Installing Auxiliary Input & iPod Connector

For Stock pre-2000 GM Delco Headunits

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1.0 Introduction

After countless years of not being able to use my iPod in my 1998 Pontiac Bonneville SSEi I finally became frustrated enough to pursue a means of hooking it up to my stock headunit while maintaining a perfectly stock appearance, and avoiding the ridiculous cost of CD changer emulator aux input units.

As always I'm not responsible for you damaging your stereo, damaging yourself, or damaging your car. I assume simply by reading this guide you have a reasonable level of electronics and mechanical skills. Realistically the worst thing that can come of trying this is frying your head unit, or a couple blown fuses, but if you manage to take fucking up to the next level, I'm not responsible, but certainly entertained.

This approach of adding an auxiliary input is based on intercepting the audio signal passed from the cassette player unit, or the CD player unit to the head units "motherboard" and injecting our own signal, and allowing remote switching between sources.

2.0 Pre-Installation

2.1 Parts

Double pole, double throw relay.

- Such as an Omron LY2-DC12
- Do not use solid state relays, they have channel resistances that will negatively affect the sound quality
- Available from www.digikey.com

iPod interface cable with **Firewire** connection and line out

- Available from www.audio-outfitters.com or eBay

3M Scotchlok Connectors

- Available at any hardware store

6' stereo mini jack patch

- Available at any electronics store

Toggle switch

2.2 Evaluating Your Head Unit

This is important simply incase your stereo does not match either of two outlined stereo types in this guide. I will be showing the modifications for a 1998 2 band EQ CD player head unit, and a 1996 2 band EQ cassette player head unit.

I will not be outlining how to remove your dash or your stereo, there is useful information on that on the internets. Google it.

2.2.1 Cassette Player Interface

There are two interface cables between the 1996 cassette player and the head unit's "motherboard" as shown in Image 1.

Image 1 – Cassette Unit Interface

The smaller of the two bus interfaces is what we're interested in, with 7 wires.

Purpose of the wires in order:

White: Unknown
Red #1: Unknown
Red #2: Unknown
Red #3: -Left Channel
Red #4: +Left Channel
Red #5: -Right Channel
Red #6: +Right Channel

2.2.2 CD Player Interface

There is only one interface cable between the 1998 CD player and the head unit's "motherboard" as shown in Image 2.

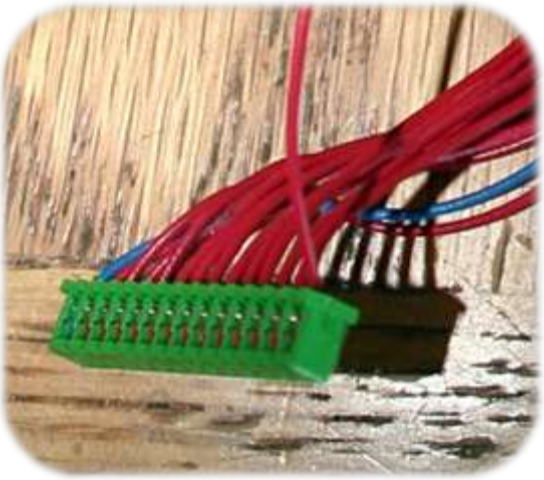
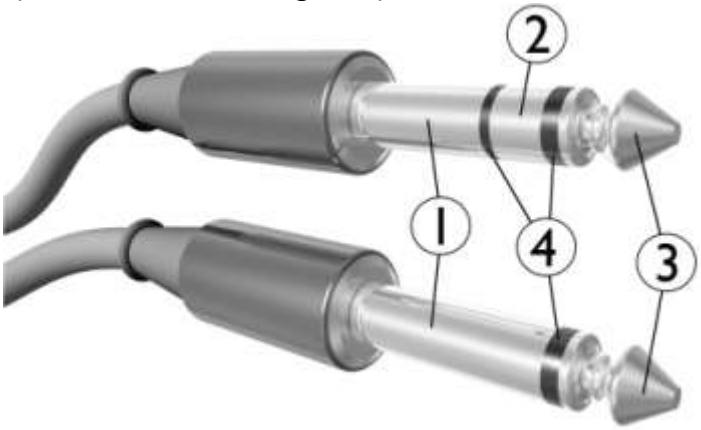


Image 2 – CD Unit Interface Bus

On this single bus we're interested in the wires FURTHER from the blue wire.
Purpose of the wires:
Furthest from blue wire: +Left Channel
Second furthest: Common –
Third furthest: -Right Channel
Rest: Unknown

2.2.3 Other Head Units
If the interface between your CD/Cassette player does not match one of the above do not fret, you can still determine which wires to tap into easily. Get a piece of 2 conductor wire stripping both ends, and a set of headphones, having a helper is useful here, have one person wear the headphones and hold one conductor to the sleeve of the headphones connector (1, as shown in Figure 1) and the other conductor to either the ring or the tip (2 or 3, as shown in Figure 1) it does not matter which.



Figure[1] 1

Start a CD or cassette playing and try different pairs of pins on the bus interface for your head unit until you can hear the CD/Cassette playing through the headphones. Once

you've found two distinct channels of sound you will have to determine which channel is left and which is right. This is extremely easy to do since this interface is outputting into an extremely high resistance load (the head unit motherboard) so when you apply your headphones to the circuit in parallel the vast majority of the signal is sent across the significantly smaller (approximately 30Ω) load. Therefore you will no longer hear any sound coming out of your car speakers, making it easy to note which side there is no longer sound coming out of, and that is the channel you've found on the bus interface!

2.3 Firewire Interface

Cut the Firewire connector off your iPod dock cable, leaving enough wire on the connector itself to allow you to determine which wires were connected to which pins on the connector itself. You're looking for the +12V (VCC) and ground (GND) wires to allow for charging of your iPod while it's connected to your car. The connector interface spec is shown in Figure 2.

Figure 2: Firewire Pinout[2]

Pin 1 is VCC which can accept up to 30V, a minimum of 5V is required to charge your iPod, we will be using your car's 12V ignition wire for a switched power source.

3.0 Installation

Now that we know which wires we need to interface with on the bus we can begin cutting and splicing in our relay.

First, cut the bus wires we need to use in the **MIDDLE.** Then use the wiring diagram shown in Figure 3 to wire up your relay. Soldering and heat shrinking (if you can) as shown in Image 3 and 4. Note: a four pole double throw relay was used in this installation; two of the poles were simply not used.

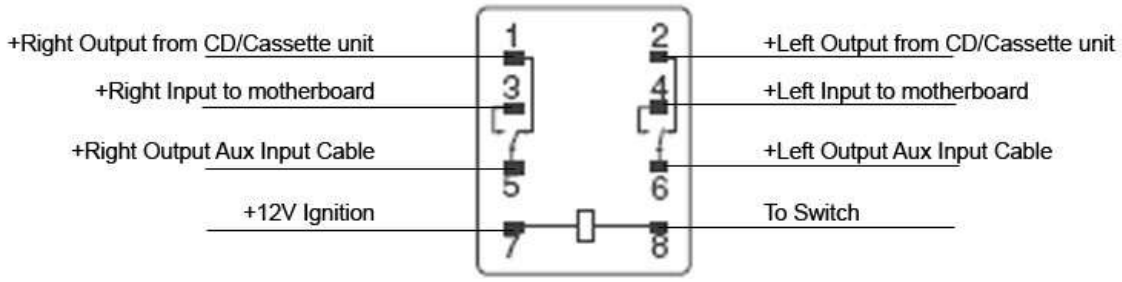


Figure 3: Relay Wiring Diagram

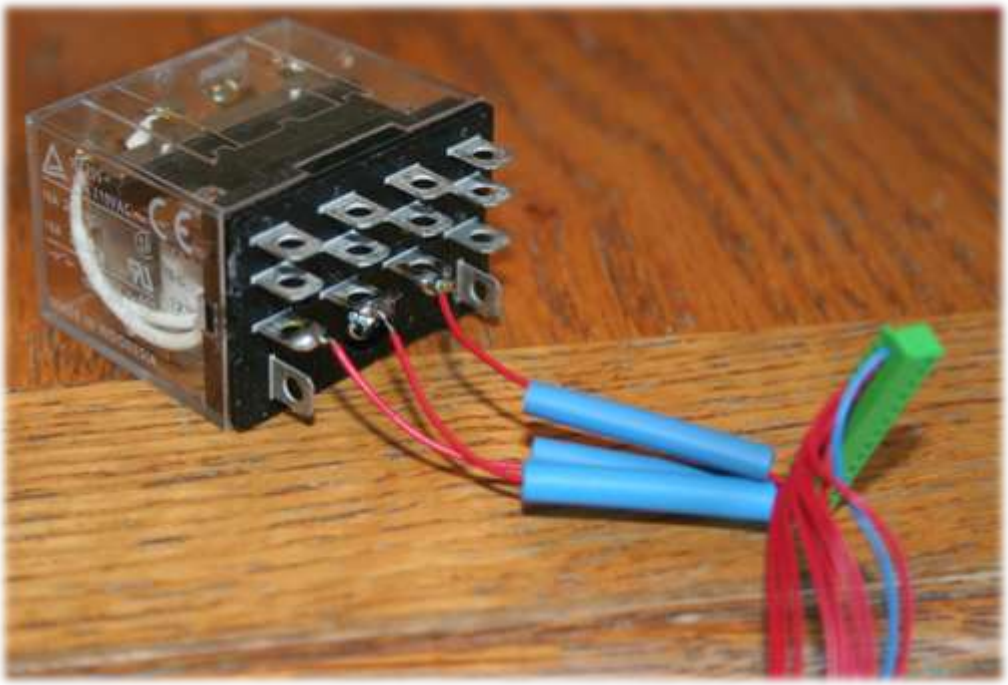


Image 3: Soldering & Heat Shrinking To the Relay

Image 4: Relay Being Installed

With this wiring scheme when you switch is in the 'on' position the aux input will be enabled. If you want the input to function the other way around ('on' position means CD/Cassette input) switch connections 1 and 5, and 2 and 6.

The ground(s) which we previously cut will need to be permanently connected to the ground from the 6' mini jack cable which has had the end cut off. **Make sure you route the minijack cable through the head units casing prior to soldering it down.** As shown in Image 5.

Image 5: Wires Routed Through A Hole

Locate and splice into the 12V ignition wire going into the wiring harness of your head unit. See the wiring harness pin out in Figure 4 for 1989-1999 vehicles.

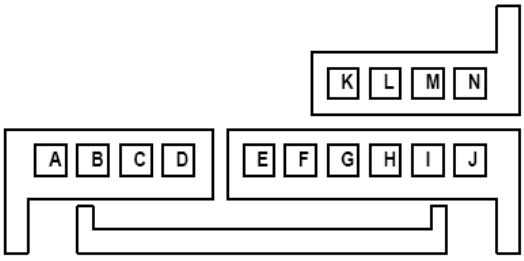


Figure 4: Wiring Harness as Viewed from the Connector[3]

Wire E is the ground wire, and wire I is the 12V ignition wire. Use the 3M Scotchlok connectors to tap into these wires, as seen in Image 6. You can also use ring terminals for the ground connections and connect them under any of the chassis screws on the radio itself. I found the latter method to be easier, as seen in Image 7. Connect the 12V source to the relay, as well as the wire in the Firewire connected you previously determined to be the 12V wire. Do the same with the ground from the Firewire wire. **Note: Make sure to ground the Firewire ground very well, if it's not grounded securely there will be a lot of noise in your connection.**

Image 6: Scotchlok Connector Being Installed

Image 7: Ring Terminals Used for Grounding

Finally ground the return from your switch to any viable chassis ground point.

4.0 Conclusions

Again I won't over any details regarding the routing of wires, or positioning your switch as that will be different for every car, and for every user's preference.

Here are some pictures of my completed installation.

Relay In Place

Switches installed in the center console, lower one is for the auxiliary/CD input switching, upper one is for the subwoofers.

The iPod sits just outside the console where my hand naturally rests for easy control.

I also tinted my iPod's screen to match my dash lights, and head unit's lights.

5.0 References

1. http://en.wikipedia.org/wiki/Image:Jack_plug.png
2. http://pinouts.ws/firewire-1394-pinout.html
3. http://www.installdr.com/Harnesses/GM-Wiring.pdf