# How to Construct a Cable for Garmin GPS receivers

Thank you for obtaining a connector for Garmin GPS receivers from us. This document will provide you with the information you need to construct virtually any type of cable you may require, whether you want to connect your GPS to a computer, two GPS units to each other, or to provide power to your GPS.

Please remember that this information is provided without warranty of any kind. Though every effort is being made to ensure that the information is accurate, we cannot be held responsible for any errors or omissions. If you construct a cable that doesn't work (or even worse, damages your GPS, computer, or yourself) as a result of a mistake in these instructions, we would appreciate learning about the error so that it can be fixed, but we cannot be held liable for any damages.

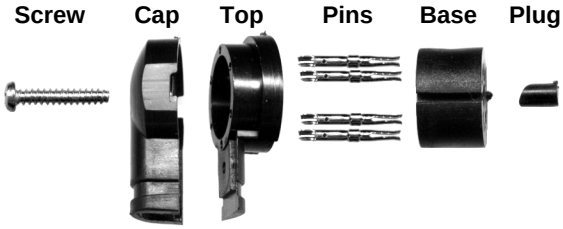
### A note about supplying power to your GPS

Some Garmin GPS receivers are capable of running off external power ranging up to +32VDC or more, whereas others can only accept a maximum of +8VDC. If your receiver can only accept 8 volts and you connect it directly to a car battery, you will damage your GPS (sometimes 18 volts or more can be present at the terminals of a 12 volt car battery, depending on its state of charge). If you want to build a cable providing power to such a receiver, you must incorporate a voltage regulator circuit to bring the voltage down to an acceptable level (the schematic diagram for such a circuit appears later in this document). Such a circuit isn't necessary if your receiver can deal directly with the voltage you are giving it.

We're aware that the GPS-12, GPS-38, and GPS-40 receivers are limited to 8 volts, thus requiring a voltage regulator, and there may be others. Garmin provides a centre plastic pin on the connector of their GPSes which are limited to low input voltages. This enables a non-regulated power supply cable to be constructed which cannot be accidentally used on such receivers. But the safest thing is to check your user manual before supplying power to your GPS.

### Assembling the Connector

The parts making up a Garmin-compatible GPS connector are shown in the exploded view below:




*Note that the base section is oriented so that the side with the larger centre hole is to the right.*

To assemble the connector, first insert the contact ends of the pins into the side of the base with the small centre hole. Then place the top over the pins so that it is flush with the base (the top and base together will hold the pins securely in place). Solder wires to the ends of the appropriate pins protruding into the top piece, ensuring that you don't let the pins get too hot, or the plastic connector may melt. You can then place the cap over the top and use the screw to hold everything together.

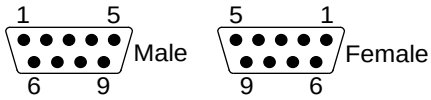
If you are making an unregulated power supply cable, consider inserting the plug into the large centre hole in the base (it's a friction fit). This will help to ensure that the cable you make is not accidentally used with a low voltage GPS receiver. If you're building a regulated circuit for a low voltage receiver that has a centre plastic pin, this plug must be left out.

For specific details on how to construct a cable, please refer to the "Connector Pinouts and Signals" diagrams to the right, as well as the information on the following page.

## Connector Pinouts and Signals

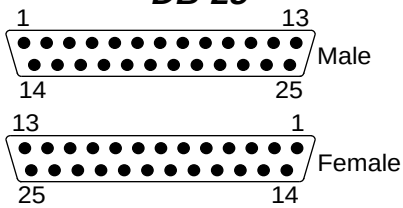
*Diagrams represent the view of the connector as seen from the side that plugs into the computer or GPS. In other words, this is the side of the connector that you do NOT attach wires to. Keep this in mind when constructing your cable.*

### *DB-9*



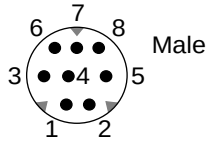

| | | |
|---|---|---|
| Pin 1 | DCD | Carrier Detect |
| Pin 2 | RxD | Receive Data |
| Pin 3 | TxD | Transmit Data |
| Pin 4 | DTR | Data Terminal Ready |
| Pin 5 | GND | Signal Ground |
| Pin 7 | RTS | Ready to Send |
| Pin 8 | CTS | Clear to Send |

### *DB-25*



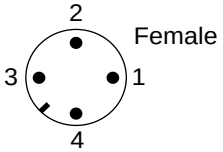

| | | |
|---|---|---|
| Pin 1 | Shield | EMI Shield |
| Pin 2 | TxD | Transmit Data |
| Pin 3 | RxD | Receive Data |
| Pin 4 | RTS | Ready to Send |
| Pin 5 | CTS | Clear to Send |
| Pin 7 | GND | Signal Ground |
| Pin 8 | DCD | Carrier Detect |
| Pin 20 | DTR | Data Terminal Ready |

### *Mini Din-8*




| | | |
|---|---|---|
| Pin 1 | HSKo | Handshake Output |
| Pin 2 | HSKi | Handshake Input |
| Pin 3 | TxD- | Transmit Data - |
| Pin 4 | SG | Signal Ground |
| Pin 5 | RxD- | Receive Data - |
| Pin 6 | TxD+ | Transmit Data + |
| Pin 7 | GPi | General purpose Input |
| Pin 8 | RxD+ | Receive Data + |

### *GPS Connector*




| | | |
|---|---|---|
| 1 | Gnd | Signal/Power Ground |
| 2 | TxD | Transmit Data |
| 3 | V+ | Power |
| 4 | RxD | Receive Data |

### Constructing a Data Cable for the IBM with a DB-9 Serial Connector

First, determine whether or not you need a male or female DB-9 to plug into the serial port of your computer (most computers will require a female DB-9). Use the pinout diagrams on the preceding page for the DB-9 and GPS connectors, and connect the following pins:

| GPS | DB-9 |
|---|---|
| Pin 4 (RxD) | Pin 3 (TxD) |
| Pin 2 (TxD) | Pin 2 (RxD) |
| Pin 1 (Gnd) | Pin 5 (Gnd) |

### Constructing a Data Cable for the IBM with a DB-25 Serial Connector

First, determine whether or not you need a male or female DB-25 to plug into the serial port of your computer. Use the pinout diagrams on the preceding page for the DB-25 and GPS connectors, and connect the following pins:

| GPS | DB-25 |
|---|---|
| Pin 4 (RxD) | Pin 2 (TxD) |
| Pin 2 (TxD) | Pin 3 (RxD) |
| Pin 1 (Gnd) | Pin 7 (Gnd) |

### Constructing a Data Cable to connect two Garmin GPS receivers

Obtain two GPS connectors and wire them as follows:

| GPS 1 | GPS 2 |
|---|---|
| Pin 4 (RxD) | Pin 2 (TxD) |
| Pin 2 (TxD) | Pin 4 (RxD) |
| Pin 1 (Gnd) | Pin 1 (Gnd) |

### Constructing a Data Cable for the Macintosh

The Macintosh serial port can deal with either RS-232 or RS-422 signals, and uses the Mini DIN-8 connector. Wire the cable as follows:

| GPS | Mini DIN-8 |
|---|---|
| Pin 4 (RxD) | Pin 3 (TxD-) |
| Pin 2 (TxD) | Pin 5 (RxD-) |
| Pin 1 (Gnd) | Pin 4 (Gnd) |

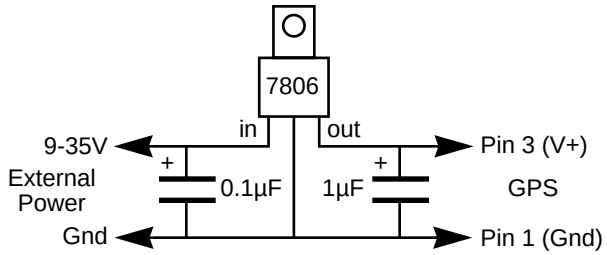
If your GPS emits a true RS-232 signal (most don't), tie Pin 8 on the Mini DIN-8 to Pin 4 to ground it.

### Incorporating a Power Source into your Cable

If your GPS is one of those capable of dealing with relatively high voltages, all you have to do is connect the positive supply to Pin 3 (V+) on the GPS connector, and the ground to Pin 1 (the same pin is used on Garmin receivers for both power and signal ground).

If you have a receiver limited to lower voltages, you'll have to incorporate a regulator circuit into your cable if you want to use your GPS with anything like a car battery (via a lighter adapter, for example). In either case, don't forget to add a fuse inline with the external power source.

The following circuit will provide a steady output of 6VDC to a GPS receiver, which should work for most Garmin models (though as always, check with your manual to be sure of the maximum voltage tolerated by your receiver, and double check the output voltage before connecting it up).




In this circuit, 7806 is a 6V voltage regulator, and the values and types of capacitors are not critical. If you find your GPS still wants to run off its internal batteries with the external supply connected, chances are that it needs a bit more than 6VDC to trigger it into using the external supply. To fix this, try a voltage regulator with a bit higher output—just don't exceed the maximum input voltage for your GPS.

### Sending in Your Pledge

If you ordered GPS connectors from Syzygy Research & Technology for a pledge, you can honour that pledge by using the self-addressed envelope provided. Please make sure that your name is clearly marked on the return address of the envelope, as well as the cheque, so that we are sure who the pledge payment has come from. If you are sending in a cheque, please make it payable to "Syzygy Research & Technology".

If you would rather honour your pledge by credit card, you can visit our web site (http://www.syz.com/gps/) to use our secure server, telephone us, or send in the information by mail. If sending credit card information by mail, please include the following details. Of course, we are always anxious to hear any comments and experiences you may have! Thank you once again for your interest in GPS connectors and the pledge concept.

Name: _____

Card number: _____

Expiry Date: _____

Pledge Amount: _____

Signature: _____

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