

# NAVIATOR USER GUIDE



## TABLE OF CONTENTS

1.	Getting Started .....	6
2.	Naviator Hangar .....	6
3.	The Main Menu .....	6
4.	The 'Fly' and 'Plan' Menus.....	7
5.	Installing Charts & Data .....	8
6.	The Map Screen .....	9
7.	Toolbar Buttons .....	10
7.1	Rubber Band Route Editing .....	10
7.2	Active Route .....	11
7.3	Nearest Waypoints .....	11
7.4	Horizontal Situation Indicator .....	11
7.5	Primary Flight Display.....	12
7.6	Synthetic Vision .....	13
7.7	Approach Plates .....	14
7.8	Vertical Navigation .....	15
7.9	Scratch Pad.....	15
8.	Flight Following.....	15
9.	Weather and TFRs .....	16
10.	Obstacles and Towers.....	17
11.	Terrain .....	17
12.	Searching the Database .....	18
13.	Altitude Optimizer .....	18
14.	User-Defined Waypoints .....	19
15.	Digital Terminal Procedures (Approach Plates).....	20
15.1	Geo-Referenced Approach Plates & Airport Diagrams .....	21

15.2	How to Enable Geo-Referenced Approach Plates and Airport Diagrams .....	22
16.	Barometric Altitude .....	23
17.	Flight Recorder .....	23
18.	Creating a Route .....	23
18.1	Quick Plan .....	23
18.2	The Active Route Screen .....	24
18.3	The Map Screen .....	24
19.	The Active Route Screen.....	25
20.	Search and Rescue Patterns .....	26
20.1	Parallel search .....	26
20.2	Creeping Line Search .....	26
20.3	Expanding Square Search .....	27
20.4	Circle Search.....	28
21.	GPX Route Export .....	28
22.	NMEA Output .....	28
22.1	Limitations of NMEA Output .....	29
23.	Zaon PCAS™ XRX™ Integration .....	29
23.1	Connecting Naviator to an XRX .....	29
23.2	XRX General Limitations and Advisories .....	30
24.	Traffic Advisories and Traffic Alerts.....	30
25.	ADS-B Integration .....	31
26.	FAA Flight Plans (DUATS) .....	31
27.	FAA Flight Plans (Lockheed Martin AFSS) .....	32
28.	Bring Your Own Charts (BYOC) .....	33
29.	Flight Simulator Connector.....	33
	Appendix A: Lat/Lon Formats .....	34



## WARNING

Use the digital charts in Naviator only to aid, not replace, the use of official charts. Do not use Naviator for any purpose requiring the precise measurement of direction, distance, location, or topography. Do not use the terrain information for primary terrain avoidance. Terrain information is intended only to enhance situational awareness. The Global Positioning System (GPS) is operated by the government of the United States, which is solely responsible for its accuracy and maintenance.

## WARNING

The synthetic vision function does NOT indicate the aircraft's attitude and is NOT intended to be used as a primary attitude reference.

Terrain and obstacle separation must NOT be dependent on the use of Naviator. Naviator is NOT intended to be used as a primary reference for terrain and obstacle avoidance and does not relieve the pilot from the responsibility of being aware of surroundings during flight. Terrain and obstacle data is obtained from third party sources and 123west Software Inc. is not able to independently verify the accuracy of the data.

## 1. GETTING STARTED

Thank you for downloading Naviator! This document will provide you with an overview of how to use the various features of the app.

The most recent version of this document can always be found at <http://www.naviatorapp.com/help/NaviatorUserManual.pdf>

The Naviator support forums are located at <http://forum.naviatorapp.com/>. This is an online community where Naviator users can get support for the app and suggest new features. We appreciate all the feedback we receive, and if there is a missing feature that you think should be in the app please let us know! Our email contact form is located at <http://www.naviatorapp.com/Contact>.

## 2. NAVIATOR HANGAR

Naviator Hangar is an online community where all Naviator customers can share their flights with their friends, or simply keep a personal diary of their flying adventures.

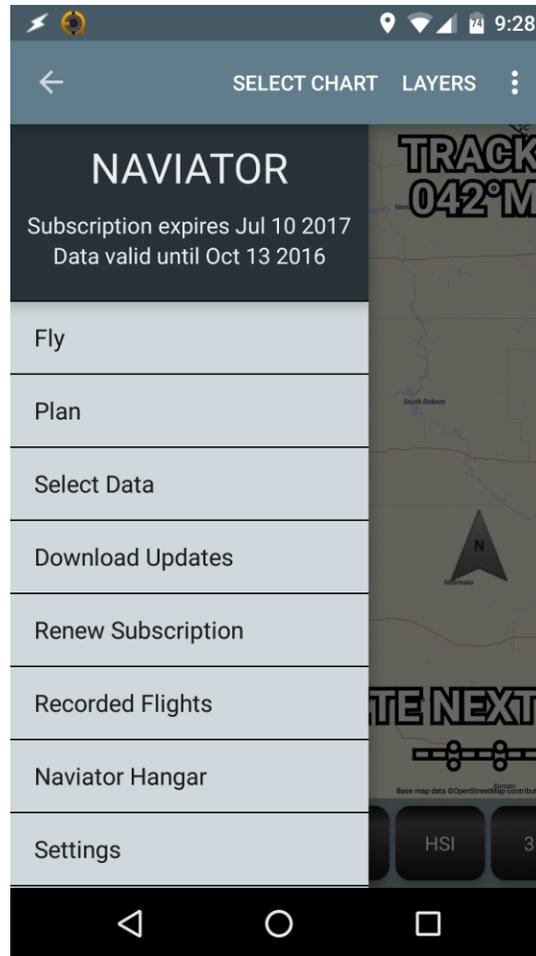
With Naviator Hangar you can upload your [recorded flights](#) to your own personal "Hangar", where you can view your flight path on a Google map as well as examine detailed elevation and speed profiles for the flight.

To claim your own Naviator Hangar, or to browse flights other Naviator customers have shared, visit <http://hangar.naviatorapp.com!>

## 3. THE MAIN MENU

To access the main menu, tap the your device's Back button or use a "swipe" gesture with your finger from the left-hand side of the screen. The main features of Naviator are easily accessible from the menu.

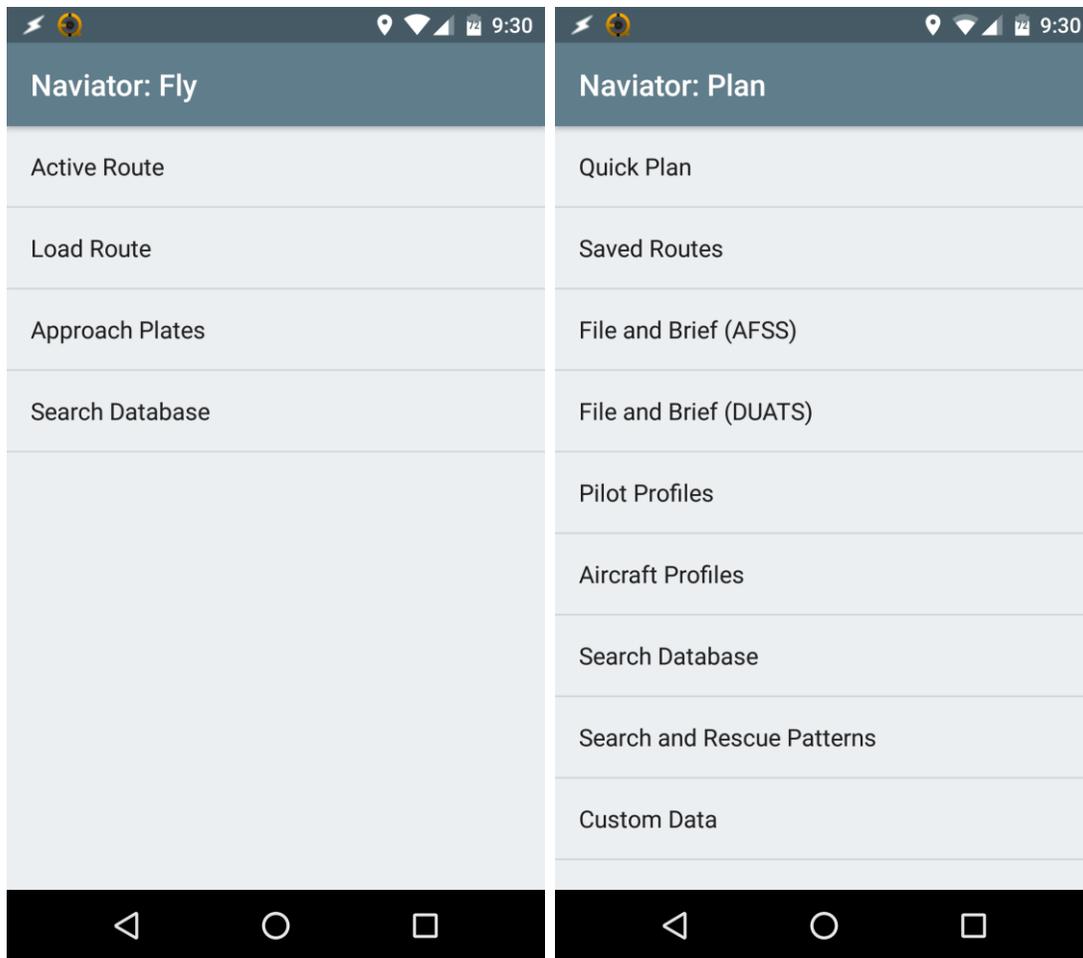
The top of the main menu will display the status of your Naviator subscription as well as provide an indication of whether or not there are any data updates available to be downloaded.



#### 4. THE 'FLY' AND 'PLAN' MENUS

The 'Fly' menu is where features that will likely be used while flying can be found, such as IFR approach plates. It is possible to search the Naviator Database for airports and navigation aids from this screen.

The 'Plan' menu is where features that will likely be used in the planning stage of a flight can be found. Examples include the [Quick Plan](#) feature, saved routes, and user-defined waypoint management. It is also possible to search the Naviator Database for airports and navigation aids from this screen.



## 5. INSTALLING CHARTS & DATA

Naviator downloads charts and databases to your device's memory. This enables the application to work without a cellular or Wi-Fi network connection, which is important while flying over sparsely populated areas or at high altitudes where a reliable internet connection is not likely to be available.

To select charts and databases for downloading, tap the "Select Data" item from the main menu screen. Files are organized first by country, and then by the type of file (ex. VFR or IFR charts). Tap on the name of a file to select it for downloading, or tap it again to deselect the file.

After you have selected the files you would like to download and have returned to the main menu, Naviator will automatically check to see if there are any updates available for the files. If updates are available, you will see a menu item with the text "Updates Available". Tapping the item will initiate the update process.

Naviator will check for updates every time the main menu is displayed, as long as an internet connection is available. **It is important that the device is set to the correct time and date for this feature to work correctly.**

Note: This feature requires an internet connection. Due to the large size of the files, a WiFi connection is highly recommended.

**WARNING!**

The 'Digital Terminal Procedures' file is only an index of the available terminal procedures. The individual terminal procedure files must still be downloaded before you will be able to use them in flight. See [section 15](#) for details.

The Naviator Database and IFR enroute charts are updated every 56 days. IFR Approach plates are updated every 28 days. VFR charts are updated as new editions become available.

To uninstall files, tap "Select Data" from the main menu screen. Find the file you would like to uninstall, then de-select the checkmark located beside its name.

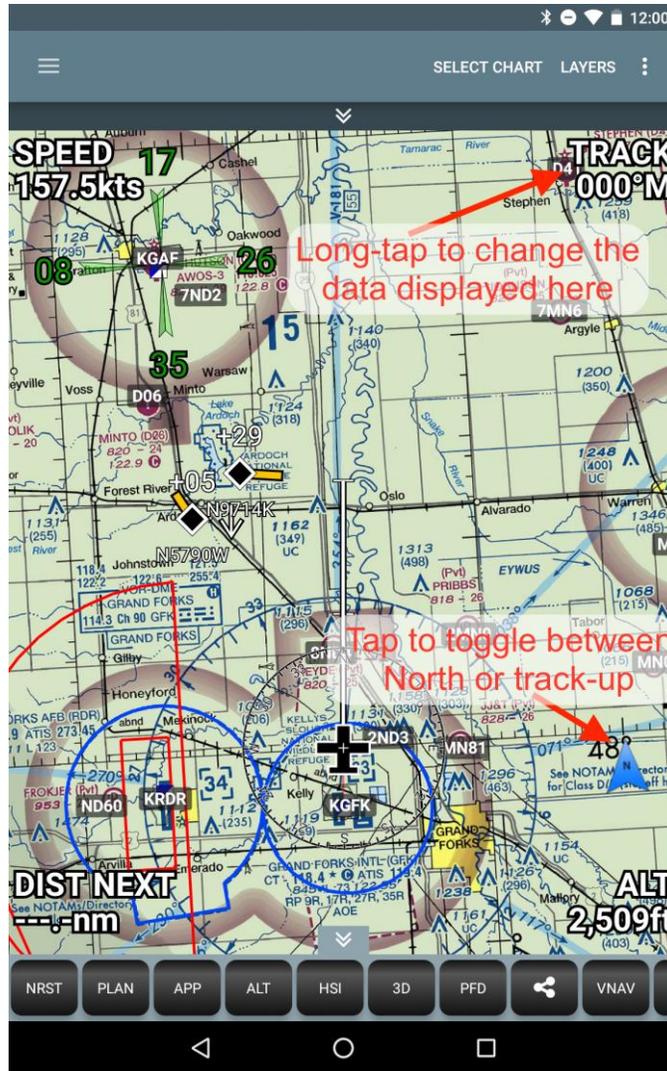
## 6. THE MAP SCREEN

The map screen displays your current position relative to airports and navigational aids. If you have downloaded charts for the area, your position will be overlaid on top of these charts. The position data is obtained via your device's Global Positioning System (GPS) receiver.

The map can be displayed in either North-Up mode or Track-Up mode. In North-Up mode the map is always oriented with North pointing towards the top of the screen. In Track-Up mode the map rotates so that the current ground track always points towards the top of the screen (see image below).

The map normally follows the position of the aircraft, always keeping the aircraft located in the center of the screen. To view other parts of the map, it can be scrolled by dragging a finger across the screen. Once the map has been scrolled it will no longer automatically follow the aircraft's position. To have the map follow the aircraft again, press the button with the airplane symbol on it (located in the bottom-left corner of the screen).

Each of the four corners of the screen can display a data field such as your current speed, track over the ground, distance from the next waypoint, etc. It is possible to change the type of data displayed by long-pressing in the corner of the screen and picking a new field type from the list when it appears.



If you have downloaded charts for your current location, you can select them by pressing the device’s Menu button and choosing “Select Chart” from the options.

See [section 18.3](#) for an overview of how to build a route from the map screen.

## 7. TOOLBAR BUTTONS

The toolbar is located along the bottom of the main map screen. Below is a brief overview of the various buttons:

### 7.1 RUBBER BAND ROUTE EDITING

Tap this button to enable rubber band route editing. When rubber band editing is enabled you can drag the magenta route line to a waypoint to insert the waypoint into the route. There will be a red outline around the map screen while route editing mode is enabled. Tap the button again to disable route editing mode.

## 7.2 ACTIVE ROUTE

The Active Route screen shows the currently active flight plan, along with relevant details such as the course between waypoints, distance between waypoints, and the estimated time of arrival (ETA) for the waypoints. The total flight plan distance and the ETA for the final waypoint are displayed at the bottom of the screen. The Altitude Optimizer feature can also be accessed from this screen.

## 7.3 NEAREST WAYPOINTS

The Nearest Waypoints screen displays the waypoints closest to the aircraft's current location, sorted in order of distance from nearest to furthest. The tabs along the top of the screen toggle between the various types of waypoints, including: Airports (APT), VORs, NDBs, Intersections (INT) and user-defined waypoints (USER). Tapping on a waypoint will display its detailed information screen.

## 7.4 HORIZONTAL SITUATION INDICATOR

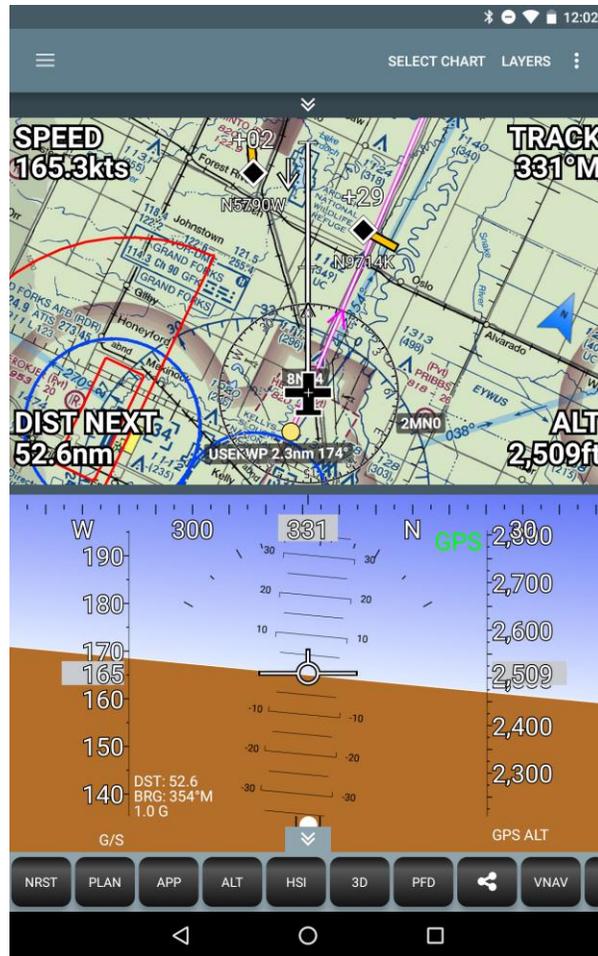
The Horizontal Situation Indicator (HSI) screen imitates a standard HSI instrument. Swipe up or down to adjust the omni bearing selector (OBS) or the track bug. Double-tap on the OBS to set a specific radial (manual OBS), or to enable the "auto OBS" feature. Auto OBS will automatically change the selected radial to the desired track as you pass each waypoint in the flight plan. The magenta arrow indicates the bearing to the next waypoint in the active route.



7.5 PRIMARY FLIGHT DISPLAY PFD

The Primary Flight Display (PFD) screen indicates the aircraft's pitch and roll, and displays additional data such as altitude and ground speed. The PFD screen functions exactly like a primary flight display that can be found in a modern "glass" cockpit. The PFD screen is only available if an external AHRS such as an iLevel ADS-B receiver is connected to Naviator.

Note: The values displayed for speed and altitude are derived from GPS data.

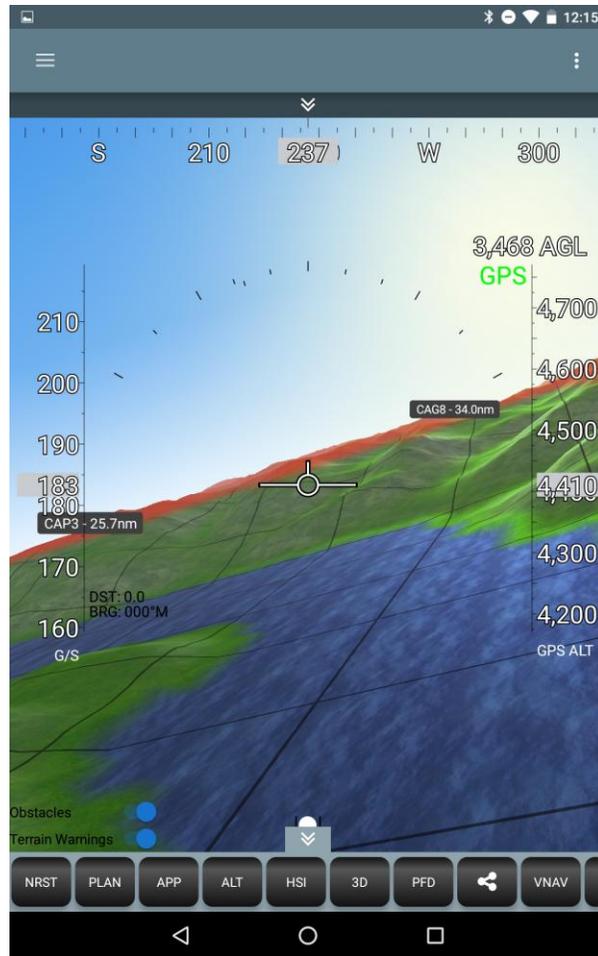


## 7.6 SYNTHETIC VISION 3D

The Synthetic Vision screen displays the terrain and obstacles surrounding the aircraft in three dimensions (3D). If an external AHRS is connected the 3D image will pitch and roll to match the aircraft's attitude. If no AHRS is available, Naviator will use the GPS-derived yaw rate to bank the 3D image similar to a turn coordinator instrument. In this case, 30 degrees of bank indicates a standard-rate turn (3° per second).

### **WARNING!**

When no external AHRS is connected it is important to note that the bank angle displayed in Naviator does NOT correspond to the aircraft's actual bank angle, and NO pitch information is displayed at all.



Swipe left or right to look in either direction. Pinch-zooming enables you to zoom the 3D view up to 4.5x. Terrain warnings will tint the terrain red if the terrain elevation is 500 feet below, or above the aircraft's altitude.

Note: The values displayed for speed and altitude are derived from GPS data.

Note: The 3D synthetic vision feature requires a device running Android 4.0.3 or higher.

## 7.7 APPROACH PLATES APP

The Approach Plates screen displays the instrument approach procedures for the final waypoint in the active flight plan, if any are available.



## 7.8 VERTICAL NAVIGATION VNAV

The Vertical Navigation screen computes the vertical speed required to reach a waypoint by the specified distance and altitude. This is useful for climb and descent planning, for example to figure out when to start descending for the destination airport while maintaining a constant 500 fpm descent.

## 7.9 SCRATCH PAD ✍️

The Scratch Pad screen enables you to use your finger to quickly write down clearances, frequencies, or any other short notes.

## 8. FLIGHT FOLLOWING

The Flight Following feature functions similarly to the various satellite-based GPS trackers available on the market, except cellular communication is used instead of satellite-based communication. Unlike the satellite-based GPS trackers, this means there are absolutely no monthly fees to use the Flight Following feature (other than your regular mobile data costs). When Flight Following is enabled, your GPS position will be transmitted to the Naviator servers every two minutes. Your position will then be displayed, in real time, on your personal Flight Following

page on the Naviator Hangar web site. You can share your Flight Following page with anyone you wish to keep updated with your location, such as your spouse or even Flight Services (by including the URL of your Flight Following page in your flight plan).

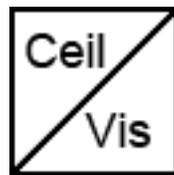
Flight Following can be enabled from the Settings screen. Note that this feature requires an internet connection in order to function. No location data is transmitted to Naviator servers unless your speed is greater than 10 knots. All data is deleted off the Naviator servers after 48 hours. If you wish to keep the data indefinitely, refer to the [Flight Recorder](#) feature.

Note: check with your country's laws regarding mobile phone usage on aircraft before using the Flight Following feature.

## 9. WEATHER AND TFRS

Naviator can periodically download weather and temporary flight restriction (TFR) updates from the internet. This feature requires an available cellular or WiFi internet connection.

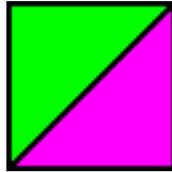
METARs are symbolically displayed on the map screen using a color-coded square split diagonally down the middle. The upper part of the square indicates the observed cloud ceiling and the lower part indicates the observed visibility. Refer to the legend below for specific color values.



Metar Flag

	Ceiling	Visibility
 (VFR)	Greater than 10,000 feet	Greater than 15 miles
 (VFR)	Between 5,000 feet and 10,000 feet	Between 7 miles and 15 miles
 (VFR)	Between 3,000 feet and 5,000 feet	Between 5 miles and 7 miles
 (MVFR)	Between 1,000 feet and 3,000 feet	Between 3 miles and 5 miles
 (IFR)	Between 500 feet and 1,000 feet	Between 1 mile and 3 miles
 (LIFR)	Below 500 feet	Below 1 mile

For example, the flag below indicates a ceiling of 3,000 to 5,000 feet with visibility less than 1 mile.



Due to the constantly changing nature of weather, METARs more than 3 hours old will not be displayed.

## 10. OBSTACLES AND TOWERS

The Naviator database contains obstacle and tower data for the United States and its territories, as well as parts of Canada and Mexico. Naviator continuously monitors nearby obstacles and alerts the user if it determines that there is a collision risk. Alerts are displayed on the map screen as well as the 3D synthetic vision screen. Naviator will also speak an audio alert, which is useful if Naviator is connected to the aircraft's intercom system or a Bluetooth-enabled headset.

### WARNING!

Terrain and obstacle separation must NOT be dependent on the use of Naviator. Naviator is NOT intended to be used as a primary reference for terrain and obstacle avoidance and does not relieve the pilot from the responsibility of being aware of surroundings during flight. Terrain and obstacle data is obtained from third party sources and 123west Software Inc. is not able to independently verify the accuracy of the data.

## 11. TERRAIN

### WARNING!

Do not use the terrain information for primary terrain avoidance. Terrain information is intended only to enhance situational awareness.

A global terrain database is available for Naviator. In addition to the global terrain database, additional high-resolution terrain databases are available for select geographic regions. Terrain databases can be installed from the "Get Data" screen. The terrain databases are large and may take a long time to download. Using a WiFi connection to download terrain databases is highly recommended!

When installed, a terrain-shaded base map and a terrain warning map overlay can be enabled or disabled via the "Layers" screen.

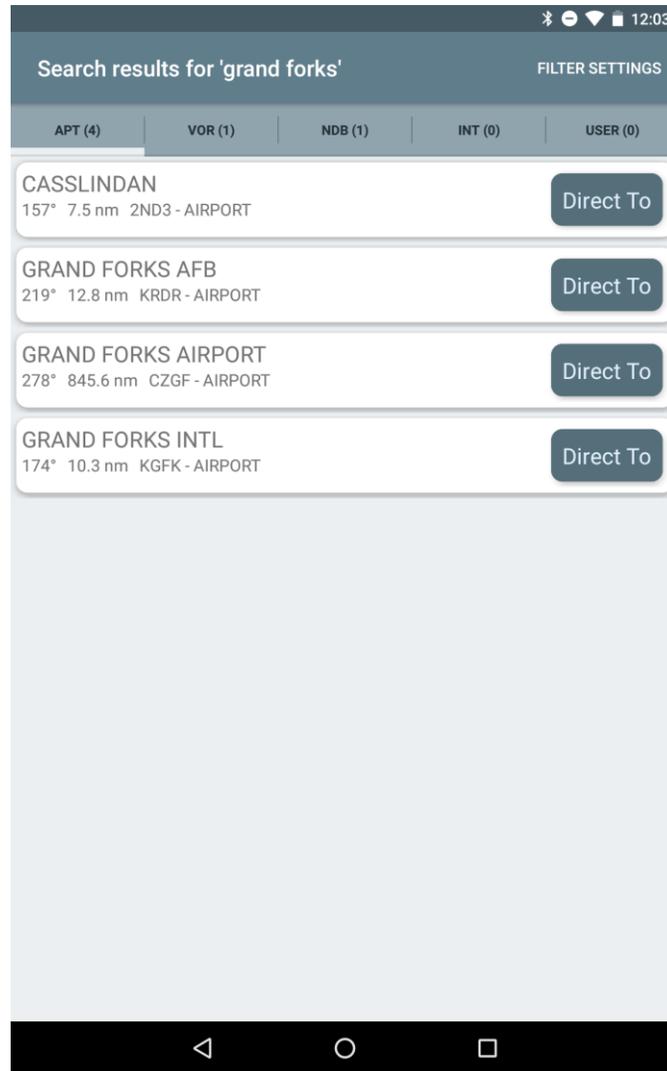
Areas of the terrain shaded red are predicted to be within 300 feet below, or above the aircraft. Areas of the terrain shaded yellow are predicted to be within 1,000 feet to 300 feet below the aircraft.

The GPS receivers in consumer devices such as phones and tablets are known to occasionally report inaccurate altitudes. Do not use the terrain information in Naviator for primary terrain avoidance. Terrain information is intended only to enhance situational awareness.

## 12. SEARCHING THE DATABASE

Selecting “Search Database” from the main menu screen or pressing your device’s Search button will enable you to search the Naviator database for airports and navigational aids such as VORs and NDBs. You can search by name (ex. Boeing Field), or identification code (ex. KBFI).

The search functionality is also available from the map screen and can be initiated by pressing your device’s Search button if it has one.

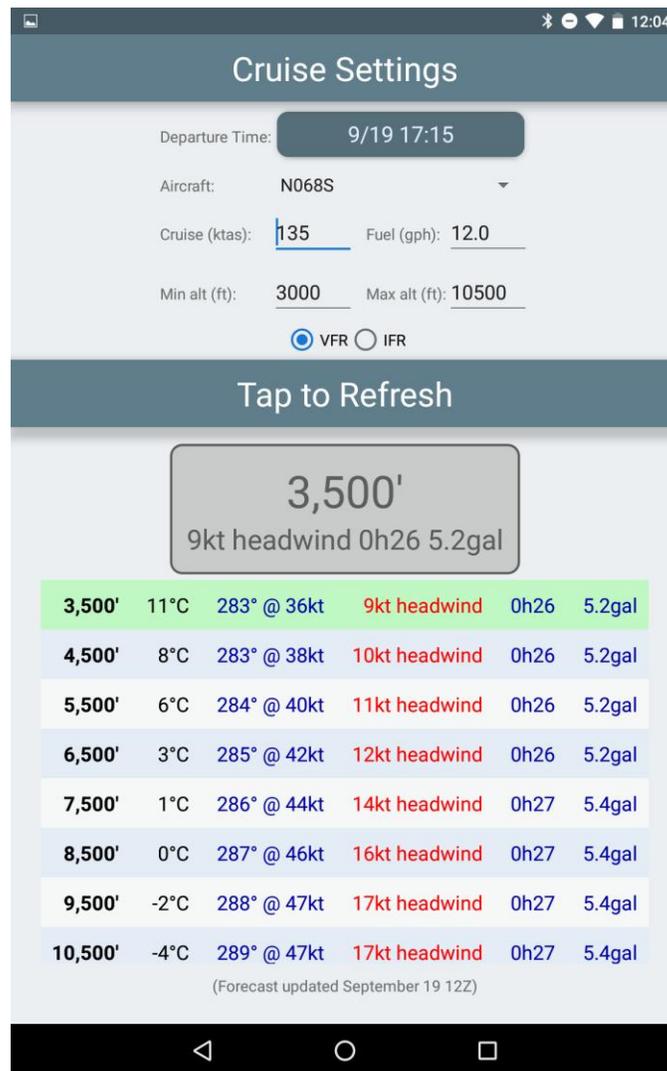


## 13. ALTITUDE OPTIMIZER

The Altitude Optimizer provides a recommended “best” cruising altitude based on the winds aloft forecast for the specified departure time along the planned route of flight.

The Altitude Optimizer feature can be accessed from the Active Route screen by tapping the Altitude Optimizer button located at the top of the screen.

**Warning:** The Altitude Optimizer does not take terrain, airspace, or obstacles into consideration when suggesting a “best” cruising altitude. It is the responsibility of the pilot in command to determine the correct altitude for the flight.



## 14. USER-DEFINED WAYPOINTS

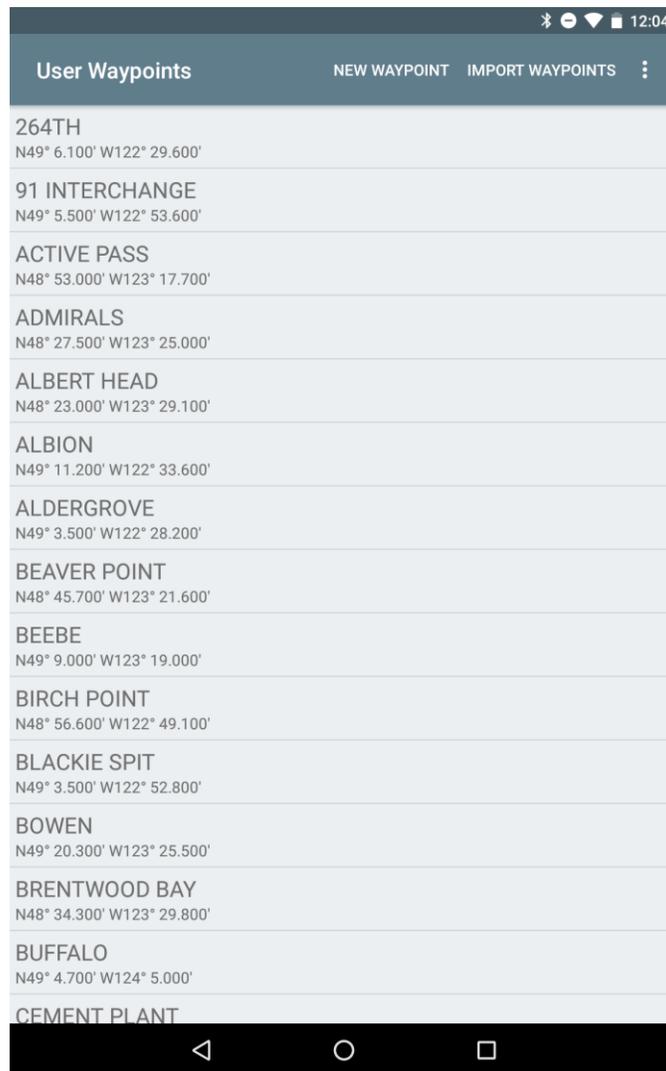
It is possible to add custom user-defined waypoints to Naviator. User waypoints behave the same as any other type of waypoint within the application. They can be added to routes, they appear on the map screen, etc. There is no limit to how many user waypoints may be added.

The user waypoint management screen can be accessed from the ‘Plan’ menu. New user waypoints can be added by pressing the ‘menu’ button and selecting the ‘New Waypoint’ option while viewing the ‘User Waypoints’ screen.

Waypoints can also be added by long-tapping on the map screen at the location you wish to place the new waypoint.

If there are a large number of waypoints to be added, it may be easier to create the waypoints on a PC or laptop computer and later import them into Naviator. There is a variety of both free and paid software available for PCs and Macs that support creating and editing GPS waypoints. To import user waypoints into Naviator, press the 'Menu' button and then select the 'Import Waypoints' option while viewing the 'User Waypoints' screen. Naviator expects the waypoints to be in the GPX file format and the file must be placed at the following location:  
/sdcard/Naviator/import.gpx

It is possible to create a backup of the user waypoints by pressing the 'Menu' button and then selecting the 'Export Waypoints' option. Naviator will create a GPX file called 'user\_waypoints.gpx' at the following location:  
/sdcard/Naviator/user\_waypoints.gpx



## 15. DIGITAL TERMINAL PROCEDURES (APPROACH PLATES)

Digital terminal procedures are accessible from the 'Fly' menu screen as well as from the details screen for individual airports under the 'PRO' tab. **It is important to note that only the files with a GREEN background have been downloaded. Any files that *do not* have a green background will need to be downloaded before they can be viewed. This is not a good thing to have happen while flying under instrument conditions, so make sure that all required procedures have been downloaded *before* you go flying! Select the states for which you wish to receive monthly updates by opening the Naviator main menu and then tapping Select Data → United States → Terminal Procedure Charts.**

Selecting the check mark beside a procedure name selects the procedure for quick access. A button labeled 'TPP' will appear on the map screen. Tapping on this button will show the procedure. Long-pressing on the button will remove it from the map screen and clear the check mark from the procedure.



### 15.1 GEO-REFERENCED APPROACH PLATES & AIRPORT DIAGRAMS

Naviator supports geo-referenced approach plates (IAPs) and airport diagrams with an optional Seattle Avionics ChartData™ subscription. The geo-referencing feature displays your current location on top of the standard FAA approach plates and airport diagrams.



## 16. BAROMETRIC ALTITUDE

Some high-end phones and tablets are equipped with an internal barometric pressure sensor. This enables Naviator to calculate altitude based on atmospheric pressure rather than via the GPS receiver. The internal pressure sensor is turned off by default, and can be enabled via the Preferences screen.

One of the caveats for using barometric altitude is that, just like a traditional altimeter, you must calibrate it using the reported atmospheric pressure at sea level. You can do this by tapping the 'ALT' button on the map screen.

Note: The internal pressure sensor detects **cabin altitude** and will not indicate the correct altitude in a pressurized aircraft.

## 17. FLIGHT RECORDER

Naviator features a flight recorder that can be used to capture the GPS output during a flight. Data fields captured include latitude, longitude, altitude and speed. The captured data can be uploaded to your personal [Naviator Hangar](#), where it can be exported into other data formats such as GPX and KML (for viewing in Google Earth).

Recording automatically starts when the ground speed increases past the 'start trigger speed'. The default start speed is 30 knots, and can be configured from the 'Preferences' screen.

Recording automatically stops when the ground speed falls below the 'stop trigger speed'. The default stop speed is 15 knots, and can be configured from the 'Preferences' screen.

The recording interval, or the length of time between recorded points, can be configured from the 'Preferences' screen. The default interval is 5 seconds.

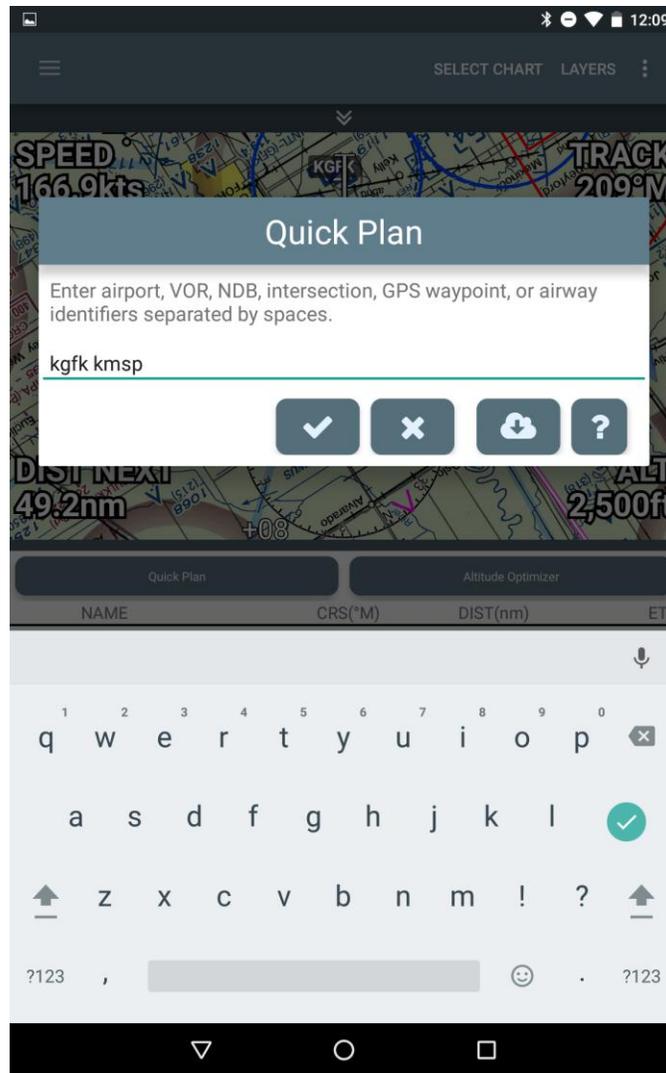
The flight recorder feature can be entirely enabled or disabled from the 'Preferences' screen.

## 18. CREATING A ROUTE

This section will outline the various ways of creating a route in the Naviator application. Routes are simply a list of the waypoints along the route that you intend to fly. Once you have created a route, it can be saved and reused again at a later date.

### 18.1 QUICK PLAN

Routes can be quickly created by selecting the "Quick Plan" item from the 'Plan' menu screen. Build the route by entering multiple waypoint identifiers separated by spaces (ex. KBFI KORS CYYJ). Routes can be created using airport, VOR/VORTAC, NDB, intersection, airway/jet route, and user waypoint identifiers. When including a user waypoint in a route, enter the waypoint name without any spaces. For example, to include a waypoint named "ACTIVE PASS" enter it as "ACTIVEPASS". You can also download your stored routes from the [AOPA online flight planner](#) by tapping the "cloud download" button.



## 18.2 THE ACTIVE ROUTE SCREEN

To create a route from the active route screen, press your device's Menu button and select the "Add Waypoint" option. You can then search the Naviator database for a waypoint to add to the route.

## 18.3 THE MAP SCREEN

To create a route from the map screen, long-press on the part of the map where you would like to add a waypoint. You will then be presented with the following options:

1. Add the selected coordinate to the route
2. Create a 'Direct To' route from your current location to the selected coordinate
3. View nearest waypoints

Selecting “View Nearest Waypoints” will show a list of the nearest airports and radio navigation aids, sorted by distance from the selected location. Selecting a waypoint will give the option to add it to the route.

“Rubber band” route editing can be enabled by pressing your device’s Menu button and then selecting “Enable Route Editing” from the available options. This mode allows you to drag an existing waypoint to a new location or insert a new waypoint between two existing waypoints by dragging on the magenta line connecting the two existing waypoints.

## 19. THE ACTIVE ROUTE SCREEN

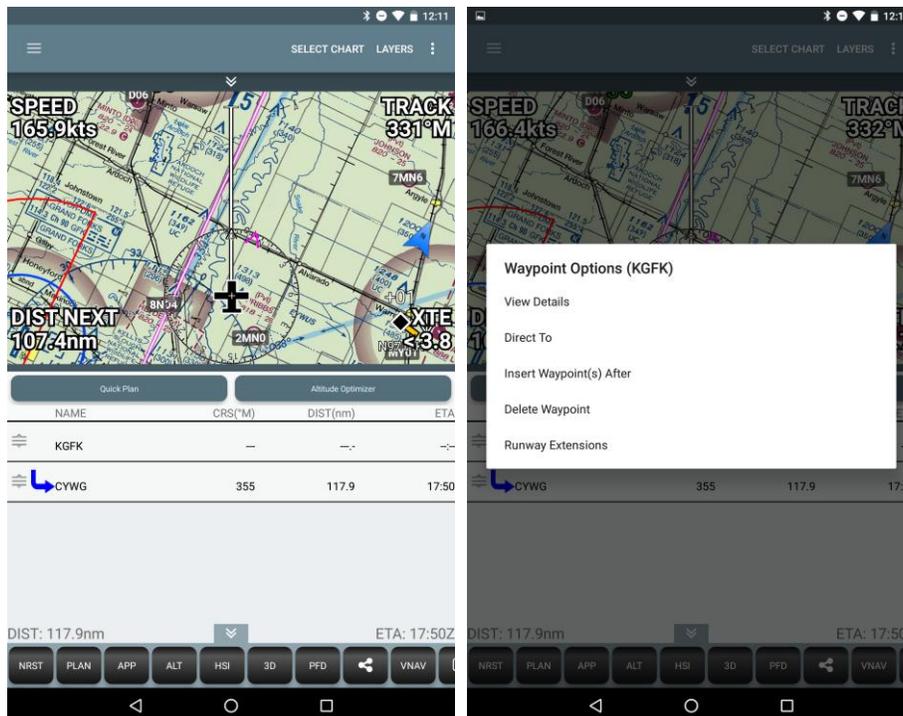
The active route screen displays a list of the waypoints that have been added to the current route, formatted as a navigation log. Beside each waypoint are the magnetic track, distance, and ETA to the waypoint.

The total distance and ETA to the final waypoint is shown at the bottom of the list.

Tapping on a row in the list will show a menu with the following options:

1. View Details
2. Activate Leg
3. Direct To
4. Insert Waypoint(s) After
5. Delete Waypoint

Pressing your device’s Menu button will give the option to add a new waypoint to the route or reverse the order of the waypoints in the route.



## 20. SEARCH AND RESCUE PATTERNS

Naviator version 3.8 introduced the ability to add search and rescue patterns to the active route. The following search patterns are currently supported:

- [Parallel](#)
- [Creeping Line](#)
- [Expanding Square](#)
- [Circle](#)

You can add these search patterns to your route by opening the PLAN menu and then tapping the "Search and Rescue Patterns" option.

### 20.1 PARALLEL SEARCH

To create a PARALLEL SEARCH pattern, enter the **initial waypoint**, initial **true track**, initial **turn direction** (left or right), the **length and spacing** of each leg and the **total number of legs**.

The initial waypoint can be an airport, navaid, waypoint or a lat/lon coordinate.



### 20.2 CREEPING LINE SEARCH

To create a CREEPING LINE SEARCH pattern, enter the **initial waypoint**, initial **true track**, initial **turn direction** (left or right), the **length and spacing** of each leg and the **total number of legs**.

The initial waypoint can be an airport, navaid, waypoint or a lat/lon coordinate.



### 20.3 EXPANDING SQUARE SEARCH

To create an EXPANDING SQUARE SEARCH pattern, enter the **initial waypoint**, initial **true track**, initial **turn direction** (left or right), the **spacing** of each leg and the **total number of legs**.

The initial waypoint can be an airport, navaid, waypoint or a lat/lon coordinate.



## 20.4 CIRCLE SEARCH

To create a CIRCLE SEARCH pattern, enter the **center waypoint** and **radius** of the circle.

The center waypoint can be an airport, navaid, waypoint or a lat/lon coordinate.



## 21. GPX ROUTE EXPORT

Naviator supports exporting the Active Route to the industry standard [GPX format](#). Exported routes can then be imported to other software, such as certain EFIS systems like the Dynon SkyView.

To export a route, open the Active Route screen and tap the Menu button on your phone or tablet. Select the 'Export to GPX' option from the menu. Exported routes are saved to the path SDCard/Naviator/Routes/.

## 22. NMEA OUTPUT

Naviator is able to output an NMEA 0183 compliant data stream over a Bluetooth connection. This feature can be used to enable Naviator to drive the aircraft's autopilot. This feature has been tested with Trio autopilots, but should also work with other autopilot systems as long as it accepts serial NMEA 0183 input.

The NMEA output feature can be enabled from the Preferences screen.

A Bluetooth-to-RS232 serial adapter, such as the RN-240 from Roving Networks ([http://www.rovingnetworks.com/products/RN\\_240](http://www.rovingnetworks.com/products/RN_240)), is required to wirelessly interface the Android device with the autopilot system. Refer to the system diagram below for details:



## 22.1 LIMITATIONS OF NMEA OUTPUT

There are some limitations of the NMEA output feature that are important to be aware of. Android devices are not dedicated aviation GPS systems, and due to factors outside Naviator's control (such as interference from other apps) it is not always possible to guarantee the reliability of the NMEA output. It is important to keep this in mind when using the NMEA output feature. We recommend that you become familiar with the failsafe modes of your autopilot system, in particular with what happens when the GPS signal is lost.

## 23. ZAON PCAS™ XRXTM INTEGRATION

Naviator is compatible with the PCAS™ XRXTM from Zaon Flight Systems. When Naviator is connected to an XRXTM, a traffic overlay will be available on the map screen.

### 23.1 CONNECTING NAVIATOR TO AN XRXTM

A Bluetooth-to-RS232 serial adapter, such as the XRXTM BlueLink (available from Zaon Flight Systems) or the RN-240M (available from Roving Networks: [http://www.rovingnetworks.com/products/RN\\_240](http://www.rovingnetworks.com/products/RN_240)), is required to wirelessly interface the Android device with the XRXTM.

1. The Bluetooth adapter should be plugged into the serial port connector on the back of the XRXTM.
2. Press the power button on the XRXTM to turn it on.
3. Press the MENU button on the XRXTM.
4. Under the COM settings page, make sure **PROFILE 2** is selected.

5. Exit the XRX menu. The XRX screen should now say **PROFILE 2**.
6. Start Naviator and go to the Preferences → Zaon XRX Settings screen.
7. Tap “Select Bluetooth Device” and then select the Bluetooth adapter that is connected to the XRX.
8. If the connection was successful you will see XRX: OK in the top-right corner of the map screen (see image below).

## 23.2 XRX GENERAL LIMITATIONS AND ADVISORIES

XRX is not recommended as a substitute for proper traffic scanning procedures as listed in the FAA Airman’s Information Manual and under the “See and Avoid” concept presented in FAA AC90-48C. This unit is intended as an additional tool in determining potential traffic threats.

NEVER operate the unit with a headset, or any other audio components, at high-volume levels. Hearing experts advise against continuous high-volume operation. Should you experience a ringing in your ears, immediately reduce the volume level or discontinue use.

Until you are familiar with the operations and limitations of this unit, abrupt changes in the control of the aircraft should be avoided unless positive identification with the traffic is made, or you have been ordered to do so by the Air Traffic Controller.

The FAA, their representatives, as well as published airspace regulations, always supersede any indication given by this unit.

NEVER connect unit to an AC outlet. This may pose a fire hazard or result in an electric shock. NEVER connect the unit to a power source of more than 40V DC. Such a connection will harm the receiver and poses a fire hazard. NEVER connect a nonfused, external power source to the unit. This may result in damage to the unit and may pose a fire hazard. DO NOT connect the unit to any power source using reverse polarity. Doing so may also damage the unit. Follow the guidelines in the XRX manual explicitly when connecting to an external power source.

NEVER expose the unit to rain, snow or any liquid. Avoid placing the receiver in excessively dusty, hot, or cold environments.

DO NOT use or place unit in areas with temperatures below -20°C (-4°F) or above +55°C (130°F).

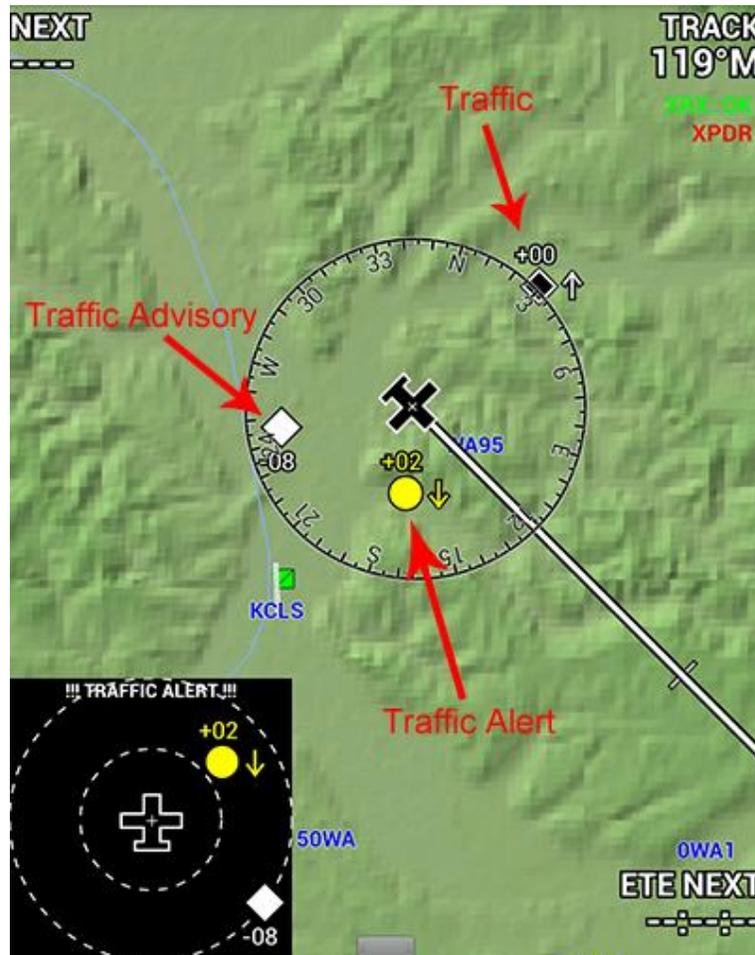
AVOID the use of chemical agents such as benzene or alcohol when cleaning, as they damage the unit surfaces.

## 24. TRAFFIC ADVISORIES AND TRAFFIC ALERTS

Naviator can display traffic information when either a Zaon XRX or an ADS-B receiver is connected. When Naviator detects traffic within **2.5 miles and +/- 1,000 feet** a solid white diamond will be displayed on the map at the location of the traffic. This is a **traffic advisory**. When you see a traffic advisory, you should immediately try to obtain visual contact with the traffic. If audio alerts are enabled Naviator will announce the advisory with “Traffic advisory! Monitor closure rate.”

When Naviator detects traffic **within 1.5 miles and +/- 700 feet**, a solid yellow circle will be displayed on the map at the location of the traffic. This is a **traffic alert**. When you see or hear a traffic alert, you should immediately obtain visual contact and take evasive action to avoid a collision if necessary. If audio alerts are enabled Naviator will announce the alert with “Traffic alert!” and a description of the traffic’s relative location.

During a traffic alert a window will pop up in the lower-left corner of the map screen. The traffic around your aircraft will be displayed in a “track up” orientation to make it easier to match what is displayed on the screen with what you see out the window (see image below).



## 25. ADS-B INTEGRATION

Naviator officially supports a wide range of ADS-B receivers, including the [NavWorx PADS WxBox](#), [Dual XGPS 170](#), [iLevel \(AW and SW models\)](#), [SkyGuardTWX](#), [Flight Data Systems Pathfinder](#) and various receivers from [FreeFlight Systems](#). Support for additional ADS-B receivers will be added as they become available.

The current version of Naviator supports regional and CONUS NEXRAD, METARs and TAFs, and traffic.

To connect to a Bluetooth ADS-B receiver, use the “ADS-B Settings” screen in the Preferences section. Wi-Fi enabled ADS-B receivers (such as the iLevel, SkyGuardTWX, Pathfinder, and FreeFlight Systems receivers) will connect automatically.

## 26. FAA FLIGHT PLANS (DUATS)

It is possible to receive a DUATS weather briefing and file VFR and IFR FAA flight plans using Naviator. In order to use this feature a DUATS account is required. If you do not already have a DUATS account, you can get one at <http://www.duats.com/>. DUATS accounts are free of charge. Flight planning features are available in the 'Plan' section of the app.

Note: It is not possible to close flight plans using Naviator. Flight plans must be closed by a different method.

The screenshot displays the 'File and Brief' interface for creating a new flight plan. The title bar at the top reads 'File and Brief' with a close icon on the left and 'New Flight Plan' in the center. Below the title bar, the flight plan details are shown: '2012-05-09' and 'KBFI to KTTD'. The pilot is listed as 'Ace McCool in N068S at 135kts and 7,500' MSL' and the departure location is 'SEA BTG'. The right side of the screen contains a form with the following fields and values: 'Flight Rules' (radio buttons for VFR and IFR), 'Pilot' (Ace McCool), 'Aircraft' (N068S), 'Depart From', 'Route', 'Cruise Alt.', 'Destination', 'Alternate', 'Dep. Time (Z): 18:36', 'Est. Time Enroute: 00:00', 'Fuel Aboard: 00:00', 'Remarks', 'No. Aboard', 'No. of Aircraft', 'Dest. Contact', and 'Dest. Phone #'. Each time field has a 'Set' button next to it. The bottom of the screen shows a navigation bar with icons for 'Conv', 'Brief', and 'File', and a status bar with the time '11:06' and various system icons.

There are two ways to file a flight plan. The first is from the main menu: tap Plan → File and Brief → New Flight Plan. An empty flight plan form will be presented as in the screen shot above.

The other way is to create a route via Quick Plan or the rubber-band feature. Next, on the Active Route screen tap Menu → File and Brief. The same flight plan form will be presented, however this time the 'Depart From', 'Route', 'Destination' and 'Estimated Time Enroute' fields will be automatically filled in.

**Note:** The Estimated Time Enroute uses a **no wind** calculation. The value will need to be manually adjusted for the forecasted winds aloft.

**Note:** Cruise altitude should be entered in **feet**. For example, to cruise at 6,500 feet enter 6500. *Do not use flight levels when entering cruising altitude.*

**Note:** Aircraft type codes are validated by the DUATS system and must be one of the designators listed in this document: [http://www.faa.gov/air\\_traffic/publications/atpubs/CNT/5-1.htm](http://www.faa.gov/air_traffic/publications/atpubs/CNT/5-1.htm)

## 27. FAA FLIGHT PLANS (LOCKHEED MARTIN AFSS)

Naviator features integration with the Lockheed Martin AFSS online portal (<https://www.1800wxbrief.com>).

This feature enables you to file flight plans directly with Lockheed Martin. Some benefits of this include no middleman - your flight plans go directly to Lockheed. A briefer can pull up your filed flight plans instantly. There will be no more "lost" flight plans as has been known to occasionally happen with DUATS. You can also opt-in to Lockheed's Adverse Condition Alerting Service (ACAS). This will provide you with alerts for adverse conditions specific to your filed flight plans via text or email.

- Naviator currently supports file/amend/cancel/activate/close for domestic VFR and IFR flight plans (Weather briefings and ICAO filing will be added in a future update).
- To use this feature you need to create an account with Lockheed's AFSS Pilot Web (<https://www.1800wxbrief.com/Website/>).
- You must authorize Naviator as a service provider for your account. Go to Account --> Profile & Preferences --> Service Provider and make sure Naviator is enabled.
- After you file you can log into Pilot Web and see it instantaneously. Conversely, if you file a flight plan using the web site you'll be able to see in the Naviator app.
- If you have notifications turned on (like ACAS, the alerting service), you should get an email or text as soon as you file.
- If you file IFR, it will get sent to ATC starting 3 hours before ETD and removed from Lockheed's system at 30 minutes before ETD.

## 28. BRING YOUR OWN CHARTS (BYOC)

"Bring Your Own Charts" is a feature that enables you to import custom charts into Naviator. Examples could include topographic maps, road maps, or aviation charts from a country not yet supported by Naviator. As long as you have access to a digital image of the map or chart, it is possible to import it into Naviator. For more details and instructions, refer to this thread in our forum: [Introducing "Bring Your Own Charts" \(BYOC\)](#)

## 29. FLIGHT SIMULATOR CONNECTOR

Naviator version 2.0 and higher features integration with Microsoft Flight Simulator. This integration enables you to use Naviator as a moving map while using Flight Simulator, exactly as if you were flying a real aircraft. To use this feature you will need to download a companion application for your Windows PC. It can be downloaded at this link: <https://www.naviatorapp.com/releases/NaviatorFSX.msi>

Using the companion application is easy: Simply run the application alongside Flight Simulator and when Flight Simulator has finished loading, click the "Connect" button. The application will then begin broadcasting the Flight Simulator GPS coordinates and AHRS (pitch, roll, heading) data over your Wi-Fi network.



To enable the Flight Simulator connection in the Naviator app, go to the Main Menu and then tap Settings → Flight Simulator Connector.

## APPENDIX A: LAT/LON FORMATS

The following four lat/lon formats are supported on the Quick Plan screen and when generating SAR patterns:

- DD.dd**            Decimal Degrees
- DD°MM'SS**      Degrees, Minutes, Seconds
- DD°MM'SS.s**    Degrees, Minutes, Seconds, Decimal Seconds
- DD°MM.mm**     Degree Minutes

Below is an example of each format using the coordinate **48°22'28.5"N 122°01'39.7"W**

FORMAT	CONVERTED LAT/LON	HOW TO ENTER IN NAVIATOR
DD.dd	48.374°N/122.027°W	48.374N/122.027W
DD°MM'SS	48°22'28"N/122°01'39"W	482228/-1220139
DD°MM'SS.s	48°22'28.5000"N/122°01'39.7000"W	4822285/-12201397
DD°MM.mm	48°22.475'N/122°01.66'W	4822.475/-12201.66