



ClearNav Flight Computer User Manual

CONTROLLER

ClearNav operation is very intuitive and many pilots start using the system immediately with little or no tutorial. The initial sections of this manual therefore describe system function in abbreviated detail for those who would like to take this 'plug-n-play' approach. Most of the graphics in the manual also display drill-down images or explanations if you mouseover or click. Other following sections will review all system features in more detail to explain complex operations, calculations, and design logic. We will therefore start the manual with a review of hand-controller function as it is your communication interface to all ClearNav features.

HAND CONTROLLER



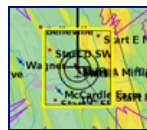
The nine-button hand controller buttons perform select, zoom and cursor movement functions like mice or game controllers.

MENU and **FOCUS** support specific ClearNav features.

MENU immediately displays/hides the ribbon menu - which gives the pilot access to all supporting screens and functions.



FOCUS immediately returns to the Moving Map when in any other screen ... or highlights the moving map Cursor Box for 5 seconds to allow easy identification on the navigation screen.






The Cursor Box can be moved quickly and precisely to any location on or beyond the displayed map - and the list of enclosed Waypoints and SUAs will be displayed in a new window when the pilot hits the **SELECT** button on the controller. The pilot can scroll down the list and select any turnpoint as an immediate destination - or just review navigation or airport information in the lower window. SUA information is also displayed in a separate tabbed window. The pilot can also mark lift or create a mark point for future reference.



The table following summarizes the behavior of the hand controller buttons in the primary screen types that support ClearNav navigation functions.

BUTTON BEHAVIOUR IN VARIOUS SCREENS

BUTTON	MOVING MAP 	TABBED MENU 	ENTRY SCREEN 
Up:	Moves Cursor Up	Moves Up Menu	Small Value Increase
Down:	Moves Cursor Down	Moves Down Menu	Small Value Decrease
Left:	Moves Cursor Left	Tab Left	N/A
Right:	Moves Cursor Right	Tab Right	N/A
Select:	Display Turnpoints & SUAs	Selects Highlighted Menu Item	Saves set value & returns to Tabbed Menu
Zoom +:	Zoom Closer to Map	N/A	Large Value Increase
Zoom -:	Zoom Away From Map	N/A	Large Value Decrease
Menu:	Toggle Ribbon Menu Display	Return to Prior Screen	Save and Return to Prior Screen
Focus:	Highlights the Map Cursor Box for 5 seconds	Returns immediately to Moving Map Screen	Returns immediately to Moving Map Screen

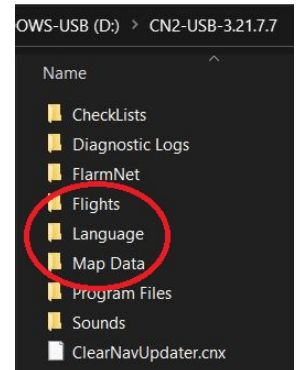
UPLOADING WAYPOINT AND OTHER FILES

A. Obtain Waypoint/Turnpoint files

- CN preloads World Terrain files ... and SUA files and Waypoint/Turnpoint files for Minden.
- You have to load SUA and Waypoint/Turnpoint files for your geographic area.
- ClearNav can use STX (Soaring Turnpoint Exchange), CUP (SeeYou), and CAI (Cambridge) files for turnpoint data. The STX format is preferred as it supports all of the ClearNav display features.
 - Pilots can usually get STX files for contests from the WW Turnpoint Exchange. They can also create STX files from scratch using Microsoft Excel, Notepad or other tools - or can convert other flat file formats to STX.

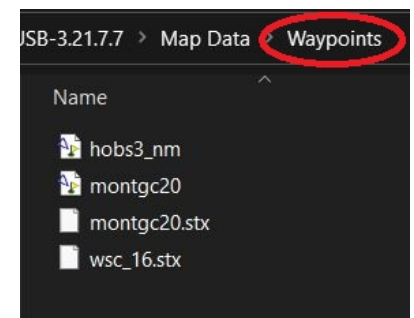
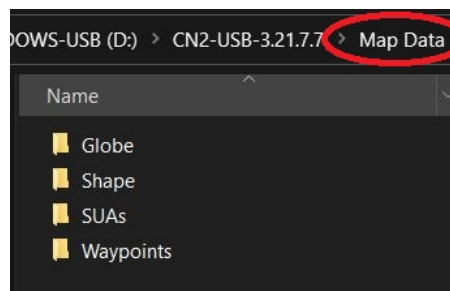
B. Copy files to USB Memory Stick (or SD Card)

- The CN supplied USB Memory sticks are preformatted with the folders needed to support the upload and download operations.
- Use the CN supplied USB Memory Stick - or format your own USB Memory Stick or SD Card using the folder and file structure that follows.



Root Folder

- Must contain ClearNavUpdater.cnx files to upload Map, WP, SUA, Language and version update files.
- May contain log files generated by the ClearNavUpdater.cnx.



Flights

- Downloaded flight log files will be placed in this folder.

Language

- Language files are uploaded from this folder. English, German, Spanish and French language files are already pre-loaded in delivered units by CN - so this folder is typically empty.

Map Data

- Globe
 - New Terrain Map Globe files can be placed here for uploading. World Globe files are already pre-loaded in delivered units by CN - so this folder is typically empty.
- Shape
 - New Terrain Map Shapefiles can be placed here for uploading. World Shape files are already pre-loaded in delivered units by CN - so this folder is typically empty.
- SUAs
 - New SUA files for your area can be placed here by the pilot for uploading.
- Waypoints
 - New Waypoint files for your area are placed here by the pilot for uploading.

C. Insert your USB stick into the ClearNav before you power up the unit

- The system will boot, display version information, and check security - displaying progress and status on the screen.
- The ClearNav application will detect the USB Stick or SD Card and will then run the Updater Program (ClearNavUpdater.exe) located in the root directory on the USB/SD device.
- The Updater System Update Screen will display to allow the pilot to select specific update options with the hand controller.

UPDATER SCREEN

ClearNavigator Updater

System Update

Don't Update Now

Select All

Software

Languages

Map Data

Waypoints

Airspace

Update

The 'Software' option is only used to upgrade the ClearNav to a new release. This option is only available if ClearNav application files (CN.exe and CN.nks) are placed on the USB Memory stick or SD Card.

- The default option is "Don't Update Now". Hit the controller select button to accept this option.
- "Select All" will check all the options - and automatically highlight the "Update" command box to initiate the update. (You can up arrow and deselect/select options.)
- Individually select or deselect each option: Languages, Map Data, Waypoints, Airspace - then highlight and select the "Update" command to initiate the update.
- Software will update your device using the ClearNavUpdater.cnx file. The other options will copy the appropriate files from the USB /SD device to solid state storage on the CN unit. These files then have to be loaded using a setup menu function.

File uploads are only allowed during the power up cycle - you may download files to a USB Memory stick or SD card at any time.

Supply Power for SIM operation at your desk using the Portable Power Connector (0652).



RIBBON MENU

The Ribbon Menu can be displayed or hidden at any time by pressing the **MENU** button on the hand controller.

- The Ribbon Menu displays at the top of the map screen - press twice to view when navigating from other screens.
- The menu item last accessed will be highlighted.
- LEFT or RIGHT controller buttons are used to highlight the desired menu option - the sub menu list will display automatically.
- Parameter changes are immediately included in the moving map and/or ClearNav calculations as appropriate.

RIBBON MENU FUNCTIONS



ACTION/NOTES

TASK FUNCTIONS - SEE TASK TUTORIAL

The **RIBBON MENU** - TASK icon gives the pilot one location to control all task functions.

Four screens are available via tab selection: Edit, Action, Task Map and Task List.

EDIT - Supports changes to any attribute of the Active Task. This screen is used to create or modify tasks.

ACTION - Allows the pilot to control Task Start, Active Leg, Turn Initiation, Final Glide Start, and Speed to use in time calculations.

TASK MAP - Displays a real-time view of all task legs and suggested turn area penetration depths calculated using a dynamic model and achieved or entered speeds.

TASK LIST - Lists all existing tasks - and supports a range of task maintenance functions including:

- **Activate/Edit** (a new / or existing task)
- **Delete** (the selected task)



GLIDE TO FINISH OR NEXT TURNPOINT

- "TO FINISH" or the name of the next Turnpoint/Waypoint will be displayed in the destination window.
- Glide to Finish will display a checkered flag in the ribbon menu - Glide to a Turnpoint will display the red pennant.
- The system will display the distance and altitude difference for the glide target as appropriate.
- If you have not reached the current target task turnpoint, the system asks for a confirmation when Glide to Next Turnpoint is selected.
- ClearNav navigates to the closest point on the bottom circumference of the Finish Cylinder. After crossing the circumference, ClearNav switches to the center of the Finish Cylinder at ground level as the navigation point.
- The altitude margin (Arrival Height AGL) value set in the Final Glide settings is added to the Finish Cylinder MSL altitude for calculating final glide margin.

DISPLAYS

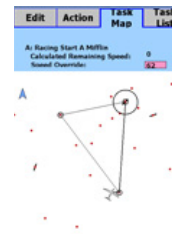
Ribbon Menu - Active Task Control Screens



TASK EDIT



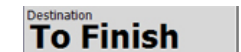
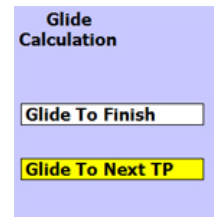
TASK ACTION



TASK MAP



TASK LIST



MC SET MACCREADY

- Up/Down Buttons = 0.5 Knots Change
- Zoom +/- Buttons = 1.0 Knots Change
 - The MC setting immediately impacts all system calculations and associated graphical displays.
 - The size of the thermal tracks, plotted as circles in the flight track on the main map page, immediately change as the MC is changed.
 - Green areas reflect measured lift rates that meet or exceed the entered MC value. These can be used as a tool to understand and identify thermal and other lift patterns.



MC = 5



MC = 1

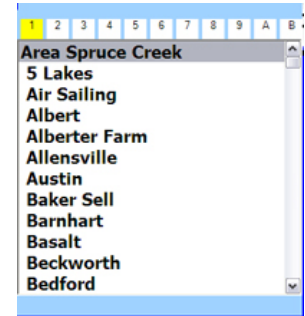


SELECT DESTINATION TP

- Displays TP List in Alphabetic order - use controller LEFT and RIGHT buttons to select desired list.
- Selected TP becomes Current Destination on Moving Map Screen. (Equivalent to TP selection using Moving Map Cursor.)

Note: If a task is in progress, navigation to the current task turnpoint is suspended - but can be restarted by selecting 'Resume' on the moving map or 'Resume Task' on the Action screen. All task metrics from the start are retained.

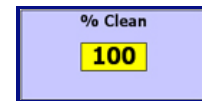
- Select hand controller **FOCUS** or **MENU** buttons to exit list with no TP selection .
- Up/Down Buttons = Scroll 1 Row
- Zoom +/- Buttons = Scroll 10 Rows



Controller Left/Right buttons select letter to use as a 'filter'. The list cursor will highlight the first occurrence of a TP matching the 'filter' value.

SET CLEAN (BUG) %

- Up/Down Buttons = 1 % Change
- Zoom +/- Buttons = 5 % Change



SET WATER BALLAST %

- Up/Down Buttons = 10 % Change
- Zoom +/- Buttons = 20 % Change

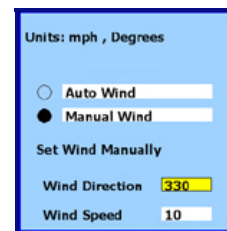


SELECT AUTO/MANUAL WINDS

AUTO/MANUAL WIND SELECTION AND ENTRY

ClearNav uses your selected wind type in all calculations.

- 'Auto Wind' uses ClearNav's last calculated Winds ... or current winds from a CNv or other supported device.
- Last calculated ClearNav winds may be from much earlier in the flight ... or could be zero (000/0) if the flight just started. You have to circle in a thermal to allow ClearNav to generate a new calculation based on GPS measured wind drift.
- 'Manual Wind' requires input of Wind Direction and Speed -Unit types (ex. mph, degrees) are displayed on the top of the Auto/Manual selection screen.



Select ClearNav Wind Source. This is immediately used in all calculations.

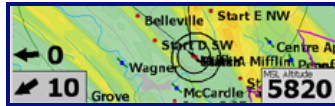
Enter Wind Speed and Direction for Manual Wind.

MANUAL WIND ENTRY

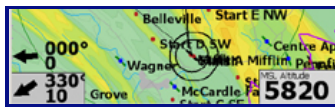
BUTTON	DIRECTION	SPEED
Up or Down	5 Units	1 Unit
Zoom + or -	10 Units	2 Unit

AUTO/MANUAL WIND DISPLAYS

- The **Auto** or **Manual** wind speed and direction information is displayed in a gray cell in the lower left corner of the Moving Map.
- If the **Manual Wind** option is selected, the **Auto Wind** speed and direction is displayed directly above to advise that ClearNav is using **Manual Wind** - and to show you the current **Auto Wind** value. If you only see the gray box, you are using Auto winds.
- The wind display can also include a numeric compass bearing - by selecting this feature in the Preferences/On-Screen Options menu.
- When two sets of wind information are displayed in the lower left corner of the map - this means Manual Wind has been selected.



- The Manually Wind value/vector is displayed in the gray box. The Auto Wind value/vector is displayed immediately above.
- The display below shows the same information - however, 'Numeric Wind Direction' has been selected in the Preferences Menu and the wind compass direction is also displayed.

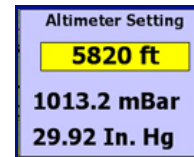


Alt

SET ALTITUDE

- Up/Down Buttons = 0.1 mBar Change
- Zoom +/- Buttons = 0.5 mBar Change

Note: ClearNav will default to the GPS field elevation at the start of each flight when it obtains a position fix. Manually entered values will not be overridden.



The mBar and In. Hg values are calculated and displayed as the Altimeter Setting is changed.



SET SCREEN LIGHT INTENSITY

- Power Save - Screen automatically sets to low intensity after 25 seconds - resets to high intensity with any controller button press.
- Low, Medium, High - adjust screen intensity to accommodate ambient light conditions.
- Off - turns display off to reduce current drain to a minimum. The system automatically switches to PowerSave mode with any controller button push.



Scroll to Power Save, Low, Medium, High or Off option ... and Select.

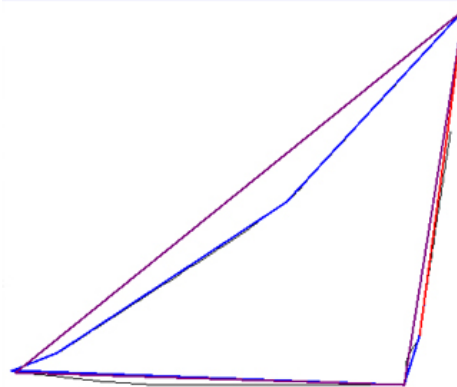
Intensity	~ Power mA
Low	400
Medium	500
High	600

OLC

ON-LINE CONTEST METRICS

- When invoked from the ribbon menu, the OLC function performs a real-time evaluation of your current flight to calculate metrics and scores. i.e. it does not constantly calculate these metrics in the background.
- The Check Box for 'OLC On' is important, because the OLC function has to track a few specific benchmarks throughout the flight to correctly calculate metrics. If you have the box unchecked before the flight - or if you uncheck during the flight - the OLC metrics may not be totally correct.
- When invoked from the ribbon menu, a "Loading, Please Wait" message will display.
- The "Finish Point" is for setting the goal, if it is not your takeoff point, which is the default.
- The app displays the achieved OLC distance and achieved FAI triangle. The FAI Triangle distance displayed assumes the finish will be completed at the Finish Point.
- Also displayed is the total distance assuming return to the finish point - along with total score (OLC Plus, unhandicapped) - also assuming returning to the finish point.
- The app assumes the triangle will be closed within 1 km horizontally and vertically per the OLC rules.

<input checked="" type="checkbox"/> OLC On			
Finish Pt	Blairstown		
Achieved	179km	Triangle	195km
Total To Goal	196km	Total Score	254pts



THERMALLING TRACKS

- Pilots can toggle Thermalling Tracks on or off ... or erase all tracks created to that point in time. Erased tracks cannot be recovered.
- ClearNav Thermal Tracks are based on real-time climb metrics and provide effective graphical guidance to the strongest lift areas.
- The MacCready setting allows the pilot to display thermal 'tracks' that meet or exceed the entered MC value.
- A high MC will typically produce small plotting circles that identify the highest lift rates found in thermal cores. Lower MC values will typically broaden the plotting circles to match the larger areas of lower lift found around the core.

Track Control

Tracks

Erase Tracks

MC = 5



MC = 1



SETUP MENUS

Setup Menus allow the pilot to create and edit:

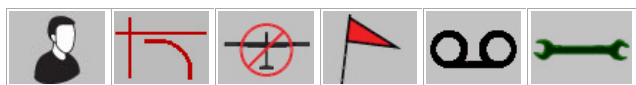
- PERSONAL SETTINGS
- GLIDERS
- SPECIAL USE AIRSPACE
- WAYPOINTS
- FLIGHT RECORDER
- TOOLS



RIBBON MENU OPTIONS

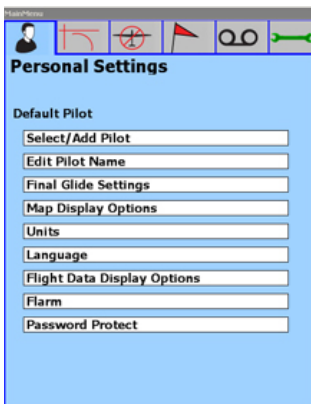
Ribbon Options

- Task
- MC
- Destination
- Bugs
- Ballast
- Wind
- Altimeter
- Backlight
- Track Control
- Glide to Finish / To Next WP
- OLC



SETUP MENU - PERSONAL SETTINGS

PERSONAL SETTINGS



AVAILABLE FUNCTIONS

- [SELECT/ADD PILOT NAME](#)
- [EDIT PILOT NAME](#)
- [FINAL GLIDE SETTINGS](#)
- [MAP DISPLAY OPTIONS](#)
- [UNITS](#)
- [LANGUAGE](#)
- [ON SCREEN OPTIONS](#)
- [FLARM](#)

SELECT / ADD PILOT



- Up/Down Buttons = Row Change
- Left/Right Buttons = Column Change

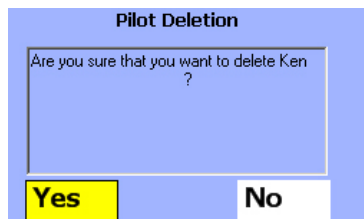
The current active pilot is displayed at the bottom left of the Select / Add Pilot Screen.

SELECT ACTIVE PILOT OR ADD NEW PILOT

SELECT - Highlighting this row/cell and hitting the controller Select button makes that pilot active and returns one level up to the Personal Preference menu.

DELETE - The controller left/right buttons allow selection of the Delete function for existing pilot records.

- The system will display a Delete Confirmation window and ask for verification. 'YES' is the default.



ADD - Selecting the Add function will display the New Pilot Name screen (below) to allow entry of the New Pilot Name.

ADD NEW PILOT NAME



- Up/Down/Left/Right = Cell Change
- Select Button = Select and Toggle

ENTER NEW PILOT NAME RECORD

- A blank row of individual cells is displayed to capture and manipulate text input. A grid of all available alphanumeric text values is displayed immediately below.
- Text is 'entered' a character at a time by toggling between the two grids. The location of the active insertion point ... or selected character is highlighted by the system.
- When you are on the capture row, the hand controller left/right arrows allow you to select the insertion point for the next letter or number. Hitting the controller select button then toggles you to the grid where you can select a letter or number.
- The system actually adds cells incrementally to the capture row - starting with one cell. The small left/right arrows below the row show how many cells are available.

EDIT PILOT NAME



- Up/Down/Left/Right = Cell Change
- Select Button = Select and Toggle

EDIT EXISTING PILOT NAME RECORD

This screen allows you to edit the currently selected pilot name ... 'Default Pilot' in this example.

- The screen displays a row with the currently selected name - and allows you to delete characters or change text ... selecting from a grid of all available text values.
- Text is deleted and/or changed a character at a time by toggling between the two grids. The location of the active insertion point ... or selected character is highlighted by the system.
- When you are on the capture row, the hand controller left/right arrows allow you to select the insertion point for the next letter or number. Hitting the controller select button then toggles you to the grid where you can select a letter or number.
- In this example, 'P' was selected and the system activated the text selection grid - positioning the highlight to 'P'. You can move to any other value on the text grid using the left/right and up/down buttons - and hit the controller Select Button to accept.

FINAL GLIDE SETTINGS

Arrival Height, AGL

Glide Amoeba

Purple Arrival Height 1000

Red Arrival Height

Show SUA Flyover Circle

MSL Altitude

- This screen allow the pilot to set the three parameters that are used in dynamic glide range calculations.
- These real-time calcs incorporate glider polar, ballast %, bug %, MC, and winds.
- CONTROLLER ALTITUDE INPUT
 - Up or Down: 100 Units
 - Zoom + or -: 500 Units

ENTER FINAL GLIDE PARMS (AMOEBEA SETTINGS)

Arrival Height, AGL

Feet

'Arrival Height, AGL' is used by the final glide calculator ... and the calculation engine for the purple amoeba ('Purple Arrival Height'). The purple amoeba shows your glide range in all directions from your current altitude to an altitude equal to your 'Arrival Height, AGL'.

As you change the 'Arrival Height, AGL' you will see this value applied automatically to the 'Purple Arrival Height' parameter. No direct modification to the latter is permitted.

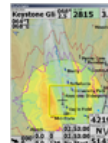
Red Arr. Height

Feet

The 'Red Arrival Height' parameter is used by the calc engine for the red amoeba. This is typically set to zero to reflect real-time glide range to the ground.

MSL Glide Range

Feet



MSL Glide Range Circle Setting Highlighted MSL Glide Range Circle

The 'MSL Glide Range' altitude is used to calculate dynamic glide range in all directions from your current altitude to the entered MSL altitude. i.e. the MSL Altitude represents an operations floor. MSL Glide Range is displayed on the ClearNav Map as a circle (in zero wind) defined by a thin black line. This real-time calculation incorporates glider polar, ballast %, bug %, MC, and winds.

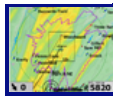
MAP DISPLAY OPTIONS



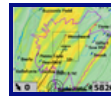
TRACKS - allows pilots to display or hide 'ground' tracks. The tracking data is retained so the pilot can switch this on/off without losing track history. 'Clear' Tracks will erase track history.



Tracks Control Menu



Tracks On



Tracks Off



Tracks Erased Message

MAP ITEMS - allows pilots to select background features that should show on the moving map. Terrain, Roads, Water Bodies, City Areas can be turned on or off individually.



Map Items Control Menu



All Features ON

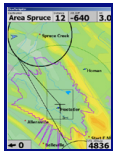


All Features Off

WAYPOINT NAMES / NUMBERS - allows pilots to select Control and Waypoint Name display options. You can display long name or short name with or without the turnpoint number. The short name is five characters long.



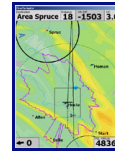
Waypoint Format Menu



Long Names

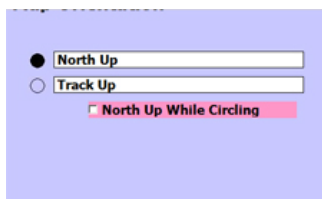


Long Names and Numbers



Short Names

MAP ORIENTATION



TRACK UP

A black reference sailplane is displayed and track is always upward on the map display. The map terrain features and waypoints rotate under the reference sailplane as heading is changed - matching the pilot's view outside the cockpit.

Map rotation is suspended if you hit the controller up, down left or right buttons to move the cursor. The sailplane image will change to the white variant to reflect this state. Rotation will restart if the Select button is pressed - or when the rotation suspense timer expires in ~ 20 seconds.

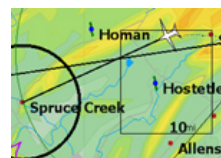
In Track Up mode, the reference sailplane is positioned in the lower third of the display to present the maximum view of terrain and waypoints ahead.



NORTH UP

Map terrain features and waypoints remain stationary fixed to north - which is assumed to be the top of the screen. The white reference sailplane rotates as heading is changed.

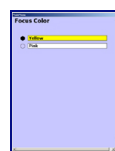
The reference sailplane is positioned in middle of the display to present the maximum view of terrain and waypoints ahead with any course change.



North Up While Circling

The **TRACK UP** mode display will auto-change to North Up when the ClearNav detects the ship is circling. (i.e. an ongoing course change of 20 degrees + per second for more than 10 seconds.) The display will revert to Track Up when circling ends.

FOCUS COLOR - allows pilots to select the color the provides the best resolution considering sun glass tint and the ambient light conditions.

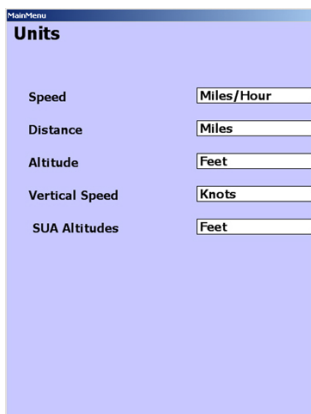


Focus Color Yellow



Focus Color Pink

UNITS



SELECT DISPLAY UNITS

The **UNITS** menu allow the pilot to select the entry and reporting basis for all displayed metrics and parameters. Selectable options include:

- **SPEED** - Kilometers/Hour, Miles/Hour, Knots
- **DISTANCE** - Kilometers, Miles, Nautical Miles
- **ALTITUDE** - Meters, Feet
Vertical Speed - Knots, Meters/Second
SUA Altitudes - Meters, Feet

LANGUAGE



SELECT LANGUAGE

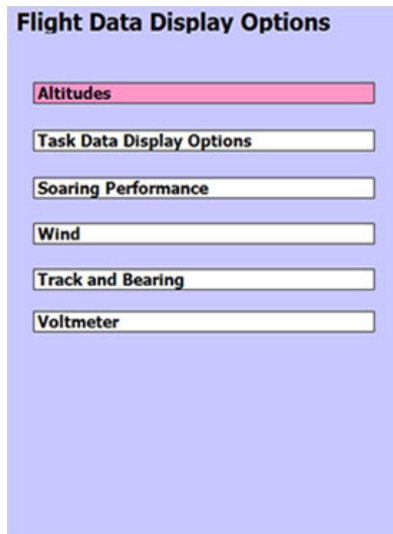
The Language Menu allows selection of the desired system language. Selectable options include:

- DEUTSCH
- ENGLISH
- ESPANOL
- FRANCAIS

FLIGHT DATA DISPLAY OPTIONS

This function allows you to display additional flight/task metrics on the moving map. All will appear immediately when selected - except the voltmeter display, which will only appear if the voltage drops to or below the designated threshold.

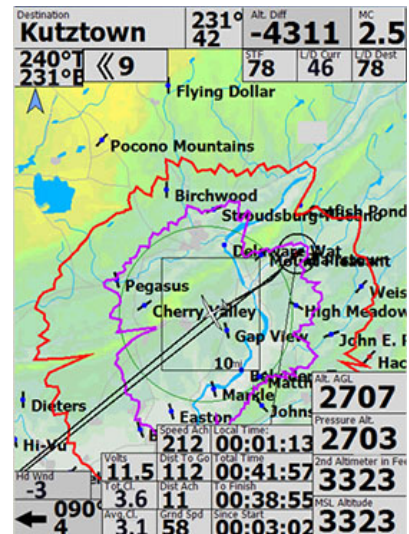
The requested parameters will be displayed in pre-mapped locations to group like items together ... i.e. Altitude items will appear in the same column, time items in the same column, etc. The displayed values are not moveable from the mapped locations.



On-Screen Option selection menu.



This is the baseline map presented when no additional on-screen items are requested.



This is the map generated when all on-screen options are requested.

FLIGHT DATA DISPLAY OPTIONS

- **Pressure**

Pressure Alt.
2703

Pressure Altitude is supplied by the ClearNav pressure transducer. (The SIM will display a N/A value.)
- **Ground Speed**

Grnd Spd
58

Calculated Speed over Ground.
- **Total Time**

Total Time
00:41:57

Total Time is the estimated time to complete -calculated by adding the Time Since Start to the Time To Finish.
- **AGL**

Alt. AGL
2707

Altitude AGL is approximate and calculated by subtracting terrain elevation from MSL Altitude.
- **Time Since Start**

Since Start
00:03:02

Time since last valid start.
- **2nd Altimeter in Feet MSL**

2nd Altimeter in Feet
3323

Second Altimeter - Always defaults to MSL in feet.
- **Time To Finish**

To Finish
00:38:55

Time To Finish is the estimated time (hh:mm:ss) to task finish – calculated by dividing the Distance To Go by the Predicted Speed.
- **Distance Achieved**

Dist Ach
11

Distance Achieved since last start.
- **Distance To Go**

Dist To Go
112

Distance To Go is the distance from your current location to remaining turnpoints to the finish point.
- **Speed Achieved**

Speed Ach
57

Achieved Speed is the average speed since the start of the task.
- **Current Average Climb**

Avg.Cl.
3.1

Average climb rate in the current thermal.
- **Flight Average Climb**

Tot.Cl.
3.6

The average climb rate since take-off – or since the last task start .
- **L/D to Destination**

L/D Dest
78

LD required to reach destination.
- **L/D Current Glide**

L/D Curr
46

LD acheived in current glide.
- **Speed-To-Fly Units /Hour**

STF
78

Speed To Fly - Computed for MC, Wind, Bugs and Ballast.
- **Ground Speed**

Grnd Spd
58

Speed over Ground
- **Local Time**

Local Time:
00:01:13

Local Tlme
- **Direction**

← 090°
4

This option allows display of the wind compass directions in degrees magnetic as a numeric value in addition to the vector arrow.
- **Headwind Component**

Hd Wnd
-3

Calculated Head Wind Component
- **Track/Bearing**

240°T
231°B

The Track/Bearing window displays the sailplane’s current track and bearing to the active waypoint
- **Bearing/Distance**

231°
42

This option adds Bearing info - to the Distance window at the top center of the moving map.
- **Track Error**

◀◀ 9

Deviation from direct track to destination -Degrees.
- **Voltmeter**

Volts
11.5

Battery Voltage

FLARM

Flarm

Show Flarm Alarm

Flarm Alarm Sound

Alarm Suppression

Alarm Suppression

None, 19 to 25 seconds

11 to 18 seconds, fewer alarms

6 to 8 seconds!

FLARM

- The FLARM options allow the pilot to control the FLARM warning audio and visual displays.
- Flarm display and audio options are controlled on the first screen.
- The Alarm Suppression options allow the pilot to control the length of the alarm warnings - and the sensitivity threshold.



SETUP MENU - GLIDER

GLIDER - MAIN MENU



AVAILABLE FUNCTIONS

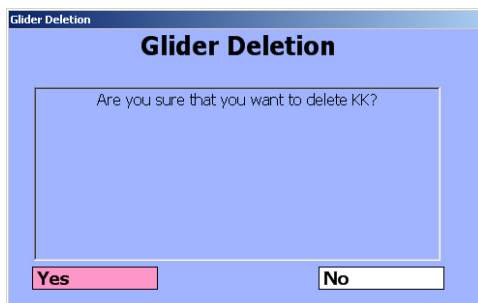
- [SELECT/ADD GLIDER](#)
- [EDIT GLIDER ID](#)
- [EDIT GLIDER TYPE](#)
- [POLAR](#)

SELECT / ADD GLIDER



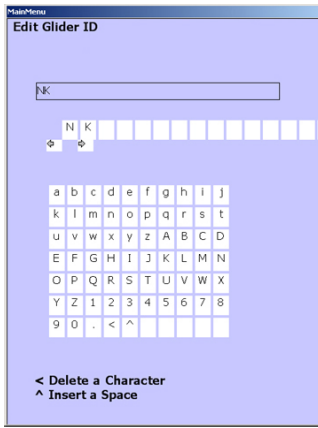
SELECT ACTIVE GLIDER ID OR ADD NEW GLIDER ID

- **SELECT** - Highlighting this row/cell and hitting the controller Select button makes that glider active and returns one level up to the Glider menu.
- **DELETE** - The controller left/right buttons allow selection of the Delete function for existing glider records.
- Up/Down Buttons = Row Change
- Left/Right Buttons = Column Change
- The current active glider is displayed at the bottom left of the Select / Add Glider Screen.
- **ADD** - Selecting the Add function will display the New Glider screen (below) to allow entry of the New Glider ID.



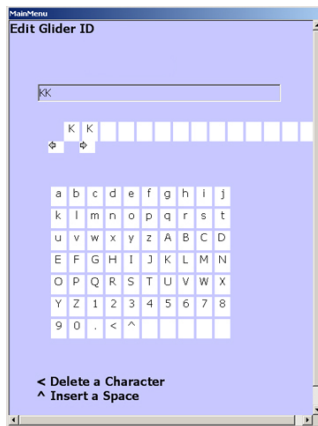
The system will display a Delete Confirmation window and ask for verification. 'YES' is the default.

ADD NEW GLIDER ID



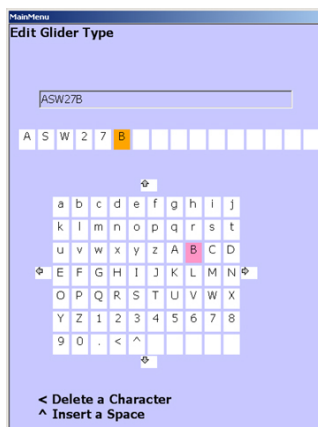
- Up/Down/Left/Right = Cell Change
- Select Button = Select and Toggle

EDIT GLIDER ID



- Up/Down/Left/Right = Cell Change
- Select Button = Select and Toggle

EDIT GLIDER TYPE



- Up/Down/Left/Right = Cell Change
- Select Button = Select and Toggle

ADD NEW GLIDER ID SCREEN

- A blank row of individual cells is displayed to capture and manipulate text input. A grid of all available alphanumeric text values is displayed immediately below.
- Text is 'entered' a character at a time by toggling between the two grids. The location of the active insertion point ... or selected character is highlighted by the system.
- When you are on the capture row, the hand controller left/right arrows allow you to select the insertion point for the next letter or number. Hitting the controller select button then toggles you to the grid where you can select a letter or number.
- The system actually adds cells incrementally to the capture row - starting with one cell. The small left/right arrows below the row show how many cells are available.
- When the system creates the new Glider ID, it automatically assigns a Glider Type record equal to the last entered Glider ID.
- Use the Edit Glider Type function to update type.

EDIT GLIDER ID SCREEN

- This screen allows you to edit the Glider ID of the currently selected Glider ID ... 'KK' in this example.
- The screen displays a row with the currently selected name - and allows you to delete characters or change text ... selecting from a grid of all available text values.
- Text is deleted and/or changed a character at a time by toggling between the two grids. The location of the active insertion point ... or selected character is highlighted by the system.
- When you are on the capture row, the hand controller left/right arrows allow you to select the insertion point for the next letter or number.
- Hitting the controller select button then toggles you to the grid where you can select a letter or number.
- No change is made to the Glider Type record associated with this ID.

EDIT GLIDER TYPE SCREEN

- This screen allows you to edit the Glider Type of the currently selected Glider ID ... 'KK' in this example.
- The screen displays a row with the currently selected name - and allows you to delete characters or change text ... selecting from a grid of all available text values.
- Text is deleted and/or changed a character at a time by toggling between the two grids. The location of the active insertion point ... or selected character is highlighted by the system.
- When you are on the capture row, the hand controller left/right arrows allow you to select the insertion point for the next letter or number.
- Hitting the controller select button then toggles you to the grid where you can select a letter or number.

POLAR

Main Menu

Polar

Ballast

Empty Weight

Best Glide

Best Glide Speed

2 m/s Sink Speed

1 kph = 0.538 kts

ADD/EDIT POLAR SCREEN

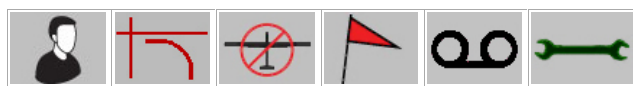
- This screen allows you to enter or edit the Polar for the currently selected Glider ID ... 'KK' in this example.
- Use the controller up/down keys to select the desired polar parameter and hit Select to bring up the entry screen.

Ballast 180 Liters	Unballasted Weight 375 Kilograms	Best Glide 55	Best Glide Speed 120 kph	2 m/s Sink Speed 165 kph
---------------------------------	---	-------------------------	---------------------------------------	---------------------------------------

The controller Up and Down ... and Zoom + and Zoom - keys will change the values.

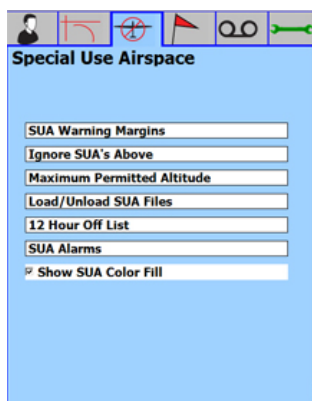
CONTROLLER INPUT	BALLAST	WEIGHT	BEST GLIDE	SPEED
Up/Down	1 Unit	5 Units	1 Unit	1 Unit
Zoom +/-	5 Units	10 Units	5 Units	5 Units

The specific unit types (metric vs imperial) displayed are determined by the options selected in the Personal Preferences (Units) menu.



SETUP MENU - SPECIAL USE AIRSPACE

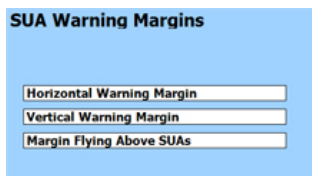
SUA - MAIN MENU



AVAILABLE FUNCTIONS

- [HORIZONTAL WARNING MARGIN](#)
- [VERTICAL WARNING MARGIN](#)
- [MARGIN FLYING ABOVE SUA](#)
- [IGNORE SUA'S ABOVE](#)
- [MAXIMUM PERMITTED ALTITUDE](#)
- [LOAD/UNLOAD SUA FILES](#)
- [12 HOUR OFF LIST](#)
- [AUDIO ALARM](#)
- [OFF BY TYPE MENU](#)
- [SUA ALARMS ARE ON](#)

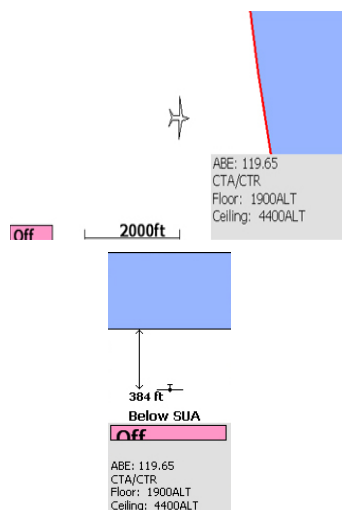
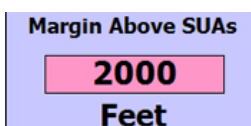
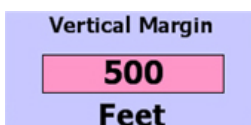
SUA - WARNING MARGINS



SET WARNING MARGINS

This menu allow you to set the distances and altitudes that will trigger airspace warnings. All warnings open a new window that shows glider position relative to the airspace - which is highlighted in blue. SUA radio frequency, airspace type, and dimensions are also displayed. The waning window can be closed by Selecting the 'OFF' option in the lower left part of the window.

SUA Warning Margins are accessed via a sub-menu.

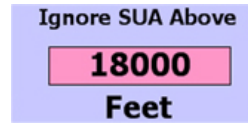


This option controls the Above SUA Warnings.

SUA - IGNORE SUA'S ABOVE



IGNORE SUA'S ABOVE

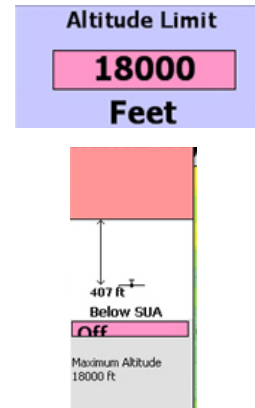


This option suppresses warnings for airspace at altitudes that you cannot realistically reach during the flight.

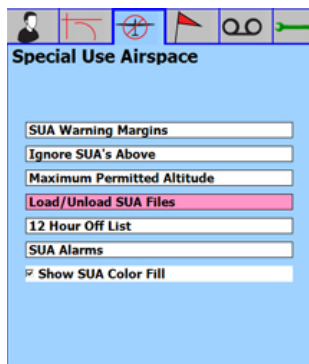
SUA - MAXIMUM PERMITTED ALTITUDE



MAXIMUM PERMITTED ALTITUDE



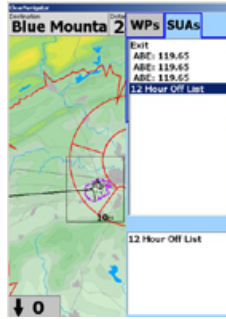
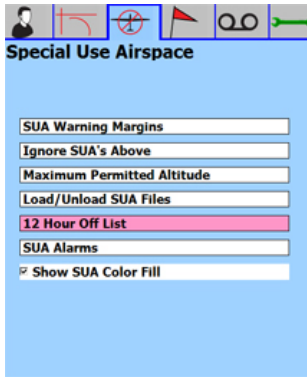
SUA - LOAD/UNLOAD SUA FILES



LOAD/UNLOAD SUA FILES FROM CLEARNAV STORAGE

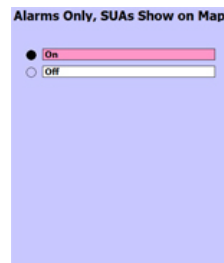
This feature allows you to identify the SUA files ClearNav will use for the current flight. The system contains a storage area to stage files uploaded from Memory Sticks or SD Cards. Although these are resident in system storage, the CN Navigator application will not use them unless specifically directed.

SUA - 12 HOUR OFF LIST



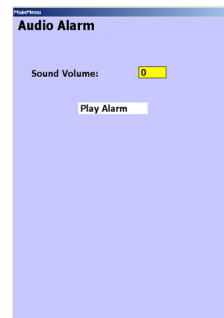
- This feature allows the pilot to turn off the alerts for a specific SUA for 12 hours.
- Position the cursor over the SUA and press Select to display the SUA information.
- Highlight '12 Hour Off List' to suppress warnings for 12 hours.

SUA - ALARMS



- This option allows the pilot to turn the SUA Alarms on or off.
- These SUA boundaries will still show on the maps and other displays as appropriate.

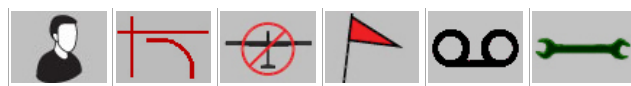
ALARM SUB-MENU



- This option allows the pilot to set the SUA warning alarm volume.

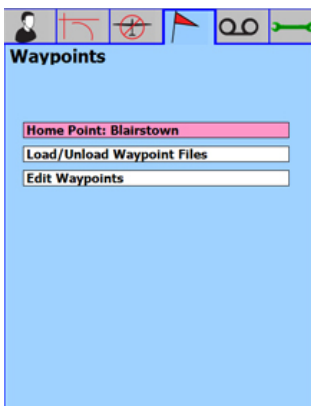


- This option allows the pilot to suppress SUA warnings for the following airspace types.
 - Danger
 - Airway
 - Wave
 - Window
 - Glider
 - Prohibited



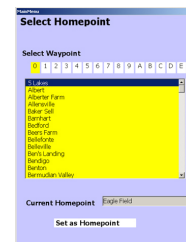
SETUP MENU - WAYPOINTS

WAYPOINTS - MAIN MENU



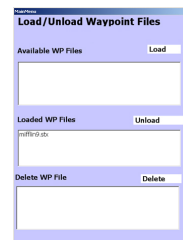
SELECT HOME FIELD

- This screen allows you to select the home field for all navigation functions.
- Use the left/right buttons to position the list to the selected alpha value ... then scroll up/down and hit 'Select' to make that waypoint your home airport.



LOAD/UNLOAD FILES

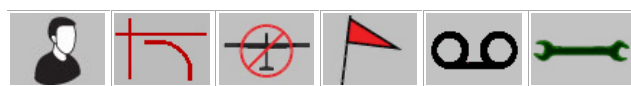
- This function allows you to manage waypoint files on your system.
- AVAILABLE WP FILES** - The top section shows the files that are in the ClearNav storage area, but not loaded. This is the staging location used to store files uploaded from your memory stick or SD card. Highlight the file and hit select to 'Load' the file - the waypoints in the file will then be available for navigation purposes.
- LOADED WP FILES** - The center sections shows loaded files - containing waypoints that are available for navigation functions. You can move files back to the Available WP Files area by highlighting the file and hitting the controller 'Select' button. The waypoints in the file will not show in any navigation function.
- DELETE WP FILE** - The lower section allows you to completely remove files from the system - highlight the file and hit 'Select' to totally delete the file and contained waypoints from the ClearNav system.



EDIT WAYPOINTS

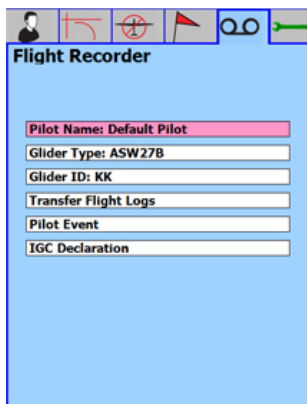
- This screen allows you to edit Waypoint Attributes.
- The uploaded waypoint file must be in STX format.





SETUP MENU - FLIGHT RECORDER

00 FLIGHT RECORDER - MAIN MENU



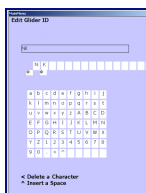
PILOT NAME

The Pilot Name currently selected in Personal Preferences will be the default for the Flight Recorder Declaration. This menu item allows you to edit the currently selected Pilot Name.



GLIDER TYPE

The Glider Type currently selected in Personal Preferences will be the default for the Flight Recorder Declaration. This menu item allows you to edit the currently selected Glider Type.



GLIDER ID

The Glider ID currently selected in Personal Preferences will be the default for the Flight Recorder Declaration. This menu item allows you to edit the currently selected Glider ID.

TRANSFER FLIGHT LOGS

- The menu item allows you to transfer flight logs from the ClearNav to a Memory stick or SD Card.
- The system will ask you to insert a stick or card if none is detected.
- A list of available files will be displayed ... along with a dropdown menu allowing you to select the file sample rate.
- Log Interval - All ClearNav log files are recorded at a one second interval. However, you can select a 1, 2, 4 or 10 second interval when you create a log file on you memory stick or SD Card to submit your flight. The longer intervals will create smaller files -but may impact your task length or number of fixes in a turn area or sector. The original ClearNav file remains unchanged - so you can transfer again with a different interval if required.
- Select '**TRANSFER LOG**' and hit the controller **SELECT** button to initiate the transfer to your memory device. An asterisk will be appended to the beginning of the log name on the list to indicate the file has been transferred.





PILOT EVENT

- This menu item allow you to record a Pilot Event record in the current flight log.



IGC DECLARATION

This function allows you to make an IGC declaration.

The current UTC Time and Date, currently selected Pilot Name, Glider Type, ID, and Task will be used in the declaration.

This declaration will be appended to any flight logs created going forward.

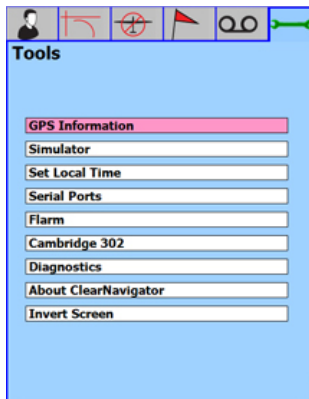
A change to Task, Pilot, Glider Type, or ID will require creation of a new IGC Declaration prior to takeoff.

A declaration cannot be made if the glider is in flight.



SETUP MENU - TOOLS

TOOLS - MAIN MENU

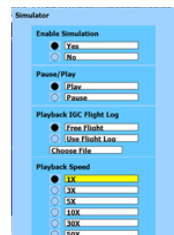


GPS INFORMATION



This screen displays real-time GPS and ClearNav data and status information. This display should update constantly.

SIMULATOR



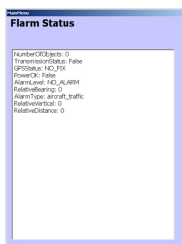
SIM Options allow you to Enable SIM operation and select Playback Speed or Pause SIM operation. Free Flight or IGC File Playback are other options.

SET LOCAL TIME



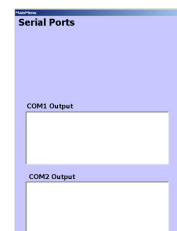
This screen allows you to set the HH value to local time. The up/down button on the controller moves HH in one hour increments. All flight log and declaration information is stored in UTC time.

FLARM STATUS



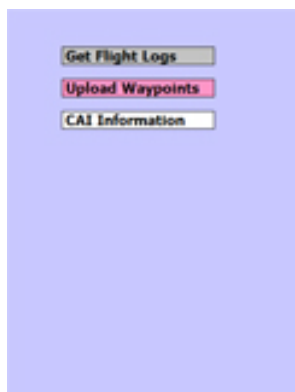
This screen displays real-time FLARM data and status information. This display should update constantly.

SERIAL PORTS



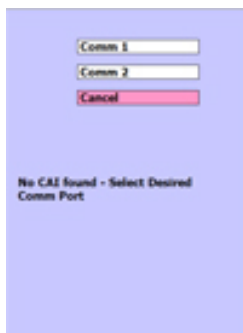
This screen displays real-time Serial Port data and status information. This display should update constantly.

CAMBRIDGE 302 MENU



The menu allows you to get flight logs from the Cambridge instrument

GET LOGS



The menu allows you to get flight logs from the Cambridge instrument

UPLOAD WP



The menu also allows you to upload WPs to the Cambridge instrument

UPLOAD WP



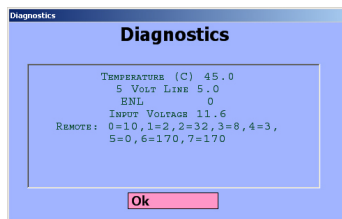
The menu also allows you to upload WPs to the Cambridge instrument

CAI INFO



Real-time CAI data and status information.

DIAGNOSTICS



This screen reports ClearNav diagnostic data that will be used by NK technicians to research operational issues.

ABOUT CLEARNAV



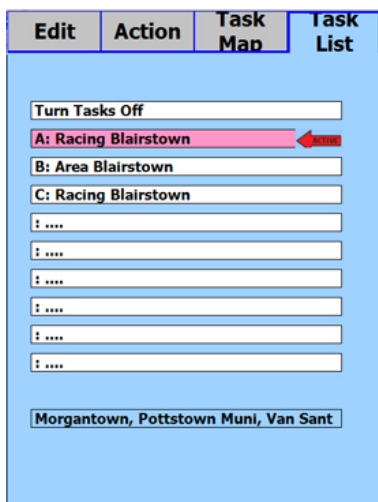
This screen reports unit serial number, installed software and firmware versions, and the unit sealed status.

TASK FUNCTION TUTORIAL



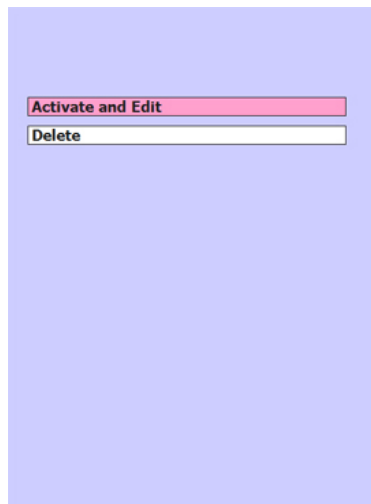
TASK LIST, EDIT AND ACTIVATE

TASK LIST SCREEN



The Task List Screen shows a table with columns: Edit, Action, Task Map, and Task List. The first row is 'Turn Tasks Off'. The second row is 'A: Racing Blairstown' with a red arrow pointing to it. The third row is 'B: Area Blairstown'. The fourth row is 'C: Racing Blairstown'. Below these are several rows with ':'. At the bottom, there is a text box containing 'Morgantown, Pottstown Muni, Van Sant'.

TASK ACTIVATE AND EDIT



The Task Activate and Edit screen has a pink header 'Activate and Edit' and a white text box 'Delete' below it.

- The Task List Screen displays the task inventory, provides tools to create and edit tasks, or turns off ClearNav task functions.
- Select **"Turn Tasks Off"** to disable all task metrics and messaging on the ClearNav Moving MapScreen.
- As you move through the tasks in the directory rows, the initial waypoints will be displayed in a window at the bottom of the screen to facilitate task selection.
- Select a task or blank row to display the Task Edit/Control function menu:
- **Activate and Edit Returns** to the Task Edit. The red "Active" arrow is moved to the selected and activated task in the background.
- **Delete** - The selected task - No confirmation will be requested.



TASK EDIT

The Task Edit / Action / Map screens are used to define the task geometry and turnpoints. Tasks are typically created before takeoff, but can be modified easily in flight using system default values and drop-down lists.

EDIT - allows entry of task parameters - 1/ Task Type 2/ Rules.-3/Turnpoints-4/ Turnpoint Radius

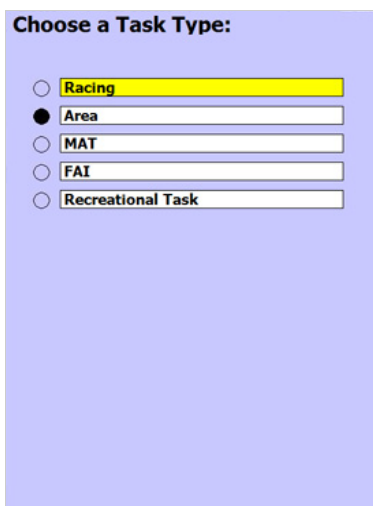
1. TASK TYPE is selected from a list of five options.

2. RULES for Start, Waypoint, and Finish geometry are specified in the rules screen - which defaults to values appropriate for the task type. See the table below for Task Rules & Defaults.

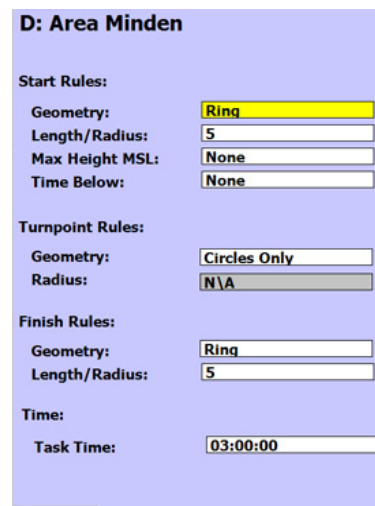


The Task Edit screen for 'D: Area Minden' shows 'Type: Area'. It has fields for 'Start: 5.0mi Ring', 'TP: Circles Only', 'Finish: 5.0mi Ring', and 'Time: 03:00:00'. Below is a table with columns for task details and a 'Set TP Dimensions' button at the bottom.

1	Minden	--	--
51	Tiger	43	10
14	Coleville	69	10
2	Finish	33	--
		145	



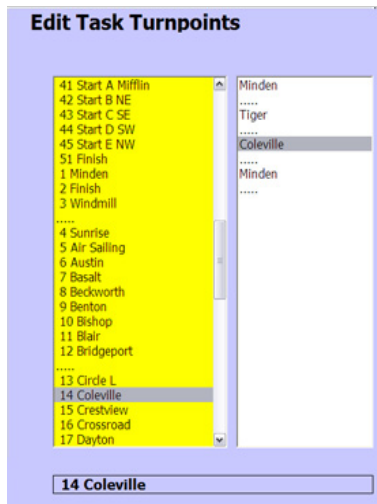
The 'Choose a Task Type' screen has radio buttons for: Racing, Area (selected), MAT, FAI, and Recreational Task.



The 'D: Area Minden' rules screen has sections for Start Rules, Turnpoint Rules, and Finish Rules. Start Rules: Geometry: Ring, Length/Radius: 5, Max Height MSL: None, Time Below: None. Turnpoint Rules: Geometry: Circles Only, Radius: N/A. Finish Rules: Geometry: Ring, Length/Radius: 5. Time: Task Time: 03:00:00.

3. TURNPOINTS are selected from the window on the left and are inserted into the selected position in the right window.

- The Controller **Left/Right** Keys selects the windows. The **Up/Down** Keys selects the row - highlighting a Turnpoint to copy - or a target location to insert.
- The elipsis ('.....') represents a blank row.
- Turnpoints in the right window are deleted by inserting an elipsis in place of the turnpoint.



4. RADIUS geometry for each Turnpoint can be set individually, if the default value is not desired.

- Highlight the Turnpoint and hit the Controller select button to display the radius adjustment screen.
- The Controller Up/Down keys will change the values.
- Start/Finish Geometry is adjusted in the window below Task Type.



ClearNav enforced rules, defaults and task characteristics follow. N/A indicates no value entry is allowed.

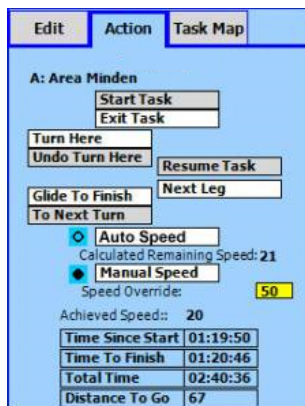
TASK TYPE RULES & DEFAULTS

CATEGORY	RULE	RACING	AREA	MAT	FAI
START	Geometry	Cylinder, US	Cylinder, US	Cylinder, US	FAI Sector
	Length/Radius	1.0	1.0	1.0	N/A
	Max Height MSL	5000	5000	5000	5000
	Time Below	2	2	2	N/A
	Speed Limit	None	None	None	None
TURNPOINT	Geometry	Point	Circles Only	Point	FAI Sector
	Radius	1 Mile	Area Specific	1 Mile	N/A
FINISH	Geometry	Ring	Ring	Ring	FAI Sector
	Length/Radius	1.0	1.0	1.0	N/A
	Min Height MSL	499	499	499	499
	Max Height MSL	None	None	None	None
TIME	Sunset	HH:MM:SS	HH:MM:SS	HH:MM:SS	HH:MM:SS
	Task Time	N/A	HH:MM:SS	N/A	N/A



SETUP - TASK ACTION AND TASK MAP SCREENS

The Task Action and Task Map Screen are typically used in flight to control the task ... provide guidance on required Turn Area penetration ... or perform speed/time calculations. These screens are also available using the Ribbon Menu Task function.



The Task Action Screen provides centralized monitoring and control of all task phases. Refer to the table below to understand control features and impact.



The Task Map Screen provides an overview of the entire task and supplies Turn Area guidance using actual or entered speed values.

TASK ACTION SCREEN CONTROLS

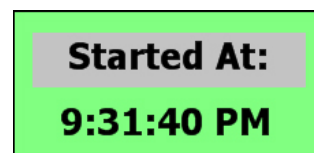
CONTROL

ACTION

START TASK

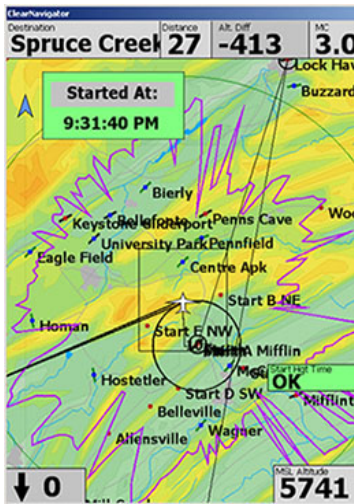
Manually starts the task. Since the task will start/re-start automatically when you exit the start cylinder or cross the start line, you should never really need this option.

A manual or automatic task start will display the "Task Started" message box.



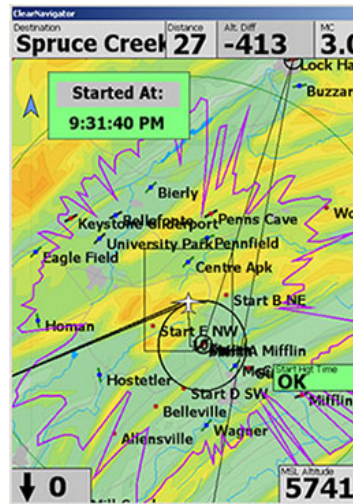
Task Start - Maximum Height Control

ClearNav start logic will also advise if the pilot is adhering to the pre-start start altitude rules. If the maximum start cylinder altitude is exceeded, a red alert will display until altitude falls below the cylinder maximum. At that point, a timer will display to count down the time below the cylinder maximum. The status will go to a green 'OK' when the time below maximum is satisfied.

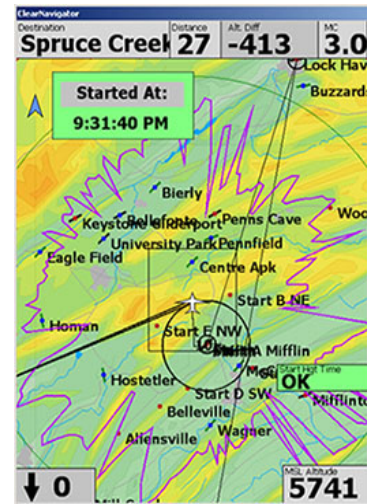


A Start was initiated ... and the pilot is below cylinder maximum altitude.

Start With Green Altitude Status



Warning that current altitude is above cylinder maximum



Count-down timer is activated when altitude falls below cylinder maximum.

ClearNav will monitor you time above the start cylinder maximum - outside the cylinder perimeter for an additional 10KM. This will insure you have an accurate status if you enter the cylinder from beyond the perimeter to start or re-start.



Start height control messages are advisory - you will get an automatic start (or can initiate a manual start) if ClearNav detects you have exited the start cylinder. You have to monitor the height control messages to insure you were below the maximum start height for the required duration.

EXIT TASK

Aborts the task. All task metrics are erased.

TURN HERE

The task is redrawn with this point as the turnpoint - the active waypoint is changed to the next waypoint in the task.

UNDO TURN HERE

Cancels prior "Turn Here" if still in current turn area. Resumes navigation to the calculated ideal turnpoint within the current turn area.

RESUME TASK

Restart task after it has been suspended – i.e. when you have manually selected a Destination Turnpoint after the task is started. **All task metrics from the last start are retained.**

NEXT LEG

Commands navigation to next task leg for area tasks.

GLIDE TO FINISH

Commands calculation/display of 'Glide to Finish' Metrics.

- The Final Glide Window and Distance Window display the altitude difference and distance for a final glide around the remaining task turnpoints to the finish.
- The Destination Window changes to "To Finish".
- Glide To Finish button is grayed-out and the To Next Turn button is enabled.
- ClearNav navigates to the closest point on the bottom circumference of the Finish Cylinder. After crossing the circumference, ClearNav switches to the center of the Finish Cylinder at ground level as the navigation point.
- The altitude margin (Arrival Height AGL) value set in the Final Glide settings is added to the Finish Cylinder MSL altitude for calculating final glide margin.

TO NEXT TURN

Resumes display of final glide and distance to the active task waypoint.

ACHIEVED SPEED

Display of speed achieved from the last start to your current position.

ClearNav Tips

Navigating the Turn Area Task with the ClearNav Flight Computer (Turn Areas, Ellipses, Leader Lines and Set Turn Area Point)

The Turn Area Task (TAT)

- Offers extensive flexibility for cross country or racing tasks, but as a result, it can be difficult to optimize your performance.
- This article describes a number of tools included in the ClearNav flight computer to help realize the best performance possible in a TAT. These tools include the ellipse, estimated speed to finish, the leader line and the ability to set a point in a turn area in place of the ellipse.

The ClearNav ELLIPSE (curved blue line)

- Used in the turn area you are in, or navigating to, is the locus of points that will give an equal distance from your present position to the ellipse and then to the next turn area (usually the center) or the finish.
- The position of the ellipse is calculated to give a total task time equal to the assigned task time based on the time used so far and the calculated remaining speed to the finish.
- Thus, the ellipse allows the pilot the to choose a route that optimizes soaring conditions while remaining confident he will achieve the distance required to arrive close to the minimum task time.
- Early in the first leg of the task, the ellipse will have minimal importance, as the estimated speed to the finish is not based on enough data to be reasonably accurate.
- Also, it is likely the pilot will elect to fly beyond the ellipse in the first turn area if soaring conditions are good to allow more flexibility later in the task.
- The ellipse will be present in the turn area you are in or are navigating to, and target points will show in subsequent turn areas. When a subsequent turn area becomes the destination turn area, (or when a turn area point is designated- see below) the ellipse will move to the new destination turn area and will be drawn through the previously displayed point.
- The ellipse is always moved first if a change is required to keep the Total Task Time equal to the Assigned Task Time. Points in subsequent turn areas are moved in sequence if necessary. For example, if you are going to be under time, the ellipse in the current turn area will first move to the far edge of the turn area before the point in the subsequent turn area is moved. This logic keeps the most flexibility and margin by keeping the target point in the last turn area in the center as long as possible.
- You will find that later in the flight (last turn area), the ellipse will be quite accurate in predicting where to turn to come home within a minute or so of the assigned time.
- In some cases the “calculated remaining speed” may be incorrect due to conditions on the last leg of the task being significantly different from earlier in the task. This includes a really good cloud street or ridge on the last leg, or conditions degrading overall. In this case, the prudent pilot will choose “Manual Speed” on the Task Action page and enter his best estimate of the remaining speed to finish. This will make suitable adjustments to the ellipse in the last turn area and to the time to finish.

The LEADER LINE (blue line extending in front of the glider symbol)

- The extension of a line drawn through the previous turn (or start) and the glider. This represents the most efficient direction of flight for adding additional distance made good (DMG) on the active leg.
- As you fly a given leg of the task, you will note the course line will adjust its intersection point with the ellipse to match the direction of the leader line, thus showing the most efficient line (DMG) to the ellipse based on your track so far.

Note: that flying along the ellipse is quite inefficient in adding DMG, thus when approaching the ellipse, the leader line assumes greater importance in choosing your course line.

- If you elect to go deeper into the turn area than the ellipse, because of good soaring conditions for example, the ellipse will automatically move to the next turn area, thus disappearing from the current turn area. This is logical because at this point, the leader line is the best tool for showing the most efficient route deeper into the turn area, and the ellipse will now be available in the next turn area for route planning of the next leg. If the next turn area is not visible on the map page, it may be viewed on the Task Map page.
- When in a turn area, but still short of the ellipse, a button labeled “Ellipse Next TA” is available. If this button is selected, the ellipse will move to the next turn area and will disappear from the current turn area. Another button, “Ellipse This TA” will now become available. At any time before reaching where the ellipse would be if it were still in the current turn area, you can move the ellipse back to the current turn area by selecting the “Ellipse This TA” button. You can turn at any point, or, continue to fly deeper into the current turn area. In either case, the task statistics will update correctly.
- In the last turn area when short of the ellipse, a button labeled “Turn Here” will be displayed. Selecting that button will shift the destination to the finish. If you fly past the ellipse in the last turn area, the ellipse will disappear, the destination will shift to the finish and the task total time will begin to count up beyond the assigned task time.

If at any time this becomes confusing, you can always go to the **Task Action** page and find the button you are looking for!

SET TURN AREA POINT

- If you wish to navigate to a specific point in a turn area instead of to an ellipse, you can move the cursor box with the arrow keys placing the cross in the center of the box at the desired point to navigate to, press select to bring up the dialog box and select “Set Turn Area Point”. The ellipse will then move to the next turn area and the course line will move to the desired point. The destination will remain the current Turn Area until you are within a kilometer of the desired turnpoint, or when you select “Turn Here” which will appear when you enter the turn area with the selected point. Your task statistics will update correctly even if you do not select “Turn Here” and the destination will change when you exit the current turn area.
- The set turn area point feature can be quite useful for task planning if you know you want to fly past the ellipse in the current turn area.
- Once set, you can change your turn area point, by moving the cursor box to the new desired point and repeating the process.
- You can always retrieve the ellipse to the current turn area after setting a point (assuming you have not already passed it) by selecting “Turn Here”, and then going to the Task Action page and selecting “Ellipse This TA”.
- While this all sounds complicated, it is really quite simple in flight. Give it a try!

Note: Based on glide speed and glide ratio achieved, climb rate achieved, MC setting, and altitude

Serial Port Communication

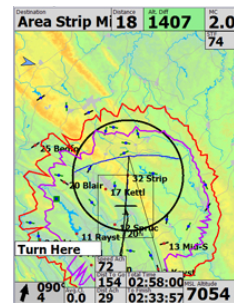
- To ensure serial port communications with attached devices such as the CAI 302 or PowerFlarm, power up the connected devices within 40 seconds of powering up the ClearNav.
- A good practice is to power up these devices before turning on your ClearNav. If successful communication is established, a small "c" and/or a small "f" for the 302 and Flarm respectively will appear in the lower left hand corner of the flying screen.

Waypoint Editing

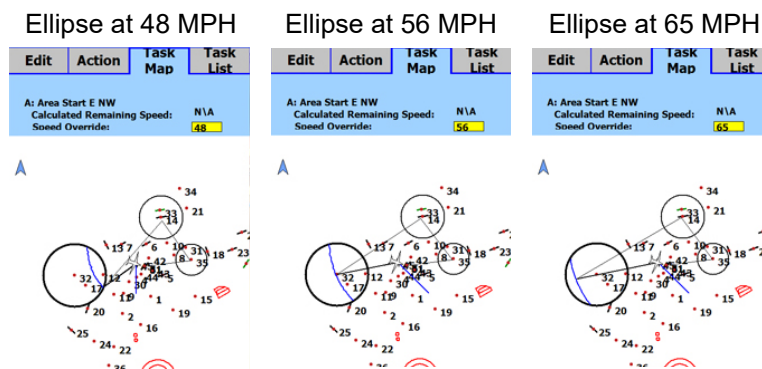
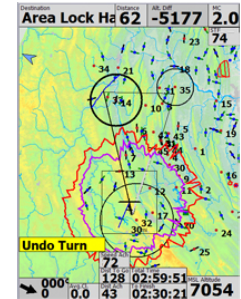
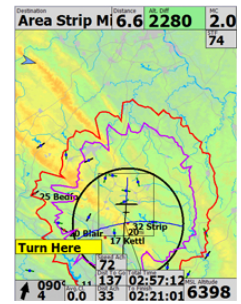
- Waypoint Editing is available under the Waypoints Tab in the Setup menu.
- A new waypoint can be created quickly if you edit an existing WP record and simply update with a new name, lat, long, elevation and attributes
- You can edit an existing WP that is no longer needed, or use the "Mark Point" feature on the Main Map to have ClearNav create a new waypoint record - which you can then edit.


Flying TATs with ClearNav

- The ClearNav Flight Computer brings a whole new approach to flying the Turn Area Task (TAT).
- The TAT replaces the standard (US) one mile radius turnpoint with one or more cylinders with a radius no greater than thirty miles. A minimum task time is specified and the pilot is free to turn anywhere he pleases within a turn area and begin flying to the next turn area or finish.
- The challenge in flying a TAT is to choose the best turnpoint location within each turn area based on the actual soaring conditions that will maximize the distance achieved with a finish close to but not less than the minimum task time. ClearNav has a number of graphical and calculation tools to make this complex task easier for the pilot.
- The first tool is 'the ellipse' - a blue line in the target turn area plotting turnpoints that give an equal distance from the previous turnpoint (or start) to the calculated turnpoint in the next turn area. (mouseover for closeup.)
- ClearNav calculates the ellipse and subsequent turnpoints using the automatic speed estimate (default) to give a task time equal to that selected in the Task Edit page, which of course should be the minimum task time assigned by the CD.
- The manual speed setting can be useful if you believe your speed for the balance of the task will be significantly different than ClearNav's estimate due, for example, to improving conditions, or running a ridge or a good cloudstreet home.
- The black course line in front of the sailplane on the map page will intersect the ellipse at the point that represents the minimum distance (and thus minimum time) from the previous turnpoint to the ellipse. If, however, you deviate from this heading to fly to a particularly good looking cloud, CN will adjust the intercept point with the ellipse accordingly.
- **Turn Here** Once inside the active turn area, a button labeled "Turn Here" will appear. Activate the Turn Here button with the focus (yellow button) and push select to activate the next Turn Area when you actually make the turn. If you forget to select "Turn Here", CN will pick the optimum turnpoint and activate the next Turn Area when you leave the current Turn Area.



- Soaring conditions may appear better in the current Turn Area than in subsequent ones. This suggests going deeper than the ellipse into the current active Turn Area, in which case CN will adjust by moving the assumed turnpoints in the subsequent Turn Area(s). Also, a leader line will appear in front of the sailplane symbol which indicates the most efficient route to fly to maximize distance from the previous turnpoint.
- If you fly beyond the ellipse in an active Turn Area, the task statistics will assume you are still flying to the currently active ellipse and will no longer be valid. In this case, simply select "Turn Here" which will shift the ellipse to the next turn area, but will continue to correctly update the flight statistics as you fly deeper into the current turn area. ClearNav will automatically pick the optimum turn point in the current turn area with no further action required on the part of the pilot.
- In the case of relatively weak soaring conditions in the Turn Area you are currently in, you may want to consider proceeding to the next Turn Area before reaching the ellipse.
- Selecting "Turn Here" will move the ellipse to the next Turn Area, thus showing how much deeper you will have to go in the next Turn Area to make up for turning before reaching the ellipse in the current Turn Area.
- If you decide to continue deeper in the current Turn Area, simply select "Undo Turn" to return the ellipse to the current Turn Area.
- The Task Map page is useful for viewing the entire task area and the likely turnpoints in the various Turn Areas, especially when you are flying a long task covering a large area. Varying your expected speed will move the ellipse and subsequent turnpoints to give you an idea of how deep you may be flying in each turn area.



- When you enter the last Turn Area, From Here 02:27:57 a green highlighted box (Time From Here) appears, showing **the predicted total task time if you turn now and proceed to the Finish**. This is helpful if you are experiencing weak conditions late in the day and are contemplating returning early (under task time) to insure a finish.
-  Another useful tool for the next to last leg on a TAT is the "Glide to Finish" option, especially if soaring conditions are deteriorating. This will show you the altitude required (Alt. Diff.) to glide to the ellipse in the last turnpoint and then to the finish.
- **Turn Here** At any time when in the last Turn Area, you can also select "Turn Here" and see the altitude (Alt. Diff.) required to get home directly from that point.
- It is helpful to display on the flying screen the "Time to Finish" and the "Total Time" for the task.
- I am sure you will find that using the above tools will make flying the TAT an easy and rewarding task.

