

BIT HAVEN

SOLDERING TUTORIAL

A beginner-friendly build for new members and visitors

DIFFICULTY

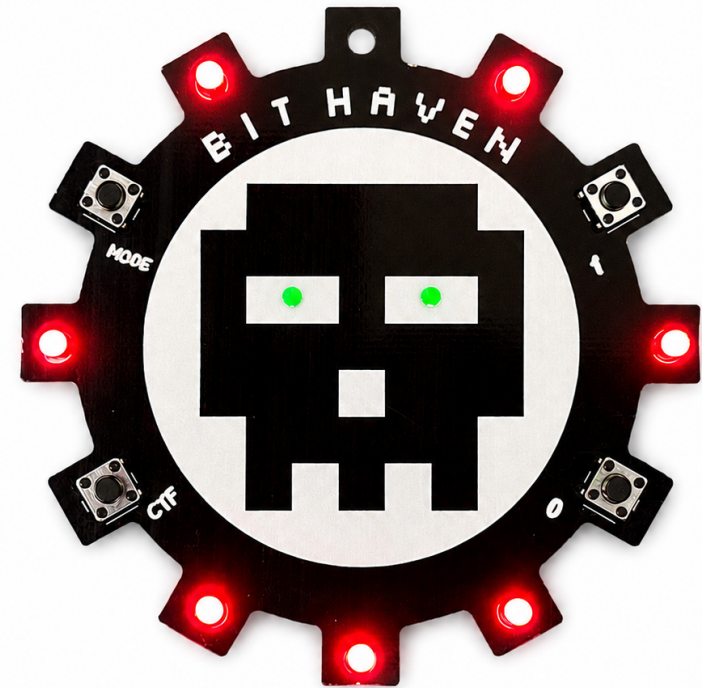
Easy

TIME

15-20 min

SOLDER COUNT

7 LEDs · 14 joints



MORALLY ALIGNED. SLIGHTLY MISCONFIGURED.

Before You Start

ABOUT THIS BUILD

DIFFICULTY

Easy

No prior experience needed

TIME

15-20 min

Take your time – it's not a race

JOINTS

7 × 2 = 14

Two solder points per LED

This badge comes mostly assembled. You'll be soldering 7 through-hole LEDs around the gear edge – pick any colours you like and have fun with the mix. The chip, switches, and battery holders are already in place.

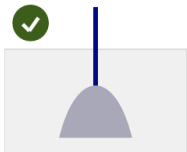
TOOLS YOU'LL NEED

- **Soldering iron**
~330 °C for leaded · ~350 °C for lead-free solder
- **Solder wire**
0.5-0.8 mm rosin-core works great
- **Side cutters**
For trimming LED legs after soldering
- **Tweezers (optional)**
For holding small components

SAFETY · QUICK NOTES

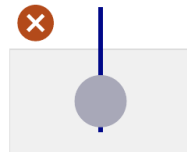
Iron tip is hot – touch only the handle. Solder fumes: work in a ventilated area. Wash hands after handling leaded solder.

WHAT A GOOD SOLDER JOINT LOOKS LIKE



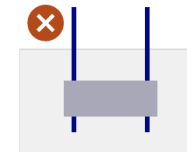
Good joint

Shiny, concave, surrounds the lead – like a tiny volcano.



Cold joint

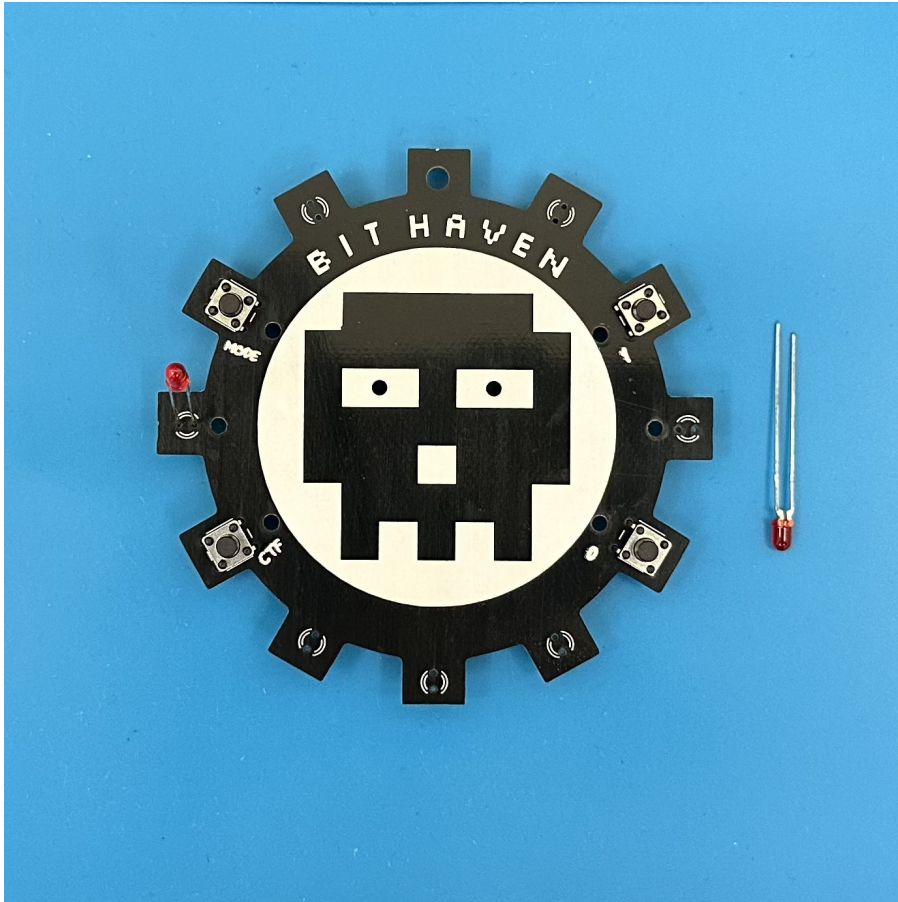
Dull, blobby, sits on top. Reflow with more heat.



Bridge

Solder spans two pads. Reheat and wick excess away.

Take a Glance



WHAT'S IN THE KIT

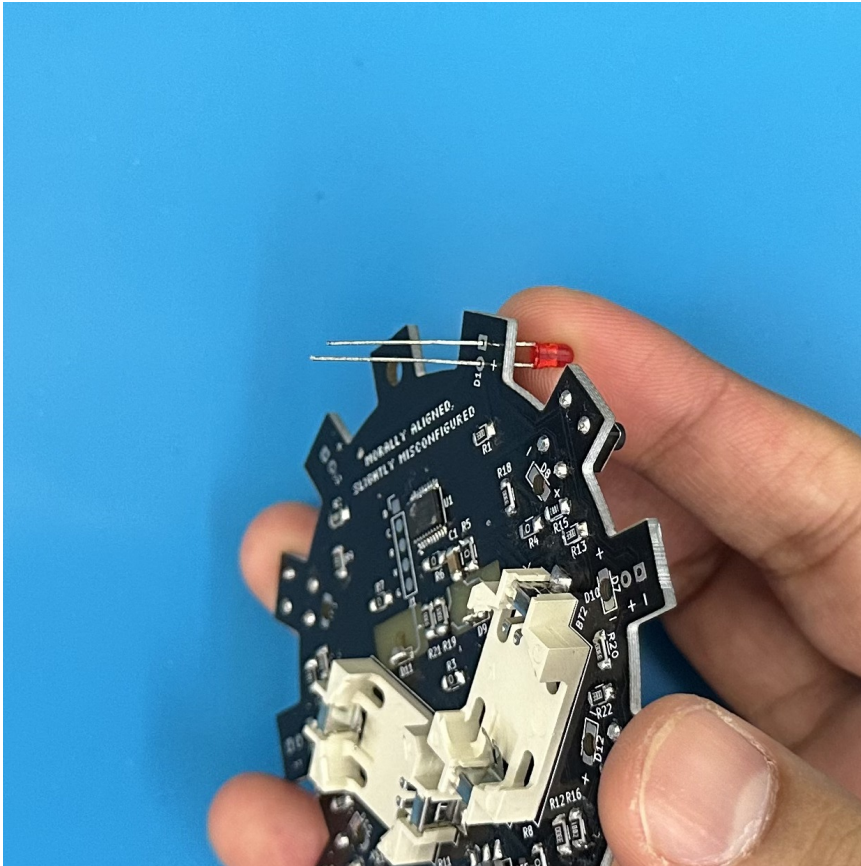
Your Bit Haven badge arrives almost finished. The chip, switches, components, and battery holders are already soldered. You'll add the 7 through-hole LEDs that ring the outer gear teeth.

- **Bit Haven badge PCB**
Pre-assembled with all electronics
- **7 × 3 mm PTH LEDs**
You pick the colours – single shade or mix
- **2 × CR2032 coin cells**
Inserted at the end, + side facing up

PICK YOUR PALETTE

Mix and match colours to customise your badge. Red, green, blue, yellow, white – go wild. There's no wrong combo.

Insert a PTH LED

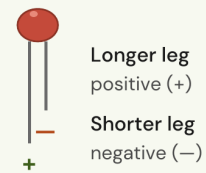


Pick an LED. The longer leg is positive (+), the shorter leg is negative (-).

Insert from the front of the board so the LED sits face-up. Push the longer leg into the round pad marked +, and the shorter leg into the square pad marked -.

POLARITY · LEG LENGTH AND PAD SHAPE

The LED



The PCB pads

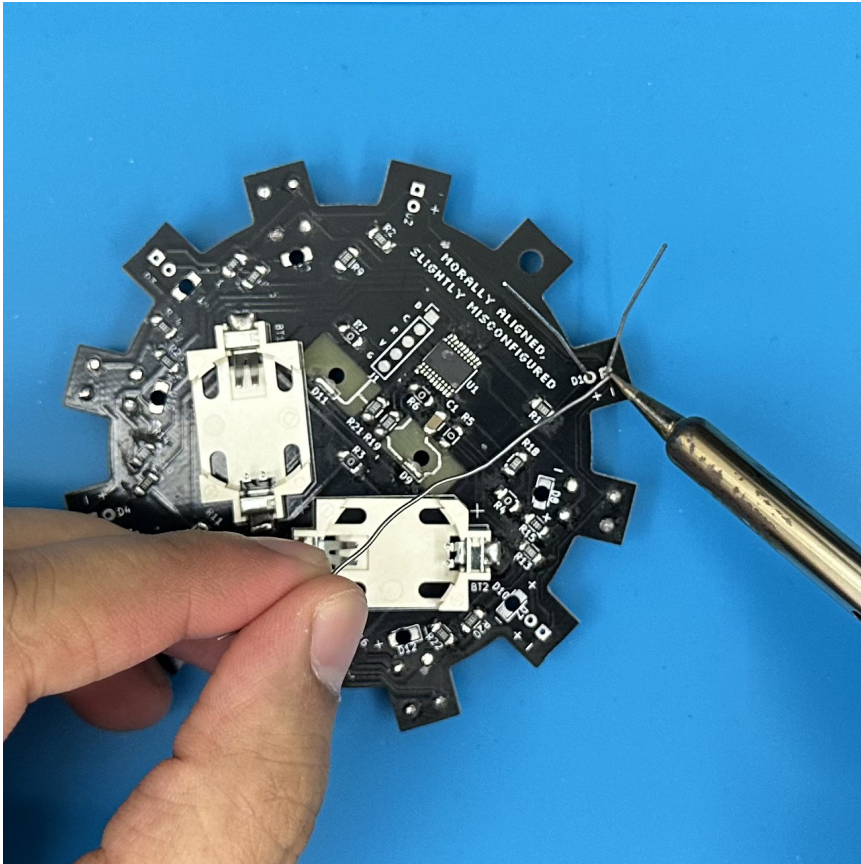


TIP

If you accidentally swap polarity, the LED won't light. The fix is easy – reheat the joint and flip the legs.

STEP 02

Heat and Solder the First Pad



Flip the board so the legs poke up at you. Bend the legs out slightly so the LED stays seated.

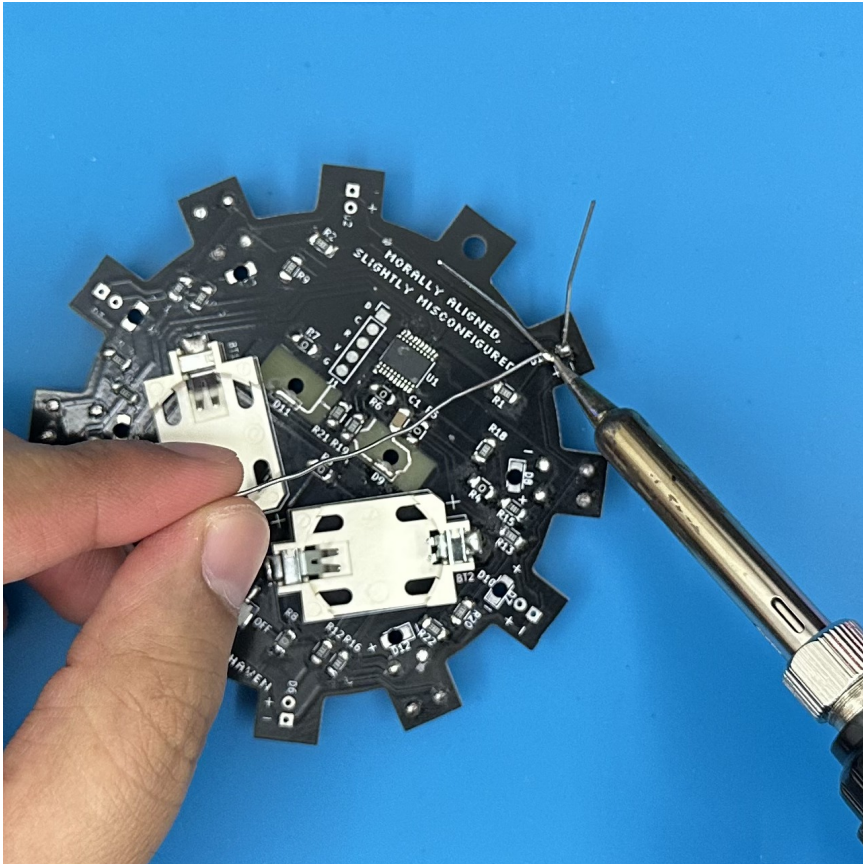
Hold the soldering iron tip against one pad and the LED leg at the same time. Count to two – let the metal heat up.

Touch the solder wire to the joint (not the iron). It should melt and flow into a small shiny mound. Pull the wire away, then the iron.

TIP

Heat the joint, not the solder. If you melt solder onto a cold pad, you get a dull, weak "cold joint" that often fails.

Solder the Other Leg, Then Repeat



Now do the second leg the same way: iron against pad and leg, count to two, feed solder.

Once both joints look shiny and concave, snip the excess leg flush with the joint using side cutters.

Repeat for the remaining 6 LEDs around the gear. Mix the colours however you like.

TIP

Working tip-to-tail: insert one LED, solder both legs, trim, then move to the next. It's faster than queueing them all up.

STEP 04

Light It Up

Slide both CR2032 coin cells into the holders on the back of the badge.

Important: + side faces up. The flat side with text and the larger surface is the positive face.

As soon as the second cell is in, the badge runs a 3-second preview – every LED you soldered will flash. This is your sanity check.

YOU'RE DONE

All 7 LEDs lit?

Wear it. Show it off. Welcome to Bit Haven.



Troubleshooting

One LED isn't lighting

Most likely the polarity is flipped or that joint is cold. Reheat one leg until the solder turns liquid, gently push the LED, and let it cool. Still dark? Reverse the LED.

LED flickers or is dim

Cold joint. Reheat both pads on that LED until the solder flows shiny and concave. Dull, lumpy solder is the giveaway.

Burnt the LED?

It happens. 3 mm PTH LEDs are cheap – ask a Bit Haven member for a spare. Try to keep the iron on each joint for under 3 seconds.

No LEDs light at all

Check the coin cells – both should be + side up, and both should be fully seated. If new batteries don't help, check that you didn't bridge two pads on one LED.

Two pads bridged with solder

Heat the bridge until it flows, then drag the iron away across the empty space. If too much solder, use desoldering braid to wick the excess.

Trimmed leg too short

If the joint still looks shiny and surrounds the lead, you're fine. If the lead is now flush with the pad, reflow with a touch more solder.

Still stuck? Ask any Bit Haven member - social debugging is more fun.

For Keen Observers

PSST...

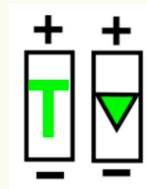
There may be more than what you see.

If you look closely at the board, you might notice ████████ solder joints.

They're part of a ████████ side-quest.

Solving it requires ████, patience, sharp eyes, and a steady hand.

HINT : ORIENTATION



The green T (or triangle) points toward the negative (-) side.