## CNv NavDisplay - Climb / Cruise / Map Screens




### Climb Screen

- Vario Average and Current Climb Scale - Range Adjustable
- MC Value - Adjustable
- 20 Second Climb Averager and timer
- Achieved Climb Averager and timer
- Climb Averager Calc Method (TE)
- Glide Slope Scale and Metrics
- Wind or Navigation Display - Selectable

### Cruise Screen

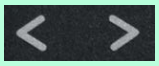
- Push Pull Indicator
- MC Value - Adjustable
- Speed To Fly Value / Target
- Cruise Averager and timer
- Cruise Averager Calc Method (N, RN)
- Glide Slope Scale and Metrics
- Wind or Navigation Display - Selectable

### Map Screen

- Moving Map still in development - supporting:
- Navigation Info - Graphics and Metrics
- Task Editor

- *Turn point geometry limited to 0,5 km circle with an FAI sector collocated*
- *No cylinders (Start, Finish, or Area)*
- *Manual selection of the next TP in a task*
- *No terrain, culture or airspace*

## CNv NavDisplay - Controls

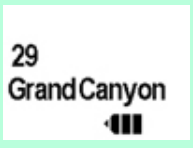




- Left / Right Navigation through Screen Sets
- Press and hold scrolls to the first or last screen / option in the set.


- Up / Down Navigation through Menus and Lists
- Changes selected mode values up / down
- Press and hold quickly scrolls to the top or bottom screen / option in the set.


The 'GO' button supports multiple funtions:

- A press toggles the wind / navigation display in the Cruise and Climb Screens


- Press and hold enables mode selection - Scale, MC or Volume - indicated by white text over a black background. (see next section)
- A 'GO' press on other screens selects files or displayed options.

## CNv NavDisplay - Screen Modes - Scale, MC, Vol

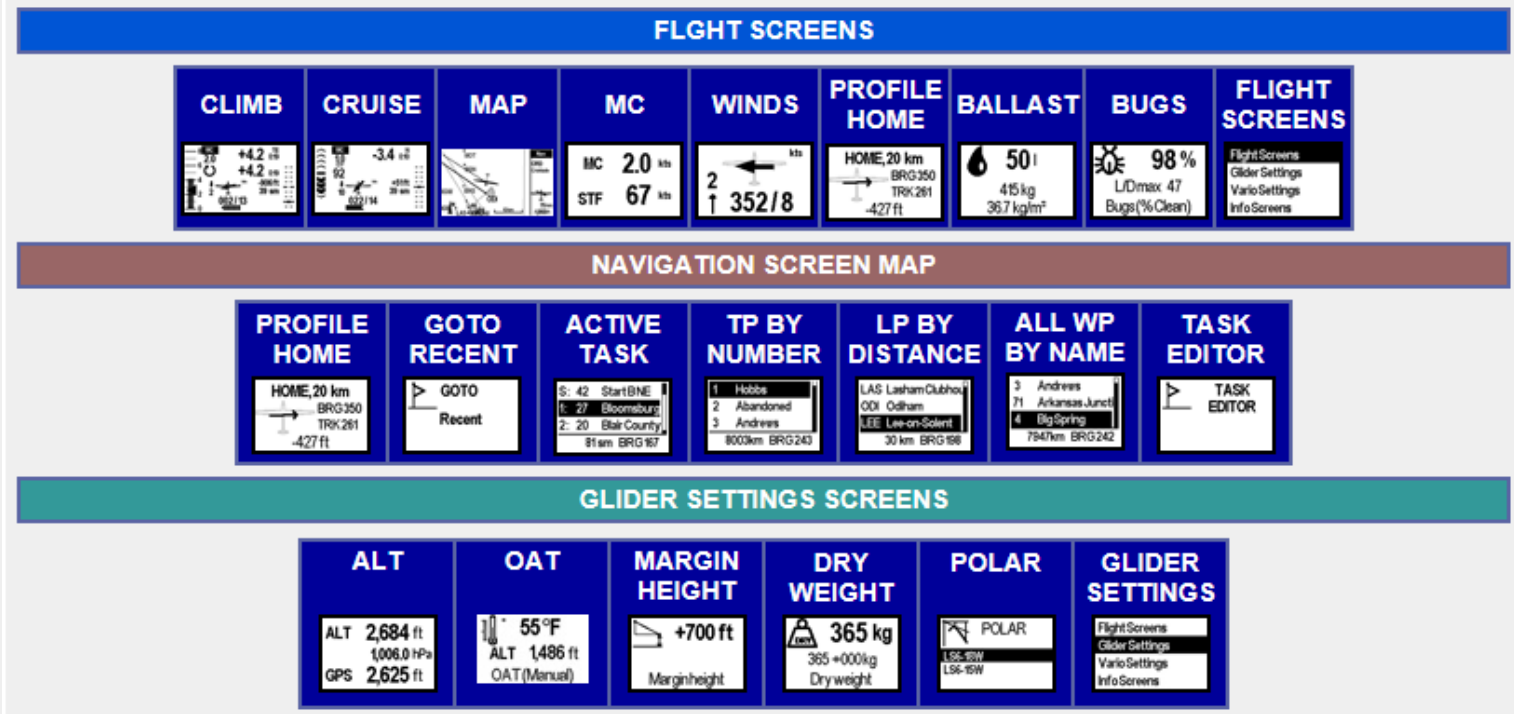
- **The mode can be switched using a press and hold on the 'GO' Button**
- **The selected mode will display on the top of the screen - over the current mode value.**
- **The value is changed by pressing the up / down button**
- **The changed values are stored in the ADC and display in all devices connected to the ADC**

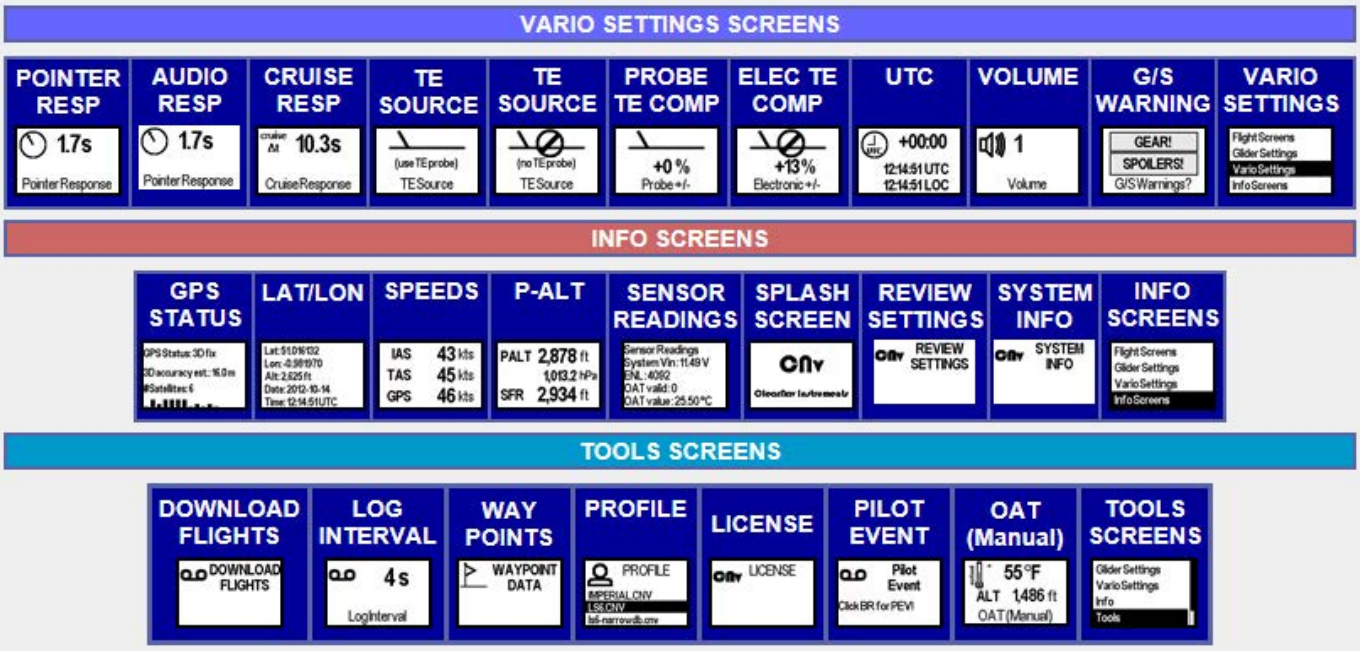


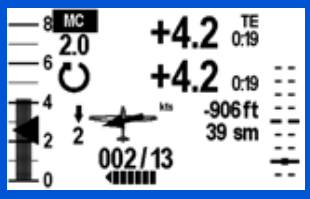


| Scale Mode | MC Mode | Vol Mode |
|---|---|---|
| **Adjusts Cruise / Climb Scale on the left side of the display using the up / down buttons** | **Adjusts vario MC value using the up / down buttons** | **Adjusts vario volume using the up / down buttons** |

## CNv NavDisplay - Screen Navigation






## *Climb Screen*

***20 Second Climb Average** - The top numeric value displays the average climb rate for the last 1,2 .. 20 seconds. Updates every second. Non Adjustable.*

*The average climb rate for the last N seconds is also indicated graphically on the variometer scale on the left side - the triangle indicator is the N second climb rate.*

***Total Climb Average** - The lower numeric value shows the average climb rate for the total climb duration. Updates every second - max duration is one hour.*

*The total average climb rate is also indicated graphically on the variometer scale on the left side - the solid bar is the total climb rate average.*

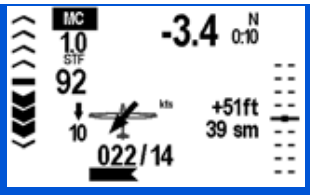
*Both values are reset to zero when the manual cruise/climb switch is cycled.*

*When automatic C/C switching is in use the screen typically switches to Climb at about 45 degrees or one eighth of a turn. The two averagers and the timers however are reset after the first few degrees of any turn so that if/when the vario goes into climb mode the averages (and the timers) display values from the first point at which turning was detected. This allows the pilot to make a faster and more accurate assessment of the lift quality.*

## *Cruise Screen*

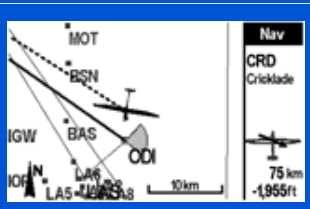
*The Netto value is the calculated vertical speed of the airmass based on the last 1 – n seconds of cruise flight where n = cruise time constant . The timer shows the actual duration from the start of the current glide.*

*The STF is calculated based on selected flight parameters (polar, ballast, bugs, MC, vertical airmass motion).*




*Wind direction and speed are displayed graphically and numerically. Navigation information information can be displayed by pressing 'GO' button.*

*Each chevron corresponds to a five knot difference between the indicated airspeed and the speed-to-fly.*



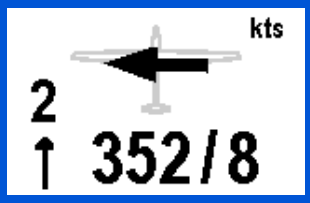

## *Map Screen*

*Content Forthcoming.*


## *MacCready Screen*

*The MC 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.*



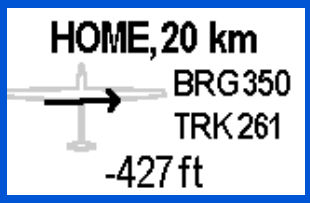

## *Winds Screen*

*The solid black arrow shows the direction of the wind relative to the ground track.*

*For small crab angles, the ground track and glider heading are roughly equal.*

*Tail wind is displayed on the left side of the screen - a tail wind of two knots is depicted.*

*The wind strength is 8 kts and is blowing from 352 degrees.*



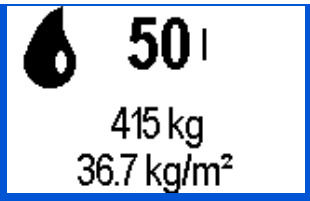

## *NAVIGATE HOME Screen*

*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 with zero margin.*

## *Ballast Screen*

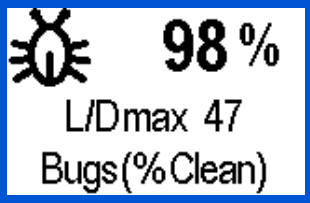



***Ballast may be litres or US gallons.***

***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***

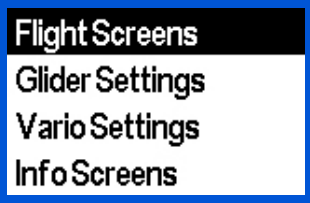



## ***Bugs / Clean Screen***

***Estimated bug coverage is adjusted using the lower encoder.***

***100% = no bugs.***

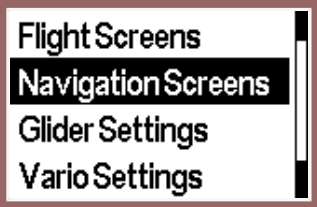
***The impact on L/D is displayed for reference***

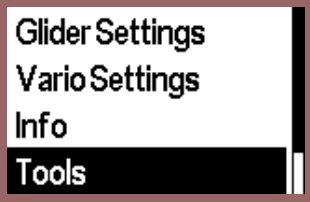



## ***Flight Screens***

***This is the entry and last screen in the Flight Screens set.***

***Other setting screen sets are selected using the up / down buttons.***




## ***Ribbon Menu - Navigation***

**The new Navigation functions are accessed through the ribbon menu item - Navigation Screen.**

**The screen examples on the left show all XC ribbon menu functions:**

- **Flight Screens**
- **Navigation Screens**
- **Glider Settings**
- **Vario Settings**
- **Info**
- **Tools**

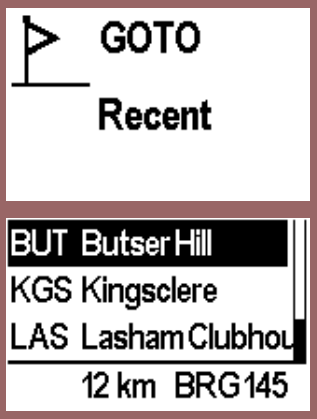
**Note: Many functions will display a header / splash screen for a second to assist in ribbon navigation.**


## ***Navigation - Home Screen***

**The CNv will default to Profile Home or last active navigation waypoint selected as the startup Navigation Home screen.**

- **NAME**
- **BRG**
- **TRK**
- **Distance**

**Altitude Delta**




## *Navigation - Recent*

**The GOTO Recent function will display a list of the last turnpoints that were selected as navigation targets.**

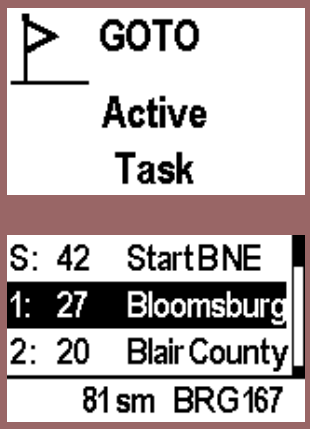
**The most recently selected will display at the top of the list.**

**The Up / Down buttons will scroll up/down the list.**

**The Distance and Bearing to each highlighted turnpoint will display.**

**The BR encoder can be pushed to select the highlighted row as the active navigation target.**

**When the list is full, the oldest Recent waypoint will scroll off the bottom of the display - it is still viewable by scrolling down.**



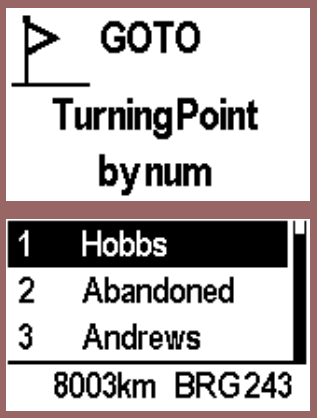

## *Navigation - Active Task*

**The Active Task is displayed.**

**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*

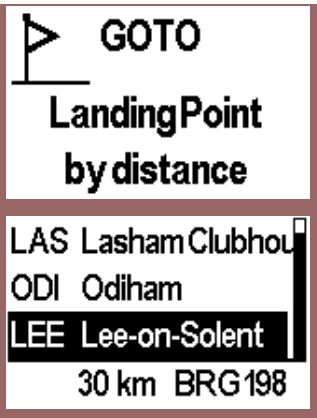
**The GOTO Turning Point by Number function will display a list of loaded turnpoints in Number Order.**

**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*

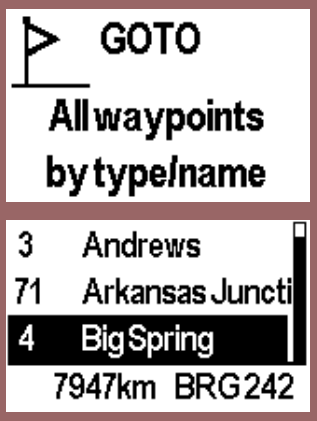



**The closest landing points display at the top of list . The remainder display in order of increasing distance.**

**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.**



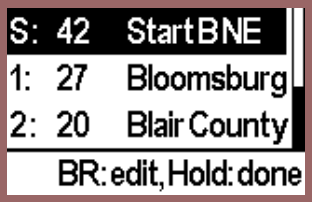

***Navigation - All Waypoints byType/Name***

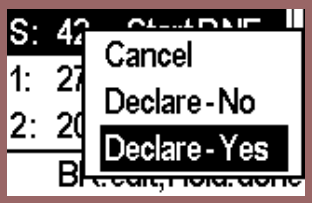
**The GOTO All Waypoints by Type/Name will display a list of loaded waypoints in type/Name Order.**

**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 last-entered active task will be displayed ... or a 'No Task' message will be displayed.**

**The The Up / Down buttons are used at his point to perform ALL task edit functions.**

**New Task Setup**

**1/ Press the BR encoder to display the list of turnpoints. The bottom highlighted row of the list will be '<<end>>'**

**2/ Press the BR encoder again to start new task creation.**

**3/ The initial task screen will display '**NoTask**' to indicate no turnpoints have been selected for this new task setup.**

**4/ Press the BR encoder to display the turnpoint list.**

**5/ Scroll down the list with the BR encoder to select a Start point. The first turnpoint selected is always assumed to be the start point and has the prefix 'S:' in the task display.**

**6/ The task will display the Start at the top of the list and '<<end>>' will be highlighted on the last line.**

**7/ Press BR encoder to display turnpoints. BR encoder will scroll through the list. Press the BR encoder to add the highlighted turnpoint to the task.**

**8/ The task will be display with the Start ... and the last selected turnpoint as Finish. The '<<end>>' will be highlighted.**

**10/ Continue add turnpoints to the bottom of the task using the BR encoder to scroll and select. The last selected turnpoint is always considered the Finish.**

**11/ When task construction is completed, depress and hold the BR encoder to display the save options.**

- **'Cancel' discards the task. The CNv will revert to the last entered task.**
- **'Declare - No' saves the task ... but does not initialize the declaration.**
- **'Declare - Yes' saves the task ... and does initialize the declaration.**

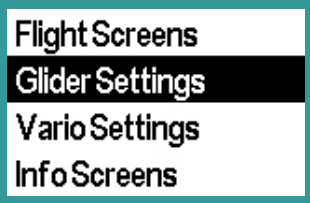
**12/ When 'Declare - Yes' or 'Declare - No' is selected, the Start turnpoint becomes the active waypoint.**

**Active Task Edit**

**1/ Existing tasks can be edited by changing an existing turnpoint ... or by deleting all turnpoints at a certain point in the task turnpoint list.**

**2/ Highlight an existing task turnpoint and press the BR encoder to select a replacement from the turnpoint list.**

**3/ Highlight an existing turnpoint and press the BR encoder to select the turnpoint list. Selecting '<<end>>' at the top of the list will erase that turnpoint and all following. New turnpoints may be selected for the deleted turnpoints to specify the revised task.**




***Glider Settings***

***This is the entry and last screen in the Glider Setting Screens set.***

***Other setting screen sets are selected using the up / down buttons.***


***ALT/ GPS Screen***

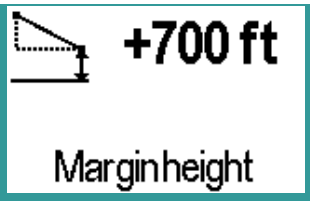
***The altimeter setting can be adjusted using the up / down buttons.***

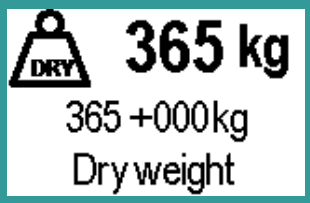

***OAT Screen***

***The OAT value can be adjusted using the up / down buttons.***

***Margin Height***

***Altitude margin added to get HOME altitude calculations.***

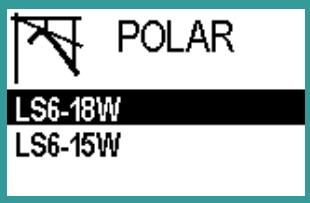



***Dry Weight***

*'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.*

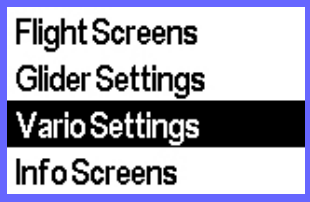



***Polar***

*A representative set of polars is available.*

*Polar (glider) is selectable using the up / down buttons.*

*Any new polar may be defined using the configuration utility.*




***Vario Settings***

*This is the entry and last screen in the Vario Settings Screen set.*

*Other setting screen sets are selected using the up / down buttons.*


***Pointer Response***

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

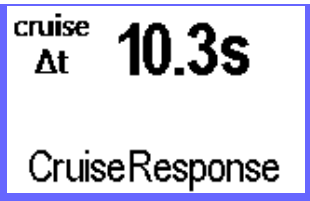
*Pointer and Audio time constants are independently adjustable.*


***Audio Response***

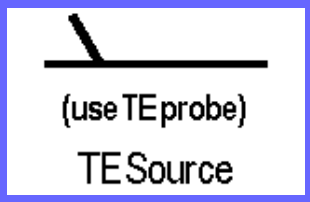
*Audio Time Constant is adjusted using the up / down buttons. 2.5 seconds is the default.*

*Pointer and Audio time constants are independently adjustable.*

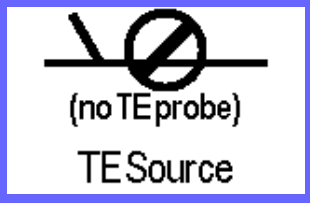
***Cruise Respone***




*This time constant controls the behavior of the STF chevrons and the netto (or relative netto) averages on the display.*




OR




## TE Source

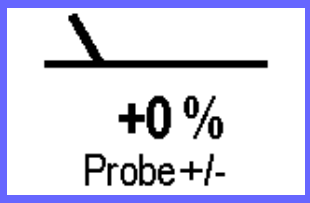
*TE Probe or Electronic TE is selected using this screen set.*

*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.*



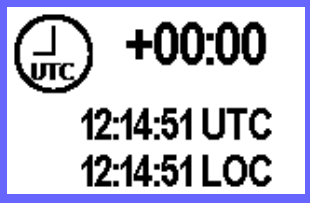

## TE Probe Compensation

*This screen appears next with a CW turn of the upper encoder if the 'Use TE probe' option is selected above.*



## TE Electronic Compensation

*This screen appears next with a CW turn of the upper encoder if the 'No TE probe' option is selected above.*

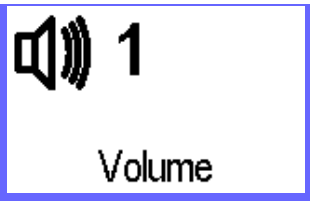




## UTC

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

## 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.*



## *Gear / Spoiler Warning Activation*

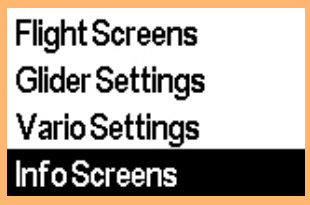
*Screen allows activation / deactivation of Gear and Spoilers Warnings.*

*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 gear or spoiler retraction is completed.*


## *Profile*

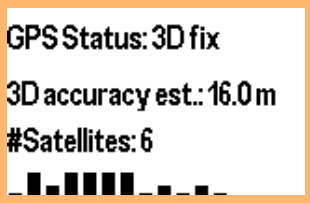
*Screen allows selection of a profile from multiple profile options created on the PC utility and uploaded to the CNv.*




## *Info Screens*

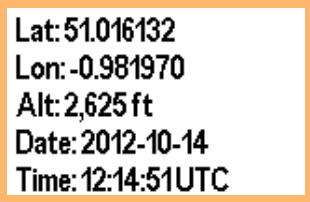
*This is the entry and last screen for the Information Screens set.*

*Other setting screen sets are selected using the up / down buttons.*



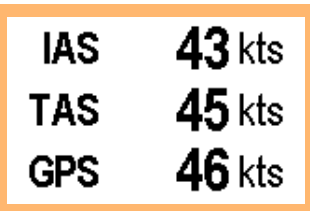

## *GPS Status*

*Display Only.*



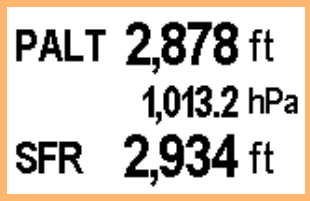

## *LAT / LON / ALT Screen*

*Display Only.*




***SPEEDS - IAS/TAS/GPS Screen***

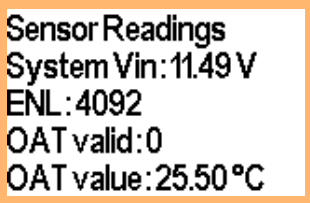
***Display Only.***




***Pressure Altitude and Fight Recorder Altitude***

***PALT is pressure altitude measured at the glider static source referenced to the 1013.2 msl datum.***

***SFR altitude is pressure altitude measured at the cockpit pressure referenced to the 1013.2 msl datum.***




***Sensor Readings***

***Display Only.***


***CNv CLUB Splash Screen***

***Display Only.***

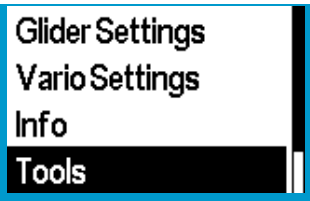

***Review Settings***

***Display Only.***


***System Info***

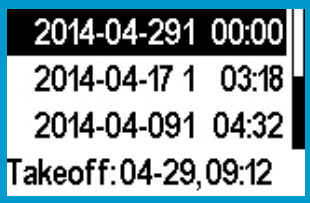
***Display Only.***

***Tools***




*This is the entry and last screen in the Tools Screen set.*

*Other setting screen sets are selected using the up / down buttons.*




***Logbook***

*A list of the flights displaying date and duration will be displayed. Scroll down the list to see take-off time.*


***Tools - Profile***

*This screen allows profile selection from multiple available to provide different CNv defaults / setups for different pilots or configurations.*

*The profiles are loaded on a USB drive and are typically selected prior to takeoff.*


***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.*


***OAT Manual Adjust***

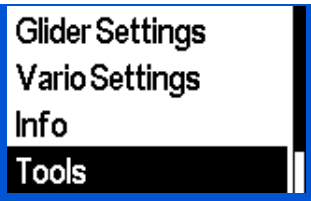
*If no temperature probe is fitted the pilot can enter a temperature (or forecast temperature) for the current altitude and the instrument will use that to approximate the temperature with varying altitude. An estimate within a few degrees will provide good IAS/TAS correction and wind calculations.*

*Note: at present we use the standard atmosphere lapse rate. We may switch to using an adiabatic lapse rate.*

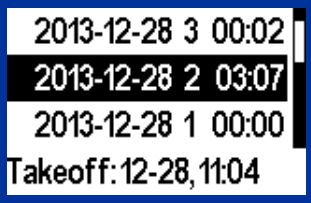
*OAT probes are available here.*

***Tools - Ribbon Menu***

**Tools is the last function on the ribbon menu.**



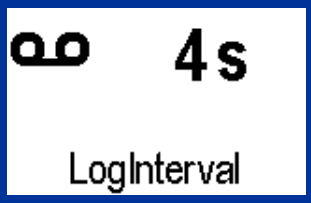





***Tools - Download Flights (Loading Waypoints)***

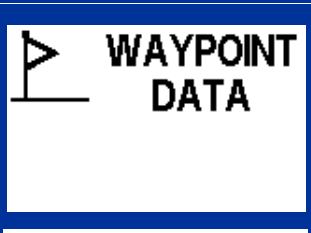
**Insert a USB drive into the ADC USB port.**

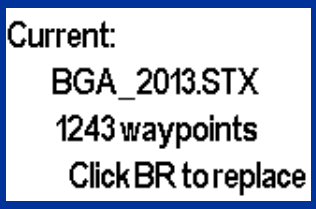
**A list of available log files will be displayed. Select the required log with the BR encoder and push the BR encoder to begin the download to the USB drive.**

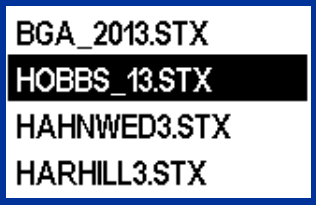


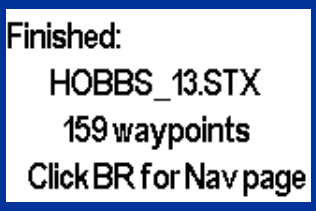

***Tools - Log Interval***

**The flight log record creation rate is adjusted using the BR encoder. The settings will result in creation of log records every 1, 2, 4, 8 or 12 seconds.**




***Tools - Waypoint Data (Loading Waypoints)***

**The Database Information screen allows you to load the CNv with waypoints required for your flight.**

**1/ Put your waypoint file(s) on a thumb drive and insert into the ADC.**

**2/ Spin the TL encoder briskly clockwise to bring up the ribbon menu.**

**3/ Scroll up/down through the ribbon menu with the BR encoder to select Tools.**

**4/ Scroll clockwise with the TL encoder to the Database Info screen. The CNV will display the name of the current loaded waypoint file - and the number of waypoints. (BGA_2013.STX is displayed in the example on the left.)**

**5/ Push/click the BR encoder to see the list of waypoint files on the USB thumb drive.**

**6/ Scroll through the list with the BR encoder and highlight the desired waypoint file. (HOBBS_13.STX is highlighted in the example on the left.)**

**7/ Push/click the BR encoder to load the waypoints in that file. 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.)**

**8/ Push/click the BR encoder to bring up the main navigation page. Profile Home is the default.**

**9/ Select a new navigation waypoint using any of the waypoint selection**

screens explained in the following sections.


***Tools - Profile***

This screen allows profile selection from multiple available to provide different CNv defaults / setups for different pilots or configurations.

The profiles are loaded on a USB drive and are typically selected prior to takeoff.


***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***

If no temperature probe is fitted the pilot can enter a temperature (or forecast temperature) for the current altitude and the instrument will use that to approximate the temperature with varying altitude. An estimate within a few degrees will provide good IAS/TAS correction and wind calculations.

Note: at present we use the standard atmosphere lapse rate. We may switch to using an adiabatic lapse rate.

OAT probes are available here.