



COMMANDER 115TC Panel and Cockpit Handbook

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Getting Started

The Commander 115 TC comes in two basic panel layouts. The difference between the two is the pilot's Primary Display. One option is the standard "steam driven" Automatic Direction Indicator (ADI) and Horizontal Situation Indicator (HSI). The other features glass avionics EADI and a Multi Function Display (MFD). The panel illustration below omits the Primary Display detail.

Pilot and Copilot Panel



1. Pilot Panel



1. Panel access icons
2. OAT/Cabin temperature indicator
3. Autopilot annunciator
4. DME readout
5. Chronometer
6. Airspeed indicator
7. Turn coordinator
8. Alternate static air sources
9. Aux. antenna switches
10. PDF
11. Gauge and panel light dimmers
12. Stall warning indicator
13. NAV/GPS selector and display
14. Annunciator panel
15. Altimeter
16. Vertical speed indicator
17. Autopilot Altitude preselector
18. ERMI indicator
19. Gyro control *
20. Gear handle
21. Engine instruments
22. Vacuum indicators
23. Graphic Engine Monitor (GEM)
24. Voltage indicator
25. Avionics master switch
26. Magnetos control
27. Power/light/fuel pump switches
28. Rudder trim indicator
29. Elevator trim indicator
30. Circuit breakers

1.1 PDF

You can choose which style PDF you wish to use on the Load Manager. See the Load Manager Handbook for more details.

Select either the standard or
glass PDF displays



Standard PDF



Glass PDF



1.1.1 HSI /EHSI Control Modules

Each requires a different control module. The standard Bendix King HSI is slaved to the Gyro Control Module. The EHSI has multiple functions which require the EHSI control module. The correct module for the type of display (Standard or Glass) that you select in the Load manager will automatically be provided to you when the Load Manager configures your panel file for you. There is nothing you need to do here to display the proper module. See the [Load Manager Handbook](#) for more details.

1.1.2 Gyro Control Module



- a) Gyro Slave Switch
 - i) Slave Mode: When in the Slave mode the HSI compass is slaved to the system's Slaving Magnetic Transmitter (SMT) unit that senses the direction of the earth's magnetic field and continuously and transmits this information through the slaving circuitry to the directional gyro which is automatically corrected for precession or "drift". This sensor is mounted remotely – usually in a wingtip – to eliminate the possibility of magnetic interference. Continual adjustment for gyro drift is not necessary when the switch is in the **Slave** mode.
 - ii) Free Mode: The gyro platform is not connected to the SMT, which will result in the HSI unit displaying the actual gyro reading. This will require occasional adjustment of the **Gyro Drift Correction Control** (2).
- 2) Gyro Drift Correction Control – For use when the Gyro Slave Switch (1) is in the **Free** mode. This control works in conjunction with the **Gyro Drift Indicator** (3) to allow precise alignment of the gyro platform to the actual aircraft heading.

- 3) Gyro Drift Indicator – When the **Gyro Slave Switch** (1) is in the **Free** mode the indicator needle will show when the aircraft is on the correct course without need for drift adjustment (needle centered). If the needle is deflected to the left or right the **Gyro Drift Correction Control** (2) will require adjustment in that direction to correct the gyro platform and insure that you are on the proper heading.
- 4) Gyro Status Test Switch – Depressing this button will test the Gyro Failure Alarm. A momentary red light (5) will be displayed.
- 5) Gyro Test Switch/Gyro failure indicator.
- 6) Compass Test Switch – Tests the integrity of the Gyro Compass. A momentary red light (7) will be displayed.
- 7) Compass Test Switch/Compass failure indicator.

1.1.3 EHSI Control Module

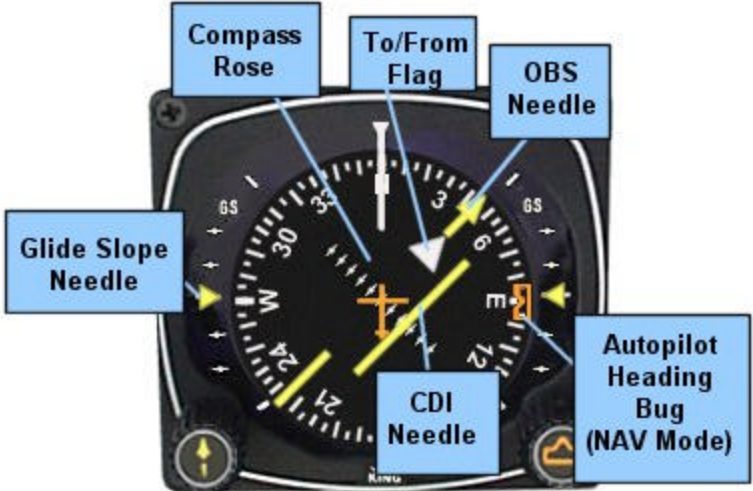
- 1) Navigation Data Controls – Selects what type of navigation radio data will be displayed on the EHSI. See Figure 1.
- 2) EHSI Display Mode – Toggles between Arc Mode and HIS mode.
- 3) Data Mode Control – Toggles between the VOR mode, where all navaids are displayed on the map, and Approach mode, where the aircraft relationship with the destination airport is all that is displayed.
- 4) Data Declutter Controls – Allows you to toggle on/off the different type of navaids available for display on the map.
- 5) Scale Control – EHSI map zoom in and out.





Figure 1
*EHSI Control Module
Navigation Data Control*

1.1.4 The Horizontal Situation Indicator (HSI)



The HSI is a cockpit navigation display, which is actually part of the flight-director system. It combines navigation and heading information in one easy to read display. All important information concerning the aircraft's position relative to ground-based navigation aids is presented in one convenient display. The HSI provides a basic horizontal view of the aircraft's navigation picture. It can provide navigation data to the selected VOR on your NAV 1 radio.

Instrument flying without an HSI requires a fair amount of mental gymnastics; for this reason, the HSI is becoming more prevalent in general aviation since it provides an excellent picture for precise navigation.



When you fly back course approaches, set in the ILS front course heading and then fly "the picture" using normal response to needle movements (i.e., needle left, correct left; needle right, correct right). Don't confuse a radial (which radiates outward from a VOR) with an inbound course (i.e., the reciprocal) when setting the course pointer.

All HSIs are equipped with "TO-FROM" NAV function, heading and glide slope warning flags. If the NAV flag appears, this means you are not currently receiving a VOR signal, so don't fly that portion of the instrument!

To function properly, you must properly set the selected course and heading information. Because the HSI is a gyroscopic device, you must set it to the magnetic heading and check it periodically.



The autopilot heading may also be selected using the right-hand knob. The autopilot heading bug shows you the autopilot heading in relation to the other navigation information



1.1.5 Multi Function Display (MFD)

The MFD displays navigation information to the pilot in numerous configurable ways, with a variety of supplemental information. Selection of MFD functions, display information, range scale and display pages are selected via the EHSI Control Module described in section 1.1a.



There are two display modes (ARC and HSI). Select the desired mode on the EHSI control panel. Both modes provide heading information in both digital and relative compass displays, navaid information, ground speed (GS) and true airspeed (TAS).



ARC Mode

Displays information on the aircraft position relative to the data selected for display on the map, with a compass arc superimposed on the display.



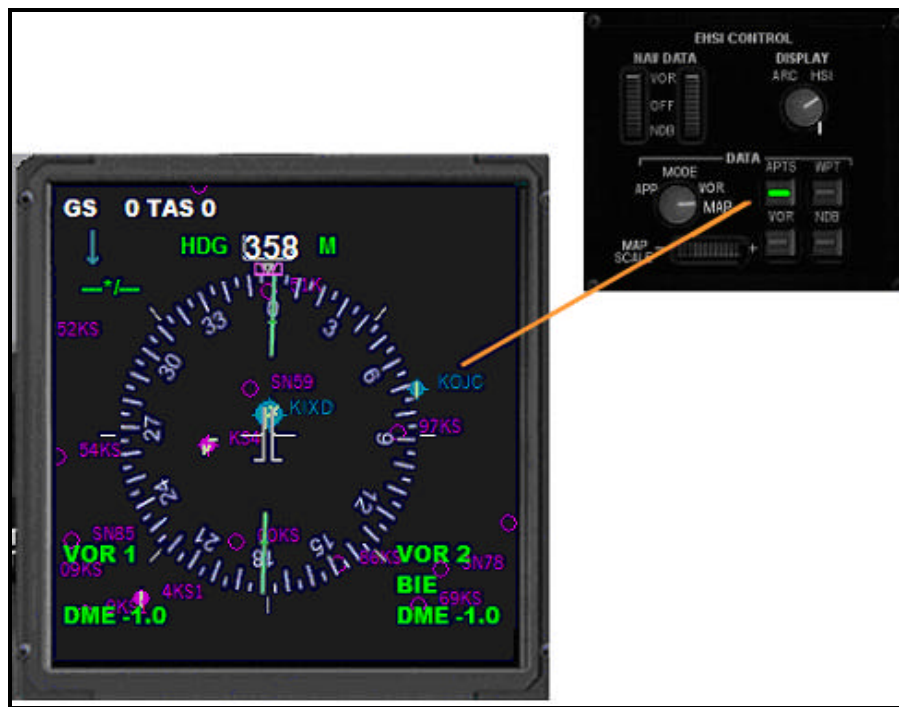
HSI Mode

Aircraft position is the center of the compass rose display. Map data is displayed, depending on the Data Mode Selector, in its relative position.

The HSI page has three display modes:

VOR Mode – This displays the compass rose. The aircraft position is the center of the rose. Map data can be toggled on and off using the map detail buttons on the EHSI Control Panel (section 1.1a).

The map may be decluttered using the Data Type buttons on the EHSI control panel.



HSI Mode – Center of the data mode knob position. The electronic display works identical to a standard HSI. While the OBS pointer is always visible on this page, you can also select a display pointer, and digital information for either the VOR data, or NDB data using the NAV Data thumbwheel controls. When turning these controls to the OFF position no navigation pointers or data will be displayed.



Approach Mode – When using a precision approach, and the VOR 1 radio is tuned to an active ILS frequency, Approach Mode will display the additional HSI data needed to track the ILS.



Segmented Arc Mode

Your relative position to the map is marked with a small aircraft symbol. Arc mode superimposes a compass arc display toward the top. Track lines from your GPS data, relative to the aircraft heading, are also available in Arc Mode.

The map may be decluttered using the Data Type buttons on the EHSI control panel.



1.2 ERM I INDICATOR

In the RMI mode Glass avionics display representing the relative bearing of the VOR 2 and ADF signals from the respective radios.

In the Radar Altimeter (R ALT) mode the instrument displays the radar altimeter data. Altitude is displayed in pie chart form, between 0 and 2,000' AGL. See Figure 2. A Decision Height indicator and audible annunciator are also incorporated into this instrument. Decision Height is adjusted using the "DH" knob.

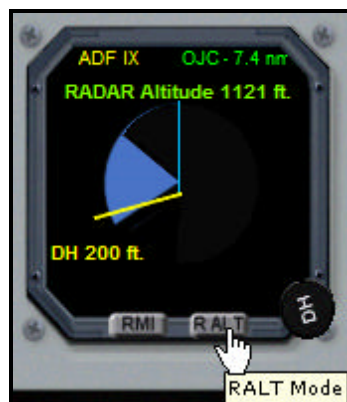


Figure 2
ERM I Radar Altimeter Mode

1.3 AUTOPILOT COMPONENTS

The autopilot consists of 5 separate elements on the instrument panel. See figure 4.



Figure 3
Autopilot Components

1. ST55X Autopilot 2. ST 360 Altitude Preselector 3. ST645 Annunciator 4. AP Master Ctrl's. 5. CWS/Yaw Damper



Figure 4
Autopilot Component Locations

Detailed instructions on the use and procedures for the autopilot system can be found in the [ST55X Pilot Operating Handbook](#).

1.4 PRIMARY INSTRUMENTS



Figure 5
Primary Instruments

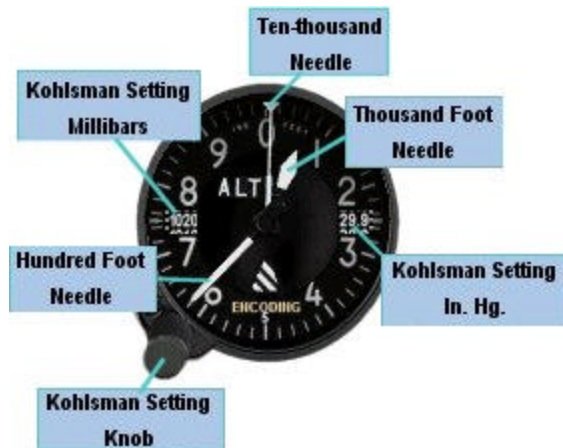
1.4.1 AIRSPEED INDICATOR (ASI)



Turn the Altitude Selector Knob until the current altitude from barometric pressure, in feet, is displayed in the Altitude Selection Indicator window. The corresponding True Airspeed (TAS), in knots, will show in the True Airspeed Calculator window.

The Indicator Needle registers Indicated Airspeed in Knots (KIAS). (See Airspeed Terminology in your Flight Simulator X\FSD International\Pilot Manuals folder)

1.4.2 Altimeter



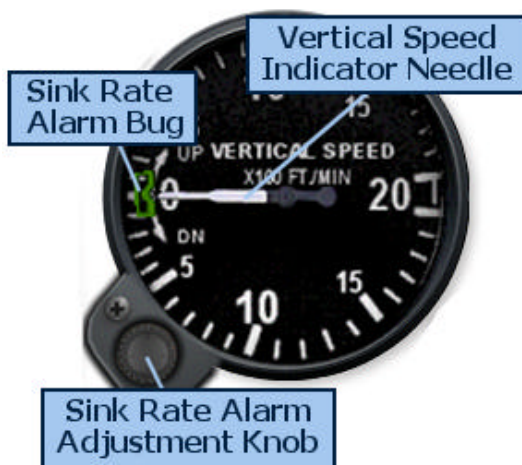
Indication needles for hundreds, thousands and ten thousand feet. Encoder gives a digital output to the Transponder for automatic transmission of the aircraft's pressure altitude to ATC.

Kohlsman setting for barometric pressure reading in millibars, or (in USA) inches of mercury (Hg) used to set a pressure altimeter's sub-scale to QFE or QNH.

1.4.3 Vertical Speed Indicator

Indication in hundreds of feet per minute.

An adjustable sink rate alarm is available to warn the pilot in case of excessive descent. The alarm will sound if the aircraft descent rate exceeds the selected amount. A setting of zero silences the alarm.



1.4.4 Turn Coordinator



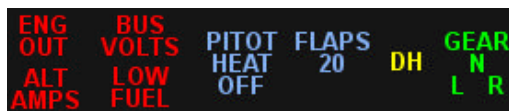
The turn coordinator is really two instruments. The gyro portion shows the aircraft's rate of turn—how fast it's changing direction. A ball in a tube called the "inclinometer" or "slip/skid indicator" shows the quality of the turn—whether the turn is "coordinated."

When the wings of the miniature airplane align with the small lines next to the "L" and "R," the aircraft is making a standard rate turn. This means the aircraft completes a 360-degree turn in two minutes.

1.5 ANNUNCIATORS

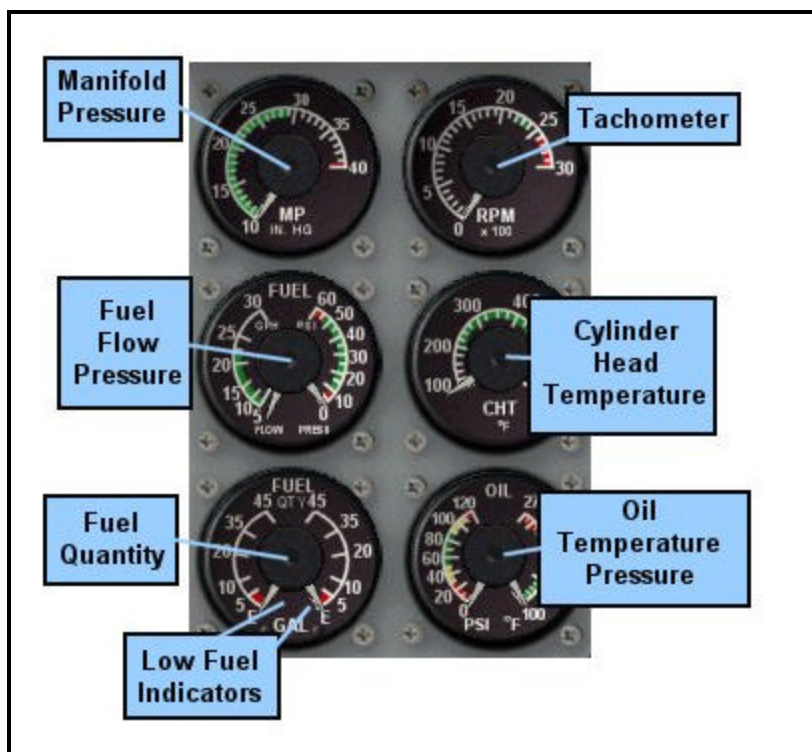


The **NAV Annunciator** allows you to control the autopilot/GPS lock interface. It will also display the marker beacon state on approach.



The **System Annunciator** displays critical information on various aircraft systems, including the landing gear annunciators and decision height (DH) indicator.

1.6 ENGINE INSTRUMENTS



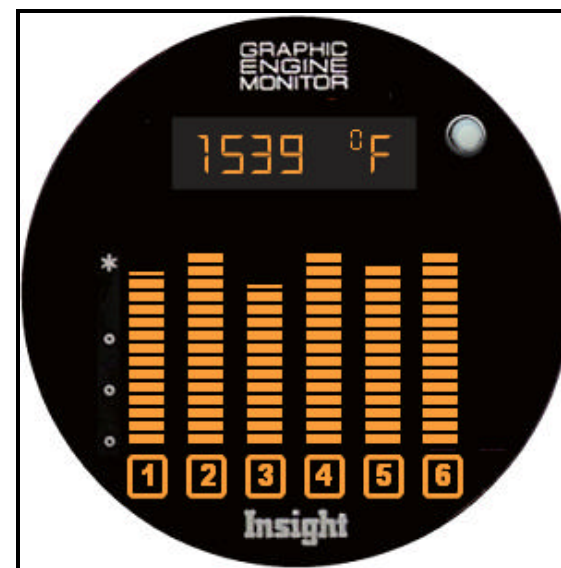
Engine input and output data is displayed on analog instruments on this section of the panel.



1.7 GRAPHIC ENGINE MONITOR (GEM)

Graphic Engine Monitors (GEM) are the most advanced engine instruments available to the pilot. Traditional multi cylinder exhaust gas and cylinder head temperature systems that force the pilot to switch or scan an indicator from cylinder to cylinder in search of critical engine data, are becoming obsolete. Using the latest computer technology, the GEM presents a clear, concise, graphic picture of all cylinder temperatures simultaneously for interpretation at a glance.

Both EGT and CHT modes are available. You switch between them using the small white button in the upper left hand corner of the instrument. A graphic display showing the temperature of each cylinder is combined with a digital readout showing the average of all cylinders



1.8 ALTERNATE STATIC SOURCE

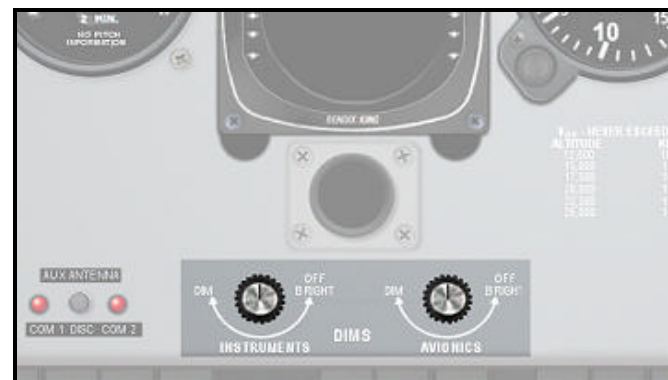
Aircraft used for instrument flight and air driven gauges should have an alternate static source because the static line can freeze shut, become blocked with debris, or the static port can ice over.

Incase of instrument failure on air driven gauges such as the airspeed indicator or the altimeter, for example, moving the Alternate Static Source switch to open (right) will allow the gauges to continue to operate.



1.9 INSTRUMENT LIGHTS

The gauge backlights and avionics displays are controlled using these two knobs. In the OFF position (90°) the backlights are off. Turning the control clockwise sets the backlights first to bright, with continued clockwise turns resulting in dimming the lights as desired.



1.10 LOWER PANEL CONTROLS

The switch bank includes the battery and alternator master switches, electronic pitch trim switch, exterior light switches, panel flood light switch, pitot heat switch and the rudder trim controls.



The panel floodlights are switched on and off using the "Panel" switch located on the switch bank.



2 Radio Stack

The radio stack is located in the center console between the pilot and copilot panels.



It can also be called up as a separate unit via the panel control icon on the upper left side of the pilot panel.





In addition the Garmin GNS 480 and the SL30 NAV2/COM 2 radio can be shown in a larger expanded view by pressing their display area.

The avionics stack consists of:

1. Garmin GNS 480 NAV/GPS/MAP/Transponder navigation unit
2. Apollo SL 30 SL30 NAV2/COM 2 radio
3. Bendix King KR 87 ADF receiver
4. STEC 55X Autopilot

Each radio is an almost exact duplicate of its real world counterpart, not simply an "FS representation".

Expanded handbooks for each of these units can be found in the same folder in this manual:

Flight Simulator X\FSD International\Pilot Manuals\Avionics

They can also be accessed through your Windows Start menu folder.

3. Throttle/Pedestal

The pedestal section contains the following:

1. Throttle quadrant
2. Manual pitch trim controls
3. Fuel tank selector switch



3.1 FUEL TANK SELECTOR



Control over fuel tank output/engine input is accomplished using the Fuel Tank Selector on the rear section of the pedestal. Possible positions are (starting from counter-clockwise):

- OFF – Total fuel shutoff
- LEFT – Fuel feeds from the left tank only
- BOTH – Fuel flows evenly from both tanks
- RIGHT – Fuel feeds from the right tank only
- OFF - Total fuel shutoff



In the 2D panel the throttle quadrant is accessed from the panel icon on the upper left side of the pilot panel.

The fuel tank selector is accessed by pressing the small arrow icon on the 2D throttle quadrant lower left.

4 Copilot Panel



- | | | |
|--------------------------------|---|-----------------------|
| 1. Radio stack (see section 2) | 5. Fuel Totalizer – see separate handbook | 9. ECS controls |
| 2. Autopilot command switches | 6. Direction gyro | 10. Air vent controls |
| 3. Flaps indicator | 7. Altimeter | 11. Circuit breakers |
| 4. Electronic flaps switch | 8. Hobbs meter – aircraft op. time | |

4.1 AUTOPILOT COMMAND SWITCHES

See the Autopilot Manual for more complete information

1. Autopilot master/servos control
2. Flight director on/off
3. Control wheel steering
4. Yaw damper



4.2 FUEL TOTALIZER

Calculates fuel used, fuel remaining, endurance and fuel to destination. See the Fuel Totalizer Manual for more details.



4.3 ENVIRONMENTAL CONTROL SYSTEM (ECS)

The ECS is a **non thermostatically** controlled heater and air conditioner. It consists of a heat intake duct from the engine, along with a compressor for air conditioning the cabin. Operation of the compressor requires starting alternator #2 inside the engine compartment.

Heater Operation

1. Press switch 3 to the left, labeled FAN
2. Select fan speed with switch 4

Air Conditioner Operation

1. Press switch #1 to start alternator #2 so that power can be supplied to the compressor
2. Move switch 3 to the compressor (COMP) position. The blue indicator light above it will illuminate when the compressor is running.
3. Select fan speed with switch 4
4. If the low volt indicator illuminates additional power can be supplied by engaging the alternator 1 – 2 transfer (switch 2)

System Test

Press button #5. All indicators lights should illuminate momentarily



4.4 CIRCUIT BREAKERS



Note that in order for the circuit breakers to control the various aircraft system the Realism Module realism setting must be in the advanced position.

5 Control Yokes

The control yokes in both the 2D and 3D panels can be hidden to allow a more unobstructed view.

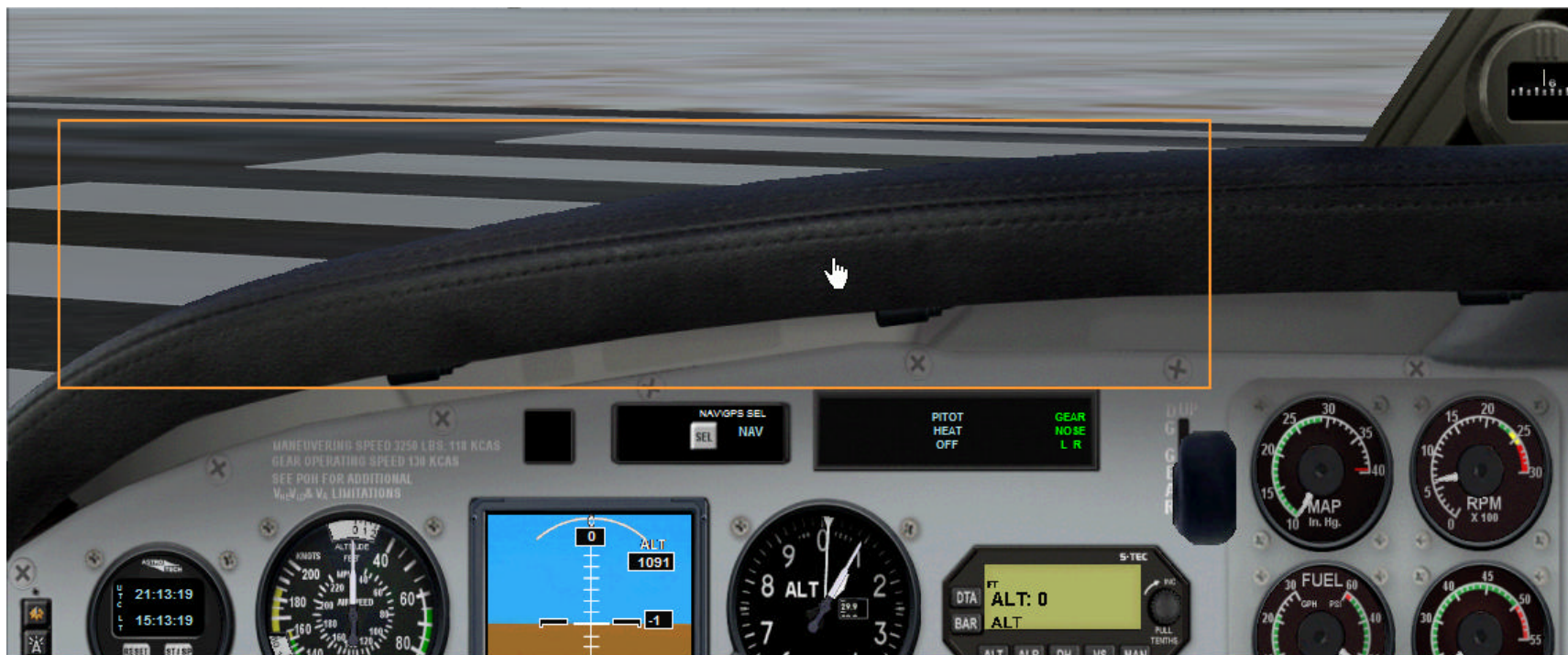
You can choose whether you want them visible by default (when the aircraft boots) by selecting the desired option on the Load Manager. See the Load Manager Handbook for more details.



6 Panel Hotspots

6.1 2D PANEL – TO SWAP FULL PANEL VIEW AND STANDARD VIEW

Mouse this area of the glare shield to swap between those views.



6.2 2D PANEL – SWAP BETWEEN PILOT AND COPILOT PANEL

Mouse the area on the right of the glare shield to swap between pilot and copilot panels. In the copilot panel, mouse click the upper left of the glare shield.



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