
FLYSIMWARE
FLY THE VINTAGE SKIES
C414AW Chancellor - RAM IV Conversion
Version 2.0

Turbo-Charger Fuel Controller

NOTE: We are happy to announce that we now have working mixture levers coded (for realism) for a turbocharged engine. You no longer have to lean for higher altitudes nor for above the critical altitude of 21K feet. This new code has a fuel controller to maintain the fuel flow. But also allows you to still set the fuel flow rate. So this way you can set the mixture rich for most of the flight and then when you descend from high altitude you can control the EGT temps so you do not crack the engine head as you now enter warmer air and prepare to land. REMEMBER TO KEEP THE AUTOMIXTURE DISABLED!!!

XBOX users will have forced automixture on so there is nothing you need to do. Until Wasm is working for Xbox you can simply ignore the mixture.

Pilot Altimeter Settings

To change the pilot altimeter settings from u.s standard system to metric system or vice-versa, go to :

General options > Misc > Units of mesurements > Us system and metric system

XBOX Limitations

Xbox users will only be able to use the GNS530 panel. The GTN 750 panels are 3rd party software and not compatible with Xbox due to a sim limitation. We hope they fix this in the future. For Xbox users the turbocharger logic is using auto mixture for now. The Wasm turbocharger logic will be fixed in the future according to Asobo. Please visit our main website product page to download the Xbox zip file for more info.

Texture Quality

The sim controls the size of the original textures that we provided through the graphic settiings. There are four graphic settings, in low and medium, the textures are half the size of the original can cause some pixelation. Using the high and ultra settings, the textures are the original size. NOTE: Asobo lowered the pixel density and liveries based on direction now show wavy and steps in the decal lines. There are methods to reduce the limitation but can't be removed completely. This was to allow more memory for Xbox. We have updated the textures to improve the livery quality due to this change and are happy with the results.

General Options > Graphics > Texture resolution

Autostart

Do not use the default autostart feature from the sims button controls. This aircraft requires that you use the actual starter buttons. Also, do not use hardware unless, you use third party software so it can use our logic.You can use the tablet autostart as this feature will be added soon.

Save State and Fuel Info

This aircraft has a save state. What you walk away from you return to. So parking modes and some switches including fuel levels will be saved when you exit a flight back to the main menu. Then returning will have this amount of fuel. If you add fuel from the flight planar this will get ignored so no need. Once back at the parking ramp add the fuel then update the fuel computer. Once you finish a flight leave the plane how you like to where you refuel now or when you return. This is how it would be done in real life and a save state is now becoming the standard for sims.

Engine failures & Maintenance

1. Running the engines hot by keeping the manifold pressure at max pressure for too long will result in power loss and may not be enough to climb in altitude. Keep the manifold pressure in the green for normal flight and only full manifold pressure during takeoff.

2. All default sim failures are available to set at any time to simulate practicing failures.

Note: We hope to bring more failures to this bird in the future! Right now we are focusing on making the best possible product for MSFS. We feel maintenance and failures is only a bonus feature and not a standard requirement to make a reliable award winning product. Also there is no help from the MSFS sim to create these unique systems which has to be all custom coded and in return this can cause bugs and make the product performance drop.

Future Goals

1. Add simulated circuit breakers. Keep in mind some switches are circuit breakers and so these are already simulated and work like a traditional circuit breakers. For example the master autopilot switch on the GNS530 panel will pop off if you use the yoke AP disconnect button or the autopilot gets disconnected from abnormal reason like moving the yoke. So this is not a typical rocker switch. Same for a few other switches on the pilot side panel. So some of the traditional circuit breakers we plan to simulate at a later time you may see some missing as I just stated they are already breaker switches.

2. Add an 'optional' maintenance system. This will include things like oil simulation, spark plug replacement, air filter replacement, light bulb replacement and much more. Failure to maintain will cause a complete engine failure. If we do add an option to increase the simulation failure rate this would only be for non engine failures. Engine failures can only be triggered by actual hours.

3. Suction gauge will have red poppers for the running engine state and not red illuminated lights.

4. Tablet payload will allow the payload widget to sync so you can choose which to use.

5. Our tech pilot requested a few other things I did not list. So I am pretty sure there is more.

Hardware Binding

Why my hardware does not work for some switches?

Due to so much custom coding which brings you more realistic functions that default assignments will no longer work and there are many users that want to use their hardware for typical functions. Below is a list of known switches that you need to use the mouse or use 3rd party software that allows you to setup hardware. We have Discord channels with different sub channels for different software that you can get instant help to setup profiles.

You can use the link below to join our Discord community and see the #hardware-binding channels for more information.
Discord Link

Here is the known list of switches:

Sync Switch
BATTERY SWITCH
LEFT ENGINE ALTERNATOR SWITCH
RIGHT ENGINE ALTERNATOR SWITCH
LEFT ENGINE STARTER
RIGHT ENGINE STARTER
PRIMER SWITCHES
LEFT FUEL PUMP
RIGHT FUEL PUMP
ALL AUDIO SWITCHES (GNS-530 PANEL)

Cessna 414AW RAM Series IV

Exterior
Exterior Height: 11 ft 5 in
Wing Span: 44 ft 2 in
Length: 36 ft 3 in
External Baggage: 54 cu ft

Interior
Cabin Volume: 142 cu ft
Internal Baggage: 31 cu ft

Occupancy
Crew: 1
Passengers: 7

Operating Weights
Max T/O Weight: 7105 Lb
Max Landing Weight: 6750 Lb
Operating Weight: 4951 Lb
Empty Weight: 4764 Lb
Fuel Capacity: 1236 Lb
Payload Useful: 2012 Lb
Payload W/Full Fuel: 953 Lb
Max Payload: 1564 Lb

Range
Normal Range: 1046 nm
Max Range: 1140 nm
Service Ceiling: 30000 ft

Distances
Takeoff Distance: 2185 ft
Balanced Field Length: 2595 ft
Landing Distance: 4000 ft

Performance
Rate of Climb: 1900 fpm
Climb Rate One Engine Inop: 325 fpm
Max Speed: 240 kts
Normal Cruise: 230 kts
Economy Cruise: 210 kts
Fuel Capacity: 206

Power Plant
Engines: 2
Horse Power: 325
Engine Mfg: Continental
Engine Model: TSIO-520NB

PERFORMANCE CHART BASED ON MSFS SIMULATION WITH RAM IV CONVERSION

ALTITUDE [Feet]	RPM	MP [InHg]	-7 C (19 F) PERCENT BHP [%]	-7 C (19 F) KTAS [Knots]	-7 C (19 F) TOTAL [lb/hr]	13 C (STD TEMP) (55 F) PERCENT BHP [%]	13 C (STD TEMP) (55 F) KTAS [Knots]	13 C (STD TEMP) (55 F) TOTAL LB/HR [lb/hr]	33 C (91 F) PERCENT BHP [%]	33 C (91 F) KTAS [Knots]	33 C (91 F) TOTAL LB/HR [lb/hr]
1,000	2450	31.5				71.7%	176	245			
	2450	29.0				64.1%	169	219			
	2450	27.0				58.1%	163	199			
	2450	25.5				53.7%	158	184			
	2300	34.0				78.3%	181	268			
	2300	32.5				74.0%	177	253			
	2300	30.5				68.1%	172	233			
	2300	29.0				63.8	168	218			
	2300	27.0				57.8	162	198			
	2300	25.0				51.9	156	178			
	2200	34.0				77.6%	180	266			
	2200	33.0				74.8%	178	256			
	2200	31.0				68.9%	173	236			
	2200	29.0				63.2%	167	216			
	2200	27.0				57.5%	162	197			
	2200	25.0				51.6%	155	177			
	2100	31.5				69.8%	173	239			
	2100	29.0				62.5%	166	214			
	2100	27.5				58.4%	162	200			
	2100	25.5				52.7%	156	180			

PERFORMANCE CHART BASED ON MSFS SIMULATION WITH RAM IV CONVERSION

ALTITUDE [Feet]	RPM	MP [InHg]	-15 C (5 F) PERCENT BHP [%]	-15 C (5 F) KTAS [Knots]	-15 C (5 F) TOTAL [lb/hr]	5 C (STD TEMP) (41 F) PERCENT BHP [%]	5 C (STD TEMP) (41 F) KTAS [Knots]	5 C (STD TEMP) (41 F) TOTAL LB/HR [lb/hr]	25 C (77 F) PERCENT BHP [%]	25 C (77 F) KTAS [Knots]	25 C (77 F) TOTAL LB/HR [lb/hr]
5,000	2450	31.5				73.1%	184	250			
	2450	29.0				65.5%	176	224			
	2450	27.1				59.6%	170	204			
	2450	25.5				54.8%	165	188			
	2300	34.0				80.1%	189	274			
	2300	32.5				75.5%	185	259			
	2300	30.5				69.5%	180	238			
	2300	29.0				65.2%	176	223			
	2300	27.0				59.0%	169	202			
	2300	25.5				54.7%	164	187			
	2200	34.0				79.4%	187	272			
	2200	33.1				76.5%	185	262			
	2200	31.0				70.5%	180	241			
	2200	29.0				64.5%	175	221			
	2200	27.0				58.7%	169	201			
	2200	25.5				54.3%	164	186			
	2100	31.5				71.1%	180	243			
	2100	29.5				65.5%	175	224			
	2100	27.5				59.5%	169	204			
	2100	26.0				55.3%	164	189			

PERFORMANCE CHART BASED ON MSFS SIMULATION WITH RAM IV CONVERSION

ALTITUDE [Feet]	RPM	MP [InHg]	-25 C (-13 F) PERCENT BHP [%]	-25 C (-13 F) KTAS [Knots]	-25 C (-13 F) TOTAL [lb/hr]	-5 C (STD TEMP) (23 F) PERCENT BHP [%]	-5 C (STD TEMP) (23 F) KTAS [Knots]	-5 C (STD TEMP) (23 F) TOTAL LB/HR [lb/hr]	15 C (59 F) PERCENT BHP [%]	15 C (59 F) KTAS [Knots]	15 C (59 F) TOTAL LB/HR [lb/hr]
10,000	2450	31.5				75.3%	194	260			
	2450	29.5				68.5%	188	234			
	2450	27.5				62.3%	181	213			
	2450	26.0				57.8%	176	198			
	2300	34.1				82.0%	199	281			
	2300	33.0				78.7%	196	269			
	2300	31.1				72.8%	191	249			
	2300	29.0				66.6%	185	228			
	2300	27.0				60.5%	179	207			
	2300	25.5				55.9%	173	191			
	2200	34.0				81.1%	197	277			
	2200	32.9				77.8%	194	266			
	2200	31.0				71.9%	189	246			
	2200	29.0				65.9%	183	226			
	2200	27.5				61.4%	179	210			
	2200	25.6				55.7%	172	190			
	2100	32.0				74.3%	190	254			
	2100	30.0				68.3%	185	234			
	2100	28.1				62.6%	179	214			
	2100	26.0				56.5%	172	193			

PERFORMANCE CHART BASED ON MSFS SIMULATION WITH RAM IV CONVERSION

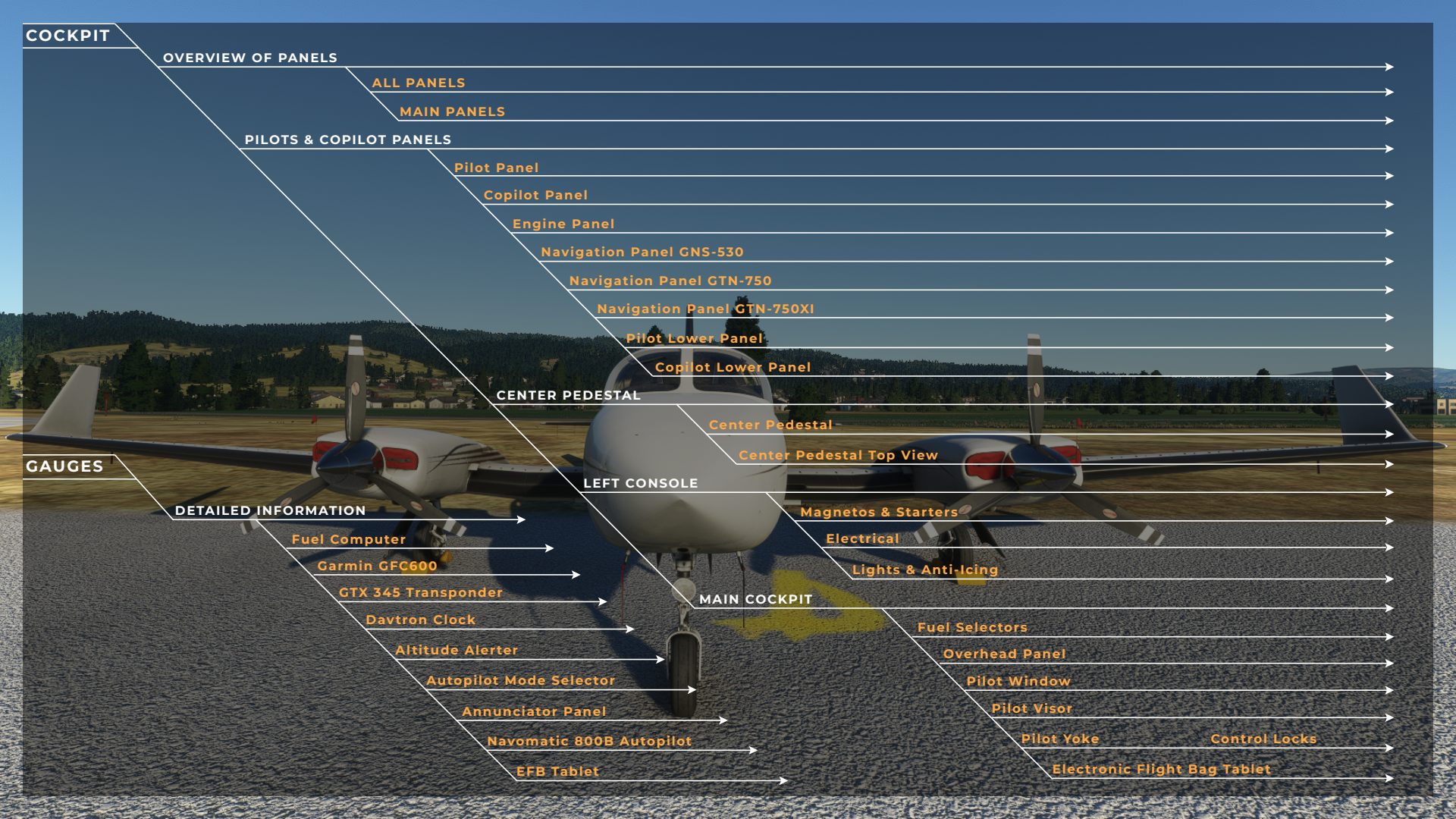
ALTITUDE [Feet]	RPM	MP [InHg]	-35 C (-30 F) PERCENT BHP [%]	-35 C (-30 F) KTAS [Knots]	-35 C (-30 F) TOTAL [lb/hr]	-15 C (STD TEMP) (6 F) PERCENT BHP [%]	-15 C (STD TEMP) (6 F) KTAS [Knots]	-15 C (STD TEMP) (6 F) TOTAL LB/HR [lb/hr]	5 C (42 F) PERCENT BHP [%]	5 C (42 F) KTAS [Knots]	5 C (42 F) TOTAL LB/HR [lb/hr]
15,000	2450	31.6				76.1%	204	260			
	2450	29.5				69.7%	197	238			
	2450	27.5				63.4%	191	217			
	2450	26.1				58.8%	185	201			
	2300	34.0				83.2%	208	284			
	2300	33.0				80.2%	206	274			
	2300	31.0				74.0%	200	253			
	2300	29.0				67.7%	194	232			
	2300	27.0				61.6%	187	211			
	2300	25.5				56.8%	182	195			
	2200	34.0				82.5%	206	282			
	2200	33.0				79.5%	204	272			
	2200	31.5				74.9%	200	257			
	2200	29.5				68.6%	194	235			
	2200	27.5				62.4%	187	214			
	2200	26.0				58.0%	182	199			
	2100	32.5				77.0%	200	264			
	2100	30.5				71.1%	195	243			
	2100	28.0				63.4%	187	217			
	2100	26.4				58.8%	182	201			

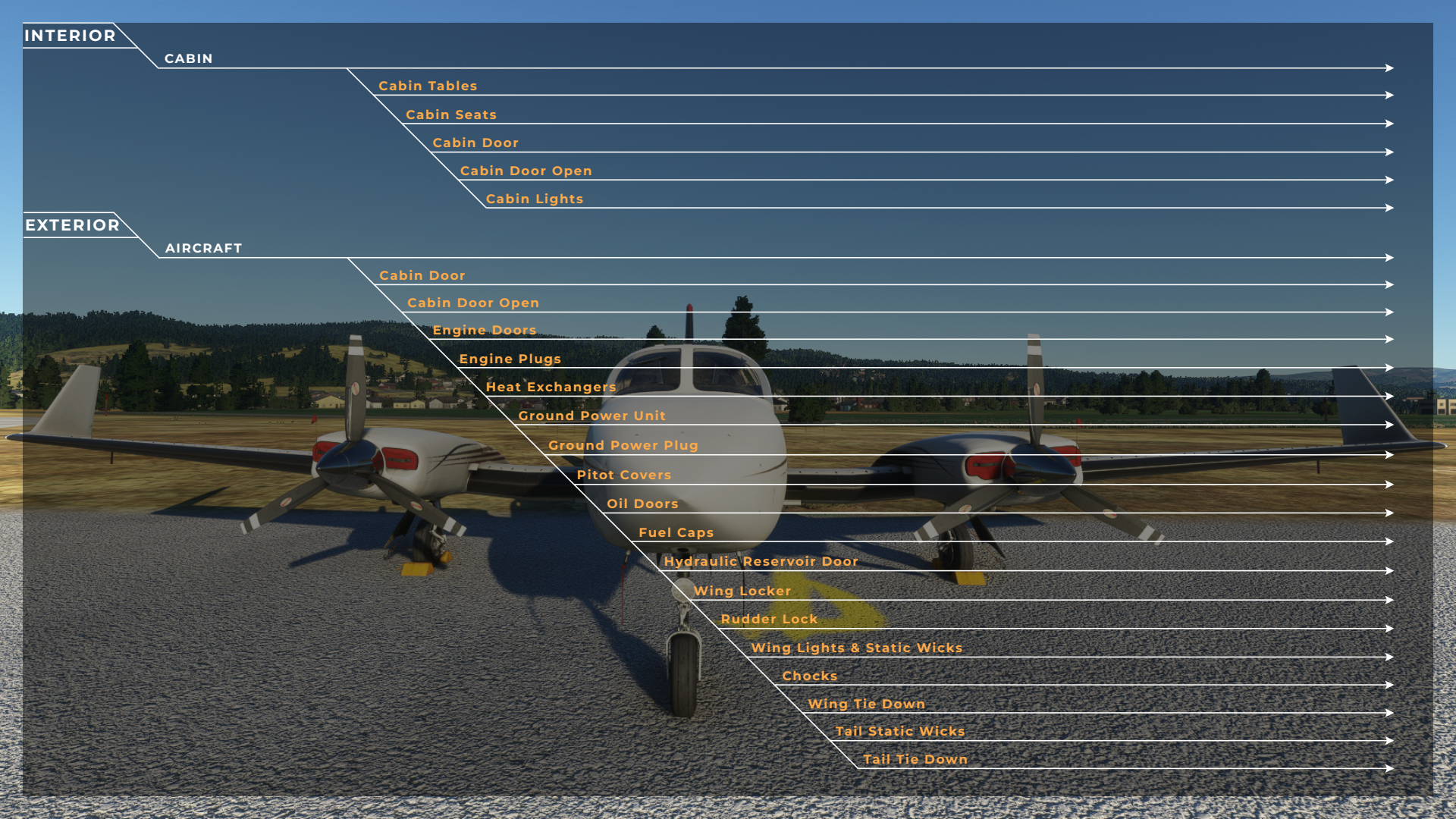
PERFORMANCE CHART BASED ON MSFS SIMULATION WITH RAM IV CONVERSION

ALTITUDE [Feet]	RPM	MP [InHg]	-45 C (-48 F) PERCENT BHP [%]	-45 C (-48 F) KTAS [Knots]	-45 C (-48 F) TOTAL [lb/hr]	-25 C (STD TEMP) (-12 F) PERCENT BHP [%]	-25 C (STD TEMP) (-12 F) KTAS [Knots]	-25 C (STD TEMP) (-12 F) TOTAL LB/HR [lb/hr]	-5 C (24 F) PERCENT BHP [%]	-5 C (24 F) KTAS [Knots]	-5 C (24 F) TOTAL LB/HR [lb/hr]
20,000	2450	29.5				70.6%	207	242			
	2450	27.5				64.2%	200	220			
	2450	25.9				59.3%	194	203			
	2300	34.0				84.3%	218	289			
	2300	33.0				81.1%	216	278			
	2300	30.9				74.7%	210	256			
	2300	29.1				68.7%	203	236			
	2300	27.0				62.1%	196	213			
	2300	25.6				57.8%	190	198			
	2200	34.0				83.6%	216	287			
	2200	33.0				80.3%	213	275			
	2200	31.4				75.3%	209	258			
	2200	29.5				69.3%	202	237			
	2200	28.0				64.8%	197	222			
	2200	26.0				58.6%	190	200			
	2100	32.5				77.8%	208	266			
	2100	30.5				71.6%	203	245			
	2100	28.5				65.5%	196	224			
	2100	27.0				61.2%	191	209			

PERFORMANCE CHART BASED ON MSFS SIMULATION WITH RAM IV CONVERSION

ALTITUDE [Feet]	RPM	MP [InHg]	-54 C (-66 F) PERCENT BHP [%]	-54 C (-66 F) KTAS [Knots]	-54 C (-66 F) TOTAL [lb/hr]	-34 C (STD TEMP) (-30 F) PERCENT BHP [%]	-34 C (STD TEMP) (-30 F) KTAS [Knots]	-34 C (STD TEMP) (-30 F) TOTAL LB/HR [lb/hr]	-14 C (6 F) PERCENT BHP [%]	-14 C (6 F) KTAS [Knots]	-14 C (6 F) TOTAL LB/HR [lb/hr]
25,000	2450	31.0				78.4%	225	269			
	2450	29.6				73.7%	220	253			
	2450	27.4				67.0%	212	230			
	2450	26.0				62.3%	206	213			
	2300	29.0				71.3%	214	244			
	2300	27.0				65.2%	207	224			
	2300	26.0				61.9%	203	212			
	2200	30.0				73.9%	214	253			
	2200	28.0				67.7%	208	232			
	2200	27.0				64.7%	205	222			
30,000	2450	28.3				72.8%	225	249			
	2450	27.5				70.5%	225	241			
	2450	26.0				65.2%	217	223			
	2300	28.4				72.7%	223	249			
	2300	27.0				68.1%	217	233			
	2300	26.0				64.9%	212	222			
	2200	28.5				72.4%	219	248			
	2200	28.0				71.2%	218	244			
	2200	27.0				67.8%	214	233			


COCKPIT
OVERVIEW OF PANELS
ALL PANELS
MAIN PANELS
PILOTS & COPILOT PANELS
Pilot Panel
Copilot Panel
Engine Panel
Navigation Panel GNS-530
Navigation Panel GTN-750
Navigation Panel GTN-750XI
Pilot Lower Panel
Copilot Lower Panel
CENTER PEDESTAL
Center Pedestal
Center Pedestal Top View
GAUGES
LEFT CONSOLE
DETAILED INFORMATION
Magnetos & Starters
Fuel Computer
Electrical
Garmin GFC600
Lights & Anti-Icing
GTX 345 Transponder
MAIN COCKPIT
Davtron Clock
Fuel Selectors
Altitude Alerter
Overhead Panel
Autopilot Mode Selector
Pilot Window
Annunciator Panel
Pilot Visor
Navomatic 800B Autopilot
Pilot Yoke
Control Locks
EFB Tablet
Electronic Flight Bag Tablet


INTERIOR
CABIN
Cabin Tables
Cabin Seats
Cabin Door
Cabin Door Open
Cabin Lights
EXTERIOR
AIRCRAFT
Cabin Door
Cabin Door Open
Engine Doors
Engine Plugs
Heat Exchangers
Ground Power Unit
Ground Power Plug
Pitot Covers
Oil Doors
Fuel Caps
Hydraulic Reservoir Door
Wing Locker
Rudder Lock
Wing Lights & Static Wicks
Chocks
Wing Tie Down
Tail Static Wicks
Tail Tie Down

MAIN PANELS


Left Console
Left Circuit Panel
Center Pedestal
Mainpanel
Circuit panel

MAIN PANELS


Pilot Panel
Engine Panel
Copilot Panel
Navigation Panel
Lower Panel

Pilot Panel

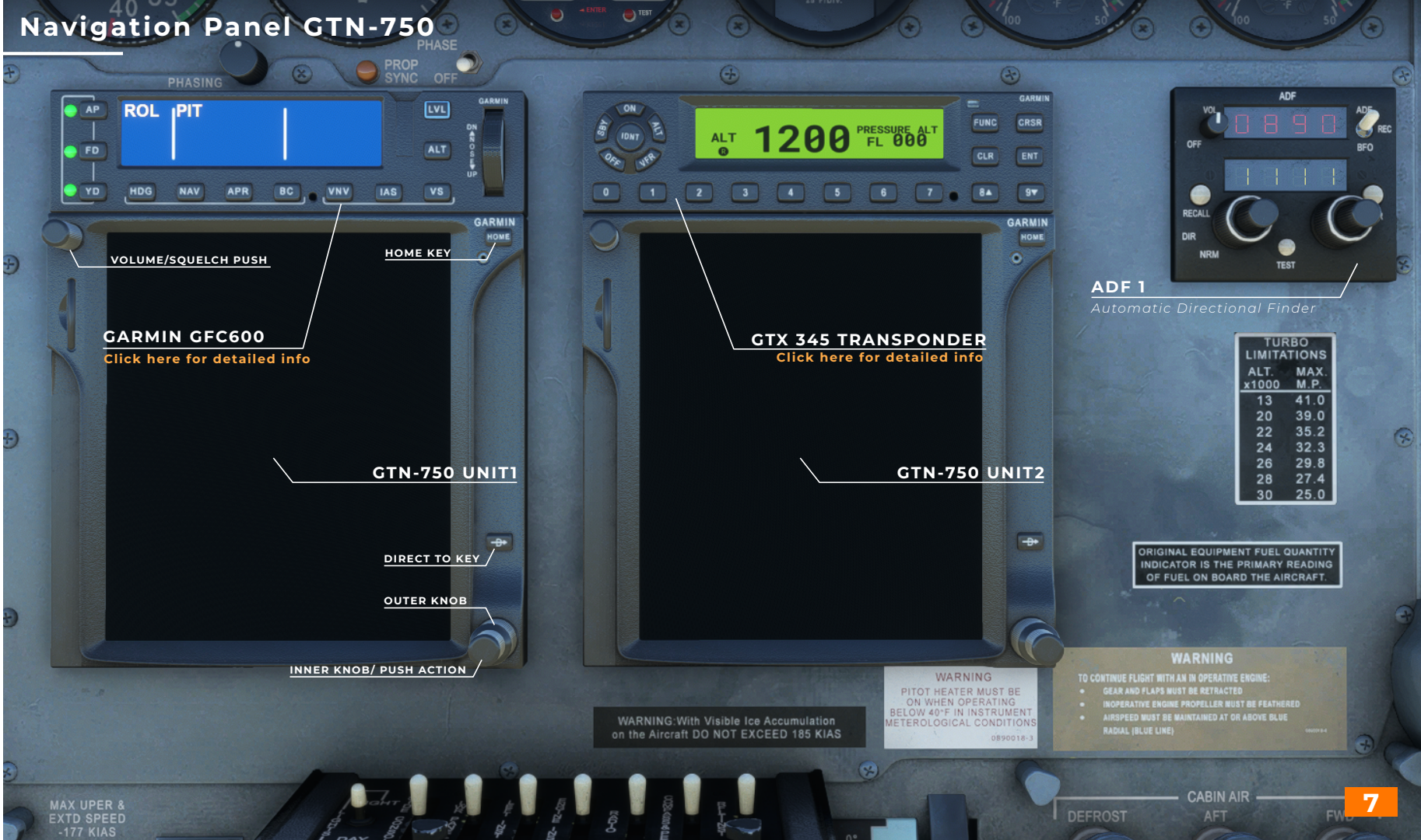

Airspeed Indicator
ADI
Attitude Directional Indicator
Altimeter
Davtron Clock
Davtron Info Here
OAT
VOR / NAV 2
RMI
Radio Magnetic Indicator
Vertical Speed Indicator
HSI
Horizontal Situation Indicator
Turn and Slip Indicator
DME
DISTANCE MEASURING EQUIPMENT
Annunciator Panel
Annunciator Panel Info Here
Altitude Alert
Altitude Alert Info Here
Autopilot Mode Selector
Autopilot Mode Info Here
N2744X

Copilot Panel

Engine Panel

Navigation Panel GNS-530

Navigation Panel GTN-750



Navigation Panel GTN-750XI

Pilot Lower Panel

Copilot Lower Panel

Flaps Control

Cabin Air Controls

Glovebox

Manual Inside

Cabin heat

Left Heat Exchanger

Right Heat Exchanger

Center Pedestal

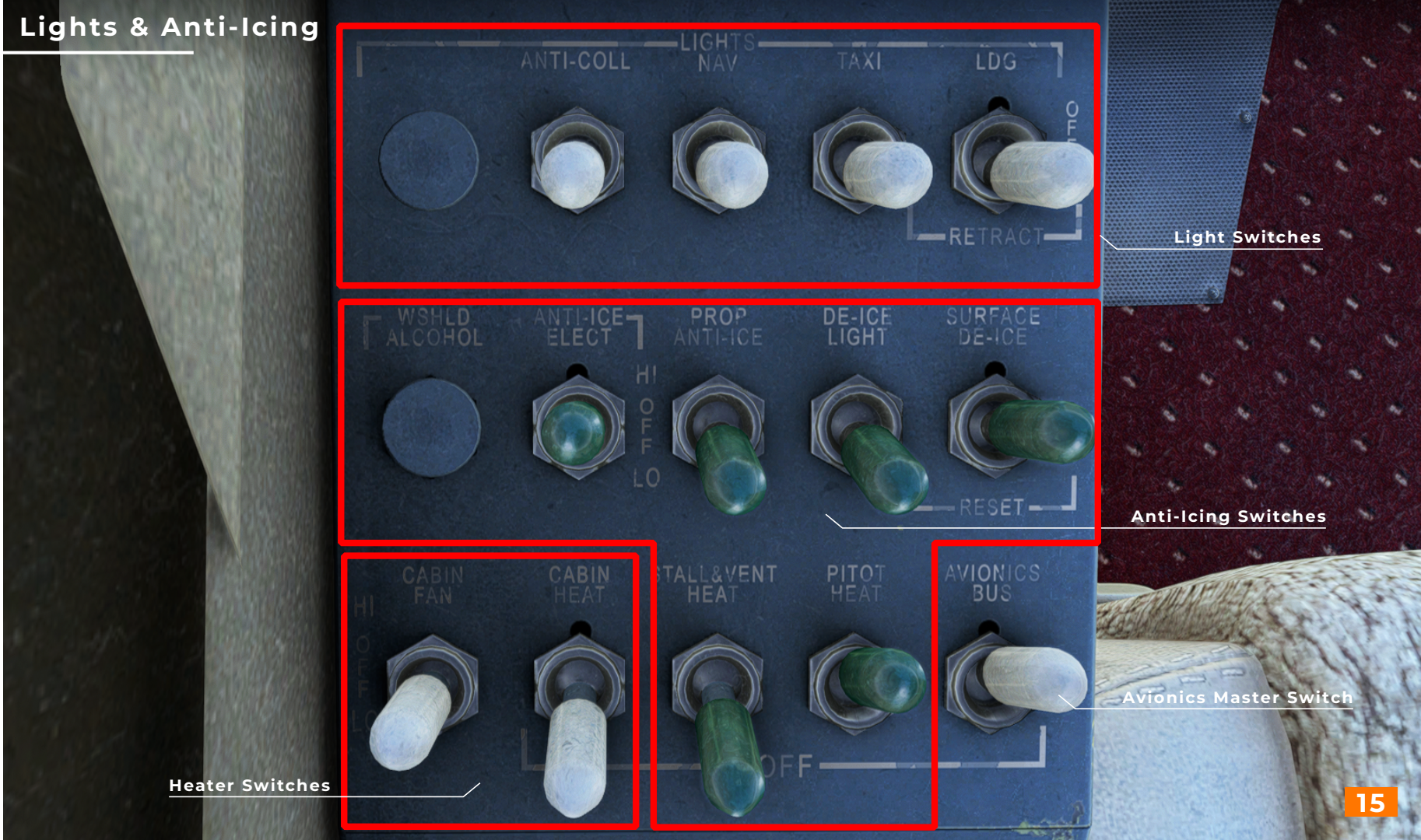
Center Pedestal Top View

Magnetos & Starters

Electrical


LOW
AMPS
R ALT
BATT
L ALT
VOLTS
Voltammeter
AMPS
50
0
100
-25
125
0
1
20
30
VOLTS
Voltammeter Mode Slector
Alternators Switches
Master Battery Switch
L ALT
BATT
R ALT

Lights & Anti-Icing



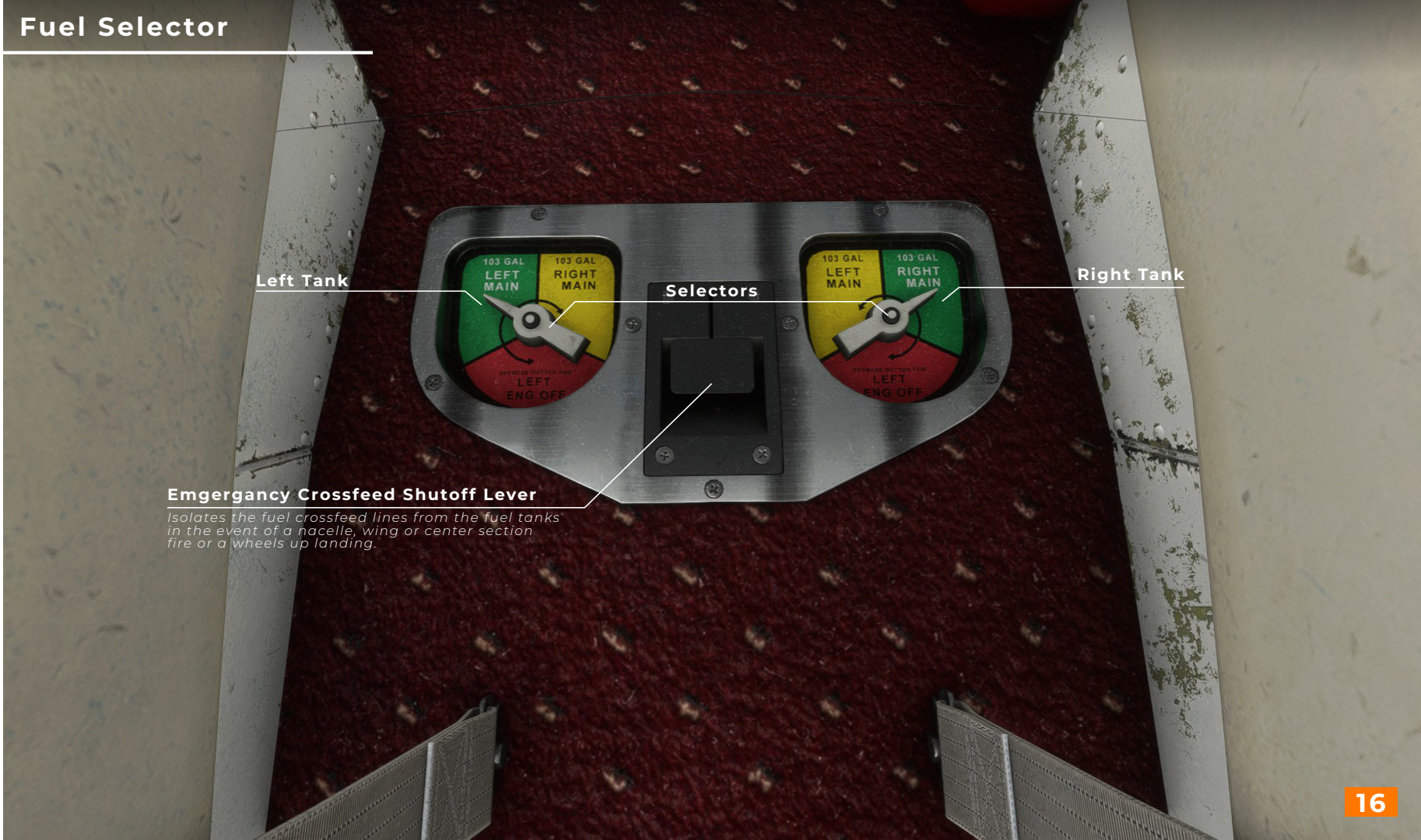
Light Switches

Anti-Icing Switches

Avionics Master Switch

Heater Switches

Fuel Selector



Emgergancy Crossfeed Shutoff Lever

Isolates the fuel crossfeed lines from the fuel tanks in the event of a nacelle, wing or center section fire or a wheels up landing.

Overhead Panel

Pilot Window

Pilot Visor


Sun Visor
Click & Drag to move
Extender
Click & Drag to move
Knob
Click & Drag to move
Joint
Click & Drag to Rotate

Pilot Yoke


Pitch Trim
Not simulated
Not simulated
Autopilot Disconnect
Not simulated
Pitch Synchronization Switch

Control Locks

Electronic Flight Bag Tablet

Cabin Tables

Cabin Seats

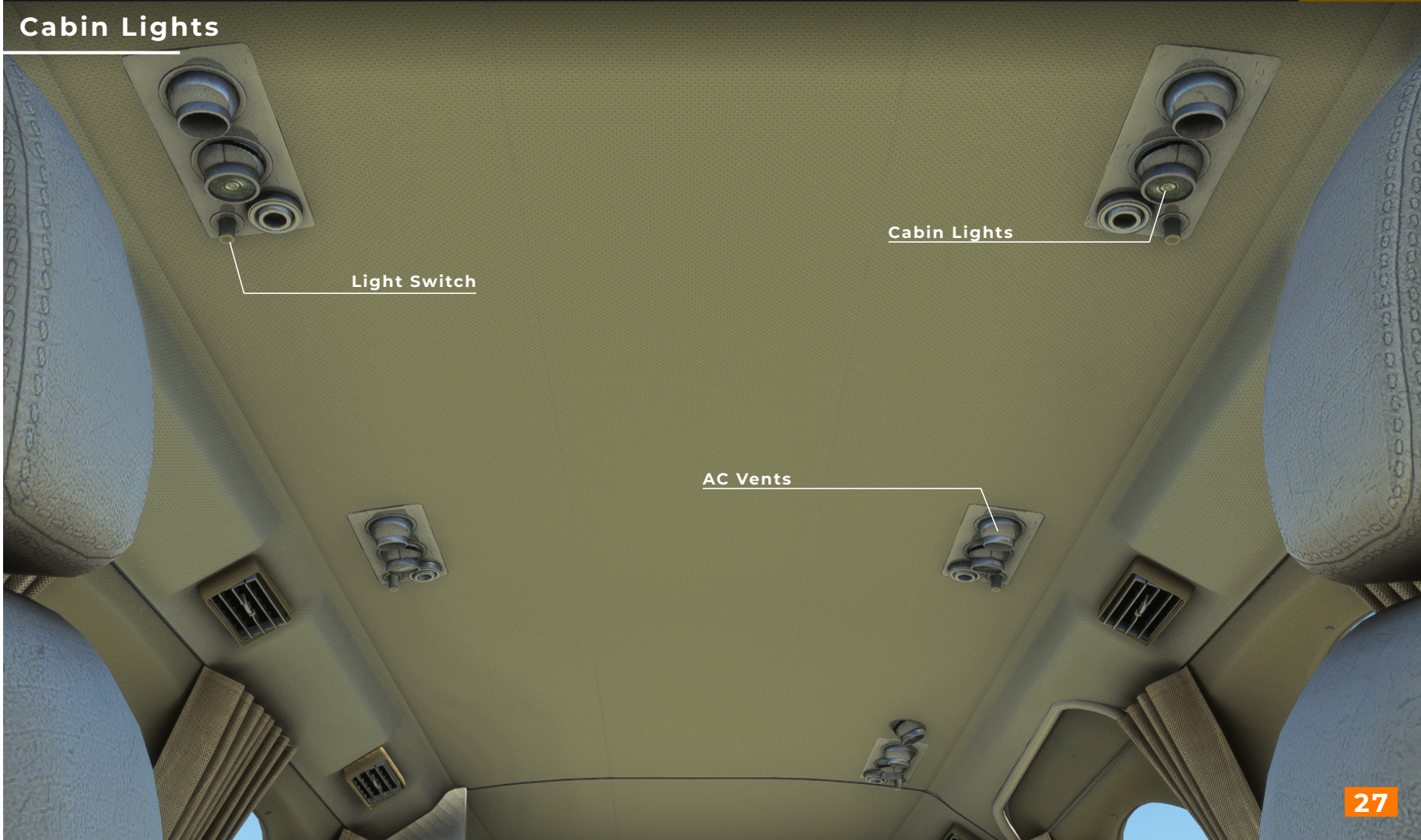

L
LAY FUEL AS
GAL
LB
UEL
50,00%
EFT MAIN
50,00%
51.50 gal
IGHT MAIN
50,00%
51.50 gal
AYLOAD
24,80%
LOT
171 lb
OPILOT
170 lb
EAT3
0 lb
EAT4
0 lb
EAT5
0 lb
EAT6
0 lb
EAT7
200 lb
ty Weight / -
4.069 LB /
-
/ Max Allowable Fuel
618 LB / 1.236 LB
oad / Max Payload
541 LB / 2.178 LB
l / Max Takeoff Weight
5.228 LB / 6.865 LB
nsumption and CO2 Emission
T
Passenger Seat 7
Remove weight to remove Seat
Enter Weight
Seat 7 will appear

Cabin Door


Upper Door Handle
Click to open and close
Leather Door Strap
Click to raise and lower upper door
Hotspot
Click to raise and close lower door
Door Light
Turns on door light

Cabin Door Open

Cabin Lights



Cabin Door

Exterior Upper Door Handle

Drag down to unlock / Drag up to lock

Hotspot

Click to raise upper door

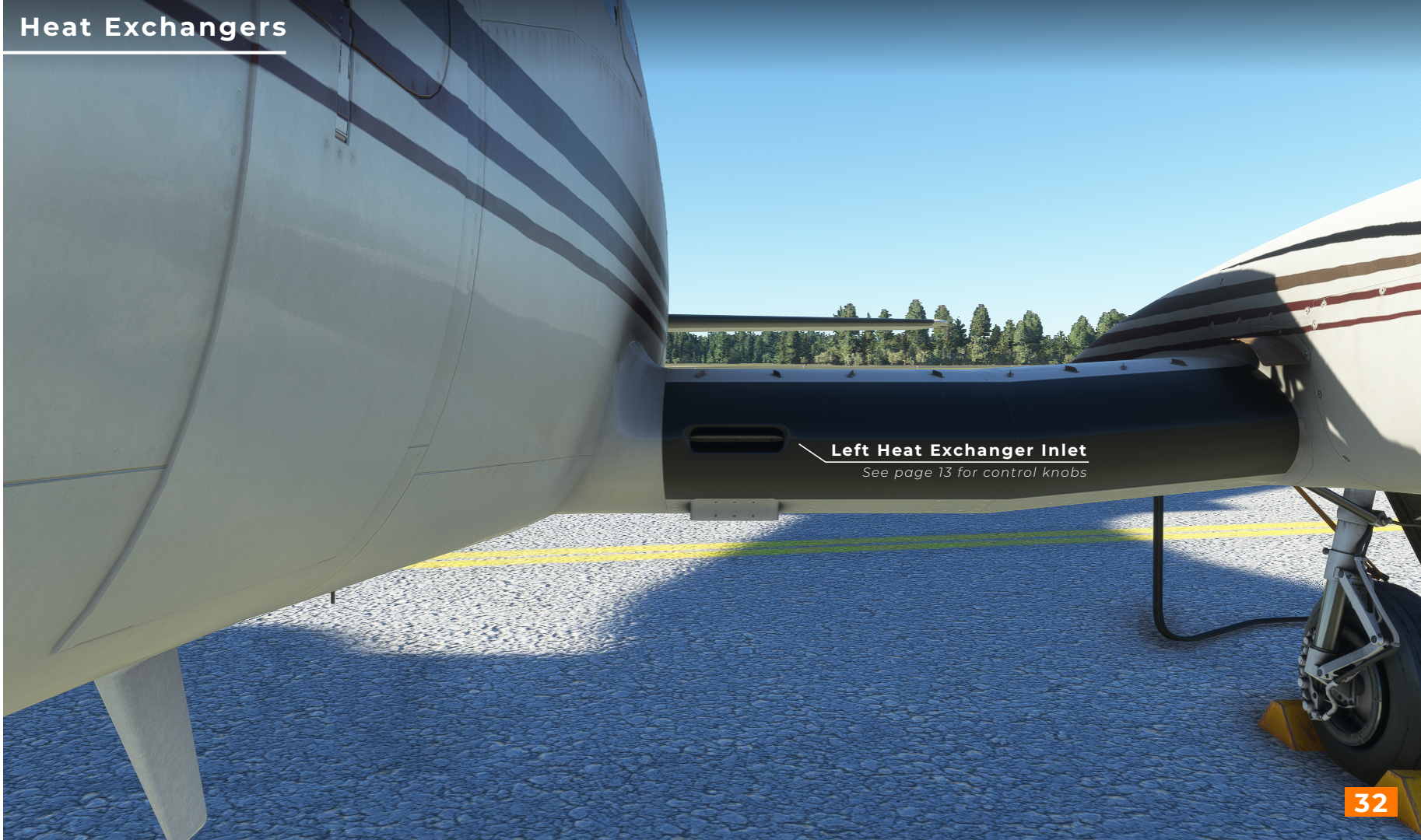
To click these hotspots it must be from 'cockpit/instruments/cabin_door' camera

Cabin Door Open

Engine Doors

Engine Plugs

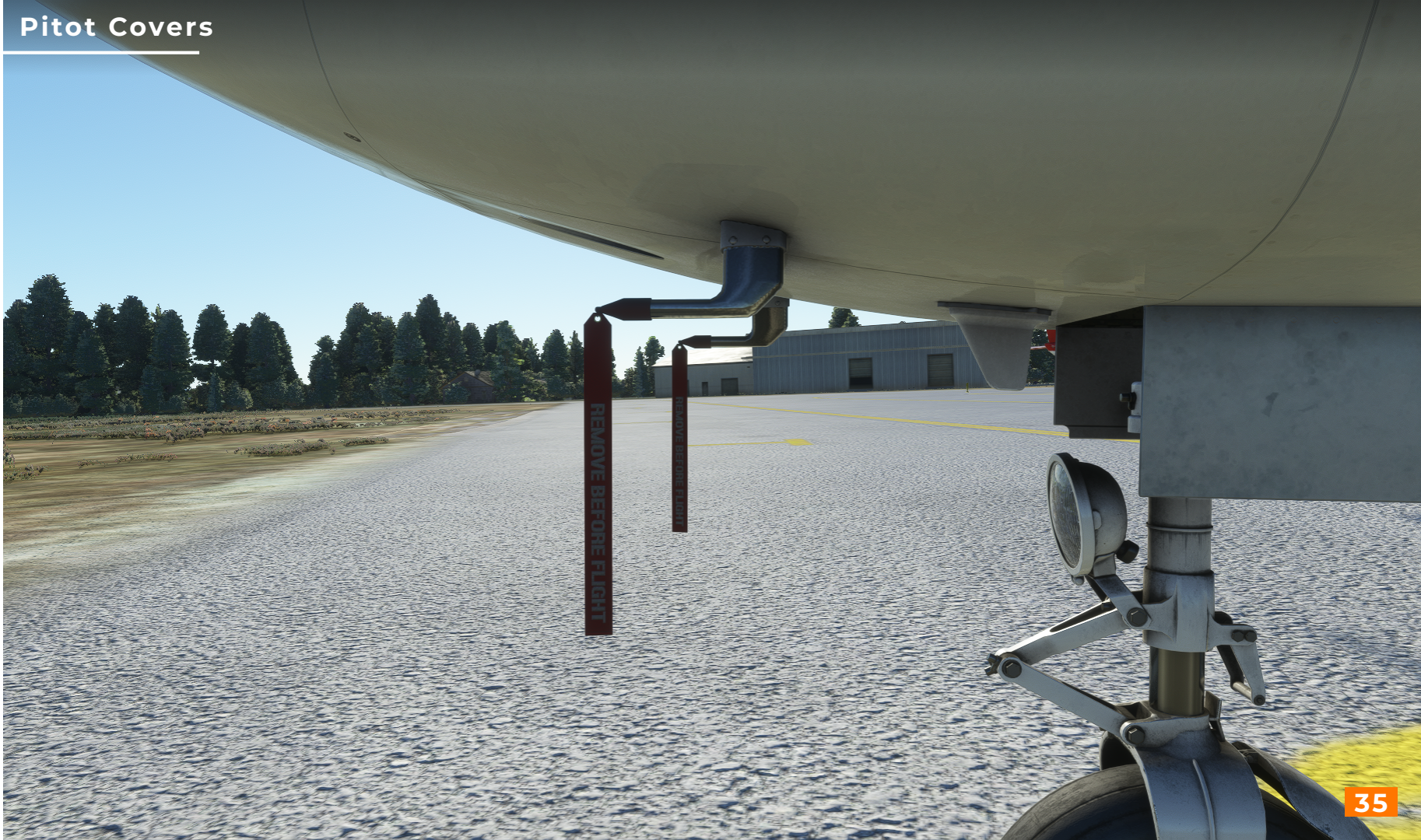
Heat Exchangers



Ground Power Unit

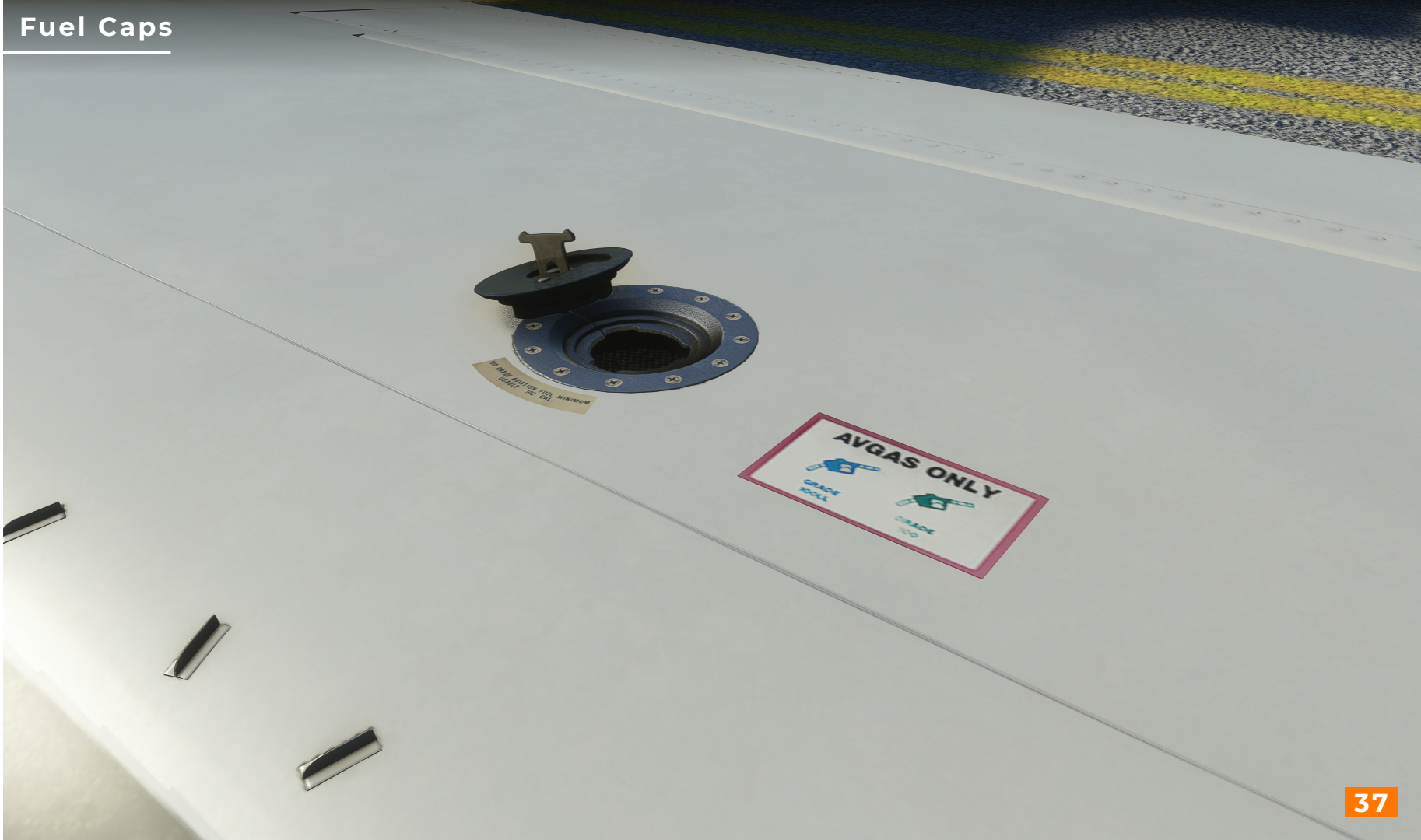
GPU Power Plug

Pitot Covers

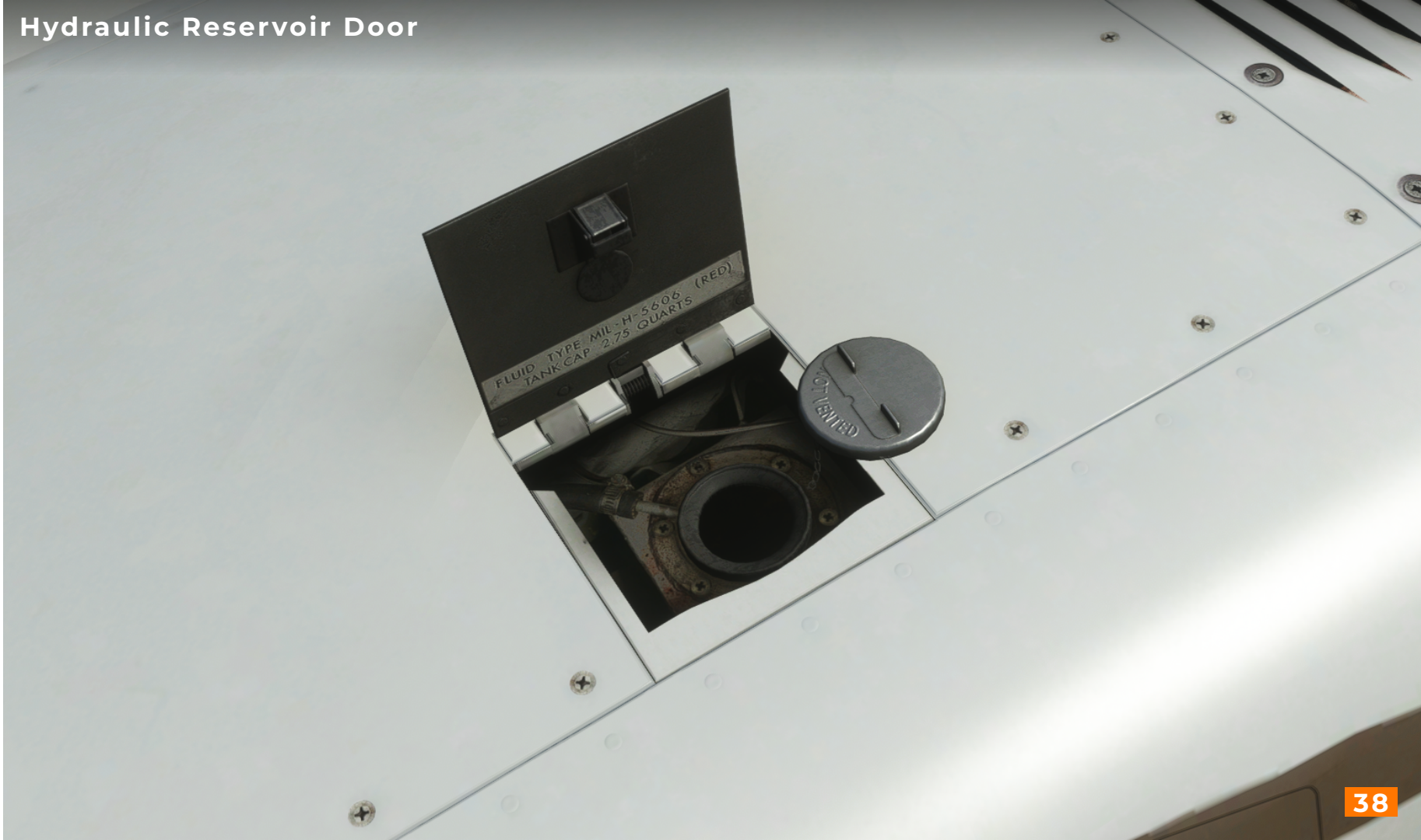


Oil Doors

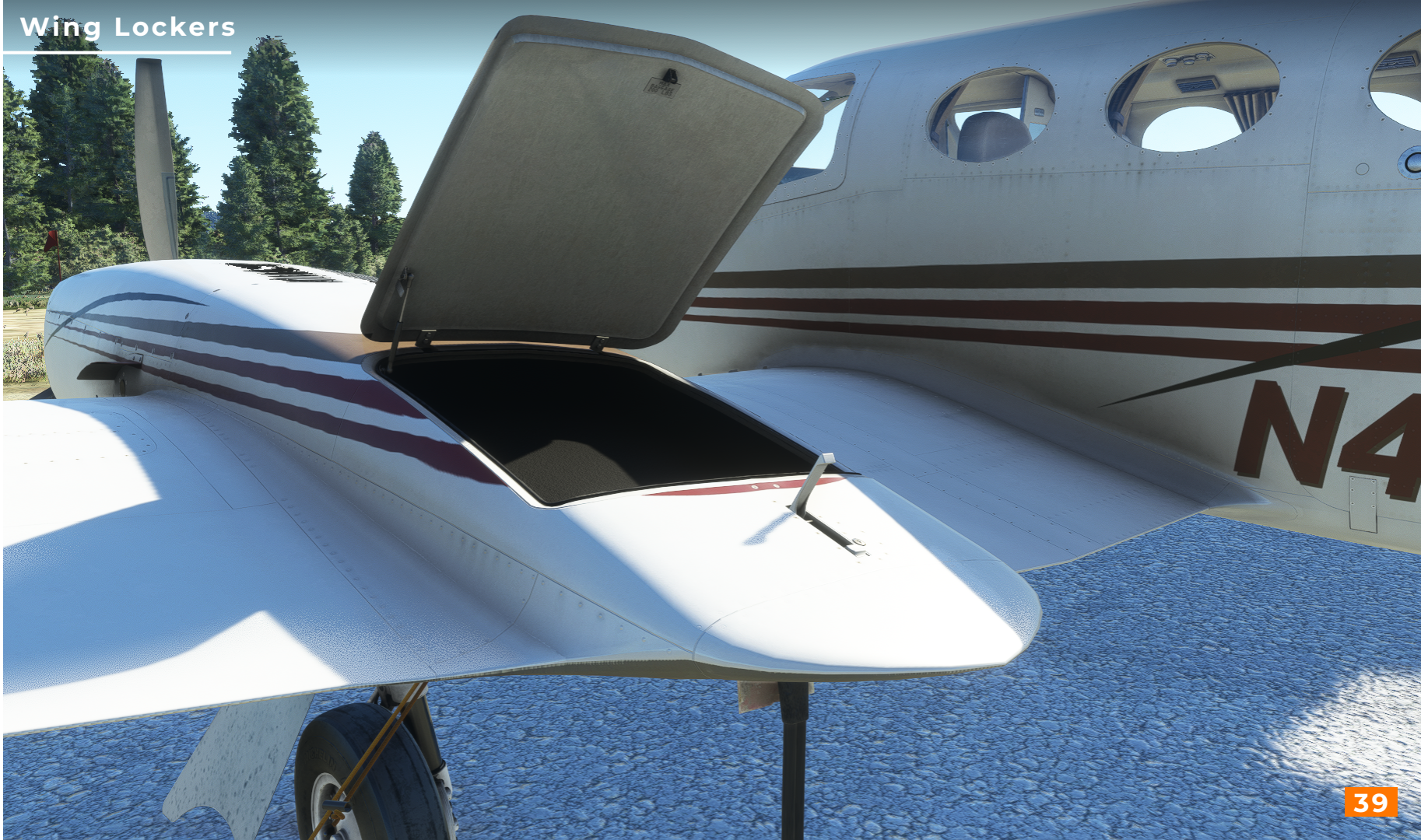
Fuel Caps



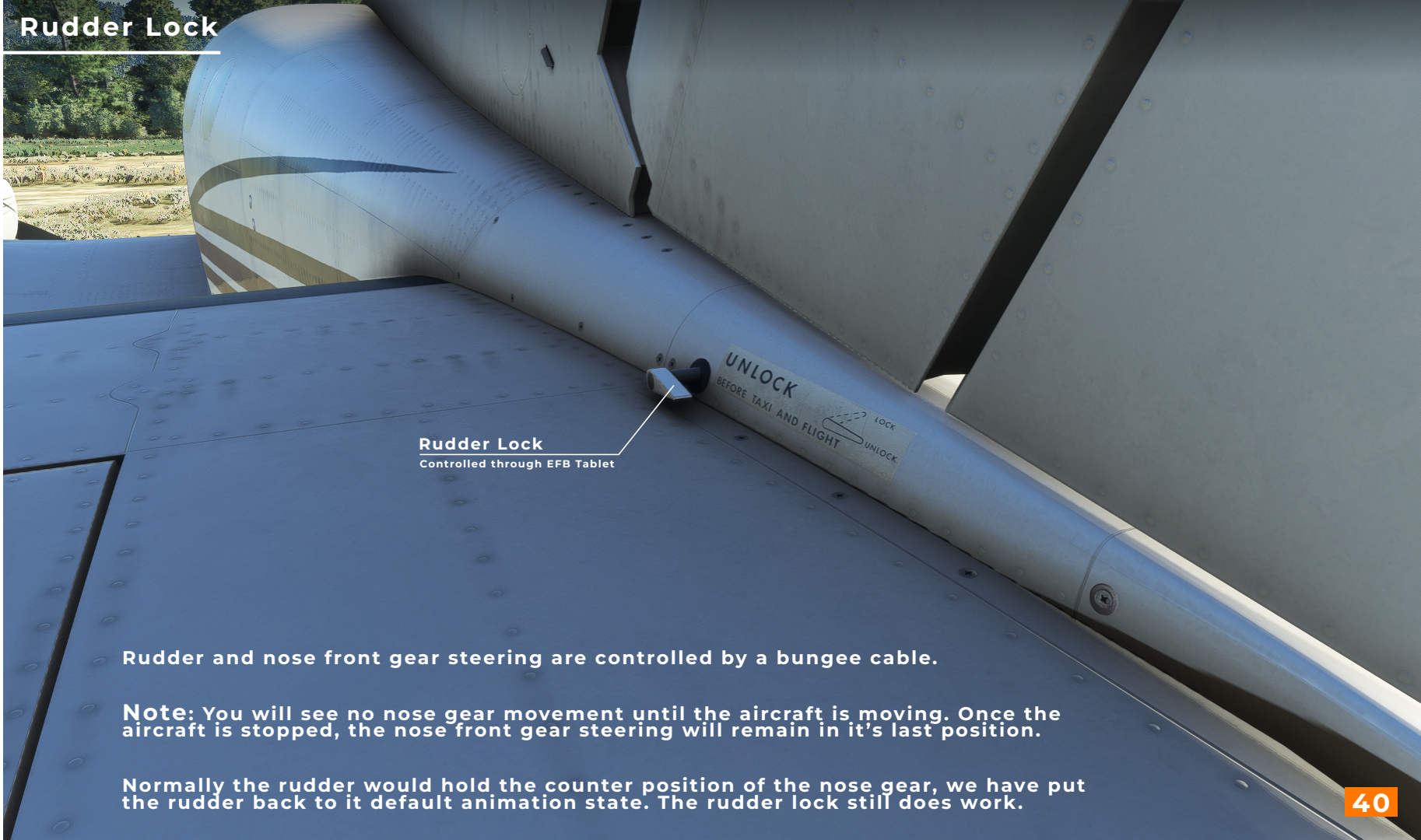
Hydraulic Reservoir Door



Wing Lockers



Rudder Lock

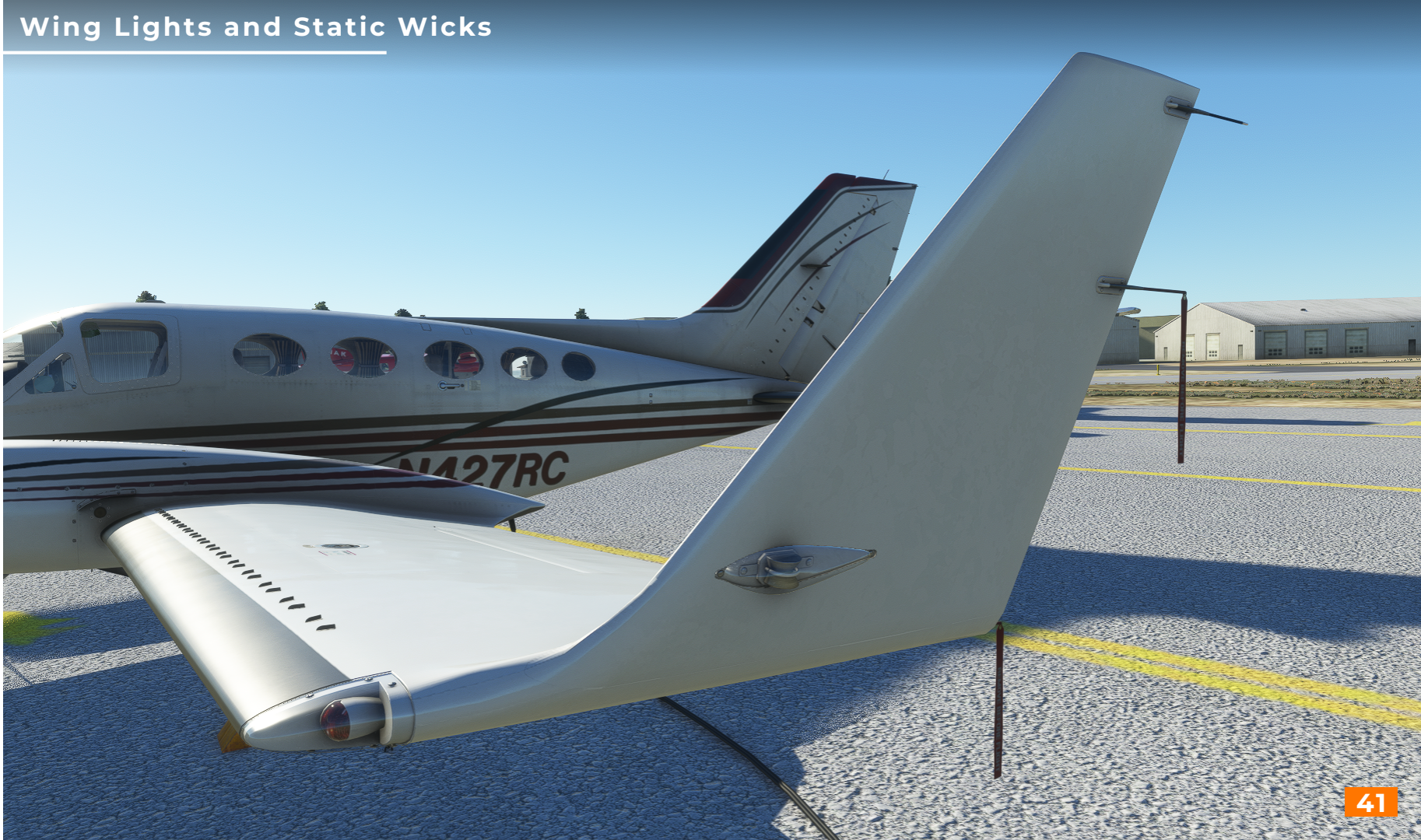


Rudder and nose front gear steering are controlled by a bungee cable.

Note: You will see no nose gear movement until the aircraft is moving. Once the aircraft is stopped, the nose front gear steering will remain in it's last position.

Normally the rudder would hold the counter position of the nose gear, we have put the rudder back to it default animation state. The rudder lock still does work.

Wing Lights and Static Wicks



Chocks

Wing Tie Down

Tail Static Wicks

Tail Tie Down

Fuel Computer

Note: Turning off/on battery takes you back to the preflight mode.

Turning battery off then pressing test then turning battery on resets fuel value to zero.

Fuel remaining in time

In-Flight Modes

Pre-Flight Modes

Function Selector Button

Selects pre-flight and in-flight function modes

Fuel Flow Indicator

Right & Left Engine

Test Button

Operation Mode Selector

Changes operation Mode to:

***ENTER** - Enter data*

***SET** - Set fuel amount*

***RESET** - Rveset gallons, pounds or timer*

What does it do?

The Fuel Computer is a deeply simulated component which constantly keeps track of your aircrafts fuel consumption, informs you about the remaining range and alerts you about abnormalities.

The computer operates in two modes, pre-flight (Lamps highlighted in red) and in-flight (Lamps highlighted in amber).

It's the pilots responsibility to accurately input the correct tanked quanitiy of fuel into the fuel computer, monitor and correct the system manually if nessesarry.

For a more indepth explanation please refer to the additional **Fuel Computer Manual**.

Garmin GFC600

CLICK HERE GARMIN GFC600 MANUAL

GTX 345 Transponder

CLICK HERE GARMIN GTX 345 TRANSPONDER MANUAL

Davtron Clock

Time Correction - Three Way Swtich

Makes minor time corrections

Time Display in Hours & Minutes

Brightness & Hour Change - Three Way Switch

Left Position *sets display brighness for daytime*

Middle Position *sets display brighness for nighttime*

Right Position *momentary position that increases the clock time by 1 hour for every time the switch is moved to this position. Note: Right click toggles the clock mode between 12 or 24 hour format only if the battery switch is off.*

Time Display in Seconds

Channel Selector - Three Way Switch

Up Position *selects real time. This channel may be set to G.M.T. Time or local time. Use time correction and hour change to set GMT or local time. Note: To change clock mode between 12 or 24 hour format, right click the dim switch only if the battery switch is off.*

Middle Position *selects Flight Time*

Right Position *selects Elapsed Time*

Elapsed Time Meter - Three Way Swtich

Up Position *is a momentary position and sets the Elapsed Time meter to zero. The switch returns to middle position when released. NOTE: Up position will zero Flight Time only if the battery switch is off.*

Middle Position *stops the Elapsed Time meter*

Right Position *starts the Elapsed Time meter*

Altitude Alert

Altitude Alert Indicator

3 Lamps indicates if aircraft is within 300 feet of selected altitude, below or above

Altitude Capure Control and Indicator

Middle ARM button *activates the altitude catpure function, provided the Autopilot is turned on and not in Vertical Mode*

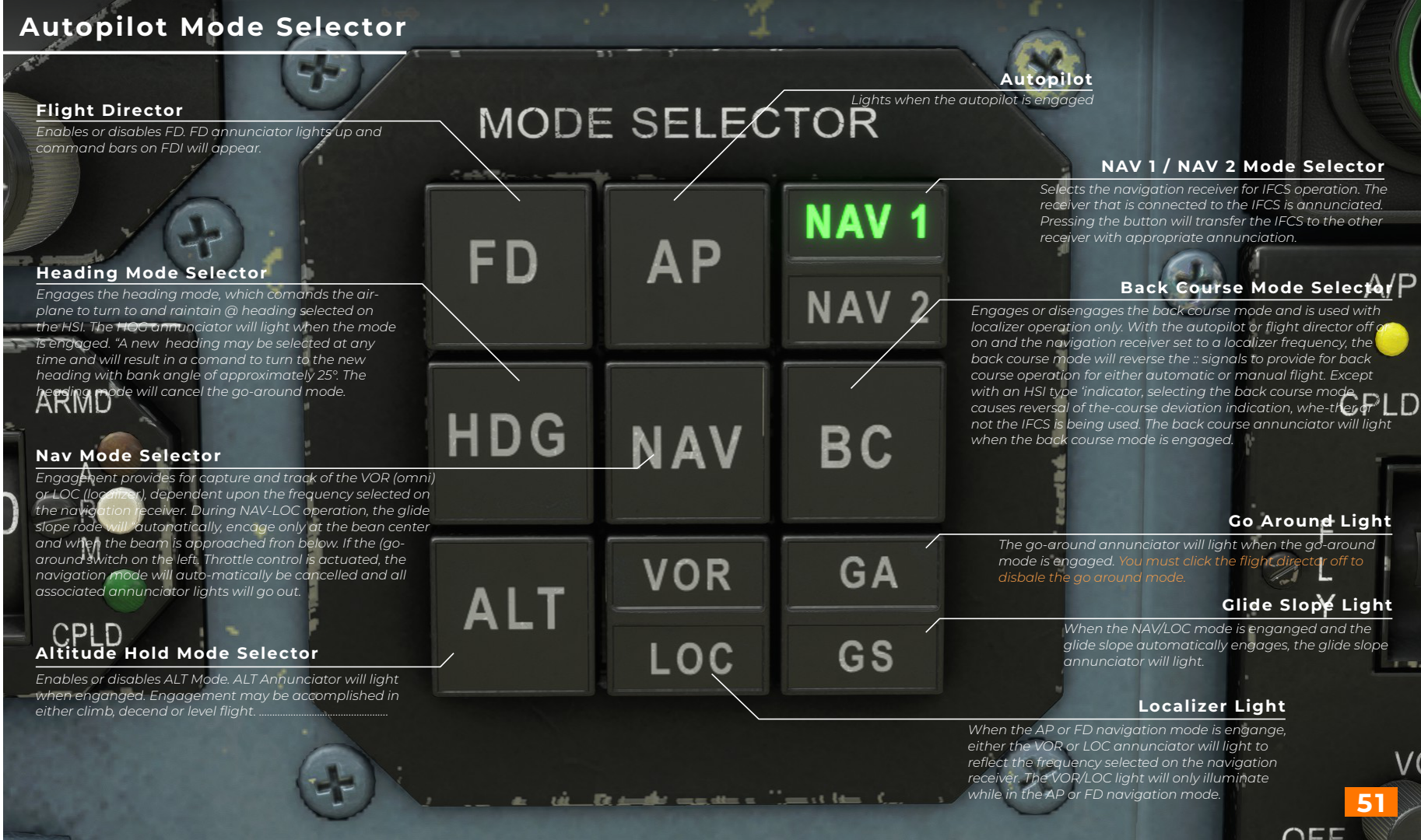
ARMD Amber Lamp *lights when ARM pushbutton switch is pushed in and altitude capture function is enabled.*

CPLD Green Lamp *lights up whenairplane reaches selected altitude. Autopilot switches to altitude hold mode automatically*

Altitude Selectors

Selects altitude between 100 and 35,000 feet

Autopilot Mode Selector



Flight Director

Enables or disables FD. FD annunciator lights up and command bars on FDI will appear.

Autopilot

Lights when the autopilot is engaged

NAV 1 / NAV 2 Mode Selector

Selects the navigation receiver for IFCS operation. The receiver that is connected to the IFCS is annunciated. Pressing the button will transfer the IFCS to the other receiver with appropriate annunciation.

Heading Mode Selector

Engages the heading mode, which comands the air-plane to turn to and raintain @ heading selected on the HSI. The HDG annunciator will light when the mode is engaged. "A new heading may be selected at any time and will result in a comand to turn to the new heading with bank angle of approximately 25°. The heading mode will cancel the go-around mode.

Back Course Mode Selector

Engages or disengages the back course mode and is used with localizer operation only. With the autopilot or flight director off or on and the navigation receiver set to a localizer frequency, the back course mode will reverse the :: signals to provide for back course operation for either automatic or manual flight. Except with an HSI type 'indicator, selecting the back course mode causes reversal of the-course deviation indication, whe-ther or not the IFCS is being used. The back course annunciator will light when the back course mode is engaged.

Nav Mode Selector

Engagement provides for capture and track of the VOR (omni) or LOC (localizer), dependent upon the frequency selected on the navigation receiver. During NAV-LOC operation, the glide slope rode will automatically, encage only at the bean center and when the beam is approached fron below. If the (go-around switch on the left. Throttle control is actuated, the navigation mode will auto-matically be cancelled and all associated annunciator lights will go out.

Go Around Light

The go-around annunciator will light when the go-around mode is engaged. You must click the flight director off to disbale the go around mode.

Glide Slope Light

When the NAV/LOC mode is enganged and the glide slope automatically engages, the glide slope annunciator will light.

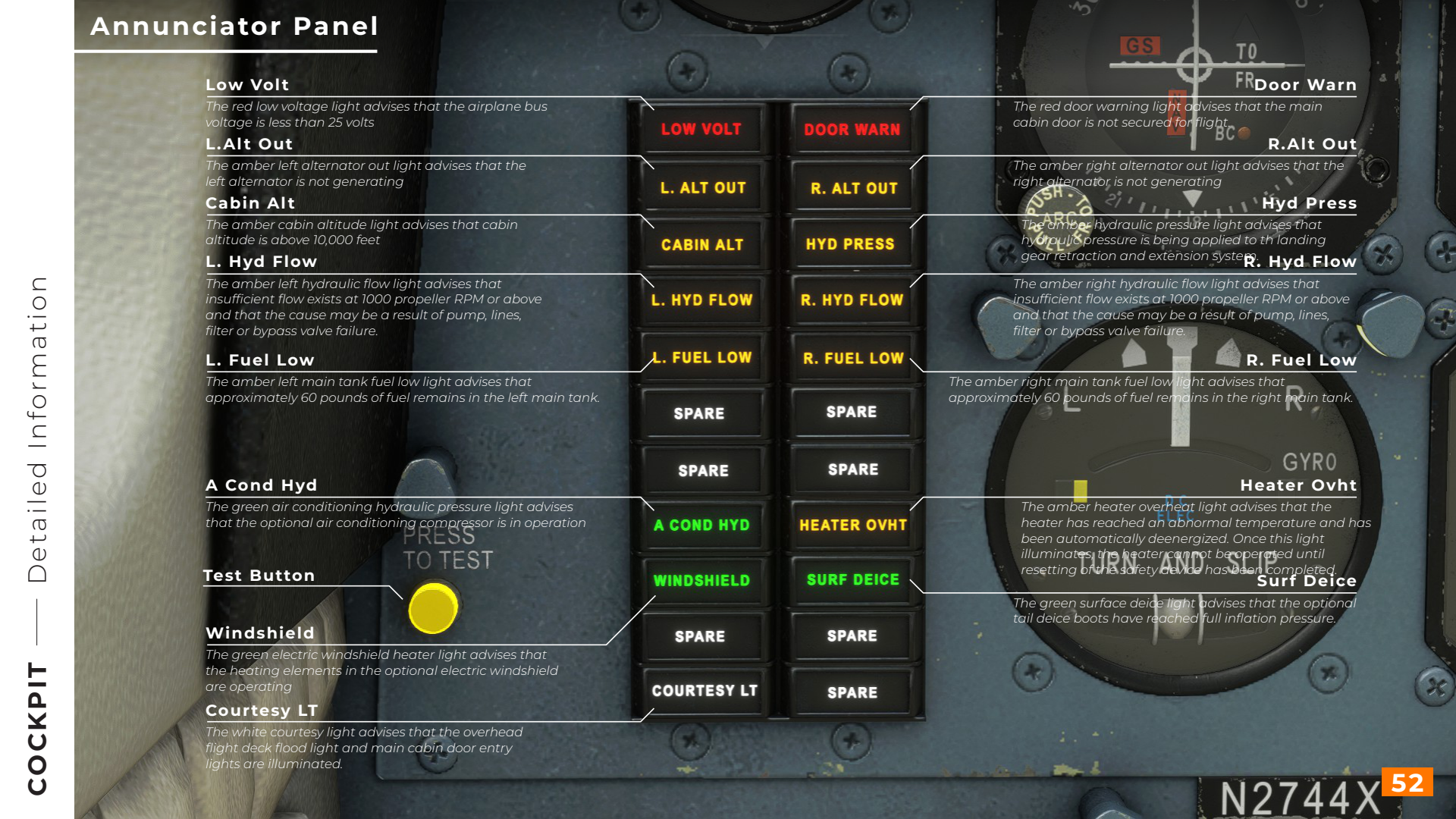
Altitude Hold Mode Selector

Enables or disables ALT Mode. ALT Annunciator will light when enganged. Engagement may be accomplished in either climb, decend or level flight. .....

Localizer Light

When the AP or FD navigation mode is engange, either the VOR or LOC annunciator will light to reflect the frequency selected on the navigation receiver. The VOR/LOC light will only illuminate while in the AP or FD navigation mode.

Annunciator Panel



Low Volt

The red low voltage light advises that the airplane bus voltage is less than 25 volts

L.Alt Out

The amber left alternator out light advises that the left alternator is not generating

Cabin Alt

The amber cabin altitude light advises that cabin altitude is above 10,000 feet

L. Hyd Flow

The amber left hydraulic flow light advises that insufficient flow exists at 1000 propeller RPM or above and that the cause may be a result of pump, lines, filter or bypass valve failure.

L. Fuel Low

The amber left main tank fuel low light advises that approximately 60 pounds of fuel remains in the left main tank.

A Cond Hyd

The green air conditioning hydraulic pressure light advises that the optional air conditioning compressor is in operation

Test Button

Windshield

The green electric windshield heater light advises that the heating elements in the optional electric windshield are operating

Courtesy LT

The white courtesy light advises that the overhead flight deck flood light and main cabin door entry lights are illuminated.

Door Warn

The red door warning light advises that the main cabin door is not secured for flight.

R.Alt Out

The amber right alternator out light advises that the right alternator is not generating

Hyd Press

The amber hydraulic pressure light advises that hydraulic pressure is being applied to th landing gear retraction and extension system.

R. Hyd Flow

The amber right hydraulic flow light advises that insufficient flow exists at 1000 propeller RPM or above and that the cause may be a result of pump, lines, filter or bypass valve failure.

R. Fuel Low

The amber right main tank fuel low light advises that approximately 60 pounds of fuel remains in the right main tank.

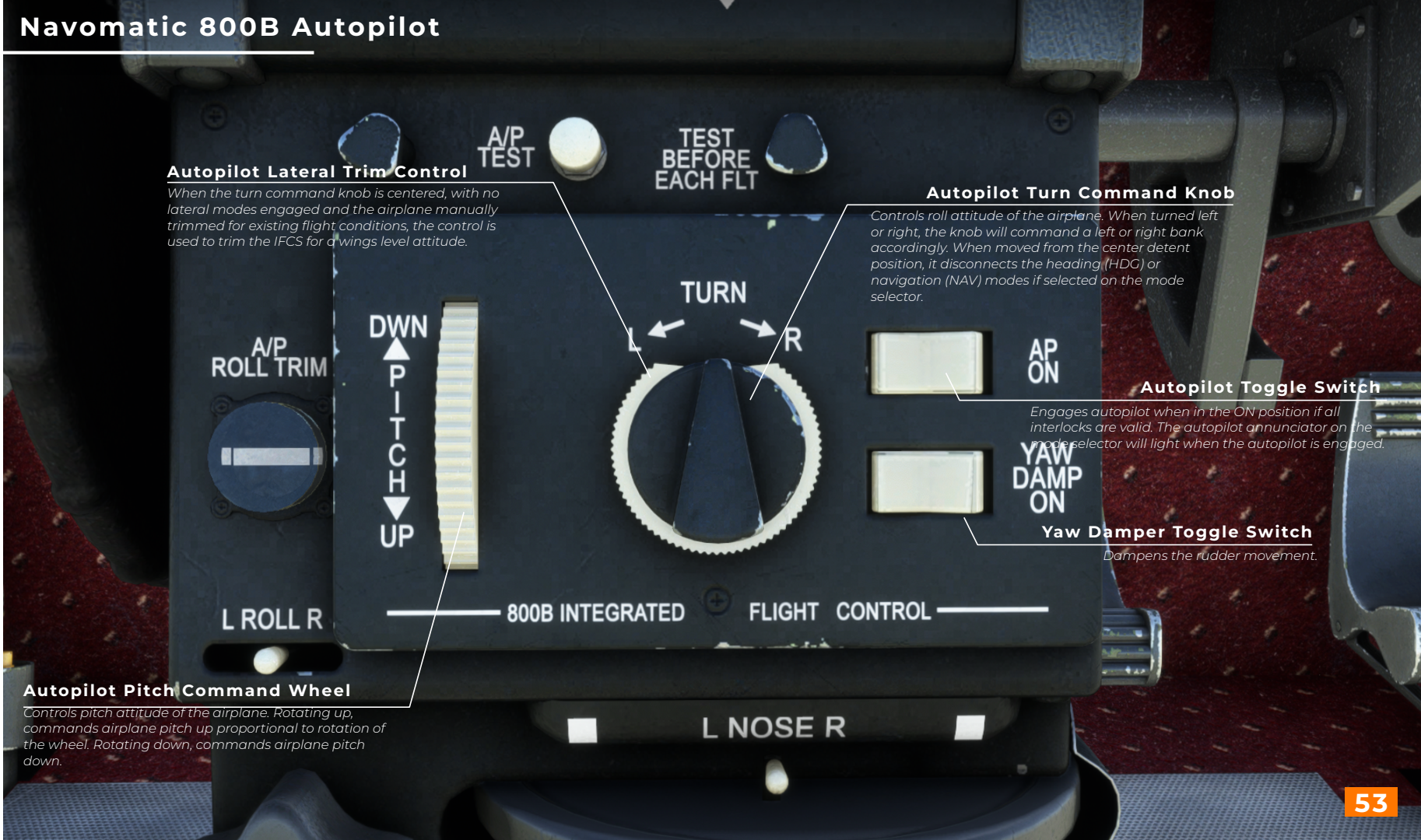
Heater Ovht

The amber heater overheat light advises that the heater has reached an abnormal temperature and has been automatically deenergized. Once this light illuminates, the heater cannot be operated until resetting of the safety device has been completed.

Surf Deice

The green surface deice light advises that the optional tail deice boots have reached full inflation pressure.

Navomatic 800B Autopilot



Autopilot Lateral Trim Control

When the turn command knob is centered, with no lateral modes engaged and the airplane manually trimmed for existing flight conditions, the control is used to trim the IFCS for a wings level attitude.

Autopilot Turn Command Knob

Controls roll attitude of the airplane. When turned left or right, the knob will command a left or right bank accordingly. When moved from the center detent position, it disconnects the heading (HDG) or navigation (NAV) modes if selected on the mode selector.

Autopilot Toggle Switch

Engages autopilot when in the ON position if all interlocks are valid. The autopilot annunciator on the mode selector will light when the autopilot is engaged.

Yaw Damper Toggle Switch

Dampens the rudder movement.

Autopilot Pitch Command Wheel

Controls pitch attitude of the airplane. Rotating up, commands airplane pitch up proportional to rotation of the wheel. Rotating down, commands airplane pitch down.

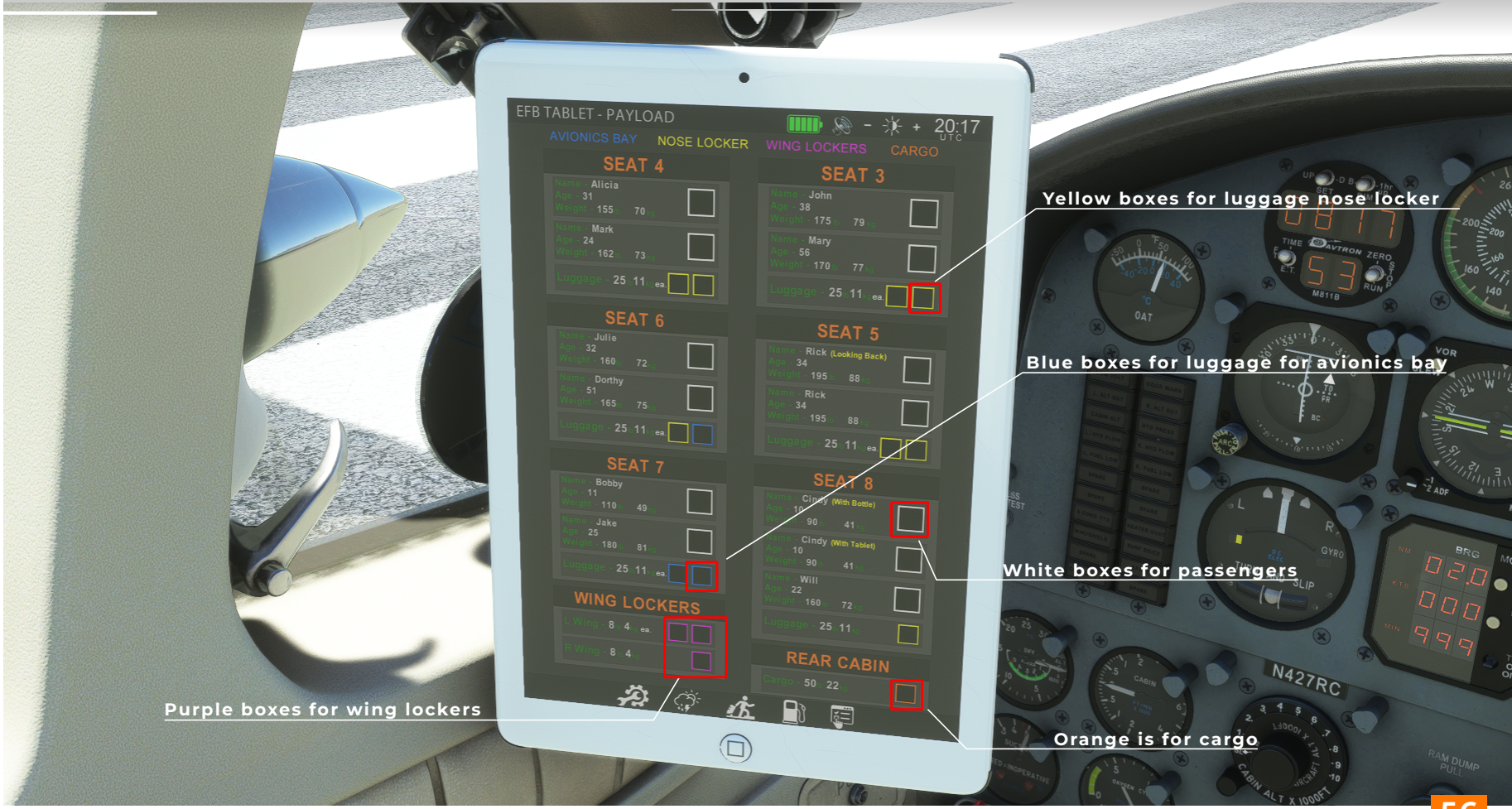
EFB Tablet


STORES/MOUNTS EFB
Hotspot
Battery life 2 hours
Note: Tablet stores in pouch near pilot leg. Click the camera again to mount the tablet.
Power Button

EFB Tablet


EFB TABLET - CONFIGURATION
20:17
UTC
EQUIPMENT
CHOCKS
ENG PLUGS
TIE-DOWNS
STATIC WICKS
PITOT COVERS
GPU
DOORS
CABIN UPPER
CABIN LOWER
NOSE DOOR 1
NOSE DOOR 2
NOSE DOOR 3
L WING LOCKER
R WING LOCKER
AIRCRAFT STATE
START ENGINES
PRESS / HOLD
READY TO START
COLD / DARK
MAINTENANCE
FUEL CAPS
OIL DOORS
HYD RESVR
ENGINE DOORS
CONTROL LOCKS
YOKE LOCK
RUDDER LOCK
CO-PILOT
SHOW CO-PILOT
Clock
Click to change from UTC to Local time
Brightness
Click to adjust brightness level
Sound
Click to mute and unmute
Battery
Battery life is 4 hours
Click to enable/disable
Page selections
N427RC

EFB Tablet


EFB TABLET - PAYLOAD
20:17 UTC
AVIONICS BAY
NOSE LOCKER
WING LOCKERS
CARGO
SEAT 4
SEAT 3
SEAT 6
SEAT 5
SEAT 7
SEAT 8
WING LOCKERS
REAR CABIN
Yellow boxes for luggage nose locker
Blue boxes for luggage for avionics bay
White boxes for passengers
Purple boxes for wing lockers
Orange is for cargo
N427RC

EFB Tablet

Each hotspot for camera location

Note: Use a custom saved camera shortcut to return to the tablet.

Note: Use the widget to open the interactive copilot checklist. This display is to just help to know when to start a checklist during the flight.

Each hotspot for checklist

Note: This opens a static checklist page for that checklist stage. Click anywhere on that page to return to this page.

For more detailed information

Click here to download

(Right click for options to open a new tab)

Garmin GFC600 PDF

For video tutorial

Click here to watch

(Right click for options to open a new tab)

For more detailed information

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Garmin GTX 330 Manual PDF

DISCLAIMER: ALTHOUGH THE BEZEL IS A GTX 345 IN THIS PRODUCT

THE CODE IS FROM THE ASOBO GTX 330

Pilot's Operating Handbook

For

HOSKINS

CFS-2000A/2001A

COMPUTERIZED FUEL MANAGEMENT

SYSTEMS

TABLE OF CONTENTS

COMPUTERIZED FUEL SYSTEMS

1.0

GENERAL SYSTEM DESCRIPTION

The Computerized Fuel Systems, herein referred to as CFS, are designed to maximize efficiency of fuel system monitoring and management and bring space-age capability and display technology to general aviation.

The CFS systems consist of a panel mounted instrument and fuel flow transducers which are designed for istalllation in the aircraft fuel lines.

MODEL	AIRCRAFT TYPE	TRANSDUCERS
CFS-1000A/1001A	Single Engine	One
CFS-1000A/2001A	Twin Engine	Two

These systems are designed for use in all single and twin engine aircraft having nore more than 60 GAL/HR continous consumption or 78 GAL/HR intermittent consumption (take off power)

1.1 PANEL MOUNTED INSTRUMENT

The panel mounted instrument contains all system electronics, operating and programing controls, and the digital readout display.

The digital readout utilizes incandescent, seven-segment displays and the function or mode legends incorporate mini-lamps. All digital readouts and legend displays are fully sunlight readable and feature automatic dimming for night and low light level flight conditions.

The systems' electronics are completely packaged in the panel mounted instrument on three rectangular circuit boards. The electronic designs features the highest quality, solid state components available and a "single-chip' microprocessor.

The system computers are designed to precisely count the number of pulses from the fuel flow transducer(S) and convert the count to gallons. A crystal controlled clock reference is used to compute the rate of fuel flow and the "TIMER" functions. The computer also routinely calculated all other displayed functions.

The basic program is permanently "burned-in" to the microprocessor chip, whi;e variable data and intermediate computation values are stored by the computer in a sparate memory bank. The aircraft's total usable fuel is programmed into this separate memory circuit by the computer in response to the installer's original instructions.

The panel mounted instrument and the flow tranducer(s) are digital devices, therefore, there is no need for adjustment or calibration. The installer programmed "FILLUP" number, or

usable fuel, is maintained in the computer memory even during aircraft shutdown. Electrical power for this function is provided by three small batteries mounted in the rear of the instrument case.

A low battery warning indicator is located on the front panel and will appear on the CFS-1000A/2000A as a minus sign in the upper display and on the CFS-1001A/2001A, a low battery legend will illuminate when the batteries become weak or need to be replaced. The batteries will typically last between 1 to 1 1/2 years and annual replacement is recommended.

1.2 FUEL FLOW TRANSDUCER

The flow transducer(s) are mounted directly in the fuel line, usually in the engine compartment. The transducer(s) measure flow of hydro-carbon fuel such as gasoline or kerosene.The transducer(s) are rated for a continous operation to 60 gallons per hour and for intermittent flows in excess of 60 gallons per hour. In addition, the tranducer(s) are precisely accurate down to 0.6 gallons per hour .

The transducer(s) supply the CFS computer with a pulse signal from a self contained opto-electronic pickup. A neutrally buoyant rotor spins with the liquid between V-jewel bearings.The rotor movement is sensed when notches in the rotor interrupt an infra-red light beam between a light emitting diode and a photo-transistor.

The transducer(s) are designed totally fail safe and complete rotor blockage cannot interrupt fuel flow. The transducer(s) life expectancy is 1,000 hours.

2.0 OPERATING PROCEDURES

The system operating procedures may be divided into two segments or conditions, Preflight and Inflight.

The Preflight, or program condition, is automatically called up by the computer when the aircraft's master switch is initially turned on. It is during the Preflight condition that the pilot updates or programs the computer to the current fuel system status.

When satisfied with current system status, the pilot verifies the accuracy of the data being entered into the computer and depresses the enter button. This action updates or programs the computer and automatically switches the system to the Inflight condition.

The words Preflight and Inflight condition do not appear in legend form on the face of the instrument. However, the legends of the Preflight condition appear on the right of the instrument and are a red color as a subtle reminder of the Preflight or program condition. The Inflight condition legends are located on the left side of the instrument and are amber in color.

2.1 FUNCTIONAL CONTROLS

The CFS system are controlled through all modes of operation by the use of three push buttons. Two are for the primary modes, and one is for the test mode. The principal operating button is in the center of the instrument display and is labeled "FUNCT" for

function. The mode operation or function is stepped automatically through a sequence by pressing the function button, in either the Preflight or the Inflight condition.

The push button located in the lower left portion of the display instrument is not labeled by silk screen as are the "FUNCT" and "TEST" push buttons. However, this push button is acompanied by a lighted legend system that automaticallly indicates the correct mode of operation and is controlled by the "FUNCT" push button. The three modes of operation are "ENTER", "SET" and "RESET".

"ENTER" -- Push to enter data into computer.

"SET" -- Set fuel amounts less than total usable.

"RESET" -- Reset button is used to zero or reset gallons used, pounds used or timer, allowing measurement of fuel and time for specific trips, holding pattern legs, or approaches.

The test push button is located on the lower right of the instrument display. When the test button is depressed, all legends and digits will illuminate for approximately three seconds, checking all legend lamps, the digital displays, and approximately 80% of the microcomputer. When the test button is depressed, all of the digits will illuminate as eights except the upper right digit which will illuminate as zero (8880). The microprocessor is programmed to automatically turn off the TEST circuit after three (3) seconds to assure no unnecessary heat build up.

The intensity of the digital displays and the lighted legends are automatically controlled to ease pilot workload and insure reliability in low and high intensity light conditions. The push-button controls have also been designed to ease pilot workload in all conditions of cockpit lighting and air turbulence.

The "Low Fuel" warning legend, located in the center of the instrument display, is designed to come on when, at current power setting, the time remaining to fly is less than one hour. When the time drops below 30 minutes, the legend blinks to further notify the pilot of & Low Fuel Status.

2.2 PREFLIGHT OPERATION

IMPORTANT NOTE : It is absolutely essential that the pilot program the computer to equal the amount of usable fuel in the aircraft's tanks before each flight. The computer measures fuel flow, and precisely counts down the remaining usable fuel from the programmed value provided during the Preflight condition. As in all computers, the accuracy of the resultant information is a direct result of the accuracy of the information that was originally provided to the computer. Therefore, complete supervision of the fueling procedure is a must.

2.3 PREFLIGHT PROGRAMMING

PREFLIGHT MODES

MODE	PROGRAMMING SITUATION USED
FILL UP	#1 Fuel Tanks Topped
GAL REM	#2 No Fuel Added
ADD GAL	#3 Tanks Not Topped
VERIFY	Verify correct information

Situation #1: Fuel Tanks Topped

Turn on the aircraft's master switch. The legend "GAL REM"will appear on the right section of the instrument, as will the legend "ENTER" on the lower portion. Simultaneously, the top section of the instrument will display the actual usable gallons of fuel remaining from the previous flight. Press the "FUNCT" button. The CFS systems display the aircraft's total usable

uel (as programmed by the installing agency) and the legend "FILLUP" will appear in red on the right section of the instrument display. The legend "ENTER" will appear on the lower center section. If you have verified the tanks being topped off, press the "ENTER" legend button, thus programming the computer.This completes the Preflight programming for a full tank situation.

The computer will automatically switch to the Inflight condition, displaying the "GAL REM" legend in amber on the left of the instrument and the usable gallons remaining across the top section. On starting the engine (or engines), fuel will begin following and the CFS systems will digitally display the gallons per hour fuel flow on the lower section of the instrument display. The instrument is now programmed and ready for flight.

Situation #2: No Fuel Added

Turn on the aircraft's master switch. The legend "GAL REM" will appear on the right section of the instrument, as will the legend "ENTER" on the lower portion. Simultaneously, the top section of the instrument will display the actual usable gallons of fuel remaining from the previous flight. If the amount displayed is sufficient to satisfy your planned flight needs, depress the "ENTER" button.This completes the Preflight programming for a "No Fuel Added" situation.

The computer will now automatically switch to the Inflight condition displaying the "GAL REM" legend in amber (on the left of the instrument) and the usable gallons remaining across the top section of the display. On starting the engine (or engines), fuel will begin flowing and the CFS instrument will display the gallons per hour fuel flow on the lower

section of the instrument. Procedure #2, explained above, programs the CFS instrument with the "GAL REM" quantity from the previous or last flight.

The CFS is now programmed with "GAL REM" from the last flight. When the engine(s) is started the "GAL REM" display will count downward to zero (0).

Situation #3: Fuel Added -- Less Than Topped

Turn on the aircraft's master switch. The top section of the instrument will display the actual usable gallons of fuel remaining. If the amount displayed is insufficient to satisfy your planned flight needs, but you do not desire to take on a full load (due to altitude or weight restrictions)press the "FUNCT" button. The CFS instrument will display the aircraft's total usable fuel (as programmed by the installing agency) and the legend "FILLUP" will appear in red on the right section of the instrument. Press the "FUNCT" button. The legend "ADD GAL" will appear in red on the right of the instrument, and the legend "SET" will appear on the lower center. Simultaneously, the digital readout on the top section of the instrument will read all zeros. You are now ready to set values into the computer equaling the amount of fuel you have added to the tanks (less than fuel). Note, the zero on the far left is blinking, enabling you to observe the digit you are currently setting. Press the "SET" button until the blinking digit is incremented (one digit step per button push) to the desired value of the first digit. Then press the "FUNCT" button to shift the blink to the next digit, and increment it with the "SET" button as before. When all digits are set, press the "FUNCT" button; the blinking will stop and the legend "VERIFY" will appear on the right of the instrument,
and "ENTER" will appear on the lower center.
If the amount of fuel displayed does not agree with your fuel ticket, press the "FUNCT"

button three (3) times to return to the "ADD GAL" mode. If the amount agrees with your fuel ticket, press the "ENTER" button. The display amount will now equal the remembered "GAL REM" plus the amount just entered into the CFS computer, or total usable fuel abroad. On pressing the "ENTER" button, the computer automatically switches to the Inflight condition. If you note an error made during the "ADD GAL"sequence and wish to revise the value on the display, appears and repeat the setting procedure. The CFS instrument is now programmed and ready for flight.

NOTE: If an error was made and the wrong amount of fuel entered into the Inflight mode, the following sequence must be used to return the computer to approximately zero so the correct amount of fuel may be entered.

1. Turn master switch off, then on, to reset the computer to Preflight condition.

2. Observe the incorrect "GAL REM" number.

3. To obtain the correction number subtract the incorrect "GAL REM" number from 1001 for twin engine aircraft and 100 for single engine aircraft.

EXAMPLE FOR TWIN :

1001 Overflow Amount
-178 Incorrect "GAL REM"
---
823 Correction Number

4. Press the function button twice to enter the "ADD GAL" mode. Enter the correction number as previously explained in
Situation #3. This will return the "GAL REM" number to approximately zero.

5. Turn master switch OFF, then ON, and step to the "ADD GAL" mode by depressing the function button. The correct "GAL REM" number may now be entered as previously explained in situation #3. This completes the correction sequence.

2.4 INFLIGHT OPERATION

As indicated in the Preflight or programming portion of this manual, the CFS systems incorporate three Preflight programming capabilities. When entering any one of these possible program situations, the computer automatically switches to the Inflight condition. Fuel flow is displayed only after the engines have been started.

The fuel flow window(s) on the lower section of the instrument will remain blank until a fuel flow is establishes. If the fuel is below 2.8 gallons per hour, the computer will blink the flow window to show a low flow situation. if at any time the flow is stopped or interrupted, the flow window will blank-out after approximately ten (10) seconds to indicate a no flow status.

The fuel flow window is updated on every 1024Th pulse. This method provides the pilot with a very stable fuel flow indication at the cruise power settings. A typical display update rate, at a fuel flow of 20 gallons per hour, would be every 2.178 seconds.

There are six Inflight modes. Each mode is selected in sequence by pressing the "FUNCT" button.

The following chart indicates the mode sequence and the legend key.

LEGEND	MODE
GAL REM	Gallons Remaining
LB REM	Pounds Remaining
TIME REM	Time Remaining
GA. US'D	Gallons Used
LB. US'D	Pounds Used
TIMER	Timer (elapsed time)

During the automatic switching from the Preflight to the Inflight mode, the computer calls up the initial mode "GAL REM". From this initial mode the pilot may change modes (in the above sequence) by pressing the "FUNCT" button.

During the transfer from the Preflight to the Inflight condition, CFS computer goes through an adjusting or rounding routine and may add or subtract, from the "GAL REM" number, two

tenths (2/10) for a single engine aircraft or up to one (1) gallon for a twin. This automatic adjustment compensates for the "K" factor setting of the instrument and does not affect the accuracy.

As noted in the Functional Controls Section the first three Inflight modes, "GAL REM", "LBS REM" and "TIME REM" are nonresettable in the Inflight condition. This protects the pilot from accidential changes during flight. The second three Inflight modes can only be reset by depressing the "RESET" button while in each mode. However, the "GAL US'D" and "LBS US'D" will be reset together because the "LBS US'D" quantity is computed from the "GAL REM" number. The conversion factor for this computation is 5.82 pounds per gallon.

In the first mode, "GAL REM", the upper display indicates fuel remaining in gallons, and the lower display indicates fuel flow in gallons per hour. The lower display also includes a legend that automatically indicates GAL/HR in all gallon modes and LB/HR in all pound modes.

The upper display includes a legend that automatically indicates "HR:MIN" or "MIN:SEC" depending on which is appropriate in a given situation.

The second mode in sequence is the "LB REM" mode. When operating the system in this mode, the upper display will indicate pounds of fuel remaining, and the lower display will indicate fuel flow in pounds per hour.

The third mode is "TIME REM" mode. When operating the systemin this mode, the upper display will indicate time remaining to fly at the current power setting, and the lower display will indicate fuel flow in gallons per hour.

During operation in the "TIME REM" mode the time remaining display will vary as the power settings are increased or decreased.

The "LOW FUEL" warning legend located in the center of the instrument is designed to come on when the current power setting results in a "TIME REM" of less than one (1) hour. If the "TIME REM" drops below thirty (30) minutes the legend will blink to furthur notify the pilot of a Low Fuel Status.

The fourth mode is the "GA US'D" mode. When operating the system in this mode, the upper display will indicate gallons used and the lower display will indicate fuel flow in gallons per hour. This mode may be reset to zero by pressing the "RESET" buttonl; however this will also reset the "LBS US'D".

The fifth mode is the "LB US'D" mode. When operating the system in this mode, the upper display will indicate pounds used and the lower display will indicate fuel flow in pounds per hour.This mode may be reset to zero by pressing the "RESET" button; however this will also reset the "GALUS'D".

The sixth mode is the "TIMER" mode. While operating the system in this mode, elapsed time is indicated. The "TIMER" mode indicates minutes and seconds up to nine minutes and fifty-nine seconds and hours and minutes beyond that point. The elapsed time is indicated in the upper display and the lower display indicates fuel flow in gallons per hour. When the "TIMER" mode is selected the elapsed time may be reset by pressing the "RESET" button.

During aircraft shutdown the "GAL REM", and "LBS REM" quantities will be retained by the computers internal memory. All other Inflight functions are reset to zero (0) when the aircraft power is turned off.

3.0 SYSTEM MAINTENANCE

The Fillup number is normally held for a period of one year by the three small Eveready MS-76 batteries in the rear of the instrument. These batteries should be replaced once each year. During installation and after replacing the batteries, the Fillup number (aircraft total usable fuel) may need to be reprogrammed. The following procedure will explain the steps necessary to change or reprogram the Fillup number.

3.1 PROGRAMMING THE FLLUP NUMBER

The CFS-1000A/1001A cannot be programmed for a "FILLUP" number greater than 99.9 gallons unless switch #3 is turned to the ON position.

FILLUP programming may be performed on the bench with a 14v or 28v DC power source or in the aircraft with aircraft power.

A. On the CFS-1000A/2000A, remove the one screw attaching the instrument battery cover. The seven mini- switches will now be exposed. On the CFS-1000A/2001A the battery cover

need not be removed. The battery compartment will be directly below on the CFS-1000A/2000A only. Locate the far left switch marked #1 and push to the ON or CLOSED position. All other switches are pre-set at the factory. Do not change their position. In the event their position is changed, refer to the Switch Table to reposition them.

B. Turn the aircraft master switch ON. Note all the digits on the top display have gone to zero and the far left zero is blinking. The minus sign on the right hand side of the display is the low battery indicator in the CFS-1000A/2000A only.

C. Press the "SET" button to advance the blinking digit to a number equalling the first number in the aircraft's usable fuel. Press the "FUNCT" button once and observe that the second digit is now blinking. Press the "SET" button to advance the blinking digit to the desired second number of the aircraft's usable fuel.

Press the "FUNCT" button again. This will cause the third and final digit to blink as did the first two digits. Press the "SET" button, advancing the third digit to the desired final figure in the aircraft's usable fuel. Press the "FUNCT" button and note the legend "VERIFY". Press the "ENTER" button if this number corresponds to the aircraft's usable fuel. The programmed number may change or blank out. This is normal, continue programing with step D.

D. Locate the mini-switch marked #1 and push to the OFF or OPEN position. (CFS-1000A/2000A Only: Reinstall the three small batteries and the battery cover.

E. Turn the power switch off.

F. Turn the aircraft master switch on and press the "FUNCT" button. The "FILLUP" legend will be illuminated and the number displayed should agree with the aircraft usable fuel or the number just programmed. If the number agrees, push the "ENTER" button. If the number does not agree, repeat steps A,B,C,D,E&F.

G. "GAL REM" should equal the aircraft usable fuel. Finally, push the "TEST" button to assure that all legends and digits illuminate properly. The digital displays will read eight (8) in the test position with the exception of the far right which will read zero (0). (After the "TEST" button has been depressed for 3 seconds, the CFS-1000A/2000A or 1001A/2001A will automatically cycle out of the test mode to avoid overheating).

H. Turn off the power switch. This completes the programming of the Fillup number.