

Mighty Tiny Audio Player Version 1.2 PC Board

Parts and Build Information Guide

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This guide will help you buy the parts and build Mighty Tiny Audio Player Board. This is a Do It Yourself project. What does that mean? Please read on...

Mighty Tiny Audio Player (MTAP for short) is a build it yourself project to help our fellow Haunters have access to some of the latest technology in prop and scene controlling. The largest hurdle for home and smaller Haunts is cost. One way to help lower the cost is by letting you use the parts you already have on hand.

To save cost, Haunt Hackers does offer limited information support services via our Facebook Group page. We do not offer repairs for any of the DIY projects. All PC boards are sold without warranty. Any unauthorized shipment of boards and other items to Haunt Hackers will not be returned. We do have a helpful group of supporters on our Facebook page (facebook.com/groups/HauntHackers) that could give you a hand.

As for custom code, you will need to do that on your own. But fear not, the Picaxe series of controller chips use the simple "BASIC" programming language that is both powerful and easy to pick up. The programs in the project library are well commented and can be used to help create your own projects.

It is up to you to buy, build and program the project. We do sell a Printed Circuit Board kit to make the project easier to build. From time to time we do offer update to the MTAP board and available as a free download.

Please consider these points carefully in deciding if this project is for you.

Sources for the Parts

When designing MTAP, we tried to use parts that TaydaElectronics.com normally stocks. This Asian seller of electronic parts has low prices with quick, low cost shipping. We've used them for several years and never had an issue with our orders. With their low prices, it would be a good idea to stock up on extra parts when ordering.

Tayda is good, but with their low prices it does limit the variety of parts they carry, so a few parts need to be ordered from other suppliers. For example, Tayda does not carry the Picaxe 08M2 (IC1) controller chip or the USB download cable for programming it. We've found that phanderson.com is a good source with low prices and their shipping to the USA is at a fair price and quick. The Picaxe 08M2 can be also ordered from robotmesh.com and other stores on the web. Be sure to shop around to find the best total price that includes tax and shipping.

We have included with your PC board few parts to save you time and money. The DFDplayer Mini Audio Module and the color button caps for the push button switches are a bit hard to find from local sources who are willing to sell at a fair price.

The following parts list will guide you through ordering from the different suppliers. Be sure to verify the parts are in stock before adding them to the shopping cart. Do not complete any order until ALL parts have been double checked and verified in stock. After all, who wants to pay for extra shipping costs because of an ordering mistake?

Parts list for Mighty Tiny Audio Player version 1.1 board.

Part	Count	Details	SKU or Part Number	Source
C1, C2	2	0.1 UF 50V Capacitors	A-553	Tayda
C3	1	100 UF 25V Capacitor	A-4541	Tayda
IC1	1	Picaxe 08M2 Micro-controller	PICAXE-08M2	phanderson.com
USB Cable	1	USB Download Cable	Rev-Ed AXE027*	phanderson.com
LED1	1	3 MM Green LED	A-262	Tayda
LED2	1	3 MM Red LED	A-261	Tayda
R1, R2	2	470 Ohms 1/4-Watt Resistors	A-2049	Tayda
R3, R4	2	1K Ohm 1/4-Watt Resistor	A-2123	Tayda
R5	1	4.7K Ohm 1/4-Watt Resistors	A-2027	Tayda
R6-R10	5	10K Ohm 1/4-Watt Resistor	A-2115	Tayda
R11	1	22K Ohms 1/4-Watt Resistors	A-2111	Tayda
S1-S3	3	SPST Micro Push Button Switch	A-5129	Tayda
S4	1	Mini Slide Switch 1P2T	A-5102	Tayda
Jack1	1	DC Power Jack 2.1mm Barrel	A-4118	Tayda
Jack2, Jack3	2	3.5mm Stereo Chassis Jack	A-853	Tayda
Socket: IC1	1	8 Pin DIP Socket	A-001	Tayda
8 Pin Female	2	Pin headers for MOD 1	A-1305	Tayda
X2	1	DG301 Screw Terminal Block 2 Positions	A-668	Tayda
X4	1	DG301 Screw Terminal Block 3 Positions	A-669	Tayda
Case	1	Plastic Project Box 03 (Optional)	A-2383	Tayda
Micro SD-Card	1	2 GB or larger at Class 4 or better		Local Store or eBay
MOD1	1	DFplayer Mini MP-3/wave player	Included with PC board kit	
Button Color Caps	3	Blue, Green and Red	Included with PC board kit	

Notes:

Most items can be found at taydaelectronics.com. Both prices and international shipping are low with turnaround taking about week to get your parts in. Not a bad idea to stock up on extra parts when ordering parts for Banshee Jr.

*The USB Download Cable (Rev-Ed AXE027) is only need for programming the Picaxe 08M2+ chip. If you already have one from other Picaxe projects, no need to order another one.

Mighty Tiny Audio Player Build Documentation

As stated when you order your MTAP PC board, this build is for those experience with “Through the hole” soldering projects and the tools necessary to do the work.

The installation of parts is based on their height with the smallest going in first. (This will aid in keeping the parts flushed with the PC board.) Please review the parts and their order of installation before soldering. Any parts with long leads (like Resistors) will need the excess length cut off close to the PC board after soldering.

- 1) Install the two 470 Ohm (Yellow, Violet, Brown) Resistor in R1 and R2. (Solder and cut leads.)
- 2) Install the two 1k Ohm (Brown, Black, Red) Resistors in R3 and R4. (Solder and cut leads.)
- 3) Install the 4.7K Ohm (Yellow, Violet, Red) Resistor in R5. (Solder and cut leads.)
- 4) Install the five 10K Ohm (Brown, Black, Orange) Resistors in R6–R10. (Solder and cut leads.)
- 5) Install the 22K Ohm (Red, Red Orange) Resistor in R11. (Solder and cut leads.)
- 6) Install the 8-pin socket for IC1. Solder just one pin and verify IC socket is flush before solder the final 7 pins.

This would be a good time to check the solder connection on the board. After all, you just did about 30 solder joints and there is a chance one or more will need to be resoldered.

- 7) Install the two 0.1 uf (104) Disc Capacitors at C1 – C2 Disc Capacitors. (Solder and cut leads.)
- 8) Install LED1 (Green) and LED2 (RED). The longer lead goes in the (+) hole. (Solder and cut leads.)
- 9) Install Jack2 and Jack3, the 1/8-inch Audio Jacks. Solder the center pin first and remelt the join and push the jack flush with the PC board. Now, solder the other four pins on each jack.
- 10) Install S1, S2 and S3 push button switches. Push the switches through the holes in the board till they are flat on board and level. Solder just one pin on each switch and verify they are in correctly. If so, solder the other three pins on each push button switch. (Do not install the color buttons cap at this time.)
- 11) Install S4 slide switch. Solder one pin and then verify the switch is flush before solder the other pins. Cut off the extra leads from S4.
- 12) Install the two 8 female pin headers for the DFplayer Mini Audio Module. Install the first header and solder one pin. Verify that the header is in flat and straight. This is crucial for the module to plug into these headers. Now, solder the 7 pins and do the same for the other socket.
- 13) Install the 2-Pin Terminals for X2. Place it on to the PC board with the terminal connection holes to the outside. Solder one pin and check for alignment and adjust as needed. Now solder the other pin on each terminal.
- 14) Install the 3-Pin Terminals for X4. Place it on to the PC board with the terminal connection holes to the outside. Solder one pin and check for alignment and adjust as needed. Now solder the other pin on each terminal.
- 15) Install the Jack 1, the DC Power Jack 2.1mm Barrel. Solder one pin and verify the placement of the jack. Please note these pins for Jack 1 will require extra solder because of their larger size.
- 16) Install C1 (100 UF 25V Capacitor) Note the positive side of the Capacitor (longer lead) goes to the (+) hole.

Review the board for bad or incomplete solder joints. Remove any cut wires or extra solder from the board.

Power Check.

Before installing the parts in their sockets, a simple power test should be done. Remove all metal from the test bench. This includes tools, parts and leftover wire cuttings. Connect the 5 Volt power source with two or more amps to Jack 1. This must be a regulated 5 Volt power with the center pin being the positive connection.

After applying power, the Green Power LED should light up. If not, please review work for issues.

Remove the power and wait for the Green Power Light to go out.

Final Installation of Components.

Static protect must be used with these final parts and note what side has the notch. Plugging the chips in backwards can destroy the chip. When install IC1 the pins will be bent outward a bit too far for the socket. Use a pair of needle nose pliers to bend them inward so the pins line up with the holes in the socket. Make sure every pin goes into the socket before pushing them in all the way in.

- 17) Install the Picaxe 08M2 chip into the IC1 (8 pin) socket. Be careful plugging in the chip since there many more pin and it's easy to bend or break a pin off. Also, plugging it backwards will destroy it. (note the Pin 1 marker.)
- 18) Install the DFplayer Mini module into the two 8-pin headers. Note the outline of the player one the PC board and the Micro SD-Card slot goes to the outer edge of the Pc board.

Do a final check that all the parts are plugged into their sockets correctly. Notch all the Intergraded Circuit have their notches to the left or top side of the chip. A chip in backwards will damage not only that chip but other parts on the board. **DO NOT RUSH THIS STEP!**

Final Systems Check

Install the latest version of the Picaxe programming software from Picaxe.com for your computer. Plug in the USB Download cable to your computer. (Follow the directions to verify that the Download cable is working.)

Connect the main power (5 Volts) to Jack1 on the MTAP PC board and verify the Green power LED is lit. Now, connect the Download cable to the 1/8-inch program jack (Jack 3) that is between S3 and S4. (This NOT the Audio Line-Out jack.) Hook up a headphone or powered speakers to the 1/8-inch audio jack (Jack 2) located next to the Speaker Terminal. (Or connect a speaker of 3 watts or less to the Speaker Terminal.) Make sure that the slide switch (S4) is in the "PRG" position.

Use the programming software to download the project's code into MTAP to verify everything is working. (See Operation Manual included with your project's program.) Once programmed, unplug the Download Cable from Jack3 and slide the S4 switch back to the run position.

Once the program has been installed on MTAP, you can only download a new version when S4 is in the “PRG” and while the RED status LED is pulsating during power-up. (This last for a few seconds.) Once the LED stop pulsating, the MTAP will no longer can be programmed. Removing power and then restoring it will restart the MTAP and let program it. (But only while the Red Status LED is pulsating.)

If your MTAP is not working, please review your work for errors.

