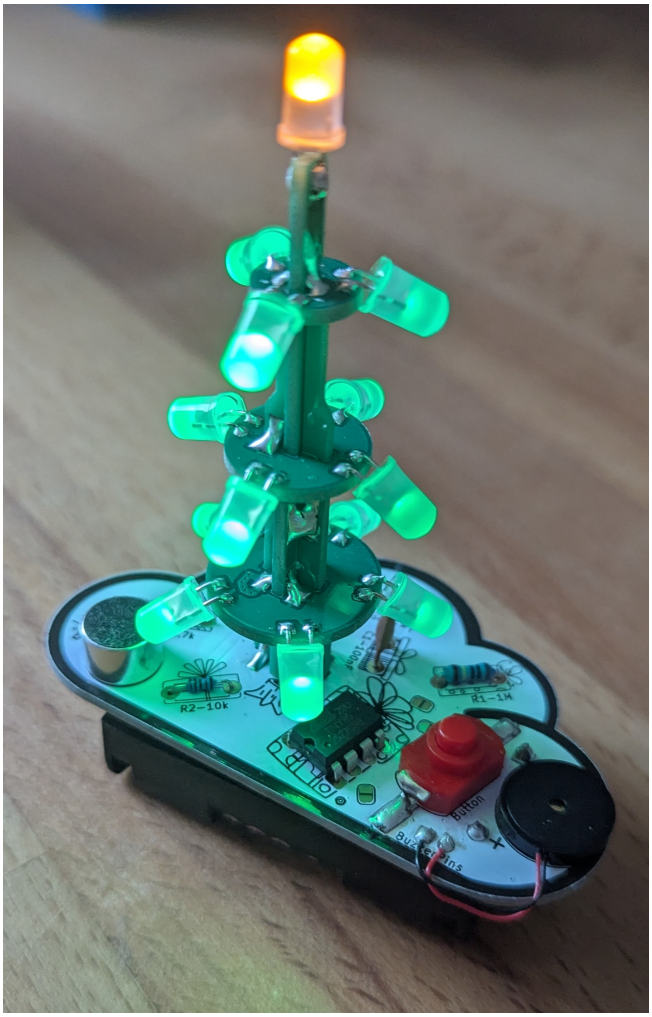
BlinkyTree



Farblegende: SI = silber; GO = gold; BK = schwarz; BR = braun; RE = rot; OR = orange; YE = gelb; GR = grün; BL = blau; VI = violett; GR = grau; WH = weiß

Quantity	Name	Description	Label/Color Code
1	IC1	Microcontroller ATtiny85	ATtiny85-20PU
1	C1	Ceramic Capacitor 100 nF	104
1	C2	Ceramic Capacitor 100 nF	104
1	D1	Protection Diode	Standard diode (stripe = cathode)
1	R1	Resistor 1 MΩ	
1	R2	Resistor 10 kΩ	
1	R3	Resistor 4.7 kΩ	
3	LED1–LED3	LED 5 mm Green (top ring)	Green LEDs
4	LED4–LED7	LED 5 mm Green (middle ring)	Green LEDs
5	LED8–LED12	LED 5 mm Green (bottom ring)	Green LEDs
1	LED13	LED 5 mm Orange (star)	Orange LED for tree top
1	MIC1	Electret Microphone	Small microphone for blow detection
1	BZ1	Buzzer	Small buzzer for sound effects
1	SW1	Push Button	push button for on/off switching
1	BAT1	Battery Pack	Battery pack with pins
2	Stem Parts	Two interlocking stem PCBs	
1	5-LED Ring PCB	Ring PCB for 5 LEDs (bottom)	
1	4-LED Ring PCB	Ring PCB for 4 LEDs (middle)	
1	3-LED Ring PCB	Ring PCB for 3 LEDs (top)	
1	Cloud PCB	Base circuit board	
1	2x AAA Batteries (not included)	Batteries for power	
1	2x AAA Batteries (not included)	Batteries for power	

Difficulty: ●●●○○ Build Time: 60–75 minutes

Manual v1.0 CC BY-NC 4.0
Board v1.0 CC BY-NC 4.0

Safety Information

- ATTENTION: Not suitable for children under 3 years, choking hazard due to small parts that may be swallowed.
- We recommend: Supervision of the assembly and soldering process by an adult.
- Keep these operating instructions in a safe place for later use! It contains important information.
- If the battery is empty, replace it only with a new battery with the same values.
- When soldering, the soldering iron, the solder and also the components being soldered become very hot.
- Always wear safety glasses when soldering and assembling the kit.
- Always use a fire proof soldering pad when soldering! This prevents the components from slipping away.
- To keep the soldering iron safe during assembly, always use a suitable soldering stand.
- The kit is designed for battery operation only.
- CAUTION: Never connect the kit to 230 V mains voltage! There is an absolute danger to life!
- Please take the device to appropriately certified disposal companies at the end of its service life. This is good for the environment and ensures correct disposal.
- Subject to changes and errors.

Disposal

This appliance is labelled in accordance with the European Directive 2012/19/EU on waste electrical and electronic equipment (WEEE). The directive provides the legal framework for the take-back and recycling of waste equipment throughout the EU.

- **packaging**: The packaging is made of environmentally friendly materials and is therefore recyclable. Dispose of packaging materials that are no longer needed accordingly.
- **waste equipment**: Old appliances often still contain valuable materials. Therefore, hand in your old appliance to your retailer or a recycling centre for reuse. Please ask your retailer or your local authority for the current disposal routes.

https://github.com/monkeyToneCircuits/BlinkyTree
Ludwigsallee 30
63739 Aschaffenburg
GERMANY







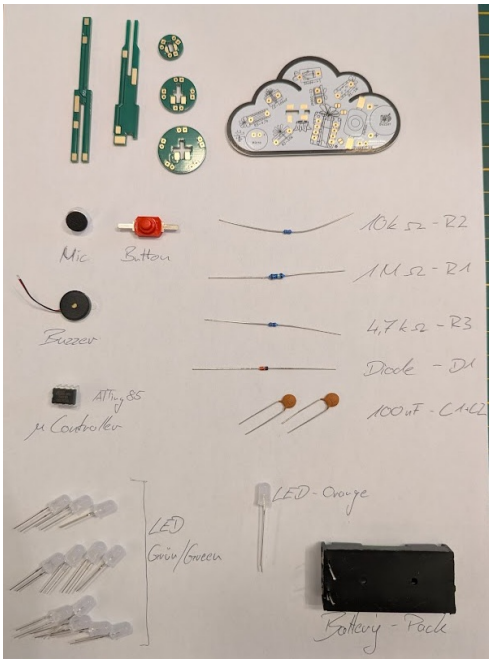
Step 1

a) Time to check your parts! Look at the parts list on page 1 and make sure you have everything.

b) You should find: main PCB, resistors, capacitors, diode, ATtiny85 chip, microphone, buzzer, button, LEDs, and battery pack.

c) Also find the 5 tree PCBs: 2 trunk parts, plus rings for 5, 4, and 3 LEDs.

d) Pro tip: Sort everything into groups - it makes building much easier!

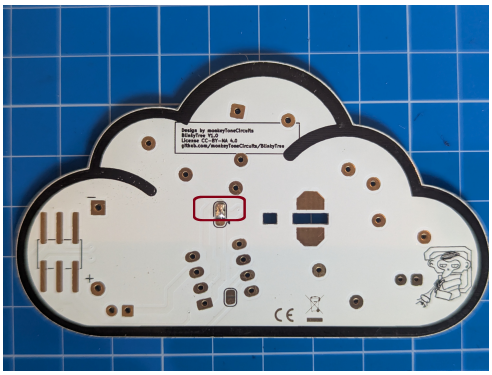


Step 2

a) Start with the base PCB - we need to add a solder bridge first! This will put your board into the correct working mode.

b) Use your soldering iron to connect the upper two pads marked in the picture.

c) Take your time and make sure the solder flows nicely between the upper pads and not the lower one.

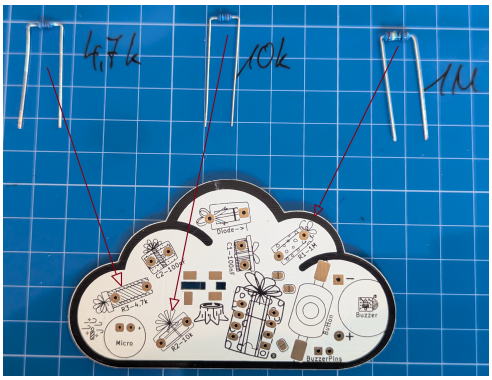


Step 3

a) Now let's add the resistors - the easy parts that don't care which way they go!

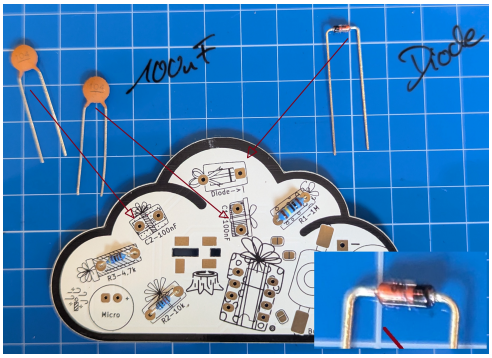
b) Find the resistors by their color bands and put them in the right spots.

c) Push them through, bend the legs on the back so that they hold by themselves, solder them, and snip off the extra.



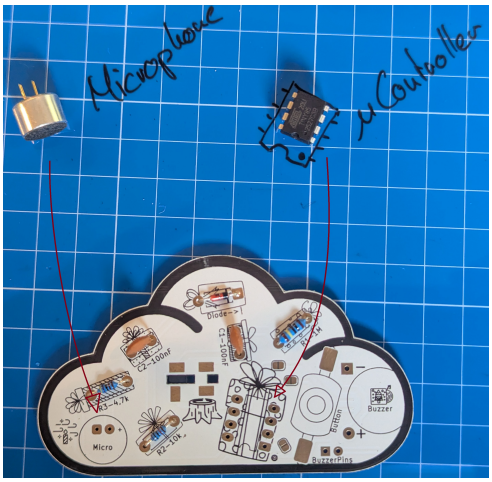
Step 4

a) Now the Capacitors (C1 and C2 - they don't have a direction) and the diode (D1) - this one's tricky because it has a direction!
b) IMPORTANT: The stripe on the diode must match the stripe on the PCB! In the lower section of the picture the stripe is on the right side.
c) If you get this backwards, the blowing mechanism won't work.



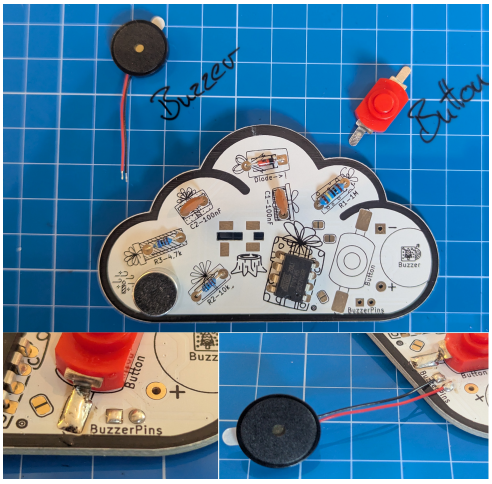
Step 5

a) Next up is the microphone and the ATtiny85 chip.
b) Solder the microphone to the marked location.
c) The microcontroller chip only goes in one way - look for the little notch or dot.
d) Line up that notch with the marking on the PCB and push it in gently.



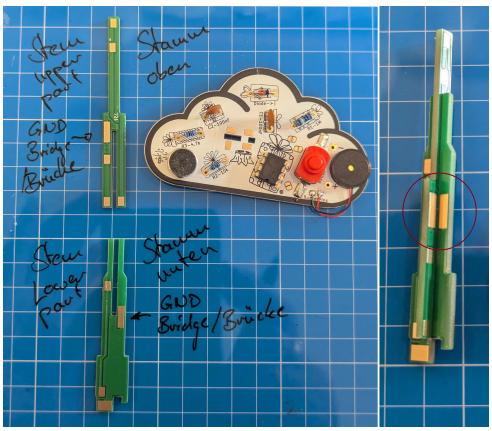
Step 6

a) Get the button and buzzer ready!
b) For the button, bend its legs flat first so that they lie flat against the PCB.
c) The buzzer has two wires - black for GND (square pad) and red for VCC (round pad).
d) Pre-tin the PCB pads to make soldering easier.
e) After that use the adhesive to stick the buzzer in place.



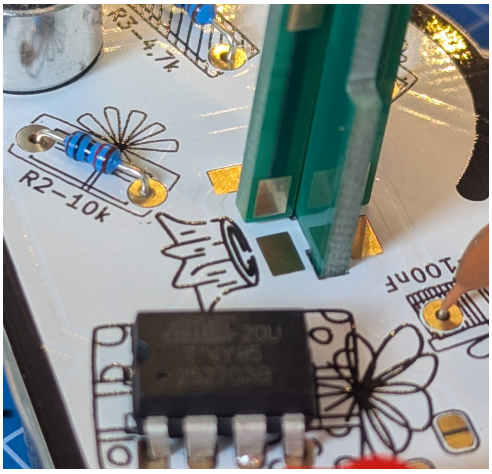
Step 7

a) Here are your two trunk parts - let's build the tree backbone!
b) Notice the connection pads on each piece.
c) The big GND pads need to be next to each other when you put them together.
d) Slide the two trunk parts together
e) Don't solder them yet - the bottom ring needs to be placed first



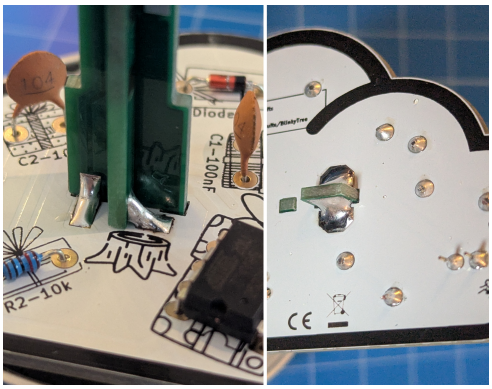
Step 8

a) Now push the combined trunk into the base PCB - it only fits one way!
b) The trunk should stand up straight and tall.
c) Look for the pads that are at 90-degree angles - those are what we'll solder.
d) Make sure the trunk is pushed all the way down before soldering.



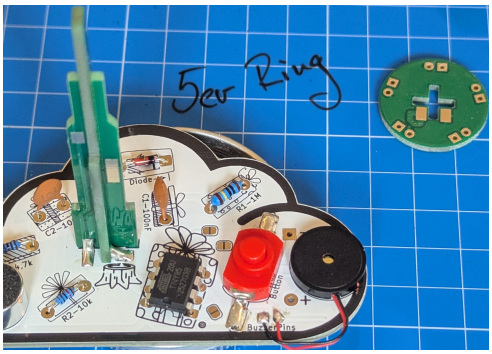
Step 9

a) Solder those angled pads to connect the trunk firmly to the base!
b) Add enough solder to make strong connections.
c) Your tree should now stand up on its own.
d) Turn the board over and solder the bottom pads of the trunk
e) REMEMBER: Still don't solder those big GND pads at the side of the trunk - the 5-LED-ring comes first!



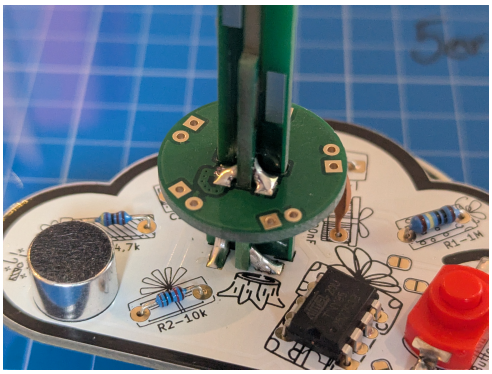
Step 10

a) Now we build the tree layers! Start with the biggest ring (5 LED holes).
b) This ring needs to slide over the top of the trunk.
c) Check the orientation - the connection pads on the ring should line up with the trunk pads.
d) Slide it down until it sits on the edge.



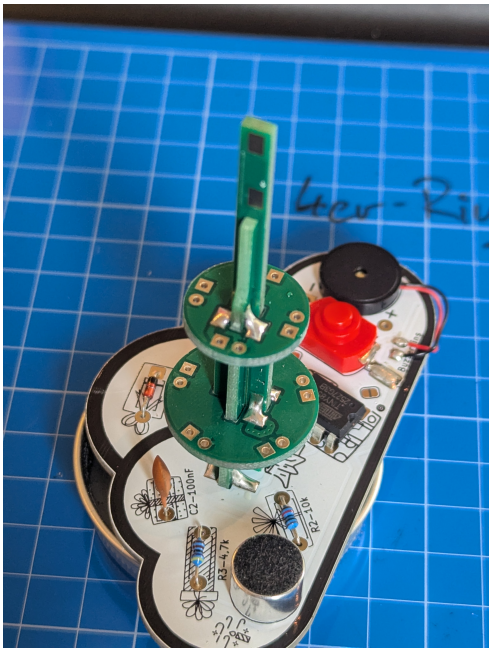
Step 11

a) Solder the ring to the trunk pads - you're making the bottom layer of your tree!
b) Make sure the solder connects both the ring and trunk nicely.
c) Now for the important step we've been waiting for - solder those big GND pads on the trunk!
d) This connects the two trunk pieces electrically and makes everything work.



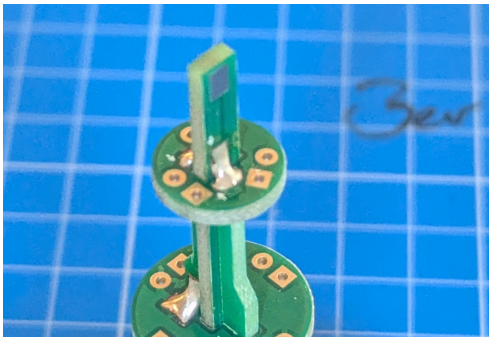
Step 12

a) Time for the middle ring (4 LED holes)!
b) Same process - check the orientation and line up those pads.
c) Slide it down the trunk until it sits on the edge.
d) This creates the middle section of your Christmas tree.



Step 13

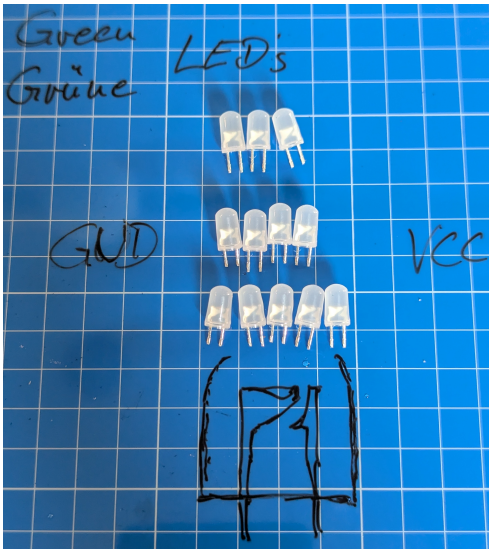
a) Last ring! The small 3-LED ring goes on top.
b) This one has arrows to show you which way it goes - match them up!
c) Solder it in place and your tree frame is complete!
d) Now we just need to add all the lights.



Step 14

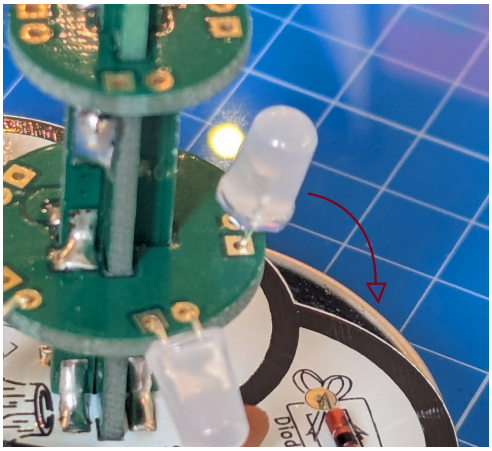
a) LED Preparation - LEDs only work one way so watch the polarity.
b) Remember: round pad = positive (+), square pad = negative (-).
c) Get this wrong and the whole ring will not light up.
d) Cut the LED legs with your side-cutters leaving about 6 mm of leg.
e) The negative (GND) leg is the one with the bigger metal piece inside the LED

and the LED body also has a flat edge on that side.



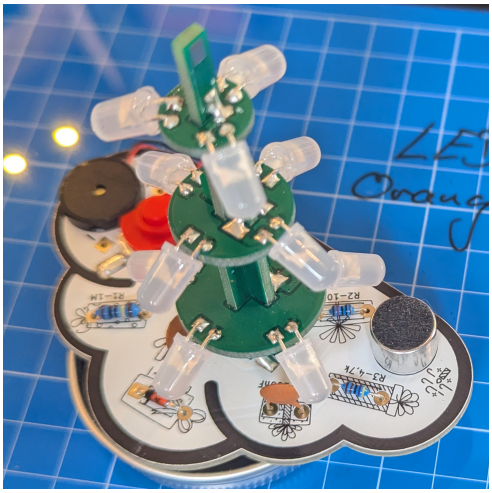
Step 15

a) Let's add LEDs - here's the trick - we're going to bend them like little hooks.
b) This makes them hold themselves in place while soldering!
c) Start by inserting the legs a little bit into the PCB.
d) Now bend the LED down until the LEDs are facing down like tree branches (push it in more if needed).



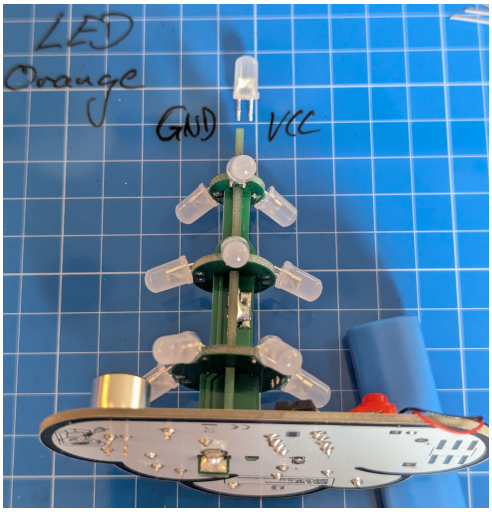
Step 16

a) Solder all the green LEDs using this hook method.
b) Start from the bottom ring and work your way up.
c) Double-check the polarity on each one - square pad is negative!
d) Solder each LED from the top, making sure the solder flows through to the pad.



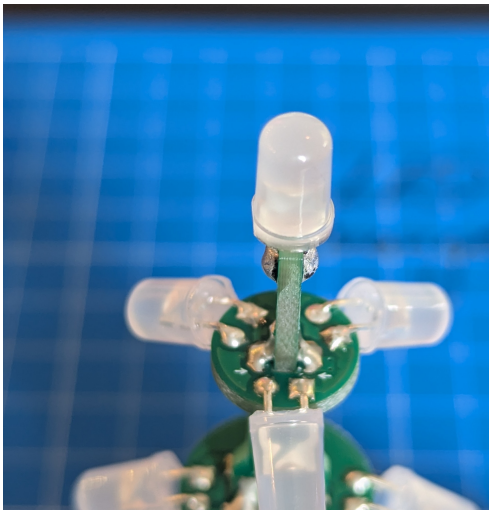
Step 17

a) The grand finale - the orange star LED on top!
b) This one is special - it goes in a specific direction.
c) REALLY IMPORTANT: negative leg toward microphone side, positive toward button side.
d) Get this right and your star will shine!



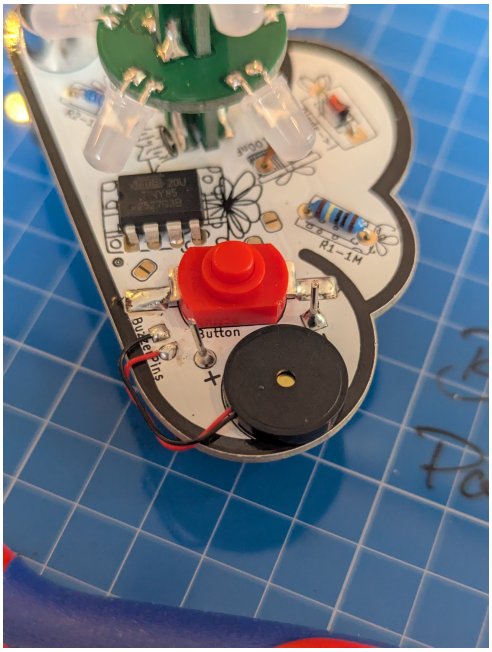
Step 18

a) Your orange star is in place - looking good!
b) All the LEDs are done, your tree is almost ready to light up.
c) Just need power now!
d) Time for the battery pack.



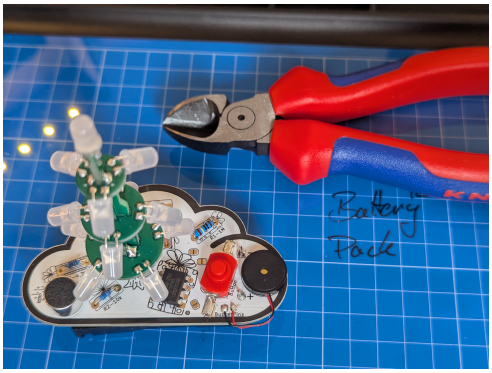
Step 19

a) Battery pack time!
b) Insert the pins through from underneath so the pack sits below the board.
c) Get it positioned right before soldering.
d) Solder those battery pack pins with plenty of heat - maybe adjust your soldering iron for this.
e) WARNING: Do NOT use normal side-cutters on these thick pins - they'll break your tool! :-)



Step 20

a) Use heavy-duty cutters for steel wires to trim those thick pins!
b) Trust me - normal electronics side-cutters WILL break on these.
c) Cut them as short as you can without damaging the solder joints.
d) Safety first - wear eye protection when cutting!



Step 21

a) The moment of truth! Pop in two AAA batteries.
b) Your tree should start flickering like a real candle.
c) Blow hard on the microphone to hear your tree's first song!
d) Congratulations - you built a BlinkyTree!



What you'll need: Soldering iron, solder wire, normal side cutters, heavy-duty side cutters (WARNING: you'll break normal ones on the battery pack!), solder sucker or wick, something to hold your PCB. **Quick guide:** Build the trunk first, add all the base parts, build up the tree rings, LEDs go on last. Super important: Don't connect those trunk GND pads until the big ring is on!