



Introduction

In [Bristol Village](http://www.bvres.org) <www.bvres.org>, a community of active seniors in Waverly, Ohio, we live in a broadcast signal reception hole. Radio stations that grownups in the Village prefer to listen to are too weak for the average table radio. The average car radio, however, is better at receiving distant signals than the average table radio. So, why not use a car radio in the house? This is the saga of how I adapted a car radio for home use.

Finding Power

The first issue to be faced is that car radios work on 12 volts DC rather than household AC power. A quick search of the Internet revealed a multitude of articles and YouTube videos describing how to re-purpose a computer power supply for use as a car radio power supply. Since I spend a lot of time in the Bristol Village Computer Club work room repairing old computers, I have access to a number of computer power supplies from computers that long ago bit the dust. However, computer power supplies are available from places like the Microcenter <www.microcenter.com> for under \$20.



Picking a Radio

Since a power source was not hard to find, the next step was to select a radio and speakers. After searching the internet, reading car radio reviews, I decided on a Pyle PLR34M. This model has plenty of power for my purpose, and it has what for me is an important feature. It has both USB and SD card connectors. This provides an easy way to listen to unlimited personally selected mp3 music files, when the broadcast stations are not playing what I want to hear.



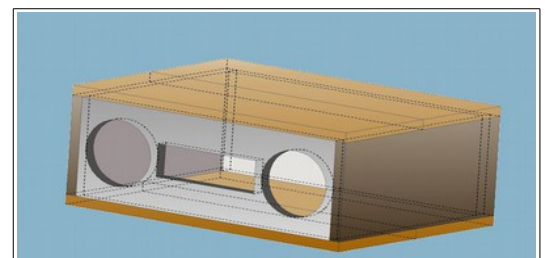
I then added a pair of Pyle PLMR41B 4" speakers. I went with the 4" size because I wanted to mount the radio and speakers on the front panel, and I did not want the radio box to get too wide. I considered mounting the speakers on the sides or top of the box, but this did not seem the best location.



One thing about car radios is that they use a type of antenna connector that is standard for car radios, but is not the standard home radio connectors which are either 75 ohm coax connectors or 300 ohm twin lead. Searching for an adapter for radio to coax drew a blank so I resigned myself to doing a bit of adapting and soldering.

Prototyping

To test the concept, I assembled the parts in a cardboard box; first of all to see if I could make the power supply and radio work together, and second to see if the car radio would pick up the desired stations. The wires on the Pyle radio were well marked, and that made things a little easier. The Internet provided the necessary information about which of the bundle of wires coming from the computer power supply to use. The YouTube videos I found were a little light on details, but after a couple of tries, I got the thing to make noise. The radio only picked two undesirable stations from the computer work room, so I moved the prototype to an exterior room and the desired (classical music) station came in loud and clear. Now it was time to get serious and put the pieces together in a presentable package.





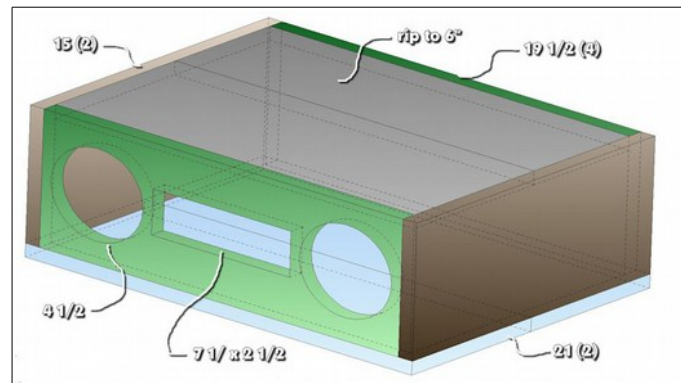
Designing the Box

Once the pieces of the project were decided on, the next step was to design a box. I could have simply sketched this out on an old napkin, but I decided to dig out my old CADKEY computer aided design software. (In an earlier lifetime, I used to write books to teach people how to use CADKEY.)

I decided to keep the box simple and use stock lumber to minimize the need for professional woodworking equipment or power tools. I decided to use 1x8 good quality pine boards. Two pieces side by side provided a 15 inch depth for the box. The height of the box was determined by the size of the lumber. Normally 1x8 lumber is $\frac{3}{4}$ inches thick by 7 $\frac{1}{2}$ inches wide. However, I found that the good quality stuff was actually 7 $\frac{1}{4}$ wide. This was not a problem, but I had to adjust my original measurements.

This layout allowed for all simple straight crosscuts except for the bottom of the box. To recess the bottom inside the other pieces required one rip cut to get the proper dimensions for the bottom.

The drawing shown here is oriented with the box upside down. This makes it a bit easier to visualize how the bottom fits between the walls of the box, while the top overlaps the walls. The dimensions in the drawing are for standard 7 $\frac{1}{2}$ inch wide lumber. I had to adjust the 6" rip dimension for the grade of wood I found in the lumber store.



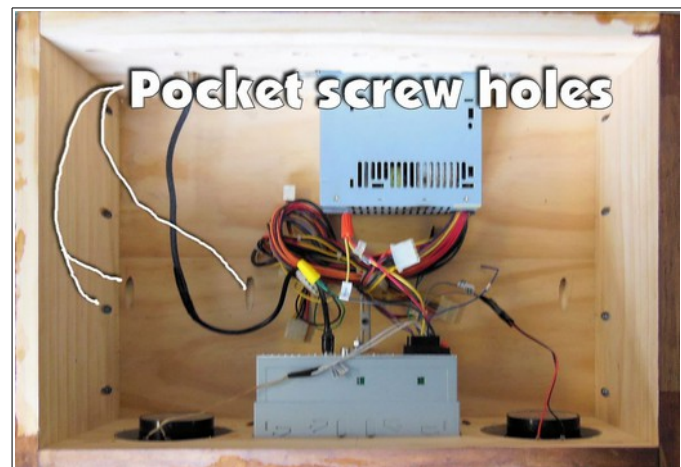
The hole size for the speakers has to be adjusted for the speakers selected. I had to make the holes slightly smaller than what is shown to insure enough wood for the mounting screws.

Assembling the Parts

The radio box was assembled by screws in pocket holes made using a Kreg Jig. The Kreg Jig is a wonderful tool for assembling projects like this. The jig has a quick clamp to hold the wood. A special drill bit cuts the pocket hole at the proper angle and depth to accommodate self tapping wood screws. No glue is necessary, and making the holes and adding the screws is easy and quick.



You can see how the pocket holes were used to assemble two pieces side by side to form the top and bottom of the box, and also to mount the side walls to the top. (The box is upside down in this picture.)





Holes were made in the front of the box to accommodate the speakers and radio.

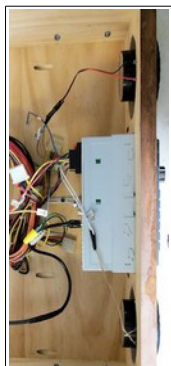
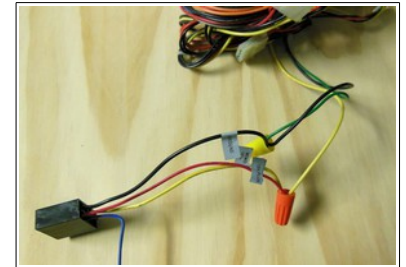
The Pyle PLR34M radio comes with a metal sleeve that has bendable tabs to lock it in place. The radio simply slides into the metal sleeve and snaps in place. The radio is supplied with a couple of keys that can be used to release the holding tabs so that the radio can be removed if needed.

Once the box was built, stain was rubbed into the wood and a couple of coats of polyurethane varnish were applied.



Wiring the Radio

This model radio comes with two connector blocks, one for power and the other for speakers. The computer power supply had plus 12 volts on the yellow wires. Black and green wires are for ground. The power supply in this example required both black and green to be connected to the radio ground. This radio has a yellow wire for +12 volts and a red wire marked accessory. The red and yellow wires both must be connected to the yellow wire from the power supply for the radio to work.

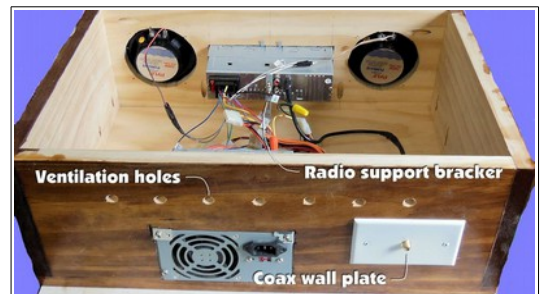


A separate Radio connector block has wires for the speakers.

This radio provides for both front and rear speakers, but in this case only the front speaker connections were used. The wires are nicely labeled left, right, + and -. Make sure that the same polarity is used on both speakers. I soldered all connections, although it is possible to twist the wires together and use wire nuts to secure the connection.

The wires for this radio come partially stripped to make it easy to connect. I taped the unused wires to prevent any unwanted contacts.

The antenna wiring was a bit of a challenge. Car radio antennas use a connector that is different from typical table top or hifi radio antenna connections. I could not find an adapter so I spliced the connector cable from a car antenna to a cable with a coax F connector. My car radio antenna cable had a very small gauge core wire, and I had a little trouble stripping it without cutting the wire. Eventually I was able to solder the core and shield wires to connect the car antenna cable to a coax cable connector. I used a standard coax wall plate to feed the antenna wire through the back of the box.



The power supply was mounted by fabricating s-shaped metal straps to attach the power supply mounting screws to the back of the rear box wall. The power supply has a cooling fan, but because it was installed in a closed box, ventilation holes were added to the back of the box. After running the power supply overnight with the box closed, the power supply was still running cool.

The radio came with a support bracket strap that was attached from the radio to the box to stabilize the radio.



The Finished Project

Overall, I am satisfied with the finished radio box. Connecting an antenna to the coax connector allows me to receive the desired radio stations from inside the house. Antenna placement is, of course, critical. Some experimentation is necessary to determine the best antenna location and orientation.

One of the things I like about the Pyle PLR34M is the USB port. I have a 4GB flash drive that has a collection of nearly 500 music files. The PLR34M plays through the selections and provides hours of uninterrupted listening enjoyment. The radio box acts as a pretty good speaker enclosure and with the 4 inch Pyle speakers provides a sound quality that to my aging ears is very good.

The included remote control makes it easy to switch between radio and USB modes, and can advance between selections with the click of a button. The radio display shows the name of each file as it is played. Of course this name has to be entered when creating the database of music files on the flash drive.

You may notice that although the radio has its own power switch, there is none for the power supply. This was taken care of by plugging it into a surge protector/ power strip and using the surge protector switch to turn off the power supply. If you use the radio presets to remember your favorite stations, the settings will be lost when the power supply is turned off.



Materials Used

Item	Cost
Computer Power Supply (Microcenter)	\$15.00
Pyle PLR34M Radio (Amazon)	\$30.35
Pyle PLMR41B 4" Speakers (Amazon)	\$15.08
1x8 pine – 16'	Around \$30.00
Stain & Varnish	Around \$10.00
Coax Wall Plate	\$5.00
Car Radio Antenna	\$10.00
Total Cost	About \$115