Section 6

Instructor's Operating Station

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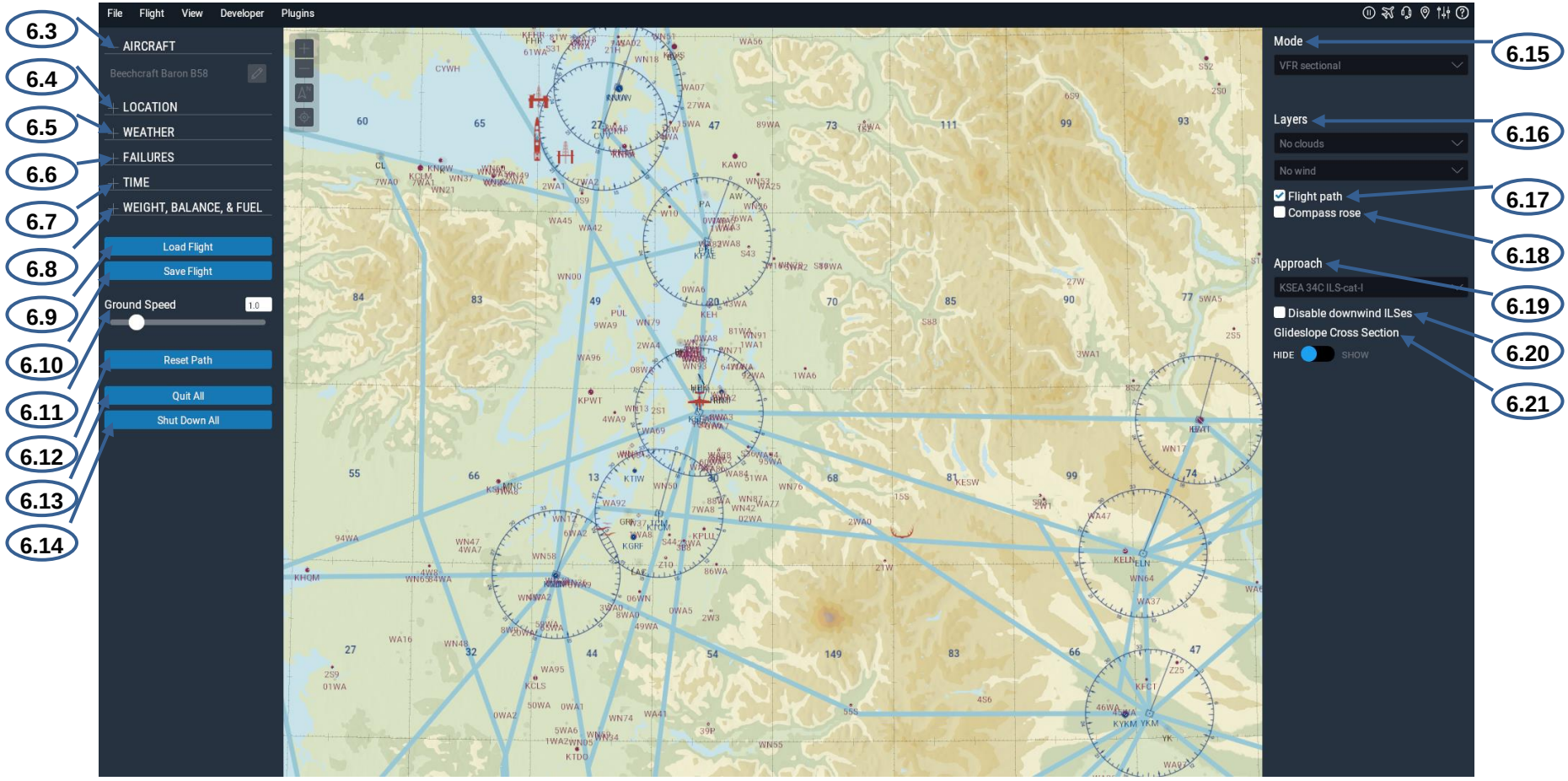
6.1 Instructor's Operating Station Sections



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6.2 Introduction

The Instructor's Operating Station (IOS) is the command center of the training device. From here, you will be able to setup the aircraft initial position, replay the flight and induce aircraft failures, change weather parameters and many more functions. You will probably spend more time using this page than any other.

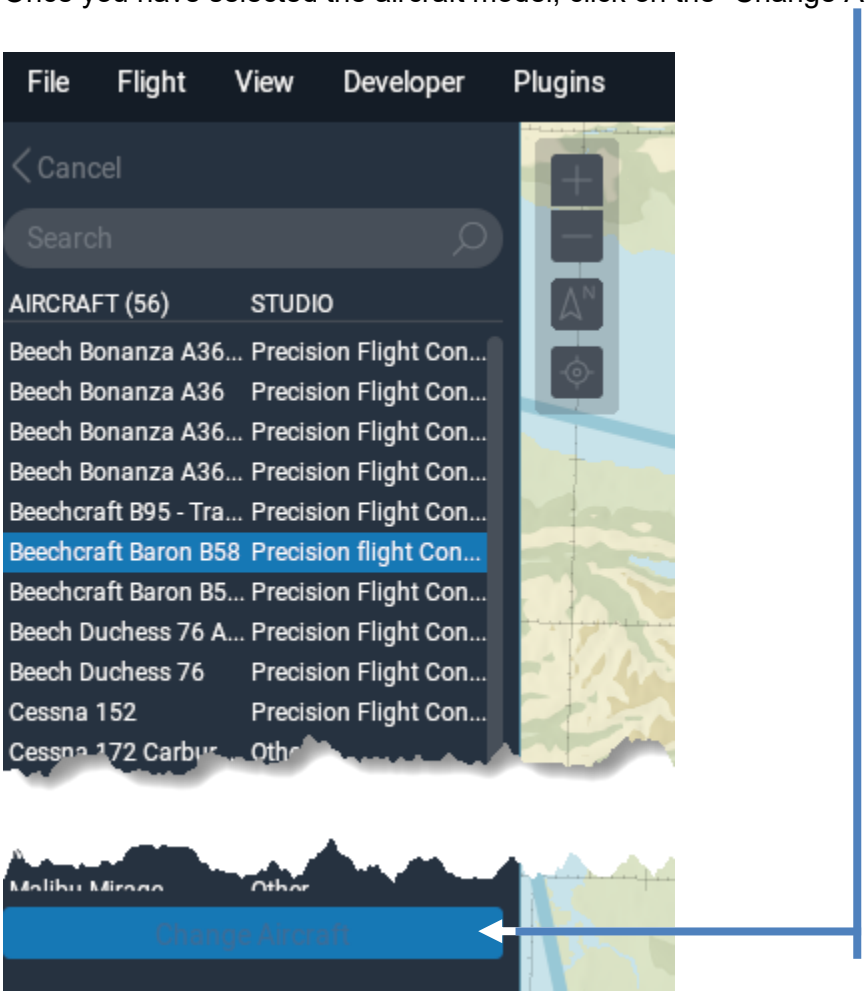
In 6.1 it shows a screen shot of the X-Plane 11 Instructor's Station (IOS). The IOS is divided to 19 main instructor functions available. These functions are:

- Aircraft
- Location
- Weather
- Failures
- Time
- Weight, Balance & Fuel
- Load Flight
- Save Flight
- Ground Speed
- Reset Path
- Quit All
- Shut Down All
- Mode
- Layers
- Flight Path
- Compass Rose
- Approach
- Disable Downwind ILSes
- Glideslope Cross Section

6.3 Aircraft

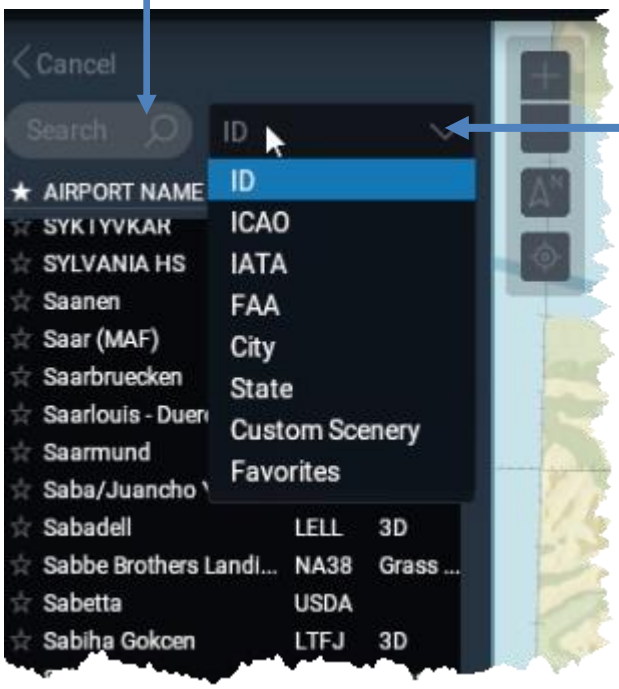
The Aircraft menu will allow you to see and change your current aircraft. Click on the + it will show your current aircraft. Click on the and on the “Search” box, type the out the name of aircraft you wish to use. Every time you select an aircraft verify that the “Studio” is Precision Flight Controls, Inc.

Once you have selected the aircraft model, click on the “Change Aircraft” button.



6.4 Location

The Location menu will allow you to see and change your current location. Click on the + you will see your airport or the one you took off from. Click on the and on you will see the “Search” box and collapsed dope down menu.



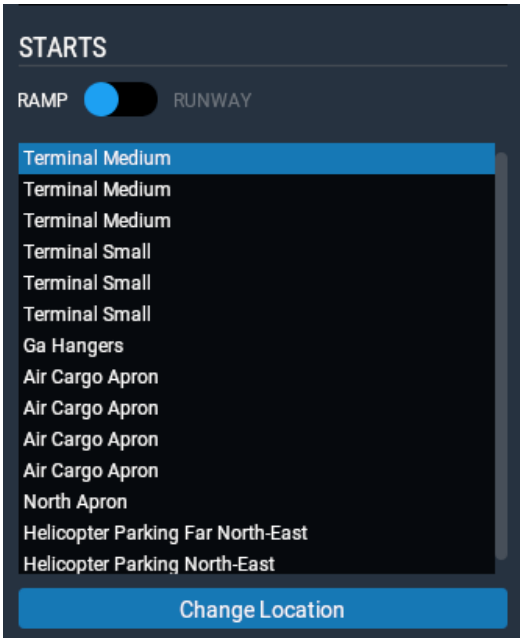
Use the drop-down menu to select the type of search you wish to perform. On the sample below we searched by ID and searched for KMHR. X-Plane will list the available Ramp or Runway available for that airport based on the position of “Starts” slider.

6.4.1 Starts Slider

The Starts slider will allow you to select between Ramp and Runway for the list to be shown.

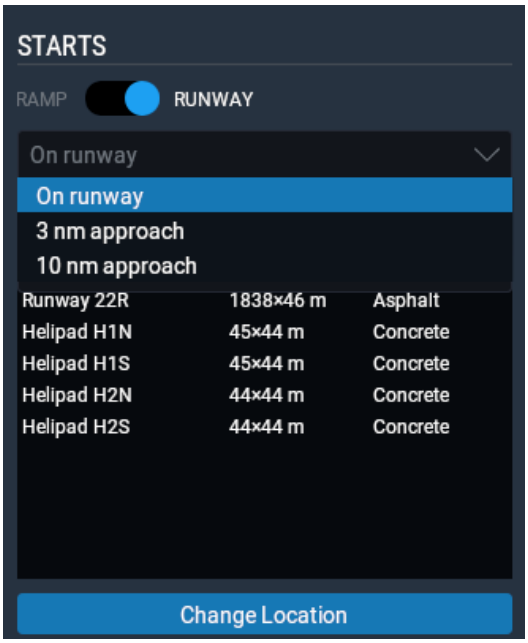
6.4.1.1 Start on Ramp

Click the slider to Ramp and then select a ramp by clicking on it. Click on Change Location to move the aircraft your desired ramp. The menu will close after the aircraft has been moved.



6.4.1.2 Start on Runway

Click on slide to Runway and then click on a runway. If preferred to put the aircraft on a 3- or 10-mile approach, click on the drop menu and select 3nm Approach or 10nm Approach. Click on Change Location to move the aircraft your desired location. The menu will close after the aircraft has been moved.

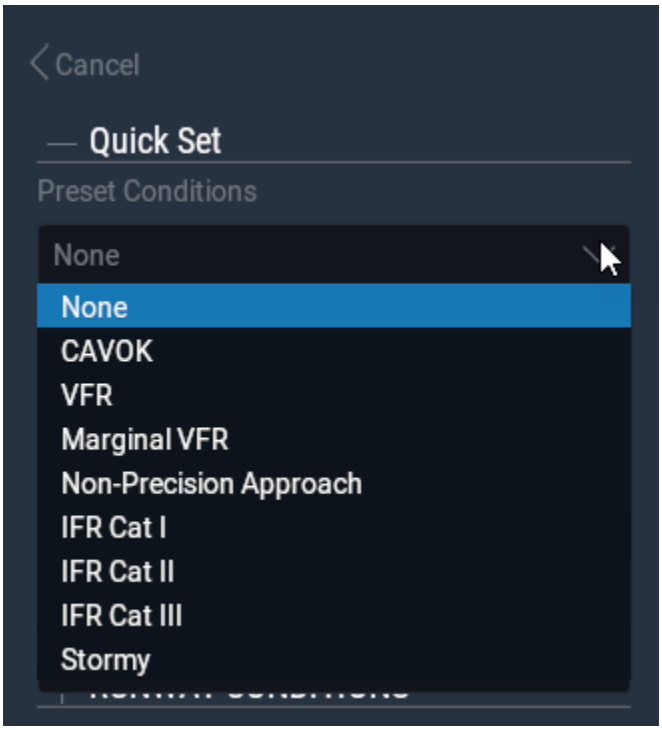


6.5 Weather

The Weather menu will allow you to see and change your current weather. Click on the + you will see the Current weather. Click on the and on you will see the list of different weather-related features you can change. After changing an option or many options, you must click on the Change Weather button on the bottom of the page to apply the new weather.

6.5.1 Quick Set

Quick Set allows you to select preset conditions. Click on the + to show the menu and click on the drop menu and select from the list. After selecting one of the preset conditions, click on Change Weather button.



These conditions are:

- None / CAVOK – Ceiling and Visibility OK. Typically referred to as CAVU. This option has no wind or cloud layers with visibility set to 25 statute miles (sm).
- VFR - sets the weather to good visual flight rule conditions—clear, sunny skies with no wind and visibility at 7sm
- Marginal VFR - sets the weather marginal VFR flying conditions, with about five miles of visibility and a 1,500-foot ceiling
- Non-Precision Approach - sets the weather for a non-precision approach, with a 3-mile visibility and a 400-foot ceiling
- IFR CAT I - sets the weather up for a Category-I ILS approach, with RVR of about 2700 feet and 200-foot ceiling

- IFR CAT II - sets the weather up for a Category-II ILS approach, with RVR of about 1100 feet and 100-foot ceiling
- IFR CAT III - sets the weather up for a Category-III ILS approach, with RVR of about 560 feet and 50-foot ceiling
- Stormy – sets weather for heavy precipitation, cloud and storm with about 200-foot ceiling.

6.5.2 Atmospheric Conditions

The Atmospheric Conditions will allow you to configure the different parts of the atmosphere. Click on the + to show the options for visibility, precipitation, storminess, temperature, barometric pressure. After selecting the changes, click on Change Weather button to apply the new settings.

6.5.2.1 Visibility

The Visibility section will allow you to change the visibility.

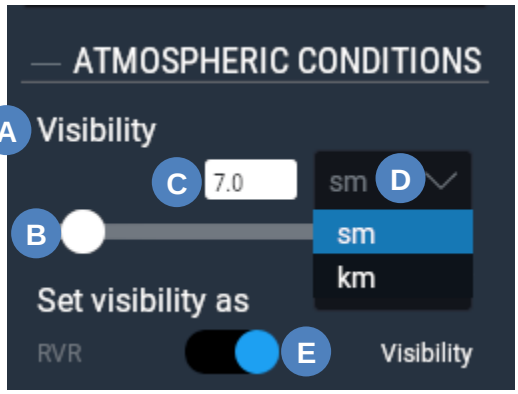


Figure 1

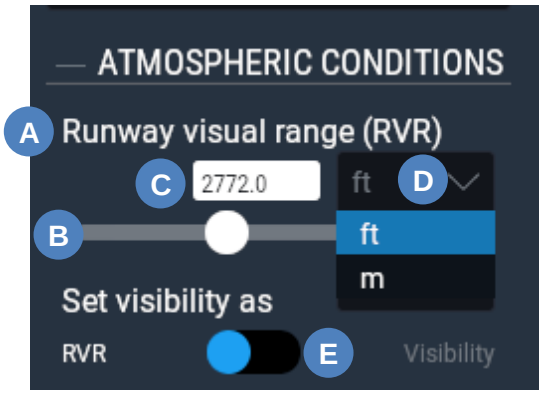


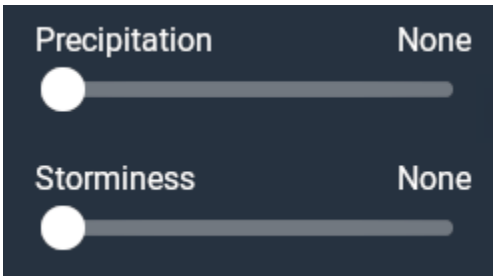
Figure 2

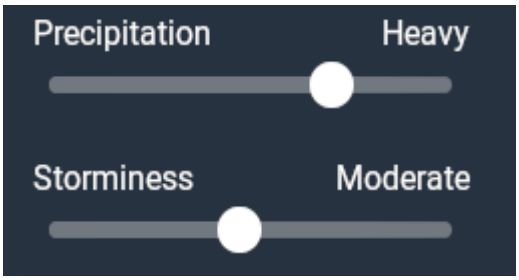
The visibility section as shown in Figure 1 and Figure 2 have the following functions:

A. Current Visibility Setting	Shows the current setting of “Set Visibility As” toggle slider. This will change from Visibility to Runway.
B. Visibility Distance Adjustment	Slider is used to adjust the visibility.
C. Visibility Setting Readout	Read out for the current visibility setting.
D. Unit Selector	In visibility mode, you can change the unit from Statute Miles (sm) to Kilometers (km). In RVR mode the units are Feet (ft) or Meters (m).
E. Set Visibility As Toggle	Allows toggling between RVR or Visibility.

6.5.2.2 Precipitation

The Precipitation slider allows adjustment to the amount of precipitation from None, Light, Moderate, Heavy and Severe. After setting the slider in the preferred position, click on Change Weather to apply the new setting.





6.5.2.3 Storminess

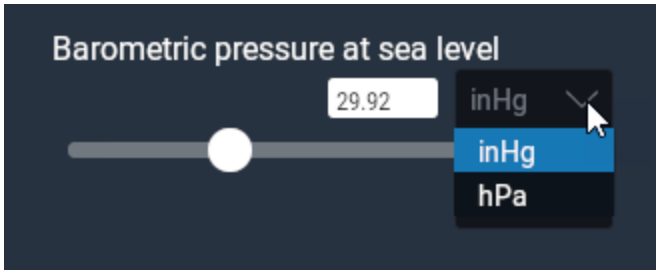
The Storminess slider allows adjustment to the amount of storm cells from None, Mild, Moderate, Heavy and Severe. Moving this slider will also move the precipitation to the same level. You can set the storminess lower than precipitation but not higher. After setting the slider in the preferred position, click on Change Weather to apply the new setting.

6.5.2.4 Temperature at Nearest Airport

The Temperature at Nearest Airport slider allows adjustment to the temperature the range is from -10°F to 125°F (-23.3°C to 51.7°C). You can also click on the box to type in the temperature. You can set temperature with one decimal number after the whole number. Temperature range when typing is -459.7°F to 18,032.0°F (-273.1°C to 10,000.0°C). After setting the slider or typing in the temperature click on Change Weather to apply the new setting.

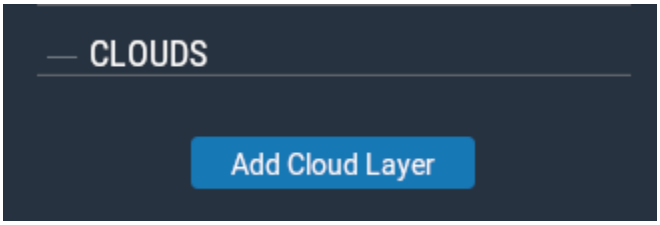
6.5.2.5 Barometric Pressure at Sea Level

The Barometric Pressure at Sea Level slider allows adjustment of the barometric pressure setting. The slider range is from 29.00 to 32.00 Inches of mercury (inHg) or 982 to 1084 Hectopascal (hPa). You can click on the box to type in the barometric pressure setting you wish to use. The range when typing is 0.00 to 7500.00 inHg or hPa.

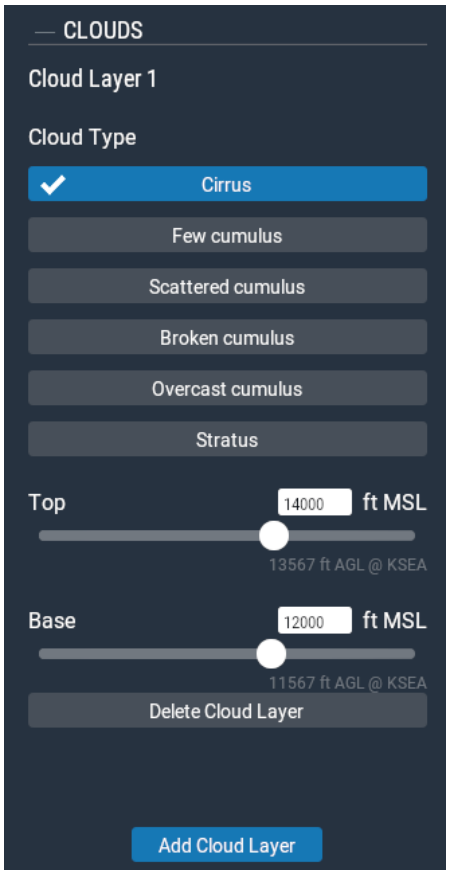


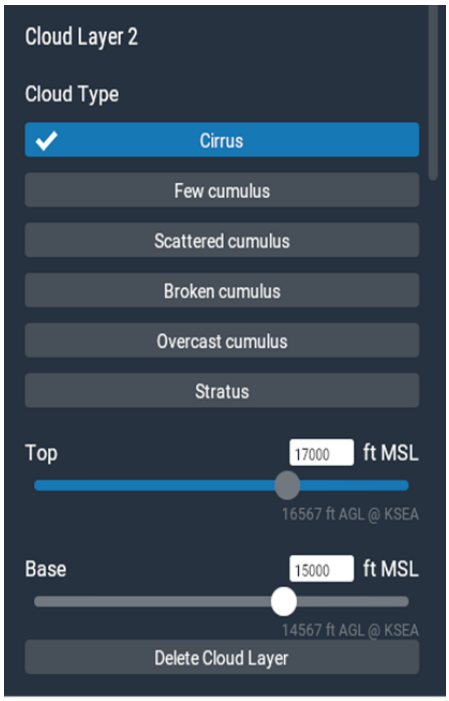
6.5.3 Clouds

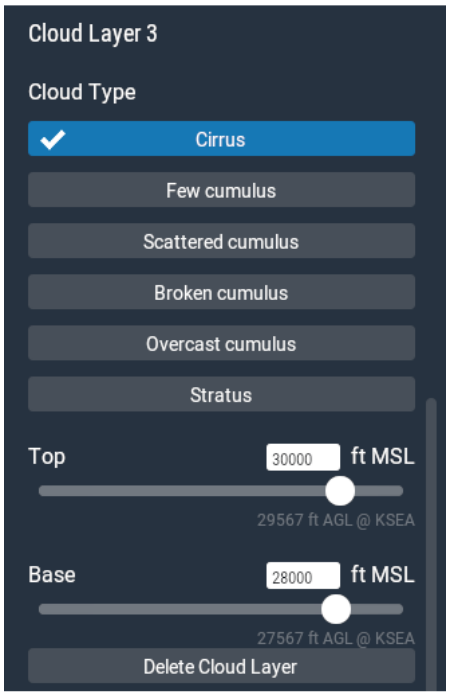
The Clouds will allow you to set up to 3 different cloud layers. Click on the + to show the menu, if currently there are no clouds you will see the Add Cloud Layer button.



If there are cloud layer existing, it will be listed first and the Add Cloud Layer button will be at the bottom. The add cloud layer button will not be shown if there are 3 cloud layers. The delete cloud layer will remove the cloud layer.



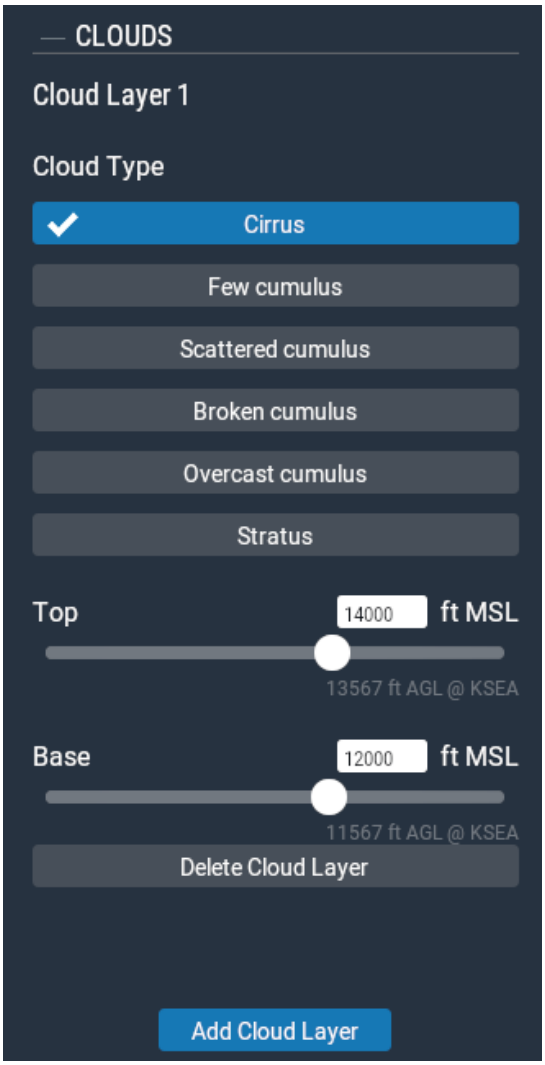




Cloud Layer 1 is closest to the ground and Cloud Layer 3 is the highest. Each cloud layer has a minimum separation limit of 2,000 feet.

6.5.3.1 Cloud Type

Each cloud layer can be set to different Cloud Type. The different cloud types are Cirrus, Few Cumulus, Scattered Cumulus, Broken Cumulus, Overcast Cumulus and Stratus. The check mark indicates the cloud selected.



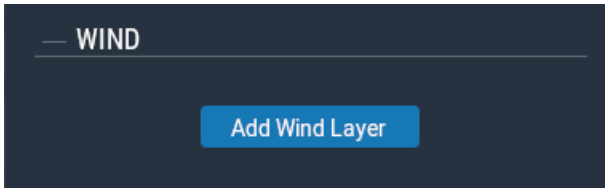
Each cloud type has the same minimum thickness of 2000 ft. The maximum thickness for Scattered Cumulus, Broken Cumulus, Overcast Cumulus and Stratus is 40,000 feet. For Cirrus and Few Cumulus maximum thickness is 2,000 feet.

Setting the top or base altitude using the slider or by typing in the white box. If the top and base you set exceeds the minimum or maximum thickness it will automatically adjust to be at the minimum or maximum.

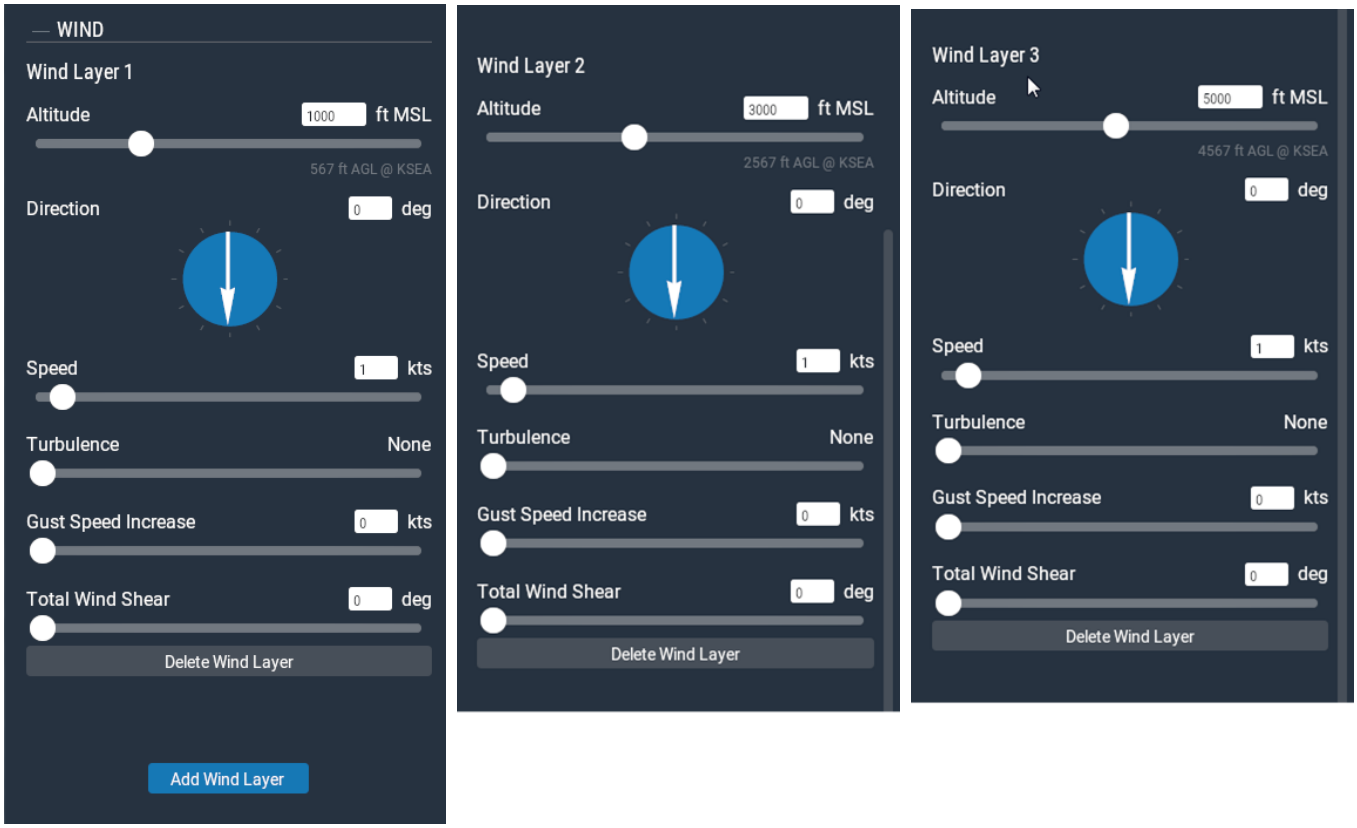
Remember to click on the Change Weather button to apply the clouds you set.

6.5.4 Wind

The Wind will allow you to set up to 3 different wind layers. Click on the + to show the menu, if currently there are no wind layer you will see the Add Wind Layer button.



If there are wind layer existing, it will be listed first and the Add Cloud Layer button will be at the bottom. The add cloud layer button will not be shown if there are 3 cloud layers. Clicking the delete cloud layer will remove the cloud layer.

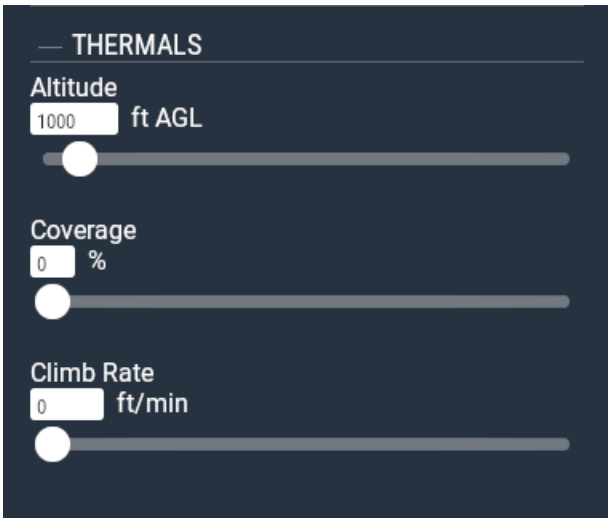


6.5.4.1 Wind Adjustments

Each wind layer can be set to different altitude, wind direction, wind speed, turbulence level, gust speed increase, and total wind shear by using the slide or typing in the white box. Remember to click on the Change Weather button to apply the wind you set.

6.5.5 Thermals

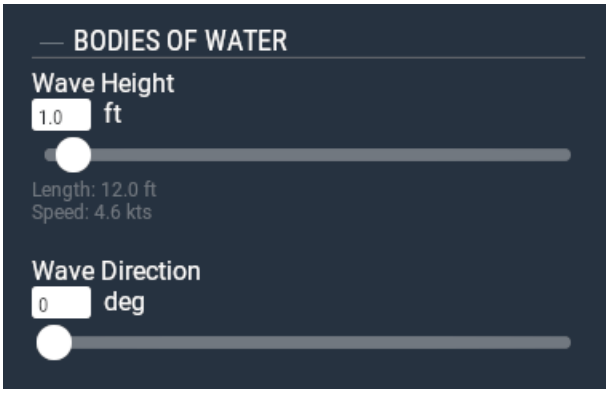
The Thermals section controls are mainly used when flying gliders. In addition to thermals, X-Plane also runs air up and down the terrain as wind blows into mountains, simulating the effects that real glider pilots have to keep in mind and try to take advantage.



Each adjustment can be made by using the slider of typing in the white box.

6.5.6 Bodies of Water

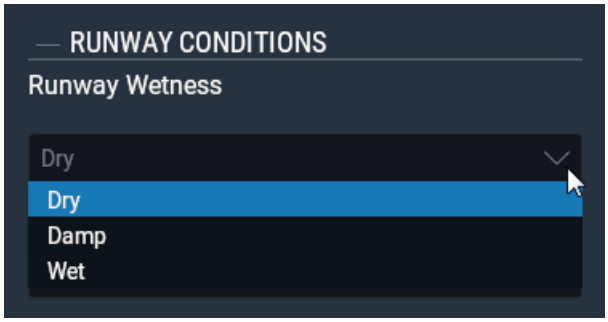
The Bodies of Water section allows the setting of wave height and wave direction for bodies of water.

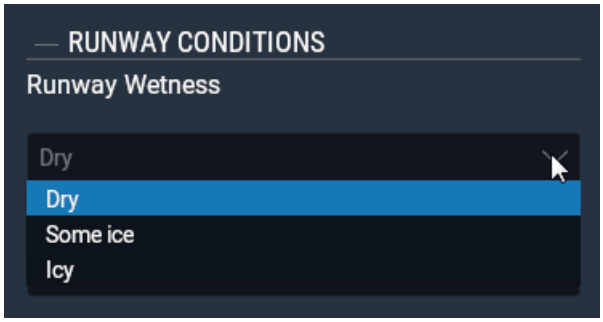


Each adjustment can be made by using the slider of typing in the white box.

6.5.7 Runway Conditions

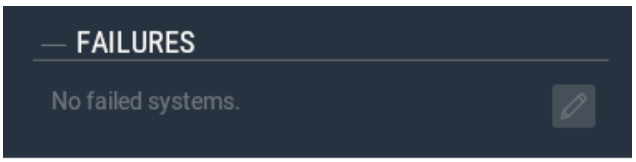
The Runway Conditions section controls the condition of the runway. If temperature is at 32.1°F or higher the selectable condition is Dry, Damp and Wet. Temperatures at 32.0°F or lower, the selectable conditions are Dry, Some Ice and Icy. Click on drop menu to select the condition preferred.

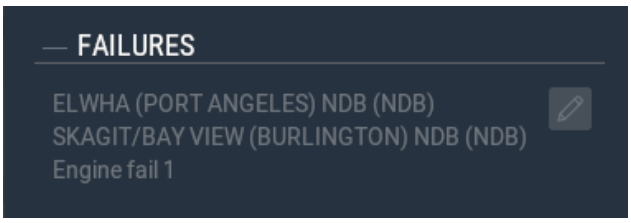




6.6 Failures

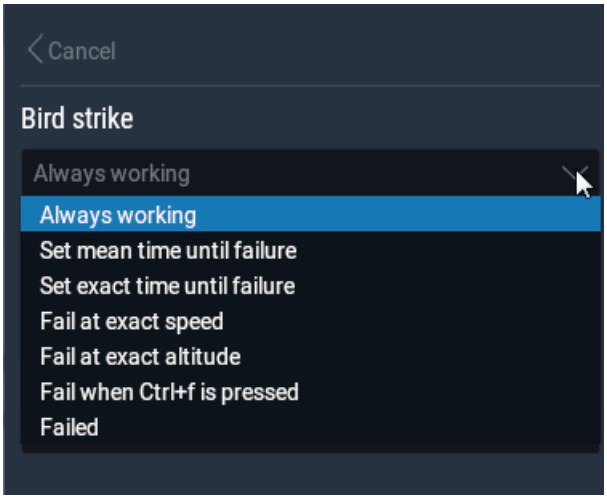
The Failures menu will allow you to see and change current failure modes. Click on the + you will see the current failure list. Click on the and on you will see the list of different category list that you can fail. After changing an option or many options, you must click on the Apply Changes button on the bottom of the page to apply the failures.

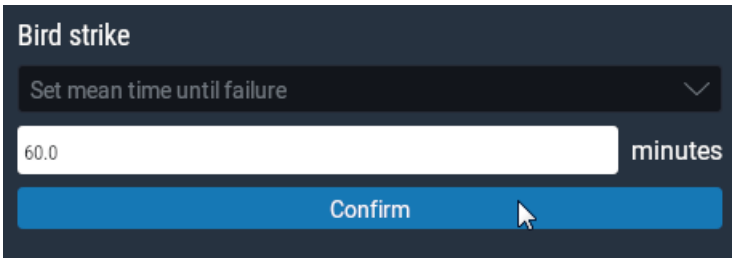




6.6.1 Failure Modes

Every failure option has six failure modes. A selecting a mode, you must click on Confirm to accept the selection.





6.6.1.1 Item Status

After setting a failure, a colored dot will indicate the actual status of item to be failed. A green dot (●) indicates always working, amber dot (●) indicates the failure is armed to fail, red dot (●) indicates failure is failed.

6.6.2 Failure Categories

There are eight failure categories list below. Items listed next to the category are a small sample of items that can be failed.

6.6.2.1 World

Includes failures for VASI / PAPI lights, Runway Lights, Bird Strike and Microburst.

6.6.2.2 Systems

Allows failing of systems. Includes sub category of Autopilot, Controls (flight controls), De-Ice, Electrical, Landing Gear and Lights.

6.6.2.3 Instruments

Allows failing of instruments only. Includes sub category of Engine, G1000, G430, Navigation, Primary, Sensors (failure of instrument sensors like Pitot tube blockage, OAT sensor, fuel quantity sensor.)

6.6.2.4 Engines

Allow failing of engine related items. Includes sub category of:

- Accessory – Throttle Governor, FADEC and etc.
- Failure - Engine fire, engine separation, etc.
- Fuel/Air - Engine driven fuel pump, fuel flow fluctuation and etc.
- Prop - Prop governor, engine drive shaft and etc.
- Start - Starter. Magneto, for turbo props hung start, hot start runaway ITT and etc.
- Wings - allows removal of wings and stabilizers.
- Control Surfaces - locking of Control Surface i.e. left aileron hard over, rudder hard over and etc.

6.6.2.5 Multi Rotors

For helicopters.

6.6.2.6 NAVAIDs

Allows failing of navigational aids, i.e. VORs, NDB, ILS and etc. This list automatically changes based on your current position.

6.6.2.7 Set mean time until failure

When set, failure will occur between when you set it and the max number of minutes you put it; i.e. if set to 15 minutes, failure will occur sometime between when failure was set and 15 minutes.

6.6.2.8 Set exact time until

When set, failure will occur at minute set.

6.6.2.9 Fail at exact speed

When set, failure will occur when indicated airspeed is at speed set.

6.6.2.10 Fail at exact altitude

When set, failure will occur when aircraft is at altitude set in AGL.

6.6.2.11 Fail when Ctrl+f is pressed

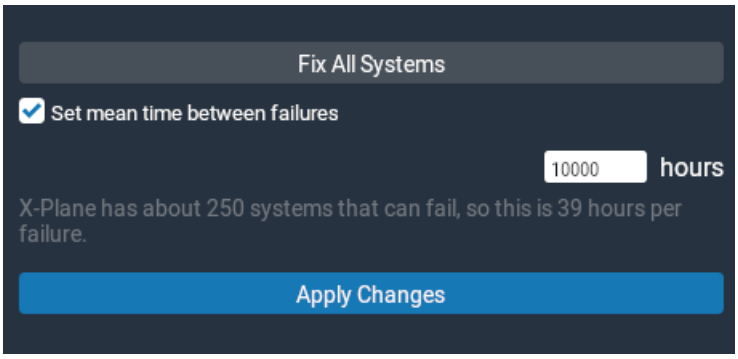
When set, you can activate failure by pressing the CTRL key and f at the same time. Usually used when trying to fail multiple items at the same time.

6.6.2.12 Failed

When selected, failure will occur immediately.

6.6.3 Fix All Systems

Clicking this button resets all systems to operational.

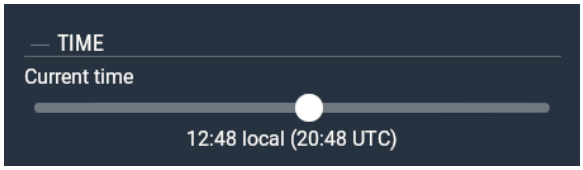


6.6.4 Set mean time between failures

Checking this box will enable random failures within the specified number of hours.

6.7 Time

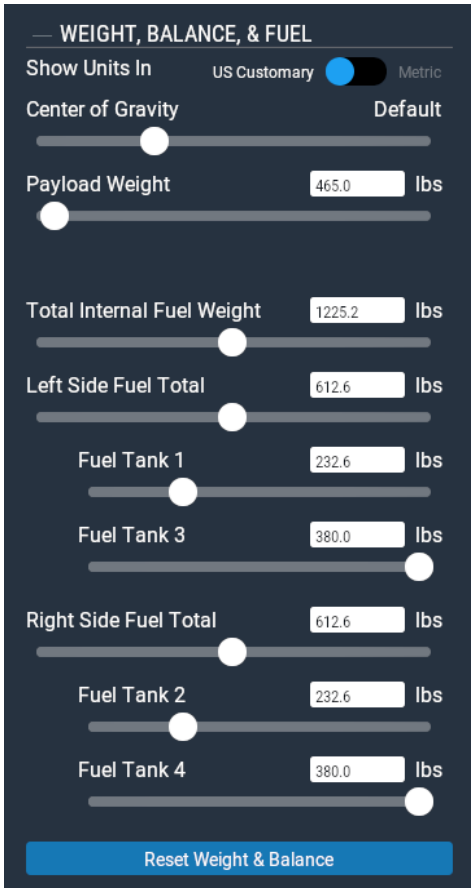
Moving the Time slider changes the time of day. The local time is based on your current position.

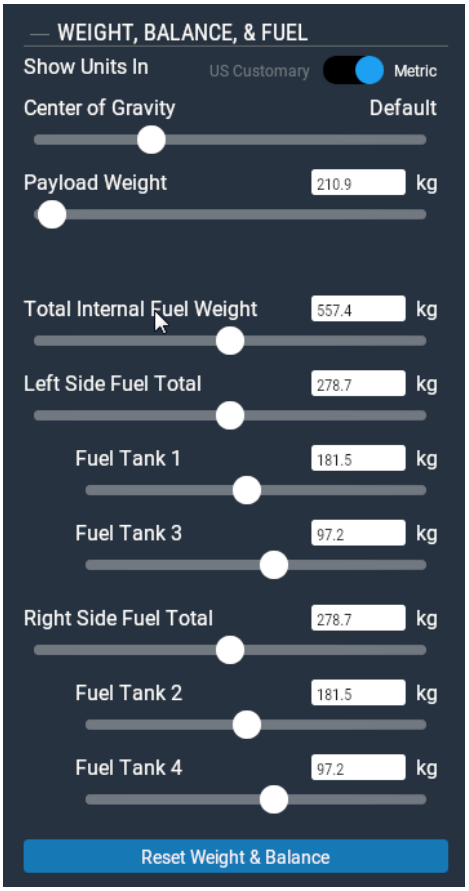


6.8 Weight, Balance & Fuel

The Weight, Balance & Fuel allow changing of the Center of Gravity (CG), Payload Weight, and Fuel.

NOTE: Changes to Weight, Balance and Fuel occurs instantly.





Picture above shows different units of weight from US Customary in pounds (lbs) to kilogram (kg) for metric.

6.8.1 Center of Gravity

The Center of Gravity (CG) slider adjusts the position of position of the CG of the aircraft.

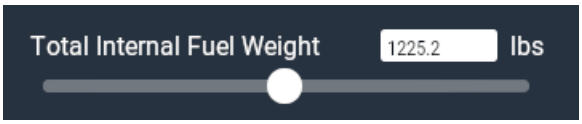
The Default position is CG in the neutral position. Sliding to the left moves the CG fore and to the right moves the CG aft.

6.8.2 Payload Weight

The Payload Weight slider adjusts the weight of payload.

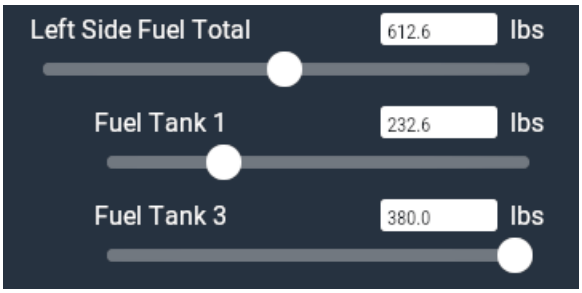
6.8.3 Total Internal Fuel Weight

The Total Internal Fuel Weight slider adjusts fuel weight to all tanks.



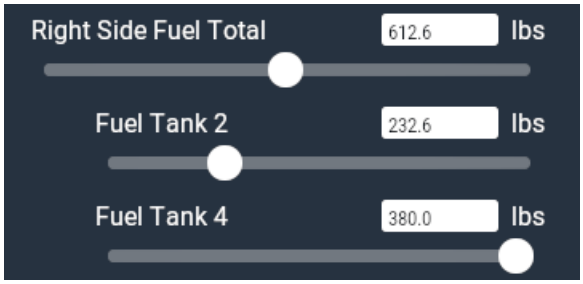
6.8.3.1 Left Side Total

The Left Side Total slider adjusts fuel weight to left tank/s.



6.8.3.2 Right Side Total

The Right-Side Total slider adjusts fuel weight to right tank/s.



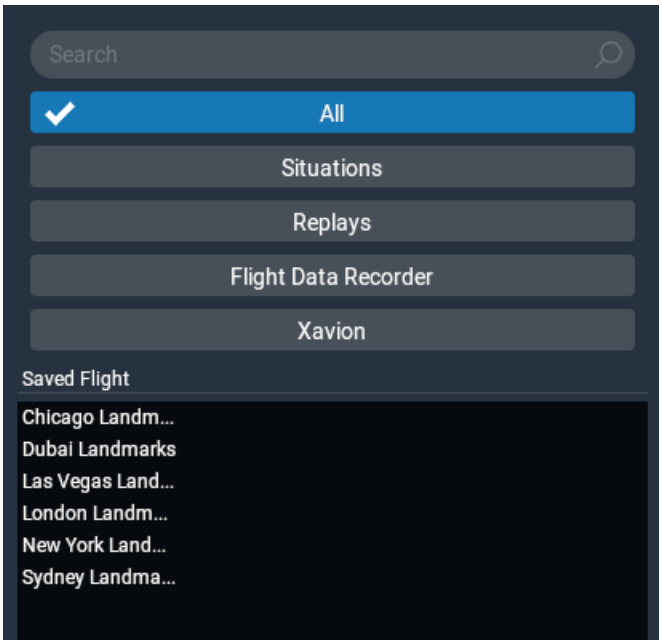
6.8.4 Reset Weight & Balance

The Reset Weight & Balance button resets the following:

- Total Fuel to 50 percent.
- Center of Gravity to neutral.
- Payload Weight to about 5 percent of max weight.

6.9 Load Flight

The Load Flight button allows you to load a Situation, Replay, Flight Data Recorder and Xavion.



- All lists all items available.
- Situations list all situation files available.
- Replays list all replay files available.
- Flight Data Recorder lists all flight data recorder files available.
- Xavion lists all Xavion files available.

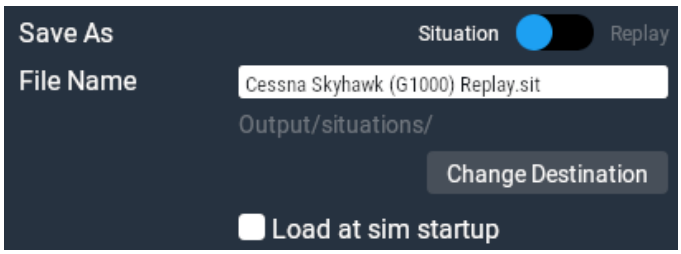
After selecting the file you wish to load, click on Load Selected Flight.

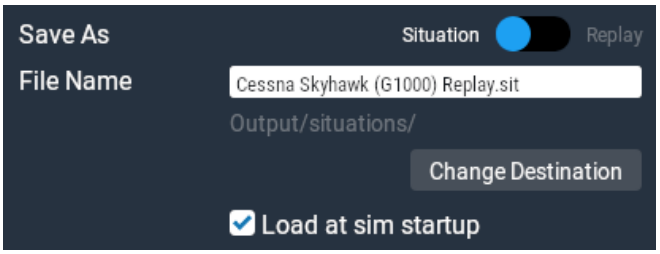
6.10 Save Flight

Save Flight allows saving of Situation or Replay.

6.10.1 Save a Situation

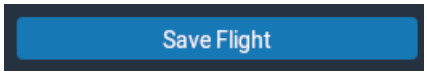
Saving a situation allows you to create a starting point of your flight. Saving a situation includes the current weather, frequencies and failures.





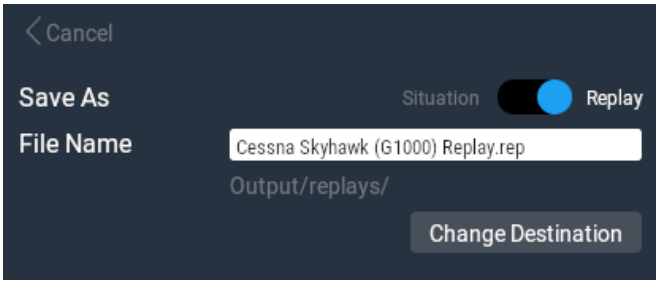
To create a situation file:

1. Select your aircraft.
2. Position your aircraft.
3. Set your altitude, airspeed and heading.
4. Click on Save Flight.
5. Slide the selector to Situation.
6. Put in the file name. It is a good practice to include a descriptive title as to the situation you are saving.
7. If desired, click on the Load at Sim startup. When enabled, anytime you start the sim, this situation file will be loaded.
8. Click on Save Flight button.



6.10.2 Save a Replay

Saving a replay allows you to create a record of the current flight. You can save a replay anytime during an active flight by initiating the Save Flight menu.



To save a reply:

1. Anytime during a flight, click on the Save Flight button.
2. Slide the selector to Replay.
3. Put in the file name. It is a good practice to include a descriptive title to what the replay is.
4. Click on Save Flight button.

6.11 Ground Speed

The Ground Speed slider allows the changing of ground speed of the aircraft.

6.12 Reset Path

Clicking Reset Path clears the red path that follows the aircraft.

6.13 Quit All

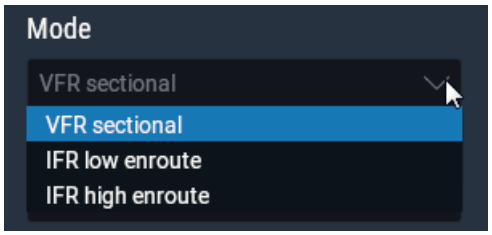
Click on Quit All to exit software but not shutdown computers.

6.14 Shut Down All

Click on the Shutdown All button to exit software **AND** not shutdown all computers for your device.

6.15 Mode

The Mode drop menu allows selection of the different map mode available for the instructor's station.



VFR Sectional mode shows a reduced version of a VFR Sectional Map.

IFR Low Enroute shows Low Altitude Airways. Use this mode to see the ILS feather on the map.

IFR High Enroute shows High Altitude Airways.

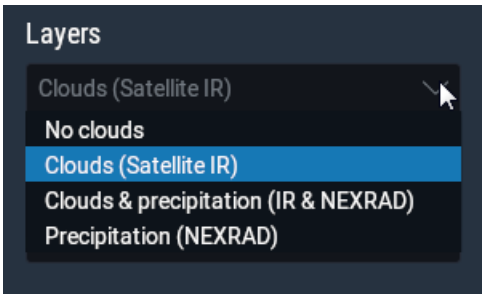
NOTE: ILS Feather which represents the lateral deviation of the aircraft on the map only shows in the IFR Low Enroute Mode.

6.16 Layers

There are two drop menus under the Layers. The first is the drop menu is to overlay clouds or precipitation location on the map. The other drop menu will over lay wind information on the map.

6.16.1 Overlay Clouds

This drop menu allows the choice of showing the clouds, precipitation or both overlaid on the map. The cloud and precipitation shown here is based on the weather configured on the Weather menu.



No Clouds when selected no cloud will be shown on the map.

Clouds (Satellite IR) when selected will show infrared representation of the clouds.

Clouds & Precipitation (IR & NEXRAD) when selected will show infrared representation of the clouds and NEXRAD colored representation of precipitation.

Precipitation when selected will show NEXRAD colored representation of precipitation only.

6.16.2 Overlay Wind

This drop menu allows the choice of showing the wind.

6.17 Flight Path

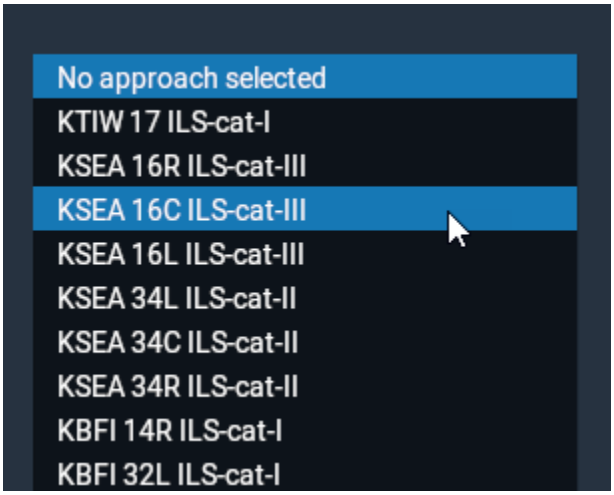
Clicking on this checkbox will show or hide the path drawn of where the aircraft has been.

6.18 Compass Rose

Clicking on this checkbox will show or hide the compass rose around the aircraft.

6.19 Approach

This works in conjunction with the Glideslope Cross Section. This drop menu allows selection of the approach you would like see on the Glideslope cross section. If none is selected, no information will be the Glideslope Cross Section. On the picture below, it shows a short list of the approaches available based on the current location of the aircraft. The list will automatically change based on the location of the aircraft.



6.20 Disable Downwind ILSes

Clicking on this checkbox will disable the downwind ILSes. Downwind direction is based on the wind direction setting only on the Wind Layer 1 in the weather page. This option does not need any wind speed or another setting in the Wind Layer 1, what fails is only determined by the wind direction. Failed ILS using this feature will be hidden from the map.

On Figure 3 below note the wind direction and speed, this is highlighted in red square. Also note that the checkbox for Disable downwind ILSes is not checked. Both ILS feather for KTCM is showing.

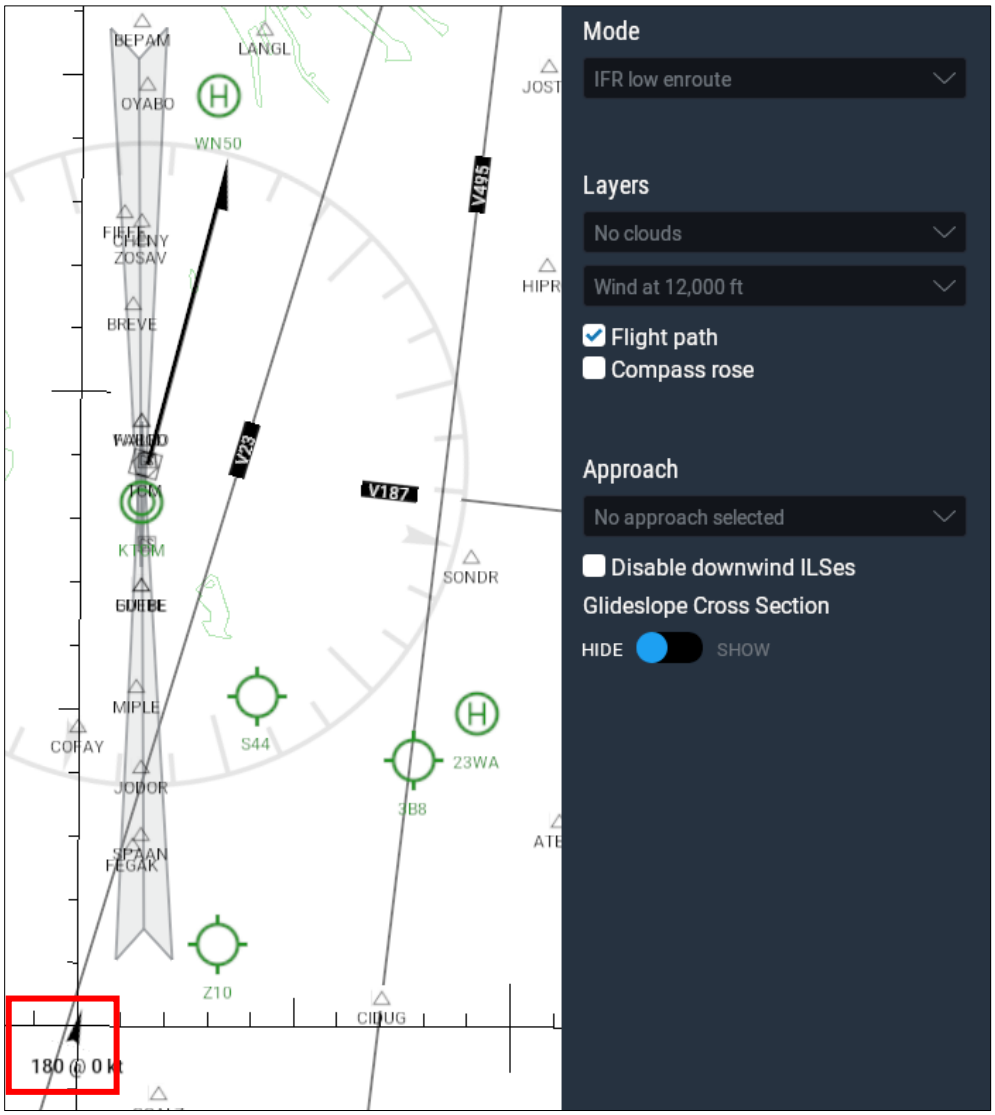
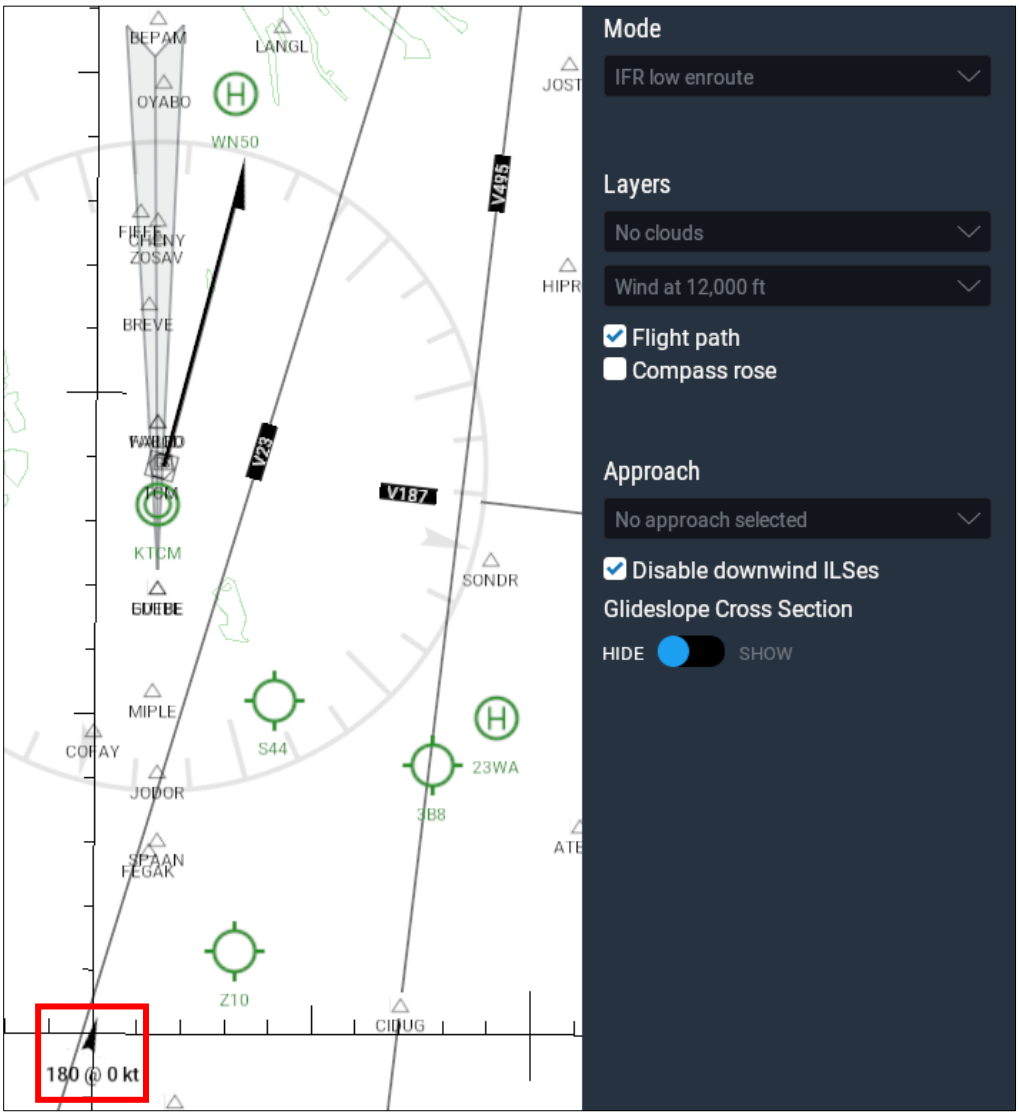


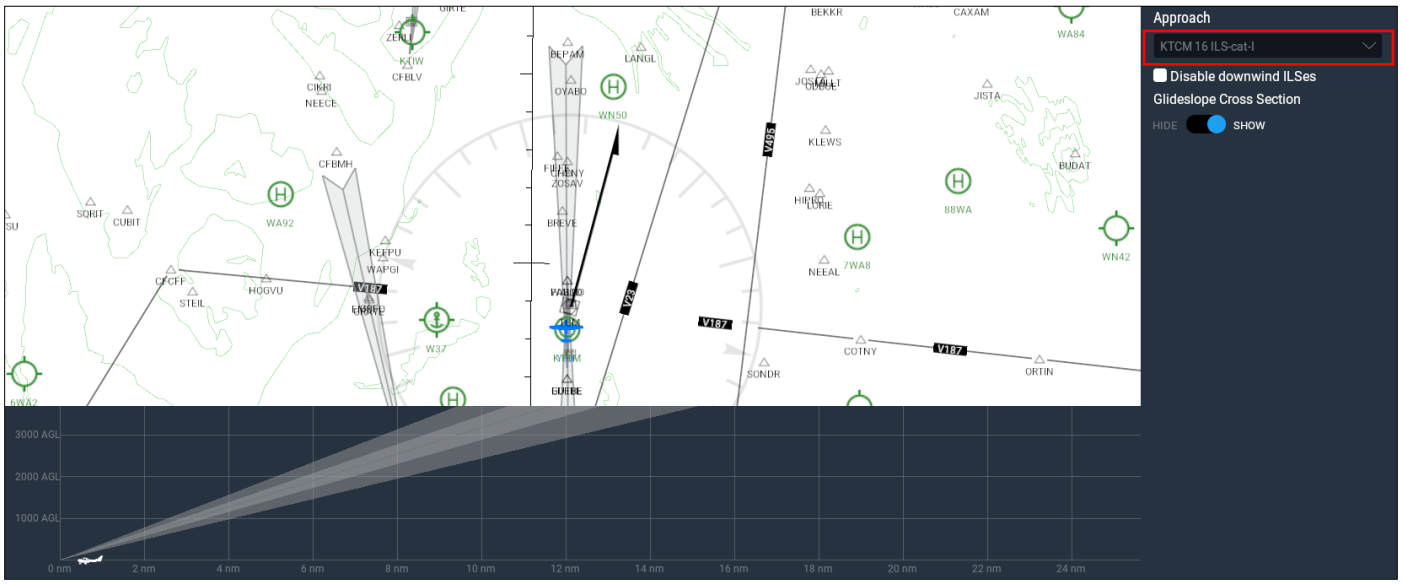
Figure 3

On Figure 4 below note the wind direction and speed, this is highlighted in red square. Also note that the checkbox for Disable downwind ILSes is checked. The ILS feather for KTCM 16L is the one showing.

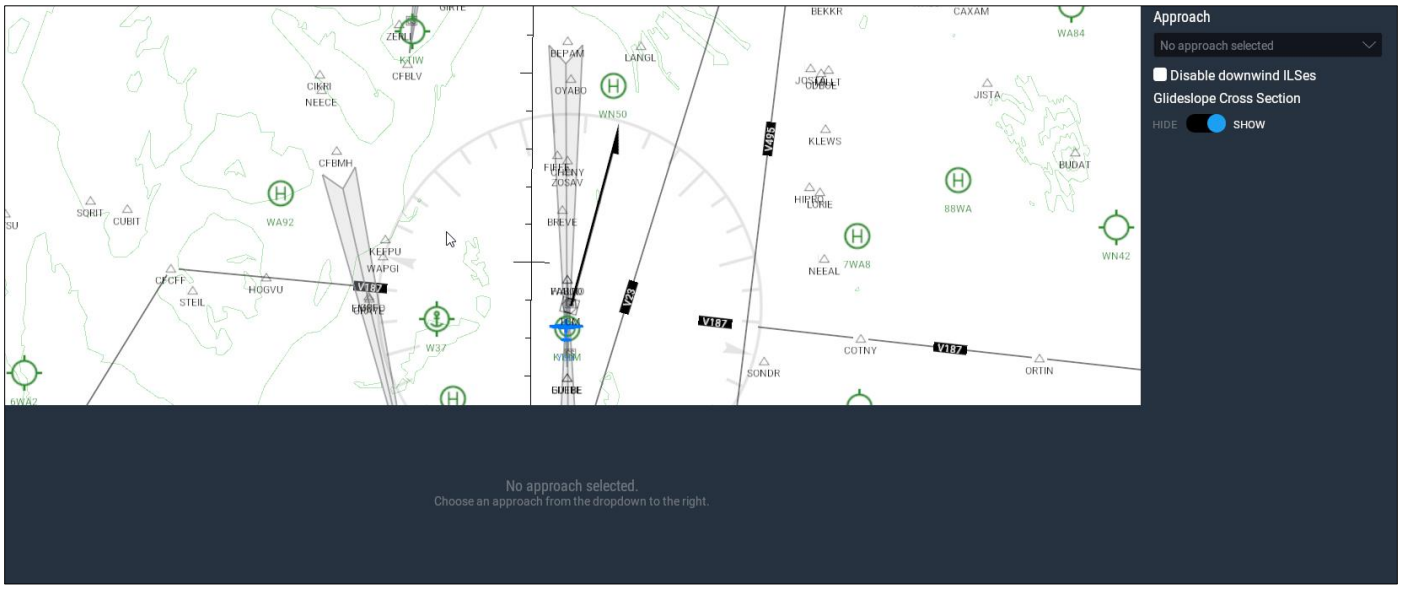


6.21 Glideslope Cross Section

The Glideslope Cross Section toggles to show or hide the glideslope cross section based on the selected approach on the approach drop menu. On the sample below, KTCM 16 ILS-cat-1is selected and is the cross section is shown.



The picture below shows no selected approach and no cross section is displayed

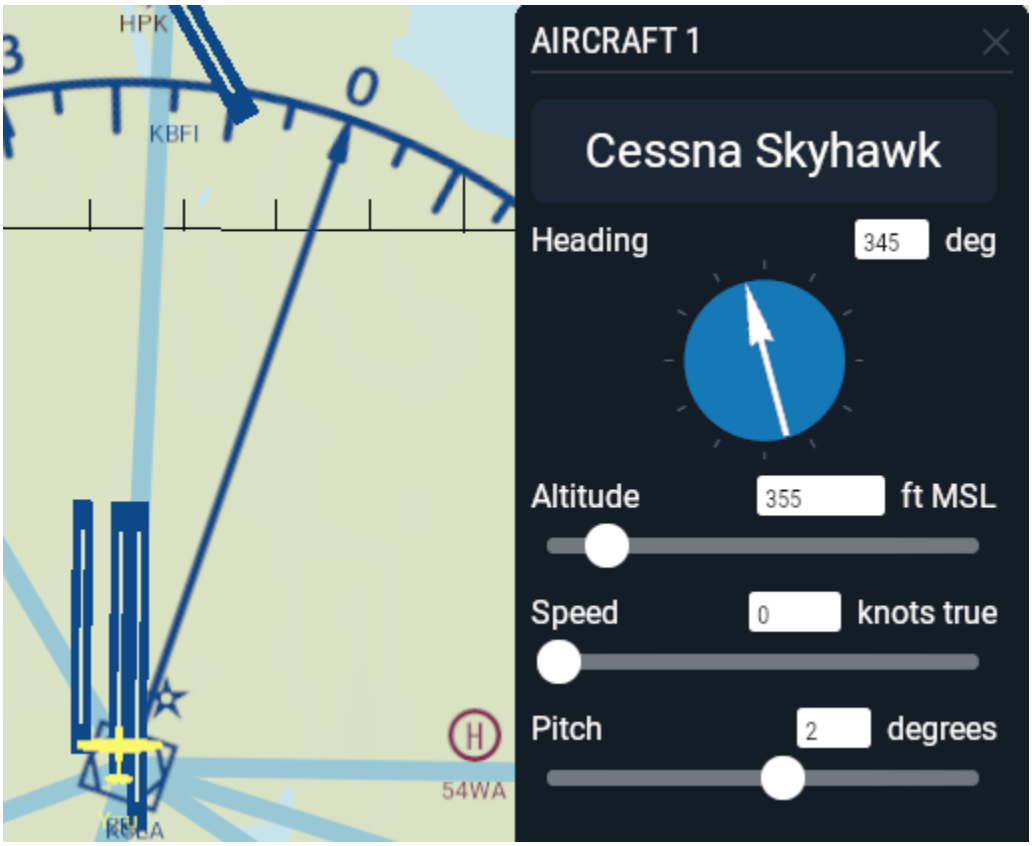


6.22 Click to Get Information

Different items in the map when clicked will show an information box. The information shown is different based on what you have selected.

6.22.1 Aircraft

Clicking on an aircraft shows the current heading, altitude, speed and pitch of the aircraft. Each information can be change through the information box. This change occurs instantly.



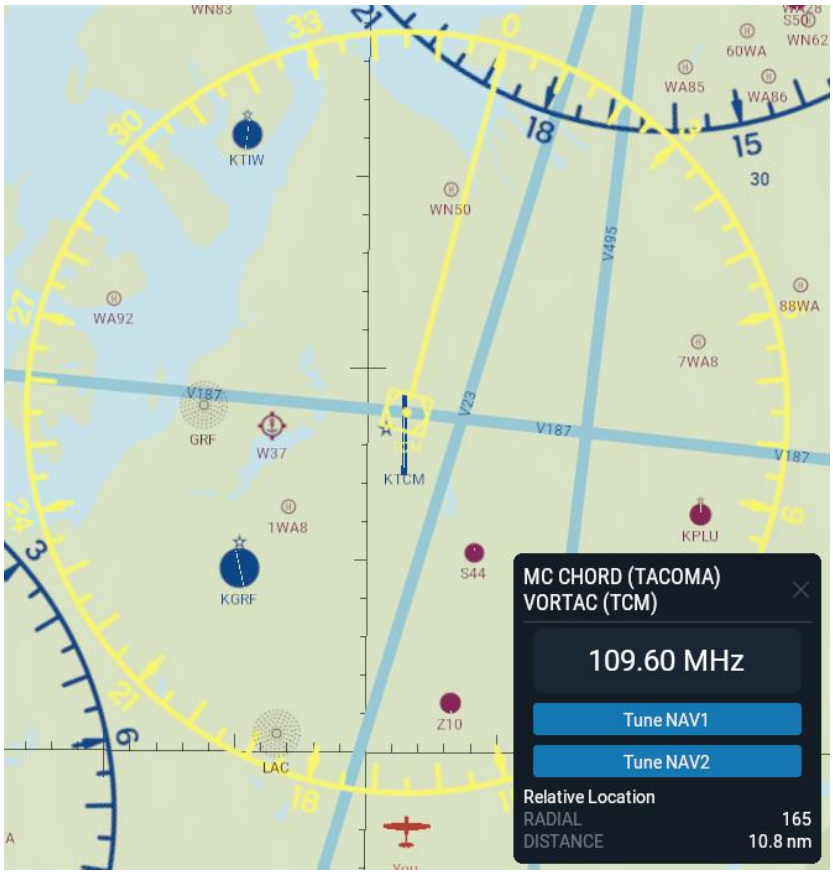
6.22.2 Airport

Clicking on an airport shows an information box with two selection. The Move tab shows all the available runway on the airport selected. Click on the runway number will move the aircraft to it. X-Plane will confirm if you wish to end your current flight. To proceed with the move, you will need to click on Start New Flight. The Final Approach button will move the aircraft to the final approach of the runway next to the button you selected. You must click on Start New Flight to proceed to move the aircraft.

The Details tab shows airport information that includes, Communications, Conditions and your aircraft Relative Location from the airport selected.

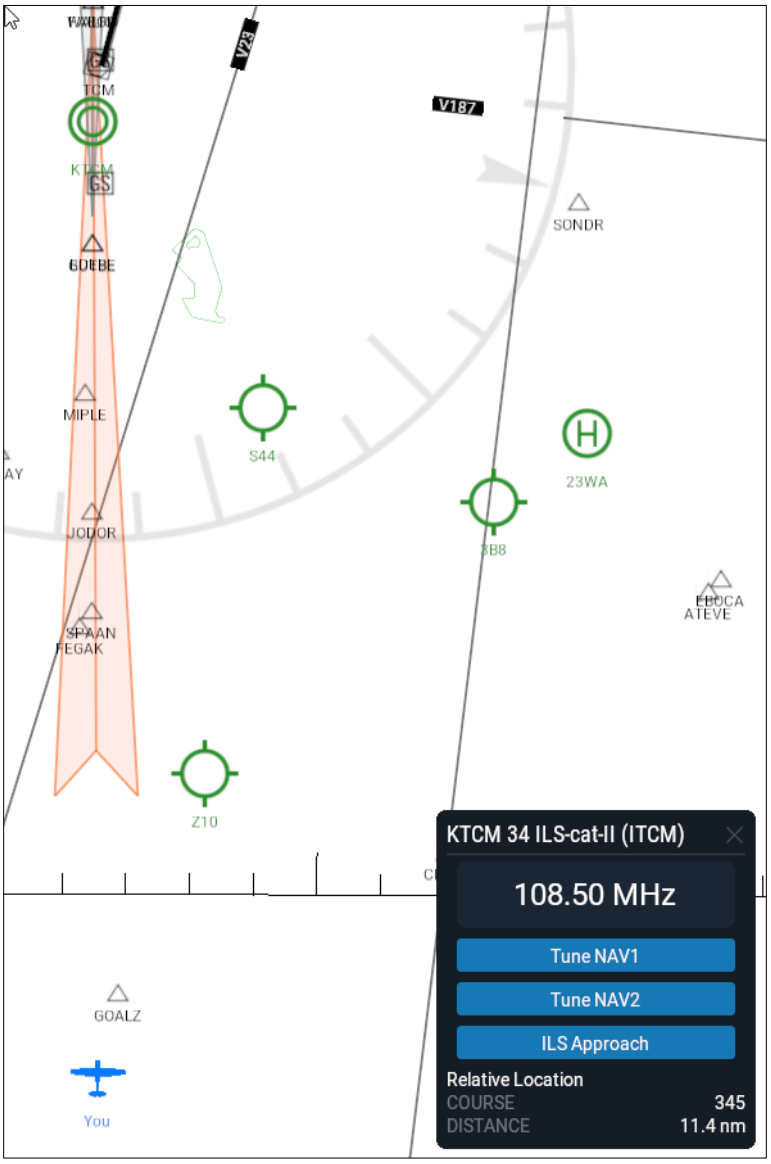
6.22.3 VOR

Clicking on VOR will show the frequency of the VOR. An option to tune the frequency to NAV1 or NAV2 by clicking on the Tune Nav1 or Tune Nav 2 button is available. The information box shows your aircraft Relative Location from the VOR selected.



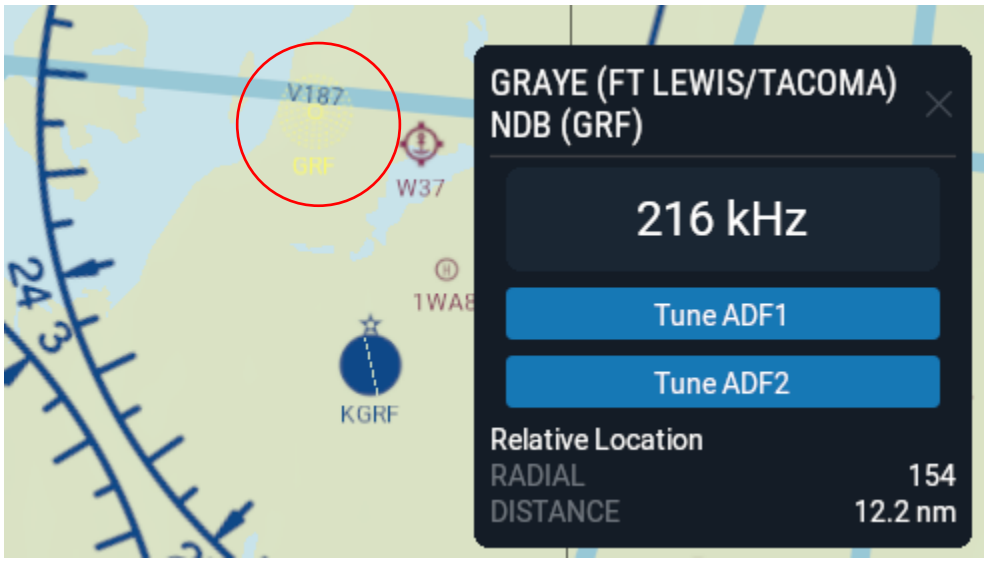
6.22.4 ILS

Clicking on ILS will show the frequency of the ILS. An option to tune the frequency to NAV1 or NAV2 by clicking on the Tune Nav1 or Tune Nav 2 button. A third option is moving the aircraft to the approach for the ILS selected. ILS feather will turn orange to distinguish the selected ILS. The information box shows your aircraft Relative Location from the ILS selected.



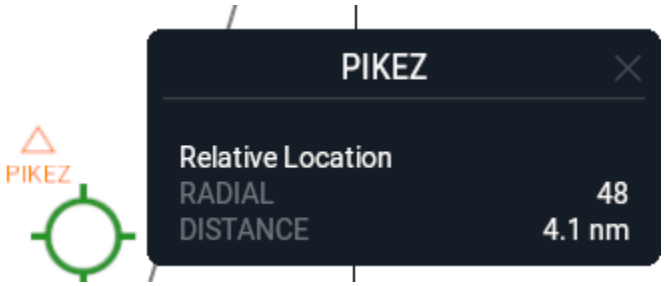
6.22.5 NDB

Clicking on NDB will show the frequency of the ILS. An option to tune the frequency to ADF 1. Though there is an option for ADF2 PFC systems only support one ADF receiver. The ADF is highlighted in red here for better visibility, in X-Plane it will turn to yellow when selected. The information box shows your aircraft Relative Location from the NDB selected.



6.22.6 Fix / Waypoint

Clicking on Fix or Waypoint will show your aircraft Relative Location from the selected item.



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