TrackerXP
Head Tracking Computer Vision
for X-Plane 9 and X-Plane 10
QUICK START GUIDE

Install TrackerXP in your X-Plane / Resources / plugins folder.

TrackerXP starts up automatically on all Macs and most Windows computers. Win users, if TrackerXP fails to work straight away, your camera may require special setup instructions; please see the following page, it’s relatively easy!

At startup, observe that the blue oval tracks your head movement. **Move your head; we are not turning our head at this time!** TRY THIS: Move your head and the oval along with it, until the oval touches the right edge of the screen. If you are doing this correctly the X-Plane view moves in the background. NOW TRY THIS: **Rock** from the waist left and right, moving the oval to the left and right edges of your monitor. The view will swing widely left and right, as if looking over your shoulders at the back of your cockpit. Now, sit up tall or slouch down to tilt the X-Plane view.

**PLEASE SEE THE INSTRUCTIONAL VIDEOS:** The first video was made using TrackerXP’s default settings. Later, when you have learned the basic movements, crank TrackerXP up to optimum settings. (See page 7) Now you can steer the view by simply turning your head.

[www.youtube.com/watch?v=hMAaYiO-yt4](http://www.youtube.com/watch?v=hMAaYiO-yt4) AND [www.youtube.com/watch?v=RV5rylz8sng](http://www.youtube.com/watch?v=RV5rylz8sng)

**IMPORTANT:** Click the X-Plane view in the background to bring X-Plane to the front. Do not close the “face time” camera window.

Align your head directly forward of your web cam. **Your eyes should be directly centered in the FaceTime view.** With built in web cams tilt your computer monitor to align the X-Plane horizon. Tilt peripheral web cams up or down.

**IMPORTANT:** **The camera must see both of your eyes.** Keep your head within the edges of your monitor and your eyes looking somewhat towards your webcam.

TrackerXP Preferences can be set from the X-Plane > Plugins > TrackerXP pull down menu. Brief Instructions can also be found there.

**MOST IMPORTANT:** Set a joystick button or keyboard key to STMA/TrackerXP/PauseTrackerXP. Short clicks toggle between Pause/Enable TrackerXP. When paused TrackerXP zooms on the panel. Long clicks Disable TrackerXP. See Appendix 1 and 2 for button and key assignment instructions. For convenient use during take off and landing, we highly recommend using your joystick thumb switch or the ‘Z’ key.
Not so... Quick Start for Windows!

There is a multitude of cameras for the Windows platform; TrackerXP provides for most! At first startup on Windows, TrackerXP uses Windows proprietary Direct Show software to find and open your camera. If Direct Show cannot detect your camera you will see a black FaceTime screen and TrackerXP will be inoperative.

Locate and open the TrackerXP_Settings.txt inside of the X-Plane/Resources/plugins/TrackerXP folder. Use any text editor to change Capture_Mode to 0 and Camera_Id to 1. Save your changes and restart X-Plane. In most cases you will see the TrackerXP FaceTime view.

If Windows has previously assigned another Video Device to Camera_Id = 1 X-Plane may crash. Please try editing the Camera_ID number to 2 or 3. Lastly try Camera_ID of 0.

Windows under BootCamp requires Camera_ID 0.

And a bug... on 27” iMac

We are seeing horizontal flashing when TXP pans quickly left and right on 27” iMacs. Surprisingly, this only occurs when the X-Plane window is to the front. This is a video problem unrelated to TrackerXP.

It is easy to hide. On the Mac open the Force Quit menu (Apple Menu > Force Quit) Move the window to the extreme bottom right corner of your screen; you can position this so you only see the red close box. TXP will be smooth as silk and you can still operate the panel controls.

If you experience PROBLEMS with the operation of TrackerXP please include the X-Plane log.txt with a note describing the problem to:

bob@shadetreemicro.com
At last, an inexpensive, easy to use Head Tracker that uses your computer’s built-in web camera. No complex peripherals or headgear required. TrackerXP smoothly pans your head left, right, up, or down through a wide field of view around your aircraft's cockpit and cabin. In TrackerXP pause mode, move your head towards the camera to Zoom in close on panel instruments for easy adjustment.

TrackerXP steadies your head motion. All smoothing, response, and null zone settings are fully adjustable from X-Plane’s pull down menu.

Instantly pause TrackerXP, freezing your current viewing angle. You are always only a single click away from Pause, Enable or Disable TrackerXP. Or return to your choice of 3D forward view.

TrackerXP can also be used to examine interior details. Use your arrow keys for a spectacular “look about” or zoomed views anywhere inside the aircraft’s cockpit or cabin. TrackerXP works with all aircraft! Macintosh, Windows; Linux at a later time.

TrackerXP works well with both X-Plane 9 and X-Plane 10.

TrackerXP includes free updates throughout the X-Plane V10 run.

This version of TrackerXP exhibits three degrees of freedom, 3 DOF. Additional parallax effects can be applied to the pilot’s seated view from the TrackerXP Preferences menu. Currently well underway, STMA has 5 DOF TrackerXP. This uses Flow Analysis to separate head movement from head pan and tilt. STMA also anticipates adding many of its popular ChaseViewDeluxe plugin features to TrackerXP in the near future.

TrackerXP is available for purchase from the x-plane.org store. STMA highly recommends users try the free TrackerXP demo on their computer system before purchase. This gives users 10 minutes of use before quietly exiting to X-Plane forward view. If this demo version does not work for you, please send your X-Plane log.txt to Shade Tree Micro Aviation. This will be used this to update future versions of TrackerXP.
COMPUTER SPECIFICATIONS

TrackerXP will run on most recent, fast computers. TrackerXP is most suitable for computers with two or more cores. Please test drive the free TrackerXP Demo version found at www.ShadeTreeMicro.com and also at www.x-plane.org before your purchase.

TrackerXP runs on Mac and Win platforms. Linux is unavailable at this time.

TrackerXP is a multi-threaded application. Performance of X-Plane V9, which runs on a single core, is unchanged on any computer with 2 or more cores. Scan size and scale delta may need to be tweaked on single core processors. Please see the Settings page for hints.

Please be sure you have X-Plane V10 set up and running at optimum performance and frame rate before installing TrackerXP. TrackerXP has been tested and runs on X-Plane V10 without performance decline on a 2GHz Intel Core 2 Duo processor. When running TrackerXP on a single or dual core processor you will want to set the number of aircraft to 1 or 2. Settings > Aircraft > Aircraft & Situations > Other Aircraft Tab > Number of Aircraft. If you are using a marginal computer you will not want to fly the complex default aircraft on either core.

INSTALLATION

Drag the complete TrackerXP plugin folder into your X-Plane / Resources / plugins folder. Do not change the folder name. Do not remove or rename any of the component files inside the folder. Do not install TrackerXP inside an aircraft / plugins folder. The correct path name is required to save your preferences.

Quick INSTRUCTIONS for TrackerXP can be viewed from the X-Plane > Plugins > TrackerXP pull down menu.
THINGS TO KNOW

X-Plane will startup in TrackerXP mode. A yellow splash screen indicates that TrackerXP has loaded. A 'FaceTime' camera view confirms your camera is operating. A blue oval should track your head movement.

SLIDE your head in the intended direction. It is easiest to rock on your bottom or tilt from your waist. Keep your eyes turned somewhat towards the center of your monitor. The camera must see BOTH of your eyes. TURNING your head will also steer the X-Plane view especially when used with TrackerXP's wide field of view preferences. Sit up tall or slouch down to tilt the X-Plane view.

A humorous way to visualize this... pretend you are dragging a long Pinocchio nose, like a stylus, across a touch screen monitor or iPad. Drag your nose, don’t point it, to right edge of the screen; now to the left edge, top and bottom.

Soon you will find that you are rocking side to side and front to back to steer the X-Plane view. With a bit of practice this is easy, natural, and pleasant. Tweak the settings for your viewing habits.

TrackerXP must have enough light to see and recognize facial features, particularly your eyes. For reliable tracking avoid distracting backgrounds OR glaring light. The blue oval must track your face. Please see the following page for trouble shooting comments.

OPERATION AND USAGE

DO NOT turn the camera window OFF. Click the X-Plane window to bring X-Plane to the front.

Assign a convenient joystick button or keyboard key to the advanced custom command STMA/TrackerXP/PauseTrackerXP. See APPENDICES for detailed instructions. We suggest using your joystick Thumb Switch or the keyboard 'Z' key. Or both.

SHORT clicks (a tap) will toggle between active head tracking or frozen view. LONG clicks (one second) will disable TrackerXP and bring you to X-Planes 3D Forward View. A short click will return you to active TrackerXP view.

While in frozen view, ZOOM the panel by moving your head towards the camera. HANDY! A short click will return you to active head tracking. A long click to 3D forward view.

While you are learning to be comfortable with TrackerXP you may find it convenient to use a long click of your joystick button or key assignment to return to 3D Forward View during landings and takeoffs.

Move up, down, left right with the arrow keys. Move forward, back with the Page Up, Page Down keys. A quick press of the ‘w’ key returns you to the aircraft’s default POV. A long press of the ‘w’ key takes you to X-Plane’s 2D Forward View with Panel.

Return to active TrackerXP with a short click of the PauseTrackerXP button or key.
TrackerXP settings

Settings can be accessed from the X-Plane > Plugins > TrackerXP > Preferences menu. Click the Up/Down buttons to change the settings.

Field of View: The larger the FOV the further the view will move with any given head movement. Slide you head to the edge of the monitor, keeping your eyes turned somewhat towards the camera, and you can look directly behind and even further! A wider FOV responds faster. With practice you will want to increase the FOV.

Response Speed: TrackerXP spreads face movement over many frames. At slow Response Speeds, small head movements are steadied out over as many as 100 frames. For slower viewing DECREASE Response Speed to below 5. At fast Response Speeds head movement has less smoothing. For faster viewing INCREASE Response Speed to above 5. With practice you will want faster Response Speed, less smoothing.

TrackerXP has an adjustable NULL ZONE allowing small movements of the head without tracking the view. This keeps the view stationary making it easy to use the mouse cursor to change instrument settings. The default setting is 40. With practice you may want to decrease NULL ZONE.

ScanSize is an advanced setting. TrackerXP searches to find every face in the camera frame. However, TrackerXP always tracks the largest face it can find. We don’t want TrackerXP wasting time finding tiny faces in the scene. We want TrackerXP to find only the face closest to the camera, your face! Increase one step at a time while maintaining reliable face tracking. Small scan size finds more faces; large scan size is faster.

ScaleDelta is an advanced performance setting. This sets how much overlap there is when looking for a face. Increase one step at a time while maintaining reliable face tracking.

View Type. This menu will be expanded in the future. Currently TrackerXP has three types: Pan and Tilt With Look About - this is the basic view, it lets TrackerXP steer your direction of view while you move around inside the aircraft using the arrow keys and new V10 view controls. Stationary with Parallax adds some 3D effects.

3 DOF for Heli’s & Small GA - the main view, displays natural parallax effects as your viewpoint moves across the cabin and when you turn your head. Look through your aircraft’s window to see the terrain below or at slung loads below your heli. This view also creates a very natural effect as you look over the nose of a taildragger aircraft. Please turn STMA’s Taildragger plugin OFF in all STMA aircraft.

Tilt Upwards allows you to adjust the aircraft panel and horizon upwards without having to tilt your camera or computer monitor.

All settings are saved when you quit out of X-Plane to the TrackerXP_Settings.txt located inside the TrackerXP plugin folder.
TROUBLE SHOOTING

TrackerXP must see the user’s face, particularly the location of both the user’s eyes. TrackerXP does not pay any attention to your face or remember your face. Greatly simplified, TrackerXP searches every camera frame trying to detect the largest oval shape with two dark patches located in the position of the eye sockets. It is remarkably good at doing this but some things can go wrong. Turn your head too far to the left and the only a single eye socket is seen; therefore it is not a face. Lower your head too much and the eye sockets are too high on the oval face shape, therefore it is not a face. Bright reflections from the computer screen on eye glasses make it difficult for TrackerXP to find the dark eye sockets. Etc. The following photos illustrate some common conditions and how to avoid them.

TrackerXP is very good at finding faces. This far-off face will steer the X-Plane view! However, it is better to increase Scan Size so the computer does not search for these tiny faces.

The bright reflection of your computer in eye glasses can cause a problem. If possible raise, lower or tilt your computer or web cam. Contact lenses work perfectly well. Small "granny" glasses are better than large lenses. We've not tested non-glare lenses.

Avoid distracting backgrounds. Even with this clutter and bad lighting TrackerXP picked out the face.

Avoid distracting backgrounds. Here the X-Plane view was jumping vertically. TrackerXP falsely found a bigger face thinking the picture frame corners were eyes!

If possible look for a uniform contrasting background. Backlit, white venetian blinds are problematic.

Keep your eyes somewhat towards the web cam. TrackerXP could not find this face.

If you experience PROBLEMS with the operation of TrackerXP please include the X-Plane log.txt with a note describing the problem to:

bob@shadetreemicro.com
TrackerXP mode can be assigned to any joystick button by using the custom command STMA/TrackerXP/PauseTrackerXP. To do this, go to the X-Plane > Settings > Joystick and Equipment menu and click the ‘Buttons Adv’ tab.

1) Press the button on the joystick you want to program! Then checkmark the “custom commands from plugins” box.

2) Select X System folder.

3) Open the STMA and remaining command folders by double clicking.
ASSIGNING A KEYBOARD KEY TO THE CUSTOM COMMAND  STMA/TrackerXP/PauseTrackerXP

TrackerXP mode can be assigned to any keyboard key by using the custom command STMA/TrackerXP/PauseTrackerXP. We find the ‘Z’ key convenient for this purpose. Note: this will overwrite the X-Plane V9’s View: backward command. You can easily restore this at a later time.

1) Go to the X-Plane > Settings > Joystick and Equipment menu and click the Keys Tab.
2) Select the key you wish to use. X-Plane V10 requires you create a New Key Assignment. See diagram below.
3) Check mark the “custom commands from plugins” box.
4) Navigate to STMA/TrackerXP/PauseTrackerXP. See Appendix One.

Appendix Two

Step 1
Note slider: New assignments found at bottom.

Step 2a
X-Plane 10 only

Step 2b

Step 3
Click Custom Commands from plugins. Navigate to STMA/TrackerXP/PauseTrackerXP
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Thank you for your purchase from Shade Tree Micro Aviation. If you have questions or comments about this plugin please write to Bob@ShadeTreeMicro.com

Blue side up,
Bob

www.ShadeTreeMicro.com
You may also want to try STMA's ChaseViewDeluxe

Available at www.x-plane.org store.