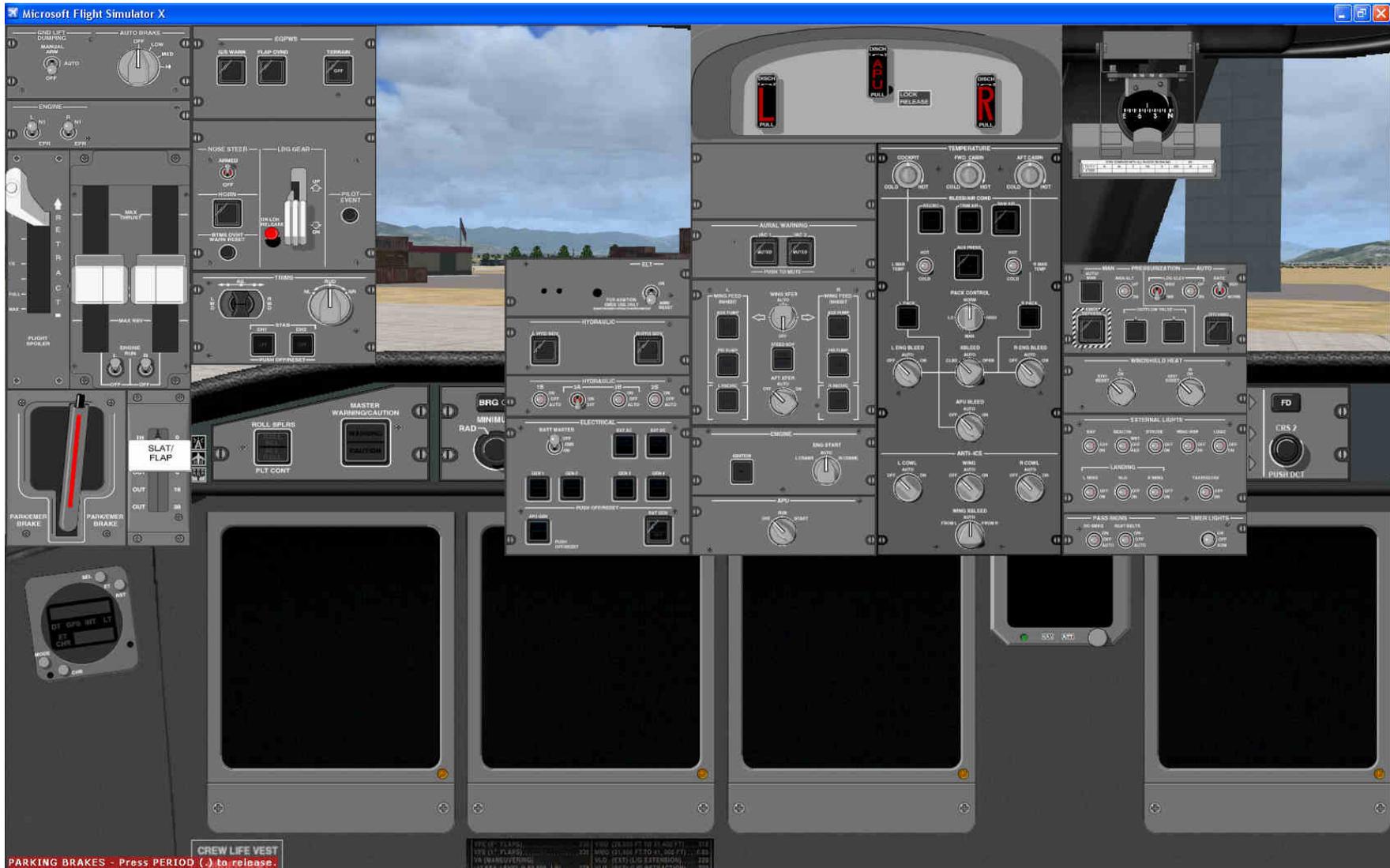


**BOMBARDIER GLOBAL EXPRESS XRS<sup>®</sup>**  
**FOR**  
**MICROSOFT FLIGHT SIMULATOR X<sup>®</sup>**



## DARK COCKPIT DISPLAY DAYTIME



Shown with Engine Control (ECU), Overhead Panel and Standby Compass popup panels displayed. Engines off and no power applied to the aircraft. Nighttime dark cockpit is totally dark and requires the Shift+L keys pressed to initially activate the cockpit lights.

# MASTER BATTERY SWITCH ON



This displays the panel with the Master Battery switch ON to power Systems.



## VIRTUAL COCKPIT (VC) VIEW



This view shows the dual Honeywell FMS (Garrett Smith's) units installed in the center pedestal of the Virtual Cockpit.

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This document was produced to guide any user of the **freeware** release of my version of the Bombardier Global Express XRS<sup>®</sup>.

The only copyright claims the author has is regarding the assembly, as well as text that was extracted from the Bombardier Global Express<sup>®</sup> Flight Crew Operating Manual, which is available on the internet.

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The information provided in this document is to be used with the Microsoft Flight Simulator X<sup>®</sup> and is **not to be used for real world flying.**

# FSX Global Express XRS Controls & Panels

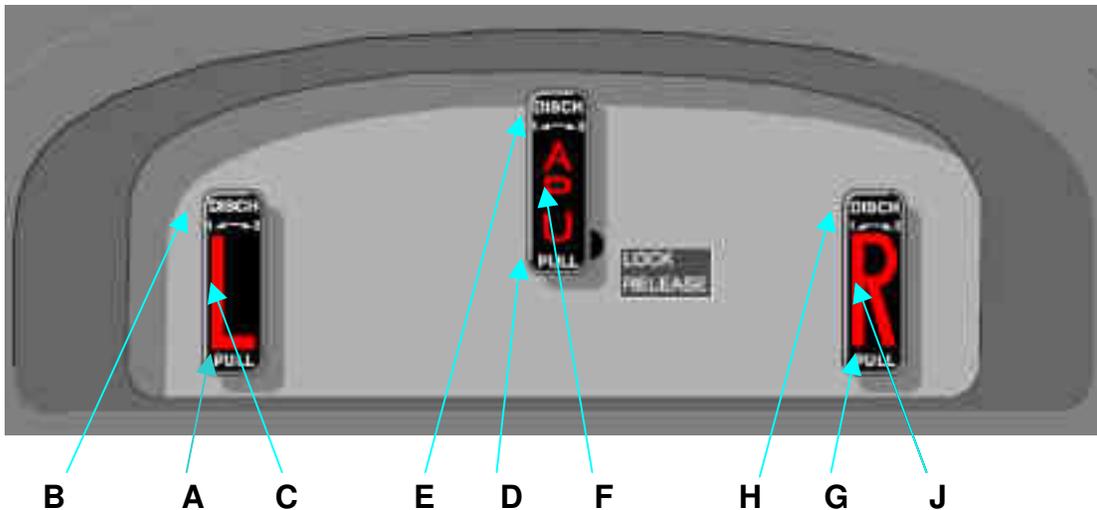
With this document, I will try to explain the operational functions of each one of the control panels used in my version of the Bombardier Global Express XRS panel. Many of the mouse areas are hidden until certain conditions are met to make them display. This will be described in each panel text. When moving the mouse pointer over mouse areas, the tool tips will indicate what is available in that spot or switch.

In the Virtual Cockpit (VC), all the mouse areas described in the document are available. When switching between 2d and VC, use caution as some switches are toggle on toggle off as opposed to a dedicated ON and OFF. **Toggles can get out of sequence in relation to the visual switch position, so exercise caution.**

**Note:** Some mouse areas (tool tips) are not displayed unless certain conditions or settings are complied with or set. This will be covered in each instrument or panel that has this requirement. When the Overhead icon is initially clicked, the Bleed Air Source Control will be set to OFF (1).

## OVERHEAD PANEL AREA:

### OVERHEAD ENGINE FIRE CONTROL PANEL:



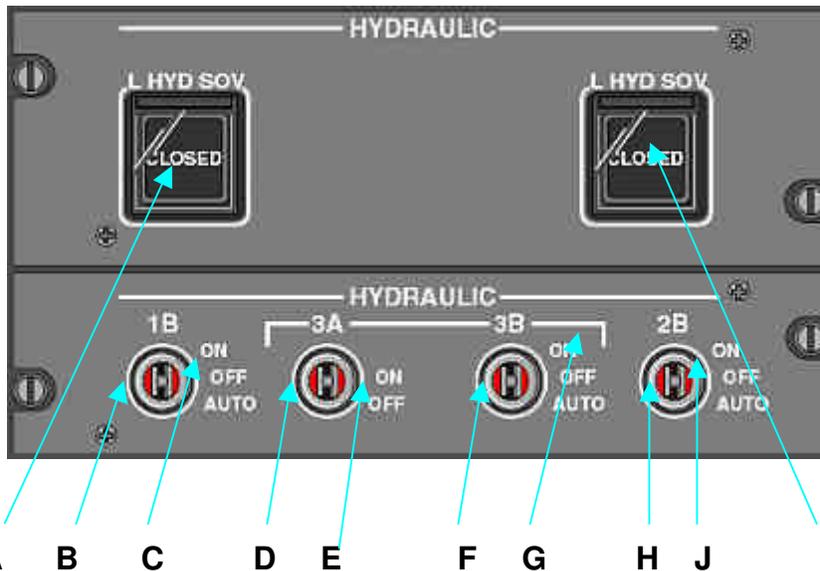
When a fire is detected in either engine or APU the L, R or APU lettering will illuminate bright RED, at the same time the RED warning on the left Caution Warning Panel will flash and the appropriate L ENG FIRE, R ENG FIRE or APU FIRE will annunciate on the EICAS primary display. When this happens, left mouse click on A, D or G will cause the handle to rotate to the left for L or APU or the right for R. This action will arm the fire bottle 1 on either L or APU or fire bottle 2 for R. Depressing area B, E or H will discharge the bottle and the red lettering will remain illuminated until the fire is extinguished. Depressing C, F or J will return the handle to the center original position.

## ELT PANEL:

- A) This panel is for simulation only as there is no ELT in FSX. Switch is default to ARM/RESET and will toggle to ON or ARM/RESET.



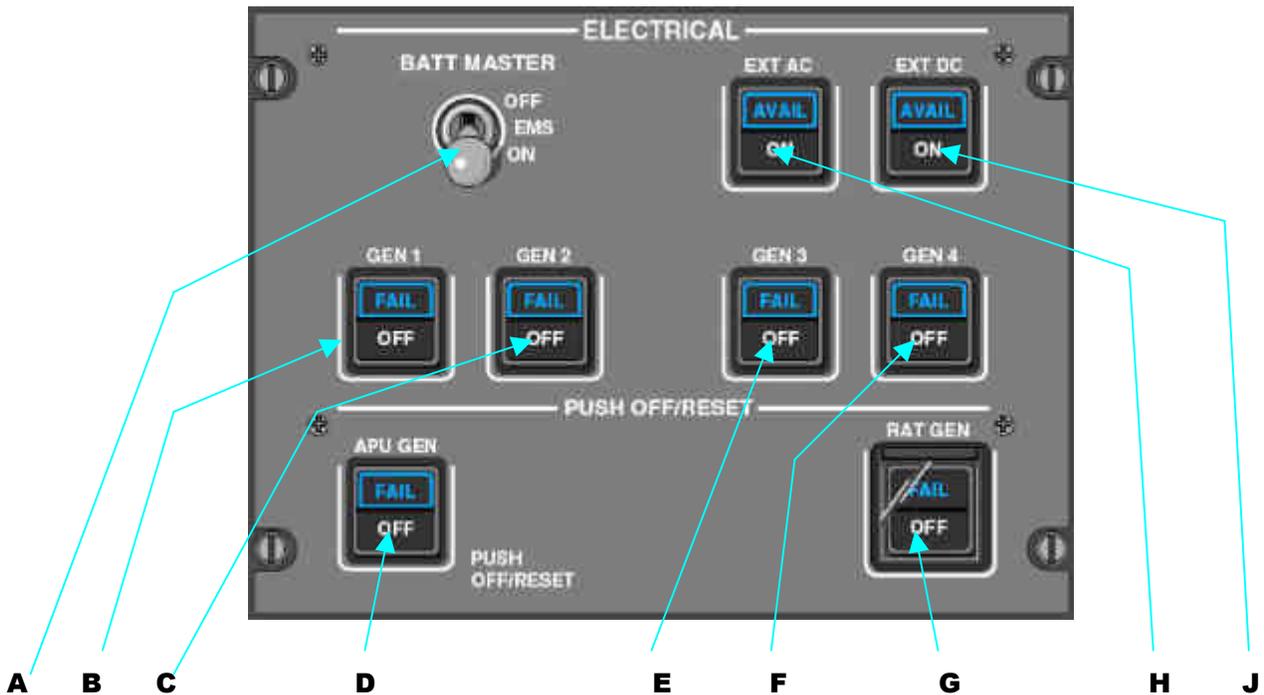
## HYDRAULIC PANEL:



**NOTE:** When starting with the engines running, click on switches 1B, 3A, 3B and 2B to set to OFF as they are all on by default if engines are running on startup. **Recommend to start with the Cold Cockpit Procedure.**

- A) Depressing shuts off Hydraulics (L HYD SOV) for L Engine (Hyd 1A)
- B) Default to OFF. When switch is up (ON), clicking on B areas will turn Hyd Pump 1B OFF.
- C) Click on ON will set HYD 1B to ON. Turn ON only if L Eng fails.
- D) 3A is default to OFF and EICAS message will display caution with CAUTION on CWP. Click on switch center to turn OFF.
- E) Clicking on ON will set HYD 3A to ON.
- F) 3B is default to OFF. If 3A is ON none of the mouse areas on 3B can be displayed. Selecting 3A to Off will automatically turn 3B ON. When 3B is on, none of the mouse areas on 3A can be displayed. This prevents both systems to be turned on at the same time.
- G) Click on ON to turn 3B on, if 3A is OFF.
- H) 2B is default to OFF. This should only be turned ON if R Eng fails. Click on ON to turn 2B ON.
- K) Depressing shuts off Hydraulics (R HYD SOV) for R Engine (Hyd 2A)

## ELECTRICAL PANEL:



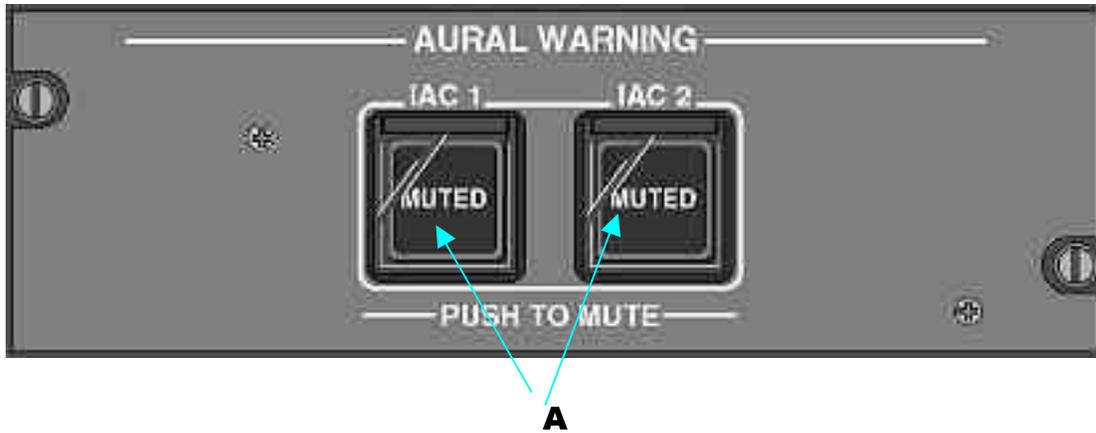
**Note:** Dark cockpit all Gen switch lights are indicating OFF, EXT AC and EXT DC are blank. If engines are operating, the GEN 1(B) and GEN 4(F) will have to be clicked once to set the switch position and remain ON (OFF legend extinguished). The default FSX only has two generators on twin-engine aircraft so GEN 2 and GEN 3 are not really functional but do show on the EICAS. FSX limitation. Be sure to select B & C to ON after starting L Engine (1) and E & F to ON after starting R Engine (2).

- A) Toggles Battery On/OFF. The actual aircraft has two batteries, one for avionics and one for APU, which also powers DC Battery Bus. FSX has only one battery function. See EICAS DC ELEC page for display.
- B) Selecting GEN 1 switch after L ENG start, turns the GEN ON. FAIL annunciation will occur when switch is on and L ENG fails or is shut down. OFF indication will remain off until switch is selected.
- C) This simulates a second generator on L ENG indication wise only on panel and EICAS. FAIL annunciation will illuminate as described above.
- D) Selects APU GEN ON or OFF, when APU is in operation. Mouse areas are not displayed until the APU is operating. (Refer to ENGINE & APU SECTION). If APU GEN switch is selected and the generator fails then the FAIL annunciation illuminates.
- E) GEN 3 switch operates the same as GEN 2 switch except functions with R ENG.
- F) GEN 4 switch operates the same as GEN 1 switch except functions with R ENG.
- G) RAT GEN is not functional as there are no provisions in FSX. Mouse area indicates this note.
- H) Select EXT AC in center will turn on the AVAIL annunciation and call for Fuel. Select the bottom of the switch light will turn off AVAIL and turn on ON.

## **ELECTRICAL PANEL (cont'd):**

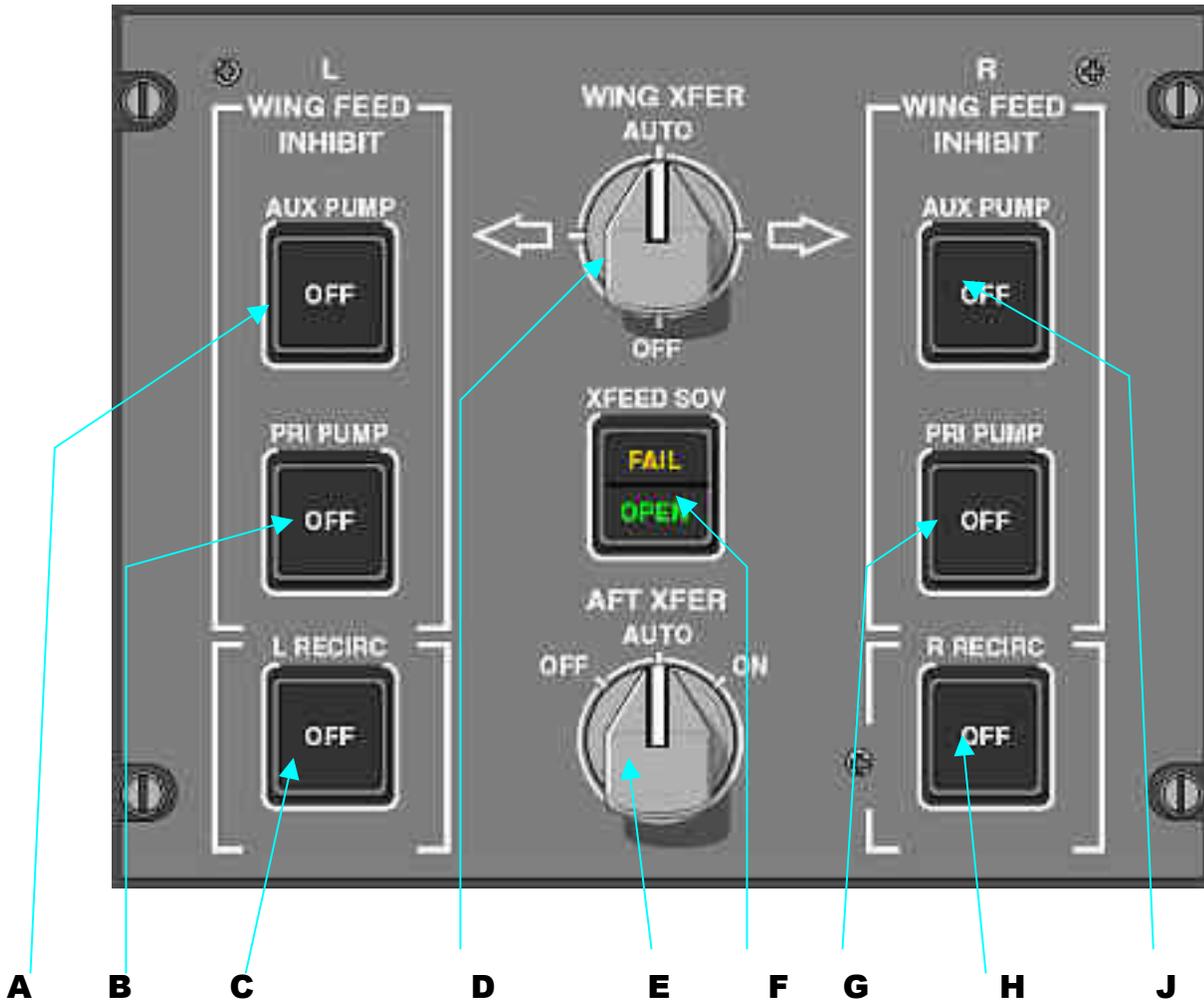
- J) Select EXT DC in center will turn on the AVAIL annunciation and is supposed to call for Fuel and Service but this does not appear to work in FSX. Select the bottom of the switch light will turn off AVAIL and turn on ON. Note that EXT AC and EXT DC cannot be selected when either one is on.

## **AURAL WARNING PANEL:**



- A) These switches are not functional.

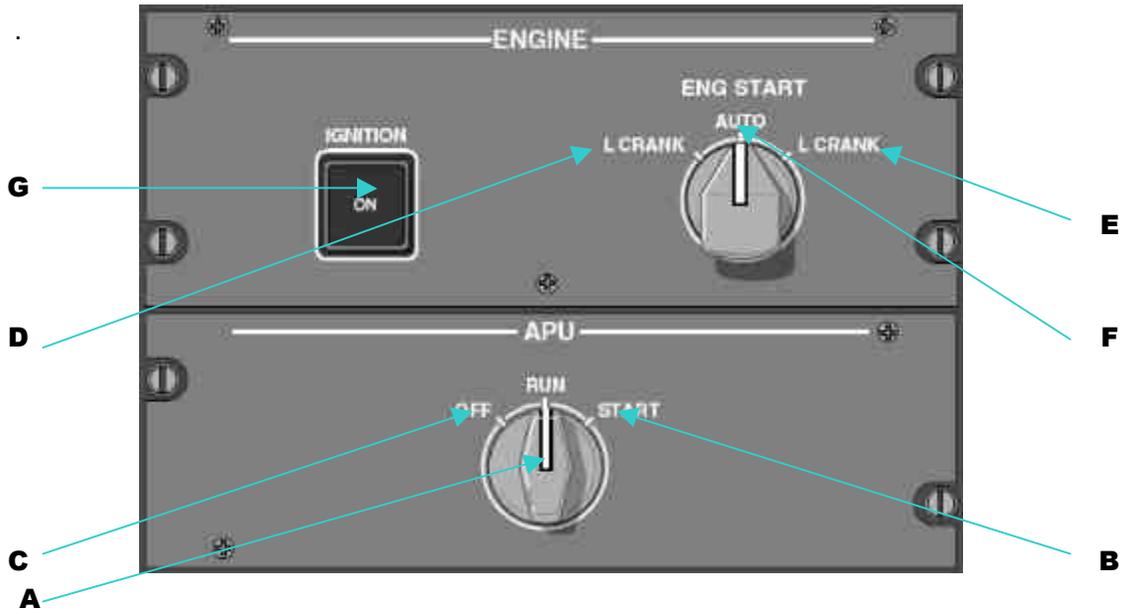
**FUEL PANEL:**



**Note: All Fuel Pumps, AFT XFER and WING XFER are OFF in default and cold cockpit. See EICAS FUEL Page for Fuel Flow graphics. There is no way to transfer fuel from one wing to the other manually doing so using the Payload and Fuel Window selection so that transfer is not functional. Cross feed burns fuel for both engines from the selected tank.**

- A) Turns L Wing Aux Pump ON or OFF. These are DC pumps and are used only for backup on landing or takeoff or when primary AC power fails. This is Graphics only.
- B) Toggles L Wing Pri Pump (Elect Fuel Pump1) ON or OFF.
- C) Turns L RECIRC pump ON or OFF. Graphics only.
- D) WING XFER is graphics only. See Note above.
- E) AFT XFER is graphic only as the fuel feeds at the same time as the mains.
- F) XFEED SOV default to Closed (blank). Selecting OPEN only shows it OPEN but has no function. FAIL is not displayed.
- G,H,and J) These function the same as L Wing except on the R Wing.

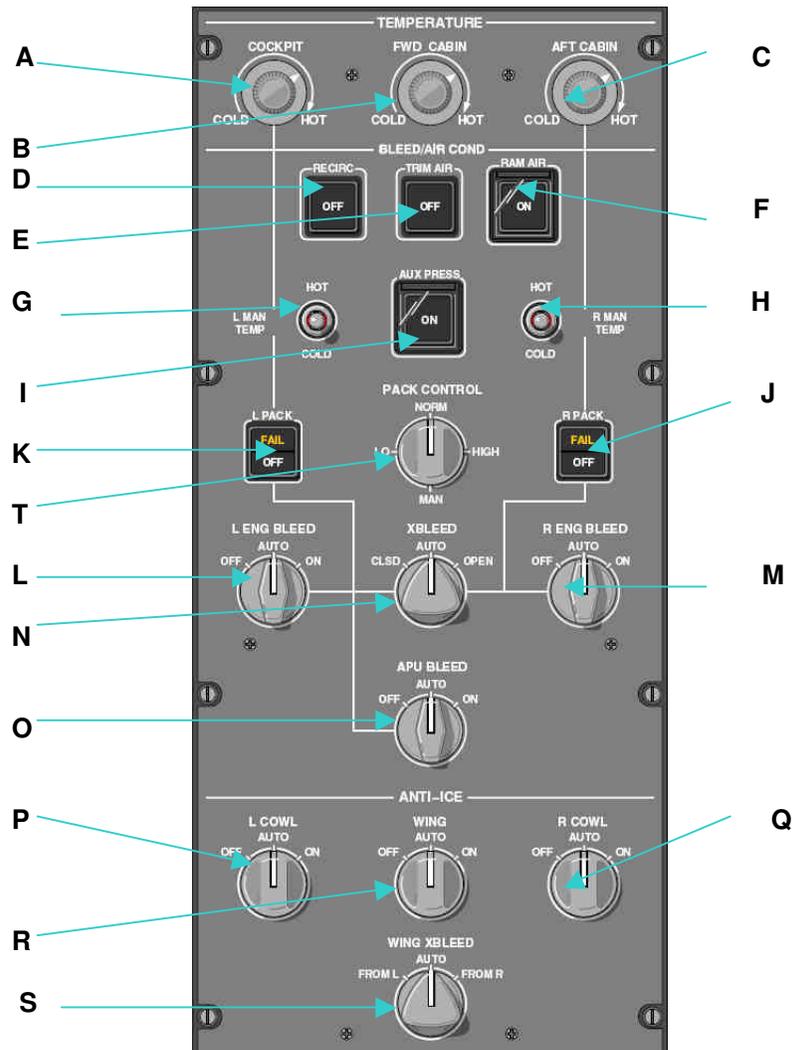
## ENGINE & APU CONTROL PANEL:



**Note: If there are fuel-starting problems, it is suggested to (with a Control Yoke installed with mixture control) try cycling the mixture slightly.**

- A) Opens the APU door (Exit4) and then START (B) mouse area is visible. EICAS panel should be displaying STATUS page. Refer to EICAS instructions. R AUX pump (DC powered) is required for APU cold start.
- B) Clicking on START legend the knob will rotate to START position, and when the APU RPM is on speed, it will rotate to the RUN position. When APU is operating, the only mouse area displayed is at the OFF legend.
- C) Click OFF legend to shut APU down.
- D) APU has to be operating for the L CRANK mouse area to be visible. Click on L CRANK legend will begin the L Engine start process. Be sure the Fuel Valve is on and L PRIM fuel pump is ON. (Note: If a yoke is installed and one of the controls is set to Mixture, it will have to be rotated to on before the fuel will start.
- E) R CRANK requires XBLEED switch to be OPEN to start. Click on R CRANK (F) to turn starter off.
- F) AUTO start will require the XBLEED and APU BLEED to be on for start.
- G) IGNITION will illuminate ON during AUTO start procedure. Can be manually selected during Normal start procedure. This switch by default is illuminated either in dark cockpit mode or with engines running on startup, therefore it should be switched off.

## AIR CONDITIONING, BLEED AIR & ANTI-ICE CONTROL PANEL:

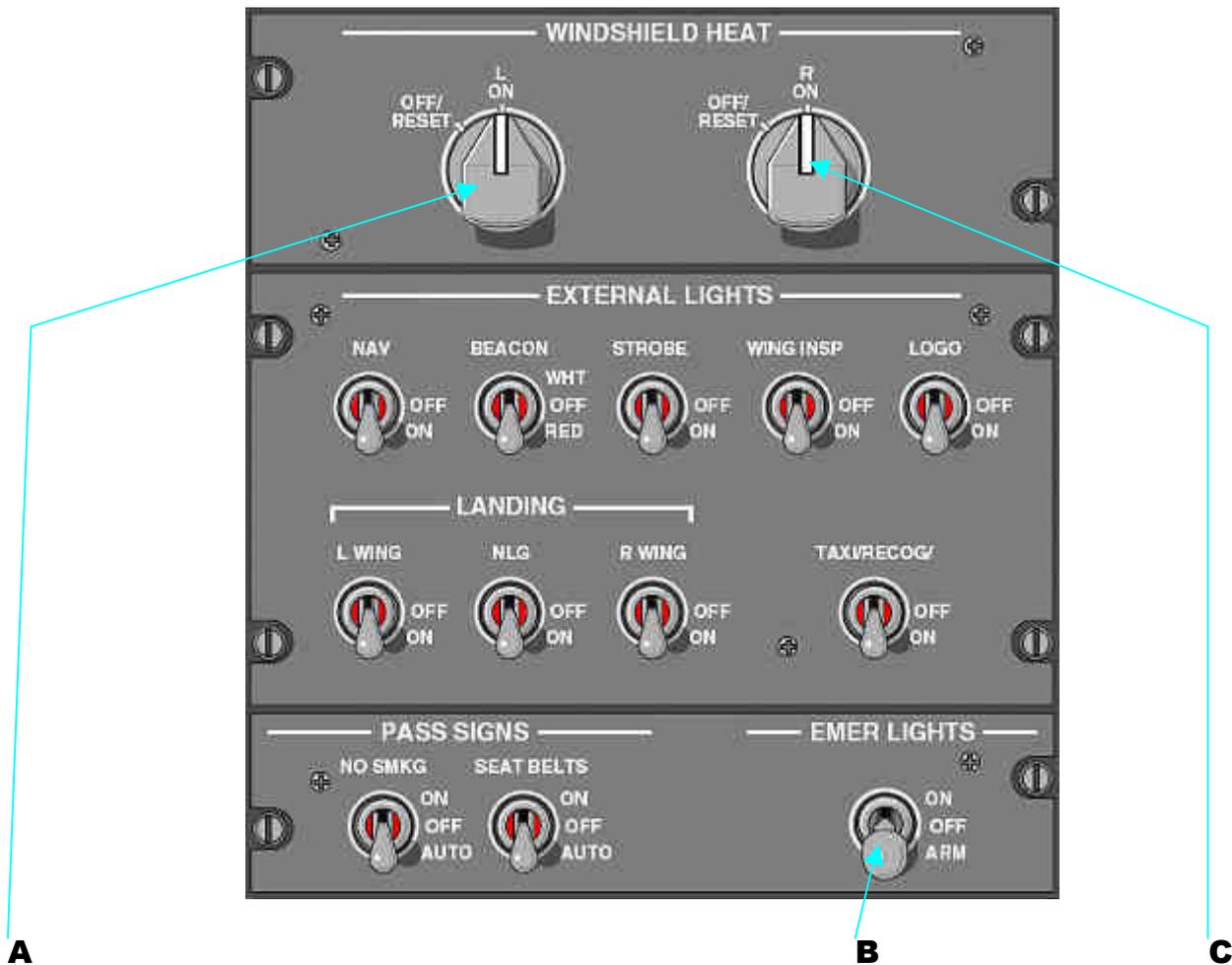


- A) Knob is stationary but left click decreases or right click increases reading. PACK CONTROL knob must be in the LO, HI or NORM position. It is set to ambient temp on initialization.
- B) Knob is stationary but left click decreases or right click increases reading. PACK CONTROL knob must be in the LO, HI or NORM position. It is set to ambient temp on initialization.
- C) Knob is stationary but left click decreases or right click increases reading. PACK CONTROL knob must be in the LO, HI or NORM position. It is set to ambient temp on initialization.
- D) Turns RECIRC air ON or OFF. Displayed on EICAS primary and EICAS secondary Air Cond/Bleed Air page.
- E) Turns TRIM AIR ON or OFF. Displayed on EICAS primary and EICAS secondary Air Cond/Bleed Air page. Requires one or both PACK switches to be on and PACK Control set to NORM.
- F) RAM AIR. Not functional.

**AIR CONDITIONING, BLEED AIR & ANTI-ICE CONTROL PANEL (cont'd):**

- G) Increases or decreases Cockpit and Fwd Cabin temp setting when PACK CONTROL knob is in MAN. Click on center of switch sets temp to ambient.
- H) Increases or decreases Aft Cabin temp setting when PACK CONTROL knob is in MAN. Click on center of switch sets temp to ambient. (Note: All temp readings and settings are display only.)
- I) AUX PRESS. Not Functional.
- J) FAIL is not displayed as there is no fail in FSX. Requires bleed air from APU with XBLEED OPEN or R ENG BLEED ON. There is only one control for both engine bleed air source in FSX. Click on OFF to turn ON and click on Top part to turn OFF.
- K) FAIL is not displayed as there is no fail in FSX. Requires bleed air from APU with XBLEED OPEN or L ENG BLEED ON. There is only one control for both engine bleed air source in FSX. Click on OFF to turn ON and click on Top part to turn OFF. Switch the Pack switch OFF before turning OFF the Bleed Air or shutting down either or both engines or APU.
- L) L ENG BLEED. Requires engines to be operating. Click ON legend to turn on (Bleed air source control changes from 2 to 3). Note: Both left and right knobs change at the same time as there is only one source control. This automatically switches APU BLEED to OFF.
- M) R ENG BLEED. Same as L above.
- N) XBLEED. Click on OPEN to turn on or click on CLOSED to close valve. With both engines operating, this can be set to Closed for isolation purposes.
- O) APU BLEED. Click ON legend to turn on and click on OFF legend to turn off. ENG BLEED selection will automatically turn OFF.
- P) L COWL ANTI-ICE. Requires L ENG BLEED ON to click ON. Click on center to turn on or off.
- Q) R COWL ANTI-ICE. Requires R ENG BLEED ON to click ON. Click on center to turn on or off.
- R) WING ANTI-ICE. Requires both engines to be operating to click ON. Click on center to turn on or off.
- S) WING XBLEED. Not functional (INOP).
- T) PACK CONTROL. Click on legends for that function.

**WINDSHIELD HEAT, EXTERNAL LIGHTS, EMER LIGHTS & PASS SIGNS:**

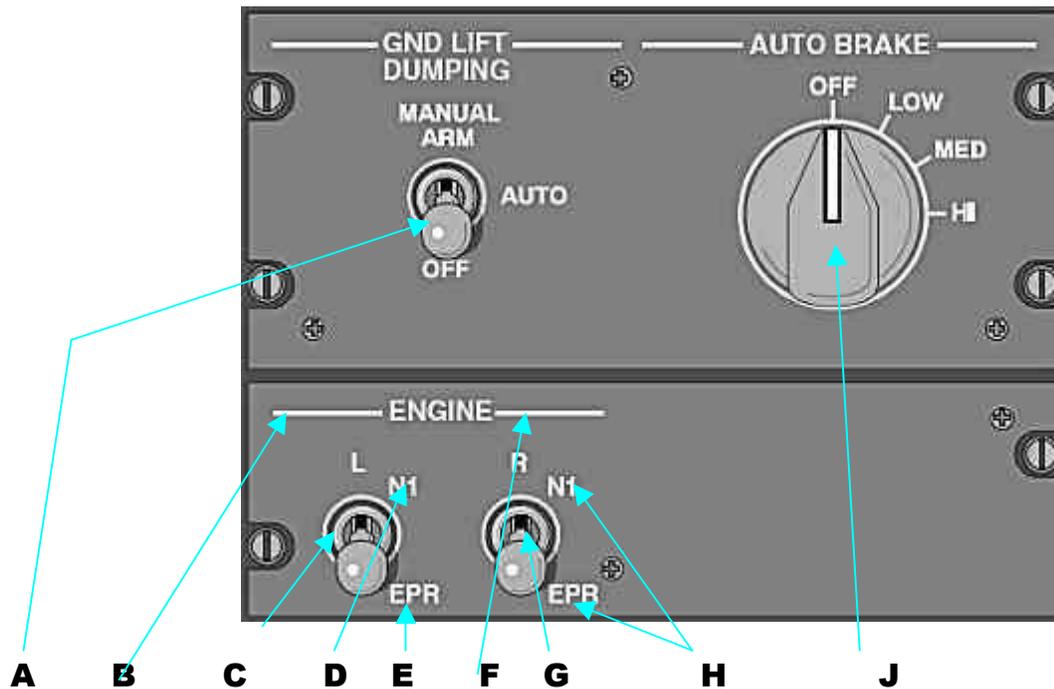


**Note: Most of the switches on these panels are standard usage so no need to explain their function. The landing lights are located on the inboard side of each wing and two on the nose gear. The taxi lights are inboard of the landing lights in the wings.**

- A) Both Windshield Heat switches are graphic only as there are no provisions for electrical windshield heat in FSX. Click on the legends to select position. This applies to C) as well.
- B) EMER LIGHTS are graphics only as there are no Emergency lights in FSX. Positions are ON, OFF and ARM. Click on the legends to select position.

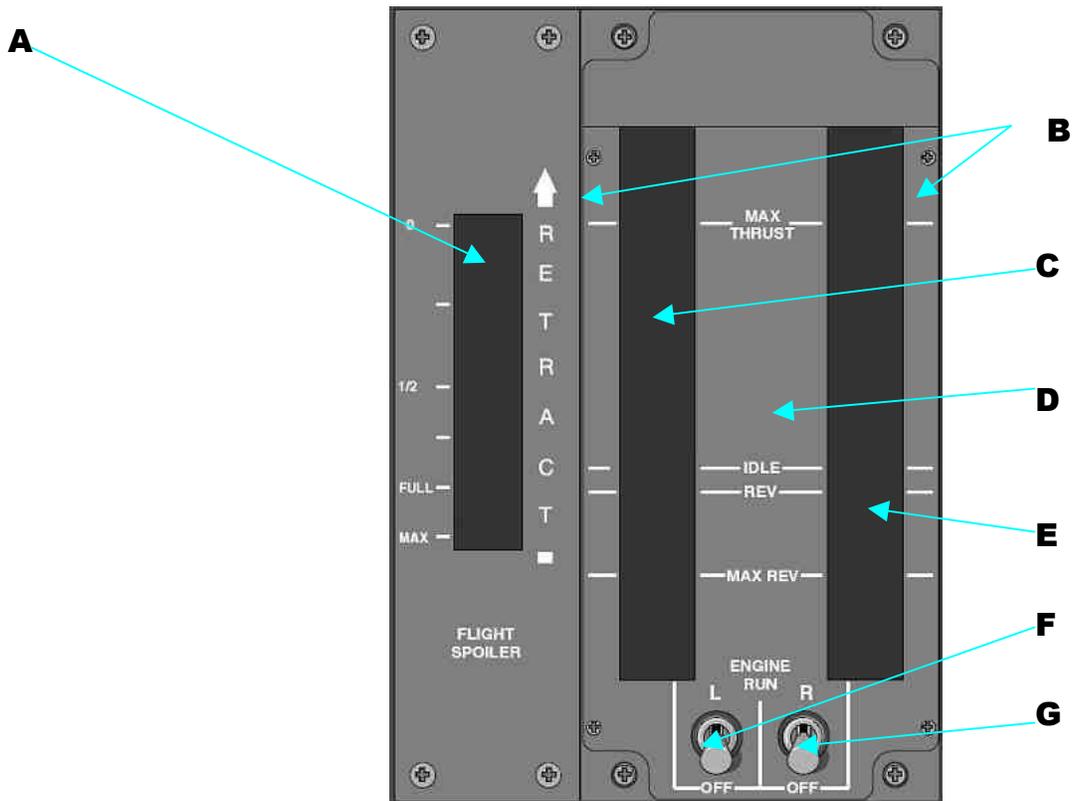
## PEDESTAL CONTROLS:

### AUTOBRAKE, GND SPOILER, ENG N1-EPR CONTROLS:



- A) GND LIFT DUMPING switch has no active function in FSX. Switch positions are for graphic effect only. Click on legends to activate switch positions.
- B) Click here to decrease N1 caret pointer setting.
- C) Click center to deselect AP Speed Hold (A/T) or N1 Control
- D) Click here to engage N1 power settings to throttle.
- E) Click here to engage AP Speed Hold power settings to throttle.
- F) Click here to increase N1 caret pointer setting.
- G) Click center to select switch OFF.
- H) Click on legend to select N1 or EPR. This is graphic simulation only, no active function.
- J) AUTOBRAKE is defaulted to OFF and is used for landing only. Position is displayed in white on EICAS message page when airborne. Should be left in OFF for takeoff. Click on left side of knob increases setting and right side decreases setting. Do not click lower than **OFF!!!!**

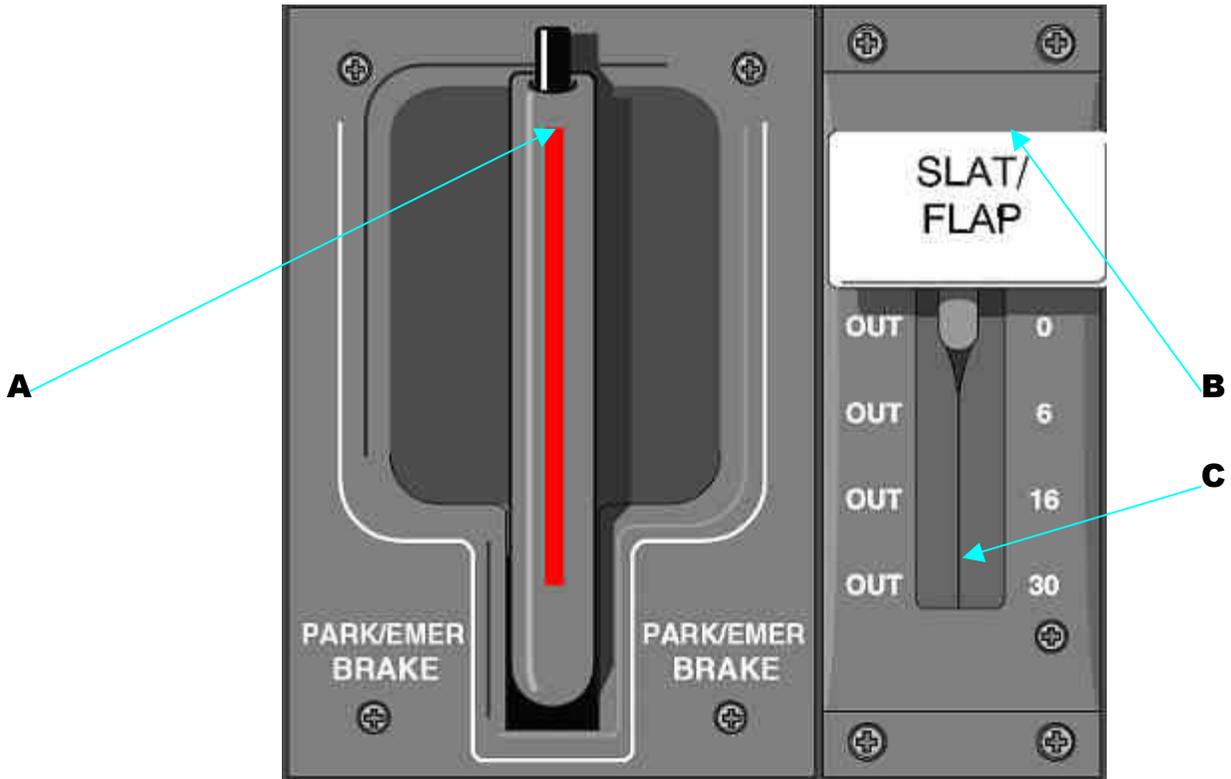
## THROTTLE/SPOILER QUADRANT:



**Note: Both ENGINE RUN toggle switches are defaulted to ON even in Cold Cockpit start. After initialization, select the ECU icon and click on L and R switches to set to OFF.**

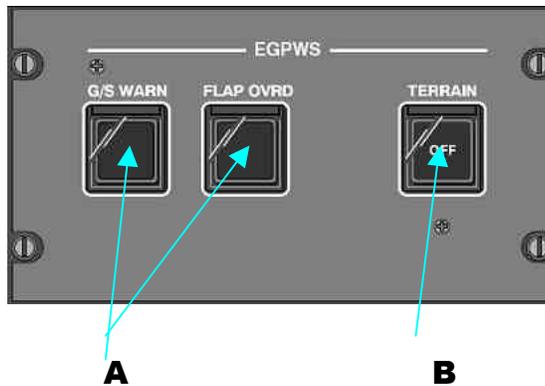
- A) Spoiler/Speed Brake area. Click and drag with mouse.
- B) TO/GA activation L or R throttle.
- C) L Throttle. Click and drag with mouse.
- D) Both throttles. Click and drag with mouse.
- E) R Throttle. Click and drag with mouse.
- F) Toggle L Fuel cutoff switch to RUN or OFF.
- G) Toggle R Fuel cutoff switch to RUN or OFF.

## PARKING BRAKE & FLAP/SLAT CONTROLS:



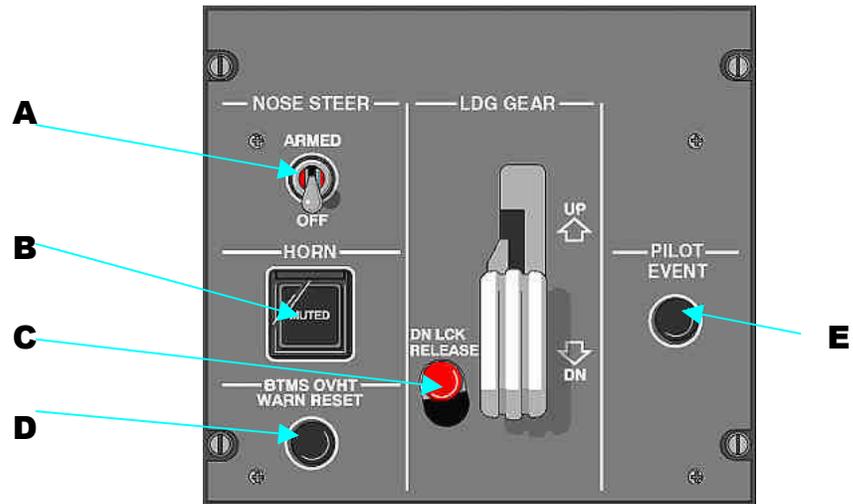
- A) Parking Brake/Emer Brake Handle. Click on handle near button toggles Parking Brake.
- B) SLAT/FLAP Handle. Click here decreases flap setting. Leading edge of flap handle shows the position of the Slats on left and Flaps on the right.
- C) Click here increases flap setting.

## EGPWS PANEL:



- A) Either switch toggles GPWS ON/OFF.
- B) Not functional.

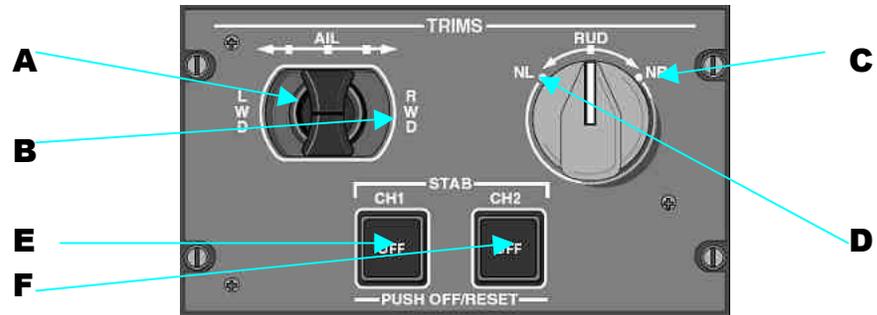
**LANDING GEAR CONTROL PANEL:**



A) No function as Steering is always ON. Select legend for ARMED or OFF. Graphics only.

B,C,D,E) Not functional.

**TRIM CONTROL PANEL:**



A) Click here to increase Left Wing Down aileron trim.

B) Click here to increase Right Wing Down aileron trim.

C) Click here to increase Nose Left Rudder trim.

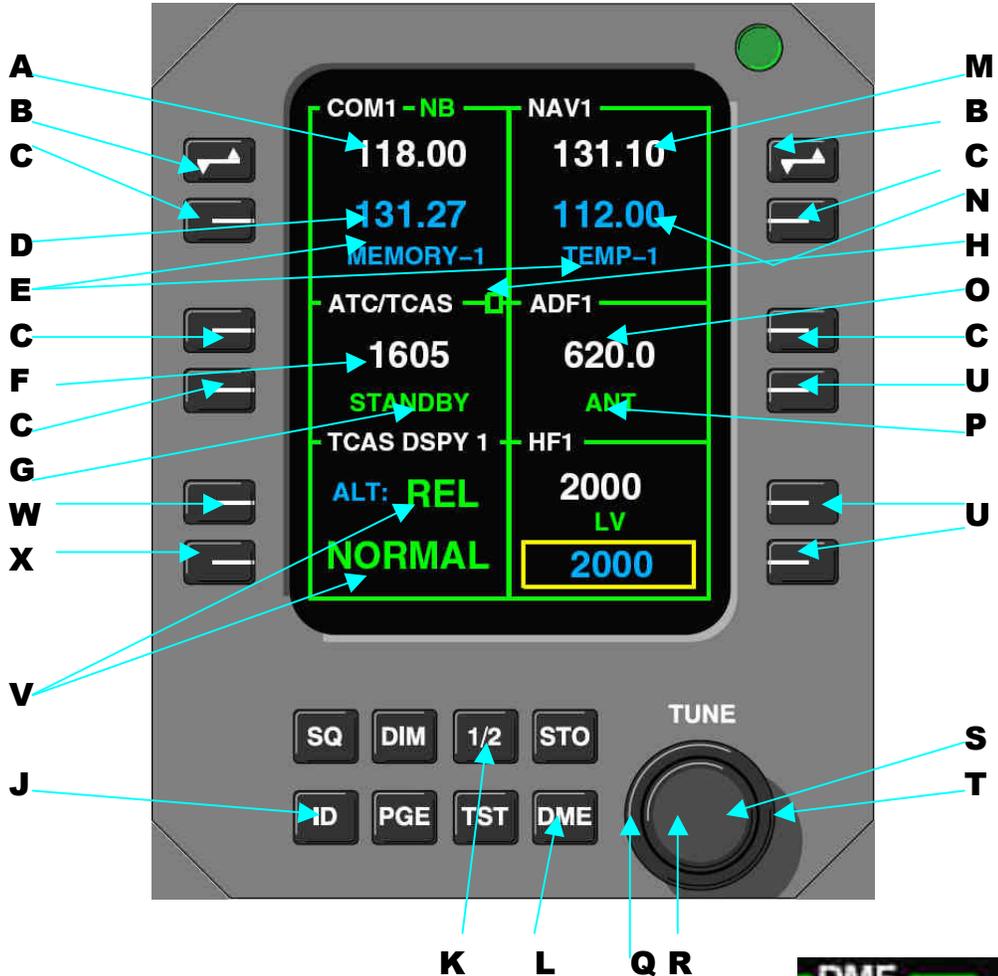
D) Click here to increase Nose Right Rudder trim.

E,F) No function.

**RADIO STACK POPUP:**

**Note: Opening this popup resets the Fuel Used to 0. See EICAS Control below for explanation.**

**RADIO MANAGEMENT UNIT (RMU):**



**DME OVERLAY (L)**

- A) Active Comm frequency. Com 1 or Com 2 depending on System 1 or 2 selection (K).
- B) Standby/Active frequency transfer button.
- C) Yellow cursor box selector button. Comm, Nav, ADF, ATC code, ATC mode. The yellow cursor indicates which system the TUNE knob will function. See (G) for ATC Mode change.
- D) Com standby frequency. Com 1 or Com 2 depending on System 1 or 2 selection (K).
- E) These are graphics as FSX has no channel memory for COM or NAV.

## **RADIO MANAGEMENT UNIT (RMU) cont'd:**

- F) ATC Code setting. Can be adjusted with mouse or using Tune knob (Q,R,S or T).
- G) ATC modes. STBY, ATC ON, ATC ALT, TA ONLY, TA/RA. This is not changing that actual ATC transponder modes in FSX as it is in ATC ALT mode when panel is powered. Traffic will display in both Map and Plan screens when either TA ONLY and TA/RA modes are active.
- H) ATC reply indication. Turns yellow center when ATC replies at approximates 12 times per minute. See (J) for ID operation. Only functions when airborne.
- J) ID Button. Depressing causes the ATC to send out reply for approximately 20 seconds. See (H)
- K) Selects System 1 or 2 page.
- L) DME Button. Selects and displays DME Overlay in the lower half of the NAV 1 or NAV 2 window. It displays the frequency (in the lower part of the overlay) of the selected NAV is tuned to and also displays the ICAO station Ident on green line.
- M) Active NAV frequency. NAV 1 or NAV 2 depending on System 1 or 2 selection (K).
- N) NAV standby frequency. NAV 1 or NAV 2 depending on System 1 or 2 selection (K).
- O) ADF active frequency. ADF 1 or ADF 2 depending on System 1 or 2 selection (K).
- P) Graphic only. Set to display ADF, which is the only operable function of the ADF.
- Q) Left side of outer knob decreases whole numbers of selected (yellow cursor box) system.
- R) Left side of inner knob decreases fractional numbers of selected (yellow cursor box) system.
- S) Right side of inner knob increases fractional numbers of selected (yellow cursor box) system.
- T) Right side of outer knob increases whole numbers of selected (yellow cursor box) system.
- U) HF section is not functional as FSX has no provisions for HF radios.
- V) The upper line displays the range in nautical miles for the TCAS sub-window. The lower line displays the mode of the TCAS system: NORMAL, ABOVE, BELOW, but has no real function in FSX..
- W) Selects the Range of the TCAS sub-window of the MFD screen.

## AUDIO PANEL:



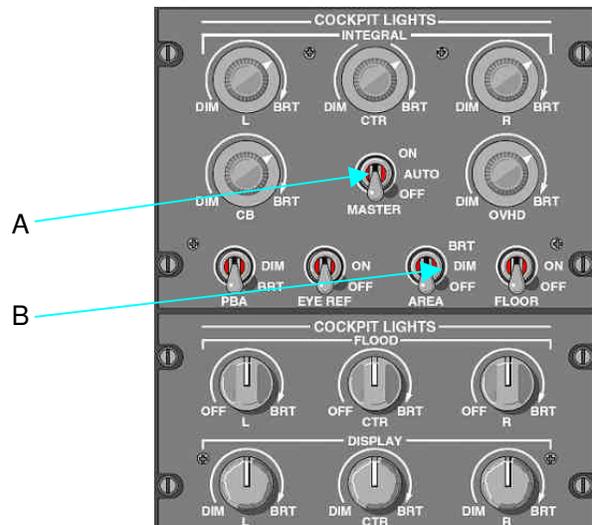
**Note: All buttons or knobs not indicated or referenced are not functional.**

- A) VHF Mic selectors. Top part of button changes white when selected. VHF1 or VHF2 cannot be selected together. They deselect if PA Mic (B) is selected.
- B) PA Mic has no function and is only simulated graphically. When selected the VHF Mic selectors deselect.
- C) EMER Mic has no function and is only simulated graphically. No effect on VHF Mic selection.
- D) Audio selectors. Shown in the OFF position and rotate right 135° when selected ON.
- E) ADF audio selector. Click on 1 or 2 legend to select that audio and select top of knob to turn OFF. Tool tips indicate action to take.
- F) DME audio selector. Click on 1 or 2 legend to select that audio and select top of knob to turn OFF. Tool tips indicate action to take.
- G) MKR MUTE default setting to indicate HI SENS.
- H) MKR audio. Click on knob to toggle ON/OFF.

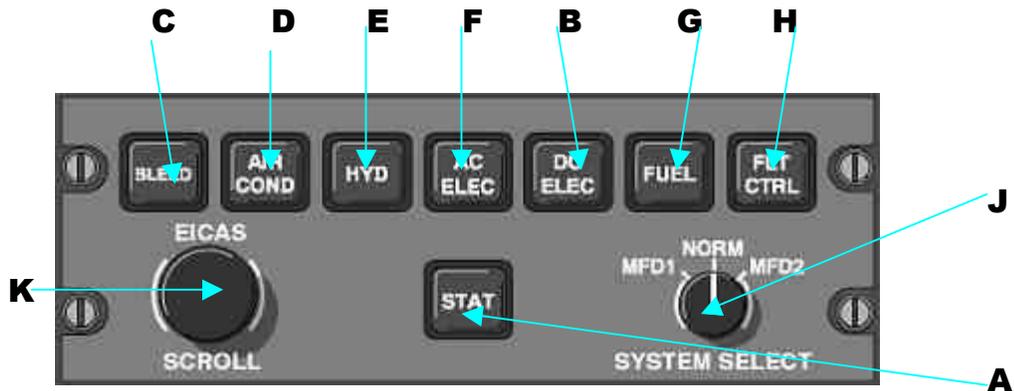
## Cockpit Lighting Panel:

There are only two active controls on this panel

- A) This switch (MASTER) controls the cockpit lights.
- B) This switch (AREA) controls the Cabin Lights.



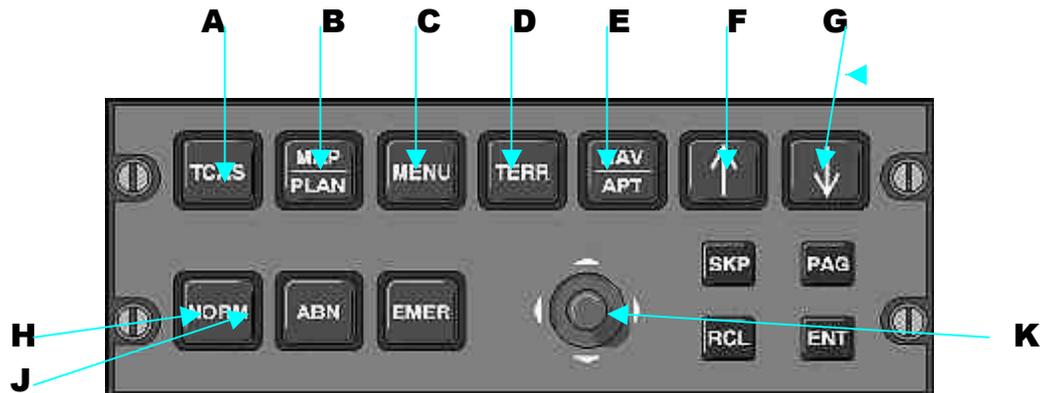
## EICAS CONTROL:



**Note:** With L Engine, R Engine, APU generators OFF and only Master Bat switch ON the STAT, FUEL, AC ELEC and DC ELEC buttons are visible and available.  
Set the Aircraft fuel configuration for the flight in the FREE FLIGHT screen or after loading desired aircraft and prior to opening the Radio Stack Icon, as the Fuel Used initialization is set to 0 when doing so and cannot be reset afterwards.

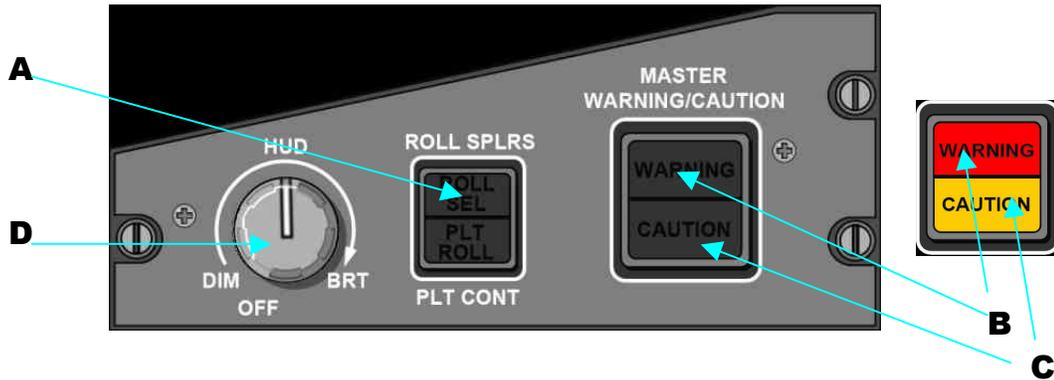
- A) Selects STAT (status) page on EICAS Secondary display.
- B) Selects DC ELEC page on EICAS Secondary display.
- C) Selects BLEED (Bleed Air distribution) page on EICAS Secondary display.
- D) Selects AIR COND (Air Conditioning distribution) page on EICAS Secondary display.
- E) Selects HYD (Hydraulics) page on EICAS Secondary display.
- F) Selects AC ELEC page on EICAS Secondary display.
- G) Selects AC ELEC page on EICAS Secondary display.
- H) Selects FLT CTRL (Flight Controls) page on EICAS Secondary display.
- J) Toggles visibility of white messages on EICAS Primary display.
- K) Mouse areas for EICAS SCROLL knob. Not functional. For future development purposes.

## MFD CONTROL:



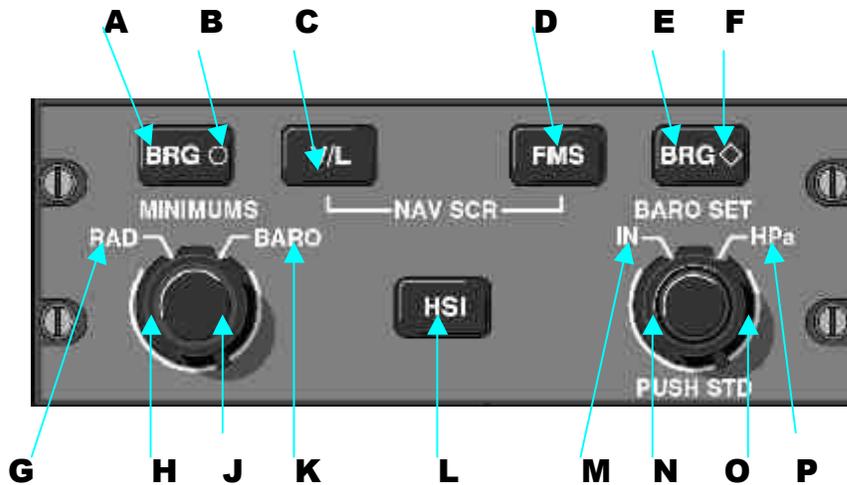
- A) TCAS opens/closes the zoomed popup sub-window on the MFD..
- B) MAP/PLAN toggles between MAP and PLAN pages on MFD.
- C) Toggles through the different pages of MENU selection.
- D) TERR button is not functional. Future upgrade possible.
- E) First click displays ADF, VORD & WAYPOINTS. Second click displays AIRPORTS and last click turns those OFF (default).
- F) Increases Map range. Default setting is 40 nm.
- G) Decreases MAP range. Minimum setting is 5 nm.
- H) Click on left side of button selects Kneeboard Checklist. Second click on the spot turns it OFF.
- J) Click on right side of button selects Kneeboard Reference. Second click on the spot turns it OFF.
- K) Joystick. There is a mouse click on each one of the arrows but not functional. Future usage.

**GLARESHIELD PANEL:  
CAUTION WARNING PANEL (CWP):**



- A) Not functional. Default to no display.
- B) WARNING annunciation. Flashing illumination whenever a warning message is displayed on primary EICAS. Click on switch light to cancel. It will re-illuminate if new WARNING is generated.
- C) CAUTION annunciation. Flashing illumination whenever a warning message is displayed on primary EICAS. Click on switch light to cancel. It will re-illuminate if new CAUTION is generated.
- D) Not Functional. Future provisions for HUD.

**PFD CONTROL:**

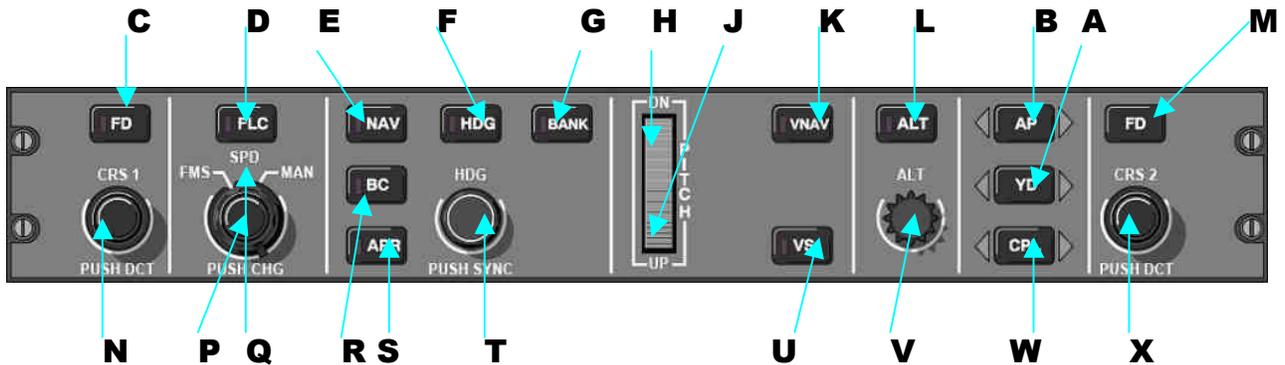


- A) PFD bearing pointer (blue) display is controlled by this button. Display is OFF, VOR1, ADF1, FMS. Click on BRG decreases setting. Symbol on right side of button corresponds to BRG pointer.
- B) Click to increase BRG setting.
- C) V/L button displays VOR1 Course pointer (green) on PFD in default setting. Tool tips will indicate action to take. Click on right when VOR1 is displayed will display VOR2 Course pointer (yellow), which indicates, cross-sided. V/L legend will display change to green. Click on the left side will return to VOR1 and V/L legend will return to white display.

**PFD CONTROL (cont'd):**

- D) Click on toggles FMS ON/OFF to drive Autopilot, if a flight plan is loaded and AP has NAV button selected (See Autopilot section). No mouse cursor (tool tip) is displayed if no flight plan is loaded.
- E) PFD bearing pointer (white) display is controlled by this button. Display is OFF, VOR2, ADF2, FMS. Click on BRG decreases setting. Symbol on right side of button corresponds to BRG pointer.
- F) Click to increase BRG setting.
- G) Click on RAD to select DH Minimums settings displayed on PFD.
- H) Click to decrease setting displayed on PFD.
- J) Click to increase setting displayed on PFD.
- K) Click on BARO to select MDA Minimums settings displayed on PFD.
- L) Toggles between Full HSI display (default) and Expanded HSI on PFD.
- M) Click on IN legend to set BARO SET to INches (default).
- N) Click to decrease setting displayed on PFD.
- O) Click to increase setting displayed on PFD.
- P) Click on HPa legend to set BARO SET to HPa.

**AUTOPILOT PANEL:**



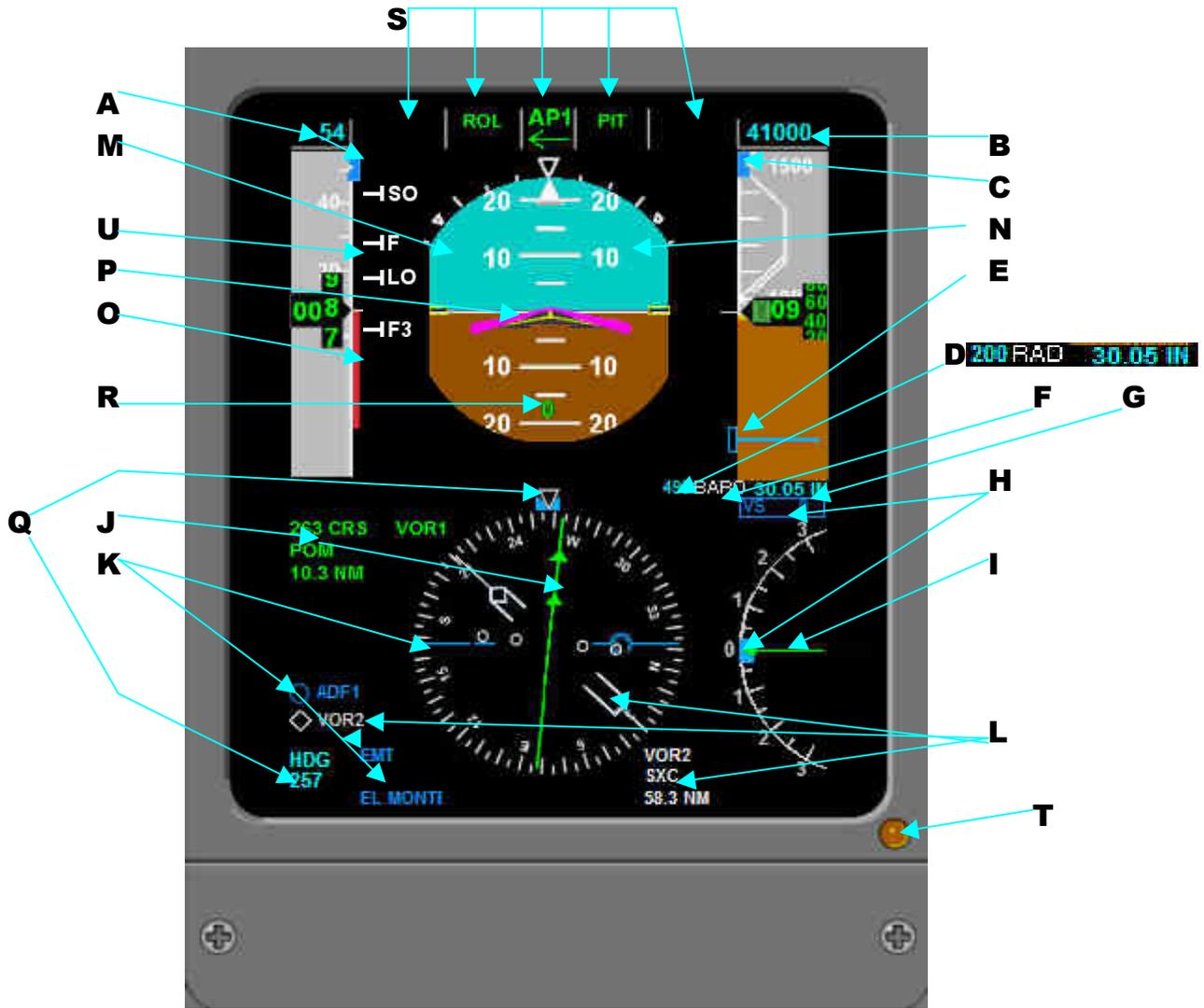
**Note:** The default has only one autopilot so any reference of operation of right AP is simulated only. This applies to AP, YD and CPL buttons.

- A) YD button, click on left arrow to turn on (green) Yaw Damper. Click on right arrow will toggle to left indication on (green). Click on center of button will disengage the Yaw Damper and the AP and remove those indications.
- B) AP button requires the L Yaw Damper to be on in order to engage AP 1 or R Yaw Damper to be on in order to engage AP 2. AP can be disengaged while Yaw Damper is ON.
- C) Toggles Flight Director ON/OFF.

## **AUTOPILOT PANEL (cont'd):**

- D) Click on button to toggle ALT HOLD and does not affect the AP ALT setting. Green indication comes on when AP Alt setting is not the same as aircraft altitude  $\pm 500'$ .
- E) Toggles NAV 1 to drive AP.
- F) Toggles HDG ON/OFF.
- G) Selects  $\frac{1}{2}$  Bank Angle. Left side of button illuminates green when selected. Controls green eyebrow indication on Attitude display in PFD.
- H) Decreases VS setting. Default is 0 fpm.
- J) Increases VS setting. Default is 0 fpm.
- K) The VNAV button is set to operate if a Flight Management Computer (FMC) is installed. Preferred is the GA Honeywell FMC gauge (by Garrett Smith). If not, this function does not operate with the FSX GPS.
- L) Left side toggles ALT HOLD ON/OFF and right side will sync AP ALT setting to current aircraft altitude.
- M) Toggles Flight Director ON/OFF.
- N) Click on center to sync VOR 1 course pointer to current tuned VOR 1 station. Left side to decrease course setting and right side to increase course setting.
- P) Click on center of knob to toggle between MAN and FMS. Left side decreases MAN speed setting and right side increases MAN speed setting on PFD.
- Q) Toggles between IAS speed reference setting and MACH reference on PFD.
- R) Toggles Back Course ON/OFF.
- S) Toggles Approach mode ON/OFF.
- T) Click on center of knob to sync heading bug (blue) to current aircraft heading. Click on left side to decrease heading bug setting and right side to increase.
- U) When VS setting is more than or less than  $0 \pm 100$  fpm, the VS button illuminates green on left side.
- V) Click on left side to decrease desired altitude setting and right side to increase setting.
- W) CPL button. Click on left arrow to couple NAV1 to autopilot and click on right arrow to couple VOR 2 to autopilot. Click on center to disengage CPL.
- X) CRS 2 knob. Click on center to sync VOR 2 course pointer to current tuned VOR 2 station. Will default to  $180^\circ$  if no valid signal. Click on left side to decrease course setting and right side to increase setting. Click on right side of V/L button on PFD control will change to green and display the yellow VOR 2 course pointer on the PFD. (Refer to PFD Control section).

**INSTRUMENT PANEL AREA:  
PRIMARY FLIGHT DISPLAY (PFD):**



- A) Airspeed hold reference or Mach reference. Set using SPD (Q) on Autopilot Control. Blue bug is Airspeed reference setting.
- B) AP Altitude Setting. Set using ALT knob (V) on Autopilot Control.
- C) Selected Autopilot Altitude hold bug.
- D) MDA or RAD setting, which is adjusted using the Minimums knob on PFD control.

## **PRIMARY FLIGHT DISPLAY (PFD) (cont'd):**

- E) MDA setting reference bug.
- F) MDA or RAD legend, is set using the Minimums knob RAD or BARO position on PFD control.
- G) BARO or HPa altimeter setting. Is set using the BARO SET knob on PFD control.
- H) VS bug and bug setting readout (box area). Set using PITCH knob on Autopilot Control ( H,J).
- I) VS pointer and VS readout box. Displays VS on scale and when exceeding 400 fpm ascending or descending the actual VS is displayed in a box behind the 0 needle area.
- J) Green NAV1 pointer and data. Changes from VOR1 to LOC1 depending on selected frequency. If a flight plan is loaded and FMS selected, source changes to FMS and color changes to magenta.
- K) BRG 1 pointer and source data. Bearing is displayed in the center blank area. (See PFD control).
- L) BRG 2 pointer and source data. (See PFD control).
- M) Area where flashing yellow MDA is displayed when aircraft is below MDA setting or RED boxed STALL when stall warning is initiated.
- N) Area where flashing yellow DA is displayed when at or below DA minimums setting. It is cancelled if the aircraft less than 20' RA or the VS is more than 0 fpm, indicating a go around.
- O) Low Speed Awareness bar. Displayed when the aircraft is approaching the stall speed. The Airspeed digits will change to amber when within 15 knots of stall speed.
- P) Flight Director bars. There are two types selectable in the MFD Menu page. One is the Single Cue (SC) style and the other is Cross Pointers (CP).
- Q) AP HDG bug and AP HDG readout (blue).
- R) RAD ALT readout (green). Range is 0 to 2500' agl.
- S) AP mode enunciator areas. Armed modes text is white and captured modes are green text.
  - ASEL (white) – If current aircraft altitude is more than 2000' below or if more than 10,000 above AP Alt setting.
  - ASEL (green) – If current aircraft altitude is less than 2000' and more than 300' below AP Alt setting or less than 10,000' and more than 300' above AP Alt setting.
  - ALT (green) – If current aircraft altitude is within  $\pm 300'$  of the AP Alt setting.
  - PIT and ROL (green) – Basic autopilot pitch and roll modes on engagement.
- T) Click on this area to display popup of instrument.
- U) Flaps, Slats and Landing Gear extension speeds. This is shown for approximate location only. Actual values are shown below and are displayed on the right side of the airspeed tape at the indicated speeds when the aircraft is below 18000' msl. :
  - SO — Slats Out and Flaps 0° — 225 knots .
  - F — Flaps extended to 6 or 16° — 10 knots.
  - LO — Landing Gear Operation — 200 knots.
  - F3 — Flaps extended to 30° — 185 knots.





**MULTI FUNCTION DISPLAY (MFD):  
PLAN PAGE with MENU Page 1/3 Popup (Flt Plan):**



- A) HDG label (white) and current aircraft heading (green).
- B) Heading bug readout (cyan).            C) Heading bug (cyan).
- D) Plan range readout. Adjusted using UP arrow or DOWN arrow buttons on MFD control.
- E) FMS (white) indicates FMS is not driving Autopilot.
- F) Wind direction arrow.
- G) Wind direction/Wind speed data.
- H) Static Air Temp, Total Air Temp, True Air Speed and Ground Speed data.

## MFD MENU PAGE 1/3 (cont'd):

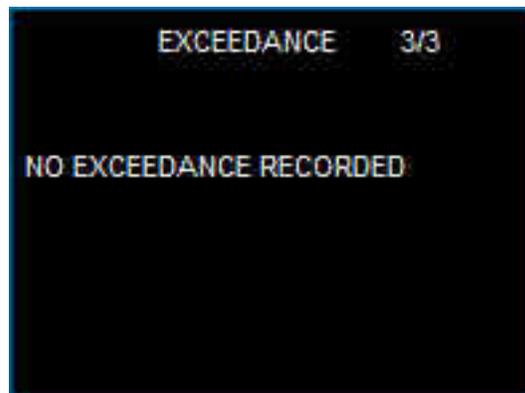
**Note:** Items J, K, L, M, N have mouse click areas ON, OFF, WYPT, DEST, SC and CP legends. Active functions are colored blue and inactive are white. Click on the legend to activate it.

- I) Menu Page Name and number.
- J) DIST/TIME changes from WYPT to DEST. Defaulted to WPT.
- K) IDENTs turns DIST/TIME data ON or OFF. Defaulted to ON.
- L) VERT PROFILE toggles between ON or OFF. Defaulted to OFF.
- M) METRIC ALT not functional
- N) FLT DIR toggles between a Single Cue (SC) and Cross Pointers (CP) display. Defaulted to SC.
- O) Click on this area to display popup of instrument. On 4:3 ratio panel, the click-zone for the far right EICAS is on the left side of the frame.
- P) Flight Plan route display.

## MFD MENU PAGE 2/3:



## MFD MENU PAGE 3/3:



**Note:** Both of these pages are defaults as shown and cannot be changed. FGC and AUTOTHROTTLE are single channel in the simulator model. EXCEEDANCE is not programmed and therefore is not recorded. (See MFD control for MENU button functions).

## MFD TCAS POPUP:

This popup is accessed by selected the TCAS Button on the MFD Control. FSX has a very limited traffic display system. There is no provision for real Traffic Advisories, much less Resolution Advisories. Only airborne traffic will be displayed however, so at least it provides some visual indication of nearby traffic



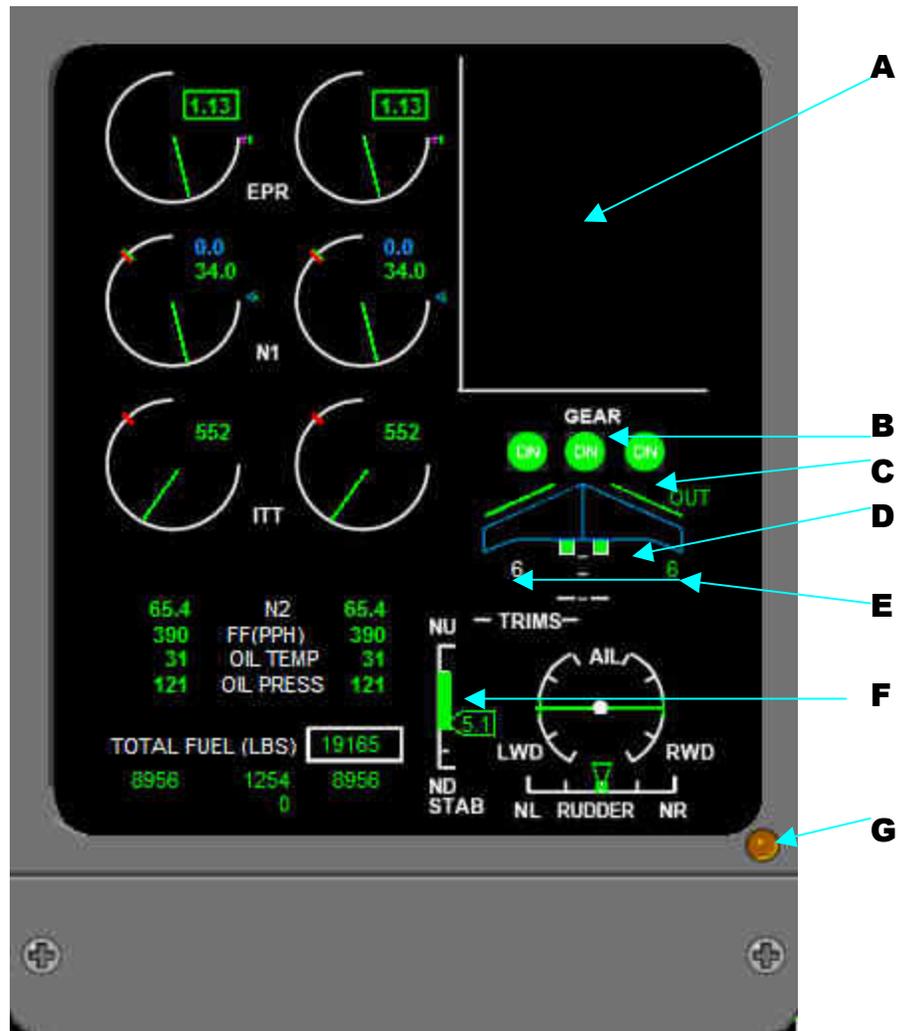
**MFD VERTICAL PROFILE:**



**NOTE:** The active waypoint line shows the distance to the waypoint and the next1 waypoint shows the distance from the active waypoint to the next1 waypoint. The active line moves towards the aircraft as the distance decreases. Page 1 Line 3 of MENU will show selection of this profile ON or OFF.

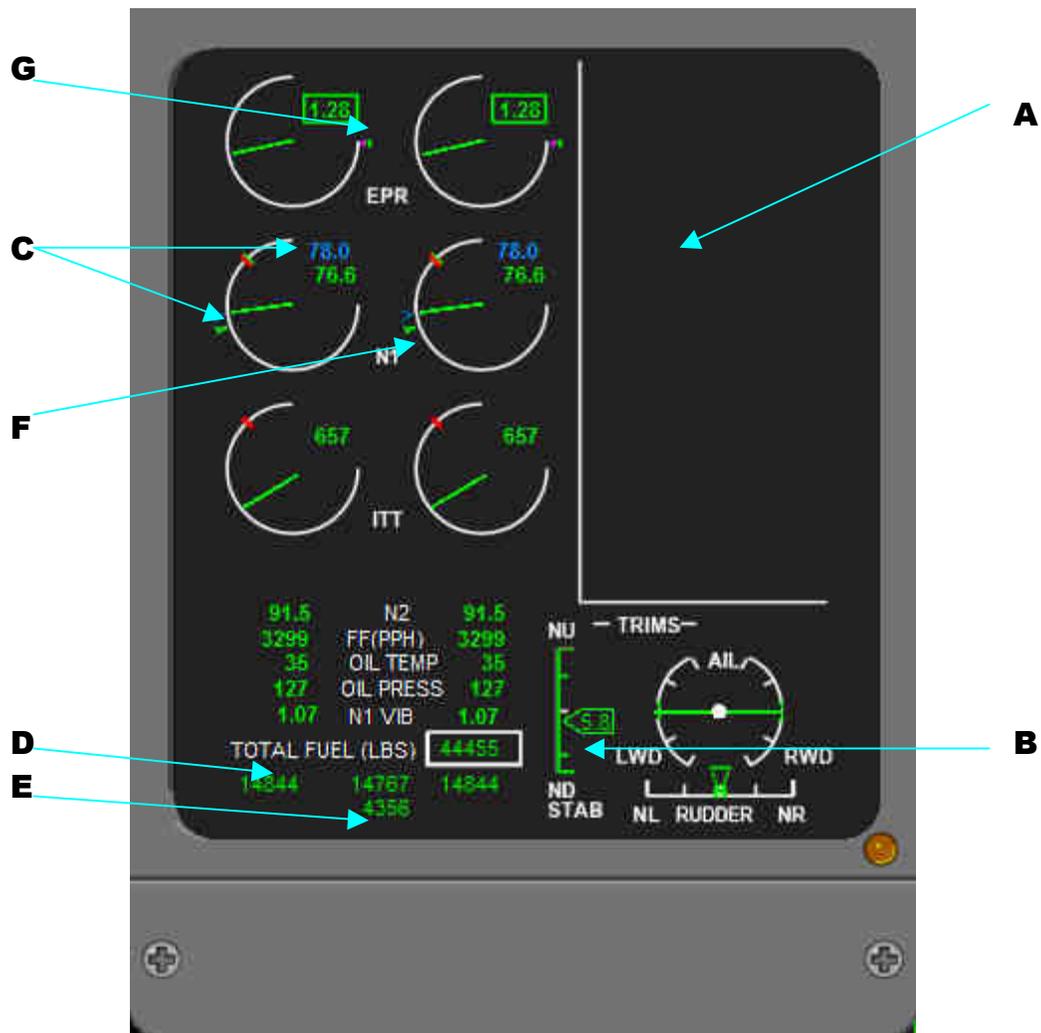
- A) Next1 waypoint Ident.
- B) Active waypoint Ident.
- C) Vertical profile scale 0 to 52000'. Range 0 to 40nm.
- D) Active waypoint range line. Remains stationary if distance exceeds 40nm then moves as distance is less than 40 nm.
- E) Aircraft symbol.
- F) AP Altitude setting line.
- G) Next1 waypoint range line. Range is 40nm maximum. It is the distance from active waypoint to it.
- H) AP Altitude setting readout
- J) Angle of altitude difference between aircraft and AP altitude setting

**EICAS PRIMARY DISPLAY:  
GROUND & LANDING PAGE:**



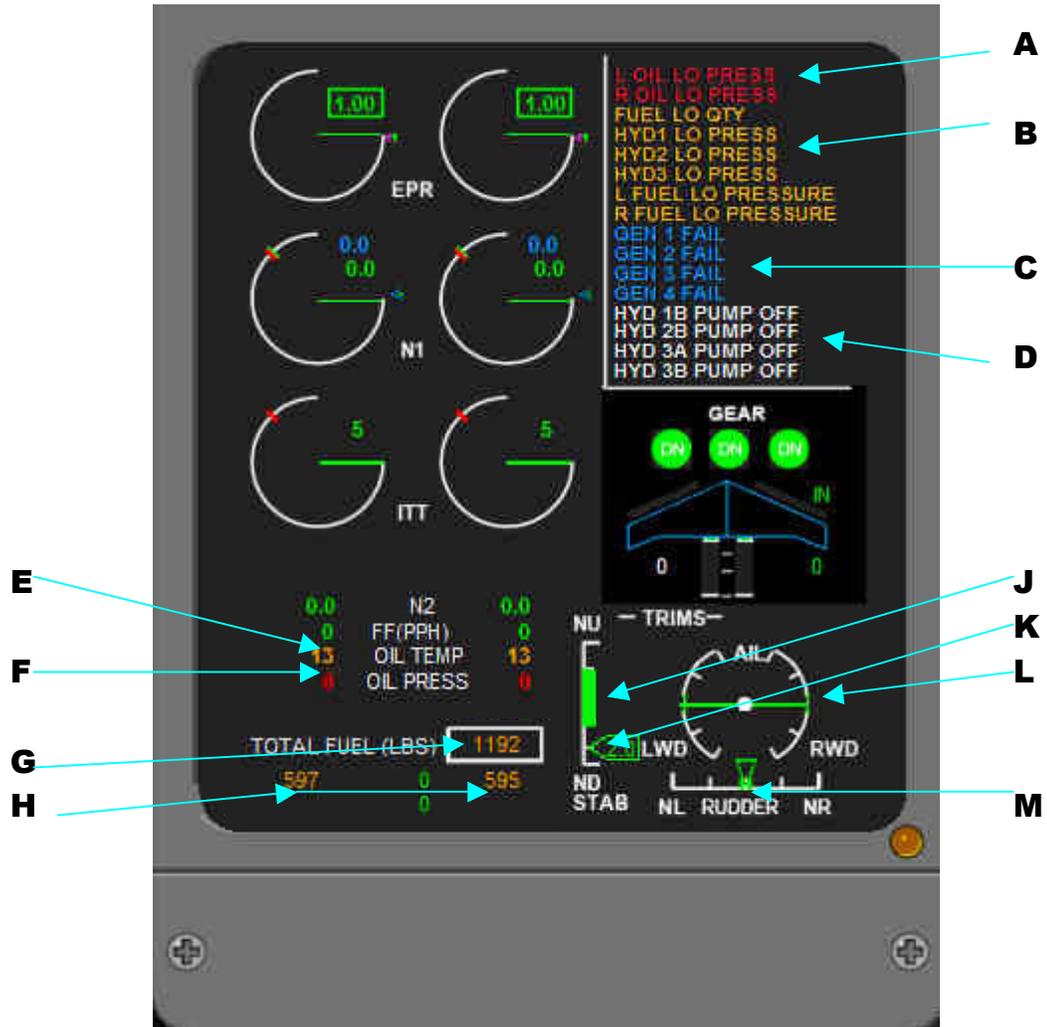
- A) EICAS message area. Smaller when landing gear and/or flaps slats are down.
- B) Landing Gear status display.
- C) Slats status display. Shown OUT. If in, no display but legend shows IN.
- D) Flap position indication. E) White number indicates position of flap handle and green is flap position in degrees.
- F) STABILIZER TRIM range marks for on ground/takeoff.
- G) Click on this area to display popup of instrument.

**EICAS PRIMARY DISPLAY (cont'd):  
AIRBORNE PAGE:**



- A) Message area is increased after flaps/slats and landing gear are retracted.
- B) STAB TRIM range marks removed after takeoff (off ground).
- C) N1 SET caret and position readout. Set using N1 control on pedestal/throttle panel.
- D) Fuel Quantity display, Left Main, Center, Right Main.
- E) Aft Tank quantity. Does not change color when empty.
- F) N1 rotating green T pointer shows throttle position.
- G) EPR green T symbol not functional. If functional, this would be used to set the EPR.

**EICAS PRIMARY DISPLAY (cont'd):  
MESSAGE AREA:**



**Note:** None of the message pages can be scrolled in this configuration. Maybe in future updates possible.

A) Warning messages (RED). Also triggers Flashing RED warning on Caution Warning panel. Requires crew immediate attention.

PARK/EMERG BRAKE ON. If Park/Emer Brake is set, and throttle is advanced above 25%, will cause a RED warning annunciation in (A) and flashing WARNING annunciation on Caution Warning Panel on glareshield.

B) Caution messages (AMBER). Also triggers amber Caution on Caution Warning panel. Requires crew action.

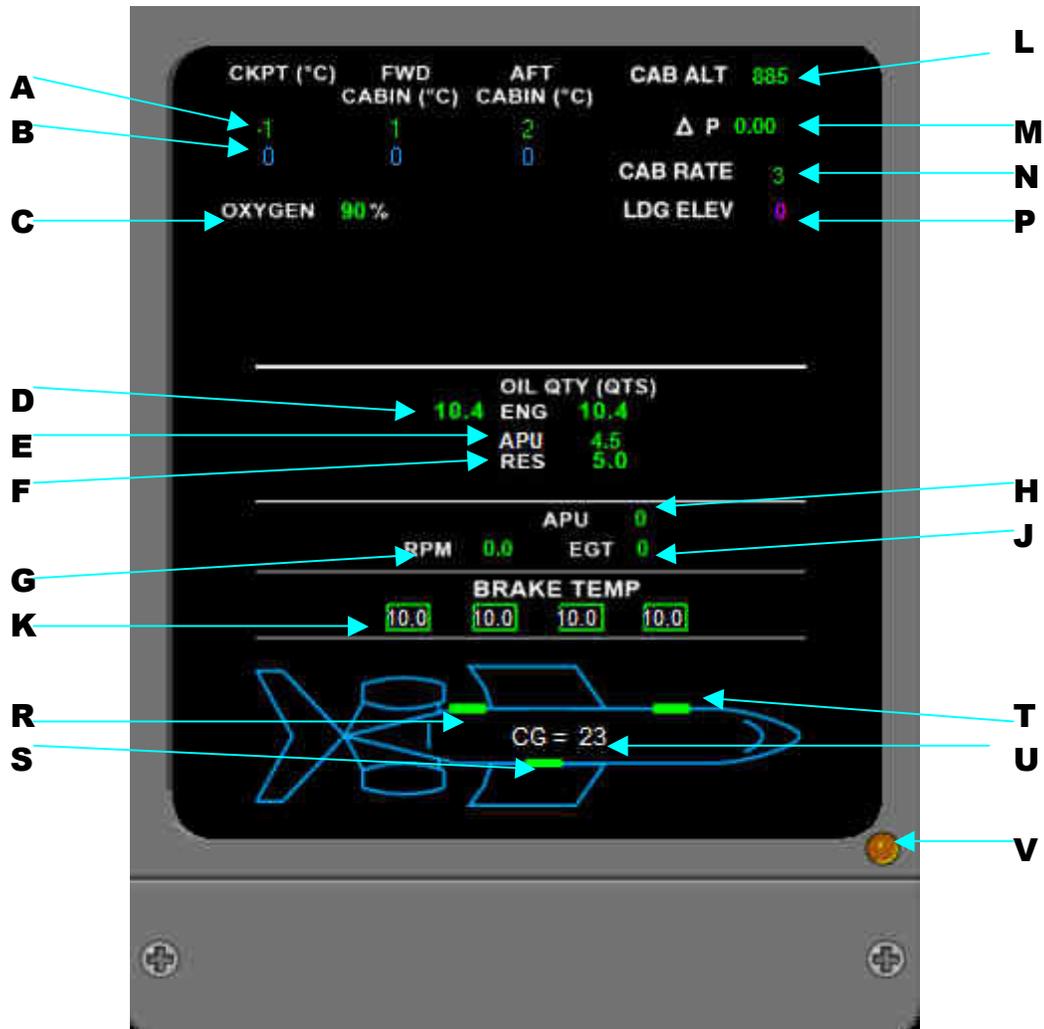
C) Advisory messages (blue). These are advisory in nature and may require further crew attention.

## **EICAS PRIMARY DISPLAY (cont'd):**

### **MESSAGE AREA (cont'd):**

- D) STATUS messages (white). These are non-normal pilot selected functions to remind the crew of this status. These can be hidden/viewed by toggling the lower right hand knob on the EICAS control panel.
- E) ENGINE OIL TEMP. Green= $21^{\circ}\text{C}$  or higher, Amber= between  $20^{\circ}$  and  $-30^{\circ}\text{C}$ , Red= less than  $-30^{\circ}\text{C}$  and will flash.
- F) ENGINE OIL PRESS. Green= 35 psi or higher, Amber= between 26 and 35 psi, Red= 25 psi or lower.
- G) TOTAL FUEL QUANTITY. Green until total quantity is 1200 lbs. or less.
- H) LEFT or RIGHT MAIN QUANTITY. Each tank remains green until that tank is 600 lbs. or less. FUEL LO QTY message is generated only when total fuel is less than 1200 lbs.
- J) STAB TRIM. Green range for takeoff is 4.5 to 11 units as displayed inside the trim pointer. Trim set outside the green band and throttle is advanced above 50% with Landing Lights On, will cause a RED warning annunciation in (A) and flashing WARNING annunciation on Caution Warning Panel on glareshield.  
**Note of Caution: FSX has only a single setting for stab trim, the nose down trim can exceed the  $-2^{\circ}$  (0 units). Do not set less than 0 shown on the pointer. The limits for the RW aircraft are  $-2^{\circ}$  nose down and  $12^{\circ}$  nose up. This is 0 to 14 units on the pointer readout.**
- K) STAB TRIM Pointer. On the ground, the pointer and readout display in green if set in the green range marks and in white if outside the range. In the air, the range marks, pointer and readout are displayed in green.
- L) AIL TRIM. Green range is  $\pm 14$ . Trim set outside the green band throttle is advanced above 50% with Landing Lights On, will cause a RED warning annunciation in (A) and flashing WARNING annunciation on Caution Warning Panel on glareshield.
- M) RUD TRIM. Green range is  $\pm 7.5$ . Trim set outside the green band and throttle is advanced above 50% with Landing Lights On, will cause a RED warning annunciation in (A) and flashing WARNING annunciation on Caution Warning Panel on glareshield.

**EICAS SECONDARY DISPLAY:  
STATUS PAGE:**

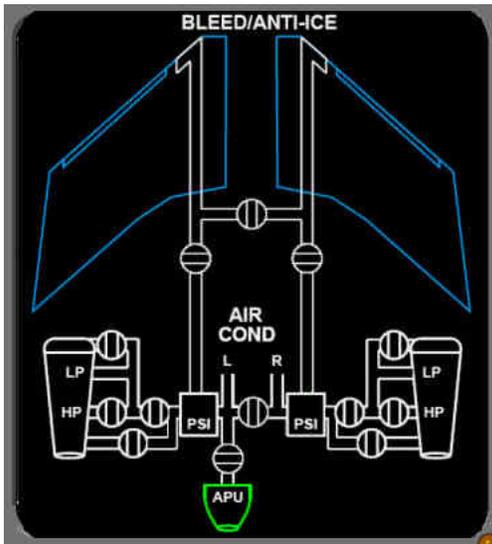


- A) Simulated compartment AirConditioning temperatures (green). Initial setting is based on outside ambient temperature when overhead panel is opened. Can be adjusted using the overhead Air Conditioning panel. (Refer to that section of this document).
- B) Simulated selected temperatures (blue). The move with the adjustment (A). Simulated temperatures. (Also refer to the AIR CONDITIONING page of this display).
- C) Emergency Oxygen System. Graphics only. Quantity not functional.
- D) Engine Oil Quantity. Will be reduced, if oil leaks are set into the Aircraft failures setup.
- E) APU Oil Quantity. Remains visible until APU is running.
- F) RES is the Engine & APU oil replenishment system quantity. This is graphic only and not functional.
- G) APU RPM readout. Indicates current rpm. J) Indicates the current APU EGT.

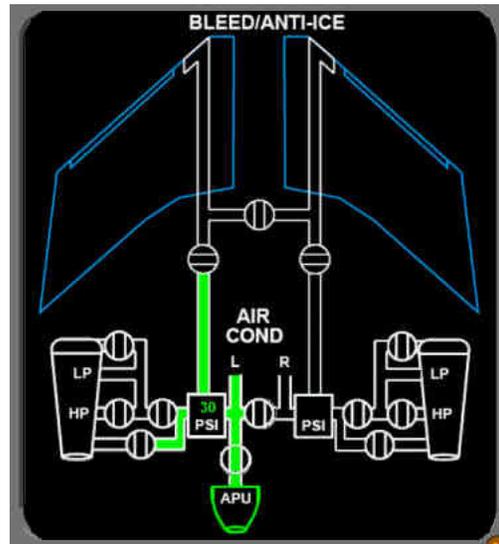
**EICAS SECONDARY DISPLAY (cont'd):**  
**STATUS PAGE (cont'd):**

- H) Indicates APU Door (Exit.3) position status. 0 is closed and 100 is fully opened. Controlled by the APU knob on the panel. (See overhead ENG APU panel section).
- K) Simulated Brake Temperatures based on outside ambient temperature. Not functional.
- L) Current Cabin Altitude (pressurization). It is based on 29.92 in. pressure. Only functions in automatic mode.
- M) Indicates Cabin Differential pressure compared to outside pressure. Maximum is 10.25.
- N) Cabin Rate. In auto mode only.
- P) LDG ELEV. With a flight plan installed and Pressurization panel in LDG ELEV switch in FMS position the destination airport field elevation (magenta) is displayed. If switch is in the MAN position and the aircraft is on the ground, the default setting (white) is 0' and if the aircraft is airborne then it is default set to 5670' by clicking on the center of the UP/DN switch. The setting can then be adjusted up or down using that switch. This does not really change operation but serves as a reminder of the airport elevation
- R) Indicates CARGO Door (Exit.1) position status. 0 is closed and 100 is fully opened. Closed is indicated in green color and open is amber color. Amber caution message is displayed on the EICAS primary instrument.
- S) Indicates overwing RH EMER EXIT (Exit.2) position status. 0 is closed and 100 is fully opened. Closed is indicated in green color and open is amber color. Amber caution message is displayed on the EICAS primary instrument.
- T) Indicates ENTRY DOOR (Exit.0) position status. 0 is closed and 100 is fully opened. Closed is indicated in green color and open is amber color. Amber caution message is displayed on the EICAS primary instrument.
- U) Weight and Balance CG readout. Displays the current CG at all times for reference.
- V) Click on this area to display popup of instrument.

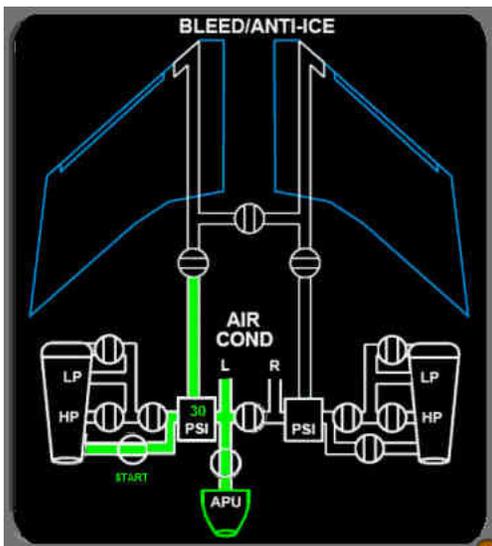
**EICAS SECONDARY DISPLAY:  
BLEED PAGE:**



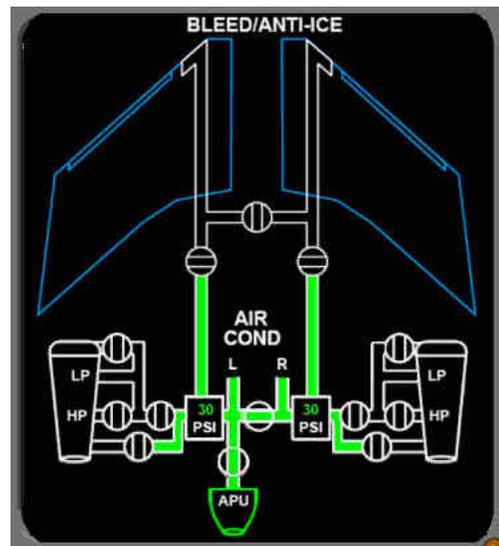
A) All Bleed Air Systems OFF



B) APU Operating & Bleed Air ON



C) L ENGINE start with APU Bleed Air

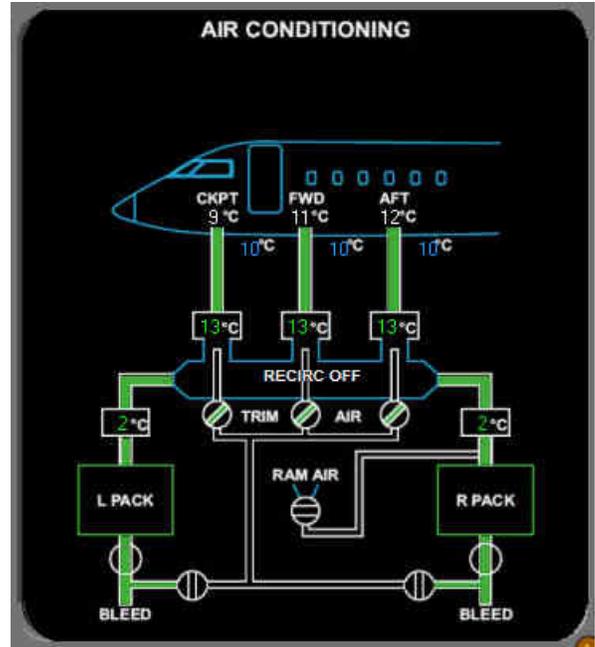


D) CROSS BLEED Valve Open

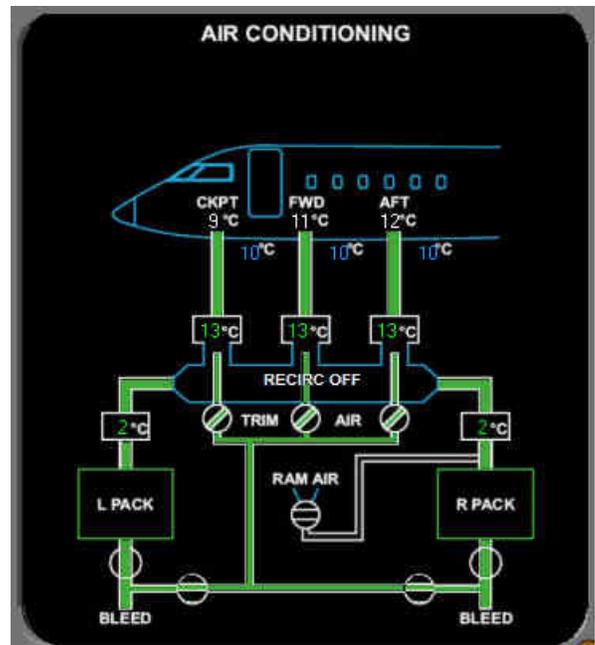


**EICAS SECONDARY DISPLAY (cont'd):  
AIR CONDITIONING PAGE (cont'd):**

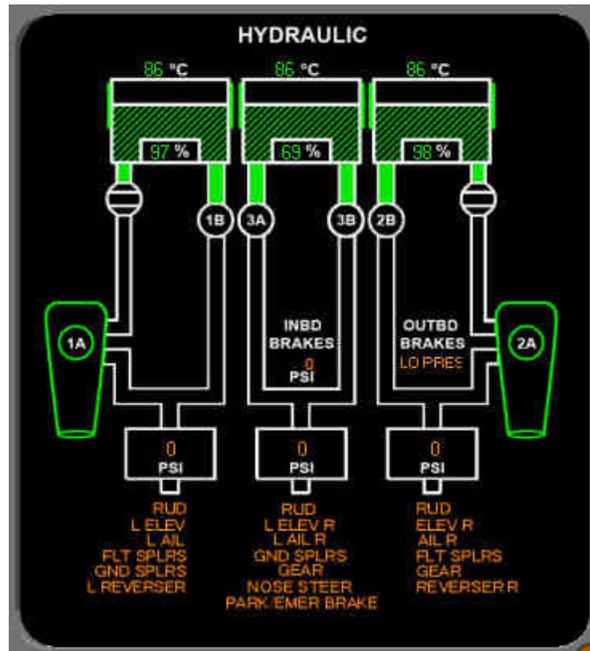
This shows both L & R PACKs ON and TRIM OFF in MANUAL mode. When PACK CONTROL knob is selected to any position other than NORM, the TRIM switch light is automatically selected to OFF and cannot be selected in those modes



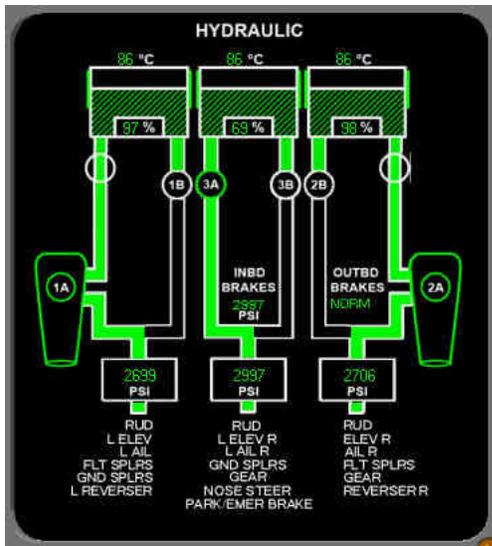
This shows in NORM (auto) mode with TRIM ON. TRIM switch light can be selected ON or OFF in Norm mode.



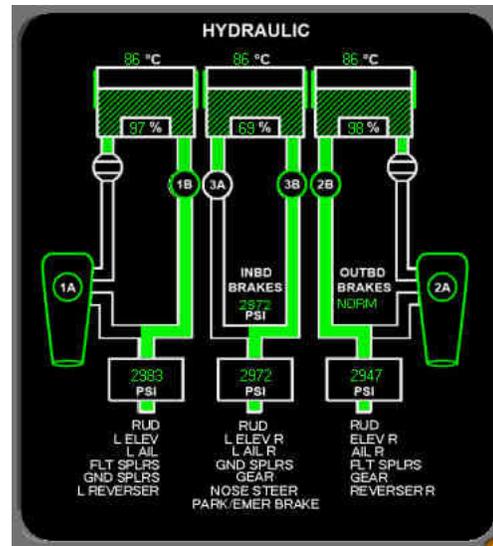
**EICAS SECONDARY DISPLAY (cont'd):  
HYDRAULICS PAGE (HYD) :**



The above shows all six 1A (L ENG), 1B (L ENG Elect Pump), 2A (R ENG), 3A and 3 B Electric Pumps turned OFF and under each which systems are disabled (orange).

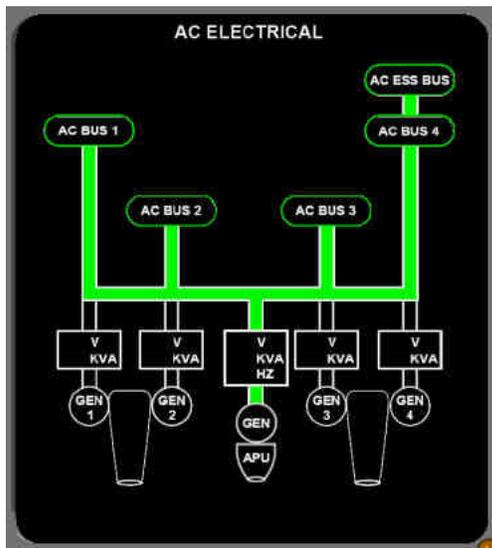


This shows 1A, 2A and 3A Hydraulic systems ON. Operational systems are displayed in white text.

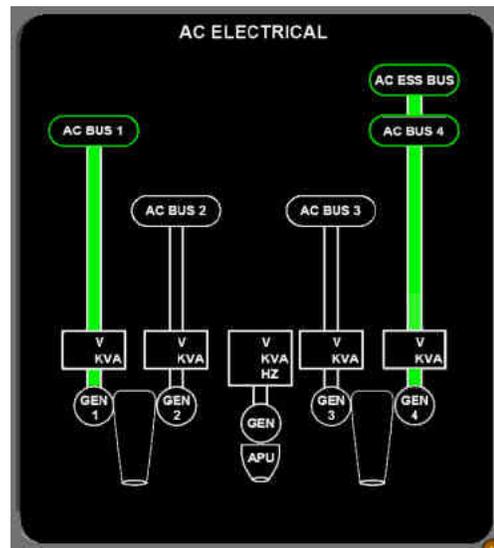


This shows 1B, 2B and 3B Hydraulic systems ON. Operational systems are displayed in white text.

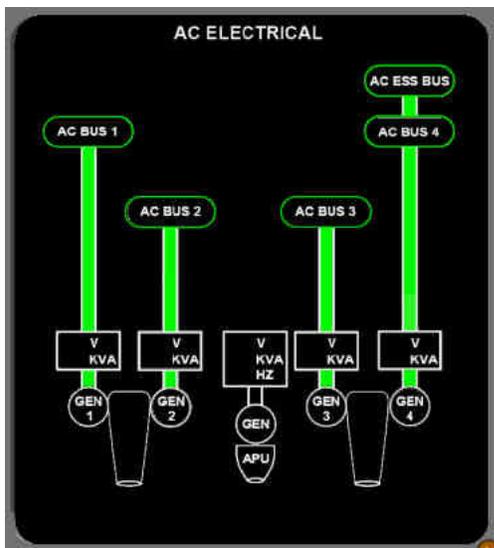
**EICAS SECONDARY DISPLAY (cont'd):  
AC ELECTRICS (AC ELEC) PAGE:**



A) APU AC generator on line powering all Busses.



B) AC BUS 1 connected to GEN 1  
ACBUS 4 and AC ESS BUS to GEN 4

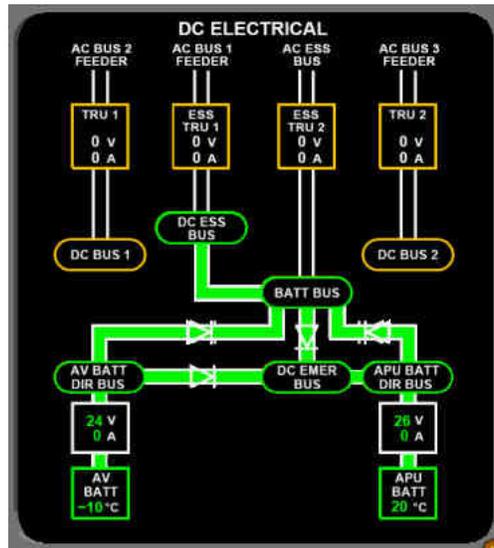


C) Additionally AC BUS2 to GEN 2 and  
AC BUS 3 to GEN 3.

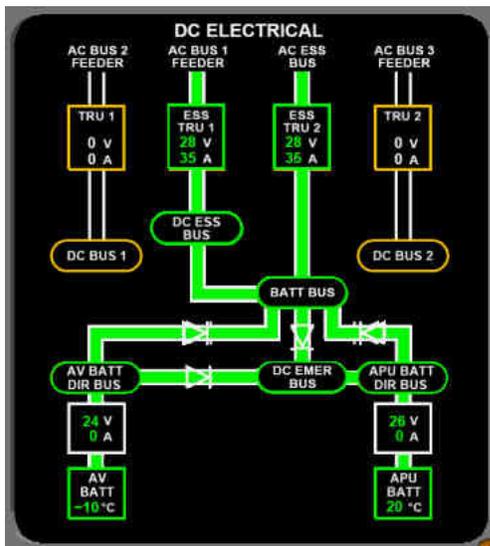
**Note:** In this configuration, GEN2 and GEN3 are simulated because FSX has only one generator configured per engine. GEN 1 for L ENG and GEN 2 for R ENG is the actual FSX power sources.

**EICAS SECONDARY DISPLAY (cont'd):  
DC ELECTRICS (DC ELEC) PAGE:**

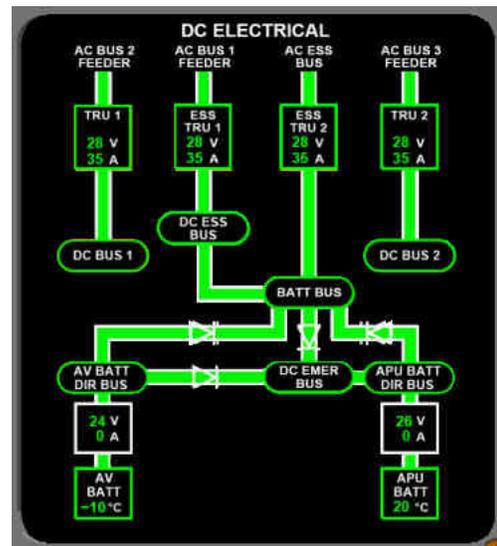
Note: There are two simulated batteries installed. APU (aircraft) battery is 28VDC and Avionics battery is 24VDC, therefore make sure the GEN 1 or GEN 4 switch lights are ON (off extinguished) before turning APU GEN off. Not doing so places the Avionics bus at 24 VDC instead of 28 VDC.



A) BATT Master switch on. BATT BUS and DC ESS BUS ON.

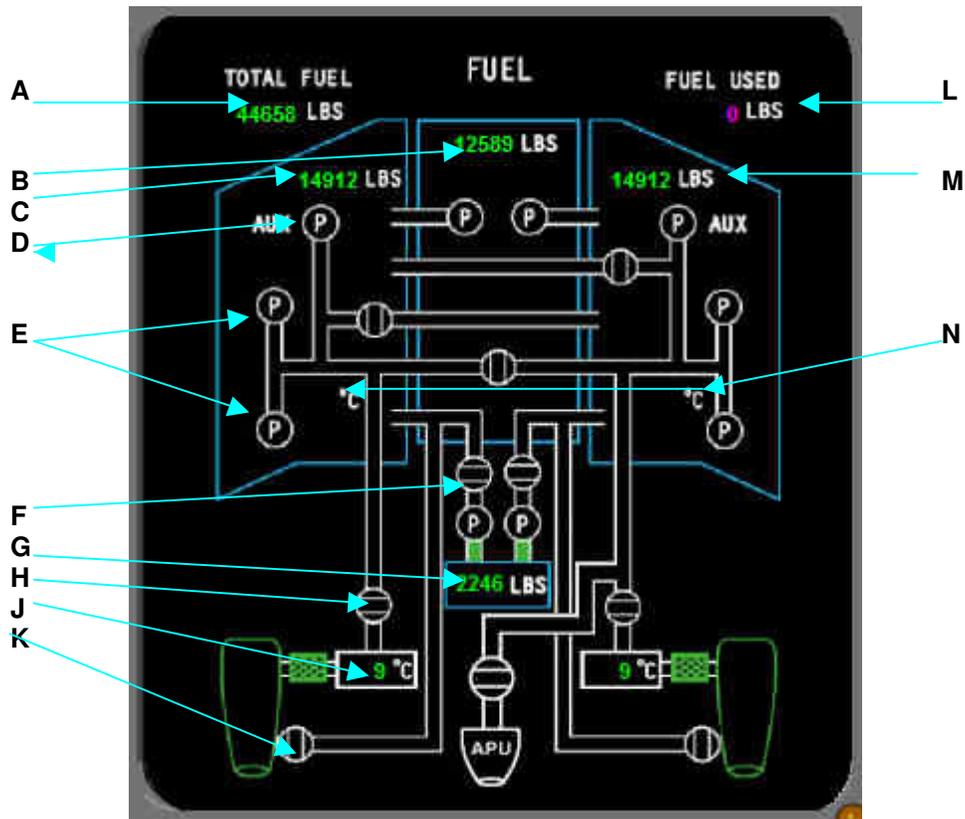


B) ESS TRU 1 powered by AC BUS 1 FEEDER  
ESS TRU 2 powered by AC ESS BUS  
BATT BUS powered on.



C) TRU1 powered by AC BUS 2  
TRU 2 powered by AC BUS 3 FEEDER  
BATT BUS powered on.

**EICAS SECONDARY DISPLAY (cont'd):  
FUEL PAGE:**



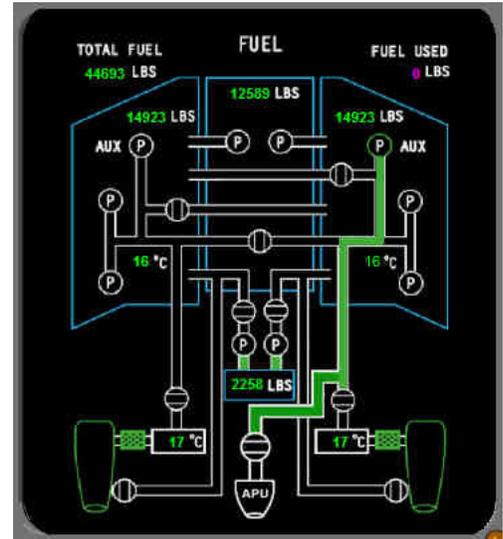
This display shows all fuel switches and selections in the OFF position. Refer to Overhead Fuel Panel for switch and operating explanation. Engines not operating.

- A) Total Fuel Quantity. Display is in pounds.
- B) Center Fuel Quantity. Display is in pounds.
- C) Left Wing Main Fuel Quantity. Display is in pounds.
- D) DC Aux Fuel Quantity. Display is in pounds.
- E) Left Wing AC Fuel pump.
- F) Aft Fuel Tank pumps and Shut Off Valves (SOV). Simulates fuel usage during engine operation.
- G) Aft Fuel Quantity. Display is in pounds.
- H) Engine fuel Shut Off Valve (SOV).
- J) Engine Fuel temperature reading, based on ambient temperature and adjusted by altitude to simulate engine oil heating the fuel and in turn the fuel cooling the oil.
- K) Fuel recirculation system Valve to return unspent fuel back to fuel tank. Graphics only not functional.

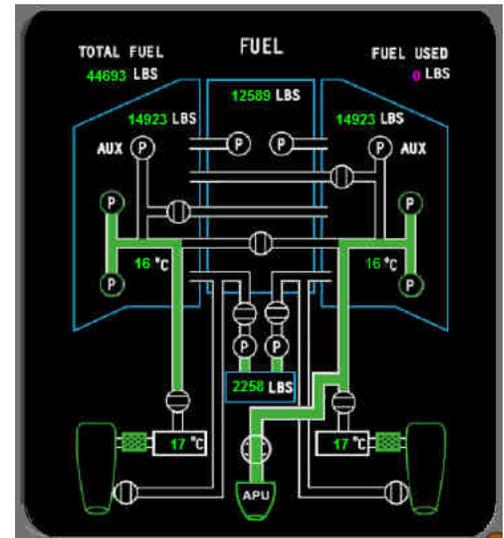
**FUEL PAGE (cont'd):**

- L) Fuel used readout. Prior to taxi after engine start, this is reset to 0. Refer to EICAS Control section.
- M) Right Wing Main Fuel Quantity. Display is in pounds.
- N) Wing fuel temperature reading. Based on outside ambient temperature.

This view shows the R Aux DC fuel pump ON, supplying fuel to APU SOV and R ENG SOV.

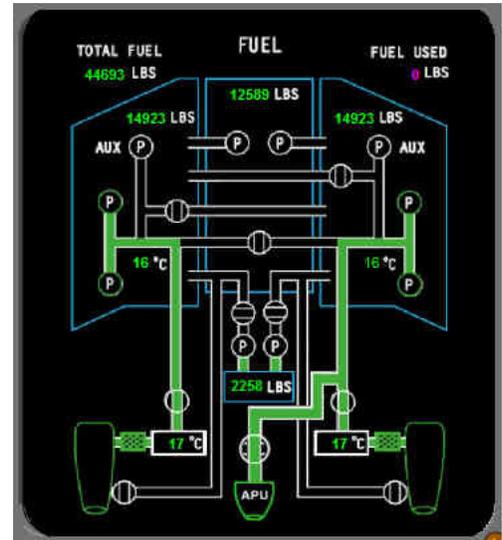


This view shows the L Primary AC fuel pumps and the R Primary AC fuel pumps ON supplying fuel to both sides and the APU operating on speed.

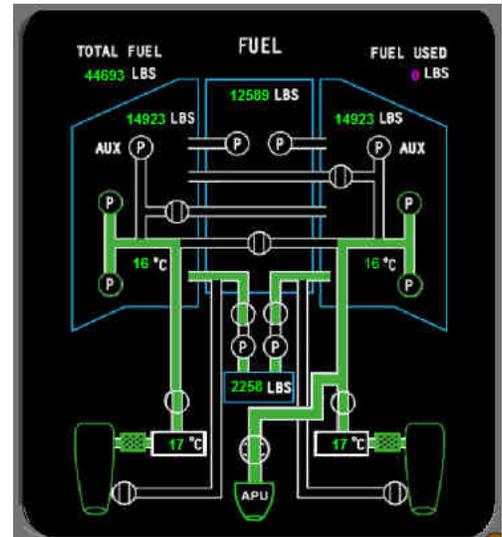


## FUEL PAGE (cont'd):

This view shows the L Primary AC fuel pumps, the R Primary AC fuel pumps ON and both the left and right engines' SOV open supplying fuel to both engines. The APU is still in operation. In FSX the APU does not actually consume any fuel from the tanks.

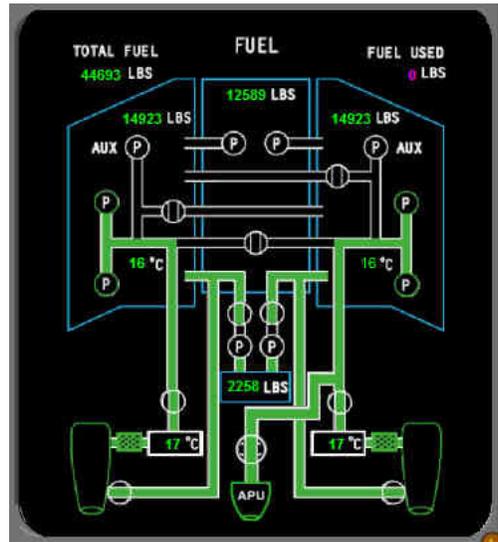


This view adds the operation of the AFT fuel tank fuel transfer to the left and right wing main tanks. This does not actually transfer any fuel to either tank. FSX uses L Main, R Main and Center until the Center tank is empty then continues with R Main, L Main and Aft tank.



## FUEL PAGE (cont'd):

This last view shows the operation of the fuel recirculation system. This is graphics only and has no function similar to the real world aircraft.



## FLIGHT CONTROLS PAGE (FLT CONT):

**Note: All controls except rudder are displayed out of the neutral position.**

Position of SLATS (leading edge flaps)

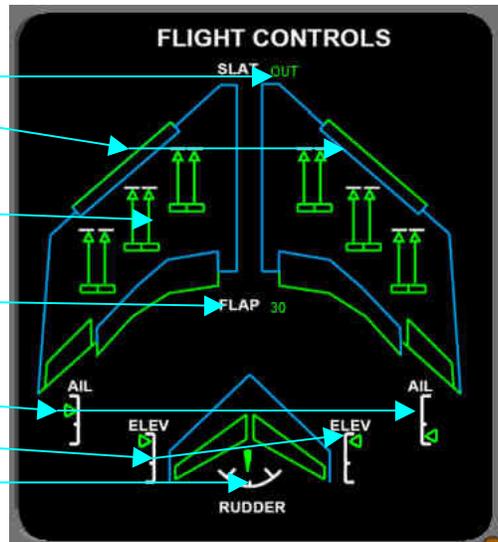
Spoilers position full up

Flaps 30°

Ailerons position.

Elevator position.

Rudder position.



## STANDBY A/S, ALT & ATT INDICATOR:

Baro setting in HPa

Mach readout

LOC & GS Deviation Bars

Attitude pitch/roll

Airspeed display

Altitude display

Baro setting IN

Nav button to display ILS1 LOC/GS standby.

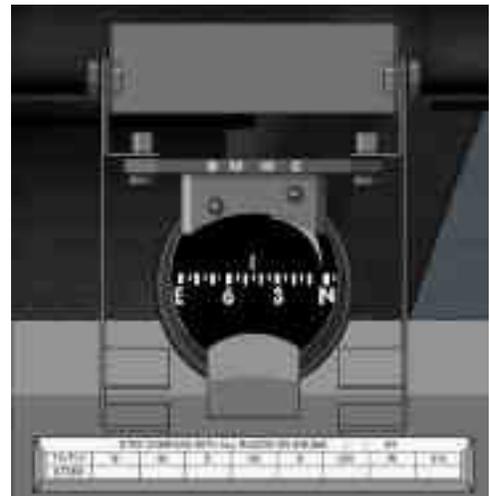
ATT button not functional.

Baro adjust knob. Click on Left side to decrease, center to set to the current Baro setting and right side to increase setting.



## STANDBY COMPASS:

This instrument is accessible by clicking on the **Others Controls** icon on the upper left side of the instrument panel. It simulates dropping down from the overhead panel. It functions as a standby whiskey compass and is normally hidden in flight.



**SIDE PANEL:  
CHRONOGRAPH:**

SEL selects ET (Flt time), which starts when aircraft is airborne, and resets to 0 when on the ground.

Time/Date display area.

DT – Displays the date (day/month/year)

GPS – Displays the current GMT time.

INT – No Function. Is darkened.

LT – Displays the Local time.

ET – Displays when ET is selected and displayed time is Flight Time. Click on button after loading panel. RST button **not** functional.

CHR – Displays chrono time (Elapsed time).

Mode – Selects the different modes of time/date.

CHR – Selects Chrono time display (count up timer) and click on the center to Start/Stop. Click on far right of knob to Reset. Click Reset after loading the panel. Prior to reset, it will display 99:XX, (XX being the current seconds). CHR is displayed in minutes and seconds up to 99:59 and ET is displayed in hours and minutes up to 99:59.

All active function modes are displayed in white legends.



**FLIGHT MANAGEMENT PANEL (FMS):**

There is an optional Flight Management System gauge (honeywell\_fmc.zip). The gauge will install in the 2d and VC (3d) cockpits. See Panel.cfg file. This can be downloaded, installed and then will interface with the Autopilot. This gauge is highly recommended and is authored by Garrett Smith, who has produced other gauges in freeware style. Many thanks to him for his devoted efforts.

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