Pilot2ATC in VR - a User Guide

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Overview

More and more flight simulation users are finding that Virtual Reality (VR) is a great way to further enhance the immersion experience from a visual perspective. Pilot2ATC provides additional immersion with regard to flight planning and ATC voice communication. Pilot2ATC works well in the VR setting, just as it does on a 2D monitor. This user guide is written so that one can get the best experience from Pilot2ATC in VR for more common setups.

While there are several VR systems available, this guide focuses specifically on using SteamVR and compatible headset products. The concepts presented here may also be of value for those that use a VR system other than SteamVR. Look for 2D Window display software for that environment and bring Pilot2ATC into your cockpit with it.

The best VR setup for Pilot2ATC for a specific user will depend upon what VR overlay package they have available and the number of physical 2D monitors attached to their system. This guide will present user information for several of the available combinations.

Image displaying an active IFR flight in X-Plane 12 with Pilot2ATC in the copilot chair.
This is using default SteamVR Desktop Floating Overlay support.
(Pilot2ATC main window, with Speech Assistant window partially covered.)

Pilot2ATC and VR Overlays

An overlay is a 2D image that is presented in the VR 3D world. It can be a complete and interactive copy of the 2D desktop (or desktops, for those with multiple monitors). It can also be a functional image of a single application. SteamVR has a built in mechanism for viewing desktop overlays. There are also other products, OVR Toolkit as an example, that provide overlay capability but often with additional functionality. This guide provides actual user insights for a few of these overlay systems.

Pilot2ATC is a 2D application that runs on the 2D desktop. However, with the careful use of a VR overlay system, Pilot2ATC can be visible and interactive in VR. For example, one might place the image of Pilot2ATC near the copilot chair, visible to the pilot. Alternately, the user might place the Pilot2ATC image above them on the roof of the plane, more out of the way, but also providing a larger image than would fit above the copilot chair. The actual placement is completely up to what each user determines is best for their situation.

Pilot2ATC, as a windowed application on the 2D screen, can be maximized to fill the entire 2D desktop. This application also has several additional sub-windows. For example, when clicking on the Config button, a sub-window pops up where one can interact with various configuration options. This window normally comes up on top of the Pilot2ATC window, but it can be dragged and moved to other space on the desktop. The same is true for the Info sub-window, the Approach sub-window and others.

Several of these sub-windows have drop-down lists, providing the user the ability to select various options for a specific setting. In Pilot2ATC, when using VR overlays, there are a few situations that one can run into where the drop-down lists do not behave as expected. This guide is specifically written to provide usable VR overlay solutions that work well for Pilot2ATC, allowing the user to interact with Pilot2ATC just as they would on the 2D desktop.

Pilot2ATC also has a special type of additional window, more than a sub-window. This is the Speech Assistant window that is engaged by clicking the "?+" button. This window, unlike other sub-windows, can be resized and can be thought of as a main Pilot2ATC window. The Speech Assistant is an excellent tool for learning grammar within Pilot2ATC and has expanded functionality over the "?" button. One advantage of the Speech Assistant window is that, being re-sizable, it can be made large enough to see all the various grammar options at once. A specific use case might be to have the primary Pilot2ATC window in one VR overlay while the Speech Assistant window is viewable, at the same time, in a second VR overlay, each located in the plane at locations best suited for the user's preference.

SteamVR Overlays and Pilot2ATC

SteamVR (as of this writing, version 2.0.10) has the ability to launch a desktop overlay within VR. It is also possible to have multiple desktop overlays (one per 2D monitor). Furthermore, the overlay may be resized, moved, and even "floated". There is one limitation to the SteamVR overlay that has impact upon various VR applications, including flight simulation with Pilot2ATC. Only one, the overlay or the simulation application, can have focus at a given time. For example, when the desktop is selected into focus the simulation application will darken, indicating it is not in focus. Certain other VR overlay system products do not have this limitation. This limitation will be explained further below.

Getting Started

In SteamVR, in the primary SteamVR menu (accessed by pushing the "System Button" on the VR controller), there is a menu bar seen in VR at the bottom. On that bar there are a series of *buttons*. Note that hovering the pointer over these menu bar *buttons* will present a name for the *button*, indicating its use. Near the center is a *button* for creating a desktop overlay, which will show the 2D desktop screen in VR. One can interact with the desktop shown in the overlay just as normally done on the 2D desktop screen, using the VR controller as a mouse would be used. The controller's scroll pad can be used for scrolling functions.

If there are more than one 2D monitors attached to the system, there will be additional desktop overlay *buttons* visible on the bar. If one clicks on a second monitor's desktop the first one will vanish and the second desktop will be visible. These desktop overlays are mutually exclusive when used this way.

Floating Overlay, Moving, Sizing

There is a "float in world" function, accessed by a *button* at the bottom of the desktop overlay when open (see *Image 1* below). Clicking this will "detach" the overlay from the menu bar. Further, by holding down the float button at the bottom of the overlay it may be moved about, including the ability to move toward or away from the user's viewpoint by moving the controller closer or further from the user. This overlay can also be sized using the slider on the bottom left. Note that when changing to this "float" mode the overlay becomes flat (not curved like when attached to the menu bar). Note that even the menu bar can be moved about by clicking on and holding the horizontal line under the menu bar.

Once the overlay is floating in this manner then the user is able to see both the plane cockpit and the overlay, unlike when the overlay is attached to the SteamVR menu bar. It is in the float mode where the overlay becomes useful for Pilot2ATC. In this mode when the overlay is in focus, the flight simulator application will be darkened to some degree, showing it is not in focus. However, this is still a usable situation. To put the plane in focus simply point the

controller away from the overlay and click the trigger. To regain focus on the overlay just click the System Button on the controller. In order to see the desktop overlay while focus is on the flight simulation the overlay must be in "float" mode.

Even with this focus limitation, the SteamVR overlays can be used effectively. It turns out that while only the desktop overlay or the flight simulation are in focus at a time, this only affects the interaction. The display part of both is still fully operational at the same time. Both the simulation (the plane is still flying) and Pilot2ATC are still executing. For example, one can, in the Desktop overlay, change the frequency of COMM1 and see, simultaneously, the comm frequency change in the plane, even though the simulation is not in focus. As such, with both Pilot2ATC and the flight simulation executing in parallel, and since the user only really interacts with one or the other at a time, the system as a whole is usable.

Image 1: The green circle shows the Float In World *button*.

Single 2D Monitor Usage

Regarding 2D monitors, if a user has only one monitor, then SteamVR will only be able to create one Desktop overlay. In this situation, one can maximize Pilot2ATC's window so that it fills the overlay, then float the overlay and position it to the user's taste, and everything will work just like on the 2D monitor. For those that do not need the Speech Assistant window this is ideal.

If one wants to also have the Speech Assistant visible (and having only one 2D monitor) a good method is, instead of maximizing the Pilot2ATC window, one can set its size to fill the top half or two thirds of the desktop. Then when the "?+" is pressed and the Speech Assistant window comes up, it can be placed and sized in the bottom part of the desktop. A picture of this setup is shown in *Image 2* below. While sizing and positioning of these two windows within the desktop can be done in VR, it may be slightly easier to do on the 2D desktop with the VR headset off. The user can try both approaches to determine what is best for them.

Image 2: Pilot2ATC occupies the top 2/3 of the desktop floating overlay while the Speech Assistant is in the lower 1/3.

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The two windows can even be overlapping to some degree to get more space available for the selected window. This is shown in *Image 3* below. The user simply clicks on the window where focus is desired to see the full window.

Image 3: This shows the Pilot2ATC window overlapping the Speech Assistant Window. This provides more size for each window, yet both are still accessible.

Below, *Image 4* shows several operational aspects of the SteamVR overlay system. This image is of the Desktop 1 overlay, in floating mode. A few items to point out are:

Orange Circle: Move *button*. Hold this down while moving the controller. The window can also be rotated, moved closer or farther away.
Green Circle: Will return the Desktop to non-floating mode.
Blue Circle: Multitasking View to access other running applications.
Red Circle: Add Desktop Window (not recommended for Pilot2ATC)
Azul Arrow: For moving the menu bar. Hold down on the horizontal line.

Image 4: Showing various functions of the SteamVR menu bar and floating Desktop

Multiple 2D Monitor usage

If the user has two 2D monitors and they want to use the Speech Assistant, the best way is to place a maximized Pilot2ATC window in the first 2D monitor's Desktop in float mode, and place the Speech Assistant window in the second monitor's Desktop, also in float mode. The Speech Assistant window can be dragged from one desktop to the other for placement. Once there it can be sized as needed, even to the full size of the second desktop.

Other Guidance

A few other important details are to be noted. The first is that, in the Speech tab of the Pilot2ATC Config panel, the "Launch as Child Window" should be off. The second item is that when the Speech Assistant window appears the user should turn off the "ON TOP" setting on the left side of that window. This will allow the user to click on either the Pilot2ATC window or the Speech Assistant window as desired, making interaction easier.

SteamVR also provides an "Add Desktop Window" *button* on the menu bar. This allows the user to select an application window to be an overlay (not a full desktop, but just an application overlay). While this might seem a good way to handle the Speech Assistant window, it is not. There are issues with this approach including interaction and drop-down list issues. This approach is not recommended for Pilot2ATC.

In the above examples Pilot2ATC will function well using the SteamVR desktop overlays built into SteamVR, with only one minor limitation dealing with only one focus at a time. This limitation requires the user to click the VR controller System Button to be able to interact with Pilot2ATC (as the simulation image slightly darkens), then click the controller's trigger to regain access to the plane cockpit controls. This shifting back and forth can, for some, become a slight issue. However, there are other products that bypass this minor limitation as well as bring much more flexibility to the user. These will be discussed next.

OVR Toolkit and Pilot2ATC

OVR Toolkit is available on Steam for $11.99, at the time of this writing. It provides several features beyond the standard SteamVR overlay functionality. While a few of these extra features, such as the ability to curve overlay windows, are helpful, the big advantage is that both the overlays and the flight simulation can be in focus at the same time. This brings a more pronounced sense of immersion and interoperability within the flying experience compared to the default SteamVR Desktop Overlay.

OVR Toolkit has plenty of features and many are beyond the scope of this user guide. Please consult the OVR Toolkit wiki for user level details of this product. There are many settings in OVR Toolkit as well and each one should be understood and set to the user's requirement. Some settings relate to scrolling operations and these should be considered when dealing with scrolling the drop-down lists, such as in the Pilot2ATC Grammar Assist panel ("?"). Presented here will only be items that are important for a basic, usable setup for Pilot2ATC. The user is encouraged to explore additional OVR Toolkit features to find the best setup for their use.

Getting Started

OVR Toolkit has the ability to put desktops into an overlay, very much like SteamVR. For Pilot2ATC, while the application can be placed into an overlay, it is best to select the desktop (called a *Display* in OVR Toolkit) as the overlay in OVR Toolkit. Placing Pilot2ATC into an application overlay, rather than a desktop overlay, may cause issues when attempting to select items from drop-down lists.

Image 5 below shows the overlay selection screen in OVR Toolkit. The top section shows the available 2D desktops (*displays*). The bottom section shows the various applications (*windows*) that are currently open which, if selected, will go into an application overlay, not a desktop overlay. The recommendation is to select Display 1 (the primary desktop) and have Pilot2ATC maximized in that desktop, even if the user has two or more 2D monitors.

Single Monitor Usage

With a single monitor, once Pilot2ATC is set up in the desktop overlay, the Speech Assistant window may be opened. The Speech Assistant will appear on top of the Pilot2ATC application in the desktop overlay. Now that the Speech Assistant is active, one can select it from the application overlay selection under *Windows* in the overlay selection menu. This can be seen in *Image 6* below (note that the Speech Assistant is already opened and visible on top of the Pilot2ATC application window).
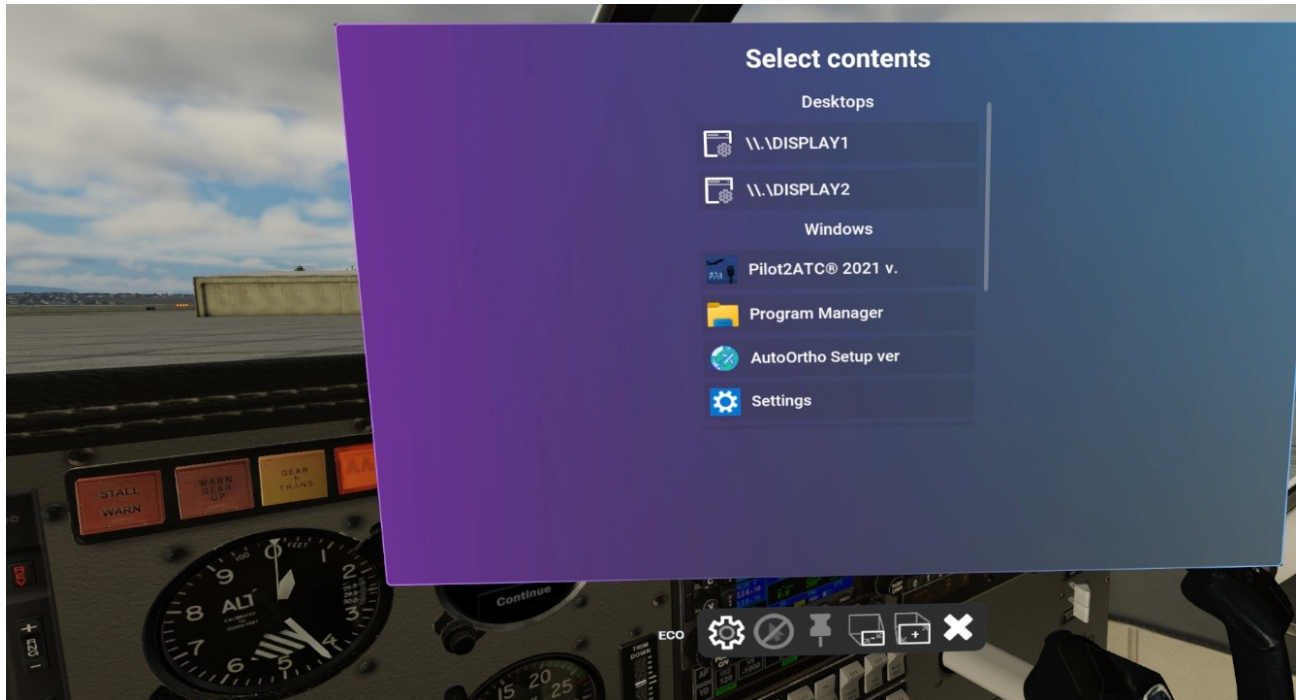
Image 5: This image shows that this user has two 2D desktop monitors.

With the Speech Assistant window now as an OVR Toolkit overlay it may be placed, sized and adjusted as needed. In actual use, it is best to turn off the ON TOP button on the left side of the Speech Assistant window.

The user will notice that when they are actively using the Speech Assistant, that window will also appear over the Pilot2ATC application on the primary desktop. However, when the user then clicks on the Pilot2ATC window then that Speech Assistant window will disappear from being over that window, thus allowing full access to the Pilot2ATC primary window.

The image shown in *Image 7* presents what a typical use case might be for a single 2D monitor situation. The image shows Pilot2ATC in a desktop overlay, fully functional, while the Speech Assistant overlay is present with working drop-down lists. For this image, the Pilot2ATC overlay has focus so that the Speech Assistant window is not on top of it. One will also note in this image that while the user is interacting with Pilot2ATC, the plane's cockpit and outside view of the simulator is also fully visually active (not darkened and out of focus, as it would be with SteamVR's overlays). This represents that desired sense of further immersion.

Image 6: This shows that the P2A Speech Assistant window is available under *Windows*

Image 7: This image shows a single monitor situation with Pilot2ATC and Speech Assistant

Multiple Monitor Usage

For those with more than one 2D monitor it is best if they open the second desktop (*display*) from the OVR Toolkit overlay selection menu. Once that desktop overlay is visible the Speech Assistant window, once opened, may be dragged to the second 2D desktop and sized, even to the full size of the desktop screen. This provides the best user situation for interaction with Pilot2ATC while using the Speech Assistant window. Of course, when not using the Speech Assistant, just using Pilot2ATC in a single desktop overlay is ideal.

Useful Overlay Settings

There are a few OVR Toolkit settings for its overlay windows that might be of interest. The settings are shown in *Image 8*. By clicking on the overlay menu's "gear" icon, one brings up that overlay's settings. One can adjust how much curve is desired, if any. Further, the user can set opacity and even framerate for the overlay's updates. For Pilot2ATC, 30 FPS and even below is more than adequate.

Image 8: This shows the OVR Toolkit overlay settings that are available

Other Guidance

As with SteamVR, the user should go to the Speech tab of the Pilot2ATC Config panel and check that the "Launch as Child Window" is turned off. Also, when the Speech Assistant window appears, the user should turn off the "ON TOP" setting on the left side of that window.

There are occasions when using overlays that a window may be completely "off-screen". This is very rare and will not be encountered in normal use. However, a function has been added to the Config P2ASetup page called "Start on Main Screen". Having this set when using these VR solutions will always have windows start over the top of the main screen.
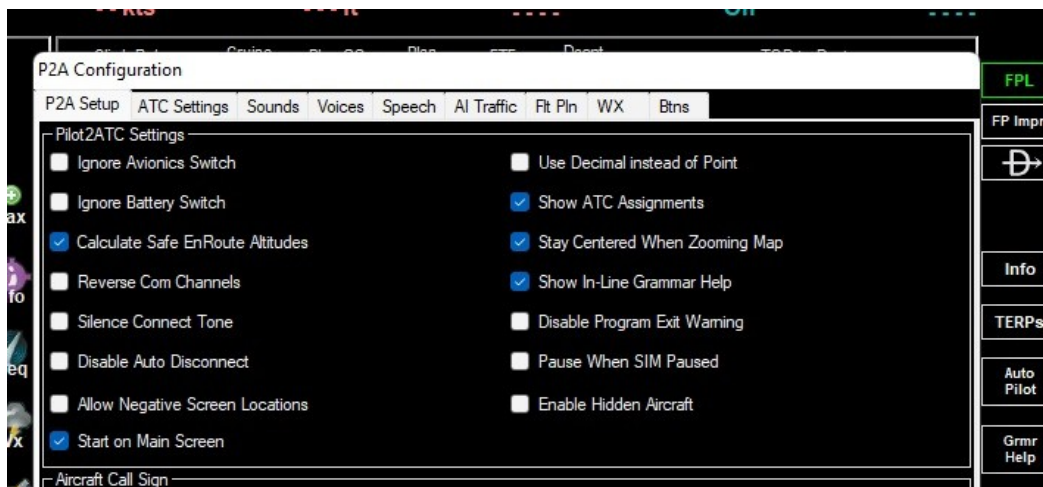
Summary

This user guide has presented two methods for utilizing Pilot2ATC in VR. Both are usable for bringing the extra level of immersion that Pilot2ATC provides to the VR capable flight simulators that Pilot2ATC supports. The SteamVR method is free and provides basic functionality but with minor limitations (darkened visual effect for the active simulation and a sense of less integration). OVR Toolkit, while payware, provides additional functionality and removes the minor annoyances that the SteamVR limitations present.

There are a few more VR overlay systems that are available. However, these are not presented in this guide as they have not been evaluated. However, for completeness, these are now briefly mentioned for those that want to spend time to explore other options.

Desktop Portal
This is available on Steam for $9.99. By some reports it is similar in capability to OVR Toolkit and may allow for the simulation to remain in focus while using the overlays, using the "Return focus to active game when not interacting" setting.

MoveVR
MoveVR is an overlay tool for use in VR specifically for X-Plane. It has been used with some success for X-Plane 11.

Desktop+
This is a free package available on SteamVR. From a brief look, this package is mainly a number of improvements over the default SteamVR overlay system. However, there are certain caveats with Desktop+ that may make it challenging to use for Pilot2ATC. The reader is welcome to experiment with Desktop+ on their own.

Virtual Desktop
This appears to be a glorified VR desktop with the ability to have and create 3D backgrounds for "eye-candy" while working with the desktop. This only allows for one desktop per physical 2D monitor. This does not seem applicable for use with flight simulators. This package is $14.99 on Steam.

Current VR technology, availability of excellent flight simulation applications, and the ability to have realistic voice capable ATC and flight planning capability with Pilot2ATC, bring together a wonderfully life-like immersive environment for those interested in flight simulation.