INSTRUCTOR'S POSITIONAL HANDBOOK

FOR THE

JOINT PRIMARY AIRCRAFT TRAINING SYSTEM
GROUND BASED TRAINING SYSTEM
T-6A FLIGHT TRAINING DEVICES

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SAFETY PRECAUTIONS

Certain safety precautions must be observed during disassembly, handling, and assembly of equipment and components. These precautions are necessary to prevent severe injury to personnel and damage to equipment or components. Personnel must also observe certain precautions when handling electrical components. Do not attempt to service any equipment, unless adequate personnel for lifting the equipment are readily available.

WARNING AND CAUTION STATEMENT

WARNING and CAUTION statements have been appropriately placed throughout this text. WARNING statements occur prior to procedures, practices, or conditions considered essential for the protection of personnel. CAUTION statements contain information necessary to prevent equipment and property damage. A WARNING or CAUTION will apply each time the related step is repeated. Before starting any task, the WARNING and CAUTION statements included in the text for that task will be reviewed and understood. Carefully observe all warnings and cautions within or preceding any procedural step in this manual for maximum personal and equipment safety.

KEEP AWAY FROM LIVE CIRCUITS

Ensure all maintenance performed is in compliance with Lockout/Tagout system policies. Hazardous voltages are present within this equipment. Do not replace components or make adjustments inside the equipment with the electrical supply turned on. Under certain conditions, dangerous potentials may exist in circuits even with power controls in the off position, due to charges retained by capacitors. To avoid injuries, always disconnect power and discharge capacitors before touching any parts.

JEWELRY AND LOOSE CLOTHING

Remove rings, watches and other metallic objects to reduce the risk of shock and to prevent snagging on moving machinery. Do not wear loose clothing that could become entangled in moving machinery. Tie up long hair or tuck it under a cap while performing maintenance.

CLEANERS, CHEMICALS, AND FLUIDS

Some cleaners, chemicals, and fluids have an adverse effect on skin, eyes, and respiratory tract. All handling of hazardous material should be in compliance with the HAZMAT program for your facility as regulated by the Military Installation policies. Observe manufacturer’s WARNING labels. Use only in authorized areas. Unless otherwise indicated in the text, use of these fluids should not result in any immediate health concerns. In general, avoid prolonged skin contact and prolonged inhalation of mist or vapors. Wash affected areas with soap and water, and launder contaminated clothing. Some fluids become very hot during normal system operation. Use caution when disconnecting fluid lines and allow the system time to cool before performing maintenance. Finally, make sure fire-fighting equipment is readily available and working order.

ELECTROSTATIC DISCHARGE

This equipment contains semiconductor devices and circuit card assemblies that may be damaged by seemingly undetectable electrostatic discharge. Care must be exercised during handling or repair of these items. A reasonable level of device protection can be achieved by using a grounded wrist strap when handling ESD sensitive devices, working on an ESD protected workbench, using ESD protective packaging for shipping and storing ESD sensitive devices. Detailed electrostatic (ESD) guidelines are provided in DOD-HDBK-263.

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SECTION 1. INSTRUCTOR STATION OVERVIEW

1.1. INTRODUCTION

The purpose of the Instructor Operating Station (IOS) is to provide the facility from which the instructor can monitor, control, and direct the training environment to which the student is exposed. This manual describes the Instructor Operating Stations for the T-6A OFT, IFT, and UTD flight training devices.

1.2. HOW TO USE THIS DOCUMENT

This manual is a guide to operating the Instructor Station and Simulation Control Panel. It consists of eight sections. Section 1 describes the components of the Instructor Station. Section 2 describes the controls and provides detail procedures available to the Instructor. Section 3 describes the Instructor Station screen fundamentals. Section 4 describes each of the Instructor Station screens. Section 5 describes each of the Simulation Control Panel screens. Section 6 describes the recording of Demonstrations and Formation Lead Profiles. Section 7 provides information about visual airfield depiction and weather areas.

1.3. OVERVIEW

The Instructor Station is located to the side of the cockpit. It consists of a console with a control panel, two display screens for simulation, one display screen for visual presentations on the OFT and IFT, a keyboard and mouse for simulation controls, and a printer for hardcopy capability. Figure 1-1 illustrates the OFT-IOS layout. Figure 1-2 illustrates the IFT-IOS layout. Figure 1-3 illustrates the UTD-IOS layout. The Instructor Stations have similar configurations for each JPATS Flight Training Device (FTD). It is important that each instructor and all personnel using the simulators be familiar with their controls. The IOS functions as the instructor's interface with the simulator and the student. The Instructor Station also provides maintenance capabilities such as software debugging, self-diagnostics, and computer diagnostics. The instructor's tools are the monitors, keyboard, mouse, and the control panel. In addition, there is a printer for capturing screen prints and a digital recorder, which allows for recording of two hours of the training period. In addition to the IOS, the simulator has a Simulation Control Panel, which is a small hand held terminal that can be used in the cockpit to provide limited control of the simulator.

For information concerning the location and use of the control panel, indicators, printer, and other hardware components, consult Section 2. The startup, operation, and shutdown of simulation are discussed in Section 3. Before using the screens or starting a lesson read Sections 3, 4, and 5. Simulator hazards and emergency shutdown procedures are discussed in Section 1.

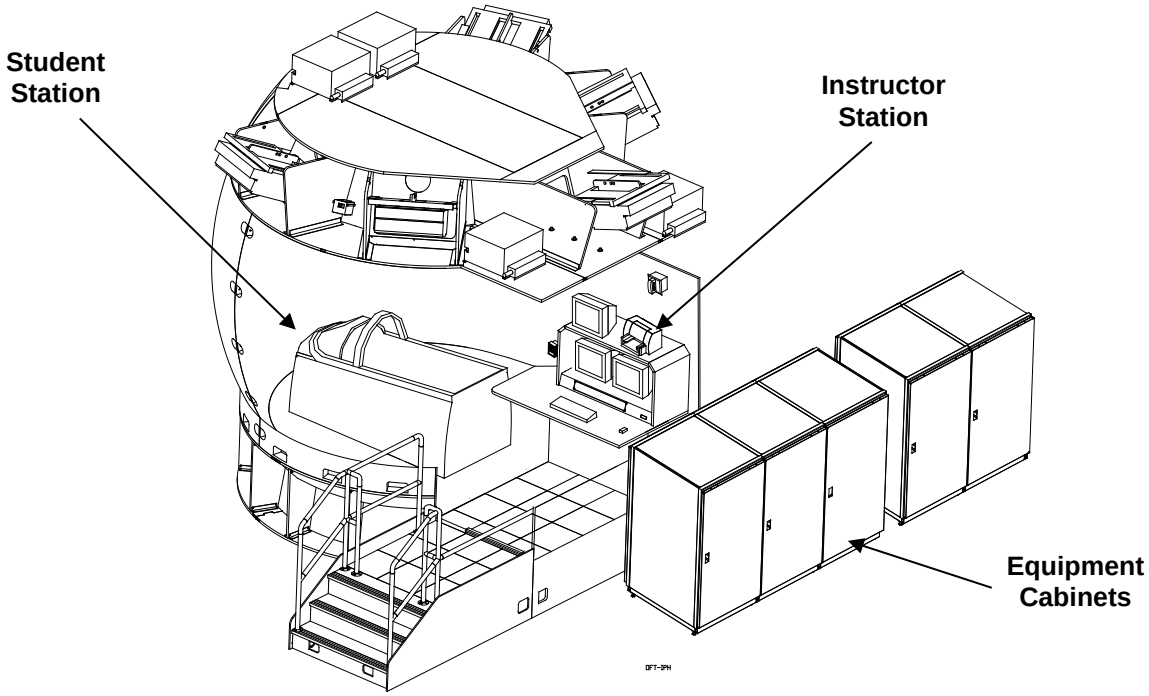


Figure 1-1. Operational Flight Trainer (OFT)

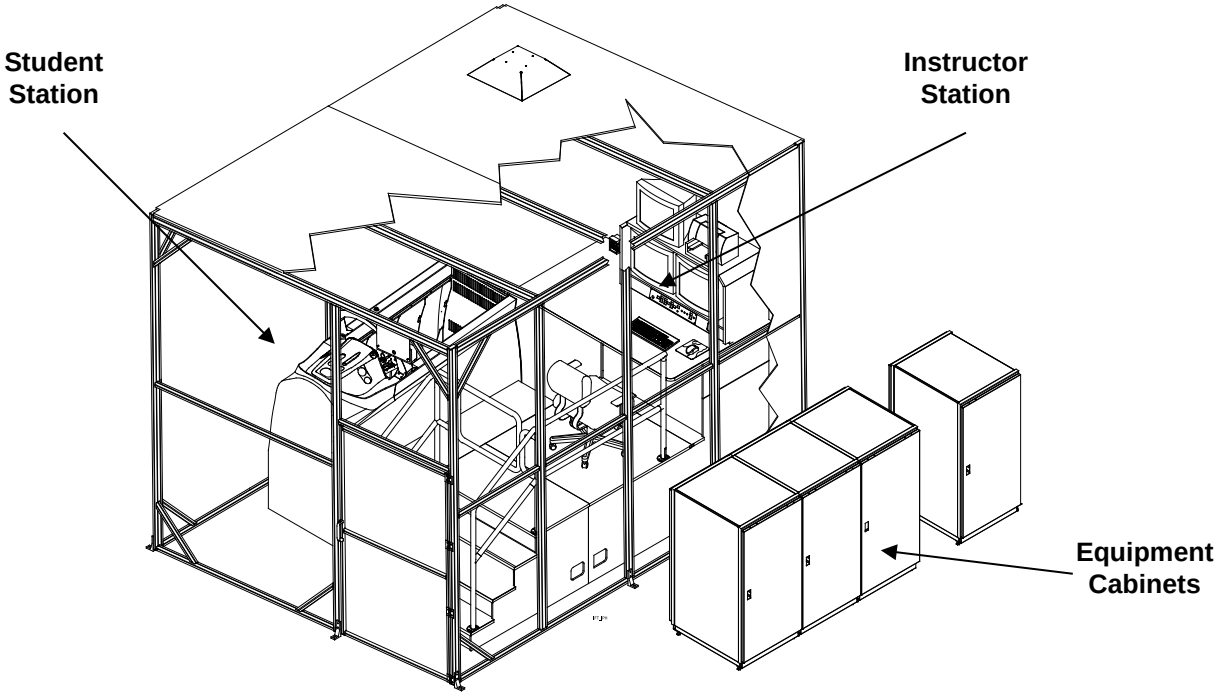


Figure 1-2. Instrument Flight Trainer (IFT)

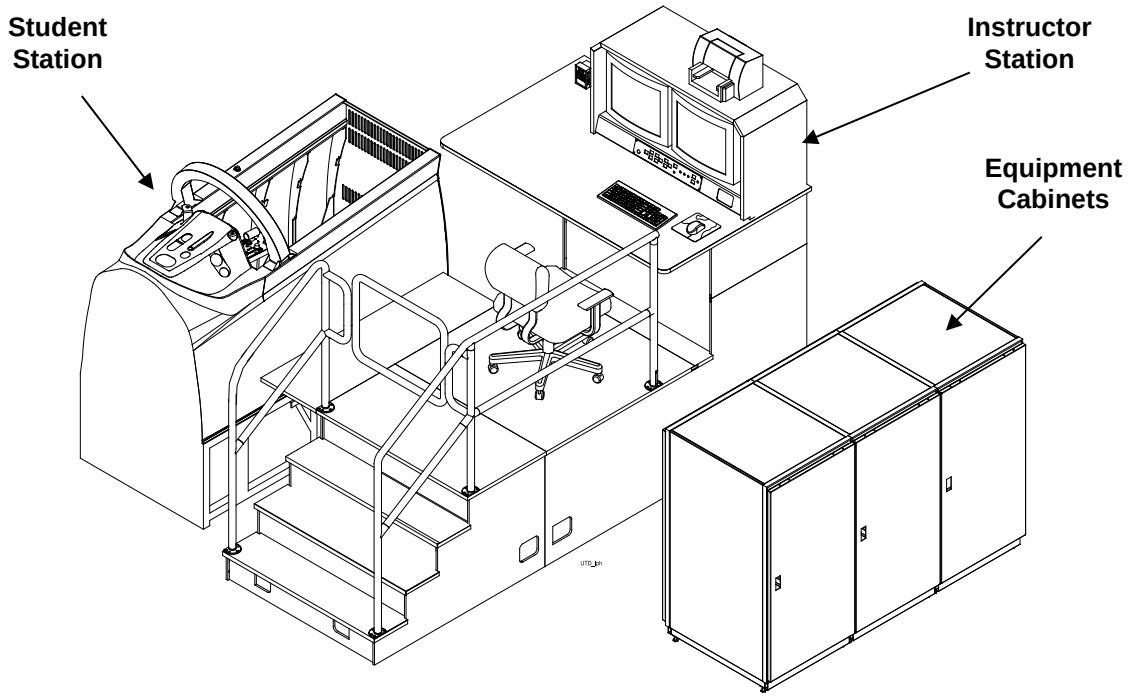


Figure 1-3. Unit Training Device (UTD)

1.4. GENERAL SYSTEM DESCRIPTION

The IOS is composed of two systems: hardware and software. The hardware system is presented in the first part of this manual. The screens themselves, through which most of the instructor's interface with the simulator is accomplished, are considered part of the software, and are presented in Section 4. The Simulation Control Panel screens are presented in Section 5.

In the hardware system, the main operator related components are:

- CONTROL PANEL & AUDIO JACK
- INSTRUCTOR STATION EQUIPMENT

  MONITORS MOUSE KEYBOARD

  PRINTER ALARM PULL
- SIMULATION CONTROL PANEL

1.5. HARDWARE FEATURES

The monitors and panels located in the instructor compartment communicate with the host computer to allow the instructor to control and monitor simulated flight.

1.5.1. Instructor Operator Station

There are two versions of the Instructor Station. One version has three monitors that are used on the IFT and OFT. The third monitor is a Visual Repeater and displays one channel of the visual display. The second version has two monitors that are used on the UTD. See Figure 1-4 and Figure 1-5. In addition to the monitors, the Instructor Station contains a control panel, keyboard and mouse, printer, audio jack panel, and an IOS alarm pull panel.

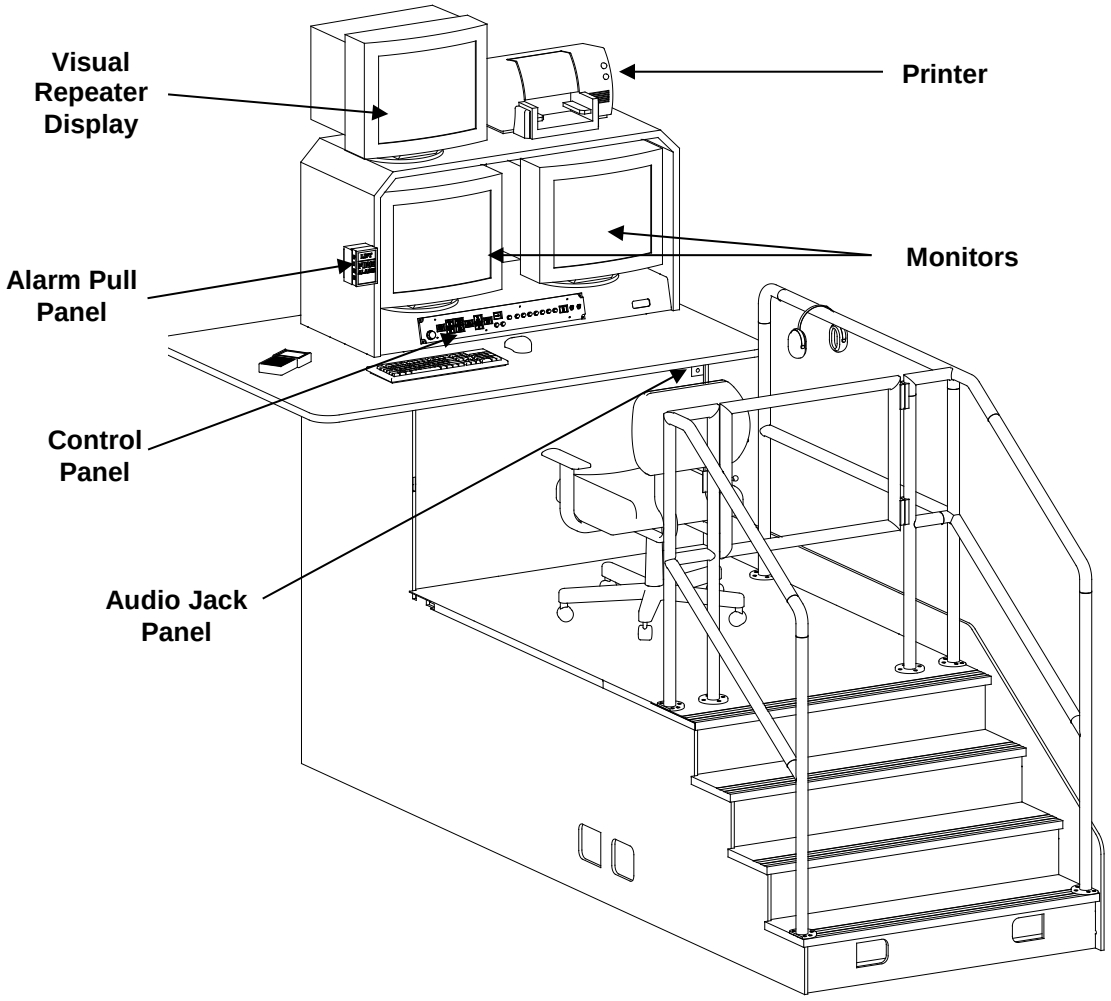


Figure 1-4. OFT/IFT IOS Layout (IFT config. shown)

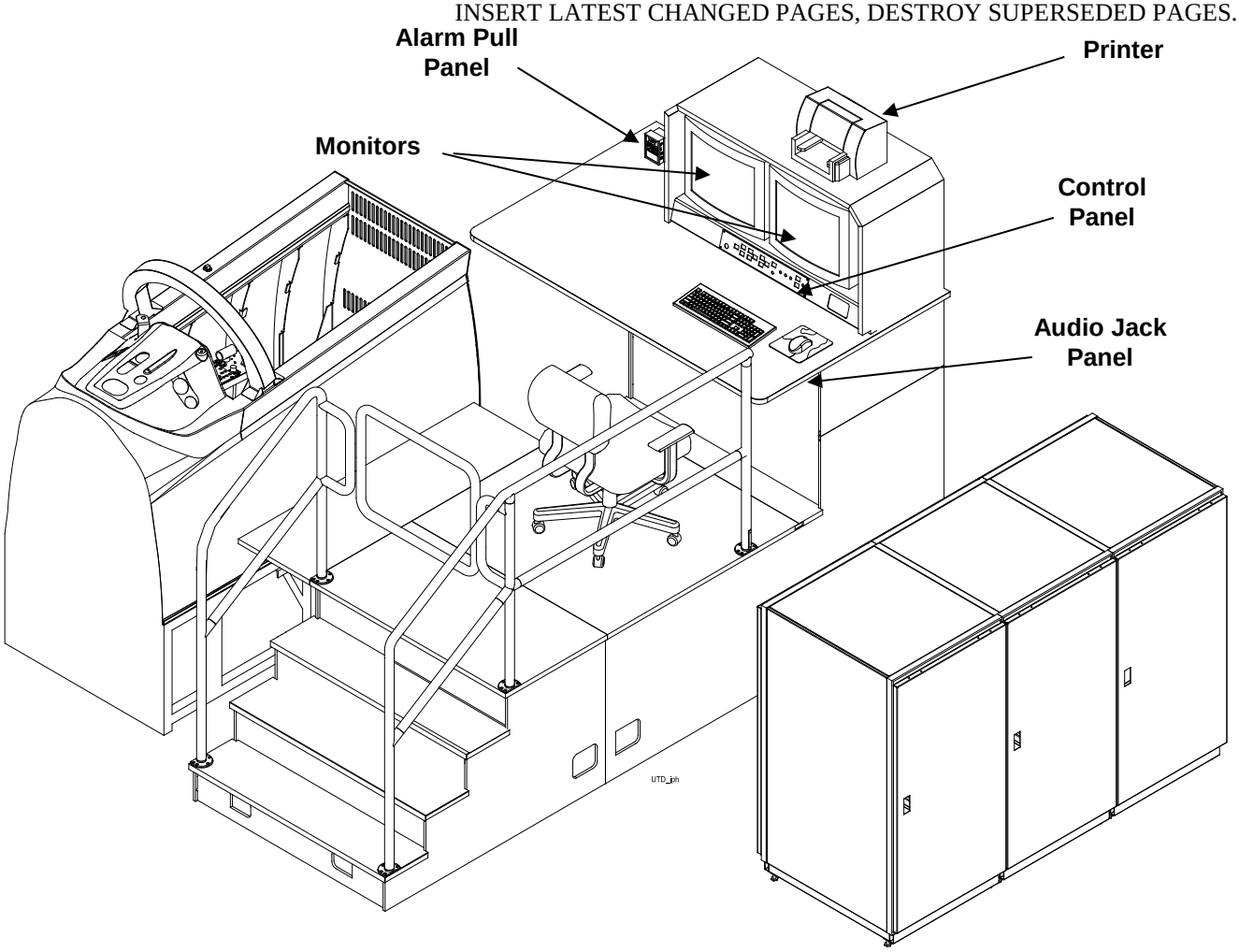


Figure 1-5. UTD IOS Layout

1.5.1.1. Control Panel

There is a control panel on the instructor station. The controls include Emergency Power Off, Master Power, Control Loading Arm, Dynamic Seat Arm, Parameter Freeze, Total Freeze, Crash Override, T/O Point, Approach IAF, System Reset, Compartment Lighting, Console EL, Simulator Sound, Interphone Volume Control, UHF Volume, VHF Volume, NAV Volume, Marker Volume, DME Volume, Radio Select, MIC Key, and Audio Select. The switches located on this panel can be used, independently or in conjunction with other simulator systems, to control and monitor simulation. Figure 1-6 shows the location of the control panel.

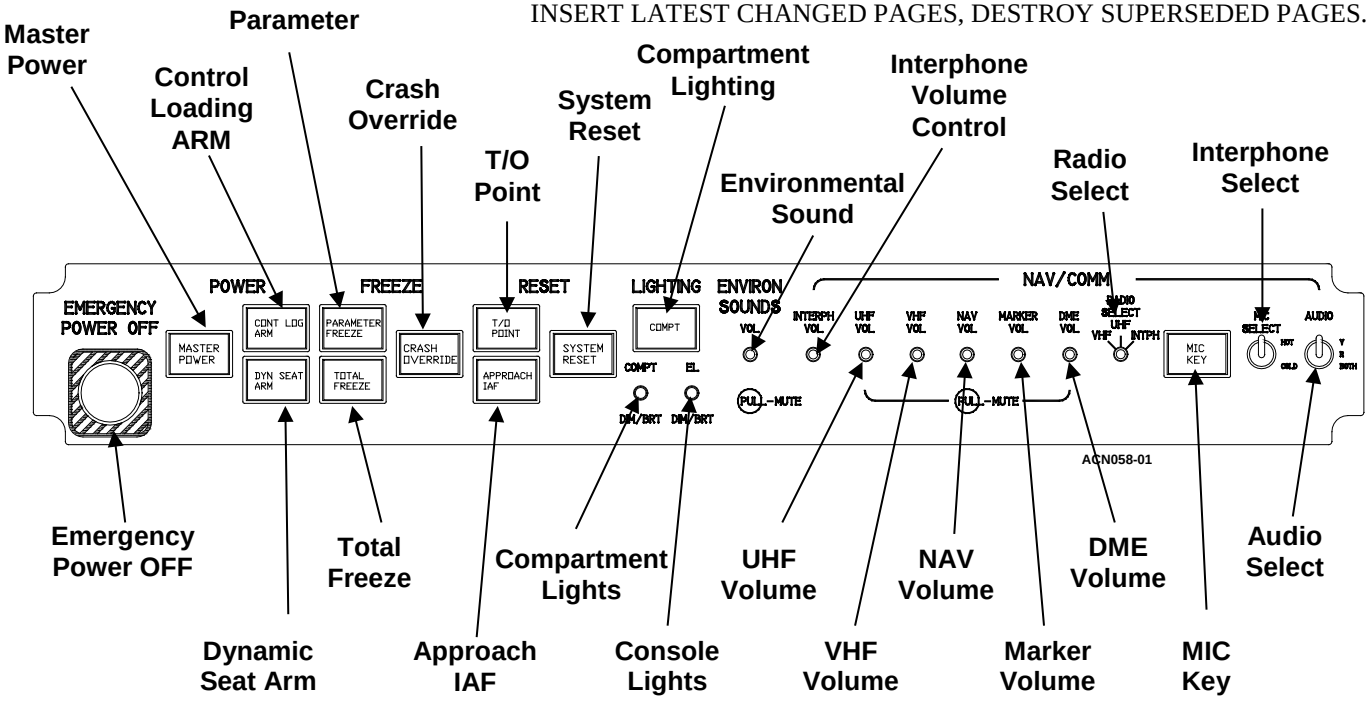


Figure 1-6. IOS Control Panel

1.5.1.2. Keyboard and Mouse

The keyboard is used by the instructor to enter data into the screens where required. The mouse is used to select items on the monitor screens and to navigate between the screens.

1.5.1.3. Monitors

Two CRT type monitors are associated with the UTD Instructor Station and three are associated with the IFT and OFT IOS Stations. These devices measure 21" diagonally across the display surface. The controls found on them consist of manual adjustments for brightness, contrast, and focus. The two monitors found side by side, just above the instructor's work surface on all three-trainer configurations make up the lesson control displays. The third one, found on top of the OFT and IFT IOS stations, provide viewing of a select part of the visual display. On the OFT, the third monitor displays the center channel of the visual system display. On the IFT, the third monitor displays the entire visual scene.

1.5.1.4. Printer

The printer is a color graphics printer and is usually located on the top shelf on the right hand side of the instructor station. This printer will print most screen displays from the monitors.

1.5.1.5. Audio Jack Panel

The Audio Jack panel is located below the writing table. It is used to interface the instructor's headphones to the simulator's audio circuits. Refer to Figure 1-4 and Figure 1-5 for the locations of the Audio Jack panel.

1.5.1.6. IOS Alarm Pull

The IOS Alarm Pull panel is mounted on the left side of the Instructor Station. It contains the fire alarm pull handle to activate the fire alarm. Refer to Figure 1-4 and Figure 1-5 for the location of the IOS Alarm Pull panel.

1.5.2. Simulation Control Panel

The Simulation Control Panel is a small hand held terminal that can be taken into the cockpit by the student. See Figure 1-7. The Simulation Control Panel provides limited control of the simulator. Section 5 of this manual contains information on the operation of the Simulation Control Panel.

Figure 1-7. Simulation Control Panel

1.6. SOFTWARE FEATURES

Programs stored in the host computer control the reactions of the simulator. Simulation software interfaces with simulator hardware devices to generate an accurate representation of an actual flight. Malfunctions, aircraft sounds, aircraft controls, visual scenes, and communications are controlled through simulation software.

The monitors present displays that can be activated when simulation programs are running. The

instructor uses these screens to control and direct flight simulation.

1.7. SIMULATOR SAFETY

1.7.1. Hazards

A simulator is a complex, expensive piece of equipment that can be dangerous. Hazards exist inside and outside of the simulator. Improper use and slow or incorrect responses during an emergency can damage the simulator or compound what might have been only minor damage. More importantly, people can be injured in and around a simulator if caution is not exercised. The information in this section is presented to minimize damage and injury in the event of an emergency.

1.7.2. Electrical Hazards

Any voltage above 50 Vac or any current above .1 ampere can be lethal. Voltage exceeding 15,000 Vac and current exceeding 200 amperes exist on the simulator. None of these hazardous voltages are exposed either inside or outside the simulator. They are concealed for safety sake. They should remain concealed except during maintenance.

Much of the electronic circuitry found in the simulator is susceptible to Electrostatic Discharge damage. To prevent this type of damage, no electrical components should be touched without using the proper precautions.

1.7.3. Fire Hazards

The IOS Alarm Pull activates a fire alarm as well as a strobe light on top of the instructor station when activated. The Fire Pull Alarm Lever is a standard fire alarm switching system found in most public areas.

1.7.4. Stopping the Simulator in an Emergency

The simulator may be stopped in an emergency using the round EMERGENCY POWER OFF push buttons located in the AC Power Controller Assembly, IOS Control Panel, the Student Station side console, and the Visual Area EPO Panel (OFT Only). When pressed they shut down the simulator's electrical power and all other subsystems.

SECTION 2. OPERATION

2.1. INTRODUCTION

Section 2 provides the typical steps an instructor would follow before and after a training session. Functional descriptions of the Instructor Station Control Panel and Printer are also provided here.

2.2. INITIAL CONDITIONS

Initial Conditions should be met before powering up after any type of power down.

1) A Walk-Around Inspection is complete and the simulator is ready for training.
2) Computers are powered up and ready for the instructor to set up a training session.
3) The Control Loading System is operational and ready for training.

2.2.1. Walk-Around Inspection

The purpose of the Walk-Around Inspection is to ensure that personnel are clear from the simulator area and that the simulator is safe to operate. If any unsafe condition exists, report it to the site technician before beginning a training session.

1) In the simulator, check for evidence of on-going maintenance, tools or test equipment, removed instruments or panels, or any other condition indicating that powering up the simulator would be unwise or dangerous.
2) At the Instructor Station, check for unusual displays on the monitors.

2.3. BRINGING SIMULATION UP

These are the procedures that an instructor should follow before beginning training. Each instructor should read SIMULATOR SAFETY in Section 1, and be familiar with emergency procedures and hazards before starting training. It is important that all instructions are followed in order, and that safety precautions be observed at all times.

2.3.1. Beginning of Session Simulator Set Up

1) Ensure that Initial Conditions are met and the simulator is ready for training.
2) Ensure that all personnel who are participating in the training session are onboard the simulator.
3) If repositioning the aircraft is necessary, perform the following:
   a) Select the REPOSITION page button on the left collar (Refer to Section 4.17).
   b) Type the desired ICAO airfield code in the IDENT edit box and press enter.
   c) Select the down arrow on the RUNWAY combo box and highlight the desired runway.
   d) Select the CHANGE push button in the Active Airport group box.

e) Select the desired takeoff position on the Reposition page.

The simulator is now ready to begin a training session.

2.4. BRINGING SIMULATION DOWN

These are the procedures that an instructor would follow for powering down the simulator after a normal training session. It is important that all instructions are followed in order, and that safety precautions be observed at all times.

2.4.1. End-Of-Session Simulator Reset

These instructions should be followed when a training session is finished.

1) Clear all malfunctions:

   a) Access the Malfunctions page by selecting the MALFUNCTIONS page button on the left collar.

   b) On the Malfunctions page, deselect any active or pre-selected malfunctions.

   c) Verify all malfunctions have been cleared by reviewing the Failure Summary box on the bottom collar.

2) Clear all snapshots:

   a) Access the Playback and Snapshot page by selecting the PLAYBACK/SNAPSHOTS button on the left collar.

   b) On the Playback and Snapshot page, select the Delete All Snapshots button.

3) Reset all killed NAVAIDs:

   a) Access the Area Map page by selecting the Area Map button on the left collar.

   b) Access the NAVAID Kill menu by selecting the NAVAID Kill button on the right.

   c) Select the Reset All NAVAIDs button and close the menu by selecting the OK button

4) Reset all popped circuit breakers:

   a) Access the Circuit Breaker Control page by selecting the CIRCUIT BREAKERS page button on the left collar.

   b) Verify all circuit breakers are normal. Reset all that are not.

5) Remove printouts from the printer.

2.5. CONTROL PANEL OPERATION

The control panel, located below the two lower monitors, can be used to control certain aspects of simulation without using the monitors. See Figure 2-1. It includes controls for controlling:

- Power
- Freezes/Resets
- Lighting
- Environmental/Simulator Sound
- NAV and Communications

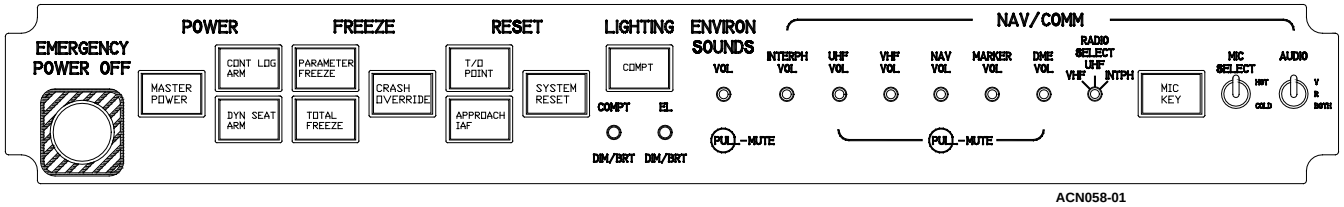


Figure 2-1. Control Panel

2.5.1. Power

2.5.1.1. Emergency Power Off

The Emergency Power Off push button is an electrical emergency power off switch. When depressed, the Emergency Power Off button will remove power from the simulator and all of its subsystems, including power to the control stick and rudders.

2.5.1.2. Master Power

The Master Power push button is the main power on/off switch. When depressed, it will activate power to the simulator.

2.5.1.3. Control Loading Arm

The Control Loading Arm push button will arm or disarm the Control Loading System when pressed. The Control Loading System is armed when the push button is amber and disarmed when green. The push button flashes amber during calibration. When the system is armed and calibrated, the control stick in the cockpit will move to the flight-neutral position.

WARNING

VERIFY THE COCKPIT IS CLEAR OF PERSONNEL TO AVOID INJURY CAUSED BY THE CONTROL STICK AND PEDALS MOVING DURING ACTIVATION OF THE CONTROL LOADING SYSTEM.

2.5.1.4. Dynamic Seat Arm

The Dynamic Seat Arm push button will arm or disarm cockpit seat motion when pressed. The cockpit seat employs electric motors to simulate certain movements of the aircraft. The simulated aircraft movement includes the ground effects as well as the flight aircraft movements. The Seat is armed when the push button is amber, and disarmed when green. The push button flashes amber during calibration or when the seat belt is not buckled.

2.5.1.4.1. Dynamic Seat Arming

Perform the following procedure to arm the cockpit Dynamic Seat.

1) Observe the CONT LDG ARM push button is steady amber indicating control loading is armed.
2) Buckle the cockpit seat belt.
3) Push the DYN SEAT ARM push button on the IOS control panel to arm the seat.
4) Allow time for the seat to calibrate as indicated by flashing amber push button.
5) Dynamic seat function is armed when the push button is steady amber.

2.5.2. Freezes/Resets

The two freeze push buttons located on the panel are used to control simulation. The two position-control push buttons are used to position the aircraft to specific locations in the simulation environment. The two position-control push buttons are momentary action buttons where they will activate their respective function each time they are pressed. The two position-control push buttons are used to reposition the aircraft to the approach or takeoff position of the active airport. All of the push buttons are backlit green when off and illuminated amber when selected. There are two Reset push buttons, one is used to reset the system variables (System Reset) and the other is used to prevent crashes (Crash Override). Each of these push buttons is describe in the following paragraphs.

2.5.2.1. Parameter Freeze

The Parameter Freeze push button displays the Freezes and Resets page on the Instructor Station when it is depressed. For information on the Freezes and Resets page, see Section 4 of this manual.

2.5.2.2. Total Freeze

The Total Freeze push button toggles the state of the aerodynamic and environmental sound simulation. When the push button is illuminated amber, the simulation is frozen. The simulator will not respond to flight control inputs and no aural cues will be present. Audio tones and voice communication remain enabled. The instructor can manipulate variables and reposition the aircraft during freeze. The student may change switch settings and radio frequencies during freeze. Some changes may not take effect until total freeze is released, such as changing the position of the landing gear or flaps. When the push button is green, the simulation is not frozen. The instructor should advise the student prior to changing the state of the simulation.

2.5.2.3. Crash Override

The Crash Override push button will prevent a crash condition from triggering a crash in the simulation environment, when it is depressed. In addition, the Crash Override allows the simulation to continue after certain crashes, if the override is activated and then the simulator is released from the resultant freeze condition.

WARNING

IF A CRASH OCCURS DURING A RECALL FROM A SNAPSHOT, DO NOT USE CRASH OVERRIDE AND ATTEMPT TO FLY OUT OF THE EVENT. THE CRASH MAY INDICATE EXTREME FLIGHT PARAMETERS, WHICH COULD CAUSE RAPID FLIGHT CONTROL MOVEMENTS. THESE MOVEMENTS COULD STRIKE THE PILOT IN THE COCKPIT. TO CLEAR THIS TYPE OF CRASH EVENT, SELECT A PRE-PROGRAMMED REPOSITION POINT FROM THE REPOSITION PAGE (See 4.18 Reposition). ENSURE THE PILOT STAYS CLEAR OF THE FLIGHT CONTROLS WHILE THE SIMULATOR IS TAKEN OFF FREEZE.

2.5.2.4. Takeoff Point

The T/O Point push button is used to position the aircraft to the active runway takeoff position at zero airspeed. The active airport and the runway are selected through the IOS monitors. Instruct the crew to lower the landing gear. Press the T/O Point push button to reposition the aircraft to the active runway takeoff point.

2.5.2.5. Approach IAF

The Approach Initial Approach Fix push button is used to reposition the aircraft to 2,000 feet above ground level (AGL) at ten nautical miles from the active runway on the runway heading.

2.5.2.6. System Reset

The System Reset is a momentary push button that will initiate a system reset when it is depressed. The System Reset will reset each of the simulation variables, such as fluid quantities, battery voltages, etc., to their default values. However, it will not clear an active and/or pre-selected malfunction. This button will not reset the simulator to the takeoff point.

2.5.3. Lighting

2.5.3.1. Compartment Lighting

The compartment lighting switch is a push button that turns the compartment lights on and off.

2.5.3.2. Console Lighting Controls

There are two control knobs that are used to illuminate the Instructor Station console area.

Compt knob controls the small overhead lamps, which illuminate the monitor area of the instructor station. Push the knob in to turn the lamp off. Pull the knob out to turn the lamp on. Rotate the knob to adjust the lamp illumination level.

EL knob controls the illumination of the electro luminescent panels and push button switches of the Control Panel on the instructor's console. Rotate the knob to adjust the illumination level.

2.5.4. Environmental Sounds

The Environmental Sounds control is a rotary control that sets the volume of the environmental sounds (engine, propeller, airstream, tire screech, etc.). When pulled out, the environmental sounds are muted.

2.5.5. Navigation and Communications

These controls are located on the instructor station to control the various communications controls and volume for the instructor only. The student station has separate controls in the cockpit of the simulator for controlling volume.

2.5.5.1. Interphone Volume Control

The Interphone Volume control is a rotary control that sets the volume of the interphones.

2.5.5.2. UHF Volume

The UHF Volume control is a rotary control that sets the volume of the UHF radio signals.

2.5.5.3. VHF Volume

The VHF Volume control is a rotary control that sets the volume of the VHF radio signals.

2.5.5.4. NAV Volume

The NAV Volume is a rotary control that sets the volume of the NAV audio circuits.

2.5.5.5. Marker Volume

The Marker Volume control is a rotary control that sets the volume of the marker beacon audio circuits.

2.5.5.6. DME Volume

The DME Volume Control is a rotary knob that sets the volume of the DME audio circuits.

2.5.5.7. Radio Select

The Radio Select control is a rotary control switch that allows the instructor to select from which radio circuit (VHF, UHF, etc.) the audio from his microphone will interface.

2.5.5.8. Microphone Key

The microphone key is a push button switch that will activate (key) the instructor's microphone when it is depressed. The MIC SELECT switch must be set to COLD to enable this feature.

2.5.5.9. Audio Select

The Audio Select switch activates the voice communications, the navigation sounds, or both to be heard, depending on the switch position. The "V" position is for Voice signals. The "R" is for navigation sound Recognition. The "Both" position will enable both types of audio to be heard.

2.6. PRINTER OPERATION

The printer is a color graphics printer, which is used to print the monitor pages. It is usually located on the upper shelf on the right hand side of the instructor station. The information presented here is for basic printer operation. Refer to the printer's user guide for detailed operation and maintenance information.

2.6.1. Printer Control Panel Definitions

There are two button controls with indicators and a single indicator located on the front, right side of the printer. The two buttons are the Power and Resume buttons, and the additional indicator light is for the Inkjet Cartridge sensor. See Figure 2-2.

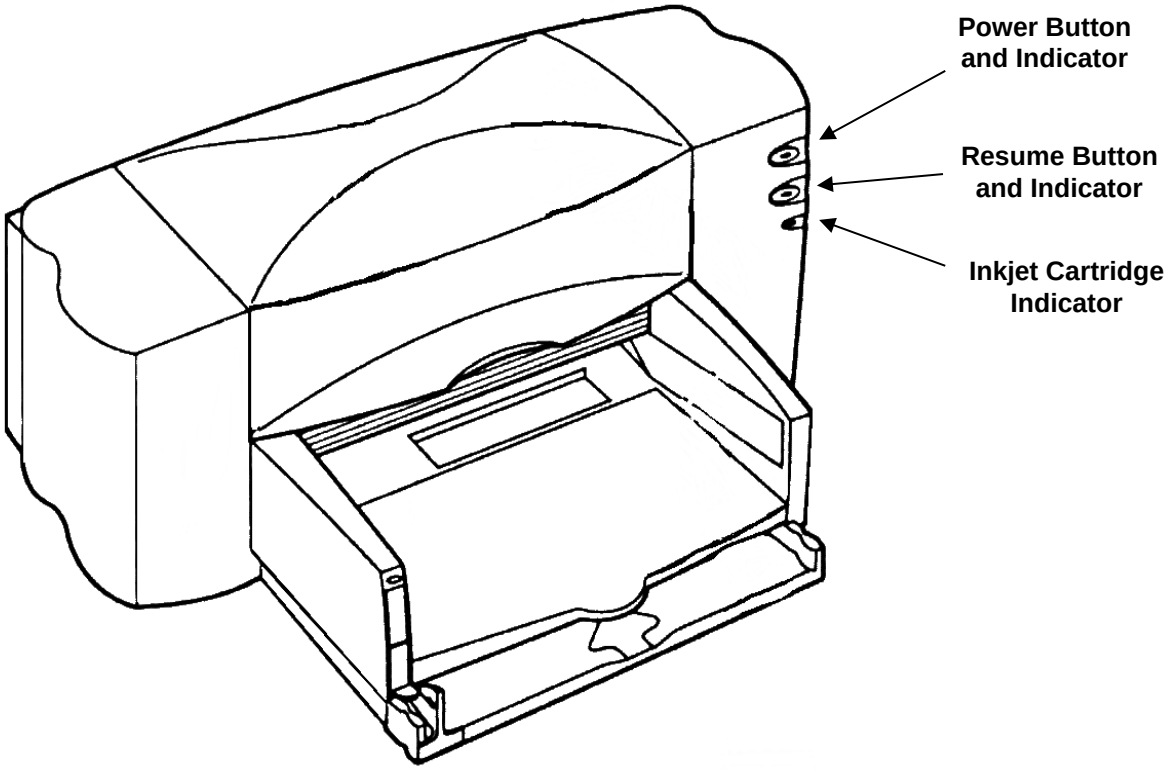


Figure 2-2. Printer

Power Switch The power switch is used to turn on and off power to the printer.

Resume Switch The resume switch is used to continue printing after a pause or error. The resume button is also used to assist in clearing paper jams.

Power Indicator The power indicator is located on the power switch. It illuminates when the printer is turned on.

Resume Indicator The resume indicator blinks when there is a pause in printing.

Inkjet Cartridge The Inkjet Cartridge indicator blinks during the turn on of the printer, while the printer is identifying the inkjet cartridge. If the cartridge cannot be identified, then the indicator will continue to blink.

SECTION 3. IOS FUNDAMENTALS

3.1. INTRODUCTION

This section offers basic information and instructions for using the screen displays. The operation procedures are applicable to most screen displays. The illustrations are representative of the system and are provided to give general information about the screen displays.

When data is required to be entered by the instructor, an edit box is provided. The instructor will then type, using the keyboard, the appropriate data, followed by pressing the Enter key on the keyboard.

3.2. TERMS

Select To activate an item on the screen by clicking with the left mouse button (unless otherwise noted). See Table 3-1.

Deselect To deactivate a previously selected item by selecting it again. See Table 3-1.

Enabled An item that is valid or that it is available for selection or de-selection is considered enabled and is displayed normally. See Table 3-2.

Disabled An item that is not valid or that it is not available for selection or de-selection is considered disabled and is displayed shaded-out. See Table 3-2.

Collar The areas at the left and bottom of the screen displays that are common amongst all pages. See Figure 3-1.

Page The entire area to the right of and above the collars. See Figure 3-1.

Overlay A partial page that appears on top of the main page area. See Figure 3-1.

3.3. COMMON USER INTERFACE ITEMS

Push Button This is a rectangular three-dimensional region used to either toggle a selection or to initiate a programmatic response. Examples can be seen in Table 3-1 and Table 3-2.

Static Text This is text that doesn’t change and that is usually within close proximity of another common user interface item so as to describe the purpose of the other common user interface item. The light blue text displayed on the bottom collar as shown in Figure 3-1 is an example of static text.

Dynamic Text This is text that changes so as to display the current value of a changing simulation value. The yellow text displayed on the bottom collar as shown in Figure 3-1 is an example of dynamic text.

Table 3-1. Selected and Deselected Common Items

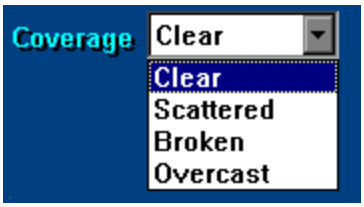
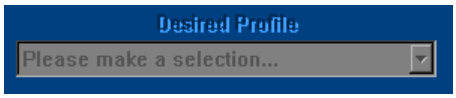
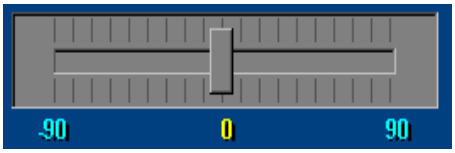
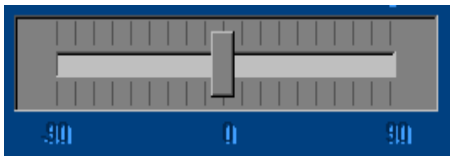
Common Items	Selected	Deselected
Push Button		
Edit Box		
Radio Button		
Check Box		
Combo Box		

Table 3-2. Enabled and Disabled Common Items

Common Items	Enabled	Disabled
Push Button		
Combo Box		
Slider		

Edit Box This is a rectangular region displayed with a flashing cursor that signifies that the software is awaiting input from the user via the keyboard. They are used to modify values used either by simulation or in other places within the IOS. Examples can be seen in Table 3-1 and Table 3-2.

Combo Box This is a rectangular region with a down arrow displayed at the right end. Selecting the down arrow causes the region to expand so as to give the user a list of valid choices for the item described by the associated static text. Examples can be seen in Table 3-1 and Table 3-2.

Slider A vertical or horizontal region containing a linear scale with a handle depicting the current value. Selecting the handle allows the user to change the associated value by sliding the handle to a new position. Examples can be seen in Table 3-2.

Radio Button A Radio button is a small round button that is grouped with other Radio buttons. Each Radio button has a specific function assigned to it. However, only one Radio button can be enabled at a time. Selecting a Radio button will automatically deselect any other Radio button in the group. Examples can be seen in Table 3-1.

Check Box A small square that has a description associated with it. If the described entity is TRUE, ON, YES, etc… then the square will contain an **X**. If the described entity is FALSE, OFF, NO, etc… then the **X** will be removed. Selecting the square or the text will toggle the value. Examples can be seen in Table 3-1.

Group Box A rectangular region that typically has a title and groups other related common user interface items.

3.4. SCREEN APPEARANCE

The IOS utilizes two basic screen formats - page display and overlay display. The ability to exit a screen display corresponds to this basic format.

A page display uses the entire screen above and to the right of the collars. To exit a page, select one of the other pages listed on the left collar. See Figure 3-1.

An overlay is a partial page that covers a portion of the main page display. The user may reposition an overlay to a more convenient screen location by holding down the left mouse button, when the mouse cursor is on top of the overlay's title bar, and dragging the title bar (thus the entire overlay) to a new position. To exit an overlay, select the **OK** button or the **X** in the upper right corner of the overlay.

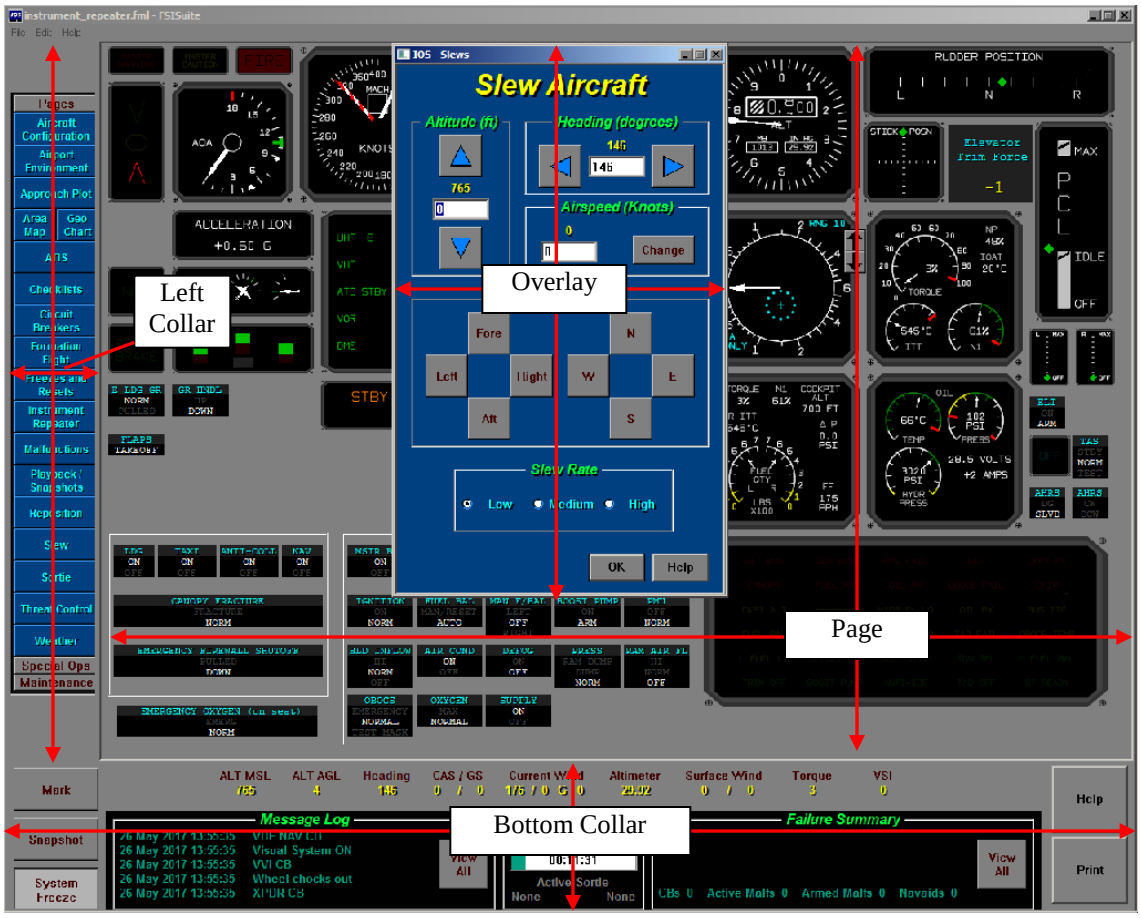


Figure 3-1. Page Display Screen Configuration

3.5. SCREEN COLLARS

The screen collars are located on the side and bottom of the instructor station pages. Refer to Figure 3-1.

There are two configurations for the collar. The left collar consists of a list of items that, upon selection, allow for accessing the IOS pages. The bottom collar consists of the wing aircraft's (simulator) positional data (Altitude, Heading, Airspeed, Ground Speed, Winds, Barometric Pressure, Torque, and Vertical Speed), Current Time and Date, a time line, a Message Log Group Box, a Failure Summary Group Box, and five push buttons. The time line tracks the time of the current training session. The Message Log displays information to inform the instructor of student switch actions in the cockpit. The Failure Summary displays active and pending (pre-selected) malfunctions, popped circuit breakers, and disabled navigation aids. The MARK push button inserts a timestamp in the debriefing data so as to remember a particular place that can be recalled during the debriefing. The SNAPSHOT push button will take a snapshot of the simulation environment and store the snapshot for possible recall at a later time. The SYSTEM FREEZE push button pauses simulation. The HELP push button displays a Help overlay that provides useful information about the page that is currently displayed. The PRINT button prints the displayed page, including the collars.

WARNING

IF A CRASH OCCURS DURING A RECALL FROM A SNAPSHOT, DO NOT USE CRASH OVERRIDE AND ATTEMPT TO FLY OUT OF THE EVENT. THE CRASH MAY INDICATE EXTREME FLIGHT PARAMETERS, WHICH COULD CAUSE RAPID FLIGHT CONTROL MOVEMENTS. THESE MOVEMENTS COULD STRIKE THE PILOT IN THE COCKPIT. TO CLEAR THIS TYPE OF CRASH EVENT, SELECT A PRE-PROGRAMMED REPOSITION POINT FROM THE REPOSITION PAGE (See 4.18 Reposition). ENSURE THE PILOT STAYS CLEAR OF THE FLIGHT CONTROLS WHILE THE SIMULATOR IS TAKEN OFF FREEZE.

3.6. MAKING SELECTIONS

The following procedure describes the process of activating areas on the screen. This process is known as selecting.

1) Move the mouse to the desired button and press the left mouse button.
2) The screen will display a page or execute the command associated with the item.

Instructions for using each of the pages and variances to the selection process can be found in Section 4.

3.7. MALFUNCTIONS

Malfunctions can be inserted into a flight training session to provide an opportunity for the student to experience system failures and emergencies in a simulated environment. These malfunctions can be selected to activate either immediately or at some predetermined time during the session. Up to 5 malfunctions can be activated at a given time. To activate additional malfunctions, some or all of the active malfunctions must be cleared. Activating multiple malfunctions of the same aircraft system is not recommended due to conflicts which may produce unexpected results. An example of this would be activating main gear stuck down and main gear stuck up simultaneously.

There are two options available to the instructor to activate a malfunction. The first option for activating a malfunction is to set up the malfunction so that it occurs immediately upon selection. The second option for activating a malfunction is to set up the malfunction so that it occurs only after specific conditions have been met. This option for activating a malfunction is referred to as “Preselecting the Malfunction”. For more information on activating malfunctions, see the Malfunctions paragraph in Section 4. To assist the instructor, each malfunction’s description can be accessed for reviewing the malfunction’s failure effects and indications.

Any selected malfunction, whether active or pre-selected, can be cleared from a training session to allow others to be entered. The effects of an active malfunction will be canceled by clearing it; however, the associated failed system may not be reset. The Systems Reset button allows the instructor to counteract the effects of previously employed malfunctions in certain systems or to replenish systems depleted through flight. Whether the system is reset after a malfunction is cleared depends upon the Malfunction Definition, which can be found in the Malfunction Document or by accessing the Malfunction Description Window.

Any active or pre-select malfunctions will be displayed in the Failure Summary box on the bottom collar.

Refer to the Malfunction Description Window for information about a specific malfunction.

SECTION 4. DISPLAY SCREEN USER REFERENCE

4.1. INTRODUCTION

This section describes the characteristics and operation of the display pages. The paragraphs are arranged alphabetically according to page title. The display screens that are described in this section are:

- Aircraft Configuration
- Airport Environment
- Approach Plot
- Area Map
- GeoChart
- ATIS Display
- Checklists
- Circuit Breaker Control
- Controls Not in Agreement
- Crash Detected
- Ejection Detected
- Formation Flight Control
- Freezes and Resets
- Instrument Repeater
- Malfunctions
- Playback/Snapshots
- Reposition
- Sortie File Control
- Threat Control
- Weather Control
- Windshear Microburst & Turbulence
- IOS Pilot

4.2. AIRCRAFT CONFIGURATION

The Aircraft Configuration page is accessed by selecting the AIRCRAFT CONFIGURATION page button on the left collar. See Figure 4-1. The Aircraft Configuration page is used to modify the aircraft operation conditions. Actual weight and weight distributions for the aircraft are programmed into the system; however, the instructor can alter the fuel quantity. Adjustments to the weight and balance parameters are reflected in the instruments and responses of the aircraft.

The Aircraft Configuration page consists of seven group boxes for modifying Ground Services, Aircraft Loading, Weight and Balance, Aural Warning Inhibit, Fuel Fill, Radio Chatter parameters, and Visual Controls.

The Ground Services group box contains two check boxes. The check boxes control the presence of External Power and Wheel Chocks. When the External Power check box is selected, the simulation environment will simulate DC Power from the airport's ground services has been supplied to the aircraft. When active, the EXTERNAL POWER check box will have an X in the check box. The WHEEL CHOCKS check box simulates that wheel chocks are positioned on the aircraft wheels. When the WHEEL CHOCKS check box is active, there will be an X in the check box.

The Aircraft Loading group box consists of two radio buttons. These radio buttons indicate if one or two pilots are flying the aircraft. Whichever button is active (has a solid black circle in the center) will determine number of pilots in the aircraft.

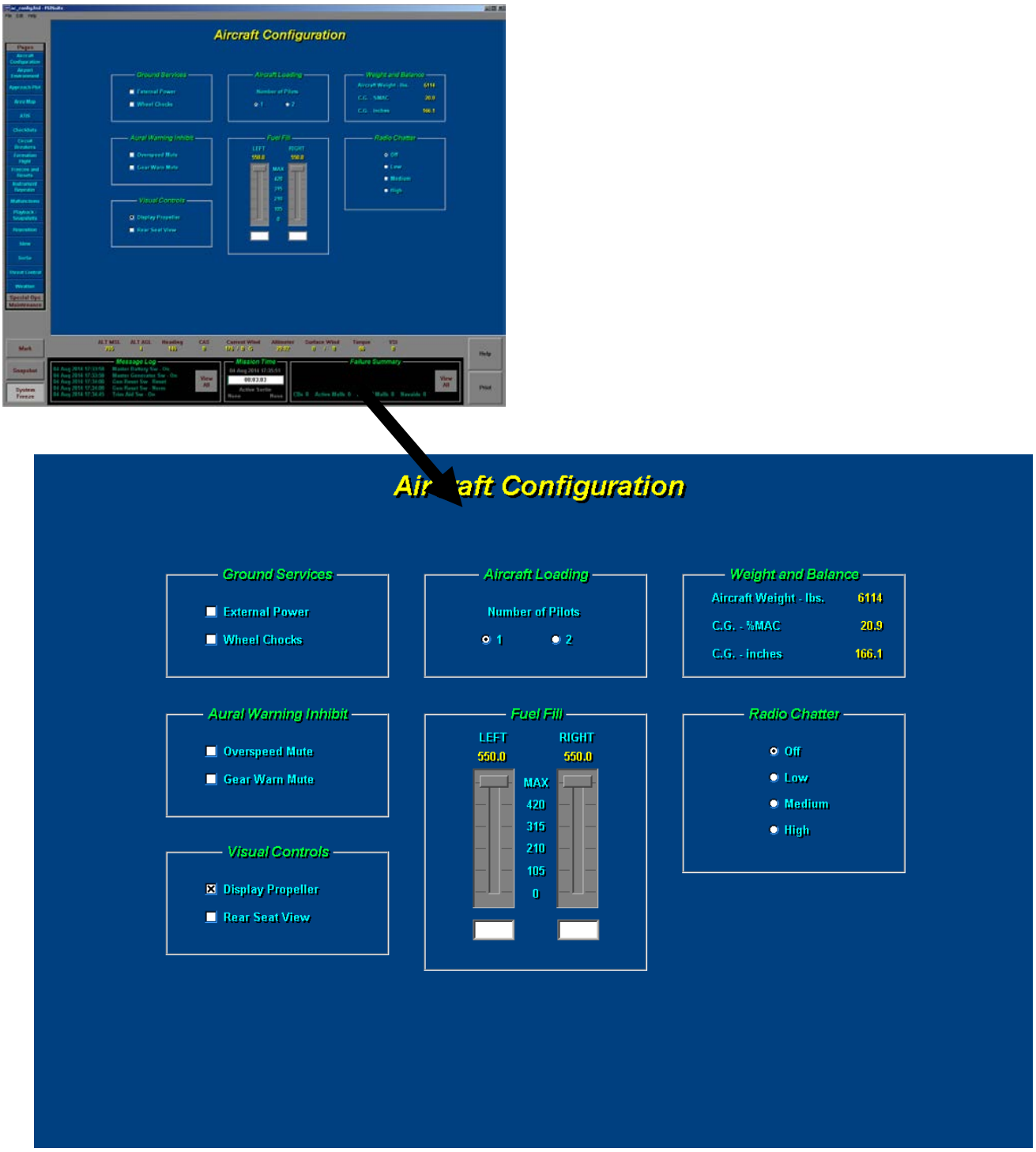


Figure 4-1. Aircraft Configuration Page

The Weight and Balance group box consists of static and dynamic text. These are non-interactive fields that display the Aircraft's Weight and Center of Gravity.

The Aural Warning Inhibit group box consists of the OVERSPEED MUTE and GEAR WARN MUTE check boxes. These check boxes will mute their respective warning tones when they are active.

The Fuel Fill group box contains slider and edit boxes which represent the left and right wing tanks. The fuel quantities are displayed above the sliders. Either fuel quantity can be adjusted by positioning its slider, or by entering the desired amount of fuel in its edit box. The collector tank fuel quantity is divided between the two wing tanks and adds an additional twenty pounds to each tank.

The Radio Chatter group box contains four radio buttons that are used to select the desired amount of background chatter that will be heard on the communication channels.

The Visual Controls group box contains the Display Propeller and Rear Seat View check boxes. The propeller is displayed when the box is checked, and removed when not. The rear seat view is displayed when the box is checked and the front seat (normal) view is displayed when not.

4.3. AIRPORT ENVIRONMENT

The Airport Visual Environment page is accessed by selecting the AIRPORT ENVIRONMENT page button on the left collar. The Airport Visual Environment page contains two group boxes, Configurable Airfield, and Airport Lighting. See Figure 4-2.

The Configurable Airfield group box provides the capability to display a generic airfield when there is no custom airfield model for the active airport. To use this feature, reposition to the desired airfield location and check the ENABLE CONFIGURABLE AIRPORTS check box. This will activate a configurable airfield with default settings. Allow up to one minute for the airfield visual scene to appear. To modify the default settings, select the down arrow on the right side of the combo box next to the desired attribute. Combo boxes are provided for the runway length and width, community lights, terminal location, VASI type, approach lights type, runway markings, and terrain type. There are check boxes for the Rotating Beacon and Runway End Identifier Lights (REIL). The Autosize Runway check box will override the runway length and width selections if checked. When all modifications are completed, select the COMPILE SCENE push button to activate the selections. Allow up to one minute for the airfield visual scene to update.

The Airport Lighting group box contains combo boxes for selecting the intensities of the Surface Brightness, Light Levels of various airfield lights, and for selecting the type of active Light Gun Signals. A limited number of airfields are equipped with light guns. Refer to Appendix B for a list of these airfields and light gun locations. The Surface Brightness combo boxes are used to set the visual intensity of the Runway, Runway Markings, and Taxiway. The Light Levels combo boxes are used to set the intensity of the various airfield lights.

A check box is provided for the Light Levels that will set the runway edge lights to non-uniform intensities when it is selected.

The MASTER LIGHT LEVEL combo box provides selections for overriding all the airport light intensities to the value selected. These intensity overrides range from OFF to MAX (maximum). The ENABLE MASTER LEVEL check box will force all airport lights to the level selected in the MASTER LIGHT LEVEL combo box, when it is checked.

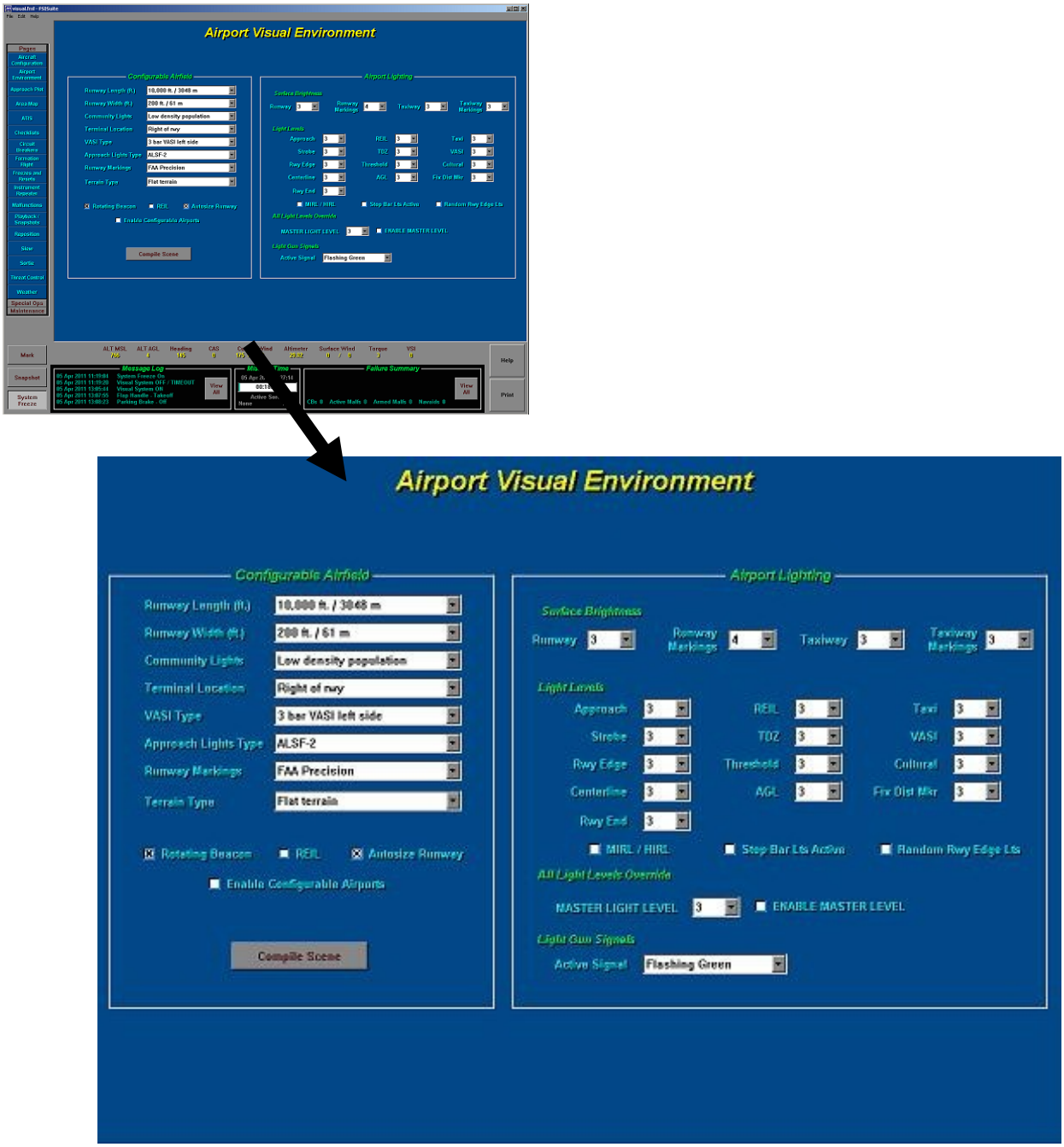


Figure 4-2. Airport Visual Environment

4.4. APPROACH PLOT

The Approach Plot page is accessed by selecting the APPROACH PLOT page button on the left collar. If the active runway has an ILS approach, the ILS Approach Plot page will be shown. If the active runway does not have an ILS approach the Non-precision Approach Plot page will appear.

NOTE

Approach plot only references the Active Airport and Active Runway as set on the Reposition page.

In an ILS approach, the upper portion of the page is the approach plan view, showing the runway and the aircraft's centerline deviation and distance from the runway. See Figure 4-3. A compass is shown in the upper right hand corner of the approach view and will indicate the direction of north. The Airport Name, Airport ID, LOC ID, Runway ID, LOC Freq., Runway ID, LOC HDG, and Runway HDG are shown at the top of the page above the approach plan view. The NM to TD (Nautical Miles to Touch Down), Feet above Touch Down, LOC Deviation, G/S Deviation (Glideslope Deviation), and V-Ref Deviation data are shown in the middle of the page, under the approach plan view. The lines of the feather are scaled to indicate one and two dot deviation from the localizer. The marker beacons are shown at their correct relative positions to the runway.

The middle portion of the page shows the approach profile view of the approach path. The five lines angling to the runway indicate the glideslope path with plus two dots and minus two dots deviations. The intercept altitudes are shown just below the plot.

The bottom portion of the page shows the V-Ref. Plot. This plot shows the aircraft's deviations in velocity.

The SCALE slider and associated edit box are used to set the scale of the Approach Plot page. The scale can be set by moving the slider to the desired scale or by entering the desired scale into the edit box. If the slider is used to set the scale, the edit box will reflect the value that the slider is set to. If the edit box is used to set the scale, the slider will reflect the value that was entered.

The TRACK ERASE push button will erase the aircraft track, when it is selected.

The Non-precision Approach Plot page will appear when the APPROACH PLOT left collar button is selected and the active runway does not have an ILS approach. See Figure 4-4. The glide path and extended runway centerline change color to orange to alert the instructor that a generic three degree glide slope and five degree course width are in use.

A compass is shown in the upper right hand corner of the approach view and will indicate the direction of north. The Airport Name, Airport ID, LOC ID, Runway ID, LOC Freq., Runway ID, LOC HDG, and Runway HDG are shown at the top of the page above the approach plan view.

The middle portion of the page shows the approach profile view of the approach path. At times, a red airplane is seen at the edge of the Approach Plot views. This red airplane indicates that the aircraft is off the plot in the area of the red airplane.

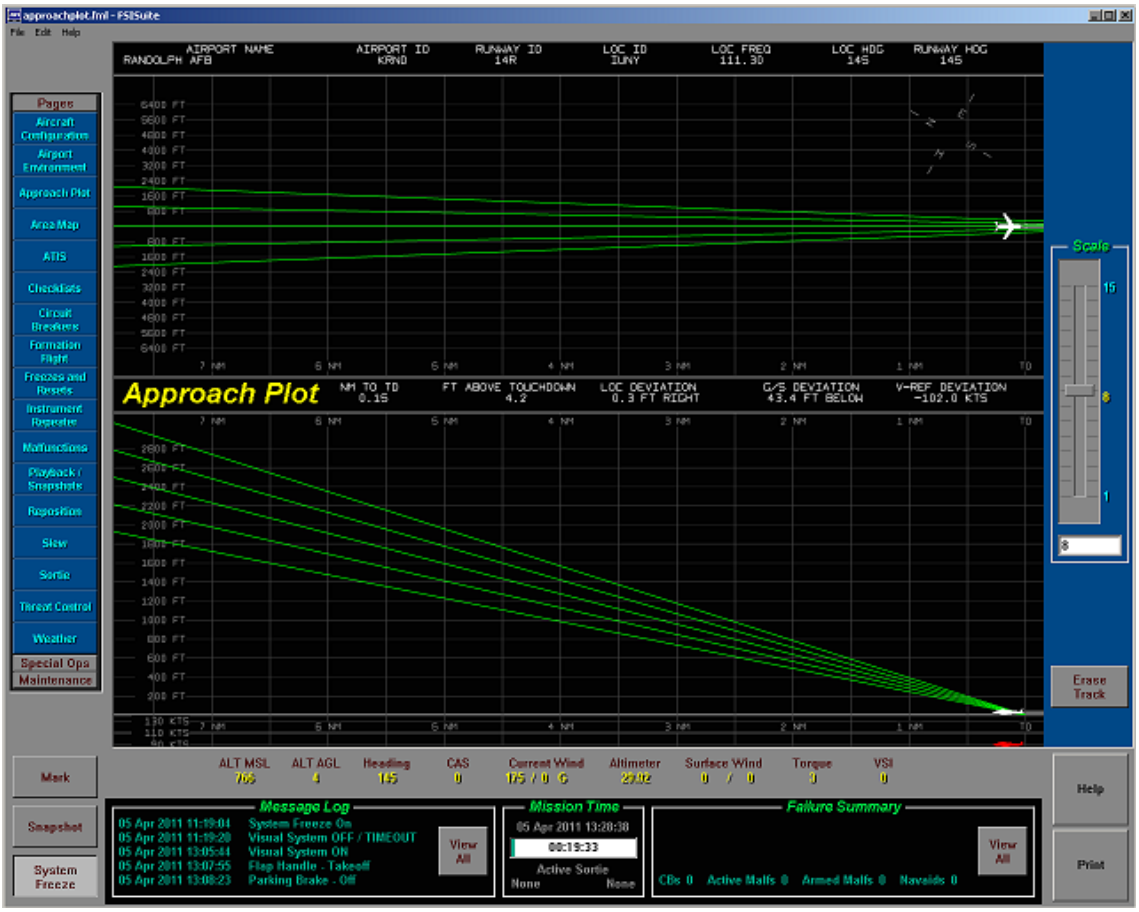


Figure 4-3. Approach Plot Page

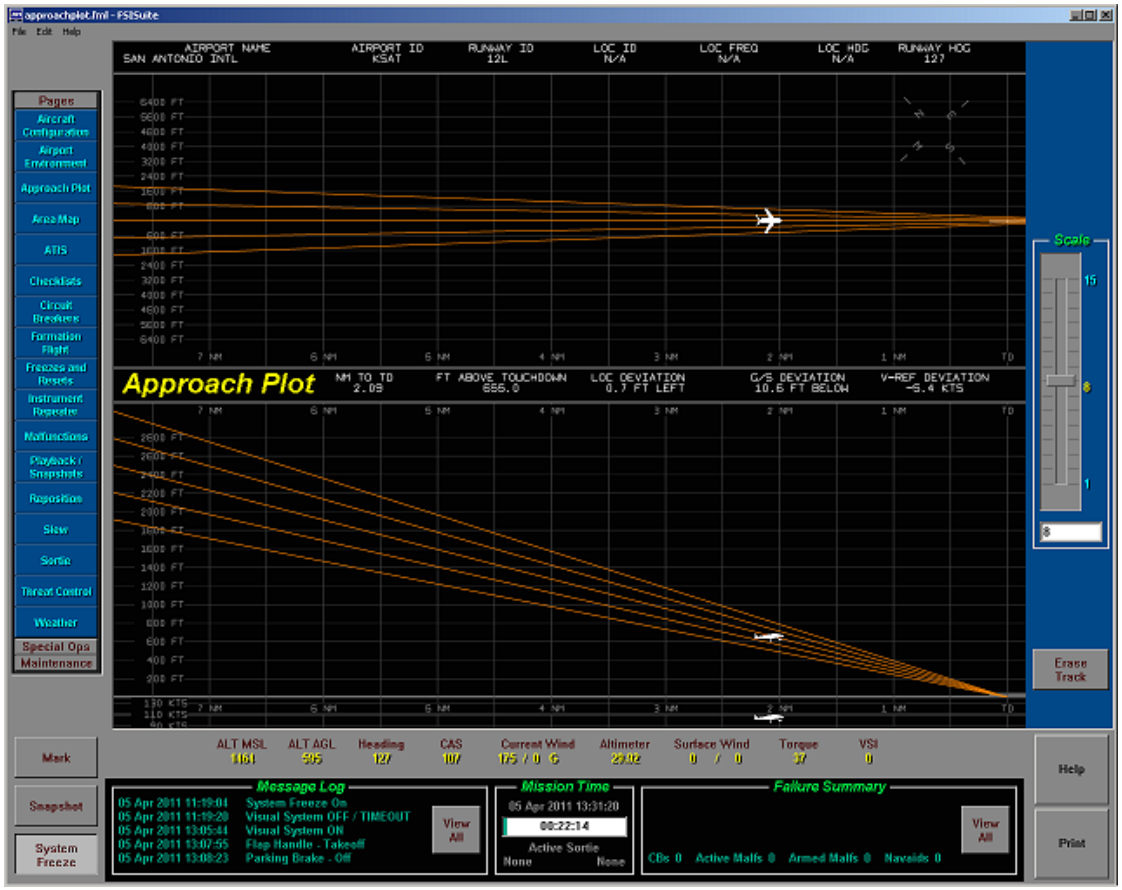


Figure 4-4. Non ILS Approach Plot Page

The bottom portion of the page shows the V-Ref Plot. This plot shows the aircraft's deviations in velocity.

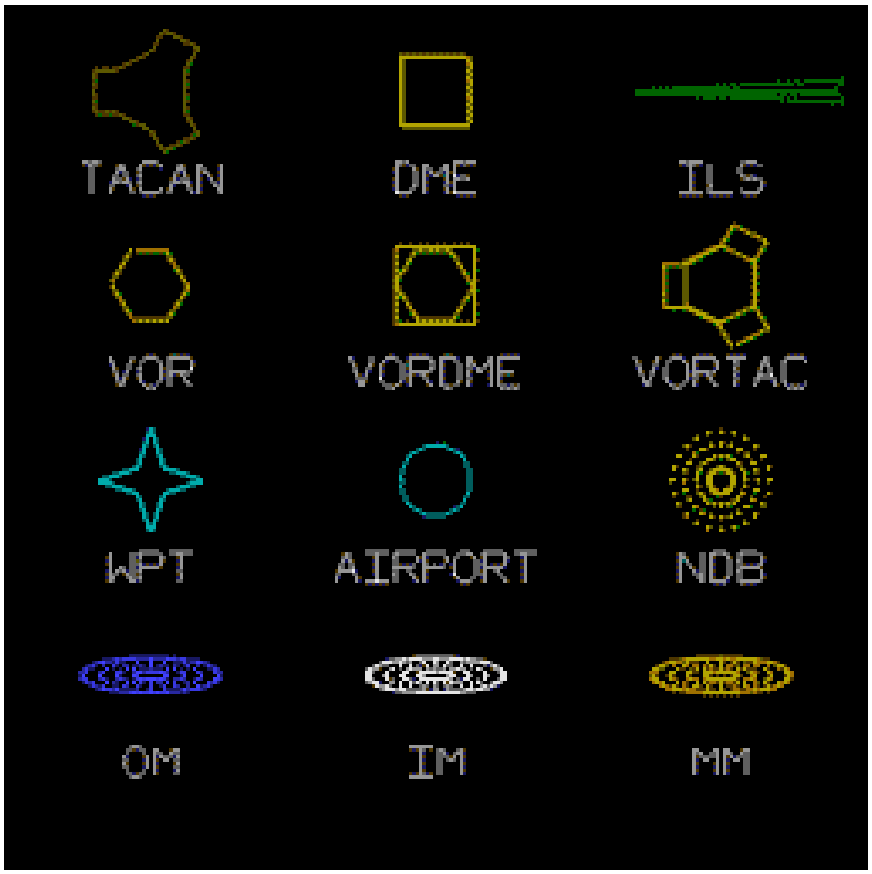
The SCALE slider and associated edit box are used to set the scale of the Approach Plot page. The scale can be set by moving the slider to the desired scale or by entering the desired scale into the edit box. If the slider is used to set the scale, the edit box will reflect the value that the slider is set to. If the edit box is used to set the scale, the slider will reflect the value that was entered.

The TRACK ERASE push button will erase the aircraft track, when it is selected.

4.5. AREA MAP

The Area Map page is accessed by selecting the AREA MAP page button on the left collar. See Figure 4-5. The Area Map is a representation of an aeronautical chart, which displays the area surrounding a specific latitude and longitude. Table 4-1 describes the Area Map Nav Symbols. The Area Map display can be modified or changed using the Map Controls on the right collar.

Table 4-1. Map Nav Symbols



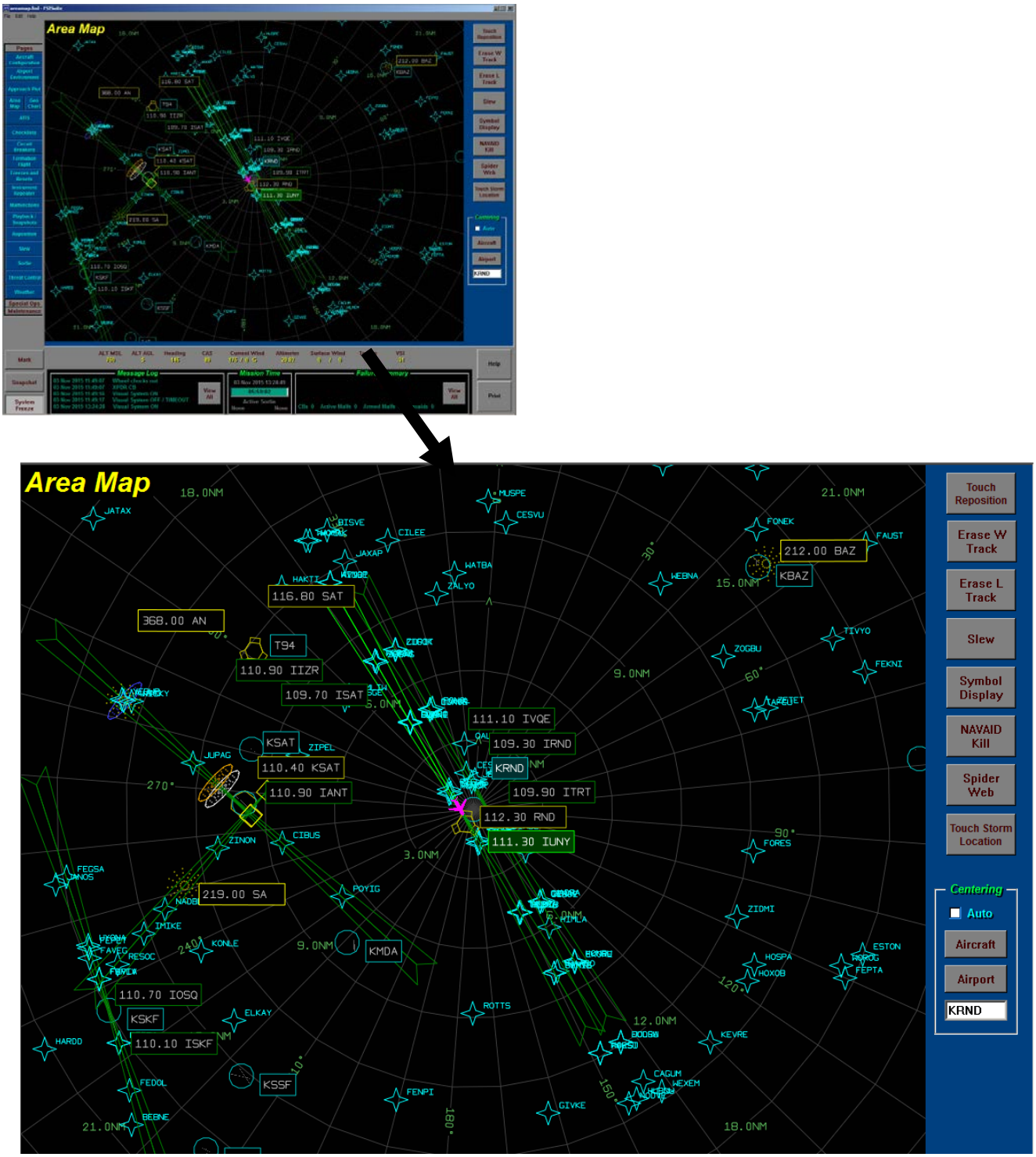


Figure 4-5. Area Map Page

When an Area Map is initially displayed, the map scale defaults to 30 nautical miles, unless specified in the sortie file. The distance is measured from the top of the screen to the bottom of the screen, excluding the collar. The map center can be selected to snap to the aircraft latitude and longitude or remain fixed at

a specific point. As the simulation proceeds, a yellow line, which plots the lead (visual) aircraft path, and a red line, which plots the wing (student) aircraft path, are drawn on the Area Map. These lines are continuously updated to indicate the last three minutes of aircraft path.

As the aircraft reaches the edge of the page, the map automatically redraws itself with the map center being determined by the last aircraft position (if the AUTO check box in the Centering group box is selected).

Use the mouse to control the Area Map page scale and location:

1) To pan, press and hold the left mouse button and drag the map in the desired direction
2) To zoom in and out, use the mouse scroll wheel

4.5.1. Mapping Controls

The Mapping Control functions are located on the right collar. See Figure 4-6. These functions are used to modify the general appearance of the map. The right collar consists of one group box and eight buttons that are not in a group box. Three of these buttons are push buttons and five are overlay buttons.

The Centering group box consists of a check box, two push buttons, and an edit box. These controls are used to center the map on a specific point. When the AUTO check box is selected, the center of the map will shift automatically to the current wing aircraft's position, if the aircraft is at the edge of the map. The AIRCRAFT push button will cause the map center to snap to the wing aircraft's current position, when it is selected. The AIRPORT push button, in conjunction with the edit box below it, is used to center the map on an airport. To center the map on an airport, select the AIRPORT push button and then enter the desired airport identifier in the edit box. The map will then center on the desired airport.

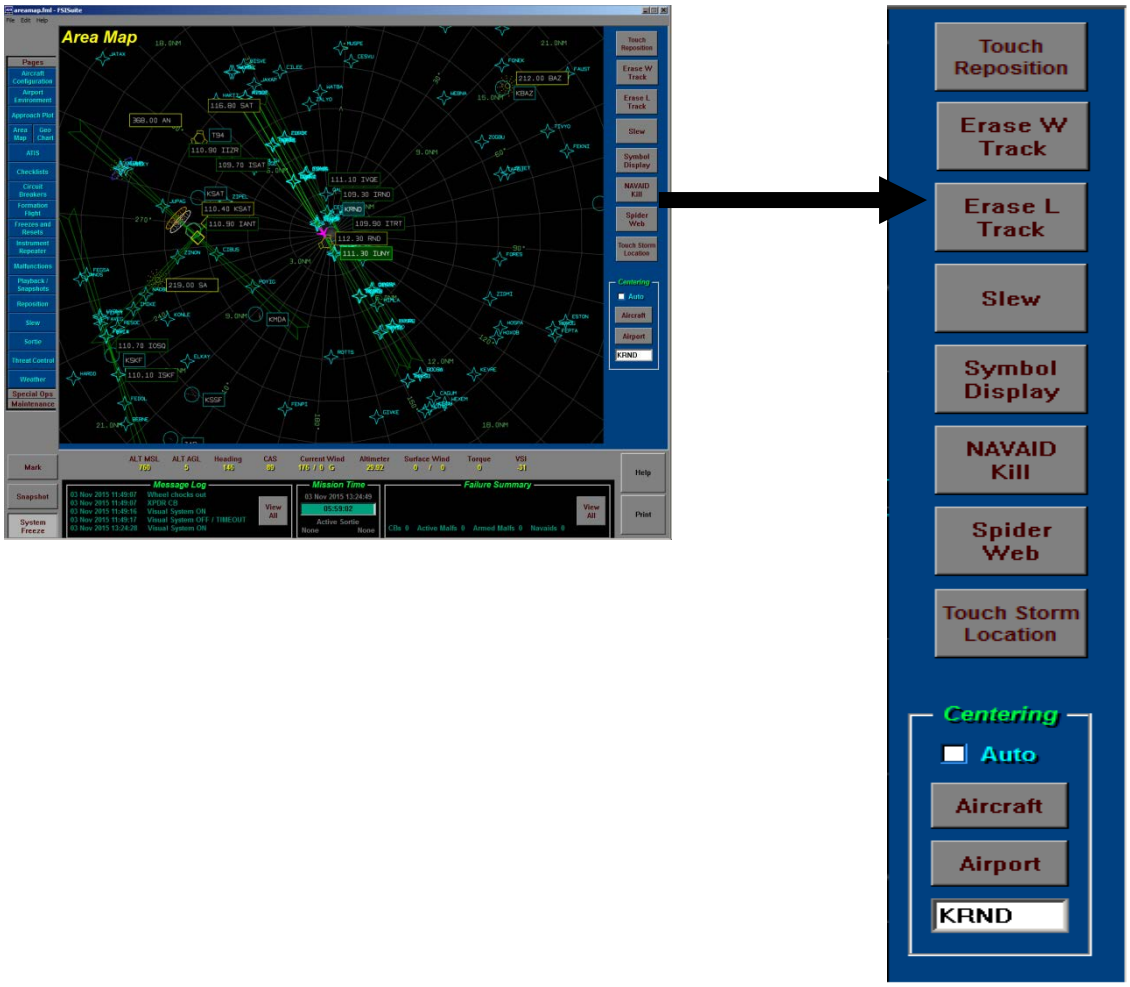


Figure 4-6. Mapping Controls

The three push buttons on the right collar are the TOUCH REPOSITION, ERASE W TRACK, and ERASE L TRACK. The TOUCH REPOSITION push button is used to reposition the wing aircraft to a point on the map that is selected by the cursor. To perform a touch reposition, select the TOUCH REPOSITION push button. Then move the cursor to the desired point on the map and select it. The point on the map that is selected will be interpreted as the latitude and longitude to which the wing aircraft will be repositioned. The Slew Aircraft overlay will automatically be displayed so as to allow refinement of the reposition point. The Slew Aircraft overlay is described in paragraph 4.5.2 - Slew Aircraft. The ERASE W TRACK push button will erase the wing aircraft track when it is selected. The ERASE L TRACK push button will erase the lead aircraft track when it is selected.

The five overlay buttons on the right collar are labeled SLEW, SYMBOL DISPLAY, NAVAID KILL, SPIDER WEB, and TOUCH STORM LOCATION. These buttons will display their respective overlay when they are selected. These overlays are described in the following paragraphs.

4.5.2. Slew Aircraft

The Slew Aircraft overlay is accessed by selecting the SLEW overlay button on the Area Map page right collar and in response to performing a Touch Reposition on the Area Map page, or from the Slew overlay button on the left collar. See Figure 4-7. The Slew Aircraft overlay is used to slew the wing aircraft's altitude, heading, airspeed and position. The overlay consists of five group boxes.

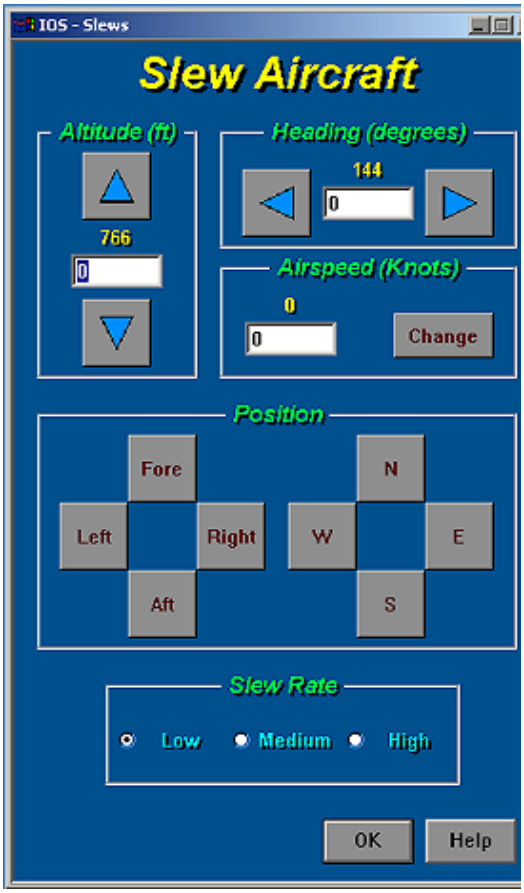


Figure 4-7. Slew Aircraft

The Altitude (ft) group box contains an UP arrow push button, DOWN arrow push button, edit box, and numeric display. The arrow push buttons will slew the aircraft altitude at the rate selected in the Slew Rate group box. The desired altitude may be entered in the edit box as an alternate method. If Total Freeze is active, the edit box method will slew the aircraft to the desired altitude instantly, otherwise, the altitude will slew at the rate selected in the Slew Rate group box. The numeric display indicates the current altitude and will update as the aircraft is slewed.

The Heading (degrees) group box contains left arrow and right arrow push buttons, an edit box, and a numeric display. The arrow push buttons will slew the aircraft heading at the rate selected in the Slew Rate group box. The desired heading may be entered in the edit box as an alternate method. If Total Freeze is active, the edit box method will slew the aircraft to the desired heading instantly, otherwise, the heading will slew at the rate selected in the Slew Rate group box. The numeric display indicates the current heading and will update as the aircraft is slewed.

The Airspeed (Knots) group box contains a numeric display, an edit box, and a push button. The numeric display is yellow and displays the current airspeed. The edit box allows the entry of a desired airspeed. The change push button is selected to accept the desired airspeed value and trim the simulated aircraft to this value.

The Position group box consists of two groups of four push buttons. The left group of buttons consists of relative position push buttons that will slew the aircraft according to the aircraft coordinates. The four slew controls for this function are Fore, Aft, Left, and Right. The right group of buttons consists of absolute position push buttons that will slew the aircraft in the direction specified, regardless of the orientation of the aircraft. The four slew controls for this function are N (North), E (East), S (South), and W (West).

The Slew Rate group box consists of three radio buttons that are set up where only one radio button can be selected at a time. These radio buttons are used to set the rate (speed) of the Altitude, Heading, and Position slews. The three options for the slew rate are High, Medium, and Low.

Selecting the HELP push button will display useful information about the Slew Aircraft overlay, selecting the OK push button will close the Slew Aircraft overlay.

4.5.2.1. Using the SLEW AIRCRAFT Function

To slew the aircraft in altitude, perform the following:

1) Access the Slew Aircraft overlay by selecting the SLEW button on the left or right collar.
2) Select the desired Slew Rate in the Slew Rate group box.
3) Slew the aircraft altitude by selecting the up or down arrow button in the Altitude (ft) group box, or type the desired altitude in the edit box and press enter.
4) The up and down arrow buttons must be selected twice, once to begin slewing and again to halt.
5) Close the Slew Aircraft overlay by selecting the OK push button.

To slew the aircraft in heading, perform the following:

1) Access the Slew Aircraft overlay by selecting the SLEW button on the left or right collar.
2) Select the desired Slew Rate in the Slew Rate group box.
3) Slew the aircraft heading by selecting the left or right arrow button in the Heading (Degrees) group box, or type the desired heading in the edit box and press enter.
4) The left and right arrow buttons must be selected twice, once to begin slewing and again to halt.
5) Close the Slew Aircraft overlay by selecting the OK push button.

To change the aircraft’s airspeed, perform the following:

1) Access the Slew Aircraft overlay by selecting the SLEW button on the left or right collar.
2) Type the desired airspeed in the edit box and press enter.

3) Select the Change push button to accept the new airspeed value.
4) Allow the simulator to complete trimming to the new airspeed.
5) Close the Slew Aircraft overlay by selecting the OK push button.

To slew the aircraft's relative position, perform the following:

1) Access the Slew Aircraft overlay by selecting the SLEW button on the left or right collar.
2) Select the desired Slew Rate in the Slew Rate group box.
3) Select the FORE, AFT, LEFT, or RIGHT push button to slew the aircraft in the desired direction relative to its current heading.
4) While slewing the aircraft, the aircraft's position can be monitored on the Area Map page and the visual system (if applicable).
5) Once the aircraft has reached its desired position, select the slew button a second time to discontinue slewing.
6) Close the Slew Aircraft overlay by selecting the OK push button.

To slew the aircraft's absolute position, perform the following:

1) Access the Slew Aircraft overlay by selecting the SLEW button on the left or right collar.
2) Select the desired Slew Rate in the Slew Rate group box.
3) Select the N, S, E, or W push button to slew the aircraft in the desired direction in respect to true North (i.e. North, South, East or West).
4) While slewing the aircraft, the aircraft's position can be monitored on the Area Map page and the visual system (if applicable).
5) Once the aircraft has reached its desired position, select the slew button a second time to discontinue slewing.
6) Close the Slew Aircraft overlay by selecting the OK push button.

4.5.3. Symbol Display

The Symbol Display overlay is accessed by selecting the SYMBOL DISPLAY overlay button on the Area Map right collar. See Figure 4-8. The Symbol Display overlay is used to select which symbols will be displayed on the Area Map. The Symbol Display consists of a list of check boxes for each symbol that can be displayed. To add Nav symbols, select the check box for the symbol to be added so that an X appears in the check box. To remove or cancel Nav symbols, deselect the check box for the symbol to be removed so that there is not an X in the check box. The HELP button will display a Help overlay that gives useful information on the usage of the Symbol Display overlay, when it is selected. To close the Symbol Display overlay, select the OK push button.

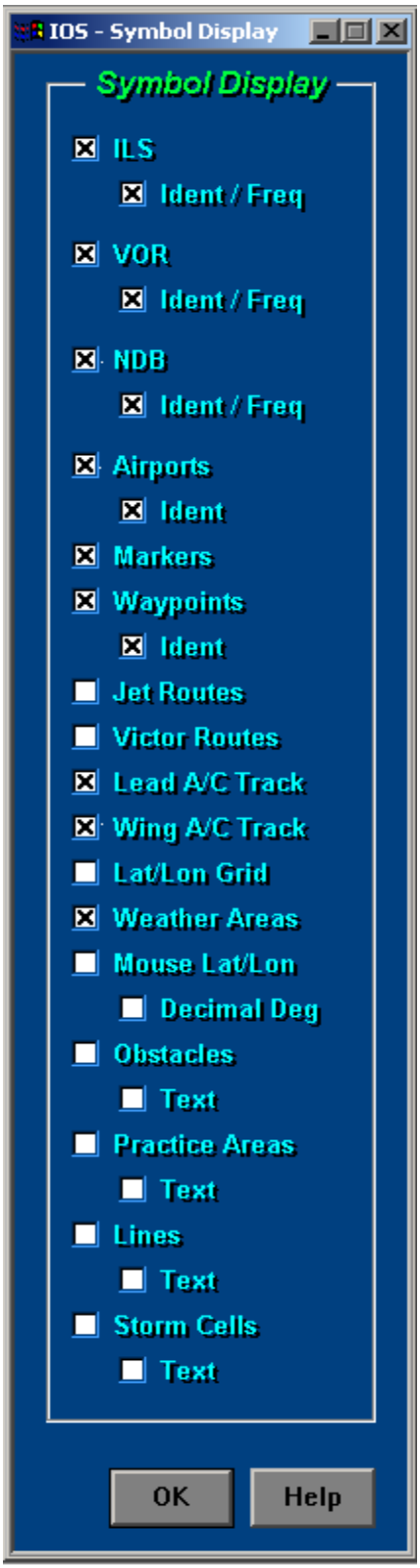


Figure 4-8. Symbol Display

4.5.4. NAVAID Kill

Selecting the NAVAID KILL button on the right collar of the Area Map page displays the NAVAID Kill overlay. See Figure 4-9. This overlay is used to fully or partially fail a station's Navigation Aids.

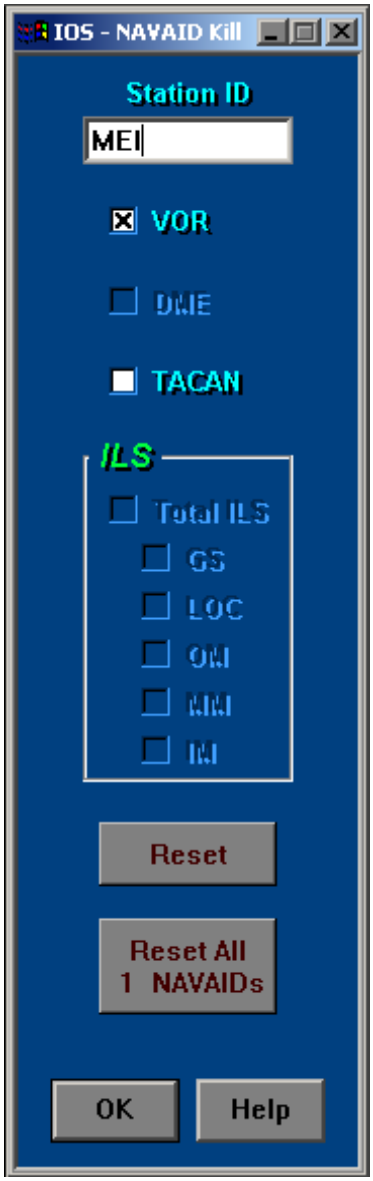


Figure 4-9. NAVAID Kill

4.5.4.1. Using the NAVAID KILL Function

1) Enter the desired 3- or 4-letter identifier code in the STATION ID edit box.
2) Fully or partially kill the selected station's NAVAIDS.
   a) For a full station failure, select all active check boxes on the overlay. If the Ident button for this station is displayed on the Area Map, it will be illuminated bright red.

b) For a partial station failure, select the NAVAID type check box that shows the type of NAVAID to fail. If the Ident button for this station is displayed on the Area Map, it will be illuminated dim red.

3) To restore the selected station to normal operations, select the RESET push button.

4) To restore all failed or partially failed station to normal operations, select the RESET ALL push button.

5) Select the OK push button to close the overlay.

4.5.5. Spider Web

Selecting the Spider Web button on the right collar of the Area Map page displays the Spider Web overlay. See Figure 4-10. This overlay is used to select the location of the spider web or remove it.

The Spider Web overlay consists of six radio buttons and two edit boxes.

The six radio buttons (OFF, AIRCRAFT, CURSOR, ACTIVE AP, AIRPORT and NAVAID) are set up so that only one can be active at a time. When a radio button is active, it has a black dot in the center. Using the Spider Web radio buttons, the spider web can be OFF, centered on the AIRCRAFT, centered on the ACTIVE AP (Airport), centered on the AIRPORT, centered on the NAVAID, or centered on a point on the map that was selected by the CURSOR.

To center the spider web on the cursor, select the Spider Web CURSOR radio button and then select a point on the Area Map. The edit box adjacent to the AIRPORT selection is used to enter the airport identifier where the spider web is to be centered.

To center the spider web on an airport, select the Airport radio button and then enter the desired airport's identifier in the edit box. The edit box adjacent to the NAVAID selection is used to enter the NAVAID identifier where the spider web is to be centered.

To center the spider web on an NAVAID, select the NAVAID radio button and then enter the desired NAVAID identifier in the edit box. The NAVAID must be either a VOR, DME, or TACAN.

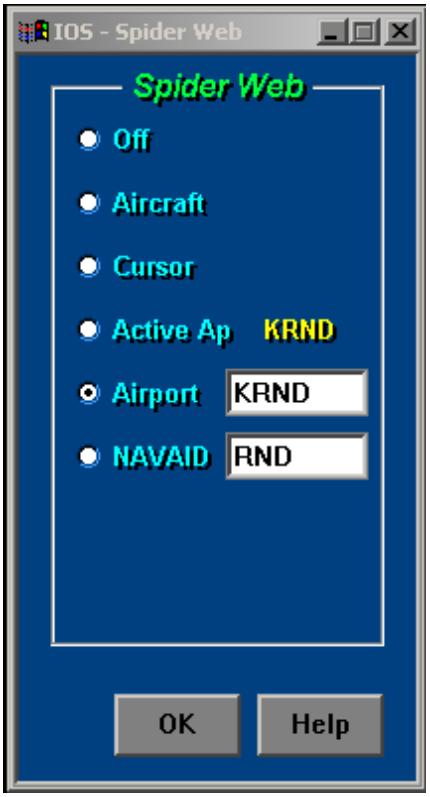


Figure 4-10. Spider Web

4.5.6. Touch Storm Location

Selecting the Touch Storm Location button allows the instructor to position a storm cell on the area map and displays the Storm Cell overlay. See Figure 4-11.

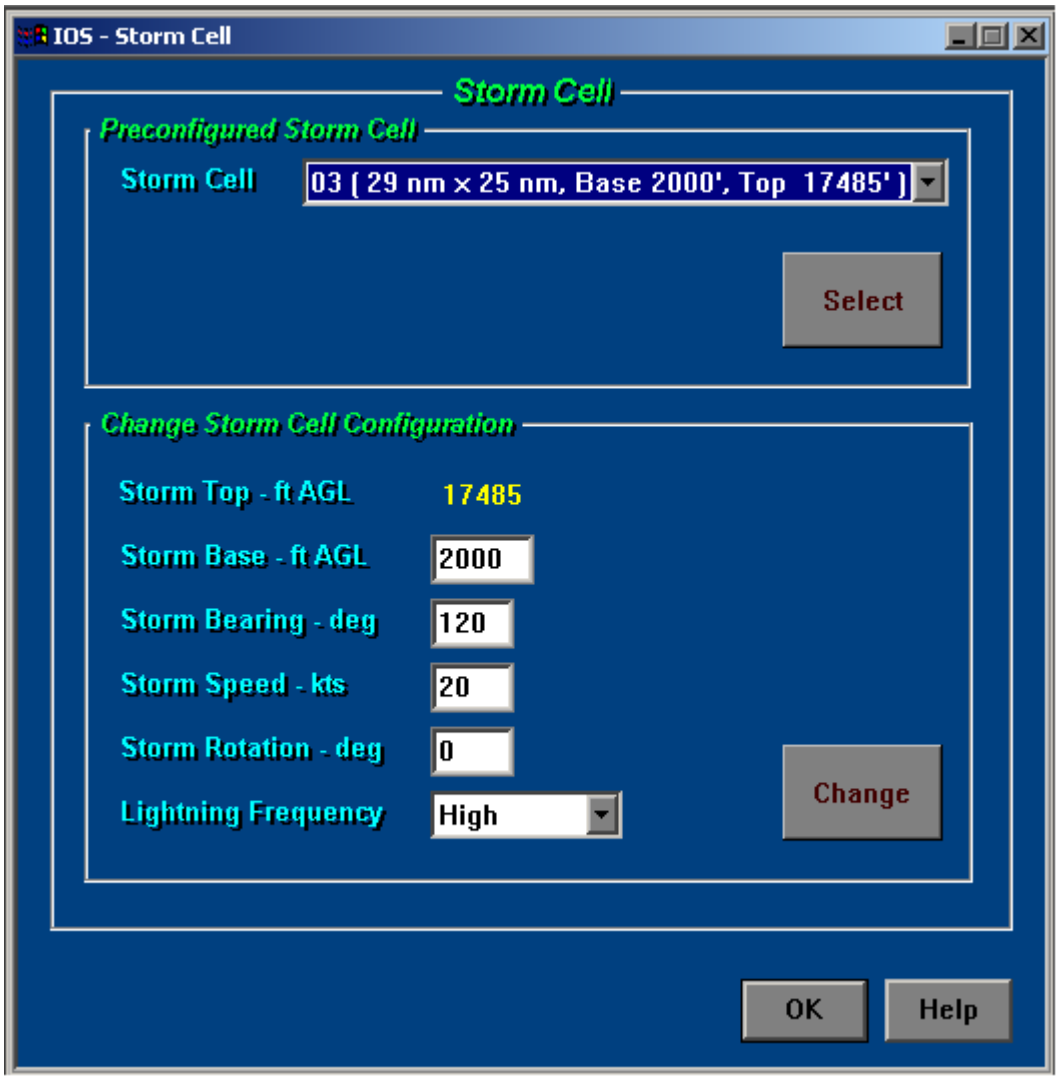


Figure 4-11. Storm Cell

4.5.6.1. Using the Touch Storm Location feature

1) Select the Touch Storm Location button and position the mouse over the area map at the desired storm cell location, then click and release the left mouse button. The point where the mouse is released determines the latitude and longitude of the storm cell.

2) After releasing the mouse, the Storm Cell overlay appears. This overlay has two group boxes for refining the storm cell parameters, Preconfigured Storm Cell and Change Storm Cell Configuration.

4.5.6.1.1. Preconfigured Storm Cell Group Box

Use the Storm Cell Combo Box to select which preconfigured storm cell to activate. The storm cell options are labeled with each storm cell's name, and in parenthesis: storm length in nautical miles, storm

width in nautical miles, storm base in ft agl, and storm top in ft agl. The storm cell options are ordered from lowest storm top to highest storm top.

Use the Select Push Button to activate the currently selected storm cell. Once the storm cell is activated, the storm cell parameters in the Change Storm Cell Configuration Group Box will update to show the active storm cell's parameters. The Slew Aircraft overlay display allows the instructor to place an aircraft at a safe altitude away or above nearby obstacles. If the Lead ship is off the edge of a chart and not able to center, the map border is drawn red, toward the general direction of the aircraft's location.

4.5.6.1.2. Change Storm Cell Configuration Group Box

Use the controls in this Group Box to change the parameters of the selected preconfigured storm cell.

Use the Edit Box for the Storm Base parameter to raise or lower the approximate lowest cloud bases in the storm cell. The Storm Top parameter will reflect this change once the Change button has been selected. This parameter is in feet above ground level and valid entries are 0 to 30,000.

Use the Edit Box for the Storm Bearing parameter to specify the direction the storm cell moves. This parameter is in degrees and valid entries are 0 to 360.

Use the Edit Box for the Storm Speed parameter to specify the speed the storm cell moves. This parameter is in knots and valid entries are 0 to 300.

Use the Edit Box for the Storm Rotation parameter to specify the degree of rotation of the storm cell about its center point. This parameter is in degrees and valid entries are 0 to 360.

Use the Lightning Frequency Combo Box to select the frequency of lightning strikes associated with the storm cell. Options are None, Low, Medium, and High.

Use the Change Push Button to apply all changes to the storm cell parameters.

4.6. GEOCHART

The GeoChart Display Page is a multi-purpose chart viewer; it is controlled by interacting with the following three (3) boxes:

1) Chart Selection Box
2) Map Center
3) Track

Additionally, to pan a chart, click and drag using the mouse. To zoom in on a chart, use the mouse wheel.

4.6.1. GeoChart – Chart Selection

The Chart Selection box contains the following three (3) map-selecting choices:

1) Pub Type drop-down menu
2) Airfield edit box
3) Available map drop-down menu

Select a publication type (Pub Type) from the drop-down menu, an airfield, and then an available map from a list of local charts using the drop-down menu or edit boxes in the Chart Selection Box. Press the Change button to display the desired map.

4.6.1.1. Chart Selection - Pub Type

The Area drop-down menu contains a list of the available chart types. The contents of this list vary depending on the site-administrator set up.

4.6.1.1.1. Pub Type - Nearby:

When Nearby is selected, then any chart that lies beneath the current latitude/longitude (lat/lon) of the Ownship becomes available to the "Available" list box. For Nearby-type charts, the “Airfield” list box is greyed out.

4.6.1.1.2. Pub Type - IAP-SID-STAR

When selecting IAP-SID-STAR, the Airfield selection box becomes active.

4.6.1.1.3. Pub Type - Sortie-Referenced

When selecting Sortie-Referenced, all charts defined in the currently loaded Sortie File show in the Available list box. For Sortie-Referenced-type charts, the "Airfield" list box is greyed-out.

4.6.1.2. Chart Selection - Airfield:

The Airfield selection lists specific airports from the larger grouping of IAP-SID-STAR contents.

4.6.1.3. Chart Selection - Change pushbutton

Selecting the Change button causes the selected chart to be loaded.

See Figure 4-12.

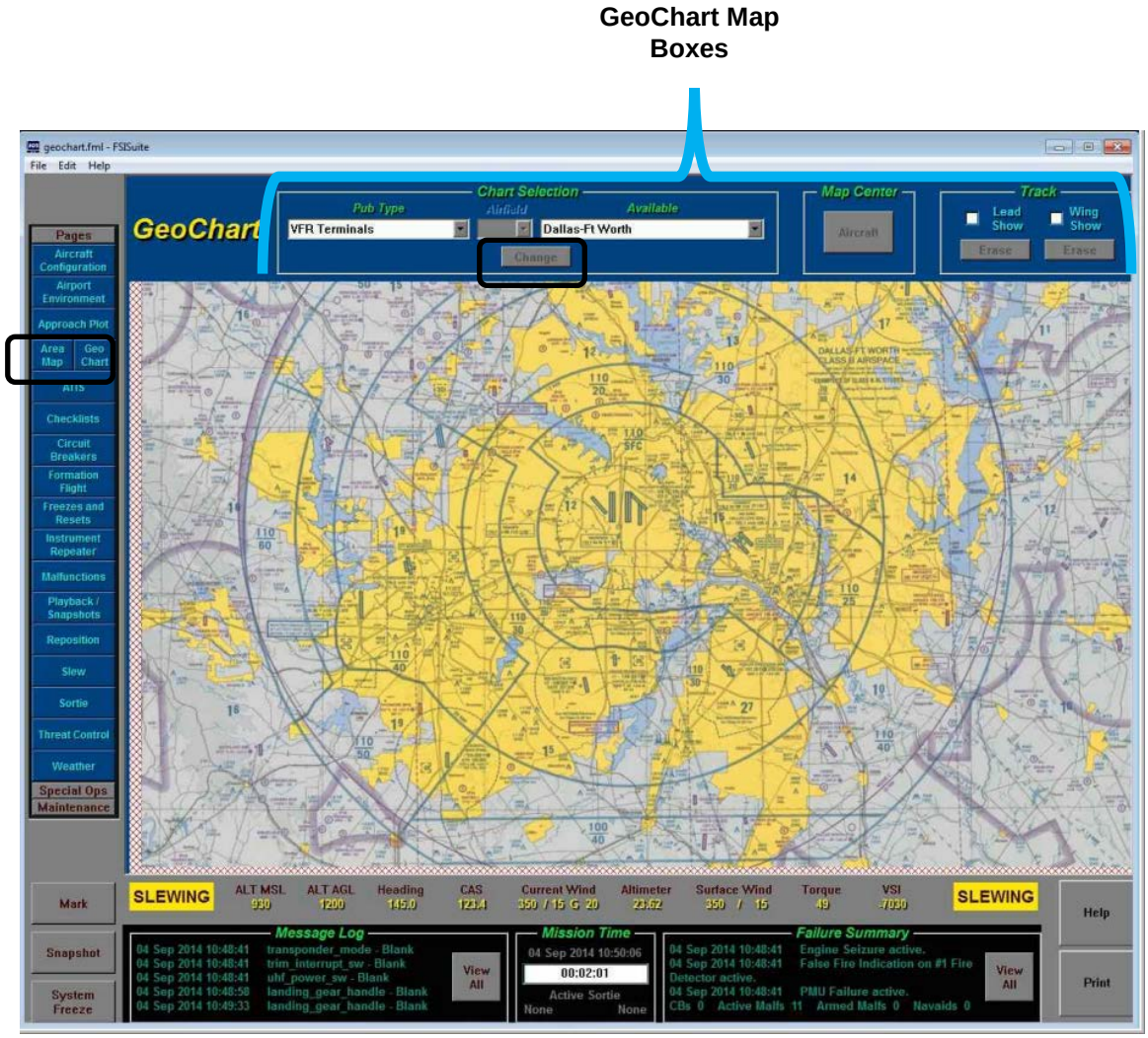


Figure 4-12. Display Pages – GeoChart

4.6.2. GeoChart – Map Center

The Map Center Box centers the map to the aircraft. To center the current chart on the location of the Ownship, select the Map Center "Aircraft" button, this only takes effect if the Ownship is within the bounds of the selected chart; otherwise, the button will grey-out and not be selectable.

See Figure 4-13.

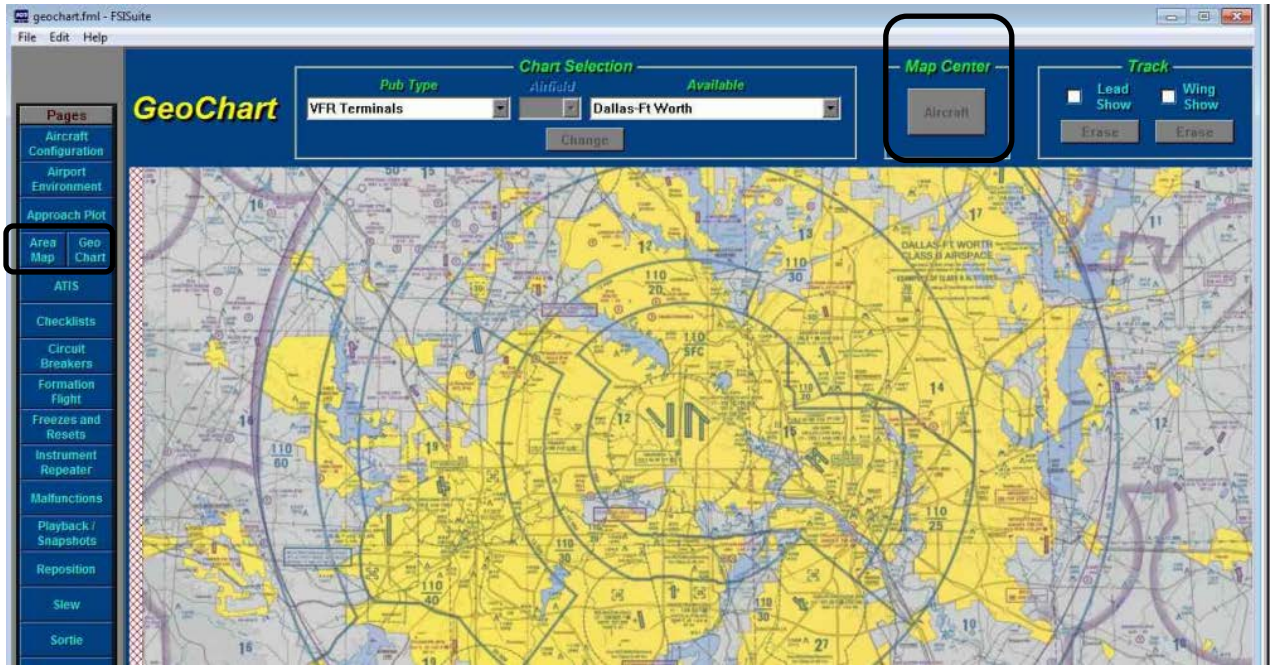


Figure 4-13. GeoChart – Selection

4.6.3. GeoChart – Tracking

The Erase W Track – Select the Erase W Track Pushbutton to erase permanently the Wing (Ownship) aircraft's track. The track will then immediately begin to re-draw starting with the Wing aircraft's current position.

The Erase L Track – Select the Erase L Track Pushbutton to erase permanently the Lead aircraft's track. The track will then immediately begin to re-draw starting with the Lead aircraft's current position.

See Figure 4-14.

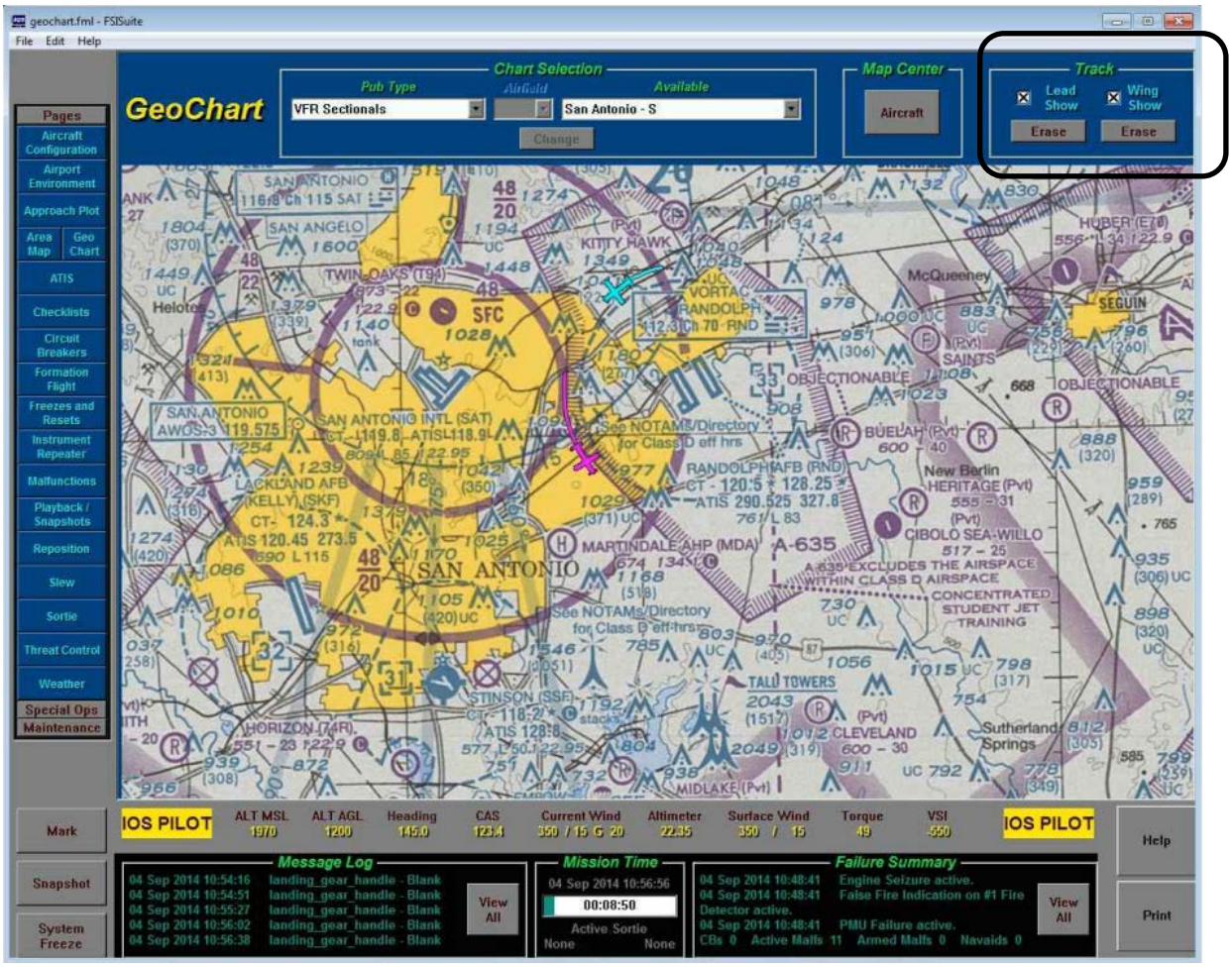


Figure 4-14. GeoChart – Tracking

4.7. ATIS DISPLAY

The Automatic Terminal Information Service (ATIS) function is accessed by selecting the ATIS DISPLAY page button on the left collar. See Figure 4-15. This page is used to monitor the ATIS Parameters for up to four airports. These parameters are the current weather conditions for the selected airports. The airports displayed correspond to the active airports loaded by the sortie file. The parameters are described below.

Airport Ident:	Display identifier of the airports
Ceiling	Display the current ceiling for each airport.
Sky Condition	Display the current cloud conditions at the airport.
Visibility	Displays current visibility at the surface.
Precipitation	Displays the current weather conditions (i.e. clear, rain, snow)
Temperature	Displays current field temperature.
Wind Direction	Displays current surface wind direction
Wind Speed	Displays current surface wind speed in knots.
Altimeter	Displays current field altimeter settings.
Active Runway	Displays current active runway.

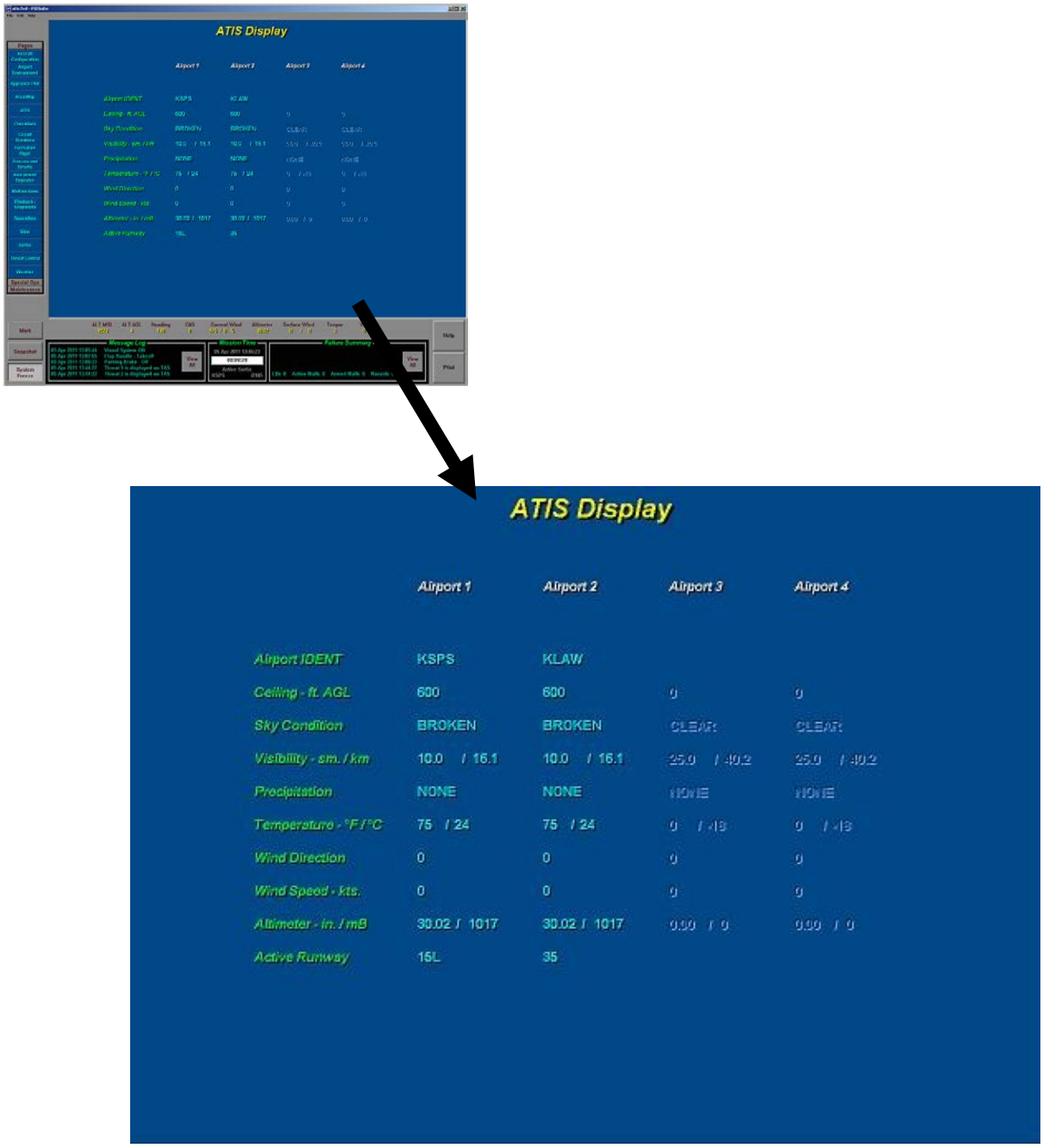


Figure 4-15. ATIS Page

4.8. CHECKLISTS

The Checklist pages are accessed by selecting the CHECKLISTS page button on the left collar. See Figure 4-16 (Sheet 1 of 3). The Checklists allow monitoring of a student's performance against standard aircraft procedures.

The Checklist Index page contains two page buttons for accessing the Normal Procedures and Emergency Procedures Index pages. See Figure 4-16 (Sheet 1 of 3). The Checklist Index page is displayed when the CHECKLISTS page button on the left collar is selected.

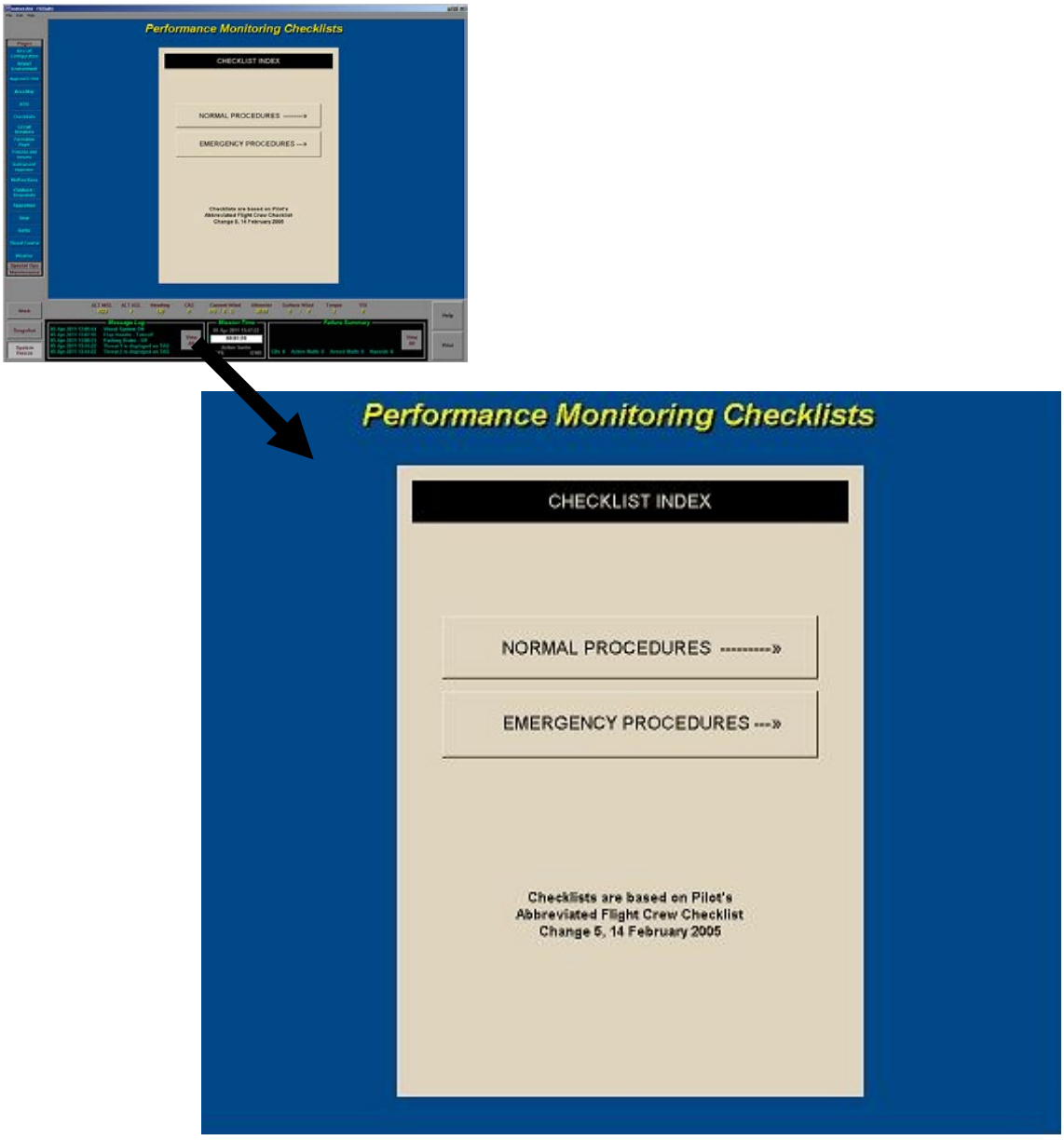


Figure 4-16. Checklists Page (Sheet 1 of 3)

The Normal Procedures Index page is a menu for accessing each of the Normal Procedures checklists. See Figure 4-17 (Sheet 2 of 3). The Normal Procedures Index page is accessed by selecting the NORMAL PROCEDURES page button on the Checklist Index page. To return to the Checklist Index page, select the INDEX page button.

Selecting any of the Checklist buttons will display the associated checklist. The text of each checklist resembles that of the official Pilot's Pocket Checklist. Most of the checklist line items contain a specific step for the student to accomplish. Associated with each line item is a current simulation parameter that allows a comparison to be made between the desired action and the student's action.

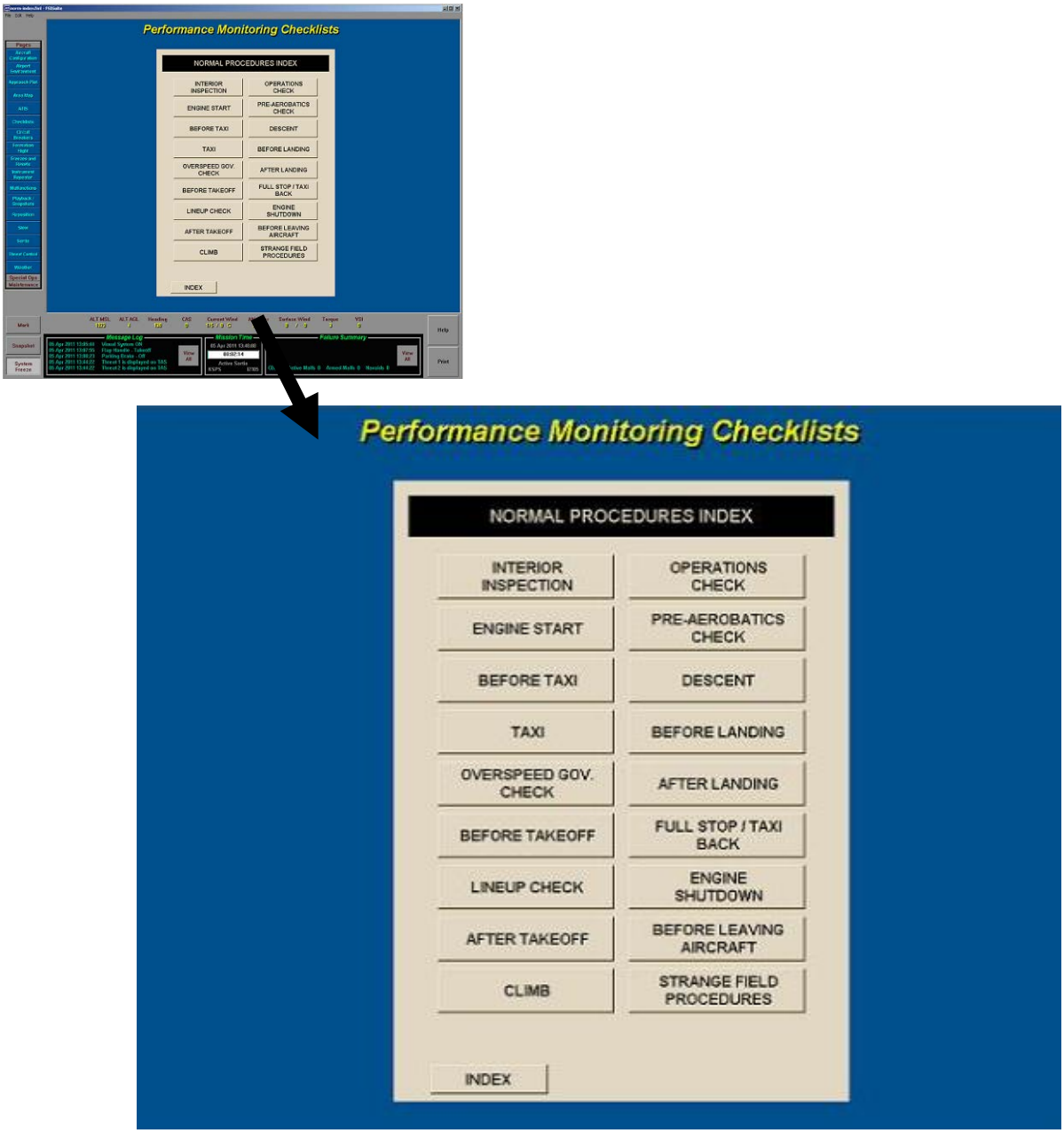


Figure 4-17. Checklists Page (Sheet 2 of 3)

The Emergency Procedures Index page is a menu for accessing each of the Emergency Procedures checklists. See Figure 4-18 (Sheet 3 of 3). The Emergency Procedures Index page is accessed by selecting the EMERGENCY PROCEDURES page button on the Checklist Index page. To access an Emergency Procedures checklist, select the desired page button. To return to the Checklist Index page, select the INDEX page button.

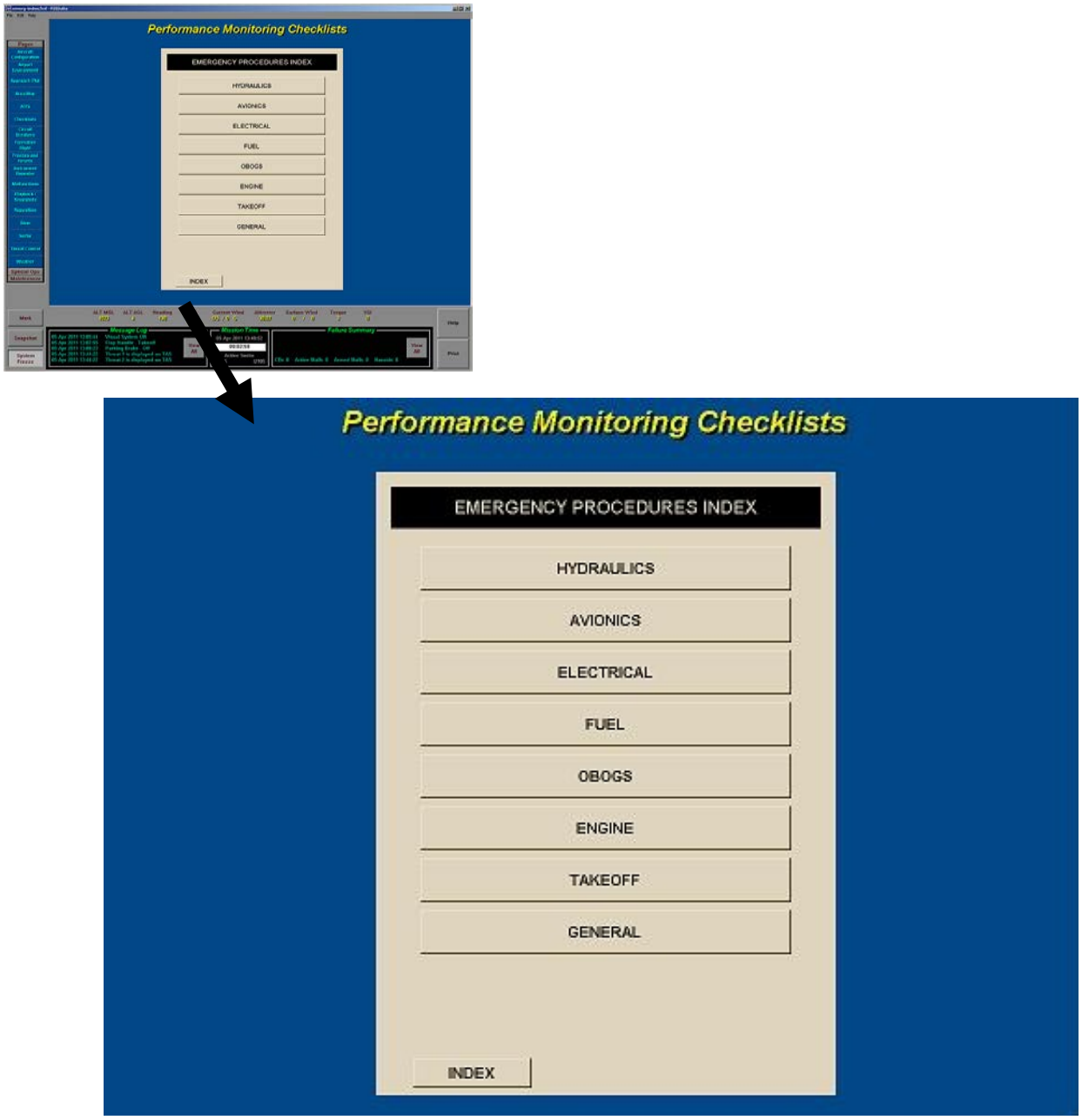


Figure 4-18. Checklists Page (Sheet 3 of 3)

4.9. CIRCUIT BREAKER CONTROL

The Circuit Breaker Control page is accessed by selecting the CIRCUIT BREAKERS page buttons on the left collar. See Figure 4-19. The Circuit Breaker Control page is used to control and monitor the cockpit circuit breakers. The Circuit Breaker Control page is a replica of the cockpit circuit breaker panels. The Circuit Breaker Control page contains rows of selectable circuit breaker buttons. All the circuit breakers show applicable amperage ratings and a description above each button.

At the bottom of the page, a Legend is provided to assist the instructor. The Legend shows that each circuit breaker can be one of three colors. If the circuit breaker is in its normal condition, it will be displayed with a black color. If the circuit breaker is out (by being tripped) and is not resettable, the circuit breaker will be displayed with a red color. If the circuit breaker is out (either by being popped or by being manually pulled) and the circuit breaker is resettable, it will be displayed with an orange color.

There are three methods that can be used to trip a circuit breaker. The instructor can select a particular malfunction from the Malfunctions page that will trip a breaker. The instructor can select a circuit breaker on the Circuit Breaker Control page, which will result in the circuit breaker being tripped. The circuit breaker can be manually pulled on the cockpit circuit breaker panel.

Typically, if a circuit breaker is tripped by either a malfunction or by the Instructor selecting the circuit breaker, it will initially be tripped and not resettable. If a circuit breaker is manually pulled, it will be resettable. To change the status of a circuit breaker from Non-Resettable to Resettable, the Instructor can either select the desired non-resettable circuit breaker on the Circuit Breaker Control page or select the MAKE ALL RESETTABLE push button in the Master Reset group box to make all tripped circuit breakers resettable.

4.9.1. Tripping Circuit Breakers

Access the Circuit Breaker Control page by selecting the CIRCUIT BREAKERS page button on the left collar.

Select the desired circuit breaker button. If the appropriate conditions exist to trip the selected circuit breaker, the CB on the cockpit circuit breaker panel will trip and the CB will illuminate red.

When it is appropriate to make the circuit breaker resettable, select the tripped circuit breaker. The circuit breaker will illuminate orange. At this time, the circuit breaker in the cockpit can be reset.

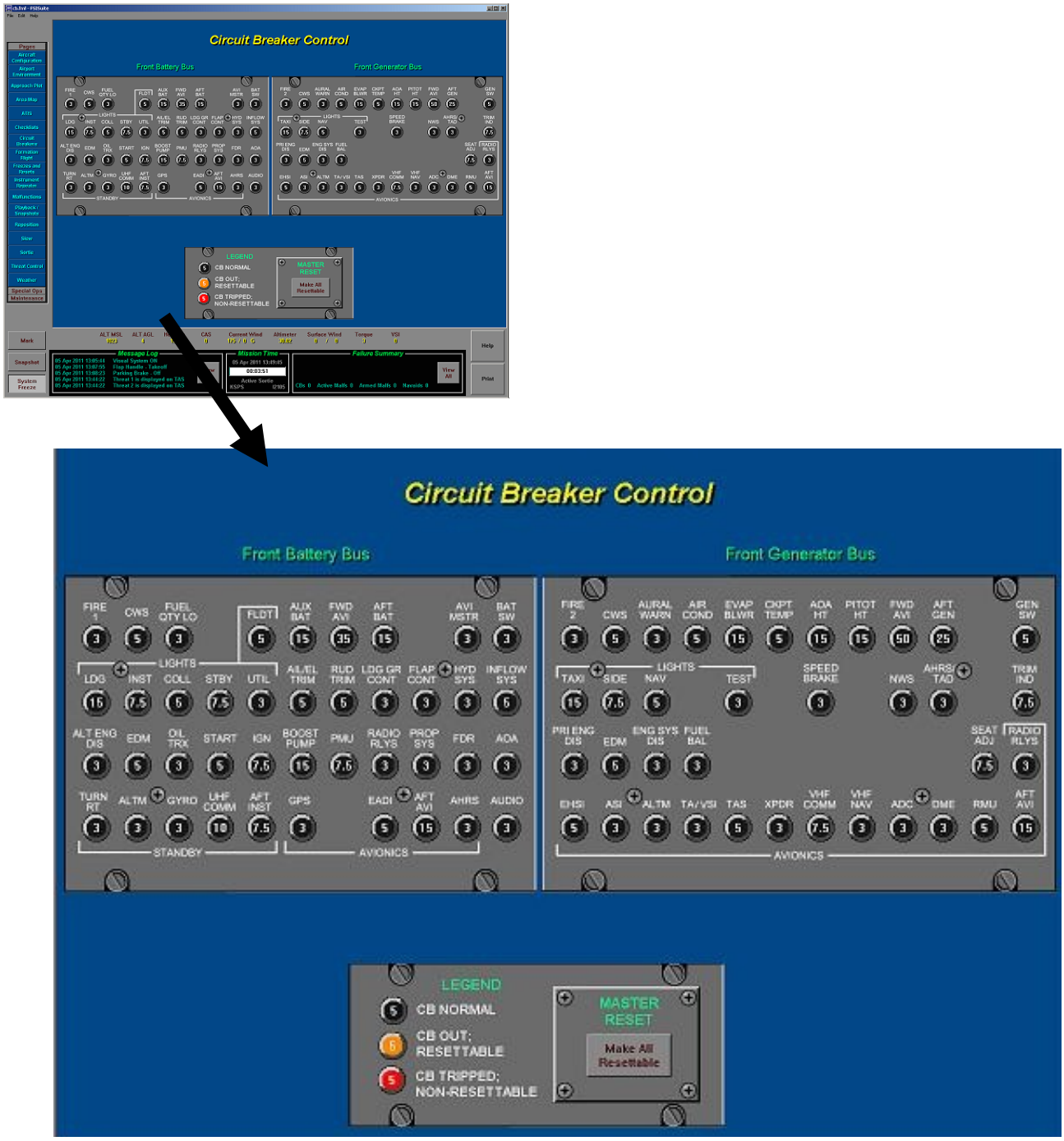


Figure 4-19. Circuit Breaker Page

4.10. CONTROLS NOT IN AGREEMENT

The Controls Not In Agreement (CNIA) overlay displays a list of cockpit controls that are in an incorrect state for the reposition being requested, such as when a snapshot is recalled. Figure 4-20 illustrates a typical CNIA page. This page cannot be accessed manually. This display shows the actual state of the controls as well as the required state for the reposition.

WARNING

IF A CRASH OCCURS DURING A RECALL FROM A SNAPSHOT, DO NOT USE CRASH OVERRIDE AND ATTEMPT TO FLY OUT OF THE EVENT. THE CRASH MAY INDICATE EXTREME FLIGHT PARAMETERS, WHICH COULD CAUSE RAPID FLIGHT CONTROL MOVEMENTS. THESE MOVEMENTS COULD STRIKE THE PILOT IN THE COCKPIT. TO CLEAR THIS TYPE OF CRASH EVENT, SELECT A PRE-PROGRAMMED REPOSITION POINT FROM THE REPOSITION PAGE (See 4.18 Reposition). ENSURE THE PILOT STAYS CLEAR OF THE FLIGHT CONTROLS WHILE THE SIMULATOR IS TAKEN OFF FREEZE.

When a reposition is requested by the Instructor, the simulator will enter in an autotrim condition. Autotrim will initialize the aircraft and trim for the demanded phase of flight. The autotrim determines the trims and torques necessary to release the aircraft straight and level with no large accelerations.

If, while performing the autotrim, the host computer determines certain controls should be reset, the CNIA overlay will appear with the name of the control, the required value, and the actual value. The control should be manually moved to the required value so the software can trim the aircraft before Flight Freeze is released. While the controls are being adjusted, the value in the Actual column will change dynamically to allow the instructor to observe the student activities.

The CNIA overlay can be closed by selecting the OK push button.

Figure 4-20. Controls Not In Agreement (CNIA) Page

4.11. CRASH DETECTED

The Crash Detected overlay displays a list of conditions that would cause the crash. The host computer evaluates the crash scenario and illuminates in orange the most probable cause of the crash. See Figure 4-21. This overlay cannot be accessed manually. To close the Crash Detected overlay, select the OK push button.

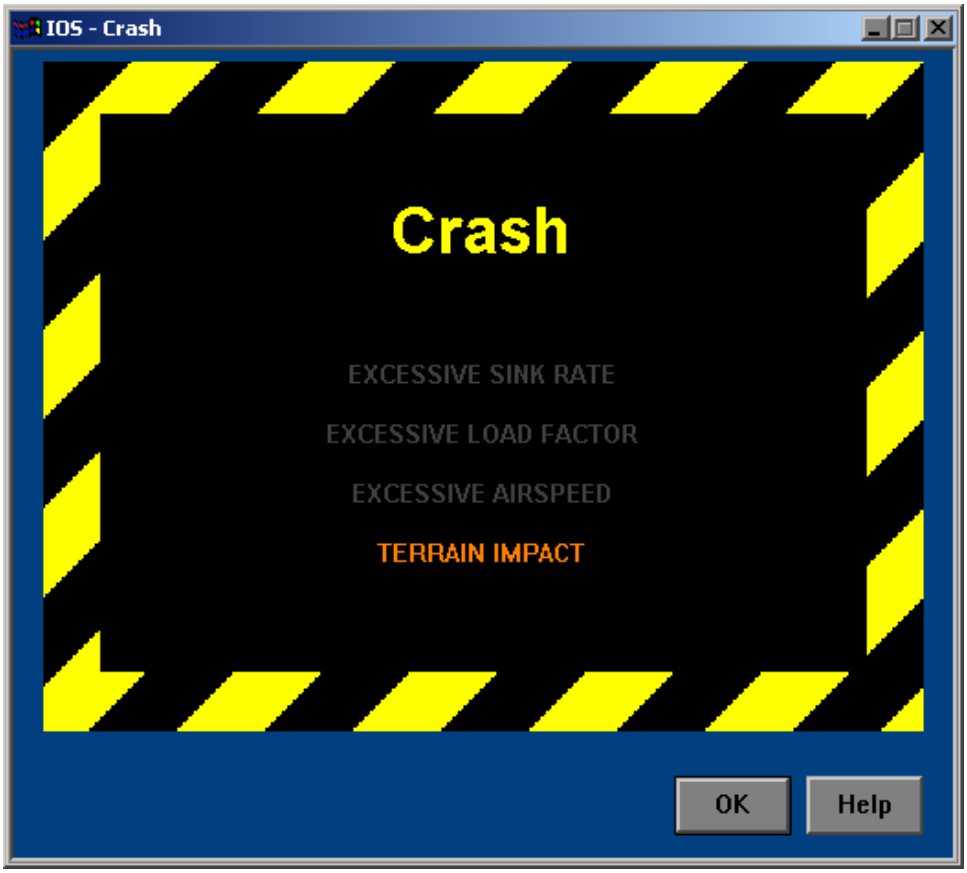


Figure 4-21. Crash Detected

4.12. EJECTION DETECTED

The Ejection Detected overlay is displayed whenever the ejection handle in the cockpit is pulled. The overlay displays the calculated probability of success as well as the aircraft parameters that are used in the calculation. See Figure 4-22. The Ejection Detected overlay cannot be accessed manually.

The Probability of Success will display if the ejection is either IN or OUT of the design ejection envelope. The parameters displayed are the current (at the time of ejection) values of the aircraft parameters that are used in the probability of success calculation.

The EJECTION RESET push button resets the simulator to the condition of not having ejected. This will cause the Ejection Detected overlay to close. The simulator remains in Flight Freeze even if the EJECTION RESET button is selected.

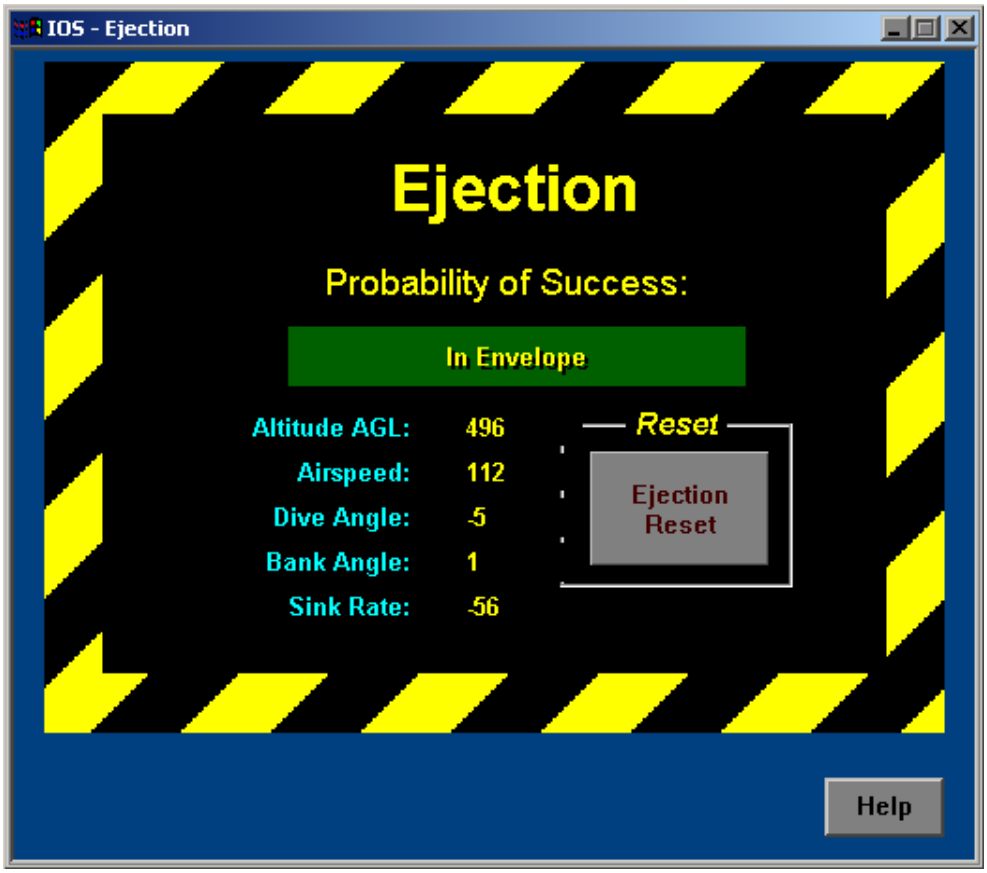


Figure 4-22. Ejection Detected

4.13. FORMATION FLIGHT CONTROL

The Formation Flight Control page is accessed by selecting the FORMATION FLIGHT page button on the left collar. See Figure 4-23. The Formation Flight Control page is used to load a prerecorded lead flight profile, modify the lead aircraft controls, select the wing formation position, and view the lead and wing aircraft's positional relationships.

The Lead Aircraft Semi-Manual Control group box consists of sliders and push buttons that provide semi-manual control of the lead aircraft. When the Formation Flight Control page is first displayed, these controls are not active (grayed out). To activate these controls, select the Lead Aircraft Semi-Manual Controls radio button. The ROLL slider allows the instructor to adjust the lead aircraft's amount of roll (left or right). The ROLL RATE slider allows the instructor to adjust the speed that the roll is accomplished. The PITCH slider allows the instructor to adjust the lead aircraft's pitch. The PITCH RATE slider is used by the instructor to set the speed that the pitch is accomplished. The IAS (Indicated Air Speed) slider is used to modify the lead aircraft's Indicated Air Speed. The ACCELERATION slider allows the instructor to adjust the rate at which the modified IAS is achieved. The four push buttons are used to cause the lead aircraft to perform a specific flight variation. These variations are Wing Dip, Porpoise, Big Wing Rock, and Small Wing Rock. Use the SEMI-MANUAL CONTROL OFF button to turn formation flight control off.

The Pre-recorded Lead Controls group box consists of the controls required to load a pre-recorded

formation flight control profile. To activate these controls, select the PRE-RECORDED LEAD CONTROLS radio button. The combo box is used to select a profile from the list of pre-recorded profiles. Four push buttons are located on the right side of the group box. These push buttons provide the interface for operating the player. The controls are: START PLAYING, PAUSE, PREVIOUS (PREV) TRACK, and NEXT TRACK. Using these controls, the instructor can control which part of the pre-recorded file to play. The TRACK NAME AND NUMBER control selects which part (track) of the selected profile to play.

The PLAN VIEW is a top down view of the formation. It has the lead aircraft always centered on the scaled spider web, with the wing aircraft shown in its relative position to the lead aircraft. The scales of the aircraft's and spider web are automatically adjusted according to the separation between the lead and wing aircrafts. The separation between the aircrafts can be determined by extrapolating the wing aircraft's position on the spider web.

The REAR VIEW is a view of the formation from the back. This view primarily shows the wing aircraft's altitude difference from the lead aircraft. The lead aircraft is always centered in a grid, with the wing aircraft shown in its relative position to the lead aircraft. The scales of the aircraft's and the grid are automatically adjusted according to the separation of the lead and wing aircraft's. The separation between the aircraft's can be determined by extrapolating the wing aircraft's position on the grid.

When the lead aircraft and wing aircraft become too small to draw legibly, they are replaced with an "L" and "W" respectively. In addition, a small gray arrow is drawn to indicate the heading of the wing aircraft.

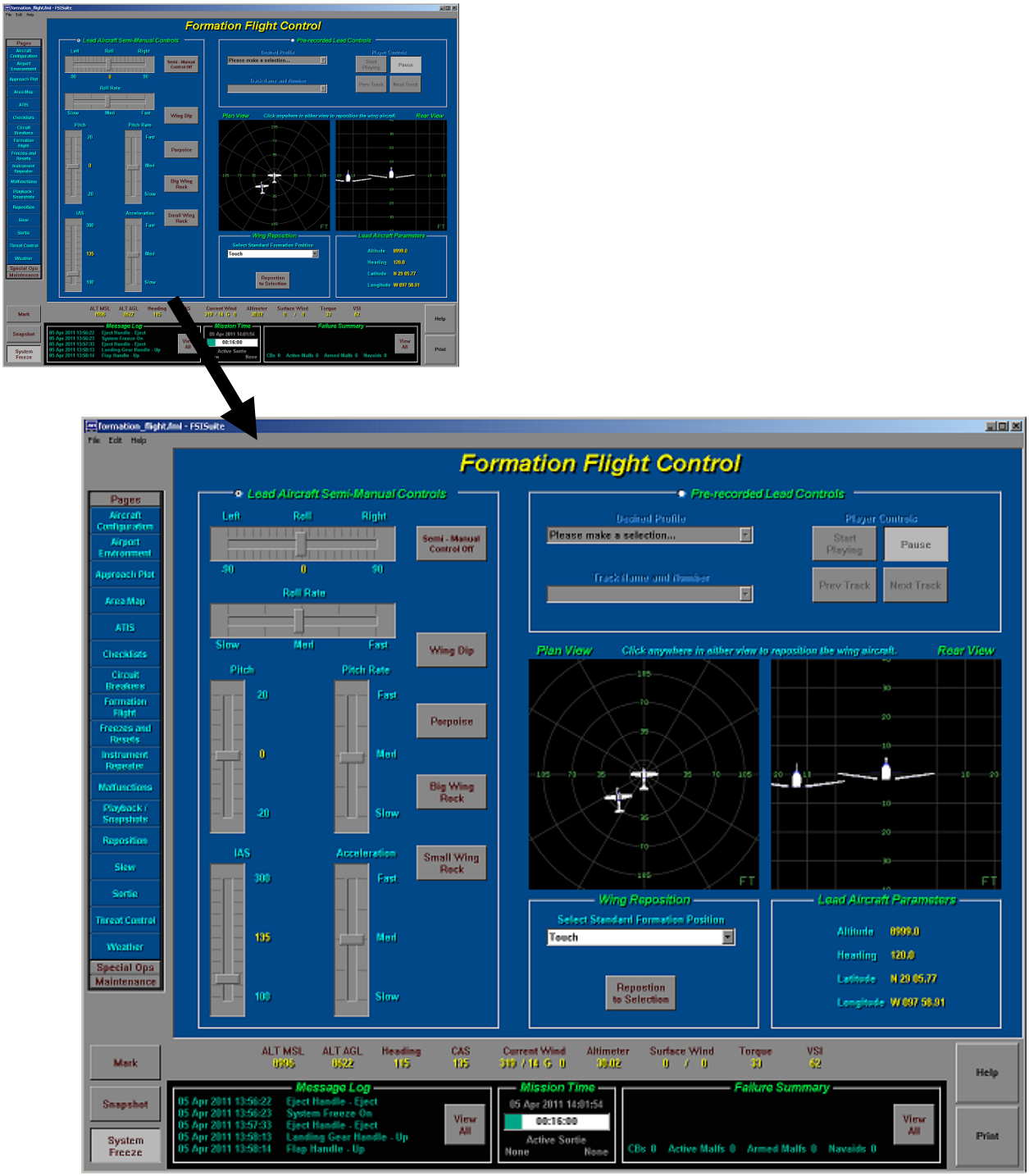


Figure 4-23. Formation Flight Control

The Wing Reposition group box consists of the controls necessary to reposition the wing aircraft's position in the formation in respect to the lead aircraft. The combo box in the Wing Reposition group box contains a list of Standard Formation Positions as well as the option to perform Touch Repositioning. If a Standard Formation is desired, it can be selected from the list. The REPOSITION TO SELECTION push button will activate the repositioning of the wing aircraft to the position selected. The

TOUCH REPOSITION option on the combo box is used to manually position the wing aircraft to a desired position on the Plan View and/or Rear View of the formation. This is accomplished by first selecting the TOUCH REPOSITION option, then selecting the position on either the Plan View or the Rear View.

NOTE

With the exception of the TOUCH REPOSITION option, the wing aircraft is not physically repositioned until The REPOSITION TO SELECTION push button is selected.

The Lead Aircraft Parameters group box shows the lead aircraft's current Altitude, Heading, Latitude, and Longitude values.

4.14. FREEZES AND RESETS

The Freezes and Resets overlay is accessed by selecting the FREEZES AND RESETS overlay button on the left collar or by selecting the PARAMETER FREEZE button on the instructor's console. See Figure 4-24. The Freezes and Resets overlay utilizes push buttons for all of its functions. The overlay is divided into four group boxes. These group boxes are FREEZE, RESET, QUICK START, and VISUAL ON. The buttons within the Freeze group box allow the instructor to set or release the System, Position, Altitude, and Heading Freezes. The SYSTEM push button commands the entire simulation to pause. The POSITION push button prevents the latitude and longitude from changing, but the rest of the simulation environment operates normally. The ALTITUDE push button prevents the altitude from changing, but the rest of the simulation environment operates normally. The HEADING push button prevents the aircraft heading from changing, but the rest of the simulation environment operates normally.

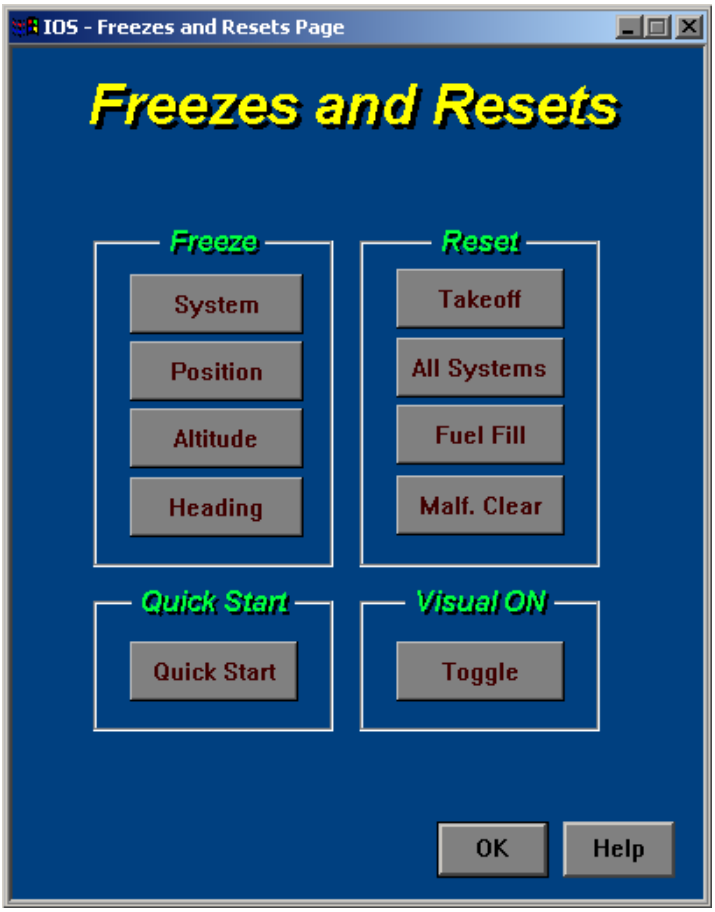


Figure 4-24. Freezes and Resets

The buttons within the Reset group box allow the instructor to reset specific simulation functions. These resets are: TAKEFOFF, ALL SYSTEMS, FUEL FILL, and MALF CLEAR. The TAKEOFF push button resets the aircraft to the Takeoff point on the runway. The ALL SYSTEMS push button will perform a reset in all aircraft systems when it is selected. The FUEL FILL push button will reset the aircraft fuel quantity to fill the fuel tanks, when it is selected. The MALF CLEAR direct button will clear any active or pre-selected malfunctions in the system.

The Engine Quick Start group box contains the QUICK START push button. If the cockpit battery switches are on and there is fuel to the engine, the QUICK START push button will bypass the normal engine start sequence and get the engine running quickly when it is selected.

The Visual ON group box contains a toggle switch that is used to toggle the visual system on when it is selected.

To close the Freezes and Resets overlay, select the OK push button.

4.15. INSTRUMENT REPEATER

Selecting the INSTRUMENT REPEATER button on the left collar displays the Instrument Repeater page. See Figure 4-25. The Instrument Repeater page provides the instructor the capability to monitor select flight deck instruments and controls. This is a display-only page.

Figure 4-25. Instrument Repeater Page

4.16. MALFUNCTIONS

The Malfunctions page is accessed by selecting the MALFUNCTIONS page button on the left collar. See Figure 4-26. The Malfunction page button is used to activate and/or pre-select malfunctions for the simulation environment. The Malfunction page has five group boxes. These group boxes are SECTIONS, MALFUNCTION SELECTION, IMMEDIATE ACTIVATION, PRESET CONDITIONS FOR ACTIVATION, and MALFUNCTION DESCRIPTION.

The Sections group box consists primarily of push buttons. The Sections group box utilizes push buttons to list the different major areas of the aircraft (i.e. Airframe, Comm/Nav, Electrical, etc). There are more areas than are shown on the page. To view additional aircraft areas, select either the PREVIOUS or NEXT push button. To view the malfunctions of any of the aircraft areas, select a Section push button. The applicable malfunctions for the selected aircraft area will be displayed in the Malfunction Selection group box.

The Malfunction Selection group box contains several push buttons. Each push button is assigned a malfunction that is available in the selected aircraft Section. Not all malfunctions for a selected Section may be visible on the group box. To view the remaining malfunctions, select either the PREVIOUS or the NEXT push button to navigate through the malfunctions. When a malfunction push button is selected, the CAUSE and EFFECTS in the Malfunction Description group box are updated to reflect the selected malfunction.

The Immediate Activation group box contains two push buttons. The IMMEDIATE ACTION radio button must be selected to enable the push buttons. The ACTIVATE MALFUNCTION push button displays the name of the selected malfunction that will be acted upon. When the ACTIVATE MALFUNCTION push button is selected, the selected malfunction will immediately be active and the title of the button will change to DEACTIVATE MALFUNCTION. The CLEAR ALL MALFUNCTIONS push button will clear all active malfunctions. It will not clear any malfunctions that have been armed but not activated.

The Preset Conditions for Activation group box contains three rows of combo boxes and edit boxes. The Preset Conditions for Activation group box is used when the instructor wants a selected malfunction to activate only when a set of conditions is met. Select the PRESET CONDITIONS FOR ACTIVATION radio button to enable the combo and edit boxes in the group box. The top and bottom rows contain two combo boxes and one edit box. The middle row has one combo box in the middle of the row. The first combo box in the top and bottom rows is used to select a variable. The second combo box in the top and bottom rows is used to select a condition (such as: less than, greater than, etc). The edit box in the top and bottom rows is used to enter a value to compare the variable in the first combo box to. The second row has only one combo box. This combo box is used to select either AND or OR to link the top and bottom conditionals. The ACTIVATE PRESELECT push button enables the pre-selected malfunction and its associated conditions.

The Malfunction Description group box displays the Cause and Effects of the selected malfunction.

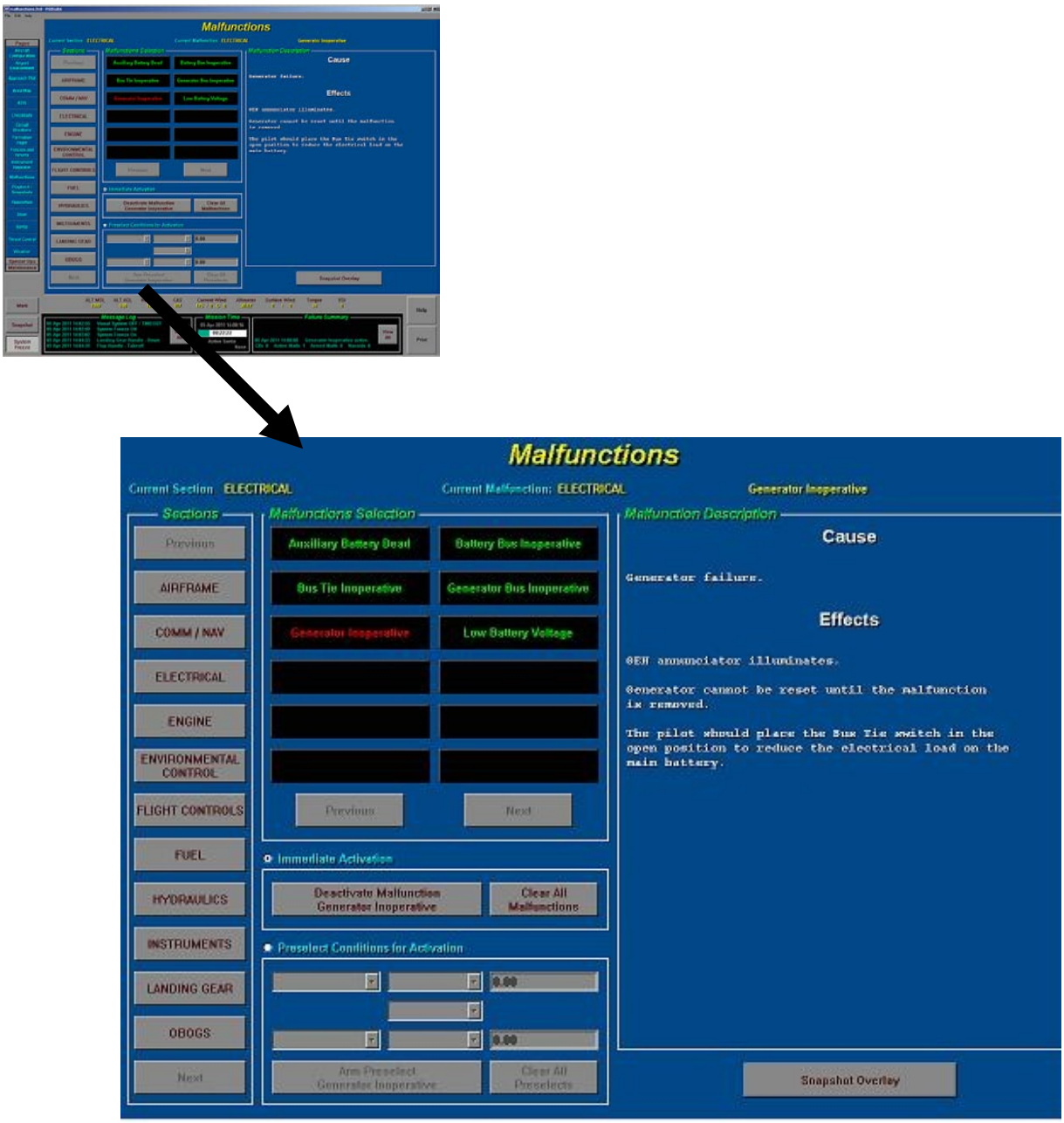


Figure 4-26. Malfunctions Page

The Snapshot Overlay is displayed when the Snapshot Overlay button is selected. See Figure 4-27. Refer to section 4.17 for a description of the snapshot function. To close the Snapshot overlay, select the OK push button.

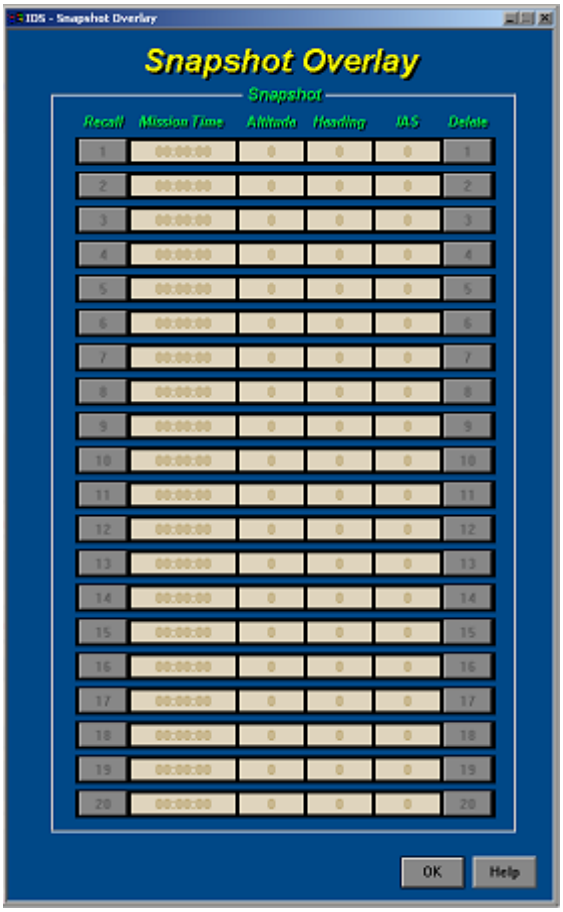


Figure 4-27. Snapshot Overlay

4.16.1. Accessing Malfunction Descriptions

1) Access the Malfunctions page by selecting the MALFUNCTIONS page button on the left collar.
2) Select the desired Malfunction Section push button in the Sections group box of the Malfunctions page.
3) In the Malfunction Selection group box, select the desired malfunction push button.
4) The corresponding Cause and Effects are displayed in the Malfunction Description group box.

4.16.2. Activating Malfunctions

1) Access the Malfunctions page by selecting the MALFUNCTIONS page button on the left collar.
2) Select the desired Malfunction Section push button in the Sections group box of the Malfunctions page.

3) In the Malfunction Selection group box, select the desired malfunction push button.
4) Select the ACTIVATE MALFUNCTION push button.

4.16.3. Entering Malfunction Pre-selects

1) Access the Malfunctions page by selecting the MALFUNCTIONS page button on the left collar.
2) Select the desired Malfunction Section push button in the Sections group box of the Malfunctions page.
3) In the Malfunction Selection Group box, select the desired malfunction push button.
4) Select the PRESELECT CONDITIONS FOR ACTIVATION radio button.
5) In the Preselect Conditions for Activation group box, select the first combo box in the top row and then select the desired variable for the pre-select.
6) In the Preselect Conditions for Activation group box, select the second combo box, in the top row, and then select the desired condition (less than, equal to, greater than, etc) for the pre-select.
7) In the Preselect Conditions for Activation group box, select the edit box, in the top row, and then enter the desired value for the pre-select.
8) Select the ARM PRESELECT push button.

4.16.4. Clearing All Active Malfunctions

1) Access the Freezes and Resets overlay by selecting the FREEZES AND RESETS overlay button on the left collar.
2) Select the MALF CLEAR push button in the Reset group box.

or,

1) Select the CLEAR ALL push button on the Malfunctions Page.

4.17. PLAYBACK and SNAPSHOTS

The Playback and Snapshots page is accessed by selecting the PLAYBACK/SNAPSHOTS page button on the left collar. See Figure 4-28. The Playback and Snapshots page is used to play previously recorded files and recall previously recorded snapshots.

WARNING

IF A CRASH OCCURS DURING A RECALL FROM A SNAPSHOT, DO NOT USE CRASH OVERRIDE AND ATTEMPT TO FLY OUT OF THE EVENT. THE CRASH MAY INDICATE EXTREME FLIGHT PARAMETERS, WHICH COULD CAUSE RAPID FLIGHT CONTROL MOVEMENTS. THESE MOVEMENTS COULD STRIKE THE PILOT IN THE COCKPIT. TO CLEAR THIS TYPE OF CRASH EVENT, SELECT A PRE-PROGRAMMED REPOSITION POINT FROM THE REPOSITION PAGE (See 4.18 Reposition). ENSURE THE PILOT STAYS CLEAR OF THE FLIGHT CONTROLS WHILE THE SIMULATOR IS TAKEN OFF FREEZE.

The Playback and Snapshots page contains the Playback and Snapshot group boxes. The Playback group box contains the controls necessary to play a previously recorded file. The Snapshot group box contains a list of previously recorded snapshots that can be either recalled or deleted.

There are two types of previously recorded files that can be played back, which are the Instant Replay and Demonstration files. The Playback group box contains the Instant Replay and Demonstration group boxes, which contain the controls for accessing the files.

The Instant Replay file is automatically recorded by the simulator continuously. While simulation is running, the system records the last ten minutes of simulation. The Instant Replay file will only contain the last ten minutes of simulation at any given moment. The Instant Replay group box is activated by selecting the INSTANT REPLAY radio button. The Previous Minutes slider is used to cause the simulation to go back the selected number of minutes and automatically trim the simulated aircraft to the conditions found at that time. Once the automatic trim operation is completed, selecting the START PLAYING push button, in the Playback group box, starts playing back simulation from the selected point. To exit an Instant Replay, select the FLY-OUT push button. This will turn control of the simulator over to the pilot.

The Demonstration files are pre-recorded files that demonstrate flight paths, maneuvers, etc. The Demonstration group box is activated by selecting the DEMONSTRATION radio button. The Filename combo box contains a list of previously recorded demonstration files. If the demonstration includes a formation profile, the Initialize Formation Demo pushbutton will be enabled. The Initialize Formation Demo pushbutton will load the associated formation profile and automatically set the Minutes from Start of File slider to the beginning segment of the demonstration file. The simulated aircraft will begin trimming to the conditions at that point in the recorded demonstration. Once the formation profile is loaded, the Initialize Formation Demo pushbutton will be disabled until the demo is reloaded or another formation demonstration is loaded. The MINUTES FROM START OF FILE slider causes the loaded demonstration file to skip to the selected number of minutes from the beginning of the file as well as automatically trimming the simulated aircraft to the conditions at that time. The FILE LENGTH (MINUTES) display indicates the loaded file’s recorded length of time. The PLAY push button will start playing back the loaded demonstration file from the selected point. The FLY-OUT push button will exit the selected demonstration and return control of the simulator to the pilot.

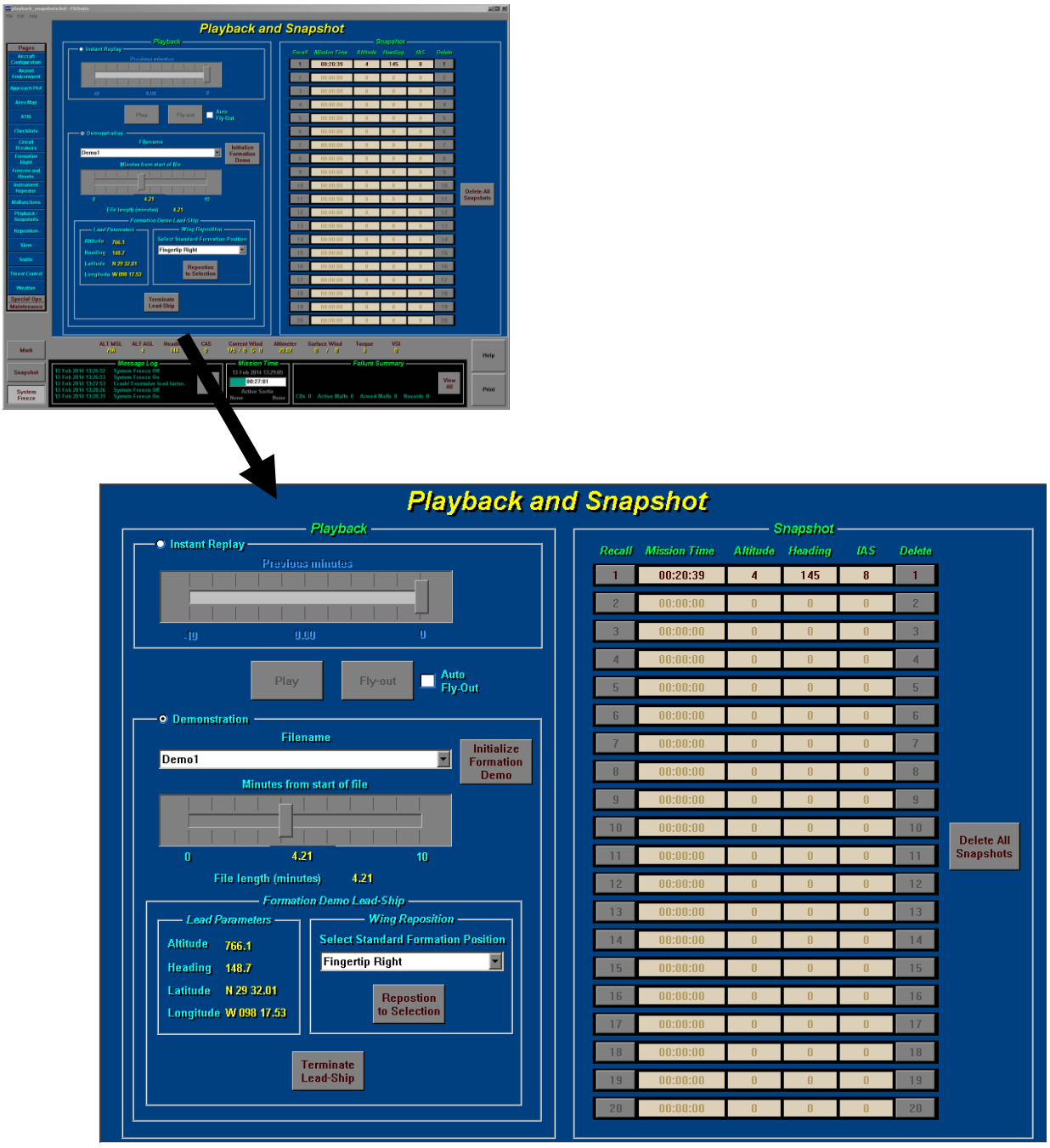


Figure 4-28. Playback/Snapshot Page

The Snapshot group box contains a list of re-recorded snapshots that can either be recalled or deleted. Each snapshot is assigned a number (1-20) and displays the following information:

Mission Time	Heading
Altitude	IAS

Each snapshot has a numbered push button on the left and right side of its entry. The left numbered push button is the RECALL push button that will load the associated snapshot. The right numbered push

button is the DELETE push button that will delete the associated snapshot file. The Delete All Snapshots pushbutton will delete all of the stored snapshots with a single click.

4.17.1. Running the Instant Replay File

Perform the following procedure to load and run the Instant Replay file.

1) Access the Playback and Snapshot page by selecting the PLAYBACK/SNAPSHOTS page button on the left collar.
2) Activate the Instant Replay group box by selecting the INSTANT REPLAY radio button.
3) Using the slider, in the Instant Replay group box, set the desired number of minutes that simulation will go back to.
4) Select the PLAY push button to start the Instant Replay.

When the file has completed playing back, the instructor can either select the slider to move simulation back to another point in time and select the PLAY push button again, or select the FLY-OUT push button, to return control of the simulator to the pilot.

4.17.2. Running a Demonstration File

Perform the following procedure to load and run a demonstration file.

1) Access the Playback and Snapshot page by selecting the PLAYBACK/SNAPSHOTS page button on the left collar.
2) Activate the Demonstration group box by selecting the DEMONSTRATION radio button.
3) Select the Filename combo box and select the desired demonstration file name.
4) Use the slider in the Demonstration group box to set timer minutes from the start of the file or, in the case of a formation demonstration, the slider will automatically be set to the beginning of the demo when the Initialize formation Demo pushbutton is clicked.
5) When trimming is complete, select the PLAY push button to start the demonstration.
6) To stop the playback of the file, select the Fly-Out pushbutton. Upon Fly-Out, if the demonstration is a formation demonstration then the Terminate Leadship pushbutton and the formation reposition controls will be enabled. Once the Terminate Leadship button is clicked, the formation profile is closed out and another demonstration can be loaded at that time.
7) The Auto Fly-Out checkbox is used to force an automatic Fly-Out at the end of the demonstration file. When unchecked and upon reaching the end of the demonstration file, the demonstration will remain active and the trainer will go into System Freeze.

4.17.3. Recalling a Snapshot File

Perform the following procedure to recall a snapshot file.

1) Access the Playback and Snapshot page by selecting the PLAYBACK/SNAPSHOT page button on the left collar.
2) Locate the desired snapshot in the Snapshot group box.
3) Select the associated RECALL push button (left button) to recall the desired snapshot file.

4.17.4. Deleting a Snapshot File

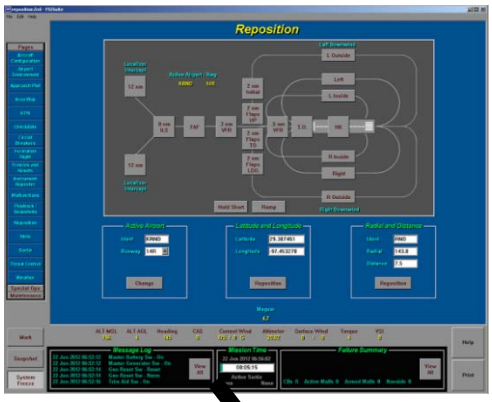
Perform the following procedure to recall a snapshot file.

1) Access the Playback and Snapshot page by selecting the PLAYBACK/SNAPSHOT page button on the left collar.
2) Locate the desired snapshot in the Snapshot group box.
3) Select the associated DELETE push button (right button) to delete the desired snapshot file.
4) All snapshots can be deleted by selecting the “Delete All Snapshots” button.

4.18. REPOSITION

The Reposition page is accessed by selecting the REPOSITION page button on the left collar. See Figure 4-29. The Reposition page is used to reposition the aircraft and to control the visual scene display. The visual scene will only change after a reposition has been executed. Repositions can be accomplished using the individual reposition points around the airport or by using the Active Airport, Latitude and Longitude, or Radial and Distance group boxes.

The Aircraft Relative Reposition group box, located at the top portion of the page, shows a graphic representation of the active runway with push buttons positioned around it. There are twenty push buttons that can be used to reposition the aircraft to the locations indicated (12nm (2-left or right), 8nm, FAF, 3nm, 2nm (4-Initial, Flaps UP, Flaps TO or Flaps LDG), .5nm, Take-off, High Key, Left Inside, Left, Left Outside, Right Inside, Right, Right Outside, Hold Short, and Ramp). When one of the push buttons is selected, the simulation environment will reposition the aircraft to that position. The Hold Short and Ramp buttons default to the Take-off position if location data is not available for the desired airfield and runway.



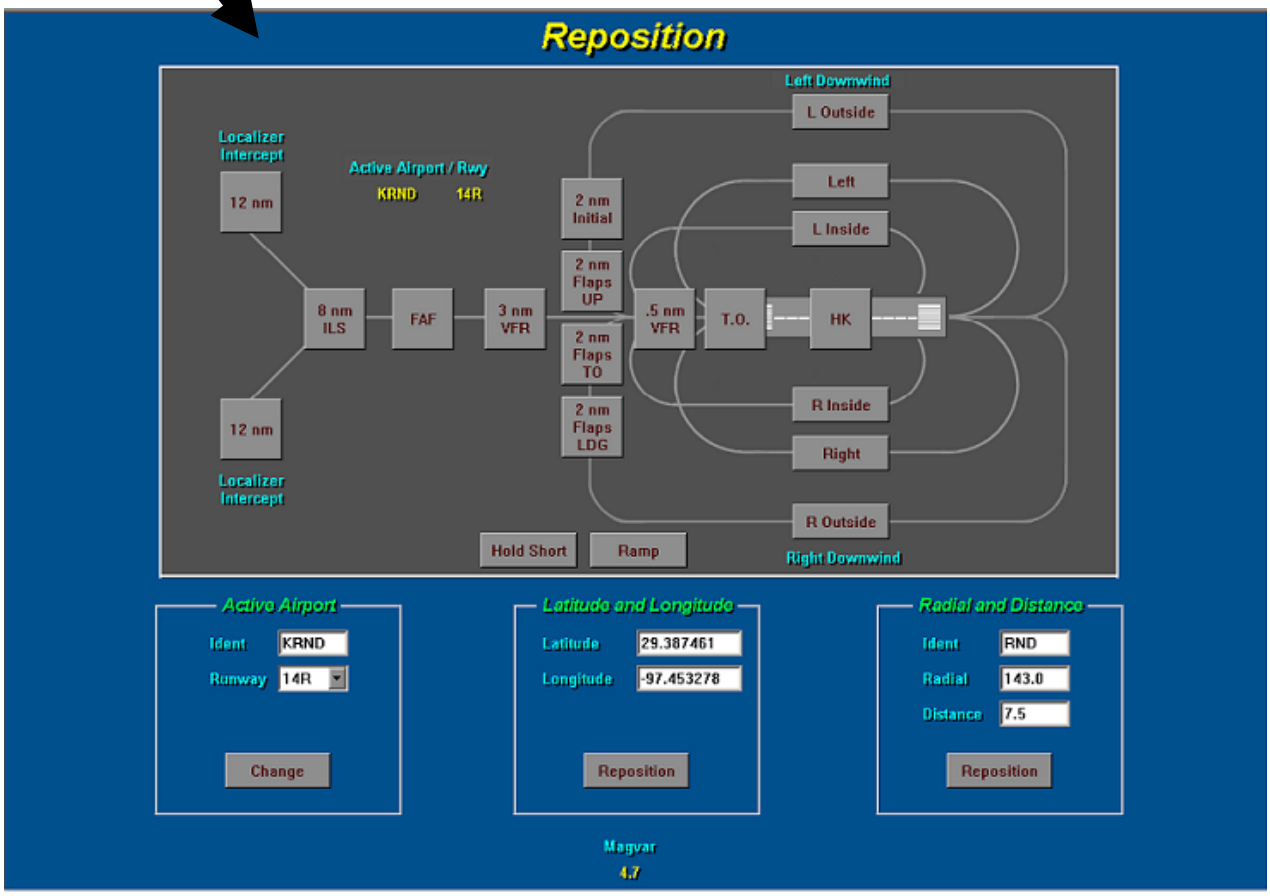


Figure 4-29. Reposition Page

The Active Airport group box contains an edit box, combo box, and push button. The IDENT edit box accepts valid airport identifiers. The RUNWAY combo box provides a list of runways for the selected airport. The instructor will select the primary runway from this list. The CHANGE push button will command the simulation to accept the new Active Airport and Runway. Selecting a new Active Airport will cause the Approach Plot page to key on the selected runway. The Spider Web on the Area Map page will be affected if the Spider Web is keyed to the Active Airport (See 4.5.5).

The Latitude and Longitude group box consists of two edit boxes and a push button. The LATITUDE

edit box is used to enter the latitude (in decimal degrees) of the location to be repositioned to. The LONGITUDE edit box is used to enter the longitude (in decimal degrees) of the location to be repositioned to. The REPOSITION push button will cause the simulation environment to reposition the aircraft to the entered latitude and longitude coordinated.

The Radial and Distance group box consists of three edit boxes and a push button. The Radial and Distance group box is used to reposition to a radial and distance from a selected navigational aid. The IDENT edit box is used to enter the desired NAVAID's identifier. The RADIAL edit box is used to enter the desired radial from the selected NAVAID. The DISTANCE edit box is used to enter the distance from the selected NAVAID. The REPOSITION push button will cause the simulation environment to reposition the aircraft to the location entered into the edit boxes.

4.18.1. Repositioning To a Relative Position

1) Access the Reposition page by selecting the REPOSITION page button on the left collar.
2) On the Aircraft Relative Reposition group box, select the desired push button that represents the location to be repositioned to.

4.18.2. Repositioning To a New Airport

1) Access the Reposition page by selecting the REPOSITION page button on the left collar.
2) Select the IDENT edit box in the Active Airport group box and enter the identifier of the new airport.
3) Select the RUNWAY edit box in the Active Airport group box and enter the desired runway number.
4) Select the CHANGE push button to affect the new active airport and runway.
5) Select a reposition point on the airport, such as TAKEOFF, to effect the reposition.

4.18.3. Repositioning To a Latitude and Longitude

1) Access the Reposition page by selecting the REPOSITION page button on the left collar.
2) Select the Latitude edit box in the Latitude and Longitude group box and enter the desired latitude in decimal degrees.
3) Select the Longitude edit box in the Latitude and Longitude group box and enter the desired longitude in decimal degrees.
4) Select the REPOSITION push button in the Latitude and Longitude group box.

4.18.4. Repositioning To a Radial and Distance

1) Access the Reposition page by selecting the REPOSITION page button on the left collar.
2) Select the IDENT edit box in the Radial and Distance group box and enter the desired NAVAID identifier.
3) Select the RADIAL edit box in the Radial and Distance group box and enter the desired radial.
4) Select the DISTANCE edit box in the Radial and Distance group box and enter the desired distance.
5) Select the REPOSITION push button in the Radial and Distance group box.

4.19. SORTIE FILE CONTROL

The Sortie File Control overlay is accessed by selecting the SORTIE overlay button on the left collar. See Figure 4-30. The Sortie File Control overlay is used to select and load preset conditions that correspond to defined student syllabuses.

The Sortie File Control overlay contains the Available Sortie Files and Preview/Edit Sorties group boxes. The Available Sortie Files group box contains the control necessary to select and load a sortie file. The Preview/Edit Sorties group box contains the control necessary to preview or edit a sortie file. The Sortie Editor application contains information on a selected sortie file, if the EDIT SORTIE push button in the Available Sortie Files group box is selected.

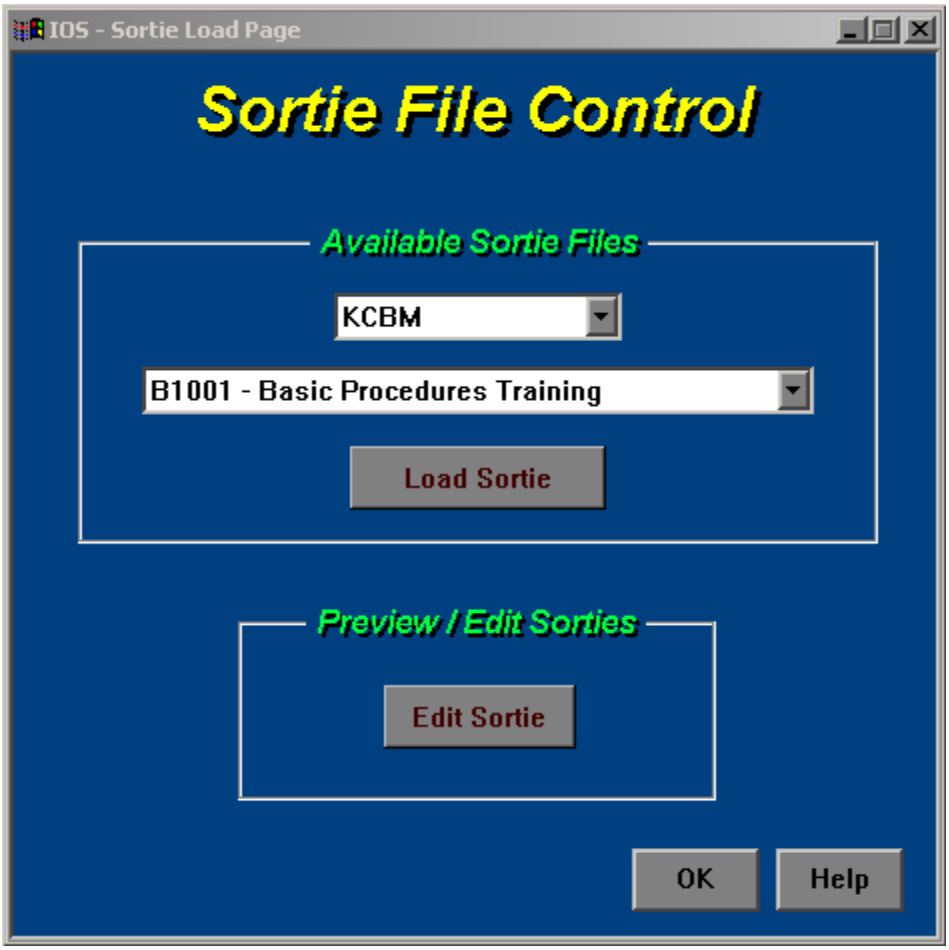


Figure 4-30. Sortie File Control Page

4.19.1. Sortie Editor

The Sortie Editor application is accessed by selecting the EDIT SORTIE overlay button on the Sortie File Control overlay. See Figure 4-31. The Sortie Editor application is used to preview and/or edit a sortie file that has been loaded using the Sortie File Control overlay. The Sortie Editor overlay contains several “tabbed pages” where portions of the selected sortie are previewed and/or edited. These “pages” cover the Global Weather, Map Settings, Reposition, Symbol Display, Threat Control, and Weather Area portions of the sortie file. Each portion of the sortie file is edited using combo boxes, edit boxes, and check boxes.

When changes to a sortie file have been completed, selecting the APPLY push button will save the changes to the sortie file. The CANCEL push button will close the Sortie Editor application without making any changes. To close the Sortie Editor application, select the OK push button.

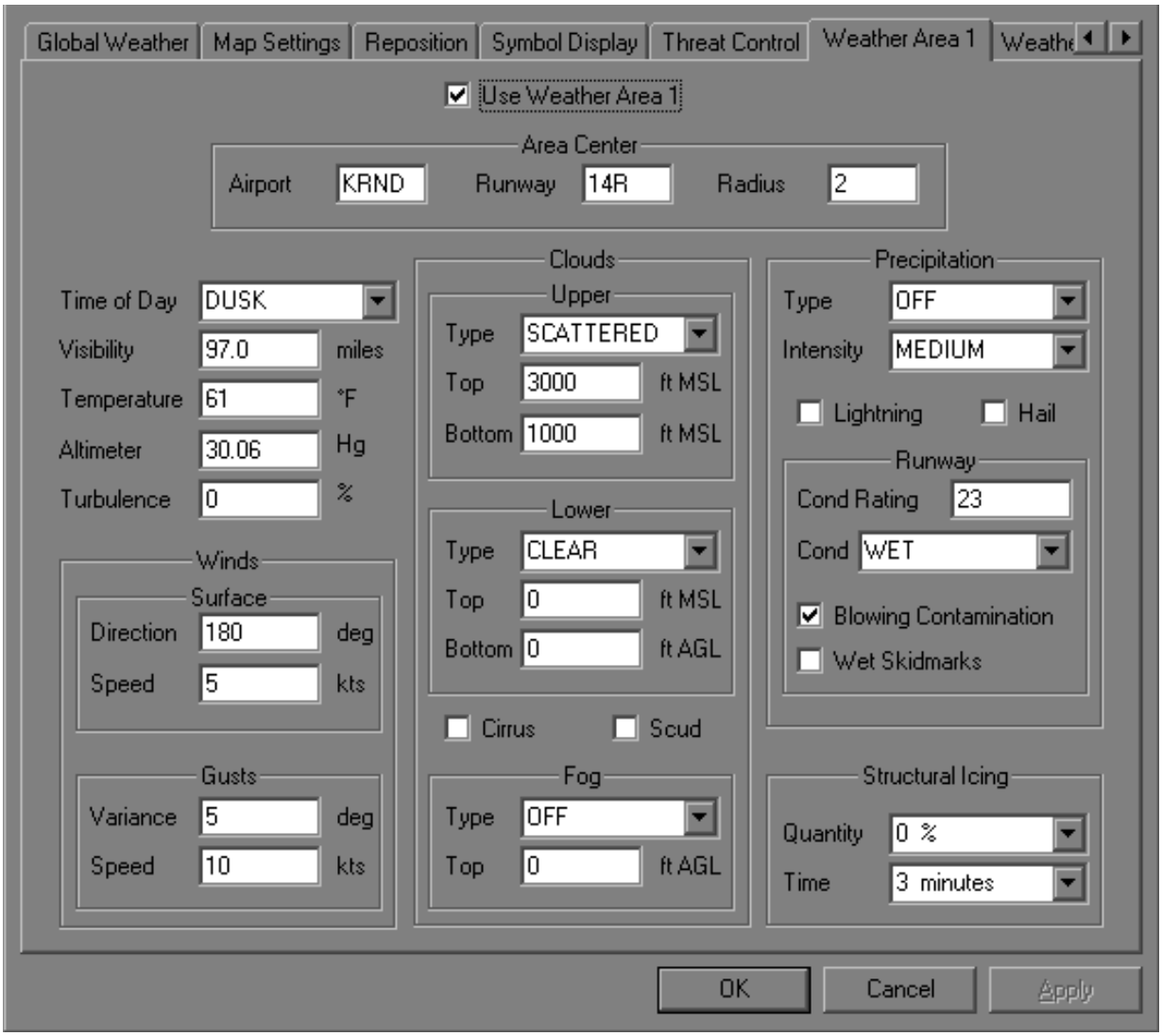


Figure 4-31. Sortie Editor

4.20. THREAT CONTROL

The Threat Control button on the left collar accesses the Threat Control page (Figure 4-32). The Threat Control page controls the airborne, ground, and TAS traffic. The Threat Control page can setup a maximum of two airborne threats and one ground hazard.

The Threat Control page contains three group boxes. These group boxes are Threat #1, Threat #2, and Ground Hazards. The Threat #1 and Threat #2 group boxes are identical. Therefore this description will only describe the Threat #1 group box.

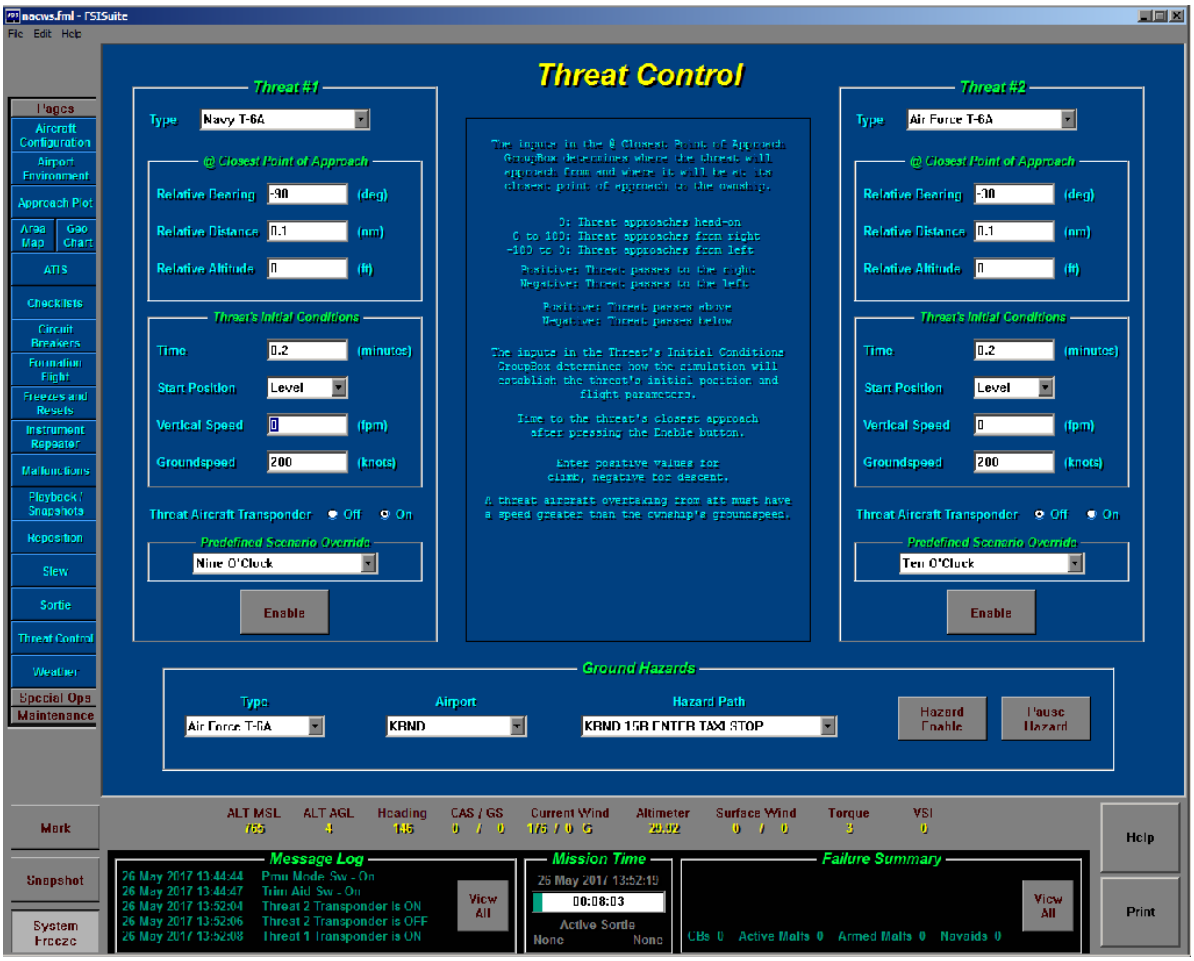


Figure 4-32. Threat Control Page

The Threat #1 group box is used to set up an airborne threat. The Type combo box allows selection of various threats such as the Air Force or Navy T-6A. The value in the Relative Bearing edit box is the bearing in degrees the threat aircraft will approach from relative to the simulated aircraft. For a threat to approach from head-on, enter a value of “0”. For a threat to approach from the left side of the simulated aircraft flight path, enter a value from “-001” to “-180”. For a threat to approach from the right side of the simulated aircraft enter a value from “+001” to “+180”. The value in the Relative Distance edit box determines the closest distance the threat will pass by the simulated aircraft. The combination of relative bearing and distance generate the threat’s flight path relative to the simulated aircraft. Use relative bearings of “0” to “80” degrees (or “0” to “-80”) and distances with the same sign (+ or -) to generate a threat approaching the simulated aircraft from the front quadrants and crossing behind it. Use relative bearings of “0” to “80” degrees (or “-80” to “0”) with distances of opposite signs to generate a threat approaching the simulated aircraft from the front quadrants and crossing in front of the simulated aircraft. Use relative bearings in excess of “±120” and distances of the same numeric sign for a threat approaching from the rear quadrants (assuming an overtake airspeed is entered) and not crossing the simulated aircraft flight path. Use bearings in excess of “±120” and distances with an opposite sign to generate a threat approaching from the rear quadrants and crossing behind the simulated aircraft flight path and overtaking to the opposite wing.

The Relative Altitude edit box is used to establish altitude separation between the simulated aircraft and the threat aircraft. If "0" is selected, the threat approaches the simulated aircraft at the same altitude. A plus altitude will cause the threat aircraft to approach from above the simulated aircraft and a negative number, from below. For example, if "–100" is selected for Relative altitude, the threat will approach from 100 feet below the simulated aircraft at its closest point of approach.

The Time edit box is used to enter how much time it will take the threat to reach its closest point of approach. The Start Position combo box is used to select if the threat is starting above, below, or level with the simulated aircraft. The Vertical Speed edit box is used to enter how quickly the threat and the simulated aircraft are approaching each other vertically in feet per minute. The Groundspeed edit box is used to establish the threat aircraft speed. You must insert a groundspeed that allows the threat aircraft to overtake the simulated aircraft for threat approaches from the rear quadrants. Selecting the Threat Aircraft Transponder ON/OFF radio buttons will control the threat display on the TA/VSI and enable or disable the TAS audio. The Predefined Scenario Override combo box allows selection of pre-defined scenarios that populate the data fields upon selection. The Enable push button will activate the threat in the simulation environment.

The Ground Hazards group box contains three combo boxes and two push buttons for setting up a ground hazard. The Type combo box is used to select from the list which type of hazard will appear. The Airport combo box is used to select from a list of airfields with hazard paths available. The list also contains the option to select the "CURRENT ACTIVE" airfield from the Reposition page. If the selected airport has no hazard paths defined, the words "NONE AVAILABLE" will be displayed in the Hazard Path combo box. The Hazard Path combo box is used to select a predefined route that the ground hazard will follow. The Hazard Enable push button will start the ground hazard in the simulation environment when it is selected. The Pause Hazard push button will pause the active ground hazard when it is selected.

4.20.1. Setting up an Airborne Hazard

1) Access the Threat Control page by selecting the THREAT CONTROL page button on the left collar.
2) In the Threat #1 group box, perform the following:
   a) Select the TYPE combo box for the desired type of threat.
   b) Enter the data for the Relative Bearing, Distance, and Altitude in the @ Closest Point of Approach Group box.
   c) Enter the desired time in the TIME edit box.
   d) Select the desired starting position in the START POSITION combo box.
   e) Select the VERTICAL SPEED edit box and enter the desired speed in feet per minute.
   f) Select the GROUNDSPEED edit box and enter the threat's speed.
   g) Select the ENABLE push button.

4.20.2. Setting up a Ground Hazard

1) Access the Threat Control page by selecting the THREAT CONTROL page button on the left collar.
2) In the Ground Hazards group box, perform the following:
   a) Select the TYPE combo box and then select the desired type of hazard.
   b) Select the AIRPORT combo box and then select the desired airfield identifier.
   c) Select the HAZARD PATH combo box and then select the desired path for the hazard to follow. Not all paths are available at all airports. Select a path consistent with the current active airport and runway.
   d) Select the HAZARD ENABLE push button.

4.21. WEATHER CONTROL

The Weather Control page (Figure 4-33) is accessed by selecting the WEATHER page button on the left collar. This page provides selection of the weather mode and control of the simulated weather conditions. These conditions include Time of Day, Visibility, Clouds, Fog, Temperature, Altimeter Setting, Winds, Precipitation, and Structural Icing. The Weather Mode determines the source of control over the simulated weather. The available modes are Automatic, Manual, and Weather Off.

When Automatic mode is selected, the Sortie File controls the weather parameters. The weather remains constant until the aircraft enters a new weather area as defined in the Sortie File. The weather settings may be changed in this mode, however, the changes will be overridden when the aircraft enters a new Sortie File weather area. The Manual Mode takes global control of all weather parameters, overriding the Sortie File. The weather parameters will reflect what is entered on the Weather Control page. The WEATHER OFF push button overrides all visual weather settings, resulting in ceiling and visibility unlimited conditions.

Wind speeds are displayed in knots and wind directions are in degrees from true north. The wind gust speed sets the maximum speed a wind gust will attain. Gust Direction Variance sets the number of degrees the wind gust direction will vary from the current wind direction. A value of zero in this field means the wind gust direction will not vary from the current wind direction. Crosswind Override will enable a specific crosswind condition. Enter a desired crosswind speed in knots and select the Activate button. This will set up a crosswind condition that is ninety degrees from the current active runway at the desired wind speed. All other wind parameters are ignored when Crosswind Override is active.

Structural Icing will accumulate only when icing conditions exist and ice quantity and time are enabled.

Selecting the Storm Cell button on the bottom right of the Weather page accesses the Storm Cell overlay (see section 4.5.6 for a description of the Storm Cell overlay). Note: if the storm cell location has not been set with the Touch Storm Location feature on the Area Map page, then the storm cell location defaults to the simulated aircraft location.

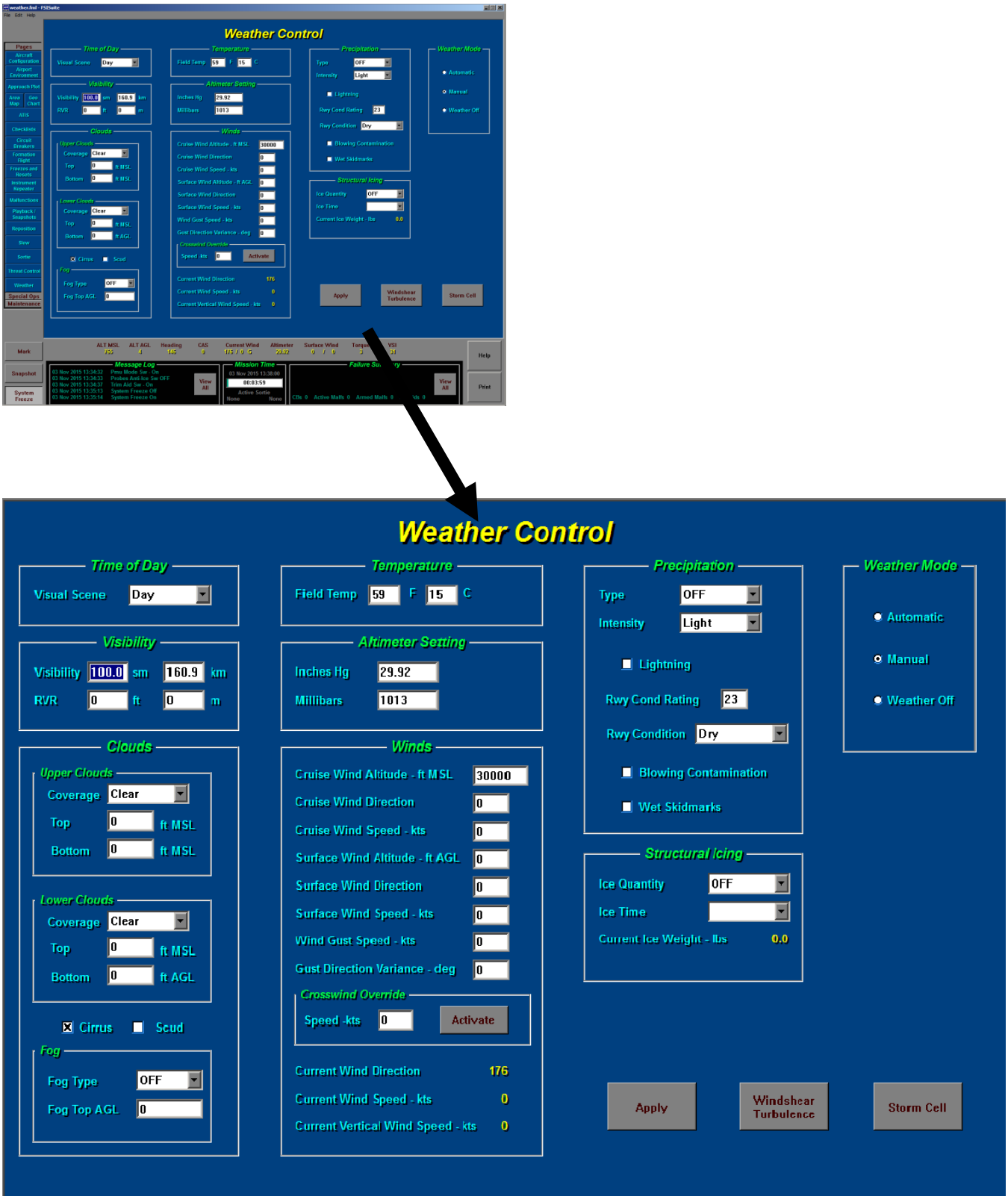


Figure 4-33. Weather Controls Page

4.22. WINDSHEAR, MICROBURST, AND TURBULENCE

The Windshear, Microburst, and Turbulence page is accessed by selecting the WINDSHEAR TURBULENCE page button on the bottom right corner of the Weather page. See Figure 4-34.

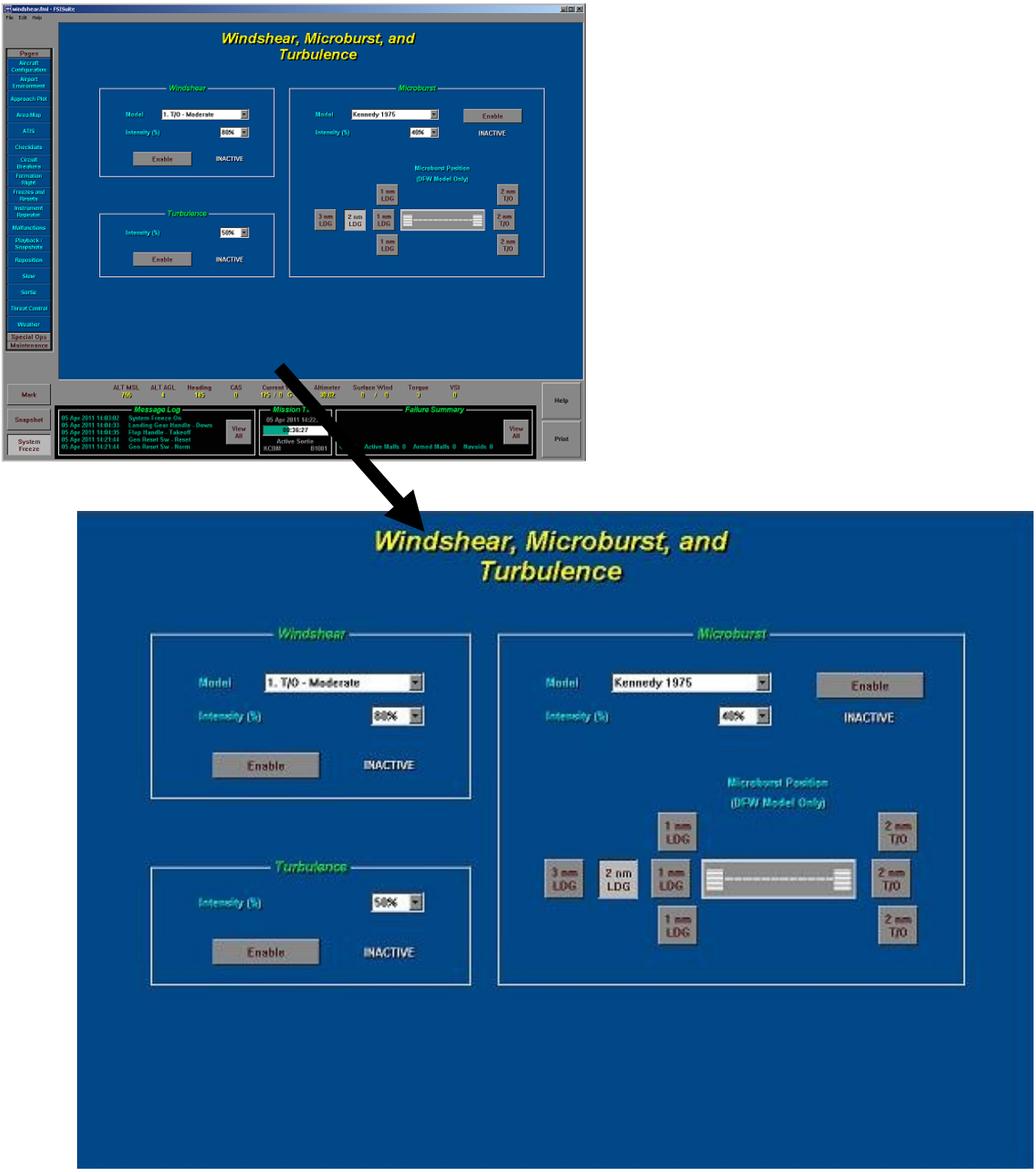


Figure 4-34. Windshear, Microburst, and Turbulence Page

The Windshear, Microburst, and Turbulence page consists of three group boxes.

The Windshear group box is used to select and enable a windshear model. The MODEL combo box is used to select one of the eight models available or none. The INTENSITY (%) combo box is used to modify the desired strength of the model. The ENABLE push button arms the windshear model when selected. The text ACTIVE is shown to the right of the ENABLE button to indicate the trigger condition has been met and INACTIVE when the model distance limit is passed or the trigger condition has not been met. Refer to section 4.22.1 for a description of the models.

The Turbulence group box is used to control general atmospheric turbulence. The turbulence can vary from airport to airport as defined by the weather areas in the sortie file. The sortie file may enable or disable turbulence automatically if the weather mode is set to automatic. The INTENSITY (%) combo box is used to select the strength level of the turbulence. The ENABLE push button will activate the turbulence with the intensity selected when it is selected. The text ACTIVE or INACTIVE will appear to the right of the ENABLE button to reflect the status of the Turbulence simulation.

The Microburst group box is used to select and activate a microburst model. If the DFW Model is not selected, then only the MODEL combo box, INTENSITY combo box, and the ENABLE push button are utilized to set the desired microburst model. The MODEL combo box is used to select the desired model from the list. The INTENSITY (%) combo box is used to select the amount of intensity for the selected model. The ENABLE push button will activate the model when it is selected. The text ACTIVE or INACTIVE will appear to the right of the ENABLE button to reflect the status of the Microburst simulation.

If the DFW model was selected from the MODEL combo box, then a Microburst Position push button must be selected before selecting the ENABLE push button. The Microburst Position push buttons depict the various positions around the active runway that the microburst could occur.

4.22.1. Windshear Models

1. Takeoff Moderate is triggered by airspeed just prior to rotation. The airspeed trigger varies from sixty-seven to eighty-four knots, depending on flap setting and gross weight. A tailwind of forty-five knots occurs between 4,500 and 7,500 feet from the trigger point and dissipates by 12,000 feet. The model becomes inactive at 15,000 feet from the trigger point.

2. Landing Moderate is triggered by descending through 200 feet AGL. A moderate downdraft occurs between 2,250 and 4,500 feet from the trigger point that dissipates by 7,000 feet. A tailwind of sixty knots occurs between 7,000 and 11,200 feet from the trigger point that dissipates by 16,800 feet. The model becomes inactive at 17,000 feet from the trigger point.

3. Takeoff Severe is triggered by climbing through 100 feet AGL. Crosswinds alternate from right to left with maximum velocity of twenty knots and dissipate by 7,800 feet from the trigger point. Vertical winds alternate between down and up with maximum velocity of twenty-eight knots and dissipate by 12,800 feet from the trigger point. A tailwind of fifty-two knots occurs between 5,200 and 7,800 feet from the trigger point, and dissipates by 12,800 feet. The model becomes inactive at 13,000 feet from the trigger point.

4. Landing Severe is triggered by descending through 800 feet AGL. Crosswinds alternate from left to right with maximum velocity of twenty knots and dissipate by 17,000 feet from the trigger point. Vertical winds alternate between up and down with a maximum velocity of twenty-eight knots and dissipate by 17,000 feet from the trigger point. A tailwind of four knots occurs at 1,000 feet from the trigger point, followed by a headwind of twenty-seven knots at 7,000 feet, and a tailwind of forty knots at 14,500 feet. The tailwind dissipates by 21,000 feet. The model becomes inactive at 25,000 feet from the trigger point.

5. Landing TYO Moderate is triggered by descending through 1,500 AGL. Crosswinds alternate from right to left with maximum velocity of sixty-five knots and dissipate by 28,600 feet from the trigger point. A headwind of twelve knots occurs at 2,000 feet from the trigger point followed by a tailwind of thirteen knots at 25,000 feet. The tailwind dissipates by 28,600 feet. The model becomes inactive at 30,000 feet from the trigger point.

6. Landing LOG Moderate is triggered by descending through 1,500 AGL. Crosswinds alternate from left to right with maximum velocity of thirty-two knots and dissipate by 28,600 feet from the trigger point. A tailwind of thirty-two knots occurs at the trigger point followed by a headwind of fourteen knots at 23,000 feet. The headwind dissipates by 28,600 feet. The model becomes inactive at 30,000 feet from the trigger point.

7. Landing PHL Severe is triggered by descending through 1,500 AGL. A downdraft with a maximum velocity of twelve knots occurs between 22,000 and 26,000 feet from the trigger point and dissipates by 28,000 feet. A headwind of with maximum velocity of forty-eight knots occurs between 1,000 and 26,000 feet from the trigger point followed by a tailwind of ten knots at 28,000 feet. The tailwind dissipates and the model becomes inactive at 30,000 feet from the trigger point.

8. Landing JFK Severe is triggered by descending through 1,500 AGL. A crosswind from the right of eight to thirteen knots occurs from the trigger point to 28,500 feet. Two downdrafts occur, the first has a maximum velocity of thirteen knots at 16,000 feet from the trigger point and the second has a maximum velocity of twenty-five knots at 20,600 feet. The downdraft dissipates by 26,000 feet. A headwind of with maximum velocity of thirty-five knots occurs between the trigger point and 21,000 feet followed by a tailwind of fourteen knots at 25,000 feet. The tailwind dissipates and the model becomes inactive at 30,000 feet from the trigger point.

4.23. IOS PILOT

Selecting the IOS PILOT button under the SPECIAL OPS menu on the left IOS collar displays the IOS PILOT Overlay. See Figure 4-35. The IOS PILOT feature provides the instructor the capability to control the simulated aircraft without the use of flight deck controls. Instructors are capable of most maneuvers using IOS PILOT but are required to stay within specific pitch, bank, and airspeed limits.

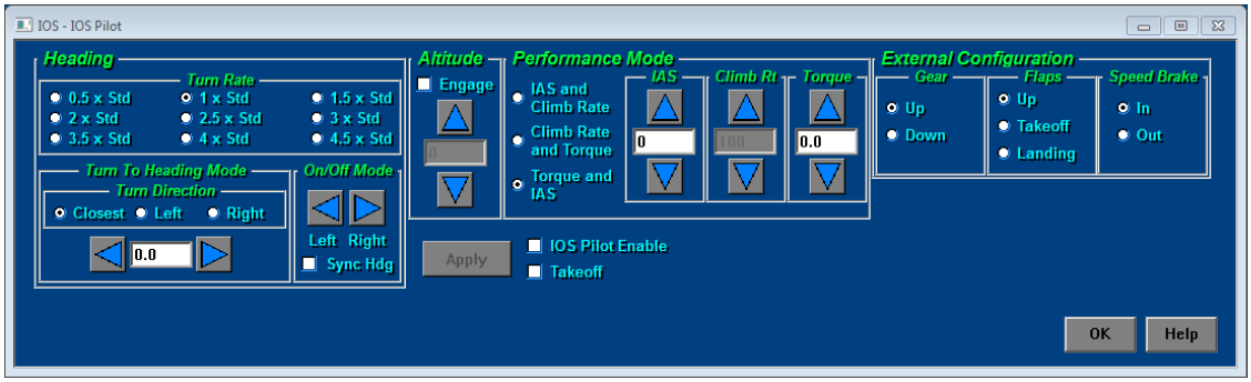


Figure 4-35. IOS Pilot Overlay

Select the IOS Pilot Enable check box to enable or disable the IOS Pilot controls. The IOS Pilot can be enabled with the simulated aircraft either on the ground or in the air. If the simulated aircraft is in the air when IOS Pilot is enabled, the simulator transitions to IOS Pilot Control and selects the closest Performance Mode to the current flight profile. The Performance Mode is selected by the two slowest moving averages of the IAS, Climb Rate, and Torque parameters. The instructor may also enter IOS Pilot two ways using the HOTAS (if installed).

Selecting the Takeoff check box initiates an automatic takeoff sequence. The aircraft is reset to the takeoff position and the system waits for the Instructor to disengage System Freeze before adding power for the takeoff. Deselecting the Takeoff check box terminates the automatic takeoff sequence. The Apply button and all Navigational Commands are disabled until the automatic takeoff sequence is complete. The automatic takeoff sequence performs as follows:

- System Freeze is engaged.
- The simulated aircraft is repositioned to the takeoff position of the active airport and runway.
- A software trim of the flight characteristics is performed.
- The Instructor must release the aircraft by disengaging System Freeze. Engine torque is automatically increased and the takeoff roll starts.
- Engine torque is advanced to maximum available.
- Liftoff occurs at 85 KIAS.
- The automatic takeoff sequence continues climbing out at 2000 ft/min or at 160kts once the speed is achieved. The climb will continue until instructor provides new flight parameters (i.e. Altitude hold) or aircraft performance can no longer maintain the flight profile.

The External Configuration group box at the top-right corner of the IOS Pilot Overlay, shown in Figure 4-35, above, allows the instructor to configure the simulated aircraft gear, flaps, and speed brake whenever the IOS Pilot is enabled. The landing gear is extended by default when on the ground. Setting the Flaps to Takeoff or Landing automatically sets the Speed Brake to In.

Selecting the OK button will remove the IOS Pilot Overlay from view. This action does not disable the IOS Pilot, therefore, the instructor will have to monitor the yellow highlighted alert displayed on the lower part of both IOS monitors when the IOS Pilot is active.

4.23.1. IOS Pilot Navigational Commands

- Heading Group.
- Altitude Group.
- Performance Group.
- Navigational Commands Limitations.

4.23.1.1. **Heading Group**

The Heading group box provides control of the simulated aircraft heading. The instructor can select a heading by typing a value in the edit box and pressing the Enter key, or using the arrows to change the heading in 1° increments for each click. The simulated aircraft will begin the turn to the new heading when the Apply button is pressed. The simulated aircraft will make the shortest turn to the new heading if Closest is selected. Alternatively, the instructor may select a left or right turn to the selected heading. The default direction of turn is Closest.

The instructor may select various turn rates from half standard (1.5° per second) to four-and-one-half standard (13.5° per second). The Turn Rate defaults to standard rate when the landing gear is up and one-half standard rate when the gear is down. Bank angle is limited to a maximum of 75°.

Selecting the Left or Right arrow in the On/Off Mode group box will cause the simulated aircraft to turn at the selected rate until deselected.

Checking the Sync Hdg box will command the heading in the Turn to Heading Mode group box to display the simulated aircraft heading, otherwise it will display the last value entered.

4.23.1.2. **Altitude Group**

The Altitude group box provides control of the simulated aircraft altitude. The instructor engages altitude mode by selecting Engage. Upon selecting Engage, an initial “level off” altitude will be predicted from the current climb rate that would allow a smooth level off if Apply is selected within seconds of selecting Altitude Engage. Alternatively, the instructor can select an altitude by typing a value in the edit box and pressing the Enter key.

The instructor can also change the desired altitude either up or down by pressing the arrow buttons. Each click of the up or down button changes the altitude value shown by 100 feet.

Select the Apply button to integrate the desired altitude into the simulated aircraft.

4.23.1.3. **Performance Group**

The Performance Mode group box provides three options for instructor control of the simulated aircraft. This allows the instructor to select which two values to command. The third value is computed ("falls out") based on the flight simulation model.

The initial value of the performance system predicts the current flight profile. In the case of an un-interrupted automatic takeoff sequence, the Torque and IAS mode will be in control. If the IOS Pilot is enabled in the air, the performance mode is predicted from the two parameters that are varying the least.

The arrow buttons may be used to change: IAS (five knot increments), Climb Rate (100 foot increments), and Torque (five percent increments).

The values entered for IAS must be in the range of 80 to 270 knots. The values entered for Climb Rate must be in the range of –4,000 to 4,000 feet per minute. The values entered for Torque must be in the range of 0 to 100 percent. If an out of range value is entered, a message is displayed which identifies the value and the allowed range. The values entered by the instructor are applied to the simulated aircraft when the Apply button is pressed.

4.23.1.4. **Navigational Command Limitations**

The values for navigational commands requested by the instructor are limited by the performance characteristics of the simulated aircraft. The current values for heading, altitude, IAS, climb rate and torque are updated while the Apply button is disabled. These automatic updates cease when the Apply button is enabled to facilitate use of the arrow buttons to increment values. The Apply button has a diminished appearance when disabled.

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SECTION 5. HANDS-ON THROTTLE AND STICK (HOTAS)

The HOTAS is an ECP-001 addition which allows the instructor to fully control the simulated aircraft from the IOS position using a commercial off-the-shelf joystick and throttle assembly.

5.1. CAUTION: Beware of Equipment Damage

- **Do not** lift the throttle assembly by the throttle levers.
- **Do not** lift the joystick assembly by the joystick.
- **Do not** place either assembly on your lap to fly.
    - Keep both assemblies on the IOS desk in the UTD, IFT, and OFT.
    - However, Instructors may also place the assemblies on the back of the cockpit in the OFT and stand to fly.
- **Do not** move any HOTAS controls while the system is trimming.
    - This caution is consistent with other simulator operations.
- Reduce the cockpit PCL friction to its minimum setting before taking control of the simulated aircraft using HOTAS.
    - Failure to reduce PCL friction may cause damage to the PCL movement servos.

5.2. HOTAS Control Designations

Figure 5-1. Joystick Functions

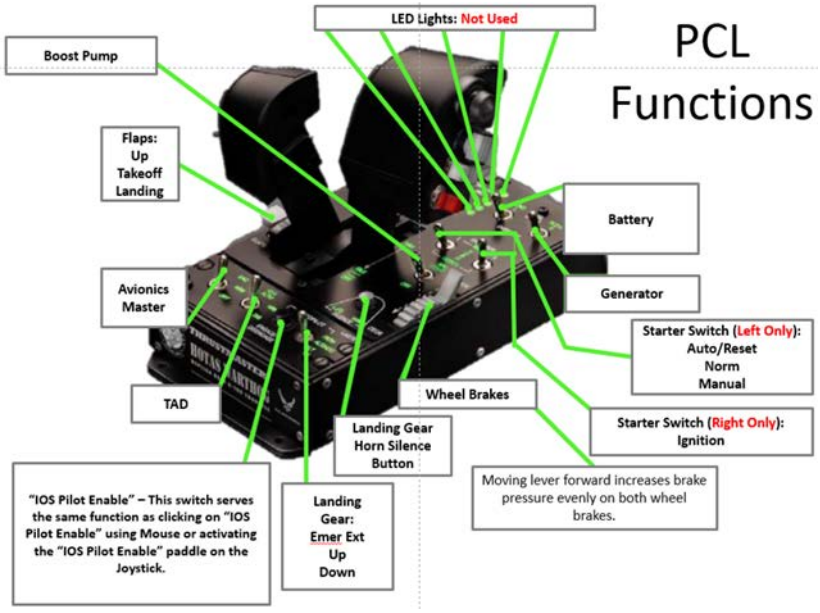


Figure 5-2. PCL Functions, Three-quarter View

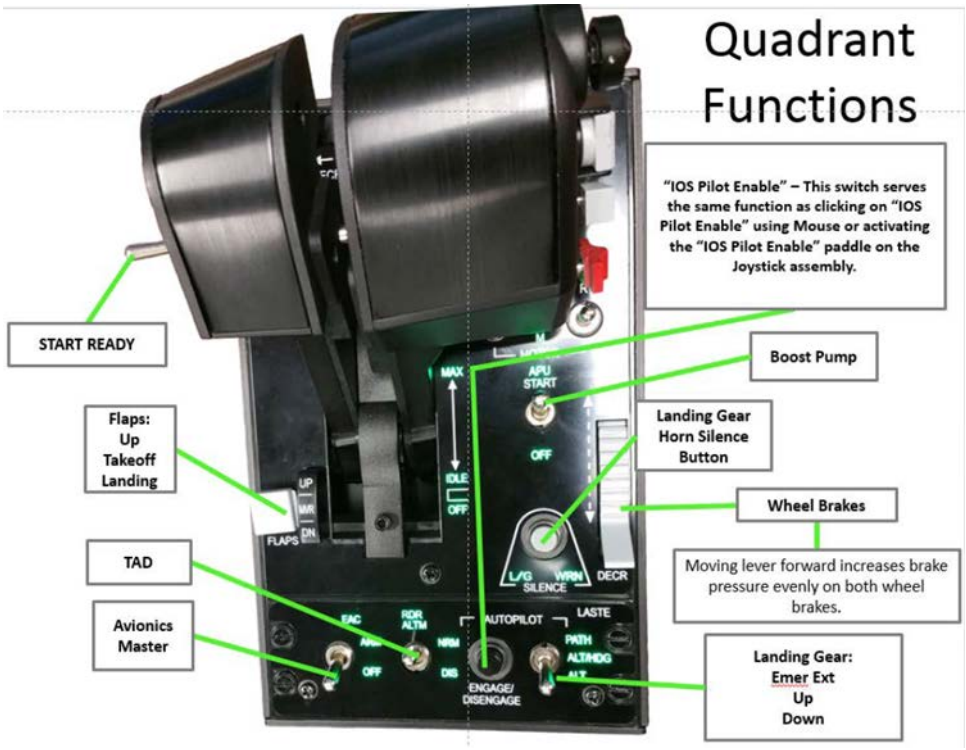


Figure 5-3. Quadrant Functions, Plan View at Full Power

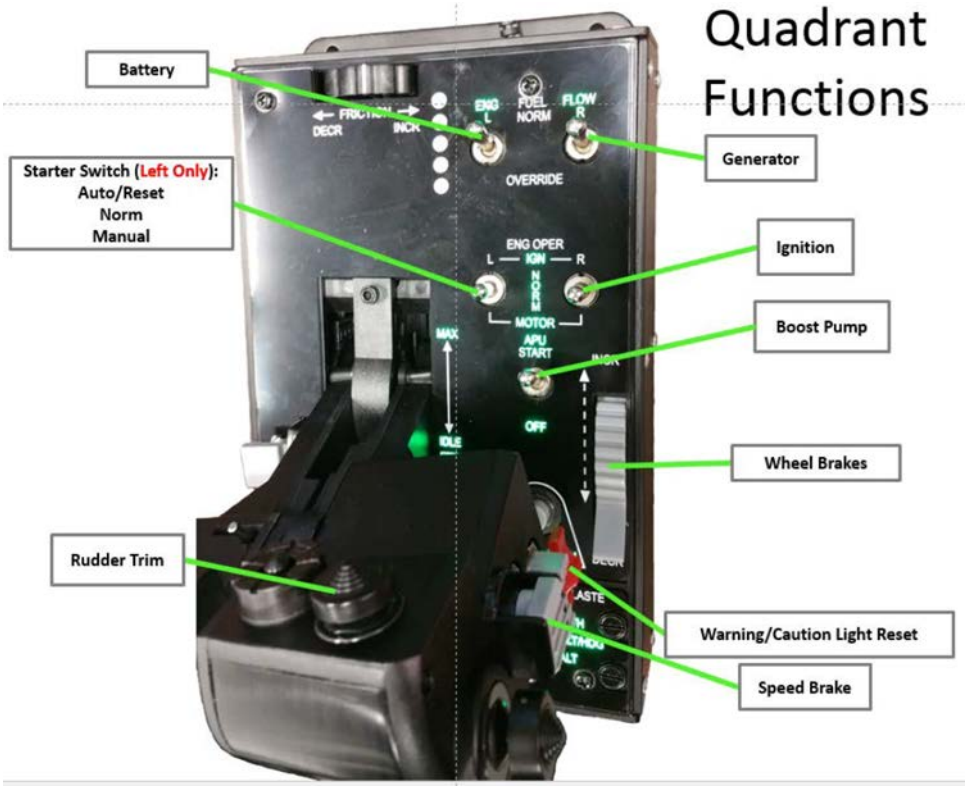


Figure 5-4. Quadrant Functions, Plan View at Idle

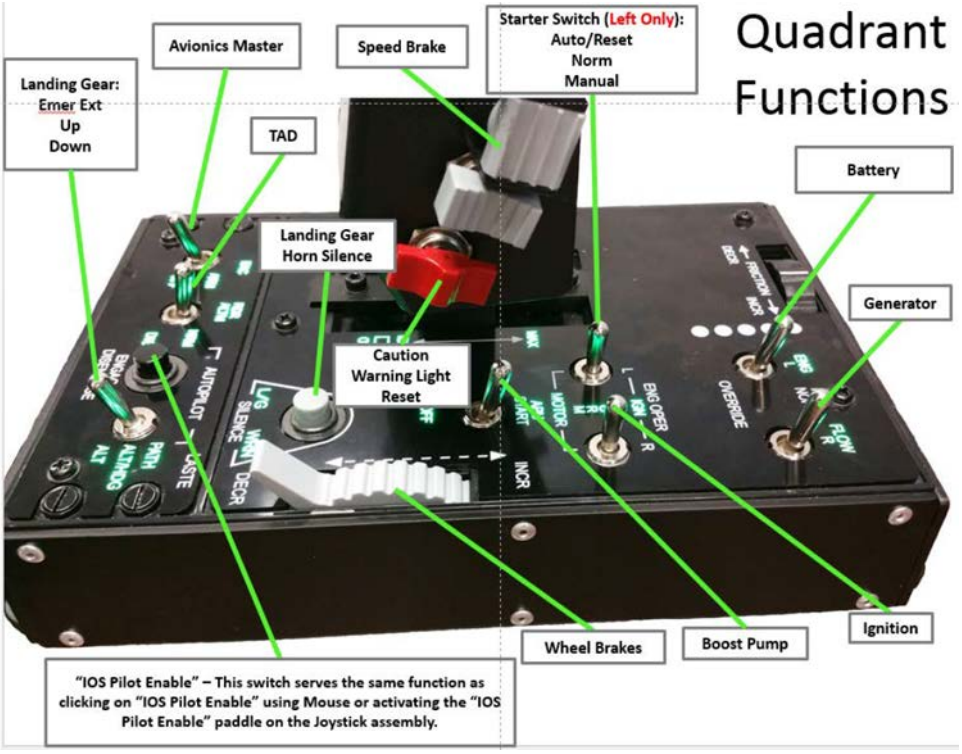


Figure 5-5. Quadrant Functions, Side View

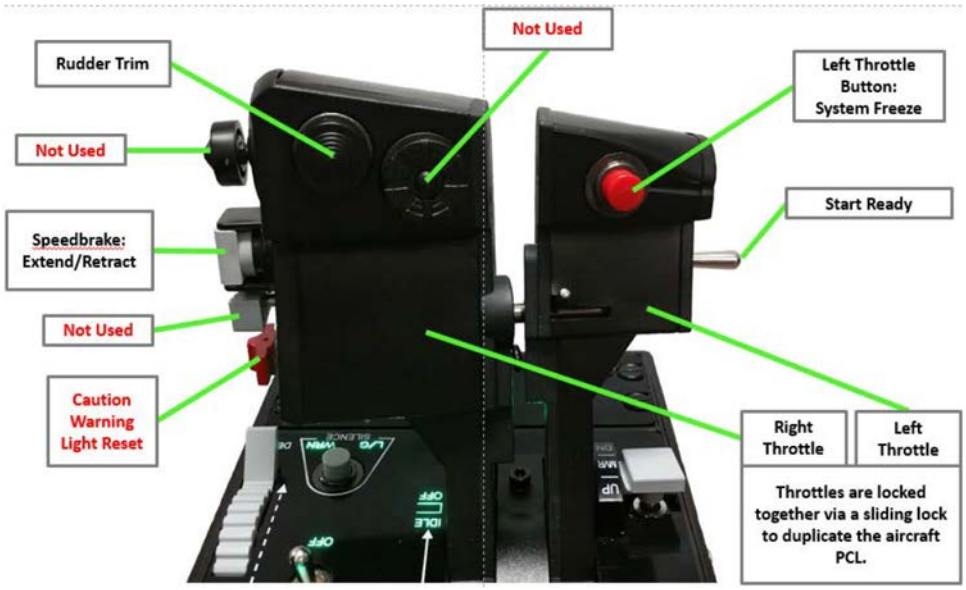


Figure 5-6. PCL Functions, Aft View

5.3. HOTAS Operations

The HOTAS allows seamless transitions between three (3) modes: Cockpit (Pilot) Mode, IOS Pilot Mode, and HOTAS Mode (Normal and Rate Modes). Only one mode is in control at any time. The system allows seamless transition between Cockpit and HOTAS modes provided the aircraft is trimmed properly. Improper trim conditions may result in minor pitch and/or heading oscillations. Figure 5-7, below, illustrates the control transfer sequence.

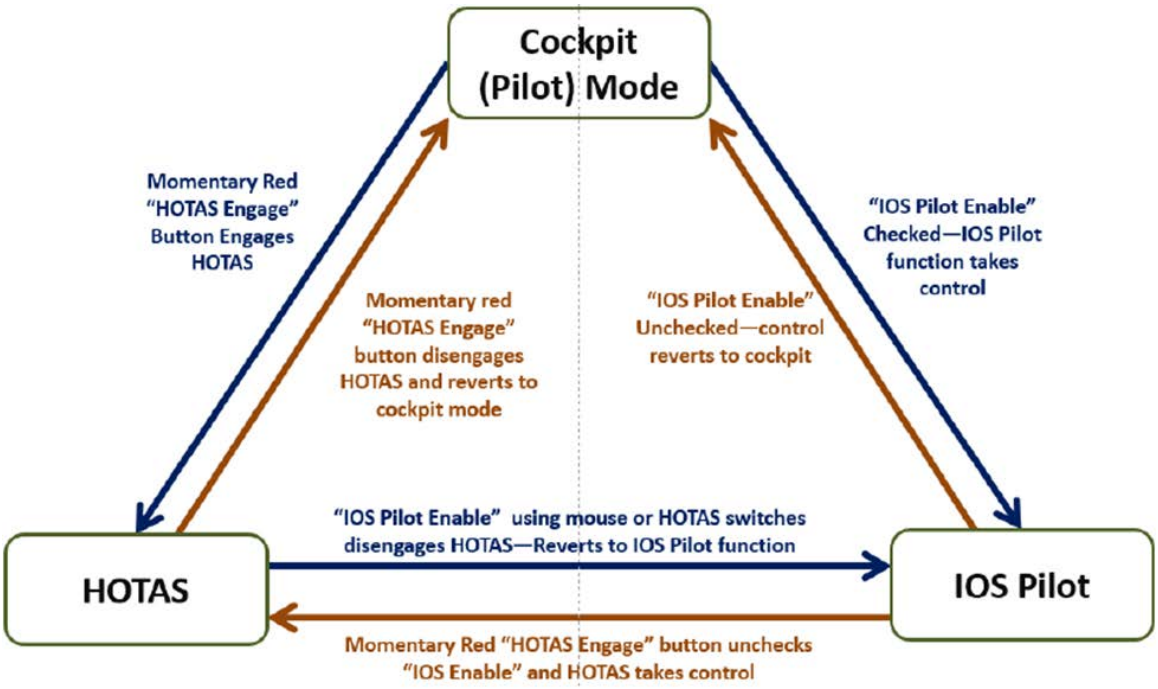


Figure 5-7. HOTAS Control Transfer Sequence

5.3.1. Cockpit (Pilot) Mode

This is the typical mode for most simulator operations at pilot training bases. Cockpit has full control of all aircraft axis. Flight manual limitations on bank, airspeed, or rate of climb/descent. IOS functions normally.

5.3.2. IOS Pilot Mode

"IOS Pilot Enabled"—IOS Pilot function control of aircraft axis based on inputs through keyboard and mouse. No cockpit or HOTAS control of aircraft axis.

Aircraft must be within IOS Pilot tolerances before selecting "IOS Pilot Enable": bank – maximum 75 degrees; airspeed – 80 to 270 knots; and rate of climb/descent – maximum 4000' per minute.

NOTE

The instructor should ensure the aircraft parameters are well within the above parameters before transitioning between modes. It is recommended that the aircraft be straight and level and trimmed before transitioning into IOS Pilot mode.

5.3.3. HOTAS Modes

HOTAS mode allows instructors to use two available modes to control the simulated aircraft. The "Normal" (Yellow HOTAS Annunciation) force-mode requires the instructor to manually trim the simulated aircraft at all times as if actually flying an aircraft.

The "Rate" (Orange HOTAS Annunciation) mode auto-trims and alleviates the requirement for the instructor to trim. It allows the instructor to set pitch and works similar to an auto pilot. Actually, it's an implementation of a side-stick controller, like those you would find in an Airbus passenger jet or in an F16 fighter; though there is more excursion from neutral than you would find in an F16, since the stick is doing double duty to accomplish force and rate modes.

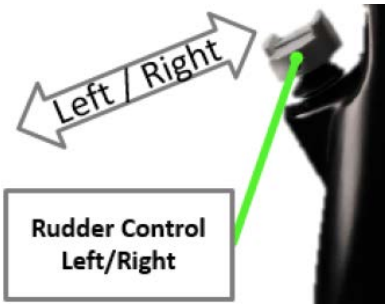
5.3.4. Activation

- Activate using Joystick "HOTAS Engage" button from any other mode.
  - Press the HOTAS Engage button for approximately 1 second.
- HOTAS overrides the cockpit and IOS Pilot inputs.
  - Cockpit controls follow HOTAS inputs, although rates are damped somewhat.
    - Warn students before making rapid control inputs.
  - IP must allow sufficient time for system to move cockpit control actuators (stick and rudder) to actual position before exiting HOTAS Mode.
- When transitioning from HOTAS to IOS Pilot, the aircraft must be within IOS Pilot tolerances.

- Bank – Maximum 75 degrees.
- Airspeed – 80 to 270 knots.
- Rate of Climb/Descent – Maximum 4000 feet per minute.

5.3.5. Rudder Control

- Rudder control in HOTAS mode is achieved using a rocker switch on the joystick as shown in the figure at right and in paragraph 5.2, Figure 5-1.



  - This spring-loaded, momentary action switch causes the rudder to move when engaged in the indicated direction.
  - When released, the switch returns to the center position and the previously selected rudder position returns to neutral at a pre-determined rate.
  - Use of the rudder switch is experienced best when using HOTAS mode during the take-off roll. As you roll down the runway and need right rudder to correct for prop-torque pulling the aircraft to the left of the center line, engage right rudder until the aircraft is realigned with the center of the runway, then continue engaging right rudder to maintain the correct heading.

5.3.6. CAUTION: Controls Disagreement

The instructor must remain fully aware of switch and handle positions when transitioning between modes.

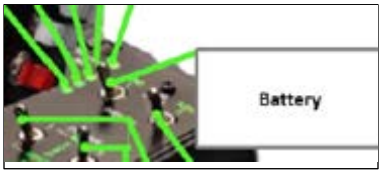
Controls at risk of disagreements between the cockpit and the IOS are:

- Battery,
- Generator,
- Avionics Master,
- Boost Pump,
- Ignition,
- TAD,
- PCL,
- Gear,
- Flaps,
- EMER LDG GR.

Cockpit switch/handle positions and IOS Pilot/HOTAS switch/handle positions should match at all times to prevent inadvertent actuation of gear, flaps, and electrical systems when changing from IOS/HOTAS to cockpit mode or cockpit mode to IOS Pilot/HOTAS. For example, if cockpit gear/flap

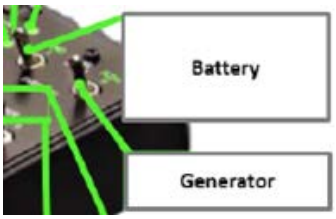
handles are in the "down" position while in IOS Pilot/HOTAS with the gear/flaps "up" on the HOTAS PCL assembly and the Instructor changes to the cockpit mode, the cockpit handle positions drive the actual configuration—the gear/flaps will extend to handle positions.

5.3.7. Battery Switch



- HOTAS mode overrides the cockpit switch positions; see the figure at right.
- Instructor can power the cockpit by entering HOTAS mode and moving the HOTAS Battery switch to the "ON" position.

5.3.8. Generator Switch



- HOTAS mode overrides the cockpit switch positions; see the figure at right.
- Instructor can power the generator by entering HOTAS mode and moving the HOTAS Generator switch to the "ON" position.

5.3.9. Avionics Master Switch

- HOTAS mode overrides the cockpit switch positions; see figure at right.
- Instructor can power the avionics by entering HOTAS mode and moving the HOTAS Avionics Master switch to the "ON" position.

5.3.10. Start Ready Switch

- HOTAS mode overrides the cockpit switch positions.
- Instructors can start the engine using the HOTAS.
- Procedure:
  - HOTAS mode active.
  - Ensure all switches are in the proper positions by using the appropriate Flight manual or condensed checklist(s).
  - Ensure the HOTAS throttle is in the "OFF" position.
  - Do NOT move the HOTAS throttle from the idle in an attempt to set "ST READY."
    - Use the "Start Ready" switch on the HOTAS left throttle to illuminate the "ST RDY" light on the CWS panel.

NOTE

If the ST READY switch is moved during start sequence, the PMU will abort the start.

- NOTE: Perform a normal start sequence.
- Move the HOTAS throttle from the "OFF" position when N1 reaches 60-percent.
  - Due to the slight movement delay between the HOTAS and cockpit throttle, it is recommended that the HOTAS throttle be moved to max power and back to idle.
  - **Do not** slam the HOTAS throttle forward or back to idle.
  - Smooth consistent movements are recommended since the cockpit PCL follows HOTAS PCL position.
- Reset Start Ready Switch to "Off" position.

5.3.11. Cockpit to HOTAS Mode Transition

- If the cockpit occupant has control of the aircraft the Instructor may take over at any time by activating the Joystick "HOTAS Engage" button.
- Ensure positive transfer of aircraft control using current AF/Navy directives.

SECTION 6. SIMULATION CONTROL PANEL USER REFERENCE

6.1. INTRODUCTION

This section describes the characteristics and operation of the Simulation Control Panel (SCP).

6.2. PURPOSE

The purpose of the Simulation Control Panel is to facilitate training in the absence of an instructor.

6.3. PHYSICAL CHARACTERISTICS

The Simulation Control Panel is a small hand held unit that can be taken into the cockpit to give the student limited control of the simulation environment. The Simulation Control Panel consists of a keyboard and a small LCD display. See Figure 6-1. The LCD displays the screens that the student will use to control simulation. The keyboard is used to enter data and navigate between the screens.

Figure 6-1. Simulation Control Panel

6.4. SCREEN NAVIGATION

The following paragraphs outline the general method of using the Simulation Control Panel and navigating through the available screens.

6.4.1. General Page Layout

The current page is always identified by the title centered on the top row of the SCP screen. The first page viewed on the SCP is the Main Menu. Most pages can be accessed directly from this page by pressing the numeric button on the SCP keypad listed to the left of a page title. The 0 button will return to the main menu from any of the pages listed on the main menu page at any time except when a data entry dialogue or sub-page is active. One must enter data or cancel out of these dialogues before making a page change.

There are five function buttons on the top row. The Back (F1) and Next (F5) buttons are relative to the order of the pages shown on the SCP main menu page (NOT relative to the order the page is visited). On the OWNSHIP CONFIGURATION page the back button opens the MAIN MENU, on the very last page the next button opens the MAIN MENU. The Create Snapshot (F2) button captures a snapshot of the current ownship configuration. The Restore Snapshot (F3) button allows the operator to restore the simulation to the parameters from a previously captured snapshot. There can be up to twenty stored snapshots to choose from. The Freeze (F4) button will toggle the simulation state in and out of freeze.

6.4.2. Triggering Events

On SCP pages all events are triggered by pressing the numeric button associated with the label on the left side of the SCP screen. Any one of three types of events may occur upon pressing the numeric value depending on the nature of the respective event. The symbol immediately following the numeric value associated with an event indicates the expected result to the user. The possible outcomes are:

Data Entry Dialogue - A manual data entry dialogue is presented. The symbol for data entry dialogue is "?".

Direct Selection - A functionality/device is toggled on or off or a value is set immediately. The symbol for data entry dialogue is "+".

Association Dialogue - A sub-page is presented containing a set of possible answers associated with numeric values. The symbol for association dialogue is "->".

6.4.2.1. Data Entry Dialogue

In dialogue mode, a subsection of the page is used for data entry while display values continue to be updated on the rest of the page. The general format of dialogue is dialogue title on the 3rd from last row of screen, acceptable range minimum and maximum values on the 2nd from last row of the screen, and a blank area preceded by a > for data entry centered on the last row of screen.

During data entry dialogue activity some buttons on the SCP have special meaning. The following outlines the special SCP buttons and their functions:

- **ENTER button** - will check the currently entered value against the configured ranges
- **ESC/Z key** - will immediately exit the dialogue with no change taking place
- **"/Y buttons** - will apply the currently entered values and clear the data entry line but not leave the current dialogue
- **-/F and _/H buttons** - will input a negative sign IF the data entry line is currently empty
- **space/backsp buttons** - will back over the preceding character and remove it from the entry.
- **</D** - will move the current cursor position to the left
- **>/E** - will move the current cursor position to the right

NOTE

You never have to use shift to get the -, ., backspace, escape, or left/right functionality. The button will produce the same results with or without the shift being pressed.

6.4.2.2. Direct Selection

When the button associated with a direct select event is triggered, the SCP immediately attempts to modify a host value.

6.4.2.3. Association

Association dialogue is essentially a sub-page opened from an SCP page that provides association between numeric buttons and possible entries for the simulation attribute being modified. As soon as a numeric button is selected an attempt is made to modify the simulation attribute and the user is returned to the page from which the association dialogue was triggered.

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SECTION 7. RECORDING FILES FOR PLAYBACK

7.1. INTRODUCTION

This section describes the recording of Demonstrations and Formation Lead Profiles, and the recording / restoring of Ramp and Hold Short reposition locations. The capability of recording aircraft maneuvers for playback is intended for the benefit of students during formal training. Recording is reserved for qualified instructors and/or aircrew with prior approval from the Government Configuration Control Board. Proper planning and preparation is the key to achieving the desired results. To avoid negative training, every detail from aircraft configuration to radio frequencies should be considered prior to recording.

7.1.1. Recording Demonstrations

Each Demonstration is limited to ten minutes maximum duration. Demonstration playback controls are discussed in section 4.17. To record a Demonstration, perform the following steps:

1) Configure the simulation to the desired starting point for recording to begin.

2) Access the maintenance collar by selecting the MAINTENANCE button on the left collar.

3) Select the RECORD button to display the Record page. (See Figure 7-1)

4) Select the Demonstration radio button to enable the recording features.

5) Enter a name in the Demo Filename edit box.

6) Check the Include Lead-Ship checkbox if a formation profile is to be included with the demonstration.

7) If the Include Lead-Ship checkbox is checked, select a formation profile and track, then click the Play pushbutton and reposition the simulated aircraft using the reposition controls if desired.

8) Deselect FREEZE.

9) Select the START RECORDING button.

10) Select the STOP RECORDING button.

11) Select FREEZE.

12) If a formation profile is playing, click the Stop Playing button.

13) Select the SAVE button and wait until the copy file progress indicator is complete.

14) Access the IOS pages by selecting the PAGES button on the left collar.

15) Select the REPOSITION button to leave the Record page.

7.1.2. Recording Formation Lead Profiles

Formation Lead Profiles are limited to ninety minutes maximum duration. The formation recording may be divided in up to ten segments, known as tracks. To record a Formation Lead Profile, perform the following steps:

1) Configure the simulation to the desired starting point for recording to begin.
2) Access the maintenance collar by selecting the MAINTENANCE button on the left collar.
3) Select the RECORD button to display the Record page. (See Figure 7-1)
4) Select the Formation radio button to enable the recording features.
5) Select the START RECORDING button.
6) Deselect SYSTEM FREEZE to begin recording Track 1.
7) Select SYSTEM FREEZE to end recording Track 1.
8) Repeat steps 6 & 7 to record tracks 2 through 10.
9) After all tracks have been recorded, select STOP RECORDING.
10) Enter a name for the profile in the Profile Name edit box.
11) Optionally enter names for each track in the Track Title edit boxes.
12) Select the SAVE push button.
13) Access the IOS pages by selecting the PAGES button on the left collar.
14) Select the REPOSITION button to leave the Record page.

Formation playback controls are discussed in section 4.13.

7.1.3. Ramp Group Box

Use the “Set Current” pushbutton to temporarily set the current aircraft position as the ramp position for the current active airport. Use the “Refresh All From File” pushbutton to restore all ramp locations from the ramp reposition location file. Use the “Save All To File” pushbutton to save all temporary ramp locations to the ramp reposition location file. Inform local maintenance personnel you have saved new data to the ramp reposition location file so they can forward the data to the MUSS to update the master file.

7.1.4. Hold Short Group Box

Use the “Set Current” pushbutton to temporarily set the current aircraft position as the hold short position for the current active airport/runway. Use the “Refresh All From File” pushbutton to restore all hold short locations from the hold short reposition location file. Use the “Save All To File” pushbutton to save all temporary hold short locations to the hold short reposition location file. Inform local maintenance personnel you have saved new data to the hold short reposition location file so they can forward the data to the MUSS to update the master file.

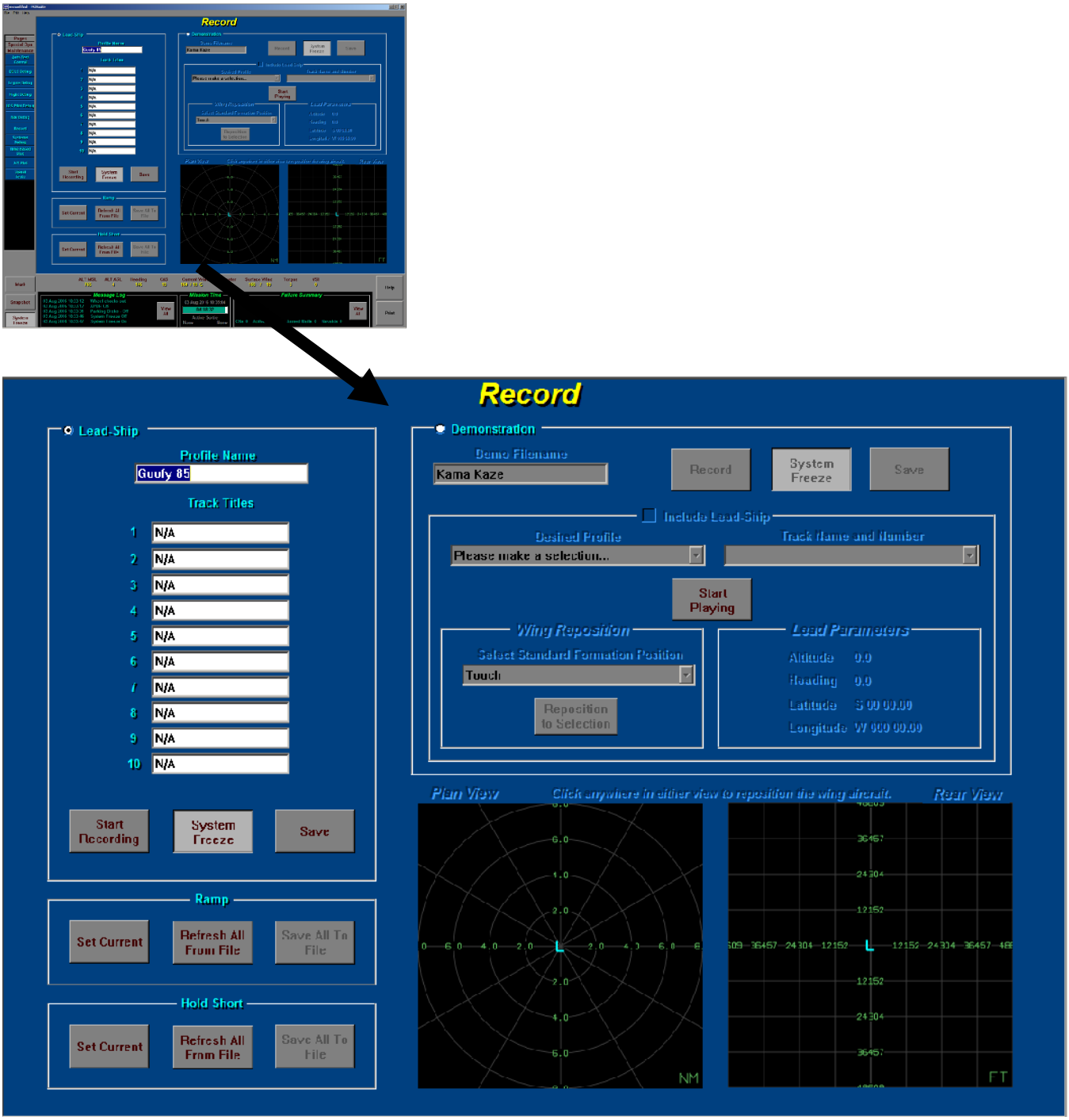

Figure 7-1. Record Page

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SECTION 8. AIRFIELDS & WEATHER AREAS

8.1. INTRODUCTION

This section provides information about visual airfield depiction and weather areas. The T-6A simulator employs two types of airfields, custom and configurable. Weather areas are part of the Sortie File.

8.1.1. Custom Airfields

Custom airfields are those generated off-line by a visual database engineer to model the real world. Refer to Appendix A for a list of the custom airfields available on the JPATS FTD. Custom airfields are displayed by the visual system each time the simulated aircraft is flown or placed in their vicinity. Repositioning is not required for the visual system to display this type of airfield. There are four types of custom airfields in the visual databases.

1. **Full Custom Airfields:**
   Full custom airfields replicate the applicable portions of the real world airbase/airfield facility to a high degree of fidelity including runways, taxiways, ramps, lighting systems and structures associated with JPATS aircraft use areas.

2. **Partial Custom Airfields:**
   Partial custom airfields replicate the real world facility to the extent of providing proper runway environmental characteristics, but with lower non- runway area characteristics. All turn-offs and taxiways directly associated with runway use are included as part of the runway environment. Other airport operational areas are partially replicated to the extent required to support the facilities training use.

3. **Enhanced Topographic Airfields**
   Geo-specific imagery will provide two-dimensional visual representation of enhanced topographic airfields. In addition, **runways will be modeled with appropriate surface, markings, edge lights as defined by AirNav lighting system description. Airport beacon will be provided where appropriate.** Enhanced Topographic airfields shall be usable for taxi, takeoff and landing operations, but with a low level of support detail.

4. **Topographic Airfields**
   Geo-specific imagery will provide two-dimensional visual representation of topographic airfields. Topographic airfields shall be included as aerial navigation landmarks only and replicate the real world runway, ramp and taxiway features as observed from an altitude of 1000 ft. Runway edge lights and airport beacons will be modeled where appropriate as defined by AirNav lighting system description **(Pilot controlled lights will not be modeled since they are normally off).**

8.1.2. Configurable Airfields

Configurable airfields are generic airfields that may be invoked when a custom airfield is unavailable. This type of airfield provides a single runway and does not replicate the real world. These airfields have several parameters, which may be altered to suit the desired training scenario. Configurable airfields must be enabled on the Airport Visual Environment page (See Section 4.3). A configurable airfield becomes the active airfield in one of two ways. The simulated aircraft is flown into the vicinity of the airfield weather area as defined in the active sortie file, or the airfield and runway are selected on the Reposition page and a reposition is performed.

8.1.3. Weather Areas

To enable a weather area, a Sortie File must be loaded, and the weather mode (See Section 4.21) should be set to automatic. Use the Sortie File Control overlay to select and load Sortie Files (See Section 4.19). Once a particular Sortie File is loaded, it may be edited via the Sortie Editor. To view or modify a weather area, select one of the Weather Area tabs at the top of the Sortie Editor. Entering a weather area by crossing the weather area boundary activates the weather set up for that area. Departing a weather area will not change the weather settings. The Sortie Files should be set up by an instructor, as required for use with a particular lesson.

APPENDIX A CUSTOM AIRFIELDS

A.1 Full Custom Airfields

ICAO	NAME	CITY	STATE
KCBM	Columbus AFB	Columbus	MS
KDLF	Laughlin AFB	Del Rio	TX
KEND	Vance AFB	Enid	OK
KHOU	Houston Hobby	Houston	TX
KHUT	Hutchinson Muni	Hutchinson	KS
KICT	Wichita Mid Continent	Wichita	KS
KLFT	Lafayette	Lafayette	LA
KMSY	New Orleans Intl	New Orleans	LA
KNGP	Corpus Christi NAS	Corpus Christi	TX
KNPA	Pensacola NAS	Pensacola	FL
KNSE	Whiting Field NAS North	Milton	FL
KRND	Randolph AFB	Universal City	TX
KSPS	Sheppard AFB Wichita Falls Muni	Sheppard	TX

A.2 Partial Custom Airfields

ICAO	NAME	CITY	STATE
1MS8	Columbus AFB Aux	Shuqualak	MS
K12J	Brewton Muni	Brewton	AL
K1R8	Bay Minette Muni	Bay Minette	AL
K5T9	Maverick Co Memorial	Eagle Pass	TX
KABI	Abilene Regional	Abilene	TX
KALI	Alice Intl	Alice	TX
KBFM	Mobile Downtown	Mobile	AL
KBRO	Brownsville/South Padre Island Intl	Brownsville	TX
KCKA	Kegelman AF Aux	Cherokee	OK
KCRP	Corpus Christi Intl	Corpus Christi	TX
KCWF	Chennault Intl	Lake Charles	LA
KDYS	Dyess AFB	Abilene	TX
KELP	El Paso Intl	El Paso	TX
KFDR	Frederick Muni	Frederick	OK
KGTR	Golden Triangle Regional	Columbus	MS
KGWO	Greenwood-Leflore	Greenwood	MS
KGZH	Middleton Field	Evergreen	AL
KHDO	Hondo Muni	Hondo	TX
KIAB	McConnell AFB	Wichita	KS
KLNK	Lincoln	Lincoln	NE
KLRD	Laredo Intl	Laredo	TX
KMEI	Key Field	Meridian	MS
KMOB	Mobile Regional	Mobile	AL
KMVC	Monroe Co	Monroeville	AL
KNBJ	Barin NOLF	Foley	AL
KNDZ	Whiting Field NAS South	Milton	TX
KNFW	Fort Worth NAS	Fort Worth	TX
KNGT	Goliad NOLF	Berclair	TX
KNMM	Meridian NAS	Meridian	MS
KNQI	Kingsville NAS	Kingsville	TX
KOKC	Will Rogers World	Oklahoma City	OK
KPHX	Phoenix Sky Harbor Intl	Phoenix	AZ
KPNS	Pensacola Regional	Pensacola	FL
KPWA	Wiley Post	Oklahoma City	OK
KRKP	Aransas Co	Rockport	TX
KSAT	San Antonio Intl	San Antonio	TX

ICAO	NAME	CITY	STATE
KSEQ	Randolph AFB Aux	Seguin	TX
KSKF	Lackland AFB Kelly Annex	San Antonio	TX
KSSF	Stinson Muni	San Antonio	TX
KT70	Laughlin AFB Aux NR 1	Spofford	TX
KTCL	Tuscaloosa Regional	Tuscaloosa	AL
KTLH	Tallahassee Regional	Tallahassee	FL
KTUP	Tupelo Regional	Tupelo	MS
KVCT	Victoria Regional	Victoria	TX

A.3 Enhanced Topographic Airfields

ICAO	NAME	CITY	STATE
2TX3	La Fonda Ranch	Brackettville	TX
50XS	Hughes Ranch	Quemado	TX
6TA4	Eagle Pass	Eagle Pass	TX
8TA0	John B Connally Ranch	Floresville	TX
K1K2	Lindsay Municipal	Lindsay	OK
K1M4	Posey Field	Haleyville	AL
K2R9	Karnes Co	Kenedy	TX
K3M2	Double Springs-Winston County	Double Springs	AL
K3M8	North Pickens	Reform	AL
K40J	Perry-Foley	Perry	FL
K50R	Lockhart Muni	Lockhart	TX
K5A4	Okolona Municipal Richard Stovall Field	Okolona	MS
K84R	Smithville Crawford Muni	Smithville	TX
K92F	Chattanooga Sky Harbor	Chattanooga	OK
KADM	Ardmore Muni	Ardmore	OK
KAFW	Fort Worth Alliance	Fort Worth	TX
KAIV	George Downer	Aliceville	AL
KAMA	Rick Husband Amarillo Intl	Amarillo	TX
KAUS	Austin Bergstrom Intl	Austin	TX
KAVL	Asheville Regional	Asheville	NC
KBAB	Beale AFB	Marysville	CA
KBAD	Barksdale AFB	Bossier City	LA
KBAZ	New Braunfels Regional	New Braunfels	TX
KBHM	Birmingham Intl	Birmingham	AL
KBIF	Biggs AAF	Fort Bliss	TX
KBIX	Kessler AFB	Biloxi	MS
KCEW	Crestview (Bob Sikes)	Crestview	FL
KCLL	Easterwood Field	College Station	TX
KCOT	Cotulla-La Salle Co	Cotulla	TX
KCQF	Sonny Callahan	Fairhope	AL
KCVB	Castroville Muni	Castroville	TX
KCVS	Cannon AFB	Clovis	NM
KCZT	Dimmit Co	Carrizo Springs	TX
KDHN	Dothan Regional	Dothan	AL
KDMA	Davis Monthan AFB	Tucson	AZ
KDRT	Del Rio Intl	Del Rio	TX

ICAO	NAME	CITY	STATE
KDUC	Halliburton Field	Duncan	OK
KECP	NW Florida Beaches Intl	Panama City	FL
KECU	Edwards Co	Rocksprings	TX
KEDW	Edwards AFB	Edwards	CA
KEFD	Ellington Field	Houston	TX
KEGI	Duke Field (Eglin AF Aux Nr3)	Crestview	FL
KFHU	Sierra Vista Muni-Libby AAF	Sierra Vista	AZ
KFSI	Henry Post AAF (Fort Sill)	Fort Sill	OK
KFSM	Fort Smith Regional	Fort Smith	AR
KFST	Fort Stockton-Pecos Co	Fort Stockton	TX
KGPT	Gulfport-Biloxi Intl	Gulfport	MS
KGRK	Robert Gray AAF (Fort Hood)	Killeen	TX
KGSB	Seymour Johnson AFB	Goldsboro	NC
KHBG	Hattiesburg Bobby L Chain Muni	Hattiesburg	MS
KHDC	Hammond Northshore Regional	Hammond	LA
KHMN	Holloman AFB	Alamogordo	NM
KHRL	Valley Intl -Harlingen	Harlingen	TX
KHRT	Hurlburt Field	Mary Ester	FL
KHSV	Huntsville Intl Carl T Jones Field	Huntsville	AL
KHUA	Redstone Army Airfield (AAF)	Huntsville	AL
KHYI	San Marcos Muni	San Marcos	TX
KISO	Kinston Regional Jetport at Stallings Field	Kinston	NC
KIWA	Phoenix Mesa Gateway	Phoenix	AZ
KJAN	Jackson Evers Intl	Jackson	MS
KJAX	Jacksonville Intl	Jacksonville	FL
KJCT	Kimble Co	Junction	TX
KJKA	Jack Edwards Airport	Gulf Shores	AL
KLAW	Lawton Fort Sill Regional	Lawton	OK
KLBB	Lubbock Preston Smith Intl	Lubbock	TX
KLFI	Langley AFB	Hampton	VA
KLMT	Klamath Falls	Klamath Falls	OR
KLSV	Nellis AFB	Las Vegas	NV
KLTS	Altus AFB	Altus	OK
KLUF	Luke AFB	Glendale	AZ
KM40	Monroe County	Aberdeen	MS
KM44	Houston Municipal	Houston	MS
KM83	McCharen Field	West Point	MS
KMAF	Midland Intl	Midland	TX

ICAO	NAME	CITY	STATE
KMFE	McAllen Miller Intl	Mc Allen	TX
KMFR	Rogue Valley Intl Medford	Medford	OR
KMGM	Montgomery Regional	Montgomery	AL
KMSL	NW Alabama Regional	Muscle Shoals	AL
KMUO	Mountain Home AFB	Mountain Home	ID
KNBG	New Orleans NAS	New Orleans	LA
KNEW	New Orleans Lakefront	New Orleans	LA
KNFJ	Choctaw NOLF	Milton	FL
KNFD	Summerdale NOLF	Summerdale	AL
KNHK	Patuxent River NAS	Patuxent River	MD
KNIP	Jacksonville NAS	Jacksonville	FL
KNKT	Cherry Point MCAS	Cherry Point	NC
KNOG	Orange Grove NALF	Orange Grove	TX
KNQB	Silverhill NOLF	Silverhill	AL
KNUN	Saufley Field NOLF	Pensacola	FL
KNWL	Waldron Field NOLF	Corpus Christi	TX
KNYL	Yuma MCAS-Yuma Intl	Yuma	AZ
KONY	Olney Muni	Olney	TX
KPAM	Tyndall AFB	Panama City	FL
KPEZ	Pleasanton Muni	Pleasanton	TX
KPQL	Trent Lott Intl	Pascagoula	MS
KPSX	Palacios Muni	Palacios	TX
KRFG	Rooke Field	Refugio	TX
KROW	Roswell Intl Air Center	Roswell	NM
KSHV	Shreveport Reginal	Shreveport	LA
KSJT	Mathis Field	San Angelo	TX
KSLN	Salina Regional	Salina	KS
KSSC	Shaw AFB	Sumter	SC
KSTF	George M Bryan	Starkville	MS
KSWO	Stillwater Regional	Stillwater	OK
KSZL	Whiteman AFB	Knob Noster	MO
KT30	McKinley Field	Pearsall	TX
KT69	Alfred C Bubba Thomas	Sinton	TX
KTFP	McCampbell-Porter	Ingleside	TX
KTIK	Tinker AFB	Oklahoma City	OK
KTUL	Tulsa Intl	Tulsa	OK
KTUS	Tucson Intl	Tucson	AZ
KUBS	Columbus Lowndes Co	Columbus	MS

ICAO	NAME	CITY	STATE
KVPS	Eglin AFB	Valparaiso	FL
KWDG	Enid Woodring Regional	Enid	OK
XS59	Mellon Ranch	Refugio	TX
XS71	San Christoval Ranch	Pawnee	TX

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APPENDIX B LIGHT GUN LOCATIONS

Airport Name	ICAO Code	Location
Columbus AFB	KCBM	Control Tower
Columbus Aux (Gunshy)	1MS8	RSU Rwy 31
Frederick Muni – Sheppard Aux	KFDR	RSU Rwy 17
Lackland AFB	KSKF	Control Tower
Laughlin AFB	KDLF	Control Tower
Laughlin AFB Aux. No. 1	KT70	RSU Rwy 13
Moody AFB	KVAD	RSU 36L
NAS Pensacola	KNPA	Control Tower
NAS Whiting North	KNSE	Control Tower
NAS Whiting South	KNDZ	Control Tower
Randolph AFB	KRND	Control Tower Rwy 32L
San Antonio Int'l	KSAT	Control Tower
Seguin	KSEQ	RSU Rwy 13
Sheppard AFB	KSPS	Control Tower
Stinson Municipal	KSSF	Control Tower

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