

Revision History

Date	Revision	Description
Sep. 7, 2000	00	Production Release

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FlightMax Charts

Introduction

This part of the Pilot's Guide explains FlightMax Charts.

Topics include:

- *Charts Overview* - presents an overview of the Charts function.
- *Charts Pages and Menus* - explains every page and menu used in Charts
- *How to Use Charts* - explains how to perform specific tasks using Charts.
- *Messages and Error Indications* - provides the meanings of Chart messages and error indications.
- *Menu Tree* - graphically shows the path to any menu in Charts.

FlightMax Charts is verified by the presence of its icon and text label in the Main Menu. If Charts' icon and label, shown in Figure 1, are not present in the Main Menu, contact your installer for assistance.



Figure 1: Charts Icon

Charts Overview

FlightMax Charts is a digitized atlas of VFR and IFR enroute charts. In the United States, VFR charts include Sectionals (1:500,000), WACs (1:1,000,000), and Terminal Area charts (TACs, 1:250,000). U.S. IFR charts include NOAA IFR low altitude and high altitude enroute charts. In other parts of the world, the available charts and scales may differ.

Avidyne employs advanced image processing techniques to convert current versions of paper charts into digital data files for use on the FSD screen. The charts are distributed on CD-ROMs. Chart data from the CD-ROM is placed on the system's hard drive using the system's data loader.

FlightMax Charts is designed to supplement whatever mode of navigation is being used, helping to increase situational awareness. It does this by keeping constant track of your aircraft in relationship to the charts. Using charts, the pilot can easily determine his location with respect to the ground features, obstructions, navaids and airports depicted on the VFR charts. Charts is not a navigation tool. It should be used as a supplement to the navigating tool(s).



WARNING

NOT FOR NAVIGATION - FlightMax Charts is an aid to situational awareness designed to facilitate the use of approved navigational charts, not to replace them. Only charts and Notices to Airmen contain all of the information needed for safe flight and the pilot is responsible for their prudent use. It is a violation of the Federal Aviation Regulations to conduct flight operations without all available information concerning the flight

Charts Pages and Menu

Charts' Data Page: the Moving Map

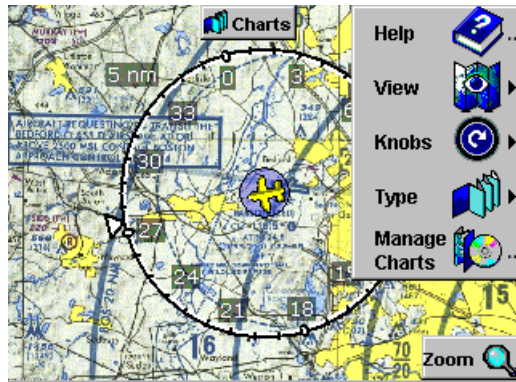


Figure 2: Charts Data Page and Main Menu

Charts' data page (Figure 2) consists of a moving map with an airplane symbol superimposed to indicate your position in relation to the features depicted on the chart.

The default mode places the airplane symbol in the center of the screen with the chart moving beneath the airplane during flight.

Any time position data from the GPS receiver becomes unavailable, Charts removes the airplane symbol from the map, indicating that it has no information by which it can determine your location. The airplane symbol is restored when data is available again. Similarly, any time ground track data is lost, the airplane symbol is changed to a blue circle (the airplane is removed), indicating that position is known but orientation is not.

View Menu

The view menu provides several options for changing and controlling the charts display. The view menu is accessed from Charts main menu.

Tracking

The VIEW→TRACKING menu contains two functions, CENTER and UNTETHERED, that determine the location of the airplane symbol on the display screen.

Center

In this mode, Charts anchors the airplane symbol at the center of the screen. This is the default mode when the system is started and is the most common enroute mode.

Untethered

In this mode, Charts anchors the map and the airplane symbol is in motion on the screen. When the airplane symbol reaches the edge of the display screen, it can continue off it. When used with the SCROLL function the pilot can move the map manually to see an area remotely located from his current position (see Knobs Menu).

Chart Orientation

The VIEW→ORIENTATION menu, provides two orientations for displaying charts.

North Up

Charts can be displayed with north at the top of the screen, similar to looking at a paper chart. The airplane symbol will still point in the direction of its heading.



Figure 3: View Menu



Figure 4: Tracking Menu



Figure 5: Orientation Menu

Track Up

Charts can also be displayed according to your ground track.

If Track Up is selected and track data is not sent by the GPS, the chart will remain in the last previously established orientation. The airplane symbol will be removed to indicate the loss of track information, but the blue circle will remain and the chart will move, indicating receipt of a valid position.

Range Ring

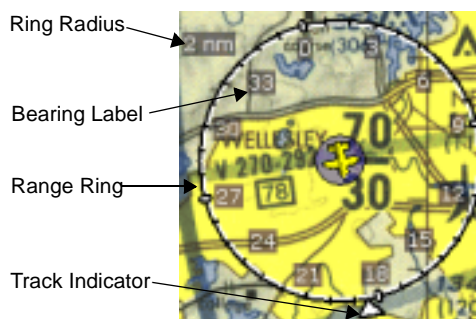


Figure 6: Range Ring

The VIEW—RANGE RING selection enables the display of a range ring on the Charts data page (Figure 6). The range ring is automatically displayed centered on the airplane symbol and uses a range scale based on the current map scale.

The radius of the ring is in nautical miles. Normally the scale of the ring is displayed alongside the upper left edge of the ring. The ring can be used to estimate distances to map features.

The range ring also provides information about the current ground track. The ring has tick marks at ten degree intervals and bearing labels every thirty degrees. It is oriented to magnetic north. A triangular indicator outside of the ring shows your current track.

If the GPS stops reporting position or ground track for any reason, the range ring is removed from the screen.

Flight Plan Overlay



Figure 7: Flight Plan Overlay

The VIEW—FLIGHT PLAN selection enables a flight plan delivered by the GPS to be overlaid on the map (Figure 7). The GPS delivered flight plan consists of magenta lines connecting the individual waypoints, each of which is represented by a small box symbol and the waypoint's name. Waypoints are not differentiated as to type, since that information is not normally supplied by the GPS and is evident from the chart itself. The waypoints are located according to latitude and longitude information passed from the GPS. Some degree of misalignment between overlaid points and airway legs and the underlying chart data is normal, originating mainly from slight errors in the charts themselves.

If the GPS stops sending flight plan information, the flight plan overlay is removed from the screen. No other annunciation is given, and this is not considered an error condition. Flight Plan can be enabled at all times and from run to run of the FSD.

Knobs Menu

The KNOBS menu contains two functions, ZOOM and SCROLL, that determine how the dual concentric knobs can control map presentation.



Figure 8: Knobs Menu

Zoom

The zoom function controls the map scale. The large outer knob is used to zoom in large increments. The small inner knob is used to zoom in small increments. Turning either knob clockwise, zooms out. Turning the knobs counter clockwise, zooms in.

Scroll

The SCROLL function modifies the map's position on the display screen. SCROLL is only available when the map is untethered. The function is disabled (grayed out) otherwise.

Scrolling is useful for viewing a portion of the map that is distant from your current location. The large, outer knob scrolls the map left and right, while the small, inner knob scrolls the map up and down.

When the FSD is shutdown and restarted, Charts remembers and restores the last used map scale.

Chart Type Menu

The TYPE menu is used to select between three different types of charts: VFR charts, IFR low altitude charts or IFR high altitude charts.

Selecting the type of chart from the menu will bring up that chart, provided it was loaded from the CD. If the type chart was not loaded, an error message is displayed indicating that chart is not loaded. When the FSD is shutdown and restarted, Charts remembers and restores the last used map type.

Some VFR charts are two-sided (Sectionals, for example). Each side is scanned separately and treated as though they were separate charts.

At present, Avidyne does not assemble the charts into a single "seamless" viewing area. When the aircraft symbol approaches the edge of a chart, the edge will be visible. Sometimes this edge will contain a white, scanned border. Sometimes it will be black. When the aircraft symbol reaches the edge of the chart, Charts will automatically



Figure 9: Chart Type Menu

switch to the adjacent chart if it is loaded.

Whenever Charts switches from one chart to another, whether because of a type change, scale change, or because the aircraft symbol has flown from one chart over another chart, it announces the name of the new chart in the message bar. This is a local message, so it will not appear if another function is displayed and will automatically be dismissed if you've enabled that feature in SYSTEM→SETUP→SETTINGS.

Manage Charts Configuration Page

Selecting Manage Charts from the Charts main menu will bring up the Manage Charts Configuration Page. This page is used to provide information about the charts loaded on the system and to do customized chart loads.

The MANAGE CHARTS configuration page displays a list of all known charts of the type purchased. The complete list always appears regardless of your particular chart subscription.

<input type="checkbox"/>	Boston Terminal	7.5 MB	5/21/98
<input checked="" type="checkbox"/>	New York North	30.2 MB	12/4/97
<input checked="" type="checkbox"/>	New York South	28.1 MB	12/4/97
<input checked="" type="checkbox"/>	New York Terminal	11.5 MB	
<input checked="" type="checkbox"/>	Wac CF-16 North	22.4 MB	1/29/98
<input checked="" type="checkbox"/>	Wac CF-16 South	22.9 MB	1/29/98
<input type="checkbox"/>	Wac CF-17 North	22.3 MB	8/13/98
<input type="checkbox"/>	Wac CF-17 South	22.9 MB	

Figure 10: Chart Status and Update Selections

For each chart in the set, the system provides status information (Figure 10). Each chart has a single line in the list that contains the following information, from left to right:

- A check box that shows whether or not the chart is currently loaded.
- The name of the chart.
- An estimate of the disk space required to store the chart (to help you optimize your use of your system's overall

disk capacity).

- If the chart is loaded on the system, its expiration date, if any.

The list also contains a special entry, LOAD ALL AVAILABLE CHARTS, that provides a convenient means of loading or updating everything in your subscription, subject to disk space limitations.

Each chart that is currently loaded on the system is indicated by blue shading in the check box and, for charts that expire, the presence of an expiration date in the fourth column of the list.

Red text and a red highlight indicate a chart that has already passed its expiration date.

How to Use Charts

Startup

FlightMax Charts starts automatically as part of the normal initialization sequence of the FSD. To start CHARTS do the following:

1. Select charts from the Main Menu.
Charts Product Identification page will appear.
2. Press Enter to start the charts application.
At startup, Charts re-establishes the chart type, map scale, and other display options that were set during the last usage.
3. Charts, then displays its data page and main menu (Figure 2).

Changing the Displayed Chart Type

1. In Charts' main menu, select TYPE.
2. Select VFR, IFR LOW or IFR HIGH, according to your preference.
3. A message in the center of the screen will appear while the new chart is being loaded. The name of the new chart will remain in the message bar.

Changing the Chart's Scale

1. If you have been scrolling the map, select KNOBS→ZOOM in Charts' main menu.
2. Use the outer knob for large scale changes.
3. Use the inner knob for small scale changes.
4. Changing the map scale may cause a new chart to be displayed. If so, its name will be shown in the message bar.

Scrolling the Chart

1. The chart must be untethered (disconnected from the aircraft's position) before it can be scrolled. Select VIEW→TRACKING→UNTETHERED.

2. Select KNOBS→SCROLL.
3. Use the knobs to scroll the chart.
4. Changing the tracking mode back to CENTER cancels the scrolling function.

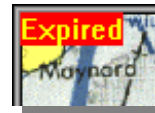
Changing the Tracking Mode

1. In Chart's main menu, select VIEW→TRACKING.
2. Select CENTER for the airplane symbol to remain centered with the chart moving beneath it.
3. Select UNTETHERED for the chart to remain stationary with the aircraft symbol moving upon it.

Updating Chart Data

Chart Updates

Aviation charts expire on different schedules depending on their type. If a particular chart is expired, an EXPIRED flag is automatically posted in the upper left-hand corner of the display screen. The pilot can also manually review the status of any chart by using MANAGE CHARTS.



New chart data files are prepared each time new charts are released. Chart data is provided on a separate CD-ROM and should be kept current. Updates are available either singly or by subscription directly from Avidyne. Please contact Avidyne (1-800-AVIDYNE) for details on these services.

Loading Charts

To load the latest chart data, an update CD-ROM must be inserted into a data loader at system startup. Avidyne's chart CD's contain a fast loader program that quickly loads charts data onto the system. If a particular Chart data file is already loaded on your system and the data loader finds that file on its update CD-ROM, it will automatically update the file on the FlightMax hard drive.

The data loader will not add files that are not already loaded. Adding a new charts data set can only be done

through MANAGE CHARTS.

To update charts do the following:

1. Insert the update CD-ROM into the data loader immediately after applying power to the system (you have approximately 30 seconds).
2. A confirmation page will appear asking you if you wish to continue with the update. Select "yes" .
3. The FlightMax will detect the CD and automatically load the data. Because the load occurs before all of the software options are started, it is much faster than using MANAGE CHARTS.

Using MANAGE CHARTS



CAUTION

The MANAGE CHARTS function should never be used as the "normal way" of loading update charts. Avidyne has incorporated several fail-safe features within MANAGE CHARTS to prevent accidental erasure of charts. However, the risk of accidentally deleting a chart increases while working within MANAGE CHARTS.

The primary purpose of the MANAGE CHARTS function is to add a new chart set to the system and to replace charts that may have been accidently deleted.

MANAGE CHARTS can perform three different tasks: load charts, remove charts and update expired charts. The type of charts (VFR, IFR high altitude or IFR low altitude) must be selected by means of the TYPE menu prior to entering MANAGE CHARTS.

Load All Available Charts

Checking the load all Available Charts, check box will load the entire CD. This is the fastest way to load all charts.

All checks and X's that are manually entered are obeyed. When loading several CD's some CD's may be skipped and the system will not keep track of disk space.

Individual Chart-by-chart Update

To update individual charts use the dual concentric knobs to indicate what operation needs to be performed on that chart.

Leaving the check box empty indicates no change to that chart.

Placing a check in the check box indicates that chart is to be updated.

NOTE: Manage charts assumes all expired charts will be updated. If you do not want to update a specific expired chart, remove the check from that box.

Placing an X in the check box indicates that the chart is to be deleted.

Manage Charts keeps track of the number of expired charts and the number that need to be loaded. This is displayed at the bottom of the Manage Charts page.

Selecting Enter

Selecting Enter will execute all operations that have been requested. After enter is pressed the system executes a three step process:

1. All the CD's needed to accomplish the requests are loaded. The system will verify that the CD's are compatible with the requests.
2. All requested deletions are accomplished
3. All loads and updates are performed and verified.

During the loading process, the system provides a status by displaying a progress bar. As loading progresses, the bar fills from left to right, indicating in rough terms what portion of the data has been loaded.

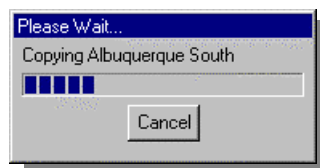


Figure 11: Chart Loading Progress Bar

The progress bar also permits you to cancel the operation by selecting Escape. If you do so, previously executed deletes and loads will remain in effect and the chart currently being loaded will be deleted.



CAUTION

All chart loading operations, especially LOAD ALL AVAILABLE CHARTS are lengthy. If necessary, abort the operation by means of the Escape key. Never turn off the FlightMax during a chart loading operation.

Updating a Chart Set

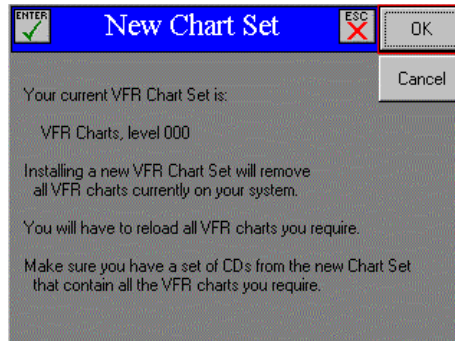


Figure 12: New Chart Set Confirmation Page

Charts maintains common information that describes the charts of a given type in a file called a chart set. To accommodate changes in the chart distribution system (for example, creation of new terminal area charts), new chart sets can be installed when they become available.

If this becomes necessary, you will receive a notice with your chart data update indicating that you must install the new chart set before you can use the data. Then, and only then, you should load the CD-ROM with the new data into the drive and select NEW CHART SET.

After confirming your intentions (Figure 12), the system will install the new file, changing the definitions of all charts of that type.

**CAUTION**

Adding a new chart set causes all charts of the active type to be deleted. If you do not have new CD-ROMs for the minimum set of charts of the active type that you need on the system, do not proceed with the operation. You will be unable to use any new charts of this type until you can load all that you need. You will be unable to load and use previously distributed chart data with the newly installed chart set.

Messages and Error Indications

FlightMax Charts requires that the on-board GPS be operational. The GPS must always send current location and ground track data.

The following is a list of messages and possible error indications while in charts:

Table 1: Mode and Error Indications

Error Indication	Meaning
Loss of airplane symbol and the range ring from the display screen.	GPS location is lost. The loss of the GPS will be displayed in the message bar and message center.
Loss of airplane symbol and the range ring from the display screen but the blue circle remains.	Ground track is lost. The map remains at the last valid orientation.
The flight plan overlay is removed.	The GPS has stopped sending flight plan data.
Delay while loading Charts.	This is normal. Sometimes it takes a significant amount of time when Charts must load new data to display a new chart or change the map scale.
Blank screen and message indicating not chart.	You've flown into an area for which there is no chart.

NOTE: never make any assumptions about your location from a map displayed without the airplane symbol, even if the map appears to move as you fly.

Menu Tree

The following Menu Tree graphically depicts the paths to all the Chart menus.

