

# Reality XP Apollo

## User's Manual



This manual is intended for Flight Simulation use only, and may not be used in any real world aviation applications. The authors are not responsible for any errors or omissions. This manual may be printed out by the user or at the user's request by a commercial print shop. This authorization is provided by the publisher of this product.

## About this manual

This manual is intended for flight simulation purposes only, and shall not be used for any real world aviation application or reference.

This manual is intentionally written using “gray scale” colored text in many areas, and much of the print is intentionally this medium gray color. This has been done to conserve ink while printing. In some cases “black” type has been used for emphasis. Photographs used in this manual have also been reduced to black and white, and also in contrast in order to conserve ink. Please be sure to double-check your printer’s settings prior to printing in order to achieve the best results. We have tested, and experienced no issues printing this manual on laser printers. If you are experiencing a problem using a laser printer, you should check the printer’s quality settings.

By reading this manual you should become well acquainted with the product, and should be able to obtain the information necessary to “fly” the product within Flight Simulator.

Please take the time to read this manual completely; so that you can become properly acquainted with the product and its operation.

We thank you for having chosen a Reality XP Product and wish you a pleasant and a safe virtual flight with us.

## Important information

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[www.reality-xp.com](http://www.reality-xp.com)

### Standard Disclaimer

This software is designed **for entertainment only**. Although we have designed the product to resemble and function like the original, it is not designed as a training device. Not all systems have been simulated, and some of those that have been simulated may not be entirely functional.

NOT FOR USE IN REAL FLIGHT OR AIRPLANE OPERATION.

## About



# **UPS Aviation Technologies**

## **Integrated Flight Management Avionics for General Aviation**

UPS Aviation Technologies makes it possible for the light aircraft owner to create a fully integrated flight management system similar in function and capability to systems found in transport category jets.

Using the most advanced digital electronic design, each component in the UPS-AT avionics line provides outstanding value and performance on its own. Working together, the avionics can automate many routine in-flight functions. For instance, as part of an integrated Navigation Management System, the MX20 multi-function display works together with the GX series GPS and the SL30 Nav/Comm to display flight-plan route segments and selected VOR radials on the pilot's custom map display. Working together, the avionics automatically queue VOR frequencies along the route of flight in the SL30 Nav/Comm, reducing pilot workload. Additionally, the system queues approach, departure, tower and ground communications frequencies for airports in the flight plan.

UPS Aviation Technologies, a wholly owned subsidiary of United Parcel Service, Inc., is recognized as a leader in the development and certification of advanced avionics systems for all types of aircraft. The company has been widely recognized for its leadership in the development of ADS-B technology, a critical component of free-flight air traffic management systems, and as a leading developer of GPS technology for aviation.

Garmin recently acquired the UPS AT and their product line can be found on the web at: [www.garminat.com](http://www.garminat.com).

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## Flight Line Apollo overview



Now you can add the highly acclaimed UPS Aviation Technologies GX GPS and Slimline avionics package to your Flight Simulator cockpit. Reality XP gives you a fully interactive avionics stack featuring the UPS-AT advanced GPS GX 50 with moving map, SL30 next-generation Nav/Comm, SL 70 Mode A/C transponder with altitude alerting feature and a full audio panel.

With Flight Line Avionics you'll be flying a simulated avionics package capable of providing the same features and benefits as the real avionics. The Reality XP Flight Line Apollo package is so realistic that pilots can use it as a training tool to familiarize themselves with the workings of the actual equipment. Each button and knob is fully functional and performs identically to its real-world counterpart. The system even creates audio and visual alerts, like the actual avionics.

## Important information for customers of a previous version

The Apollo 2005 is a major upgrade from previous versions. In addition to the gauge name changes, several configuration settings may work differently.

Prior to installing the Apollo in an aircraft with the Apollo Config application, it is recommended to remove any previous installations with the EZConfig program. The EZConfig program locates the v2.x installations and is installed in the following folder:

```
[fs9]\RealityXP\Flight Line Apollo\obsolete\
```

NB: custom designed retrofits may be broken when upgrading from Apollo v2.x to Apollo v5.0+

## Additional information

After installation, a new program group is accessible from your Windows Start Menu \ Reality XP. This program group contains the necessary utilities and documentation. Make sure you review all available documentation.

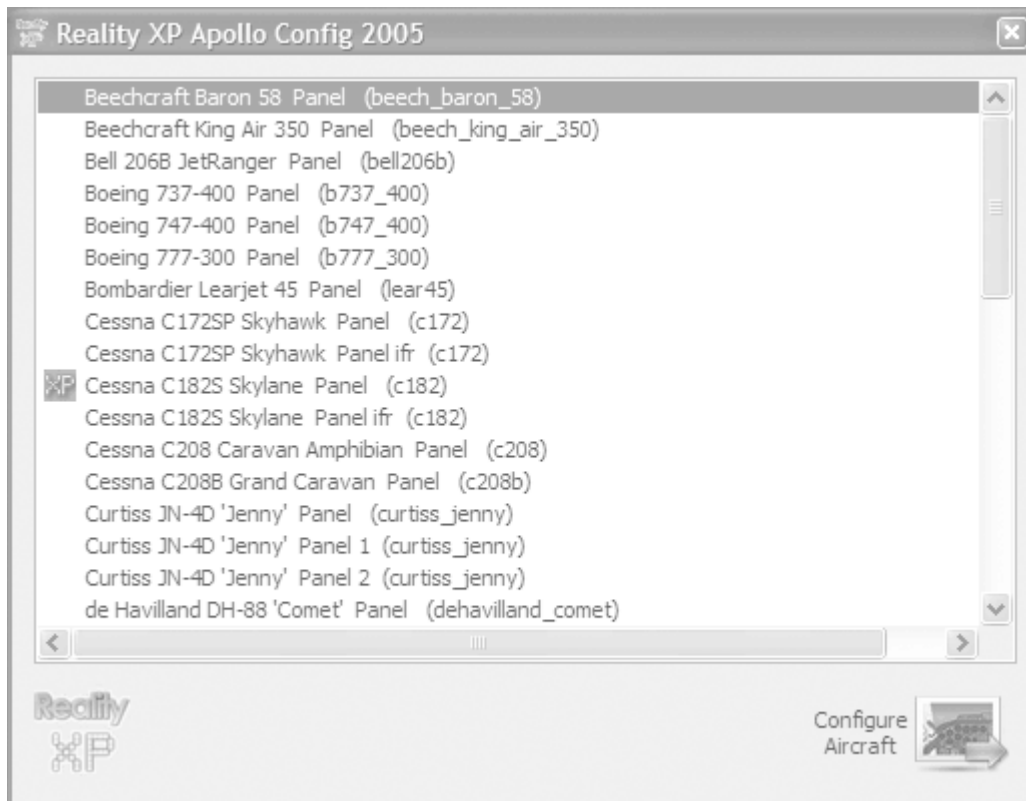
Please take the time to read all manuals completely; so that you can become properly acquainted with the product and its operation.

## Getting Started

The Apollo is a Flight Simulator compatible gauge and can be configured in any Flight Simulator aircraft panel. The software package includes an easy to use configuration program to assist with integration and configuration: Apollo Config

When first started, Apollo Config detects and prompts you with all available aircrafts and panels with the “select an aircraft” panel. Flight Simulator has an open architecture that permits several aircraft to share the same panel, and the selected aircraft can use different panel configurations. Not all available aircraft and panels configurations are listed in the “select an aircraft”: Apollo Config lists only the unique combinations of both aircraft and panels.

*NB: Apollo Config operation, advanced panel integration and Apollo gauges settings are covered in separate documents. Make sure to review the complete documentation located in your Windows Start Menu / Reality XP program group.*



## General features

All of the Reality XP gauges and controls utilize a relatively unique implementation of click spots. They work as follows:

1. As your mouse cursor passes over a click spot on the panel it will cause it to turn from an arrow cursor into a “hand” cursor. There are no + or - click spots: the hand cursor will be empty.
2. Whenever a single click spot is used, and depending upon its function a left click will accomplish the same task as a right click. In other cases, a left click will accomplish one task, while a right click will accomplish another.
3. In some cases the click spot will not function as stated above, but instead will feature separate functions for the left and right clicks. Example: For a toggle switch with 3 positions, a left click will move the switch in one direction, while a right click will move it in the opposite direction.
4. Certain click spots will work with left and right clicks, and the mouse wheel, if your mouse is so equipped. This type of click spot is used on gauges that require adjustment, such as the knobs, etc. In this case the left click turns the item “left” and a right click turns it “right”. Forward / back scrolling on your mouse wheel will also do the same.

## Tool-tips

By turning on FS “Tool Tips” you will see descriptions of these clicks spots when your mouse cursor is placed over them.

## Operation with Flight Simulator

The gauges can be configured for a variety of panel/aircraft situation. These features are designed to get the most out of Flight Simulator.

### Configuration File

Apollo Config provides a graphical user interface to most of the settings provided for the Apollo. These settings are configured in a file located at:

```
[fs9]\RealityXP\Common\Settings\RXPAPOLLO.INI
```

NB: All settings including keyboard shortcuts configuration are documented in the file.

### Hidden clickspots

- **Screen:** the GPS screen can be configured as a mouse clickspot to function as a popup window toggle
- **Autoresize:** the top edge of the GPS function as an autoresize/maintain ratio clickpost.
- **Auto-course:** right-click on the DTO key toggles the auto-course mode. When the mode is active, the VOR/HSI OBS is automatically adjusted to the DTK (Desired Track).
- **Flight Plan Browsing:** when in FPL mode, the INFO key toggles the flight plan file browsing mode. When the mode is activated, use the outer/inner knob to scroll the available flight plan files, and the ENTER key to select a flight plan file.

*Refer to the additional Apollo Service Manual (located in your Windows Start Menu \ Reality XP program group) for additional details and configuration options.*

### Dual NavCom

The FL30 has been designed to be the only NavCom unit on a panel. It provides extra features such as Comm. monitor and Nav monitor powerful enough to supplement a dual NavCom set. The implementation of the FL30 in Flight Simulator is:

- In normal mode, the Comm. radio uses the Flight Simulator COM1, the Nav radio uses the NAV1.
- In monitor mode, the standby Comm. radio uses the Flight Simulator COM2, the standby Nav radio uses the NAV2.

## Integration with Flight Simulator

This section details the enhanced navigational capabilities with this product.

### Navigation data and Flight Simulator

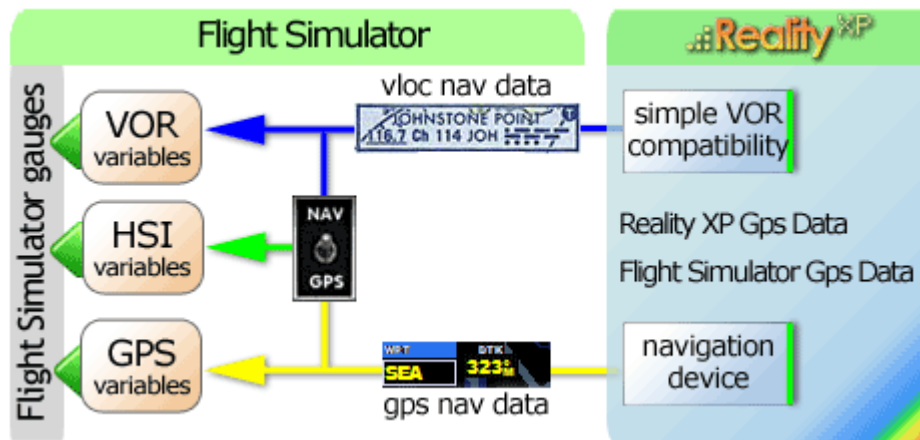
Flight Simulator is designed to work with a single GPS source. Gauges made with the Flight Simulator SDK (Software Development Kit) can only access three basic sources of information:

1. VOR: related to VLoc type of information such as signal strength, CDI deviation.
2. HSI: to display both VLoc and GPS information. The type of information is selected with the typical FS Nav/Gps switch.
3. GPS: to display GPS only information, like desired track, cross track etc...

### Enhanced capabilities with Reality XP

When a Reality XP product is loaded that offers additional Navigation Information the flight simulator Options Menu displays an additional “Navigation Device” selection. The possible entries in the menu are described below.

The Reality XP technology enhances the basic capabilities to offer realistic options to the virtual pilot. The following diagram shows the basic Flight Simulator structure, and the enhancements introduced with the Reality XP solution:



**Navigation Device:** selects the active GPS data source. The selection is made from the Options menu and/or the Device Select Switch Gauge included in the product. The Default FS GPS source is always available.

**Simple Vor Compatibility:** some VOR gauges working with the VOR variables require this option to be checked to display the information from the Reality XP GPS source.

The following guidelines cover most of the situations:

- Advanced EHSI displaying nav data sources simultaneously (VOR + GPS) should run with Simple Vor “off”.
- General and regular VOR, should run with Simple Vor “On” for having the VOR CDI displaying the correct information.

### **Autopilot and GPSS**

In addition to selecting the navigation information source gauges display, the Navigation Device Menu selects the device driving the Autopilot Course to Steer (CTS) when armed in NAV mode.

### **HSI / VOR / RMI Operation**

The Flight Line Apollo replaces or complements the Flight Simulator default GPS system. It is able to drive any Flight Simulator EHSI / VOR / RMI gauge information and display:

- CDI deviation per Apollo current phase flight (enroute, terminal...)
- TO/FR flag
- NAV Flag
- Distance to Waypoint
- Waypoint Name
- Desired Track

Due to Flight Simulator limitations, the Flight Line Apollo is not able to interface yet with XML gauges. This is the type of gauge found with the default Baron 58 EHSI gauge.

## FL15M, the Audio Selector Panel

The Flight Line FL15M represents the next step in cockpit audio control and intercommunications. The unit is designed for outstanding ergonomics and visually defined mode annunciation and selection.

We recommend that you read this manual completely. This will ensure that you will take full advantage of all the advanced features of the Flight Line FL15M.

### General Information



Receiver audio is selected through two momentary and six latched, push-button, backlit switches. Each of the buttons provides audible feedback with a "key click". The FL15M "remembers" the last position of any of its buttons from session to session. When you return to Flight Simulator, the Audio Selector Panel will return to its previous state. It is a convenient feature if you like to have a predetermined configuration and retrieve it anytime you fly.





The rotary microphone selector switch controls what transceiver is being heard, the **COM 1** and **COM 2** push buttons are the momentary switches and do not remain in when selected. This is designed as to provide an “auto” function. You will always hear the audio from the transceiver that is selected for transmit by the rotary mic selector switch. Noting which of the green switch LEDs are illuminated indicates the receivers that are selected.



Push buttons labeled **NAV 1**, **NAV 2**, **MKR** (marker), **ADF**, **DME**, **AUX** (auxiliary), and **SPR** (speaker) are “latched” type switches. When one of these buttons is pressed, it will stay in the “in” position. Press the switch again and it will be in the “out” position and remove that receiver from the audio.



The **SPR** button stands for speaker. This switch will place all selected audio on the cockpit speaker when this switch is selected. The speaker amplifier is deactivated in the “split mode”. In Flight Simulator, no audio volume difference will be heard if the button is set to the “in” or the “out” mode.

## Microphone Selector

The FL15M has an automatic selector mode. Audio from the selected transceiver is also heard in the headsets and speakers. You can check this function by switching from COM 1 to COM 2 and watch the selected audio light on the selector change from COM 1 to COM2. This ensures the pilot will always hear the audio from the transceiver he is transmitting on.

When switching the mic selector rotary switch from COM 1 to COM 2, while COM 2 audio had been selected, COM 1 audio will continue to be heard. This eliminates the pilot having to switch COM 1 audio back on.

When switching from COM 1 to COM 2 while COM 2 has not been selected, COM 1 audio will be switched off.

The TEL position, fully clockwise on the mic selector switch, places the microphone and headphones on the cell phone. It is not a supported feature by Flight Simulator.

### Transmit Indicator

The Transmit Light Indicator is linked to the ATC window of Flight Simulator. Anytime the ATC window is opened, the indicator will light. When the ATC window is closed, the indicator switches off.

## Split Mode

Turning the rotary switch to COM 1 / COM 2 places the FL15M into “Split Mode”. This places the pilot on COM 1 and the copilot on COM 2. The actual implementation of the split mode in Flight Simulator is to set the transceiver to the one set for the pilot.

In split mode, the pilot and copilot are usually isolated from each other on the intercom. The ICS button in Split Mode activates the VOX intercom between the pilot and the copilot. Flight Simulator does not provide any intercom mode. This feature is not implemented.

## Volume Control

The volume control knob adjusts the volume of the following audio:

- Aural Warning System volume
- Marker beacon audio indicator

## Marker Beacon

The FL15M uses visual and audio indicators to alert you when the airplane passes over a Marker Beacon transmitter.



The Blue lamp, labeled “O”, is the Outer Marker lamp and is associated with a 400-Hertz ‘dash’ tone. The lamp and tone are keyed at a rate of two tones / flashes per second.

The Amber lamp, labeled “M” is the Middle Marker lamp and is associated with a 1300-Hertz tone. The lamp and tone are keyed at a rate of 95 combinations of a short ‘dot’ and a long ‘dash’ per minute.

The White lamp, labeled “I” is the Inner Marker lamp and is associated with a 3000 Hertz tone. The lamp and tone are keyed at a rate of 6 per second.



The audio from the Marker Beacon Receiver is heard by setting the MKR button to the “in” position.



A switch located to the right of the OMI lamps is used to set the receiver sensitivity and to test the indicator lamps. The “test” position has two functions:

- It will illuminate all three lamps simultaneously to assure the lamps are working.
- It will mute the marker audio for 12 seconds. This will prevent distraction from the marker audio on the approach, while allowing the next beacon to be heard.

## Aural Warning

The FL15M is equipped with an Aural Warning System. The Flight Line Avionics includes a standard Electronic Monitoring System that triggers the following messages:

Function	EGT or CHT	Fuel Flow or Level	Oil Pressure or Temperature	Volt / Amp	RPM	Manifold Pressure
Message Text	<i>"Check temperature"</i>	<i>"Check fuel"</i>	<i>"Check oil"</i>	<i>"Check battery"</i>	<i>"Check engine speed"</i>	<i>"Check boost"</i>



Anytime the determined condition occurs, the Aural Warning Alert repeats every 2 seconds.

This switch is used to arm or disarm the Aural Warning:

- When set to the "crew" position, the aural warning is armed and can be heard if a condition occurs.
- When set to the other positions (iso, all), the aural warning is disarmed and no warning alert can be heard.

Refer to the supplemental guide for advanced information about programming the Aural Warning to your specific airplane.

## GL50, the high performance GPS

The Flight Line GL50 is a high performance GPS with a high resolution moving map display. In today's demanding aviation requirements, its large Database combined with the advanced navigation information operations sets the GL50 as a major component of your radio stack.

The Flight Line GL50 feature a 160 x 80 pixel electro luminescent graphic display and is conveniently package to provide easy access through its functions with a simple user interface.

### General Information



### Controls

The GL50 uses a variety of controls to manage the features. The controls include a power knob, dual-concentric knobs (called Large and Small), hard keys, and Line Select Keys (LSK).

## Hard Keys

The hard keys are located on the right side of the display:



### Navigation

Press the NAV key to access the navigation functions.



### Nearest

The nearest waypoint mode displays the closest waypoints to your position.



### Information

The information function gives supplementary information about any waypoint in the database. Press INFO a second time to return to the previous display.



### Selection

The SEL key activates editing of options. Editing mode is active on the items that flash on the display. Press SEL a second time to deactivate selection.



### Map

Press the MAP key to access the moving map function.



### Direct To

This function defines a direct course from your present position to a selected waypoint.



### Enter

Press ENTER to save or validate the information flashing on the display.

## **Line Select Keys**

For mode specific functions, the GL50 provide five additional keys. The function of each key is dynamically defined according to the current active mode.

### **MSG**

#### **Message**

Press the MSG key to access the message function. The MSG annunciator will flash when a new message is pending. Press the MSG a second time to clear the message list.

### **DB**

#### **Database**

Press the DB key to access the full database of the GL50.

### **FPL**

#### **Flight Plan**

Press the PFL key to access the Flight Planning functions. You can then view, activate or deactivate a standard Flight Simulator flight plan into the GPS.

### **SKIP**

#### **Skip** (during startup)

Press the SKIP key during startup to bypass internal tests.

## **Map Waypoint Keys**

The moving map function provides its own set of Line Select Keys Annunciator to allow you to declutter the map. There are 3 selections possible for each key. Pressing the Line Select Key cycles the available selections as described below.

**APT** **VOR** **INT** **NDB**

**APT**

A Thin outline around the waypoint type means that it is turned off and no information is displayed on the map.

**APT**

A Solid Inverse drawn annunciator means the waypoint identifier and symbol will both be displayed.

**APT**

A Bold outline means only the symbol will be displayed.

**2**

If more than one page of annunciator is available, pressing the Line Select Key will cycle to the available options.



## Getting Started

This section explains how to get started using your GPS. We will review the basic operations and how to:

- Select a waypoint
- Find a Nearest Waypoint
- Fly Direct-To a Waypoint
- Load a Flight Plan
- Activate a flight plan
- Use the moving Map

### Power On

Click on the Power Knob to switch on the GPS unit. The startup screen, software and database information shows on the display, and then will go into the Navigation function. When the GPS is turned on and during the power on test sequence, the software version number is displayed:



### Select a Waypoint

There are several methods available to navigate the GPS Database. You can search character-by-character, sort the database by selecting the first few characters of the identifier, or look at every entry in order.

You can search for waypoints by identifier, by city name or by facility name.

### Find a Waypoint by name

DB



1. Press the **DB** key. The Database function is activated.
2. The waypoint type will flash. Turn the **Small** knob to change through AIRPORT, VOR, NDB and INT.

AIRPORT	00AZ
CORDES	
FACIL	AZ USA
MSG	DB FPL SYS



INFO →

3. Turn the **Large** knob to move the selection to the identifier, the name, (or the facility / city field when viewing the airport database.)
4. Turn the **Small** knob to parse all the waypoints in the database for the currently selected type and field.
5. Press info to view information about the currently displayed waypoint or press **Direct-To** then **Enter** to fly direct to the waypoint.

### Sorting waypoints by characters

DB



SEL

1. Press the **DB** key. The Database function is activated.
2. The waypoint type will flash. Turn the **Small** knob to change through AIRPORT, VOR, NDB and INT.
3. Turn the **Large** knob to move the selection to the identifier or the name of the waypoint.
4. Press **SEL** to activate the cursor

AIRPORT	<u>00</u> AZ
CORDES	
FACIL	AZ USA
MSG	DB FPL SYS



SEL

5. Turn the **Small** knob to change the selected character and show a waypoint starting with that character.
6. Turn the **Large** knob to move the cursor from character to character
7. Press **SEL** again to deactivate the cursor, Info or Direct-To to fly to the selected waypoint

### Duplicate City or Facility Names

While searching a waypoint in the database, the word “**dup**” might be displayed on the bottom line. This means that there is more than one waypoint for the displayed city or facility name.

Use the small knob to list the duplicate entries in the database.

**Waypoint Information** Pressing the INFO key will provide the information about the currently selected TO waypoint, or the currently displayed waypoint.

INFO

1. Press the **INFO** key to view information about the waypoint.

KORD	AIRPORT	KORD	APPR	125.70
CHICAGO-O'HARE I			APPR	128.45
FACIL	IL USA		ATIS	135.40
MSG	DB	FPL	SYS	



2. Turn the **Small** knob to view the available information about the waypoint

KORD	ILS / DME
	IOR 109.75
	RUNWAY 14R
MSG	DB FPL SYS

INFO

3. Press the **INFO** key again to return to the previous display.

## Finding a Nearest Waypoint

The GL50 provides a convenient feature to find the nearest 20 waypoints of a type, within 600 nm of your present position.


In case of an emergency, it is just a matter of depressing 2 keys to fly direct to the closest alternate airport. It is also convenient when the ATC directs you to fly direct a specific waypoint. With the Nearest function, it is easy to setup your GPS with the proposed waypoint and fly direct to it.

If your aircraft condition or type requires specific limitations for a Runway, you can also be selective about the runway length and surface type. The LIT option is available but not functional.

NRST

1. Press the **NRST** key to start the Nearest Find function.

The screen displays the distance and bearing from your present position to the indicated waypoint.



```

NEAR  1 TO PPos
KCGX  APT IL USA
BRG 173° ↓ 1.05NM
MSG  DB  FPL  SYS
    
```

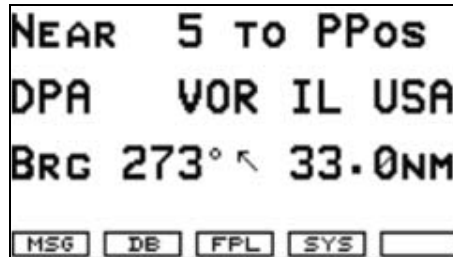
2. Turn the **Large** knob to cycle the different waypoint types.

```

NEAR  1 TO PPos
ORD   VOR IL USA
BRG 299° ↖ 14.7NM
MSG  DB  FPL  SYS
    
```



- turn the **Small** knob to view the 20 nearest waypoints.



- To quickly navigate to the currently displayed nearest waypoint, click **Direct-To** then **Enter**.

## Runway Limits

The GL50 provides a powerful and convenient feature that helps you select which airports to find in the Nearest function, based on Runway type and length.

The Runway Limits condition is also applied on the MAP mode to declutter the screen.

To set a Runway Limit preference:



While in Nearest Find mode, turn the **Large** knob to access the Runway Limits page



- Press the **SEL** key to activate the cursor.
- Turn the **Large** and the **Small** knobs to set the desired limits.



- Press the **ENT** key to validate or the **SEL** key to cancel.

## Direct-To a waypoint

The Direct-To button is a powerful feature of the GL50. Any time you need to fly directly to a waypoint, or need to change your current flight plan, the Direct-To function updates your current navigation status to go from your Present Pos to the selected Waypoint.



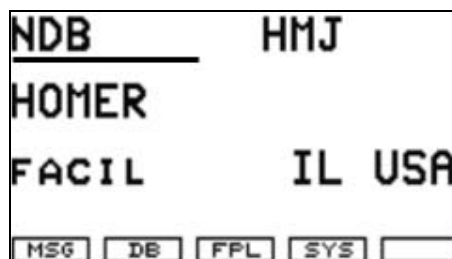
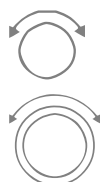
1. Press the **NRST** key to start the Nearest Find function.



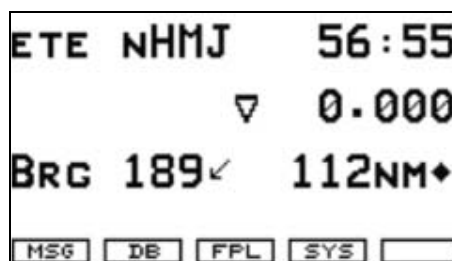
You can also browse the database as described in the section above with the **DB** key.



2. Press the **Direct-To** key to go the waypoint selection screen. The displayed waypoint from the Database or the Nearest Find screen is presented. You can however browse the Database to select another waypoint.



3. Validate the selection with the **Enter** key. The GPS automatically switch to the default Navigation Screen with the selected **TO** waypoint and its associated navigation information.



## Load a Flight Plan

The GL50 has a powerful feature to allow any standard Flight Simulator flight plan to be loaded in the GPS. To make a flight plan available to the GPS, just save your Flight Simulator Flight Plan in the default user flight plan directory, which typically is:

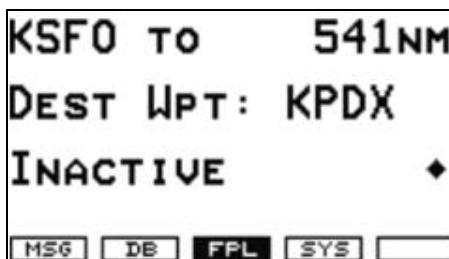
### My Documents\Flight Simulator Files

This directory is the only place Flight Simulator allows you to save the flight plans you create with its included flight planner. The limitations for the flight plans are:

- Only the first 1023 flight plans found in this directory will be accessible to the GPS.
- Only the first 255 waypoints of a flight plan will be loaded into the GPS memory.

FPL

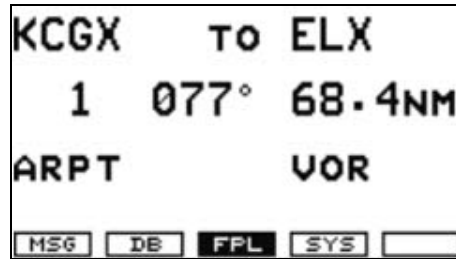
1. Press the **FPL** key to start the Flight Planning. While the GPS retrieve the information of the first flight plan, or the currently active flight plan, you are prompted to wait.
2. Once the flight plan is loaded in the memory of the GPS, the main **Flight Plan Summary Page** is displayed with basic information such as origin and destination identifier, and the total distance in nm.



3. The diamond displayed at the lower right of the screen means that there are more pages available. You can navigate through the pages with the **Small knob**.

For a flight plan, the Small knob browses the **legs and waypoint** information.





4. Turn the **Large** knob to browse your stored flight plans. Press the **FPL** key again to return to the **Flight Plan Summary Page**.

### Activate a Flight Plan

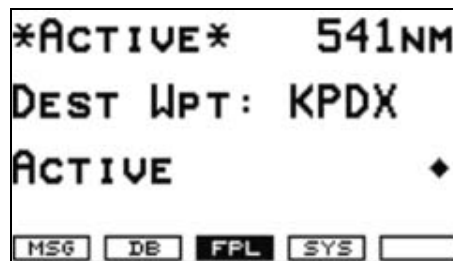
Activating a flight plan copies it to the active flight plan memory.

**FPL**

1. Press the **FPL** key and turn the **Large** knob to the desired flight plan.

**ENTER**

2. Press the **Enter** key to activate the flight plan.



## Using the Moving Map

The moving map is a graphic representation of your flight progress. You can select the type of waypoint to display and have visual clues about:

- Route line and Highlighted current TO waypoint.
- ATC ring of 5 nm around airports with a control tower.
- Navigation information for the current TO waypoint.
- Airspace Sectors

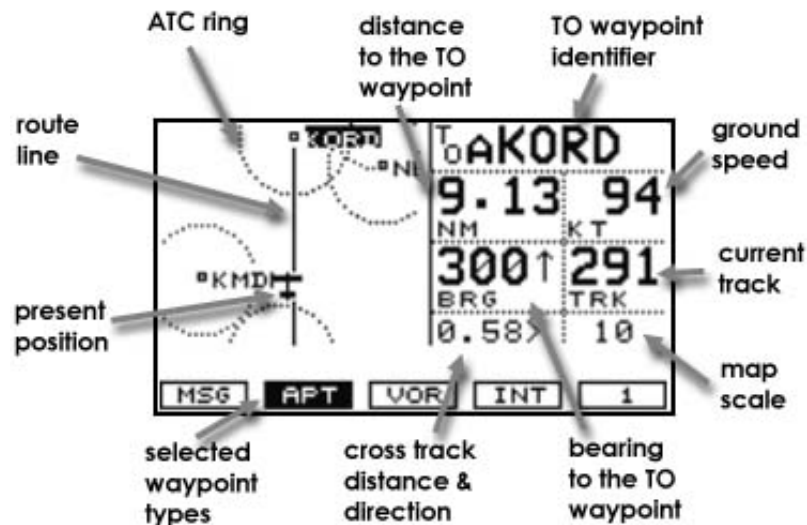


1. Press the **MAP** key to display the Moving Map.



2. Turn the Small knob to change the Map Scale from 0.1 nm to 250 nm.

The Map lowest Map scale is displayed as “auto”. When the scale is set to auto, the map automatically adjusts the scale up to 250 nm, to make the current TO waypoint visible on the screen.



## Navigation Basics

This section explains the powerful features of the navigation mode of the GPS.

### About navigation

The GPS is a central computing unit that continuously updates the navigation information available to the pilot. Its main purpose is to accurately define the navigation parameters to get from a **FROM** waypoint to a **TO** waypoint. Whatever the active mode you are using, as long as there is an active FROM waypoint (usually present pos – PPOS - or a defined waypoint from a flight plan) and an active TO waypoint, the navigation information is displayed.

### About the navigation display

While you are flying, the Flight Line GPS gives you information in the Navigation function display.

The **Large** knob will select the higher level Nav functions:

- Nav Pages
- GPS Position
- Countdown Timer

The **Small** knob will cycle the pages available for each function. A diamond at the lower right of the screen indicates that more than one page is available.

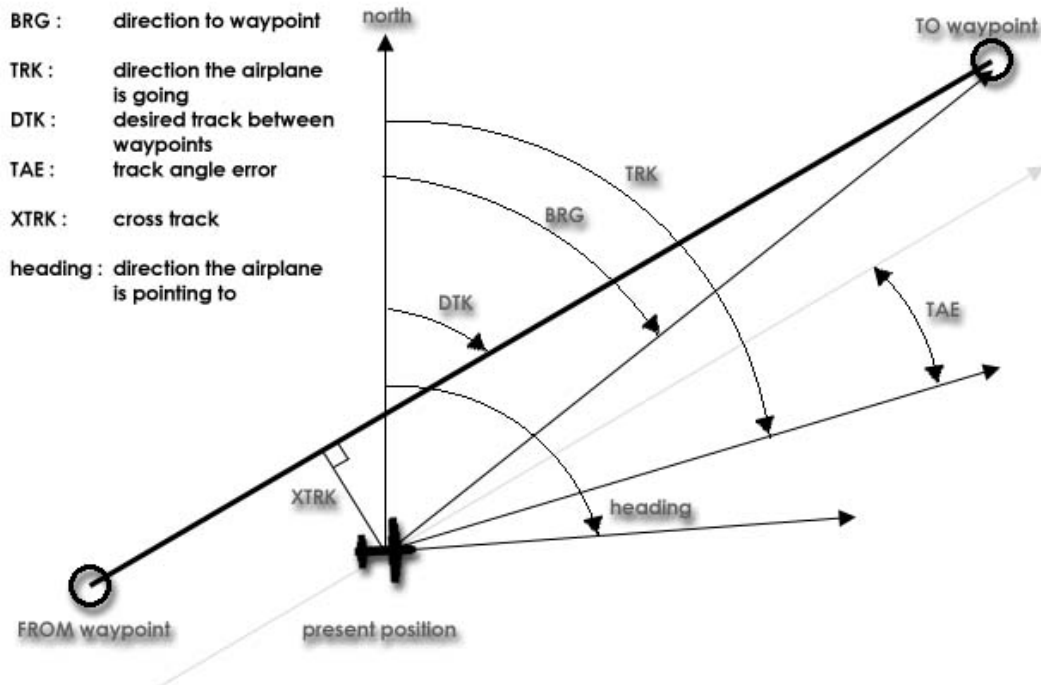
### Nav Home Page

The Nav Home Page is the default page available in the Navigation Function. The information displayed shows:

- Destination waypoint identifier
- Estimated Time En Route (ETE)
- CDI
- Bearing and Distance











### Navigation Terms and Abbreviations



### Navigation Terms and Abbreviations

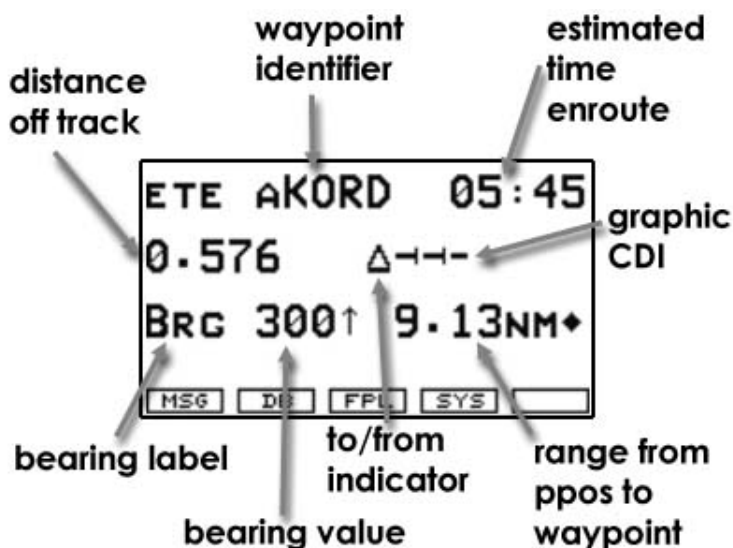
#### Relative Bearing Indicator

The relative bearing indicator is a small arrow located at the right side of the bearing value, that indicates the approximate bearing to the TO waypoint, relative to the airplane current heading. The indicator is displayed when your ground speed is greater than 5 knots. The following table describes the bearing range for each arrow.

							
23°	68°	113°	158°	203°	248°	293°	338°
to	to	to	to	to	to	to	to
67°	112°	157°	202°	247°	292°	337°	22°

## Nav Pages

The navigation pages of the Flight Line GPS provide all the navigation information on a number of displays that you can select with the Large knob. Anytime a diamond symbol appears in the lower right corner, turn the Small knob to view more related information.



### Estimated Time Enroute (ETE)

ETE is computed with your ground speed and the distance to the TO waypoint. The value is in the format HH:MM or MM:SS if less than 60 minutes. If there is no valid TO waypoint, your ground speed is less than 5 kt, the value is replaced with dashes. If there is no valid TO waypoint, the TO waypoint identifier is replaced by dashes.


### Bearing (Brg)

This is the angle from your present position (PPOS) to the TO waypoint. It is calculated with the magnetic variation at the present position. If the FROM or TO waypoints are not defined, the Bearing value will be dashed.

## Range










This is the distance from your present position to the TO waypoint, in nautical miles. The value is dashed if there is no valid FROM or TO waypoints.

## Course Deviation Indicator (CDI) and Distance Off Track

The course deviation indicator provides two values: a graphical representation of the deviation off course, and a numerical value in nm of the deviation. A triangle symbol  shows your relative position relative to being “on-course”. When the bar graph is to the left of the triangle, you must fly left to return “on-course”.

The triangle symbol is also a TO / FROM indicator relative to the current TO waypoint. When the triangle is facing up, you are on the TO side of the destination waypoint. When the triangle is facing down, you are on the FROM side.

The CDI bar graph features an automatic sensitivity scaling according to the values listed in the following table:

Sensitivity = 0.3 nm	Sensitivity = 1.0 nm	Sensitivity = 5.0 nm
Each  = 0.012 nm	Each  = 0.04 nm	Each  = 0.2 nm
Each  = 0.06 nm	Each  = 0.2 nm	Each  = 1.0 nm
Full scale = 0.3 nm 	Full scale = 1.0 nm 	Full scale = 5.0 nm 

If the TO waypoint is not defined, the CDI will display:

“—Nav Flagged—”

### Desired Track (Dtk)

The desired track is the initial course between the From and the To waypoint, referenced to the magnetic variation at the From waypoint.



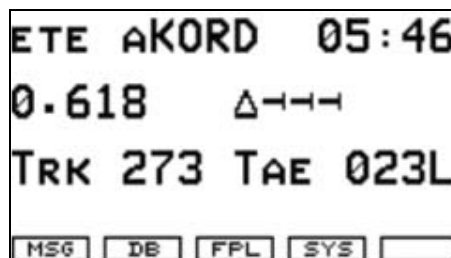
ETE AKORD 05:46  
0.618     Δ---  
DTK 296     14.4NM  
MSG DB FPL SYS

### Leg Distance (From - To)

The distance from the current From to the current To waypoint is shown in nm, on the right side of the Desired Track page.

### Track Angle (Trk)

Track angle is your actual direction of travel, computed with the magnetic variation at the Present Position. The track value will be dashed if there is no valid FROM or TO waypoint, or if the ground speed is less than 5 knots.



ETE AKORD 05:46  
0.618     Δ---  
TRK 273     TAE 023L  
MSG DB FPL SYS

### Track Angle Error (Tae)

The track angle error is the difference between the Desired Track and Track Angle. Track Angle Error is computed using the magnetic variation at the present position.

The Tae value will be dashed if there is no valid FROM or TO waypoint, or if the ground speed is less than 5 knots.

The Tae value is followed by the letter **L** or **R** to show the direction of the error in relation to track angle.

### Ground Speed

The ground speed is calculated in knots. The value will be replaced with dashes if the speed is less than 5 knots, or the TO waypoint is not defined.

### Flight Time

The flight time counter is triggered when your ground speed exceed 60 knots. It is displayed in HH:MM or MM:SS if less than 60 minutes. To reset the Flight Time counter, just turn off then back on the GPS.



### Bearing and Track Angle

This page shows the bearing to the side you are off course, and the current track.





## Time UTC

The time is displayed using the 24 hour clock based on Universal Coordinated Time. Units are HH:MM.



## Minimum Safe Altitude (MSA)

The MSA is calculated by taking the Maximum Elevation Figure (MEF) from the sectional chart grid that corresponds to your current position. In areas below 3,000 feet, 1,000 feet is added. In areas above 3,000 feet, 2,000 feet is added. If you are within 5 nm of another grid with a higher MEF, the higher MEF will be used.

The MEF on the sectional chart is derived by taking the altitude of the highest obstruction within the grid, rounded up to the next 100 feet, and adding 300 feet. For example, if the highest obstruction is 5,230 feet, the MEF would show as 5,600 feet and the MSA at 7,600 feet.



### Estimated Time of Arrival (ETA)

The ETA for the current TO waypoint is derived from you current ground speed and UTC time. Units are HH:MM based on the UTC 24 hour clock. The values will be replaced with dashes if the speed is less than 5 knots, or there is no valid TO waypoint.

### Minimum En Route Safe Altitude (MESA)

The MESA is the highest MSA for every point between the airplane present position and the TO waypoint, with a 5 nm buffer around the course. The value will be replaced with dashes if there is no valid TO waypoint.

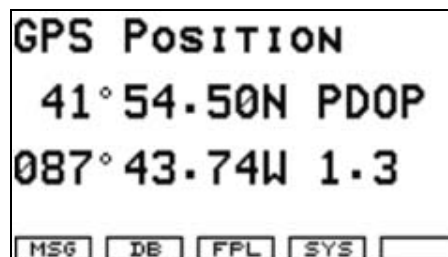
In the example above, the MESA for the present position (KCGX) to KSAN is 7,300 feet.

### GPS Position

The GPS position page shows the calculated Latitude and Longitude at the present position, as well as its Position Dilution of Precision (PDOP). This value is based on the geometry of the satellites used in the position solution. A lower number is a better value than a large one.



In the navigation mode, turn the **Large** knob to display the GPS position.



## Countdown Timer



The countdown timer allows you to set a timer that will alert you when it expires with a flashing MSG annunciator. The maximum time is 99:59:59 (HH:MM:SS). The default time on power up is the previous time that was entered.

1. In the navigation mode, turn the **Large** knob to display the Countdown Time page
2. press the **Sel** key to start editing the value. The minutes will flash.



3. turn the **Large** knob to cycle the fields, turn the **Small** knob to change the values.
4. Press the **Enter** key to start the timer with the selected value, or the **Sel** key to revert to the previous value.
5. Press the **Sel** key twice to reset the timer.



When the timer has expired, a flashing MSG annunciator will alert you of the event. Press the MSG key to read and clear the alert.

## Last Page Recall

The GPS remembers the last page visited in the NAV mode. While cycling back and forth the NAV mode and the MAP mode for example, you will be presented the last navigation page visited when leaving the NAV mode.

## Autonav mode

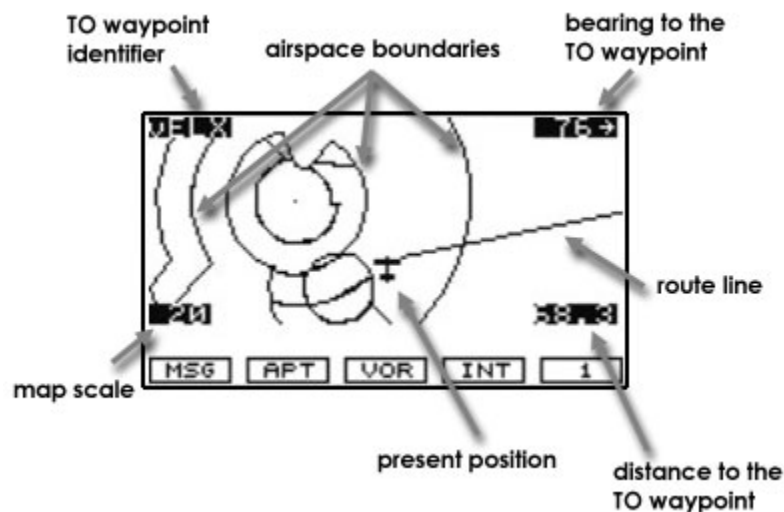
The NAV mode features a new function called: Autonav. While in NAV mode, press the **ENTER** key to activate the Autonav mode. The Navigation Information Pages will automatically cycle every 4 seconds by default. Press the **ENTER** key again, or any other key, to cancel the Autonav Mode.

## Moving Map Functions

Press the **MAP** key to reach the Moving Map function and view the progress of your flight on a graphic display. Your present position, nearby waypoints and special use airspaces display options are user-selectable. Three main pages are available in the moving map function: full screen map, split screen with map and Nav info, and map setups.

### Full Screen Map

The full screen map page of the Moving Map function shows a graphic map of the aircraft position, nearby user-selected waypoints, airspaces, track history and your route. The aircraft position is shown by an airplane symbol near the center of the display. The TO waypoint identifier is shown in reversed text on the upper left corner. The bearing from your current position to the TO waypoint is shown on the upper right corner. The map scale is shown in the lower left corner. The distance from the current position to the TO waypoint is shown in the lower right corner. A 5 nm “ATC Ring” can be drawn around airports that have a control tower.



**Controls** The Large knob moves to different pages of the Map function.  
The Small knob changes the map scale.

### Waypoint Type Keys

The smart keys select the display of the waypoint types. The waypoint types selectable from the map view are: Airports, VORs, Intersections, User-defined and NDBs. Press the smart key to control the display of the waypoint type. There are three selections possible: waypoint identifier and location symbol, location symbol only, and off. Pressing the smart key subsequent times will control which selection is made.

**APT**

A Thin outline around the waypoint type means that it is turned off and no information is displayed on the map.

**APT**

A Solid Inverse drawn annunciator means the waypoint identifier and symbol will both be displayed.

**APT**

A Bold outline means only the symbol will be displayed.

**2**

If more than one page of annunciator is available, pressing the Line Select Key will cycle to the available options.

## Map Scale

The Map Scaling is controlled by turning the **Small** knob while viewing the map. The map scale value shown is the vertical height of the screen in nautical miles. Map scales choices in nautical miles are: 0.1, 0.2, 0.5, 1, 2, 5, 10, 15, 20, 30, 40, 50, 75, 100, 150, 200, 250, and auto. The auto selection automatically adjusts the map scale so the TO waypoint remains on the display until the aircraft passes over the waypoint.

## Map Setup

The map setup function allows you to select the route line, map orientation, airspace type and special use airspaces. Although presented, the airspace alerts setting are not implemented in v2.0 of Flight Line Avionics.

## Route Line

A Route Line can be drawn for the legs of the active route when the selection is turned on.

## Waypoint Database

### **Waypoint Information**

The GPS provides an extensive database of waypoint information. The database is divided in 5 categories.

The waypoint categories are:

- Airport
- VORs (Very High Frequency Omnidirectional Ranges)
- NDBs (Non Directional Beacons)
- INTs (Intersections)
- USR (User Waypoints)

### **Available Waypoint Information**

The following information is available for each waypoint category. Use the waypoint INFO function to get this information.

#### **AIRPORT waypoint information**

- Identifier, city / facility name, state, country
- Bearing and distance From / To present position
- Radio communication frequencies
- Airport type and Elevation
- Runway map, length, surface type and lighting
- Lat / Lon coordinates
- Sunrise / Sunset times

#### **VOR waypoint information**

- Identifier, facility name, state, country
- Radial and distance From the VOR
- Bearing and Distance from present position
- Operating frequency
- Lat / Lon coordinates

- Sunrise / Sunset times

### **NDB waypoint information**

- Identifier, facility name, state, country
- Bearing and Distance from present position
- Operating frequency
- Lat / Lon coordinates
- Sunrise / Sunset times

### **INT waypoint information**

- Identifier, state, country
- Bearing and Distance from present position
- Lat / Lon coordinates
- Sunrise / Sunset times

### **Airport Information Pages**

Most of the needed information is included in the Database. The Airport information page is described in details below. Similar information is available for each category in the Database. This information is shown after selecting a waypoint and pressing the **Info** key.



## Main Page

This is the page where the waypoint is selected, as described in the Getting Started section.



AIRPORT 00AZ  
CORDES  
FACIL AZ USA  
MSG DB FPL SYS

## Title Page

INFO

Press the **Info** key to go to the waypoint title page. The waypoint identifier, type, the facility name, the state / country are shown.

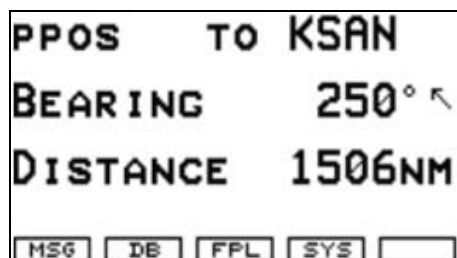


KSAN AIRPORT  
SAN DIEGO INTL-L  
FACIL CA USA  
MSG DB FPL SYS

## Bearing and distance from present position



Turn the **Small** knob. An arrow shows the relative bearing to the waypoint from the PPOS.



PPOS TO KSAN  
BEARING 250° ↖  
DISTANCE 1506NM  
MSG DB FPL SYS

### Airport frequencies



Turn the **Small** knob to view the available frequencies.

KSAN APPR 119.60			
APPR 124.35			
ATIS 134.80			
MSG	DB	FPL	SYS

### ILS info



Turn the **Small** knob to view the ILS runway information when available.

KSAN ILS / DME			
ISA 110.90			
RUNWAY 09			
MSG	DB	FPL	SYS

### Identifier, type and elevation



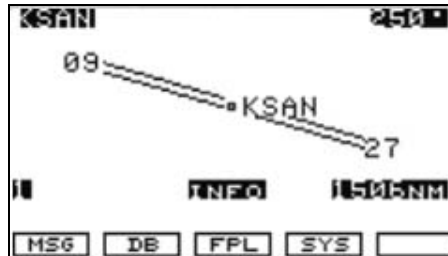
Turn the **Small** knob to view the airport type and elevation.

KSAN		AIRPORT	
PUBLIC			
ELEV		14FT	
MSG	DB	FPL	SYS

### Airport Map



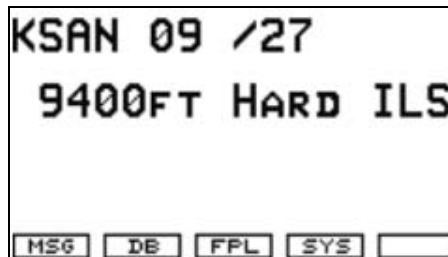
Turn the **Small** knob to view a map of the airport. The Water runways are shown in dotted lines. The Heliports are shown as a capital H inside by a circle.



### Runway Info



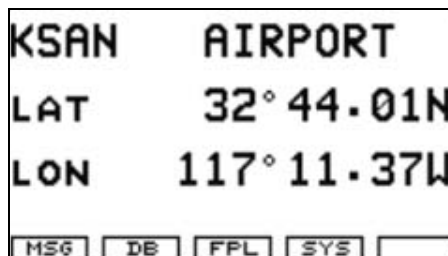
Turn the **Small** knob to view the runway information.



### Lat / Lon position



Turn the **Small** knob to view the Lat / Lon position.



### Sunrise / Sunset Time



Turn the **Small** knob to view the Sunset / Sunrise time for the waypoint in UTC time.

14 FEB UTC TIME			
KSAN	RISE	14:24	
ARPT	SET	01:12	
MSG	DE	FPL	SYS

## Flight Plan Functions

The GL50 GPS has been designed to be compatible with the standard Flight Simulator flight plans. The default flight planning tool or several third party tools can be used to generate a Flight Simulator flight plan.

To make a flight plan available to the GPS, just save your Flight Simulator Flight Plan in the default user flight plan directory, which typically is located in:

### **My Documents\Flight Simulator Files**

This directory is the only place Flight Simulator allows you to save the flight plans you create with its included flight planner.

The limitations for the flight plans are:

- Only the first 1023 flight plans found in this directory will be accessible to the GPS.
- Only the first 255 waypoints of a flight plan will be loaded into the GPS memory.

The GPS classifies the Flight Plans in two categories: the stored flight plan (on the hard drive) and the Active Flight Plan (in memory). The active flight plan is always used for the current flight.

Flight Plan leg pages show the leg number and FROM and TO waypoint identifiers on the display, along with the bearing and distance between the waypoints. One asterisk (\*) next to the leg number means that the displayed leg is in the Active flight plan. Two asterisks (\*\*) mean that the displayed leg is the active leg and shows the current FROM and TO waypoints, which are being used for navigation.

## Flight Plan Pages

The main Flight Plan Summary Page is displayed with basic information such as origin and destination identifier, and the total distance in nm.

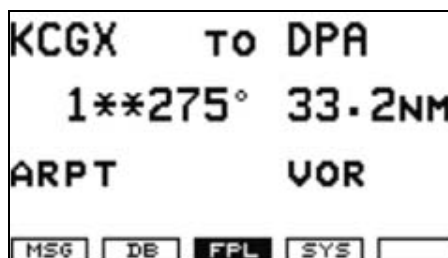
If a diamond is displayed at the lower right of the screen, it means that there are more pages available. You can navigate through the pages with the **Small** knob.

Turn the Small knob to browse the **legs and waypoint** information. Turn the **Large** knob to browse your stored flight plans. Press the **FPL** key again to return to the **Flight Plan Summary Page**.

## Reaching the Flight Plan function

FPL

Press the **FPL** key to reach the flight plan function. You may need to press the Nav key first if you were viewing the moving map. The active leg is the first page you will see when pressing the FPL key once.



Turn the **Small** knob to view the individual legs of the Flight Plan.

NB: pressing the INFO key while in FPL mode opens an alternate flight plan file listing mode to list and select a flight plan from the filename instead of the origin/destination information.

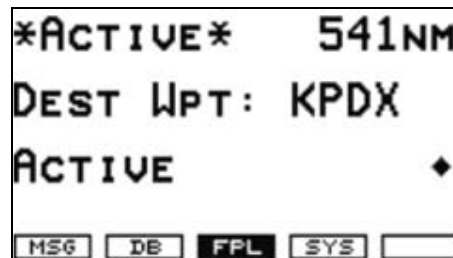
## Activate a Flight Plan

Activating a flight plan copies it to the active flight plan memory. You have to reach the summary page of the flight plan to activate it.

FPL



1. Press the **FPL** key to reach the flight plan function
2. turn the **Large** knob to the desired flight plan.



ENTER

3. Press the **Enter** key to activate the flight plan.

## Deactivate a Flight Plan

You have to reach the summary page of the flight plan to deactivate it.

FPL FPL

SEL

1. Press the **FPL** key to reach the flight plan function. You are presented the current active leg of the active flight plan. Press the **FPL** key again to reach the Flight Plan Summary Page.
2. Press the **SEL** key to deactivate the current active flight plan.

## Active Waypoint Info Page

At any time during your flight, you can press the INFO key to access the information about the current active TO waypoint.

**User  
Waypoint**

The GL50 Flight Plan function has been design to load flight plans formatted for Flight Simulator.

A number of Flight Planning Tools are now compatible with this format and might have waypoint information different than the standard Flight Simulator Navaid database.

If a waypoint in the Flight Plan is not exactly recognized in the GL50 database, it is then loaded as a “user” waypoint with the Latitude and Longitude stored in the flight plan file.

**GPSS:  
drives  
the  
Autopilot**

When a Flight Plan is active in the memory of the GL50 GPS, the units sends Course To Stear information to the Autopilot. The feature is called: GPSS or GPS Steering. The complete Flight Plan can be flown using this feature. The Heading information is computed according to the current Track, Speed, Distance to the TO waypoint, Track Angle Error and Magnetic Variation.

A safety feature disables the GPSS if the airplane is below 500 ft AGL (Above Ground Level).

**Cross Wind and GPSS**

The GPSS feature of the GL50 GPS has been certified to correctly provide steering information to the Autopilot up to the actual cross wind limitations of the airplane in use.

**Turn Anticipation**

The GPSS will provide information to the Autopilot to smoothly transition from one flight plan leg to the next. Turns are anticipated according to your current ground speed, distance to the TO waypoint, angle from the current leg to the next leg. In case of cross wind, the turn anticipation might not be totally accurate.

Turns are made at 3 degrees per second if the ground speed is under 250 knots, or 1.5 degrees per second if the ground speed is greater than 250 knots.



## Activate the GPSS

The process of activating the GPSS is as easy as to activate a Flight Plan in the GL50.

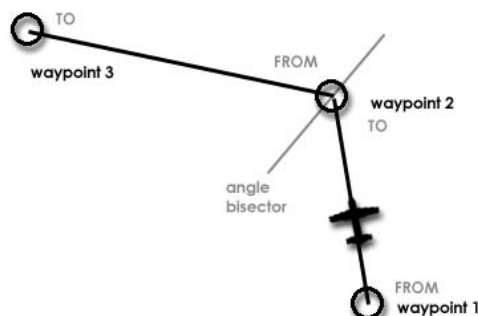


1. Activate a Flight Plan in the GPS as described above.
2. Arm the **GPS / NAV switch** of your airplane to GPS as illustrated (the switch could be located elsewhere for you airplane. Check your current airplane documentation to find where the GPS / NAV switch is located)
3. Arm the Autopilot and the Nav or Heading mode (the default installation configures the GPSS to be linked to the Flight Simulator NAV autopilot mode)



## Flight Plan Sequencing

When a Flight Plan is active in the memory of the GL50 GPS, the legs are automatically sequenced from one leg to the next as you fly past each waypoint. A line that evenly divides (bisects) the angle between the two legs determines when the flight plan sequences to the next leg.



## Direct-To Function

The GL50 GPS has a powerful feature called **Direct-To**. Any time you need to directly fly to a waypoint, set the GPS to drive you to the nearest alternate airport, or need to change your flight plan with last minute ATC vectors, the Direct-To function will help with a few key presses.

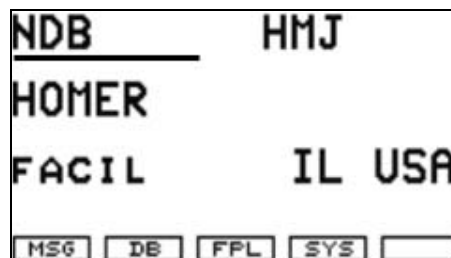
### Using the Direct-To

The Direct-To function can be activated while viewing a waypoint in the **Database**, or while viewing a waypoint in the **Nearest** function. When using the Direct-To function, the GPS current FROM waypoint becomes "DIRECT" (direct) and the current TO waypoint becomes the one selected.

The waypoint shown when pressing the Direct-To key is the currently viewed waypoint.



1. From the **Database** or the **Nearest** function, press the **Direct-To** key to go the waypoint selection screen. You can browse the Database to select another waypoint from the one presented.



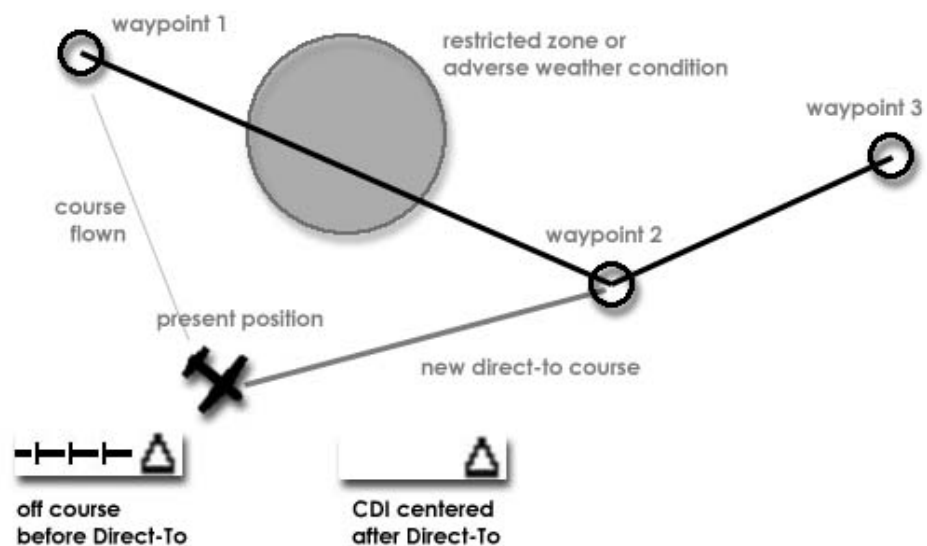
2. Validate the selection with the **Enter** key. The GPS automatically switch to the default Navigation Screen with the selected **TO** waypoint and its associated navigation information.

**Direct-To examples** The following examples provide some of the more common ways to use the powerful Direct-To function.

### Center the CDI

You have changed your course to avoid weather, or comply to ATC. You may need to reset your course to center the CDI.

- DB 1. Press the **DB** key to retrieve your current TO waypoint (you may need to return to the Navigation Page first)
- 2. Press the **Direct-To** key
- ENTER 3. Press the **Enter** key to validate

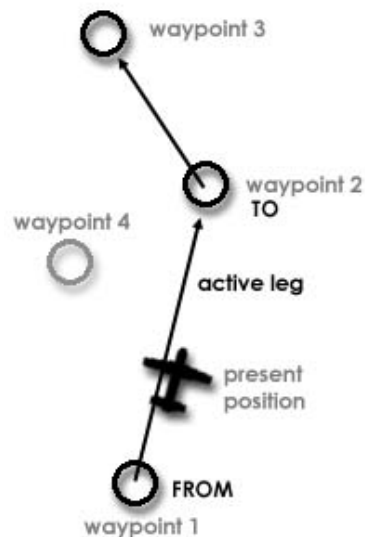


### Insert a new Waypoint into the active Flight Plan

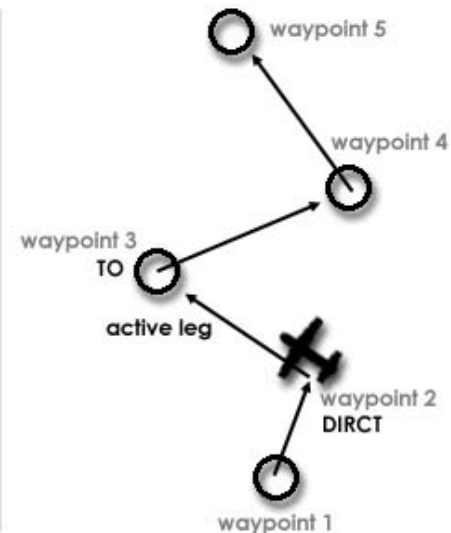
With a Flight Plan active, you may want to divert to a new waypoint but keep your existing flight plan. By using Direct-To, you can add this new waypoint into your existing flight plan.

- DB**
1. While on the active leg of your active flight plan, you need to divert to another waypoint. Press the **DB** or **Nearest**.
- 
2. Press the **Direct-To** key and select the new waypoint you want to add in your flight plan.
- ENTER**
3. Press the Enter key to validate. Your active flight plan will include the new waypoint. Note that the stored flight plan on your hard drive is not modified.

**Before adding a Direct-To waypoint**



**After adding a Direct-To waypoint**

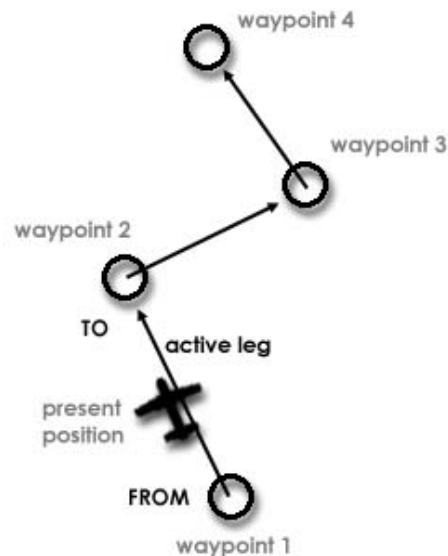


### Bypass a leg in the active Flight Plan

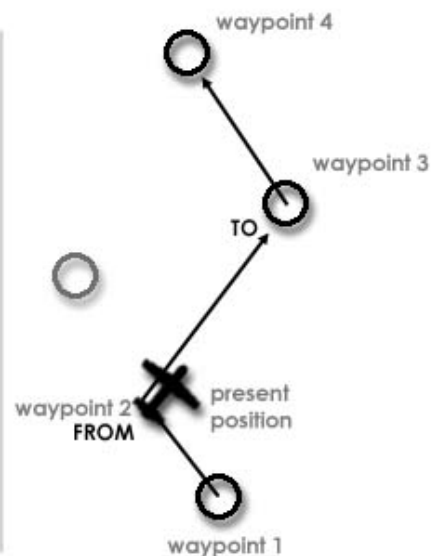
With a Flight Plan active, you may want to cut a few legs to fly direct to another waypoint. By using Direct-To, you shorten your active flight plan.

- DB**
4. While on the active leg of your active flight plan, you want to shorten the flight. Press the **DB** or **Nearest**.
- 
5. Press the **Direct-To** key and select the waypoint you want to fly direct to in your active flight plan.
- ENTER**
6. Press the Enter key to validate. Your active flight plan will reflect the new path. Note that the stored flight plan on your hard drive is not modified.

**Before executing  
Direct-To**



**After executing  
Direct-To**

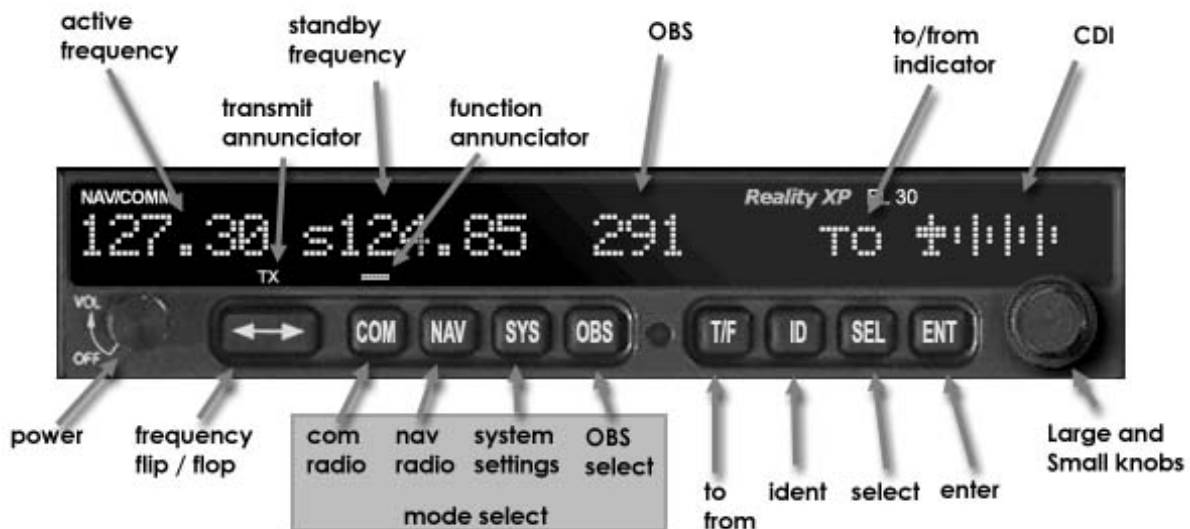


## FL30, the Nav Comm.

The Flight Line FL30 is a state of the art Navigation and Communication unit. With more than 760 channels VHF communications transceiver and 200 channels VOR and Localizer, the unit is a complete solution for beginners and advanced pilots.

### General Information

The FL30 provides workload-reducing functions such as automatic decoding of the Morse Code Station Identifier, most-used frequency storage, built-in CDI and when used with the GPS, automatic frequency transfer from the GPS to the NavComm.



### Display

The FL30 features a single line of 32-characters 5x7 dot matrix alphanumeric display.

A transmit indicator ( TX ) located above the Flip /Flop button lights when the Flight Simulator ATC window is opened.

## Controls Power on / off

The knob on the left side of the FL30 controls power on / off.

If you turn the FL30 off for less than 15 seconds and then back on, it will bypass the initialization process.

When the FL30 is powered off, a unique safety feature tunes the FL30 to the emergency channel (121.50 MHz) and the audio will be turned on, whatever the setting on the FL15M.



## Large and Small knobs

The dual concentric knobs are used to select frequencies, to view the pages of a function or to make changes.



## Flip / Flop

The Flip / Flop key is used to switch between the active and the standby frequency.



## Comm.

The **COM** key is used to select the Comm. Radio Mode. The annunciator will light above the button when the mode is active. Press **COM** again to monitor the standby frequency.



## Nav

The **NAV** key is used to select the Navigation Radio Mode. The annunciator will light above the button when the mode is active. Press **NAV** again to monitor the standby frequency.



## System

The **SYS** key is used to select the System mode. The annunciator will light above the button when the mode is active.



## OBS

The **OBS** key is used to display the current OBS setting and

graphic CDI. If the annunciator above the button lights, you may use the **Large** and **Small** knobs to change the displayed OBS values.

### **To / From**

**T/F**

The **T/F** key is used to toggle between the bearing TO or the radial FROM the active VOR.

### **ID**

**ID**

The **ID** key is used to decode the NAV audio.

### **SEL**

**SEL**

The **SEL** key is used to change values, or access the frequencies stored in memory. Press the **SEL** key again to cancel the selection process.

### **ENT**

**ENT**

The **ENT** key is used to save values, confirm a prompt or save the standby frequency.

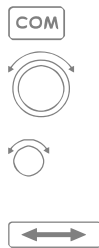


## Comm. Radio Mode

### Basic Operation

#### Selecting a Comm. Frequency

To select a frequency, first edit the standby frequency, then toggle between the standby and the active when needed.



1. Press the **COM** key to activate the Comm. Radio function.
2. Turn the **Large** knob to change the values in 1 MHz increments.
3. Turn the **Small** knob to change the values in 25 KHz increments.
4. Press the **Flip / Flop** key to toggle the standby frequency to the active frequency.

### Advanced Operation

#### Monitoring a Comm. Frequency

The FL30 allows you to listen to the standby frequency while listening to the active frequency. The frequency monitor function is turned off when you flip / flop frequencies, recall a frequency or press the **COM** key again. Monitoring is not canceled by switching to the Nav Mode.

To activate the COM monitor function, press the **COM** key while in COM mode. A small “m” will replace the “s” in front of the standby frequency.

127.30	m124.85	299	1st TO
--------	---------	-----	--------

## Saving a Comm. Frequency

The standby frequency can be saved in the internal memory of the FL30 with a name of up to four characters. The memory can hold up to 250 Comm. and Nav. Frequencies. After 250 frequencies are saved, a “Database Full” message will display. You will have to remove frequencies before any more can be saved.

A frequency type can be saved with the selection. Types available include:

- Tower (TWR)
- Ground control (GND)
- ATIS (ATS)
- Air Traffic Frequency (ATF)
- Approach (APP)
- Arrival (ARR)
- Automated Weather Station (AWS)
- Clearance (CLR)
- Common Traffic Advisory Frequency (CTF)
- Departure Control (DEP)
- Flight Service Station (FSS)
- Remote Flight Service Station (RFS)
- Unicom (UNI)
- Mandatory Frequency (MF)

ENT

1. In Com Mode, press the **ENT** key.

127.30 s124.85 store as ...



2. Turn the **Small** knob to change the character
3. Turn the **Large** knob clockwise to advance the cursor.
4. When the cursor is past the 4<sup>th</sup> character, three underscores will flash at the end of the line



ENT

5. Turn the **Small** knob to choose the type.
6. Press the **ENT** key to validate the selection and the **SEL** key to cancel.

## Removing a Comm. Frequency



1. In Com Mode, press the **SEL** key.
2. Turn the **Large** knob to the user list and the **Small** knob to the desired frequency.

3. Press the **SEL** key.

127.30 121.15 KORD APP Remove?



4. Press the **ENT** key to remove the selection and the **SEL** key to cancel.

## Changing or Replacing a saved Comm. Frequency

You can change or update the frequency of a saved Comm. channel while keeping the same name and type.

1. Note the name and the type of the channel you want to change.
2. set the new frequency in the standby field.
3. Press the **ENT** key to display the “store as” prompt.
4. Turn the **Large** and the **Small** knobs to enter the previously used name and frequency type.
5. Press the **ENT** key to validate the change.

## Recalling a Comm. Frequency

The FL30 provides a convenient feature in storing the frequencies in 5 different categories.

Turn the **Large** knob to cycle the categories. Turn the **Small** knob to list the frequencies within a category. Press the **ENT** key to copy the displayed frequency to the standby frequency. Press the **Flip / Flop** key to copy the displayed frequency to the active frequency.

### Remote Comm. Lists from the GPS

When the FL30 is paired with the GL50, the Remote list is updated when the current TO waypoint of the GPS is updated.

Each remote list begins with a facility identifier such as KORD. A diamond indicates that more channels are available for the displayed facility.

```
127.30 5121.15 KORD 119.00*
```

### Auto list

The last ten used active frequencies are available separately for Nav and Comm. (ten for each). The list begins with the most recent used frequency. Duplicates are not saved again but moved to the top of the list.

A diamond indicates that more channels are available for the displayed list.

```
127.30 5121.15 autolist 127.30*
```

### User Comm. list

The Frequencies that you saved are in this list. This list is sorted alphabetically by name.

### Weather Channels

This feature is not supported within Flight Simulator. The frequencies are displayed but cannot be selected.

### **Emergency Channel**

The standard emergency channel (121.50 MHz) is stored in the memory.

Should you need to quickly set the Com Radio to the Emergency Channel:

1. Press the **SEL** key
2. Turn the **Large** knob **Counter Clockwise** once to display the emergency channel.
3. Press the **Flip / Flop** key to make the channel the active channel.

### **Stuck Mic**

If the microphone is keyed for longer than 35 seconds, the FL30 will return to the receive mode on the selected frequency. A “Stuck Mic” message will display.

The Flight Simulator implementation of the stuck mic feature is to consider the ATC window opened as a keyed mic. If the ATC window is left opened for 35 seconds, the message will alert you and the window will automatically be closed by the FL30.

## Nav Radio Mode

### Basic Operation

#### Selecting a Nav Frequency

To select a frequency, first edit the standby frequency, then toggle between the standby and the active when needed.



5. Press the **NAV** key to activate the Nav Radio function.
6. Turn the **Large** knob to change the values in 1 MHz increments.
7. Turn the **Small** knob to change the values in 25 KHz increments.
8. Press the Flip / Flop key to toggle the standby frequency to the active frequency.

### Advanced Operation

#### Monitoring a Nav Frequency

The FL30 allows you to listen to monitor the standby Nav frequency similar to the Comm. radio. The frequency monitor function is turned off when you flip / flop frequencies, recall a frequency or press the **NAV** key again. Monitoring is not canceled by switching to the Comm. Mode.

To activate the NAV monitor function, press the **NAV** key while in NAV mode. A small “m” will replace the “s” in front of the standby frequency.

110.50 m113.90 (116) TO

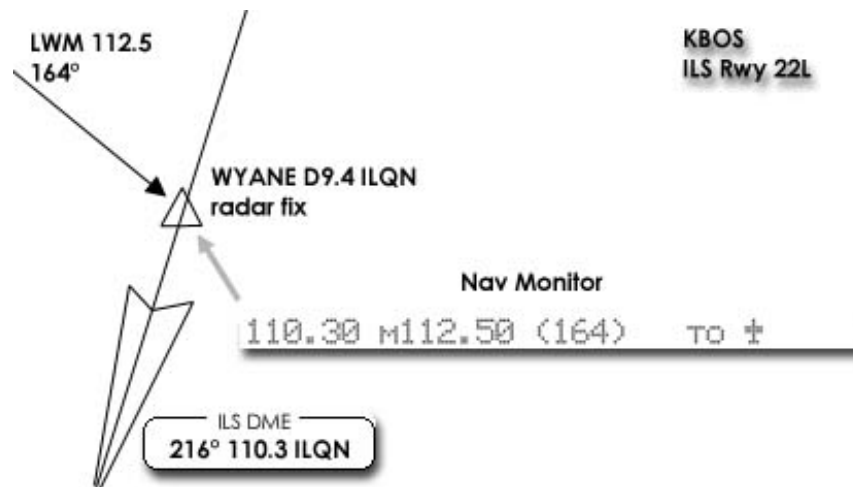
In Nav Monitor, the From radial for the standby frequency is shown in parentheses. This replaces the station identifier, OBS course or VOR / LOC indicator. You cannot monitor a Localizer channel.

If no signal can be tracked on the standby channel, then it will be dashed out: ( --- ).

### Practical example: using the Standby frequency to monitor a fix

You can use the monitor function of the standby channel as if it were a second Nav receiver. This is useful to check for crossing points on final. The following example shows how to monitor the Radar Fix WYANE on the KBOS ILS Rwy 22L at KBOS.

The WYANE radar fix is at the intersection of the course of the ILS ILQN and the Radial 164 of LWM. To monitor the crossing point, set the standby frequency to 112.50 MHz (LWM VOR) to display its radial between parentheses. Set the active frequency to 110.30 MHz (ILQN ILS) and display the CDI to monitor your alignment. When the CDI needle is centered and the value displayed between the parentheses is 164°, you are at the WYANE radar fix.



### Listening to the Audio channel

The Nav audio for the active and the standby channels can be mixed with the Comm. audio output. The audio is toggled between modes using the **ID** key. The annunciator above the button will light while Nav Audio is activated and the audio signal will be mixed with the Comm. audio output.

Press the ID key to start the ID mode. "IDENT" will be displayed for three seconds. The morse code tones over the VOR / LOC will be heard.

Press the ID key again. "VOICE" will be displayed for three seconds. The Morse code tone volume is adjusted to also hear the voice transmission more clearly.

Pressing the ID key again turn the audio and the annunciator off.

The last audio output selection is kept in memory even if the FL30 is powered off. Using this feature, you may leave the audio enabled and then control it by the FL15M audio panel.

### **Automatic Morse Code Decode / Display**

The Morse code identifier will not be available until two messages have been successfully received, which may take from 15 to 60 seconds. The Morse code identifier is decoded correctly at least 99.5% of the time. Poor reception such as the station is far away may delay or inhibit the automatic decode function.

### **Saving a Nav Frequency**

The standby frequency can be saved in the internal memory of the FL30 with a name of up to four characters. The memory can hold up to 250 Comm. and Nav. Frequencies. After 250 frequencies are saved, a "Database Full" message will display. You will have to remove frequencies before any more can be saved.

If the station is a LOC or ILS, additional information can be saved: the Runway Number (01 – 36) and designation (L, C or R).

To save a Nav frequency, proceed like a Comm. frequency. While in Nav mode, press **ENT**, then use the **Small** and **Large** knobs to set the name and the additional information, then **ENT** to save or **SEL** to cancel.



## Removing a Nav Frequency

SEL



SEL

1. In Nav Mode, press the **SEL** key.
2. Turn the **Large** knob to the user list and the **Small** knob to the desired frequency.

3. Press the **SEL** key.

112.50 ±110.30 KB05 22L Remove?

ENT

4. Press the **ENT** key to remove the selection and the **SEL** key to cancel.

## Recalling a Nav Frequency

The FL30 provide a convenient feature in storing the Nav frequencies in 5 different categories.

Turn the **Large** knob to cycle the categories. Turn the **Small** knob to list the frequencies within a category. Press the **ENT** key to copy the displayed frequency to the standby frequency. Press the **Flip / Flop** key to copy the displayed frequency to the active frequency.

## Remote Localizer List from the GPS

When the FL30 is paired with the GL50, the Remote Localizer list is updated when the current TO waypoint of the GPS is updated and the destination airport has runways equipped with LOC or ILS

Each remote list begins with a facility identifier such as KORD. A diamond indicates that more channels are available for the displayed facility.

110.50 ±113.90 KORD 14R 109.75\*

### Remote VOR List from the GPS

When the FL30 is paired with the GL50, the Remote VOR list is updated when the current TO waypoint of the GPS is a VOR

110.50	±113.90	DPA VOR	108.40
--------	---------	---------	--------

### Auto list

The last ten used active frequencies are available separately for Nav and Comm. (ten for each). The list begins with the most recent used frequency. Duplicates are not saved again but moved to the top of the list.

A diamond indicates that more channels are available for the displayed list.

127.30	±121.15	AUTOList	127.30♦
--------	---------	----------	---------

### User Nav list

The Frequencies that you saved are in this list. This list is sorted alphabetically by name.

### DST Data Display (DME)

The FL30 is paired with the Flight Simulator DME sensor. The data computed by the sensor is sent to the FL30 and displayed by the FL30. If the display of Distance – Speed – Time (DST) data is not activated, you will be prompted to show the data when you view the DST selection in the channel recall lists.

113.90	±110.50	11.9K	91K	0:07
--------	---------	-------	-----	------

The displayed information is: Distance in nm, Ground speed in knots, ETE in HH:MM.

### Enable DST Data Display



In Nav mode, press the **SEL** key to access the Nav lists.

Turn the **Large** knob to the DST Data List.

110.50 s113.90 SHOW DME DATA?



Press the **ENT** key to enable the display of DST data.

### Disable DST Data Display



In Nav mode, press the **SEL** key to access the Nav lists.

Turn the **Large** knob to the DST Data List.

113.90 s110.50 REMOVE DME DATA?



Press the **ENT** key to disable the display of DST data. The DST data display may also be deactivated by pressing either the **T/F** key or the **OBS** key.

## OBS Mode

### OBS Operation

OBS mode is used to display the CDI on the right side. The mode provides an OBS course setting readout in the center of the display. To activate the OBS mode, press the **OBS** key. If OBS mode is allowed, the annunciator above the OBS key will light.

To adjust the OBS setting, turn the **Large** knob to adjust the value by tens and turn the **Small** knob to adjust by degrees.

### OBS Direct-To

To navigate Direct-To a VOR, select a VOR frequency in Nav Mode, then press the **OBS** key twice. The CDI will now center in the TO condition.

### OBS Mode Disabled

The OBS mode is not available if the active frequency is a localizer. The CDI scale is automatically adjusted for LOC sensitivity and LOC is displayed in place of the OBS setting value.

### CDI

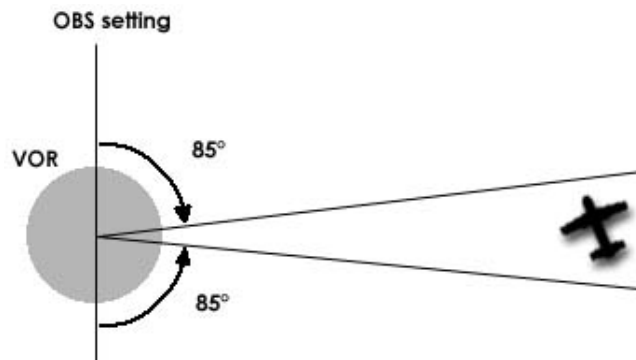
When the FL30 Nav radio is tuned to a VOR station, the OBS mode displays the OBS setting value, and a graphic CDI to its right.

When no signal is received, the CDI graphic is dashed and marked "flagged". If you enable the "Display Ident over OBS" selection in System Mode, the Morse code station identifier will replace the OBS value when the code is decoded.

118.70	5127.30	ORD	to	
--------	---------	-----	----	--

118.70	5127.30	ORD	---FLAGGED---	
--------	---------	-----	---------------	--

The graphic CDI represents an airplane icon at the center, that points up in the TO condition or points down in the FROM condition. When you are on radials that are more than 85° off the OBS course setting, the range defines an area of ambiguity. The airplane icon will be replaced by the “+” symbol if such situation occurs.



#### VOR CDI Scale

The graphic CDI is shown as a bar graph of up to five pairs of short and tall bars right or left of the airplane icon. Fly towards the bars to be on course. When you see only the airplane icon, you are on course.

A pair of a short and a tall bar indicates a 2 degrees deflection. In the following example, the airplane is 9 degrees to the left of the selected radial.

118.70	5127.30	ORD	to	+	
--------	---------	-----	----	---	--

#### LOC CDI Scale

When a LOC is tuned in the NAV radio, the CDI scale is automatically adjusted for more precision. The full scale shows a 2.5 degrees deflection

110.50	5113.90	IJAV	to	+	
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## To / From Radial

The VOR radial display shows the To/From radial computed, as well as the Morse code identifier. If no signal is received, the bearing will be dashed. Until the identifier is decoded, "vor" will be displayed.

113.90 5110.50 vor FROM 269

113.90 5110.50 vor TO 089

To activate the To / From mode, press the T/F key. The current radial TO or FROM the station is displayed. Press the T/F key again to toggle between the Bearing TO and Radial FROM the VOR.

The T/F key is not functional if a localizer frequency is selected on the Nav radio.

## System Mode

When you press the **SYS** key, the annunciator above the key will light and you will reach the configuration adjustment screens of the FL30. The menus provided are:

- System info
- Nav options

While in System mode, to navigate in the menus, turn the **Large** knob and press the **ENT** key to select a menu.

While in a menu, turn the **Large** knob to select a sub-menu, turn the **Small** knob to select an option. Press the **ENT** or the **SYS** keys to exit the System mode.

## System Info

System Info provides information about the Software version.

## Nav Options

### Additional CDI Info

The empty side of the CDI can provide additional information when enabled with this option.

The options available are:

1. **None:** leave the space blank.
2. **To / From:** displays a TO or a FROM indicator.
3. **Numeric:** displays the value of the deviation from 0 to 10° if a VOR station is tuned, from 0 to 2.5° if a LOC station is tuned.

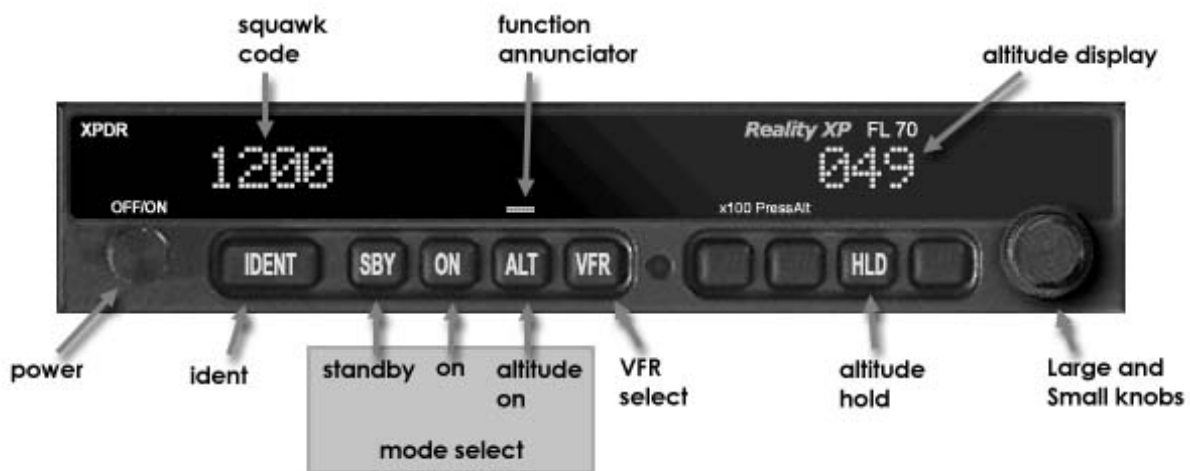
### Display Ident over OBS

If this option is set to NO, then the OBS course will be displayed. If the option is set to YES, then the decoded Morse code identifier will be displayed.

## FL70, the Mode C Transponder (XPDR).

The Flight Line FL70 is a Mode C transponder that includes a squawk code display and selection with a user-friendly operation. Advanced functions are provided with a Barometric Altitude display and Altitude Hold feature.

### General Information



The FL70 display is featured with a four-digit Squawk code, and a Pressure Altitude display. The altitude value resolution is 100 ft.

### Controls

The FL70 features a consistent integration with the Flight Line Avionics series for its operation. Press the key once to activate the selected operation. A LED annunciator above each key will light when that key is pressed.

#### Power on / off

Press the **On/Off** key to turn the transponder power on. Press the key again to turn power Off.

If you turn the FL70 off for less than 15 seconds and then back on, it will bypass the initialization process.

#### Large and Small knobs

The dual concentric knobs are used to select squawk codes and change altitude values. Turn the **Large**





knob to move the cursor and enable the code editing function. Turn the **Small** knob to change values.

### **Ident**

IDENT

Press the **Ident** key once to reply with an identifying squawk code. In Ident mode, the reply LED located above the key will be lighted for 20 seconds.

The Reply LED will also flash when the FL70 generates transponder replies.

### **Standby**

SBY

Press the **Standby** key to place the transponder in standby mode. The FL70 is “on” but no information will be transmitted.

### **Mode A**

ON

Press the **ON** key to place the transponder in Mode A operation. The FL70 is “on” and will transmit its squawk code when interrogated.

### **Mode C**

ALT

Press the **ALT** key to place the transponder in Mode C operation. The FL70 is “on” and will transmit both its squawk code and altitude when interrogated.

### **VFR**

VFR

Press the **VFR** key to set the default VFR squawk code (1200).

Press the **VFR** key a second time to toggle between the VFR squawk code and the previously entered code.

### **Hold**

HOLD

Press the **HOLD** key to enable / disable altitude hold. The LED above the Hold key is lighted when altitude hold is enabled.

## **Select a Squawk Code**

The selected squawk code is always in use. As you change a squawk code, the original code will be sent until you are finished selecting the new code. When changing a code, the display will stop flashing and selection is stopped if the controls are not used for three seconds or more.

The VFR code is automatically set when the FL70 is turned on.

1. Rotate the **Large** knob clockwise one position. The first digit will flash
2. Rotate the **Small** knob to select the first number
3. Rotate the **Large** knob to move the cursor to the next digit and turn the **Small** knob to select the desired number.
4. Repeat step 3 for each of the desired digits.
5. After the last digit is selected, rotate the **Large** knob clockwise one more position. The display will stop flashing and the new code will be sent.

### **Special Squawk Codes**

1200 – Default VFR code in the USA

7500 – Hijacking

7600 – Loss of communications

7700 – Emergency

## Using Altitude Hold

Altitude Hold helps you maintain a constant altitude. The current pressure altitude is stored as a reference and is the displayed value. The Altitude is displayed in 100-foot increments and is the same as is sent for Mode C interrogation replies.

When the **Hold** key is pressed, the altitude display will be set to +000. The altitude display values will increase or decrease as the airplane changes altitude. The altitude display will flash and an audible warning tone will be heard when the airplane change in altitude exceeds the selected threshold.

### Setting the Hold Altitude

HOLD

Press the **HOLD** key to set the current altitude as the hold altitude. The LED above the Hold key will light to indicate that the mode is active.

The altitude display shows a value that is relative to the hold altitude in 100-foot increments. In the following example, you are 200 ft above the hold altitude.

1200	002↑
------	------

### Setting the Hold Altitude Threshold

HOLD

1. Press the **HOLD** key for **two seconds** or longer.
2. Turn the **Small** knob to select a value between 200 and 2500 feet. The value is retained when the FL70 is turned off.
3. Press the **HOLD** key again to save the value.

1200	±03
------	-----

## Product Support

You should read this manual, and the others included with this product from cover to cover before asking for support or help with this product. We have found that over 95% of all product support questions can be answered by reading the manua.

You can visit the Reality XP General Forum for general customer service issues.at:

<http://www.reality-xp.com/community/users.htm>

While anyone may read this support forum, you will need to register in order to post a question or reply with an answer. Support at this forum may be provided by any one of the following individuals:

1. Members of the Development / Publishing Team.
2. Members of the product's beta testing team.
3. Knowledgeable users of the product who know the correct answer.

If you still require help: Product support is available through our online help system. Please visit <http://www.reality-xp.com> for additional support information.

Thank you.