

The Medallion Foundation, Inc

# **ATD INSTRUCTION MANUAL**

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## REVISIONS

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## **PURPOSE**

The purpose of this manual is to instruct users of Medallion Foundation Inc. (Medallion) ATD equipment in the operation of the hardware and software components; as well as provide an introduction and step by step guide for setting up Controlled Flight Into Terrain (CFIT) Avoidance scenarios. Also included is information for operating GPS units included in the software.

This manual's focus is on basic operating exposure and CFIT Avoidance simulations; it will not replace any instruction from a qualified Certified Flight Instructor, nor is it intended to be used as a flight training guide.

First time users of ATD equipment are encouraged to seek out additional advice from other pilots who are familiar with the operation and flight characteristics of ATD's, and who have experience in flying CFIT Avoidance Simulations.

Medallion Foundation's programs are designed for trained and qualified pilots. The content of this manual is intended for such an audience and assumes all users are familiar with common aviation terms and have flying experience.

## **SECTION 1: INTRODUCTION**

## ***1.1 Fixed Wing***

Medallion fixed wing ATD's are manufactured by Precision Flight Controls (PFC).

PFC fixed wing ATDs are Category III Aviation Training Devices.

This means that when using the approved X-Plane or ELITE software, time can be logged to a maximum of 10 hours in pursuit of an Instrument rating; if the session is completed in company of an appropriately rated instructor who signs off on the time in the student's logbook.

**FAA letters of authorization are posted at each location. If you cannot find them, please let us know.**

Time can also be logged up to a maximum of 2.5 hours in pursuit of a Private Pilot's certificate with the same condition of having an instructor present who signs the student's logbook.

Pilots may also maintain instrument proficiency on the ATDs provided they are instrument-current at the time, are using the approved X-Plane software, and have an appropriately rated instructor witness the session.

Instrument Current is defined as.

- Within the preceding 6 months you will have performed;
  - 6 instrument approaches
  - Holding procedures
  - Intercepting and tracking VOR radials

## **SECTION 2: FIXED WING ATD OPERATION**

## ***2.1 Equipment***

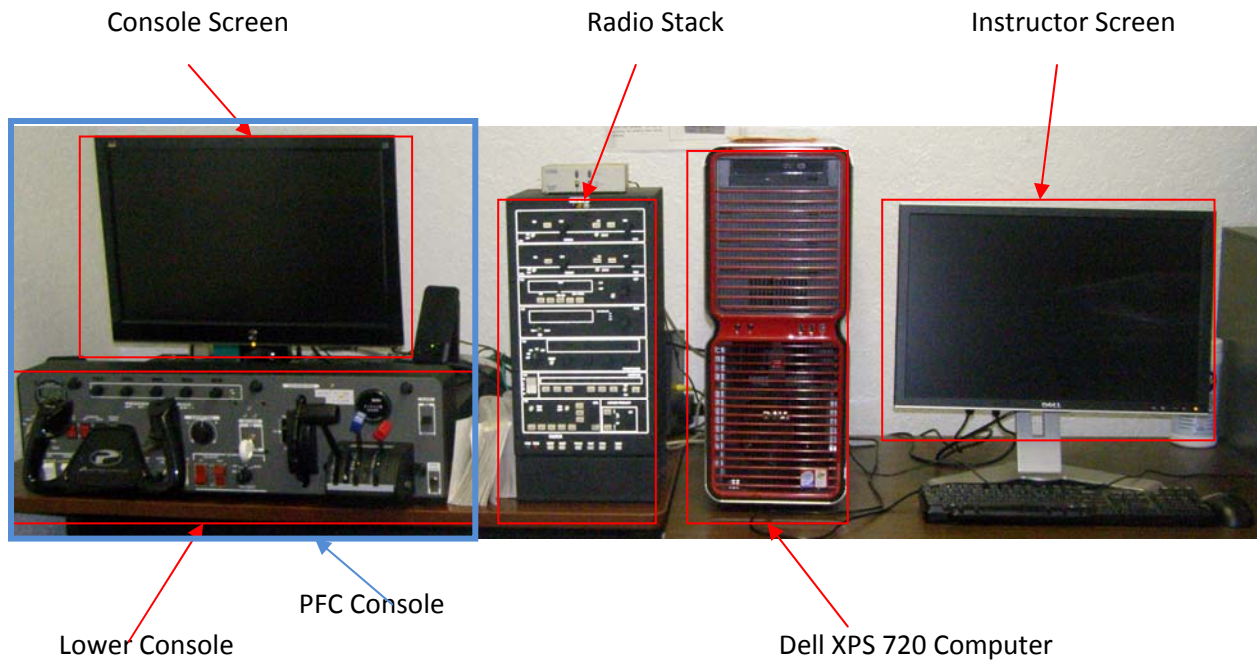
Medallion Fixed Wing ATD Equipment is comprised of 5 main components.

1. Precision Flight Controls (PFC) console
  - a. Console Screen
  - b. Lower Console Panel
2. Rudder Pedals
3. Dell XPS 720 Computer with Windows XP
4. "Instructor Screen" – LCD standalone display screen
5. Radio Stack

The PFC Console houses: a display screen, yoke assembly, throttle unit, and lower console panel with standard aircraft rocker switches, buttons, and dials. There is a standalone radio stack which includes dual communications and navigation radios; DME, Transponder, Auto Pilot, and GPS controls.

The lower console panel includes:

- ADF/RA Controls the ADF or Radar Altimeter
- HDG Controls the Heading Bug or HSI card; whichever is applicable
- CRS/DG Controls the Course Selector
- ALT Adjusts the Altimeter
- OBS Controls NAV1 or NAV2 Omni Bearing Selectors Note: The OBS selector can be switched between NAV1 and NAV2 with the co-located toggle switch.
- Parking Brake button just below the yoke
- Landing gear handle
- Aircraft ignition keys (should stay on Both)
- Flap handle
- Cowl Flap handle
- Trim wheel



The Rudder Pedals are designed to act like standard aircraft rudder controls with steering most effective when heels are resting on the platform, and braking accomplished by pressing on the upper 1/3 of the pedals (toe brakes).

Dell XPS 720 computers are running Windows XP which has proven to be a highly stable platform for running high-demand programs.

When using X-Plane or ELITE, the information and controls for weather, equipment failures, flight analysis, and map are displayed on the Instructor screen. The mouse can be scrolled between the console and instructor screens either off the right or left side of the screen.

## ***2.2 Software***

There are 2 software programs installed on the Medallion Fixed Wing ATDs: Microsoft (MS) Flight Simulator X, and X-Plane. Each program has its unique benefits; both will provide pilots with opportunities to enhance their skills and can be used for the CFIT Avoidance scenarios as well as preparation for other in-flight situations.

### **2.2.1 Microsoft Flight Simulator X**

Microsoft (MS) Flight Simulator X is the newest release in the MS Flight Simulator family. The program has extensive terrain graphics and high quality features displaying cities and airports. MS Flight Simulator X includes enhanced graphics loaded from Eterra's satellite imagery of select mountain passes within Alaska. These enhanced areas allow pilots to fly through mountain passes in simulation with a high degree of realism and varying weather conditions before flying those passes in real aircraft. Also included in this installment of MS Flight Simulator are many guides and tutorials to assist users in learning the program.

The following list includes those passes which are included in the enhanced graphics package.

Anaktuvuk	Merrill
Antigun	Portage
Chickaloon	Rainy
Isabel	Thompson
Lake Clark	Windy
Mentasta	Broad

### **2.2.2 X-Plane**

X-Plane was developed as an all around simulation program. Terrain is displayed in high resolution and detail. X-Plane was developed by combining highly sophisticated computer modeling which results in very accurate aircraft performance and handling characteristics. PFC is currently using X-Plane as the primary program for their consoles.

## ***2.3 Beginning a Session***

When beginning a session with Medallion ATD's, its best to first take a good look at the equipment you will be using. Each Medallion ATD station includes the 5 components described in the Introduction, and has them set up in generally the same way at all locations.

At each station there should be at least a Medallion sign-in sheet, and a copy of this manual. Some locations will also have various charts, airport facility directories, and other printouts left by other users which a pilot might find useful.

If you happen to find a cable which is unplugged or notice any damage to the equipment, notify the Medallion Foundation ATD Technician. You can contact the ATD technician through the main Medallion telephone number 907-743-8050.

## ***2.4 Before Starting the Computer***

Before you start the computer, there are a few items which must be completed. Skipping these steps may cause unsuccessful connections between the console and the computer, or undesirable feedback when the pilot begins flying.

- Locate 4 large red rocker switches on the lower console to the left of the yoke; these switches marry the hardware to the software on the computer, and also control the power to the hour meter. Ensure all 4 switches are in the off (down) position.
- On the right side of the lower console, just above the throttle box there is a small silver toggle switch that is labeled on the left side for Elite, and on the right for MS Flight Simulator/X-Plane. Move this switch to the correct position for the software which you intend to use.
- Change the throttle unit to one which best represents the type of airplane that you will be flying: single Engine w/ mixture, single engine w/ prop control and mixture, multiengine with prop controls and mixture, or multiengine turbine. (If planning on using a single engine turbine like the Cessna Caravan in Microsoft flight simulator, use the multiengine turbine throttle quadrant; only the left controls will be effective). The throttle unit is attached to the lower console panel by two black brass screws. To remove the unit, put the throttle, mixture, and prop controls in the full aft position. Hand tighten only, do not over-tighten or the screws could cross thread or be difficult to remove. Move the throttle to mid-range and put the prop control and mixture in the full upward position to start.
- The Landing Gear handle should be in the down position and securely attached to the console. (When transitioning the landing gear while flying, gently pull the handle out and move it to the desired position before releasing it.)
- Turn the trim wheel to the neutral position.
- Both of the ignition keys should be on the "Both" position.

## ***2.5 Computer and Console Startup***

You are now ready to start the computer. Press once on the small button located above the silver Dell logo. You should see a light come on and hear the computer's fan start. Very soon after, you will hear the tone for Windows starting (if the speakers are turned up...).

Once the computer has finished booting up you will see that both the console screen and the instructor screen are active. The instructor screen displays the desktop icons for MS Flight Simulator X, X-Plane and ELITE. Locate the mouse pointer, move the mouse to scroll between the screens. The pointer will move off the left or right side of one screen and onto the other.

If you see the same image on both screens or if the image you need is on the wrong screen, please use the posted instructions labeled "Change Monitor Image".

Turn the 4 red rocker switches to the "on" position. The lower console panel lights will illuminate.

Decide which program you will be using and double click on the icon.

Note: The program may take several minutes to start. Please be patient and wait for the programs to completely load.

The program will display a screen indicating that the program is initializing.

If you will be using both Flight Simulator X and X-Plane during one session then please exit whichever one you are using first and cycle (turn off, then on) the large four red switches before starting the other program.

Please turn to the individual program sections for detailed information on using MS Flight Simulator, X-Plane and ELITE.

## **SECTION 3: MS FLIGHT SIMULATOR X**

### ***3.1 Program Launch***

MS Flight Sim opens on the console to a screen which has a menu on the left 1/3 of the display.

The menu options are:

- Home (opens fsinsider.com... internet not available on Medallion ATDs).
- Free Flight –To start flying without setting any options
- Missions – This option is mainly for the ‘gaming’ aspect but it is a good way to learn the program
- Multiplayer – opens for multiplayer gaming on the internet. (not an option as Medallion ATDs are not connected to the internet)
- Pilot Records – the program keeps an automated log of all activity
- Learning Center – This opens to the tutorials and information about the program. There is an abundance of information in the Learning Center to explore.
- Settings – This section is where the pilot may manipulate display options, realism settings, and calibrate the controls.

### ***3.2 Free Flight***

Free Flight is a concept of the program where the pilot either accepts pre-loaded settings for aircraft, weather, location, and time/season – then chooses to fly with those settings; or pilot can also customize their aircraft, weather, location, and time/season.

At the bottom of the free flight options is a tool bar with buttons for “Fuel and Payload”, “Load”, “Save” “Flight Planner”, and “Failures”.

- Fuel and Payload – The pilot can choose different fuel and pay loads to experiment with aircraft handling characteristics.
- Load – Choose from a list of saved flights. The Eterra Mountain Passes are available in this option.
- Save – Click on this button to save your aircraft, location, weather, equipment loads, and failures to develop a custom scenario. (such as a CFIT Avoidance scenario)
- Flight Planner – opens to a series of options to build a flight plan before flying
- Failures – any system can be set to fail in the program. Components can be failed on cue, or randomly.

### ***3.3 Aircraft Selection***

To choose an aircraft; click on the change button under the menu “Current Aircraft” on the Free Flight screen.

- A display of available aircraft will be shown.
- To filter manufacturers click on the drop down menus. Choose a manufacturer then click on the aircraft model.
  - Aircraft can also be selected by type.
- Select an aircraft by double clicking on the icon or click once on the icon and then click OK.

- The pilot can select “Details” and learn more information about that aircraft as well as customize the tail number.

### ***3.4 Selecting Location***

Changing location is accomplished by clicking the change button on the “Current Location” menu on the Free Flight Screen.

- Box will open fields for displaying locations by Airport Name, Airport ID, and City Name. A list of available airports is provided so the pilot can click on the correct one.
  - There are also filters at the bottom of the box with drop down menus for choosing country, region, city, state, and runway.
- First select either ALL, or the specific state or region in which you’d like to fly before typing the airport ID.

### ***3.5 Time and Season***

Click on the Change button under the “Time and Season” menu.

There are several selections to choose from for the time of day: Dawn, Day, Dusk, or Night. You can also input a specific time which can also be displayed as GMT.

For Seasons, winter, spring, summer, and fall are available choices as well as a customized field for specific months, and a calendar to choose specific days.

### ***3.6 Weather***

MS Flight Sim has 3 levels for setting weather. To start; click on the change button under the “Current Weather” menu to open the weather options box.

Ten weather themes will be listed. To select one, click on it and click OK.

(Note: if you choose an option that has storms associated with it the weather will deteriorate over time)

The option for “Real World Weather” doesn’t work because Medallion ATDs are not connected to the internet.

If you wish to customize your weather settings, click on “User Defined Weather”. Then click “Customize”.

#### ***3.6.1 User Defined Weather***

“User Defined Weather”, opens a map display with three bubble selections at the top.

- All weather stations (setting at individual stations will be lost)
- Stations that you have not set (retains individual station settings)

- A specific weather station: (the program lets you know here which station is being selected or, if there is more than one “Multiple stations selected” will appear.

There are also 4 slider bar menus which can be used for setting customized weather, although it won't be as detailed as the “Advanced Weather” settings.

Note: the legend keys across the top of the map are explained in a dialog box at the bottom of the display screen.

Weather stations are identified on the map by a square with a diagonal line through it. Select a weather station to customize, or hold the CTRL key down and select several at once.

Once your weather station(s) are selected manipulate the slider bars for desired weather or, click on “Advanced Weather”, which gives you the most options.

To confirm all User Defined selections; click OK 2 times to return back to the Free Flight screen.

### 3.6.1.1 Advanced Weather

Advanced weather can be programmed for a single weather station, multiple weather stations, or on a global level.

There are 4 tabs across the top of the screen for different atmospheric conditions.

- Clouds
  - Includes Precipitation
- Wind
- Temp/Pressure
- Visibility

Clouds can be set in layers; bases and tops can be defined. To add a layer, click on the legend button showing a (+) sign with a cloud. After a layer has been added, scroll the mouse pointer to the uppermost border of that layer... a double ended arrow will appear. Click on the cloud layer border and move it up or down to the desired altitude (zoom in or out on the cloud layer box with the magnifying glass + or – buttons to refine altitude selection).

To delete a layer, click on that layer (layers turn a bright Blue when selected) and click on the button showing a (-) sign with a cloud.

Select cloud Type

- Cirrus
- Cumulus
- Stratus
- Thunderstorm

Select cloud layer coverage.

- Few = 1/4
- Scattered = 3/8 – 1/2
- Broken = 5/8 – 7/8
- Overcast = Full coverage

Select turbulence and icing

- Turbulence and icing are selected by the desired severity.
  - o None
  - o Trace
  - o Moderate
  - o Severe

Note: Choosing Moderate or Severe levels of Turbulence or Icing may result in very un-desirable aircraft handling characteristics.

Select Precipitation

- Precipitation is selected by the type, and rate.
  - o Base altitude box for selecting where the precipitation dissipates or stops. (Default is set to the earth's lowest altitude [-1,499] so all precipitation will fall to the ground if setting is not changed).

Fog can also be set by creating a cloud layer at the ground level, making the tops from 500'-3000' and creating a visibility layer in the same manner. Set the visibility to 5 miles or less for realism.

Select Wind Layers

MS Flight sim has imbedded the ability for transitions between layers so an abrupt shift does not take place (of course you can always modify that by increasing the windshear).

The wind layer box can be customized by altitude, shear, gusts, direction, speed, and turbulence.

- Add Wind layer: layers are chosen for a specific altitude.
- Click and drag with the mouse on the circular wind direction tool to choose where the wind is blowing From.
- Determine Gust by clicking on the "Gusts to" text box and typing in the desired gust-speed in knots.

Select Temp / Pressure

If no selections are made here, program automatically sets the lowest temperature to ground level at your location; then applies the standard lapse rate.

Modification of the Temperature and Barometric Pressure is accomplished by adding layers at specific altitudes much like the wind settings.

Changing the atmospheric pressure will affect aircraft performance just as in the real-world.

Visibility is set in layers much like the clouds, and then refined by a slider bar which goes from fractions of a mile to unlimited.

To confirm all Advanced Weather selections; click OK 3 times to return back to the Free Flight screen.

### ***3.7 Flying Screen/Display***

After you have selected your aircraft, time/season, weather, location, and any equipment malfunctions you are ready to fly.

- Click the “Fly Now” button. The program will load your selections and present you with a display of your aircraft cockpit in the environment which you selected.
  - This may take a few minutes – please be patient.
- Ensure the parking brake is off (button below the yoke) and away you go.

#### **3.7.1 Accessing the Menu**

If you wish to modify any part of your flying experience you’ll need access to the menu.

Pressing (P) on the keyboard will pause your session. The ALT key will bring up a standard windows menu bar across the top of the screen. From this menu you can access any element of the program.

Note: the menu bar will remain at the top of the screen unless you right click anywhere on that screen and select to hide the menu

- Flights
  - Load – a flight
  - Reset – resets the flight back to origin
  - Save – the flight
  - Flight Planner – opens the planner
  - End Flight
  - Exit – Flight Sim
- Aircraft
  - Select Aircraft – change the aircraft you’re using
  - Keyboard – an invaluable tool... includes the legend for keyboard shortcuts
  - Visual Flight Path – brings up a “fly through the boxes” tool
  - Fuel and Payload
  - Realism Settings
  - Failures
- World
  - Time and Season
  - Go To Airport – change location
  - Map
  - Weather
  - Scenery library

- Options
  - Pause (P)
  - Sim Rate
  - Inst. Replay
  - Flight Video
  - Flight Analysis
  - Sound
  - Settings

If you wish to begin flying in mid-air, not taking off from a runway, pause the simulation at this time (P), and press the (ALT) key on the keyboard to bring up the menu. Select the World tab, then select Map. The settings for altitude, airspeed, and heading can be modified.

Once your selections have been completed; click OK to return to the flying screen. And press the (P) to un-pause the flight.

Note: you must select an appropriate airspeed after selecting your altitude. Otherwise the aircraft will immediately begin falling from the sky upon returning to flight.

## ***3.8 Save or Load a Flight***

### **3.8.1 Saving a Flight**

When saving a flight the program will record: Aircraft selection, location, failures, weather settings, and altitude / heading information.

From the Free Flight Screen

- Click Save on the toolbar across the middle of the screen
- Name your flight.
- Click Save

If you are currently flying:

- Click the ALT key on the keyboard
- Choose the Flights tab
  - Select Save
- Name your flight and
- Click OK

### **3.8.2 Loading a Saved Flight and Mountain Passes**

From the Free Flight Screen

- Click Load on the toolbar across the middle of the screen
- Choose the saved flight from the drop down list
- Select Fly Now

(Note: When loading a Mountain Pass the program loads the selection in a 172, midair, in the vicinity of the entrance to the pass; and with a mini panel view)

If you are currently flying:

- Click the ALT key on the keyboard
- Choose the Flights tab
  - Select Load
- Select the flight from the drop down list
- Click Fly Now

### **3.8.3 View Modes and Options**

The Kneeboard has an all inclusive list of keyboard commands for interfacing with MS Flight Sim. The Learning Center also has tutorials for working with the various view modes and options.

Access the kneeboard by pressing the ALT key, then clicking on the Aircraft tab, and Kneeboard

The Yoke buttons can also be used to switch views. These functions are programmed specifically at the console and may vary from station to station depending on users programming.

In the Cockpit View mode - pushing on the Right index finger button on the Yoke should return your view to center.

### ***3.9 Program Shut Down Procedures***

When you have finished your session in MS Flight Simulator; exit the program by pressing the ALT key, then click on Flights – Exit. This will end your flight and exit the program. Click on Yes to confirm that you'd like to exit flight simulator.

If you are also finished with the computer:

- Turn off the 4 Red Rocker switches
- Click on (Start – Turn Off Computer) on the console screen.
  - A window will pop up on the console screen – confirm you wish to turn off the computer.

## **SECTION 4: X-PLANE**

## ***4.1 Program Launch***

After you have started the X-Plane program and it has finished loading, the following screen will appear indicating that a hardware validation has passed.

- Click “Understood” to continue.

X-Plane is now loaded. You should have an aircraft instrument panel displayed on the main screen.

The Instructor’s Operating Station (IOS) and map will be displayed on the instructor screen. You should see an instrument panel and flight environment on the console screen.

It is possible that the instrument panel and IOS are switched from where they should be. If this happens there is a video router box which is used to change monitor images to the appropriate screen. Instructions should be posted on the wall and are labeled “Change Monitor Images”.

X-Plane loads the last airplane and airport used. The program will begin with the parking brake set, and in position on the runway for a takeoff.

- To change the startup default airport and aircraft; please refer to the Situation File explanation (4.6).
- To release the parking brake
  - Locate the button just below the yoke (labeled “Parking Brake”). Press the button to release the brakes.
  - Verify the status of the parking brake by the illumination light located on the lower portion of the cockpit display. The illumination light at the lower Left side of the cockpit display will extinguish when the brakes are released.

## ***4.2 Instructor Operating Station (IOS)***

The IOS display on the ATD instructor screen is the main interface for operating the program.

The IOS is largely made up of the map display.

The left side menu is comprised of menu options, many of which will take you to a completely different screen within the program, such as weather or equipment failures.

The right side menu includes controls for aircraft situation, and checkboxes for viewing preferences within the IOS. The map panning, and zoom tools are on the lower right side.

Along the “Header Bar” (the upper portion of the display) are 5 tabs which are options for map viewing.

- Hi Speed - requires less demand on the computer than other options
- Low Enroute (Chart)
- High Enroute (Chart)
- Sectional (Chart) – most popular
- Textured – Highest rendering detail. The computer may slow significantly

On the upper right there are 5 checkboxes

- IOS: Turns on/off controls to provide larger viewing area
- Edit: Turns on/off the nav aids editor
- Replay: Turns on/off replay feature
- Slope: Turns on/off the glide slope
- Inst: Turns on/off instructors instruments.

When the pilot is flying, the moving map will remain centered on the aircraft as long as the person working with the IOS does not pan the map.

If you get a pop up box warning you that there are too many rendering options, click on “Understood”. Then choose “High Speed”; this will reduce the load on the computer.

### ***4.3 Airport Selection***

Airport selection can be accomplished 3 different ways. The first is by directly typing the airport identifier in the small “Reference Field” window located at the upper left side menu of the IOS. After the airport identifier is typed correctly, the buttons just below will display the runways available. Select a runway to re-locate.

If you don’t know or aren’t sure about the airport identifier, the second method of relocating is to click on the “Go To Airport” button on the left side menu of the IOS and scroll through the presented list. Clicking on the button opens a small box with a list of airports available to “Go To”. This list is all inclusive of the airports in the program so could it could take some time scrolling to the desired airport. Once you have found the airport, click on the “Go To This Airport” button.

- You can also type the Airport identifier within the open text field at the bottom of the airport list.

The third method of relocating is to repeat the steps from the second method, then type the city name into the text box provided at the bottom of the airport list. Again, click the “Go To This Airport” button.

### ***4.4 Aircraft Selection***

Note: If you should change aircraft when in flight, it will be placed on the ground at a nearby airport.

Locate the “Load Aircraft” button on the left side of the IOS.

Click on the button, the program will open into a smaller screen with a drop down menu at the top and a window underneath with list of options.

- Click on the drop down menu and choose X System folder.
- In the list of options choose either PFC Aircraft, or Medallion Aircraft.
- This will open a new list of options to choose from, named by the model of aircraft (aircraft file names will end in - .acf).
- Click on the desired aircraft. The program will return to the IOS with the new aircraft represented in the console screen.

### ***4.5 Time, Weather, Weight & Fuel, Failures***

After completing all selections within this section; click the small X at the top Right of the screen to return back to the IOS.

#### ***4.5.1 Time***

Click the “Set Time” button on the left side menu. The program will open to a box with slider bars which you can manipulate to set the desired time of day and date. There is also an option to set the program to stay current with the time and date.

## 4.5.2 Weather

There are many ways program weather into the flight environment. X-Plane has the ability to set cloud types and altitude, precipitation, visibility, wind, icing, severe weather, and thermals.

To open the weather options screen; click on “Set Weather” on the left side menu

The menu screen is divided into 3 columns.

On the left:

- The upper section is for selecting cloud type and altitude. When setting cloud altitude, you will choose the altitude for the “tops” and the “bases”. (The bases can be set for MSL or AGL altitudes.) Two separate cloud layers can be set, making flight between layers possible.
  - There is a 3000’ minimum distance between cloud layers.
- Beneath the clouds section are the settings for temperature and barometric pressure
- The lower section column is for setting visibility, precipitation, icing, thunderstorms, wind and turbulence, microburst probability, and rate of change.
  - All of the options are slider bars in this section.

Note: if you wish to have stagnant weather: choose None for thunderstorms, and No Rate of change which is in the neutral position between deteriorating and improving weather.

The mid section:

- Wind can be set for varying conditions. Turbulence can be also be added. The wind options can be set across 3 layers.

On the Right:

- The top section is where thermals can be set. Intended for gliding, the thermals can cover a small or very large area, and can be set for various rates of climb.
- Underneath is a drop down menu for setting runway condition. There are three choices; clean and dry, slushy, icy.
- The third section on the right side is reserved for working with real time weather received from the internet. These functions will not work on Medallion ATDs as they are not connected.
- The lower section is a map display which graphically shows the weather settings.

## 4.5.3 Weight and Fuel

Click the “Weight and Fuel” button on the left side menu. This opens the fuel/payload box. All selections are slider bars. Fuel will decrease while flying so here is where you would top off if necessary.

## 4.5.4 Fail Equipment

Any of the aircraft systems can be failed. Failures can be accomplished as soon as the pilot clicks a button, or can be programmed to fail sometime in the future.

Click on the “Fail Equipment” button on the left side menu. The System Failures box has tabs across the top for choosing which system will be affected.

Once you’ve had enough of the challenge. Click the “Reset all systems to operational” to continue with no additional failures.

## ***4.6 Situation Files***

A situation file is used to save your preferences for a specific flight to include a specific aircraft, location, weather and avionics settings. This can be used as a quick start file that gets you flying quickly, such as choosing your preferred default aircraft a CFIT Avoidance Scenario (Section 5).

Before you “Save” a situation, you must create the situation by the following

- Select your aircraft
- Place your aircraft on an airport and runway of your choice
- Select your weather settings
- Set up your avionics with the frequencies

Now you have something to save; click on the “Save Situation” button on the left side menu of the IOS. Give the situation a name that you can easily recognize.

To Load your saved situation; Click on the “Load Situation” button and choose your situation from the list of files provided.

## ***4.7 Pause, Freeze, and Speed***

The Pause, Freeze, Double Speed and Quad Speed buttons are located on the left side menu.

Click on “Pause” to stop the simulation giving you time to evaluate and discuss a procedure or maneuver. You can also configure you aircraft when paused. Click on “Pause” again to continue your flight.

Click on “Freeze Location” to freeze the simulation. The aircraft is will be frozen in space; however other the aircraft will continue to accept pitch, power, and bank input. Click on “Freeze Location” to continue the flight.

The “Double Speed” feature doubles your ground track/speed along the path of your flight. Click once to turn it on and again to turn it off; remember “Double Speed” will be 2(x) the simulation rate.

The “Quad Speed” feature quadruples your ground track/speed along the path of your flight. Click once to turn it on and again to turn it off. Remember “Quad Speed” will be 4(x) times the simulation rate.

## ***4.8 Reset Path***

The button for “Reset Path” is located on the bottom left side menu.

A path is indicated by the magenta line trailing behind the aircraft as it flies; if you have the “Show Path” feature selected which is indicated by a check mark on the right side menu. If you wish to turn off the path, click again on the “Show Path” check box. Click on the “Reset Path” button to reset the path; doing this will remove any existing path, and begin a new one.

## ***4.9 Information Center***

Along the bottom part of the IOS screen is an information center where the pilot or instructor can fill in information pertaining to the flight.

- Pilot: Displays current pilot, typed in by instructor of student
- Aircraft: Current aircraft being flown
- Instructor: Name of instructor, typed in by instructor
- Comments: Typed in by student or instructor
- Current Date: Date automatically received from computer
- Current Time: Time automatically received from computer

## ***4.10 Heading, Altitude, Airspeed and Transponder***

On the upper right side menu are check boxes that allow you to manipulate the Heading, Altitude, and Airspeed.

- Click the top buttons to increase number values, and the down buttons to decrease.
- To change the Transponder code, use the dials below the code on the radio stack.

## ***4.11 Check Boxes, Slew, and Zoom***

The checkboxes located on the right side of the IOS display are provided as a way of de-cluttering the map. When the items are displayed, the checkbox will be green and have the checkmark in it.

Pilots can slew the map in all directions with the large circular button.

To zoom in, click on the button with the large mountains. To zoom out, click the button with the small mountains.

Click “Center on Aircraft” to center the map on the aircraft.

## 4.12 Alternate Views

Alternate views can be accomplished by using Keyboard shortcuts. To 'activate' the commands, move the mouse pointer to the console screen displaying the aircraft cockpit.

Inside Views:

- [ Page Down ] Used to view the lower cockpit pane
- [ Page Up ] Used to view the upper cockpit panel
- [ W ] This provides the normal view of the cockpit. Use anytime to get the view inside the aircraft.
- [ ; ] This makes the cockpit transparent. Good for landings and takeoffs

Outside Views

- [ A ] This gets the view outside the aircraft and is necessary for the following views.
- [ Keyboard Arrows ] Moves view 360 degrees around the aircraft as well as up and down.
- [ + ] Moves View Closer
- [ - ] Moves View Away
- [ / ] Shows forces on various aircraft components. Press the Slash key twice to cancel

Yoke Control:

With X-Plane it is easy to view all the way around the aircraft while on the ground or in the air. This is especially helpful when you are doing non precision approaches and landing the aircraft. There is a rocker switch located on the top of the right grip. Push the rocker with your thumb to rotate the outside view.

Whenever the view is not directly forward, an orange plane symbol at the top of the view will remind you of which view you are in. You can cycle all the way around the aircraft 360 degrees by continuously pressing the switch.

### ***4.13 General Instruments for Aircraft***

Several of X-Plane's aircraft utilize the same instruments and avionics configurations. Although many of the instruments look the same there are obvious differences depending on the type of aircraft being flown. The aircraft in the Medallion Aircraft folder also contain a variety of different Instruments.

Some of the advanced aircraft such as the Mooney, A-36 Bonanza, Beech Baron, Seminole and Seneca are equipped with an HSI (Horizontal Situation Indicator).

- The HSI is always connected to the NAV1 Receiver. Adjustments to the indicator are done via the knobs on the front of the console
- The HSI has a Course Deviation Indicator (CDI) yellow line, orange aircraft symbol, Compass card

CDI (Course Deviation Indicator) is commonly found in most General Aviation Aircraft. It is connected to either NAV 1 or NAV 2. The compass card is rotated via the OBS selector. A red NAV flag indicates that it is out of range or not receiving a signal.

The Omni Bearing Selector Switch selects between OBS 1 and OBS 2. Depending on the aircraft you chose you may have only one OBS. If the aircraft only has one OBS, keep the switch to the "One" position.

An RMI (Radio Magnetic Indicator) is usually found in most of the X-Plane Aircraft. The RMI is a slaved compass card. It has a green needle that is slaved to the NAV2 receiver and the yellow needle is connected to the ADF receiver. If either needle is parked in the 90° position it means that it is not picking up the station.

### ***4.14 Radio Stack***

X-Plane communicates with navigation aids via the Radio Stack (there are no radios displayed in the software). FAA Approved flight training systems require the radio stack as an integral part of the ATD. These radios perform and resemble their real counterpart typically found in General Aviation Aircraft.

Along the bottom of the radio stack are 6 buttons; these control functions in the X-PLANE software.

RESET = Resets flight back to origin

START = Resets flight back to origin

FREEZE = Freezes the aircraft in flight however the dynamic weather settings do not cease.

MAP = Hide / Display instructor screen

CON = Takes pilot directly to the weather settings page.

INSTR = Hide / Display instructor screen

All X-Plane aircraft are equipped with a Flight Management Annunciator (FMA) display. This display shows the current condition of the autopilot in use.

#### ALTITUDE PRE-SELECTOR

The Altitude Pre-Selector works with or without a flight director. As part of the Autopilot system there is a switch, push buttons and encoder on the avionics stack that controls the V/S (vertical speed) and ALT (altitude). If used in conjunction with the autopilot adjusting the V/S and ALT will move the flight director up or down. With the autopilot engaged the flight director will try to maintain the vertical speed that you have set in the window and capture the altitude selected.

Note: Hardware is provided to control the VS and ALT.

#### FLIGHT DIRECTOR (V bar type)

Some aircraft in X-Plane are equipped with a Flight Director. If you are flying an aircraft that utilizes a Flight Director the “FD” button on the autopilot will enable and disable it. Also located on the control yoke are the Pitch Sync buttons that will sync the Flight Director to the current pitch attitude of the Aircraft.

### ***4.15 System Shut Down Procedures***

Click on “QUIT ALL” which will shut down the X-Plane program.

- If you are also finished with the computer:
  - Turn off the 4 Red Rocker switches
  - Click on (Start – Turn Off Computer) on the console screen.
    - A window will pop up on the console screen – confirm you wish to turn off the computer.

If you wish to end your session completely; click on “SHUT DOWN ALL” from the IOS; which will shut down the program and the computer.

- Turn off the 4 Red Rocker switches

## **SECTION 5: ELITE**

**Additional detailed information on using ELITE can be found in the ELITE Operator's Manual that should be located nearby.**

## ***5.1 Program Launch***

After you double click on the ELITE icon on the computer desktop, you will be presented with aircraft options. Be sure to use the scroll bar on the right to see all of your options.

- Double click the aircraft to select it.

Next you will be presented options of airspace to fly in. Most people chose Alaska, the top left option.

- Double click your desired airspace to select it.

You should see the aircraft panel on the console screen and the Instructor's Operating Station on the instructor screen.

It is possible that the instrument panel and IOS are switched from where they should be. If this happens there is a video router box which is used to change monitor images to the appropriate screen. Instructions should be posted on the wall and are labeled "Change Monitor Images".

The program will begin in "Freeze" mode with the parking brake set.

- To unfreeze, click the "FREEZE" button on the bottom of the radio stack.
- To release the parking brake
  - Locate the button just below the yoke (labeled "Parking Brake"). Press the button to release the brakes.

## ***5.2 Instructor Operating Station (IOS)***

The IOS display on the ATD instructor screen is the main interface for operating the program.

To change values using the on screen knobs, click and hold down on the center of the knob and drag to the right to increase values and to the left to decrease values.

The IOS is largely made up of the Map display.

The instruments at the top of the screen are duplicates of the instruments in the cockpit.

Most options are located on the right hand side of the screen. There are options to change the heading, altitude and airspeed. You also have various Map viewing options, vertical profiles, replay options and Map repositioning options. The zoom in and out tools are at the bottom right hand area.

Along the right hand side are various options

- Clear – deletes the path traced behind the aircraft

- Print – prints the contents of the IOS
- Path – Saved the path traced behind the aircraft
- Route – Create, manipulate and save routes. Consult the ELITE Operators Manual for instructions on how to use this.
- Radial – Displays a radial on any fix, airport or navigational aid. Click the radial button first and then select a fix, airport or nav aid.
- Profile and Extended – displays a the vertical profile of glide path for the airport you are approaching
- Replay – use the controls to replay your flight
- Repose – reposition your aircraft to a different airport.

The “**Menu**” at the bottom right of the page gives you many options, the relevant ones follow,

- Quit – Exits the program
- Malfunctions – select from the options
- Meteo – change the weather over time or instantly
- Map – returns you to the default IOS view
- Control – set the time, payload and fuel imbalances

### ***5.3 Map Positioning & Zooming***

Your aircraft is represented by a red aircraft symbol on the IOS screen. You can move the IOS screen to view an area that is not shown or you can zoom in and out.

Reposition the IOS screen

- Click on a red arrow pointing (up, down, right or left) These are located under the “repos” button, located on the lower right area of the screen.
- Center the view to the aircraft by clicking on the red aircraft symbol, located in the center of the red arrows.

Zoom In and Out

- There are two magnifying glass symbols located on the bottom right of the screen, they are a bit hard to see. These zoom the IOS view in and out.

### ***5.4 Reposition Aircraft***

At any time you can reposition your aircraft anywhere by using the IOS.

- Freeze the simulation by pressing the “Freeze” button located on the bottom of the radio stack.
- Increase your altitude by using the knob located above the label “True Alt (ft)”. This is located on the upper right area of the screen

- Give your aircraft some speed, (or you will plummet to the ground). Use the knob above IAS (kts)”
- Click on the red aircraft symbol, located on the IOS and drag it to where you would like to be.
- Press the “Freeze” button again to unfreeze the simulation

## ***5.5 Shortcuts***

Click the ? button located on the lower right area of the screen to display a list of helpful shortcuts.

## ***5.6 Finding Frequencies***

The frequencies in the ELITE software are not the current frequencies in the real world. To find the ILS frequency that you have to use for an airport, zoom into the airport and click on the ILS symbol. These symbols are located on the front or end of the runways and are small circles with two legs sticking out an angle of about 30 degrees.

## ***5.7 Airport Selection***

- Click the “repos” button and
- Click on your desired airport name. Be sure to use the scroll bar to see all of your options.
- Click the “Choose” button

## ***5.8 Aircraft Selection***

Aircraft are selected at program start. To select a different aircraft

- Select Menu and then “Quit”
- Restart ELITE

## ***5.9 Time***

To change the time and date

- Select Menu and then Control
- Under the “Visual Control” heading, upper left area of the screen, use the knobs to select the date and time of day.

## ***5.10 Weather (Cloud Layer, Visibility, Wind & Turbulence, Altimeter, Temperature, Structural Icing)***

- Select Menu and then “Meteo”
- There is a Wind page and a Clouds page. Use the button near the bottom center of the page to switch between these. The weather is updated immediately or over time, in layers or not, as you chose. All times are referenced to the “Ref. Meteo Time” located in the bottom left of the screen. Reset this by clicking the “Reset” button

### ***5.10.1 Visibility***

You have options when setting the visibility

- Immediately - use the arrows to the right of the “To” on the bottom visibility row.
- Over Time – Set start and end time points for the visibility to change between.
  - Set the time in the left box using the left knob. This is the time that the visibility will be what is set in the “From” box. You will be able to change this after you set the end time.
  - Set the time on the right box using the right knob– this is the end time when the visibility will be what you set in the “To” box.
- Layers – when you create cloud layers, you can set the visibility between them.

### ***5.10.2 Clouds***

You have options when setting the clouds. The bottom layer of clouds is called “Cloud Layer 3”. The buttons to the right of “Coverage” (located on each cloud layer) create cloud cover from clear sky to overcast.

- Immediately – Using Cloud Layer 3. With the “Coverage” button “Ovc” (overcast) selected you can set the top and base of a cloud layer by using the arrows to the right of the “To” boxes for each. With any of the other “Coverage” buttons selected, you can only set the base layer.
- Over Time – Set start and end time points for the top and/or base of the cloud layer
  - Beginning with Cloud Layer 3. Select the “Coverage” button “Ovc”.
  - Set the time in the left box using the left knob. This is the time that the cloud (top or base) will be what is set in the “From” box. You will be able to change the “From” value after you select these times.
  - Set the time in the right box using the right knob. This is the end time when the cloud (top or base) will be what is set in the “To” box(es).
- Layers – You can set additional layers by using the “Cloud Layer 2” and “Cloud Layer 1”

### ***5.10.3 Wind & Turbulence***

If you are on the Cloud page after you select “Meteo” from the Menu, then select the “Wind” button located near the center of the page on the bottom of the screen.

You have options when setting the wind. Three layers of wind are available and you can set the direction, speed and turbulence for each. The buttons labeled “CW” or “CCW” stand for clockwise and counterclockwise respectively. The “+/-” button when clicked for direction provides variable wind plus or minus 10 degrees. The “+/-” for the speed provides variable wind speed. Turbulence values from 1 (light) to 12 (extreme) are available.

- Immediately – Use the up/down arrows to the right of each “To” box for direction, speed and turbulence.
- Over Time – Set start and end time points for direction, speed and turbulence.
  - Set the time in the left box using the left knob. This is the time that the wind condition will be what is set in the “From” box. You will be able to change the “From” values after you select these times.
  - Set the time in the right box using the right knob. This is the end time when the wind condition will be what is set in the “To” box(es).
- Layers – You can set additional layers, as provided in the software.

### ***5.10.4 Altimeter***

The altimeter settings are on the Wind page. It is set using the same method as the wind.

### ***5.10.5 Temperature***

The temperature settings are on the Wind page. It is set using the same method as the wind.

### ***5.10.6 Structural Icing***

The structural icing settings are on the Wind page.

- Enforce – click this button and select an intensity level to activate icing regardless of outside air temperature.
- Enable – click this button and select an intensity level to activate temperature/moisture dependant icing. Ice will begin forming at the intensity level chosen anytime the aircraft is in visible moisture and the temp. is 32 degrees Fahrenheit and lower. Visible moisture is defined as ¼ stature mile visibility and less, or flying in an overcast layer.

### ***5.11 Weight & Fuel***

Access the settings for weight and fuel by selecting “Control” from the Menu. Use the knobs to set the payload and fuel in each tank. Fuel imbalances can affect the center of gravity if you select the button “Fuel imbalance Affecting CG”.

### ***5.12 Malfunctions***

Access the settings for malfunctions by selecting “Malfunctions” from the Menu. You have the opportunity to selectively or randomly fail individual instruments, systems, avionics, engines, gear, flaps and much more.

Note: All timed failures reference the time indicated in the lower left area of the screen labeled, “Ref. Failure Time”. This means that all failures will begin according to this time. Reset this time to zero by clicking the “Reset” button.

Notice the button in the lower left area of the screen labeled “Clear all failures”

For additional instructions on malfunctions, consult the ELITE Operators Manual that should be located nearby.

### ***5.13 Save & Load a Flight***

You can save a flight with the aircrafts position, altitude, heading, airspeed, current avionics settings. You also can save the weather and malfunction information as well. These options are available on the default IOS view. If you are on another page, select “Map” from the Menu.

**Save:** Make sure the aircraft is set up the way you would like and then click the “save” button under “Aircraft State”. Give the file a name that is meaningful. You will be given the option to save specific information with the file. You can ignore saving the Navigation Data information.

**Load:** Click the “load” button under the heading “Aircraft State” and select your file from the options.

### ***5.14 Freeze and Speed***

You can freeze the simulation whenever you like by pushing the “Freeze” button, located on the bottom of the radio stack.

Speed up the simulation by pressing F on the keyboard. Slow the simulation by pressing S.

## ***5.10 Quit & Shutdown***

Select “Quit” from the Menu, which will shut down the ELITE program.

- If you are also finished with the computer:
  - Turn off the 4 Red Rocker switches
  - Click on (Start – Turn Off Computer) on the console screen.
    - A window will pop up on the console screen – confirm you wish to turn off the computer.

## **SECTION 6: CFIT AVOIDANCE**

## 6.1 Introduction

Definition:

CFIT occurs when an airworthy aircraft is flown, under the control of a qualified pilot, into terrain (water or obstacles) with inadequate awareness on the part of the pilot of the impending collision.

Some contributing factors of CFIT accidents:

### **Deteriorating Visibility:**

- Avoidance Considerations and Preparation: Pilots should recognize that deteriorating weather conditions may exist on the route of flight, even if all indication is for fair weather. Follow pre-determined weather minimums and execute a 180 degree turn or divert when those minimums are met.
- Knowledge of in-flight visibility. Develop a procedure(s) for estimating in-flight visibility and utilize the procedure when flying in the ATD.
- Develop procedure for course reversal: consider terrain, aircraft performance, obstruction clearance, and communication.

### **Flat Light:**

Flat light is an optical illusion, also known as "sector or partial white out." It is not as severe as "white out" but the condition causes pilots to lose their depth-of-field and contrast in vision. Flat light conditions are usually accompanied by overcast skies inhibiting any good visual clues. Such conditions can occur anywhere in the world, primarily in snow covered areas but can occur in dust, sand, mud flats, or on glassy water. Flat light can completely obscure features of the terrain, creating an inability to distinguish distances and closure rates. As a result of this reflected light, it can give pilots the illusion of ascending or descending when actually flying level. However, with good judgment and proper training and planning, it is possible to safely operate an aircraft in flat light conditions.

Avoidance Considerations and Preparation:

The key to preparation is recognizing that flat light/gray out conditions may exist on your route of flight. Consider whether terrain on your route of flight is flat, featureless, and covered with snow. Featureless terrain means there aren't any trees, rocks, stumps or other characteristics available that enable you to accurately judge your height above ground. Will you be flying low level over glassy water out of sight of land? Will there be overcast? If you will be flying over snow covered featureless terrain with an overcast, you will more than likely encounter flat light/gray out conditions during a portion of your flight.

- Do you or operate within an area where flat light/gray out can occur?
- Do you operate during flat light/gray out conditions? If yes, what are the procedures you use for operations during these conditions?
- Preflight – do you expect flat light or gray out conditions to be present on your route of flight today? Yes, or No. If yes, what are you prepared to do if flat light/gray out is encountered?
- Mission Requirements: will you traverse an area of flat light route of flight? If so, consider establishing a "minimum enroute altitude" or a "minimum sector altitude" so to provide a safe height above ground. If there is overcast in the area of intended flight, and it is low enough that

you can't maintain a safe distance above the ground and at least regulatory distance from clouds, consider a different route or cancel the flight. If the flight requires landings, plan ahead and possibly take something along to mark the ground around the landing area.

**White Out:**

As defined in meteorological terms, white out is when a person becomes engulfed in a uniformly white glow. The glow is a result of being surrounded by blowing snow, dust, sand, mud or water. There are no shadows, no horizon or clouds and all depth-of-field and orientation are lost. A white out situation is severe in that there aren't any visual references. Flying is not recommended in any white out situation. Flat light conditions can lead to a white out environment quite rapidly, and both atmospheric conditions are insidious: they sneak up on you as your visual references slowly begin to disappear. White out has been the cause of several aviation accidents in snow-covered areas.

**Self-Induced White Out:**

This effect typically occurs when a helicopter takes off or lands on a snow-covered area. The rotor down wash picks up particles and re-circulates them through the rotor system. The effect can vary in intensity depending upon the amount of light on the surface. This phenomenon can happen on the sunniest, brightest day with good contrast everywhere. However, when it happens, there can be a complete loss of visual clues. If the pilot has not prepared for this immediate loss of visibility, the results can be disastrous.

**Avoidance Considerations and Preparation:**

Recognize that whiteout conditions may exist on your route of flight for the day. Consider whether the terrain on your route of flight is flat, or snow covered with little to no prominent markings. Will you be flying at low level over calm water? Will there be overcast? If you will be flying over calm water with low overcast conditions, you may encounter gray out. Practice in recognizing and avoiding conditions which are conducive to the onset of white out/gray out.

- Do you operate in an area where white out occurs?
- What is your company's procedure for recognizing and avoiding white out/gray out?
- Flight – Can you file IFR? Have a plan if going VFR. Keep visual contact with the ground with adequate ground clearance?
  - Never fly past the last good visual reference point on your route of flight. Execute a 180 degree turn or otherwise divert before you get to the visual reference point
- What are your procedures for exiting an encounter with whiteout conditions?

**Escape Maneuvers:**

Escape Maneuvers are intended for use as an avoidance or 'escape' from inadvertent flight into flat light, white out or deteriorating visibility. These maneuvers should be planned out in advance and used as a procedure to be followed. The procedure may call for continuing into the condition after filing IFR, diverting, declaring an emergency, or other form of avoidance. Action is the key when you recognize that your minimums have been exceeded.

Medallion provides both the fixed wing and the helicopter ATDs to practice CFIT Avoidance scenarios. Pilots are encouraged to utilize these scenarios for practice in recognition of the above conditions; and perform their escape maneuvers in a simulation environment.

Pilots are encouraged to develop their own weather minimums before starting a session on the ATDs. Having a firm plan of action helps prepare you to be looking out for the visual cues indicating the flight may be entering one of the three conditions common to CFIT accidents.

Keep in mind while performing the CFIT Avoidance scenarios: Depending on your level of experience and comfort level as a pilot, your minimums and escape maneuver may not be the same as your buddy's.

## ***6.2 CFIT Avoidance Scenarios***

The following are three scenarios developed for practicing CFIT Avoidance recognition techniques and escape maneuvers. These scenarios are designed to work in both Microsoft Flight Sim and X-Plane. Each scenario can also be re-located to better replicate the pilot's real life flying experience.

Tips for setting up these scenarios:

- Stratus clouds work the best for either program.
- Ensure that the clouds are displayed in the highest detail.
  - Click on ALT, then choose the Options tab and select Settings.
  - Click on Weather and choose the highest detail settings for clouds.

### **6.2.1 ATD set-up for Deteriorating Visibility (VFR into IMC)**

1. Position aircraft at Anchorage International Airport. The route of flight will include a VFR departure from ANC and flight up Turnagain Arm, finishing up Portage Pass.
2. Set Stratus cloud layer base at ANC OVC 3000 feet – tops as desired
3. Set visibility at ANC to 10 miles.
4. Click OK – then select the “Stations you have not set” bubble
5. Set Stratus cloud layer base at OVC 800 feet – tops as desired
6. Set visibility at to  $\frac{3}{4}$  mile
7. Depart Anchorage and fly up Turnagain Arm toward Portage Pass.
8. As the weather deteriorates, begin estimating in-flight visibility. Continue to assess visibility as the flight continues.
9. When weather minimums are reached. Execute the course reversal or divert according to the pre-determined procedure.
10. Debrief or alter as necessary.

## 6.2.2 ATD Set Up for Flat Light

ATD setup for simulating flat light conditions over featureless snow covered ground or water.

1. Place the aircraft on a 10 mile final to ANC RNWY 7R at 1500ft MSL, heading of 070. Freeze aircraft at this location.
2. Put a cloud deck (undercast) beneath the aircraft with the base at 50ft MSL, and the tops at 200ft MSL. Set the visibility for 0mi in the undercast.

The top of the undercast layer is the simulation of featureless snow covered terrain, or flat calm water with an overcast.

3. Place a second cloud deck over the aircraft with the base at 5500ft MSL. Set the visibility at about 0mi within this cloud layer. (NOTE: the weather is 5500ft overcast and visibility is good. VFR conditions)
4. Create a third visibility layer between 250' – 5500' at 10mi.
5. Unfreeze aircraft and begin flying to ANC
6. As you fly this route, try to determine your height above the "ground". Begin a series of gradual climbs and descents; as you maneuver, continue to call out or estimate your height above the "ground". (You will not be able to determine your height above ground until you "crash")
7. Replace the aircraft at the original position and begin the same scenario again. This time, practice your procedure for **recognition of the onset and avoidance** of flat light/gray out conditions. i.e.; escape maneuver, transition to instruments, diverting, etc.

### 6.2.3 ATD Set Up for White Out

#### White Out/Gray Out

ATD set-up for demonstrating whiteout conditions in snow or gray out over water.

1. Place the aircraft over Nenana airport at an altitude of 2000 feet on a heading of approximately 010 and freeze.
2. Put a cloud deck (undercast) under the aircraft with a base at ground level, and tops at 1000 feet MSL. Set the visibility at 0 miles within the undercast. The top of the undercast is the simulation of featureless snow covered terrain, or flat calm water under an overcast.
3. Place a second cloud deck over the aircraft with a base at 5500 feet MSL. Set the visibility at 0mi within the cloud layer.
4. Set a third visibility layer between the two cloud layers at 5mi.
5. Unfreeze the aircraft and begin toward the hills that provide a good ground reference. Notice that everything in front of the aircraft is white except for the hills. (MS Flight Sim programmed for Winter does a great job of realism here)
6. Continue the flight until you have lost sight of the hills. As you approach the hill, notice that there aren't any additional ground reference points beyond the hill.
7. You will notice that you are now looking at uniformly white or gray glow and you have no horizon, clouds, or depth perception. The only way to fly now that you have flown past your last point of reference is to use your instruments.
8. Replace the aircraft at the original starting position and begin the flight again. Practice your procedures for **recognition of the onset and avoidance** of whiteout or gray out conditions. Your procedures should include at a minimum, never flying past your last visible ground reference point.

## **SECTION 7: GPS**

Microsoft Flight Simulator has two GPS units to choose from; one a handheld and the other a panel mount. Both are representations of Garmin units.

The panel mount is a GPS 500. The handheld is a GPSMAP 295.

Microsoft has published a guide for using the GPS units in Flight Simulator. This “Using the GPS” guide can be found in the Learning Center of MS Flight Sim X under Navigation. For convenience, it has been copied and placed in this section so pilots can learn the functions while flying.

To find the “Using the GPS” guide in the Learning Center; click on Learning Center from the home screen of the program, then click on Navigation.