

# AirMap® 600c

## Handheld Mapping GPS Receiver

### Operation Instructions

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**WARNING!**

**A CAREFUL NAVIGATOR NEVER RELIES ON ONLY ONE METHOD TO OBTAIN POSITION INFORMATION.**

**CAUTION**

*When showing navigation data to a position (waypoint), a GPS unit will show the shortest, most direct path to the waypoint. It provides navigation data to the waypoint regardless of obstructions. Therefore, the prudent navigator will not only take advantage of all available navigation tools when traveling to a waypoint, but will also visually check to make sure a clear, safe path to the waypoint is always available.*

**WARNING!**

**When a GPS unit is used in a vehicle, the vehicle operator is solely responsible for operating the vehicle in a safe manner. Vehicle operators must maintain full surveillance of all pertinent driving, boating or flying conditions at all times. An accident or collision resulting in damage to property, personal injury or death could occur if the operator of a GPS-equipped vehicle fails to pay full attention to travel conditions and vehicle operation while the vehicle is in motion.**

# Notes



# Section 1: Read Me First!

## *How this manual can get you flying, fast!*

Welcome to the exciting world of GPS! We know you're anxious to take off and begin navigating, but we have a favor to ask. Before you grab the batteries and head for the plane, please give us a moment or two to show you how to skip around our manual for the information you need. (Tips start on page 2.) We want to help you get the best performance from this versatile little GPS unit — in the air, on the ground and on the sea!

Before we go any further, we want to thank you for buying an AirMap® 600. Whether you're a first time GPS user or a professional navigator, you'll find that the AirMap 600 includes a complete set of powerful aeronautical mapping and navigation features, yet is easy to use. How easy? **Well, if you've already figured out how to load the card and batteries yourself, and you just *can't* wait any longer, turn to the Quick Reference on page 40 and head outside with your AirMap! You can be practicing touch-and-goes at a nearby airport in only 12 steps.**

Not in *that* big of a hurry? Good, because we *really* recommend you practice a bit before taking your AirMap aloft. The AirMap 600 is a true pocket-sized GPS+WAAS receiver, but its slim silhouette is crammed with lots of extra features and value. You don't need to learn them all right away, but a little practice on the ground *will* help you become familiar with AirMap's capabilities — and make you a safer pilot. Flying, of course, is why you bought an AirMap, but it's like having three different GPS receivers in one. Here are the other two reasons why.

Need business or pleasure travel directions or phone numbers after landing? You don't need another GPS — when you leave the cockpit, just slip your AirMap in to pocket or purse and take advantage of the fully-functional Land Navigation Mode. With your own custom-built MapCreate™ 6 map, your AirMap can use a massive *searchable* Point of Interest database of businesses and attractions to lead you to your final destination. (Land Mode Operation is described in Section 4; Searching is covered in Section 6.)

And AirMap performance doesn't stop at the water's edge. If your destination is a boating or fishing adventure, your AirMap will help you safely navigate the Great Lakes and coastal U.S. waters with our 70,000 item database of marine navigation aids, wrecks and obstructions. (This also requires a MapCreate map; functions are discussed in Section 4. The MapCreate manual has an Easy Mode Quick Reference of its own; it'll help you make a map in just 6 steps.)

Whether your AirMap 600 is the only GPS in the cockpit or backing up an in-panel display, you're using the most versatile and most affordable hand-held GPS receiver in the aviation market today.

Our goal for this book is to get you in the air (or out on the road) fast, with a minimum of fuss. Like you, we'd rather spend more time flying, and less time reading the manual!

So, we designed our book so that you *don't* have to read the *whole thing* from front to back for the information you want. At the start (or end) of each segment, we'll tell you what content is coming up next. If it's a concept you're already familiar with, we'll show you how and where to skip ahead for the next important topic.

You may be the button-pushing type who just likes to play with the GPS first, before peeking inside the manual. That's fine, because AirMap menus have a pop-up Help feature that will answer many of your questions. If this is your learning style, turn to the installation instructions in Section 2, then step outdoors with your unit. When you come to a menu command you want to learn more about, jut turn to the Table of Contents or the Index and look it up.

The manual is organized into six sections. If you're new to GPS, prefer a tutorial approach to learning or just want to explore more of the awesome features in your AirMap, we suggest you skim some of these sections more closely.

This first section is an introduction to AirMap, GPS and WAAS. It tells you the basics you need to know before you can make AirMap look around and tell you where you are.

Section 2, *Installation*, will help you get the batteries and MultiMedia Card (MMC) correctly installed in your AirMap. (The card contains the Jeppesen® Americas and Lowrance Obstructions aeronautical databases.) We'll also show you how to install the mounting bracket on a yoke and the remote active antenna in an aircraft window or on top of the instrument panel.

Section 3 is really the heart of our book, *Aviation Mode Operation*. It will introduce you to the *basic* airborne GPS functions. This section includes the one-page Aviation Mode Quick Reference we mentioned earlier. The rest of Section 3 contains short, easy-to-scan lessons that follow one another in chronological order. They're all you'll need to know to get in the air quickly.

Aviation Mode instructions are only 40 pages long, and these lessons will meet the navigation needs of many pilots. But, after you've learned

the basics (or if you already have some GPS experience), you may want to try out some of AirMap's many advanced features. That brings us to Section Four, *Land Mode Operation*, which also includes its own one-page quick reference. After we introduce the Land Mode menus and submenus, the rest of the section contains AirMap's more advanced command functions.

Your AirMap is ready to use right out of the box, but you can fine tune and customize its operation with dozens of options. We describe how to use them in Section 5, *System Setup and GPS Setup Options*. This section covers both Aviation Mode and Land Mode options.

Finally, in Section 6, we go into more detail on one of AirMap's most remarkable capabilities — Searching. We'll introduce a couple of search examples in both the Aviation and Land mode sections, but there are so many map and aeronautical items you can search for, we had to give this function its own section in the manual! For example, we mentioned telephone numbers earlier. Your AirMap can function as a virtual Yellow Pages, and we'll show you how in Section 6.

Now, if you're into the fine details, glance over the next segment on specifications to see just how much GPS power you hold in your hand. It's important to *us* (and our power users), but, if *you* don't care how many waypoints AirMap can store or how long the batteries last, skip ahead to important information on how AirMap works, on page 5.

## Capabilities and Specifications

- Display:** .....2.83" (7.2 cm) diagonal. TFT, Quarter VGA (256 colors).
- Resolution:** .....320V pixel x 240H pixel resolution; 76,800 total pixels.
- Backlighting:** .....White LED screen backlighting for night and low-light viewing.
- Input power:**.....3 volts DC (two 1.5v AA batteries); operates up to 12 hours on batteries when using one-second position updates (longer update rates and optional power saving settings further extend battery life, but will reduce GPS accuracy). Cigarette lighter power adapter included.
- Case size:** .....5.6" H x 2.5" W x 1.2" D (142 x 65 x 30 mm); water resistant to IPX-7 standards.

- Weight:** .....8.7 ounces (246.6 grams) with batteries.
- Receiver:**.....Internal, 16 parallel channel GPS+WAAS; advanced active remote external antenna included.
- Recording:**.....Removable MMC or SD memory cards for recording GPS trip details, displaying custom maps, upgrading operating system software and transferring trip data to personal computer without a slow serial connection. USB card reader included with unit.
- MMC slots:**.....One, inside battery compartment. Accepts non-proprietary MMC or SD memory cards.
- Aeronautical map:**.....Jeppesen® Americas database with airports, VORs, NDBs, intersections and airspaces (including Class D). Lowrance Obstructions database displays ground obstructions in AGL or MSL heights.
- Background map:**.....Built-in custom, detailed Lowrance map. Contains: low-detail maps of the whole world (containing cities, major lakes, major rivers, political boundaries); and medium-detail maps of the United States (containing all incorporated cities; Interstate, U.S. and state highways; Interstate highway exits and exit services information; large- and medium-sized lakes and streams.)
- Custom mapping:**.....Accepts custom, higher-detail MapCreate™ 6 mapping on memory cards, with searchable Points-of Interest database of hotels, restaurants, shopping, services and more. NauticPath™ USA, Fishing Hot Spots® Elite, LakeMaster® ProMaps, Navionics® charts are optional.
- Mapping memory:** .....Up to 2 GB on one MMC (MultiMedia Card) or SD (Secure Digital Card.)
- Position updates:**.....Every one second.
- Position points:**.....1,000 waypoints; 1,000 event marker icons.
- Graphic symbols for waypoints or event marker icons:**.....63.
- Routes:** .....100; up to 100 waypoints per route.

- Plot Trails:**..... 100 savable; up to 9,999 points in a single trail.
- Nearest Airport:**..... Quickly locates an airfield closest to your current position. (Aviation Mode only.)
- Man Overboard:**..... MOB feature precisely marks man overboard location with special icon, then automatically displays navigation data to that position. (Land Mode only.)
- Com Port:**..... One serial communications port, NMEA 0183 version 2.0 compatible. Allows exchange of position data with another device, such as an autopilot or personal computer. Optional combination serial/power cable available.
- Zoom range:** ..... 39 ranges; 0.02 to 4,000 miles.

**NOTE:**

The above memory capacities refer only to AirMap's on-board memory. The amount of GPS data you can record and save for recall later is only limited by the number of MMC cards you carry with you.

**How AirMap Works**

You'll navigate faster and easier if you understand how AirMap scans the sky to tell you where you are on the earth — and, where you're going. (But if you already have a working understanding of GPS receivers and the GPS navigation system, skip on ahead to Section 2, *Installation & Accessories* on page 11. If you're new to GPS, read on, and you can later impress your friends with your new-found knowledge.)

First, think of your AirMap as a small but powerful computer. (But don't worry — we made AirMap so easy to use, you don't need to be a computer expert to find your way!) The unit includes a keypad and a screen with menus so you can tell AirMap what to do. The screen also lets AirMap show your location on a moving map, as well as point the way to your destination.

This pocket-sized computer also contains an antenna and specialized scanning receiver, something like your car radio. But instead of your favorite dance tunes or VOR signals, this receiver tunes in to a couple of dozen GPS satellites circling the earth. (WAAS satellites, too, but more about them later.)

AirMap listens to signals from as many satellites as it can "see" above the horizon, eliminates the weakest signals, then computes its location in relation to those satellites. Once the AirMap figures its latitude and

longitude, it plots that position on the map shown on the screen. While the screen is updated once a second the internal calculations are done several times a second.

The performance doesn't stop there. Stored in the permanent memory of each AirMap is a basic background map of the *entire* world. (For just what's in the map, see the preceding segment on specifications.) We lock it in here at the factory — you can't change or erase this map.

The background map, along with the Jeppesen and Lowrance aeronautical databases, are all you need for aerial navigation. (Your unit reads these databases automatically from the MMC card included in the package.)

The background map is also suitable for many land and marine navigation chores, but for maximum surface accuracy and much more detail, you need a custom map from MapCreate 6. Some AirMap features — such as searching for businesses and addresses — won't work without a custom MapCreate Map. There is so much detail in our background map (and even more in MapCreate) that we'll compare their contents and differences in Section 3, *Aviation Mode Operation*.

Another portion of AirMap's onboard memory is devoted to *recording* GPS navigation information, which includes waypoints, event marker icons, trails and routes. This lets you plan a route for a flight or look back the way you came. Think of this data storage like the hard drive memory in a computer. You can save several different GPS data files, erase 'em and record new ones, over and over and over again. Like any computer file, these **GPS Data Files** (file format \*.usr) can be shared between AirMaps, other Lowrance GPS or sonar/GPS units, even personal computers.

AirMap has one more thing in common with a personal computer. Just as computers have a floppy disk drive for storing and exchanging files, AirMap has a slot for an MMC (MultiMedia Card) or SD card (Secure Digital Card) flash memory card. These solid-state memory devices are about the size of a postage stamp, but can hold data ranging from 8 MB to 1 GB in size. (Compare that to a floppy disk's 1.44 MB capacity!) AirMap uses all that MMC space for two key purposes.

First, you can backup your onboard GPS Data Files by copying them to the MMC. Since the MMC is removable (like a floppy disk or a video tape), you can store these GPS Data Files on a personal computer equipped with an MMC card reader. (Or store them on a pocketful of MMCs, if you don't have a computer handy.) Our MapCreate mapping software can save, edit or create its own GPS Data Files, which can be copied to the MMC and then loaded from the MMC into AirMap's memory. (**NOTE:** No matter where they come from, GPS Data Files

*must* be loaded from the MMC into memory before AirMap can use them.)

As we mentioned earlier, the other key use for MMCs is storage of the aeronautical databases and high-detail maps from MapCreate. These **Custom Map Files** (file format \*.lcm) can also be shared between AirMaps, other Lowrance GPS or sonar/GPS units and personal computers.

You make your own Custom Map Files with our MapCreate software, but you don't have to. We also sell ready-to-use FreedomMaps™. These custom maps are pre-loaded on MMCs. (No computer work required!).

## **Introduction to GPS and WAAS**

Well, now you know the basics of how AirMap does its work. You might be ready to jump ahead to Section 2, *Installation & Accessories*, on page 11, so you can install the batteries. Or you might want to see how our text formatting makes the manual tutorials easy to skim. If that's the case, move on to "How to Use This Manual" on page 9. But, if you want to understand the current state of satellite navigation, look over this segment describing how GPS and its new companion WAAS work together to get you where you're going.

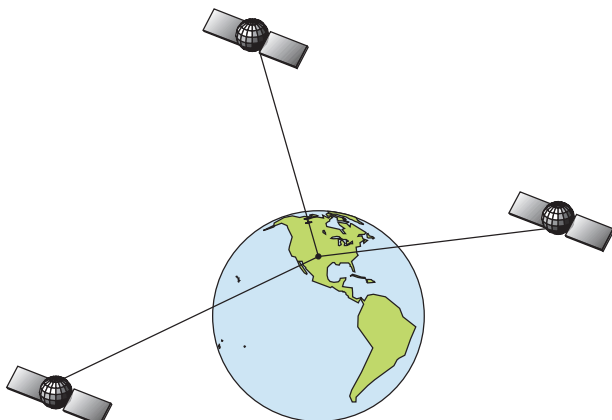
First of all, why are pilots so excited about GPS navigation? GPS is more accurate than other nav aids, such as VOR and NDB. GPS is free of environmental limitations that affect other navigation systems and it's available worldwide. GPS receivers like your AirMap are highly affordable, easy to use and not confined to your cockpit! GPS frees a pilot to accurately navigate to or from virtually any map place on earth — navigation is no longer limited to the aeronautical nav aid network. With a mapping GPS, a pilot always knows exactly where he is. A GPS receiver makes it easier for a pilot to apply wind correction angles and fly true headings, as well as determine true ground speed.

The Global Positioning System (GPS) was launched July 17, 1995 by the United States Department of Defense. It was designed as a 24-hour-a-day, 365-days-a-year, all weather global navigation system for the armed forces of the U.S. and its allies. Civilian use was also available at first, but it was less accurate because the military scrambled the signal somewhat, using a process called Selective Availability (SA).

GPS proved so useful for civilian navigation that the federal government discontinued SA on May 2, 2000, after the military developed other methods to deny GPS service to enemy forces. Reliable accuracy for civilian users jumped from 100 meters (330 feet) under SA to the present level of 10 to 20 meters (about 30 to 60 feet).

Twenty-four satellites orbit 10,900 nautical miles above the Earth,

passing overhead twice daily. A series of ground stations (with precisely surveyed locations) controls the satellites and monitors their exact locations in the sky. Each satellite broadcasts a low-power signal that identifies the satellite and its position above the earth. Three of these satellites are spares, unused until needed. The rest virtually guarantee that at least four satellites are in view nearly anywhere on Earth at all times.



**A minimum of three satellites are required to determine a 2D fix.**

The system requires signal reception from three satellites in order to determine a position. This is called a 2D fix. It takes four satellites to determine both position and elevation (your height above sea level — also called altitude). This is called a 3D fix.

Remember, the unit must have a clear view of the satellites in order to receive their signals. Unlike radio or television signals, GPS works at very high frequencies. These signals can be easily blocked by trees, buildings, an automobile roof, a wing, even your body.

Like most GPS receivers, AirMap doesn't have a compass or any other navigation aid built inside. It relies solely on the signals from the satellites to calculate a position. Speed, direction of travel, and distance are all calculated from position information. Therefore, in order for AirMap to determine direction of travel, you must be moving and the faster, the better. This is not to say that it won't work at walking or boat trolling speeds — it will. There will simply be more "wandering" of the data shown on the display.

GPS is plenty accurate for route navigation, but the U.S. Federal Aviation Administration has special needs for aircraft traffic control that go beyond basic GPS. The FAA has a plan under way to boost GPS performance even further with its Wide Area Augmentation System, or



WAAS. This GPS add-on will include a time control element that will help airliners fly closer together while avoiding collisions. In addition to carefully spacing airplanes along travel corridors, WAAS will eventually make instrument landings and takeoffs more accurate as it replaces existing aviation navigation systems.

WAAS signals make your GPS navigation even more accurate. Your AirMap automatically receives both GPS and WAAS signals. However, WAAS has some limits you should know about.

First, the U.S. government has not completed construction of the WAAS system, so it is not yet fully operational. The ground stations are in place, but only a few of the needed WAAS satellites have been launched.

WAAS *can* boost the accuracy of land and marine GPS navigation, but the system is designed for aircraft. The satellites are in a fixed orbit above the Equator, so they appear very low in the sky to someone on the ground in North America. Aircraft and vessels on open water can get consistently good WAAS reception, but terrain, foliage or even large man-made structures frequently block the WAAS signal from ground receivers.

You'll find that using your GPS+WAAS receiver is both easy and amazingly accurate. It's easily the most accurate method of electronic navigation available to the general public today. Remember, however, that this receiver is only a tool. As this manual goes to press, the FAA has not yet certified any hand-held GPS+WAAS receivers for use as the sole navigation aid for VFR pilots. Always have another method of navigation available, such as a sectional chart and your aircraft's magnetic and gyro compasses, or a conventional nav/com radio.

Also remember that this unit will always show navigation information in the shortest line from your present position to an airport, VOR or other waypoint, regardless of obstacles and terrain! It only calculates position, it can't know what's between you and your destination, for example. It's up to you to safely navigate around obstacles and rising terrain, no matter how you're using this product.

## **How to use this manual: topographical conventions**

Many instructions are listed as numbered steps. The keypad and arrow "keystrokes" appear as boldface type. So, if you're in a real hurry (or just need a reminder), you can skim the instructions and pick out what menu command to use by finding the boldface command text. The paragraphs below explain how to interpret the text formatting for those commands and other instructions:

### **Arrow Keys**

The arrow keys control the movement of dotted cross-hair lines on your

mapping screen called the cursor. The arrow keys also help you move around the AirMap menus so you can execute different commands. They are represented by symbols like these, which denote the down arrow key, the up arrow, the left arrow and the right arrow: ↓ ↑ ← →.

## Keyboard

The other keys perform a variety of functions. When the text refers to a key to press, the key is shown in bold, sans serif type. For example, the "Enter/Save" key is shown as **ENT** and the "Menu" key is shown as **MENU**.

## Menu Commands

A menu command or a menu option will appear in small capital letters, in a bold sans serif type like this: **SYSTEM SETUP**. These indicate that you are to select this command or option from a menu or take an action of some kind with the menu item. Text that you may need to enter or file names you need to select are shown in italic type, such as *trail name*.

## Instructions = Menu Sequences

Most functions you perform with AirMap are described as a sequence of keystrokes and selecting menu commands. We've written them in a condensed manner for quick and easy reading.

For example, instructions for deleting all icons from memory would look like this:

1. Press **MENU** | ↓ to **DELETE MY ICONS** | **ENT** | **ENT**.
2. Press ← to **Yes** | **ENT**.
3. Press **EXIT**.

Translated into complete English, step 1 means: "Press the Menu key. Next, press the down arrow key to scroll down the menu and select (highlight) the Delete My Icons menu command. Finally, press the Enter key twice."

Step 2 means: "Press the left arrow key to select Yes, then press Enter."

Step 3 means: "Press the Exit key to clear the menu and return to the Map Page."

## ***Important Keyboard Shortcut Tip:***

There are often three ways to move around an AirMap menu. For simplicity, we've written our instructions using the Enter key (**ENT**) to complete a move from one menu to the next. However, many commands have shortcuts that will help your fingers fly across the keys. Almost every page menu command lets you press ← or → *instead of* **ENT**. This is always true for commands with an ellipsis (**MAP DATA...**) or an arrow (**GPS SETUP ►**). Our menus also "wrap around;" that is, they form a circular loop. This means when you open a menu and need to reach the bottom command, you can get there by pressing ↑ one time *instead of* holding or repeatedly pressing ↓. A cockpit can be a busy place; practice with these shortcuts and you can run AirMap commands faster, with less finger movement from key to key.

# Section 2:

## Installation & Accessories

### Power

The AirMap operates from AA batteries or on 3 volts DC using an optional external power cable with a cigarette lighter adapter. If the power cable is used, the AirMap automatically switches to it if the external power is greater than the battery voltage. If the external power fails, the unit automatically switches to the batteries.

#### NOTE:

Some pilots like to keep fresh batteries in their units, even when using the external power. If the power fails, the unit will automatically switch to the batteries, thus keeping the unit on without interruption.

#### Warning!

**With earlier Lowrance Aviation units, some pilots liked to remove the cigarette lighter plug from the adapter cable and splice the exposed wires directly to their dash consoles. However, the AirMap 600 cigarette lighter adapter contains *in the plug* a voltage regulator to convert 12 volts down to about 3. Without this regulator, connecting your unit to a 12-volt power source will destroy the unit – and this damage will not be covered by your warranty.**

Flash memory and an internal lithium battery will keep your stored data safe and accessible for the life of the product.

### Batteries

The unit requires two, 1.5 volt AA batteries. We recommend that you use alkaline batteries for the best trade-off between battery life and cost. We recommend DURACELL® brand, but other brands will work. If you're looking for an extended-life battery, the Duracell® ULTRA battery has performed well in our tests.

You can also use rechargeable AA alkaline batteries, such as those made by RAYOVAC®, or rechargeable AA nickel metal hydride (NiMH) batteries. We do not recommend nickel cadmium (NiCd) rechargeable batteries because you will get poor battery life.

Rechargeable alkaline batteries will not last as long as standard alkaline batteries. NiMH batteries are rechargeable and should also give you suitable battery life.

Do not mix different battery types. Mixing battery types may cause leakage. (For example, don't use both alkaline and NiMH batteries at the same time, and don't use standard alkalines with rechargeable alkalines.)

### **Battery Installation**

Turn the unit over so that the back is facing you. With your thumb or nail, pull back on the small clip to release the battery cover latch as shown in the following images. Once the latch is released, pull the battery cover up out of the grooves in the bottom of the case.



#### **Remove AirMap battery cover.**

Install the batteries according to the embossed signs in the battery compartment, which shows the correct polarity. Point the positive pole of the upper battery to the left; point the positive pole of the bottom battery to the right.

#### **NOTE:**

Inside the battery compartment is a rotating MMC card lock. The grip on this lock must be turned parallel with the direction of the batteries for them to fit properly.

Replace the battery compartment cover. First align the latch tabs at the bottom of the cover with the slots at the case's base. Press the cover into place, and then firmly push up on the clip at the top of the cover until it latches in place. There is usually an audible click when the latch engages.



**Replace battery compartment cover. Align tabs with slots in the base, left. Press latch firmly until it clicks, as shown right**

## Cigarette Lighter Power Adapter

To use external DC power: Plug the power cable's cigarette lighter adapter into a cigarette lighter receptacle. Next, pull aside the rubber cover on the bottom of the unit and insert the other connector as shown in the following image. A small clip on the connector should hold the connector in place.



**Attach external power cable to iFINDER.**

The iFINDER can use two other optional external cables to supply a NMEA/serial data connection or a combination of power and data. These cables are discussed in the following segment on NMEA connections.

## NMEA Cable Connections

NMEA is a standard communications format for marine electronic equipment. For example, an autopilot can connect to the NMEA interface on this unit and receive positioning information. The unit can exchange information with any device that transmits or receives NMEA 0183 data.

To exchange NMEA data, Lowrance offers an optional data only cable and a power/data combo cable. The NMEA/serial communications cable has a standard female DB-9 connector on one end to attach your unit to a computer's serial communications port.

The other cable combines a cigarette lighter power adapter with a DB-9 plug for a NMEA/serial com port connection to a laptop computer or other device. This is our favorite cable for connecting the AirMap to a laptop computer. By transmitting NMEA data to the computer, you can get live position data for GPS-compatible mapping software.

You can also run one of our free Lowrance GPS emulators on your laptop, and operate it with real-time position information.

To use it, plug the power adapter into a cigarette lighter socket, plug the DB-9 connector into a serial port on the computer and attach the cable to the AirMap. Then see "Com Port Configuration" in Sec. 5.

## MMC or SD Memory Card Installation

Your AirMap uses a MultiMedia Card to store information, such as custom maps, waypoints and other GPS data. The unit can also use Secure Digital Cards (SD cards) to store information.

### NOTE:

Throughout this manual, we will use the term MMC, but just remember that your unit can use an MMC *or* SD card to store data.

Both of these solid-state flash memory devices are about the size of a postage stamp. An SD card is slightly thicker than an MMC. As this manual went to press, MMCs were available in storage capacities of 8 MB, 16 MB, 32 MB, 64 MB and 128 MB. SD cards were available in capacities of 8 MB, 16 MB, 32 MB, 64 MB, 128 MB, 256 MB and up. We have successfully tested SD cards up to 1 GB.

Additional MMC cards are available from LEI Extras; see ordering information inside the back cover of this manual. MMCs and SD cards are also available at many consumer electronics stores.

The MMC slot is located in the battery compartment, beneath the batteries on the right side of the unit. The contact pins are springy, to make it easier to insert and remove the MMC card.

### To remove an MMC

1. Remove battery compartment cover.
2. Remove batteries, if present.
3. Hold unit facedown in right hand. Use your thumb or index finger and press down on the center of the MMC label.



**Remove an MMC Card.**

4. Drag the MMC from the slot into the battery compartment.
5. Turn the AirMap face up and give it a shake to dump the MMC into your hand or onto a work surface.

### To add an MMC or SDC

1. Remove battery compartment cover.
2. Remove batteries, if present.
3. Hold unit facedown in right hand. Drop the MMC card into the slot, label-up, with the notched edge toward the right.
4. Press down on the center of the label and slide the card to the right.



### Add an MMC Card.

5. Turn the plastic rotating card lock until it holds the card firmly in place, with the grip parallel to the direction of the batteries.
6. Replace the batteries and battery cover.

## FreedomMaps™

FreedomMaps are pre-made custom maps that cover multiple states, provinces, countries or other geographic regions on a single memory card. They give you all the features found in our MapCreate™ mapping software, but without the necessity of using a computer. FreedomMaps are available for the United States, Canada and Europe.

Like custom maps built in MapCreate, the custom map on a FreedomMap card contains all of these features: rivers/lakes/tributaries; more than 60,000 critical navigation aids; more than 10,000 wrecks/obstructions in coastal and Great Lakes waters; interstate/federal/state highways; interstate exit services; searchable Points-of-Interest (POI) database including: airports, hotels, restaurants, entertainment, emergency services; rural roads and city streets; cities and towns; railways; key landmarks; searchable street intersections and street addresses; national parks and forests with boundaries; wildlife preserves; and more!

FreedomMaps come to you preloaded on a single 128 or 256 MB memory card. Simply insert the memory card into your Lowrance GPS unit, and you're ready to go.

FreedomMaps are available through LEI-Extras. To order a card (or for a list of the areas available) see the ordering information in the back of this manual.

## External Active Antenna

A GPS antenna requires a clear view of the sky for optimum operation. Inside the cockpit, your AirMap can sometimes maintain satellite lock while sitting on the seat beside you, but we don't recommend this for optimum performance.

Since the "view" is restricted to what can be seen through the window, this operating mode will reduce position accuracy and will increase the chance of losing satellite lock. Inside a plane, the unit operates best with an external antenna mounted on the windshield or dash.

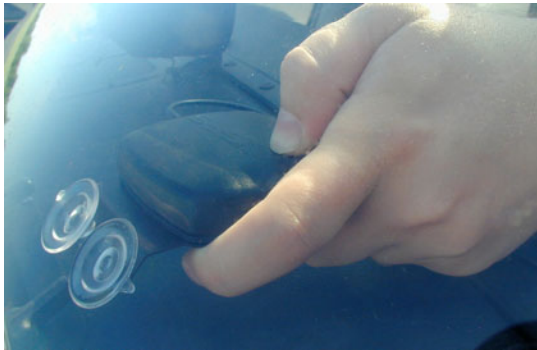


### **Attach AirMap antenna to windshield bracket with two screws.**

You may achieve good results by simply placing the external antenna on the top of the dash, at the base of the windshield. Many pilots like to attach the antenna to the top of their instrument panel glare shields. Depending on the surface, a strip of adhesive Velcro® or a piece of the rubber non-skid shelf liner material available in recreational vehicle supply stores will help hold the antenna in place.

We recommend attaching the antenna to your windshield or other window. For this reason, the remote active antenna packaged with your AirMap includes a suction-cup mount. Be sure to mount the antenna in a location where it will not obstruct *your* view.





**Press suction cup plate firmly against a window with unobstructed view.**

Wherever you mount the antenna, make sure it is in a location with an unobstructed view of the sky. If you're sticking it to a window, moisten the suction cups on the mounting plate and press firmly against the window. Route the cable so that it won't interfere with flying. Then, simply plug the connector into the unit's antenna socket, located on the back, in the upper left corner of the case. The AirMap 600 will automatically switch to use the RAA-3 remote antenna when plugged in.

## **Bracket Mounting System**

A mounting bracket is shipped with your AirMap. The mounting arm and cradle can swivel on a ball for easy viewing in any type of vehicle.

Attach the mounting bracket to the stem of the yoke. Then, tighten the knob at the bracket's base to keep the bracket from sliding around on the yoke stem. Next, angle the arm so that the unit will be held in front of the yoke. When you are satisfied with the bracket position, tighten all the knobs to keep the bracket from shifting.



**Find a good position for the mounting bracket. Then, slide the AirMap into the bracket. (AirMap 500 model shown.)**

# Notes

## Section 3:

# Aviation Operation

This section addresses AirMap's main aviation GPS functions. The principles are the same in both operating modes, so this discussion also serves as a good introduction to Land Mode work.

Before you turn on AirMap and find where you are, it's a good idea to learn about the different keys, the five Page screens and how they all work together. BUT, if you just can't wait to get outside, grab the batteries and turn to the one-page *Quick Reference* on page 40.

### Keypad



**AirMap 600 keypad.**

1. **PWR/LIGHT** (Power & Light) – The PWR key turns the unit on and off and activates the backlight.
2. **PAGES** – Pressing this key switches the unit between the three different page screens in Aviation Mode (Status, Navigation, and Map). Each page represents one of the unit's major modes of operation, and several pages have multiple display options.
3. **MENU** – Press this key to show the menus, which allow you to select or adjust a feature from a list.
4. **ARROW KEYS** – These keys are used to navigate through the menus, make menu selections, move the chart cursor and enter data.
5. **ENT/SAVE** (Enter & Save) – This key allows you to save data, to accept values or to execute menu commands. Also use it to quickly create waypoints or icons.

6. **EXIT** – The Exit key lets you return to the previous screen, clear data or erase a menu.
7. **FIND** **➔** (Direct To) – The Find key launches the AirMap search menus. It also allows you to go Direct To items shown in search lists.
8. **ZOUT** – (Zoom Out) – This key lets you zoom the screen out to see a larger geographic area on the map. Less detail is seen as you zoom out.
9. **ZIN** – (Zoom In) – This key lets you zoom the screen in to see greater detail in a smaller geographic area on the map.

## Power/lights on and off

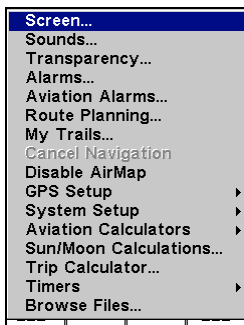
To turn on the unit, press **PWR**. To turn on the backlight, press **PWR** again. Pressing **PWR** once again will turn off the backlight. (Press **EXIT** to clear any message or alarm displays.)

Turn off the unit by pressing and holding the **PWR** key for 3 seconds.

## Main Menu

Aviation Mode has a single Main Menu, which contains some function commands and some setup option commands. The tutorials in this section will deal only with primary functions, the basic commands that make AirMap do something. These lessons are designed for use with the unit's options set at their factory defaults. But, if you want to learn more about the various option settings, see Sec. 5, *System Setup and GPS Setup Options*.

To access the Main Menu from any Page: press **MENU|MENU**. To clear the menu screen and return to the page display, press **EXIT**.



**Main Menu, Aviation Mode.**

The Main Menu commands and their functions are:

**Screen** command: changes the contrast or brightness of the display screen.

**Sounds** command: enables or disables the sounds for key strokes and alarms and sets the alarm style.

**Transparency** command: adjusts the level of transparency of on-screen menus, allowing you to see the map behind them.

**Alarms** command: turns arrival, off course and anchor GPS alarms on or off and changes alarm thresholds.

**Aviation Alarms** command: turns distance, time, near and inside air-space alarms on or off and changes alarm thresholds.

**Route Planning** command: used to plan, view or navigate a route.

**My Trails** command: shows, hides, creates and deletes plot trails. Also used to navigate or backtrack a trail.

**Cancel Navigation** command: turns off the various navigation commands. Used to stop navigating after you have reached your destination navaid, waypoint, Point of Interest or map cursor location; or after you reach the end of a route or trail.

**Disable AirMap** command: turns off Aviation Mode operation and switches to Land Mode. See Sec. 4 for details on Land Mode Operation.

**GPS Setup** command: sets various GPS receiver options and runs the GPS Simulator.

**System Setup** command: sets general configuration options.

**Aviation Calculators** command: controls several aeronautical calculators. These include: E6B flight computer functions (altitude and air speed calculator, wind speed and direction calculator.) and a vertical navigation calculator. alarm clock, up timer and down timer.

**Sun/Moon Calculations** command: finds the rising and setting times of the sun and moon for any location on any day from the year 2000 to 2064. This also shows the moon phase.

**Trip Calculator** command: shows trip status and statistics, such as trip time, distance and average speed.

**Timers** command: controls settings and alarms for an up timer, a down timer and an alarm clock.

**Browse MMC Files** command: this allows you to view the installed MMC card and the files it contains.

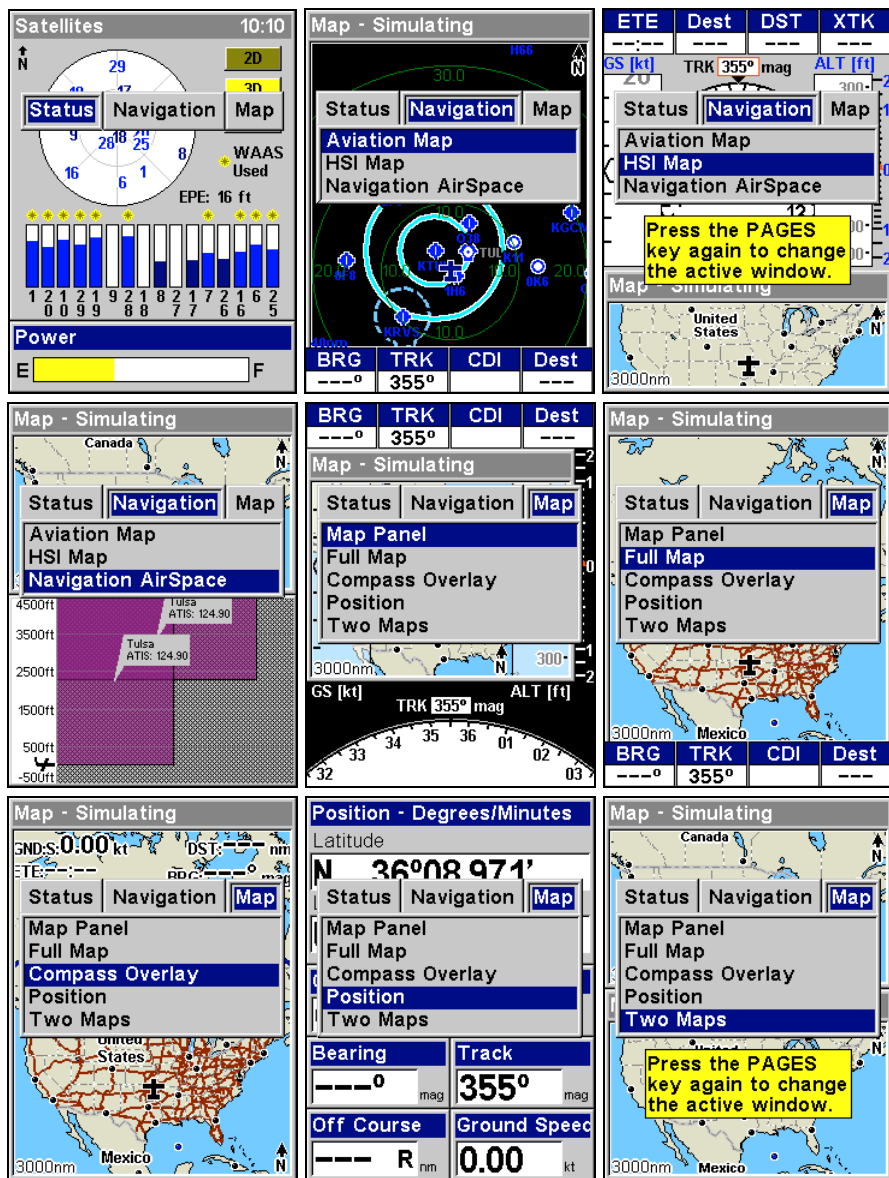
## Pages

Aviation Mode has three main Page displays that represent the three major operating modes. They are the Satellite Status Page, the Navigation Page and the Map Page. They are accessed by pressing the **PAGES** key, which calls up the Pages Menu. You then press the left ← arrow key or the right → arrow key to scroll among the three pages.

The Navigation Page has three display options: Aviation Map, HSI Map and Navigation AirSpace. The Map Page has five display options: Map Panel, Full Map, Compass Overlay, Position and Two Maps. You

access these display options by pressing the **PAGES** key, then the down ↓ arrow or up ↑ arrow keys. To clear the Pages Menu, press **EXIT**.

The following series of nine images shows the Pages Menu and display options on their corresponding screens.



This series of figures shows the Pages Menu for all three main screens and their various display options.

Each of the three main Pages also has a submenu screen associated with it. You access a Page Submenu by pressing the **MENU** key one time while the page is displayed. (Pressing the **MENU** key *twice* takes you to the Main Menu.)

Several pages share similar display features. For example, the Navigation Page's HSI Map and the Map Page's Map Panel option both have a VSI or Vertical Speed Indicator. To reduce redundancy in our text, we will describe some of these duplicate features when discussing the page on which they are most prominent.

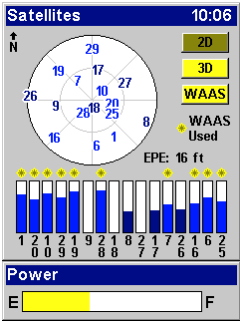
### Satellite Status Page

This Page, shown in the following image, provides detailed information on the status of AirMap's satellite lock-on and position acquisition. To get to the Satellite Status Page: press **PAGES** repeatedly until the page you want appears.

No matter what page you are on, a flashing current position indicator/question mark symbol and flashing GPS data displays indicate that satellite lock has been lost and there is no position confirmed. This page shows you the quality and accuracy of the current satellite lock-on and position calculation.

**WARNING:**

**Do not begin navigating with this unit until the numbers have stopped flashing!**



**Satellite Page shows satellite-lock on with a 3D position acquired (latitude, longitude and altitude) and WAAS corrections. The bottom of the screen shows a battery power indicator with "E" for empty and "F" for full.**

This screen shows a graphical view of the satellites that are in view. Each satellite is shown on the circular chart relative to your position. The point in the center of the chart is directly overhead. The small inner ring represents 45° above the horizon and the large ring represents the horizon. North is at the top of the screen. You can use this to see

which satellites are obstructed by obstacles in your immediate area if you hold the unit facing north.

The GPS receiver is tracking satellites that are in blue type. The receiver hasn't locked onto a satellite if the number is in dark blue, therefore it isn't being used to solve the position.

Beneath the circular graph are the bar graphs, one for each satellite in view. Since the unit has twelve channels, it can dedicate one channel per visible satellite. The taller the bar on the graph, the better the unit is receiving the signals from the satellite.

The EPE, "Estimated Position Error" (horizontal position error) shown in the lower right corner of the screen is the expected error from a benchmark location. In other words, if the EPE shows 50 feet, then the position shown by the unit is estimated to be within 50 feet of the actual location. This also gives you an indicator of the fix quality the unit currently has. The smaller the position error number, the better (and more accurate) the fix is. If the position error flashes dashes, then the unit hasn't locked onto the satellites, and the number shown isn't valid.

The Satellite Status Page has its own menu, which is used for setting various options. (Options and setup are discussed in Sec. 5.) To access the Satellite Status Page Menu, from the Status Page, press **MENU**.

### Navigation Page

To get to the Navigation Page: press **PAGES** then either **→** or **←** to select the page. (Clear the Pages Menu by pressing **EXIT**.)

The Navigation Page has its own menu, which is used for setting various options. (Options and setup are discussed in Sec. 5.) To access the Navigation Page Menu, from the Navigation Page, press **MENU**.

The data boxes on the Aviation Map and HSI Map can be fully customized. You can select from 28 types of navigation information. For customization instructions see the Customize Page Displays topic in Sec. 5, *System and GPS Setup Options*.

The HSI Map combines the main compass display in one window with a map display in another window, plus four data boxes. An amazing amount of information is crammed into this one display. We'll discuss how to move between the two windows at the end of this segment.





Navigation Page, HSI Map display option.

## Navigation Display Options

### Aviation Map display option

The Aviation Map provides a simplified version of the Map Panel as described later (under Map Display Options). The Aviation Map, unlike the general map, shows only Aviation nav aids, against a black background. For more information on the AirMap's moving maps work, read about the various Map Page displays later in this section.

### Navigation AirSpace display option

The Navigation Airspace Page has two windows. The top window (Map Window) shows the relief map overlaid with Jeppesen data and terrain awareness color shading. The bottom window (Profile Window) shows your altitude relative to a 2D cross-section of the terrain under and ahead of you. This window also shows shading for different airspace categories.

**Map Window** - In the Map Window, the cross-hatched line extending from the nose of the aircraft symbol represents your projected track. The area under this projected track is shown in the Profile Window below.

You can use the cursor to view the terrain in other areas on the map. As you move the cursor, the projected track line will swing around, leading the cursor. The 2D display changes according to the selected terrain.

**Profile Window** - In this window, your current position (or cursor position if cursor is up) is always at the left edge of the screen. The terrain ahead of you stretches to the right. The line extending from the aircraft nose is your altitude and vertical speed indicator. In level flight, the altitude line is parallel to the ground. In a climb, the altitude line will swing up. It will swing down when descending. Controlled airspaces are shown in different colors and in the appropriate 2D shapes. Note that vertical speed and altitude information in this display are not as accurate as the position information.

The terrain appears in cross-section at the bottom of the window. The terrain is color coded to indicate the relative elevation below you. Obstacles are represented by a line extending into the air, with a circular callout at the top of the line. The callout shows proximity to your track: an X indicates the obstacle is on your track or within 500 feet of it; an L indicates the obstacle is more than 500 feet to the left of your track, an R indicates the obstacle is more than 500 feet to the right of your track.

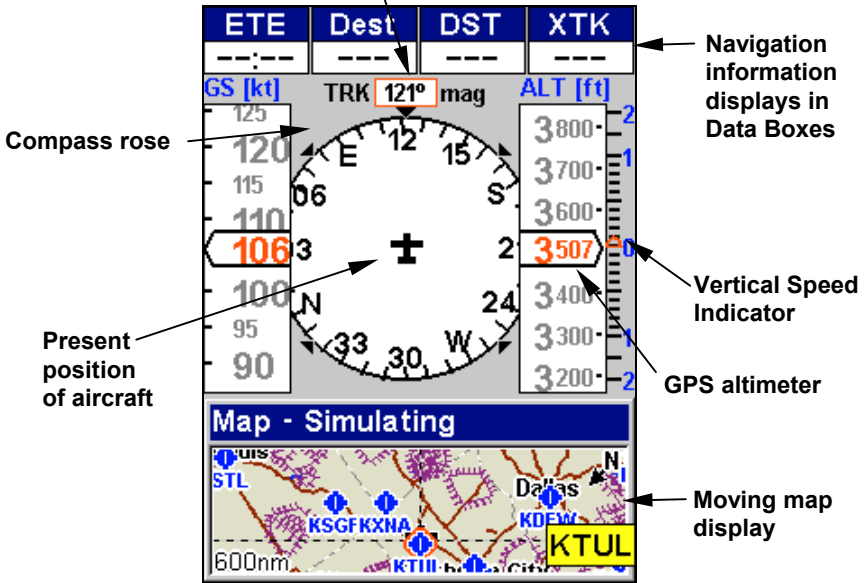
#### **HSI Map display option (Compass Rose With HSI and OBS Hold)**

The HSI Map combines several instruments and situational awareness tools that offer the look of a "glass cockpit" panel display. The instruments surrounding the central compass rose are discussed when we describe the Map Page's Map Panel option on page 35. Now, we want to talk about the heart of this display – the compass rose – and its Horizontal Situation Indicator.

The compass rose shows your direction of travel and the direction to a recalled waypoint or other destination, such as an airport or VOR. It can also show your intended course and whether you are currently on course or off course.

The navigation screen looks like the one in the following image when you're *not* navigating to a waypoint or other destination. No graphic course information is displayed. Your position is shown by an airplane symbol in the center of the screen. The arrow pointing down at the top of the compass rose indicates the current track (direction of travel) over the ground.

Track or compass heading indicator, showing direction of travel



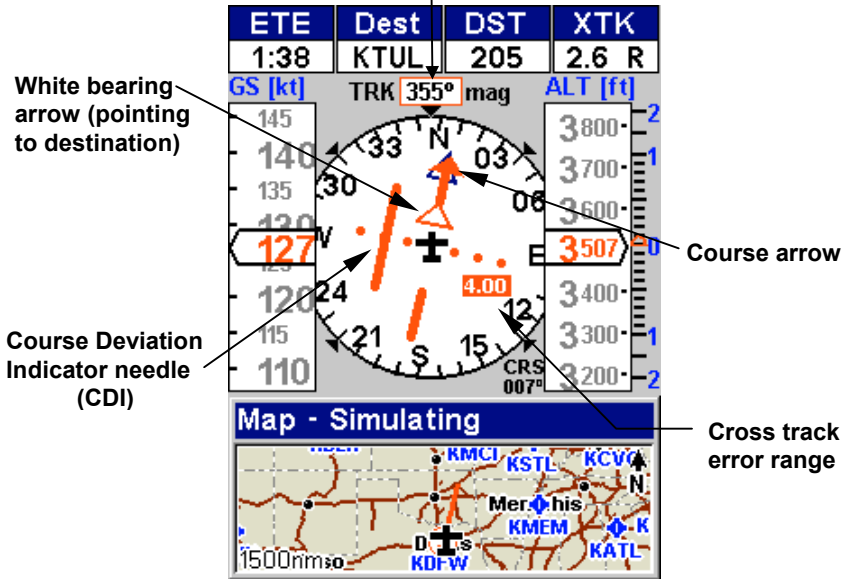
Navigation Page, traveling north. Page looks like this when AirMap is not navigating to a waypoint, following a route, or backtracking a trail.

When navigating to a waypoint or following a route, the HSI screen looks like the one shown in the next image. Navigation information such as bearing, track and course can be shown in data boxes.

**Tip:**

You can fully customize the upper z, easy to read visual indicator of the relationship between your current direction (track) and desired direction (course). Pilots familiar with "fly to the needle" VOR instruments or large in-panel GPS screens will quickly feel comfortable with this HSI feature.

Track or compass heading indicator, showing direction of travel

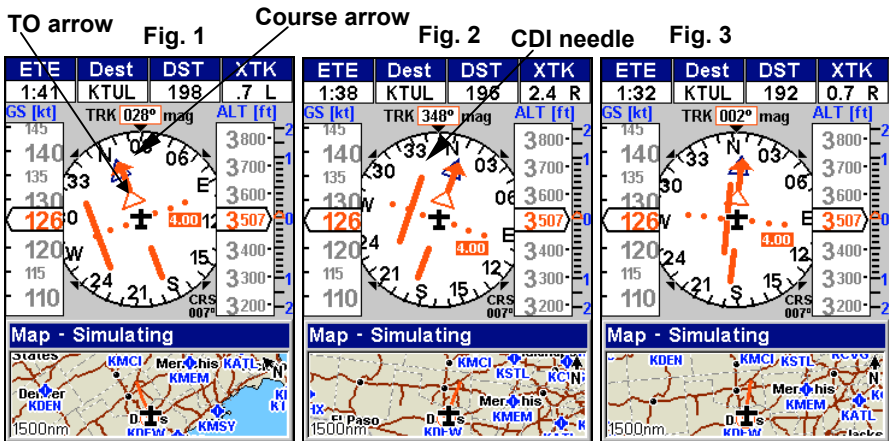


Navigation Page, flying TO KTUL on a course of 355°. The pilot needs to turn left to "center the needle" and get on course. The plane is currently 2.6 nautical miles to the right of the course. The cross track error range is set at 4.00 nautical miles.

The course line is an imaginary line drawn from your position when you started navigating to the destination waypoint. It's shown on the HSI screen as a segmented course arrow. The cross track error is the distance you are off-course to the side of the desired course line. The current cross track error can be shown in a data box (Off Course) and graphically by the CDI needle, which is the middle segment of the course arrow.

Dots on either side of the course arrow show the current cross track error scale, which is a graphic depiction of the cross track error range. The default for the cross track error range is 4.0 nautical miles, which is shown in a floating text box under the scale. If you veer four nautical miles to the left or right of the course, the off course alarm will appear.

If you are off course to the right, the range box floats to the right of the course line. If you are off to the left, the range box appears to the left of the course arrow. While you are on this page, you can use the **ZIN** or **ZOUT** keys to increase or decrease the cross track error range.



Following a course by "chasing the needle." Fig. 1, plane has veered off course to the right by nearly 3 nautical miles, away from the needle. Fig. 2, pilot turns on heading of 348°, steering left toward CDI needle to intersect intended course. Fig. 3, pilot has intercepted his route and is virtually on course.

The most important graphic element, however, is the CDI needle. The CDI and the cross track error scale instantly show you the distance to the course line, as well as the direction to steer to get back on course. In the example above, fig. 1 shows the pilot off course to the *right*, so the CDI needle appears to the *left* of the plane symbol. Fig. 3 shows the pilot back on course, so the CDI needle appears to line up with the course arrow. If you steer toward the CDI needle line, you'll always be heading in the correct direction to get back on course.

**NOTE:**

The examples above all show navigation *to* a waypoint, the most common method of GPS navigation. To show navigation *from* a waypoint, see the instructions on the OBS Hold feature later in this section.

**Navigating with OBS Hold**

AirMap contains an OBS Hold feature to help you navigate along a pilot-selected radial *to* or *from* a location. You must first turn on navigation *to* a location before you can access OBS Hold. While running a route or navigating to a waypoint, you launch OBS Hold from the Navigation Page; just press the right or left arrow to initiate it.

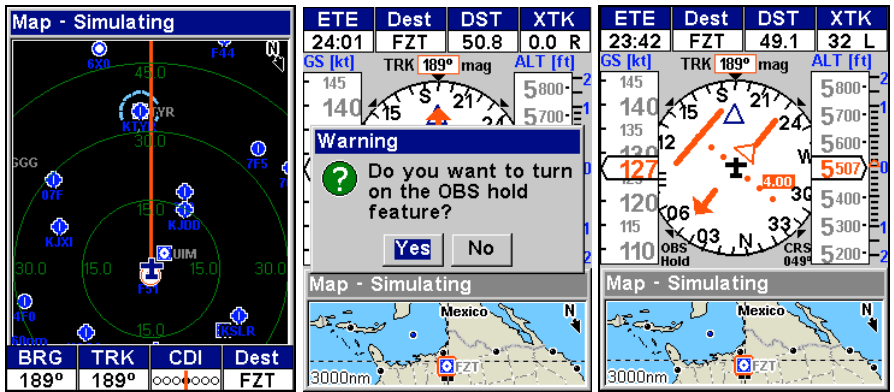
**NOTE:**

You *must* be navigating to some destination to begin using OBS Hold. Usually this will be a VOR, or some other Aviation Waypoint in the Jeppesen database. See the entry *Searching* later in this section if you need help finding and setting up navigation to a waypoint.

In the example below, Air Traffic Control contacts a pilot flying north across Oklahoma and warns him of a dangerous storm ahead. To avoid it, they instruct him to fly outbound on a radial of 320° from the nearby VOR "FZT."

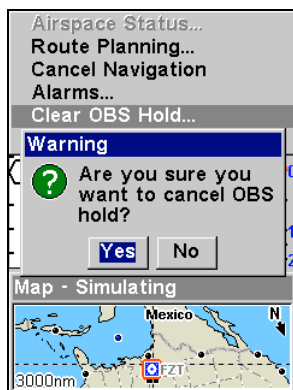
To use OBS Hold:

1. From the Navigation Page, while navigating to something, press ← or →.
2. A window will pop up asking you if you want to activate OBS Hold. Press ←|ENT. Use ← or → to change the OBS Hold radial until it reaches the angle you need. Press ← to decrease the angle, press → to increase it.



Left, pilot navigating to VOR. Center, Navigation Panel page with OBS Hold menu. Right, HSI display with OBS Hold activated. The Course (if displayed) shows the OBS direction instead of original Course.

The navigation data will now begin showing directions along the OBS radial instead of toward your original destination. The white arrow near the airplane icon indicates you are navigating FROM a waypoint. Remember that you can change the radial of OBS Hold using the right and left arrow keys. Press ← to decrease the angle, press → to increase it.



Use the **Clear OBS Hold** command to resume navigation. The HSI display will point to your original destination again.

You can turn off OBS Hold at any time using the Navigation Page menu.

1. Press **MENU** |  $\downarrow$  to **CLEAR OBS HOLD** | **ENT**.
2. A window will pop up asking you if you want to cancel OBS Hold. Press  $\leftarrow$  | **ENT**. Press **EXIT** to clear the menu.

The navigation data will once again direct you to your destination, or the next waypoint in the route you're navigating. Beginning navigation to a new destination will automatically clear OBS Hold, as well.

## Map Page

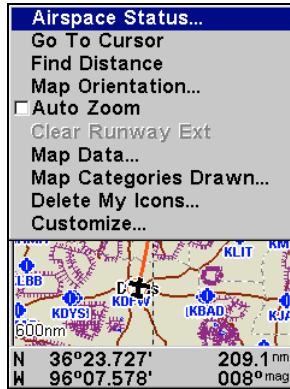
The map screens show your course and track from a "bird's-eye" view (except the Position screen, described later). These are moving map displays, that is, the map automatically scrolls beneath you as you fly. The Map Page offers five display options, which we will describe in a moment.

By default, this unit almost always shows aviation maps in Track Up orientation. (This can be changed using options described in the topic *Map Orientation*, in Sec. 5.) If you're navigating to a waypoint, the map also shows your starting location, present position, course line and destination.

### NOTE:

When our text says "navigating to a waypoint," we really mean navigation to *any* selected item, whether it is a waypoint you made, a map feature or an item (like a VOR) from the Jeppesen database.

To get to the Map Page: Map Page's Full Map option is the default screen when AirMap is turned on. To switch from another page to the Map Page, press **PAGES** then use  $\rightarrow$  or  $\leftarrow$  to select a page, then press  $\uparrow$  or  $\downarrow$  to select a page display option. (Clear the Pages Menu by pressing **EXIT**.)



Map Page Menu.

## Map Page Menu

To get to Map Page Menu: press **MENU** while displaying a map page.

The map menu has many options. It allows you to get information on the airspace you're in with the Airspace Status command. You can also find distances, change the orientation of your map, view map data, and other helpful map functions. Read more about these functions in Sec. 5, *System Setup and GPS Setup Options*.

### **Tip:**

We've incorporated some type of map display in several different pages. Most of the screen characteristics described in this segment apply to virtually every map display in the unit.

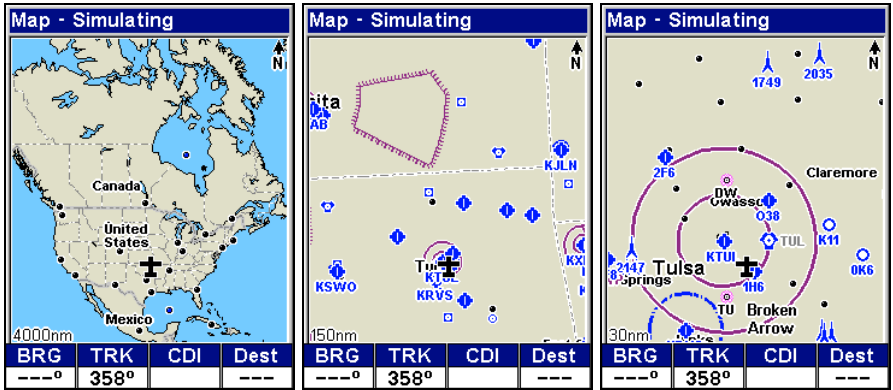
## Map Display Options

### Full Map page display option

The aircraft symbol centered in the lower third of the screen is your present position. It points in the direction you're traveling. The default setting is off, but you can display a solid line extending from the plane's tail to mark your plot trail, or path you've taken. (Remember, a flashing question mark on your plane symbol or flashing text displays means AirMap has not yet calculated a position.)

The map zoom range is the distance across the screen. This number shows in the lower left corner of the screen. In the first example below left, the range is 4,000 nautical miles from the left edge of the map to the right edge of the map. In the right image, the range is 30 nm.



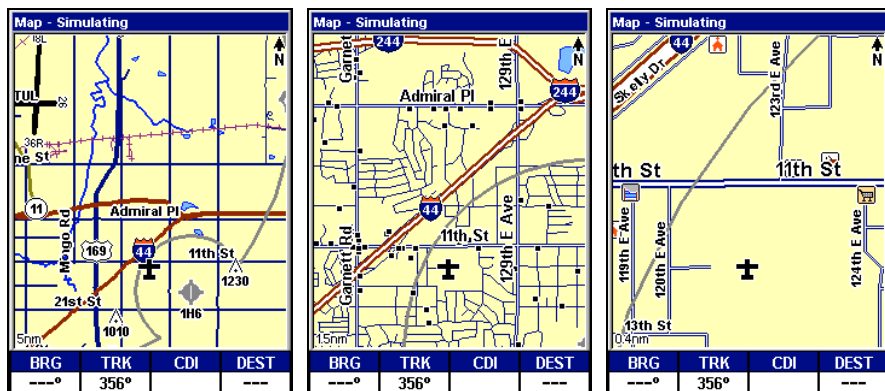


Far left, Map Page opening screen, Full Map display option. Center, zoomed to 100 nautical miles and right, zoomed to 30 nautical miles. (Note that the four data boxes or text boxes appearing in the bottom of these images are *on* by default. They can be individually turned off or you can customize the display to show a different type of information in each box.)

The Zoom In and Zoom Out keys zoom the map to enlarge or reduce its coverage area and the amount of mapping detail shown. There are 40 available map zoom ranges, from 0.02 nautical miles to 4,000 nautical miles.

AirMap's high resolution screen makes it possible to display aeronautical chart features that look like the "real thing." If you're familiar with sectional charts, you will instantly recognize items such as obstacles, VORs, special airspaces, paved and unpaved airports and more. As you zoom in closer, you'll see Class B airports appear at a fairly wide zoom. Zoom in closer and Class C and D airports appear, as well as restricted airspaces. At closer zooms still you can even see Class C airspace borders around airports.

If you're using only the factory-loaded background map, the maximum zoom range for showing *additional* land map detail is 6 nautical miles. You can continue to zoom in closer, but the map will simply be enlarged without revealing more map content (except for a few major city streets.) Load your own high-detail custom map made with MapCreate, and you can zoom in to 0.02 nautical miles with massive amounts of accurate map detail.



Map Pages with high-detail map of an urban area loaded on the MMC, with the Earth Map Detail option set to Medium, the default. At left, arterial streets appear at the 5 nautical mile zoom range. Center, at 1.5 nautical miles, minor streets appear, along with square dots representing Points of Interest. Right, at the 0.4 nautical mile zoom, you can see major and minor streets as well as Point of Interest icons for a hotel and a grocery store.

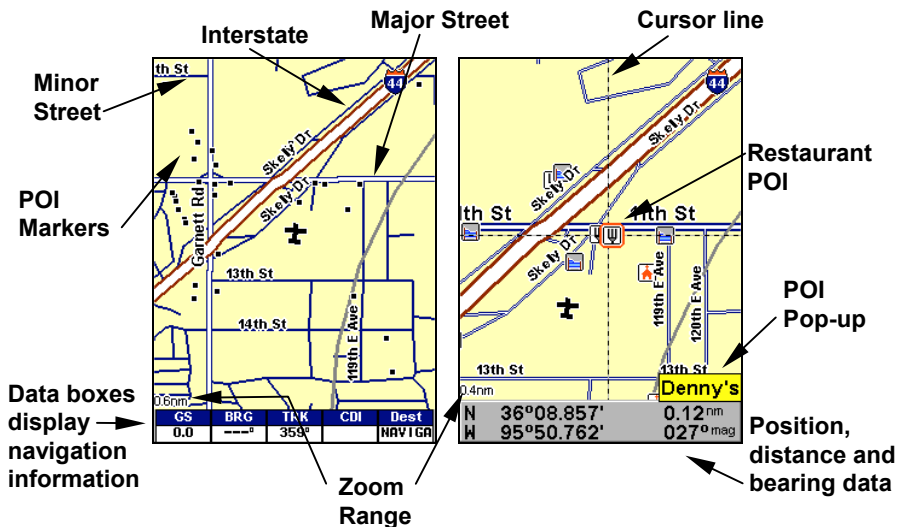
### Background map vs. MapCreate map content

The background map includes: low-detail maps of the whole world (containing cities, major lakes, major rivers, political boundaries); and medium-detail maps of the United States.

The medium-detail U.S. maps contain: all incorporated cities; county boundaries; some major city streets; Interstate, U.S. and state highways; Interstate highway exits and exit services information; large- and medium-sized lakes and streams; and more than 60,000 navigation aids and 10,000 wrecks and obstructions in U.S. coastal and Great Lakes waters.

MapCreate custom maps include massive amounts of information not found in the background map. MapCreate contains: the searchable Points of Interest database, all the minor roads and streets, all the landmark features (such as summits, schools, radio towers, etc.); more rivers, streams, smaller lakes and ponds and their names.

What's more important is the large scale map detail that allows your GPS unit to show a higher level of position accuracy. For example, the background map would show you the general outline and approximate shape of a coastline or water body, but the higher detail in MapCreate shows the shoreline completely and accurately (finer detail). Many smaller islands would not be included in the background map, but are, of course, in MapCreate.



When the map is zoomed out far enough, most POIs appear as square dots. As you zoom in closer, the symbols become readable icons. In the 0.4 nautical mile zoom example at right, the cursor has selected the Denny's restaurant POI, which triggers a pop-up box with the POI name. This pop-up box works on POIs at any zoom range.

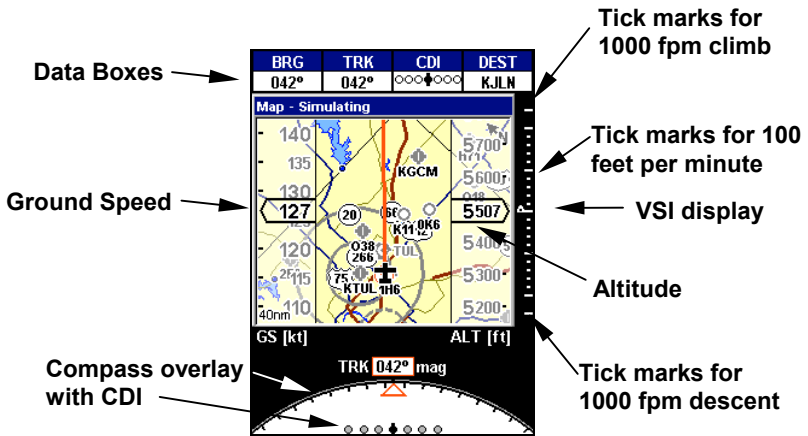
### Tip:

In some urban areas, businesses are so close to one another that their POI icons crowd each other on the screen. In the preceding figure, you can see a packed string of POIs all along the west half of 11th. You can reduce screen clutter and make streets and other map features easier to see by simply turning off the *display* of POIs you're not watching for. (To see how, check the text on Map Detail Category Selection, in Sec. 5. It shows how to use the Map Categories Drawn menu to turn individual POI displays off and on.) Even though their display is turned off, you can still search for POIs and their icons will pop-up when your unit finds them for you.

### Map Panel page display option

The Map Panel page has several features that offer the look of a “glass cockpit” panel display. In addition to the central map and the customizable data boxes across the top, it has an altitude window to the right and a ground speed window to the left.

A VSI or Vertical Speed Indicator is also located at the far right of the screen. A bar above zero shows rate of climb and a bar below zero shows the rate of descent.

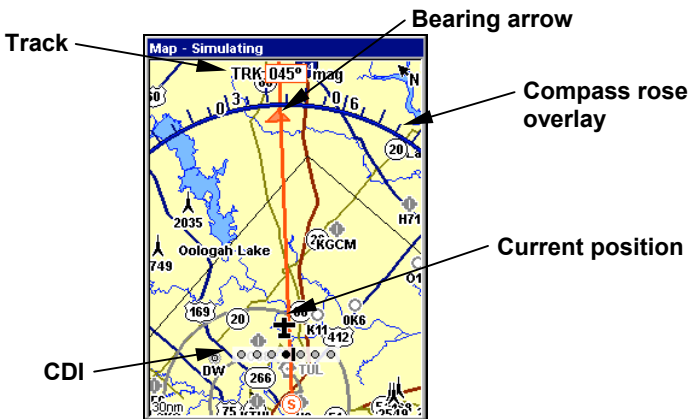


**Map Page: Map Panel display option.**

The compass overlay at the bottom of the screen includes a bearing arrow that points toward your destination, along with a CDI or Course Deviation Indicator. The CDI shows when you are off course. Steering toward the CDI needle will bring you back on course. The CDI only appears when navigating.

**Compass Overlay page display option**

The Compass Overlay page is a map with a portion of a compass rose displayed on top. A bearing arrow points toward your destination. Your current track or heading is shown in a window at the top of the page. A CDI graphic appears beneath the current position indicator.

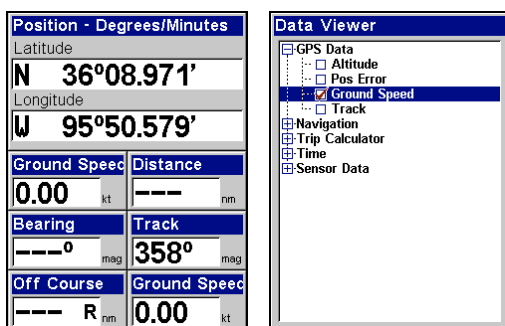


**Map Page: Compass Overlay display option. The CDI shows the pilot is slightly off course to the left**

Additional information can be displayed using compass overlay data that appears at the top of the page. This information can be customized with the Compass Overlay Data command, which is discussed in Sec. 5, *System Setup and GPS Setup Options*. You can select from 28 different types of information to display.

### Position page display option

The Position display provides detailed textual information on your present position and the status of your trip. For example, it can display information such as your current latitude, longitude, travel time to destination and more.



Position display, left, Position display Customize Menu, right.

The Position display can be fully customized. The lower window can display ten of 22 types of navigation information. For customization instructions see the Customize Page Displays topic in Sec. 5, *System and GPS Setup Options*. Some of the popular information displays include:

**Altitude** is height above sea level, not ground level. **Speed** (ground speed) is the velocity you are making over the ground. **Closing Speed** is also known as velocity made good. It's the speed that you're making toward a destination.

**Distance** shows how far it is to the next waypoint you're navigating toward. **Total Distance** tells how far to a final destination when navigating a route or trail. If your route has multiple legs, this option will total them for you.

**Travel Time (ETE)** is the time it will take to reach your destination at your present closing speed. **Arrival Time (ETA)** is the local time that it will be when you arrive at the destination, based upon your present closing speed and track. **Total Travel** time tells how long it will take to reach a final destination when navigating a route or trail.

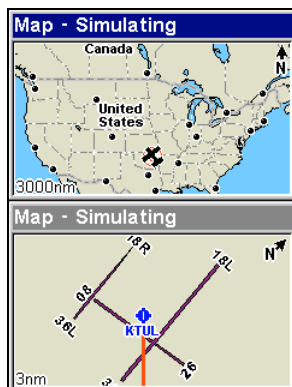
**Track** is the heading, or the current direction you are actually traveling.

**Bearing** is the direction of a line-of-sight from your present position to a destination. No matter what direction you are steering, the Bearing shows the compass direction straight to the destination from your location at the moment. **Off Course** tells you how far you are to the left or right of the intended direction or line of travel toward a destination. Most of the unit's displays show Off Course as "Cross Track" or "XTK."

### Two Maps page display option

This option provides a split map, showing your current position in the top map, and an auto zoomed view of the destination airport in the bottom map. Both maps are always in "Track Up" mode. You can manually select any zoom range in the top map or switch it to Auto Zoom.

To change settings, you need to specify which map the Menu, Zoom In and Zoom Out keys correspond to. To do this, switch the active map by pressing **PAGES | PAGES**. The window with the blue title bar at the top is the active map window. To switch back, just press **PAGES | PAGES** again.



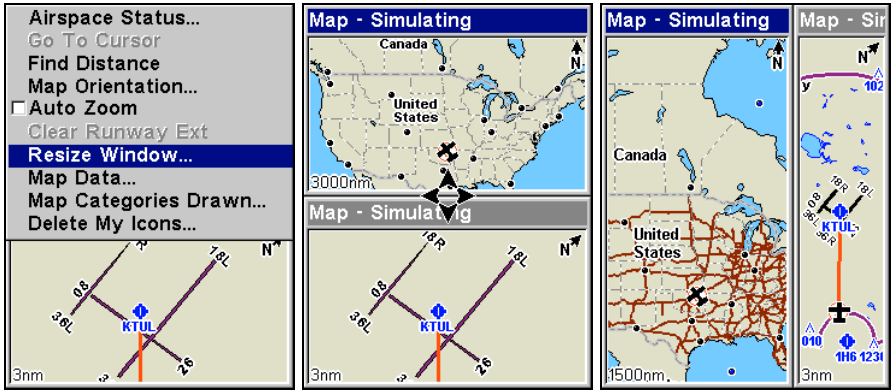
### Map Page: Two Maps display option.

By default, the bottom position map will always show your location relative to the destination airport.

### Tip:

Don't like the window sizes or orientation we selected? Well, pick your own! You can re-size the two map windows and even switch to vertical windows. Here's how to use the Resize Window command:

1. From the Two Maps page, press **MENU | ↓** to **RESIZE WINDOW | ENT**.
2. The window adjustment arrow appears. Use the arrow keys to adjust the window size. To switch to horizontal, press the **↑** or **↓** keys. To switch back to vertical, press the **→** or **←** keys. When you are finished, press **EXIT** to clear the adjustment arrow.



**Resize Window command lets you use the arrow keys  
to adjust split window displays**

We've done everything we could with AirMap to make it a powerful navigation tool, but also to keep it simple to use. Sometimes describing all of the options AirMap contains can make it sound hard to use, but it's really not!

The following page contains a 12-step quick reference for the most basic aviation GPS operations. If for some reason you don't want to carry the manual with you as you practice with the AirMap, you might consider photocopying this quick reference page and tucking it into your pocket or flight bag.

## Aviation GPS Quick Reference

*Start outdoors, with a clear view of open sky. Imagine you're flying to a nearby airport to practice landings. (If you're practicing on foot or by car, substitute a restaurant for an airport. Pick one a few blocks away. While learning, navigation in too small an area constantly triggers alarms.*

1. Insert the MMC and batteries. Mount AirMap on the yoke. Connect to electric power and the active antenna. (See install details on page 11.)
2. Turn on the AirMap: press and release **PWR** key. Press **EXIT** to clear each of the warning and copyright message screens.
3. Opening screen— displays map of North America at the 3,000 nautical mile zoom range. Rotate through three main Page screens by pressing **PAGES** key, then **→** or **←** key. Switch pages to display Satellite Status Page, then press **EXIT** to clear the Pages Menu.
4. Wait while unit locates satellites and calculates current position. Process is visible on Satellite Page. This takes an average of 1 minute or less with sky unobstructed by terrain or structures. When the unit acquires position, a tone sounds and a position acquired message appears.
5. With position acquired, press **PAGES** | **→** to **MAP** | **EXIT** to display Map Page, showing a bird's eye view of the earth. Move around the map by:
  - Zoom in** closer to see greater detail: press **ZIN** (zoom in key.)
  - Zoom out** to see more area, less detail: press **ZOUT** (zoom out key.)
  - Scroll** map north, south, east or west using arrow keys **↑ ↓ → ←**.To stop scrolling and return to current position on map, press **EXIT** key.
6. At the airport, set a waypoint (*Wpt 001*) at your current position so you can navigate back here: press **ENT** | **ENT**. Waypoint symbol and "001" appears.
7. Zoom/scroll map to find a nearby airport to go to. Use arrow keys to center cursor cross-hair over the airport symbol or wherever you want to enter the pattern.
8. Navigate to airport: press **MENU** | **↓** to **Go To CURSOR** | **ENT** | **EXIT**, and take off. Follow red course line on Map Page or Course Arrow on Navigation Page. (Remember to "steer to the needle.")
9. At airport, Arrival Alarm goes off; to clear it, press **EXIT**. Enter pattern and land. Cancel navigation: press **MENU** | **MENU** | **↓** to **CANCEL NAVIGATION** | **ENT** | **←** to **YES** | **ENT**.
10. Return to Wpt 1 by Navigate To Waypoint: press **FIND** | **↓** to **MY WAYPOINTS** | **ENT** | **ENT**. Use **↑** or **↓** to select *Wpt 001*, press **ENT** | **ENT**; follow navigation displays.
11. Back home, Arrival Alarm goes off; press **EXIT**. Cancel navigation: press **MENU** | **MENU** | **↓** to **CANCEL NAVIGATION** | **ENT** | **←** to **YES** | **ENT**.
12. To turn off AirMap, press and hold **PWR** key for three seconds.



## Find Your Current Position

Finding your current position is as simple as turning AirMap on. Under clear sky conditions, the unit automatically searches for satellites and calculates its position in approximately one minute or less.

### NOTE:

"Clear sky" means open sky, unobstructed by terrain, dense foliage or structures. Clouds do not restrict GPS signal reception.

If for some reason satellite acquisition takes longer, you may be inside a structure or vehicle or in terrain that is blocking signal reception. To correct this, be sure you are positioned so that the unit (if using the built-in antenna) or the external antenna has as clear a view of the sky as possible, then turn the unit off and back on again.

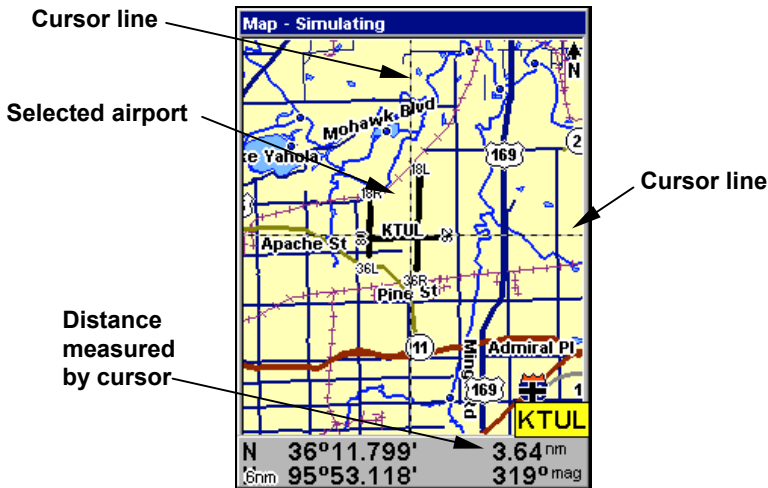
## Moving Around the Map: Zoom & Cursor Arrow Keys

The map is presented from a bird's eye view perspective. The current zoom range shows in the lower left corner of the screen.

1. Press the **ZIN** key (zoom in) to move in closer and see greater detail in a smaller geographic area.
2. Press the **ZOUT** key (zoom out) to move farther away and see less map detail, but a larger geographic area.

When you are flying, walking or riding in another vehicle, the map will automatically move as you move. This keeps your current location roughly centered on the screen.

You can manually pan or scroll the map northward, southward, eastward or westward by using the arrow keys, which launches the cross-hair map cursor. This allows you to look at map places other than your current position. To clear the cursor, press **EXIT**, which jumps the map back to the current position or the last known position.



The selected airport to the northwest is 3.64 nautical miles away.

### *Tip:*

Use the cursor to determine the distance from your current position (or last known position, when working indoors) to any map object or location. Simply use the arrow keys to position the cursor over the object or place. The distance, measured in a straight line, appears in the data box at the bottom of the map. Press **EXIT** to clear the cursor.

## Selecting Any Map Item With the Cursor

1. Use the zoom keys and the arrow keys to move around the map and find the item you wish to select.
2. Use the arrow keys and center the cursor cross-hair on the desired object. On most items, a pop-up box will give the name of the selected item.

You will also notice a black ring surrounds the item as it becomes selected. Once that happens, if you press **FIND** the Find Menu will pop up with an extra option at the top of the list: **SELECTED ITEM**. Press **ENT** to see the Information screen for the selected item.

### *Tip:*

The AirMap has an extremely handy Cursor Undo feature that lets you instantly return to the previous location you were looking at without scrolling. It works like this: Use the cursor (arrow keys) to scroll the map to some far away location or waypoint. Press **EXIT** to clear the cursor and jump back to your current position on the map. When you want to take another peek at that distant place, just press **EXIT** again. You can use this trick to toggle between your current position and your destination without a lot of scrolling.

## Searching

Now that you've seen how AirMap can find where *you* are, let's search for something somewhere else. Searching is one of the most powerful features in the Lowrance GPS product line.

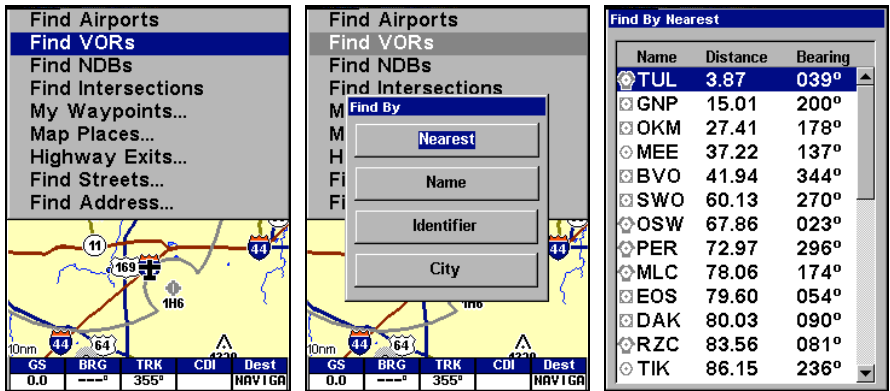
In this example, we'll look for the *nearest* VOR. For more information on different types of searches, refer to *Sec. 6, Searching*.

### NOTE:

This example requires the Jeppesen database included with your AirMap.

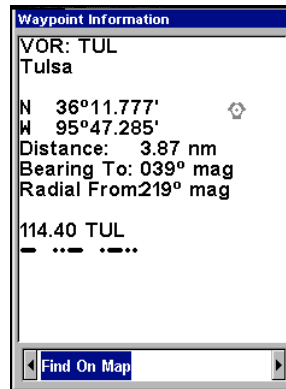
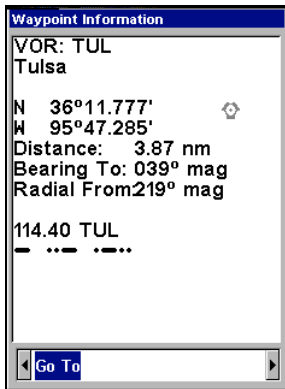
After AirMap has acquired a position:

1. Press **FIND** | **↓** to **FIND VORs** | **ENT**.
2. You could search the VOR category by any of these four criteria (by Nearest, by Name, by Identifier or by City), but in this example we will just search for nearest. When the Find By menu pops up, press **ENT**.
3. AirMap says it is calculating, then a list of VORs appears, with the closest at the top of the list, and the farthest at the bottom of the list. The nearest is highlighted.



Find VORs Menu, left; Search Criteria menu, center; and list of the nearest VORs, right.

4. If you wish, you could scroll **↑** or **↓** here to select another VOR, but for now we will just accept the nearest one. Press **ENT**.
5. The waypoint information screen appears. If you wanted to navigate there, you press **ENT**, since the **Go To** command is highlighted. But we just want to see it on the map, so press **→** to **FIND ON MAP** | **ENT**.



Waypoint information screen on VOR nearest this position. Screen shows name, identifier, city, radio frequency, latitude/longitude and its compass bearing. It also shows both distance to the VOR and your "Radial From" – information ready at your fingertips when Air Traffic Control wants a position report! The figure at left shows Go To command; right figure shows Find On Map command.

6. AirMap's map appears, with the cross-hair cursor highlighting the VOR's symbol. A pop-up name box identifies the VOR. A data box at the bottom of the screen continues to display the location's latitude and longitude, distance and bearing.



Map screen showing Finding Waypoint, the result of a VOR search.

7. To clear the search and return to the last page displayed, press **EXIT|EXIT|EXIT|EXIT|EXIT**. (Before you completely exited out of the Search menus, you could have gone looking for another place.)

## NOTE:

Search works from high detail mapping data loaded in AirMap. Aviation Navigation searches use information from a Jeppesen database, and general navigation searches use POI information available with a MapCreate custom map. If you do not have a high-detailed Jeppesen map (or a custom map containing POI data) for the area you are searching loaded on the MMC, you may not find anything.

## Find Nearest Airport (shortcut)

One of flying's most terrifying events is having to make an emergency landing. This situation can be deadly at any time. It's particularly dangerous when you're flying over unfamiliar territory, with no idea where you can safely stop. Of course, the first thing to do is remain calm and follow all standard emergency procedures. Naturally, no instrument by itself can get you through an emergency situation, but we have done our best to provide you with the tools you need as a pilot.

One of these emergency tools in the AirMap is a Find Nearest Airport feature that automatically locates, selects, and shows navigation data to the airport nearest the location where the feature was activated. To activate Find Nearest Airport, press the **ZOUT** and **ZIN** keys at the same time. A Find By Nearest screen appears, showing a list of the closest airports. Use **↑** or **↓** to select the best airport for your situation (the bottom of the list displays the length of the longest runway at each airport.) Then you can press **ENT** to get detailed information about the airport, or press **→** (the **FIND** key) to begin navigating to the selected location.

## Navigating to Nearest Airport with the AirMap

Find your way to the selected airport with the Navigation Page or Map Page. Any time navigation is activated, the Navigation Page shows the compass rose with its bearing arrow pointing toward the desired destination position, and the destination name shown in a data box. The Map Page displays a dotted line from your start point to the desired airport.

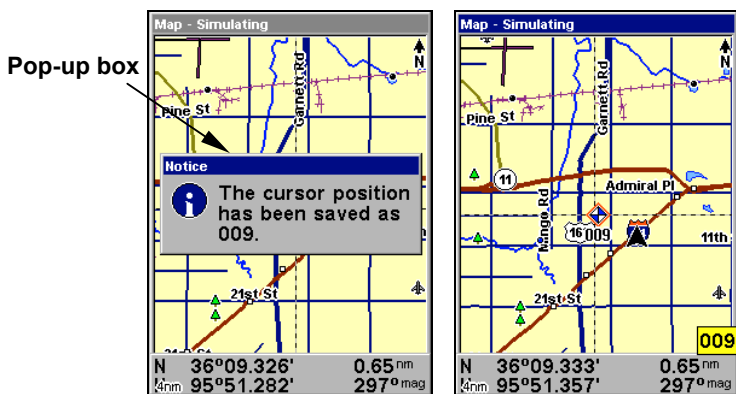
### *Tip:*

You don't need to have an emergency to use the Find Nearest Airport feature. You can also use it to maintain positional awareness by finding the nearest landing strip at any time.

To cancel navigation to Nearest Airport, press **MENU | MENU | ↓** to **CANCEL NAVIGATION | ENT | ←** to **YES | ENT**. AirMap stops showing navigation information to the airport.

## Setting a Waypoint

A waypoint is simply an electronic "address," based on the latitude and longitude of a position on the earth. Both the Aviation and the Land mode allow you to save waypoints to mark specific locations you'd like to return to (or maybe send a friend to, or even specifically *avoid*). To save a waypoint, move the cursor to the desired location, then: 1. Press and release **ENT**. 2. The **CREATE WAYPOINT** menu appears, with the **QUICK SAVE** method selected. To place a waypoint at your current cursor position, press **ENT**. The waypoint icon appears on the map, and a pop-up box tells you the waypoint's name (in this case, "009.")



**Create a waypoint.** The pop-up box with waypoint name is shown at left. At right, you can see Waypoint 009, with the default waypoint symbol.

This example shows a waypoint set at the cursor location. If the cursor was not active, the point would be placed at your current position. When you're traveling fast and want to set a waypoint in a hurry – at your current position – just quickly press the Enter key twice, **ENT | ENT**.

## Navigate Back to a Waypoint

To navigate to a waypoint that you've created:

1. Press **FIND | ↓** to **MY WAYPOINTS | ENT | ENT**. Press **↑** or **↓** to select from the list the waypoint you want to navigate to, then press **ENT**. Use the navigation arrows on the Map Page or the compass rose on the Navigation Page to make your way to the selected waypoint.

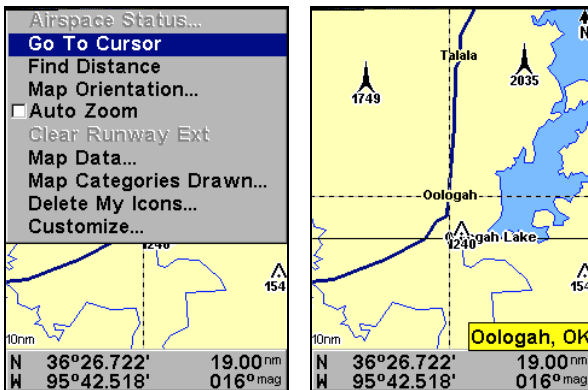
To cancel navigation, press **MENU | MENU | ↓** to **CANCEL NAVIGATION | ENT | ←** to **YES | ENT**. AirMap stops showing navigation information.

## Navigate to Cursor Position on Map

The **Go To Cursor** command navigates to the current cursor position on the map.

To navigate to a particular location on the map, first find the location, then select the location with the cursor. Use the Go To Cursor command to lead you there:

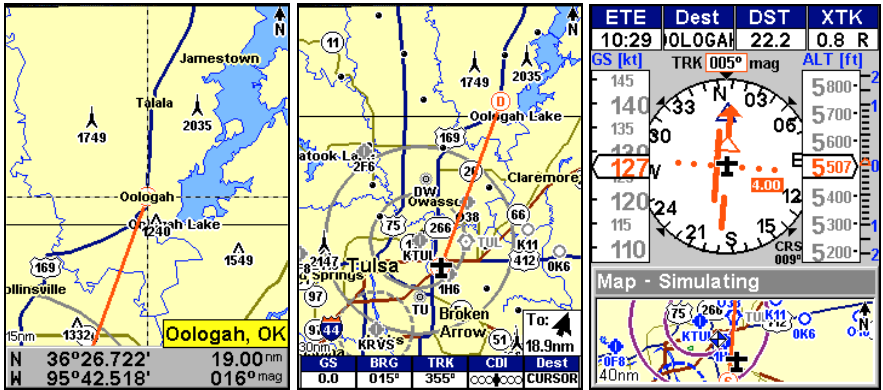
1. Use the cursor (controlled by the arrow keys) with the zoom in and zoom out keys to maneuver around the map until you find a location you want to go to.
2. Center the cursor over the location to select it. If you have selected a location that contains navigation information, the icon you're pointing at will be highlighted, indicating it's selected. See the following example.



**Navigate to cursor command on the Map Page Menu. In this example, the cursor has selected the town of Oologah, Oklahoma.**

3. Press **MENU** ↓ to **GO TO CURSOR** | **ENT** and AirMap will begin navigating to the cursor location.

The Map Page will display a dotted line from your current position to the cursor position. The Navigation Page displays a compass rose showing navigation information to your destination. See examples in the following images.



The 15-nautical mile zoom figure at left clearly shows the dotted course line connecting your current position to your destination. The 30-nautical mile zoom, center, shows both current position and destination on screen. The Navigation Page, right, will also show navigation information.

To stop navigating to the cursor, use the Cancel Navigation command: press **MENU | MENU | ↓** to **CANCEL NAVIGATION | ENT | ←** to **YES | ENT**. AirMap stops showing navigation information.

### Navigate to a Point of Interest

AirMap can navigate to any Point of Interest (POI) you can look up with the **FIND** key. (For help with **FIND**'s searching capabilities, see the entry on Searching earlier in this section, or turn to Sec. 6, *Searching*, for detailed instructions.)

After you have looked up an item with the find command, use the **←** to make sure the **Go To** command is highlighted at the bottom of the screen, then press **ENT**. AirMap begins showing navigation information to the item.

To cancel navigation, press **MENU | MENU | ↓** to **CANCEL NAVIGATION | ENT | ←** to **YES | ENT**. AirMap stops showing navigation information.

### Go "Direct To" (Using the Direct To Button)

You will notice a symbol above your **FIND** button that looks something like this: **➔**. In addition to launching searches, the Find/Direct To button also serves several other purposes, depending on when it is used.

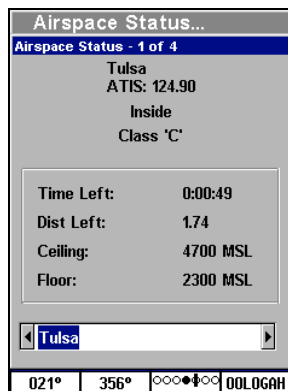
For instance, you can use the Direct To shortcut in searches. Let's say you've done a search for nearest VOR, and a long list of VORs appears. You scroll through the list and select the one you want to navigate to. Instead of pressing **ENT** (which would bring up an information screen), if you press **➔** it will automatically begin navigating to the selected item in the list.



You can also use Direct To when navigating a route, to force AirMap to navigate toward a particular waypoint in the route. To do this (from the Map Page), press **MENU | MENU | ↓** to **ROUTE PLANNING | ENT | ↓** to *route name* | **ENT**. Now press **↓** to select the waypoint you want from the list, and then hit **↔**. The AirMap will automatically begin navigating to the selected waypoint, and on arrival will continue navigating the route from there.

## Airspace Status

The AirMap can show you information about any airspace contained in its database. While you are in motion, you can press **MENU | ENT** to run the **AIRSPACE STATUS** command. (You can also press **ENT** whenever an Aviation Alarm goes off to see this screen for the airspace that triggered the alarm.) A screen like the one in the following image appears, showing you information about any controlled airspaces that you are currently approaching.



**Airspace Status page, showing information about Tulsa International Airport.**

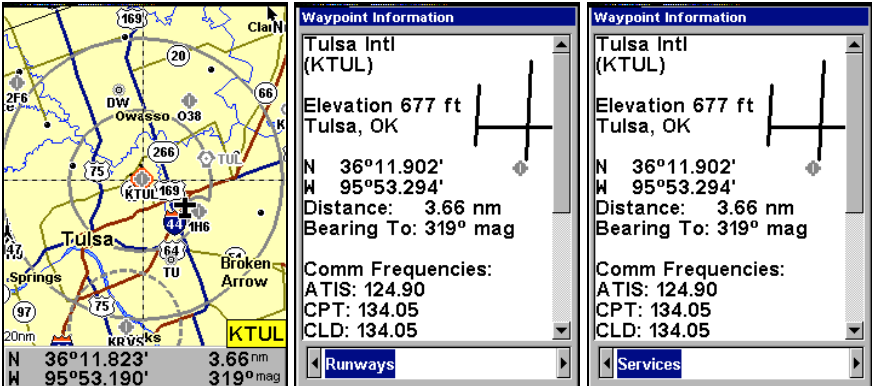
Press **←** or **→** to cycle through the various information pages if there is more than one. Press **EXIT | EXIT** to clear the Airspace Status page and return to the previous page.

## Airport Information

We've already mentioned the waypoint information screen – this screen pops up whenever you view the details of a selected item from the map, or when you select an item from a search list. Different information appears on the information screen depending on what kind of map object you have selected. Earlier, we had an example of a VOR information screen, complete with radio frequency and Morse identifier.

In the AirMap, airports have information screens *packed* with useful information. They include much of the same information as a VOR information screen. In addition, airport information screens contain a line drawing showing the general layout of the airport's runways. Also, note that the radio frequencies listed at the bottom make a much longer list. You can press ↓ at the information screen to scroll down and see all of these frequencies.

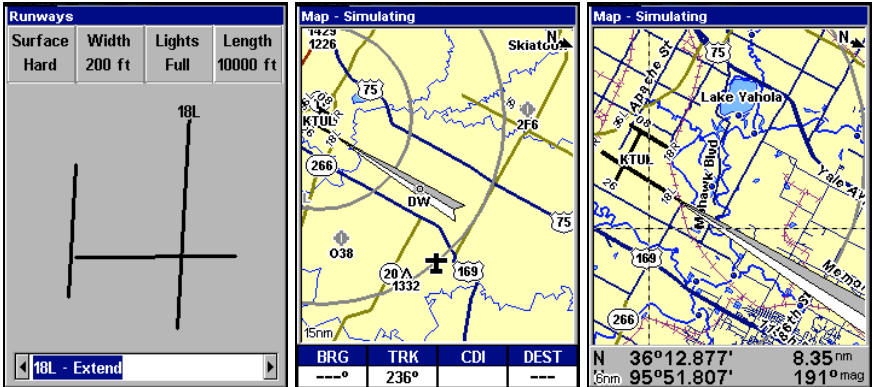
When you first open the airport information screen, you'll see "Go To" highlighted at the bottom. You already know how to use **GO TO** and **FIND ON MAP**, but airports have two more options: **RUNWAYS** and **SERVICES**.



Airport information screen. Runways selected center, and Services at right.

**Runways**

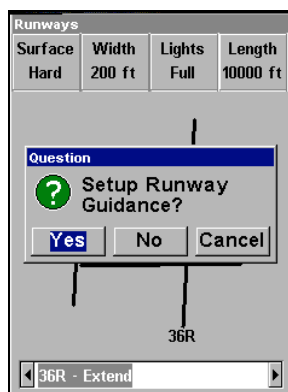
The Runways screen shows you everything AirMap knows about the runways at the selected airport. Display boxes contain the runway surface type, its length, its width and the lighting available.



Runways screen at left, with Extend option select. Center, map shows the fan-shaped Runway Extension north of the airport. At right, you can see where the runway extension begins at the very end of runway 18L.

At the runways screen you can press ← or → to cycle through the airport's runways. In the previous image, you can see we've selected 18L, so all of the information shown refers to that particular runway.

The previous images show not only the information available on this screen, but also the Runway Extension feature. To turn on a runway extension, use ← or → to select the desired runway, then make sure the box at the bottom of the screen says "Extend" next to the runway name. (As long as we have sufficient information about it in our database, AirMap can display a runway extension for any runway.) Press **ENT** and the unit will ask "Do you want to setup Runway Guidance?" Press → to **No** | **ENT**. The runways screen will go away, returning you to the airport information screen. Now you can press **EXIT** | **EXIT** to see the runway extension on the map.



**Runway guidance selection message.**

Runway extensions are meant to serve as visual references to help you orient the plane as you approach an airport for a landing. The extension appears as a fan-shape, with its tip pointing directly to the touch-down zone or threshold of the runway you're approaching. This allows you to navigate toward the wider end of the fan, so once you turn down the extension you can easily judge how far you've got to touch-down.

To turn off an airport extension, press **MENU** | ↓ to **CLEAR RUNWAY EXT** | **ENT** | **EXIT**.

### **Runway Approach Guidance feature**

The AirMap also uses the Runway Extension command to extend a localizer-type display to the landing runway; we call it the Runway Approach Guidance feature. After selecting a runway extension (see instructions at the bottom of the previous page) the unit will ask "Do you

want to setup Runway Guidance?" (See the previous image.) If you want the AirMap to navigate a localizer-type approach, select **YES** and press **ENT**. (Select **No** if you want to continue your own navigation with a regular runway extension.)

When you select Runway Guidance, the unit will display a localizer-type fan and create a route automatically for guidance down the runway's extended centerline. Once selected, however, you are no longer navigating your earlier route, because the AirMap assumes you are on radar vectors or your own vectors to intercept final.

The HSI and all other CDI displays will now be set to the inbound runway course and will give guidance to left or right of centerline via the CDI display. However, the hollow (white) bearing arrow will continue to point to the runway touchdown zone (TDZ).

The automatic route will be created and set to track inbound on the extended runway's centerline from any distance from the airport. If you desire, you can navigate to the notch of the fan for an approximate five mile final approach. Just press **➔** (**FIND**), select **CURRENT ROUTE** and select the *LOC* waypoint in the route.

If you plan a short approach and want to bypass the use of runway centerline guidance, and navigate directly to the runway threshold, you can press **➔** (**FIND**), select **CURRENT ROUTE** and select the *TDZ* waypoint in the route.

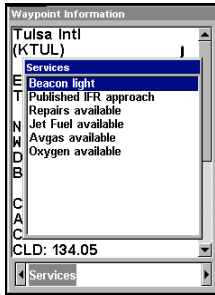
When the Runway Approach Guidance feature is working, after passing the TDZ the route sequences to the runway center, and then the airport center. After landing and turning the AirMap off, this temporary route is automatically deleted.

### **Tip:**

For an even more complete runway guidance display, turn on the "Markers" (outer marker) subcategory in the Aviation category. See the Map Categories Drawn topic for more information.

### **Services**

The Services screen shows you all of the published services available at the selected airport. You can press **↑** or **↓** to scroll through the listed items, in case the list runs past the bottom of the screen.



**Airport Services screen for KTUL (Tulsa International).**

## Terrain Awareness Display

We'll discuss the Map Categories Drawn feature elsewhere in this document, but one of the most powerful Aviation tools available is the Map Category "Terrain Awareness." When you turn on this map category, the AirMap draws color contours on all map displays to show you the height of the surrounding terrain.

As mentioned, the Terrain Awareness feature can be turned on and off in the Map Categories Drawn menu by checking (on) or unchecking (off) the Terrain Awareness category. If you turn off the Background subcategory, the map screens will not show shaded relief. If you turn off the Warnings subcategory, potentially hazardous terrain will not be highlighted in various colors. Removing these categories will allow you to better distinguish the color coding of the Terrain Awareness.

### Color Code

As you fly, the AirMap notes your current altitude and the height of the terrain below you. The relief map shows areas with different risk levels in different colors, according to the following parameters:

Red highlight: indicates terrain that is at your current altitude or higher.

Yellow highlight: indicates terrain 500 feet below your current altitude.

Green highlight: indicates terrain 1,000 feet below your current altitude.

When flying over the ocean, the surface shading in the Profile Window reverts to a pattern of small Xs, indicating no risk of flying into elevated terrain.

All map screens will show the terrain relief shading except for the Navigation Panel and the Aviation Map option. On those screens, the terrain awareness color highlight does appear.

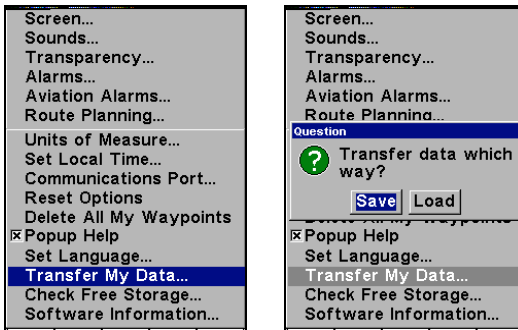
## Transfer Custom Maps and GPS Data Files

**Custom maps** work only from the MMC card or SDC card. When a card containing a Custom Map File is loaded into the unit, AirMap automatically loads the map into memory when the unit is turned on.

Instructions for copying Custom Map Files to an MMC are contained in the instruction manual for your MMC card reader and MapCreate 6 software. For instructions on inserting an MMC into AirMap, *see Sec. 2, Installation/Accessories.*

**GPS Data files**, containing waypoints, routes, trails and event marker icons, must be copied from an MMC to AirMap's internal memory before AirMap can read them. Here's how:

1. Press **MENU | MENU | ↓** to **SYSTEM SETUP | ENT.**
2. Press **↓** to **TRANSFER MY DATA | ENT** and the screen in the following image appears.



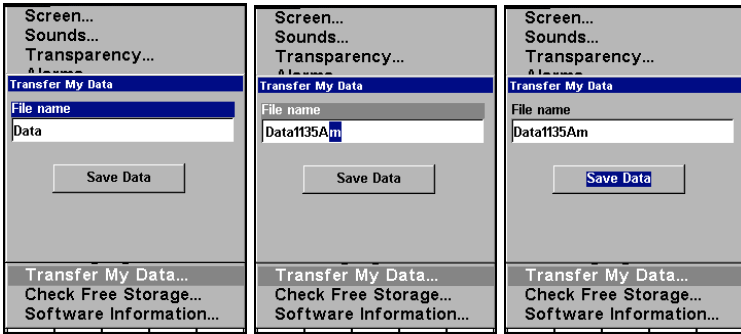
The **Transfer My Data** submenu asks if you want to save data to the MMC or load data from the MMC into AirMap's memory.

2. The **Transfer My Data** menu includes a message which tells you if an MMC is present or not. If no MMC is present, you must first insert a card into AirMap in order to activate the **Load** or **Save** commands.

To transfer data *from AirMap to the MMC*: press **ENT** (for **SAVE**.)

To transfer data *from the MMC to AirMap*: press **→** to **LOAD | ENT.**

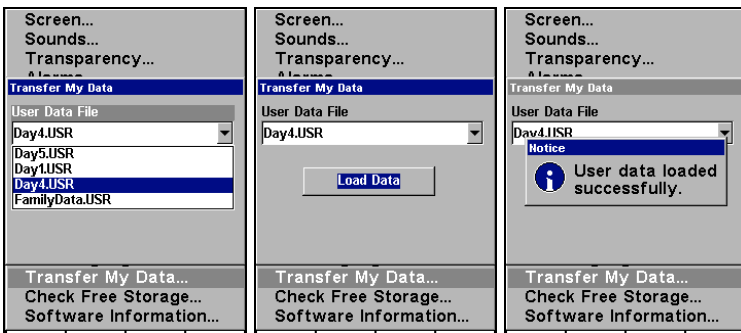
3. **Saving**: A file name box appears. To accept the default name "Data" for the GPS Data File, press **↓** to **SAVE DATA | ENT.** If you wish to rename the file (as in the following example), press **ENT** to activate the selection box. Press **↑** or **↓** to change the first character, then press **→** to the next character and repeat until the name is correct. Then, press **ENT | ↓** to **SAVE | ENT.**



From left to right, these figures show the menu sequence for naming and saving a GPS Data File from AirMap's memory onto an MMC.

The unit will display first a progress then a completion message when the data transfer is finished. To return to the Page view, press **EXIT | EXIT**.

4. **Loading:** There may be more than one GPS Data File (\*.USR) on the card. To select a file, press **ENT** to activate the selection box, use  $\downarrow$  or  $\uparrow$  to highlight the file, then press **ENT** to accept the selection. Next, press  $\downarrow$  to **LOAD | ENT**. The unit will display a completion message when the data transfer is finished. To return to the Page view, press **EXIT | EXIT**.



From left to right, these figures show the menu sequence for loading a GPS Data File from an MMC into AirMap's memory.

## Switch to Land Mode

To leave Aviation Mode and switch to Land Mode:

1. Press **MENU | MENU |  $\downarrow$**  to **SYSTEM SETUP | ENT |  $\downarrow$**  to **DISABLE AIRMAP | ENT**.
2. Unit asks, "Are you sure you want to turn on land navigation mode?"
3. Press  **$\leftarrow$  | ENT** and the unit switches to Land Mode.

## Switch Back to Aviation Mode from Land Mode

To leave Land Mode and switch back to Aviation Mode:

1. Press **MENU | MENU | ↓** to **SYSTEM SETUP | ENT | ↓** to **ENABLE AIRMAP | ENT**.
2. Unit asks, "Are you sure you want to turn on aviation mode?"
3. Press **← | ENT** and the unit switches to Aviation Mode.

## Aviation Calculators

To help you with flight planning, this unit has three aviation utilities built into it that let you calculate density altitude, true airspeed, wind speed and direction, plus vertical navigation.

### NOTE:

AirMap also includes another set of general-purpose utilities. These are discussed in Sec. 4, *Utilities*.

### E6B Altitude/Airspeed Calculator

The Altitude/Airspeed Calculator lets you calculate density altitude or true airspeed. To get to the altitude/airspeed calculator menu: while in Aviation Mode, press **MENU | MENU | ↓** to **AVIATION CALCULATORS | ENT | ENT**. The screen in the following image appears.

For each item in the top portion of the screen, press the enter key, use **↑** and **↓** to enter the field value, and then press **EXIT** when you're done. You'll need to enter indicated altitude (**ALTITUDE**), barometric pressure (**BARO**) in inches of mercury, outside air temperature (**TEMP**), and calibrated airspeed (**CAS**).

In the example shown, the indicated altitude is 5000 feet, barometric pressure is 30.02", outside air temperature is 15° Celsius, and the calibrated airspeed is 129 knots. This gives us a pressure altitude of 4908 feet, a density altitude of 5740 feet, and a true airspeed of 140.4 knots. Obviously, you don't need airspeed to calculate density altitude, this was done for illustration purposes.



Altitude/Airspeed Calculator	
Altitude:	Baro:
5000 ft	30.02 "Hg
Temp:	CAS:
+15 C	129 kt
Pressure Altitude 4908 ft	
Density Altitude 5740 ft	
True Air Speed 140.4 kt	

### E6B Altitude/Airspeed Calculator

### E6B Wind Speed/Direction Calculator

To determine the wind speed and direction, first find true airspeed using the Altitude/Airspeed Calculator (see above). Once you have that, open the Wind Speed/Direction Calculator. To get to the wind speed/direction calculator menu: while in Aviation Mode, press **MENU | MENU | ↓** to **AVIATION CALCULATORS | ENT | ↓** to **E6B WIND SPEED/DIR | ENT**.

A screen similar to the one in the following image appears. The current true airspeed is automatically used, and you only need to enter your heading. Use the arrow keys to change the heading in the box at the top of the screen.

In the example shown, the heading is 39° magnetic. This gives us a wind speed of 11.5 knots on a bearing of 44° magnetic, for an 11.4 knot headwind.

Wind Speed/Direction	
Heading:	039 mag
True Air Speed 140.4 kt	
Ground Speed 129.0 kt	
Track 38 mag	
Wind Speed 11.5 kt	
Wind From Direction 45 mag	
Head Wind: 11.4 kt	

### E6B Wind Speed/Direction Calculator

# Vertical Navigation Calculator

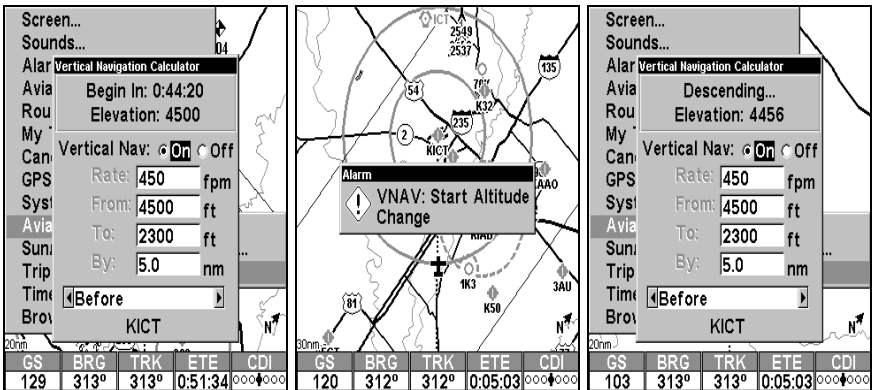
With the Vertical Navigation Calculator, the AirMap 2000 can help you decide when to let down for an approach to an airport. To get to the vertical navigation calculator menu: while in Aviation Mode, press **MENU|MENU|↓** to **AVIATION CALCULATORS|ENT|↓** to **VERTICAL NAV |ENT.** (The command only works when you are navigating to a waypoint.)

In the following example, we're travelling to the Wichita Mid-Continent airport in Wichita, Kansas. Its identifier is shown at the bottom of the screen – KICT. We are travelling at 4500 feet, and need to be at the pattern altitude (about 2300 feet) by 5 nautical miles from the airport using a 450 fpm descent.

After determining the above information, use **↑** or **↓** to highlight each field, then press **ENT.** In each box, use the arrow keys to enter the data. When you're finished, highlight **ON** next to the "Vertical Nav" label and press **ENT.** A screen similar to the one below appears.

The solution to our vertical navigation problem shows at the top of the screen. Our current altitude is 4500 feet and at our current airspeed, we should begin our descent in 44 minutes and 20 seconds. If we maintain a 450 fpm descent starting in about 44 minutes, then we should reach pattern altitude 5 nautical miles before we reach the airport.

You can watch the clock count down your approach. If you increase your speed, the clock will decrease more quickly. If you slow down, it will take longer. Either way, when you reach the point at which you should begin your descent, the box at the top of the screen changes. Now in place of the timer, it indicates that you *should* be descending. Above that, it shows the altitude you *should* be at.



Vertical Navigation Calculator


# Section 4:

## Land Operation

### Keypad



AirMap 600 keypad.

1. **PWR/LIGHT** (Power & Light) – The PWR key turns the unit on and off and activates the backlight.
2. **PAGES** – Pressing this key and the arrow keys will switch the unit between the three different page screens in Land Mode (Satellite, Navigation and Map). Each page represents one of the unit's major modes of operation.
3. **MENU** – Press this key to show the menus, which allow you to select or adjust a feature from a list.
4. **ARROW KEYS** – These keys are used to navigate through the menus, make menu selections, move the chart cursor and enter data.
5. **ENT/SAVE** (Enter & Save) – This key allows you to save data, accept values or execute menu commands. Also use it to quickly create waypoints or icons.
6. **EXIT** – The Exit key lets you return to the previous screen, clear data or erase a menu.
7. **FIND**  (Direct To) – The Find key launches the AirMap search menus. It also allows you to go Direct To items shown in search lists.
8. **ZOUT** – (Zoom Out) – This key lets you zoom the screen out to see a larger geographic area on the map. Less detail is seen as you zoom out.

9. **ZIN** – (Zoom In) – This key lets you zoom the screen in to see greater detail in a smaller geographic area on the map.

### Power/lights on and off

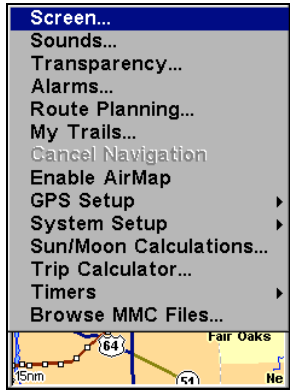
To turn on the unit, press **PWR**. To turn on the backlight, press **PWR** again. Pressing **PWR** once again will turn off the backlight.

Turn off the unit by pressing and holding the **PWR** key for 3 seconds.

### Main Menu

Land Mode has a single Main Menu, which contains some function commands and some setup option commands. The instructions in this section will deal only with functions, the basic commands that make AirMap do something. AirMap will work fine for these instructions right out of the box with the factory default settings. But, if you want to learn about the various options, see Sec. 5, *System Setup and GPS Setup Options*.

To access the Main Menu from any Page: press **MENU|MENU**. To clear the menu screen and return to the page display, press **EXIT**.



Main Menu, Land Mode.

### Pages

Land Mode has three main Page displays that represent the three major operating modes. They are the Satellite Status Page, the Navigation Page and the Map Page. They are accessed by pressing the **PAGES** key, which calls up the Pages Menu. You then press the left ← arrow key or the right → arrow key to scroll among the three pages.

Each Page has a submenu screen associated with it. You access a Page Submenu by pressing the **MENU** key one time while the page is displayed. (Pressing the **MENU** key twice takes you to the Main Menu.)

## Satellite Status Page

This page provides detailed information on the status of AirMap's satellite lock-on and position acquisition. No matter what page you are on, a flashing current position indicator/question mark symbol and flashing GPS data displays indicate that satellite lock has been lost and there is no position confirmed. This page shows you the quality and accuracy of the current satellite lock-on and position calculation.

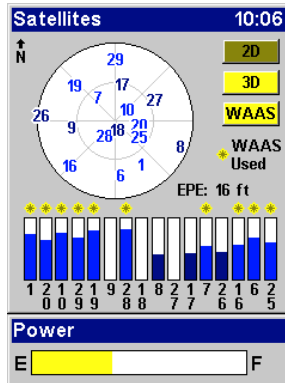
### WARNING:

Do not begin navigating with this unit until the numbers have stopped flashing!

### NOTE:

Refer to Sec. 3, *Aviation Operation*, for further explanation and more illustrations of the Satellite Page.

1. To get to the Satellite Status Page: press **PAGES** | ← to **STATUS** | **ENT**.
2. To get to Satellite Status Menu: press **MENU**.



Satellite Status Page.

## Status Menu

The Satellite Status Menu allows you to set your own GPS options such as initializing the GPS location or turning off track smoothing.

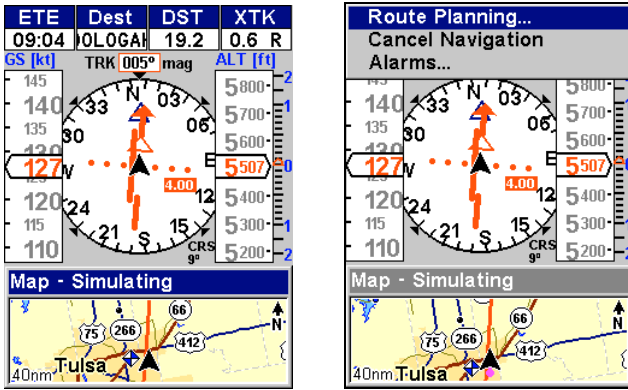
## Navigation Page

This screen has a compass rose that not only shows your direction of travel, but also the direction to a recalled waypoint. The navigation screen looks like the one in the following image when you're navigating to a waypoint. Your position is shown by an arrow in the center of the screen. Your trail history, or path you've taken is depicted by the line extending from the arrow. The large arrow pointing down at the top of the compass rose indicates the current track (direction of travel) you are taking.

**NOTE:**

Refer to Sec. 3, *Aviation Operation*, for further explanation and more illustrations of the Navigation Page.

1. To get to the Navigation Page: press **PAGES** | ← to **NAVIGATION** | **ENT**.
2. To get to Navigation Page Sub Menu: press **MENU**.



Navigation Page, left, Navigation Menu, right.

**Navigation Menu**

The Navigation Menu allows you to cancel navigation, set up alarms, and plan or edit your route.

**Map Page**

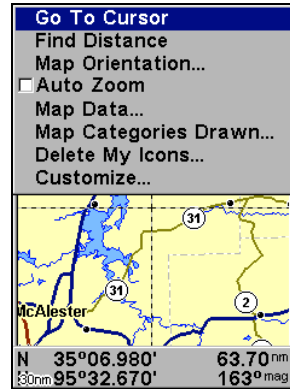
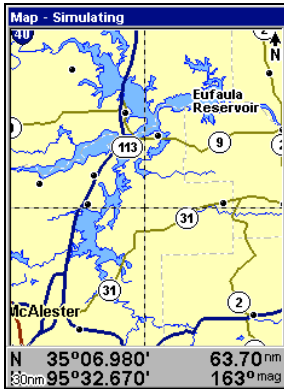
The map screens show your course and track from a “bird’s-eye” view. By default, this unit shows the map with your current track at the top of the screen. (This can be changed. See the topic *Map Orientation*, in Sec. 5.) If you’re navigating to a waypoint, the map shows your starting location, present position, course line and destination. You don’t have to navigate to a waypoint, however, to use the map.

The Zoom In and Zoom Out keys zoom the map to enlarge or reduce its coverage area and the amount of mapping detail shown. There are 40 available map zoom ranges, from 0.02 nautical miles to 4,000 nautical miles.

**NOTE:**

Refer to Sec. 3, *Aviation Operation*, for further explanation and more illustrations of the Map Page.

1. To get to Map Page: Map page is the default when AirMap is turned on. To switch from another page to the Map Page, press **PAGES** | → to **MAP** | **ENT**.
2. To get to Map Page Menu: press **MENU**.



Map Page, left, Map Menu, right.

## Map Menu

The map menu has many options. The map menu allows you to find distances, change the orientation of your map, view map data, and other helpful map functions.

## Moving Around the Map: Zoom & Cursor Arrow Keys

The map is presented from a bird's-eye view perspective. The current zoom range shows in the lower left corner of the screen. If the zoom range says "4 nm," the map shows an area 4 nautical miles wide from the left edge of the screen to the right edge of the screen.

1. Press the **ZIN** key (zoom in) to move in closer and see greater detail in a smaller geographic area.
2. Press the **ZOUT** key (zoom out) to move farther away and see less map detail, but a larger geographic area.

You can pan or scroll the map northward, southward, eastward or westward by using the arrow keys, which launches the cross-hair map cursor. To clear the cursor, press **EXIT**, which jumps the map back to the current position or the last known position.

## Find Distance From Current Position To Another Location

1. While on the Map page press: **MENU** | ↓ to **FIND DISTANCE** | **ENT**.
2. Center your cursor over the position you want to find the distance to. A rubber band line appears, connecting your current position to the cursor's location. The distance along that line will appear in the lower right-hand corner of the screen.
3. Press **EXIT** to return to regular operation.



The distance to Dallas from the starting point is 207.5 nautical miles.

### Find Distance From Point to Point

You can also measure distance between two other points on the map.

1. While on the Map page press: **MENU** | ↓ to **FIND DISTANCE** | **ENT**.
2. Center your cursor over the first position. (A rubber band line appears, connecting your *current* position to the cursor's location.) Press **ENT** to set the first point, and the rubber band line disappears.
3. Move the cursor to the second position. The rubber band line reappears, connecting the first point you set to the cursor. The distance along that line will appear in the lower right-hand corner of the screen.
4. Press **EXIT** to clear the command and return to the page screen.

### Find Your Current Position

Finding your current position is as simple as turning AirMap on. Under clear sky conditions, the unit automatically searches for satellites and calculates its position in approximately one minute or less.

#### NOTE:

"Clear sky" means open sky, unobstructed by terrain, dense foliage or structures. Clouds do not restrict GPS signal reception.

If for some reason satellite acquisition takes longer, you may be inside a structure or vehicle or in terrain that is blocking signal reception. To correct this, be sure you are positioned so that the unit has as clear a view of the sky as possible, then turn the unit off and back on again.

If you have the cursor activated, any information the unit gives you will be based on the cursor position, not your own. If you want to find where you are, just press **EXIT** until the cursor goes away and the map snaps back to center on your position.



# Icons

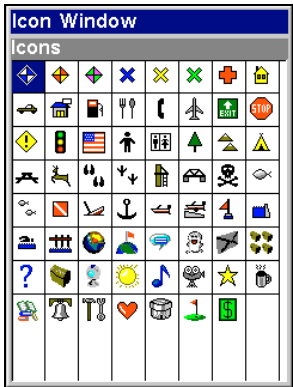
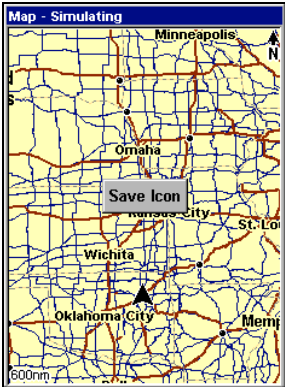
Icons are graphic symbols used to mark some location, personal point of interest or event. They can be placed on the map screen, saved and recalled later for navigation purposes. These are sometimes referred to as event marker icons. AirMap has 63 different symbols you can pick from when creating an icon.

Icons are similar to waypoints, but they do not store as much information (like names) as waypoints do. You can't use a menu to navigate to icons as you can with waypoints. (But, you *can* use the map cursor and navigate to any icon on the map.)

You can create an icon at the cursor position on the map, or at your current position while you are navigating.

## Create Icon on Map

1. Use the arrow keys to move the cursor to the place where you want to make an icon.
2. Press and *hold* **ENT** until the screen shows a "Save Icon" menu, then *release* the **ENT** key.
3. Press ← or ↑ or → or ↓ to select your icon symbol, then press **ENT**. The icon appears on the map.



Save icon command, left, Select symbol menu, right.

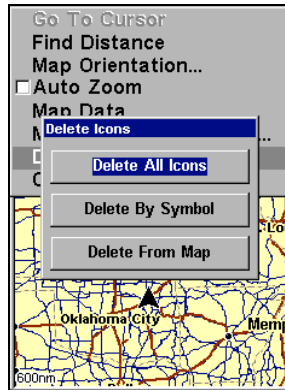
## Create Icon at Current Position

1. While you are traveling, press and *hold* **ENT** until the screen shows a "Save Icon" menu, then *release* the **ENT** key.
3. Press ← or ↑ or → or ↓ to select your icon symbol, then press **ENT**. The icon appears on the map.

## Delete an Icon

You can delete all the icons at one time, you can delete all icons represented by a particular symbol, or you can use the cursor to delete a selected icon from the map.

1. Press **MENU** | **↓** to **DELETE MY ICONS** | **ENT**.
2. Press **↓** to **DELETE ALL ICONS**, **DELETE BY SYMBOL**, or **DELETE FROM MAP** and press **ENT**.

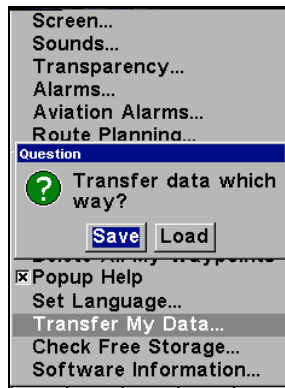


Delete icons menu.

## Load GPS Data Files from an MMC

**GPS Data files**, containing waypoints, routes, trails and event marker icons, must be copied from an MMC to AirMap's internal memory before AirMap can read them. Here's how:

1. Press **MENU** | **MENU** | **↓** to **SYSTEM SETUP** | **ENT** | **↓** to **TRANSFER MY DATA** | **ENT** and the following screen appears.



The Transfer My Data submenu asks if you want to save data to the MMC or load data from the MMC into AirMap's memory.

2. The Transfer My Data menu includes a message which tells you if an MMC is present or not. If no MMC is present, you must first insert a card into AirMap in order to activate the Load or Save commands.

To load data from the MMC to AirMap: press → to **LOAD** | **ENT**.

3. **Loading:** There may be more than one GPS Data File (\*.USR) on the card. To select a file, press **ENT** to activate the selection box, use ↓ or ↑ to highlight the file, then press **ENT** to accept the selection. Next, press ↓ to **LOAD** | **ENT**. The unit will display a completion message when the data transfer is finished. To return to the Page view, press **EXIT** | **EXIT** | **EXIT**.

## Navigate

Navigation is one of the most powerful reasons for owning an AirMap, and has already been addressed in Sec. 3. Land navigation is just as useful, though. Just like the air navigation options, you can get accurate information about where you want to go, how to get there, how long it will take, and other useful trip information.

### Navigate Back to Man Overboard Waypoint

In Land Mode, this unit has a man overboard feature that shows navigation data to the location where the feature was activated. (This feature replaces Aviation Mode's "Find Nearest Airport" shortcut.) To activate it, press the **ZOUT** and **ZIN** keys at the same time. Your position at the time these keys are pressed is used as the man overboard position. The unit automatically begins navigating to the MOB waypoint.

### Cancel Navigation

Press **MENU** | **MENU** | ↓ to **CANCEL NAVIGATION** | **ENT** | ← to **YES** | **ENT**.

### Navigate a Route

1. From the **NAVIGATION PAGE**, press **MENU** | **ENT** or from the **MAP PAGE**, press **MENU** | **MENU** | ↓ to **ROUTE PLANNING** | **ENT**.

2. Press ↓ to select *route name* | **ENT** | ↓ to **NAVIGATE** | **ENT**.

**NOTE:** To navigate a route *in reverse*: instead of the instructions in step 2, press ↓ to select *route name* | **ENT** | ↓ then → to **REVERSE** | **ENT** | ← to **NAVIGATE** | **ENT**.

3. Upon arrival at your destination, cancel navigation: press **MENU** | **MENU** | ↓ to **CANCEL NAVIGATION** | **ENT** | ← to **YES** | **ENT**.

### Navigate to Cursor Position on Map

1. Use arrow keys to center cursor cross-hair over the map object or location.

2. To navigate to the selected location: press **MENU|ENT|EXIT**. Follow steering arrow on Map Page or compass bearing arrow on Navigation Page.

### Navigate to an Icon

Use the Navigate to Cursor command above, and use the cursor to select the icon.

### Navigate to Point of Interest (POI)

For POIs that are in view on the map, you can easily use the Navigate to Cursor command above; just use the cursor to select the POI. The other method involves searching for POIs with the Find command. (see Sec. 6, *Searching*, for detailed instructions on POI searches.)

Whenever you locate a POI, the Point of Interest information screen appears (with phone number, position, etc.) and the **Go To** command is automatically highlighted in the command box. To navigate to that POI, press **ENT** and AirMap begins displaying navigation information to that location.

### Navigate to a Waypoint

You can select any waypoint visible on the Map Page with the cursor, then use the Navigate to Cursor command. However, you can avoid scrolling the map to pick your waypoint if you use the Find commands:

1. Press **FIND|↓** to **MY WAYPOINTS|ENT**. To look up the nearest waypoint, press **ENT**, or to look by name (and scroll through the entire waypoint list), press **↓|ENT**. For this example, look by name.
2. If your waypoint list is a long one, you can spell out the waypoint name in the **FIND BY NAME** box to search for it. (Press **↑** or **↓** to change the first character, then press **→** to move the cursor to the next character and repeat until the name is correct, then press **ENT** to jump to the list below.)
3. If the list is short, you can jump directly to the **FIND IN LIST** box by pressing **ENT**. Use **↑** or **↓** to select the waypoint name, press **ENT** and the waypoint information screen appears with the **Go To** command selected.
4. To begin navigating to the waypoint, press **ENT**.

### Navigate a Trail

#### NOTE:

Trails are described in more detail later in this section, under the heading "Trails." If you are unfamiliar with plot trails, consider skipping ahead and reading the introduction to them before reading about trail navigation.

There are two methods for following your back trail. The simplest requires no menu commands at all, but provides no navigation information during

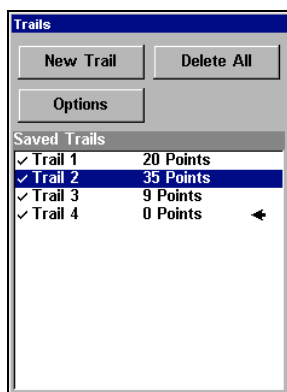
the trip, such as the time to your destination. The other requires only three key strokes and provides a full range of navigation data. Try both methods and see which you prefer. When hiking at walking speed, we often just use visual back trailing because it is better at following each little turn on a foot path. At faster speeds, whether cruising at 120 kts or zip-ping down the highway, the Navigate Trail command is handy.

### Visual Back Trailing

1. On the Map Page, zoom (**ZIN** or **ZOUT**) so your flashing trail is visible.
2. Begin moving and watch the Map Page (or Navigation Page, if you prefer). Simply walk or steer so that your current position arrow traces along the trail you have just made.

### Navigate a Back Trail

1. Press **MENU|MENU|↓** to **MY TRAILS|ENT** and a screen similar to the one in the following image appears.



Trails Menu.

2. Press **↓** then use **↓** or **↑** to select a trail to navigate.
3. With the trail name highlighted, press **ENT|→** then **↓** to **NAVIGATE|ENT**.
4. Wait while AirMap creates a route from the trail. When the progress message disappears, the unit displays a route information screen. Press **↓** to highlight the **NAVIGATE** command.

### Tip: Back Track a Trail

Simply running the Navigate command will lead you along the trail from its starting point to its ending point — forward order. You can also *back track* a trail, or follow it in *reverse* order (from its ending point to its starting point.) You must first select the Reverse command to reverse the trail point order before you start navigating: press **→** to **REVERSE|ENT|←** to **NAVIGATE**.

5. To follow the trail, press **ENT**. The unit begins showing navigation data along the trail. Follow the steering arrow on the Map Page or the compass bearing arrow on the Navigation Page.

**NOTE:**

If you are at or near the start of the trail, the arrival alarm will go off as soon as navigation begins because of your proximity to the trail's first point. Just press **EXIT** to clear the alarm.

6. Upon arrival at your destination, cancel navigation:  
press **MENU | MENU | ↓** to **CANCEL NAVIGATION | ENT | ←** to **YES | ENT**.

**Backtrack a Trail**

See the "tip" paragraph in the previous entry, *Navigate a Trail*.

**Routes**

A route is a series of waypoints, linked together in an ordered sequence, that's used to mark a course of travel. You can visualize a route as a string of beads: The beads represent waypoints and the string represents the course of travel connecting waypoint to waypoint.

The course from one waypoint to the next is a leg; routes are composed of one or more legs. The legs of all GPS routes are based on straight lines between waypoints.

A route provides the automatic capability to navigate through several waypoints without having to reprogram the unit after arriving at each waypoint. Once programmed into the GPS unit, a route provides the option of navigating forward through the route waypoints or in reverse order. (You can even begin navigating in the middle of a route!)

**Create and Save a Route**

You have the option of creating a route in the unit, or on your computer if you have purchased our MapCreate 6 software.

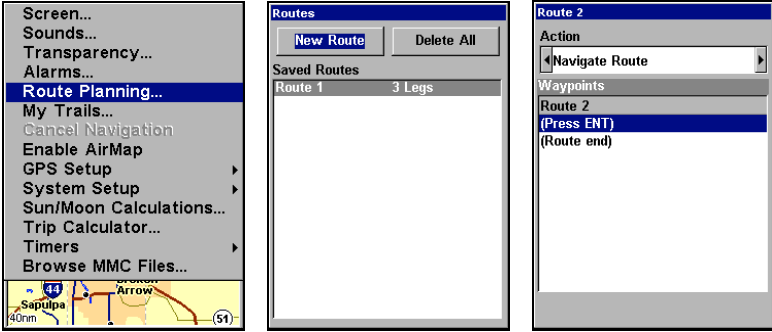
**PC-created Routes**

When you're making routes exclusively for use in Land Mode, MapCreate is the easiest method for preparing them, simply because your PC's larger screen, keyboard and mouse are easier to manipulate than the smaller AirMap.

To load a MapCreate route into AirMap, follow instructions in MapCreate's manual for creating a route and saving it as part of a GPS Data File (file format \*.usr). Copy the GPS Data File to an MMC and insert the MMC in AirMap. (See Sec. 2 for instructions on installing MMCs. To load the GPS Data File into AirMap memory, see the entry on *Transferring GPS Data Files between AirMap and a Computer* in this section.)

## Routes Created in AirMap

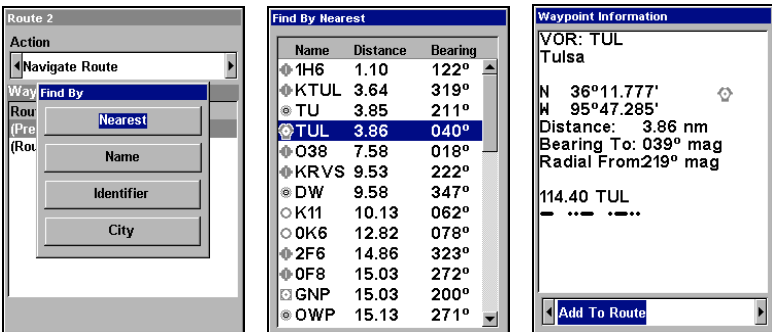
If you plan on flying the route – or if you just want to make it quickly without using a computer – you can create a route in the unit. You do this by selecting existing waypoints from your waypoint list or the Aviation Waypoints, or by making new route waypoints on the map with cursor arrows and the Enter key.



Route Planning on Main Menu is shown left. Center, New Route command on the Routes Menu. Right, Edit Route Menu with no waypoints in the waypoint list.

Adding Aviation Waypoints is the most effective way to build a route for a flight plan. To begin, press **MENU|MENU|↓** to **ROUTE PLANNING|ENT**. Make sure **NEW ROUTE** is selected at the top of the Routes Menu, and press **ENT** again.

To begin making your route, press **↓** to highlight the first empty space in the waypoint list. Pressing **ENT** will bring up the menu in the following image. Select **ADD AVIATION WAYPOINT** and press **ENT**.

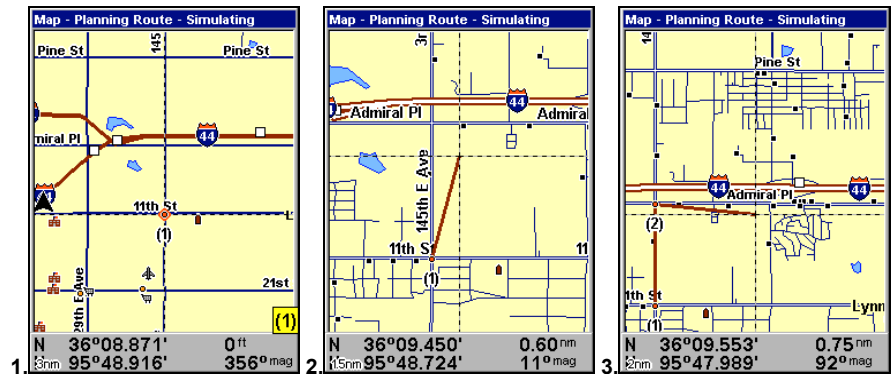


Process for adding an Aviation Waypoint to a route. At left, Find By menu appears after selecting Add Aviation Waypoint. Center, select the desired waypoint from the list (notice the symbols at the left showing the type of waypoint). At right, Waypoint Information screen with "Add to Route" option selected.

Keep adding waypoints in this way until you have plotted your whole route. Of course, you don't have to use just one method. You could add a handful of Aviation Waypoints but in between place some waypoints from the map, if you want to detour over a particular landmark. Or even include personal waypoints in your route, if you'd like to fly over a friend's house. Since you add one waypoint at a time, you can choose the best way to enter each one.

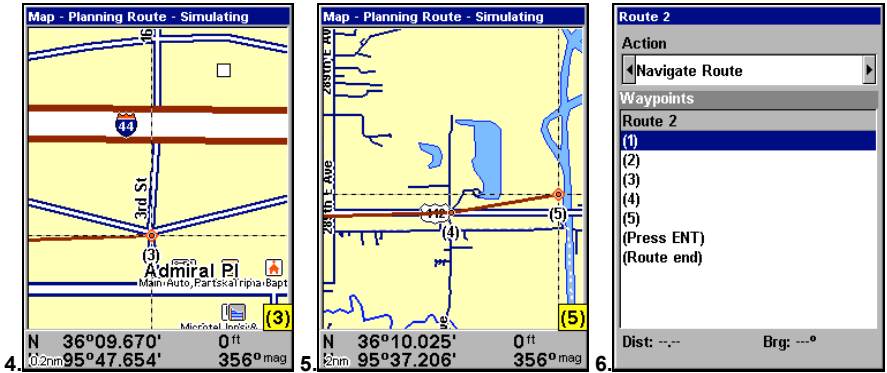
For another example, we'll go through the process of creating a Land Mode route using only the map option.

1. From the **NAVIGATION PAGE**, press **MENU|ENT** or from the **MAP PAGE**, press **MENU|MENU|↓** to **ROUTE PLANNING|ENT**.
2. Make sure **NEW ROUTE** is selected and press **ENT|↓** to **(ROUTE END)|ENT|↓** to **ADD FROM MAP|ENT**. The Map Page appears with the cursor showing.
3. Use the Zoom keys and arrow keys to move the map and cursor until the cursor is centered on the spot where you want your route to begin. (If you are starting at your current position or the current cursor position, you are already at the starting spot.)
4. Set the first route waypoint: press **ENT**. In this example we moved to the intersection of 11th Street and 145th E. Ave. to start our route to a public hunting area next to a river.
5. Move the cursor to the next point in the route, a spot where you need to turn or change direction, and press **ENT** to set the next waypoint.
6. Repeat step five until the route reaches your destination.



Route creation sequence, from left: Fig. 1. Set route waypoint (1) at 11th St. & 145th Ave. Fig. 2. Zoom in; move cursor north to set point (2) at 145th & Admiral. Fig. 3. With point (2) set, move cursor east to mark interstate on-ramp with waypoint (3). In figures 2 and 3, notice the rubber band line extending from the previously set waypoint to the cursor. This line will become the course for the route.





Route creation sequence, continued: Fig. 4. Point (3) set at on-ramp turn.  
 Fig. 5. Waypoint (4) set at highway exit to frontage road leading to river.  
 Waypoint (5) ends the route at a tree stand in the hunting area.  
 Fig. 6. Press **EXIT** to save the route and you return to this screen.

7. To save your route, press **EXIT**. AirMap reverts to the Route screen, with the route automatically named "Route 1" and stored in AirMap's internal memory.
8. You can edit the name if you wish. Press **↑** to **NAME** | **ENT**. Press **↑** or **↓** to change the first character, then press **→** to move the cursor to the next character and repeat until the name is correct, then press **ENT**.
9. You can execute other route commands, such as **NAVIGATE**. With the command box active, just press **←** or **→** to highlight a different command, then press **ENT**.
10. If you are finished with the route for now, you can return to the last page displayed by pressing **EXIT** | **EXIT** | **EXIT**.

### Delete a Route

1. From the **NAVIGATION PAGE**, press **MENU** | **ENT** or from the **MAP PAGE** press **MENU** | **MENU** | **↓** to **ROUTE PLANNING** | **ENT**.
2. Press **↓** to the route list, then press **↓** or **↑** to select *route name* | **ENT**.
3. Press **↓** then **→** to **DELETE** | **ENT** | **←** to **YES** | **ENT**.

### Save GPS Data Files to an MMC

1. Press **MENU** | **MENU** | **↓** to **SYSTEM SETUP** | **ENT** | **↓** to **TRANSFER MY DATA** | **ENT**.
2. The Transfer My Data menu includes a message which tells you if an MMC is present. If no MMC is present, you must first insert a card into AirMap in order to activate the Save command.
3. To save data *from* AirMap *to* the MMC: press **ENT** (for **SAVE**.)

4. To accept the default name "Data" for the GPS Data File, press ↓ to **SAVE|ENT**. (If you wish to rename the file, press **ENT** to activate the selection box. Press ↑ or ↓ to change the first character, then press → to the next character and repeat until the name is correct. Then, press **ENT|↓** to **SAVE|ENT**.)

The unit will display first a progress then a completion message when the data transfer is finished. To return to the Page view, press **EXIT|EXIT|EXIT**.

### Searching

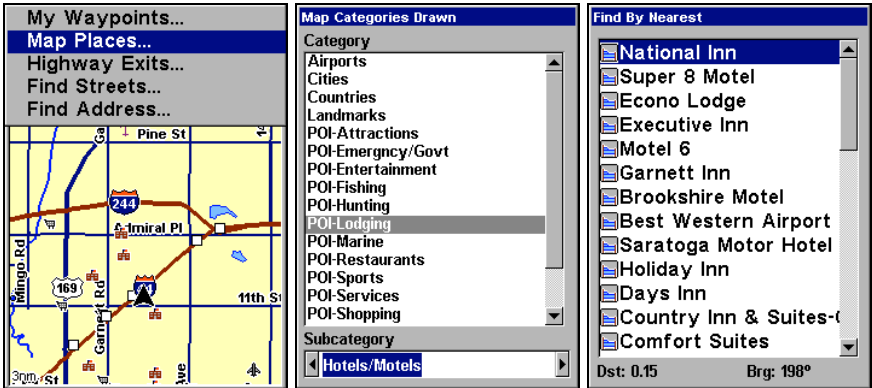
In this example, we'll look for the *nearest* hotel or motel. For more information on different types of searches, refer to Sec. 6, *Searching*.

**NOTE:**

This example requires the Point of Interest (POI) database included with MapCreate 6. Always use a custom map if you want to be able to search for Points of Interest.

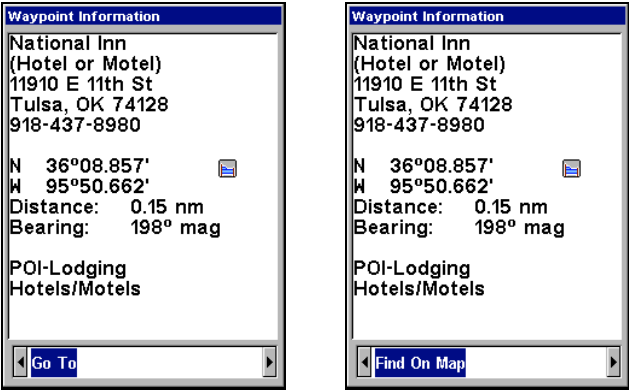
After AirMap has acquired a position:

1. Press **FIND|↓** to **MAP PLACES|ENT|↓** to **POI-LODGING**.
2. You could search the entire lodging category, but in this example we will narrow our search. Subcategory is listed below the main selection list. Press → to **HOTELS/MOTELS|ENT|ENT**.
3. AirMap says it is calculating, then a list of hotels and motels appears, with the closest at the top of the list, and the farthest at the bottom of the list. The nearest is highlighted.



**Find Map Places Menu, left; Category Selection menu, center; and list of the nearest motels, right.**

4. If you wish, you could scroll  $\uparrow$  or  $\downarrow$  here to select another motel or hotel, but for now we will just accept the nearest one. Press **ENT**.
5. The POI information screen appears. (This is what makes AirMap handy as a business phone directory!) If you wanted to navigate there, you could press Enter, since the Go To command is highlighted. But we just want to see it on the map, so press  $\rightarrow$  to **FIND ON MAP | ENT**.



**POI information screen on hotel nearest this position.**

Screen shows name, street address, phone number, latitude/longitude, distance to the hotel and its compass bearing. Figure at left shows Go To command; right figure shows Find On Map command.

6. AirMap's map appears, with the cross-hair cursor highlighting the hotel's POI symbol. A pop-up name box identifies the POI. A data box at the bottom of the screen continues to display the location's latitude and longitude, distance and bearing.



**Map screen showing Finding Waypoint, the result of a lodging search.**

7. To clear the search and return to the last page displayed, press **EXIT | EXIT | EXIT**. Press **EXIT** one more time if you want to clear the cur-

sor and let the map return to the current or last known position. (Before you completely exited out of the Search menus, you could have gone looking for another place.)

### **Switch to Aviation Mode**

To leave Land Mode and switch to Aviation Mode:

1. Press **MENU | MENU | ↓** to **SYSTEM SETUP | ↓** to **ENABLE AIRMAP | ENT**.
2. Unit asks, "Are you sure you want to turn on aviation mode?"
3. Press **← | ENT** and the unit switches to Aviation Mode.

### **Switch Back to Land Mode from Aviation Mode**

To leave Aviation Mode and switch back to Land Mode:

1. Press **MENU | MENU | ↓** to **SYSTEM SETUP | ↓** to **DISABLE AIRMAP | ENT**.
2. Unit asks, "Are you sure you want to turn on land navigation mode?"
3. Press **← | ENT** and the unit switches to Land Mode.

### **NOTE:**

In Aviation Mode, trail displays are turned off by default, but trails may still be recording. When you switch the unit back to Land Mode, any trails you've recorded will again be displayed. If these trails cause too much clutter on the map display, you can hide them (using the Map Categories Shown option) or delete any unnecessary trails (as described in the following segment).

## **Trails**

A trail, or plot trail, is a string of position points plotted by AirMap as you travel. It's a travel history, a record of the path you have taken. Trails are useful for repeating a journey along the same track. They are particularly handy when you are trying to retrace your trip and go back the way you came.

AirMap lets you save up to 100 trails in its memory. Since you can copy these trails to MMCs in the form of GPS Data Files (\*.usr format), the only true limit on the number of trails you can record is the number of MMCs you can carry in your pockets.

(For various trail options, see the *Trail Options* entry in Sec. 5.)

### **Create and Save a Trail**

AirMap is set at the factory to automatically create and record a trail while the unit is turned on. It will continue recording the trail until the length reaches the maximum trail point setting (default is 2,000, but the unit can record a single trail up to 9,999 points long). When the point limit is reached, AirMap begins recording the trail over itself.

To preserve a trail from point A to point B, you must "turn off" the trail by making it inactive before heading to point C or even back to point A. When a trail is set inactive, AirMap automatically creates and begins recording a new trail.

### **Delete a Trail**

To erase or delete a trail: Press **MENU | MENU | ↓** to **MY TRAILS | ENT | ↓** to *trail name* | **ENT | →** to **DELETE TRAIL | ENT | ←** to **YES | ENT**.

### **Edit a Trail Name**

To edit a trail name: press **MENU | MENU | ↓** to **MY TRAILS | ENT | ↓** to *trail name* | **ENT | ENT**. Press **↑** or **↓** to change the first character, then press **→** to the next character and repeat until the name is correct. Press **EXIT | EXIT | EXIT | EXIT** to return to the previous page display.

## **Transferring GPS Data Files Between AirMap and a Computer**

To copy GPS Data Files from AirMap's memory to an MMC, see the entry in this section on *Save GPS Data Files to an MMC*.

To copy GPS Data Files from an MMC into AirMap's memory, see the entry in this section on *Load GPS Data Files From an MMC*.

To copy GPS Data Files from an MMC to your computer, see the instruction manual that came with your MapCreate 6 mapping software or your MMC card reader.

## **Transferring and Loading Custom Maps From Computer to AirMap**

**Custom maps** work only from the MMC card or SD card. When a card containing a Custom Map File is loaded into the unit, AirMap automatically loads the map into memory when the unit is turned on.

Instructions for copying Custom Map Files to an MMC are contained in the instruction manual for your MMC card reader and MapCreate 6 software. For instructions on inserting an MMC into AirMap, see Sec. 2, *Installation/Accessories*.

## **Utilities**

Utilities are useful tools for traveling or for outdoor activities.

### **NOTE:**

AirMap also includes a set of Aviation-only utilities. These are discussed in Sec. 3, *Aviation Utilities*.

## Alarm Clock

To get to the alarm clock menu: press **MENU | MENU | ↓** to **UTILITIES | ENT | ↓** to **ALARM CLOCK | ENT**.

## Sun/Moon Rise & Set Calculator

To get to the Sun/Moon menu: press **MENU | MENU | ↓** to **UTILITIES | ENT | ENT**.

## Trip Calculator

To get to the Calculator menu: press **MENU | MENU | ↓** to **UTILITIES | ENT | ↓** to **TRIP CALCULATOR | ENT**.

## Trip Down Timer

To get to the Down Timer menu: press **MENU | MENU | ↓** to **UTILITIES | ENT | ↓** to **DOWN TIMER | ENT**.

## Trip Up Timer

To get to the Up Timer menu: press **MENU | MENU | ↓** to **UTILITIES | ENT | ↓** to **UP TIMER | ENT**.

## Waypoints

A waypoint is simply an electronic "address," based on the latitude and longitude of a position on the earth. A waypoint represents a location, spot, or destination that can be stored in memory, then be recalled and used later on for navigation purposes. Simply think of it as an electronic address. You can create a waypoint at the cursor position on the map, or at your current position while you are navigating.

### Create a Waypoint

These techniques use the Quick Save method, the fastest and easiest way to create a waypoint.

#### Create Waypoint on Map

1. Use the arrow keys to move the cursor to the place where you want to make a waypoint.
2. Press **ENT | ENT**. The waypoint is saved and automatically given a name with a sequential number, such as "waypoint 001." The waypoint symbol and number appear on the map.

#### Create Waypoint at Current Position

While you are traveling, press **ENT | ENT**. The waypoint is saved and automatically given a name with a sequential number, such as "waypoint 002." The waypoint symbol and number appear on the map.

## Create a Man Overboard Waypoint

This unit has a man overboard feature that shows navigation data to the location where the feature was activated. To activate it, press the **ZOUT** and **ZIN** keys at the same time. Your position at the time these keys are pressed is used as the man overboard position. The unit automatically begins navigating to the MOB waypoint. For further details, see the subject *Navigating Back to a Man Overboard Waypoint* earlier in this section.

## Create a Waypoint by Average Position

This feature sets a waypoint at the current position after taking several position readings and averaging them. This boosts waypoint position accuracy by helping to eliminate errors caused by atmospheric conditions and other factors.

1. Press **ENT** | ↓ to **AVERAGE POSITION** | **ENT** | (cursor jumps to highlight **CREATE**) | **ENT**.
2. Wait while the unit takes points to average for the position. (The greater the number of points, the greater the accuracy.) When the desired number of points accumulates, press **ENT** to create and save the waypoint.
3. The Edit Waypoint menu appears. You can simply save the waypoint by pressing **EXIT** | **EXIT** or you can edit the waypoint.

## Create a Waypoint by Projecting a Position

This feature sets a waypoint at a point located a specific distance and bearing from a reference position. The reference position can be selected from your waypoint list, a map feature or from the Points of Interest list.

1. Press **ENT** | ↓ to **PROJECTED POSITION** | **ENT** | (cursor jumps to highlight **CREATE**) | **ENT**.
2. Press ↓ to **CHOOSE REFERENCE** | **ENT**. Use ↑ and ↓ to select a waypoint, map feature or Point of Interest. When the point has been selected, press **ENT** and the point's position appears as the reference position.
3. Press ↓ to **DISTANCE** | **ENT**. Press ↑ or ↓ to change the first character, then press → to the next character and repeat until the distance is correct. Press **ENT**.
4. Press ↓ to **BEARING** | **ENT**. Press ↑ or ↓ to change the first character, then press → to the next character and repeat until the bearing is correct. Press **ENT**.
5. Press ↑ to **PROJECT** | **ENT**. The Edit Waypoint menu appears. You can simply save the new projected waypoint by pressing **EXIT** | **EXIT** or you can edit the waypoint. (Press **EXIT** | **ENT** if you want to immediately begin navigating to the new waypoint.)

## Selecting a Waypoint

To select a waypoint on the map (for navigating to, for editing, etc.,) use the arrow keys and center the cursor over the waypoint. A highlighted halo will appear around the waypoint.

## Delete a Waypoint

To delete a waypoint: press **FIND**|↓ to **MY WAYPOINTS**|**ENT**|↓ to **NAME**|**ENT**|**ENT**|↓ to *waypoint name*|**ENT**|→ to **DELETE**|**ENT**|← to **YES**|**ENT**. To return to the previous page, press **EXIT**|**EXIT**.

## Edit a Waypoint

### Waypoint Name

To edit waypoint name: 1. Press **FIND**|↓ to **MY WAYPOINTS**|**ENT**|↓ to **NAME**|**ENT**|**ENT**|↓ to *waypoint name*|**ENT**|→ to **EDIT WAYPOINT**|**ENT**|**ENT**.

2. Use the arrow keys to rename the waypoint, then press **ENT**. To return to the previous page, press **EXIT**|**EXIT**.

### Waypoint Symbol

To edit waypoint symbol: 1. Press **FIND**|↓ to **MY WAYPOINTS**|**ENT**|↓ to **NAME**|**ENT**|**ENT**|↓ to *waypoint name*|**ENT**|→ to **EDIT WAYPOINT**|**ENT**|↓ to **EDIT SYMBOL**|**ENT**.

2. Use the arrow keys to select desired symbol and press **ENT**. To return to the previous page, press **EXIT**|**EXIT**|**EXIT**.

### Waypoint Position

To edit waypoint position: 1. Press **FIND**|↓ to **MY WAYPOINTS**|**ENT**|↓ to **NAME**|**ENT**|**ENT**|↓ to *waypoint name*|**ENT**|→ to **EDIT WAYPOINT**|**ENT**.

2. Latitude: press → to **LATITUDE**|**ENT**, then press ↑ or ↓ to change the first character, then press → to the next character and repeat until the latitude is correct. Press **EXIT**.

3. Longitude: press →|↓ to **LONGITUDE**|**ENT**, then press ↑ or ↓ to change the first character, then press → to the next character and repeat until the longitude is correct. Press **EXIT**.

4. When latitude and longitude are correct, return to the previous page: press **EXIT**|**EXIT**|**EXIT**|**EXIT**.

### Waypoint Altitude

To edit waypoint altitude: 1. Press **FIND**|↓ to **MY WAYPOINTS**|**ENT**|↓ to **NAME**|**ENT**|**ENT**|↓ to *waypoint name*|**ENT**|→ to **EDIT WAYPOINT**|**ENT**|↓ to **ALTITUDE**|**ENT**.

2. Use the arrow keys to set the altitude, then press **ENT**. To return to the previous page, press **EXIT**|**EXIT**.



# Section 5:

## System & GPS Setup Options

### Alarms

This unit has several GPS alarms. You can set an arrival alarm to flash a warning message and sound a tone when you cross a preset distance from a waypoint. For example, if you have the arrival alarm set to 0.1 mile, then the alarm will flash a message when you come within 0.1 mile of the recalled waypoint.

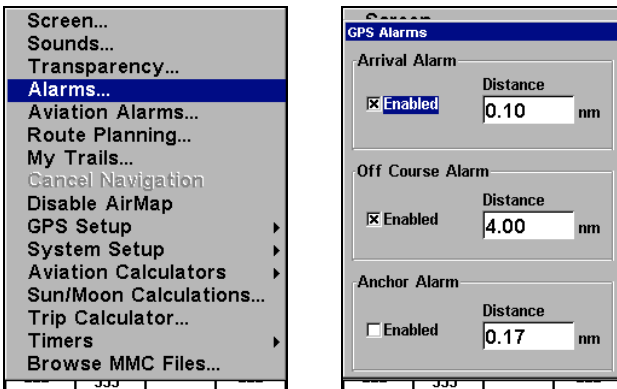
The off course alarm warns you when your track drifts too far to the right or left of the course line to the waypoint. For example, if the alarm is set to 0.1 mile, then the alarm flashes a message if you drift 0.1 of a mile or more to the right or left of the line to the waypoint.

The anchor alarm is triggered when you drift outside of a preset radius. Again, using the 0.1 mile as an example, if you're anchored and your boat moves more than 0.1 of a mile, the alarm will flash a message and sound a tone.

You can use the Alarm Menu to adjust distance settings or to turn alarms off or on.

#### NOTE:

The AirMap also includes several Aviation Alarms, which are only available when the unit is in Air Mode. For detailed descriptions of the Aviation Alarms, see the following entry.



Alarms command, left; Alarm menu, right.

To change alarm settings:

1. Press **MENU | MENU | ↓** to **ALARMS | ENT**.

2. Scroll ↓ or ↑ to select the desired category, then press **ENT** to turn the alarm on or off.
3. To change the alarm range, press → to **DISTANCE** | **ENT**. Press ↑ or ↓ to change the first character, then press → to the next character and repeat until the distance is correct. Then press **ENT**.
4. To return to the last page displayed, press **EXIT** | **EXIT**.

**IMPORTANT ALARM NOTES:**

Anchor Alarm – The anchor alarm may be triggered even when you're sitting still. This typically happens when using small (less than 0.05 mile) anchor alarm ranges.

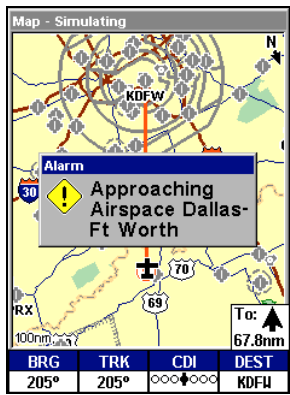
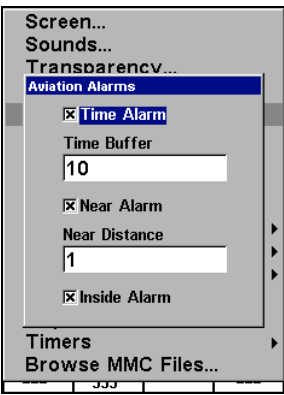
Arrival Alarm - If you set the arrival alarm's distance to a small number and you run a route (see the Navigate Routes segment), this unit may not show navigation data to the next waypoint, once you arrive at the first one, since you may not be able to come close enough to the first waypoint to trip the arrival alarm.

**Aviation Alarms**

This unit has three airspace alarms that are triggered by any airspace that it's capable of showing. The alarms are three-dimensional in nature; that is, they are triggered by both horizontal distance and altitude.

The Time Alarm is a "look-ahead" alarm that (based on your current speed and track) sounds an alarm 10 minutes before you reach an airspace. The Near Alarm sounds when you are within one nautical mile of an airspace. Finally, the Inside Alarm sounds to let you know you have entered an airspace.

All of these alarms can be turned on or off using the Aviation Alarms menu. The limits that trigger them are adjustable from this menu as well.



Aviation Alarms menu, left; a Time Alarm showing arrival at DFW International Airport in 10 minutes, right.

To change any of these settings while in Aviation Mode:

1. Press **MENU | MENU | ↓** to **AVIATION ALARMS | ENT**.
2. Scroll **↓** or **↑** to select the desired category, then press **ENT**.
3. In number boxes, press **↑** or **↓** to change the first character, then press **→** to the next character and repeat until the distance or time is correct.
4. To return to the last page displayed, press **EXIT | EXIT**.

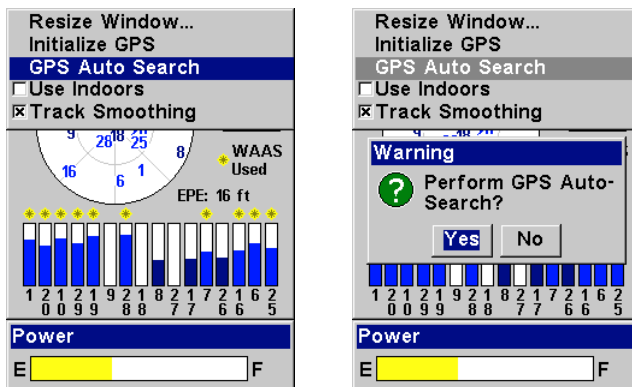
## Auto Satellite Search

To lock onto the satellites, the GPS receiver needs to know its current position, UTC time and date. (Elevation (altitude) is also used in the equation, but it's rarely required to determine a position.) It needs this data so that it can calculate which satellites should be in view. It then searches for only those satellites.

When your GPS receiver is turned on for the first time, it doesn't know what your position or elevation (altitude) is. The unit begins searching for the satellites using data that it acquired the last time it was turned on. This was probably at the factory. Since it's almost certain that you're not at our factory, it's probably looking for the wrong satellites.

If it doesn't find the satellites it's looking for after a short time, it switches to Auto Search. The receiver looks for any satellite in the sky. Due to advanced technology, the auto search time has shrunk significantly from the early days of GPS.

Once the unit locks onto the satellites, it should take less than a minute to find your position the next time it's turned on, provided you haven't moved more than approximately 100 miles from the last location it was used.



Satellite Status Menu.

You can force the unit to immediately kick into auto search mode. Here's how:

1. Press **PAGES** | ← to **STATUS** | **ENT**.
2. Press **MENU** | ↓ to **GPS AUTO SEARCH** | **ENT** | ← to **YES** | **ENT**.

## Battery Indicator

AirMap contains a battery capacity indicator, and will also flash low battery warning messages when battery power declines to a certain level.

When plugged into the DC cigarette lighter adapter, the power indicator instead displays the Voltage of the external power source.

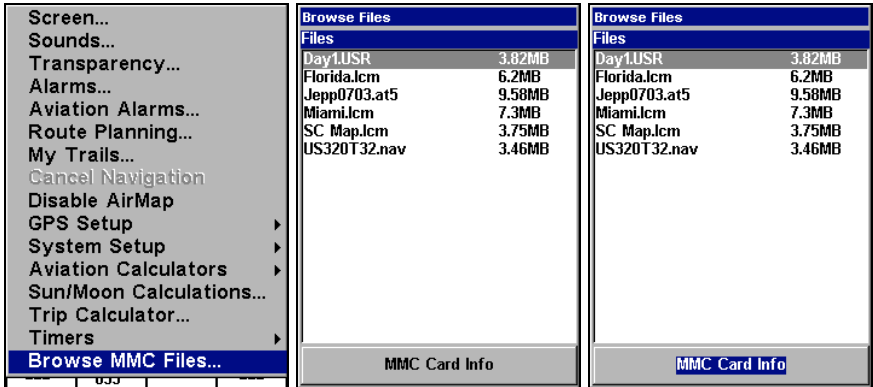


Battery capacity shown in the Power box at bottom of Satellite Page. Figure at left shows nearly full power with fresh batteries. At right, batteries show approximately 10 percent of their power is left.

## Check MMC Files and Storage Space

To check MMC Files:

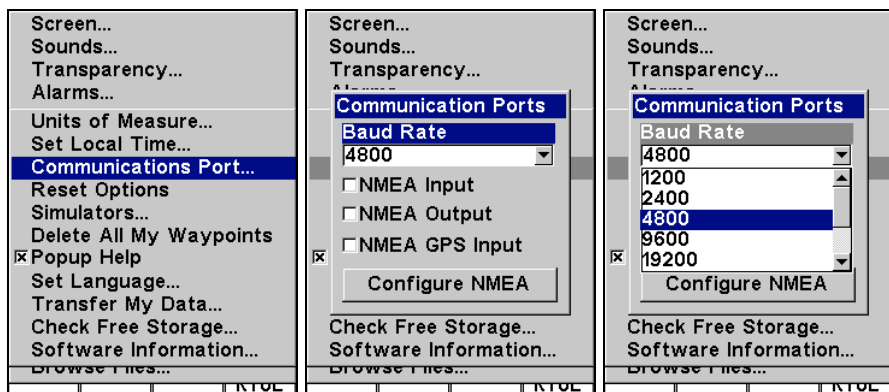
1. Press **MENU** | **MENU** | ↓ to **BROWSE MMC FILES** | **ENT**.



At left, Main Menu with Browse MMC Files selected. MMC File Browser is shown at center, and MMC Card Info at right.

## Com Port Configuration

AirMap has one NMEA 0183 version 2.0 compatible communication port, or com port for short. The Com Port Menu, which is accessed from the System Setup Menu, allows you to configure the communications port to send data to another electronic device, such as an autopilot.



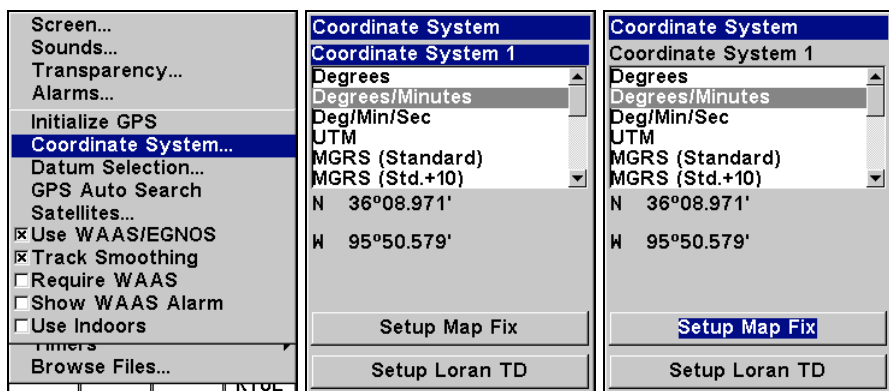
Menus for changing Com Port settings.

For connectors and wiring information for another device, consult the factory; phone numbers are in the back of this manual. To set Com Port Configuration:

1. Press **MENU | MENU | ↓** to **SYSTEM SETUP | ENT.**
2. Press **↓** to **COMMUNICATIONS PORT | ENT.**

## Coordinate System Selection

The Coordinate System Menu lets you select the coordinate system to use when displaying and entering position coordinates.



Menus for changing coordinate system used to display positions.

- To get to Coordinate System Selection:
1. Press **MENU | MENU | ↓** to **GPS SETUP | ENT.**
  2. Press **↓** to **COORDINATE SYSTEM | ENT.**

This unit can show a position in degrees (36.14952°); degrees, minutes and thousandths of a minute (36° 28.700'); or degrees, minutes, seconds and tenths of a second (36° 28' 40.9"). It can also show position in: UTM (Universal Transverse Mercator) projection; MGRS (Standard); MGRS (Standard + 10); Map Fix; Loran TD; British, Irish, Finnish, German, New Zealand, Swedish, Swiss, Taiwan and Military grids.

UTM's are marked on USGS topographic charts. This system divides the Earth into 60 zones, each 6 degrees wide in longitude.

British, Irish, Finnish, German, New Zealand, Swedish, Swiss and Taiwan grid systems are the national coordinate system used only in their respective countries. In order to use these grid systems, you must be in the respective country. This unit will pick the matching datum for you when you select the grid. See the entry on Map Datum Selection for more information.

The military grid reference system (MGRS) uses two grid lettering schemes, which are referred to as standard and alternate MGRS on this unit. Your position and datum in use determines which one to use. If you use standard, and your position is off significantly, then try the alternate.

**NOTE:** When the position format is changed, it affects the way all positions are shown on all screens. This includes waypoints.

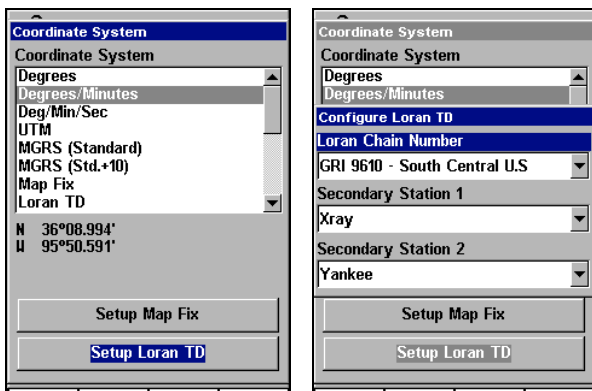
To select a coordinate system:

To change the coordinate system, press **ENT** while **COORDINATE SYSTEM** is highlighted. Press the  $\uparrow$  or  $\downarrow$  arrow keys to highlight the desired format. Press **ENT** to select it. Press **EXIT** to erase the menus.

To setup Loran TD:

**NOTE:**

If the Loran TD conversion is chosen, you must enter the local Loran chain identification for the master and slaves. Do this by selecting "Setup Loran TD" at the bottom of the "Coordinate System" menu and select the ID. Press **EXIT** to erase this menu.



At left, Setup Loran TD option on the Coordinate System Menu.  
At right, Configure Loran TD menu.

## Map Fix

Map Fix is used with charts or maps. This system asks for a reference position in latitude/longitude, which you take from a marked location on the map. It then shows the present position as distance on the map from that reference point.

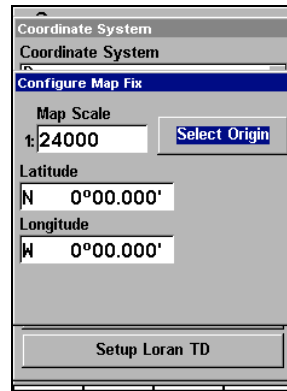
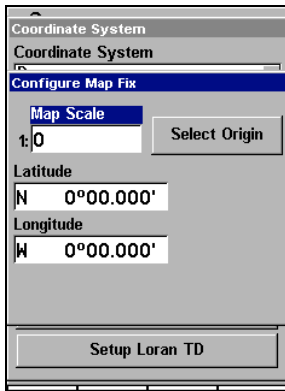
For example, if it shows a distance of UP 4.00" and LEFT 0.50", you then measure up four inches and to the left a half-inch from the reference point on the map to find your location.

To configure a map fix:

To use this format, you need to follow these steps in order. First, take your map of the area and determine a reference latitude/longitude. (Note: in order for this system to work, the latitude/longitude lines must be parallel with the edge of the map. USGS maps are parallel, others may not be. Also, this works better with smaller scale maps.) The reference position can be anywhere on the map, but the closer it is to your location, the smaller the numbers will be that you'll have to deal with.

Once you've decided on a reference position, you can save it as a waypoint. See the waypoint section for information on saving a waypoint. Save the reference position as a waypoint. Exit from the waypoint screens.

Now press **MENU|MENU|↓** to **GPS SETUP|ENT|↓** to **COORDINATE SYSTEM|ENT|↓** to **SETUP MAP FIX|ENT**. The following left screen appears, and **MAP SCALE** is highlighted. Press **ENT** and enter the map's scale. This is generally at the bottom of the paper map. It's shown as a ratio, for example 1:24000. Press **EXIT** and the unit returns to the Configure Map Fix screen.



**Configure a map fix so AirMap can find your position on a printed chart, sectional or topographical map.**

Press → to **SELECT ORIGIN|ENT|ENT (MY WAYPOINTS)** if you saved the reference point as a waypoint. Select the waypoint that you saved the reference point under and press **ENT**. The unit displays a waypoint information screen with the command **SET AS ORIGIN** selected; press **ENT** and the unit returns to the **Configure Map Fix** menu. Finally, press **EXIT** to erase this menu. Now press ↑ to **COORDINATE SYSTEM|ENT**, select **MAP FIX** from the list and press **ENT**. All position information now shows as a distance from the reference point you chose.

### Customize Page Displays

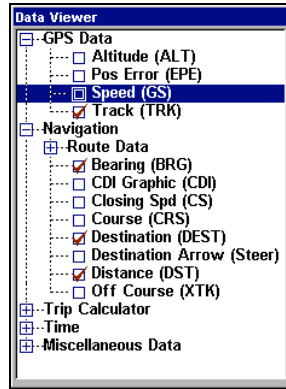
Every Page display option except **Compass Overlay** (on the **Map Page**) has customizable data boxes to provide constant on-screen information. The information provided in these data boxes is fully customizable.

The various data available from your unit are divided into categories in the **Customize** menu. These categories include **GPS Data**, **Navigation**, **Trip Calculator**, **Time**, and **Miscellaneous Data**. You can select items from any of these categories for display on any page — the category divisions are only there to help you sort through the information.

**To change the information displayed on your screen:**

While on the Page display you wish to change, press **MENU|↓** to **CUSTOMIZE|ENT**. You'll see a list of the information categories with "+" or "-" symbols next to each category name. A category with a "+" next to it is *expandable*, meaning its contents are currently hidden.





**Customize Menu, with "GPS Data" and "Navigation" categories expanded.**

Selecting the category name and pressing **ENT** will show the category's contents, so you can choose items within it. An expanded category (one with a "-" next to its name) can be collapsed to hide its contents, and make more room on your screen. Just select the category name and press **ENT**.

Expand any categories that might contain information you want to display. Then press **↓** or **↑** to select a display option. With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off). As you turn categories on, boxes will be added in a row at the top or bottom of the display. Every Page display has a limit to the maximum number of boxes you can add.

You can also turn off all categories to increase the available screen size. After all options are set, press **EXIT** to return to the page display.

## GPS Simulator

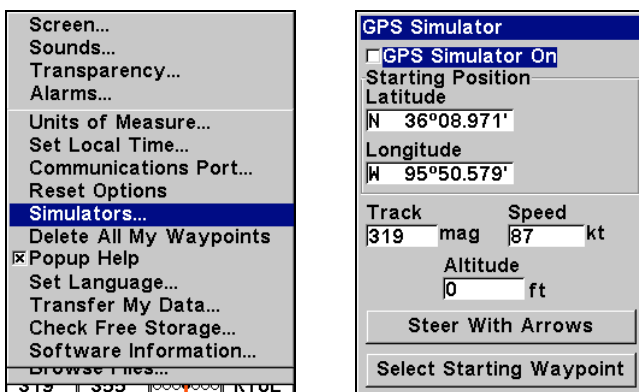
The GPS simulator lets you use the unit as if you were outdoors navigating somewhere. You can set the starting location in latitude/longitude (Starting Position) or from a stored waypoint location (Select Starting Waypoint). You can steer your position on the map by using the arrow keys (Steer With Arrows) or by setting the track and speed in the boxes provided on the simulator screen.

To get to the GPS Simulator:

1. Press **MENU | MENU | ↓** to **SYSTEM SETUP | ENT**.
2. Press **↓** to **SIMULATORS | ENT**.

Make the desired settings, then turn the simulator on by highlighting the **SIMULATOR On** box and pressing the **ENT** key. Press **EXIT** to erase this menu.

A message appears periodically, warning you that the simulator is on. Repeat the above steps or turn the unit off to turn the simulator off.



GPS Setup Menu, left, GPS Simulator Menu, right.

## Map Auto Zoom

This receiver has an auto zoom feature that eliminates much of the button pushing that other brands of GPS receivers force you to make. It works in conjunction with the navigation features.

First, start navigation to a waypoint. (See the waypoint section for more information on navigating to a waypoint.) Then, with the auto zoom mode on, the unit zooms out until the entire course shows, from the present position to the destination waypoint. As you travel toward the destination, the unit automatically begins zooming in — one zoom range at a time — always keeping the destination on the screen.

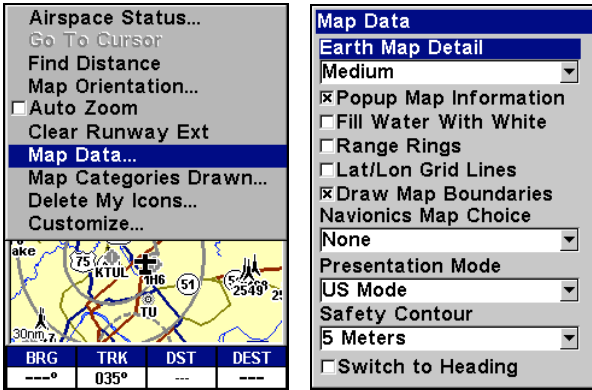
To turn this feature on, from the **MAP PAGE**, press **MENU** | ↓ to **AUTO ZOOM** | **ENT**. Repeat these steps to turn it off.

## Map Data

This menu lets you turn the map off, if desired, which turns the map screen into a GPS plotter; turn off or on the pop-up map info boxes; draw the map boundaries or boxes around the areas of detail; or fill water areas with white. You can also turn on or off Map Overlays, which display latitude and longitude grid lines or range rings on the map. This menu lets you select Navionics Maps; for instructions, see the *Navionics Charts* entry in this section.

To get to Map Data:

1. From the Map Page, press **MENU** | ↓ to **MAP DATA** | **ENT**.



Map Menu, left, Map Data Menu, right.

## Show Map Data

Press **MENU** | **↓** to **MAP DATA** | **ENT**. Press **ENT** to adjust the level of detail using **EARTH MAP DETAIL**. After the option is set, press **EXIT** to return to the page display.

### NOTE:

In Aviation Mode, turning **EARTH MAP DETAIL** to Off will clear all land map information from the map display, but the aviation map remains. You can also select other degrees of detail, from Low to High. This is a good way to quickly control clutter if you need to focus on just the air map.

## Pop-up Map Information

Press **MENU** | **↓** to **MAP DATA** | **ENT**. Press **↓** to **POPUP MAP INFORMATION**. With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off). After the option is set, press **EXIT** to return to the page display.

## Fill Water with White

Press **MENU** | **↓** to **MAP DATA** | **ENT**. Press **↓** to **FILL WATER WITH WHITE**. With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off). After the option is set, press **EXIT** to return to the page display.

## Map Overlays (Range Rings; Lat/Long Grid)

The map screen can be customized with rings that are 1/2 and 1/4 of the zoom range and/or grids that divide the plotter into equal segments of latitude and longitude.

**To set range rings:** Press **MENU** | **↓** to **MAP DATA** | **ENT**. Press **↓** to **RANGE RINGS**. With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off). After the option is set, press **EXIT** to return to the page display.

**To set Lat/Lon Grid:** Press **MENU** | ↓ to **MAP DATA** | **ENT**. Press ↓ to **LAT/LON GRID LINES**. With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off). After the option is set, press **EXIT** to return to the page display.

### Draw Map Boundaries

Press **MENU** | ↓ to **MAP DATA** | **ENT**. Press ↓ to **DRAW MAP BOUNDARIES**. With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off). After the option is set, press **EXIT** to return to the page display.

### Map Datum Selection

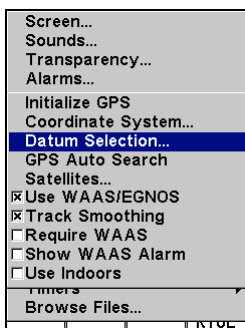
Maps and charts are based on a survey of the area that's covered by the map or chart. These surveys are called "Datums." Maps that are created using different datums will show the same latitude/longitude in slightly different locations.

All datums are named. The GPS system is based on the WGS-84 datum, which covers the entire world. Other datums may also cover the entire world, or just a small portion of it. By default, your position shows using the WGS-84 datum. However, it can show your position using one of 191 different datums.

To change the datum:

1. Press **MENU** | **MENU** | ↓ to **GPS SETUP** | **ENT** | ↓ to **DATUM SELECTION** | **ENT**.
2. Scroll ↓ or ↑ to select the desired datum, then press **ENT**.
3. To return to the last page displayed, press **EXIT** | **EXIT**.

A list of the datums used by this unit is in the back of this manual.



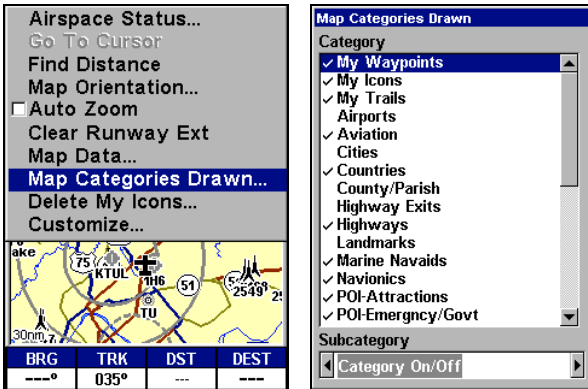
GPS Setup Menu, left, Map Datum Menu, right.

### Map Detail Category Selection

This menu determines which of the mapping features are shown on the screen. This includes, waypoints, trails, icons, cities, highways, etc. You can selectively turn on or off any of these items, customizing the map to your needs.

To get to Map Categories:

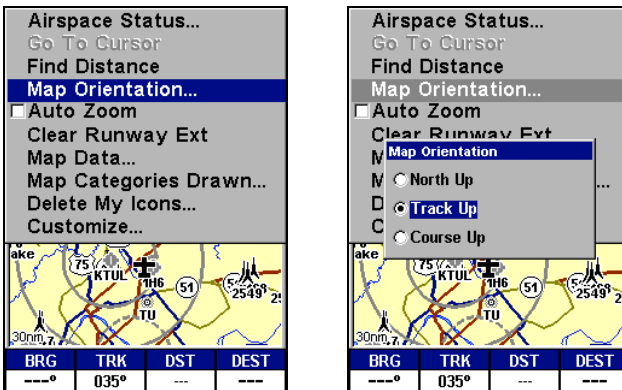
1. Press **MENU** | **↓** to **MAP CATEGORIES DRAWN** | **ENT**.
2. Press **↑** or **↓** to select a category or subcategory. Press **ENT** to turn it off (no check) or on (checked). You can also press **→** or **←** to select subcategories, so you could turn off all Rural and Minor Roads to reduce clutter, but leave on Major City Roads for landmarks.
3. To return to the last page displayed, press **EXIT** | **EXIT**.



Map Menu, left, Map Categories Menu, right.

## Map Orientation

From the Map Page, press **MENU** | **↓** to **MAP ORIENTATION** | **ENT**. Press **↓** or **↑** to select an orientation option. With the option highlighted, press **ENT** to select it, which will immediately turn it on. After the option is set, press **EXIT** | **EXIT** to return to the page display.



Map Menu, left, Map Orientation window with the Track Up map orientation option selected.

By default, many receivers show the map with north always at the top of the screen. This is the way most maps and charts are printed on paper. This is fine if you're always traveling due north. What you see to your left corresponds to the left side of the map, to your right is shown on the right side of the map, and so on. However, if you travel any other direction, the map doesn't line up with your view of the world.

To correct this problem, AirMap defaults to a track-up mode that rotates the map as you turn. Thus, what you see on the left side of the screen should always be to your left, and so on. Another option is course-up mode, which keeps the map at the same orientation as the initial bearing to the waypoint. When either the track-up or course-up mode is on, an "N" shows on the map screen to help you see which direction is north .

## Navionics® Charts

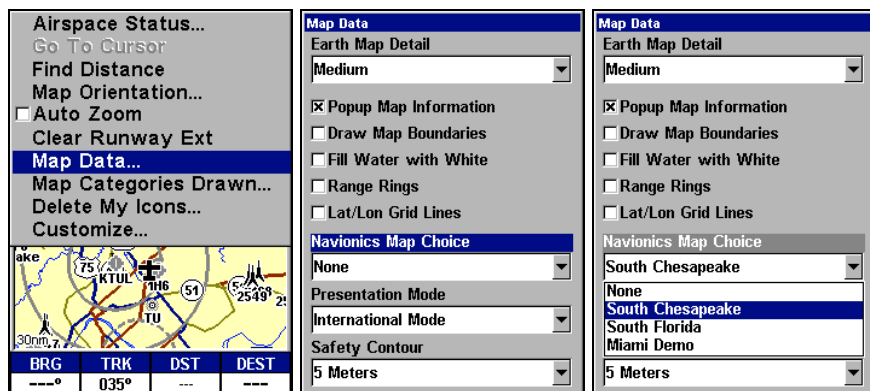
Your unit can display Navionics® electronic charts on MMCs. Both the GOLD™ and CLASSIC™ format charts are accepted. They work just like a MapCreate custom map on an MMC.

### WARNING:

**You should never format the MMC containing your Navionics chart. Formatting the MMC will permanently erase the chart from the card.**

### To display a Navionics chart:

1. Install the Navionics MMC in the memory card compartment and turn on the unit. (For full card install instructions, see Sec. 2.)
2. From the Map Page, press **MENU** | **↓** to **MAP DATA** | **ENT** | **↓** to **NAVIONICS MAP CHOICE** | **ENT**. Use **↑** or **↓** to select the *Map Name*, then press **ENT** | **EXIT** | **EXIT**.



These figures show menu sequence (from left to right) for selecting a Navionics chart for the South Chesapeake area.

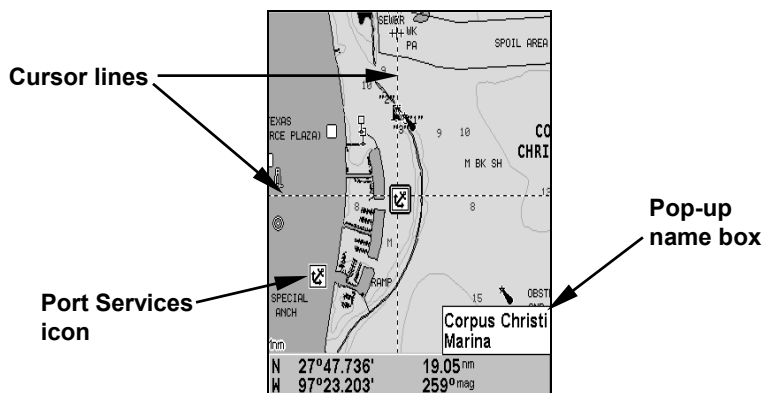
3. To turn off a Navionics chart, from the Map Page, press **MENU** | **↓** to **MAP DATA** | **ENT** | **↓** to **NAVIONICS MAP CHOICE** | **ENT**. Use **↑** or **↓** to select **NONE**, then press **ENT** | **EXIT** | **EXIT**.

## Port Information

Navionics charts contain Port Services information, represented by anchor icons on the map display. These icons appear at the 2 nautical mile zoom range. An example is displayed in the following figures.

### To view Port Services information:

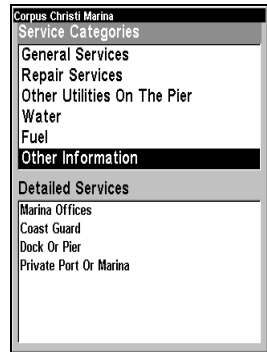
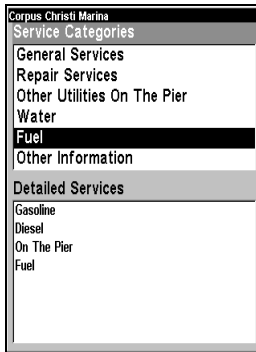
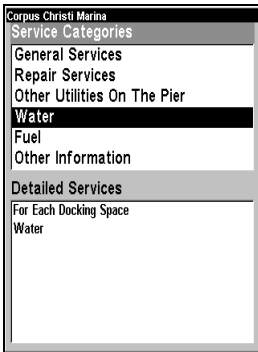
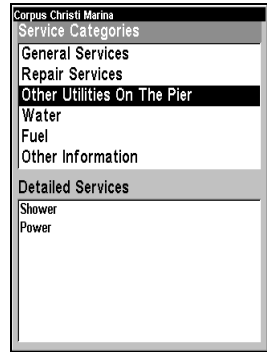
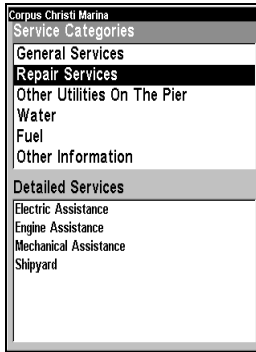
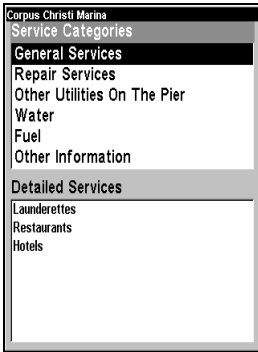
1. Use the arrow keys to move the cursor over a Port Services icon. When selected, a pop-up name box appears.
2. Press **FIND** | **FIND** to display the Port Services Information screen.



Navionics chart showing Port Services icon selected by cursor. When first highlighted, the Pop-Up name box appears. The position, distance and bearing are displayed at the bottom of the screen.

The Port Services information screen has two windows. The top window lists the various service categories. The lower window lists the detailed services available in each basic category.

3. To scroll through the Service Categories window: press **ENT** then use **↑** or **↓** to see the types of services available. As you highlight a different category, the list in the lower window changes. To return to the Map Page, press **EXIT** | **EXIT**.



**Port Services information screens.**

4. Depending on the location, the Detailed Services window may have a long list of services under the General Services category. To scroll through the Detailed Services window: from **SERVICE CATEGORIES**, press ↓ to **DETAILED SERVICES** | **ENT**, then use ↑ or ↓ to read the list of available services. To return to the Map Page, press **EXIT** | **EXIT**. To return to the top service category window, press **ENT** | ↑.

### **Tidal Current Information**

Navionics charts contain Tidal Current information, represented at large zoom ranges by a box icon with the letter "C." The icon stands for a Tidal Current Station location. An example is displayed at right.

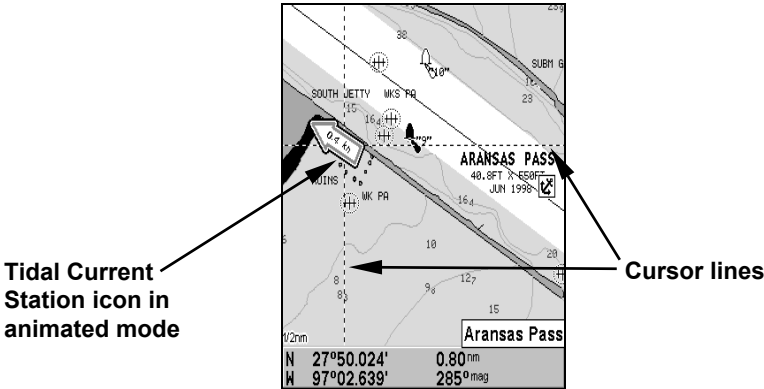


When you zoom in to a sufficiently small zoom range (1/2 nautical mile), the icon itself becomes an animated arrow showing tidal current velocity and direction *for the selected tidal station* at the present time. At larger zoom ranges, you can select the boxed "C" icon and it becomes an animated arrow with a pop-up name box (the name box disappears after a few seconds). Examples are displayed in the following figures.

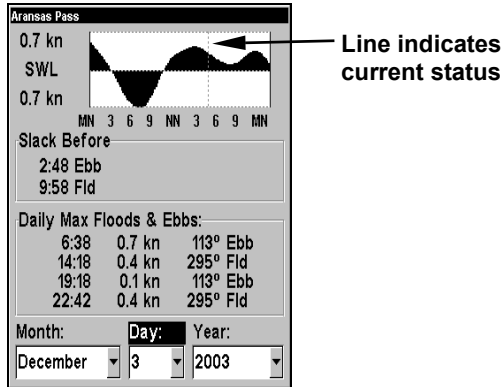


**To view Tidal Current information:**

1. Use the arrow keys to move the cursor over a Tidal Current Station icon. When selected, a pop-up name box appears.
2. Press **FIND | FIND** to display the Tidal Current Information screen.



Navionics chart showing Tidal Current Station icon selected by cursor. The icon animates automatically without selecting it at the 1/2 mile zoom range. The tidal current is flowing toward the northwest at a velocity of 0.4 kn.



**Current Information screen.**

The Tidal Current Information screen displays daily tidal current data for this station on this date at the present time. The graph at the top of the screen is an approximate view of the flood and ebb pattern for the day, from midnight (MN), to noon (NN) to midnight (MN). The velocity scale at the top left side of the graph changes dynamically based upon the maximum velocity of the current for that day.

Slack water, the period of little or no current, is represented by the Slack Water Line (SWL). The flood appears above the SWL and the ebb appears below the SWL.

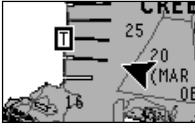
You can look up tidal current data for other dates by changing the month, day and year selection boxes. To select another date:

1. Use → and ← to highlight month, day or year, then press **ENT**.
2. Use ↑ and ↓ to select the desired month, day or year, then press **ENT**.

To clear the information screen, press **EXIT**.

**Tide Information**

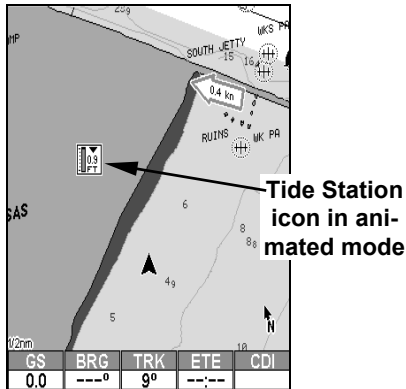
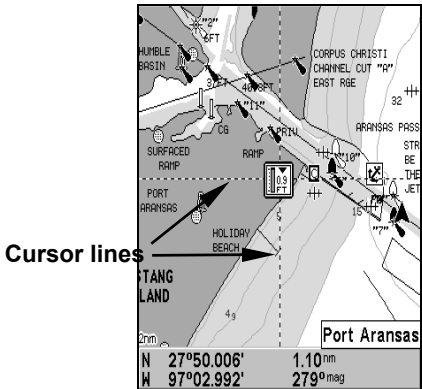
Navionics charts contain Tidal Information, represented at large zoom ranges by a box icon with the letter "T." The icon stands for a Tidal Station location. An example is displayed at right.



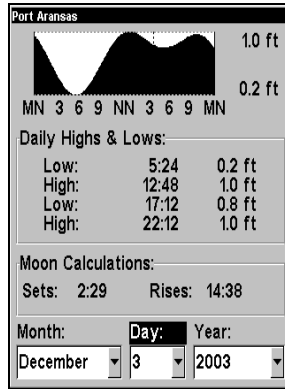
When you zoom in to a sufficiently small zoom range (1/2 nautical mile), the icon itself becomes an animated gauge showing a rising or falling tidal height for the selected station at the present time. At larger zoom ranges, you can select the boxed "T" icon and it becomes an animated gauge with a pop-up name box. Examples are displayed in the following figures.

**To view tide information:**

1. Select a Tide Station icon: use the arrow keys to move the cursor over an icon. When it is selected, a pop-up name box appears.
2. After selecting the Tide Station icon, press **FIND | FIND** to display the Tide Information screen.



At left, Navionics chart showing Tide Station icon selected by cursor. Right, icon animates automatically without selection at the 1/2 mile zoom range. In the example above, the tide is at 1.5 feet and falling, as shown by the down arrow at the top of the icon.



**Tide Information screen.**

The Tide Information screen displays daily tidal data for this station on this date at the present time. The graph at the top of the screen is an approximate view of the tidal range pattern for the day, from midnight (MN), to noon (NN) to midnight (MN). The dotted line across the graph is the Mean Lower Low Water line (MLLW).

The height scale on the top right side of the graph changes, based upon the maximum *range* of the tide for that day. The MLLW line also adjusts its position as the height scale changes.

You can look up tidal data for other dates by changing the month, day and year selection boxes. To select another date:

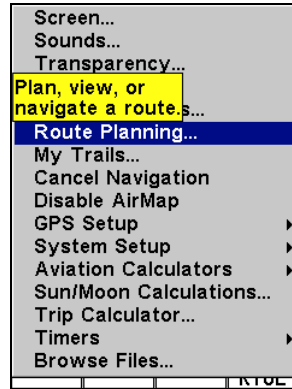
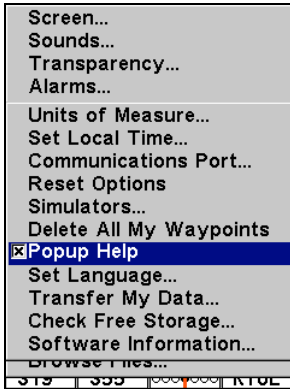
1. Use → and ← to highlight month, day or year, then press **ENT**.
2. Use ↑ and ↓ to select the desired month, day or year, then press **ENT**.

To clear the information screen, press **EXIT**.

## Pop-up Help

Help is available for virtually all of the menu labels on this unit. By highlighting a menu item and leaving it highlighted for a few seconds, a "pop-up" message appears that describes the function of the menu item. This feature is on by default.

**To set up Pop-up Help:** Press **MENU | MENU | ↓** to **SYSTEM SETUP | ENT | ↓** to **POPUP HELP**. With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off). After the option is set, press **EXIT | EXIT** to return to the page display.



This example shows the Pop-up Help message for the Route Planning command, located on the Main Menu.

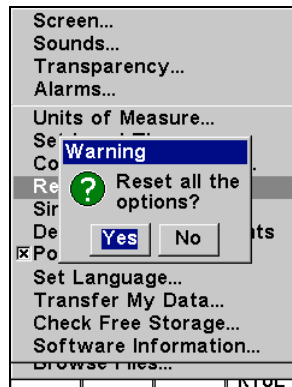
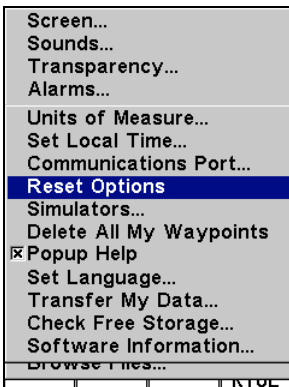
## Reset Options

To reset all features to their factory defaults:

1. Press **MENU | MENU | ↓** to **SYSTEM SETUP | ENT | ↓** to **RESET OPTIONS | ENT | ←** to **YES | ENT**.

### NOTE:

Reset Options does *not* erase any waypoints, routes, icons or plot trails.



Reset Options command, left, and the Reset Options Menu, right.

## Screen Contrast and Brightness

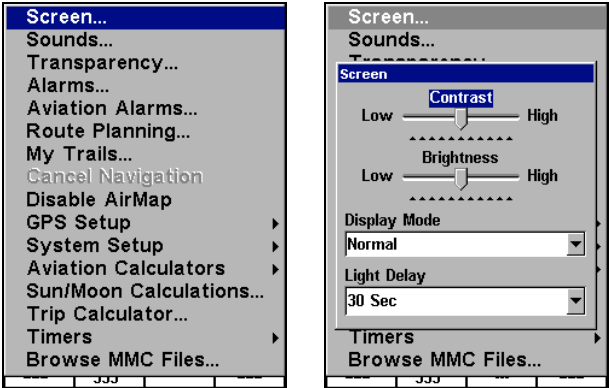
To access these screen commands, you first press **MENU | MENU | ENT**.

### Once in the Screen menu:

To adjust the display's contrast:

1. The **CONTRAST** slider bar is already selected. Press **→** or **←** to move the bar. The left end of the scale is minimum contrast; the right end is

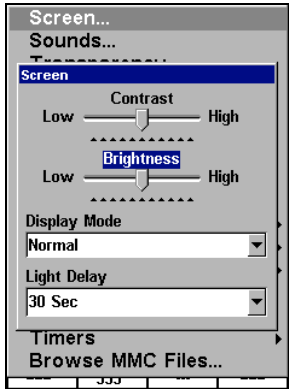
maximum contrast. Adjust the screen so that you see white, black & 2 shades of gray at the top of the screen.



Screen Command, left, and Contrast bar, right.

To adjust the display's brightness:

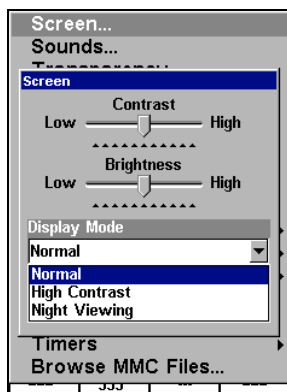
1. Press ↓ to **BRIGHTNESS**. Press → or ← to move the bar. The left end of the scale is minimum backlight brightness; the right end is maximum backlight brightness.



Screen menu with Brightness bar selected.

To adjust the screen's display mode:

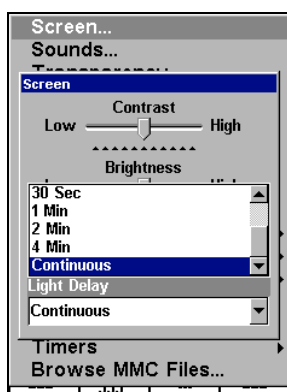
1. Press ↓ to **DISPLAY MODE** | **ENT** | press ↑ or ↓ to select *mode* | **EXIT**.



### Display Mode menu.

To adjust the display's back light delay options:

1. Press **↓** to **LIGHT DELAY** | **ENT** | press **↑** or **↓** to select *mode* | **EXIT**.
2. To leave the screen settings and return to the last page displayed, press **EXIT** | **EXIT**.



**Light Delay menu.** Setting shown is "continuous." The backlight time will automatically change to "continuous" when the unit is attached to an external power source.

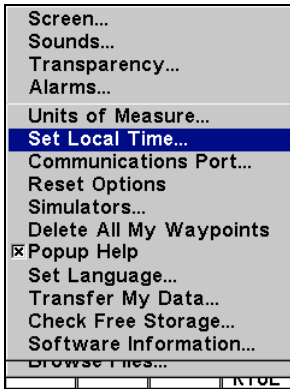
## Set Language

This unit's menus are available in 10 languages: English, French, German, Spanish, Italian, Danish, Swedish, Russian, Dutch and Finnish. To select a different language:

1. Press **MENU** | **MENU** | **↓** to **SYSTEM SETUP** | **ENT**.
2. Press **↓** to **SET LANGUAGE** | **ENT**.
3. Use **↓** or **↑** to select a different language and press **ENT**. All menus now appear in the language you selected.

## Set Local Time

The local time and date are saved when a waypoint is created. Begin by pressing **MENU | MENU | ↓** to **SYSTEM SETUP | ENT | ↓** to **SET LOCAL TIME | ENT**.



Set Local Time Command: left, Main Menu; center System Setup menu.  
At right, the Time Settings menu.

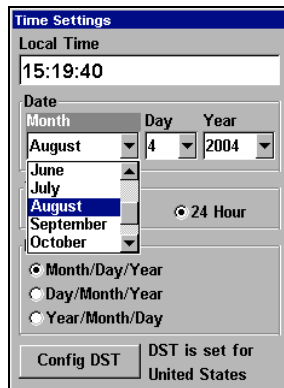
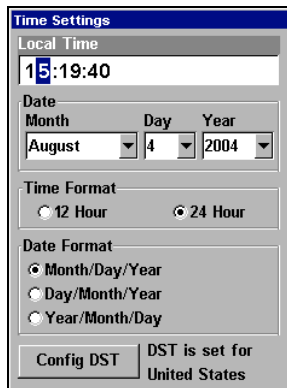
### Once in the Time Settings menu:

**To set Local Time:** Press **ENT**. Press **↑** or **↓** to change the first character, then press **→** to move the cursor to the next character. Repeat until the time is correct, then press **ENT**.

**To set the Month:** Press **↓** to **MONTH | ENT**. Press **↑** or **↓** to select the month, then press **ENT**.

**To set the Day:** Press **↓ | →** to **DAY | ENT**. Press **↑** or **↓** to select the day, then press **ENT**.

**To set the Year:** Press **↓ | →** to **YEAR | ENT**. Press **↑** or **↓** to select the year, then press **ENT**.



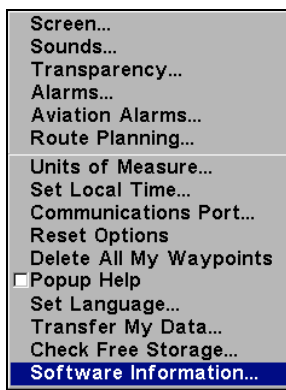
Adjusting the time, left, Adjusting the month, right.

The last field in this menu is **CONFIG DST**. This feature allows your unit to automatically adjust with the time change caused by Daylight Saving Time (you should only have to set it once). You may select which set of rules matches DST in your region, or simply accept the default.

Once you have each field set the way you want, press **EXIT** repeatedly until you return to the previous page.

## Software Version Information

From time to time, Lowrance updates the operating system software in some of its products. These software upgrades are usually offered to customers as free downloads from our web site, [www.lowrance.com](http://www.lowrance.com). These upgrades make the unit perform better or introduce a new feature or function. You can find out what software version is running in your AirMap by using the Software Info command.



System Setup menu with Software Info command selected.

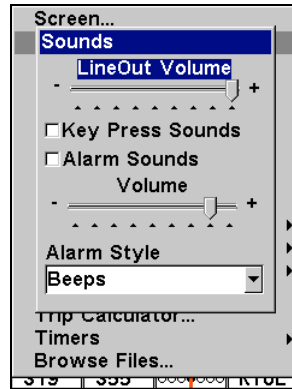
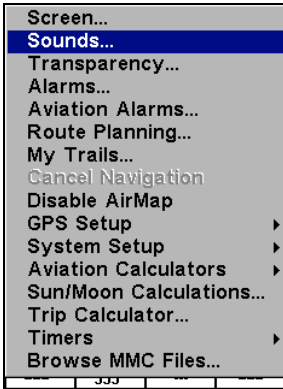
1. Press **MENU | MENU | ↓** to **SYSTEM SETUP | ENT | ↓** to **SOFTWARE INFORMATION | ENT**.
2. Read the information displayed on the screen.
3. To return to the previous page, press **EXIT | EXIT**.

## Sounds and Alarm Sound Styles

Sounds triggered by key strokes and alarms can be adjusted.

To access the Sounds menu, press **MENU | MENU | ↓** to **SOUNDS | ENT**.





At left, Main Menu with Sounds command selected.  
At right, the Sounds menu.

**Once in the Sounds menu:**

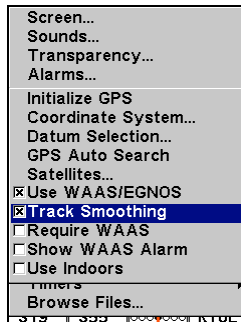
**To set Key Sounds:** With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off). After the option is set, press **EXIT|EXIT** to return to the page display.

**To set Alarm Sounds:** Press **↓** to **ALARM SOUNDS**. With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off). After the option is set, press **EXIT|EXIT** to return to the page display.

**To set Alarm Style:** Press **↓** to **ALARM STYLE|ENT**. Press **↑** or **↓** to change the style, then press **ENT**. After the option is set, press **EXIT|EXIT** to return to the page display.

## Track Smoothing

This is a factory setting that *should always be left on*. When stopped or traveling at slow speeds (such as walking or trolling), Track Smoothing prevents wandering of trails, the steering arrow, compass rose and a map in track-up mode.



Track Smoothing option, turned on.

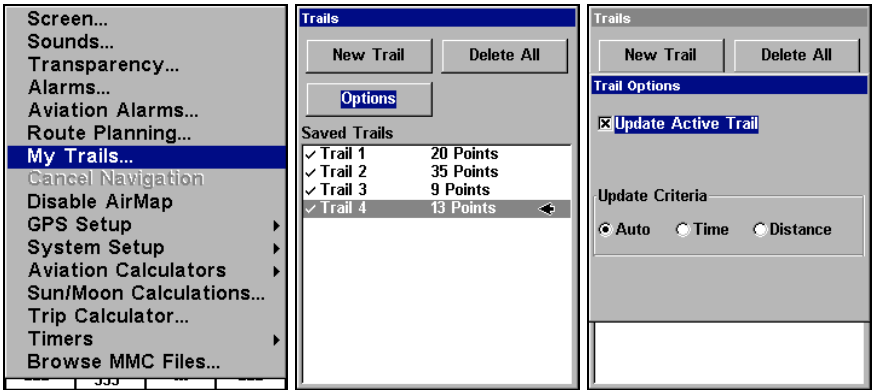
# Trail Options

There are several options you can use with trails. Some affect all trails, other options can be applied to a particular trail. You can change the way trails are updated, you can display or hide trails, make them flash on the screen or not flash, create a new trail, delete a trail, etc.

## General Trail Options

To access the Trails Menu:

1. Press **MENU | MENU | ↓** to **MY TRAILS | ENT | →** to **OPTIONS | ENT**.



Main Menu, left, Trails Menu, center, Trail Options, right.

## Delete All Trails

To remove all of the trails from memory: from the Trails Menu, press → to **DELETE ALL | ENT | ←** to **Yes | ENT**.

## Update Active Trail Option

This menu lets you change the way the trail updates occur.

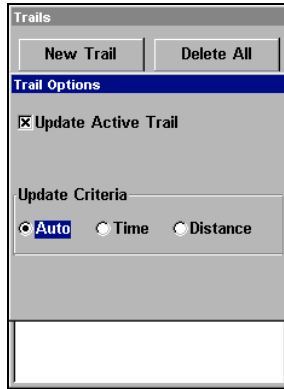
### WARNING:

If you *uncheck* the Update Active Trail option, automatic trail creation and recording will be turned *off*, and you must turn it back on to record trails. The default setting is on.

Press ↓ or ↑ to **UPDATE ACTIVE TRAIL**. With the option highlighted, press **ENT** to check it (turn on) and uncheck it (turn off).

## Update Trail Criteria (Auto, Time, Distance)

The options are automatic, time, or distance. When it's in the default automatic mode, the unit doesn't update the plot trail while you're traveling in a straight line. Once you deviate from a straight line, the unit "drops" a plot point (trail waypoint) onto the trail. This conserves plot trail points. If a plot trail uses all of the available points allotted to it, the beginning points are taken away and placed at the end of the trail.



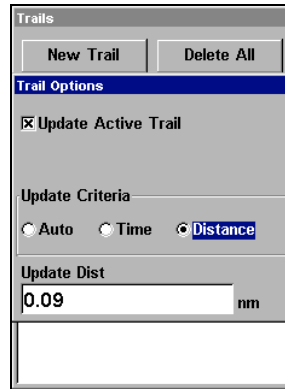
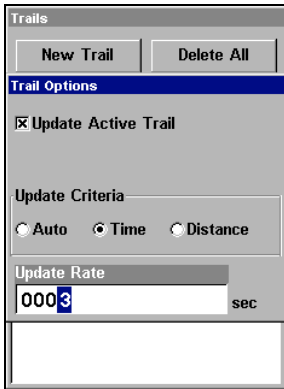
Trail Options menu.

Press ↓ to **UPDATE CRITERIA**, then press → or ← to select *criteria type* | **ENT**.

### Trail Update Rate (Time, Distance)

You can update a trail by time, with a range from 1 second to 9999 seconds; the default is 3 seconds. You can update by distance, with a range from 0.01 miles/nm/km to 9.99 miles/nm/km; the default is 0.10 nautical miles.

With the proper Update Criteria activated, press ↓ to enter its data entry box and press **ENT**. Press ↑ or ↓ to change the first character, then press → to the next character and repeat until the entry is correct. Press **EXIT** | **EXIT** to return to the Trail Options Menu.

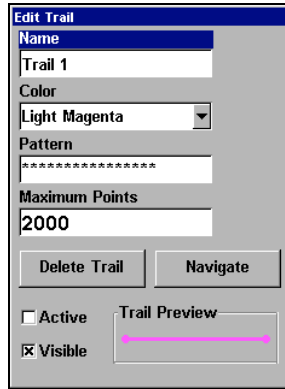


Trail Options menu.

### Specific Trail Options

#### New Trail

To manually start a new trail or delete a trail: From the Trail Options Menu, press **ENT**. The trail menu appears as seen below:



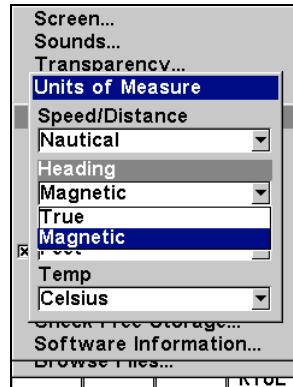
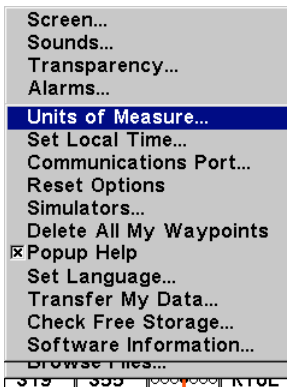
Trail menu.

The name, maximum number of points in the trail, activity, and visibility are all changed on this screen. The Active setting determines whether or not AirMap is recording new points for a particular trail.

Press ↓ or ↑ to highlight the section you wish to change, then press **ENT**. Press **EXIT** to erase this menu.

## Units of Measure

This menu (shown below) sets the speed and distance (statute, nautical miles, meters), depth (feet, fathoms, or meters), temperature (degrees Fahrenheit or Celsius) and heading (true or magnetic) units. To change the units, you first press **MENU | MENU | ↓** to **SYSTEM SETUP | ENT | ENT**.



System Setup menu, left, Units of Measure Menu, right.

**To set Speed/Distance Unit of Measure:** Press **ENT**. Press ↑ or ↓ to change the Speed/Distance, then press **ENT**. After the option is set, press **EXIT | EXIT** to return to the page display.

**To set Heading:** Press ↓ to **HEADING|ENT**. Press ↑ or ↓ to change the heading, then press **ENT**. After the option is set, press **EXIT|EXIT** to return to the page display.

**To set Depth:** Press ↓ to **DEPTH|ENT**. Press ↑ or ↓ to change the depth units, then press **ENT**. After the option is set, press **EXIT|EXIT** to return to the page display.

**To set Temperature:** Press ↓ to **TEMPERATURE|ENT**. Press ↑ or ↓ to change the temperature units, then press **ENT**. After the option is set, press **EXIT|EXIT** to return to the page display.

# Notes

## Section 6: Searching

Whether you are in Aviation Mode or Land Mode, AirMap's search functions all begin with the **FIND** key, and the search menus work the same in each mode. However, the Aviation Mode searches appear only in Aviation Mode (while the general searches appear in both Aviation and Land mode).



Aviation Mode Find menu, left; Land Mode Find menu, right.

### NOTE:

You can search for items even if AirMap hasn't acquired a position yet, or start from a position other than your own. When you do a search, distance and bearing to the selected item will be calculated from AirMap's current position. If AirMap hasn't acquired a position, it will use the last known position. If the cursor is active, AirMap will always begin the search at the cursor. You can look up items by name, or search for the item nearest to you.

## Aviation Mode Searches

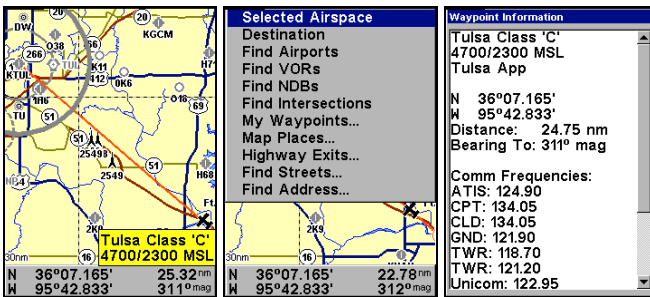
### Find An Airspace (Using Cursor)

On the Map Page, you can select airspaces with the cursor by scrolling over the airspace border. When the airspace is selected, the line defining its border will expand. Press **FIND|ENT** and an Information Page will appear showing you details about the selected airspace. To return to the previous page, press **EXIT**.

### NOTE:

The position, distance, and bearing information shown on the waypoint information screen are based on the *cursor position* within

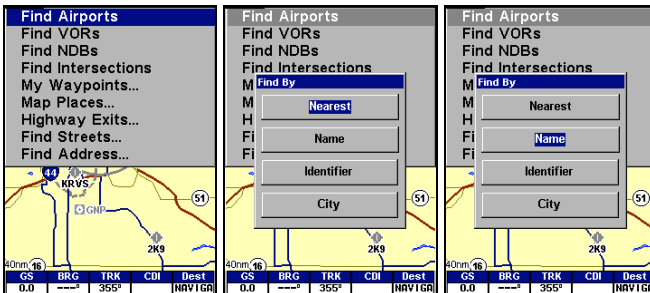
the airspace, not on the airspace itself. This means you can scroll the cursor to the far side of the airspace to check how far it is across, or move it to the exact spot you plan on entering the air-space for more precise navigation information.



At left, we have selected the airspace around Tulsa Airport. Center, the Selected Airspace option on the Find menu. At right, you can see the Airspace Information page.

## Find Airports (*Aviation Mode only*)

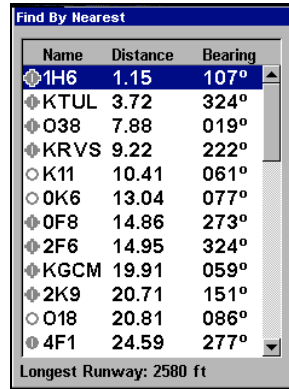
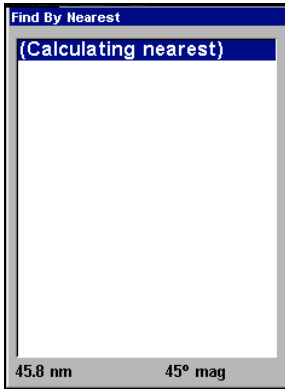
1. Press **FIND | ENT**.
2. If searching for the *Nearest* airport, press **ENT**. If searching for an airport *By Name*, press **↓** to **NAME | ENT**. You can also search *By Identifier*, and *By City*.



Find menu, left, and Find By Nearest, center, Find By Name, right.

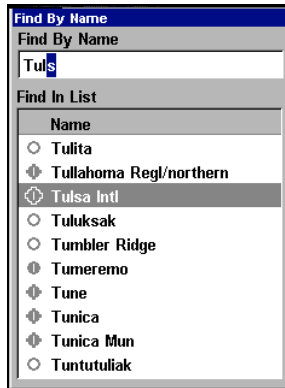
3. If you're looking for nearest, AirMap says it is calculating, then a list of airports appears. The closest is highlighted at the top of the list and the farthest is at the bottom of the list. Press **ENT** and the waypoint information screen appears. To find the airport, press **→** to **FIND ON MAP | ENT**. To return to the previous page, press **EXIT | EXIT | EXIT | EXIT**.





Calculating message, left, and list of the nearest airports, right.

4. If you're looking by name, there are two options: **A.** You can **spell out** the name in the top selection box. Press  $\uparrow$  or  $\downarrow$  to change the first letter, then press  $\rightarrow$  to move the cursor to the next letter and repeat until the name is correct, then press **ENT|ENT**. **B.** Jump down to the lower selection list by pressing **ENT**, then press  $\downarrow$  or  $\uparrow$  to select an airport from the list, then press **ENT**. The waypoint information screen appears. To find the airport, press  $\rightarrow$  to **FIND ON MAP|ENT**. To return to the previous page, press **EXIT|EXIT|EXIT|EXIT|EXIT**.



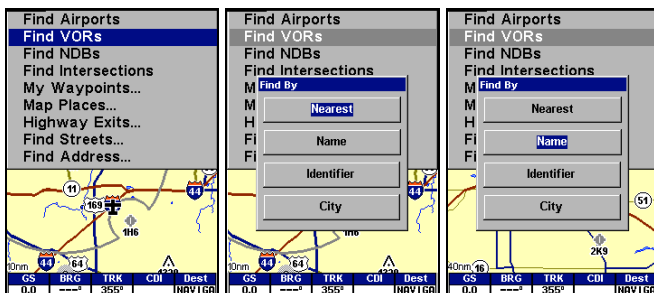
Find By Name menu.

5. If you're looking by identifier or by city, the method is the same as by name (described in step 4). Use the arrow keys to enter the airport's identifier or the name of a city, and the AirMap will show you all available airports matching the criteria you entered.

### Find VORs (Aviation Mode only)

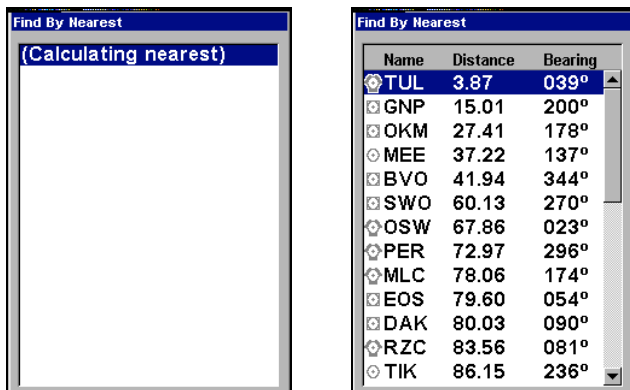
1. Press **FIND|↓** to **FIND VORs|ENT**.

2. If searching for the *Nearest* VOR, press **ENT**. If searching for a VOR *By Name*, press ↓ to **NAME|ENT**. You can also search *By Identifier*, and *By City*.



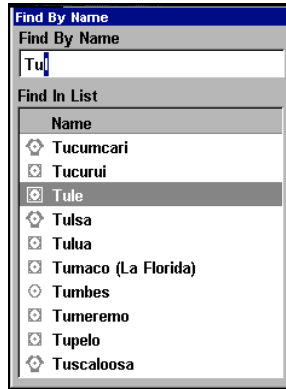
Find menu, left, and Find By Nearest, center, Find By Name, right.

3. If you're looking for nearest, AirMap says it is calculating, then a list of VORs appears. The closest is highlighted at the top of the list and the farthest is at the bottom of the list. Press **ENT** and the waypoint information screen appears. To find the VOR, press → to **FIND ON MAP|ENT**. To return to the previous page, press **EXIT|EXIT|EXIT|EXIT**.



Calculating message, left, and list of the nearest VORs, right.

4. If you're looking by name, there are two options: **A.** You can **spell out** the name in the top selection box. Press ↑ or ↓ to change the first letter, then press → to move the cursor to the next letter and repeat until the name is correct, then press **ENT|ENT**. **B.** Jump down to the lower selection list by pressing **ENT**, then press ↓ or ↑ to select a VOR from the list, then press **ENT**. The waypoint information screen appears. To find the VOR, press → to **FIND ON MAP|ENT**. To return to the previous page, press **EXIT|EXIT|EXIT|EXIT|EXIT**.



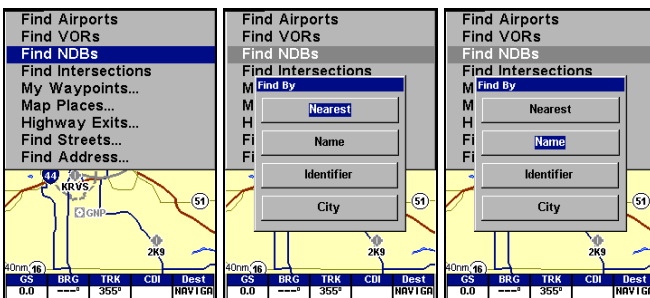
Find By Name menu.

5. If you're looking by identifier or by city, the method is the same as by name (described in step 4). Use the arrow keys to enter the VOR's identifier or the name of a city, and the AirMap will show you all available VORs matching the criteria you entered.

### Find NDBs (*Aviation Mode only*)

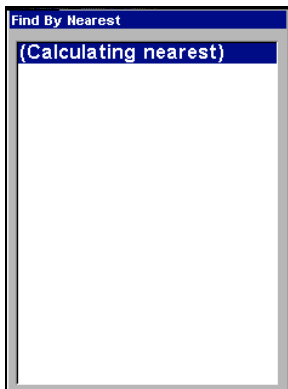
1. Press **FIND** | ↓ to **FIND NDBs|ENT**.

2. If searching for the *Nearest* NDB, press **ENT**. If searching for an airport *By Name*, press ↓ to **NAME|ENT**. You can also search *By Identifier*, and *By City*.



Find menu, left, and Find By Nearest, center, Find By Name, right.

3. If you're looking for nearest, AirMap says it is calculating, then a list of NDBs appears. The closest is highlighted at the top of the list and the farthest is at the bottom of the list. Press **ENT** and the waypoint information screen appears. To find the NDB, press → to **FIND ON MAP|ENT**. To return to the previous page, press **EXIT|EXIT|EXIT|EXIT**.

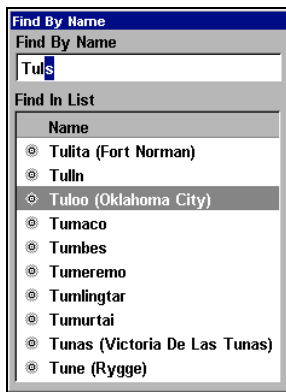


The screenshot shows a window titled "Find By Nearest" with a blue header. Below the header is a table with three columns: Name, Distance, and Bearing. The table contains the following data:

Name	Distance	Bearing
⊗ TU	3.83	211°
⊗ DW	9.59	346°
⊗ OWP	15.14	271°
⊗ OK	24.21	188°
⊗ TZO	36.29	227°
⊗ BV	42.21	345°
⊗ TQH	42.77	104°
⊗ MKO	42.87	137°
⊗ HET	45.47	186°
⊗ CUH	47.85	247°
⊗ CQB	53.88	238°
⊗ ID	55.06	359°
⊗ GGU	57.06	224°

Calculating message, left, and list of the nearest NDBs, right.

4. **If you're looking by name**, there are two options: **A.** You can **spell out** the name in the top selection box. Press  $\uparrow$  or  $\downarrow$  to change the first letter, then press  $\rightarrow$  to move the cursor to the next letter and repeat until the name is correct, then press **ENT | ENT**. **B.** Jump down to the lower selection list by pressing **ENT**, then press  $\downarrow$  or  $\uparrow$  to select an NDB from the list, then press **ENT**. The waypoint information screen appears. To find the NDB, press  $\rightarrow$  to **FIND ON MAP | ENT**. To return to the previous page, press **EXIT | EXIT | EXIT | EXIT | EXIT**.

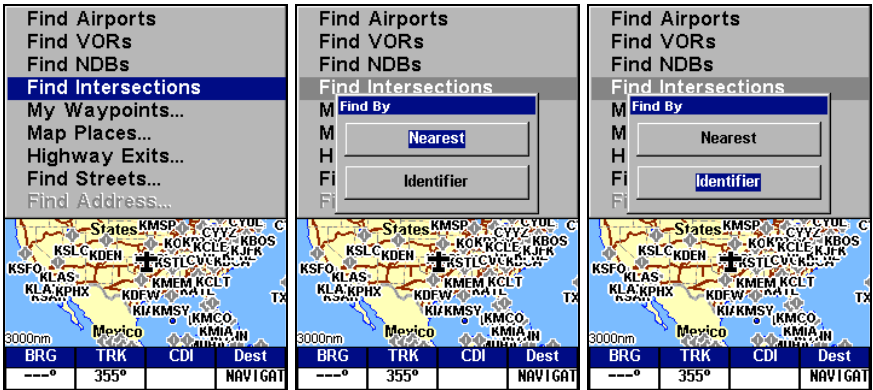


Find By Name menu.

5. **If you're looking by identifier or by city**, the method is the same as by name (described in step 4). Use the arrow keys to enter the NDB's identifier or the name of a city, and the AirMap will show you all available NDBs matching the criteria you entered.

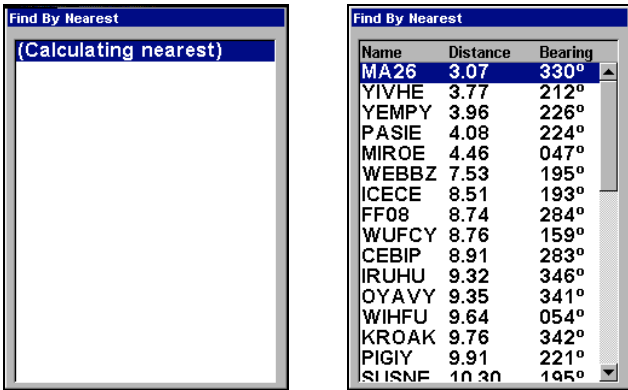
# Find Intersections (Aviation Mode only)

1. Press **FIND** | ↓ to **FIND INTERSECTIONS** | **ENT**.
2. If searching for the *Nearest* intersection, press **ENT**. If searching for an airport *By Identifier*, press ↓ to **IDENTIFIER** | **ENT**.



Find menu, left, and Find By Nearest, center, Find By Identifier, right.

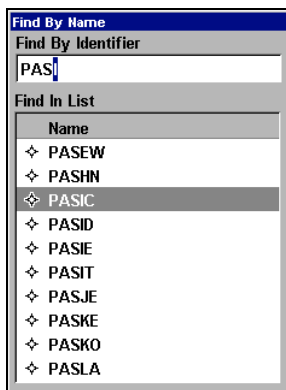
3. If you're looking for nearest, AirMap says it is calculating, then a list of intersections appears. The closest is highlighted at the top of the list and the farthest is at the bottom of the list. Press **ENT** and the waypoint information screen appears. To find the intersection, press → to **FIND ON MAP** | **ENT**. To return to the previous page, press **EXIT** | **EXIT** | **EXIT** | **EXIT**.



Calculating message, left, and list of the nearest intersections, right.

4. If you're looking by identifier, there are two options: **A.** You can **spell out** the identifier in the top selection box. Press ↑ or ↓ to change the first letter, then press → to move the cursor to the next letter and repeat until the identifier is correct, then press **ENT** | **ENT**. **B.** Jump down to the lower selection list by pressing **ENT**, then press ↓ or ↑ to select an intersec-

tion from the list, then press **ENT**. The waypoint information screen appears. To find the intersection, press **→** to **FIND ON MAP** | **ENT**. To return to the previous page, press **EXIT** | **EXIT** | **EXIT** | **EXIT** | **EXIT**.

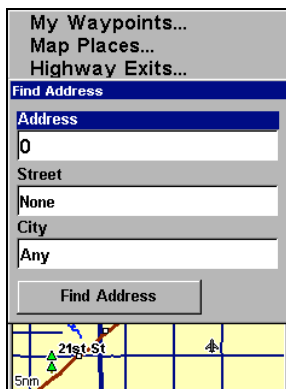


Find By Name menu.

## Land Mode Searches

### Find Addresses

1. Press **FIND** | **↓** to **ADDRESSES** | **ENT**.
2. Press **ENT** to search in the Address field.



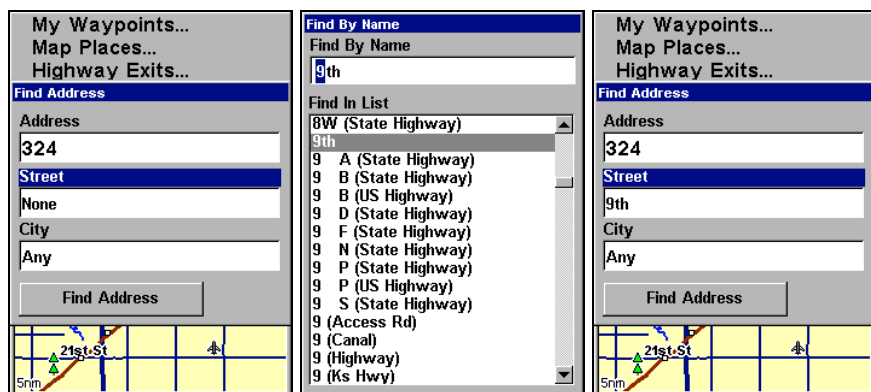
Find Address Menu.

3. **To enter an address number**, press **↓** or **↑** to **ADDRESS** | **ENT**. Press **↑** or **↓** to change the first number, then press **→** to move the cursor to the next number and repeat until the number is correct, then press **ENT**.
4. To enter a street name, press **↓** or **↑** to **STREET** | **ENT**. There are two options: **A**. You can **spell out** the name in the top selection box. Press **↑** or **↓** to change the first letter, then press **→** to move the cursor to the next let-

ter and repeat until the name is correct, then press **ENT|ENT**. **B.** Jump down to the lower selection list by pressing **ENT**, then press  $\downarrow$  or  $\uparrow$  to select a street name from the list, then press **ENT**. The street name you selected is now in the street field. To return to the previous page, press **EXIT**.

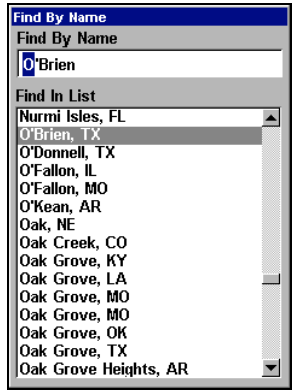
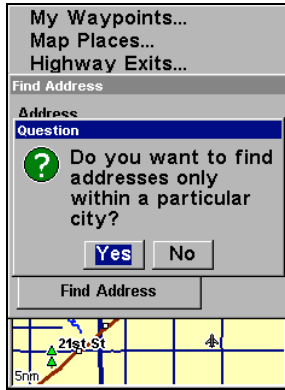
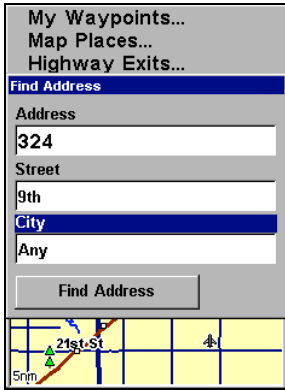
**Tip:**

When entering a street name, do *not* enter the street's compass direction (N, S, E or W) in the street name field. Just enter the number, or name. If the example below had been a search for "324 E. 9th St," you would enter "9th" and press **ENT**. The AirMap will generate a list of all possible 9th streets, and let you choose the one you want.



Find street field, left, Find street by name menu, center, Street entry complete, right.

5. **To enter a city name**, press  $\downarrow$  or  $\uparrow$  to **CITY|ENT**. You will be asked whether you would like to find addresses only within a particular city. This option is designed so if you have a city already entered you can choose not to search in a city. If you select yes, there are two options: **A.** You can **spell out** the name in the top selection box. Press  $\uparrow$  or  $\downarrow$  to change the first letter, then press  $\rightarrow$  to move the cursor to the next letter and repeat until the name is correct, then press **ENT|ENT**. **B.** Jump down to the lower selection list by pressing **ENT**, then press  $\downarrow$  or  $\uparrow$  to select a city name from the list, then press **ENT**. The city name you selected is now in the city field. To return to the previous page, press **EXIT**.



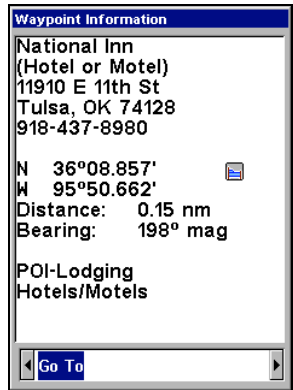
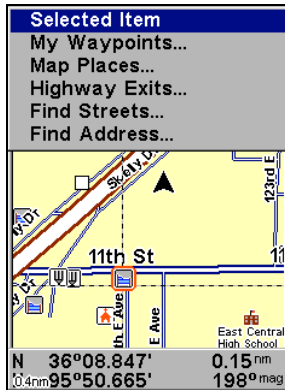
Find city field, left, Search in particular city only option, center, Find City by name, right.

**NOTE:**

It is recommended that you not enter a city name unless the list you are given is too large when you try searching without one. AirMap can search quicker without a city entered, and you save time by not entering one in.

**Find Any Item Selected by Map Cursor**

1. With an item selected by the cursor, press **FIND|ENT**. To return to the previous page, press **EXIT**.



A POI selected by the cursor, left, The Find Menu, center, POI information screen, right.

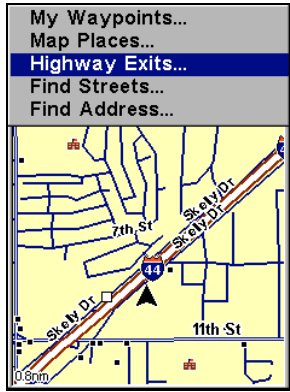
**NOTE:**

You can "navigate" to the POI by pressing **ENT** while in the POI information screen.



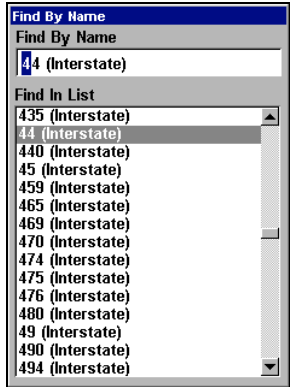
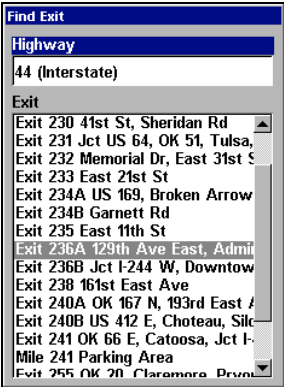
# Find Interstate Highway Exits

1. Press **FIND** | ↓ to **HIGHWAY EXITS** | **ENT**.



Land Mode Find menu, with Highway Exits option selected.

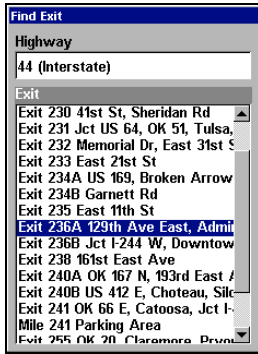
2. First select a highway by pressing **ENT**. There are two options: **A.** You can **spell out** the highway in the top selection box. Press ↑ or ↓ to change the first letter, then press → to move the cursor to the next letter and repeat until the name is correct, then press **ENT** | **ENT**. **B.** Jump down to the low selection list by pressing **ENT**, then press ↓ or ↑ to select a highway from the list, then press **ENT**.



Find Exit using the Highway Name.

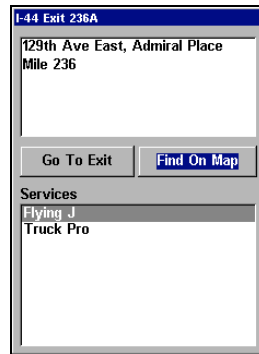
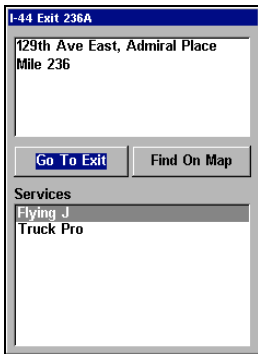
3. Once you have selected a highway you can then select an exit by pressing ↓ then pressing ↓ or ↑ until you find the exit, then press **ENT**.

4. In the Exit information screen you have two choices. **A.** Press **ENT** to navigate or "go to" the exit. **B.** Press → | **ENT** to find the exit on the map.



Selected exit.

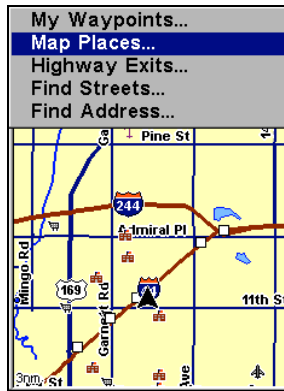
4. In the Exit Information screen you have two choices. **A.** Press **ENT** to navigate or "go to" the exit. **B.** Press **→|ENT** to find the exit on the map.



"Go To" option, left, "Find On Map" option, right.

## Find Map Places

1. Press **FIND | ↓** to **MAP PLACES | ENT**.



Land Mode Find menu, with Map Places command selected.

2. Press ↓ or ↑ to select a POI category then press **ENT**. You will be given two options: Search by nearest or by name.

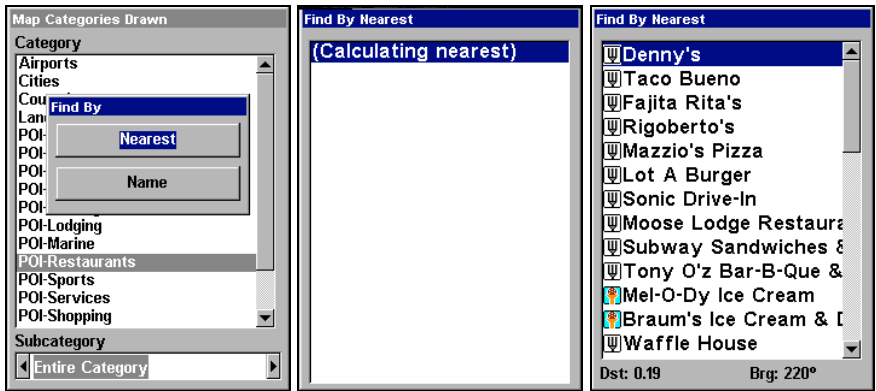
**NOTE:**

To narrow your search press → and then ↑ or ↓ to select a subcategory before pressing **ENT**.



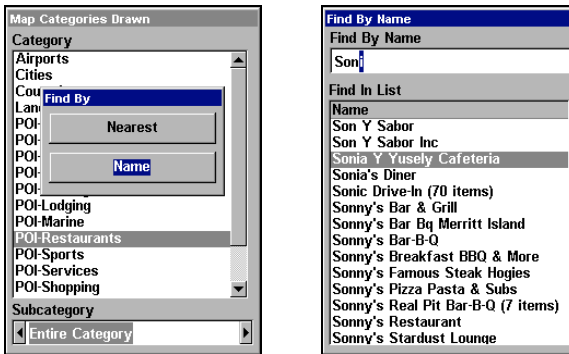
Map Places category menu.

3. **Search by nearest POI.** Press **ENT**. The "find by nearest" menu will show a "calculating" screen then a list of nearest POI's. Press ↓ or ↑ to the selected POI and press **ENT**.



Find by nearest option, left, Calculating screen, center, POI list, right.

4. **Search by name of POI.** Press ↓|ENT. There are two options: **A.** You can **spell out** the POI in the top selection box. Press ↑ or ↓ to change the first letter, then press → to move the cursor to the next letter and repeat until the name is correct, then press ENT|ENT. **B.** Jump down to the lower selection list by pressing ENT, then press ↓ or ↑ to select a POI from the list, then press ENT.



Find by name option, left, Find by name menu, right.

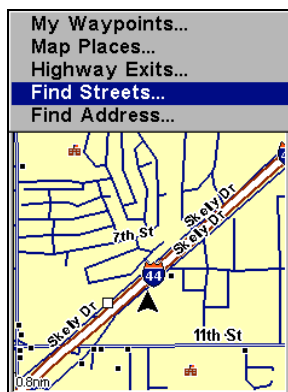
5. You are then shown the POI's information screen. You can choose to "Go To" the POI by pressing ENT or find it on the map by pressing →|ENT.



"Go To" POI option, left, "Find on Map" POI option, right.

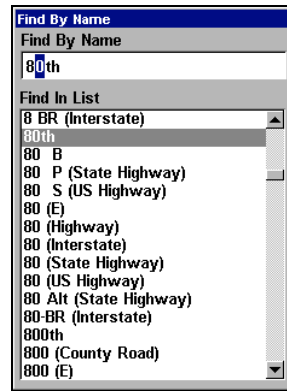
## Find Streets or (Street) Intersections

1. Press **FIND** | ↓ to **STREETS** | **ENT**.

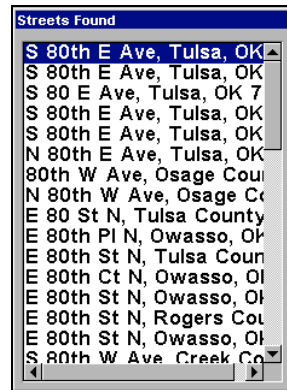
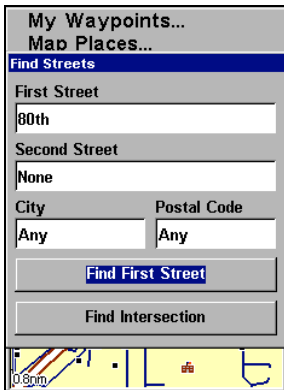


Land Mode Find menu, with Find Streets command selected.

2. **To find a street.** Press **ENT**. There are two options: **A.** You can **spell out** the street in the top selection box. Press ↑ or ↓ to change the first letter, then press → to move the cursor to the next letter and repeat until the name is correct, then press **ENT** | **ENT**. **B.** Jump down to the lower selection list by pressing **ENT**, then press ↓ or ↑ to select a street from the list, then press **ENT**. Then press ↓ to Find First Street and press **ENT**. Press ↑ or ↓ to the street you are searching for and press **ENT**.

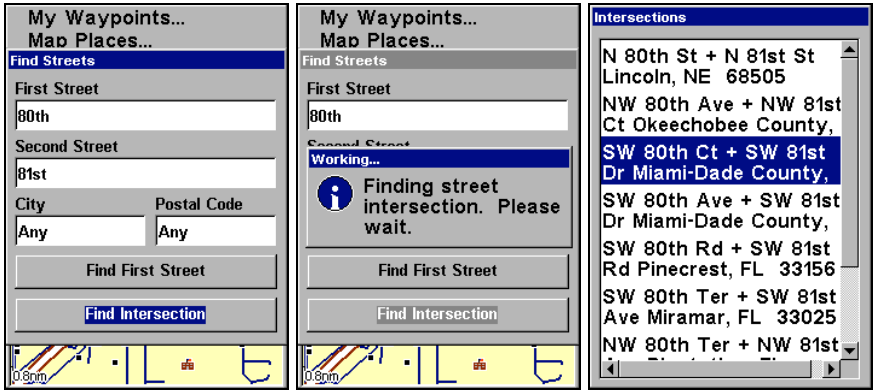


Find streets or intersections menu, left, Find street by name, right.



Find first street, left, Street found, right.

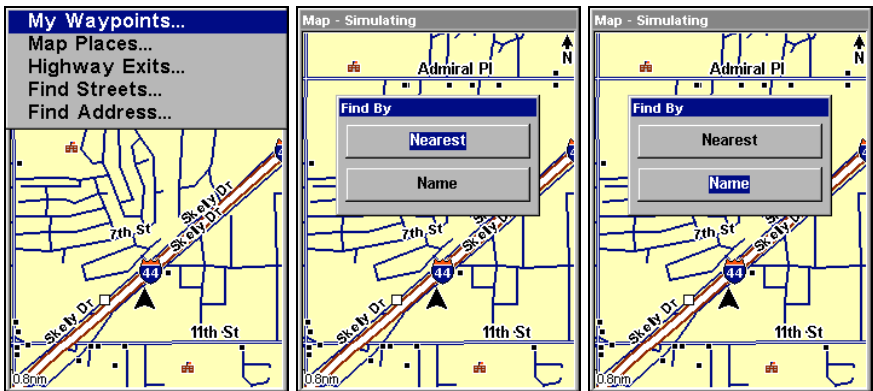
3. **To find an intersection.** First enter an address into the "first street" field by pressing **ENT**. There are two options: **A.** You can **spell out** the street in the top selection box. Press **↑** or **↓** to change the first letter, then press **→** to move the cursor to the next letter and repeat until the name is correct, then press **ENT|ENT**. **B.** Jump down to the lower selection list by pressing **ENT**, then press **↓** or **↑** to select a street from the list, then press **ENT**. Repeat this process for the second street. Now press **↓** to "find intersection" and press **ENT**. A "working" screen appears and then a list of intersections. Press **↑** or **↓** to the intersection you are searching for and press **ENT**.



Find intersection, left, and "Working" menu, center, Intersection list, right.

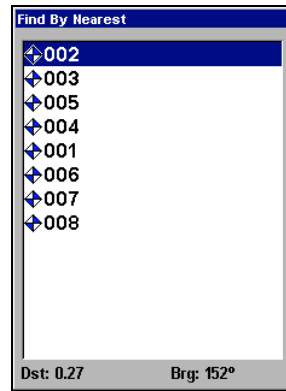
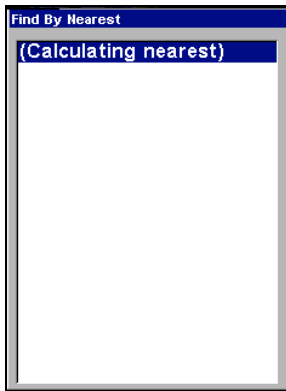
## Find Waypoints

1. Press **FIND | ENT**.
2. If searching for the *Nearest* waypoint, press **ENT**. If searching for a waypoint *By Name*, press **↓** to **NAME | ENT**.



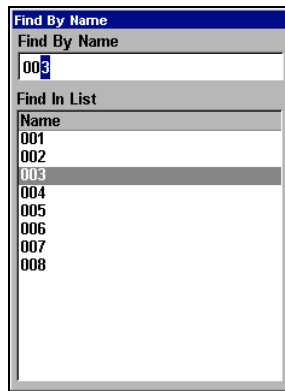
Find menu, left, and Find By nearest, center, Find by name, right.

3. **If you're looking for nearest**, AirMap says it is calculating, then a list of waypoints appears. The closest is highlighted at the top of the list and the farthest is at the bottom of the list. Press **ENT** and the waypoint information screen appears. To find the waypoint, press **→** to **FIND ON MAP | ENT**. To return to the previous page, press **EXIT | EXIT | EXIT | EXIT**.



Calculating message, left, and list of the nearest waypoints, right.

4. If you're looking by name, there are two options: **A.** You can **spell out** the name in the top selection box. Press  $\uparrow$  or  $\downarrow$  to change the first letter, then press  $\rightarrow$  to move the cursor to the next letter and repeat until the name is correct, then press **ENT|ENT**. **B.** Jump down to the lower selection list by pressing **ENT**, then press  $\downarrow$  or  $\uparrow$  to select a waypoint from the list, then press **ENT**. The waypoint information screen appears. To find the waypoint, press  $\rightarrow$  to **FIND ON MAP|ENT**. To return to the previous page, press **EXIT|EXIT|EXIT|EXIT|EXIT**.



Find By Name menu.



# Section 7: Supplemental Material

## Datums Used by This Unit

WGS 1984 Default	Zaire, Zambia and Zimbabwe	Australian Geodetic 1984 - Australia & Tasmania
Adindan Mean for Ethiopia, Sudan	Arc 1950 - Botswana  Arc 1950 - Burundi	Ayabelle Lighthouse - Djibouti
Adindan Burkina Faso	Arc 1950 - Lesotho  Arc 1950 - Malawi	Bellevue (IGN) - Efate & Erromango Islands
Adindan Cameroon	Arc 1950 - Swaziland	Bermuda 1957 - Bermuda
Adindan Ethiopia	Arc 1950 - Zaire  Arc 1950 - Zambia	Bissau - Guinea- Bissau Bogota Observatory - Colombia
Adindan Mali	Arc 1950 - Zimbabwe	
Adindan Senegal	Arc 1960 - Mean for Kenya, Tanzania	Bukit Rimpah - Indo- nesia (Bangka & Be- litung Islands)
Adindan Sudan	Ascension Island 1958 - Ascension Island	Camp Area Astro - Antarctica (McMurdo Camp Area)
Afgooye Somalia	Astro Beacon E 1945 - Iwo Jima	Campo Inchauspe - Argentina
Ain el Abd 1970 Bahrain	Astro DOS 71/4 - St. Helena Island	Canton Astro 1966 - Phoenix Islands
Ain el Abd 1970 Saudi Arabia	Astro Tern Island (FRIG) 1961 - Tern Island	Cape - South Africa
Anna 1 Astro 1965 Cocos Islands	Astronomical Station 1952 - Marcus Island	Cape Canaveral - Bahamas, Florida
Antigua Island Astro 1943; Antigua (Lee- ward Islands)	Australian Geodetic 1966 - Australia & Tasmania	Carthage - Tunisia
Arc 1950; Mean for Botswana, Lesotho, Malawi, Swaziland,		Switzerland
		Chatham Island Astro 1971; New Zealand (Chatham Island)

Chua Astro Paraguay	European 1950 England, Channel Islands, Ireland, Scotland, Shetland Islands	L.C. 5 Astro 1961 Cayman Brac Island
Corrego Alegre Brazil		Leigon Ghana
Dabola Guinea	European 1950 Finland, Norway	Liberia 1964 Liberia
Djakarta (Batavia) Indonesia (Sumatra)	European 1950 Greece	Luzon Philippines (Exclud- ing Mindanao)
DOS 1968 New Georgia Islands (Gizo Island)	European 1950 Iran	Luzon Philippines (Min- danao)
Easter Island 1967 Easter Island	European 1950 (Sicily)	Mahe 1971 Mahe Island
European 1950 Mean for Austria, Belgium, Denmark, Finland, France, West Germany, Gi- braltar, Greece, Italy, Luxembourg, Neth- erlands, Norway, Portugal, Spain, Sweden, Switzerland	European 1950 Malta	Massawa Ethiopia (Eritrea)
	Ireland 1965 Ireland	Merchich Morocco
	ISTS 061 Astro 1968 South Georgia Is- lands	Midway Astro 1961 Midway Islands
	ISTS 073 Astro 1969 Diego Garcia	Minna Cameroon
European 1950 Mean for Austria, Denmark, France, West Germany, Netherlands, Swit- zerland	Johnston Island 1961 Johnston Island	Minna Nigeria
European 1950 Mean for Iraq, Israel, Jordan, Lebanon, Kuwait, Saudi Arabia, Syria	Kandawala Sri Lanka	Montserrat Island Astro 1958; Montser- rat (Leeward Islands)
	Kerguelen Island 1949 Kerguelen Island	M'Poraloko Gabon, Nahrwan, Oman (Masirah Is- land)
European 1950 Cyprus	Kertau 1948 West Malaysia & Singapore	Nahrwan Saudi Arabia
European 1950 Egypt	Kusaie Astro 1951 Caroline Islands	Nahrwan United Arab Emirates

Naparima BWI Trinidad & Tobago	North American 1927 Canada (Alberta, British Columbia)	Old Hawaiian Mean for Hawaii, Kauai, Maui, Oahu
North American 1927 Mean for Antigua, Barbados, Barbuda, Caicos Islands, Cuba, Dominican Republic, Grand Cayman, Jamaica, Turks Islands	North American 1927 Canada (Manitoba, Ontario)	Old Hawaiian Hawaii
North American 1927 Mean for Belize, Costa Rica, El Salva- dor, Guatemala, Honduras, Nicaragua	North American 1927 Canada (New Brunswick, New- foundland, Nova Scotia, Quebec)	Old Hawaiian Kauai
North American 1927 Mean for Canada	North American 1927 Canada (Northwest Territories, Sas- katchewan)	Old Hawaiian Maui
North American 1927 Mean for CONUS (Continental United States)	North American 1927 Canada (Yukon)	Old Hawaiian Oahu
North American 1927 Mean for CONUS (East of Mississippi River) including Lou- isiana, Missouri, Min- nesota	North American 1927 Cuba	Oman Oman
North American 1927 Mean for CONUS (West of Mississippi River)	North American 1927 Greenland (Hayes Peninsula)	Ordinance Survey Great Britain 1936 - Mean for England, Isle of Man, Scotland, Shetland Islands, Wales
North American 1927 Alaska	North American 1927 Mexico	Ordinance Survey Great Britain 1936 - England
North American 1927 Bahamas (Except San Salvador Island)	North American 1927 CONUS	Ordinance Survey Great Britain 1936 - England, Isle of Man, Wales
North American 1927 Bahamas (San Sal- vador Island)	North American 1983 Alaska, Canada, CONUS	Ordinance Survey Great Britain 1936 - Scotland, Shetland Islands
	North American 1983 Central America, Mexico	Ordinance Survey Great Britain 1936 - Wales
	Observaorio Metereo 1939; Azores (Corvo & Flores Islands)	Pico de las Nieves Canary Islands
	Old Egyptian 1907 Egypt	Pitcairn Astro 1967 Pitcairn Island

Point 58		Tokyo
Sweden	South American 1969 Chile	Mean for Japan, Korea, Okinawa
Santo (DOS) 1965 Espirito Santo Island	South American 1969 Colombia	Tokyo Japan
Sao Braz Azores (Sao Miguel, Santa Maria Islands)	South American 1969 Ecuador	Tokyo Korea
Sapper Hill 1943 East Falkland Island	South American 1969 Ecuador (Baltra, Galapagos)	Tokyo Okinawa
Schwarzeck Nambia	South American 1969 Guyana	Tristan Astro 1968 Tristan da Cunha
Selvagem Grande Salvage Islands	South American 1969 Paraguay South American 1969 Peru	Viti Levu 1916 Fiji (Viti Levu Island) Wake
SGS 85 Soviet Geodetic System 1985	South American 1969 Trinidad & Tobago	Eniwetok 1960 Marshall Islands
South American 1969 Mean for Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Trinidad & Tobago, and Venezuela	South American 1969 Venezuela South Asia	Wake Island Astro 1952 Wake Atoll
South American 1969 Argentina	Singapore Tananarive Observatory 1925; Madagascar	WGS 1972 Global Definition Yacare Uruguay
South American 1969 Bolivia	Timbalai 1948 Brunei, East Malaysia (Sabah, Sarawak)	Zanderij Suriname
South American 1969 Brazil		

## FCC Compliance

This device complies with Part 15 of the U.S. Federal Communications Commission (FCC) Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

### **Note:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the factory customer service department for help.

# Notes

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