `fskneeboard-autostart-windows-store.bat` for owners who have purchased via Windows Store (which simply calls `fskneeboard.exe --winstorefs`), or
  - `fskneeboard-autostart-steam.bat` for owners who have purchased via Steam (which simply calls `fskneeboard.exe --steamfs`)
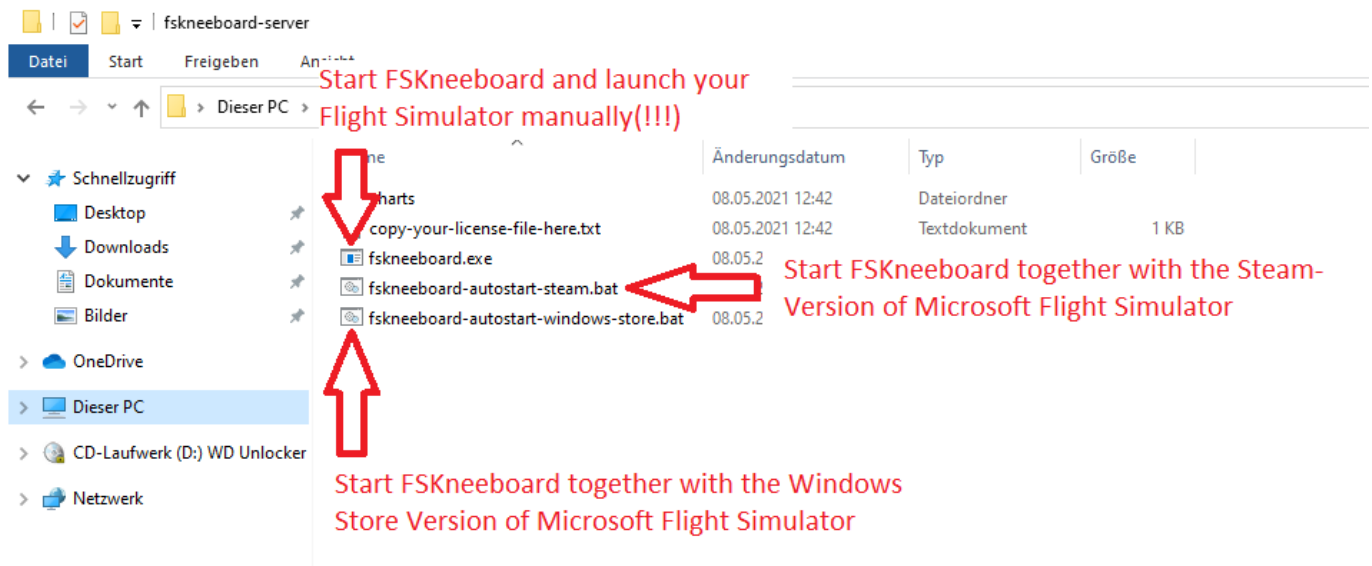

FSKneeboard - Autostart Scripts

- If you encounter any errors or unexpected behaviour, simply run `fskneeboard.exe`. This has the autostart feature disabled by default. FSKneeboard will now wait until you have started Flight Simulator **manually**!
- Open up the ingame panel once inside the sim (like you would do for ATC etc.)
- Place conveniently in your VR space
- Click "Center Airplane" to initially center the map on your airplane.

Bring Up The FSKneeboard Panel in VR

In order to open up the actual FSKneeboard panel inside MSFS, first enter VR mode. Next, hit the [TAB] key to bring up the ingame toolbar and click the FSKneeboard icon to bring up the ingame panel.
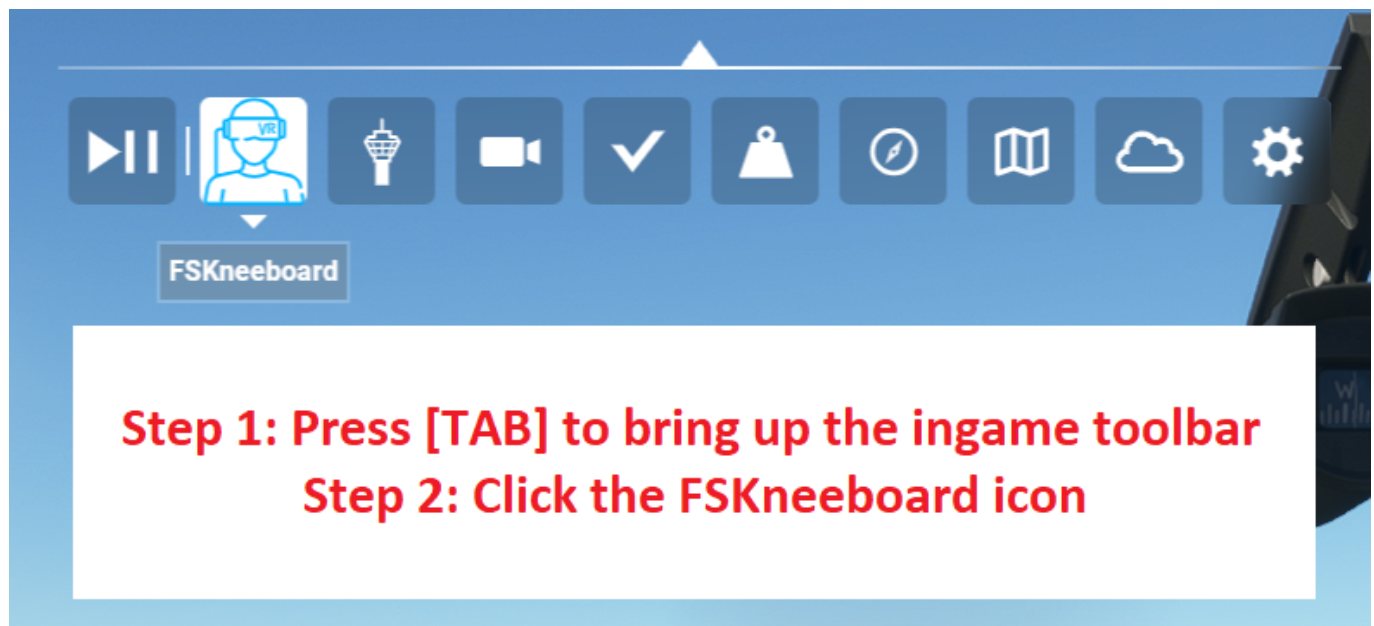

How to open the ingame panel (old icon)

Usage

Dynamic Resolution Scaling

Depending on your personal preference and various external factors (like your 2D screen resolution, your MSFS window size, your supersampling settings) chances are the map inside your FSKneeboard panel may appear too small or to large, or in some cases even stretched in a weird way. In that case you may use FSKneeboard's dynamic resolution controls to adjust the panel's resolution to your personal preference.
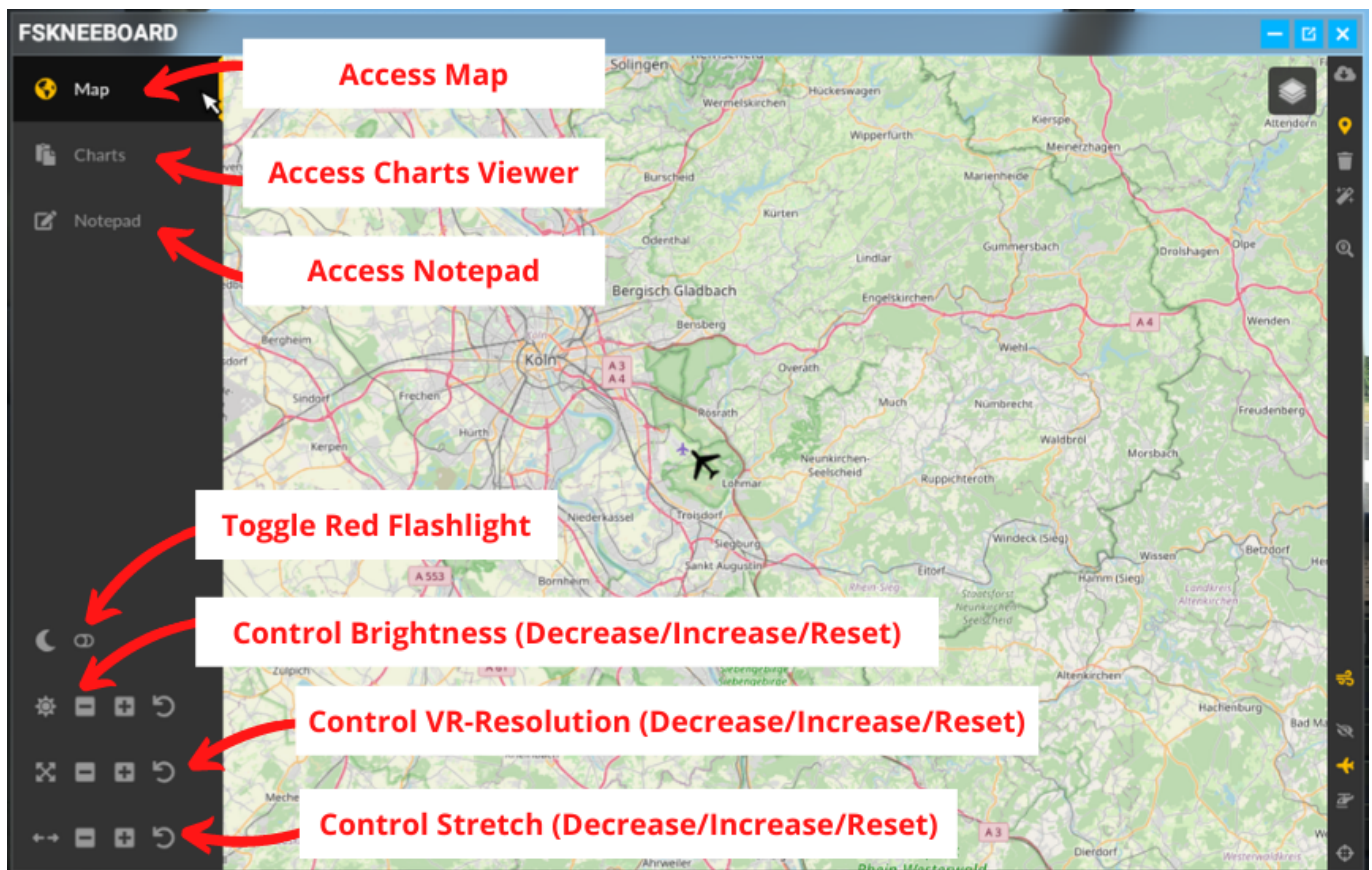
If the map is hard to read and appears too small, no matter how far you have zoomed in or out, click the button with the four arrows pointing outwards **multiple times** to stepwise increase the size of the panel's content for better readability. If it appears too large, then click the button button with the arrows pointing inwards in the same fashion.

If the map appears to be compressed horizontally, then click the button with the two horizontal arrows pointing outwards **multiple times** to stepwise stretch the panel in the horizontal direction. If, on the other hand, the panel appears stretched horizontally, click the button with the two horizontal arrows pointing inwards in the same fashion.

The reset button on the very right hand side allows you to reset both your custom resolution and stretch settings.

Map Viewer

The map is the core component of FSKneeboard and available to FREE and PRO users alike. It contains several map modes as well as a representation of your own aircraft that you may also turn off so that you can "navigate by hand" on bush trips and the likes.

Owners of FSKneeboard PRO can also access the waypoint feature, which allows you to manually place waypoints on the map:

- A track will be automatically added between waypoints and a flag will show you information about the distance to the final waypoint and the heading of your track.
- You can click any given waypoint you have placed to toggle the visibility of its particular info-flag. The info-flag of the last waypoint of your track is always visible.
- If you get in the proximity of less than 0.5 NM of any given waypoint it will automatically be removed from the map. The last waypoint on your track will not be removed automatically, however, so you can use it to find a mission target or destination.
- You may click your own aircraft to toggle the "rubberband" that connects your airplane to the first waypoint.
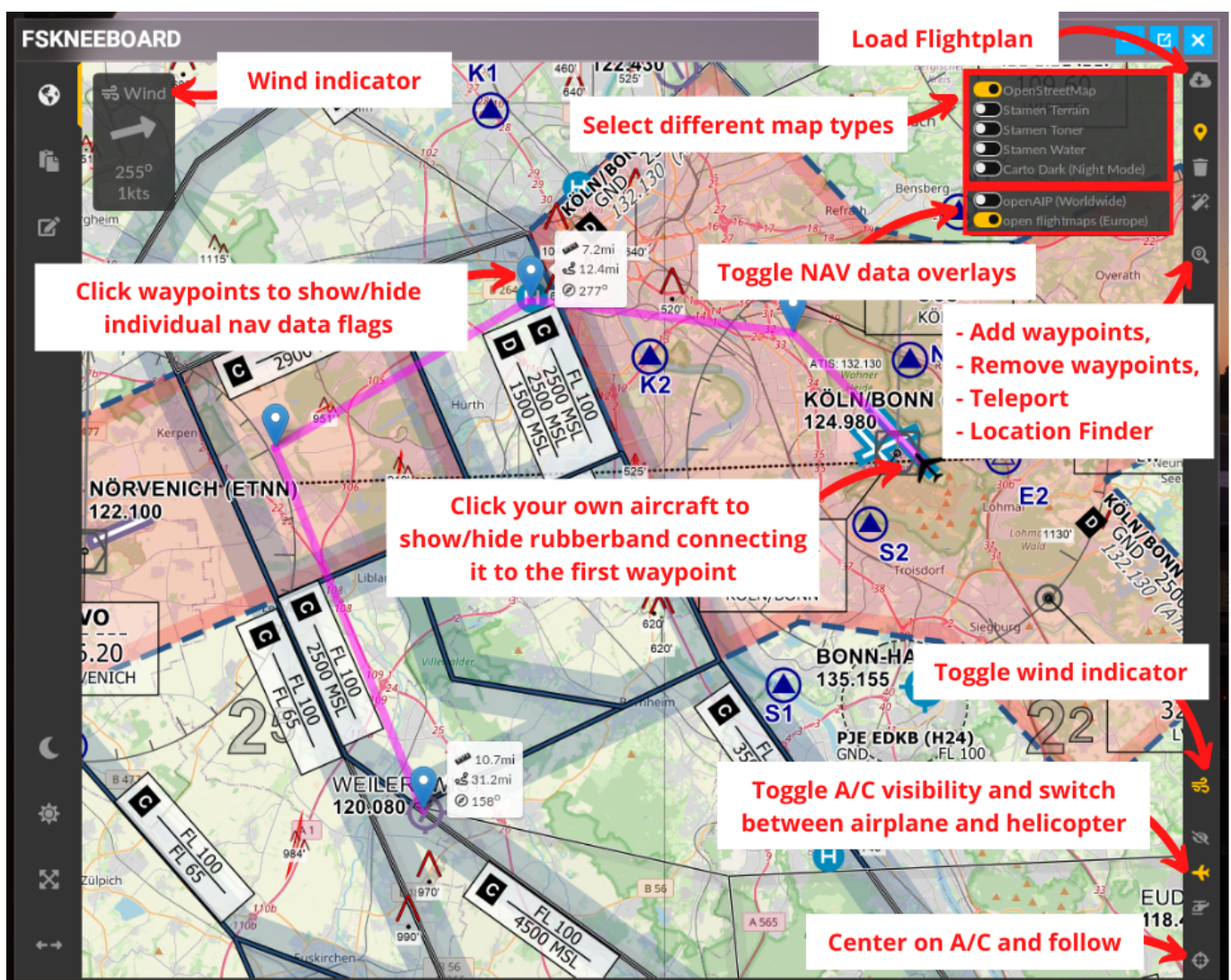
Map Viewer

Loading a Flightplan (PRO)

PRO users may also pull the currently loaded ingame-flightplan from their Flight Simulator onto the kneeboard by clicking the "cloud-icon" in the bottom left corner. This will load the flightplan you have created on the Worldmap screen before starting the flight. This will replace all manually placed waypoints on your map.

> PLEASE NOTE: When you change your flightplan by adding or removing waypoints through your ingame GPS, for example, these changes will not be reflected by the flightplan pulled from the Sim by this feature. For the time being, this is a known limitation of the feature. Please configure your flightplan before taking off on the Worldmap screen of MSFS.

Location Finder (Experimental)

> REMARKS:
>
> - This feature is an experimental feature. It's not bulletproof and may require some tweaking in the future. Use it at your own discretion and please provide feedback!
> - I noticed that the location finder has a minor glitch when it is showing the results list (see screenshot). It's not perfect, yet, but it gets the job done. I figured it's worth getting it into your hands as soon as possible than to spend another one or two weeks tweaking the final 5% out of the release. I hope you agree 😃

The location finder can be accessed via the search icon on the toolbar and allows you to type in any street address or POI via the onboard keyboard and find it on the map. You can then select to just pan the map there, add a waypoint at this location or teleport there.

Map Viewer Location Finder

Charts Viewer

FSKneeboard PRO contains a fully-fledged charts viewer for charts in png format. You can navigate the charts by either using the toolbar on the top or by dragging to pan the map around. You can also use your mouse wheel to zoom.

Charts Viewer

You can browse and access your charts folder by clicking the browse charts button in the toolbar. You can also use the left and right arrow buttons on the toolbar to browse the individual documents inside the current directory.
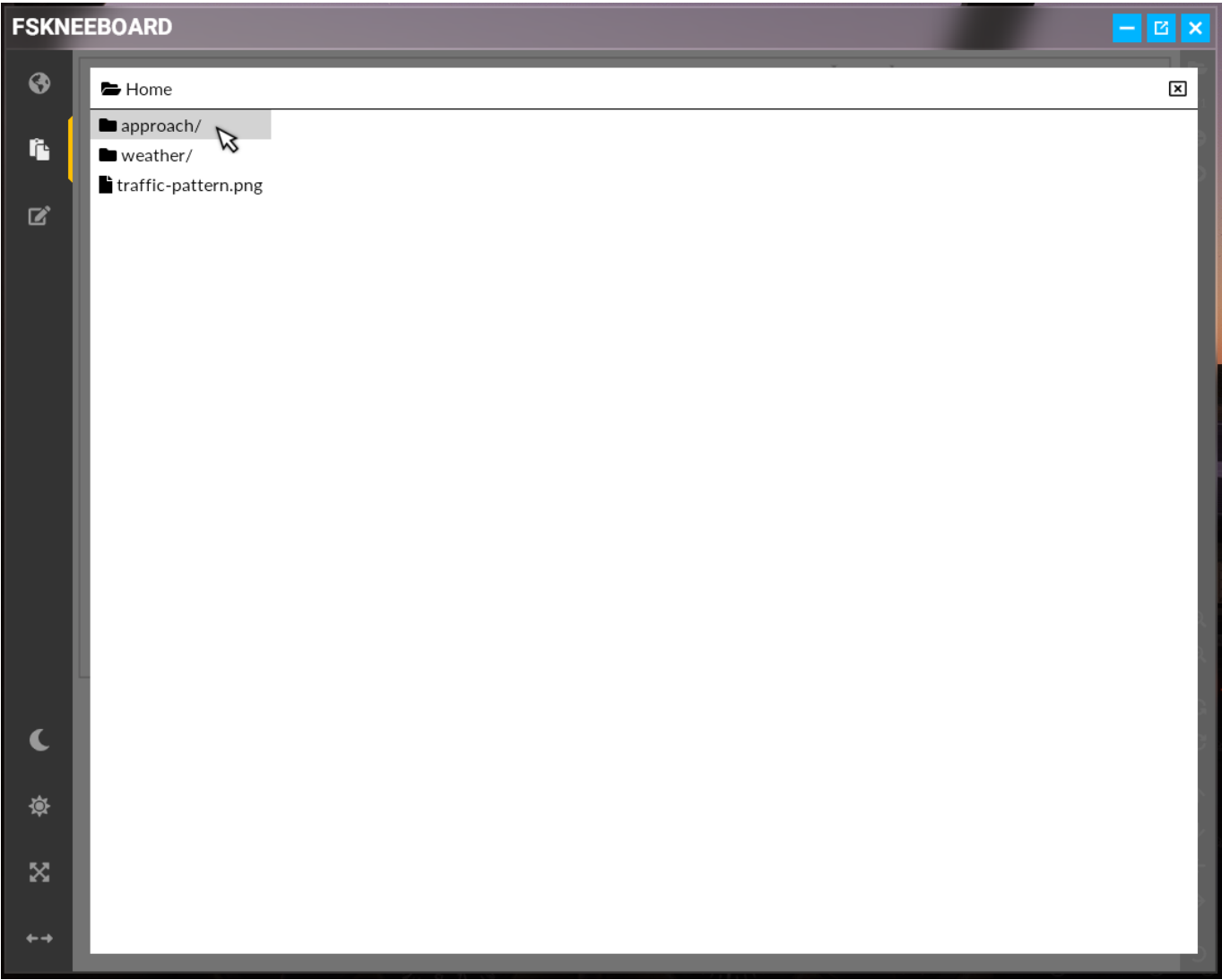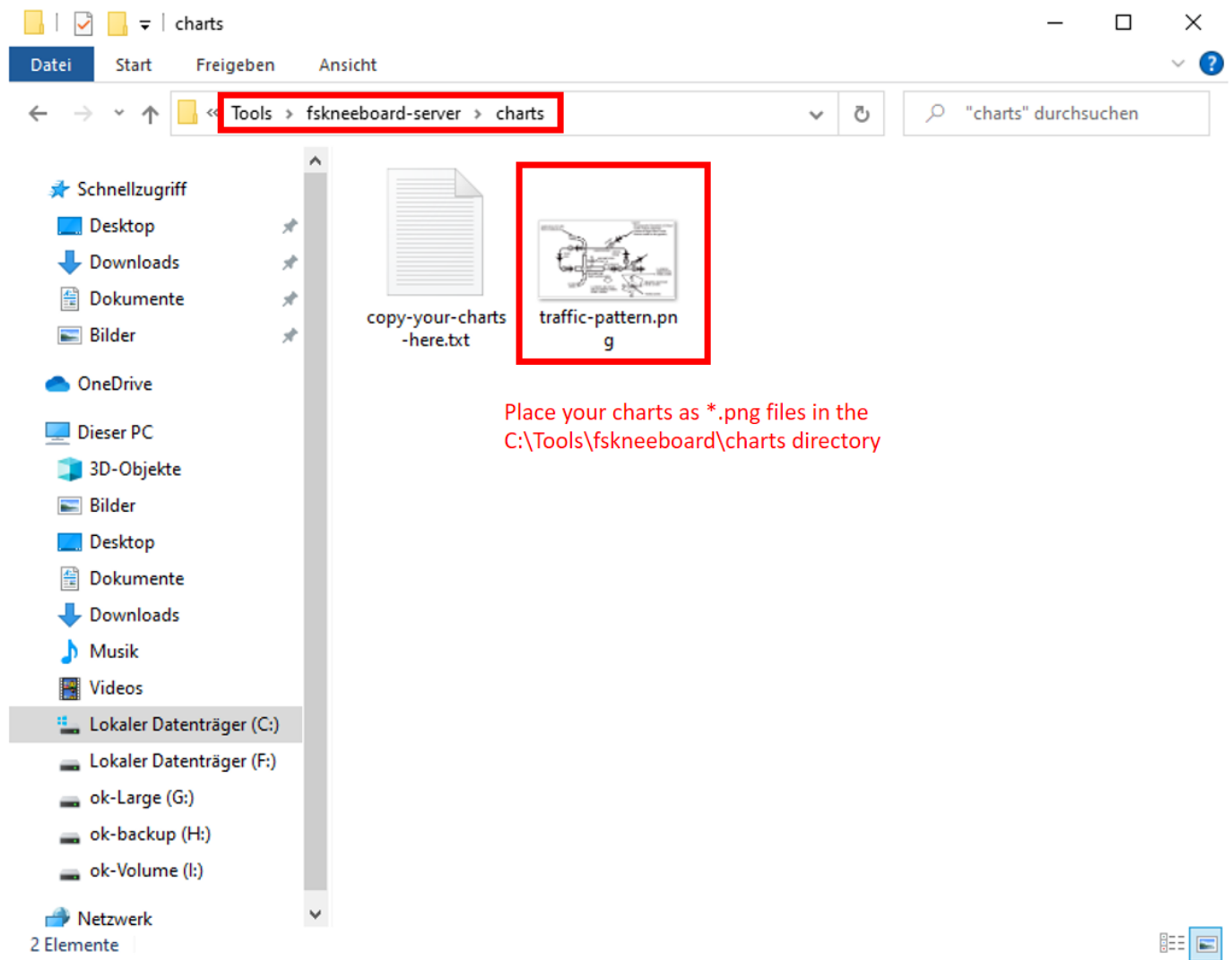
Charts Viewer Document Browser

Make sure to place your charts inside the `charts` folder inside the server directory. You can also use subdirectories to organize your charts (to checklists from approach charts for example).
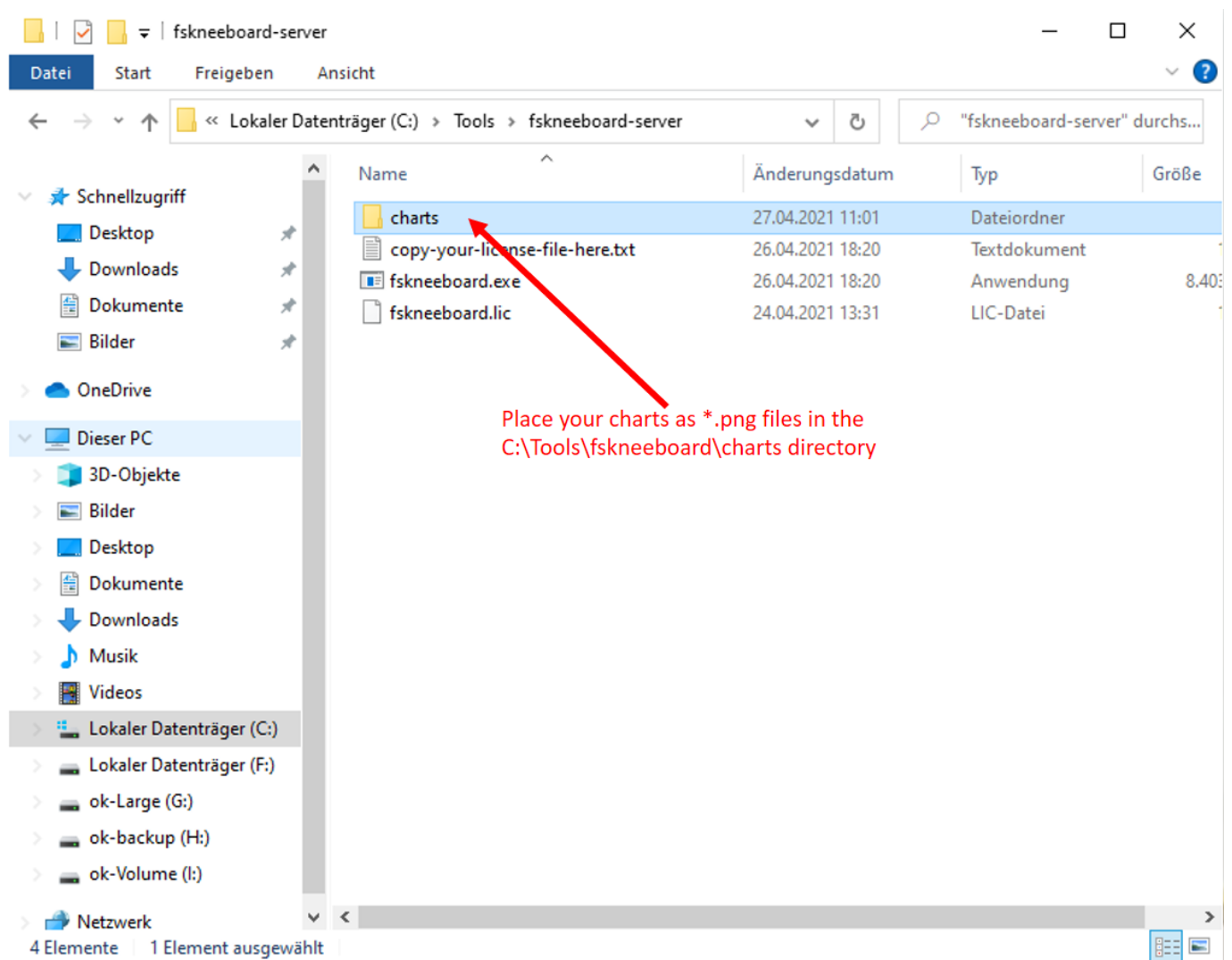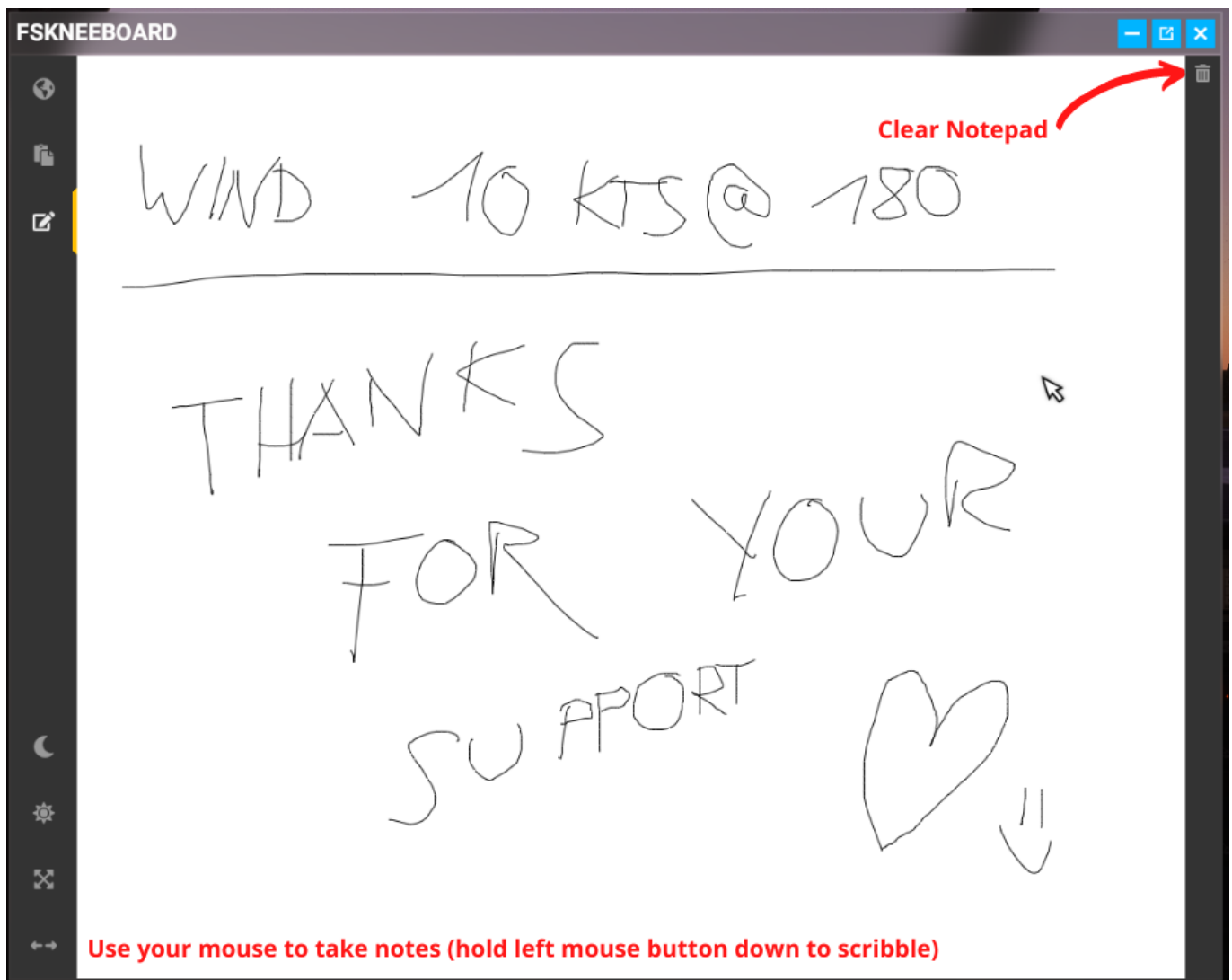

Charts Folder

Your charts folder should look like this:

Inside Your Charts Folder

Notepad

Notepad is another feature that FSKneeboard PRO users have access to. It allows you to take notes during your flight session by simply drawing on it with your mouse.


Notepad

Autosave

> REMARKS: Please make sure to NOT launch fskneeboard with the --autosave option when you are planning to go on a bush trip! It seems that once a flight is saved via SimConnect (which is the interface that FSKneeboard uses internally to communicate with MSFS), Flight Simulator falls flat on its face when trying to properly save the Bush Trip progress. Both MSFS and FSKneeboard will in fact continue to save the flight; but unfortunately as a free flight, not as a bush trip flight, which leads to conflicts when trying to load the flight back up... MSFS does automatically save your bush trip progress automatically, anyway, so you don't need FSKneeboard's autosave in that particular scenario!

Autosave is a feature that allows you to automatically create "snapshots" of your flights on predefined intervals. This is especially useful if you happen to encounter occasional (or even frequent) crashes to desktop (CTDs) with Microsoft Flight Simulator in VR.

Simply run FSKneeboard with the flag `--autosave [number]` to create a snapshot every `[number]` minutes. For example, run `fskneeboard.exe --autosave 5` to create one savegame every 5 minutes.
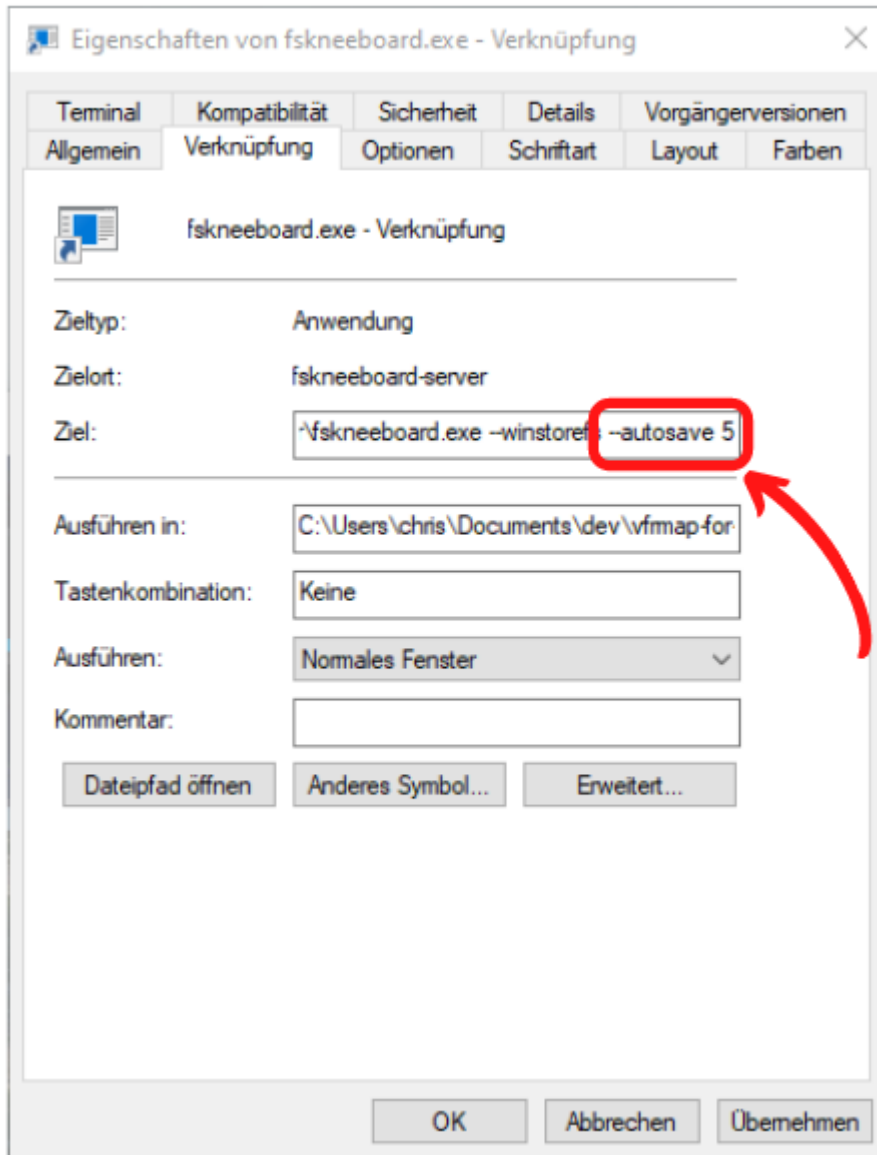
Autosave Shortcut

FSKneeboard automatically deletes older snapshots and keep only the latest 5.

If you need to restore a flight, you can find your autosaves inside your FSKneeboard-Server folder in the subdirectory `autosave`, e.g. `C:\Tools\fskneeboard\autosave`.

Hotkey (Experimental)

> REMARKS:
>
> - This feature is an experimental feature. It's not bulletproof and may require some tweaking in the future. Use it at your own discretion and please provide feedback!
> - When the panel is hidden via the hotkey it is technically still there in your 3D space. Any attempt to control cockpit instrumentation that is hidden "behind" your invisible kneeboard will not work. The panel still intercepts your 3D cursor. Please make sure to position your kneeboard panel in a way that would allow you to interact with your cockpit instrumentation all the time, no matter if the panel is hidden or not!

You can define one of three hotkeys to toggle the visibility of the FSKneeboard ingame panel. The hotkey can be configured by starting FSKneeboard with the `--hotkey [number]` with `[number]` having the following meaning:

- `--hotkey 1 => [Alt]+F`
- `--hotkey 2 => [Alt]+K`
- `--hotkey 3 => [Alt]+T`
- `--hotkey 4 => [Ctrl]+[Shift]+F`
- `--hotkey 5 => [Ctrl]+[Shift]+K`
- `--hotkey 6 => [Ctrl]+[Shift]+T`

For example, launch `fskneeboard.exe --hotkey 1` to setup `[ALT]+F` as your FSKneeboard hotkey.
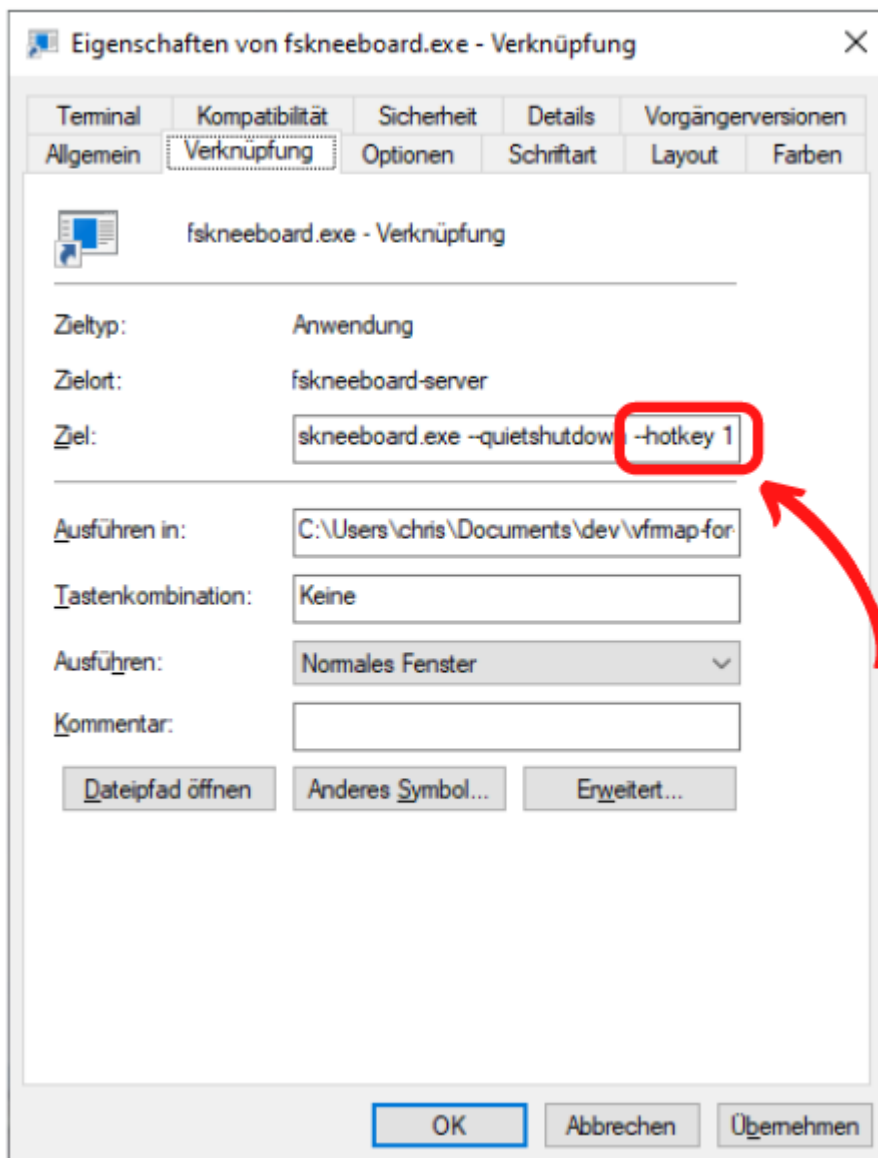

Hotkey Shortcut

When ingame, you'll have to open the FSKneeboard panel ONCE by clicking it on the toolbar. For the rest of the flight, you can use the configured hotkey to toggle the panel's visibility as desired.

If you like, you can use your HOTAS configuration software to map this hotkey/shortcut to any button on your HOTAS.

Advanced Usage

The FSKneeboard server can be started with several commandline arguments to further customize its behaviour. In general, all you need to do is add them behind your "fskneeboard.exe" shortcut.

- `--autosave [number]`: Automatically create snapshots/savegames of your flights every `[number]` minutes.
- `--hotkey [number]`: Enable the hotkey feature and set it to Alt+F `[number] = 1`, Alt+K `[number] = 2` or Alt+T `[number] = 3`.
- `--winstorefs`: Start FSKneeboard together with your Flight Simulator purchased via Windows Store.
- `--steamfs`: Start FSKneeboard together with your Flight Simulator purchased via Steam.
- `--noupdatecheck`: Prevent FSKneeboard from checking the GitHub API for updates every three days.
- `--quietshutdown`: Prevent FSKneeboard from showing a "Press ENTER to continue..." prompt after disconnecting from MSFS
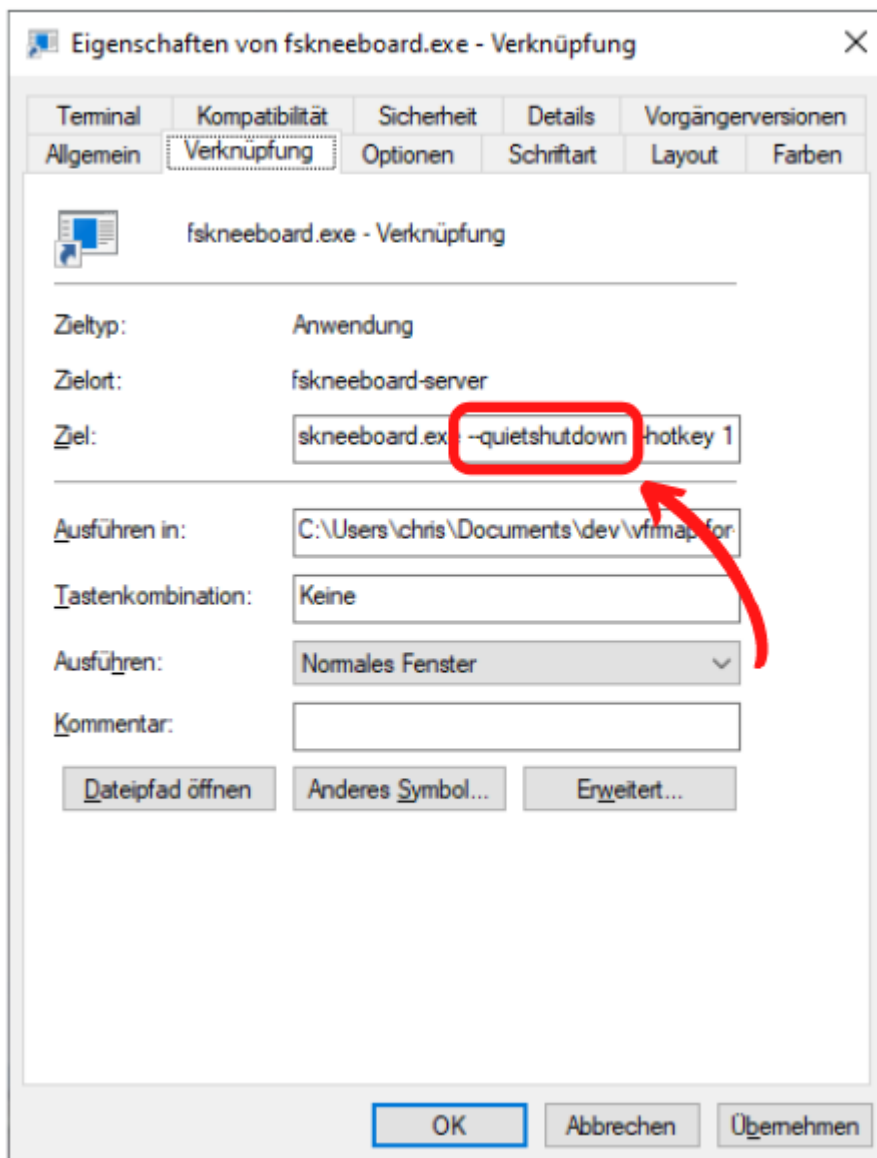
Quietshutdown Shortcut

Troubleshooting

"I cannot see the FSKneeboard ingame panel inside MSFS. What is wrong?"

> There are typically two reasons why this can happen:
>
> 1. First, make sure that you have opened up MSFS's ingame toolbar. In 2D mode, that happens automatically when you hover your mouse over the chevron on the very top of the window. In VR mode you need to press the `[TAB]` key to bring up this toolbar! Now, double-check whether the FSKneeboard icon appears on that toolbar or not. If it does, then click it. Issue solved 😃
> 2. Second, if the icon does not appear, it is very likely that the ingame panel was installed to the wrong directory. To identify the proper community folder please read the next section and then come back... Got your community folder location? Great! Now uninstall FSKneeboard and run the installer again. When prompted to enter your community folder location, enter the community folder path that you have just identified. Restart MSFS and the panel should appear.

"I cannot find my community folder. Help!!!"

> Here's how to localize your active community folder with 100% certainty:
>
> 1. Start MSFS and wait for the main menu to be loaded.
> 2. Now click Options > General
> 3. Open the "Developers"-settings-page, which is located at the bottom of the list on the left
> 4. Turn on "Developers Mode"
> 5. A new menu bar will appear on the top of your screen. Select Tools > Virtual File System
> 6. Now you can locate the community folder under "Watched Bases"

"I get errors when I try to start the server!"

> This can happen if, for whatever reason, `fskneeboard.exe` cannot write `simconnect.dll`. Use your windows search to search for simconnect.dll (or download a copy somewhere on the interwebs) and copy it to the same directory `fskneeboard.exe` is located!

"Windows says FSKneeboard contains a virus!"

> That is a false positive and a well-known problem with software written in GO. Please make sure to read the section HELP!!! Why Does My Virus-Scanning Software Think This Program Is Infected? below.

"I've placed my pdf-charts in the charts directory but I can't see them inside the sim!"

> Due to the limited capabilities of the browser engine that is embedded in Flight Simulator, the charts viewer can only display charts in png format. You will have to convert your charts. There is a multitude of pdf-to-png converters available online for free. Alternatively, you may want to take a look at GIMP, which is a freeware that also enables you to convert pdf files to png locally. If you know about other options, please reach out and let me know so that I can add them to this readme file.

Roadmap

Here's a list of features that I've planned to implement in the foreseeable future:

- Migrate the entire server component from GO to .NET to mitigate false virus alerts
- Integrate Navigraph and Little Nav Map (if feasible)
- Take notes via iPads and then have them synced to your in-sim notepad
- Allow for multiple notes to be taken, instead of having only one "sheet"
- Embed Twitch Chat / Discord / YouTube(?)
- (... This could be your wish 😃 ...)

And here are some wishes from the community that I have to check for feasibility as soon as I get to it:

- Is it possible to add frequencies (such as VOR/DME/Comm)?
- Is it possible to change airport elevation data from [m] to [ft]?

Attribution

This project uses forks of two amazing community projects. Without them, it would have taken me an incredible amount of time building this thing all on my own. Hence, I want to thank the two:

- The original server was forked from lian/msfs2020-go.
- The original client/ingame panel was forked from bymaximus/msfs2020-toolbar-window-template.

Great work, guys! Thanks for sharing your work with us!!!

Icons

- Helicopter Icon provided by SVGRepo.
- Other Icons provided by FontAwesome.

Maps and APIs

- OpenStreetMap
- Stamen
- Carto
- openAIP
- open flightmaps

Sample Documents

- The Traffic Pattern Sample Chart is in the public domain and sourced from Wikimedia
- (PRO) The Weather Forecast Sample Chart is in the public domain and sourced from Wikimedia
- (PRO) The Approach Sample Chart is in the public domain and sourced from Wikimedia

Releases and Downloads

Program zips of FSKneeboard FREE are released and uploaded here.

If you decide to support the development of this mod by buying a copy of FSKneeboard PRO here you will be emailed a link where you can download the FSKneeboard PRO binaries.

How to Contribute?

If you have suggestions or issues, please feel free to reach out to me or create an issue within the Github repository. You may also add stuff yourself. Pull requests are very welcome!

HELP!!! Why Does My Virus-Scanning Software Think This Program Is Infected?

From official golang website https://golang.org/doc/faq#virus

"This is a common occurrence, especially on Windows machines, and is almost always a false positive. Commercial virus scanning programs are often confused by the structure of Go binaries, which they don't see as often as those compiled from other languages."

Personal statement:

> If you don't trust the binary my suggestion would be two-fold:
>
> - Step 1: Upload the binaries to virustotal and see how many scanners throw a positive.
> - Step 2: Clone the repository and build the binary yourself. Everything is open-source, hence anyone who knows anything about building software can check the codebase for harmful code...
>
> Generally speaking (and that's true for anything you download from the web): If you don't trust the code, don't execute it! Especially NOT with elevated rights(!!!) I can understand anyone who doesn't want to run the software and appreciate how people ask questions instead of simply running the server...
>
> At the end of the day, it is your call. If you don't trust me and a binary that is flagged by a virus scanner, I do respect that. It's common sense, and I am not happy with the entire false-positive situation either. That is why in the mid-term I am planning to migrate the entire server component from GO to .NET, which should hopefully help to mitigate the issue.

However, here's a virus report from virustotal for the binaries of Version 1.2.0. Please note how many virus scanners do NOT flag the server as a positive. Please upload your own copy of FSKneeboard to virustotal to see the results of the latest version for yourself.

Virustotal Report of Version 1.2.0

Support Your Modders 😃

If you enjoy this project, please consider buying me a coffee and/or donating to the guys I mentioned in the Attribution section above. It allows us to keep developing addons and mods like these ones and making them available for free. Any amount is welcome! Thank you.