

Wee Little Talker Information Guide

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This guide will help you buy parts and build a Wee Little Talker Board. This is a Do It Yourself project. What does that mean? Please read on...

Wee Little Talker is based on the Technology used in the larger Banshee Super Prop Controller. Since it only drives one servo for the Jaw, we could reduce the parts count and lower the cost to build. It still uses the MSGEQ7 Audio Spectrum Analyzer to help convert a voice into lip-sync movements.

When designing Wee Little Talker, we tried to use parts that TaydaElectronics.com stocks. This Asian seller of electronic parts has low prices with quick, low cost shipping. We've used them for a number of years and never had an issue with our orders.

While most of the parts will come from Tanda Electronics, a few parts are from other suppliers. In the case of the Picaxe 20X2 (IC 1) controller chip, I've found that phanderson.com is a good source. Their prices are good and shipping to the USA is quick.

IC1 (MSGEQ7), IC3 (Voltage Regulator), DFplayer Module and the 3 Color push button caps are included in your PC board kit to help keep your ordering cost down. (The suppliers charge many times more for shipping than the part itself.)

What we can't do is write custom code for you. But fear not, the Picaxe series of controller chips use a simple Basic language that is both powerful and easy to pick up. The programs in the project library are well commented and can be used in your own projects.

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 Wee Little Talker Version 3 PC board.

Part	Count	Details	Tayda SKU	Other SKU	Source
C1	1	33 PF Capacitors	A-525		
C2 – C7	6	0.1 UF 50V Capacitors	A-553		
C8	1	100 UF 25V Capacitors	A-4541		
Jack 1	1	DC Power Jack 2.1 mm	A-4118		
Jack 2 & 3	2	1/8" audio jack	A-853		
LED1	1	3 MM Red LED	A-261		
LED2	1	3 MM Green LED	A-262		
R1	1	200K Ohm 1/4-watt Resistor	A-2134		
R2, R3	2	22k Ohm 1/4-watt Resistor	A-2111		
R4	1	470 Ohm 1/4-watt Resistor	A-2049		
R5	1	150 Ohm 1/4-watt Resistor	A-2059		
R6	1	330 Ohm 1/4-watt Resistor	A-2067		
R7, R8	2	68 Ohm 1/4 Watt Resistor	A-2086		
R9, R10	2	4.7K Ohm 1/4 Watt Resistor	A-2027		
R11 – R15	5	10K Ohm 1/4 Watt Resistor	A-2115		
S1-3	3	SPST Push Button Switch	A-5129		
IC1	1	MSGEQ7 ASA chip		Included with Basic PC board kit.	
IC2	1	PICAXE-20X2		PICAXE-20X2	phanderson.com
IC3	1	MCP1700-3302E		Included with Basic PC board kit.	
USB Cable	1	USB Download Cable		AXE027*	phanderson.com
Socket: IC1	1	8 Pin DIP Socket	A-001		
Socket: IC2	1	20-Pin DIP Socket	A-1600		
X1 - DG128	1	2 Positions Terminal 5mm	A-664		
8 Pin Socket	2	8 Pin 2.54mm Single Row Female	A-1305	(Used to mount DFplayer Mini)	
Pin Jumper	5	Mini Jumper 2.54mm	A-1324		
Mod1	1	DFplayer Mini		Included with Basic PC board kit.	
Red Button Cap	1	Red cap for S1		Included with Basic PC board kit.	
Blue Button Cap	1	Blue cap for S2		Included with Basic PC board kit.	
Green Button Cap	1	Green cap for S3		Included with Basic PC board kit.	
Micro SD-Card	1	2 GB or larger & Class 4 or better			Local or eBay.com
Pin Headers	3	40 pin Single Row Pin Headers	A-197		
Use the 40 pin Single Row Pin Headers to make the following headers					
JP1	1	15-Pin Header			
JP2	1	8-Pin Header			
JP3	1	15-Pin Header			

*Order the PICAXE USB Download Cable if you don't already have one. This is needed to program the Picaxe 20X2 chip.

Building the Wee Little Talker

As stated when you ordered your Wee Little Talker PC board, this project's PC board is for those experienced with "Through the hole" soldering and owns the tools necessary to do the work.

The installation of parts is based on their height with the shortest 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.

- 1) Install the 200K Ohm (Red, Black, Yellow) Resistors in R1.
- 2) Install the two 22K Ohm (Red, Red, Orange) Resistors in R2 and R3.
- 3) Install the 470 Ohm (Yellow, Violet, Brown) Resistors in R4.
- 4) Install the 150 Ohm (Brown, Green, Brown) Resistors in R5.
- 5) Install the 330 Ohm (Orange, Orange, Brown) Resistors in R6.
- 6) Install the two 68 Ohm (Blue, Grey, Black) Resistors in R7 and R8.
- 7) Install the two 4.7K Ohm (Yellow, Violet, Red) Resistors in R9 and R10.
- 8) Install the Five 10K Ohm (Brown, Black, Orange) Resistors in R11, R12, R13, R14 and R15.

Note that all IC sockets have a small notch on one side. The notched side always goes on the left side when installing the socket. This is also marked on the PC board too. This notch will help in installing the IC parts later.

When soldering multi-pin parts like Sockets, check that all pins are straight and fit through the holes on the PC board. When soldering, start with just one pin and then check that the part is flush with the PC board. If not, melt the solder while pushing the part flush on the board. Next, solder a pin on the opposite side of the part and verify that the part is still flush with the PC board. If everything checks out, solder the remaining pins.

- 9) Install the 8-pin IC sockets for IC1. (Do NOT install the MSGEQ7 at this time.)
- 10) Install the 20-Pin IC Socket for IC2. (Do NOT install the Picaxe 20X2 at this time.)

This would be a good time to check the solder connections on the board. After all, you just did a bunch and there is a chance one or more will need to be fixed by reheating the solder joint.

- 11) Install LED1 (Red) and LED2 (Green). The longer lead goes in the right side (+) hole.
- 12) Install the 33 pf (33) C1 Disc Capacitor. It's to the left and below of IC1.
- 13) Install the six 0.1 uf (104) Disc Capacitors in C2, C3, C4, C5, C6 and C7.
- 14) Install Jack 2 and Jack 3 1/8-inch Audio Jacks. Solder the center pin first and verify the jack is flush with the PC board. If need be, melt the solder joint and push the jack flush with the PC board. Now, solder the other four pins on each jack.
- 15) Install the MCP1700-3302E, a 3.3 Volt Regulator in IC3. First bend the middle lead away from the flat side of the TO-92 case. (This will help install the middle lead into its hole.) Note the diagram for IC3 on the PC Board and insert matching the regulator flat side matches. Push the regulator down till it about 1/8 of an inch from the PC board. Solder the three pins and cut the extra part of the leads off.
- 16) Install S1, S2 and S3 push button switches. Push the switch's leads through the holes in the board till they are flat on board and level. Solder just one pin. Verify that the switch is level and then solder the other pins. Do not install the three color button caps at this time.
- 17) To make the 15-pin header for JP1, take a 40 pin Single Row Pin Header and cut between the 15th and 16th pins with a pair of wire cutters.
- 18) To make the 8-pin header for JP2, take a 40 pin Single Row Pin Header and cut between the 8th and 9th pins with a pair of wire cutters.

- 19) First, install JP1 (15-pin header) with the short side going into the holes on the PC board. Now, solder just one on the end. After soldering, check the alignment and melt the solder joint should the placement need fixing. Next solder one pin on the other end. As before, verify the is straight up and mounted flush to the PC board. The next step is to solder the other pins.
- 20) Install 8-pin Header into JP2. Solder only one pin and the alignment and melt the solder joint should the alignment need fixing. Now, solder the other seven pins.
- 21) Install the two 8 pin female sockets for the DFplayer Mini. 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 sockets. Now, solder the other 7 pins and do the same for the other socket.
- 22) Install the DG128 - 2 Positions Terminal at X1. Make sure the holes for the speaker wires are facing outward on the PC board.
- 23) Install Jack 1, the DC Power Jack 2.1 mm. Be sure to match the diagram on the PC board. Solder just one pin at first. (It will take more solder then the parts that you installed earlier because the size of the holes.) Verify the power jack is flat on the PC board and matches the diagram. Melt the solder if the power jack needs moving. Now, solder the other two pins on Jack 1.
- 24) Install C8 (100 UF 25V Capacitor.) Note the positive side of the Capacitor (longer lead) goes to the hole towards the middle of the PC board. That hole also has (+) mark too. Solder and cut off the leads.
- 25) Install the three color button caps. S1=Red, S2=Green and S3=Blue. (See photo 1.)
- 26) On the Sound Header (JP2, eight-pin header) install three jumpers on pins 1-2, 5-6 and 7-8. (Note: The settings for the jumpers may change based on the software and other options.)

Review both boards 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 adapter to Jack 1. (Center pin of the power connector is positive.)

After applying power, the Green Power LED should light up. If not, please review your work for a bad solder joints or mistakes.

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

Final Installation of Components.

Static protection must be used with these final parts. Please note what side has the notch. Plugging the chips in backwards can destroy the chip. When install IC1 and IC2, 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 all the way in. Be careful, the pins can easily bend and break should they not go into the socket's holes.

- 27) Install the MSGEQ7 ASA chip into IC 1 socket.
- 28) Install the Picaxe 20X2 chip into the IC 2 (20 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.

29) Install the DFplayer Mini module into the two 8-pin sockets near the top of the PC board.

Do a final check that all the parts are soldered or plugged into their sockets correctly. Check that all the Intergraded Circuits have their notches (pin 1) to the left side of the PC board. 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 sound files from the SD-CARD folder of the program's audio files. The Micro SD-Card slides in with the lable side up. It should slide in easily at first, then a spring will cause some resistance. Keep pushing till the card some to a stop. (As this point, the card is locked into position.) Pushing on the card again will unlock it for easy removal. The Micro SD-Card will only work when it's in the fully locked position.

To install the Wee Little Talker program, first connect the Serial Download Cable to your computer and following the directions at Picaxe.com to install the drivers for it.

Start up the Picaxe editor and load the Wee Little Talker program for download into the Picaxe 20X2 chip. Set the Chip type to 20X2 and plug the 1/8 plug into the programming Jack next to the Blue (S3) button. Now plug in a set of powered speakers or head phones in the Audio Jack near the Voltage Regulator (IC3). Plug in your 5 Volt power supply into the DC power jack.

After a few seconds, click the program button near the top of the window. The program should find both the serial download cable and the Wee Little Talker board. It should take about ½ minute to download the program. If there is a problem, please see the help system of the Picaxe editor for information on the use of the serial Download cable.

Once the program has been downloaded, the Wee Little Talker board will reset and pulsate the Red Status LED for a few seconds. If the Red Select button is pressed while the Red LED is pulsating, the board will force the running of the setup menu.

The board will run through system diagnostics to verify that the main systems are working correctly. First up is the DFplayer Mimi audio player. The board will check if it can talk to the module. Should there be a communication error then the Red Status LED will flash about once a second.

The next check is for all the system and menu Vocal files are intact. The Red Status LED will flash fast if there is a problem in the files on the Micro SD-Card.

At this point the board will announce the name of the program and version number via the audio output jack.

The last system check is the MSGEQ7 Audio Spectrum Analyzer chip. The program will play 7 tones to verify the chip can hear them. (You will not hear the 7 tones.) If there is an issue with the MSGEQ7 chip hearing the tones, the board will tell you the chip is bad and flash the Red Status LED.

Please refer to the Wee Little Talker program's user manual for information using the setup menu and general use.

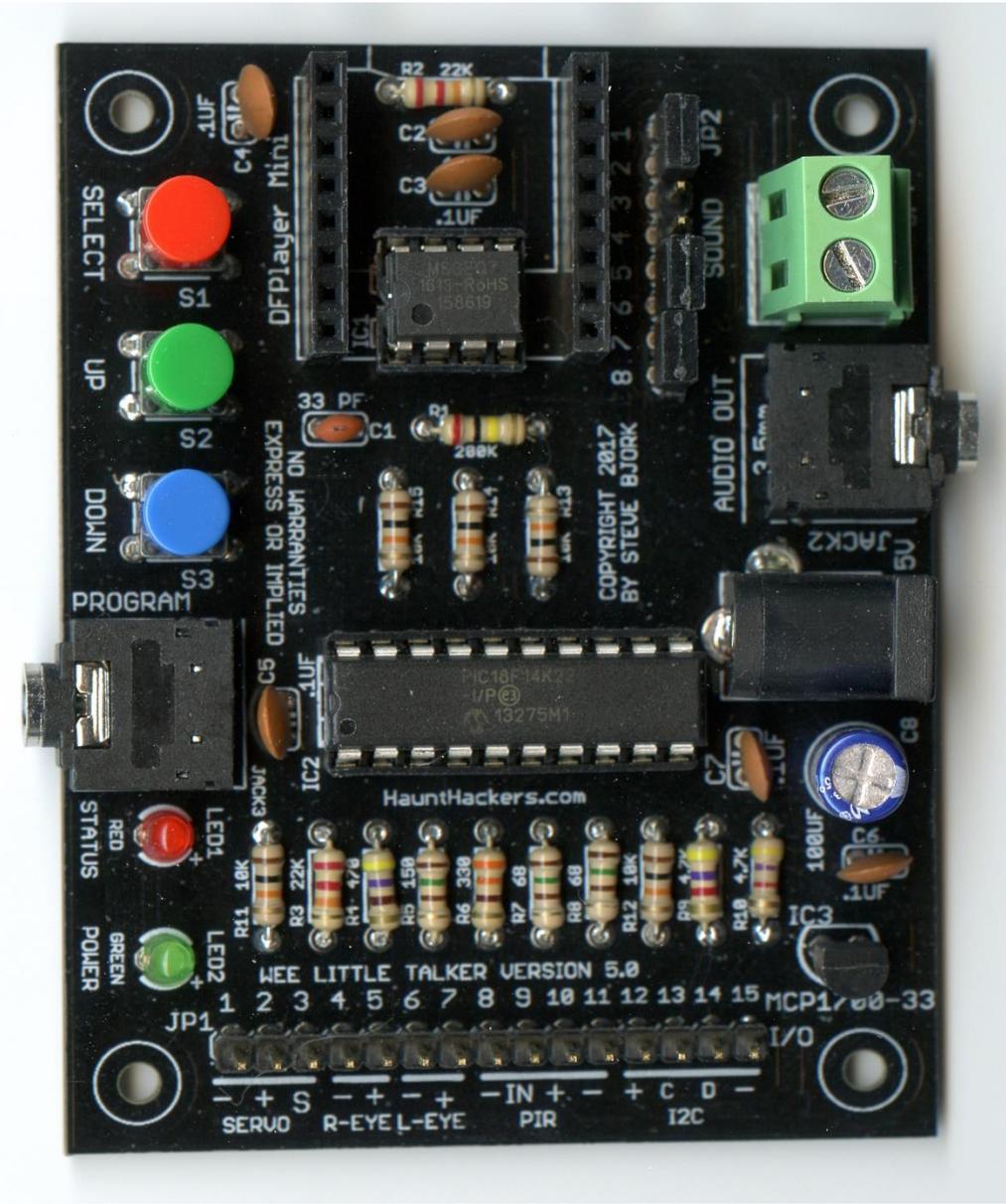


Photo 1

(Wee Little Talker without DFplayer Mini Installed.)

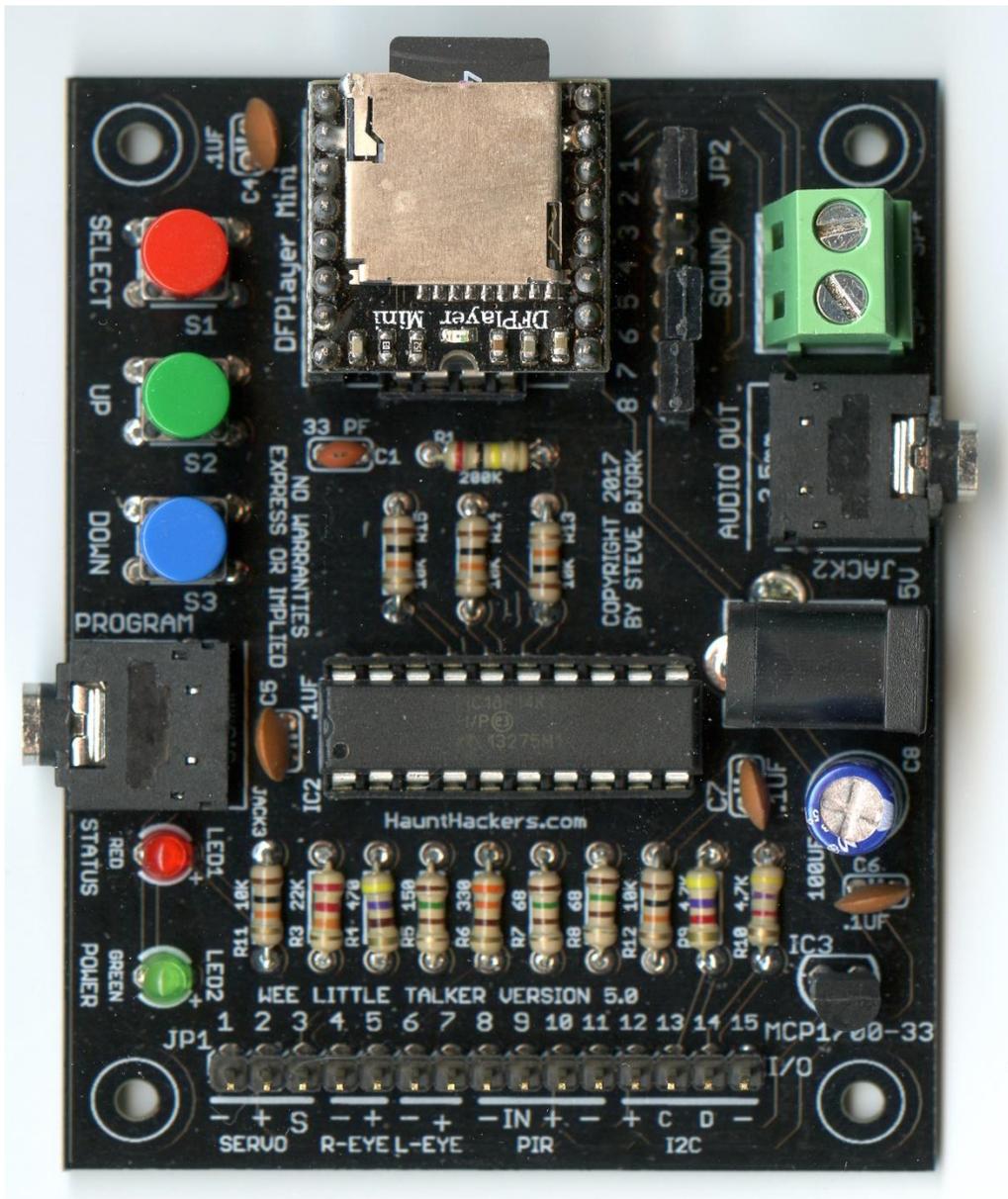


Photo 2

(With DFPlayer Mini Module Installed.)