

NAVGPS PRO & NAVGPS PRO/PCFS USER'S MANUAL

Aviation Navigation Made Easy
Version 4.2



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Website: <http://www.FlyNavgps.com>
E-mail: support@FlyNavgps.com

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1 Introduction

Navgps Pro is an aviation navigation software for Microsoft PocketPC pdas and Windows laptops.

Major features are:

- World-wide aviation database
- World-wide vector topography w/ elevation display and warning
- Real-world cockpit user-interface
- Approach mode
- Victor/Jet airways flight-planning
- Vertical navigation
- User-extendable database

This manual details the PocketPC version, but the differences between it and the laptop version are minimal.

Navgps Pro/PCFS is a product that in addition to providing all the features of Pro, also interfaces with PCFlightSystems' EFIS solid-state attitude indicator. Features specific to it are tagged with a vertical line down the left side of the paragraph.

Here are some explanation to terms/styles used in this manual.

- Menu selections are denoted by ». For example, *Options»Simulator* means select the Options menu and then the Simulator item.
- PocketPC has four hardware application buttons at the bottom. They are referred to, left to right, as B1, B2, B3 and B4 respectively. It's specific to the iPAQ make, but should be compatible with most other makes.
- PocketPC also has a hardware directional pad – referred to as Direction-pad. They provide the functionality of the arrow direction keys on a PC.
- Pressing the center of the Direction-pad invokes the enter-command – also known as the Action-button. When any dialog-box is open, it can be closed by pressing the Action-button.

2 Installation

The software can be downloaded from our website using the link below:

<http://www.FlyNavgps.com/downloads.shtml>

Once the appropriate install file is downloaded to your desktop, connect your pda to your desktop and make sure Activesync is active¹.

Run the downloaded install file on the desktop and it should automatically install the software on your pda. If you tap on the Start-Menu on your pda – you should see a new entry for Navgps Pro².

If you'd like to do an over-the-air install (i.e. using a non-Windows OS or pda is directly connected to the internet), then please follow the instructions on the following link:

<http://www.FlyNavgps.com/airinstall.shtml>

You can try out the software for 30 days before your purchase decision. During the trial period certain features are disabled. Major one being that gps-connection is only allowed for 20-25 minutes.

HINT: Install the software on external memory (e.g. SD or CF card). This way if the battery dies and you have to do a hard-reset, you'll be able to run Navgps without the need to re-install. Just find navgps executable with the built-in File-Explorer and run it. It'll create a short-cut to itself and all your settings will be preserved.

When you install, the installer will prompt whether to install in the default folder – select NO and then the name of the external card where you want Navgps installed to.

3 Quick Test

In this section, we'll walk a new user quickly through the most commonly used features.

Tap on the Navgps Pro entry in the Start-Menu. Navgps will start up.

It'll display a screen listing the data-files that were loaded. After reviewing the screen, tap on the "OK" button at the bottom of the screen.

At this time, it'll try to connect to a gps-receiver. For now we'll assume you don't have one and want to test the software. From the menu select *Options»Simulator*. Assuming you're using the USA download, this will position you over northern New Jersey. The Europe download will position you over Germany.

As a way of introducing you quickly to the basic features, you can do the following:

- o Use the left/right Direction-pad buttons to change heading.

¹ The Activesync icon in the icon-tray (bottom of your desktop screen) should be green.

² There should also be an entry in *Start Menu»Programs*.

- Using the stylus, tap on an identifier to get an info-box. On the info-box, you can tap on the “D” soft-button to go direct to that waypoint. Tap anywhere on the info-box to make it close.
- A quick flight-plan can be created by selecting *Plan»Enter* menu option. Just enter some nearby identifiers separated by spaces and close it. You should see the flight-plan drawn.
- The four application hardware buttons by default are defined as follows from left to right:
 - Goto-Direct (B1)
 - Resume-Nav (B2) – return to flight-plan
 - Flight-plan display page (B3)
 - Switch To PCFS (B3) – toggles between Navgps and PCEFIS software.
 - Nearest-Airports (B4)
- You can use the up/down Direction-pad buttons to set the new active waypoint from the flight-plan.
- You can tap on the icons on the main toolbar to control the nav aids displayed and the range of the map.
- You can press the Record-button (on iPAQs), press ‘P’ or select menu *Options»Next Page* to rotate through the different display pages.

If you'd like to change the simulator to start at your local geographical position, here's what you can do.

Select menu *Options»Prefs*. Then go to the Prefs3 page. On the displayed page, in the *Sim-mode Start Position* field, enter the identifier of your base airport or a nearby navaid.

Tap OK – Navgps will either change the display to that location. If it doesn't that means that navaid wasn't found. Be sure you've loaded the appropriate av-database for the region³.

At this time, you should see familiar av-data on the moving-map. If you see a “NO TOPO” display on the top-left hand corner, that means the topography file for the area was not found. See section 8.8.

The above information covers the basics for a typical flight. Now on to the details...

³ See section 8.8 on how to load data manually.

4 Initial Start-Up Page

When you start Navgps, the initial screen will display the status of the data-files loaded.

The different types are:

- Av-Data Files: These files (extension .NG2) contain airport and navigation data. There are eight regions covering the world and you can load any combination. They are issued every 28 days.
- Topography Files: These files (extension .NG3) contain topography data⁴. Again, you can load any combination and are limited only by available memory.
- User-Created .UDB.TXT and .NDB Av-Data Files: These files are files that user's can create to augment the native av-data information⁵. For example, you can create your own airports and nav aids⁶.
- User-Created Obstruction Data Files: These files (extension .OBS) are files that user's can create to add obstruction data.

You can tap on the '?' button to display the load-status file. This file will display a list of files that were loaded, their location, version and errors of any.

After reviewing the page, tap on the 'OK' button.

5 Connecting a Gps Receiver

Navgps requires a gps receiver that outputs data using the NMEA protocol. You can see if your gps is compatible by looking at the specifications of your receiver. If you see that it can be connected to a PC and outputs NMEA – you're set.

There are four ways you can connect a receiver to your pda:

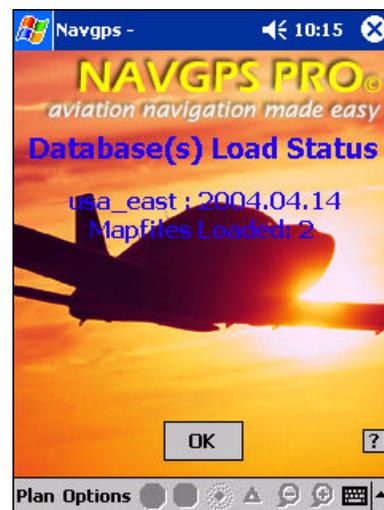
- Compact-Flash (CF) receiver. Of course this requires that your pda have a CF slot – most do now.
- Serial receiver. Many serial gps receivers come with cables that allows you to connect directly to the pda and also powers both the receiver and pda⁷.
- Standalone receiver. These are standalone receivers – usually with it's own display. For example, Garmin III.
- Bluetooth receiver. This allows the receiver to wirelessly send the data to the. Your pda needs to have the Bluetooth feature.

Once you've decided to go with a specific type of receiver – connect it to the pda and start Navgps.

Once you tap on "OK" on the start-up page, Navgps will automatically search for a receiver.

It'll display progressive messages as it searches for a receiver. Here is a list of those messages and what they mean:

- "No Gps Rcvr Activity" – at the current port and speed setting, no data was received.



⁴ <http://www.FlyNavgps.com/downloadmap.shtml>

⁵ <http://www.FlyNavgps.com/downloadndb.shtml>

⁶ <http://www.FlyNavgps.com/udb.shtml>

⁷ If you're creating your own serial cables – please see our website for more information.

- o "Waiting for NMEA Data" – data was received and making sure it's the correct gps format.
- o "Waiting for NMEA gprmc" – data format is correct...now making sure that the required commands are being sent.
- o "Waiting for NMEA gpgga" – waiting for another required command.
- o "Locating Satellites" – if you see this message, it's good news. Gps receiver was found, it's sending the required data and now waiting for satellites to lock on to.

If you don't get to the "Locating Satellites" message after a while, then you might have to manually tell Navgps where to find the receiver. This is usually in the case of Bluetooth receivers.

In Navgps, select the *Options»Prefs* menu option and then activate the Prefs1 page. You should see an option for "Auto-set Port/Speed" – unselect that option and then manually either select or type in the port and speed⁸. Tap on "OK" and Navgps will try the port and speed that you specified.

If you still have problems connecting or would like more detailed information on gps receiver requirements, please go to the link below:

<http://www.FlyNavgps.com/gps.shtml>

6 Basic Navgps Usage

Once you have the gps connected and it has locked on to the satellites, Navgps will display the main moving-map page⁹.

At this time, you're ready to navigate. Navgps will display the track and ground-speed as you start moving.

Here are some common actions:

6.1 Direct-To Navaid

Mostly you'll want to navigate to a navaid. There are two ways of doing it.

On the moving-map, if you tap on a navaid identifier, an info-box will pop up. This will display some additional information regarding the navaid. It'll also display a row of buttons at the bottom. Tap on the 'D' button to go direct to that navaid.

You can also press the Direct-To hardware application button¹⁰. A dialog-box will appear and you can enter the identifier of the fix you want to navigate to.

If you'd like to also get vertical navigation – enter the altitude you'd like to be at when reaching the navaid. Enter the altitude in hundreds of feet. For example, 2000 ft would be 20 and 540 feet would be 5.4. Leave the field blank if you do not want vertical navigation. See 7.2 For more information.

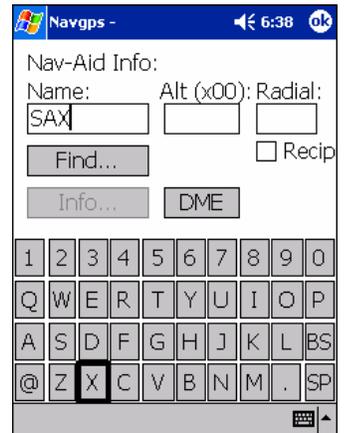
This dialog-box also allows you to enter a radial. Navgps will draw the specified radial in solid-line and the reciprocal in dashed-line. This feature would be useful for:

- o Non-precision approaches – enter the in-bound heading radial.

⁸ This is usually provided by the gps manufacturer.

⁹ Or if you don't have a gps connected, you can test in sim-mode. Select menu *Options»Simulator*.

¹⁰ Default is B1 button.



- o Holding – enter the in-bound heading.
- o Runway extension – with the airport selected as the active waypoint enter the runway heading for the radial.

If you don't know the identifier of the navaid/airport, you can press the FIND button. See section 6.2.

The INFO button will be enabled when a valid airport identifier is entered. This feature is useful when you need airport information but it's not currently visible on the moving-map.

Pressing the DME button will display the DME to the navaid on the moving-map. On the map, you can tap on the DME info to show bearing from that navaid (i.e. the radial). Tapping again will hide the data. You can track as many dme/radial station as you want.

6.2 Find-By-Name Dialog

This dialog can be displayed by clicking on the FIND button on either the Goto/Direct-To or the Enter-Plan dialog.

Use it when you don't know the identifier for the navaid/airport but do know the first few letters of the name.

As you enter the name, Navgps will display a list of the nearest navaids/airports with similar names. The more you enter, the more accurate the list.

Once you find the identifier, tap on it – the dialog will be closed and will be automatically entered in your Goto or Enter-Plan dialog.

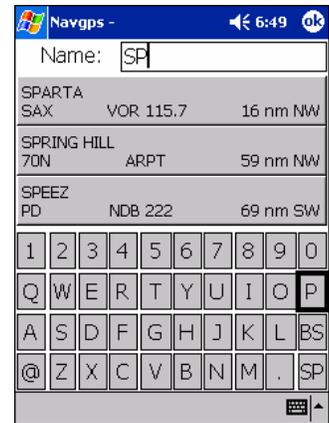
6.3 Changing Display Page

There are several different pages that you can display. Pages can be changed by selecting menu *Options»Next Page*, pressing 'P' key or by pressing the Record-button.

As you press it, the display will rotate through:

- o Map – moving-map only.
- o Map+HSI – an HSI is displayed over a moving map.
- o HSI.
- o North-Up – map displays true-north straight up and the airplane icon rotates depending on the track.
- o EFIS.
- o Nav-data – large-font detailed nav-data information. No map. PocketPC version only.
- o Satellite – shows the current gps connection status and reception strength.
- o Flight-plan – displays distance, ETE and ETA to each waypoint in the active flight-plan. Can also select a new active waypoint.
- o Nearest – displays a list of nearest airports and navaids. See section 7.7.

HINT: The pages included in the rotation can be set via *Options»Prefs* and *Pages* tab.



6.4 Changing Display Range

The current display range of the map is displayed at the lower-right corner. That is the distance from the airplane icon (your current position) to the top of the map.

The range can be changed by tapping on the zoom in/out icons on the toolbar.

If you're in not sim- mode (i.e. you have a gps-receiver connected), you can also press the left-right Direction-pad keys to change range.

The zoom range is from 1 to 1000 nm.

If you have Auto-zoom enabled, the range will revert to the preferred range in about 45 seconds.

6.5 Selecting Navaid Display

There are four classes of nav aids that are displayed – airports, VOR, NDB and fixes (i.e. intersections). For display purposes, Navgps further divides the last three by their usage-class:

- o Low – low-power nav aids...range about 50 nm.
- o High – higher-power nav aids...range around 100 nm.
- o Terminal – terminal area nav aids...range around 10 nm.
- o VRP – (only fixes) visual reporting points.

You can control what nav aids are displayed on the moving-map by tapping on the nav aid icons on the toolbar. The resulting behavior depends on a preferences setting – “*Rotate thru low, high, terminal, VRP, off*”¹¹ (rotate-pref).

If it's selected, then tapping on the nav aid icon in the toolbar will result in the display for that nav aid class rotate through the different usage-classes and also turning it off entirely.

If the rotate-pref is not selected, then tapping on the nav aid icon will toggle that nav aid display on/off.

To avoid cluttering the screen at high zoom-out levels, display of certain nav aids is dependent on the current zoom range.

The table below shows the maximum zoom range condition necessary for the display of the different nav aid classes.

For example, it shows that on the PocketPC platform terminal-fixes are only displayed at zoom levels 15 nm or lower.

Nav Layer	PocketPC	Desktop
Terminal Fix	15	25
Fix ¹²	40	65
NDB	40	65
Airports	65	100
VOR	65	100
Obstructions	40	65
Runway	4	8
Runway Labels	4	4

¹¹ In Prefs1 page.

¹² Fixes of usage-class TERMINAL will be displayed at a higher rez only. If you do not see a fix and it's been enabled – zoom in.

7 Advanced Usage

7.1 Creating Flightplans

There are two different ways of creating a flight-plan. You can switch between the two anytime.

7.1.1 Graphical

Select *Plan»Visual View/Edit* to create and/or view a flight-plan graphically. A moving-map will be displayed centered either at your current position or the simulator start-position¹³.

The orientation is true-north up. The arrow on the top-right hand corner points to magnetic north.

At this time, you would normally want to add the first waypoint in your flight-plan. You can search for in one of two ways:

- Pan the screen. Hold the stylus down on one side of the screen and move it towards the center. Or press the Direction-pad keys in the direction you want to pan.
- Select the *Options»Find* menu option or press the hardware button mapped to Direct-To action. Enter the identifier you're looking for and on finding the navaid, it'll be positioned at the center of the map.

You can control on the navaid icons on the toolbar to control what navaid classes are displayed on the map.

Once you find the navaid on the map, you can add or delete it from your flightplan by tapping on the identifier. The info-box will be displayed.

If the waypoint is not currently in the flight-plan, a button with a '+' (plus) is displayed. Tap on it to add it to the plan.

If the waypoint is in the flight-plan, a button with a '-' (minus) is displayed. Tap on it to remove it from the plan.

All the waypoints in the plan will be connected by a line (the planned flight-path) and the distances for each of the legs will be displayed. The lines are drawn as great-circles – that is the shortest path between any two waypoints. If the leg distances are large, it'll look curved on the map – that's normal.

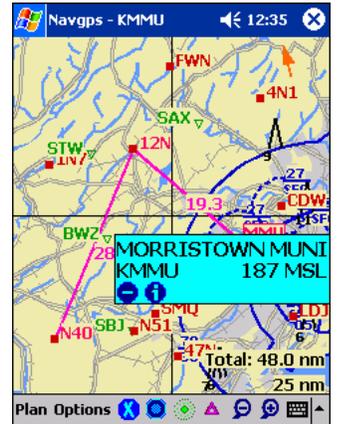
One particular waypoint in the plan might also be under-lined – that's the insert-waypoint. It's the waypoint after which the next added waypoint will be inserted. Tapping on a waypoint in the plan or adding a new one makes that the insert-waypoint. It's also displayed on the title-bar.

Also, note that the total distance is displayed on the bottom right.

Select *Plan»Visual View/Edit* again to exit edit-mode. You'll revert back to the mode you were in before you entered edit-mode.

7.1.2 Text Entry

This method allows you to enter the route as a sequence of identifiers. If you know the identifiers in advance, this is a much faster way of creating the plan.



¹³ Set via preferences.

This option can be selected by tapping on the *Plan»Enter...* menu option. Then within the text entry box, enter the navaid/airport identifiers in your route separated by spaces.

If you have current databases loaded, you also have the option of entering airways as cleared by clearance. Navgps will automatically create the full plan from it. For example, you're cleared "CDW BREZY V39 SOARS POU" by clearance. Just type the same and Navgps will create the full flight plan for you.

You have to make sure that the identifier immediately before and after the airway identifier is part of the airway. You can have one airway follow another one immediately – in that case Navgps will create a temporary fix at the point where they intersect.

New Flight-plan Checkbox – Enable this option if this is a new flight-plan. If you're editing the plan while en-route then de-select it. The difference is that if you de-select this option (i.e. not a new plan), then Navgps will remember the waypoints that you've already visited. Otherwise Navgps will think it's a new plan and start navigating towards the first waypoint in the plan.

Once done, it's always a good idea to select *Plan»Visual View/Edit* menu option to view the full route graphically to make sure the correct navaids are chosen. Also, look at the total flight-plan distance on the bottom-right to confirm it's close to what you expect.

If you don't know the identifier for a navaid/airport – tap on the FIND button. See section 6.2.

The displayed screen-shot also shows another feature – vertical navigation. The last part of the plan (i.e. "CMK@50") instructs Navgps to provide vertical navigation so that you'll be at 5000 ft msl when you reach CMK. See section 7.2 for more information.

HINT: When specifying airways, sometimes there'll be a navaid with the same name. To force it to be interpreted as an airway, prefix '@' to the airway name. For example "BREZY @V39 CMK".

7.2 VNAV

You're flying along at cruise altitude and need to descent to your destination. You want to descend at around 500 fpm...what do you do?

Flip out an E6B...start playing mental gymnastics? If you're flying with Navgps Pro, all you do is specify the destination altitude.

Bring up the Direct-to dialog and enter the altitude you'd like at the destination in units of hundreds of feet. For example, 2000 ft msl would be 20 and 120 ft msl would be 1.2 etc¹⁴.

Navgps Pro will display a vertical scale down the right side of the moving-map. The CDI needle behaves like a traditional glide-slope but the tolerances are higher - it's +/- 3 degrees.

¹⁴ When you enable VNAV, Navgps will automatically flash the ALT display. This means synch your gps altitude to your altimeter reading.



The number below shows by how many feet you're off the initial target slope path. The number at the top shows your DVS (desired vertical speed). This is the speed you should be descending at - that is it should be the reading of your VSI instrument.

Now let's get back to your problem. With Pro, just set the destination altitude as explained above and then wait until the DVS is around -500 and then start descending at that rate.

Note that the DVS is dependent your ground-speed. If you descend without powering back, your ground speed will increase and so will your DVS. If you'd like to descend at a given rate but do not want to power back, then initiate your descent a little bit before your target DVS. For example, in the above case, around -450 DVS then as you descend...your ground-speed will increase and your DVS will be close to -500.

This feature applies to both descents and climbs.

Just before you initiate your descent/climb, you should bring up the Direct-to dialog (press B1 button), no need to change anything and then close it (press the Action-button). This will cause Navgps to re-compute the optimum slope, the CDI will be centered. Now following the DVS will keep the CDI centered.

Also, this feature can be part of your flight-plans using the *Plan»Enter* menu option. Enter the navaid identifier, then '@' and then the desired altitude in the above format. For example, let's say you want to be at 3500 ft msl at the BREZY fix. Enter "BREZY@35".

If you do not enter an altitude for all the waypoints in your flight-plan, Navgps will assume you want to climb/descent at a constant rate to the destination navaid.

For example, if your current altitude is 8000 msl, plan "A B C@20" means you want to be at C at 2000 ft. Navgps will guide you at a constant rate thru A and B to C. If that's not what you want, then you need to enter the altitudes for A and/or B also.

7.3 Instrument Approach Plates (IAP)

In Navgps you can specify a runway threshold as a fix in any flight-plan. This along with the previous VNAV feature means that you can depict most instrument approaches thereby greatly increasing situational awareness.

The syntax is airport identifier, followed by ".R" and then the runway identifier. Examples are, KCDW.R3, CDW.R21L etc¹⁵.

Create a flight-plan containing the waypoints of the approach and then save it. The waypoints usually end with a runway and then the destination airport.

So that you can find it easily, the format of the name is suggested be the airport identifier followed by the approach name. For example, "CDW LOC22".

Now fly your normal en-route segment and then as you get close to your destination and ATC has told you which

¹⁵ This feature may not be available for all runways.

approach to expect, load the appropriate flight-plan. Navgps will vector you to the first waypoint in the plan.

For approaches with multiple initial-approach-fixes (IAF), create multiple flight-plans with the same file-name format and suffix the IAF identifier. For example, "CDW LOC22 SAX" etc.

7.4 Approach Mode

WARNING: As always you're to use Navgps as backup to your primary instruments. You're absolutely **NOT** authorized to shoot approaches using Navgps as your primary instrument. You can lose gps signal anytime.

When an airport info-box is displayed and if you tap on the APP button, you'll be put into approach mode. You'll also be put in this mode automatically when you select the Nearest-airport feature.

In this mode, Navgps will display the runways, ATIS and tower frequencies on the bottom left hand corner.

It is assumed that the pilot will find out the weather at this time. Then tapping on the active runway number will put him/her on final lateral guidance to that runway¹⁶.

Tap on the airport info-box to hide it.

If the *Enable Vert/Horz Appr. Guidance* preferences is enabled, then a more traditional vertical/horizontal guidance is displayed.

These are the conditions for it's display:

- o It has to be enabled via the preferences
- o You have to be within 10nm of the runway threshold
- o Your track has to be within 45° of the final inbound heading.

The figure to the left is what you'd see for a typical approach. In this case runway 06 of 4N1 airport.

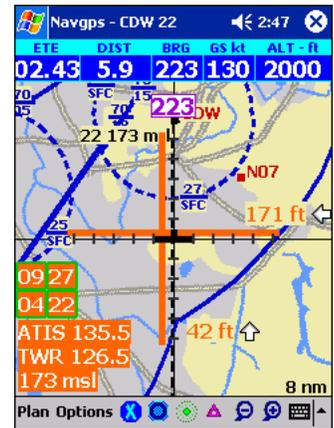
You have the moving map displaying the view from the top and the cross-hairs displaying the vertical and horizontal guidance (ala loc and glide-slope). The airplane icon changes from a top-down view to that of one as viewed from the rear.

The limits of the horizontal guidance is 2.25° of the center-line. The current cross-track is displayed in nm along with an indication of which direction you need to move. In the example, you're slightly to the right of the center-line and need to move a little bit to the left.

The vertical guidance is a standard 3° glide-slope. Amount of feet below or above the glide-slope is displayed at the bottom-right of the grid. In the example, we're below the glide-slope by 41 feet.

This feature will not be available for airports in expired databases. You'll see the runway-extension-line but the vertical guidance will not be available.

WARNING: Navgps just provides a standard glide-slope vertical guidance. It does not provide for terrain clearance



¹⁶ When you tap on a runway, Navgps will automatically flash the ALT display. This means synch your gps altitude to your altimeter reading.

and adjustments for runways requiring non-standard glide-slopes.

WARNING: You can lose the gps signal anytime! Altitude is even more susceptible to loss than position info – so chances of vertical guidance loss is greater. In such cases the guidance line will not be drawn.

7.5 Waypoint Sequencing

When a flight-plan is active, there are two ways that Navgps can select the active waypoint.

The two modes are auto and manual-sequencing. You make the selection via the *Options»Prefs* menu and then Prefs2 page. If you put a check-mark next to 'Auto-sequence flight-plan waypoints', auto-sequencing is selected, else manual.

7.5.1 Auto-Sequencing

In auto-sequencing, Navgps picks the waypoint whose bearing is closest to the current track of the plane.

Therefore, you can select the active waypoint by just turning approximately in the direction of the desired waypoint.

For example, take the example flight-plan. SAX is chosen because it's bearing is closest to the current track (327). If the pilot turned left, TINNI would be chosen and if he turned right FWN would be chosen. More right and 4N1 would be chosen.

Also, note that for those waypoints whose bearings are approximately the same (SAX and FWN), Navgps will give preference to the nearer one.

You can use the Up/Down Direction-pad keys to manually select a waypoint. But within 45 seconds, Navgps will revert back to auto-sequencing. Within that time you should turn towards the desired waypoint.



7.5.2 Manual Sequencing

In manual sequencing, Navgps sets the destination to the first waypoint in the flight-plan. As you come within 1 nm radius of that waypoint, the next waypoint is selected.

So in the same example above, the first waypoint would be TINNI – until you flew within 1 nm radius of it, then it would be SAX and so on.

Navgps will try to detect the scenario where you miss your waypoint. If you're between 1 and 3 nm of your waypoint and it's behind you and are pointed in the direction of the next waypoint – Navgps will automatically select the next waypoint.

You can override the selection process by using the Up/Down Direction-pad keys to select waypoints manually. You can select a new active waypoint with the Flightplan display-page also.

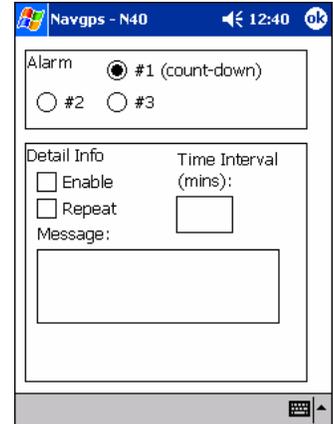
7.6 Timers & Alarms

These are enabled through the *Options»Set Alarm* menu selection.

When you view the Alarms dialog, there are options for selecting one of three alarms. The first one is the count-down timer and the other two are alarms.

Select the one you'd like to set and then set the values for the fields below:

Enable	Set it to enable that particular alarm/timer.
Repeat	Set it so that it repeats after the user resets the alarm after activation
Time Interval	Enter the time (in minutes) when the alarm/timer is to be activated. The format is minutes and optionally colon and the seconds. For example, 2:55.
Message	Enter the message that you'd like to see displayed when the alarm/timer is activated.



When you enable the timer, it's displayed on the top-right hand corner – but it's not started. It's started when you tap on it. After it counts down to zero, the message you enter will flash in that part of the screen. After you reset it (by tapping on the message), the timer will be armed once again.

The alarms time start as soon as you tap on ok. When the set time has elapsed, the entire screen will flash with the message you entered. You can reset the flashing by tapping anywhere on the screen or by pressing one of the Direction-pad keys.

7.7 Nearest-Navaid

The Nearest-Navaid page can be displayed by pressing the Action-button if you've enabled it to be part of the rotation.

A quicker way to view the page is to press the hardware key mapped to the nearest-navaid function. Pressing the button again will revert the to the last display-page.

The important point to note here is that in the case of an emergency, you'll be able to get the nearest airport by just pressing the hardware buttons – as opposed to using the stylus.

The units for the distances are the same as the user-set unit in the Preferred options.

This page consists of four different sub-pages.

- o Airport
- o VOR
- o Fix – list of nearest non-terminal and non-VRP fixes
- o Fix – list of terminal fixes
- o VRP – visual reporting points (mainly for Europe...but you can create your own fixes and assign them the VRP usage-class).

You can select the different sub-pages by either tapping on the tab or pressing the Left/Right arrow hardware buttons.



HINT: While the Nearest display-page is displayed, you can select a tab by pressing Left/Right buttons. You can select an airport/navaid by pressing Up/Down buttons. Then to navigate to the selected navaid, press the Action-button.

You can also press the button that's mapped to the Direct-To button if you'd like to enter an altitude and/or radial.

7.7.1 Airport Sub-Page

The contents of the list is dictated by your selection at the top of the screen:

- Include User-Created Airports – the list will include user-created airports (i.e. from .ndb files). You will not get approach-mode or runway guidance for these airports. If you enable it, the options below will be disabled.
- Hard-Surface Only – only hard-surface runways will be included.
- Min. Runway Length (ft) – enter the minimum length of the runway.

7.7.2 Navaid Sub-Pages

The rest of the sub-pages display nav aids.

For each, it displays the bearing to the station, the distance and relative position of the airplane relative to the station (i.e. the bearing from the station). This last information is displayed in a format conducive for reporting to ATC.

For example, in the sample image to the right, you're 10.8 nm to the north-west of TETERBORO VOR.

	SPARTA	SAX	274°	8.8	E
1	SPARTA	SAX	274°	8.8	E
2	TETERBORO	TEB	151°	19.4	NW
3	HUGUENOT	HUO	343°	22.1	S
4	STILLWATER	STW	270°	24.3	E
5	BROADWAY	BWZ	244°	27.7	NE
6	LA GUARDIA	LGA	143°	28.4	NW
7	CANARSIE	CRI	157°	35.2	N
8	SOLBERG	SBJ	224°	35.3	NE
9	CARMEL	CMK	084°	36.4	W
10	KENNEDY	JFK	149°	37.9	NW

AIRPORT VOR FIX TERM VRP

Plan Options

7.8 Flight-Track

Navgps will allow you to record your flight-track.

There are four sub-menu selections related to this feature:

- Enable – select this option to toggle the track feature. If it's currently enabled, you'll see "TRK" on the title-bar.
 - During a trip, you can enable/disable different flight segments as many times as you want.
- Clear – clears the entire track-history.
- Open – allows you a load a pre-existing track-file. You can view the track by selecting the *Plan»Visual View/Edit* menu option.
- Save As – allows you to save the current track-history to a track-file.

Track-files have file extension .trk. It's a text file with a line written to every 5 seconds. Each line contains the date, time, geo-posn, ground-speed, track and altitude.

You can re-load the file later to view your flight or export into a spread-sheet to analyze it further.

7.9 Creating Dynamic Fixes

Navgps allows the user to create fixes dynamically while flying en-route.

These fixes are stored in the userfix.ndb file and can be used later for navigation or editing.

Menu *Options»Edit User Fix* will display a dialog with a list of all the user-fixes created. You can use the standard interface provided to edit the entries.

Usually you have don't know the exact geo-position but do know an approximate point on the moving-map. Here are the ways of creating a fix when the moving-map is displayed for the different platforms:

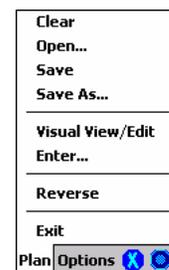
- o Windows users can right-click on the approximate position where you want the fix to be created. A menu will pop up – select the create-fix option.
- o PocketPC 2002 users can use the stylus tap-and-hold procedure. Hold the stylus down on the approximate position where you want to create the fix for about 1-2 seconds. A menu will pop up – select the create-fix option.
- o For PocketPC 2000 users and others – a fix at the current position can also be created by selecting the *Options»Edit User Fix* menu option. Select New at the next dialog prompt and you'll see a dialog form to create a new fix. All the entries are initialized with the current position. Just tap on 'Ok' to confirm the creation of the fix.

8 Appendix

8.1 Menu

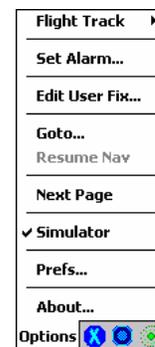
8.1.1 Plan Menu

- Clear – creates a blank flight-plan. Also clears the existing flight-plan.
- Open – pops up a file-open dialog box. Select a flight-plan file. It'll be the active flight-plan.
- Save – saves the existing flight-plan.
- Save As – Enables you save the current flight-plan under a new name.
- Visual View/Edit – Enters flight-plan edit-mode. If currently in edit-mode, select this entry again to exit edit-mode.
- Enter... – Enables you to enter/edit the flight-plan in text mode.
- Reverse – Gets enabled when there's an active flight-plan. With reverse selected (check-mark next to item), it'll be assumed that you want to fly the reverse of the active flight-plan.
- Exit – exit Navgps.



8.1.2 Options Menu

- Flight Track – When enabled your ground track-history will also be drawn on the map. See section 7.8.
- Set Alarm – Allows you to set timer/alarms. See section 7.6.
- Edit User Fix... - See section 7.9.
- Goto... – Allows you to directly go to an airport or navaid. This menu is renamed Find in graphical plan edit-mode.
- Resume Nav – If you've temporarily deviated from a flight-plan (by going to another navaid/airport), selecting this option will allow you to resume your flight-plan navigation.
- Next Page – See section 6.3.
- Simulator – If checked, you'll be in simulator mode. Review all the functionality of the software on the ground without the need for a gps-receiver. If you're in sim-mode¹⁷, select this menu entry again to exit.
- Prefs... – Allows you to set your preferences. See section 8.2.
- About – Displays information about the software release. If you're in trial-mode, it'll also display the registration window after you tap 'OK'.



8.2 Preferences

The preferences dialog is viewed by tapping on the *Options»Prefs* menu selection.

The displayed dialog-box contains five pages.

8.2.1 Prefs1 Page

- **PCFS gyro-module connected**
If enabled, Navgps Pro/PCFS will try to connect to the gyro-module. If disabled, then Navgps will not connect to the module. Effectively, it's in Pro mode then – you can connect to a gps-receiver and navigate.

¹⁷ There'll be a check-mark next to the *Options»Simulator* menu entry.

- **GPS connected via gyro-module**
Enable this option if you have the gps-receiver connected via the gyro-module. Disable it if you have the gps-receiver connected in some other way (e.g. compact-flash).
- **Auto-set Port/Speed**
If enabled, Navgps will automatically search for the gps-receiver. It'll find of the common ones, if it doesn't – you should disable this feature. On doing it, the Port and Speed boxes will be enabled. You should select or type-in the correct ones for your receiver.
- **Ignore Mag-Var Data from GPS**
Most gps-receivers will not send magnetic variance data to Navgps. On not receiving the data, Navgps will display a dialog-box stating the condition. Enabling this option, will disable that dialog-box pop-up.

Certain gps-receivers also send incorrect mag-var data...in those cases you should also enable this option.

When ignored Navgps will use the mag-var data stored in the av-data of the nearest airport.

- **Min. Obs. Display Hgt.**
This option controls the display of obstructions.

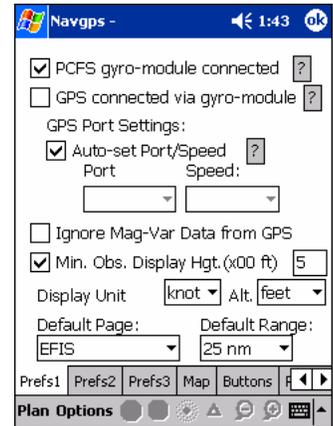
If enabled and in graphical plan-edit-mode only obstructions of the user-specified height and above are displayed

If enabled and not in plan-edit-mode (i.e. in normal flight-mode), only obstructions within the user-specified height of the current altitude is displayed.

For example, if it's set to 5 – that means display obstructions only when the top of it is within 500 feet of the current airplane altitude.

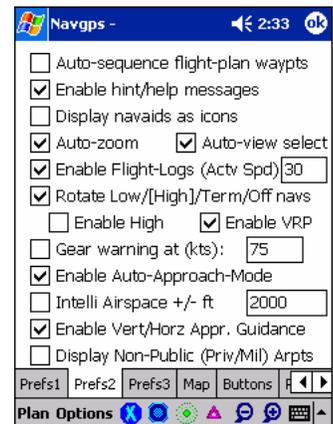
When you're at or above the obstruction, it's displayed in orange. When below, in red.

- **Ground-speed Display Unit**
Sets the units for display of ground-speed and distance.
- **Default Page**
Sets the preferred page-view. See next.
- **Default Range**
Sets the preferred zoom range.
In the next section, you'll read about auto-view and auto-zoom. When those options are enabled, then Navgps will revert to the page and range specified here.



8.2.2 Prefs2 Page

- **Auto-sequence flight-plan waypoints**
With an active flight-plan, the next waypoint selection is based on your current track. Navgps will automatically choose the waypoint whose bearing is closest to your current track. So as you bank left and right, waypoints will be chosen automatically. (See section 7.5)
- **Enable hint/help messages**
Enables messages at the bottom left of the screen. Tapping on the message box will make it go away.
- **Display navaids as icons**
Enables the display of navaids/airports as bitmap images. Otherwise, you'll see drawn images.
- **Auto-zoom**
Useful when you have a flight-plan active. With this



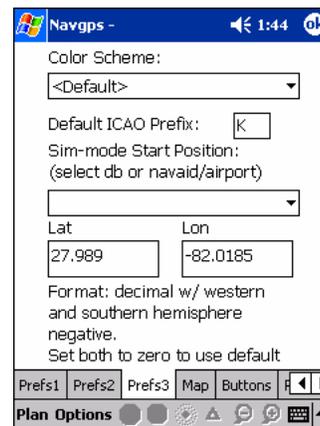
feature enabled, Navgps will always try to make sure that the current waypoint is visible - zooms in as close as possible. For performance reasons, this feature is overridden when the waypoint is relatively far away. Also depending on your airspeed, it'll zoom in/out. For example, on the ground it'll zoom in for you to see the runways.

- **Auto-view select**
On the ground, the HSI view is selected and once airborne, the EFIS view is selected. This feature is slaved to Auto-zoom.
- **Enable Flight-Logs**
When enabled, your flight-time gets logged to a file named navgps-log.txt. You can use the Activation Speed field to specify when to start/stop recording. A value of -1 means at start-up and shutdown - otherwise you should put in a value half of your normal rotate speed. See section 8.5.
- **Rotate thru off/low/[high]/term navs**
When enabled, as you tap on the toolbar navaid buttons, navaid display will rotate through the different types. low-altitude, terminal and then off.
If disabled, then the toolbar buttons act as an on/off toggle.
 - **Enable High**
Allows you to view high-altitude navaids. If above rotate feature is enabled then High-alt navs will be part of the rotation.
 - **Enable VRP**
Same as above except for Visual-Reporting-Points. Mainly for non-USA users.
- **Gear warning**
If you fly a retractable gear plane, enter the typical ground-speed (not the approach speed). You'll get a gear-down warning when you reach this speed. You can reset the warning by tapping anywhere on the screen or pressing one of the ARROW keys.
- **Enable Auto-Approach Mode**
If enabled, as you come within 30 nm of your destination airport, Navgps will automatically display the airport frequencies and runways.
- **Intelli display**
When enabled, only airspaces that's within the current altitude +/- the buffer specified by the user will be displayed. This effectively de-clutters the screen.
- **Enable Vert/Horz Appr. Guidance**
If enabled, on final approach to the runway, you'll get horizontal and vertical guidance. See section 7.4.
- **Display Private Airports¹⁸**
If enabled, private airports are displayed. Even if disabled, you can still always navigate to any of the airports in the database.

8.2.3 Prefs3 Page

- **Color Scheme**
The top control allows you to select the color scheme. Navgps comes with two built-in ones - default and night-flight.

You can create your own color schemes (see section 8.4) After doing so, the name of the scheme will appear in this list and then you can select it to be the active one.
- **Default ICAO Prefix**
This entry allows you to set the default ICAO prefix for



¹⁸ At this time valid only for USA database users.

the airports.

Airports with ICAO designations have four letters in their identifier. This feature allows you to view and enter just the last three letters – less screen clutter.

- **Sim-mode Start Position**
Allows you to set the start-position when you enter sim-mode.

You can:
 - Select a region database. The default for that region will be used.
 - Enter the navaid/airport identifier – usually the most useful.
 - Enter the latitude/longitude.

8.2.4 Map Preferences Page

Navgps Pro has topography coverage support for the entire world. It divides the world into small regions – with each represented by a map file. Map-file has extension *NG3* (e.g. map002.ng3). Users can download the file for their regions from the Navgps web-site.

The number of map files you can load simultaneously is restricted only by the amount of memory the computer has.

This page gives the user control over the display of the topographical data.

The first checkbox allows you to enable/disable the display of maps entirely.

If the master checkbox is enabled, then the rest of the options allow fine control over the display.

Though you can select what items you'd like to see displayed, Navgps will decide what data is displayed at various zoom levels. The table below shows the maximum range at which certain elements are shown.

Topo Layer	PocketPC	Desktop
Population	40	65
Lakes	65	100
Rivers	40	65
Railroad	25	40
Roads	65	100
Land	1000	1000

Elevation data can be displayed in one of two modes:

- **Absolute Mode**
Each elevation contour is assigned a color based on it's actual msl elevation. By default the color will range from tan to dark brown.
- **Relative Mode**
The elevation contour color is dependant on the current aircraft altitude. All elevation less than 500 ft below the current altitude and above will be red. From 500-1000 ft below will be orange. The rest will be standard contour color as assigned in Absolute mode.

NOTE: For accuracy, you should sync your panel altimeter reading to the gps altitude as often as you can.

You can also select some map-related preferences:

- **Disable Map/Bdry During Approach Mode**
If enabled, during approach-mode (i.e. cross-hairs visible), the topo-map and the airspace boundary will not be displayed. This gives you a clearer picture of the more relevant information.

8.2.5 Buttons Page (PocketPC)

The PocketPC version of Navgps, allows you to assign different functions to the four hardware buttons on the front of the pda and also the Record-button on some of the pda units.

You can assign a functionality when you press once and also on double-presses. In the case of the latter, the interval between the two successive presses have to be within .5 second – otherwise the single press function will be executed.

The functions you can assign are:

- No Assignment – the default system action will be active. For example, calendar, contact etc.
- Toggle screen on/off – enables you to turn the screen on and off. This would be useful if you're running off batteries because the screen is quite a drain on them.
Important note: If the screen is off when a gps connection is lost – Navgps will automatically turn it on.
- Goto/Find Navaid – pops up the goto/find dialog.
- Resume Nav – cancel current active waypoint and go back to flight-plan route.
- Toggle Edit Plan – enables you to enter and exit flight-plan edit mode.
- Enter Route – pops up the enter-route dialog.
- Preferences – pops up the preferences dialog.
- Nearest Display Page – shows you a list of the nearest airports/navaids. See section 7.7. Press defined button again to revert to last display-page.
- Flight-plan Page – shows the flight-plan page. Press defined button again to revert to last display-page.
- Enter Key – If pressing the standard Action-button – center of the direction-pad is too difficult...you can assign a button to this function. You can use this to whenever you need to press the enter-key.

8.2.6 Display-Page Page

This page allows you to select which display pages that'll be part of the rotation when the Action-button is pressed.

8.2.7 Plug-In Page

This page will be active if you've added either the auto-pilot or the Merlin weather add-in modules.

8.3 Button Definitions

Navgps is designed so that there's a minimum need for using the stylus while en-route.

This is achieved by defining the hardware buttons to the most commonly used functions also knowing what they do in different contexts.

8.3.1 Normal Mode

This is when the moving-map is displayed. The default functionality is:

Key	Function
B1	Direct-To
B2	Resume- Nav
B3	Flight-Plan Page
B4	Nearest Page
Record	Next Page
UP	Select Next waypoint in Flight-plan
DN	Select Previous
LEFT	Zoom In
RIGHT	Zoom Out
Action	N/A

In sim-mode, these button/key definitions are used:

Key	Function
LEFT	Turn Left by 5 degrees
RIGHT	Turn Right by 5 degrees
's' and 'w'	Adjust speed
'a' and 'q'	Adjust altitude
Shift-LEFT/RIGHT-ARROW	Change heading by 1 degree increment
'o'	Toggles auto-fly mode

In flight-plan edit mode, the directional buttons are used to pan the moving-map. You can also use your stylus to pan the map.

8.3.2 Nearest/Flightplan Display Page

Key	Function
B1	Display Direct-To Dialog
B2	N/A
B3	To Previous Page
B4	To Previous Page
Record	Next Page
UP	Previous Row
DN	Next Row
LEFT	Previous Tab
RIGHT	Next Tab
Action	Direct-To Current ID

8.3.3 Dialog

This applies to any dialog with the large keyboard displayed (e.g. Direct-To dialog). Navgps will allow you to select letters with just the hardware-buttons.

Key	Function
B1	Previous Field
B2	Next Field
B3	Clear Field
B4	Close
Record	N/A
UP	Move Cursor Up
DN	Move Cursor Down

LEFT	Move Cursor Left
RIGHT	Move Cursor Right
Action	Select Letter

8.4 Color-Scheme Files

Navgps allows you to specify your own colors if you're not happy with the built-in schemes.

You have to create a scheme-file. This is a text file and has extension SCM. An example of one can be found at <http://www.FlyNavgps.com/misc/my-day.scm>

When you look at that file, you'll find it's a simple text file. You can edit it in notepad if you wish.

Once you're done with the file, using Activesync save the new file in the Navgps folder. Restart Navgps and select the new file from the *Options»Prefs Prefs3* page.

8.5 Flight-Log File

When enabled via preferences, Navgps can also keep a log-file of all your flights. This file will contain a line for each flight – the start date/time, which airport you took off from, the ending airport and the elapsed time.

The format of the file is specifically designed so that you can export the file into another program (e.g. Excel spreadsheet).

This file is named `navgps-log.txt` and is normally saved in your `\My Documents` folder. This way when you sync your pda, the file will be uploaded to your desktop.

In *Options»Prefs*, under the *Prefs2* tab, there's an option to enable this feature.

You can also specify a ground-speed at which you want the log-file entries made.

If you want the entries to time engine run time (i.e. traditional hobbs time), you should specify a value of `-1` (default). The start-entry is made on `gps-connection` and stop-entry is made on `program exit`.

If you want the entries to time true flight-time, then you should specify a value that's approximately half of your normal rotate speed.

Here's a typical line from a file:

```
20031120,16:22,CDW,17:29,HPN,67,1.2
```

A single-line contains log-info for one flight:

- o Start-Date
- o Start-Time
- o Take-off Airport. If event was recorded at an non-airport position, then the nearest fix would be recorded. This would be the case also if you re-started Navgps in mid-air.
- o Landing-Time
- o Landing Airport
- o Elapsed time in minutes

- o Elapsed time in hrs and tenth of an hr.

8.6 Creating Av-Database

There might be cases where Navgps does not include the airport or navaid that you need. In such cases Navgps, allows you to create your own database files.

There are two formats supported:

- o .UDB.TXT files. This format will allow you to specify full airport info – it'll even replace an existing .NG2 airport if you wish.

For more info:

<http://www.FlyNavgps.com/udb.shtml>

- o .NDB files. Simpler format.

For more info:

<http://www.FlyNavgps.com/ndb.shtml>

Users have also created files and made it available on our site. Check the link below:

<http://www.FlyNavgps.com/downloadndb.shtml>

8.7 Data-Folder

The data-folder is the place where all secondary files are stored. It's either the “\My Documents” folder or the folder where Navgps is installed¹⁹.

Navgps will search the documents folder first and then the install folder. If the same file is found in both folders, then the one in the documents folder will be used.

*.NG2	Region navaid/airport database file
*.NG3	Region topographical file (Navgps Pro only)
*.SCM	Color scheme file (optional)
*.UDB.TXT	User-created database file (optional)
*.NDB	User-created database file (optional)
*.OBS	User-Created Obstruction file (optional)
NAVGPS.INI	Program settings file. This file is encrypted.
NAVPGS-LOG.TXT	Text file containing flight logs. Can be imported into other third-party programs.
NAVGPS LOAD STATUS.TXT	Contains the load status (i.e. error messages etc) when loading user database files. File gets created each time Navgps is run.

8.8 Adding Data-Files

It might be that the default installation does not install the av-database or topography for your area. In such cases, you'll have to add the data-files manually. Also, you might want to add the current av-data. Either way, once in a while you'll want to add or update data-files.

The procedure for adding any kind of Navgps data-file is the same.

¹⁹ Default is “\Program Files\Navgps Pro”

If the file you want to download is zipped – that is compressed and has extension .zip, then it needs to be uncompressed first. You can use the shareware software Winzip²⁰ to uncompress the data-files.

Make sure Navgps is not running. When you activate the PocketPC Today screen, you should not see the Navgps icon on the bottom-right corner.

Data-files can reside in either the "My Documents" folder or the folder where Navgps is installed²¹.

Navgps will search the documents folder first and then the install folder. If the same file is found in both, then only the one in the documents folder is loaded.

There are two ways of downloading the file to your pda.

- o Drag & drop the file onto the "Pocket_PC My Documents" folder²² on your desktop and then let Activesync copy the files to your pda automatically²³.
- o Adding files to your install folder requires your pda be connected to your desktop via Activesync. Then activate the Activesync application on the desktop and follow these steps:
 - o Select *File»Explore* menu.
 - o Open "*My Pocket PC*" folder.
 - o Open "Program Files" folder.
 - o Open "Navgps Pro" folder²⁴.
 - o Using Windows, drag&drop the data-file from the desktop into this folder.

Once the files have been downloaded to your pda – start Navgps. The start-up page should reflect the files you downloaded.

If not – here are some things to watch out for:

- o Make sure you've downloaded to the proper folder.
- o Make sure the file is unzipped – that is uncompressed.
- o Make sure the file extension is correct.
- o If you downloaded to the install folder, make sure the same file is not in the document folder – because that's the one that will be loaded.

When loading NDB, UDB.TXT and OBS files, note that Navgps will not report syntax errors directly to the user. But it saves the load status after every load to a file in the My Documents folder named "navgps load status.txt". If there seems to be a problem open that file using the File Explorer.

²⁰ Available at <http://www.winzip.com>

²¹ For Navgps Pro it's "\Program Files\Navgps Pro" and for Pro/PCFS it's "\Program Files\Navgps Pro+PCFS"

²² This folder has an image of a folder with circular arrows within it.

²³ Assumes your pda is connected to your desktop – Activesync icon in the icon-tray should be green.

²⁴ Navgps Pro+PCFS for Navgps Pro/PCFS.

8.9 Registering Navgps

After you purchase the software, you'll receive an e-mail with information on where you can register the software.

Before going to that link, you should already have installed Navgps on your target device – either a pda or a laptop. Start Navgps on that device and note the device-id. It should be one of the first pages displayed – an example is to the right.

Once the device-id has been noted, go to the link provided in the confirmation e-mail and after logging in – enter the device-id. The web-site will display your registration-key. Enter that verbatim on the registration page of your target device and you should be set.

If there are any problems, please double-check your device-id and then send us an e-mail.

NAVGPS QUICK REFERENCE CHART

ACTION	KEY	BTTN	MENU	STEPS
Direct-To	G	B1	<i>Options»Goto</i>	When map is displayed, tap on navaid identifier. When info-box pops up, tap on 'D' soft-button.
Cancel active navigation and rejoin flight-plan	R	B2	<i>Options»Resume Nav</i>	
Rotate thru the display-pages	P	Record Button	<i>Options»Next Page</i>	
Change display zoom range	Z Shift-Z	LEFT/ RIGHT		Tap on zoom icons on toolbar. LEFT/RIGHT with <u>gps</u> -active only.
Nearest Airport	N	B4		Use UP/DN keys and then Direct-To to select new active airport.
Navaid Info				When map is displayed, tap on navaid identifier. When info-box pops up, tap on 'I' soft-button.
Enter Approach-mode				When map is displayed, tap on airport identifier. When info-box pops up, tap on 'APP' soft-button. Tap on desired runway.
In Pro/PCFS – toggle between Navgps and EFIS software		B3		
Create a Flightplan			<i>Plan»Enter</i>	
View Flightplan waypoints	F	B3		Use UP/DN keys and then Direct-To to select new active waypt.
Select New Flightplan waypoint		UP/DN		When map is displayed. This can also be done with the Flightplan display page.
Enable Flight-Tracking			<i>Options»Flight Track»Enable</i>	
Exit			<i>Plan»Exit</i>	