WinPilot Live!
for iPhone/iPad

User's Manual

April 2019

Table of Contents

Installation

When purchasing the application from Apple AppStore, the store will make the app ready to use.
After the app is up and running, it can be customized by adding additional files, like Polars, Airspace files, Turnpoint files and Satellite and Terrain Tiles. All files can be imported by sending an email message to the iOS device, and clicking on the attachment.

External Hardware

LxNav S10

S10 can be connected to WinPilot using Bluetooth. If an external Flarm is connected to S10, then the Alarm data is also transferred to WinPilot and shown on the map.
TO enable s!0 in WinPilot, go to WP.Settings and select LxNav ON.

Butterfly Vario

Starting with version 1.63 WinPilot for iOS can connect to a Butterfly Vario equipped with a WiFi Dongle.
With this connection, WinPilot can receive GPS positioning data, Flarm Target data (up to 100 simultaneous targets), and McCready setting, Vario, TAS, Wind speed and direction.
Below are the steps to configure this connection.

Setting Up the Butterfly Vario:

- Power on Butterfly Vario

- Go to *Menu* then *Setup* then *Device*, *Peripherals*, and set *WiFi* to *Yes*

- Go to *Menu* then *Setup*, *Device* and GPS On, Flarm On, and LXWP On

Setting Up your iPad or iPhone:

- Power on Butterfly Vario

- Open the iOS®-Settings App on your iOS Device.

- Go to *Wi-Fi* and make sure WiFi is active.

- In the *Choose a Network..*-field the Network of your Butterfly Vario appears. It is always named *Butterfly Vario* followed by a multi-digit number code.

- Tap on the *Butterfly Vario*-Network to establish a connection

- Tap on the little blue arrow next to the *Butterfly Vario*-Network

- In the field *IP-Address* choose *Static*
- Enter the following IP-Address in the field *IP-Address*: ***192.168.1.2***

- Enter the following Subnet-Mask in the field *Subnet-Mask*: ***255.255.255.0***

Setting Up WinPilot:

- Before starting WinPilot, make sure that your iOS device is connected to the Butterfly_Vario WiFi network.
- Start WinPilot, go to Settings.Other.External Hardware and slide the 'Butterfly Vario' switch to ON.
- If WinPilot connects to the data stream coming from Butterfly, this switch will stay ON. If for some reason WinPilot cannot connect, then this switch will turn OFF, and an error message will be displayed. In this case WinPilot will fall back automatically on the internal GPS.
- While WinPilot is connected to the Butterfly vario, there is an indication on the main map screen, which is a small red butterfly symbol placed on the arrow showing North.
- While Butterfly is on, the main Settings page in the section dedicated to Wind, will have one more option in addition to regular 'Auto' and 'Manual', which is 'Butterfly'. This gives the pilot an option to either enter the Wind manually 'Manual', use wind calculated by WinPilot 'Auto', or use winds calculated by the Butterfly vario 'Butterfly'.

Transferring files in and out of WinPilot

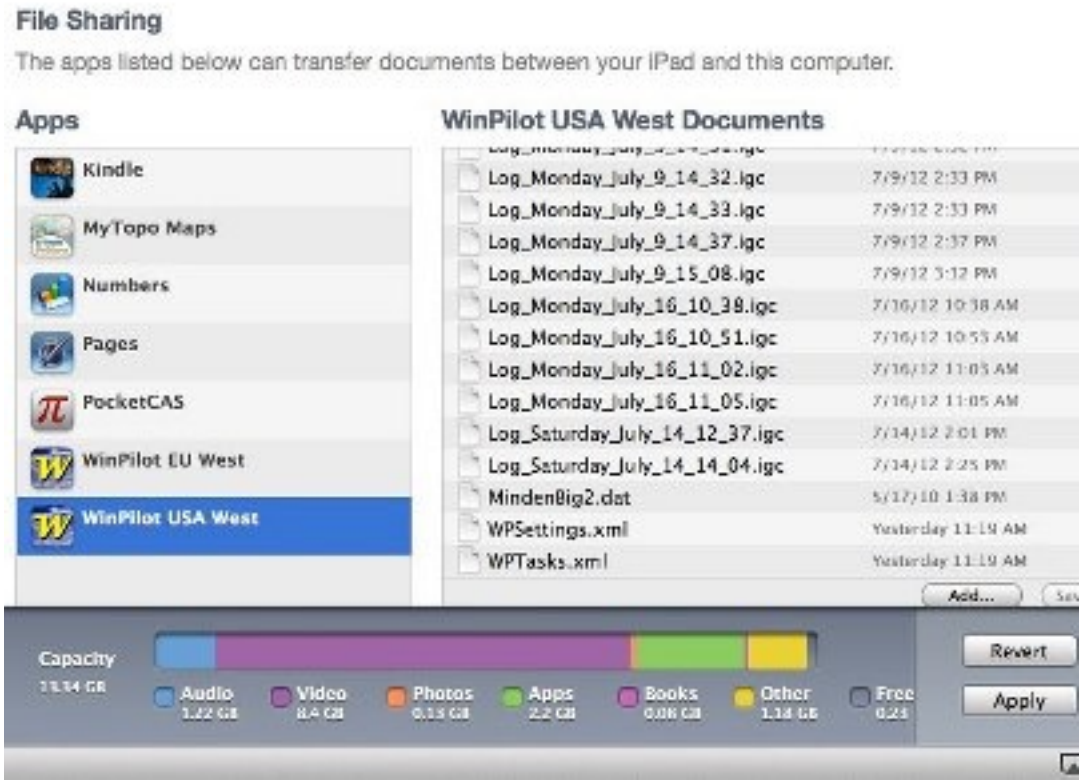
Using email

Smaller files like polars, airspace and waypoint can be transferred into WinPilot by including them in an email attachment, and emailing them to your iOS device. Then, clicking on this attachment and selecting WinPilot as the program which should open it, will import the file into WinPilot. Use Settings.Polar to see your new polar file, and Settings.Files to see all the other newly imported files.

It is also possible to send the files to another user using email. Go into Settings.Files, and select the file to be emailed. Then select Email File to email out a Flight Log, Waypoint File, or an Airspace File.

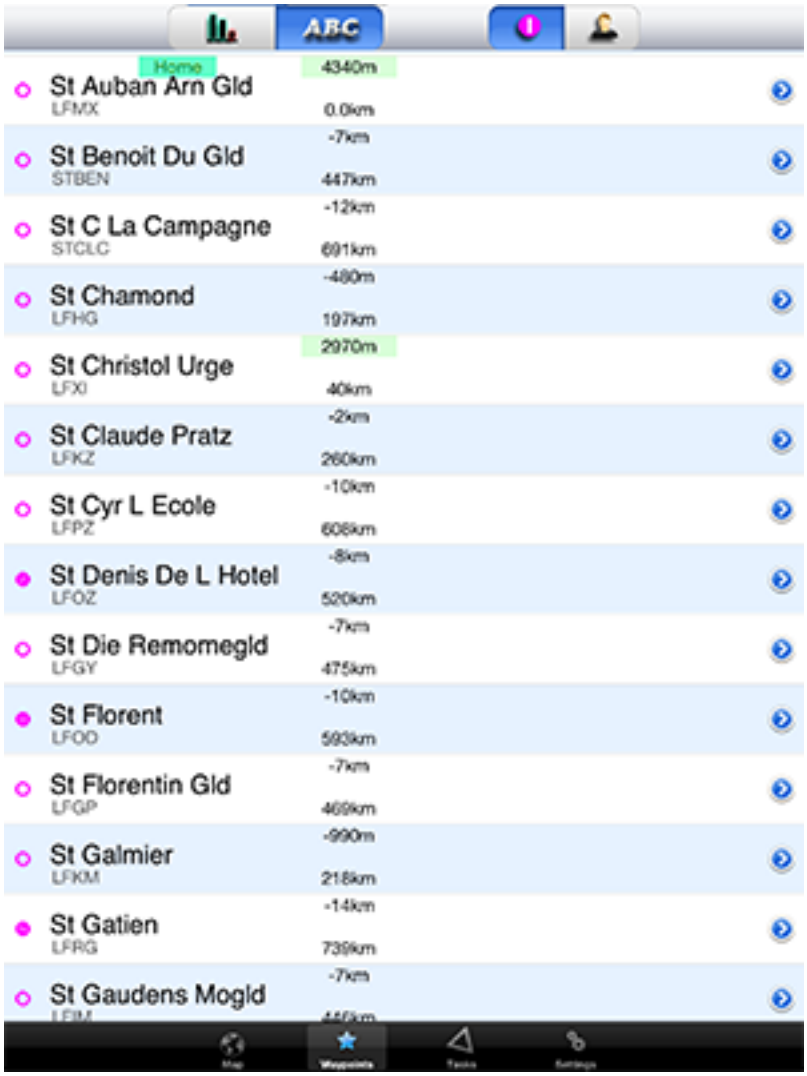
Using iTunes

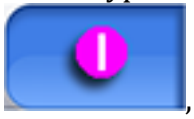
Start iTunes App on your desktop, select your iOS device, click Applications and then WinPilot. You will get a window with all files on your iOS device (see the screen shot below). From there, you can drag and drop files in and out of the device. Note that we have changed the extension of OpenAir SUA files on iOS version from .txt to .air, to make it easier to differentiate SUA files from regular text files.



The Main Four Pages

The Waypoints Page



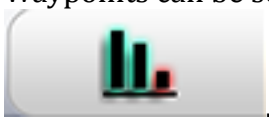
The Waypoints page shows either airports that are built into the program:  , or user waypoints imported by the user: 

Where to get Waypoint files from

Waypoint files can be loaded from WinPilot: Settings.Files.Download Waypoints, or from:

http://soaringweb.org/TP

Waypoints can be sorted either by Name: 

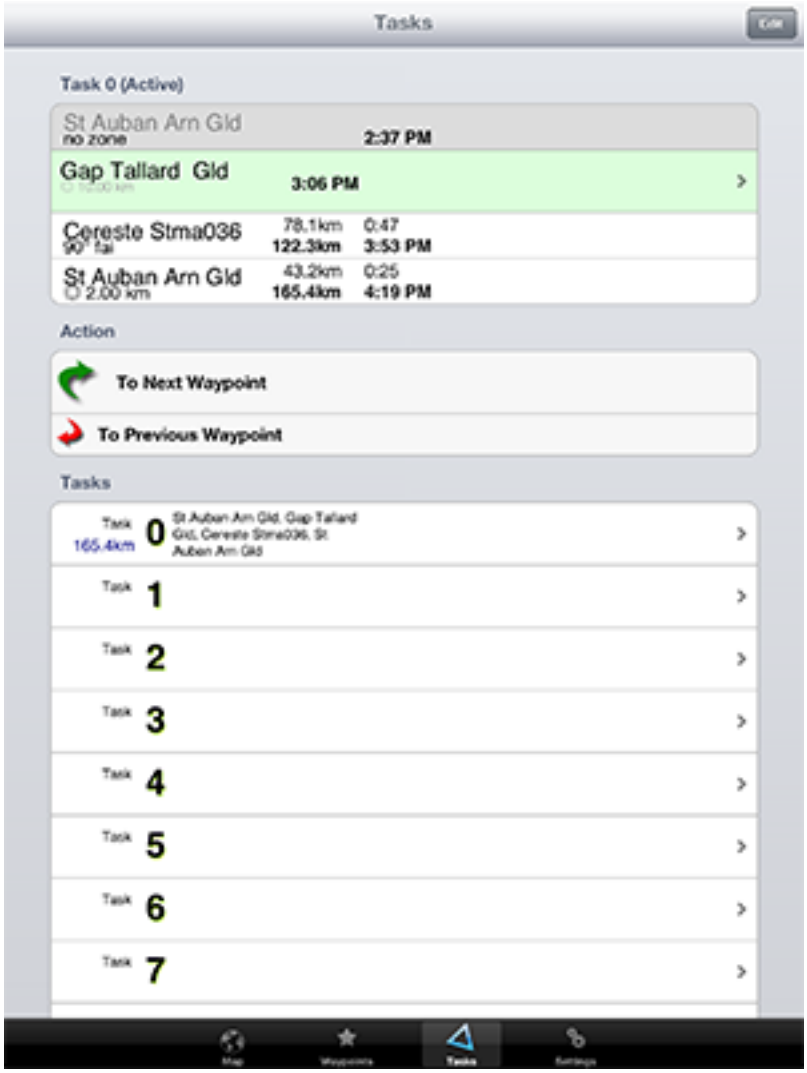
, or by arrival altitude:  . User Waypoints can be added as a text file in the Cambridge .dat format (See the Appendix for the format description).

Setting Up Home Airport

Home Airport can be set up from the Waypoints page by pressing the name of the airport, and then selecting “Set As Home Airport”. When there is no task selected, WinPilot will always compute Final Glide to the Home Airport.

The Task Page


●●○○○ T-Mobile Wi-Fi
2:58 PM
Tasks
Edit
TASK 0 (ACTIVE)
Minden Tahoe
no zone
2:51 PM
Cerro Gordo
no zone
324.4km 3:15
324.4km 5:56 PM
Hadley
no zone
244.9km 2:27
569.4km 8:23 PM
Minden Tahoe
no zone
228.6km 2:17
798.0km 10:41 PM
ACTION
To Next Waypoint
To Previous Waypoint
FOR TASK 0
Download Map Tiles
Delete Map Tiles
Map
Waypoints
Tasks
Settings

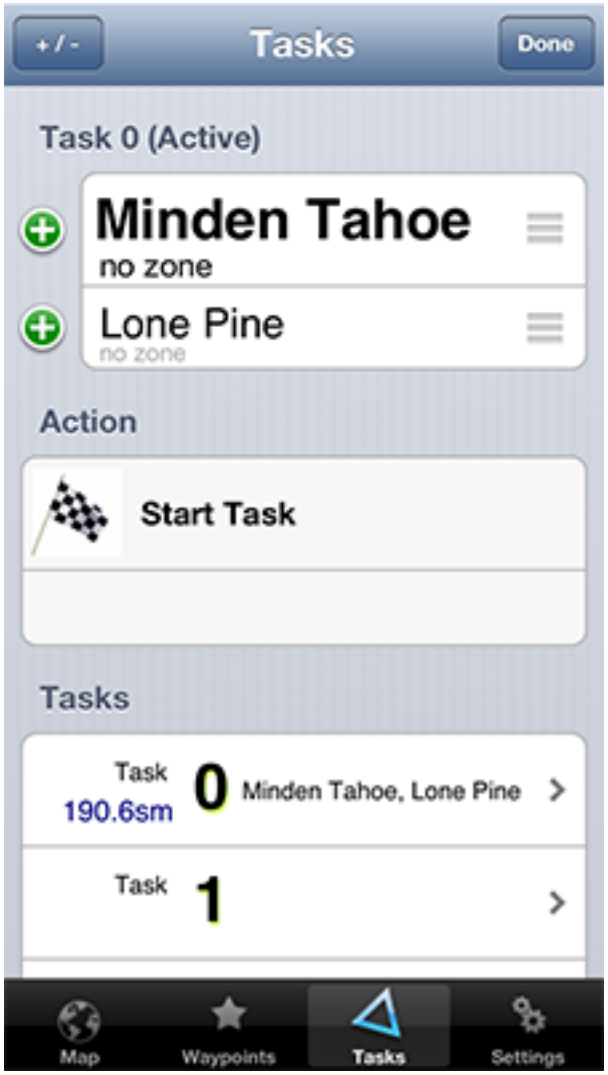


The Task Page contains memory for 24 tasks. **Task 0 is always the active task** being shown on the map, flown, and edited.
Any task can be copied into Task 0 by clicking the row with that task, and then selecting Activate. Task 0 can be copied into any other task by selecting the row with Task 0, and choosing Copy from the Menu.

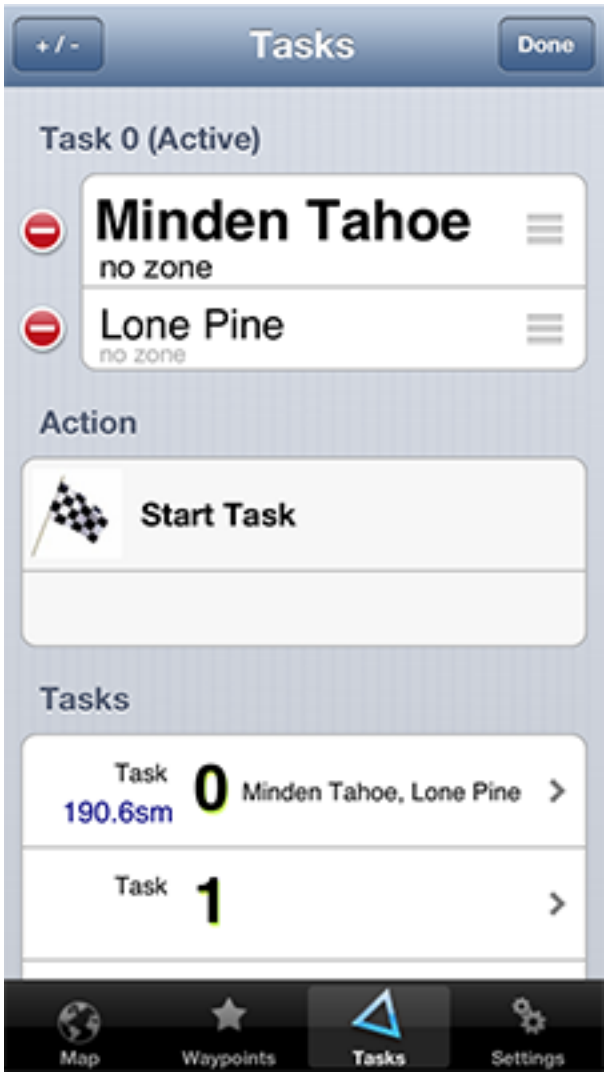
Tasks can be created/edited in two ways:
- From the Waypoints page - by selecting a waypoint and pressing 'Add To Task 0' menu option, and
- From the Task Page, by first pressing the Insert Waypoint to add the first waypoint, and then pressing the green Plus next to the slot in the task where the next waypoint should go in. After the task has been created, it then can by edited by pressing the Edit button in the upper right corner.

The Task Edit page can be in one of two modes: Insert Mode, or Delete mode.

Task Page in the Insert Mode



Task Page in the Delete Mode



To switch between Insert and Delete Modes press the **+/-** button in the upper left corner of the screen.

When using Tile Map style, the Task Page also allows downloading map tiles before the flight by selecting the '**Download Map Tiles**' menu, or deleting tiles for a given task (for example to make room for tiles for another task) by selecting 'Delete Map Tiles' menu item.

Another option that can be enabled on this page is 'Auto Zoom' that allows zooming in the map when near by a task waypoint.

Task Editing

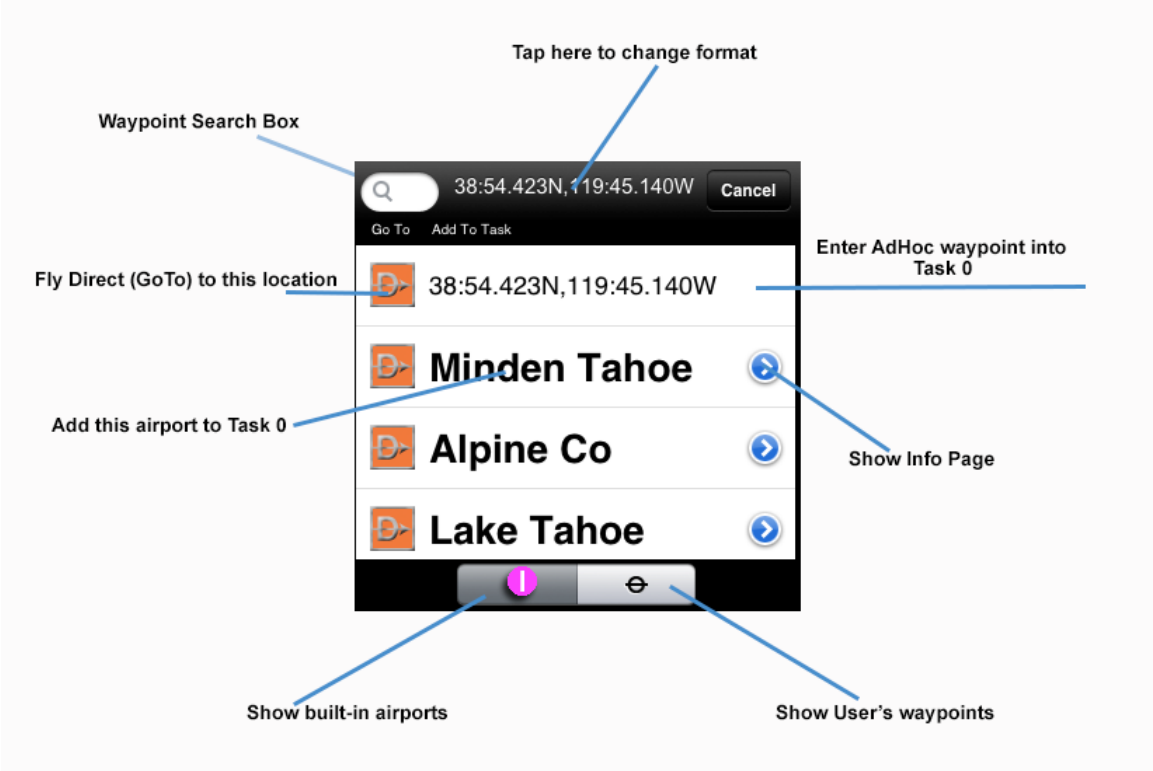
There are two main ways of editing a task: from the Task page, and from the Map screen.

Visual Task Editing

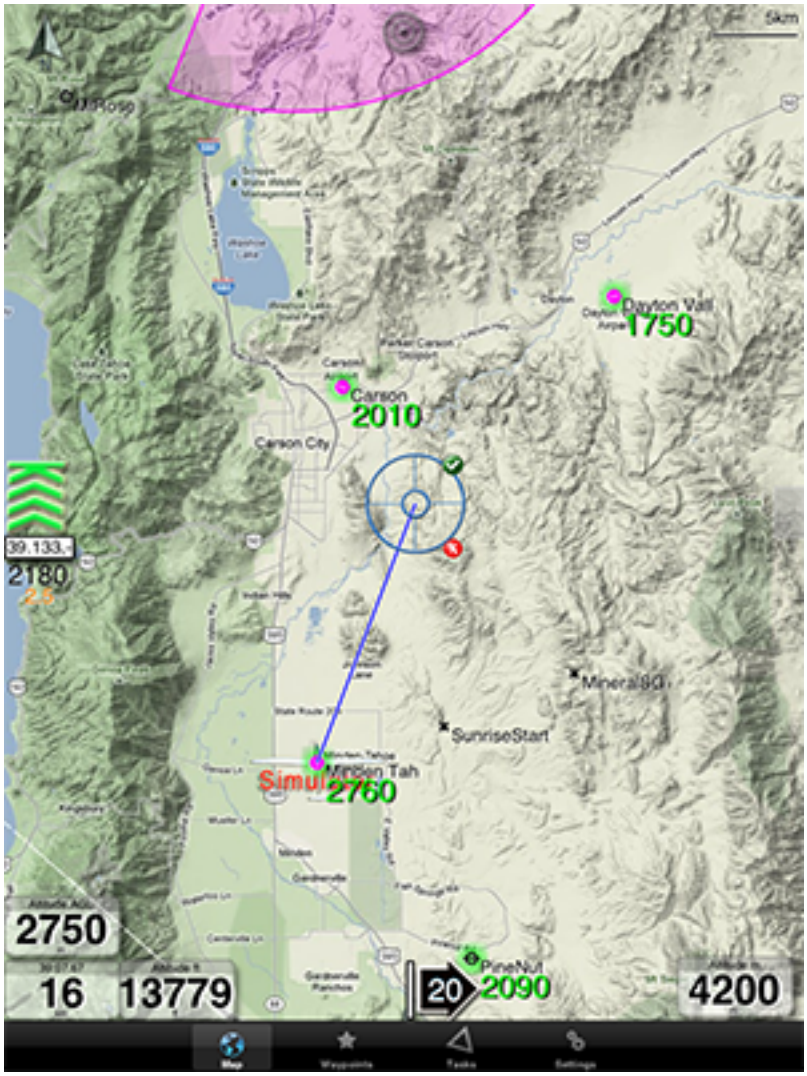
Starting with version 1.50 WinPilot offers task editing directly from the Map screen. The Visual Task Editor is OFF by default and can be enabled by selecting Tasks.On Map Task Editor.
Below is a tour explaining some features of the visual editing.

Adjusting the movable GoTo point

1. Tap anywhere on the screen. A dialog similar to this will appear:



2. Tap the  image (not the text with coordinates) on the first entry in the dialog. This will create an Ad Hoc waypoint at the tapped location and engage the Direct To, or Go To function to the selected location. If you want to edit or fine tune the location, tap at the end of the blue goto line to see the blue edit location circle:



This waypoint can be then moved on the map to any location – the final glide info will be updated automatically.

3. Press the green checkmark icon to place the waypoint on the map. Select the first row to leave it in the current location.

4. This is an Ad Hoc GoTo waypoint.

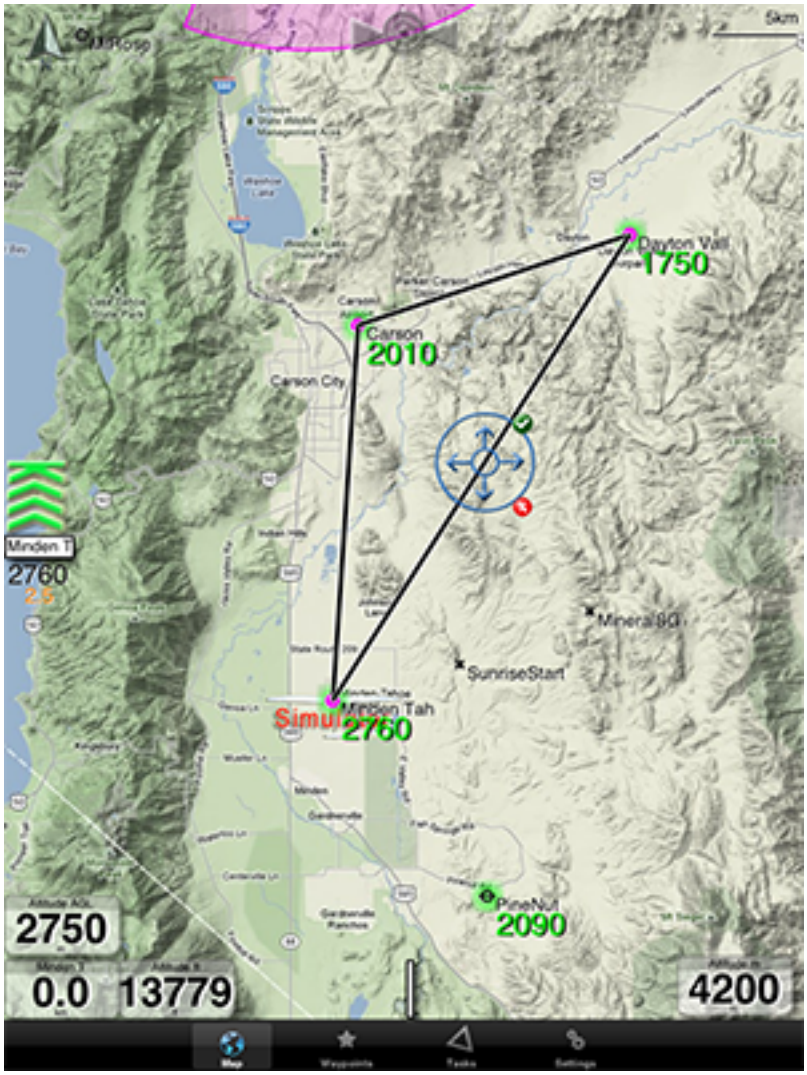
To remove this GoTo waypoint and disengage the GoTo function (ie perform Un-Goto), tap on the red X icon in the right lower corner of the blue circle.

Creating a task on the Map screen

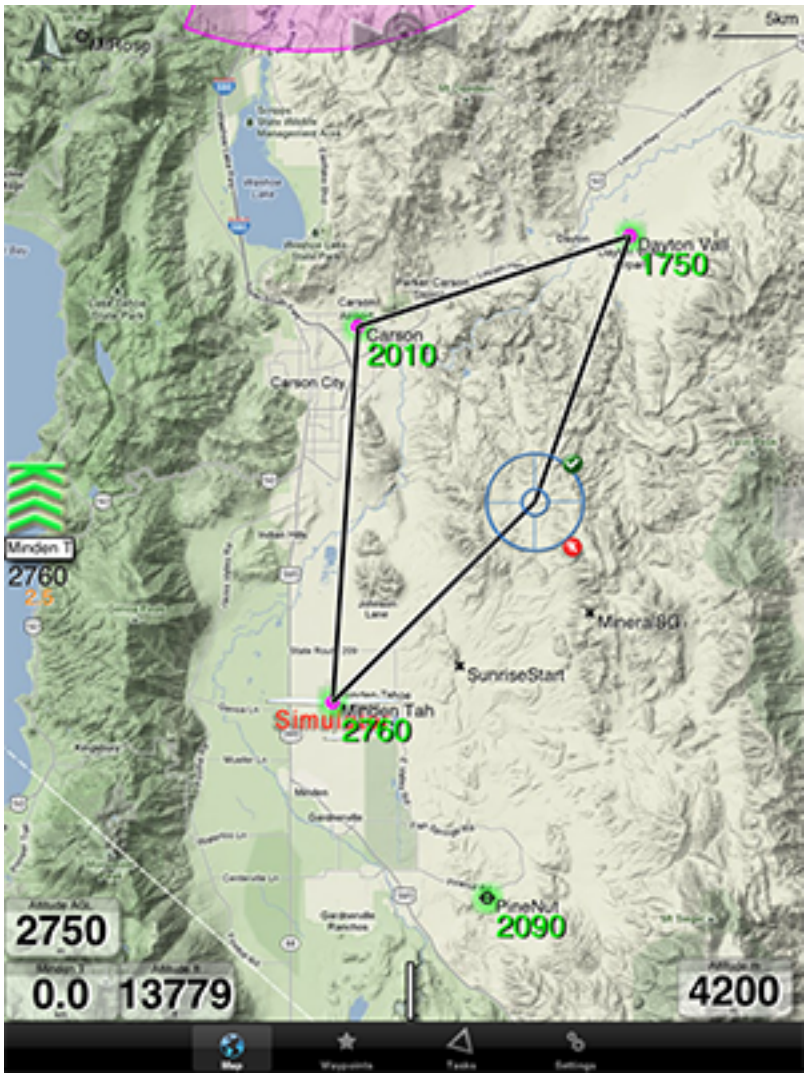
1. Tap anywhere on the screen to get the waypoint selection dialog (as in point 1 in previous exercise).
2. This time do not tap on the Direct-To icon image, but tap on the text. This will add either the selected Ad Hoc location, or selected airport to the task.
3. To remove an airport from the task, tap on its name on the map, and select 'Remove From Task'.

Inserting a new waypoint into an existing task leg

1. Tap on any of the legs of a shown task to get the blue edit circle:



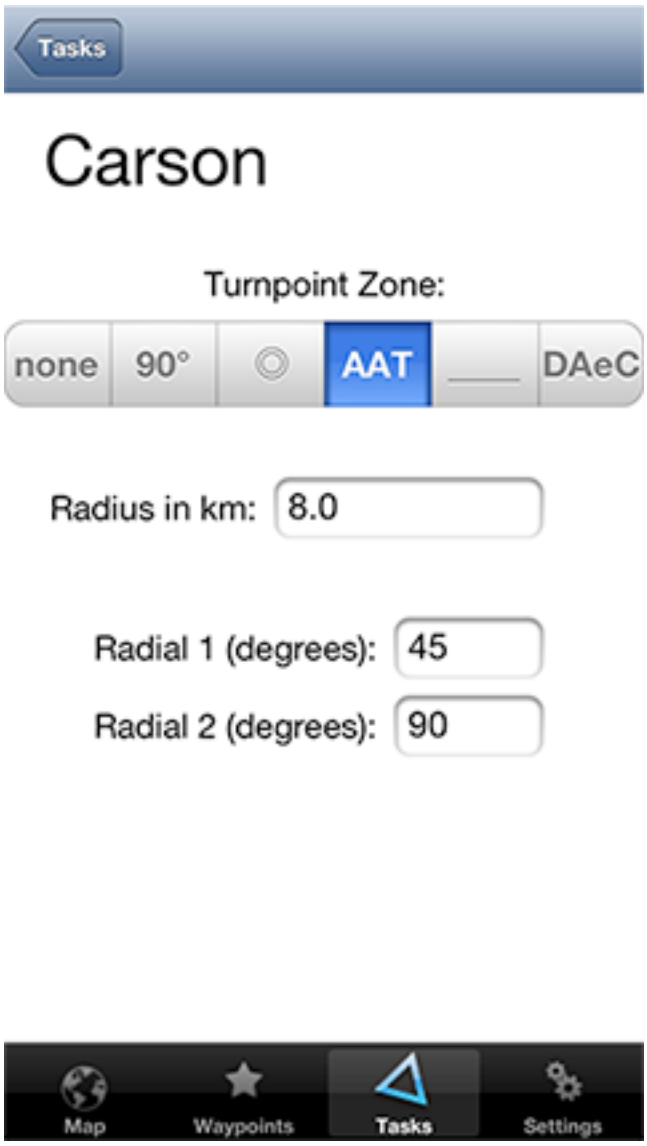
2. Move the circle around to the desired location:



3. Press the green OK icon to place it
4. That will pop up the 'Where to place it?' dialog allowing you to keep to place the new waypoint in the current location, or snap it to one the near by airports or user waypoints.

Setting Turnpoint Control Zones

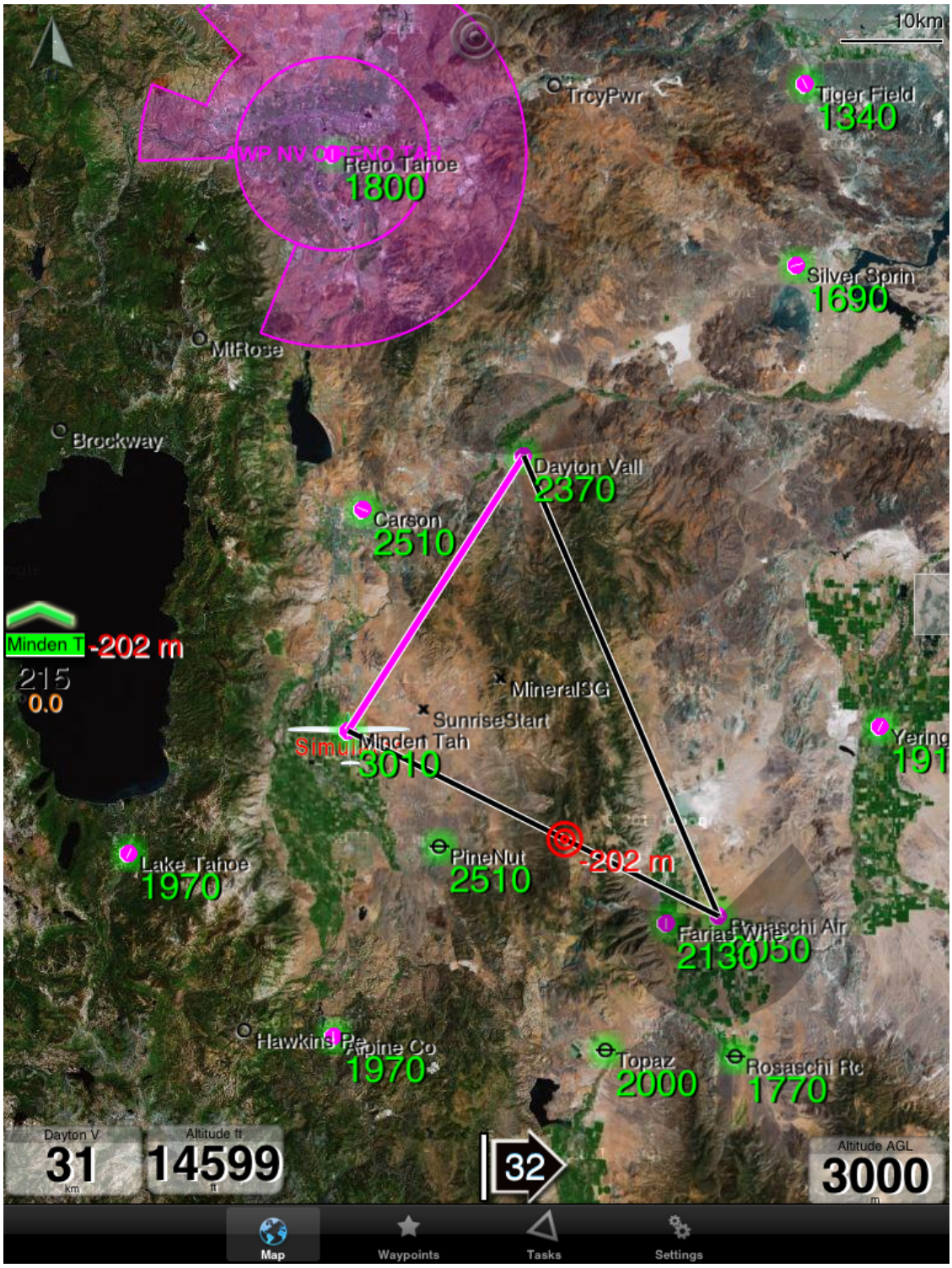
To specify a zone for a given turnpoint, click on the name of the turnpoint in the upper pane of the Task Page. The following dialog appears:



The available options are as follows:

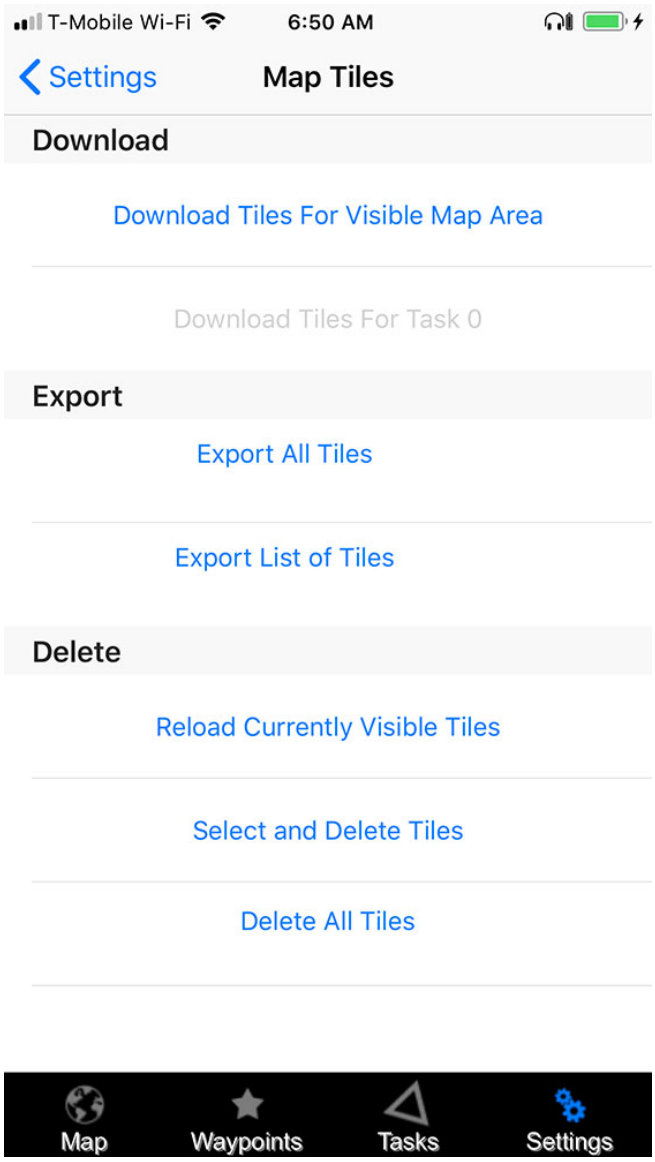
- None – this turnpoint will have no control zone.
- 90 – 90 degrees FAI sector
- O – Cylliner control zone
- AAT – Area defined be radius and two radials
- ---- - Start or Finish line
- DAeC – DaeC sector
- OLC

The Main Map Screen



Using Tile Maps

WinPilot has been designed for several different types of tiles to be loaded at the same time: terrain tiles (prefix t_), or satellite tiles (prefix gs_), and where available aviation sectional tiles. This came about from realization that depending on the particular situation, a different type of tile can be best suited for the task. For example, when flying above mountains, a relief map provides a lot more useful data than the satellite map, but when flying close to a restricted airspace segment, or getting familiar with a new airport, a satellite map can be better.
To change what kind of tiles are shown on the Map, click the gray rectangle in the middle right part of the map, and select the tile icon below the gray zoom buttons.



Tile Management

Tiles can be loaded by scrolling the map screen while connected to the Internet, or through the Settings.Map Tiles menu.
Export can be used to send tiles from one device to another.
User can send All tiles, or just the tiles missing on the other device.
To send only the missing tiles, first 'Export List of Tiles' should be performed on the RECEIVING device. This sends list of tiles to the sending device, which then can send only missing tiles.

	
Terrain Map	Satellite Map

Calculating Final Glide

The Map screen shows final glide calculations to all visible airports in the built-in database, as well as user turnpoints that are landable, considering current polar, water ballast, bugs, wind, altitude, and elevation of the target. See the top picture. Also shown is the currently flown **Task 0** (black lines), and the active leg of Task 0 (magenta line). Task turnpoint control zones are shown as a gray areas. The green chevrons on the left side of the screen show the final glide info to the next turnpoint. Each individual chevron symbolizes 5% of the final glide height needed. McCready settings, wind, and polar info are set on the Settings page.

The Chevrons on the left side show either final glide to home airport, or to Go To waypoint, or, when Task is active, to the final point of the task around all remaining waypoints.

Adjusting McCready value

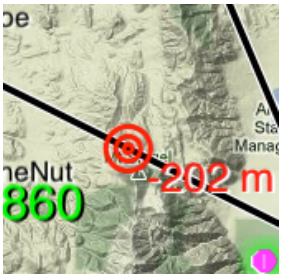
McCready can be by adjusted either on the Settings page, or on the map screen. To adjust it directly on the map (starting in version 1.51), tap the name of the waypoint in the Chevrons display to get this UI:

Adjusting Final Glide Buffer Altitude

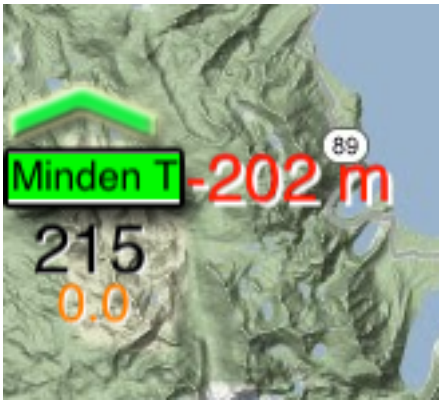
A pilot can increase the elevation of the turn point that the final glide is calculated to by adding an extra safety buffer in Settings.Navboxes.Final Glide Buffer, or on the DEM Radar page.

Final Glide Over Terrain

Starting with version 1.32, WinPilot is able to project the descent during the track the task route, and compare it with the terrain elevation database (DEM) along the route. This is done to detect a situation when final glide is achievable based solely on the current altitude of the glider, but because there is a terrain obstacle in a way (a mountain range), the goal is unreachable.
When WinPilot detects this type of situation, it will alert the pilot by showing a red concentric circle around the point on the map where the projected final glide descend path intersects the terrain the most:

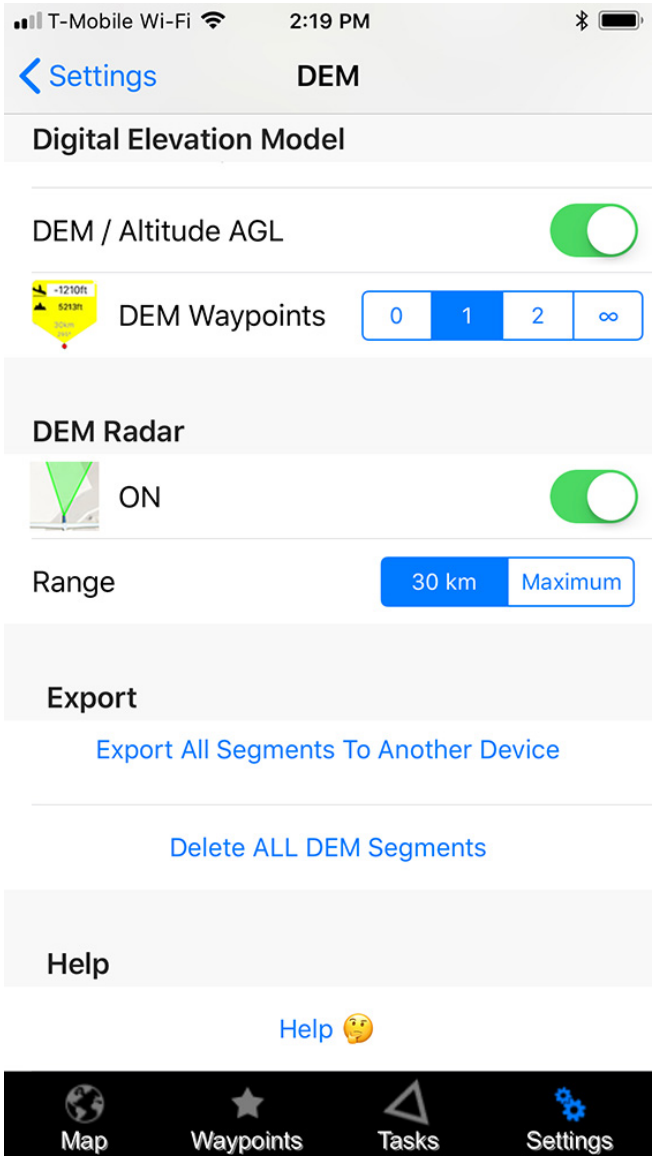


If such a situation is detected, the main final glide indicator with Chevrons, will show a red number indicated altitude below terrain at which the final glide path intersects the mountain:



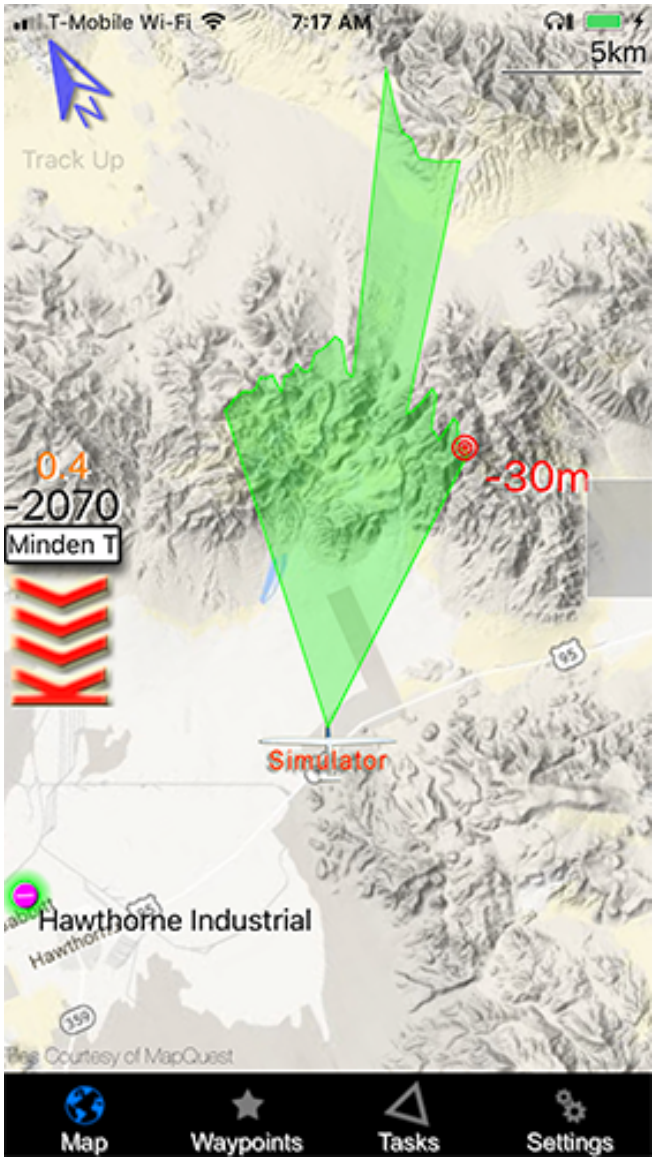
In the example above, the regular final glide calculator shows that the task destination (Minden) can be reached at 215m. However, the final glide over terrain calculator detected that the projected descent path will intersect the terrain to the depth of 202m. Therefore, to reach the goal, the pilot must climb at least 202m higher, plus any safety buffer for the errors in terrain database, and any other factors that the pilot should take into account.

DEM Terrain



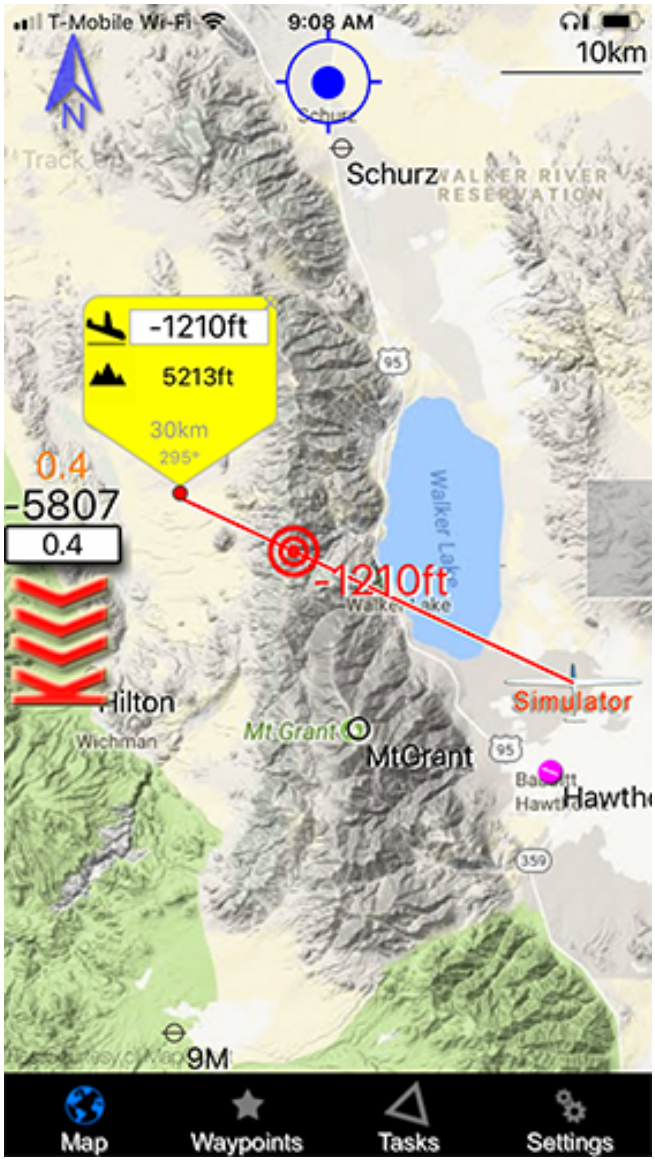
WinPilot uses high resolution Digital Elevation Model (DEM) based on a 90 meter grid. DEM features are controlled via WP.Settings.More Settings.DEM Terrain menu (see left).
DEM/Altitude AGL enables or disables all the DEM functions.
DEM Waypoints - see below.
Delete DEM Data - Deletes ALL the downloaded and locally stored DEM data files.
DEM Radar - see below.

DEM Radar



WinPilot looks forward and calculates final glide taking into account terrain ahead, and current wind and McCready values.
The green polygon represents what is reachable from the current altitude.
In the Simulator, the altitude of simulated glider can be changed by touching and moving the glider, which makes the altitude adjustment buttons to appear.
How far forward does the radar looks can be adjusted by selecting Range (either 30km or Maximum).
If the final glide radar beam doesn't intersect any terrain, then it looks down to detect the highest terrain feature and show the clearance above it by showing w green concentric circle with a clearance above it.

DEM Waypoints



Final Glide Over Terrain is useful when the glider is flying close to the task line, but what if the flight takes place away from the course line (view videos of resent SGP in Chile for examples)? Enter DEM waypoints.

When pilot presses a point on the map WinPilot will insert a DEM waypoint there, and calculate final glide over terrain to that point, showing the lowest altitude above or below terrain en route from the current position to that point.

If the way to DEM waypoint crosses the terrain, a point of the biggest deficit of altitude will be shown as a red concentric set of circles (see left).

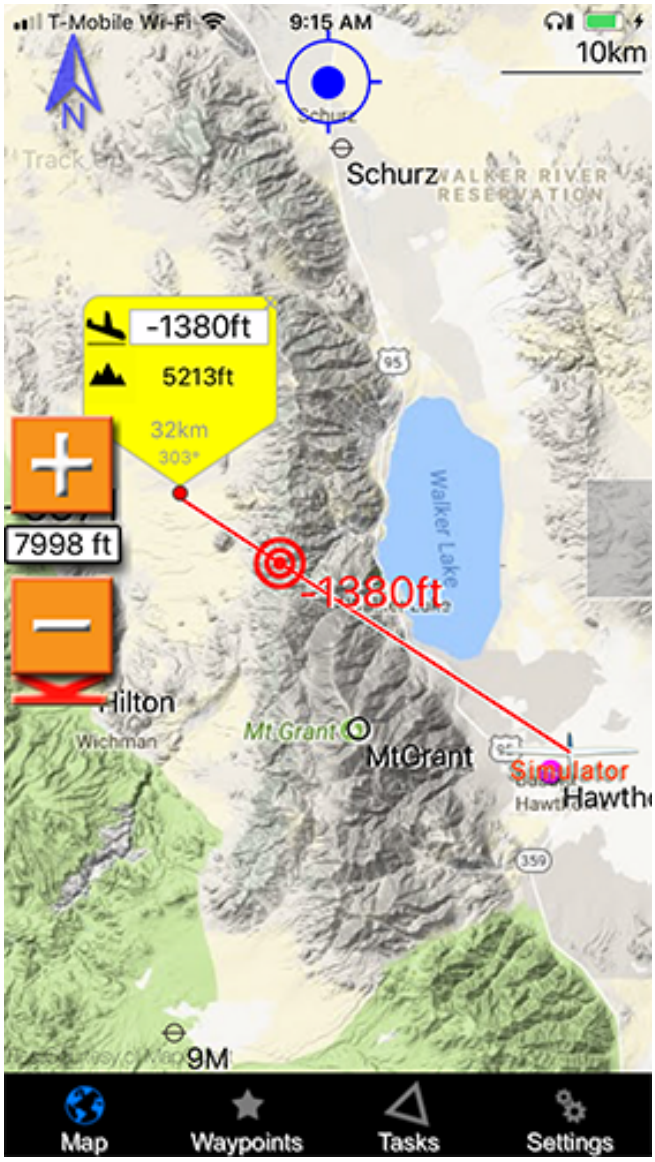
If the the glider can make it to DEM waypoint without crossing terrain, the circus change color to green.

DEM waypoints can beloved around on the map to perform what-if calculations as the flight progresses.

It is possible to open multiple DEM waypoints to track available options of crossing several

mountain passes as the altitude and location of the glider changes.

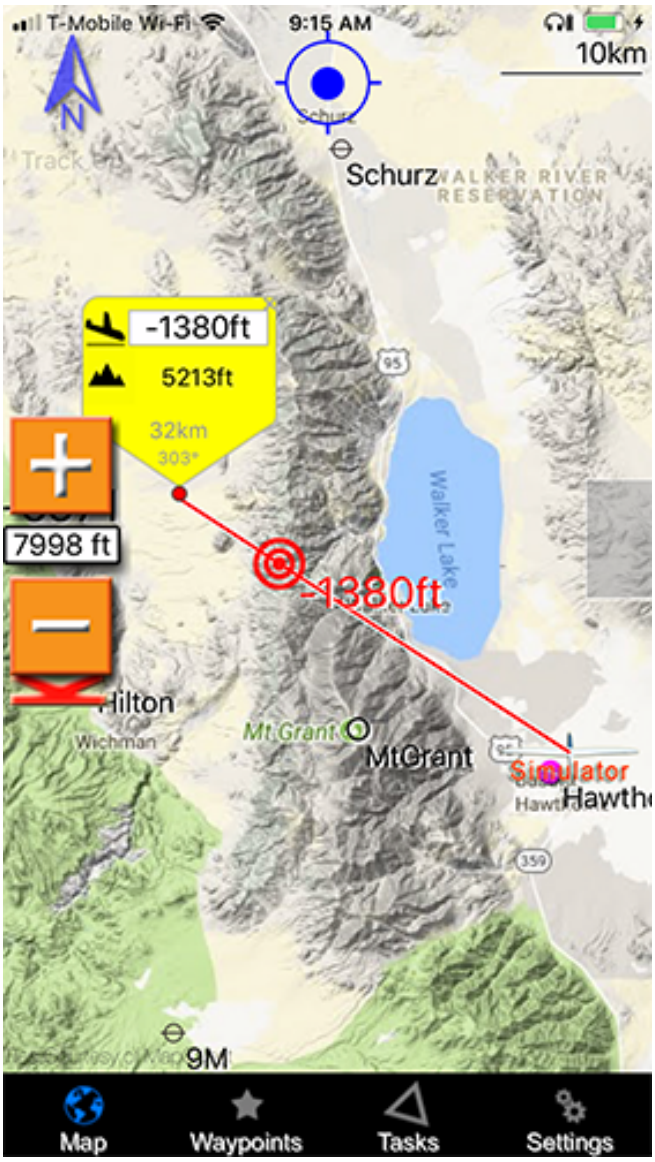
Preparing for a mountain flight using DEM Waypoints



DEM waypoints can also be used in the Simulator. The location of simulated glider can be easily changed by dragging the glider symbol on the map to the desired location. When dragging the glider, a plus and minus buttons appear, which allow changing of the simulated glider's altitude (see left).

Before the flight the pilot can set the expected wind and lift strength, and then move the simulated glider to key locations during the task, and by creating DEM waypoints there he can estimate how much altitude will be required to cross the key mountain passes (or gates) during the flight.

It is also possible to change course of the Simulator glider by touching the glider with two fingers and rotating it. This along with adjusting altitude using MC buttons and DEM radar gives the pilot a full set of tools to run the What-If simulations before the flight to determine altitudes needed at critical points of the task, e.g. before crossing mountain passes.


T-Mobile Wi-Fi
9:15 AM
10km
N
Schurz
WALKER RIVER RESERVATION
-1380ft
5213ft
32km
303°
7998 ft
-1380ft
Walker Lake
Hilton
Wichman
Mt Grant
MtGrant
Hawthe
359
9M
Map
Waypoints
Tasks
Settings

Hiding The Final Glide Indicator

When the pilot wants to see the Map full screen, without the Final Glide or the Tab Bar at the bottom, he can do that by pressing the Final Glide chevrons on the map, and then pressing the round X symbol.

OLC Plus Task Defined

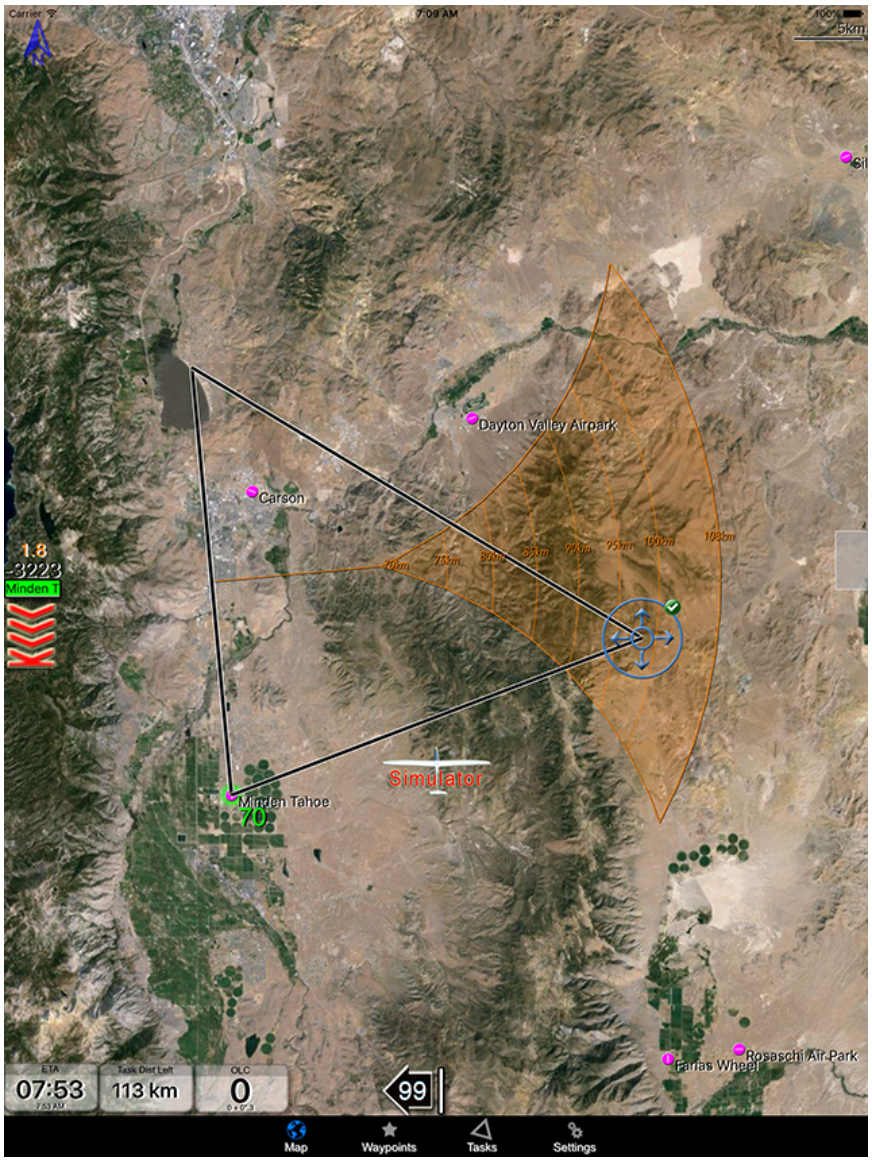
As of 2016, the OLC Plus task score is comprised of two parts: OLC Classic Course and FAI triangle course. Here are the definitions:
OLC Classic Course:
After the flight, a departure point, up to five turn points and a finish point are positioned on the recorded flight path in such a way that the raw point score, from the departure point round the turn points to the finish point, is a great as possible and the departure altitude is no more than 1000m above the finish altitude.
FAI OLC Course : If possible, three turn points are chosen on the recorded, closed flight path such that they define an FAI triangle with the greatest possible circumference, whereby
- the shortest leg must be at least 28% of the FAI distance
- if the FAI distance is 500 km or more, the shortest leg must be at least 25% and the longest leg at most 45% of the FAI distance. The departure point can be between two turn points of the triangle. The flight path is considered to be closed if the finish point is within 1 km of the start point, and the departure altitude is not more that 1000 m above the finish altitude.

Flying an OLC Plus Task

Here is a typical work flow when flying OLC task:

A. When triangle bonus points are not important:
    1. Set Settings.OLC to ON.

    2. During flight, WinPilot will optimize the best set of task legs given the track of the glider up to the current location, plus a leg from the current location back home. The pilot can observe the OLC NavBox for predicted OLC score



B. When OLC Triangle bonus points are desired:

1. Create a task with 3 turnpoints, first turnpoint near the flight start, and second turnpoint near the predicted start of the second leg, third turn point near the FAI 28% zone, and the fourth turnpoint the same as the first one. That will show OLC turn sector on the map, visualizing where the next turn needs to be made to satisfy the 28% minimum leg FAI rule. Adjust the third turn point so it is inside the FAI Zone.

2. Select the predicted McCready value for the day by touching the Chevrons on the map. Make sure that the ETA Navbox is on, so that the predicted finish time

can be shown. Adjust position of the turn points by touching them and selecting "Make Movable" option.

3. After release from tow, when ready to start the OLC flight, press the Chevrons on the map, and then Start. This will create a 1000m circle on the map denoting the finish zone. The pilot needs to finish the flight inside this zone, and within 1000m from starting altitude shown on map, for the flight path to be considered a closed flight path, and only then can the triangle bonus be added.

If the first and last turn point of the task are the same, and have gate types set to OLC, then pressing Start will automatically adjust their positions to the position of the start. Also, the last turn point's elevation will be changed to start altitude minus 1000m, so that the Final Glide indicators will guide the pilot to the center of the 1000m finish circle, and to the altitude of Start altitude minus 1000m

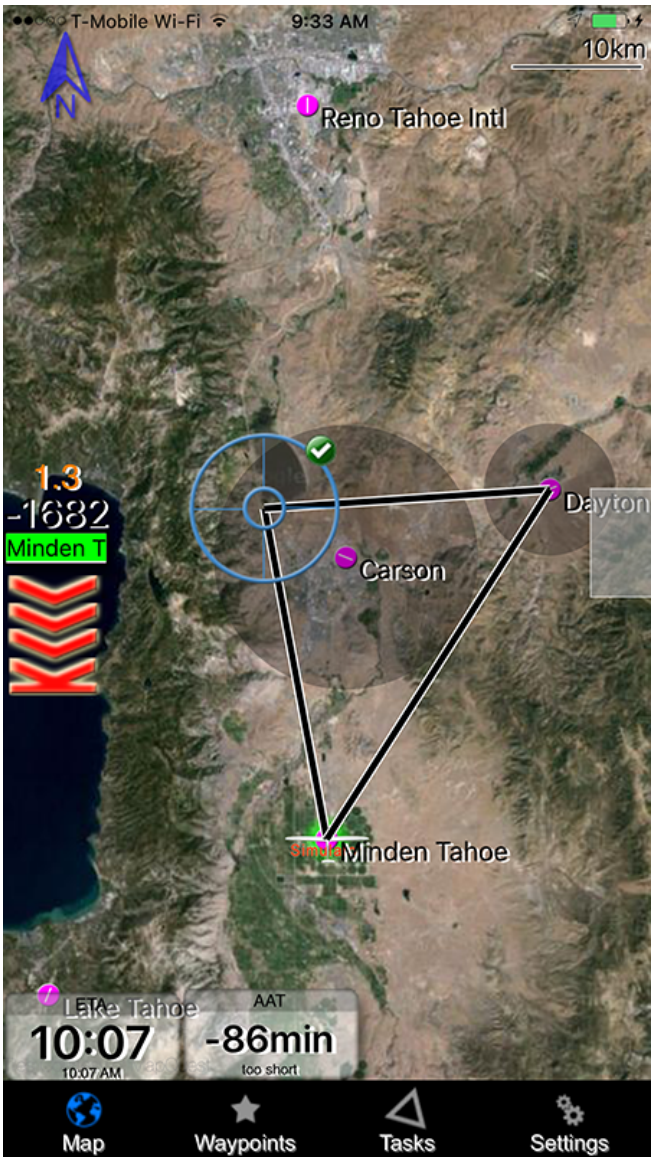
4. During the flight when the conditions get better, or worse than predicted, it is possible to move the second turn point, and therefore change the shape of the FAI triangle zone. To accomplish that, press in the upper left corner of the turn point to get the Movable Turnpoint UI. Drag the turn point around on the map, and observe the change in the FAI zone and ETA. When satisfied, press the checkmark on the movable turn point to anchor it in place.

It is possible to check the way the OLC optimizer looks by playing back an existing IGC log file. To do that, email an igc file to your iOS device, and select "Open with WinPilot" option available when the file is tapped inside an email message. To play the file, select Settings.Files, select the IGC log, and press Play while the Settings.OLC is ON.

WinPilot will attempt to determine the start of the free flight, and it is also possible to start the free flight manually by tapping the Chevrons on the map, and then Start OLC.

Flying an AAT Task

1. Set Settings.OLC to OFF.
2. Enable Settings.NavBoxes.AAT NavBox.
3. Create a task by touching waypoints on the map, or from Waypoints page, or directly from Task page. After a task is created, go into Tasks page, and click on a



waypoint to define the AAT sector for that waypoint. After at least one AAT sector is defined, the Task page will display a new menu item: AAT Duration.

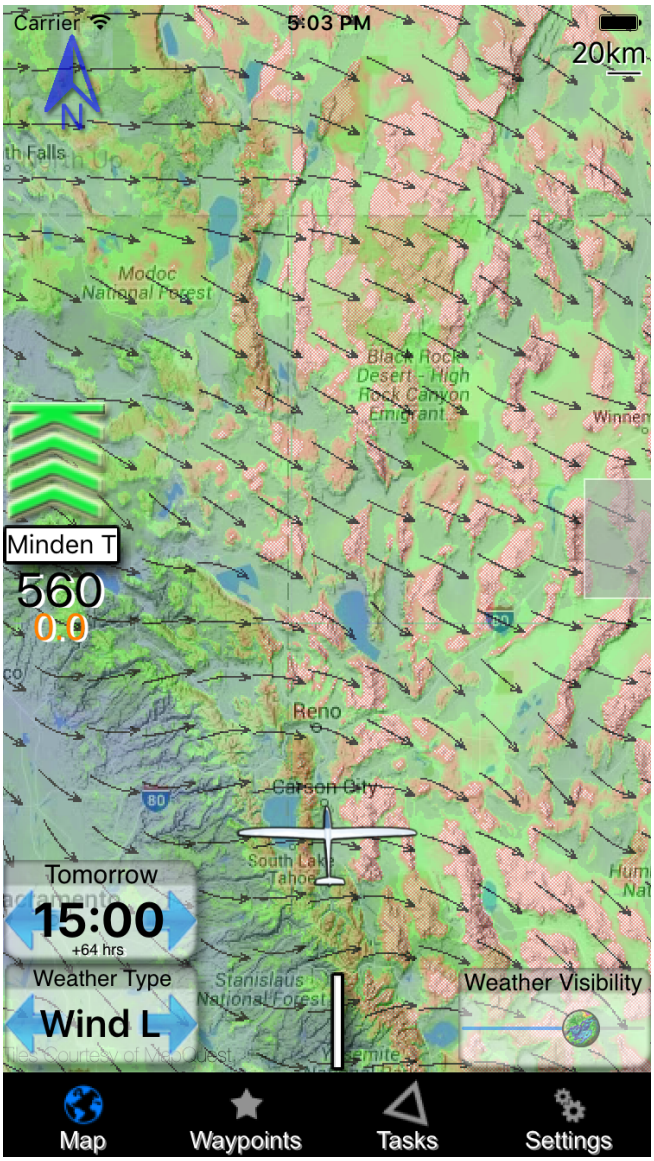
4. Click on AAT duration, so that the AAT Navbox can then give a proper reading of AAT overtime or undertime.
5. Select the predicted McCready value for the day by touching the Chevrons on the map.
6. The key point is the ability to move the turnpoints around and watch the impact on the AAT estimated overtime or undertime Navbox.
7. Waypoints can be moved one at a time. To move a waypoint, click near the upper left corner of the waypoint symbol. A circle with a check mark will appear:
8. To accept position of a given waypoint click on the checkmark.

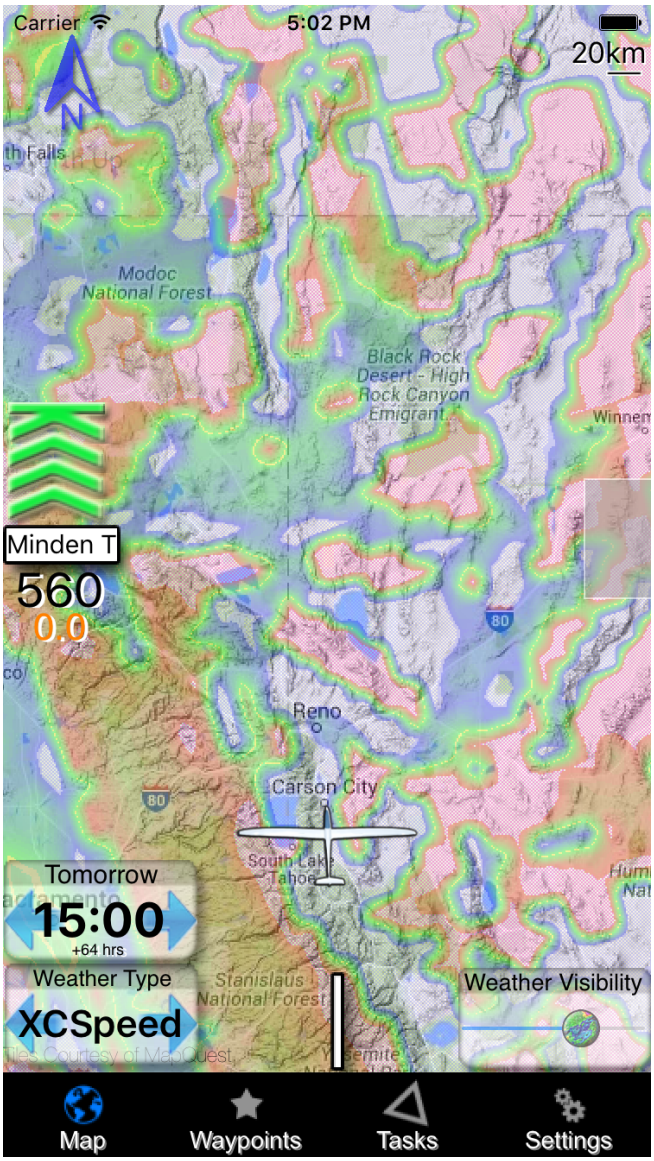
Using Weather Service

WinPilot Live! allows downloading of weather maps directly into WinPilot and showing them during a flight on top of map of terrain. Included with WinPilot subscription are maps for zoom levels 6 and 7. To see maps at zooms 8 to 11, a separate subscription is needed that can be obtained at www.fcst24.com.
At that web site, enter your email and password, and follow dialogs to establish a payment service for either a monthly or annual subscription.
Then enter the email and password used on fcst24.com into WinPilot Live! on page Setting.Weather.fcst24 account.

The currently available weather maps are:
- Cumulus cloud base
- Predicted cross country speed
- Overdevelopment
- Thermal Updraft Velocity
- Thermal and Convergence lift
- Wind speed and direction at 10 meters
- Wind at the top of Boundary layer
- Wave lift/Wind 3D (at selectable altitude)
- Rain
- Temperature at 2 meters

The weather maps can be downloaded for each hour separately. Then, during a flight, a map for the hour of interest can be selected using Navbox Weather Time. This can be specified on Settings.Weather.


Carrier
5:03 PM
20km
N
Modoc National Forest
Black Rock Desert - High Rock Canyon Emigrant
Minden T
560
0.0
Reno
Carson City
South Lake Tahoe
Tomorrow
15:00
+64 hrs
Weather Type
Wind L
Weather Visibility
Stanislaus National Forest
Map
Waypoints
Tasks
Settings


Carrier
5:02 PM
20km
N
Modoc National Forest
Black Rock Desert - High Rock Canyon Emigrant
Minden T
560
0.0
Reno
Carson City
South Lake Tahoe
Tomorrow
15:00
+64 hrs
Weather Type
XCSpeed
Weather Visibility
Stanislaus National Forest
Map
Waypoints
Tasks
Settings

OpenGlider Network (OGN)

OGN allows tracking of other gliders in real time. This van be enabled in WinPilot using WP.Settings.OGN. Because the number of tracked gliders can be very large, WinPilot allows selecting a filter to track only selected gliders of interest using the Friends option. It is also possible to specify the distance radius of interest, with gliders only pithing that range being shown on the map.

Format Of WinPilot Files

Polar File

Name.plr

Here is a sample polar file (a * at the beginning of a line makes it a comment line):
*LS8 (15m) WinPilot POLAR file: MassDryGross[kg], MaxWaterBallast[liters], Speed1[km/h], Sink1[m/s], Speed2, Sink2, Speed3, Sink3
360, 180, 100,-0.67,155,-1.45,185,-2.5

Turnpoint file

Name.dat

WinPilot Turnpoint file for a given site should be comprised of entries in the following format:
Id, Latitude, Longitude, Elevation, Attribute, Name, Comment
where:
Id = turnpoint identifier (each turnpoint must have a different Id)
Latitude, Longitude: in one of the following formats (ss=seconds, dd = decimals):
dd:mm:ss (for example: 36:15:20N)
dd:mm.d (for example: 36:15.3N)
dd:mm.dd (for example: 36:15.33N)
dd:mm.ddd (for example: 36:15.333N)
followed by N,S,E,or W
Elevation – a number that can be followed by the letter 'F' if the elevation is in feet (if no letter is present it is assumed that elevation is given in meters), for example:
,1623F, – elevation is 1623 feet
,1623, - elevation is 1623 meters
Attribute: the following attributes are supported:
A = Airport,

T = Turnpoint,
L = Non-Airport Landing Point
S = Start, F=Finish, (not currently used),
M = Markpoint – a navpoint without an arrival cylinder drawn around it
H = Home (there must be one and only one turnpoint with attribute 'H' in the WinPilot.dat file, it is the default navigation target)
Name: Name of the waypoint, maximum 12 characters long
Comment: Additional description, maximum 12 characters long, shown at the bottom of the TP Arrow Nav Box, and on the pop-up waypoint labels.

Example of thext line describing Minden turnpoint:
16,39:00.000N,119:45.200W,4718F,ATH,Minden ,12/30 122.8

User Airspace file

Name.air (note that the extension is: **.air** for the iOS version of WinPilot, and .txt for the older Windows CE versions).

*
*
• AIRSPACE-related record types:
* ==========
*
*AC class ; where class can be:
R restricted
Q danger
P prohibited
A Class A
B Class B
C Class C
D Class D
GP glider prohibited
CTR CTR
W Wave Window
AN string ;string = Airspace Name
AH string ;string = Airspace Ceiling
AL string ;string = Airspace Floor
AT coordinate;coordinate = Coordinate of where to place a name label on the map (optional)
NOTE: there can be multiple AT records for a single airspace segment
TERRAIN-related record types (NYI):
TO {string}; Declares Terrain Open Polygon; string = name (optional)
TC {string); Declares Terrain Closed Polygon; string = name (optional)
SP style, width, red, green, blue ; Selects Pen to be used in drawing

PEN STYLES in SP command:

SOLID	0
DASH	1
NULL (transparent)	5

Example: for a 1 pixel wide, dashed, light gray pen use: SP 0,1,192,192,192
SB red, green, blue ; Selects Brush Color to be used in drawing
Example: to select white interior of a closed polygon, use: SB 255, 255, 255
To select transparent interior use: SB -1,-1,-1
Record types common to both TERRAIN and AIRSPACE
V x=n ; Variable assignment.
Currently the following variables are supported:
D={+|-} sets direction for: DA and DB records
'-' means counterclockwise direction; '+' is the default; D is automatically reset to '+' at the beginning of new airspace segment
X=coordinate : sets the center for the following records: DA, DB, and DC
Z=number ; makes the element invisible at zoom levels > number
T=1 ; transparent Airspace segment (draw border only)
DP coordinate ;add polygon point
DA radius, angleStart angleEnd ; add an arc, angles in degrees, radius in nm
DB coordinate1, coordinate2 ; add an arc, from coordinate1 to coordinate2
DC radius ; draw a circle (center taken from the previous V X record, radius in nm