

# 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 3 mm Green (top ring)	Green LEDs
4	LED4-LED7	LED 3 mm Green (middle ring)	Green LEDs
5	LED8-LED12	LED 3 mm Green (bottom ring)	Green LEDs
1	LED13	LED 3 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	Momentary push button for mode changes
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	Main PCB	Base circuit board	
1	Batteries (not included)	Batteries for power	
1	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.

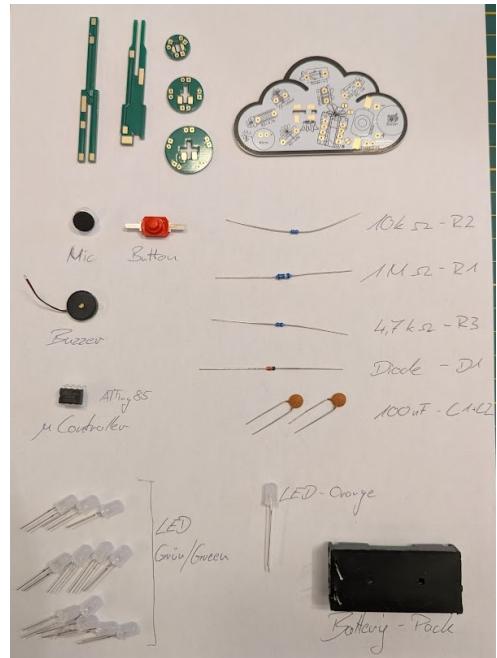
<https://github.com/monkeyToneCircuits/BlinkyTree>  
Ludwigsallee 30  
63739 Aschaffenburg  
GERMANY



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### Step 1

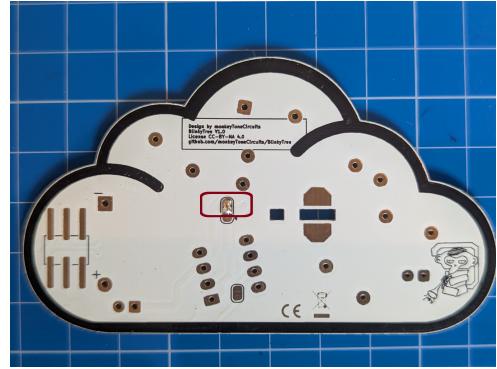
- a) Time to check your parts! Look at the parts list on page 1 and make sure you have everything.
- b) You should find: main PCB, resistors, capacitors, diode, ATtiny85 chip, microphone, buzzer, button, LEDs, and battery pack.
- c) Also find the 5 tree PCBs: 2 trunk parts, plus rings for 5, 4, and 3 LEDs.
- d) Pro tip: Sort everything into groups - it makes building much easier!



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### Step 2

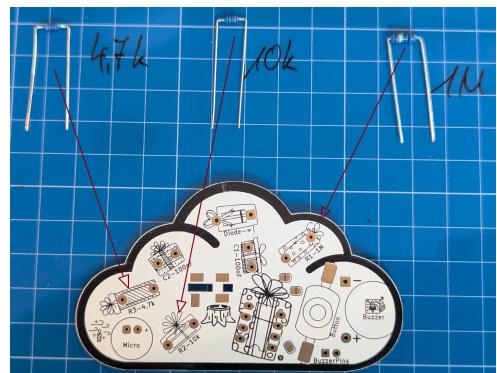
- a) Start with the base PCB - we need to add a solder bridge first! This will put your board into the correct working mode.
- b) Use your soldering iron to connect the upper two pads marked in the picture.
- c) Take your time and make sure the solder flows nicely between the upper pads and not the lower one.



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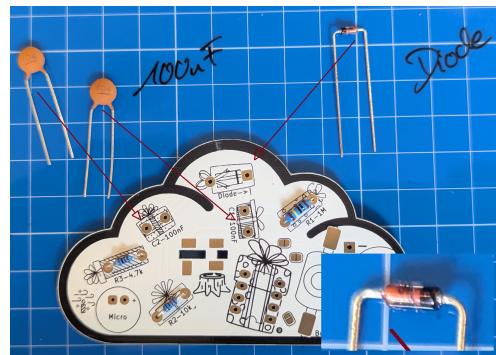
### Step 3

- 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.



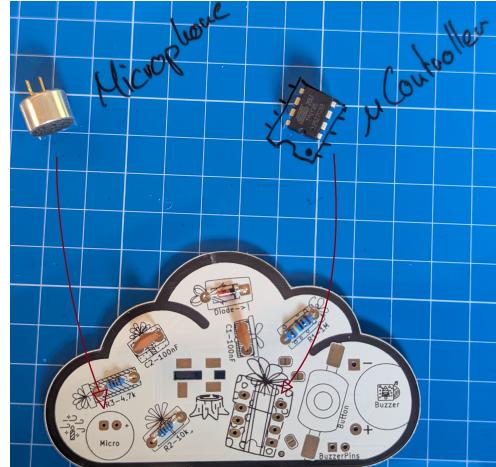
## Step 4

- 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!
- 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.
- If you get this backwards, the blowing mechanism won't work.



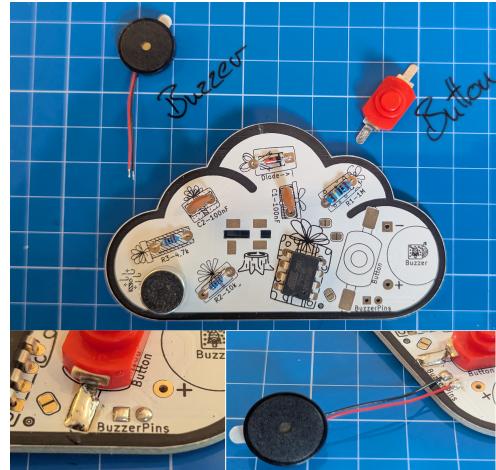
## Step 5

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



## Step 6

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



## Step 7

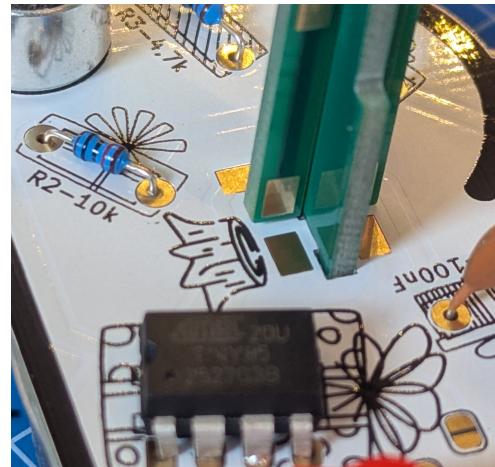
- Here are your two trunk parts - let's build the tree backbone!
- Notice the connection pads on each piece.
- The big GND pads need to be next to each other when you put them together.
- Slide the two trunk parts together
- Don't solder them yet - the bottom ring needs to be placed first



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### Step 8

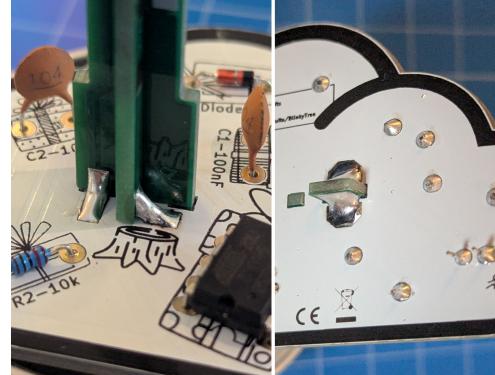
- a) Now push the combined trunk into the base PCB - it only fits one way!
- b) The trunk should stand up straight and tall.
- c) Look for the pads that are at 90-degree angles - those are what we'll solder.
- d) Make sure the trunk is pushed all the way down before soldering.



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### Step 9

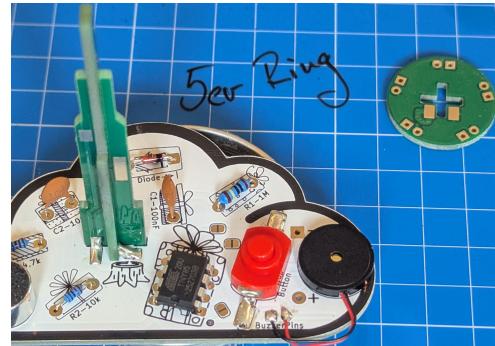
- a) Solder those angled pads to connect the trunk firmly to the base!
- b) Add enough solder to make strong connections.
- c) Your tree should now stand up on its own.
- d) Turn the board over and solder the bottom pads of the trunk
- e) REMEMBER: Still don't solder those big GND pads at the side of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



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### Step 10

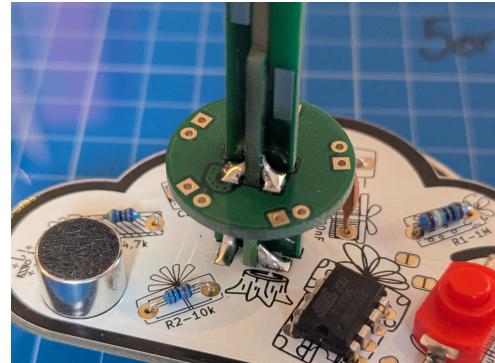
- a) Now we build the tree layers! Start with the biggest ring (5 LED holes).
- b) This ring needs to slide over the top of the trunk.
- c) Check the orientation - the connection pads on the ring should line up with the trunk pads.
- d) Slide it down until it sits on the edge.



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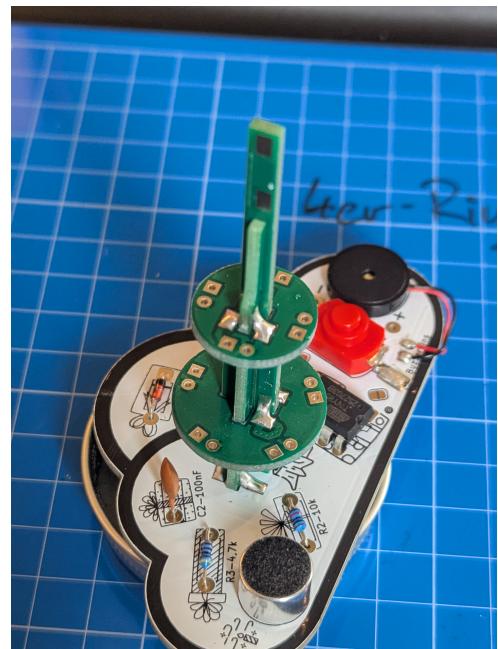
### Step 11

- 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.



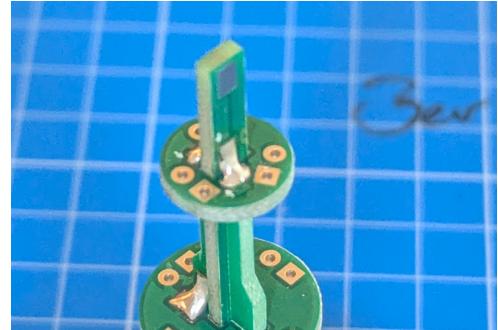
### Step 12

- 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

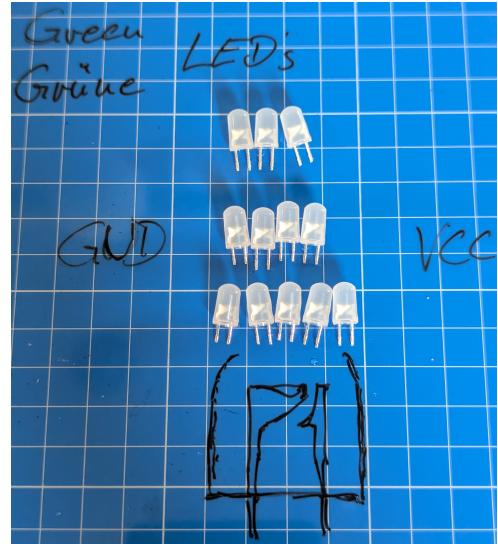
- a) Last ring! The small 3-LED ring goes on top.
- b) This one has arrows to show you which way it goes - match them up!
- c) Solder it in place and your tree frame is complete!
- d) Now we just need to add all the lights.



### Step 14

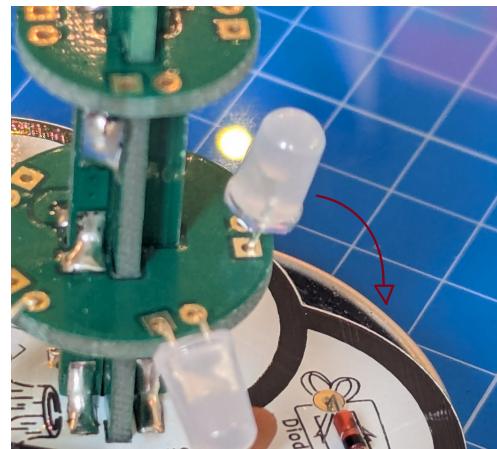
- a) LED Preparation - LEDs only work one way so watch the polarity.
- b) Remember: round pad = positive (+), square pad = negative (-).
- c) Get this wrong and the whole ring will not light up.
- d) Cut the LED legs with your side-cutters leaving about 6 mm of leg.
- e) The negative (GND) leg is the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



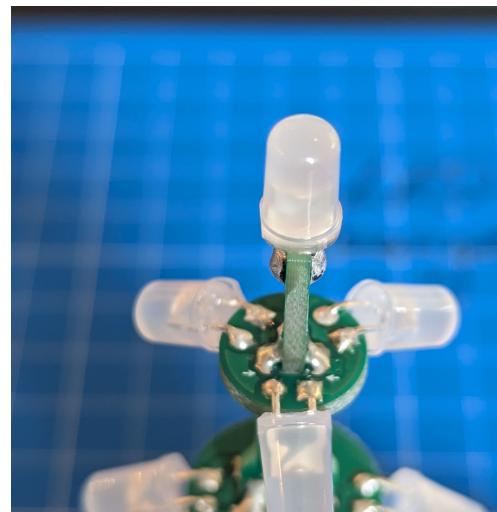
### Step 17

- 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!



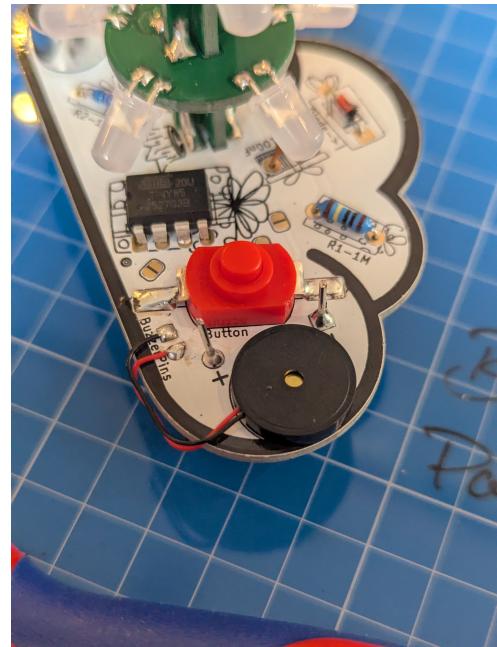
### Step 18

- 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!

