

# Wee Little Talker Information Guide

Version 1.0

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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.

MDfly.com is the only source for the Mod AU5017 audio media player module. At the current price of \$4.99, it's about ½ the cost of other audio players on the market. Don't forget to order the color button caps with the Audio Module. While the switches will work without the color caps, it's much easier to use with them.

RN1 (Resistor Array), IC1 (MSGEQ7) and IC3 (Voltage Regulator) are included in your PC board kit to help keep your cost down. (The supplier charges many times more to ship it 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, C3, C4, C5, C6	5	0.1 UF 50V Capacitors	A-553		
C7, C8	2	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, R5	2	150 Ohm 1/4-watt Resistor	A-2059		
R6	1	330 Ohm 1/4-watt Resistor	A-2067		
R7, R8	1	68 Ohm 1/4 Watt Resistor	A-2086		
RN1	1	5 Unit 10K Ohm Resistor Array		Included with Basic PC board kit.	
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	LD1117V33 (3.33 Volts)		Included with Basic PC board kit.	
USB Cable	1	USB Download Cable	Rev-Ed AXE027*		phanderson.com
Socket: IC1	1	8 Pin DIP Socket	A-001		
Socket: IC2	1	20-Pin DIP Socket	A-1600		
8 Pin Socket	3	8 Pin 2.54mm Single Row Female	A-1305		
Mod1	1	MP-3/Wave File Player		MOD-AU5017	MDfly.com
Red Button Cap	1	Red cap for S1		CMP-BU0061	MDfly.com
Blue Button Cap	1	Blue cap for S2		CMP-BU0064	MDfly.com
Green Button Cap	1	Green cap for S3		CMP-BU0063	MDfly.com
Micro SD-Card	1	2 GB or larger & Class 4 or better			Local or eBay.com
Pin Headers	2	40 pin Single Row Pin Headers	A-197		
Use the 40 pin Single Row Pin Headers to make the following headers					
JP1	1	13-Pin Headers			
8-pin header	3	Used to mount MOD-AU5017			

\*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 two 150 Ohm (Brown, Green, Brown) Resistors in R4 and R5.
- 4) Install the 330 Ohm (Orange, Orange, Brown) Resistors in R6.
- 5) Install the two 68 Ohm (Blue, Grey, Black) Resistors in R7 and R8.

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.

- 6) Install the 8-pin IC sockets for IC1. (Do NOT install the MSGEQ7 at this time.)
- 7) 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.

- 8) Install LED1 (Red) and LED2 (Green). The longer lead goes in the right side (+) hole.
- 9) Install the 33 pf (33) C1 Disc Capacitor. It's to the left of IC1.
- 10) Install the five 0.1 uf (104) Disc Capacitors in C2, C3, C4, C5 and C6.
- 11) 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.
- 12) Install the LD1117V33, a 3.3 Volt Regulator in IC3 with the metal tab lays flat on the PC board. See image on PC board.) The three pins will need to be bent at a 90-degree angle at 3.5 mm from the body of the regulator. Solder the three pin and cut the extra part of the leads off. An optional nut and bolt can be used to hold the Voltage Regulator in place. See Figure two.

The Resistor Array (RN1) replaces six individual resistors with an easy to solder package. As before, solder just one pin and check that it is flush on the PC board by melting the solder joint and push it down.

- 13) Install RN1 (6 Pin, 4606X-101-103LF) 5 Unit 10K Ohm Resistor Array. Pin 1 (the dot) goes to "1" marking on the PC board. Like before, solder one pin and verify placement. Only then solder the final 5 pins.
- 14) 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.

- 15) To make the 13 pin header for JP1, take a 40 pin Single Row Pin Header and cut between the 13<sup>th</sup> and 14<sup>th</sup> pins with a pair of wire cutters.
- 16) Start with soldering just one pin of JP1 (13-Pin header). After soldering the first pin, check the alignment and melt the solder joint should the placement need fixing. Now, solder the other pins.
- 17) Install the three 8 pin female sockets for the AU-5017 Audio Player. 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 two sockets.
- 18) 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 than 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.
- 19) Install C7 and C8 (100 UF 25V Capacitors.) Note the positive side of the Capacitor (longer lead) goes to the holes nearest the edge of the PC board. Those holes also have (+) mark too. Cut off the leads near the solder joint.
- 20) Install the three color button caps. S1=Red, S2=Green and S3=Blue. (See photo 1.)

AU-5017 media player module needs pins added so it can be mounted on the Wee Little Talker's PC Board. The next section will install the three sets of mounting pins to hold it in place. Please review Photo #2 for proper mounting.

- 21) Install the first of the three 8-pin headers on the AU-5017 Audio Media Player by first placing the pin header on the underside of the module for the row marked 1-8. (See photo 2.) It's important that the pins are perpendicular to the board so the module will plug into the three sockets on the PC board. Like before, solder just one pin of the header and verify the alignment before soldering the other seven pins.
- 22) Install the next 8-pin header on the opposite side of the module. (The RX row.) Once again solder only one pin at first and verify the header is perpendicular and then solder the other 7 pins. Now, install the final 8-pin header following the previous steps. Do not plug in the AU-5017 module at this time.

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

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## Power Check.

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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 up 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 an bad solder joints or mistakes.

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

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## Final Installation of Components.

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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.

23) Install the MSGEQ7 ASA chip into IC 1 socket.

24) 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.

25) Install the AU5017 Media player module into the three 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. Notch all the Intergraded Circuits have their notches to the left 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!

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## Final Systems Check

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Install the sound files from the SD-CARD folder of the program's zip file. To open the Micro SD-card holder of the MOD-AU5017, look for the "open" with a direction arrow. Slide the metal cover in the direction of the arrow till it clicks. (Do not use too much force or the holder will break.)

Note the outline for the Micro SD-card in the holder. (It can only go in one way.) Make sure the Micro SD-Card is in correctly and lying flat before closing the cover over the card. It should slide in the direction of the "lock" arrow and click in place. Forcing the cover could break it.

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 MOD-AU5017 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.

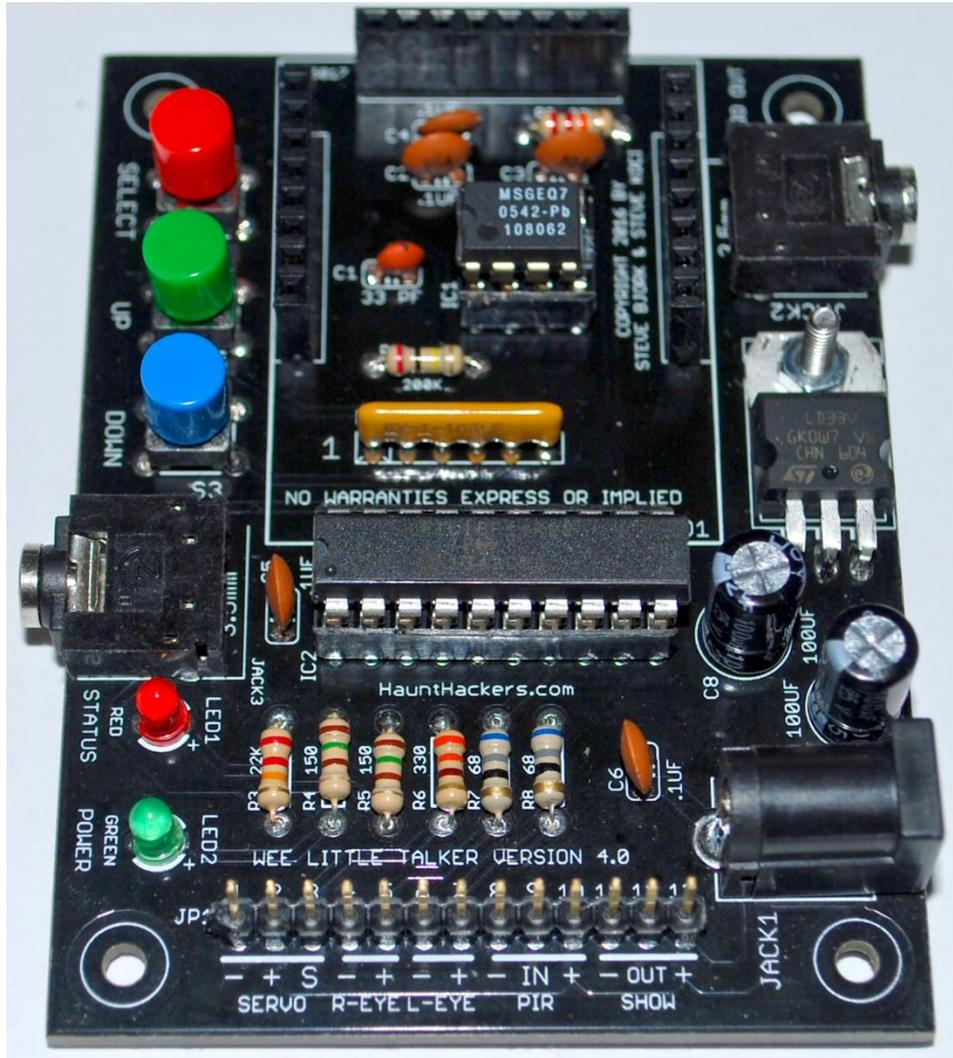


Photo 1

(Wee Little Talker without MOD-AU5017 Installed.)

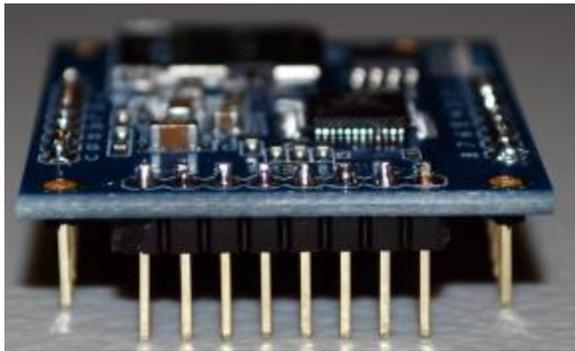


Photo 2

(MOD-AU5017 Audio Media Player Board)

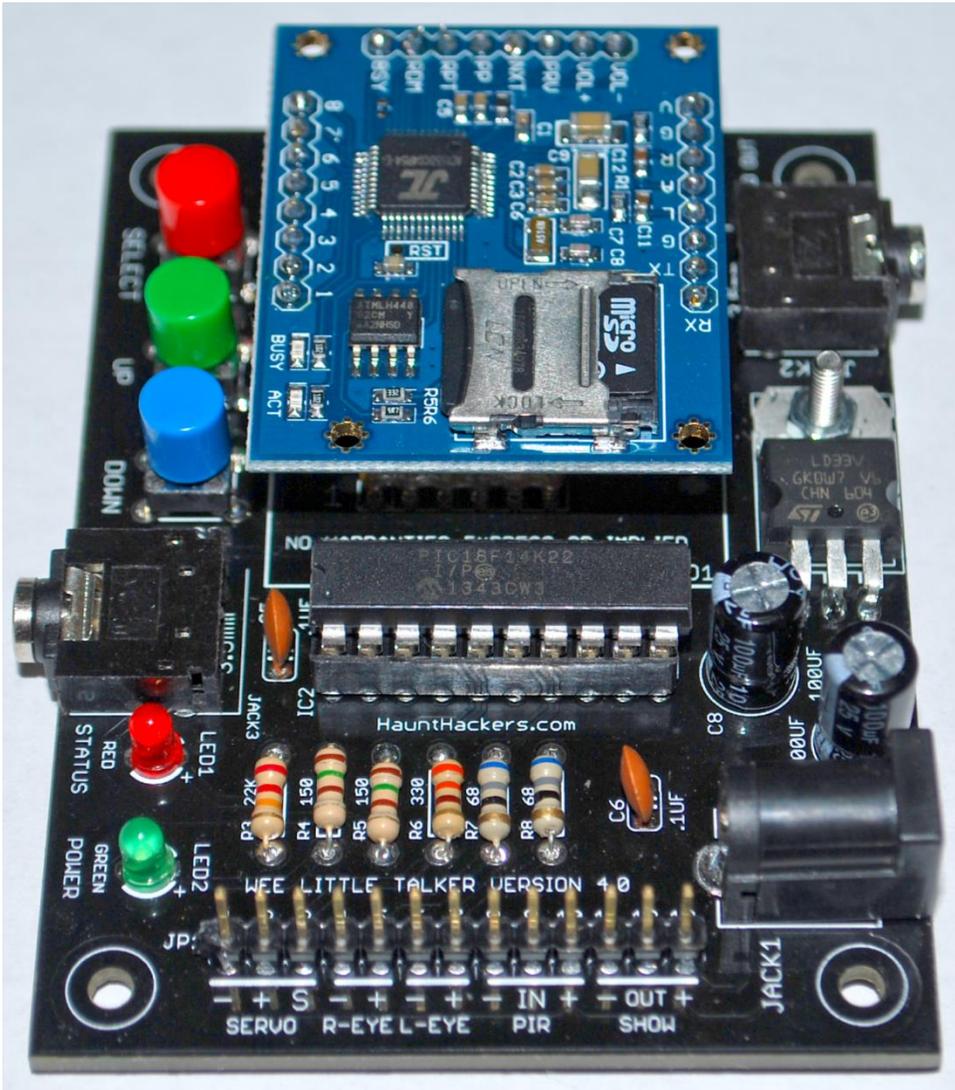


Photo 3

(With MOD-AU5017 Installed.)