CNv NavDisplay - Climb / Cruise / Map Screens

Climb Screen

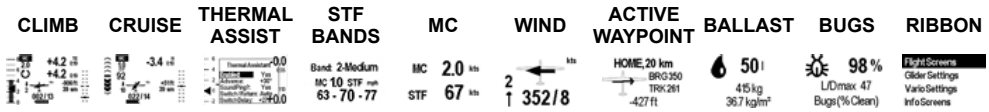
Cruise Screen

- A momentary press on the Left or Right Arrow allow you to move sequentially a screen at a time through the nine Flight Screen in series.
- **Home**
- **Thermal assist**
- **M/C**
- **STF Band**
- **Wind**
- **Active T/P**
- **Ballast**
- **Bugs**
- **Ribbon**
- Pressing and holding the Left Arrow always returns directly to the Home (Climb/Cruise) screen.
- Then, pressing the Left Arrow on a Climb or Cruise screen immediately toggles to the other screen.
- Pressing and holding the Right Arrow always returns directly to the Ribbon select screen.
- The Up and Down Arrows change values (in the MC for example) ... or allows selection of menu options, or functional options, or items in a list.
- The GO button is used whenever a selection is required.
- Pressing the GO Button on the Cruise or Climb screen allows selection and adjustment of Vario Audio Volume, Vario Range, Vario indicator type on the left side of the display. Once you select an option - you then use the up and down buttons to change values / selections. A selection has to be made in ~5 seconds - or the display reverts back to the default MC option.

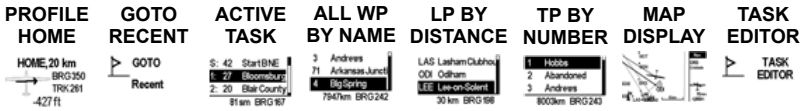
The following sections will review all CNv Screens and button function in detail - highlighting any departure from the navigation rules outlined above.

CNv NavDisplay - Screen Navigation

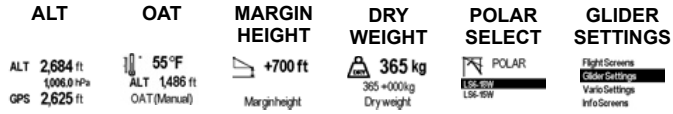
FLGHT SCREENS



NAVIGATION SCREENS



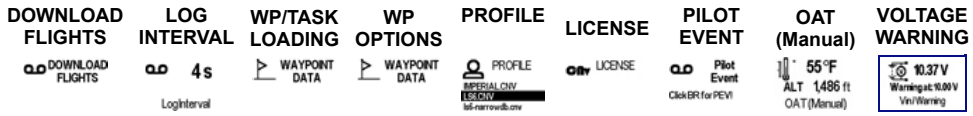
GLIDER SETTINGS SCREENS



VARIO SETTINGS SCREENS

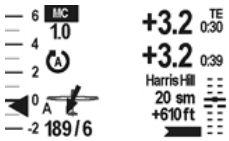
INFO SCREENS

TOOLS SCREENS



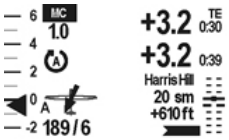
Flight - Climb

VALUE/DISPLAY OPTIONS



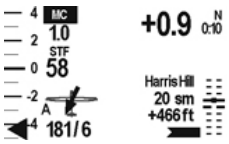
- **MC**: The MC value may be adjusted up or down using the up or down arrow buttons.
- **Vario Volume**: pressing the GO button once will activate the vario volume control - 'MC' in the black square will change to 'Volume' - and the up and down buttons can be used to adjust vario volume. The option will automatically switch back to MC in ~5 seconds.
- **Scale**: pressing the GO button twice will allow the pilot to change the Vario scale on the left side of the display. 1X, 2X, and 4X ranges are available. (ex. 4, 8, and 16 knots).
- **Cruise**: Vario / STF - Pressing GO three times will allow changing the display at the left of the screen between a vario tape indicator or a STF Push-Pull indicator.

DISPLAYED VALUES



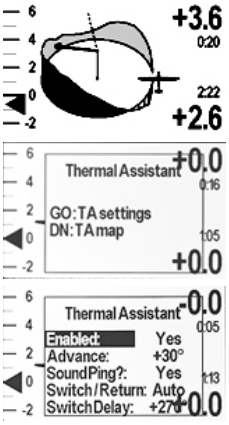
- **Vario Scale:** (left side) - TE climb/sink rate.
- **MC:** (left upper) - The MC value may be adjusted up or down using the up or down arrow buttons.
- **(A) (left middle)**: indicates switch to climb was Auto initiated. **A (F)** indicates switch to climb was Forced using c/c switch. Vario will stay in this mode until switched back.
- **Winds - (left lower)**: Auto winds are enabled. Quick and Manual winds are available in the winds screen.
- Climb Average - (top right) - Gives average TE climb for last 360 deg circle. Looking at the example screen - 0:30 displays number of seconds for last 360 deg circle.
- Climb Average This Thermal - (below top right) - Next average down is average climb for this thermal, bottom of thermal to current circle. 0:39 is number of seconds in this thermal.
- Both averages reset when returning to Cruise.
- Both averages start accumulating data when a turn is started even though switch to Climb is delayed.
- Waypoint - The active waypoint, distance, altitude delta, turn indicator, and glideslope scale are enabled.

Flight - Cruise



- **Push / Pull Indicator - (left side)**: *Each chevron corresponds to a five knot difference between the indicated airspeed and the speed-to-fly*.
- **MC - (left upper)**: The MC value may be adjusted up or down using the up or down arrow buttons.
- **STF Target - (left middle)**: The STF target for the MC value, winds, wing loading, and bugs is displayed.
- **Winds - (left lower):** Automatic Winds are enabled. The vario can be configured to use Auto or Manual winds.
- ***Cruise Average - (top right):*** *average air mass movement (N = Netto) for last n sec. Default for n is 10 seconds, but it may be changed on the Vario ribbon*.
- **Waypoint:** The distance, altitude delta, and glideslope scale are enabled.

Flight - Thermal Assist



- TA Settings now appear on one screen. Pressing the “GO” button cycles through the options.
- The “Switch” and “Return” options are combined into one setting which can be “Auto” or “Manual”.
- A new setting “Switch Delay” can be set at 90/180/270/360 degrees. Previously the “Auto” switch to the TA occurred at 270 degrees.
- Regardless of the above setting, the best direction arrow will not be displayed until a 270 degree turn has been accomplished.

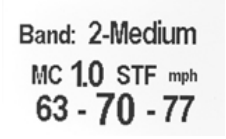
Flight - STF BAND

- **STF (Speed to Fly)** Band settings support the well known block speed-to-fly strategy adopted by many good pilots. The pilot sets MC and wing loading which generates a still air STF. The pilot is essentially saying he will fly at this speed unless vertical airmass movement is particularly good or bad. The CNvario will now support this strategy by only telling the pilot to speed up or slow down if the Target STF is outside the selected deadband. If the pilot is particularly good at flying block speeds, the CNvario will remain quiet most of the time!
- The Cruise Speed-to-Fly option is selected on the Vario page of the CNvUtility. The Cruise Audio deadband width can be adjusted in flight on the fourth screen to the right on the NavDisplay Flight Ribbon by selecting None, Narrow, Medium or Wide. The corresponding speeds are shown on the screen.

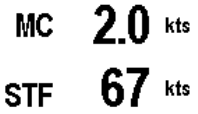
- The speed-up tone is a lower frequency (bom-bom-bom…..) and the slow down tone a higher frequency (bib-bip, bib-bip, bib-bip,…..). These tones may be turned on or off in the CNvUtility.
- Once the vario indicates positive climb rates, it will switch to climb tones.
- **Band 2 (Medium)**: looking at the screen example - the vario will generate a speed-up or climb tone when the glider airspeed is outside the band range. For a MC = 1.0 in this example, the band values are 63-70-77 ... the middle value (70) is the calculated STF in still air.

Cruise Speed-to-Fly Options

- The new Cruise Speed-to-Fly options are designed to allow the configuration of the CNvario to best support the pilot's style of flying.
- The CNvario determines the correct speed to fly (Target STF) from the glider polar, MC setting, wing loading and vertical airmass movement. It is well known that chasing a varying STF number does not produce good results. Most pilots prefer the vario to be quiet if they are flying more or less at the right speed.
- The STF deadband width is now adjustable, giving the pilot control over how far his actual speed must be from the Target STF before the vario makes a noise.

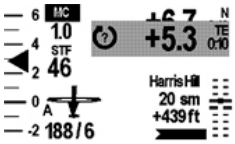


- The new STF Modes (Block or Classic) are not to be confused with Target STF audio. The new modes give the pilot the option of overlaying their choice of Cruise Audio Mode (N, RN, TE) with speed-up and slow-down tones if they are flying too slow or too fast relative to the Target STF and the audio deadband width.
- Classic STF mode compares the current IAS with the current Target STF and tells the pilot to speed-up or slow-down if the difference is big enough. This mode helps the pilot follow the Target STF, but does not produce bothersome noises if his speed is "close enough".
- Block STF Mode supports the well known block speed-to-fly strategy adopted by many good pilots. The pilot sets MC and wing loading which generates a still air STF. The pilot is essentially saying he will fly at this speed unless vertical airmass movement is particularly good or bad. The CNvario will now support this strategy by only telling the pilot to speed up or slow down if the Target STF is outside the selected deadband. If the pilot is particularly good at flying block speeds, the CNvario will remain quiet most of the time!
- The Cruise Speed-to-Fly option is selected on the Vario page of the CNvUtility. The Cruise Audio deadband width can be adjusted in flight on the fourth screen to the right on the NavDisplay Flight Ribbon by selecting None, Narrow, Medium or Wide. The corresponding speeds are shown on the screen.
- The speed-up tone is a "bom-bom-bom…..) and the slow down tone a (bib-bip, bib-bip, bib-bip, …..).
- **Note:** These tones may be turned on or off in the CNvUtility.



Flight - MacCready

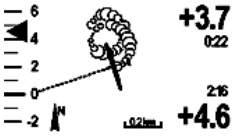
- The value is adjusted using the up / down buttons.
- The STF is calculated using the MC setting, ship polar, dry weight, ballast, and bug % entered by the pilot. This is the STF in neutral air.



Preempt Climb Option

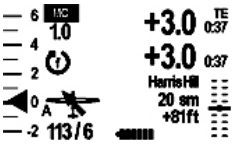
- When encountering rising air, and flying slowly enough (thinking of maybe thermalling?) the Preempt Climb Option will display a TE average on the flight screen over the Cruise average and switch the audio to TE.
- This is helpful in making the climb or continue on cruising decision.

Thermal Map Page



- When cruising and viewing the NavDisplay flight screen, momentary climb mode may be initiated by pressing the left arrow, and forced climb mode may be initiated by a press and hold of the left arrow. Returning to cruise from a forced climb mode requires another press and hold of the left arrow. This is especially useful when low attempting to center elusive lift.
- Pressing GO when on this screen enables map configuration which includes map scale (zoom) and orientation (track up, N up, or goal up). The up and down arrows are used to make the desired selection, and pressing GO again advances to the next configuration choice.

Enable Climb Mode

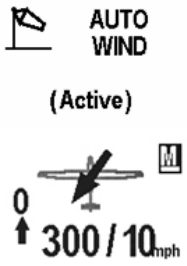


- When cruising and viewing the NavDisplay flight screen, momentary climb mode may be initiated by pressing the left arrow, and forced climb mode may be initiated by a press and hold of the left arrow. Returning to cruise from a forced climb mode requires another press and hold of the left arrow.

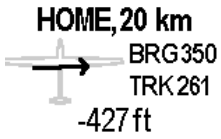
Circle Average

- The 20 second climb average has now been changed to a full 360deg climb average. This provides a more stable climb average which helps centering.

Flight - Winds



- The vario can be configured to use Auto or Manual winds.
- Quick winds are calculated by the instrument - Quick winds are based on a smaller set of sample points but display fairly accurate wind information in the shortest duration possible.
- Manual winds allow the pilot to override automatic wind calculations.
- The A and M indicators indicate which configuration is being used by the vario.

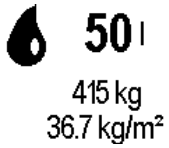


Flight - Active Waypoint

The XC version displays navigation information for the currently selected waypoint, or the next waypoint in a task declared in the Map Screen.

For Club versions, this screen will provide Navigation to the Home airport. The coordinates for HOME and the elevation of the home field must be entered using the configuration utility.

In this example, the glider has to turn right ~ 90 degrees to get home. but is 427 below the altitude required to arrive at home elevation plus altitude margin set in the glider ribbon.



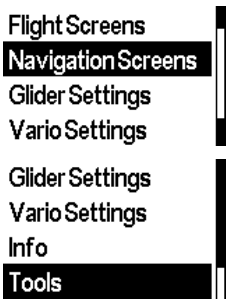
Flight - Ballast Screen

The value is adjusted using the up / down buttons.
For US gallons the AUW of the ballasted glider is computed and displayed in lbs. For litres the AUW of the ballasted glider is computed and displayed in kg.

AUW = Dry Weight + Ballast

Flight - Bugs / % Clean Screen

The value is adjusted using the up / down buttons. Estimated bug coverage is adjusted using the lower encoder. 100% = no bugs. The impact on L/D is displayed for reference

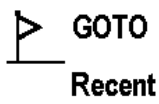


Flight - Ribbon Menu

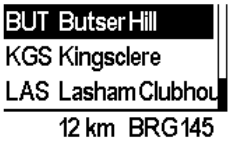
Navigation - Home Screen

Displays Profile Home, the last selected waypoint, or active waypoint from the active task.

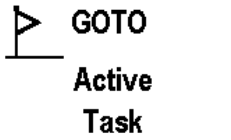
Navigation - Recent

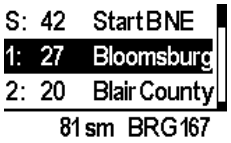


- The GOTO Recent function will display a list of the last turnpoints that were selected as navigation targets. The most recently selected will display at the top of the list.
- The Up / Down buttons will scroll the list.



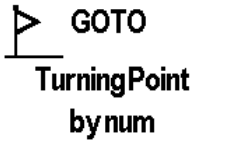
- The Distance and Bearing to each highlighted turnpoint will display.Hit
- GO to make the highlighted waypoint the active waypoint.
- When the list is full, the oldest Recent waypoint will scroll off the bottom of the display - it is still viewable by scrolling down.





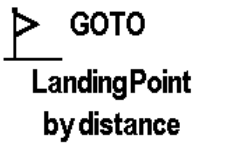
Navigation - Active Task

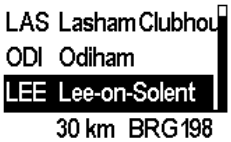
- Active Task is displayed if there is an Active Task. Active Waypoint can be changed by selecting from Active Task waypoint list.
- The Up / Down buttons scroll through each turnpoint in the task. (These are not editable in this screen.)
- The Distance and Bearing to each highlighted turnpoint will displayed.
- The Go Button can be pressed to select the highlighted row as the active navigation target.



Navigation - Turning Point by Number

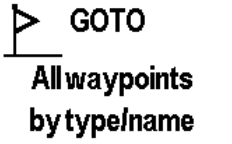
- The GOTO Turning Point by Number function will display a list of loaded turnpoints in Number Order.
- The Up / Down buttons will scroll up/down the list.
- The Distance and Bearing to each highlighted turnpoint will displayed.
- The Go Button can be pressed to select the highlighted row as the active navigation target.





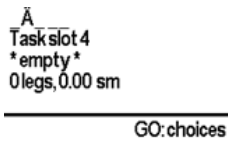
Navigation - Landing Point by Distance

- The closest landing points display at the top of list . The remainder display in order of increasing distance.
- The Up / Down buttons rotation will scroll up/down the list.
- The Distance and Bearing to each highlighted turnpoint will displayed.
- The GO button can be pressed to select the highlighted row as the active navigation target.



Navigation - All Waypoints byType/Name

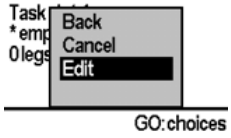
- The GOTO All Waypoints by Type/Name will display a list of loaded waypoints in type/Name Order.
- The Up / Down buttons will scroll up/down the list.
- The Distance and Bearing to each highlighted turnpoint will displayed.
- The GO Button can be pressed to select the highlighted row as the active navigation target.



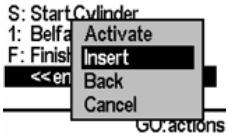
Navigation - Task Editor

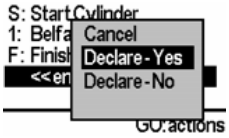
- The TASK EDITOR is entered by scrolling all the way to the right with the Left / Right buttons.
- The header “Task” is displayed, followed in a few seconds by the Task List.

New Task Setup (a sample of selected screens are displayed on left)



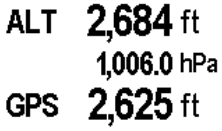
1. Select an “empty” slot and press GO.Press
2. GO again to display an actions menu.
3. Select “Edit” and press GO.
4. <<end>>0.00mi is displayed. Press GO for actions menu.
5. Select “Insert” and press GO.
6. Select desired turnpoint (usually a start point at the beginning) and press GO.
7. The turnpoint selected for the start (S) will be displayed followed by <<end>>.
8. Press GO again, select “Insert” and press Go again.
9. Select first turnpoint and press GO.
10. Repeat steps 8 & 9 for each desired turnpoint.
11. The last turnpoint will always be displayed as the finish (F). When the desired finish is in the (F) position with the line <<end>> below, highlight the <<end>> row and press GO.
12. Highlight “Activate” and press GO.
13. Select desired action “Declare-Yes”, “Declare-No” or “Cancel”
14. The task will be activated and the first turnpoint (most likely start) will be displayed as the active waypoint on the Navigation page.





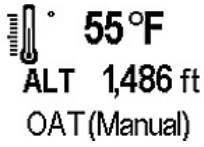
Task Edit

- Select the task you wish to edit from the task list and press GO.
- The task can then be edited using the action menus and the GO button in a similar fashion to the new task setup.



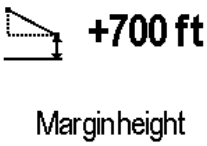
Glider Settings - ALT/ GPS Screen

- Pressing Go sets altimeter to a value near the GPS altitude allowing a more rapid adjustment of the altimeter to the field elevation.



Glider Settings - OAT Screen

- OAT Screen (manual): Adjust OAT prior to takeoff. OAT Screen (auto): Shows OAT read by probe if installed.

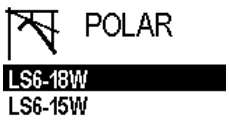


Glider Settings - Margin Height

- Set altitude safety margin to be added for final glide calculations.

Glider Settings - Dry Weight

- 'Dry Weight' of the ship can be adjusted using the up / down buttons.
- Dry weight is the manufacturer's weight of the empty ship + instruments + pilot + chute + all other baggage. i.e. the actual weight of the ship with you in it - sitting on the takeoff grid - not including ballast.



Glider Settings - Polar

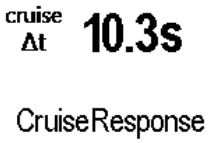
- Polars may be defined in the Profile Utility. A few representative polars are included in the Default Profile provided with software.
- Polar (glider) is selectable using the up / down buttons.

Vario Settings - Pointer Response

- Pointer Time Constant is adjusted using the up / down buttons. 2.5 seconds is the default.

Vario Settings - Audio Response

- Audio Time Constant is adjusted using the up / down buttons. 2.5 seconds is the default.
- Pointer and Audio time constants are independently adjustable.

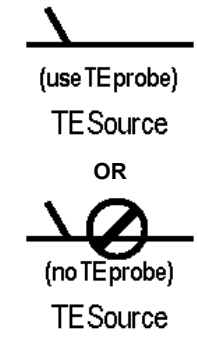


Vario Settings - Cruise Response

- ***The time constant*** for the cruise vario averager. The default is 10 seconds.

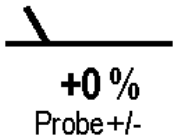
Vario Settings - Gust Filter

- *The gust filter provides a mechanism for electronic gust filtering - this logic is still in development - advise the ClearNav team on how this works for you.*



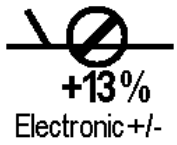
Vario Settings - TE Source

- TE Probe or Electronic TE is selected using this screen set.
- The up / down buttons toggle between two screen options:
- 1/ Use TE probe
- 2/ No TE probe
- The option selected here determines which TE compensation adjustment screen (following) will be displayed.



Vario Settings - TE Probe Compensation

- This screen appears next if the 'Use TE probe' option is selected above.



Vario Settings - TE Electronic Compensation

- This screen appears if the 'No TE probe' option is selected above.

Vario Settings - UTC

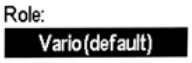
- *The up / down buttons are used to enter the UTC offset required for a correct local time display.*

Vario Settings - Volume

- Audio Level (volume) is adjusted using the up / down buttons.
- The up / down buttons always function as a volume control on the Cruise/ Climb Screen.

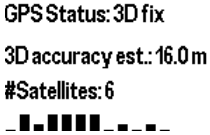
Vario Settings - Gear / Spoiler Warning Activation

- Screen allows activation / deactivation of Gear and Spoilers Warnings.
- Switch connections from the gear and spoiler actuators must be made to the ADC.
- The warning will flash over the top of all screens until dismissed by pressing GO -or until the warning condition is corrected.
- Configure the switch arrangement in CNv Utility.



Vario Settings - Display Role

- Under development. No function at this time.

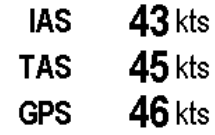


Info Screens - GPS Status

- Display Only.

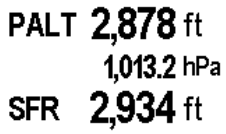
Info Screens - LAT / LON / ALT Screen

- Display Only.



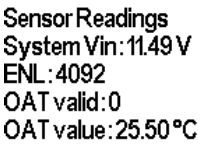
Info Screens - SPEEDS - IAS/TAS/GPS Screen

- Display Only.



Info Screens - Pressure Altitude and Fight Recorder Altitude

- PALT is pressure altitude measured at the glider static source referenced to the 1013.2 hPa standard sea level pressure.
- SFR altitude is pressure altitude measured at the cockpit pressure referenced to the 1013.2 standard seal level pressure.



Info Screens - Sensor Readings

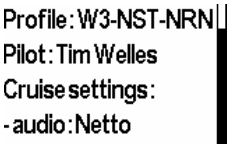
- Display Only.

Info Screens - License Status

- Display Only.

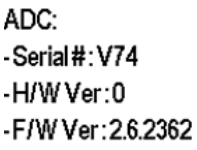
Info Screens - Review Settings

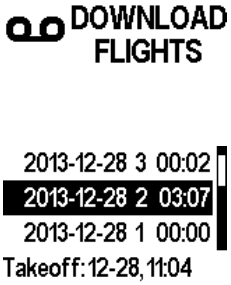
- Display Only.



Info Screens - System Info

- Display Only.



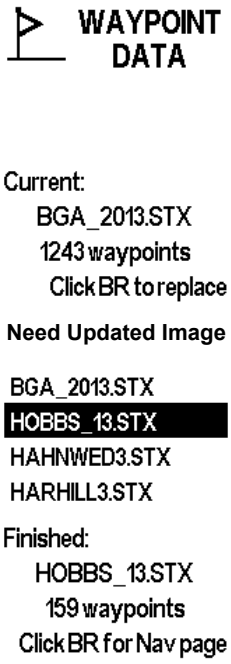


Tools - Download Flights (Loading Waypoints)

- Insert a USB drive into the ADC USB port.
- A list of available log files will be displayed. Select the required log with the UP /DOWN buttons push the GO button to begin the download to the USB drive.

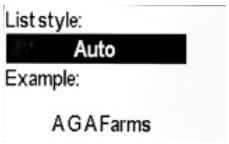
Tools - Log Interval

- Select the desired sample interval to use for the current file download. All source files in the vario are recorded with a one second interval.
- The value is adjusted using the up / down buttons.



Tools - Waypoint And Task (Loading)

- The Database Information screen allows you to load the CNv with waypoints required for your flight.
    - Put your waypoint file(s) on a thumb drive and insert into the ADC.
    - Select Go to Replace.
    - Scroll through the list and highlight the desired waypoint file. (HOBBS_13.STX is highlighted in the example on the left.)
    - Press GO to Load.
    - The CNv will display loading messages and status - then will display a finished message with the file name and the number of waypoints loaded. (HOBBS_13.STX is displayed with 159 waypoints in the example on the left.)



Tools - Waypoint Options - Name Display Formats

- Select Waypoint Name display format using the Up / Down keys: Auto, Num + Name, Trigrapgh + name (UK), Id + name, Name only .

Tools - Profile

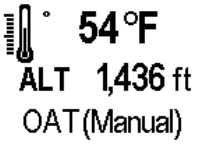
- This screen allows loading a profile from those available on the USB stick. A profile may be select prior to takeoff - or while in flight.

Tools - License

- This screen allows the pilot to select and install a license from a usb memory stick. Installation is only required once - the CNv will retain the license information.

Tools - Pilot Event

- This screen allows the pilot to records pilot event. The time of the last event is displayed.



Tools - OAT Manual Adjust

- OAT Screen (manual): Adjust OAT prior to takeoff. OAT Screen (auto): Shows OAT read by probe if installed.

Tools - Warning Voltage - Low Threshold

- Set the low-voltage warning threshold using the Up/ Down keys. A low voltage warning threshold may be set on the voltage/voltage warning screen at the far right of the Tools Ribbon using the up or down arrow. This is especially useful for LFP batteries..