**Parts List:**

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<th>Item</th>
<th>Part #</th>
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<td>1 pair of Dayton Audio B652s</td>
<td>300-652</td>
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<tr>
<td>1 Dayton Audio DTA-2 amplifier</td>
<td>300-385</td>
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<td>1 MP3 module</td>
<td>320-350</td>
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<tr>
<td>1 7805 +5 VDC voltage regulator</td>
<td>7805</td>
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<td>1 12 VDC 2A power supply</td>
<td>129-077</td>
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<tr>
<td>1 2.1 mm panel mount jack</td>
<td>090-488</td>
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<td>1 3.5 mm panel mount stereo jack</td>
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<td>1 Belkin 18 AWG 25 ft. speaker wire</td>
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<tr>
<td>1 3.5mm Stereo Metal Phone Plug</td>
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</tr>
<tr>
<td>1 Belkin Cat 5e 3 ft. Patch Cable</td>
<td>109-352</td>
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<tr>
<td>1 #8 x 1/2&quot; Self-Tapping Truss Head Screws</td>
<td>081-460</td>
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<td>1 Heat Shrink 2:1 Black Assorted Sizes</td>
<td>080-720</td>
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**Tools List:**

- Jigsaw, or handsaw
- Electric or battery powered drill
- 7/32" drill bit
- 5/16" drill bit
- 1/2" drill bit
- Soldering iron
- Solder
- #2 Phillips screw driver
- Hot glue and hot glue gun, or two-part epoxy
- Wire strippers
- Diagonal cutters
- Helping hands for soldering

**Instructions:**

There are many different ways to build this project. The following documents the steps we used here at Parts Express. Feel free to stray from these directions as needed. The wiring, though, should be followed.

Begin by removing the drivers (tweeter and woofer) and stuffing from one of the B652 cabinets. Two pairs of wires (one white and black pair for the woofer, one red and black pair for the tweeter) and an electrolytic capacitor are attached to the internal cup terminals on the inside of the speaker cabinet. Cut and remove the wires about two inches from the terminals for future connection to the DTA-2 left speaker output. A capacitor lead is soldered to the positive terminal. Cut this connection as close to the terminal as possible and gently remove the capacitor from the glue on the terminal; set aside for future use.
Mark a center-line on the side of the cabinet where you plan to install the MP3 player module (320-350) and DTA-2's volume control (300-385). The DC power jack (090-488), and optional 3.5 mm stereo input jack (090-317) should be rear mounted, and the easiest place is on the speaker terminal cup.

We chose to install the MP3 module and volume control on the left side of the right master speaker cabinet so that we could still use its remote control and easily adjust volume while sitting at the desk where we planned to use them. The power jack and optional 3.5 mm stereo input jack are mounted on the rear to keep the master speaker from looking too cluttered on the side.

After marking where the items will reside on the master speaker, cut a 2-1/2" wide by 1-1/4" rectangular hole for the MP3 module. Pay close attention to the dimensions listed for the module so that the four mounting screws have enough material to hold the module in place after cutting out the hole.

About an inch below the MP3 module, we drilled a 5/16" through hole and a 1/2" recess hole for the mounting of the volume control included with the DTA-2. The recess hole allows you to adjust how far the volume control protrudes from the cabinet. We made our recess hole on the outside of the cabinet (for ease of drilling), pressing the volume control's mounting nut into place.

In order to make the volume control completely level with regards to the cabinet surface, a few washers were used to make the back surface (on the inside of the cabinet) level with the metal finger that would otherwise hold the volume control in place when used with a molded plastic cabinet. Once tightened in place, connect the ribbon cable that will later feed to the DTA-2.

Next, drill the holes for the 3.5 mm audio input (optional) and the 2.1 mm power jack, which are 7/32" and 5/16" respectively. We chose to place these on the rear of the cabinet spanning the speaker input terminals on the vertical axis of the terminal cup. The reason for using the speaker terminal cup was that the material thickness facilitated easy mounting.

The hardest part of this project is the wiring. That's not to say that it's too tough, it just takes some time, planning, and a careful touch.

The first part we began wiring was the MP3 module. At the time we were working without the included harnesses, so this should be easier for you.

For all of the connections on the MP3 module, we used 18 AWG Belkin speaker wire and marked which wire went where using different color Sharpie® brand markers. In order to make future work with each electronic component easier, each wire run was about 12" longer than it had to be for performing all work outside of the speaker enclosure. See the image below for reference:
The +5 VDC and ground wires were soldered to the bottom of the MP3 module at the solder points that feed to the pins above. The left and right wires were soldered to the bottom of the board, but due to close proximity, the ground wire was soldered directly to the adjacent pin on the top of the board. Once the solder cooled, we wrapped the board with a cable tie to hold the wires firmly in place. This is a safety measure and is optional.

The MP3 module was then installed using #8 x 1/2" self-tapping truss head screws (which are a little on the large side with regards to the hole diameter), was what we had on hand. Substitute with any screw that suits your taste and needs. #6 fits the screw hole diameter properly.

Prior to installing the 3.5 mm jack (centered above the speaker terminals), cut and separate the eight wires within the Belkin Cat5 cable removing them from the cable assembly. These will serve as the conductors for the audio input jack. Cat5 cable conductors were chosen for their flexibility, and feed into the through holes on the 3.5 mm jack perfectly for soldering.

We soldered a solid blue conductor to the center tab of the jack for ground, a white striped wire to the small silver tab for the left positive, and a solid orange on the small gold tab for right positive. Again, 12" of extra wire was added to each conductor to facilitate ease of future installation and wiring. When connected to a patch cable, the wiring follows the tip (L+), ring (R+), sleeve (ground) convention.

Install the jack into the speaker terminal cup and once you are satisfied with its position (the inner ring abutting the patch plug should be flush with terminal cup) use epoxy to hold it in place. After five minutes we tested the jack to make sure it would stay in place while testing continuity between the opposite end patch plug and the internal wiring.

Next, solder the DC power jack with the 18 AWG Belkin speaker wire observing polarity. With this particular jack, there are two ground tabs; one centered, and one on the right with tabs in the 9, 12, and 3 o'clock position. The left tab is your +12 VDC. Once soldered, be sure to cover your connections using heat shrink.
Install the DC power plug into place on the terminal cup, centered and below the speaker terminals. There is an angle to the lower section, so make sure you have your hole drilled as low as the cup allows. Once installed, use a small amount of epoxy to hold it in place. After the epoxy dries, connect the 12 VDC power supply listed on the parts list and check for proper voltage and polarity. Up to 12.5 VDC is perfectly fine when not under load.

The MP3 module requires 5 VDC power, and if you would like to use the USB port for charging a smart phone (in addition to reading MP3 files) it is highly recommended to use a voltage regulator in conjunction with the 12 VDC power supply.

We chose a 7805 IC for the voltage regulator due to the wide operating input voltage (in case something was to go wrong with the power supply). We have listed a regulated power supply in the parts list, so we are operating safely with two regulated voltages.

The three pins on the 7805 are (from the left): 1 for voltage (+) in, 2 for shared ground (-), and 3 for voltage (+) out. See the image below for reference:

![Image of 7805 IC](image)

Feed the +12 wire from the 2.1 mm DC input jack to pin 1 of the 7805. Additionally, cut a section of positive conductor from the speaker cable to create the +12 for the DTA-2 power input. Strip away about 3/8" from the end of the wire from the jack and 3/8" from each end of the second positive conductor. Solder the two separate cables together and place about 1-1/2" piece of heatshrink over the pair. Solder this pair to pin 1, placing the heatshrink over the assembly butting against the chip section of the 7805 and shrink into place.

Solder the +5 VDC wire from the 7805 IC to the +5 VDC on the MP3 module (make sure you place a piece of heatshrink over one of the wires) and then heatshrink to insulate the joint. Do this also with one of the ground wires from the 7805 to the ground wire of the MP3 module. At this time you can mount the voltage regulator onto a small copper covered coin (drill a hole through this coin; it is to be used as a heatsink) and secure inside the speaker cabinet using a 4-40 pan head screw no more than 1/2" long. Keep in consideration that the second +12 VDC wire from the 7805 and second ground wire still need to be connected to the DTA-2. See the image below for reference.
First, solder a pair of speaker wires onto the + and – terminals for A; repeat for B. Separate red and black wires are included with the DTA-2 kit. Use these for the power connection at C. Two ferrite cores are included with the kit, as well as two output non-polarized capacitors. Loop each pair of speaker wires coming from the DTA-2 through and around its ferrite core and set to the side.

Slide a piece of heatshrink over, connect, and solder together the +12 VDC and ground wires, from both the 7805 and DTA-2, together; heatshrink the joints for insulation. Next cover (with heatshrink), connect, and solder together the right speaker output negative (from the DTA-2) to both of the black terminated speaker wires that were removed from the speaker terminals at the beginning of the project, and one lead of the output capacitor.

Cover (with heatshrink), connect, and solder together the positive right speaker output (from the DTA-2), white terminated speaker wire (for the woofer), a lead from the capacitor removed from the terminal cup, and the other lead of the output capacitor included with the DTA-2. Cover (with heatshrink) and solder together the other lead of the capacitor from the terminal cup to the red terminated speaker wire (for the tweeter).

Solder the left DTA-2 speaker outputs to the internal speaker terminals, red to the left for positive and black to the right for negative. The output capacitor is then soldered in parallel between these terminals.

Connect the ribbon cable from the volume control to the DTA-2, and locate a free, non-interfering location within the cabinet to epoxy or hot glue the DTA-2 board to. Epoxy and position the DTA-2 in place. We chose the area directly behind the woofer since it will sweep air across this position (which vents through small gaps on the MP3 module).
The gaps on the MP3 module slightly affect bass performance, but it's not enough of an issue to seal the entire unit up.

We now need to feed the audio signal connections from both the 3.5 mm jack and MP3 module to the DTA-2. Due to the number of connections, we found it easiest to solder the audio signal connections together (left + to left +...etc.) and then to a 3.5 mm stereo plug, observing the image below:

Once you have this internal patch cable is finished, connect it to the DTA-2 and epoxy (or hot glue) into place. After the epoxy dries, lay the cabinet on its side and temporarily connect the woofer and tweeter to their respective wires.

Now it's time for testing. Connect the left slave speaker terminals to the master speaker's external speaker terminals. Connect the 12 VDC power supply to the 2.1 DC jack. Right away, the green LED on the MP3 module should illuminate. Save a few MP3 files into the root directory of a USB memory stick or SD card.

Connect the storage device to the MP3 module, after a few moments the module should find the MP3 files and start to play automatically; the green LED will flash when playing songs. If not, press the USB/SD button on the module, then play. Once you have a flashing LED, turn the amplifier on with the volume control and adjust to a reasonable level.

While playing an MP3 file, connect an external audio device to the 3.5 mm stereo input. As soon as a signal is seen over this connection by the amplifier, the amplifier should auto switch to external signal. You should notice that you are able to get a higher volume using an external device, this is normal. Remove the external device from the 3.5 mm stereo input. The amplifier will switch back to the MP3 player automatically.

After verifying everything above works, reinstall the stuffing and install the speakers. **Congratulations, you're finished!** For portability, we do offer an 8 AA cell battery holder (140-978) that can be used to power this system with the addition of a 2.1 x 5.5 DC power plug (090-477) wired center positive. Additionally, you could use a cigarette lighter adapter (265-562) with a 2.1 x 5.5 DC power plug.