GPS 17

GPS receiver/antenna

installation guide

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Note: Operation of this device is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Introduction

Use this area to record the serial number (8-digit number located on the bottom of the antenna). Keep your original sales receipt in a safe place or attach a photocopy.

Serial Number: ____ ____ ____ ____ ____ ____ ____ ____

Contact Information

If you should encounter any difficulty while using your GPS 17, or if you have any questions, in the U.S.A. contact Garmin® Product Support by phone: 913/397.8200 or 800/800.1020, Monday–Friday, 8 AM–5 PM Central Time; or by e-mail at sales@garmin.com.

In Europe, contact Garmin (Europe) Ltd. at 44/0870.8501241.

Complete information concerning NMEA & RTCM formats and sentences is available for purchase at:

National Marine Electronics Association (NMEA)
PO Box 3435, New Bern, NC 28564-3435, USA
Tel. 252/638.2626 Fax 252/638.4885 www.nmea.org

Radio Technical Commission For Maritime Services (RTCM)
1800 Diagonal Road, Suite 600, Alexandria, VA 22314-2480, USA
Info line 703/684.4481 Fax. 703/836.4229 www.rtcm.org

This manual uses the term **Warning** to indicate a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

This manual uses the term **Caution** to indicate a potentially hazardous situation, which, if not avoided, may result in minor injury or property damage. It may also be used without the symbol to alert you to avoid unsafe practices.

Warning

Failure to avoid the following potentially hazardous situations could result in an accident or collision resulting in death or serious injury.

When navigating, carefully compare information received from the GPS 17 to all available navigation sources, including information from street signs, visual sightings, and maps. For safety, always resolve any discrepancies or questions before continuing navigation.

Use an electronic chart in conjunction with the GPS 17 only to facilitate, not to replace, the use of authorized government charts. Official government charts and notices to mariners contain all information needed to navigate safely.

WARNING: This product, its packaging, and its components contain chemicals known to the State of California to cause cancer, birth defects, or reproductive harm. This Notice is being provided in accordance with California's Proposition 65. If you have any questions or would like additional information, please refer to our Web site at http://www.garmin.com/prop65.

Caution

Failure to avoid the following potentially hazardous situations may result in injury or property damage.

Use the GPS 17 only as a navigational aid. Do not attempt to use the GPS 17 for any purpose requiring precise measurement of direction, distance, location, or topography. This product should not be used to determine ground proximity for aircraft navigation.

The Global Positioning System (GPS) is operated by the United States government, which is solely responsible for its accuracy and maintenance. The government's system is subject to changes which could affect the accuracy and performance of all GPS equipment, including the GPS 17. Although the GPS 17 is a precision navigation device, any navigation device can be misused or misinterpreted and, therefore, become unsafe.

Specifications

Physical Characteristics

Size: 3.58” (91.0 mm) diameter, 3.60” (91.5 mm) high

Weight:

GPS 17 only: 7.1 oz (201 g)

With 30 foot cable: 16.8 oz (465 g)

With pole mount adapter & cable: 18.2 oz (516 grams)

Pole mount adapter alone: 1.4 oz (40 grams)

Cable alone: 9.7 oz (275 g)

Cable: White PVC-jacketed, 30 foot, foil-shielded, 8-conductor 28 AWG with JST connector termination

Color: White with blue logos

Case Material: Polycarbonate thermoplastic that is waterproof to IEC 60529 IPX7 level (immersion in 1 meter of water for 30 minutes).

Thread Specifications: Standard one-inch, 14 threads-per-inch

Electrical Characteristics

Input Voltage: 8.0 VDC to 40 VDC unregulated

Input Current: 60 mA @ 8 VDC; 40 mA @ 12 VDC; 15 mA @ 40 VDC

Standby Current: <1.0 mA

GPS Receiver Sensitivity: -165 dBW minimum

Environmental Characteristics

Operating Temperature: -30°C to +80°C

Storage Temperature: -40°C to +90°C

For more specifications, refer to the *GPS 16/17 Technical Specifications* located on the Garmin Web site.

Mounting the GPS 17

Thoroughly read and completely understand these instructions before attempting the installation. When in doubt, seek professional assistance.

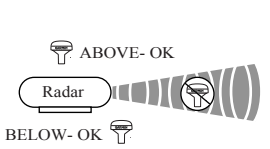
You can use an antenna mount to install the GPS 17. The receiver base fits a standard 1-inch, 14 threads-per-inch marine mount. Check with your Garmin dealer or a marine retailer for a suitable mount for the installation location.

Power to the receiver may be controlled by an on/off switch, such as a switch on the control console. Check with your Garmin dealer or a marine/electric retailer for this item.

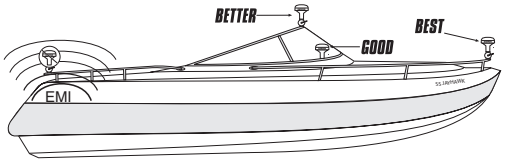
Before permanently installing and wiring the GPS 17, temporarily place the unit in the desired location, connect the wiring, and then check operation with potential interfering equipment turned on and off. Examples of sources of interference are other electronic equipment, fan motors, engine ignition, alternators, generators, radars, and VHF radio transmissions.

If you find a problem with interference, try moving the antenna a few feet away from the source of interference to solve the problem. When a you find a suitable location, permanently install the GPS 17.

Three common sources of interference for GPS units are radar equipment, VHF radio antennas, and electromagnetic interference from engine components.



Radar VHF Radio Antenna



EMI (Electromagnetic Interference) from engine components

Mounting Location Tips

- Position the receiver so that it has the clearest possible view of the sky and horizon in all directions.
- Avoid mounting the antenna next to large areas of conductive material (metal, aluminum, etc.) as this may cause poor signal reception.
- Do not mount the GPS 17 high on a mast, as the top of the mast travels more than the boat. The unit will provide more stable readings if it is located near the water level.
- When routing the wiring to the GPS 17, avoid routing the cable near the vessel's alternator or ignition system components or parallel to other power lines.
- As a general rule, mount the receiver at least three feet from all other antennas and the vessel's electrical system components (alternator/ignition system).
- The GPS 17 is supplied with a 30-foot power/data cable. Be sure that the cable can be routed to the necessary devices.

To flush mount the GPS 17:

1. Turn the GPS 17 upside down. To create a template, punch a hole in the three mounting screw holes.
2. Use the template to mark the hole locations on the mounting surface. The centers of the holes are 2.44" (62 mm) apart. Use an 11/64" drill bit to drill a hole at each marked location.
3. Align the GPS 17 over the three holes and fasten the M4 screws. The threads are 8.10 mm deep: do not use screws that will thread into the base any deeper, as this may damage the GPS 17.

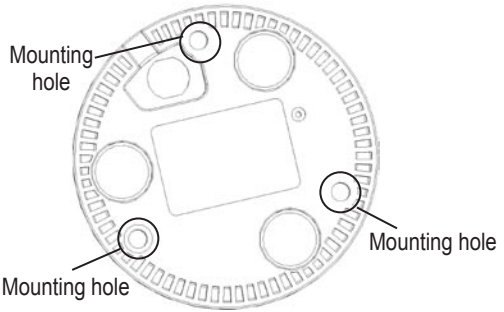


Figure 1: Bottom of GPS 17 Base

To attach the enclosed pole to the base:

1. Thread the cable though the pole mount.
2. Align the tab on the pole to the notch on the base.
3. Use the enclosed screws to secure the pole to the base.

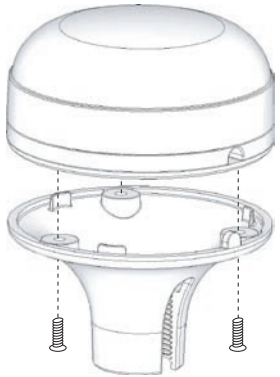


Figure 2: Attaching the Pole Mount to the Base

To mount the GPS 17 with cable outside mount:

1. Place the cable in the vertical slot along the side of the base of the unit.
2. Screw the GPS 17 onto the mount. Do not overtighten: it is possible to tighten the unit to the point that the cable may be cut in two.
3. Fill the remaining gap in the cable exit with marine sealant.

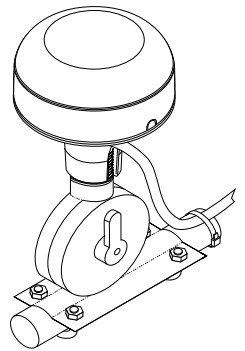


Figure 3: Running the Cable Outside of the Mount

To mount the GPS 17 with cable through mount:

1. Position the mount in the desire location and mark the approximate center of the mount
2. Drill a hole large enough for the cable to pass through at the marked location.
3. Slide the cable through the mount and screw the GPS 17 onto the mount.
4. Fasten the mount to the boat.

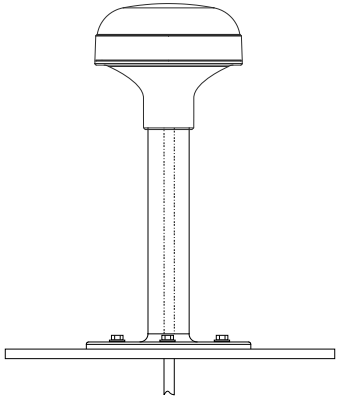


Figure 4: Running the Cable Through the Mount

Routing the Cable

You can shorten or coil excess cable and secure it in an inconspicuous location. When routing the power/data cable, try to avoid the following things:

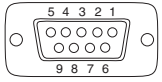
- Sharp edges that can cut the cable.
- Routing the cable parallel to other power lines.
- Excessively twisting, straining or bending the cable.

WIRING THE GPS 17

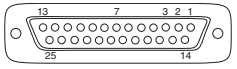
After mounting the GPS 17 in the desired location, connect the wiring. Connect the GPS 17's Port 1 Data In, Data Out, Remote On/Off, and Ground (Return) lines to your NMEA device or PC. Port 2 is used for RTCM input only.

For reliable communication, it is essential that the GPS 17 and the receiving device share the same ground. This ground connection acts as the (signal) Return line. Wire the unit to its own circuit to avoid interference from other electronics.

You need a DB-9 or DB-25 serial connector (normally female) if you are connecting the GPS 17 to a PC. Check with a PC or electronics supplier for these items.



DB-9 Female
Serial Connector



DB-25 Female
Serial Connector

Garmin recommends that you install a 1A fuse on the power (+) line of the receiving device.

Wire Color Code

Red: Power (+) 8–40 VDC.

Black: Ground (Power (-) and Data Signal Return)

Yellow: Remote power On/Off

Blue: Port 1 NMEA Data Input

White: Port 1 NMEA Data Output

Gray: Pulse Per Second Output

Green: Port 2 RTCM Data Input

Violet: Port 2 RTCM Data Output (Not Used)

Wiring Diagrams

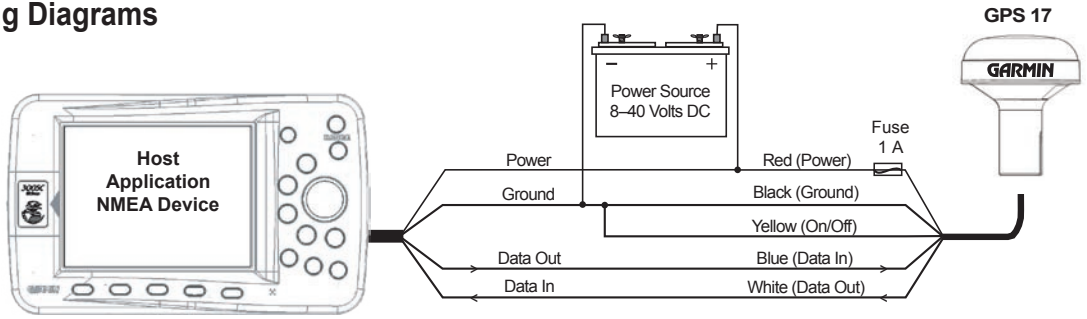


Figure 5: NMEA and GPS 17 Wiring

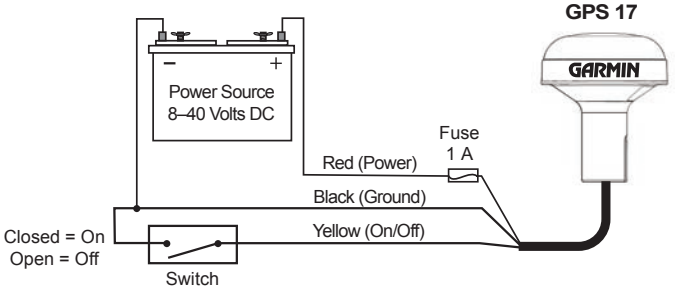


Figure 6: GPS 17 Switch Wiring

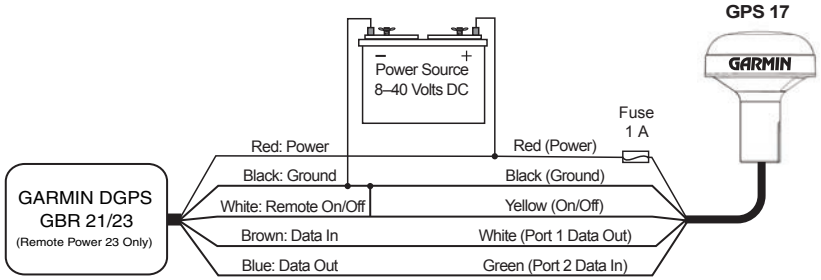


Figure 7: DGPS GBR 21/23 and GPS 17 Wiring

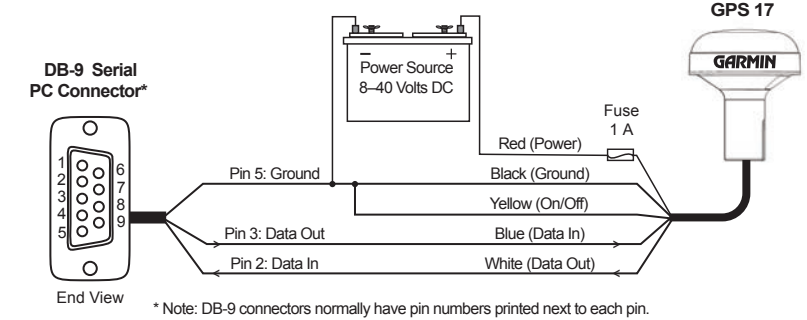


Figure 8: DB-9 and GPS 17 Wiring

To wire the GPS 17 to a NMEA Device or PC Connector:

1. Connect the White (Port 1 Data Out) wire from the GPS 17's power/data cable to the DATA INPUT line of the NMEA device or to pin 2 on a DB-9 (pin 3 on DB-25).
2. Connect the Blue (Port 1 Data In) wire to the DATA OUTPUT line of the NMEA device or pin 3 on the DB-9 (pin 2 on DB-25).
3. Connect the Black (-) wire to the GROUND wire of the NMEA device and/or pin 5 on the DB-9 (pin 7 on DB-25). If connecting to a PC, the Black (-) wire must also be run to a ground.

   If the Black wire is connected to the same ground terminal as the NMEA device, no additional connection is required, unless a separate data return line is required by the NMEA device.
4. Connect the Red (+) wire from the power/data cable to a 8–40 VDC power source.
5. If the receiver is being wired to a circuit that is already switched, (with the NMEA device for example) connect the Yellow wire to the same place as the Black wire. When the Black and Yellow wires are combined, the GPS 17 will turn on/off when power is applied/removed to the Red (+) wire.

   If a remote power switch is being installed, refer to Figure 6 on page 7. This will allow the GPS 17 to remain connected to a power source but manually powered on (pull down to less than 0.5 volts) and off (open).

Some non-Garmin devices may have a separate data line labeled RETURN, DATA GROUND, or DATA -. If one of these lines exist, connect the Black wire from the power/data cable to it.

You may output data to up to three NMEA devices. The number of devices is determined by the total amount of impedance from all devices.

USING THE GPS 17

First Time Fix

The first time you turn on your GPS 17, the receiver must be given an opportunity to collect satellite data and determine its present position. To ensure proper initialization, the GPS 17 is shipped from the factory in AutoLocate® mode, which allows the receiver to "find itself" anywhere in the world.

When turned on, the GPS 17 searches for satellites. After it has calculated an initial position fix, the GPS 17 outputs navigation data. For more information about the data output by the GPS 17, refer to the *GPS 16/17 Technical Specifications* located on the Garmin Web site.

WAAS Capability

The GPS 17 can receive WAAS (Wide Area Augmentation System) satellite signals. WAAS is an FAA-funded project to improve the overall integrity of the GPS signal and increase position accuracy for users in North America.

The system is made up of satellites and approximately 25 ground reference stations positioned across the United States that monitor GPS satellite data. Two master stations, located on either coast, collect data from the reference stations and create a GPS data correction message. Initial reception of the WAAS signal may take up to 20 minutes.

According to the FAA's Web site, testing in September 2002 of WAAS confirmed an accuracy performance of 1–2 meters horizontal and 2–3 meters vertical throughout the majority of the continental United States and portions of Alaska. For more information, go to http://gps.faa.gov/Programs/WAAS/waas.htm.

WAAS is just one service provider that adheres to the minimum operational performance standard for global Satellite Based Augmentation Systems (SBAS). Eventually, there will be several services of worldwide geostationary communication satellites and ground reference stations. All SBAS systems use the same receiver frequency and are capable of providing your GPS unit with increased accuracy at any location in the world.

Limited Warranty

This Garmin® product is warranted to be free from defects in materials or workmanship for one year from the date of purchase. Within this period, Garmin will at its sole option repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs.

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Garmin retains the exclusive right to repair or replace the unit or software or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

To obtain warranty service, contact your local Garmin authorized dealer or call Garmin Product Support for shipping instructions and an RMA tracking number. The unit should be securely packed with the tracking number clearly written on the outside of the package. The unit should then be sent, freight charges prepaid, to any Garmin warranty service station. A copy of the original sales receipt is required as the proof of purchase for warranty repairs.

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