LOWRANCE

M52 Pro
Fish-finding Sonar & GPS Plotter
Installation and 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.

Section 1: M52 Pro Specifications

General

Display: ....High-contrast Film SuperTwist LCD. Diagonal viewing area: 3.5" (8.9 cm).

Resolution: ....160 pixel x 240 pixel resolution; 38,400 total pixels.

Backlighting: ....LED backlit screen with multiple lighting levels; backlit keypad.

Input power: ....10 to 17 volts DC.

Current drain: ....170 ma lights off; 240 ma lights on.

Case size: ....5.8" H x 4.3" W x 2.5" D (14.7 cm H x 10.8 cm W x 6.6 cm D) sealed, waterproof; suitable for saltwater use.

Back-up memory:...........Built-in memory stores GPS data for decades.

Languages: ....10; menu languages selectable by user.

Sonar

Frequency: ....200 kHz.

Transducer:.......................A Skimmer® transducer comes packed with your sonar unit. Its 20° cone angle offers a wide fish detection area of up to 60° with high sensitivity settings. Operates at boat speeds up to 70 mph (61 kts).

Transmitter:....................800 watts peak-to-peak; 100 watts RMS.

**Sonar sounding
depth capability:**............600 feet (180 meters). Actual capability depends on transducer configuration and installation, bottom composition and water conditions. All sonar units typically read deeper in fresh water than in salt water.

Depth display: ....Continuous display.

Audible alarms:..............Deep/shallow/fish/zone.

Automatic ranging:.......Yes, with instant screen updates.

Auto bottom track:........Yes

Zoom bottom track:.......Yes.

Split-screen zoom:.........Yes.

Surface water temp: .....Yes, built into transducer.

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GPS

Receiver/antenna: ....Internal 12 parallel channel GPS/WAAS.

Position updates:...........Every second.

Position points:..............1,000 waypoints; 1,000 event marker icons.

Man Overboard:.............MOB feature precisely marks man overboard location with special icon, then automatically displays navigation data to that position.

Audible alarms:..............Arrival/off-course/destination passed/anchor.

**Graphic symbols for
waypoints or event
marker icons:**..................42.

Routes: ....100; up to 100 waypoints per route.

Plot Trails:.......................10 savable; up to 9,999 points per trail.

Zoom range: ....39 ranges; 0.02 to 4,000 miles.

NOTICE!

The storage and operation temperature range for your unit is from -4 degrees to +167 degrees Fahrenheit (-20 degrees to +75 degrees Celsius). *Extended storage or operation in temperatures higher or lower than specified will damage the liquid crystal display in your unit. This type of damage is not covered by the warranty.* For more information, contact the factory's Customer Service Department; phone numbers are listed on the last page.

How to use this manual: typographical conventions

Most functions you perform with this unit are described as a sequence of key strokes and selecting menu commands. Instructions for navigating a trail would look like this:

1. From the Plotter Page, press **MENU│MENU│↓** to **MY TRAILS│ENT**.

2. Press **↓** to *Trail 1│***ENT│→│↓** to **NAVIGATE│ENT**.

Here is what the instructions mean:
Step 1: "From the Plotter Page. Press the Menu key twice. Use down arrow keys to select My Trails on the menu. Press the Enter key."

Step 2: "Use the down arrow key select the trail named Trail 1, and press Enter. Press the right arrow key and then the down arrow key to highlight the Navigate command. Press Enter."

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Section 2:
Installation & Accessories

Preparations

You can install the sonar and GPS systems in some other order if you prefer, but we recommend this installation sequence:

CAUTION:

You should read over this entire installation section before drilling any holes in your vehicle or vessel!

1. Determine the approximate location for the sonar/GPS unit, so you can plan how and where to route the power/transducer cable. This will help you make sure you have enough cable length for the desired configuration.

2. Determine the approximate location for the transducer and its cable route.

3. Determine the location of your battery or other power connection, along with the power cable route.

4. Install the transducer and route the transducer cable to the sonar/GPS unit.

5. Route the power cable from the unit's location to an appropriate power source and connect it there.

6. Connect the transducer/power cable to the unit and mount the sonar/GPS unit to the bracket.

Transducer Installation

These instructions will help you install your Skimmer® transducer on a transom, on a trolling motor or inside a hull. Please read all instructions before proceeding with any installation.

Your Skimmer transducer typically comes packaged with a one-piece stainless steel bracket for mounting it to the transom of your boat. The optional trolling motor mount uses a one-piece plastic bracket with an adjustable strap. These are "kick-up" mounting brackets. They help prevent damage if the transducer strikes an object while the boat is moving. If the transducer does "kick-up," the bracket can easily be pushed back into place without tools.

Read these instructions carefully *before* attempting the installation. Determine which of the installation methods is right for your boat.

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Remember, the transducer location and installation is the most critical part of a sonar installation.

Recommended Tools and supplies

If you prefer the option of routing the cable through the transom, you will need a 5/8" drill bit.

NOTE:

The following installation types also call for these recommended tools and required supplies that you must provide (supplies listed here are *not* included):

Transom installation

Tools include: two adjustable wrenches, drill, #29 (0.136") drill bit, flat-head screwdriver. Supplies: *high quality, marine grade* above- or below-waterline sealant/adhesive compound.

Trolling motor installations

Tools: two adjustable wrenches, flat-head screwdriver. Supplies: plastic cable ties.

Shoot-through hull installations

Tools: these will vary depending on your hull's composition. Consult your boat dealer or manufacturer. Other tools are a wooden craft stick or similar tool for stirring and applying epoxy, and a paper plate or piece of cardboard to mix the epoxy on. Supplies: rubbing alcohol, 100 grit sandpaper, specially formulated epoxy adhesive available from LEI (see ordering information on the inside back cover). A sandwich hull also requires polyester resin.

Selecting a Transducer Location

1. The location must be in the water at all times, at all operating speeds.

2. The transducer must be placed in a location that has a *smooth flow* of water at all times. If the transducer is not placed in a smooth flow of water, interference caused by bubbles and turbulence will show on the sonar's display in the form of random lines or dots whenever the boat is moving.

NOTE:

Some aluminum boats with strakes or ribs on the outside of the hull create large amounts of turbulence at high speed. These boats typically have large outboard motors capable of propelling the boat at speeds faster than 35 mph. Typically, a good transom location on aluminum boats is between the ribs closest to the engine.

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3. The transducer should be installed with its face pointing straight down, if possible. *For shoot-thru applications:* Many popular fishing boat hulls have a flat keel pad that offers a good mounting surface. On vee hulls, try to place the transducer where the deadrise is 10° or less.
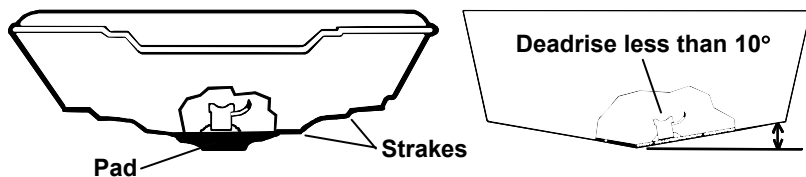
**Left, vee pad hull; right, vee hull. A pod style transducer is shown here, but the principle is the same for Skimmers inside a hull.**

4. If the transducer is mounted on the transom, make sure it doesn't interfere with the trailer or hauling of the boat. Also, don't mount it closer than approximately one foot from the engine's lower unit. This will prevent cavitation (bubble) interference with propeller operation.

5. If possible, route the transducer cable away from other wiring on the boat. Electrical noise from engine wiring, bilge pumps and aerators can be displayed on the sonar's screen. Use caution when routing the transducer cable around these wires.

CAUTION: Clamp the transducer cable to transom near the transducer. This will help prevent the transducer from entering the boat if it is knocked off at high speed.
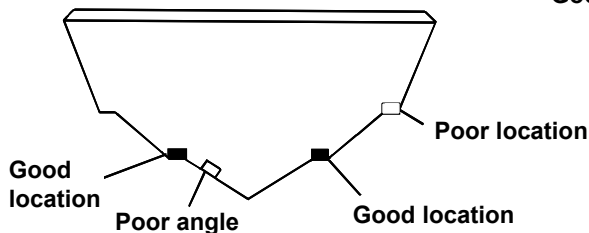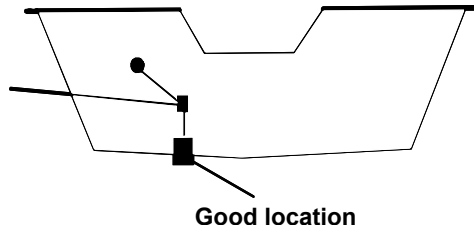
Good and poor transducer locations.

How low should you go?

For most situations, you should install your Skimmer transducer so that its centerline is level with the bottom of the boat hull. This will usually give you the best combination of smooth water flow and protection from bangs and bumps.

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Transducer centerline

Transom
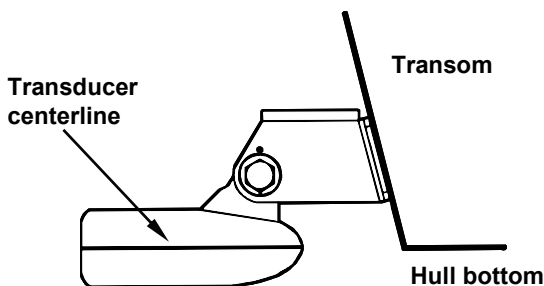
Hull bottom

Align transducer centerline with hull bottom.

However, there are times when you may need to adjust the transducer slightly higher or lower. (The slots in the mounting brackets allow you to loosen the screws and slide the transducer up or down.) If you frequently lose bottom signal lock while running at high speed, the transducer may be coming out of the water as you cross waves or wakes. Move the transducer a little lower to help prevent this.

If you cruise or fish around lots of structure and cover, your transducer may be frequently kicking up from object strikes. If you wish, you may move the transducer a little higher for more protection.

There are two extremes you should avoid. Never let the edge of the mounting bracket extend below the bottom of the hull. Never let the bottom – the face – of the transducer rise above the bottom of the hull.

Shoot-thru-hull vs. Transom Mounting

In a shoot-thru-hull installation, the transducer is bonded to the *inside* of the hull with epoxy. The sonar "ping" signal actually passes through the hull and into the water. This differs from a bolt-thru-hull installation (often called simply "thru-hull"). In that case, a hole is cut in the hull and a specially designed transducer is mounted *through* the hull with a threaded shaft and nut. This puts the transducer in direct contact with the water.

Typically, shoot-thru-hull installations give excellent high speed operation and good to excellent depth capability. There is no possibility of transducer damage from floating objects, as there is with a transom-mounted transducer. A transducer mounted inside the hull can't be knocked off when docking or loading on a trailer.

However, the shoot-thru-hull installation does have its drawbacks. First, some loss of sensitivity does occur, even on the best hulls. This varies from hull to hull, even from different installations on the same hull. This is caused by differences in hull lay-up and construction.

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Second, the transducer angle cannot be adjusted for the best fish arches on your sonar display. (This is not an issue for flasher-style sonars.) Lack of angle adjustment can be particularly troublesome on hulls that sit with the bow high when at rest or at slow trolling speeds.

Third, a transducer **CAN NOT** shoot through wood and metal hulls. Those hulls require either a transom mount or a thru-hull installation.

Fourth, if your Skimmer transducer has a built in temp sensor, it will only show the temperature of the bilge, not the water surface temp.

Follow the testing procedures listed in the shoot-thru-hull installation section at the end of this lesson to determine if you can satisfactorily shoot through the hull.

TRANSOM TRANSDUCER ASSEMBLY AND MOUNTING

The best way to install the transducer is to loosely assemble all of the parts first, place the transducer's bracket against the transom and see if you can move the transducer so that it's parallel with the ground.

1. **Assembling the bracket.** Press the two small plastic ratchets into the sides of the metal bracket as shown in the following illustration. Notice there are letters molded into each ratchet. Place each ratchet into the bracket with the letter "A" aligned with the dot stamped into the metal bracket. This position sets the transducer's coarse angle adjustment for a 14° transom. Most outboard and stern-drive transoms have a 14° angle.
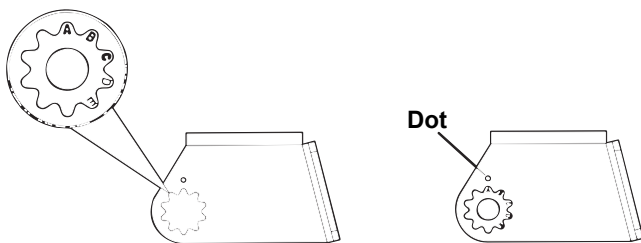
Align plastic ratchets in bracket.

2. **Aligning the transducer on the transom.** Slide the transducer between the two ratchets. Temporarily slide the bolt though the transducer assembly and hold it against the transom. Looking at the transducer from the side, check to see if it will adjust so that its face is parallel to the ground. If it does, then the "A" position is correct for your hull.

If the transducer's face isn't parallel with the ground, remove the transducer and ratchets from the bracket. Place the ratchets into the holes in the bracket with the letter "B" aligned with the dot stamped in the bracket.

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Reassemble the transducer and bracket and place them against the transom. Again, check to see if you can move the transducer so it's parallel with the ground. If you can, then go to step 3. If it doesn't, repeat step 2, but use a different alignment letter until you can place the transducer on the transom correctly.
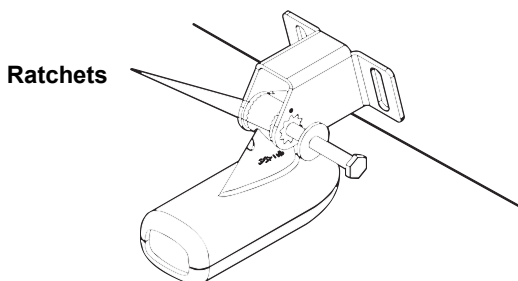
Insert bolt and check transducer position on transom.

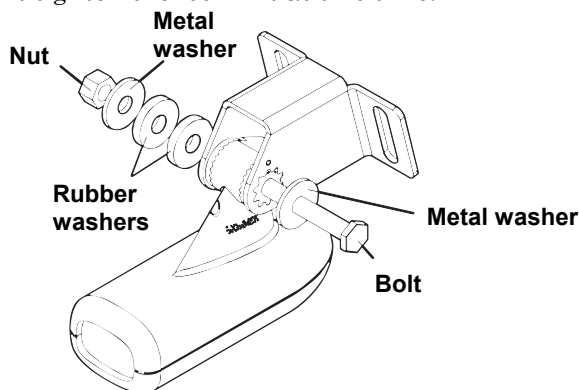3. **Assembling the transducer.** Once you determine the correct position for the ratchets, assemble the transducer as shown in the following figure. Don't tighten the lock nut at this time.

Assemble transducer and bracket.

4. **Drilling mounting holes.** Hold the transducer and bracket assembly against the transom. The transducer should be roughly parallel to the ground. The transducer's centerline should be in line with the bottom of the hull. Don't let the bracket extend below the hull!

Mark the center of each slot for the mounting screw pilot holes. You will drill one hole in the center of each slot. Drill the holes using the #29 bit (for the #10 screws).

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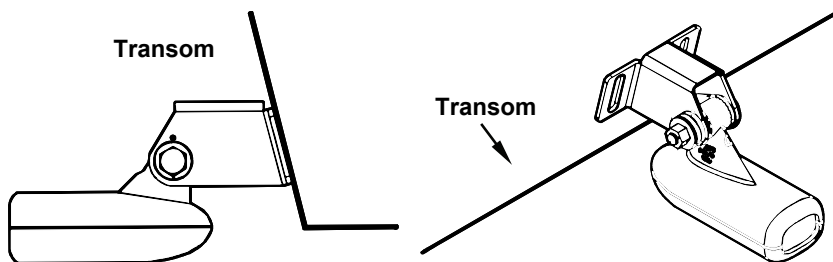
Position transducer mount on transom and mark mounting holes. Side view shown at left and seen from above at right.

5. **Attaching transducer to transom.** Remove the transducer from the bracket and re-assemble it with the cable passing through the bracket over the bolt as shown in the following figures.
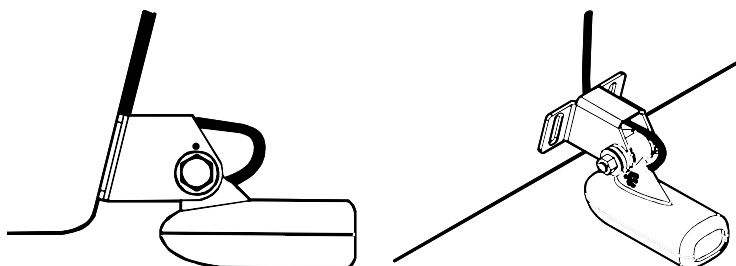
Route cable over bolt and through bracket. Side view shown at left and seen from above at right.

Attach the transducer to the transom. Slide the transducer up or down until it's aligned properly with the bottom of the hull as shown in the preceding and following figures. Tighten the bracket's mounting screws, sealing them with the sealant/adhesive compound.

Adjust the transducer so that it's parallel to the ground and tighten the nut until it touches the outer washer, then add 1/4 turn. *Don't over tighten the lock nut!* If you do, the transducer won't "kick-up" if it strikes an object in the water.
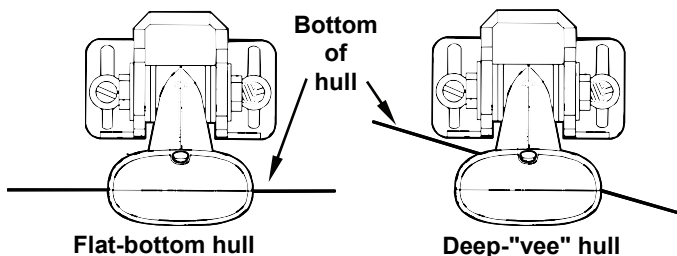
Flat-bottom hull   **Deep-"vee" hull**
Align transducer centerline with hull bottom and attach to transom.

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6. Route the transducer cable through or over the transom to the sonar unit. Make sure to leave some slack in the cable at the transducer. If possible, route the transducer cable away from other wiring on the boat. Electrical noise from the engine's wiring, bilge pumps, VHF radio wires and cables, and aerators can be picked up by the sonar. Use caution when routing the transducer cable around these wires.

WARNING:

Clamp the transducer cable to the transom close to the transducer. This can prevent the transducer from entering the boat if it is knocked off at high speed.

If you need to drill a hole in the transom to pass the connector through, the required hole size is 5/8".

Caution:

If you drill a hole in the transom for the cable, make sure it is located above the waterline. After installation, be sure to seal the hole with the same marine grade above- or below-waterline sealant/adhesive used for the mounting screws.

7. Make a test run to determine the results. If the bottom is lost at high speed, or if noise appears on the display, try sliding the transducer bracket down. This puts the transducer deeper into the water, hopefully below the turbulence causing the noise. Don't allow the transducer bracket to go below the bottom of the hull!

TROLLING MOTOR BRACKET INSTALLATION

1. Attach the optional TMB-S bracket to the transducer as shown in the following figure, using the hardware supplied with the transducer. (Note: The internal tooth washer is supplied with the TMB-S.)

Bolt   **Internal tooth washer**   **TMB-S bracket**

Nut

Flat washer
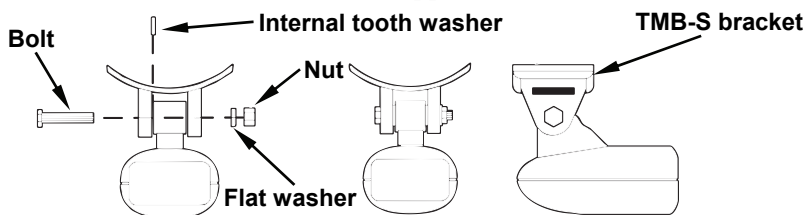
Attach motor mounting bracket to transducer.

2. Slide the adjustable strap supplied with the TMB-S through the slot in the transducer bracket and wrap it around the trolling motor. Position the transducer to aim straight down when the motor is in the water. Tighten the strap securely.

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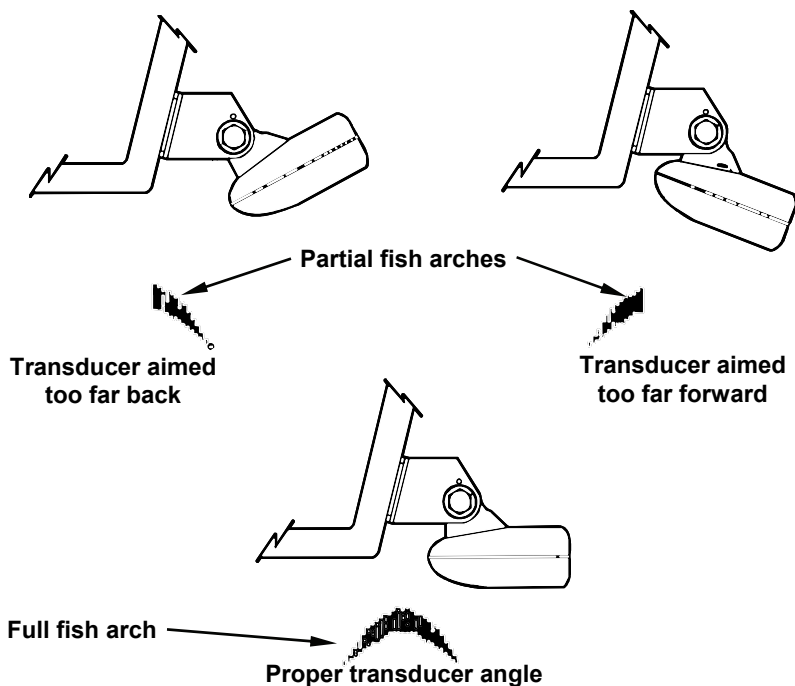3. Route the transducer cable alongside the trolling motor shaft. Use plastic ties (not included) to attach the transducer cable to the trolling motor shaft. Make sure there is enough slack in the cable for the motor to turn freely. Route the cable to the sonar unit and the transducer is ready for use.

TRANSDUCER ORIENTATION AND FISH ARCHES

If you do not get good fish arches on your display, it could be because the transducer is not parallel with the ground when the boat is at rest in the water or at slow trolling speeds.

Partial fish arches

Transducer aimed too far back

Transducer aimed too far forward

Full fish arch

Proper transducer angle

Transducer angles and their effects on fish arches.

If the arch slopes up – but not back down – then the front of the transducer is too high and needs to be lowered. If only the back half of the arch is printed, then the nose of the transducer is angled too far down and needs to be raised.

NOTE:

> Periodically wash the transducer's face with soap and water to remove any oil film. Oil and dirt on the face will reduce the sensitivity or may even prevent operation.

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SHOOT-THRU-HULL PREPARATION
Hulls With Floatation Materials

The transducer installation inside a fiberglass hull must be in an area that does not have air bubbles in the resin or separated fiberglass layers. The sonar signal must pass through solid fiberglass. A successful transducer installation can be made on hulls with flotation materials (such as plywood, balsa wood or foam) between layers of fiberglass if the material is removed from the chosen area. See the figure below.

WARNING:

Do not remove any material from your inner hull unless you know the hull's composition. Careless grinding or cutting on your hull can result in damage that could sink your boat. Contact your boat dealer or manufacturer to confirm your hull specifications.

Epoxy the transducer to a solid portion of the hull.
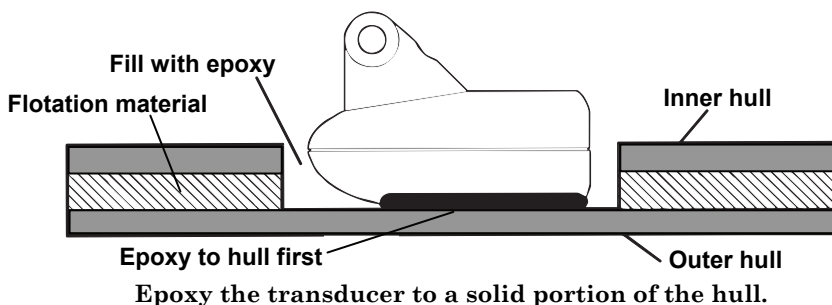
For example, some (but not all) manufacturers use a layer of fiberglass, then a core of balsa wood, finishing with an outer layer of fiberglass. Removing the inner layer of fiberglass and the balsa wood core exposes the outer layer of fiberglass. The transducer can then be epoxied directly to the outer layer of fiberglass. After the epoxy cures for 24 hours, fill the remaining space with polyester resin. When the job is finished, the hull is watertight and structurally sound. Remember, the sonar signal must pass through *solid* fiberglass. Any air bubbles in the fiberglass or the epoxy will reduce or eliminate the sonar signals.

Testing Determines Best Location

Ideally, the shoot-thru transducer should be installed as close to the transom as possible, close to the centerline. This will give you the best performance during high speed maneuvers.

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Transducer location (high speed)

Transducer location (trolling speed)
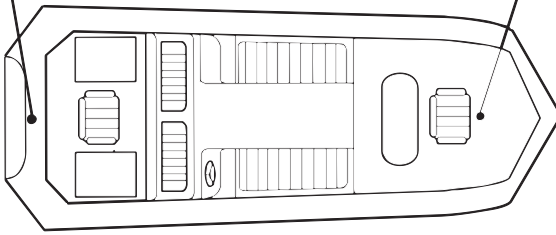
Shoot-thru-hull transducer locations for high speed or trolling speed operation.

To choose the proper location for shoot-thru-hull mounting, follow these testing procedures: (You may need a helper to complete these steps.)

1. Anchor the boat in about 30 feet of water. Add a little water to the sump of the boat. Plug the transducer into the sonar unit, turn it on, then hold the transducer over the side of the boat in the water. Adjust the sensitivity and range controls until a second bottom echo is seen on the display. (You'll need to turn off Auto Sensitivity, Auto Depth Range and ASP™. Try a range setting that is two to three times the water depth. The harder (more rocky) the bottom, the easier it will be to get a second bottom signal.) Don't touch the controls once they've been set.

True bottom

Second bottom

Manual range setting
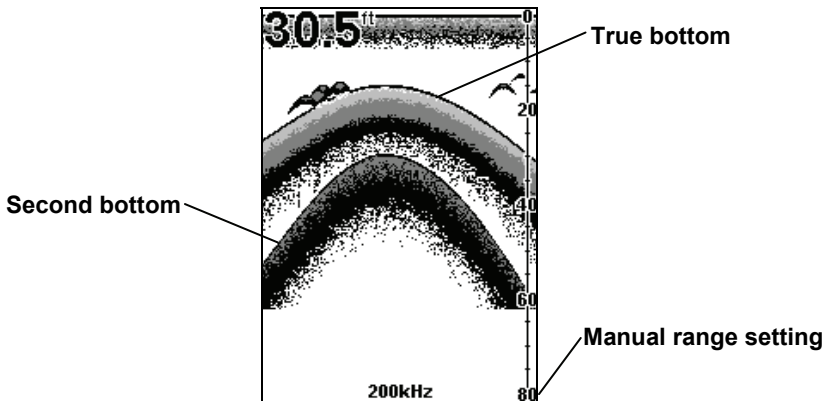
Example of a second bottom signal. Unit is in 30 feet of water, with range set at 80 feet and sensitivity set at 87 percent.

2. Next, take the transducer out of the water and place it in the water in the sump of the boat, face down. (The transducer face is shown in the figure on the following page.) Notice how the signal strength decreases. The second bottom signal will probably disappear and the bottom signal intensity will likely decrease.

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3. Now move the transducer around to find the best location with the strongest possible bottom signal. If you find a spot with an acceptable bottom signal, mark the location and move on to step 4.

If you can't get an acceptable bottom signal, try turning up the sensitivity by three or five keystrokes and then move the transducer around once more. If you find a spot that works, mark it and move on to step 4.

If you have to turn up sensitivity by more than five keystrokes to get a good signal, the transducer should be mounted on the outside of the hull. This is especially true if you have to turn sensitivity all the way up to get a decent bottom signal.

4. Most people can get good results by following steps 1 through 3, so this step is *optional*. If you want to make an extra effort to be absolutely sure that your selected location will work under all conditions, make a test run with the boat on plane and observe the bottom signal. You'll need to figure some way to prop the transducer into position while you make your test run. (A brick or two might be sufficient to hold it in place.)

5. When you're satisfied with a location, mark it and proceed with the installation.

## Shoot-thru-hull Installation

If you are installing the transducer on a hull with floatation material sandwiched within the hull, refer to the text "Hulls With Flotation Materials."

1. Make sure the area is clean, dry and free of oil or grease, then sand both the inside surface of the hull and the face of the transducer with 100 grit sandpaper. The sanded hull area should be about 1-1/2 times the diameter of the transducer. The surface of the hull must be flat so the entire transducer face is in contact with the hull prior to bonding. After sanding, clean the hull and transducer with rubbing alcohol to remove any sanding debris.

WARNING:
Use *only* the epoxy available from LEI. It has been formulated to work with these installation procedures. Other epoxy types may be too thin or may not cure to the right consistency for optimum transducer performance.

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2. The epoxy consists of the epoxy itself and a hardener. Remove the two compounds from the package and place them on the paper plate. Thoroughly stir the two compounds together until the mixture has a uniform color and consistency. Do not mix too fast or bubbles will form in the epoxy. After mixing, you have 20 minutes to complete the installation before the epoxy becomes unworkable.

Spread epoxy here

Sand this surface

Epoxy transducer to hull.
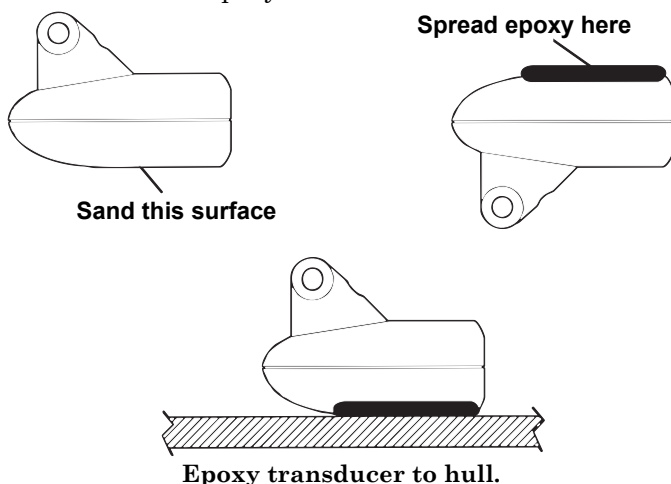
Spread a thin layer of epoxy (about 1/16" or 1.5 mm thick) on the face of the transducer as shown in the previous figure. *Make sure there are no air pockets in the epoxy layer!* Then, apply the remaining epoxy to the sanded area on the hull.

3. Press the transducer into the epoxy, twisting and turning it to force any air bubbles out from under the transducer face. Stop pressing when you bottom out on the hull. When you're finished, the face of the transducer should be parallel with the hull, with a minimum amount of epoxy between the hull and transducer.

4. Apply a weight, such as a brick, to hold the transducer in place while the epoxy cures. Be careful not to bump the transducer while the epoxy is wet. Leave the weight in place for a minimum of three hours. Allow the epoxy to cure for 24 hours before moving the boat.

5. After the epoxy has cured, route the cable to the sonar unit and it's ready to use.
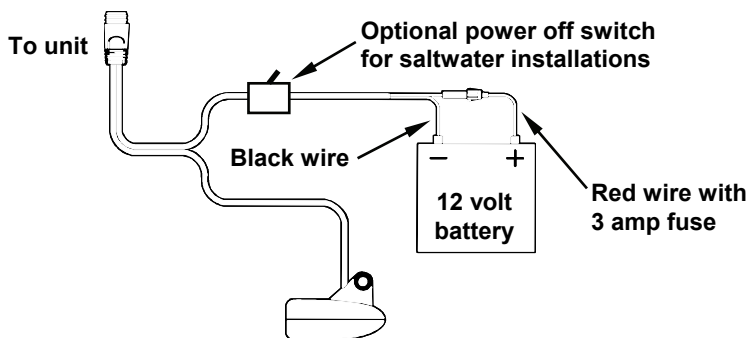
POWER AND CABLE CONNECTIONS

The unit works from a 12-volt battery system. For the best results, attach the power cable directly to the battery. You can attach the power cable to an accessory or power buss, however you may have problems

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with electrical interference. Therefore, it's safer to go ahead and attach the power cable directly to the battery.

CAUTION:

When using the unit in a saltwater environment, we strongly recommend that you shut off the power supply to the power cable when the unit is not in use. When the unit is turned off but still connected to a power supply, electrolysis can occur in the power cable plug. This may result in corrosion of the plug body along with the electrical contacts in the cable and the unit's power socket.

In saltwater environments we recommend you connect the power cable to the auxiliary power switch included in most boat designs. If that results in electrical interference, or if such a switch is not available, we recommend connecting direct to the battery and installing an inline switch. This will let you shut off power to the power cable when the unit is not in use. When you are not using the unit, you should always shut off power to the power cable, especially when the power cable is disconnected from the unit.

Power and transducer connections for the M52 Pro sonar units (direct battery connection shown).

If possible, keep the power cable away from other boat wiring, especially the engine's wires. This will provide the best isolation from electrical noise. If the cable is not long enough, splice #18 gauge wire onto it. The power cable has two wires, red and black. Red is the positive lead, black is negative or ground. Make sure to attach the in-line fuse holder to the red lead *as close to the power source as possible.*

For example, if you have to extend the power cable to the battery or power buss, attach one end of the fuse holder directly to the battery or power buss. This will protect both the unit and the power cable in the event of a short. It uses a 3-amp fuse.

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WARNING:

This product *must* be independently fused with the enclosed 3-amp fuse (or equivalent), even if you connect to a fused accessory or power buss.

If a malfunction happens inside the unit, extensive damage can occur if the enclosed fuse is not used. As with all electrical devices, this unit could be damaged to a point that it is unrepairable and could even cause harm to the user when not properly fused.

CAUTION:

Failure to use the enclosed 3-amp fuse will void your warranty! For a replacement, use a type 3AG 3-amp fuse.

This unit has reverse polarity protection. No damage will occur if the power wires are reversed. However, the unit will not work until the wires are attached correctly.

MOUNTING THE SONAR UNIT: In-Dash or Bracket

You can install the sonar unit on the top of a dash with the supplied bracket. It can also be installed in the dash with an optional FM-6 dash-mounting kit.

In-Dash Installation

The following figure shows the approximate shape for in-dash mounting an M52 Pro. The in-dash adapter kit includes a template for cutting the mounting hole and complete installation instructions on instruction sheet 988-0147-631.

Top

ALWAYS VERIFY DIMENSIONS.

Cut along this line
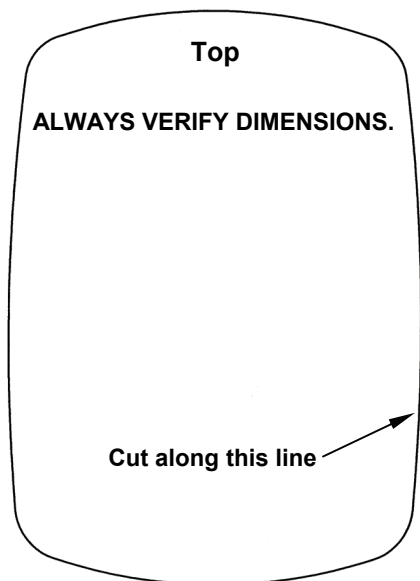
In-dash mounting template for M52 Pro.
NOTE: This figure is *not* printed to scale.

Bracket Installation

Mount the unit in any convenient location, provided there is clearance when it's tilted for the best viewing angle. You should also make sure there is enough room behind the unit to attach the power/transducer cable. (See the following drawings, which show the dimensions of a mounted M52 Pro sonar unit.)

Holes in the bracket's base allow wood screw or through-bolt mounting. You may need to place a piece of plywood on the back side of thin panels to reinforce the panel and secure the mounting hardware.

Drill a 5/8" (15.9 mm) hole in the dash for the power/transducer cable. The best location for this hole is immediately under the mounting bracket location. This way, the bracket can be installed so that it covers the hole, holds the cable in position and results in a neat installation. Some customers, however, prefer to mount the bracket to the side of the cable hole — it's a matter of personal preference. After drilling the hole, pass the connector *up* through the hole from under the dash.

107.5 [4.23]

82.7 [3.26]

156 [6.26]

12.09 [0.48]

76.9 [3.03]

Millimeter [Inch]

70.3 [2.77]
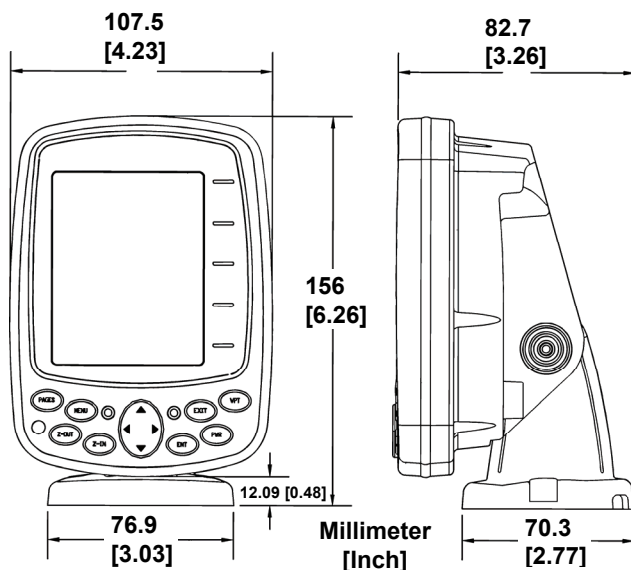
Front view (left) and side view (right) showing dimensions of the M52 Pro when mounted on quick release bracket.

If you wish, you can fill in the hole around the cable with a good marine sealant compound. (Some marine dealers stock cable hole covers to conceal the opening.)

This unit uses a quick release mounting bracket. When you run the cable through the hole, make sure you allow enough slack for tilting the unit and attaching the connector. (The snug fit of the push-on waterproof connector requires some force to attach.) Also be sure there is enough cable slack for rotation if you decide to use the optional GBSA-3 swivel base. The swivel base lets you to rotate the sonar so it can be seen from different parts of the boat.

Align the bracket over the cable hole with the cable slots facing away from you and fit the cable through one of the slots. Fasten the bracket to the dash using the three screw holes.

23
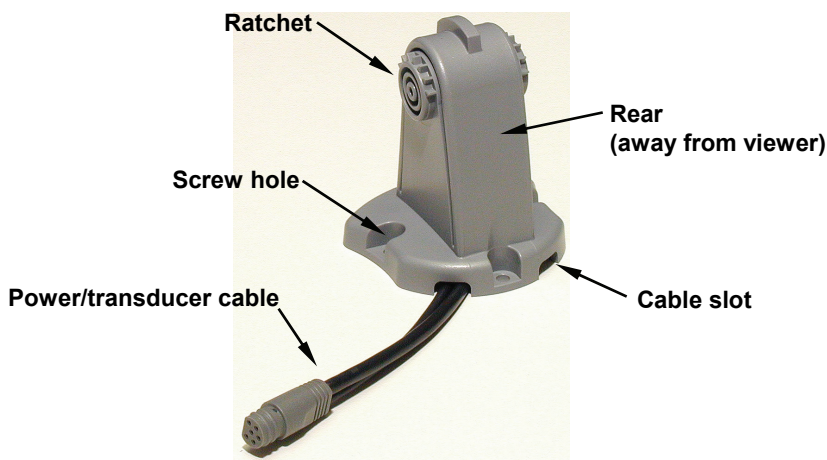
M52 Pro quick release mounting bracket. Slots in the base allow routing the cable from beneath the mount.

Attach the unit to the bracket by first connecting the power/transducer cable. Then, hold the sonar unit vertically and slide it onto the bracket from above. (The back of the unit should be touching the front of the bracket as you lower it into position.) As you push down, the unit will lock into place with a distinct click.

To adjust the viewing angle, pinch the ratchets with one hand, then tilt the unit with your other hand. Release the ratchets and the unit locks into the new position. To dismount the unit for storage, press the ratchets and lift the unit off the bracket.

Adjust viewing angle: use one hand to press and release the spring-loaded ratchets while you move the unit with the other hand. An optional GBSA-3 swivel base is shown with the quick release bracket.

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Portable Sonar Installation

Like many Lowrance products, the M52 Pro sonar is capable of portable operation. It uses the optional PPP-12 portable power pack.

The power pack and portable transducers expand the uses for your sonar. An alternative to the PPP-12 is the PPP-15 portable power pack, which was designed especially for ice fishing. It includes a rechargeable gel cell battery and a transducer designed for stationary use.

The PPP-12 package includes the power pack, battery adapter and a portable transducer. The transducer can be stored inside the power pack. The PPP-12 requires eight AA alkaline batteries. Batteries are not included.

Installing the Batteries

Release the latch on the front of the power pack case. Open the compartment and install eight AA batteries into the adapter. For the longest life, we recommend you use alkaline batteries.

After installing the batteries, plug the cable's power connector into the socket on the battery compartment cover. Route the cable's unit connector and about 6 inches of cable through the opening under the sonar mount. Close the cover, plug the connector into the sonar unit and mount the unit on the built-in bracket.

In cold weather the efficiency of dry cell batteries drops with the temperature. We find it a good idea to have the sonar unit good and warm along with the batteries before we leave home.

WARNING:
> **Never heat the batteries over an open flame or direct hot air onto them. A fire or explosion could result.**
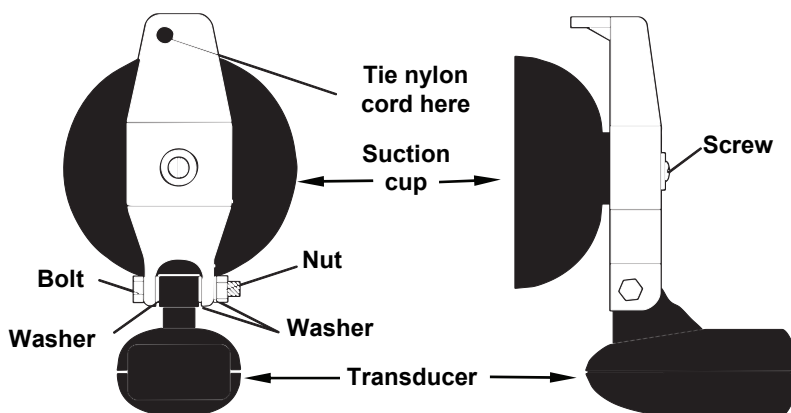
Portable Transducer Assembly

Recommended tools for installation include a slotted screw driver and two adjustable wrenches.

Assemble the transducer and bracket as shown in the following figure. Attach the transducer to the bracket with the supplied hardware.

Make sure there is one washer on each side of the transducer, inside the bracket. Slide the other washer over the end of the bolt and thread the nut onto it.

Screw the suction cup onto the bracket using the supplied screw and flat washer. Tie the nylon cord through the hole in the top of the bracket. When using this transducer, tie the other end of the nylon cord to the boat. This will help prevent the loss of the transducer if it comes off the boat.

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Portable transducer assembly: rear view (left) and side view (right.)

Clean the chosen area of the hull before attaching the suction cup. Locate the transducer on the hull as shown in the following figure. Don't allow the bracket to extend below the hull, because water pressure against it can cause the suction cup to come off at speed.

Moisten the cup, then press it onto the hull as firmly as possible. Tie the nylon cord to the boat and route the transducer cable to the sonar unit. Your portable sonar is now ready for use.
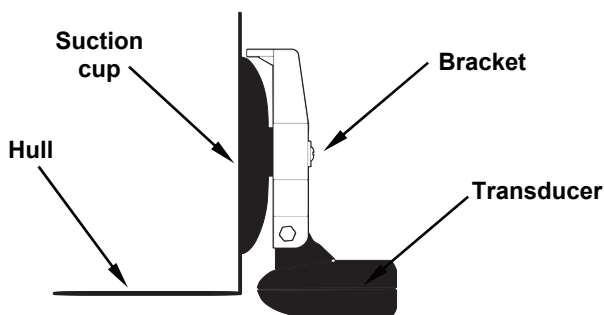
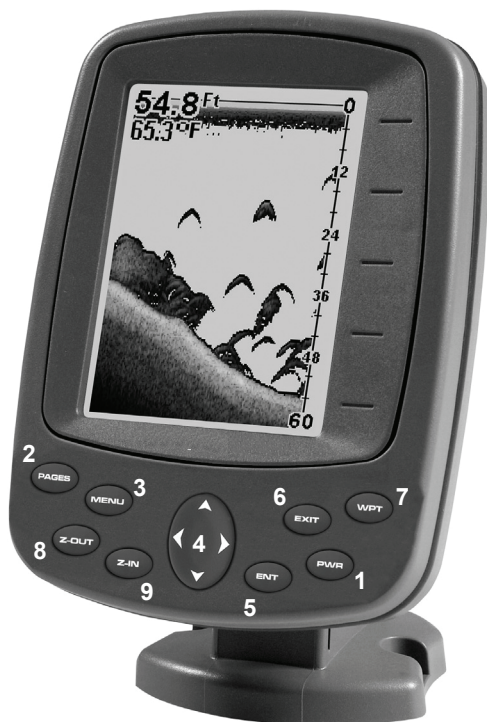**Portable transducer installed on boat transom.**

NOTE:

For optimum operation, the portable transducer should be adjusted so that it is parallel to the ground. For more information on this, see the earlier segment on Transducer Orientation and Fish Arches.

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Section 3:
Basic Sonar Operation

Keyboard

Numbers in the photo correspond to key explanations below.

Lowrance M52 Pro Sonar.

1. **PWR/LIGHT** – The **PWR** key turns the unit on and off and activates the backlight. *Depress the **PWR** key for 3 seconds to turn off the unit.*

2. **PAGES** – Pressing this and the arrow keys (4) switches the unit between the different page display screens.

3. **MENU** – Press this key to show the menus and submenus, which allow you to select a command or adjust a feature. This also accesses search functions for streets, intersections, addresses and highway exits.

4. **ARROW KEYS** – These keys are used to navigate through the menus, make menu selections, move the plotter cursor and sonar chart cursor and enter data.

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5. **ENT** – This key allows you to save data, accept values or execute menu commands. It is also used to create event marker icons.

6. **EXIT** – The Exit key lets you return to the previous screen, clear data or close a menu.

7. **WPT** – The Waypoint key is used to save and recall waypoints, search for waypoints and access the waypoint list. It's also involved in some navigation functions.

8. **ZOUT** – This key lets you zoom the screen out. On the Sonar Page, this key returns you to a full sonar chart display, showing the entire water column from surface to bottom. On the Plotter Page, this lets you see a larger geographic area on the display. Less detail is seen as you zoom out.

9. **ZIN** – This key lets you zoom the screen in. On the Sonar Page, this key enlarges fish signals and bottom detail. On the Plotter Page, zooming in lets you see greater detail in a smaller geographic area on the display.

Main Menu

Access the Main Menu by pressing **MENU|MENU**. Select a menu item by using ↑ or ↓ to highlight the command and pressing **ENT**. To clear the Main Menu screen and return to the Page display, press **EXIT**.

Main Menu Commands

• **Screen**:(**CONTRAST**, **BRIGHTNESS** and **DISPLAY MODE**): change the appearance of the display screen. Use these commands to adjust how the screen looks under various lighting conditions.

• **Sounds**: controls sound levels for keystrokes and alarms.

• **Alarms**: turns alarms on or off and changes alarm thresholds.

NOTE:
>   Route Planning, My Trails, GPS Setup and Trip Calculator will be addressed in the GPS section.

• **Set Keel Offset**: calibrates the unit to show depth under the keel or actual depth from the surface.

• **Sonar Simulator**: turns the unit's simulator feature on and off.

• **System Setup**: provides access to general configuration options, like Units of Measure, Reset Options, Pop-up Help, Set Language, etc.

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• **Sun/Moon Calculations**: displays the rising and setting time of the sun and moon.

• **Timers**: gives you access to the Up Timer, Down Timer and Clock Alarm Dialogs.

Sonar Menu

Access the Sonar Menu by pressing the **MENU** key one time. Select a menu item by using ↑ or ↓ to highlight the command and then pressing **ENT**. To clear the menu screen and return to the Page display, press **EXIT**.

Sonar Menu Commands

• **Sensitivity**: allows you to set the degree of sensitivity used for display sonar echoes on the screen.

• **Auto Sensitivity**: automatically adjusts degree of sensitivity based on the depth of the water.

• **GrayLine™**: separates fish and structure near the bottom from the actual bottom, and defines bottom composition/hardness.

• **Depth Range**: manually sets the depth range shown on the sonar chart.

• **Auto Depth Range**: automatically sets the depth range shown on the sonar chart to always keep the bottom in view.

• **Upper and Lower Limits**: sets the upper and lower depth limits of the sonar chart. Lets you zoom in on portion of the water column.

• **Stop Chart**: stops the sonar chart from scrolling. Used when you want to "freeze" the image for closer study.

• **Chart Speed**: sets the scrolling speed of the sonar chart.

• **Depth Curso**r: displays a cursor line on the sonar chart which allows you to accurately measure the depth of a sonar target.

• **Overlay Data**: allows you to select the types of information shown on the sonar chart screen.

• **Sonar Features**: launches the Sonar Features menu gives you access to features like, screen color mode, auto depth and sensitivity, surface clarity, noise rejection, Fish I.D.™ symbols, zoom and zone bars.

• **Ping Speed**: sets the rate sonar pings are transmitted.

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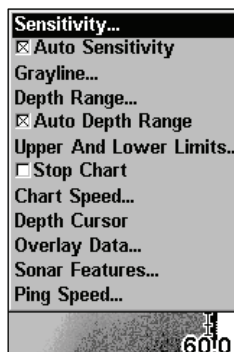
Basic Sonar Quick Reference

1. Mount the transducer and unit. Connect the unit to electric power and the transducer.

2. Launch your boat.

3. To turn on the unit, press and release **PWR** key.

4. Head for your fishing grounds. Your unit automatically displays digital depth and surface water temperature in the corner of the screen.

The auto settings will track the bottom, displaying it in the lower portion of the screen. The full sonar chart will scroll from right to left, showing you what's under the boat as you cruise across the water.

5. As you're watching the sonar returns, you can change the display by:

    Zoom in to enlarge the chart for more detail: press **ZIN**.
    Zoom out to return to full chart mode: press **ZOUT**.

6. If necessary, adjust sensitivity to improve chart readability. Press **MENU|ENT** and the Sensitivity Menu will appear on the left of your screen. Use ↑ and ↓ to change the setting.

Boosting sensitivity will show more information on your screen, which may cause clutter. Reducing sensitivity will filter out some information, but could omit important images. We recommend adjusting sensitivity until the background is lightly "peppered" — that is, scattered dots appear, but individual objects (like fish arches or bottom structure) can be easily picked out of the background.

7. Watch the display for the appearance of fish arches. When you see arches, you've found fish! Stop the boat and get your lure or bait into the water at the depth indicated on the sonar chart.

8. Gauge the fish depth by visually comparing the fish arches with the depth scale on the right side of the screen, or get a more accurate measure with the Depth Cursor. Press **MENU|↓** to **DEPTH CURSOR|ENT**. Press ↓ (or ↑) to align the cursor line with the fish arch. The exact depth appears in a box at the right end of the cursor line. To clear the cursor, press **EXIT**.

9. If you are drifting at a very low speed or anchored, you are not moving fast enough for a fish to return the tell-tale fish arch signal. As you drift over a fish, or as a fish swims through the transducer's signal cone, the fish echo will appear as a straight line suspended between the surface and the bottom.

10. To turn off the unit, press and hold **PWR** key for three seconds.
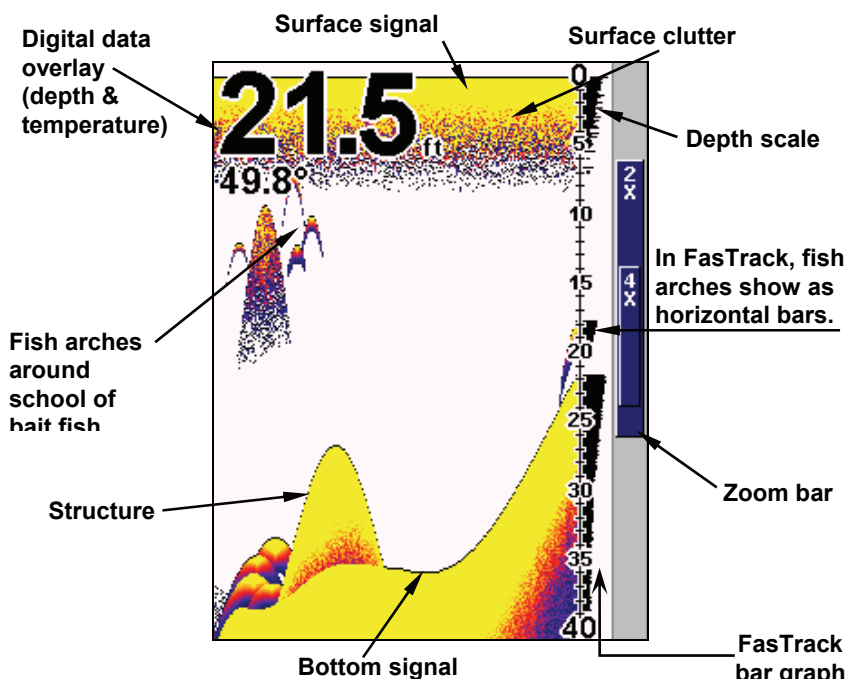
**Sonar Page, showing full sonar chart mode.**

Pages

The M52 Pro has five major Sonar display options. They are the Full Sonar Chart, Split Zoom Sonar Chart, Digital Data, Flasher and Pro Tips.

You access the various display modes by pressing the **PAGES** key. Press → to **SONAR** | ↑ or ↓ to *desired page* | **ENT**. Press **EXIT** to clear the Page menu.

The Full Sonar Chart is the main Sonar display option. This is a "cross-section" view of the water column beneath the boat. The chart moves across the screen, displaying sonar signal echoes that represent fish, structure and the bottom.

31
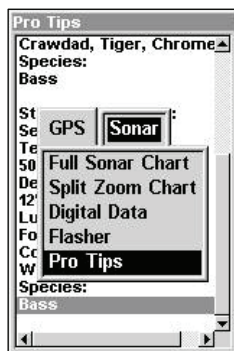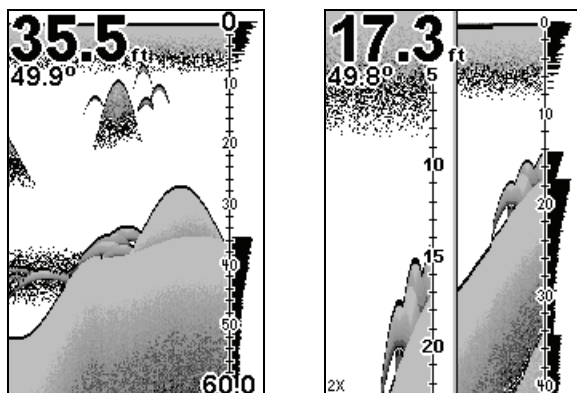
**Full sonar chart (left) and Split Zoom Chart (right).**
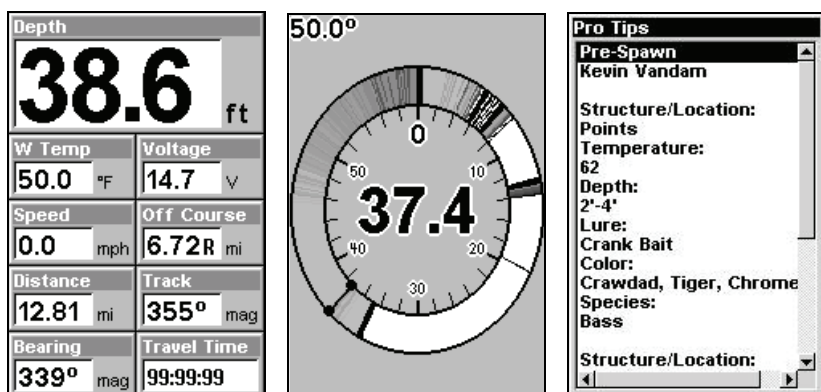
Digital Data page (left) with Flasher page (center) and Pro Tips page (right).

Sonar Operations

Sensitivity controls the unit's ability to pick up echoes. If you want to see more detail, try increasing the sensitivity. There are situations when too much clutter appears on the screen. Decreasing the sensitivity can reduce the clutter and show the strongest fish echoes, if fish are present.

You can change the sensitivity level whether you are in Auto Sensitivity mode or Manual Sensitivity mode.

32
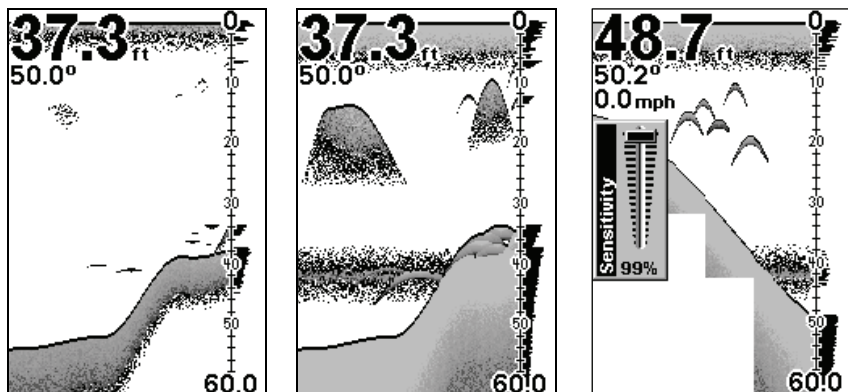
These figures show results of different sensitivity levels on the same location. Sensitivity set at 50 percent (left). Sensitivity set at 100 percent (center). Sensitivity Control bar (right).

To adjust sensitivity:

1. Press **MENU|ENT**.

2. The Sensitivity Control Bar appears. Press ↓ to decrease sensitivity; press ↑ to increase sensitivity. Press **EXIT**.

NOTE:

If you want to change the sensitivity in Manual Mode, first turn off Auto Sensitivity: from the Sonar Page, press **MENU|↓** to **AUTO SENSI-TIVITY|ENT|↑** to **SENSITIVITY|ENT**. Press ↓ or ↑ to pick a different sensitivity setting. When it's set at the desired level, press **EXIT**.

Important Tip:

It is possible to scramble the settings so the sonar picture disappears from your screen. If that happens, remember it is easy to switch back to full automatic operation by restoring factory default settings.

To Restore Factory Settings

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

2. The unit asks if you want to reset all the options. Select **YES** and press **ENT**. All options are reset, and the unit reverts back to the original settings.

Fish Symbols vs. Full Sonar Chart

You may have noticed in the quick reference that we used fish arches in full sonar chart mode for our example, and not the popular Fish I.D.™ fish symbol feature.

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Fish I.D. *is* an easier way for a sonar novice to recognize a fish signal return when he sees it. However, locating fish by symbol *only* has some limitations.

Your sonar unit's microprocessor is remarkably powerful, but it can be fooled. Some of the echoes *calculated* to be fish could be tree limbs or turtles! *To see what's under your boat in <u>maximum detail</u>, we recommend you turn off Fish I.D. and begin learning to interpret fish arches.*

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Section 4:
Sonar Options & Other Features

ASP™ (Advanced Signal Processing)

The ASP™ feature is a noise rejection system built into the sonar unit that constantly evaluates the effects of boat speed, water conditions and interference. This automatic feature gives you the best display possible under most conditions.

The ASP feature is an effective tool in combating undesired signals (noise) from sources like bilge pumps, engine ignition systems, air bubbles passing over the face of the transducer and vibration from the engine(s). In all cases, noise can produce unwanted marks on the display.

The ASP feature has four settings — Off, Low, Medium and High.
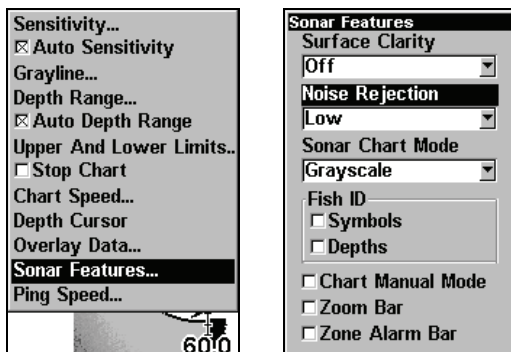
At left, Sonar Menu with Sonar Features selected. In the Sonar Features menu, Noise Rejection is selected with ASP in the default low setting.

To change the ASP level:

1. From the Sonar Page, press **MENU**|↓ to **SONAR FEATURES**|**ENT**.

2. Press ↓ to **NOISE REJECTION**|**ENT**.

3. Press ↓ or ↑ to select a setting, then press **ENT**.

4. To return to the previous page, press **EXIT**|**EXIT**.

Alarms

This unit has three different types of sonar alarms: Fish Alarm, Zone Alarm and Depth Alarm.

Depth Alarm

The Depth Alarm has both a Shallow and Deep setting. The depth alarms sound a tone when the bottom signal is shallower than the shallow alarm's setting or deeper than the deep alarm's setting. These alarms can be used at the same time or individually.

35
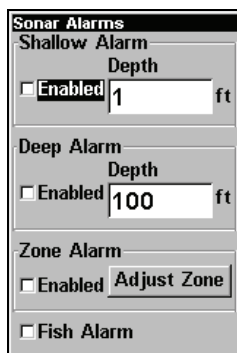
At left, Main Menu and Sonar Alarms command.
At right, the Sonar Alarms menu.

To adjust and turn on the shallow alarm:

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

2. Press ↓ to **SHALLOW ALARM DEPTH**|**ENT**.

3. Press ↑ or ↓ until the depth is correct, then press **ENT**.

4. Press ↑ to **SHALLOW ALARM ENABLED**|**ENT**|**EXIT**.

5. To turn off the alarm, press **MENU**|**MENU**|↓ to **SONAR ALARMS**|**ENT**|**ENT**|**EXIT**.

To switch to a different depth setting, open the Sonar Alarms menu and repeat the instructions in step 3 above.

To adjust and turn on the deep alarm:

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

2. Press ↓ to **DEEP ALARM DEPTH**|**ENT**.

3. Press ↑ or ↓ until the depth is correct, then press **ENT**.

4. Press ↑ to **DEEP ALARM ENABLED**|**ENT**|**EXIT**.

5. To turn off the alarm, press **MENU**|**MENU**|↓ to **SONAR ALARMS**|**ENT**|↓ to **DEEP ALARM ENABLED**|**ENT**|**EXIT**.

To switch to a different depth setting, open the Sonar Alarms menu and repeat the instructions in step 3 above.

Zone Alarm

The zone alarm is triggered when any echo passes inside the zone alarm bar, shown on the right side of the screen.

To adjust and turn on the zone alarm:

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

2. Press ↓ to **ZONE ALARM ENABLED**|→ to **ADJUST ZONE**|**ENT**.

36
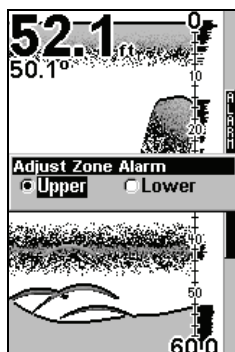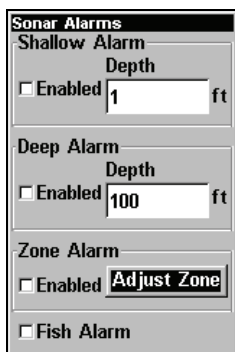
**At left, Sonar Alarms menu, with Adjust Zone command selected.
At right, Adjust Zone Alarm selection box, with Upper Limit selected.**

3. To set the upper boundary for the Zone Alarm, use ← or→ to select
UPPER. Press ↑ or ↓ to move the top of the bar to the desired depth.

4. To set the lower boundary for the Zone Alarm, use ← or→ to select
LOWER Press ↑ or ↓ to move the bottom of the bar to the desired depth.

5. Press **EXIT|←** to **ZONE ALARM ENABLED|ENT|EXIT|EXIT|EXIT**. Now, any
echo — fish, bottom, structure — within the zone alarm's depth range
will trigger the zone alarm.

6. To turn off the alarm, press **MENU|MENU|↓** to **ALARMS|ENT|↓** to **SO-
NAR ALARMS|ENT|↓** to **ZONE ALARM ENABLED|ENT|EXIT|EXIT|EXIT**.

To switch to a different depth setting, open the Sonar Alarms menu
and repeat the instructions in steps 3 and 4 above.
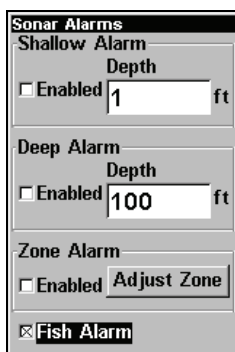
**Sonar Alarms menu with Fish Alarm selected. The check box
to the left is checked, indicating the alarm is turned on.**

Fish Alarm
With Fish I.D. turned on, the fish alarm will sound a tone when a fish
symbol or other suspended objects appear on the display.

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To turn on fish alarm:

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

2. Press ↓ to **FISH ALARM**|**ENT**|**EXIT**.

3. To turn off the alarm, press **MENU**|**MENU**|↓ to **SONAR ALARMS**|**ENT**|↓ to **FISH ALARM**|**ENT**|**EXIT**.

Chart Speed

Chart Speed allows you to control the rate echoes scroll across the screen.
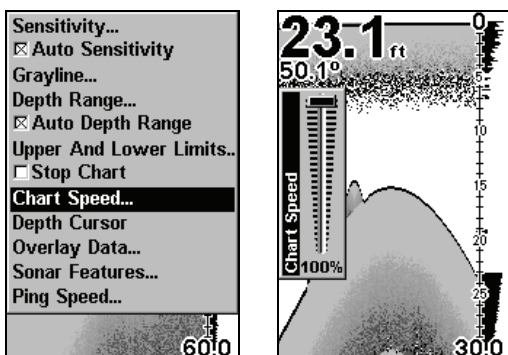
**At left, Sonar Page menu. At right, Chart Speed Control Bar.**

To change chart speed:

1. From the Sonar Page, press **MENU**|↓ to **CHART SPEED**|**ENT**.

2. The Chart Speed Control Bar appears. Press ↓ to decrease chart speed; press ↑ to increase chart speed.

3. When it's set at the desired level, press **EXIT**.

Depth Cursor

The depth cursor consists of a horizontal line with a digital depth box on the right side. The numbers inside the box show the depth of the cursor. The cursor can be moved to any location on the screen, letting you pinpoint the depth of a target.
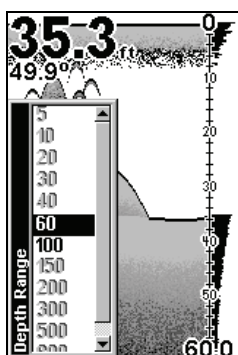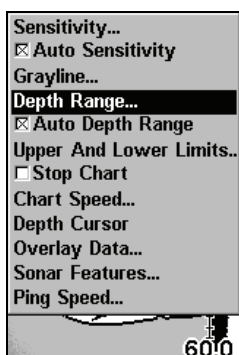
1. From the Sonar Page, press **MENU**|↓ to **DEPTH CURSOR**|**ENT**.

2. The depth cursor appears. Press ↓ to lower the cursor line; press ↑ to raise the cursor line.

3. To clear the depth cursor, press **EXIT**.

38
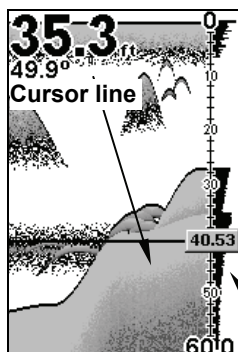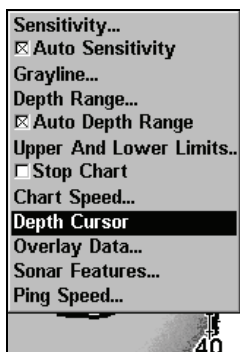
At left, Depth Cursor selected. At right, sonar chart with the depth cursor active. The line indicates the large fish is 40.53 feet deep.

Depth Range - Automatic

When turned on for the first time, the bottom signal is automatically placed in the lower half of the screen. This is called Auto Ranging and is part of the automatic function.

At left, Sonar Page menu with Depth Range command selected. At right, the Depth Range Control Scale.

To select Automatic Depth Range:

1. From the Sonar Page, press **MENU**|↓ to **DEPTH RANGE**|**ENT**.

2. The Depth Range Control Scale appears. Press ↑ or ↓ to select a different depth range. A dark bar highlights the selected range. Range numbers in gray cannot be selected.

3. When the new range is selected, press **EXIT** to clear the menu.

Depth Range - Manual

You have complete control over the range when the unit is in the manual mode. There are 12 depth ranges, from 5 feet to 800 feet.

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To switch to Manual Depth Range:

1. First, turn off automatic depth range. From the Sonar Page, press **MENU**|↓ to **AUTO DEPTH RANGE**|**ENT**.

2. Press ↑ to **DEPTH RANGE**|**ENT**.

3. Press ↓ or ↑ to select a different depth range. A horizontal dark bar highlights the selected range.

4. When the new range is selected, press **EXIT** to clear the menu.
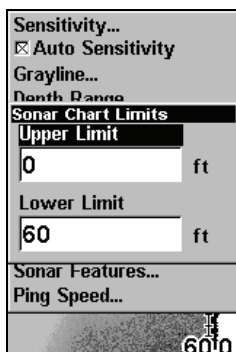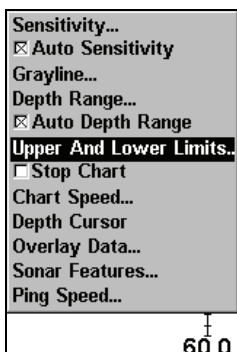
At left, Sonar Page Menu with Upper and Lower Limits command selected. At right, Sonar Chart Limits menu, with Upper Limit selected.

Depth Range - Upper and Lower Limits

Virtually any segment of the water column can be displayed by using the upper and lower limit feature. This lets you pick the shallow and deep depth range limits that are shown on the screen, provided there is at least 5 feet between the upper and lower limit you select.
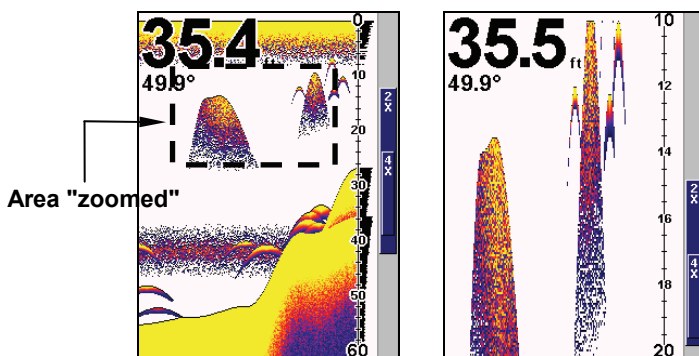

Normal display, in auto depth range mode, left. At right, display "zoomed" with Upper and Lower Limits focusing on the portion of the water column from 10 feet to 20 feet deep.

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To change the upper and lower limits:

1. From the Sonar Page, press **MENU|↓** to **UPPER AND LOWER LIMITS|ENT**. The Sonar Chart Limits menu appears, with Upper Limit selected.

2. To set the upper limit, press **ENT**. Press ↑ or ↓ until the first digit is correct, then → to move to the second digit. Repeat until the depth is correct, then press **EXIT**.

3. To set the lower limit, press ↓ to **LOWER LIMIT|ENT**. Press ↑ or ↓ until the first digit is correct, then → to move to the second digit. Repeat until the depth is correct and then press **EXIT**.

To turn off upper and lower limits:

1. From the Sonar Page, press **MENU|↓** to **AUTO DEPTH RANGE|ENT|EXIT**.

Sonar Page showing FasTrack.
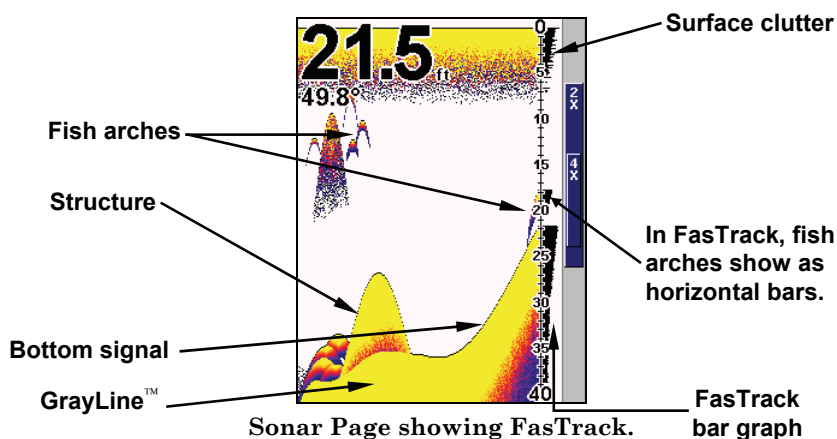
FasTrack™

This feature automatically converts all echoes to short horizontal lines on the display's far right side, giving you a rapid update of conditions directly under the boat.

Fish I.D.™ (Fish Symbols & Depths)

The Fish I.D. feature displays fish-like targets as fish symbols on the screen. *When using Fish I.D. remember, there are instances where Fish I.D. can't distinguish between fish and other suspended objects such as trotlines, turtles, submerged floats, air bubbles, etc.*

To turn on Fish ID:

1. From the Sonar Page, press **MENU|↓** to **SONAR FEATURES|ENT**.

2. Press ↓ to **FISH ID SYMBOLS|ENT|EXIT|EXIT**. To turn off Fish I.D., repeat these instructions.

41
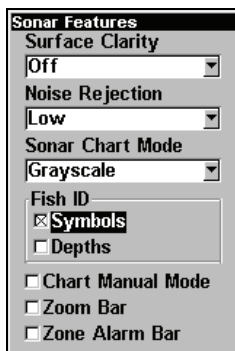
**Sonar Features menu with Fish I.D. Symbols selected.
When the check box to the left is checked, the feature is on.**

FishTrack™

FishTrack shows the depth of a fish symbol when it appears on the display. This feature is available only when the Fish I.D. is turned on.

To turn on FishTrack and Fish ID:

1. From the Sonar Page, press **MENU**|↓ to **SONAR FEATURES**|**ENT**.

2. Press ↓ to **FISH ID DEPTHS**|**ENT**|**EXIT**|**EXIT**.

To turn off FishTrack, repeat these instructions. Turning off FishTrack in this manner will not turn off Fish I.D. symbols.
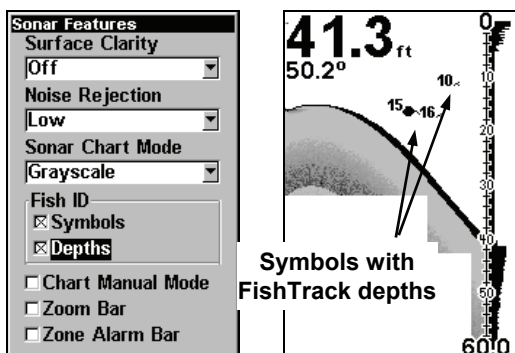
Sonar Features menu with Fish I.D. Depths selected. When the check box to the left is checked, the feature is on. At right, Sonar Page showing Fish I.D. symbols and FishTrack depths turned on.

Grayline®

Grayline helps you tell the difference between a hard and soft bottom. For A soft, muddy or weedy bottom returns a weaker signal shown by a narrow or no gray line. A hard bottom returns a strong signal which causes a wide gray line.

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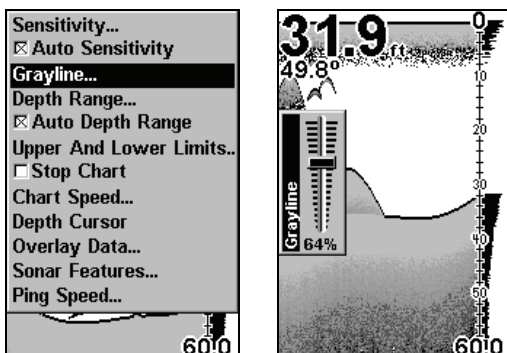
**At left, Sonar Page menu with GrayLine command selected.
At right, the GrayLine control bar.**

To adjust the Grayline level:

1. From the Sonar Page, press **MENU|↓** to **GRAYLINE|ENT**.

2. The Grayline Control Bar appears. Press ↓ to decrease Grayline; press ↑ to increase Grayline.

3. When it's set at the desired level, press **EXIT**.
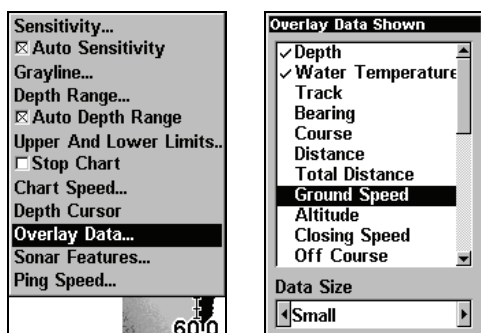
**Overlay Data command on the Sonar Menu, at left. Overlay Data
Shown selection menu, right. In this example, we scrolled down the
data list to highlight "Water Speed."**

Overlay Data

Overlay data is digital data that may be overlaid on the screen.

To change overlay data:

1. Press **MENU|↓** to **OVERLAY DATA|ENT**.

2. Press ↓ or ↑ to select *Data Type*|**ENT**. When selected, a check mark appears beside the data type.

3. To return to the previous page, press **EXIT|EXIT**.

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To turn off overlay data:

1. Press **MENU|↓** to **OVERLAY DATA|ENT**.

2. Press ↓ or ↑ to select *Data Type,* then press **ENT** until the check mark to the left of the selected data type disappears.

3. To return to the previous page, press **EXIT|EXIT**.

To change overlay data font size:

1. Press **MENU|↓** to **OVERLAY DATA|ENT**.

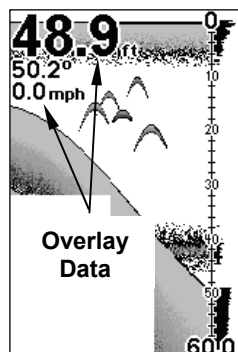2. Press ↑ or ↓ to select *Data Type.* The **DATA SIZE** (displayed in the bottom of the Overlay Data Shown window) can be changed using ← or →. When a desired size is achieved, press **EXIT**.

3. To return to the previous page, press **EXIT**.

Ping Speed & HyperScroll™

Ping Speed controls the rate at which the transmitter and transducer broadcast sonar sound waves — pings — into the water. The unit has a default ping speed of 50 percent, which automatically provides enough return echoes to scroll the chart at normal boating speeds.

However, when you are running at high speeds you may want to use the HyperScroll™ feature. When you change the Ping Speed to any setting greater than 50 percent, the unit automatically enters HyperScroll mode.
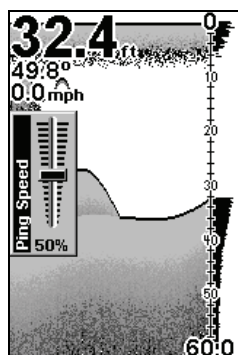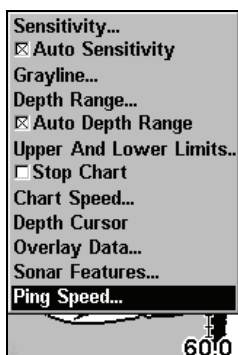
**At left, Sonar Menu with Ping Speed command selected.
Ping Speed Control Bar, right, at default setting.**

To change Ping Speed:

1. From the Sonar Page, press **MENU|↓** to **PING SPEED|ENT**.

2. The Ping Speed Control Bar appears. Press ↑ to increase ping speed; press ↓ to decrease ping speed. Press **EXIT**.

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To adjust Sensitivity:

1. From the Sonar Page, press **MENU|ENT**.

2. The Sensitivity Control Bar appears. Press ↓ to decrease sensitivity; press ↑ to increase sensitivity. When it's set at the desired level, press **EXIT**. (When you reach the maximum or minimum limit, a tone sounds.)

To turn off HyperScroll:

1. From the Sonar Page, press **MENU|↓** to **PING SPEED|ENT**.

2. The Ping Speed Control Bar appears. Press ↓ to decrease ping speed to 50 percent. When it's set at the desired level, press **EXIT**.

When you enable HyperScroll, the width of the FasTrack bar graph display doubles in width at the right side of the screen, giving you a better view of Fastrack's instantaneous sonar returns.

Reset Options

This command is used to reset all features, options and settings to their original factory defaults. This is useful when you have changed several settings and want to return the unit to basic automatic operation.

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

2. Press ↑ or ↓ to **YES|ENT**.

3. All features and options are returned to the factory default settings.

Sensitivity & Auto Sensitivity

The sensitivity controls the ability of the unit to pick up echoes. A low sensitivity level (from zero to 50 percent) excludes much of the bottom information, fish signals, and other target information. High sensitivity levels let you see this detail, but it can also clutter the screen with many undesired signals. Typically, the best sensitivity level shows a good solid bottom signal with Colorline and some surface clutter.

Automatic Sensitivity

This unit has two sensitivity modes: Automatic and Manual. In automatic you can adjust sensitivity up to 100 percent but the unit will limit your *minimum* setting.

In manual mode, you have *complete* control over sensitivity, with the ability to set it anywhere from zero to 100 percent.

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To adjust sensitivity in auto mode:

1. From the Sonar Page, press **MENU** | ↓ to **AUTO SENSITIVITY** | **ENT**.

2. Highlight **SENSITIVITY** and press **ENT**.

2. The Sensitivity Control Bar appears. Press ↓ to decrease sensitivity; press ↑ to increase sensitivity. When it's set at the desired level, press **EXIT**.
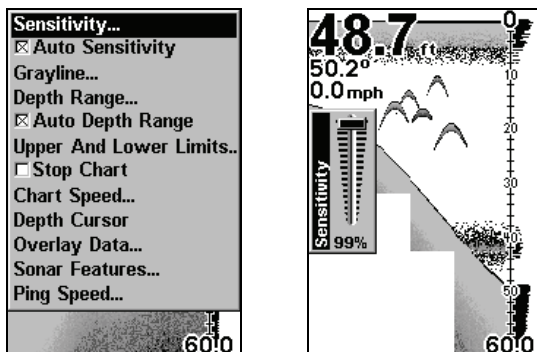
At left, Sonar Menu with Sensitivity command selected. At right, the Sensitivity Control Bar.

To adjust sensitivity in manual mode:

1. First, turn off Auto Sensitivity: from the Sonar Page, press **MENU** | ↓ to **AUTO SENSITIVITY** | **ENT**.

2. Press ↑ to **SENSITIVITY** | **ENT** and the Sensitivity Control Bar appears. Press ↓ or ↑ to pick a different sensitivity setting. When it's set at the desired level, press **EXIT**.

Keel and Waterline Offset

Water depth is measured from the transducer to the bottom, which not only diminishes the accuracy of depth readings, but also could present a problem for vessels with a large keel. The Offset feature can correct both issues via Keel Offset and Waterline Offset.

Keel Offset

You can protect your boat's keel from obstructions by changing unit settings to display water depth from the keel to the bottom instead of from the transducer to the bottom. Before setting keel offset, measure the distance from the transducer to the lowest part of the keel. *If, for example, the keel is 3.5 feet below the transducer, it will be input as –3.5 feet.*

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To set Keel Offset:

1. Press **MENU│MENU│**↓ to **SET KEEL OFFSET│ENT**.

2. The Keel Offset dialog box appears. Press ↓ to so that the displayed number shows a minus (–) sign instead of the plus (+) sign.

3. Press ↓ until the number shows – 3.5, then press **EXIT**. The depth indicators now accurately show the depth of water beneath the keel.

Waterline Offset

You can get a more precise measure of water depth by using waterline offset, which takes into account the distance from the transducer to the waterline when calculating depth.

Before setting waterline offset, you must measure the distance from the transducer to the waterline on your boat. *If, for example, the transducer is 1.5 feet below the waterline, it will be input as +1.5 feet.*

To set Waterline Offset:

1. Press **MENU│MENU│**↓ to **SET KEEL OFFSET│ENT**.

2. The Keel Offset dialog box appears with a plus (+) sign at the front of the box.

3. Press ↑ until the displayed number is + 1.5 and press **EXIT**. The depth indicators now accurately show the water depth from surface to bottom.

Sonar Color Mode

The default color scheme for the sonar chart is grayscale, but we offer other variations to suit your viewing preferences. You have the chart displayed in reverse grayscale, bottom black or FishReveal mode.

To change the chart mode color scheme:

1. From the Sonar Page, press **MENU│**↓ to **SONAR FEATURES│ENT**.

2. Press ↓ to **SONAR CHART MODE│ENT**.

3. Press ↓ or ↑ to *Mode Name│***ENT**.

4. Press **EXIT│EXIT** to return to the Sonar Page.

Sonar Chart Display Options

The M52 Pro offers five Sonar chart display options. To choose among them, press **EXIT** to clear any menus, then press **PAGES** and use the arrow keys to select the desired mode.

Full Sonar Chart

This is the default mode used when the Sonar is turned on for the first time or when it's reset to the factory defaults. The bottom signal scrolls across the screen from right to left. Depth scales on the right side of the

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screen aid in determining the depth of targets. The line at the top of the screen represents the surface. The bottom depth and surface temperature (if the unit is equipped with a temperature sensor or a transducer with a temp sensor built in) show at the top left corner of the screen. The FasTrack™ display shows just to the right of the scale. This changes all echoes into short horizontal bars, replicating a flasher sonar. The zoom bar on the far right shows the area that's zoomed when the zoom is in use. (See the Zoom section for more information.)
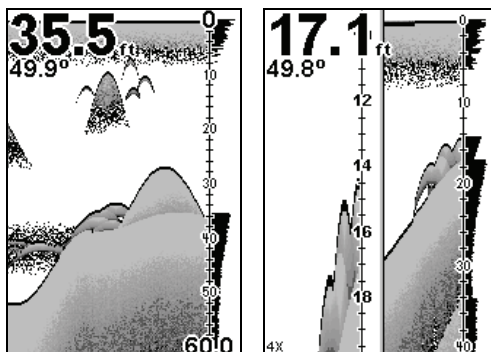
Full Sonar Chart (left). Split Zoom Sonar Chart (right) with left window zoomed to 4X.

Split Zoom Sonar Chart

A split chart shows the water column from the surface to the bottom in the right panel. The left panel shows an enlarged version of the right panel.
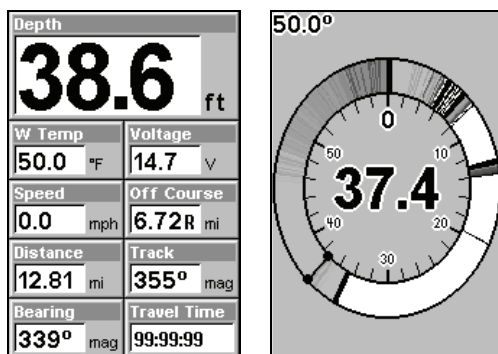
Digital Data page (left). Flasher page (right).

Digital Data/Chart

This mode shows nine digital boxes or windows containing (by default): Water Depth; Water Temp; Speed; Distance to Destination; Bearing; Travel Time; Track; Off Course; and the unit's Voltage.

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Flasher

The Flasher page represents a flasher-style sonar. A circular dial shows all returning echoes at a high screen refresh ra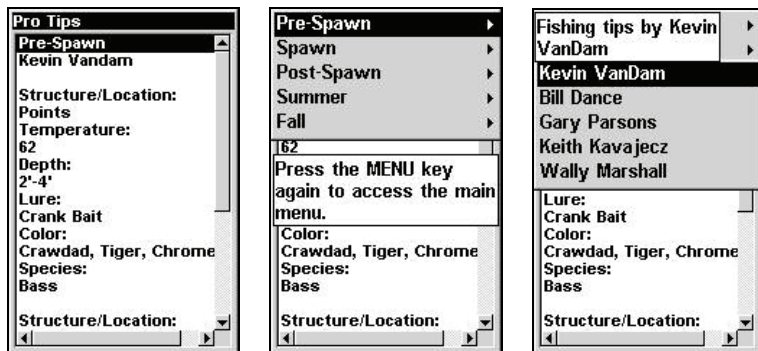te. It uses the Grayline feature to show weaker targets as lighter colors. The bottom depth is also shown as a black bar across the outer circle.

Pro Tips page (left). Pro Tips menu (center). Pro anglers list (right).

Pro Tips

The Pro Tips page gives you access to fishing tips from professional anglers covering a variety of topics, including Structure/Location, Temperature, Depth, Lure, Color and Species.

To access the pro tips menu:

1. Press **PAGES** and select the **SONAR** Tab. Highlight **PRO TIPS** and press **ENTER**. A fishing tip will appear.

2. Press **MENU**, which will launch the Pro Tips menu with the following seasonal categories: Pre-Spawn, Spawn, Post-Spawn, Summer and Fall.

3. Use the up and down arrow keys to select the desired season. Press the right arrow key to access the professional angler list.

4. Highlight a fisherman and press **ENT**. One of the selected fisherman's fishing tips will appear.

5. Press **EXIT** repeatedly to return to the sonar chart display.

Sonar Simulator

The Sonar Simulator allows you to use the unit in simulator mode.

To use the simulator:

1. From the Sonar Page, press **MENU**|**MENU**|↓ to **SONAR SIMULATOR**|**ENT**.

2. Turn off Sonar Simulator by pressing **MENU**|**MENU**|↓ to **SONAR SIMULATOR**|**ENT**|**EXIT**.

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Stop Chart

The Stop Chart feature allow you to stop the sonar chart from scrolling.

To stop/start chart:
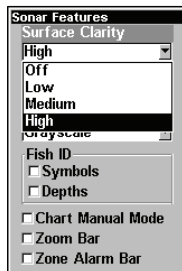
1. Press **MENU**|↓ to **STOP CHART**|**ENT**|**EXIT**. Repeat this step to restart the sonar chart.

Surface Clarity

Surface Clarity control reduces or eliminates surface clutter signals from the display.

To adjust the Surface Clarity level:

1. From the Sonar Page, press **MENU**|↓ to **SONAR FEATURES**|**ENT**|**ENT**.

2. Press ↓ or ↑ to select *clarity level*|**EXIT**|**EXIT**|**EXIT**.

Zoom & Zoom Bar

The Zoom feature allows you to zoom in the screen.

To switch the zoom:

1. Press **ZIN** to zoom in display 2X. Press **ZIN** again for a 4X zoom.

2. Press **ZOUT** to reduce the zoom and show more of the chart.

To turn on the Zoom Bar:

1. Press **MENU**|↓ to **SONAR FEATURES**|**ENT**.

2. The Sonar Features menu appears. Press ↓ to **ZOOM BAR**|**ENT**|**EXIT**|**EXIT**. To turn off the Zoom Bar, repeat steps 1 and 2.
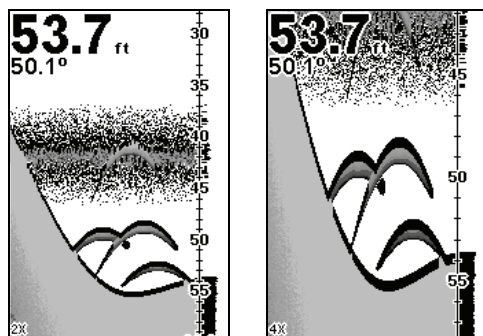
Sonar Page zoomed 2X (left). Sonar Page zoomed 4X (right).

Zoom Pan

The Zoom Pan feature lets you move up and down water column when the 2X or 4X zoom is active.

To use Zoom Pan:

1. Switch to a manual Depth Range setting and turn on 2X or 4X Zoom.

2. Press ↑ or ↓ to pan up and down the water column.

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Section 5:
Sonar Troubleshooting

Unit won't turn on:

1. Check the power cable's connection at the unit. Check the fuse. Also check the wiring.

2. Make certain the power cable is wired properly. The red wire connects to the positive battery terminal, black to negative or ground.

3. Make sure battery voltage is at least 11 volts.

Unit operates only in demo mode:

The transducer or antenna module has not yet been connected or has been disconnected.

Unit freezes, locks up, or operates erratically:

1. Electrical noise from the boat's motor, trolling motor, or an accessory may be interfering with the sonar unit. Rerouting the power and transducer cables away from other electrical wiring on the boat may help. Route the sonar unit's power cable directly to the battery instead of through a fuse block or ignition switch

2. Inspect the transducer cable for breaks, cuts, or pinched wires.

3. Check both the transducer and power connectors. Make certain both are securely plugged in to the unit.

Weak bottom echo, digital readings erratic, or no fish signals:

1. Make certain the transducer is pointing straight down. Clean the face of the transducer. Oil, dirt and fuel can cause a film to form on the transducer, reducing its effectiveness. If the transducer is mounted inside the hull, be sure it is shooting through only one layer of fiberglass and that it is securely bonded to the hull.

2. Electrical noise from the boat's motor can interfere with the sonar, causing the noise rejection level to increase, eliminating weaker signals like fish or even structure.

3. The water may be deeper than the sonar's ability to find the bottom.

4. Check the battery voltage. If the voltage drops, the unit's transmitter power also drops, reducing its ability to find the bottom or targets.

Bottom echo disappears at high speeds or erratic digital reading or weak bottom echo while boat is moving

1. The transducer may be in turbulent water. It must be mounted in a smooth flow of water in order for the sonar to work at all boat speeds. Air

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bubbles in the water disrupt the sonar signals, interfering with its ability to find the bottom or other targets. The technical term for this is cavitation.

2. Electrical noise from the boat's motor can interfere with the sonar. Try using resistor spark plugs or routing the sonar unit's power and transducer cables away from other electrical wiring on the boat.

No fish arches when the Fish I.D. feature is off:

1. Make certain the transducer is pointing straight down. This is the most common problem if a partial arch is displayed.

2. The sensitivity may not be high enough. In order for the unit to display a fish arch, it has to be able to receive the fish's echo from the time it enters the cone until it leaves. If the sensitivity is not high enough, the unit shows the fish only when it is in the center of the cone.

3. Use the Zoom feature. It is much easier to display fish arches when zoomed in on a small range of water than a large one.

4. The boat must be moving at a slow trolling speed to see fish arches. If the boat is motionless, fish stay in the cone, showing on the screen as straight horizontal lines.

NOISE

Noise usually appears on the sonar's display as random patterns of dots or lines. In severe cases, it can completely cover the screen with black dots, or cause the unit to operate erratically, or not at all.

To eliminate or minimize the effects of electrical noise, try to determine the cause. With the boat at rest in the water, turn all electrical equipment on the boat off. Make sure the engine is also off. Turn on your sonar, then turn off Noise Reject {ASP feature (Advanced Signal Processing)]. Sensitivity should be set at 90-95 percent. There should be a steady bottom signal on the display. Now turn on each piece of electrical equipment on the boat and view the effect on the sonar's display. If you find noise interference from an electrical instrument, trolling motor, pump, or radio, try to isolate the problem. You can usually reroute the sonar unit's power cable and transducer cable away from the wiring that is causing the interference.

If no noise displays on the sonar unit from electrical equipment, start the engine and increase the RPM with the gearshift in neutral. If noise appears on the display, the problem could be one of three things; spark plugs, alternator, or tachometer wiring. Try using resistor spark plugs, alternator filters, or routing the sonar unit's power cable away from engine wiring. When no noise appears on the sonar unit after all of the above tests, then the noise source is probably cavitation.

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Section 6:
Basic GPS Operations

Main Menu

You can access the Main Menu from any of the four Page screens by pressing **MENU|MENU**. To clear the menu screen and return to the page display, press **EXIT**.

Main Menu.

The Main Menu commands and their functions are:

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

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

Alarms: turns GPS or sonar alarms on or off and changes alarm thresholds.

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

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

Cancel Navigation: turns off the various navigation commands. Used to stop navigating after you have reached your destination waypoint or plotter cursor location; or after you reach the end of a route or trail.

GPS Setup: sets various GPS receiver options.

System Setup: sets general configuration options.

**Sun/Moon Calculations**: finds the rising and setting time of the sun and the moon.

Trip Calculator: shows trip status and statistics.

Timers: controls the up timer, down timer and alarm clock settings.

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

Pages

The unit has four GPS Page displays that represent the four major operating modes. They are the Satellite Status Page, the Navigation Page, Plotter Page, Position Page and Pro Tips Page. They are accessed by pressing the **PAGES** key, then using ↑ or ↓ to select a Page. (Clear the Pages Menu by pressing **EXIT**.)
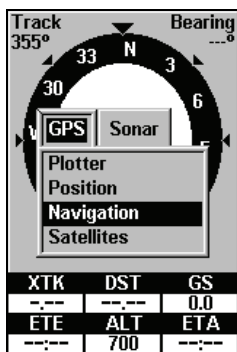
Pages Menu, showing the GPS display options.

Sonar Pages

Like the GPS Pages, there are four Sonar Page displays. The heart of the Sonar Page is the sonar chart, a view of the water column from the surface to the bottom. The chart scrolls across the screen from right to left, displaying signal echoes that represent fish, structure and the bottom.

To access Sonar Pages:
1. Press **PAGES**|→ to **SONAR**|↑ or ↓ to *page*|**ENT**. (Clear the Pages Menu by pressing **EXIT**.)
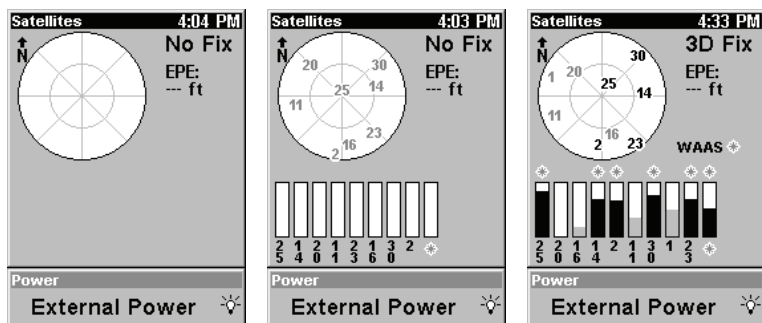
Satellite Status Page

The Satellite Status Page, shown, provides detailed information on the status of the unit's satellite lock-on and position acquisition.

To access the Satellite Status Page:
1. Press **PAGES**|← to **GPS**|↑ or ↓ to **SATELLITES**|**ENT**.

WARNING:

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

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Satellite Page. Left view indicates unit has not locked on to any satellites and does not have a fix on its position. Center view shows satellites being scanned. Right view shows satellite lock-on with a 3D position acquired (latitude, longitude and altitude.)

This screen shows a graphical view of the satellites that are in view. 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 the unit is facing north.

The GPS receiver is tracking satellites that are in light blue. The receiver hasn't locked onto a satellite if the number is dark blue, therefore it isn't being used to solve the position. The "Estimated Position Error" (horizontal position error) shown in the upper left 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.

The Satellite Status Page has its own menu, which is used for setting various options. To access the Satellite Status Page Menu, from the Status Page, press **MENU**.
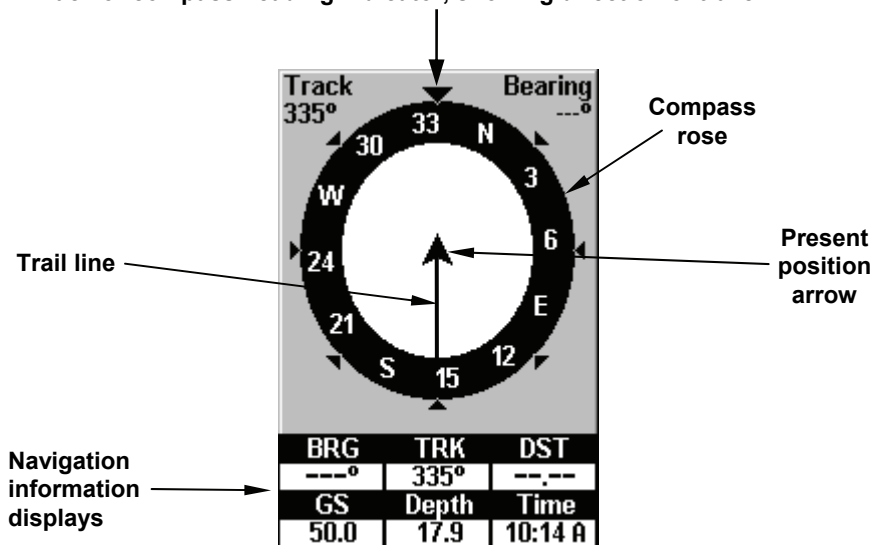
Navigation Page
This screen has a compass rose that not only shows your direction of travel, but also the direction to a recalled waypoint.

To access the Navigation Page:

1. Press **PAGES**|← to **GPS**|↑ or ↓ to **NAVIGATION**|**EXIT**.
The navigation screen looks like the one below when you're *not* navigating to a waypoint or following a route or trail. Your position is shown by an arrow in the center of the screen. Your trail history is depicted by the line extending from the arrow. The arrow pointing down at the top of the compass rose indicates your current track.

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Track or compass heading indicator, showing direction of travel

Compass rose

Present position arrow

Trail line

**Navigation information displays**

Navigation Page, recording a trail, traveling east. Page looks like this when the unit is not navigating to a waypoint , following a route, or backtracking a trail.

When navigating to a waypoint, the Navigation screen looks like the following figure. Your ground speed, track, distance and bearing to waypoint, and course are all shown digitally on this screen.

NOTE:

Remember, when the Speed, Track and Position information displays are flashing, satellite lock has not been achieved and no position fix has been determined. A question mark will also flash on the present position arrow in the center of the compass rose.

The Off Course window shows the current cross track error, illustrated in the figure below. This shows the distance you are off-course to the side of the desired course line. The course line is an imaginary line drawn from your position when you started navigating to the destination waypoint. The course line is shown on the Navigation Page screen (and the Plotter Page screen) as a dotted line. The cross track error range is shown on the compass rose as a wide, white, corridor enclosing the course line. The outer edges of this
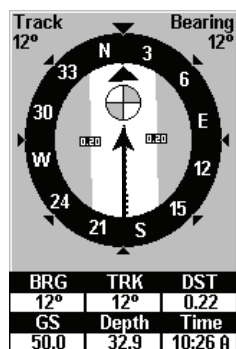
Navigation Page, backtracking a trail.

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white corridor represent lines that show the current cross track error range. The default for the cross track error range is 0.20 miles.

In the example above, the driver is headed north (a 12º track) toward a waypoint 12º (bearing) away. The cross track error range (white corridor) is 0.20 miles either side of the course. The driver is headed toward a waypoint which is 0.22 miles away.

The Navigation Page has its own menu, which is used for some advanced functions and for setting various options. To access the Navigation Page Menu from the Navigation Page, press **MENU**.

Position Page

This page 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. To get to the Position Page: press **PAGE** repeatedly until the page you want appears.

Position Page

The Position Page can be fully customized. The lower window can display ten of 22 types of navigation information. Some of the popular information displays include: Altitude, Speed, Closing Speed, Distance, Total Distance, Travel Time, Arrival Time, Total Travel, Track, Bearing and Off Course.

The Position Page has its own menu, which is used for setting various options. To access the Position Page Menu, from the Position Page, press **MENU**.

Plotter Page

The Plotter Page screens show your course and track from a "bird's-eye" view. By default, this unit shows the plotter with north always at the top of the screen. If you're navigating to a waypoint, the plotter also shows your starting location, present position, course line and destination.

Plotter Page is the default screen that appears when you turn on the unit. To get to the Plotter Page from another page: Press **PAGES|←** to **GPS|↑** or **↓** to **PLOTTER|EXIT**. When the Plotter Page is displayed, a screen similar to the following figures appears.

The arrow in the center of the screen is your present position. It points in the direction you're traveling. The flashing line extending from the back of the arrow is your plot trail, or path you've taken.

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The plotter's zoom range is the distance across the screen. This number shows in the lower right corner of the screen. In the first example figure below, the range is 4,000 miles from the left edge of the display to the right edge.

The Zoom In and Zoom Out keys zoom the plotter to enlarge or reduce its coverage area and the amount of detail shown. There are 39 available zoom ranges, from 0.02 miles to 4,000 miles.

The Plotter Page has its own menu, which is used for several functions and for setting various options. To access the Plotter Page Menu, from the Plotter Page, press **MENU**.
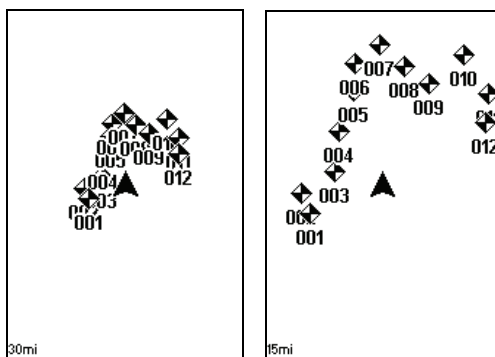
At left, Plotter Page zoomed to 30 miles (note the overlapping, unreadable waypoints) and right, zoomed to 15 miles (with waypoints visible).

Viewing the Plotter: Zoom & Cursor Arrow Keys

The plotter is presented from a bird's eye view perspective. The current zoom range shows in the lower right 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 detail, but a larger geographic area.

When you are traveling, the plotter will automatically move as you move. This keeps your current location roughly centered on the screen.

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

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Selecting Any Plotter Item With the Cursor

1. Use the zoom keys and the arrow keys to move around the plotter 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.

Navigate to Cursor Position on Plotter

The **GO TO CURSOR** command navigates to the current cursor position on the plotter. It's a quick and handy way to navigate to anything you can see on the plotter display.

1. Use the cursor (controlled by the arrow keys) with the zoom in and zoom out keys to maneuver around the plotter until you find a location you want to go to.

2. Center the cursor over the location to select it. See the example in the following figure.

3. Press **MENU|ENT** and the M52 Pro will begin navigating to the cursor location.

The Plotter 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 the following examples.
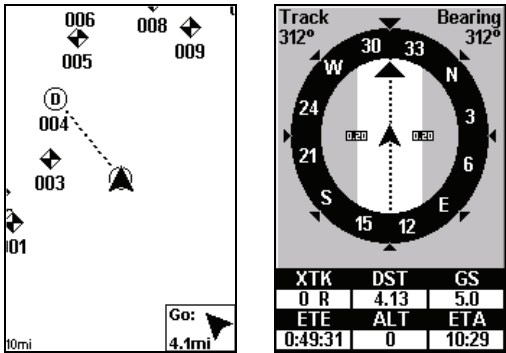
The Plotter Page at left clearly shows the course line connecting your current position to your destination. The Navigation Page, right, will also show navigation information.

GPS Quick Reference

Start outdoors, with a clear view of the open sky. As you practice, try navigating to a location at least a few blocks away. While you're learning, navigation in too small an area will constantly trigger arrival alarms.

1. Connect the unit to electric power and the antenna module. Make sure the MMC is in. (See complete installation details beginning on page 9.)

2. To turn on the M52 Pro, press and release **PWR** key.

3. Opening screen displays the GPS plotter at the 4,000 mile zoom range. Rotate through the four main GPS Page screens (Plotter, Satellite Status, Navigation and Position Page) by pressing **PAGES**|↓ or ↑ to select *Page Name*|**EXIT**. Switch Pages to display Satellite Status Page.

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 under clear sky conditions (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** key to display Plotter Page, which shows your position in the center. You can move around the plotter 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 display north, south, east or west using arrow keys ↑↓→←.
To stop scrolling and return to current position, press **EXIT** key.

6. Set a waypoint (*Wpt 001*) at your current position so you can navigate back here: press **WPT**|**WPT**. Waypoint symbol and "001" appears.

7. If you've already made some waypoints or event marker icons, zoom/scroll to find a nearby location to go to. Otherwise, travel around some and place some waypoint at place of interest. When you have several in place, use arrow keys to center cursor cross-hair over one of your existing waypoint or locations.

8. Navigate to destination: press **MENU**|**ENT**|**EXIT**. Follow dotted course line on Plotter Page or compass bearing arrow on Navigation Page.

9. At destination, Arrival Alarm goes off; to clear it, press **EXIT**. Cancel navigation: press **MENU**|**MENU**|↓ to CANCEL NAVIGATION|**ENT**|← to YES|**ENT**.

10. Return to Wpt 1 by Backtrack Trail. Press **MENU**|**MENU**|↓ to MY TRAILS|**ENT**. Press ↓ to *Trail 1*|**ENT**|↓ to NAVIGATE|**ENT**|→ to REVERSE|**ENT**|← to NAVIGATE|**ENT**. (If arrival alarm sounds, press **EXIT**.) 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 the unit, press and hold **PWR** key for three seconds.

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Find Distance between Points

1. While on the Plotter 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 information box at the bottom of the screen.

3. Press **EXIT** to return to regular operation.

Cancel Navigation

You can turn off any of the navigation commands after you reach your destination or at any other time by using the Cancel Navigation command.

To cancel navigation:
Press **MENU** | **MENU** | ↓ to **CANCEL NAVIGATION** | **ENT** | ← to **YES** | **ENT**.
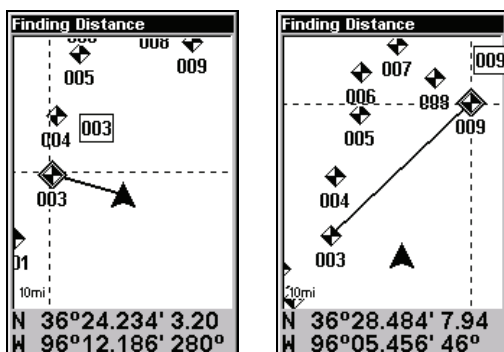
At left, the distance from the boat's current position to nearest waypoint is 3.20 miles. At right. the distance from waypoint 003 to waypoint 009 is 7.94 miles.

Waypoints

A waypoint is simply an electronic address based on the latitude and longitude.

Create a Waypoint

You can create a waypoint at the cursor position or at your current position while navigating. You also can create a waypoint by manually entering the position's latitude and longitude.

NOTE:

To create and save a Waypoint, these first two techniques use the Quick Save method, the fastest and easiest way to create a waypoint.

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Create Waypoint at Current Position

While you are traveling, press **WPT|WPT**. The waypoint is saved and automatically given a name with a sequential number, such as "way-point 003." The waypoint symbol and number appear on the plotter.
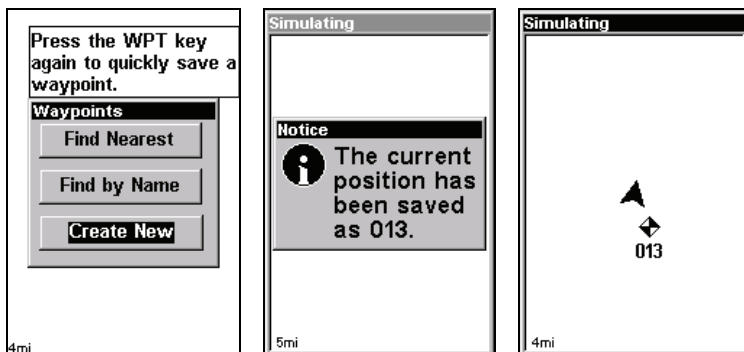
Sequence for setting a waypoint. Step 1: while traveling, *quickly* press WPT *twice* to call up Find Waypoint screen (shown at left) and set a point. Step 2: a message says the waypoint has been saved (shown center). Step 3: vehicle continues on its way; number waypoint symbol is visible on plotter (shown at right).

Create Waypoint on Plotter

1. Use the arrow keys to move the cursor to the place where you want to make a waypoint.

2. Press **WPT|WPT**. 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 plotter.

Create Waypoint by Entering a Position

1. Press **WPT|↓** to **CREATE NEW|ENT**.

2. Press **↓** to **ENTERED POSITION|ENT|ENT**.

3. Press **↓** to **LATITUDE|ENT**. Enter the latitude by pressing **↑** or **↓** to change the first character, then press **→** to the next character and repeat until the latitude is correct. Press **ENT**.

4. Press **↓** to **LONGITUDE|ENT**. Enter the longitude by pressing **↑** or **↓** to change the first character, then press **→** to the next character and repeat until the longitude is correct. Press **ENT|EXIT|EXIT**. The waypoint symbol and number appear on the plotter and in the waypoint list.

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Create Waypoint by Average Position

This feature sets a waypoint at the current position after averaging several position readings.

1. Press **WPT**|↓ to **CREATE NEW**|**ENT**.

2. Press ↓ or ↑ to **AVERAGE POSITION**|**ENT**|**ENT**.

3. 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.

4. The Edit Waypoint menu appears. You can simply save the waypoint by pressing **EXIT**|**EXIT** or you can edit the waypoint.

Create Waypoint by 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 must be selected from your waypoint list.

1. Press **WPT**|↓ to **CREATE NEW**|**ENT**.

2. Press ↓ to **PROJECTED POSITION**|**ENT**|**ENT**.

3. Press ↓ to **SET REFERENCE**|**ENT**. Use ↑ and ↓ to select a waypoint. When the point has been selected, press **ENT** and the point's position appears as the reference position.

4. 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**.

5. 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**.

6. 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.)

Delete a Waypoint

To delete a waypoint from the waypoint list: press **WPT**|**ENT**|↓ to *waypoint name*|**ENT**|→ to **DELETE**|**ENT**|← to **YES**|**ENT**. To return to the previous page, press **EXIT**|**EXIT**.

To delete a waypoint from the plotter:

1. Use the arrow keys to select the waypoint with the cursor.

2. Press **WPT**|→ to **DELETE**|**ENT**|← to **YES**|**ENT**. To return to the previous page and clear the cursor, press **EXIT**.

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To delete all waypoints at one time:

1. Press **MENU**|**MENU**|↓ to SYSTEM SETUP|**ENT**|↓ to DELETE ALL MY WAY-POINTS|**ENT**|← to YES|**ENT**.

2. To return to the previous page, press **EXIT|EXIT**.

Edit a Waypoint

Edit Waypoint Name

1. Press **WPT**|**ENT**|↓ to *waypoint name*|**ENT**|→ to EDIT NAME|**ENT**.

2. Press ↑ or ↓ to change the first character, then press → to the next character and repeat until the name is correct. Press **ENT** then **EXIT**|**EXIT** to return to the previous page display.

Edit Waypoint Symbol

1. Press **WPT**|**ENT**|↓ to *waypoint name*|**ENT**|→ to EDIT SYMBOL|**ENT**.

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

Edit Waypoint Position

1. Press **WPT**|**ENT**|↓ to *waypoint name*|**ENT**|→ to EDIT POSITION|**ENT**.

2. Latitude: press ↓ to LATITUDE|**ENT**. 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**. 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**.
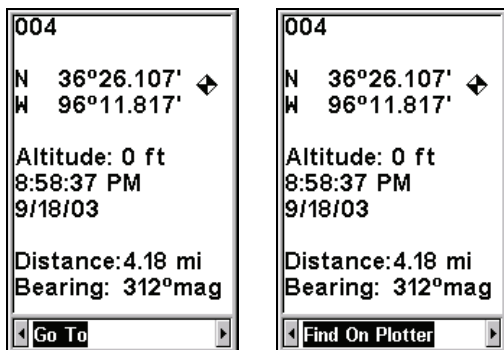
Select a Waypoint

To select a waypoint on the plotter use the arrow keys and center the cursor crosshairs over the waypoint.

Find a Waypoint

To access a waypoint stored in your unit's memory, press the **WPT** key. You'll see the Waypoint Menu, which offers these commands: FIND BY NEAREST, FIND BY NAME, and CREATE NEW.

1. Press **WPT**. To look up the nearest waypoint, just press **ENT**, then scroll down the list to find the desired waypoint; or, to look by name, press ↓ to FIND BY NAME|**ENT**. For this example, use FIND 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. Press **ENT** to jump to the list.)

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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.

Waypoint information screen on waypoint 004. Screen shows name, latitude/longitude, distance to waypoint and its compass bearing. Figure at left shows Go To command; right figure shows Find On Plotter command.

4. You can use ← or → to select various options on the waypoint information screen. If you wanted to navigate there, just press **ENT**, since the **GO TO** command is highlighted. If you want to see it on the plotter, press → to **FIND ON PLOTTER** | **ENT**.

5. The M52's plotter appears, with the cross-hair cursor highlighting the waypoint's symbol. A pop-up name box identifies the waypoint, as well as its distance and bearing. A data box at the bottom of the screen continues to display the location's latitude and longitude.
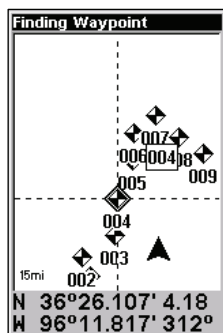
Plotter screen showing Find Waypoint.

7. To clear the search and return to the last page displayed, press **EXIT** | **EXIT**.
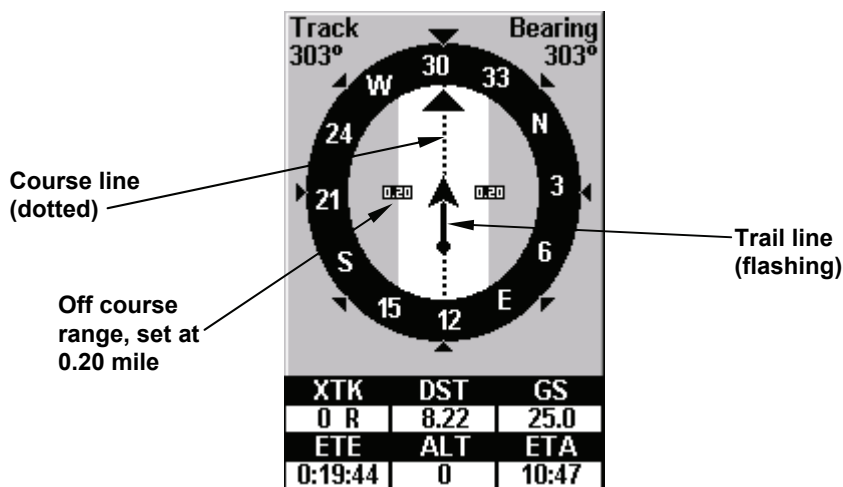
Navigate To a Waypoint

You can select any waypoint visible on the Plotter Page with the cursor, and then use the Navigate to Cursor command. Or, you could avoid scrolling the plotter to pick your waypoint if you use the Find Waypoint commands:

1. Press **WPT**. To look up the nearest waypoint, just press **ENT**; or, to look by name (and scroll through the entire waypoint list), press ↓ to **FIND BY NAME** | **ENT**. For this example, look by name.

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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**.

Navigation Page, navigating toward a waypoint and leaving a trail.
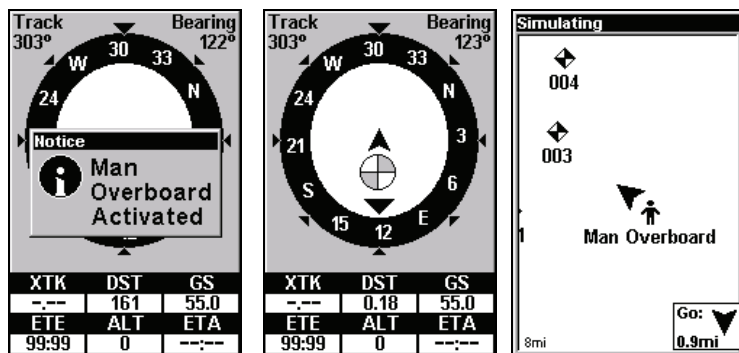
Set Man Overboard (MOB) Waypoint

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.

Caution:

Saving a new "Man Overboard" waypoint will overwrite and erase the previous "Man Overboard" waypoint.

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Navigate Back to MOB Waypoint

Find your way back to the accident position with the Navigation Page or Plotter Page. When MOB is activated, the Navigation Page automatically shows the compass rose with its bearing arrow pointing toward the man overboard position.

Navigating to Man Overboard: Navigation Page, left and center, and Plotter Page, right. The victim is astern of the vessel; the GPS shows which direction to steer to for the rescue.

The man overboard position is stored in the waypoint list for future reference. It can be edited the same as any other waypoint.
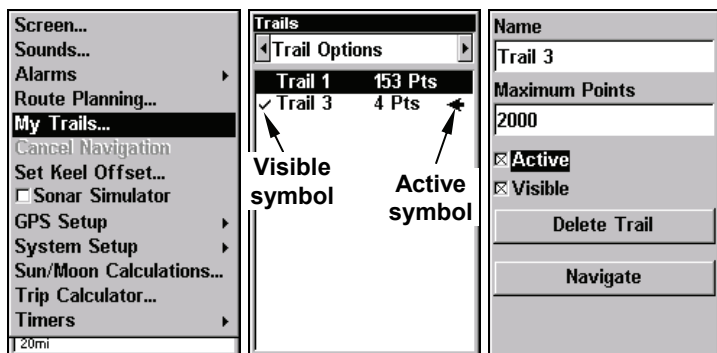
Trails

A trail, or plot trail, is a string of position points that record the path you have taken.

Creating and Saving a Trail

The M52 Pro is set at the factory to automatically create and record a trail while the unit is turned on. The unit will continue recording the trail until the length reaches the maximum trail point setting (default is 2,000, but the unit can record trails 9,999 points long). When the point limit is reached, the M52 Pro begins recording the trail over itself.

With the default auto setting, the M52 Pro creates a trail by placing a dot (trail point) on the screen every time you change directions.

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 the current trail is set inactive, the M52 Pro *automatically* begins recording a new trail.

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Sequence for saving a trail and beginning a new one. At left, My Trails command. Center, the Trails Menu. The arrow to the right of Trail 3 indicates the trail is "active," and the check to the left indicates the trail is visible on the plotter display. The right figure shows the Edit Trail menu, with the Active command selected.
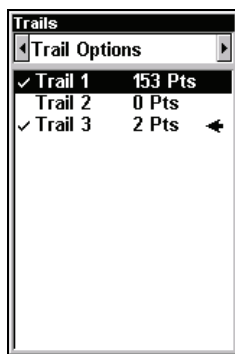
New trail, named "Trail 3," is created when Trail 2 is made inactive. Any new travel will be recorded in this trail, which is active and visible. Trails do not need to be visible in order to be active.

To save a Trail:

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

2. Press ↓ to the *Active Trail Name*|**ENT**.

3. Press ↓ to **ACTIVE|ENT**. This unchecks the Active option.

4. To return to the previous page, press **EXIT** repeatedly.

You can save and recall up to 10 different plot trails.

Tip:

Another quick way to stop recording one trail and begin a new one is to use the New Trail command: Press **MENU|MENU|↓** to **MY TRAILS|ENT|ENT**.

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Delete a Trail

This is the command used to erase or delete a trail.

1. Press **MENU|MENU|↓** to **MY TRAILS|ENT|↓** to *trail name***|ENT**.

2. Press **→** to **DELETE TRAIL|ENT|←** to **YES|ENT**.

Tip:

You can also delete all trails at once.

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

2. Press **→** to **DELETE ALL|ENT|←** to **YES|ENT**.

Display a Saved Trail

The active trail is automatically visible on the plotter display with the factory default settings. You can selectively turn the trail display off and on for any saved or active trail.

To turn off trail display:

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

2. Press **↓|↓** to enter the Saved Trail list, then use **↑** or **↓** to select the desired *Trail Name***|ENT**.

3. Press **↓** to **ACTIVE|→** to **VISIBLE|ENT**. To return to the previous page, press **EXIT** repeatedly.

To turn on trail display:

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

2. Press **↓|↓** to enter the Saved Trail list, then use **↑** or **↓** to select the desired *Trail Name***|ENT**.

3. Press **↓** to **ACTIVE|→** to **VISIBLE|ENT**. To return to the previous page, press **EXIT** repeatedly.

Edit a Trail Name

1. Press **MENU|MENU|↓** to **MY TRAILS|ENT|↓** to *trail name***|ENT|ENT**.

2. Press **↑** or **↓** to change the first character, then press **→** to the next character and repeat until the name is correct. Press **ENT**. Press **EXIT** repeatedly to return to the main display.

Tip:

You can quickly call up the Edit Trail menu by selecting a trail on the plotter with the cursor. Simply move the cursor over a trail and a pop-up box appears. Press **WPT** and the Edit Trail menu opens.

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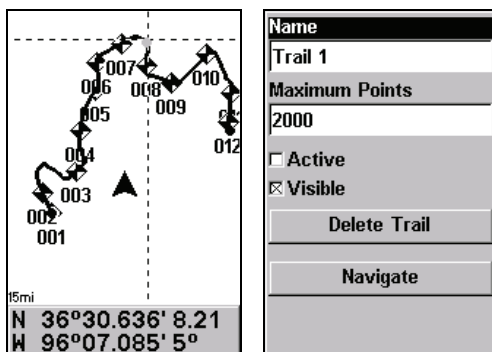
At left, trail selected with plotter cursor. The info box at the bottom of the screen shows distance and bearing from current position to the selected point on the trail. At right, the Edit Trail menu.

Navigate a Trail

There are three methods for following a trail: visual trailing, navigating a trail (forward) and backtracking a trail (backward). Visual trailing is the simplest method. It uses only the Plotter Page and requires no menu commands at all. The technique works the same if you are running a trail forward or backward.

Visual Trailing

1. On the Plotter Page, zoom (**ZIN** or **ZOUT**) so your flashing trail is visible.

2. Begin moving and watch the Plotter Page. Simply walk or steer so that your current position arrow traces along the trail you have just made.

Tip:

Generally, when using this method, the smaller the zoom range, the more accurately you will be able to steer along the trail.

Navigate a Trail (forward)

The following figures illustrate the menu sequence for navigating a trail.

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

2. Press ↓ to enter the Saved Trail list, then use ↑ or ↓ to select the desired *Trail Name*|**ENT**.

3. Press → to **DELETE TRAIL**|↓ to **NAVIGATE**|**ENT**.

4. Press ↓ to **NAVIGATE**|**ENT**. The unit begins showing navigation information along the trail.

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NOTE:

If you are already located at or near the beginning of your trail, the arrival alarm will go off as soon as you press Enter. Just press **EXIT** to clear the alarm and proceed.

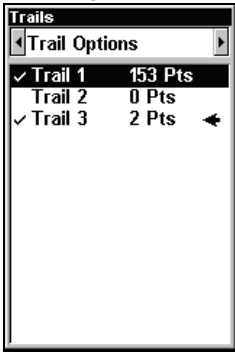5. When you reach your destination, cancel navigation.
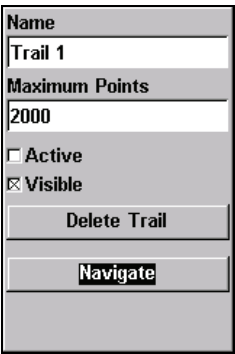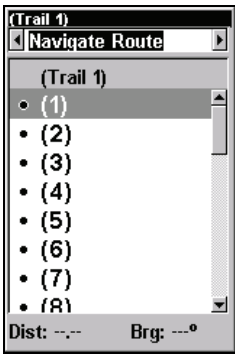

| Figure 1 | Figure 2 |

| Figure 3 | Figure 4 |

Navigate a trail menu sequence: Fig. 1, My Trails command. Fig. 2, Trails Menu. Fig. 3, Edit Trail Menu. Fig. 4, Edit Route Menu with Navigate command highlighted for Trail 1. A trail is always converted to a "route" when you navigate the trail.

On the Plotter Page, the trail you are navigating is represented by a flashing line. The Navigation Page will also show the navigated trail as a flashing line. The bearing arrow on the compass rose points to the next waypoint on the trail.

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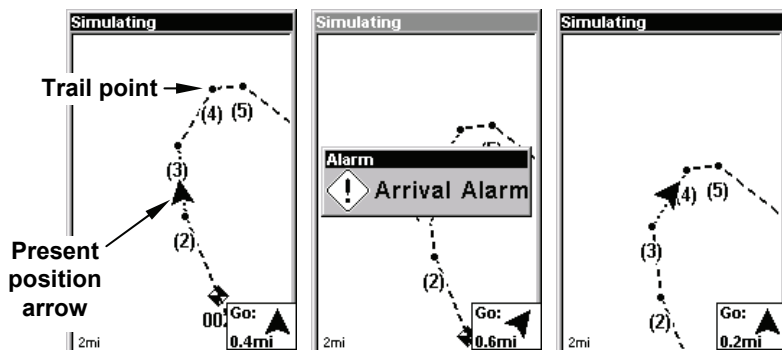
Navigate trail, plotter views: at left boater is heading straight toward trail point 3. Center, when the point is reached, Arrival Alarm goes off and the steering arrow points toward next trail point. At right, boater has reached point 3 and has turned northeast to follow trail to point 4. (Flashing trail line is turned off for clarity.


Navigate trail, navigation page (compass rose) views: at left, boater is northbound heading straight toward trail point 3; bearing arrow shows the trail point straight ahead. At right, driver has reached trail point 3 and must turn northeast to follow the trail. Arrival alarm goes off and bearing arrow swings around to say turn right (northeast), toward the next waypoint, trail point 4. The M52 Pro now shows navigation information to point 4, which is 0.43 miles away.

Navigate a Back Trail

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

2. Press **↓|↓** to enter the Saved Trail list, then use **↑** or **↓** to select the desired *Trail Name*|**ENT**.

3. Press **→** to **DELETE TRAIL|↓** to **NAVIGATE|ENT**.

4. Press **↓** to **NAVIGATE|→** to **REVERSE|ENT|←** to **NAVIGATE|ENT**. The unit begins showing navigation information along the trail, in reverse.

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Icons

Icons are graphic symbols used to mark some location, personal point of interest or event. They can be placed on the plotter screen, saved and recalled later for navigation purposes. These are sometimes referred to as event marker icons. The M52 Pro has 42 different symbols you can pick from when creating an icon.
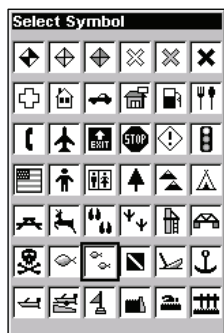
Create Icon on Plotter

1. Use the arrow keys to move the cursor to the place where you want to place an icon.

2. Press **ENT** and the screen shows a "Select Icon Symbol" menu.

3. Select the desired symbol for the icon and press **ENT**. The icon appears on the plotter.

Create Icon at Current Position

1. While you are traveling, press **ENT** and the screen shows a "Select Icon Symbol" menu.

2. Select the desired symbol for the icon and press **ENT**.

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 plotter.
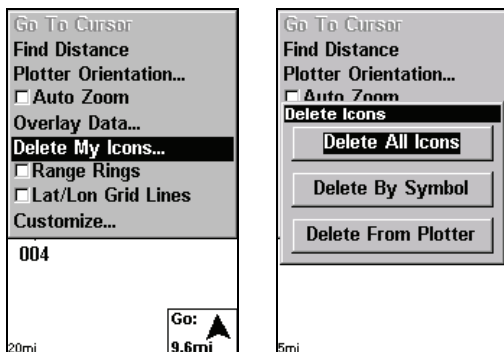
Delete icons menu.

To Delete All Icons:

1. Press **MENU** | ↓ to **DELETE MY ICONS** | **ENT**.

2. Press ↓ to **DELETE ALL ICONS** and press **ENT**.

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3. The Delete All Icons command will ask if you are sure. Press ← to **YES|ENT**. All icons will be deleted from the plotter.

To Delete By Symbol:
1. Press **MENU|↓** to **DELETE MY ICONS|ENT**.

2. Press ↓ to **DELETE BY SYMBOL** and press **ENT**.

3. The Delete by Symbol command will launch the Select Symbol menu. Select the icon symbol to delete and press **ENT**. A message appears saying all icons with the selected symbol have been deleted.

To Delete from Plotter:
1. Press **MENU|↓** to **DELETE MY ICONS|ENT**.

2. Press ↓ to **DELETE ALL ICONS**, **DELETE BY SYMBOL**, or **DELETE FROM PLOTTER** and press **ENT**.

3. The Delete From Plotter command will prompt you to move the cursor over an icon to select it. After selecting the icon, press **ENT** and it will be removed from the plotter.

Navigate to an Icon

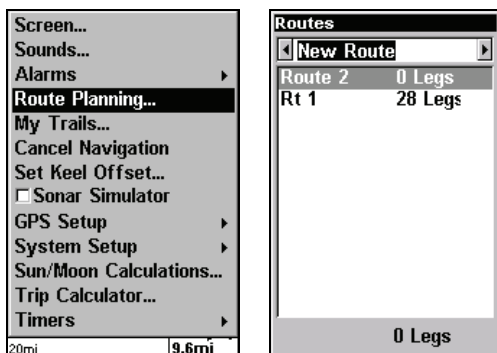1. Use arrow keys to center cursor cross-hairs over the icon.

2. To navigate to the selected icon location: press **MENU|ENT|EXIT**. Follow course line on the Plotter Page or the compass bearing arrow on the Navigation Page.

Routes

A route is a series of waypoints, linked together in an ordered sequence used to mark a course of travel. The course from one waypoint to the next is a leg; routes are composed of one or more legs.
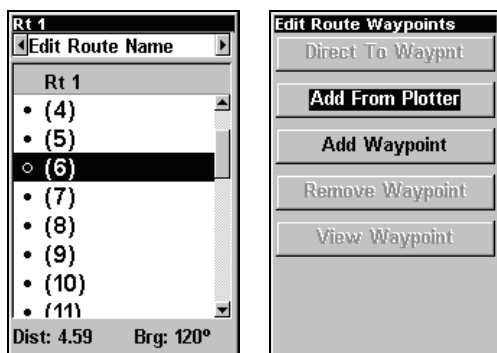
Create and Save a Route

You can create a route by selecting existing waypoints from the waypoint list or you can set a series of route waypoints on the plotter with cursor arrows and the Enter key.

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Screen...	Routes
Sounds...	◀ New Route ▶
Alarms ▶	Route 2 0 Legs
Route Planning...	Rt 1 28 Legs
My Trails...	
Cancel Navigation	
Set Keel Offset...	
☐ Sonar Simulator	
GPS Setup ▶	
System Setup ▶	
Sun/Moon Calculations...	
Trip Calculator...	
Timers ▶	
20mi 9.6mi	0 Legs

**Route Planning command on Main Menu, left,
will open the Route List screen, right.**

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

2. Press **↓|↑** or **↓** to *route name*|**ENT|↓** to **(ROUTE END)|ENT|↓** to **ADD FROM PLOTTER|ENT**. The Plotter Page appears with the cursor showing.

Rt 1	Edit Route Waypoints
◀ Edit Route Name ▶	Direct To Waypnt
Rt 1	**Add From Plotter**
• (4)	Add Waypoint
• (5)	Remove Waypoint
○ (6)	View Waypoint
• (7)	
• (8)	
• (9)	
• (10)	
• (11)	
Dist: 4.59 Brg: 120°	

**Edit Route menu, left. Edit Route Waypoints menu, right,
with Add From Plotter command selected.**

3. Use the arrow keys to center the cursor on the waypoint or event marker icon located at the start of your route.

4. Set the first route waypoint and press **ENT**. In this example, we are adding fishing spots to a route so we can visit each one in order. We started with waypoint 1 and moved along them in order.

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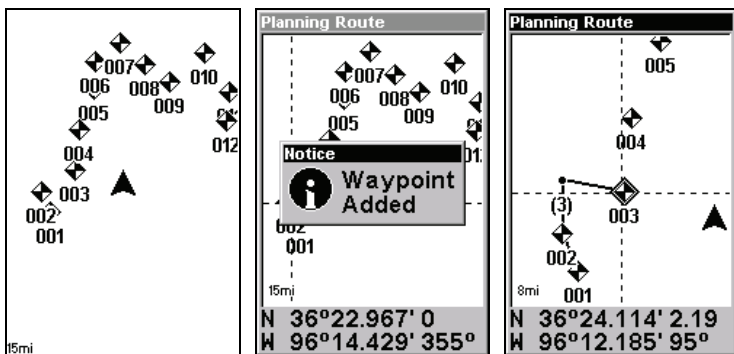
Route creation sequence: At left, the Plotter Page shows the waypoints we want to visit in our route. Set the first route point at waypoint (001). Center, move cursor to the next waypoint in the route and press Enter. Waypoint added message appears. Right, continue adding waypoints until you reach the end of the route.

5. Move the cursor to the next point in the route and press **ENT** to set the next waypoint.

6. Repeat step five until the route reaches your destination.

7. To save your route, press **EXIT**. The M52 Pro reverts to the Edit Route screen, with the route automatically named "Route 1" and stored in the M52's internal memory. To return to the main display press **EXIT** repeatedly.

Delete a Route

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

2. Press ↓ to *route name*|**ENT**.

3. Press ↓ to **NAVIGATE**|**ENT**|→ to **DELETE**|**ENT**|← to **YES**|**ENT**.

Tip:

You can also delete all routes at once.

1. From the **NAVIGATION PAGE**, press **MENU**|**ENT** or from the **PLOTTER**

PAGE press **MENU**|**MENU**|↓ to **ROUTE PLANNING**|**ENT**.

2. Press → to **DELETE ALL**|**ENT**|← to **YES**|**ENT**.

Edit a Route Name

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

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

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3. 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**. Return to the main display by pressing **EXIT** repeatedly.

You also can edit the route by adding and removing waypoints.

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

2. Press ↓ to *route name*|**ENT**|↓ to **ROUTE WAYPOINTS LIST**. Use ↓ and ↑ to select a waypoint, then press **ENT**.

3. Use ↓ and ↑ to select a command from the Edit Route Waypoints menu and press **ENT**.

Add From Plotter lets you insert a waypoint in the route by clicking on a plotter location with the cursor. Add Waypoint calls up the Waypoint List so you can insert a waypoint from the list. Remove Waypoint will delete the waypoint from the route. View Waypoint will show you where the selected waypoint is on the plotter.

Navigate a Route

1. From the **NAVIGATION PAGE**, press **MENU**|**ENT** or from the **PLOTTER PAGE**, press **MENU**|**MENU**|↓ to **ROUTE PLANNING**|**ENT**.
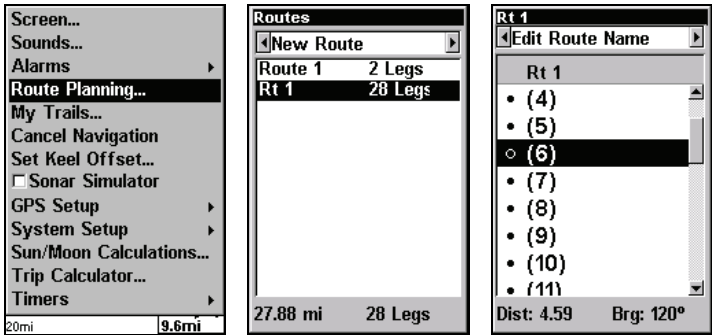
Route Planning command on Main Menu, left; Routes menu, center; Edit Route menu, right. Navigate command is selected.

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

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

The following figures show what the Navigation Page and Plotter Page look like while navigating a route.

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Navigate a Route backward

Here's how you run a route backward, from the end waypoint to the beginning waypoint:

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

2. Press ↓ to select *route name*|**ENT**|↓ to **NAVIGATE**|→ to **RE-VERSE**|**ENT**|← to **NAVIGATE**|**ENT**.

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

Figure 1.	Figure 2.	Figure 3.

Figure 4.	Figure 5.	Figure 6.
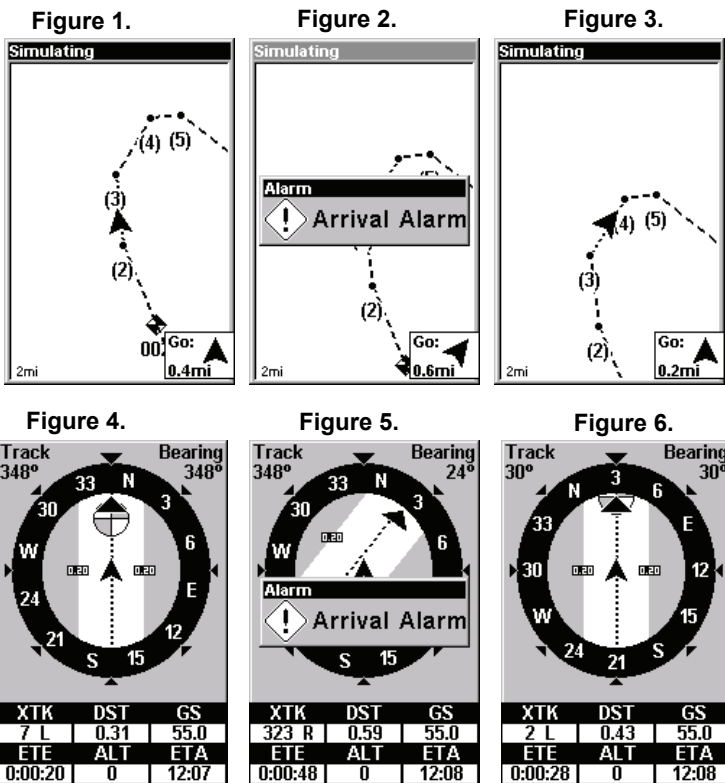
Navigating along a route: Figs. 1 & 4 show the Plotter Page (top) and Navigation Page (bottom) while running a route. Boater is heading straight for waypoint 3. In Figs. 2 & 5, the traveler has arrived at Wpt 3; the arrival alarm has been triggered and the bearing arrow on the compass rose has turned to point toward Wpt 4, off to the northeast. In Figs. 3 & 6 the traveler has turned northeast on his new course and is heading straight for Wpt 4, which is 0.43 miles away.

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Utilities

Utilities are useful tools for traveling or for outdoor activities.

Alarm Clock

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

Sun/Moon Rise & Set Calculator

To get to the Sun/Moon menu: press **MENU**|**MENU**|↓ to **SUN/MOON CALCU-LATIONS**|**ENT**.

Trip Calculator

To get to the Calculator menu: press **MENU**|**MENU**|↓ to **TRIP CALCULA-TOR**|**ENT**.

Trip Down Timer

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

Trip Up Timer

To get to the Up Timer menu: press **MENU**|**MENU**|↓ to **TIMERS**|**ENT**|**ENT**.

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Notes

Section 7:
System & GPS Setup Options

Alarms

You unit has three alarms: Arrival Alarm, Off Course Alarm and Anchor Alarm. You can turn the alarms off and on and change their distance settings.

You can set an arrival alarm to flash a warning message and sound a tone when you cross a preset distance from a waypoint. If, for example, 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. If, for example, 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. If, for example, you are anchored and your boat moves more than 0.1 mile, the alarm will flash a message and sound a tone.
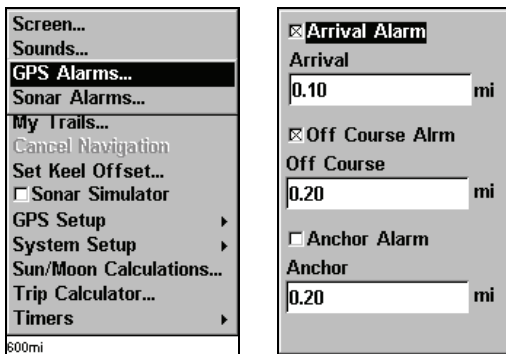
Alarms command, left; Alarm menu, right.

To change alarm settings:

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

2. Scroll ↓ or ↑ to select the desired category, then press **ENT** to check or clear the Enabled box. This turns the alarm on (checked) or off (unchecked.)

3. To change distance settings, scroll ↓ or ↑ to select the desired category, then press →|**ENT** to activate the distance dialog box. Press ↑ or ↓ to change the first character, then press → to the next character and repeat until the name is correct.

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4. When your adjustments are finished, return to the last page displayed by repeatedly pressing **EXIT**.

IMPORTANT ALARM NOTES:

Anchor Alarm — The anchor alarm may be triggered even when you are sitting still. Typically, this 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 (less than 0.05 mile), the unit may not show navigation data to the next waypoint after you arrive at the first one because you may not be able to come close enough to the first waypoint to trip the arrival alarm.

Auto Satellite Search

When your GPS receiver is turned on for the first time, it will not know your position. The unit begins searching for the satellites using the data it acquired the last time it was turned on, probably at the factory. Since it's almost certain that you are not at the factory, it is probably looking for the wrong satellites.

If it doesn't find the satellites it's looking for after approximately one minute, it switches to Auto Search, looking for any satellite in the sky. 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 have not moved more than approximately 100 miles from the last location it was used.
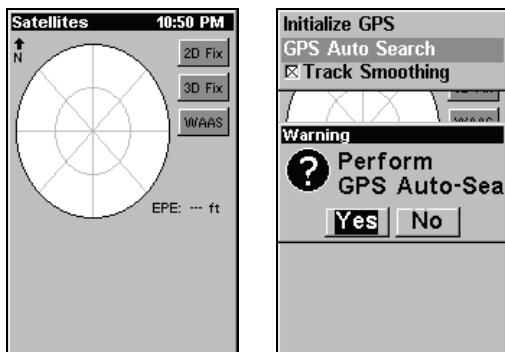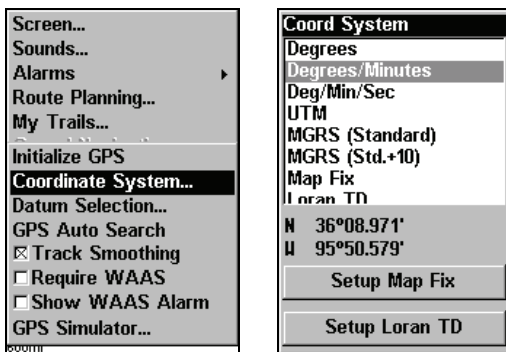

GPS Auto Search on the Satellite Status Menu.

You can force the unit to switch to auto search mode.

1. Press **PAGES** and switch to the Satellite Status screen.

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

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Coordinate System Selection

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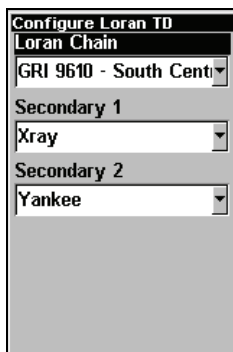

Menus for changing coordinate system used to display positions.

To get to Coordinate System Selection:

1. Press **MENU|MENU|↓** to **GPS SETUP|ENT**.

2. Press **↓** to **COORDINATE SYSTEM|ENT**.

To change the coordinate system

1. Press **ENT** while **COORDINATE SYSTEM** is highlighted.

2. Press the arrow keys to highlight the desired format. Press **ENT** to select it. Press **EXIT** to close the menus.

Configure Loran TD menu.

To setup Loran TD:

1. If the Loran TD conversion is chosen, you must enter the local Loran chain identification for the master and slaves.

2. Select **SETUP LORAN TD** at the bottom of the Coordinate System menu and select the ID. Press **EXIT** to close this menu.

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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:

1. Take your map of the area and determine a reference latitude/longitude.

NOTE:

> Please note that 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.

2. Once you have picked a reference position, save it as a waypoint. Press **EXIT** repeatedly to return to the main display.

3. Press **MENU|MENU|↓** to **GPS SETUP|ENT**.

4. Press **↓** to **COORDINATE SYSTEM|ENT**.

5. Press **↓** to **SETUP MAP FIX|ENT**. The following screen appears with **MAP SCALE** is highlighted.

6. Press **ENT** and enter the map's scale. This is generally at the bottom of the paper map. It's shown as a ratio, like 1:24000.

7. Press **EXIT** and the unit returns to the Configure Map Fix screen.

8. Press **↓** to **SELECT ORIGIN WAYPOINT|ENT|ENT|ENT** to bring up the waypoint list.

9. 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.

10. Press **ENT** and the unit returns to the Configure Map Fix menu.

11. Press **EXIT** to close the menu.

12. Press **↑** to **COORD SYSTEM|ENT**, select **MAP FIX** from the list and press **ENT|EXIT**. All position information now shows as a distance from the reference point you chose.

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Customize Page Displays

The Plotter, Position and Navigation pages all have customizable options. These options control which information is displayed on each page.

Customize Position Page

1. While on the GPS Position Page, press **MENU**|↓ to **CUSTOMIZE**|**ENT**. The display box in the top left corner begins flashing.

2. Use the arrow keys to select a display box. With the display box highlighted and flashing, press **ENT** to open a list of options.

3. Scroll ↑ and ↓ to select a different display option, then press **ENT**. After all options are set, press **EXIT** to return to the page display.

Customize Plotter or Navigation Page

1. While on the Plotter or Navigation pages, press **MENU**|↓ to **CUSTOMIZE**|**ENT**.

2. Press ↓ or ↑ to select a display you would like to see on the plotter page. With the display highlighted, press **ENT**. The selected display is checked and moves to the top of the list.

3. After all options are set, press **EXIT** to return to the page display. Display boxes at the bottom of the screen now provide the customized data.
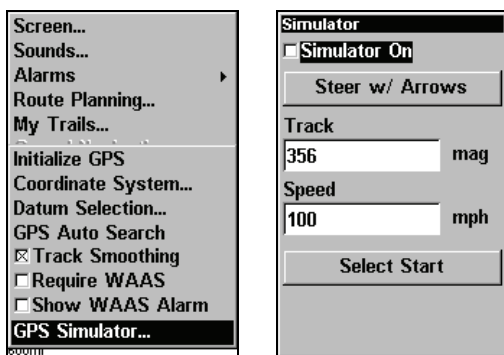
GPS Setup Menu, left; GPS Simulator menu, right.

GPS Simulator

The GPS simulator allows you to use the unit in simulation mode.

To access GPS Simulator:

1. Press **MENU**|**MENU**|↓ to **GPS SETUP**|**ENT**.

2. Press ↓ to **GPS SIMULATOR**|**ENT**. The GPS Simulator Menu appears.

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Input the desired settings, then turn on the simulator by highlighting the **GPS SIMULATOR ON** box and pressing **ENT**. Press **EXIT** repeatedly to close this menu. A message and tone appear periodically, warning you that the simulator is on. To turn the simulator off, repeat the above steps or turn the unit off.

Hide GPS Features

If there is no GPS antenna/receiver module attached to this unit, the GPS menus and features can be hidden from view with this command. The default setting is off, allowing you to rotate between the Sonar Page and the GPS pages and features.

To hide GPS features:
1. Press **MENU|MENU|↓** to **SYSTEM SETUP|ENT|↓** to **HIDE GPS FEATURES|ENT**. The GPS menus and pages are now hidden. Repeat this step to restore GPS features.

Initialize GPS

This command is handy when you are practicing in simulator mode. In simulator mode, this command makes the unit operate as if it is sitting someplace other than its actual location. So, you and your unit could be located in Kansas City, but easily practice navigating in the ocean off Islamorada, Florida.

1. Press **MENU|MENU|↓** to **GPS SETUP|ENT|ENT**.

2. A message appears, telling you to move the cursor near the desired location and press **ENT**. When the message automatically clears, follow the message instructions.

3. In a moment, your present position marker arrow appears on the plotter in the location you selected with the cursor. The unit will consider that spot as it's last known position until you initialize it again or a live satellite lock-on or a new simulator location.

Plotter Auto Zoom

With auto zoom 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 on auto zoom:
1. From the Plotter Page, press **MENU|↓** to **AUTO ZOOM|ENT|EXIT**. Repeat these steps to turn it off.

Plotter Orientation

By default, this receiver shows the plotter with north always at the top of the screen. This is the way most maps and charts are printed on paper.

To switch to a different orientation, a track-up mode rotates the plotter display as you turn. Another option is course-up mode, which keeps the plotter at the same orientation as the initial bearing to the waypoint.

To change plotter orientation:
1. From the Plotter Page, press **MENU|↓** to **PLOTTER ORIENTATION|ENT**.

2. Use ↑ or ↓ to select the desired mode, then press **ENT**. Press **EXIT|EXIT** to return to the page display.
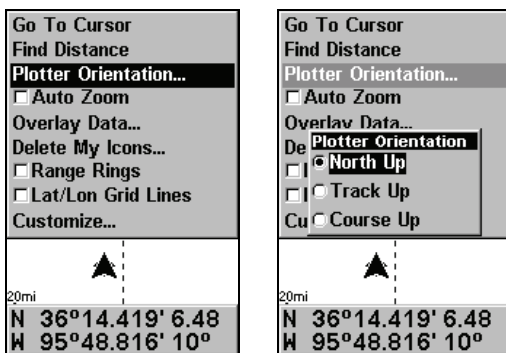
**GPS Menu, left; Plotter Orientation menu with
the North Up plotter orientation option selected, right.**

Overlay Data

To change the digital data shown on top of the Sonar Page or the Plotter Page:

First, press **PAGES**, use the arrow keys to select the right page, then press **EXIT**.

To select data for display:
1. From the Plotter or Sonar page, press **MENU|↓** to **OVERLAY DATA|ENT**.

2. Press ↓ or ↑ to select *Data Type*|**ENT**.

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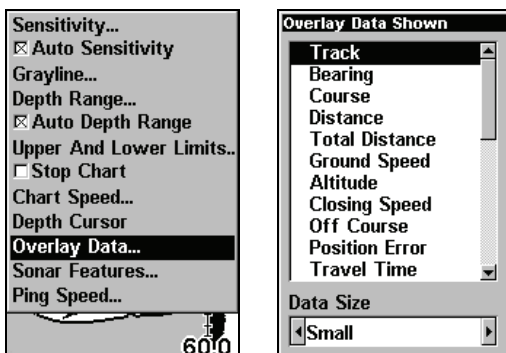
Overlay Data command on the Sonar Menu, at left. Overlay Data Shown selection menu, right. In this example, we scrolled down the data list to highlight "Ground Speed."

When selected, the data type shifts to the top of the data list and a check mark appears beside the data type. (If you wish, you may now use ↓ or ↑ to select other Data Types for display.)
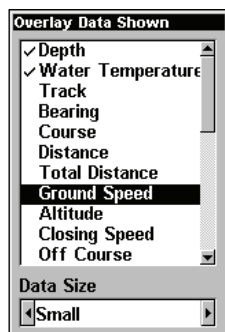
3. To return to the previous page, press **EXIT|EXIT**.

To turn off displayed data:
1. From the Plotter or Sonar page, press **MENU|↓** to **OVERLAY DATA|ENT**.

2. Press ↓ or ↑ to select *Data Type*|**ENT**. The selected data type disappears from the top of the list and reverts to its previous, unchecked position. (If you wish, you may now use ↓ or ↑ to select other Data Types to turn off.)

3. To return to the previous page, press **EXIT|EXIT**.

To change displayed data font size:
1. From the Plotter or Sonar page, press **MENU|↓** to **OVERLAY DATA|ENT**.

2. Press ↓ or ↑ to select *Data Type*|press → or ← to *Data Size*|**EXIT**.

The selected data type will be displayed in the new size. (To change the font size for another Data Type, press **ENT** and repeat these steps, beginning with step two above.)
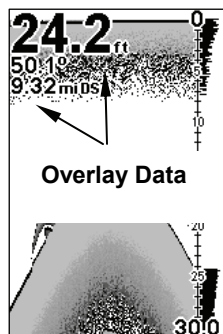
3. To return to the previous page, press **EXIT**.

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Tip:

If you wish, you can change the displayed data font size when you select a data type:

1. From the Plotter or Sonar page, press **MENU**|↓ to **OVERLAY DATA**|**ENT**.

2. Press ↓ or ↑ to select *Data Type*|press → or ← to select *Data Size*|**ENT**.

The data will be shown in the new font size. To return to the previous page, press **EXIT**|**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.
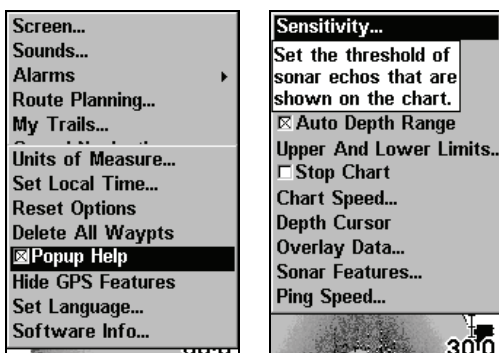
System Setup Menu, left, with Pop-up Help command highlighted. At right, this example shows the Pop-up Help message for the Sensitivity command, located on the Sonar Menu.

To turn on Popup Help:
1. Press **MENU**|**MENU**|↓ to **SYSTEM SETUP**|↓ 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** to return to the page display.

Position Pinning

When you are standing still or moving at extremely slow speed, a GPS receiver can have trouble determining the direction you are traveling. In the past, this resulted in a wandering plot trail that moved around the plotter, even if you were standing still.

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The Position Pinning feature was developed so that when you stopped, the unit locked the present position on the GPS plotter until you moved a short distance or exceeded a very slow speed.

To turn on Position Pinning:

1. Press **MENU**|**MENU**|↓ to **GPS SETUP**|**ENT**|↓ to **POSITION PINNING**|**ENT**.

2. Press **EXIT**|**EXIT** to return to the previous page.

Reset Options

This command is used to reset all features, options and settings to their original factory defaults. This is useful when you have changed several settings and want to return the unit to basic automatic operation.

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

2. Press ↑ or ↓ to **YES**|**ENT**.

3. All menus are cleared and all options are returned to factory settings.

Screen Contrast and Brightness

To access the Screen menu, press **MENU**|**MENU**|**ENT**.

Once in the Screen menu:

To adjust the display's contrast:

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.
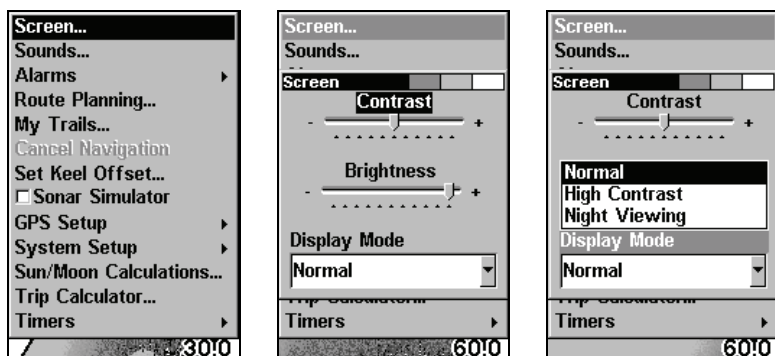
Screen Command, left, and Screen Menu with Contrast bar selected, center. Display Mode menu, right.

To adjust the display's brightness:

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

To adjust the screen's display mode:

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

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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

Using the correct local time setting is handy when estimating local arrival time while navigating. Also, the time and date are saved when a waypoint is created.

To access the Set Local Time menu, you must first acquire your position. Once that is done: press **MENU|MENU|↓** to **SYSTEM SETUP|ENT|↓** to **SET LOCAL TIME|ENT**.

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**.

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). Once you have each field set the way you want, press **EXIT** repeatedly.

Show WAAS Alarm

When the signal is available, your unit will automatically use WAAS to boost the accuracy of the position fix. When the WAAS signal is lost or acquired, an alarm message appears.

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To show WAAS Alarm:
1. Press **MENU|MENU|↓** to **GPS SETUP|ENT|↓** to **SHOW WAAS ALARM**.

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

3. You can return to this command and press **ENT** again to turn the feature on.

Software Version Information

You can find out what software version is running in your sonar unit by using the Software Information command.

1. Press **MENU|MENU|↓** to **SOFTWARE INFO|ENT**.

2. Read the information displayed on the screen.

3. To return to the last page displayed, press **EXIT|EXIT**.

Sounds and Alarm Sound Styles

Sounds triggered by key strokes and alarms can be adjusted:

1. You first press **MENU|MENU|↓** to **SOUNDS|ENT**.
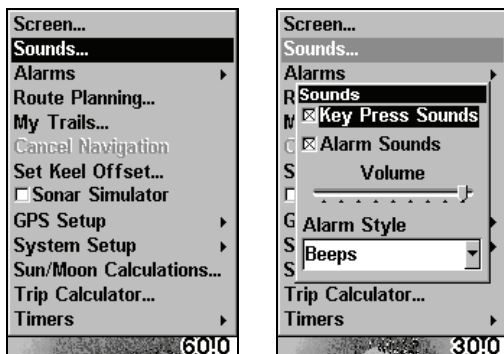
Sounds command, left. At right, the Sounds menu.

Once in the Sounds menu:
To set Key Press 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.

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To set Alarm Volume: Press ↓ to **VOLUME**. Press → or ← to move the bar. The left end of the scale is low volume; the right end is high volume. 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

Track Smoothing prevents wandering of trails, the steering arrow, compass rose and plotter display in track-up mode.

To turn on/off track smoothing:
1. Press **MENU|MENU**, highlight **GPS SETUP** and press **ENTER**.

2. Select **TRACK SMOOTHING** and press **ENTER**.
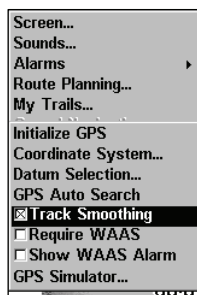
Trail Options

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, create a new trail, delete a trail, etc.

To access the Trails Menu:
1. Press **MENU|MENU|↓** to **MY TRAILS | ENT**.
Delete All Trails
To remove all of the trails from memory: from the Trails Menu, press → to **DELETE ALL | ENT | ←** to **YES | ENT**.
WARNING:
> **If you *uncheck* the Update Trail option, automatic trail creation and recording will be turned *off*. You must turn it back on to record trails. The default setting is on.**

Update Trail Option
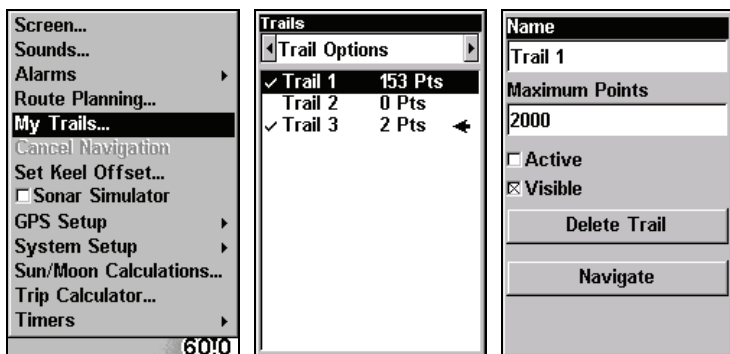This menu lets you change the way the trail updates occur.

To turn on/off active trail:
1. From the Trails Menu, press → to **OPTIONS | ENT**. With **UPDATE ACTIVE TRAIL** 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

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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.

Screen...	Trails	Name
Sounds...	◄ Trail Options ►	Trail 1
Alarms ►	✓ Trail 1 153 Pts	Maximum Points
Route Planning...	Trail 2 0 Pts	2000
My Trails...	✓ Trail 3 2 Pts ◄	□ Active
Cancel Navigation		☒ Visible
Set Keel Offset...		Delete Trail
□ Sonar Simulator		
GPS Setup ►		Navigate
System Setup ►		
Sun/Moon Calculations...		
Trip Calculator...		
Timers ►		
60!0		

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

To change update criteria:

1. From the Trails Menu, press → to **OPTIONS|ENT|↓** to **UPDATE CRITERIA**. Press ↑ or ↓ to select *criteria type*|**ENT**. If you selected Time, the Update Rate data entry box appears on the menu. If you selected Distance, the Update Distance data entry box appears on the menu.

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 mile/nm/km to 9.99 mile/nm/km; the default is 0.10 miles.

With one of the Update Criteria selected, use the cursor arrows to highlight either the **UPDATE RATE** or **UPDATE DISTANCE** data entry boxes 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** to return to the Trail Options Menu.

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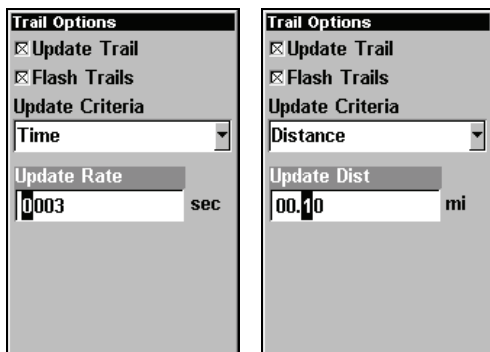
Trail Options menu: Update Time Rate setting, left, and Update Distance setting, right.

Specific Trail Options
Delete Trail

To delete a specific trail: From the Trails Menu, press ↓ to *Trail Name*|**ENT**. The Edit Trail menu appears as seen in the following figure. Press → to **DELETE TRAIL** | **ENT** | ← to **YES** | **ENT**.

New Trail

To manually start a new trail, in the Trails Menu, make sure **NEW TRAIL** is highlighted and press **ENT** | **EXIT**.

Trail Visible/Invisible and Other Trail Options

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

On the Edit Trail menu, press ↓ or ↑ to highlight the section you wish to change, then press **ENT**. Make your changes, then press **EXIT** to close this menu.

Units of Measure

This menu sets the speed and distance (statute or nautical miles, meters), depth (feet, fathoms, or meters) and temperature (degrees Fahrenheit or Celsius). To change the units:
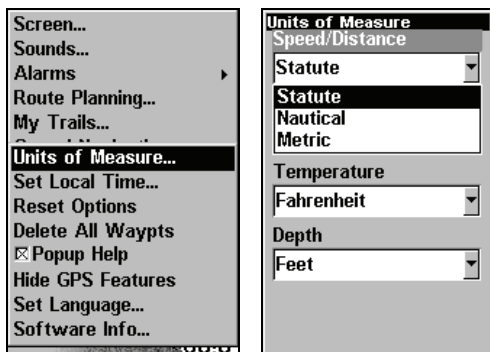
Main Menu, left, Units of Measure Menu, right.

To change unit of measure:

1. Press **MENU**|**MENU**|↓ to **SYSTEM SETUP**|↓ to **UNITS OF MEASURE**|**ENT**.

2. Press ↓ to the desired units and then press **ENT**. After all the options are set as desired, press **EXIT|EXIT** to return to the page display.

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Notes

Notes

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If it becomes necessary to send a product for repair or replacement, you must first receive a return authorization number from Customer Service. Products shipped without a return authorization will not be accepted. When shipping, we recommend you do the following:

1. Please do not ship the knobs or mounting bracket with your unit.

2. If you are sending a check for repair, please place your check in an envelope and tape it to the unit.

3. For proper testing, include a brief note with the product describing the problem. Be sure to include your name, return shipping address and a daytime telephone number. An e-mail address is optional but useful.

4. Pack the unit in a suitable size box with packing material to prevent any damage during shipping.

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