

## Quick Build Guide (I/O PCB)

**I/O (Small PCB)** \*FT232 USB chip is pre-soldered as hand soldering is nearly impossible without damage.

### Building Tips for novice or expert.

To avoid scratching aluminum panels. Wait until complete assembly and you are confident to construct the final 'build'.

Begin with resistors, all resistors are labelled. Stack the bags in order as below so when you populate you aren't distracted by 'locating parts'.

If they are stacked in order this will go faster for you and with less likeliness or error.

Install parts in order listed below. Most have visual board examples to view and check for error.

### Important!

Even an expert will make an error. Only a novice wont admit it!

There are many many parts on this kit. It is almost impossible not to make a mistake.

After each section such as resistors, then electrolytic caps, ICs etc. Go back and **CHECK YOUR WORK!**

Do not solder items until you have placed components and thoroughly checked for correct placement and orientation for parts marked with (+/-)

Solder resistors, caps, and jacks etc. first.

**Leave the diodes and then ICs for last to solder.** This will give you practice on less destroyable parts. Diodes and Digital ICs especially may be damaged

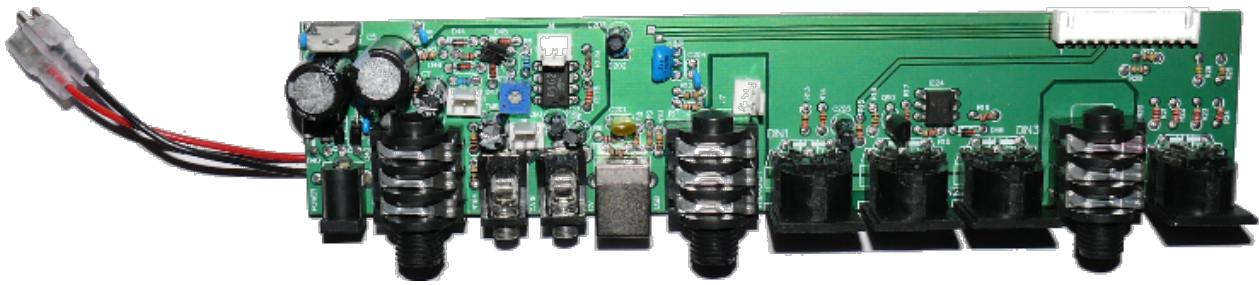
very quickly. A **30watt** solder iron is recommended. Practice this approach on both PCBs. Resistors and jacks etc. are the least likely to be damaged in soldering.

So they are perfect practice for warming up your skills.

For parts with polarity such as ICs, it is recommended to double-check placement is correct before soldering. For ICs. Solder pin 1 first and then go to another and solder pin 1 and then the next IC pin 1 etc., etc. After all ICs have pin 1 soldered. Make a loop of the next number and repeat for pin 2, 3 etc., etc.

Rotating around like this will help prevent enormously. Over-heating the digital ICs by soldering all legs at the same IC at a time. This method in timing lets it cool the device rather than overheating. Most components can only withstand 1-2 seconds of heating.

**An error in assembly may take a fraction of a minute that may (and probably will) take hours to days to maybe never locate afterwards!**



[click for larger view](#)

Part	Locations					Total	Comments
<a href="#">FT232BL</a>	IC25					1	<b>Pre-Soldered</b>
<a href="#">1K</a>	R2	R17				2	<b>Resistor Begin</b> (board photos linked)
<a href="#">1.5K</a>	R8					1	
<a href="#">1.8K</a>	R179					1	
<a href="#">2.2K</a>	R21	R22	R23	R24	R178	5	
<a href="#">2.4K</a>	R5					1	
<a href="#">4.7K</a>	R9					1	
<a href="#">5.6K</a>	R4					1	
<a href="#">6.8K</a>	R3					1	Resistors all include at least 1 spare.
<a href="#">10K</a>	R10	R11				2	
<a href="#">100K</a>	R25	R26	R27	R28		4	
<a href="#">10ohm</a>	R186	R164				2	
<a href="#">22ohm</a>	R20					1	
<a href="#">27ohm</a>	R6	R7				2	
<a href="#">100ohm</a>	R1					1	
<a href="#">150ohm</a>	R16					1	
<a href="#">220ohm</a>	R13	R14	R15	R18	R19	5	
<a href="#">470ohm</a>	R12					1	<b>Resistor End</b>
<b>Check Placement/Orientation</b>							
<b>Solder &amp; Trim</b>							
<a href="#">IN4001 (+/-)</a>	D40	D41	D42	D43		4	<b>Diode Begin (board photos linked)</b>
<a href="#">1N4148 (+/-)</a>	D44	D45	D46	D47	D48	5	<b>Diode End</b>
<b>It is recommended to place the diodes but wait to solder lastly after other components &amp; checking polarity.</b>							
16V 2200uF (+/-)	C3	C5				2	<b>Electrolytic Caps Begin</b>
25V 100uF (+/-)	C7	C8				2	
25V 10uF (+/-)	C60	C61	C203	C205		4	<b>Electrolytic Caps End</b>
333J/K	C201					1	
104 1uF	C1	C2	C4	C6	C202 C204	6	
TP202	TM6					1	

ZTT6.00 XTL2 1

**Check Placement/Orientation Solder & Trim**

4N37 (+/-)	IC24	1	<b>Orientation Indented Sides Match</b>
AN6562 (+/-)	IC23	1	<b>Orientation Indented Sides Match</b>
L7805CV (+/-)	IC20	1	<b>Faces Inwards / Apply Heatsink Last</b>
2C536F (E or G) (+/-)	Q50	1	<b>Orientation Indented Sides Match</b>
LM336-Z5 (+/-)	IC22	1	<b>Orientation Indented Sides Match</b>
WS78L05 or L 06 (+/-)	IC21		<b>Orientation Indented Sides Match</b>

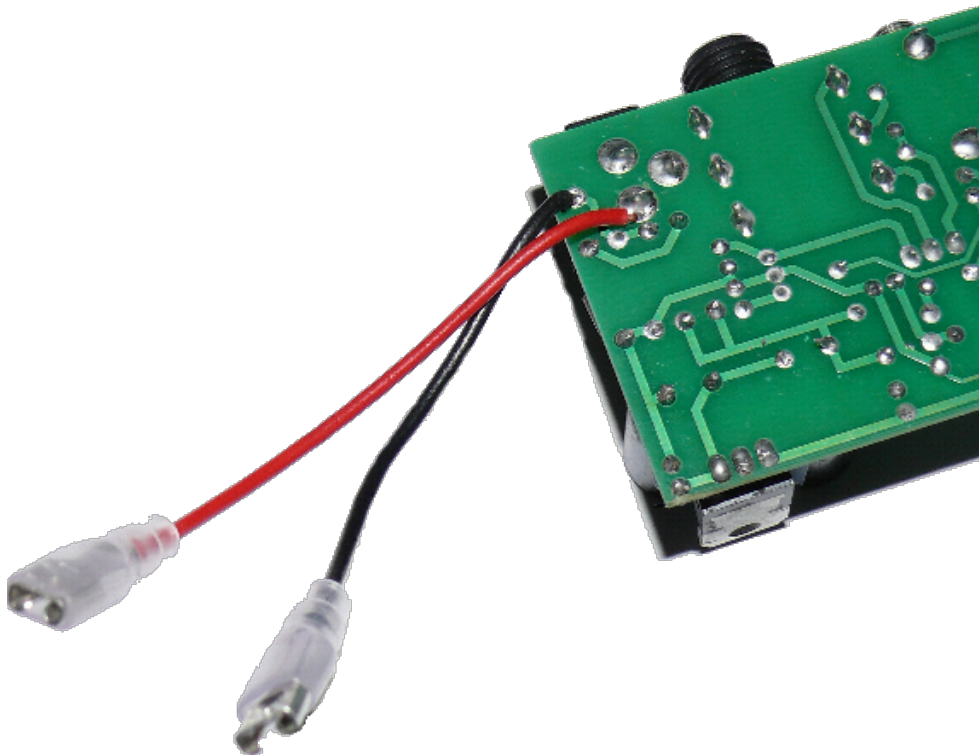
**Note:** 78L05 for overdriven amp prevention.

**Check Placement/Orientation Solder & Trim**

Flat Film Connect	J3					<b>Right Angled Female Side Outwards See Photo for placement</b>
Jumper Header	J4	J5	J6	J7		
DIN Jack	DIN1	DIN2	DIN3	DIN4		
1/4" Jack	MIXIN	MIXOUTPHONE				
1/8" Jack	GATE	CV				
USB Jack	USB					
Power In Jack	POWER					

**Check Placement/Orientation Solder & Trim**

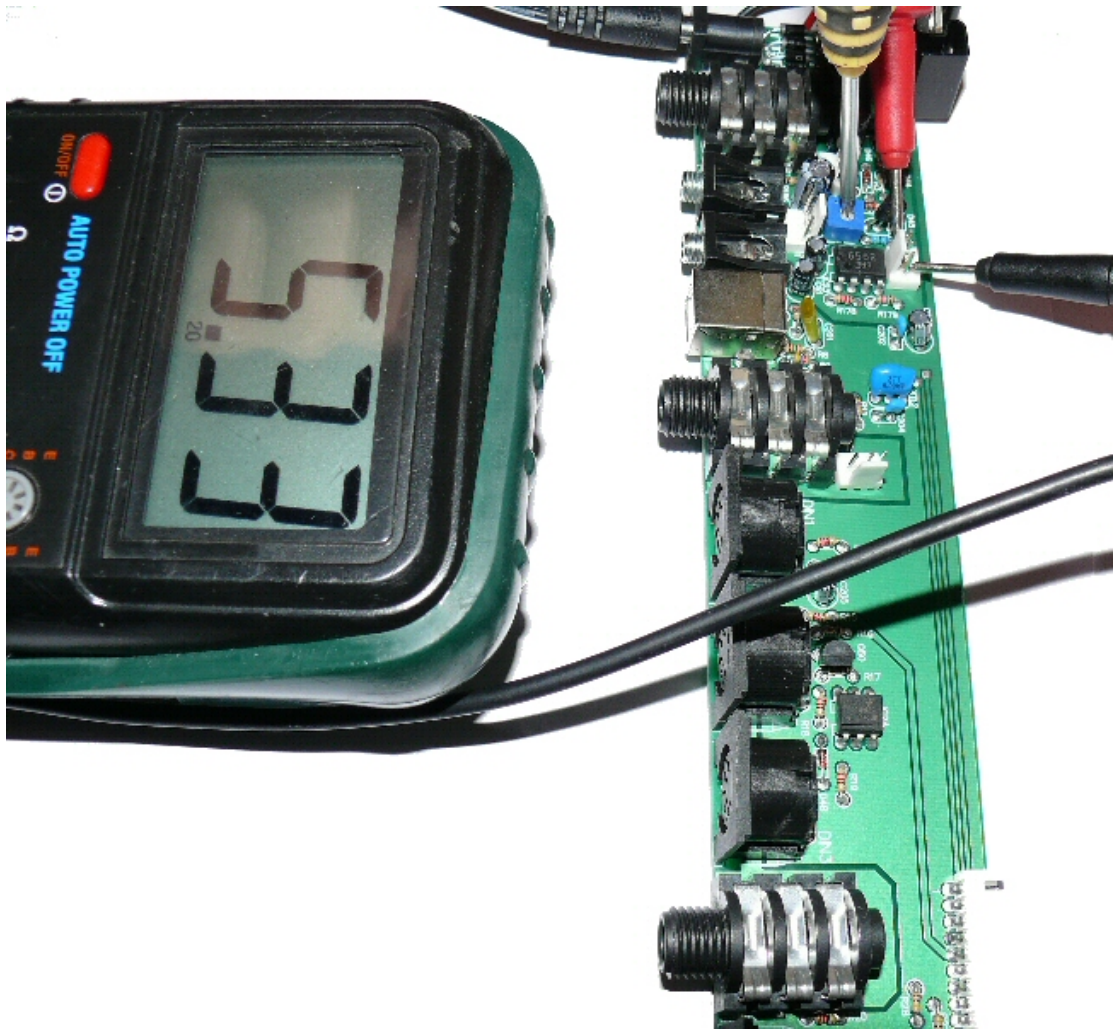
**Solder Power Switch Cables as Shown. Wait until completion to insert power switch for testing.**



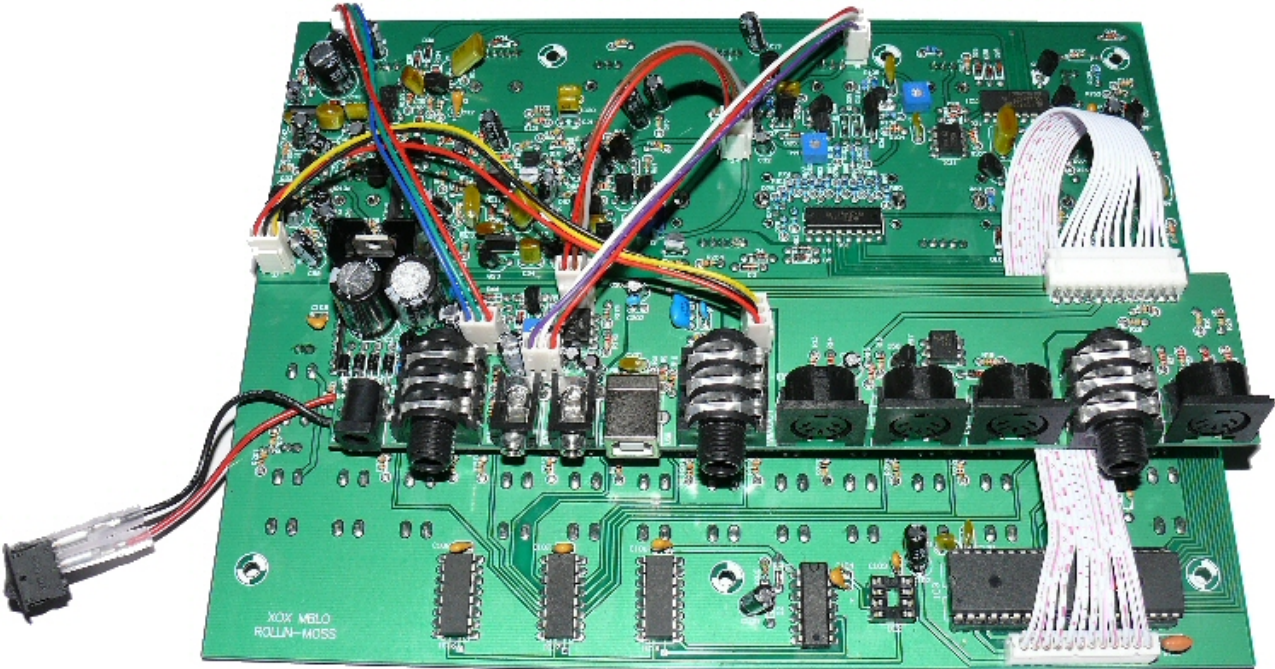
**J4 Must be calibrated to exactly 5.33v for correct tuning of the VCO.** Use a DVM with center pin ground (black) and left pin (red). Then adjust Trim as shown until exactly 5.33v. If you cannot adjust correctly or the readings change. Change your battery. After calibration verify 12v (approximate) is fed from the right pin (red) with the negative tip still at center.

**Left (red) = 5.33v exactly Middle = ground (black)**

**Middle = ground (black) Right = 12v approximate (red)**



Cabling must be connected as oriented with colors as shown. Be especially careful which way you attach the white 'header' sockets!



[click for larger view](#)