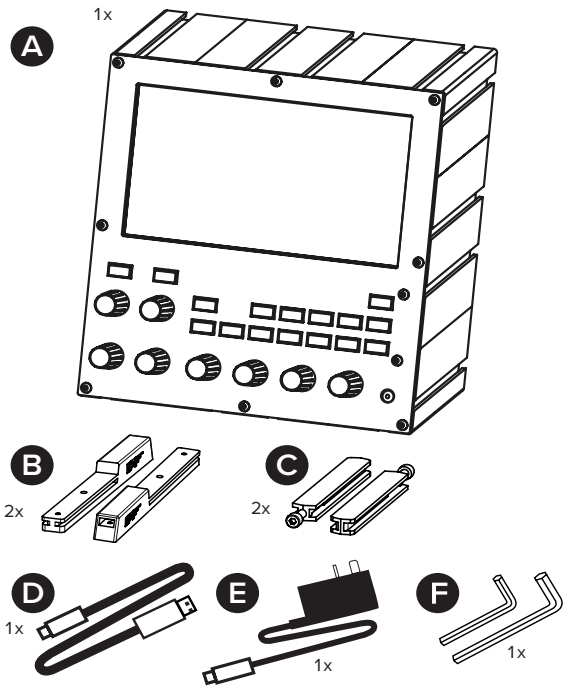
SWITCHO RADIOS/ RADIOS-E

USER'S MANUAL

Rev. 3.1 - January 2025



1. IN THE BOX

A) SWITCHO RADIOS

B) Anti-slip legs

C) "H"connecting piece between modules

D) USB-A to USB-C Cable

E) USB-C Power supply (with four regional interchangeable heads)

F) Allen keys (n.2, n.3)

For support, contact us at support@virtual-fly.com

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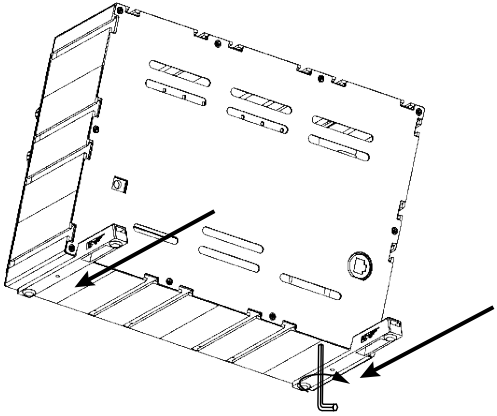
2. HARDWARE SETUP

2.1 ATTACHING TO DESKTOP/HOME COCKPIT SETUP

OPTION A: Using Anti-slip Legs

Introduce both anti-slip legs (B) in the lower slots from the backside, as indicated below. Using the n.2 Allen key (H), tighten the screw on each anti-slip leg until you feel resistance.



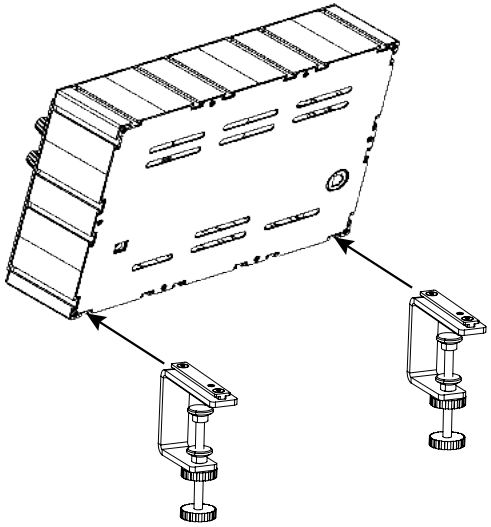
To secure your SWITCHO RADIOS into your desktop, simply place them the device on the surface it will rest, and the anti-slip legs will ensure it won't move.

OPTION B: Using SWITCHO CLAMP (not included)

Set up your SWITCHO RADIOS in your home cockpit using the SWITCHO Clamp to fix it into your support base. This item is sold separately in our website at:

https://www.virtual-fly.com/shop/avionics/switcho-radio

Slide in the SWITCHO Clamp into the lower slots of the SWITCHO RADIOS as displayed in the diagram below, and attach the clamp onto the support base.

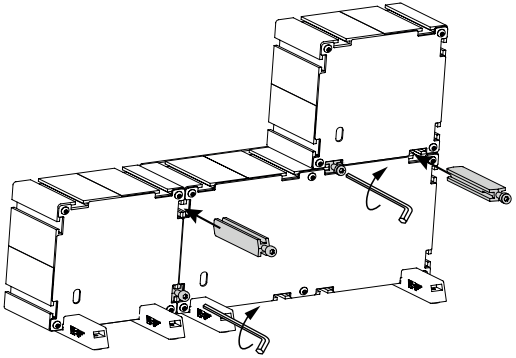


2.3 MODULE ASSEMBLY

If you own another SWITCHO module, you can combine the modules with the provided connecting pieces **(C)**.

The modules can be combined forming rows and columns. Expand your SWITCHO Family and configure it to your preferences.

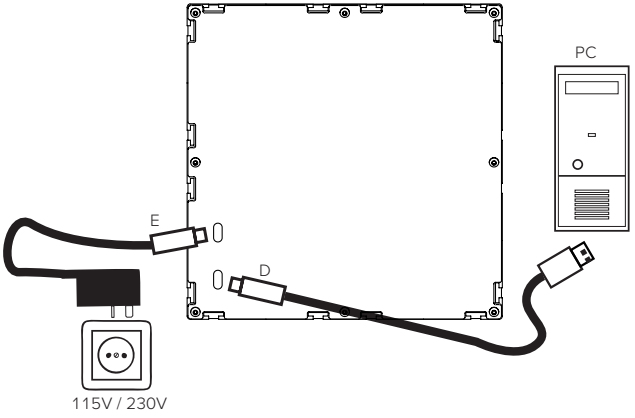
Join the modules you want to combine and introduce the connecting pieces **(C)** as displayed below. Tighten the screw with n.3 Allen key (H) until you feel resistance.



2.4 CONNECTING TO PC

Connect the USB-C power supply cable (E) to the back of the SWITCHO RADIOS labelled as “Power 5V” and the USB-A to USB-C cable (D) to the back of the SWITCH module labelled as “PC USB”. Connect the power supply to a wall power socket and the free end of the USB cable (D) to the computer where the flight simulator software is running.

! To avoid connectivity issues, it is recommended to connect the SWITCHO RADIOS to a **USB 3.0 port** on the computer or alternatively to a powered USB hub



3. SOFTWARE SETUP

Microsoft Flight Simulator PREPAR3D XPLANE

The SWITCHO RADIOS module interacts with any computer using our own custom protocol through VFHub, which makes it compatible with MSFS, Prepar3D$_{V4\text{-}V5}$ and X-Plane 11/12. VFHub is the software developed by Virtual Fly to simplify setting up our products. With VFHub, you can fly your favorite flight simulation software without worrying about configuring your Virtual Fly flight controls.

You can download the latest VFHub version from this link: https://www.virtual-fly.com/setup-support. The VFHub installer takes care of installing VFHub and all the required modules. VFHub is compatible with MSFS, Prepar3D$_{V4\text{-}V5}$ and X-Plane 11/12.

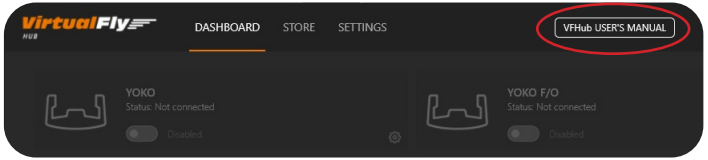
After installing VFHub, make sure your SWITCHO RADIOS is connected to your computer. Run VFHub and verify that the SWITCHO RADIOS status displayed in the Dashboard is "Connected".

VFHub takes care of making your SWITCHO RADIOS module work with MSFS, X-Plane 11/12 and Prepar3D$_{V4\text{-}V5}$, so it **must always be running** when you use the SWITCHO RADIOS.

!

Although this is done automatically, if you want to **select the COM port** your RADIOS uses select the **device's options button** (⚙) in **VFHub's Dashboard**.

For detailed instructions on all the tuning and customization possibilities of VFhub, **check the USER's MANUAL button in the VFHub software.**

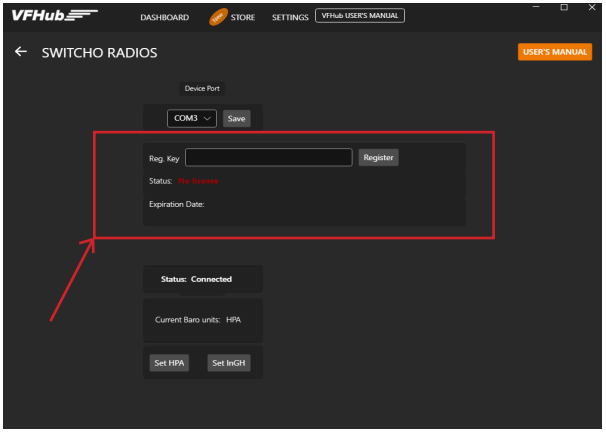


3.1 ACTIVATING YOU SWITCHO RADIOS-E ADD-ON PURCHASE

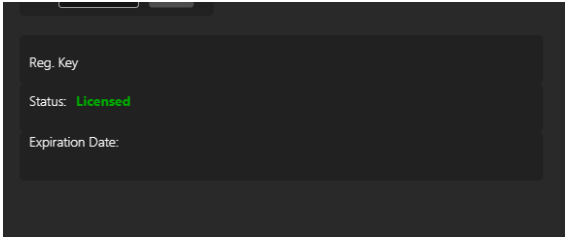
The **SWITCHO RADIOS** includes a secondary screen where you can access the **engine display** and the **EFIS**. To access this screen, simply **swipe right** on the touch-sensitive display.

If you have not purchased the new add-on, the following message will appear on the screen:

To activate the feature, navigate to **VFHub**, locate the **SWITCHO RADIOS section**, and enter the **Registration Key** provided by Virtual-Fly upon purchasing the update. Refer to the following figure for guidance:



Once the **Registration Key** is activated, the screen will appear as shown below:

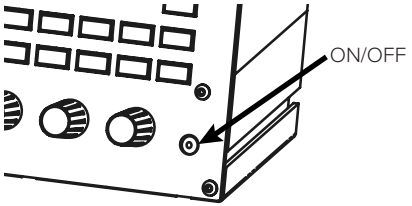


4. START UP

4.1 ACTIVATING PROCEDURES

1. Start your preferred flight simulation software (MSFS, Prepar3D or X-Plane 11/12).

2. After the RADIOS is connected to the PC, press the ON/&OFF button indicated below to turn ON the device.



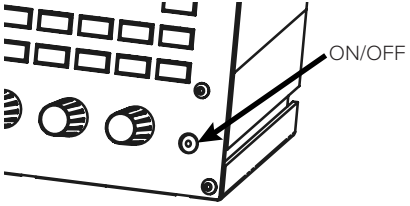
3. After the device is ON with the screen showing the defualt screen, execute the VFHub software. Make sure VFHub dashboard shows “Connected” status for the RADIOS, press the push button (a) indicated below to start the RADIOS.

! It is **very important to activate/deactivate the device using the ON/OFF button** and to **wait for the software to load** before deactivating the device.

! If the **main bus is not energized**, neither the main screen nor the secondary screen will display **any information**.

4.2 DEACTIVATING PROCEDURES

Press the push button of the SWITCHO RADIOS and wait until everything has stopped before unplugging the SWITCHO RADIOS from the power source.



4.3 UPDATING THE DEVICE

If when you turn on VFHub a message appears on your device saying there is a newer version available, simply press the update button and wait 3-5 minutes. Once the update is finished, the device will restart and will be good to go!

5. RADIOS FUNCTIONS

5.1 KEYS AND KNOBS

The SWITCHO RADIOS contains push buttons (keys) and rotary switches (knobs) to control RADIO and AUTOPILOT functionalities. **The knobs have four different functions: (R), (C), (P) or (R+P)** depending on how they are actuated:

- **(R)** Rotating the Knob
- **(C)** Clicking the Knob (once)
- **(P)** Pressing the knob for 1 second
- **(R+P)** Rotating + Pressing the knob

RADIO

- **NAV1 | NAV2 key:** Transfers the standby and active NAV frequencies.
- **COM1 | COM2 key:** Transfers the standby and active COM frequencies.
- **NAV1 | NAV2 knob: (R)** Sets the kHz of the standby NAV frequency. **(C)** Toggles the tuning cursor (white box) between the NAV1 and NAV2 fields. **(R+P)** Sets the MHz of the standby NAV frequency.
- **COM1 | COM2 knob: (R)** Sets the kHz of the standby COM frequency. **(C)** Toggles the tuning cursor (white box) between the COM1 and COM2 fields **(R+P)** Sets the MHz of the standby COM frequency.
- **ADF knob: (R)** Sets the kHz of the standby ADF code. **(C)** Transfers the standby and active ADF codes. **(R+P)** Sets the standby ADF code in larger steps.
- **XPDR knob: (R)** Sets the selected XPDR code digit. **(C)** Changes the selected digit of the code. **(R+P)** Sets the XPDR mode.

AUTOPILOT & NAVIGATION FUNCTIONS

The SWITCHO RADIOS's autopilot is inspired by the design and functionality of both G1000 NXI and Bendix KFC22, and is limited to the functionality of MSFS, X-Plane 11/12 and Prepar3D$_{V4\text{-}V5}$.

This autopilot seeks to integrate all available functionalities in all default General Aviation aircraft of MSFS, X-Plane 11/12 and Prepar3D$_{V4\text{-}V5}$.

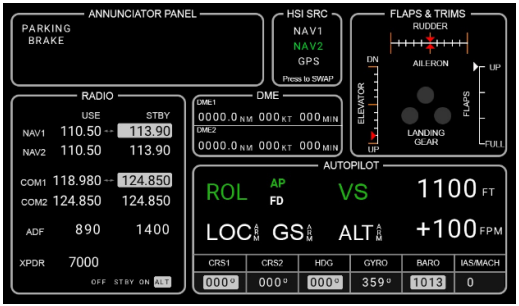
- **AP key:** Engages the Autopilot, Flight Directors and Yaw Damper (if installed). By default, the PIT and ROL modes will be activated upon activation of the Autopilot. If pressed with Autopilot active, it will disengage the Autopilot.
- **YD key:** Engages/disengages the Yaw Damper (if installed). *Not available for Prepar3D.*
- **FD key:** Activates/deactivates the flight director and turns on the flight director in the default pitch axis and roll axis modes. If the autopilot is engaged, the FD Key is disabled.

- **A/T:** Activates/deactivates Autothrottle (if installed).
- **FLC key:** Selects/deselects the Flight Level Change Mode (if installed).
- **HDG key:** Selects/deselects Heading Select Mode.
- **NAV key:** Selects/deselects the Navigation Select Mode. The NAV source can be selected via the HSI SRC zone (explained in page 11).
- **VNAV key:** Selects/deselects Vertical Navigation Mode. *This button only works with XPlane. Future updates to VFHub will implement the VNAV button functionality in MSFS and Prepar3D.*
- **APR key:** Selects/deselects the Approach Mode.
- **REV B/C key:** Selects/deselects Back Course Mode.
- **ALT key:** Selects/deselects the Altitude Hold Mode.
- **VS key:** Selects/deselects the Vertical Speed Mode.
- **UP and DN keys:** Increases/Decreases the active pitch reference for the Pitch Hold, Vertical Speed, and Flight Level Change modes.
- **CRS1 | CRS 2 knob: (R)** Changes the course of the NAV1 and NAV2 modes. **(C)** Sets the knob mode to change the course of CRS1 or CRS2. **(R+P)** CRS CTR. Note that when cycling between NAV1/NAV2 via the HSI SRC button, the mode to change the CRS1 or CRS2 is automatically updated according to the current NAV mode.
- **HDG | GYRO knob: (R)** Sets the Heading Bug/ Gyro directional value in the HSI. **(C)** Transfers between Heading and Directional Gyro mode. **(P)** Syncs the Heading Bug to the current heading. Note that if the E-Version PFD screen is displayed, the HDG mode will be automatically selected so the user can modify the HSI's hdg bug directly.
- **BARO | IAS knob: (R)** Sets the BARO or IAS value. **(C)** Sets the knob to change between BARO or IAS. **(P)** Sets the BARO to STD or changes between IAS/MACH. Note that if the E-Version PFD screen is displayed, the BARO mode will be automatically selected so the user can modify the barometer setting directly.
- **ALT knob: (R)** Sets the Altitude Bug in the altimeter. **(C)** Syncs the Altitude Bug to the current altitude. **(R+P)** Increases/decreases the Altitude Bug in the altimete in steps of 1000s ft.

6. TOUCHSCREEN

6.1 MAIN SCREEN

The SWITCHO RADIOS features a touchscreen with various sections and funionalities.



Below, the following specific sections are detailed along with all the different options accessibles from the SWITCHO RADIOS.

- AUTOPILOT
- AUDIO PANEL (shown in page 11)
- MARKER BEACON RECEIVER (shown in page 11)
- HSI SOURCE
- FLAPS & TRIMS
- RADIO and DME
- ANNUNCIATOR PANEL

AUTOPILOT

The Autopilot Annunciation screen displays all active or armed autopilot modes. All possible modes and indicators are shown below. Note that the annunciations are limited to the functionality of MSFS, X-Plane 11/12 and Prepar3D$_{V4-V5}$.

- **Autopilot**: Activate flight control surface servos, providing automatic flight control

  Annunciation: **AP**

- **Flight Director**: Provides commands to the autopilot

  Annunciation: **FD**

- **Yaw Damper**: Provides rudder control to avoid Dutch-roll oscillations and to coordinate turns when banking. *Not available for Prepar3D.*

  Annunciation: **YD**

- **Autothrottle**: Manages aircraft speed, engine performance and power to allow the aircraft to climb, descend or maintain altitude.

  Annunciation: **AT**

- **Pitch Hold**: Holds aircraft pitch attitude; may be used to climb/descend to the Selected Altitude.

  Annunciation: **PIT**

- **Roll Hold**: Holds the current aircraft roll attitude or rolls the wings level, depending on the commanded bank angle.

  Annunciation: **ROL**

- **Heading**: Captures and tracks the Selected Heading.

  Annunciation: **HDG**

- **Navigation**: Captures GPS, VOR or LOC.

  Annunciation (Active): **VOR** , **LOC** *or* **GPS**

  Annunciation (Armed): **VOR** , **LOC** *or* **GPS**

In navigation mode, VOR, LOC or GPS will be displayed active or armed. VOR means autopilot is following a VOR radial, LOC means autopilot is following ILS signals and GPS means autopilot is following a flight plan.

- **VNV Target Altitude**: Captures the Vertical Navigation (VNV) Target Altitude. *Not available yet for MSFS and Prepar3D.*

  Annunciation (Active): **ALTV**

  Annunciation (Armed): **ALTV**

- **Vertical Path Tracking**: Captures and tracks descent legs of an active vertical profile. *Not available yet for MSFS and Prepar3D.*

  Annunciation (Active): **VPTH**

  Annunciation (Armed): **VPTH**

- **Glideslope**: Captures and tracks the ILS glideslope on approach.

  Annunciation (Active): **GS**

  Annunciation (Armed): **GS**

- **Glidepath**: Captures and tracks the GPS glidepath on approach. *Not available yet for MSFS and Prepar3D.*

  Annunciation (Active): **GP**

  Annunciation (Armed): **GP**

- **Back Course**: Captures and tracks a localizer signal for back course approaches.

  Annunciation (Active): **REV**

  Annunciation (Armed): **REV**

- **Altitude Hold**: Holds current Altitude Reference.

  Annunciation (Active): **ALT** *and* **±XXXXX FT**

  Annunciation (Armed): **ALT**

If Altitude Hold is active, the actual plane's altitude at the moment the pilot presses ALT Button will show in green. If Altitude Hold is active and the pilot changes the Autopilot Altitude Reference, the displayed Altitude will display the Autopilot ALtitude Reference **±XXXXX FT**.

- **Flight Level Change**: Holds aircraft airspeed while aircraft is climbing/descending to the Selected Altitude.

  Annunciation (Active): **FLC** *and* **±XXX KT**

  Annunciation (Armed): **FLC** *and* **±XXX KT**

- **Vertical Speed**: Holds aircraft vertical speed; may be used to climb/descend to the Selected Altitude.

  Annunciation: **VS** *and* **±XXXX FPM**

- **Autoplit Altitude**: Shows the Autopilot Altitude Reference.

  Annunciation: **±XXXXX FT**

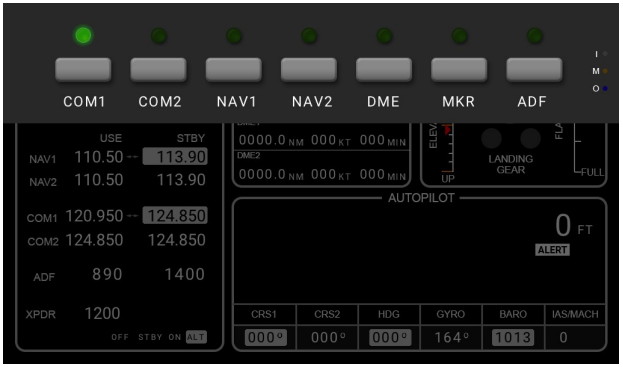
- **Altitude Alert**

  Annunciation: **ALERT** *(flashing or static)*

Illuminates as a solid alert in the region from 1000 to 200 feet from the selected altitude if the airplane was previously outside of this region. Flashes for 5 seconds the first time the airplane crossed the selected altitude. Flashes continuously in the region from 1000 to 200 feet from the selected altitude if the plane was previously inside of this region.

AUDIO PANEL

To access the Audio Panel, touch the upper part of the screen and slide down with your finger, the following menu will appear. Below you will see the functionalities of each option.



- COM1: When selected, audio from the #1 COM receiver can be heard.

- **COM2**: When selected, audio from the #2 COM receiver can be heard.
- **NAV1**: When selected, audio from the #1 NAV receiver can be heard
- **NAV2**: When selected, audio from the #2 NAV receiver can be heard
- **DME**: Pressing turns DME audio on or off.
- **MKR**: Mutes the currently received marker beacon receiver audio.
- **ADF**: Pressing turns on or off the audio from the ADF receiver

MARKER BEACON RECEIVER

The marker beacon receiver is used as part of the ILS. The marker beacon receiver is always on and detects any marker beacon signals within the reception range of the aircraft.

- **Inner Marker**: Lights up on initial approach fix on ILS.
- **Middle Marker**: Lights up on middle approach fix on ILS.
- **Outer Marker**: Lights up on final approach fix on ILS.

HSI SOURCE (HSI SRC)

The **SWITCHO RADIOS** includes the HSI SRC region displayed below, which displays the selected navigation source.

This region can be pressed via the touchscreen to cycle through the NAV1 / NAV2 and GPS sources.

FLAPS & TRIMS

On the touchscreen, a designated section titled **“Flaps & Trims”** will display the current position of every trim available on the aircraft you are operating, along with the status of the flaps. Additionally, you will be able to check the landing gear status.

RADIO and DME

Labeled as **RADIO** and **DME**, you will be able to view updated information regarding active and standby frequencies, as well as details about distances and relative speeds from the DME.

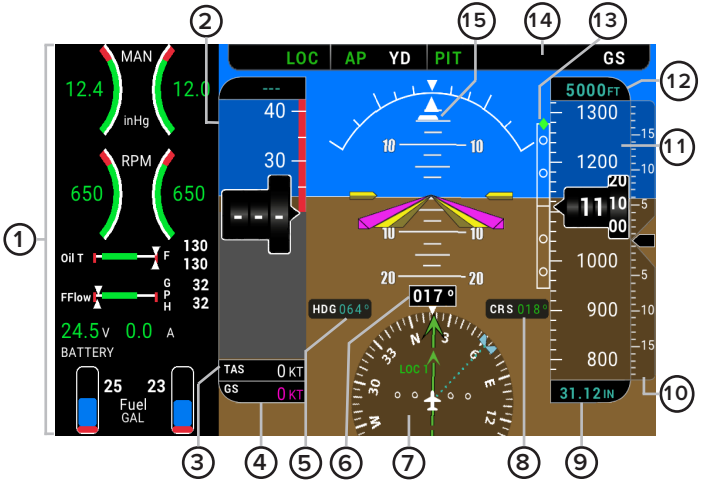
ANNUNCIATOR PANEL

Displays abbreviated annunciations for the pilot with information regarding the aircraft’s state. You **can see** the **list of annunciations** at the **end of the manual**.

6.2 SWITCHO RADIOS-E (v2.0.0 onward)

6.2.2 FUNCTIONS

In the following figure are shown the different functions that **SWITCHO RADIOS-E ADD-ON secondary screen** enables:



1	Engine Display	6	Current Heading	11	Altimeter
2	Airspeed Indicator	7	HSI	12	Reference Altitude
3	True Airpspeed	8	Selected Course/Desired Track	13	Glideslope/Glidepath
4	Ground Speed	9	Barometric Altimeter Setting	14	Autopilot Header
5	Selected Heading	10	VSI	15	Attitude Indicator

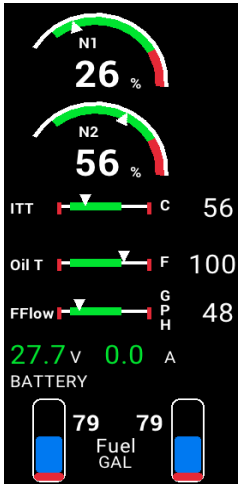
1.- ENGINE DISPLAY

There are different possibilities for the engine display box depending on the engine configuration you have.

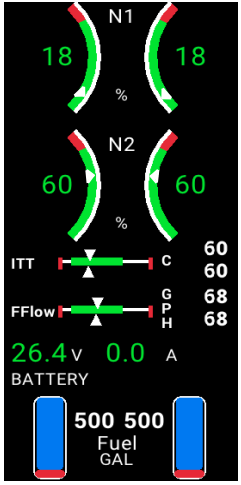
SINGLE JET/TWIN JET

It includes information (read from top to bottom) about **N1** and **N2**, **Interstage Turbine Temperature (ITT)**, **Fuel Flow**, **Battery** and **Fuel Tank Capacity**.

Also for the single jet one there is information about the **Oil Temperature**.



Single Jet Engine Display

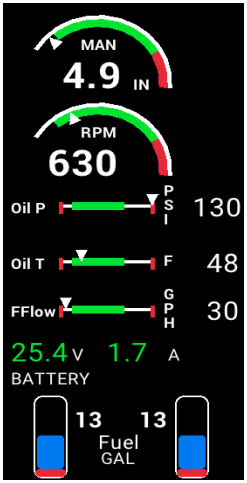


Twin Jet Engine Display

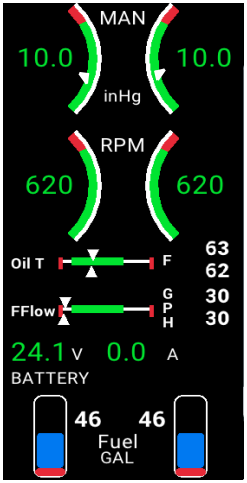
SINGLE PISTON/TWIN PISTON

It includes information (read from top to bottom) about **Manifold Preassure, RPM, Oil Temperature**, **Fuel Flow**, **Battery** and **Fuel Tank Capacity**.

Also for the **single piston** one there is information about the **Oil Preassure**.



Single Piston Engine Display

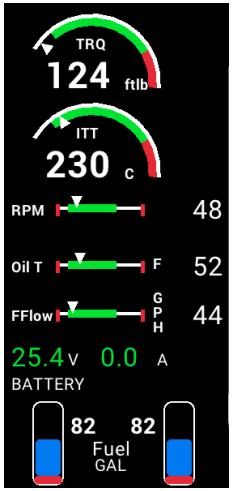


Twin Piston Engine Display

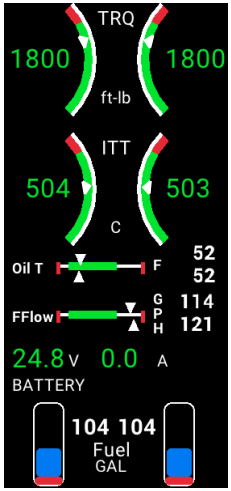
SINGLE PROP/TWIN PROP

It includes information (read from top to bottom) about **Torque (TRQ), Interstage Turbine Temperature (ITT), Oil Temperature**, **Fuel Flow**, **Battery** and **Fuel Tank Capacity**.

Also for the **single prop** one there is information about the **RPM**.



Single Prop Engine Display



Twin Prop Engine Display

2.- AIRSPEED INDICATOR

Displays the **aircraft's speed** relative to the air surrounding it, measured in knots. The **coulored bands** (white, green, yellow and red) are **dynamic** and also **change depending on the plane** you that are flying with.

3.- TRUE AIRSPEED

The **actual speed of the aircraft** through the air, corrected for altitude and temperature, crucial for navigation and performance.

4.- GROUND SPEED

The aircraft's **speed over the ground**, factoring wind, used to calculate travel time and fuel efficiency.

5.- SELECTED HEADING

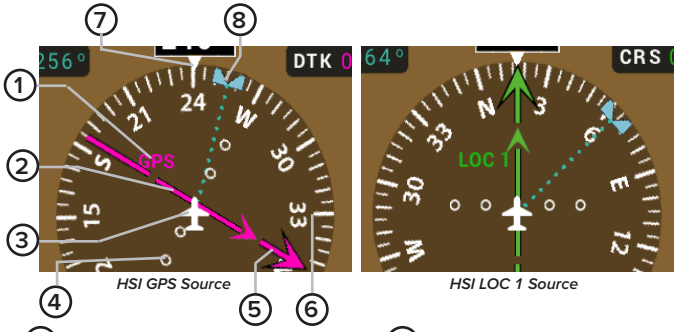
A **manually set heading** on the indicator used as a reference for autopilot or navigation.

6.- CURRENT HEADING

The **actual direction** of the aircraft relative to **magnetic north**, updated continuously during flight.

7.- HSI (HORIZONTAL SITUATION INDICATOR)

Combines a **heading indicator** with **navigation data**, showing the **aircraft's position relative** to a set **course**.



1. Navigation Source
2. Course Deviation Indicator (CDI)
3. Aircraft Symbol
4. Lateral Deviation Scale
5. Course Pointer
6. Rotating Compass Card
7. Lubber Line
8. Heading Bug

8.- SELECTED COURSE/DESIRED TRACK

The **Selected Course** is the manually set navigation path, while the **Desired Track** is the ideal trajectory calculated by the system to follow the **planned route**. Both ensure accurate alignment with the intended navigation path.

9.- BAROMETRIC ALITMETER SETTING

The **local pressure input** into the altimeter ensures accurate **altitude readings**, adjusted with changes in atmospheric pressure.

10.- VSI (VERTICAL SPEED INDICATOR)

Indicates the **climb or descent rate (FPM)**, aiding in maintaining desired vertical speeds during flight.

11.- ALTIMETER

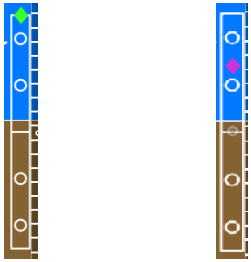
Measures **altitude** above sea level using atmospheric pressure, essential for terrain and traffic separation.

12.- REFERENCE ALTITUDE

A **preset target altitude** for climbs, descents, or level-offs, displayed on autopilot or primary flight displays.

13.- GLIDESLOPE/GLIDEPATH INDICATOR

Shows position relative to the descent path for landing, ensuring a safe approach during **ILS** or **GPS-guided landings.**



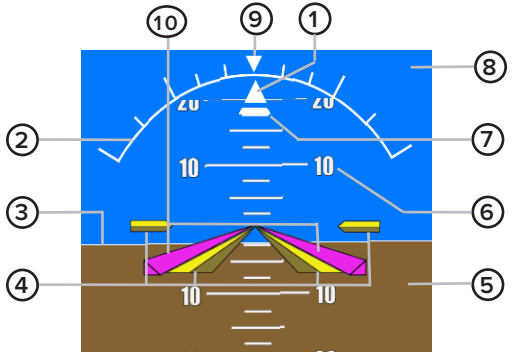
14.- AUTOPILOT HEADER

Interface for **setting modes** like heading, altitude, ... automating flight for precision and reduced workload.

The **various mode options** have already been described in detail in **Section 6.1. Main Screen**.

15.- ATTITUDE INDICATOR

Displays aircraft **pitch** and **roll** relative to the horizon, critical for orientation in low visibility or instrument conditions.



Attitude Indicator

1. Roll Pointer
2. Roll Scale
3. Horizon Line
4. Aircraft Symbol
5. Land Representation
6. Pitch Scale
7. Slip/Skid Indicator
8. Sky Representation
9. Roll Scale Zero
10. Flight Path Marker

7. ANNUNCIATIONS LIST

The next table shows **all anunciations** that **SWITCHO RADIOS** integrates. Note that annunciations are accompanied with **L, R** or **L/R** indications if suitable to the selected aircraft:

WHITE	FUEL PUMP: Fuel Pump(s) active.
	DOOR UNLATCHED: Door not secured.
	AP TRIM: AP Elevator Trim not activated
	MAN PRES: Manifold Pressure low.
	STARTER ENGD: Starter Energized.
	AVIONICS OFF: Avionics not powered
	PARKING BRAKE: Parking Brake ON
AMBAR	LOW VACUUM: Vacuum low alert.
	MASTER CAUTION: Master Caution Alert
	PITOT HEAT: Pitot Heat Off.
	HIGH VOLTS: Main Bus Voltage High.
	FUEL SELECTOR: Fuel Selector Off.
	FUEL FLOW: Fuel Flow Too High
	OIL TEMP HIGH: Oil temperature high.
	LOW FUEL: Fuel Level below 20%.
	ALT/GEN INOP: Alternator/ Generator Off.

RED	MASTER WARNING: Master Warning Alert
	PITOT HEAT: Pitot Heat Fail
	STALL ANNUN: Wing Approaching Stall
	FLAP OVSPD: Exceeded V_{fe} with flaps deployed
	ENGINE FIRE: Engine Fire Warning
	GENERATO: Generator/ Alternator failed
	AOA ANNUN: Angle of Attack Warning
	FUEL PRES LOW: Fuel pressure low.
	OIL TEMP LOW: Oil temperature low
	OIL PRES LOW: Oil pressure low
	GEAR UNSAFE: Gear unsafe
	LOW FUEL : Combined Fuel Level below 20%

List of SWITCHO RADIOS annunciations