

iPhone-flashlight adjustable stand



Summer / September 2026

Presented by

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The Problem It Attempts To Solve

- Pitch dark in my room starting sunset and afterwards
 - Roommate is heavily insistent on gaming past 7pm with all lights off besides computers and mobile devices since he's a "professional deadlocks gamer" who "needs ideal lighting conditions"
 - Therefore, circumvention of desk lamp restriction using the loophole of allowing mobile devices - turn the phone's flashlight feature into a desk lamp.
 - Thus, he can't make me turn it off since it's my personal phone, which is allowed



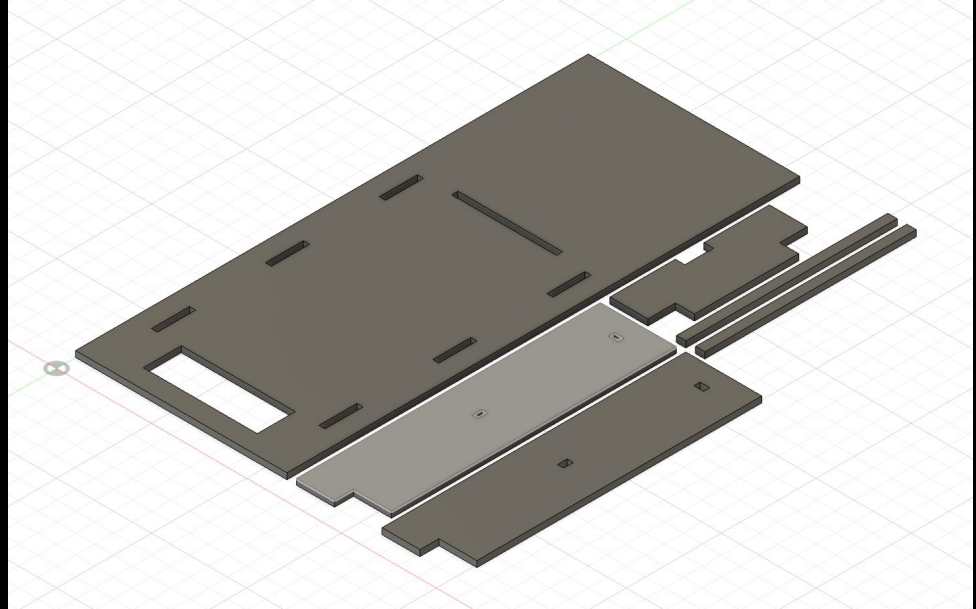
The Main Features

- Adjustable height/angle of phone flashlight with 3 options (see 3 pairs of joints-holes in side of spine)
- Highly structurally stable with 2 supports, 1 long spine base, 2 connector sticks stabilizing the 2 supports, and 1 large joint between phone clutch and spine
 - Plus wood glue to hold supports + connectors and clutch + spine
- Hole up top of spine for flashlight to shine through



The Structural Design

- Spine is 270mm tall by 111.35mm length by 3.175mm width
 - Support holes are 20mm tall by 3.175mm length by 3.175mm width
 - Clutch hole is 3.175mm tall by 55mm length by 3.175mm width
- Upper clutch is 20mm tall by 84mm length by 3.175mm width
 - Lower clutch is 10mm by 55mm length by 3.175mm width (the part that goes into the clutch hole)
- Lower supports are 150mm tall by 40mm length by 3.175mm width
 - Upper supports are 10mm tall by 20mm length by 3.175mm width (the part that goes into the support holes)
- Connectors are 111.35mm by 3.175mm by 5mm



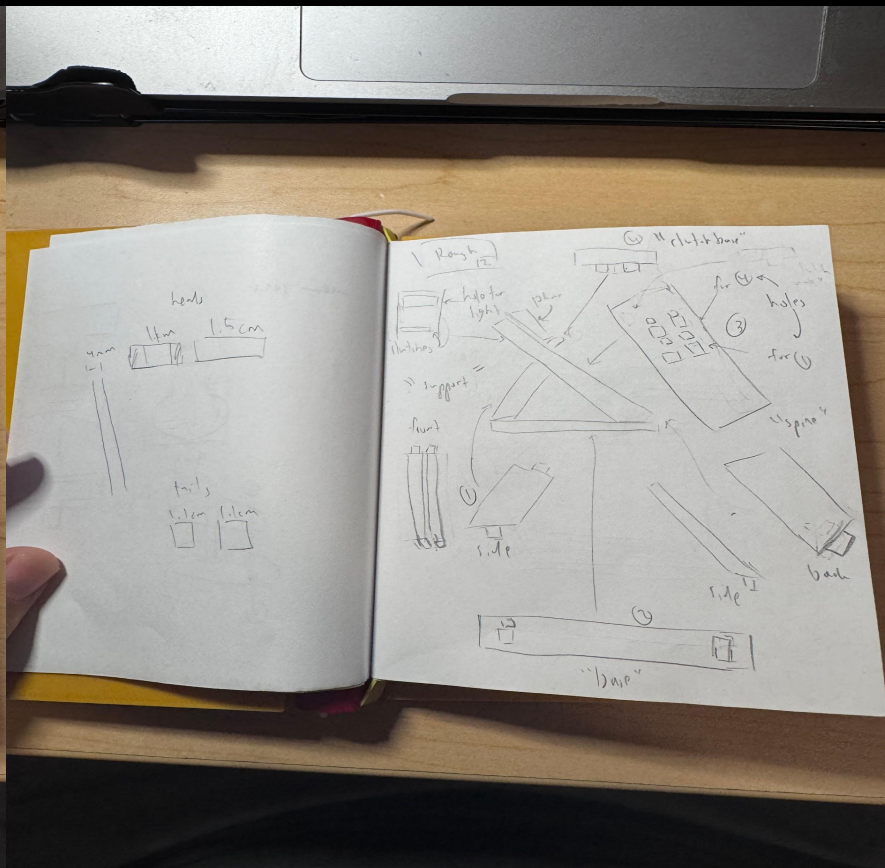
The image shows two hand-drawn sketches of a mechanical device, labeled 'Rough 1' and 'Rough 2'. The sketches are drawn on a piece of paper placed on a wooden surface.

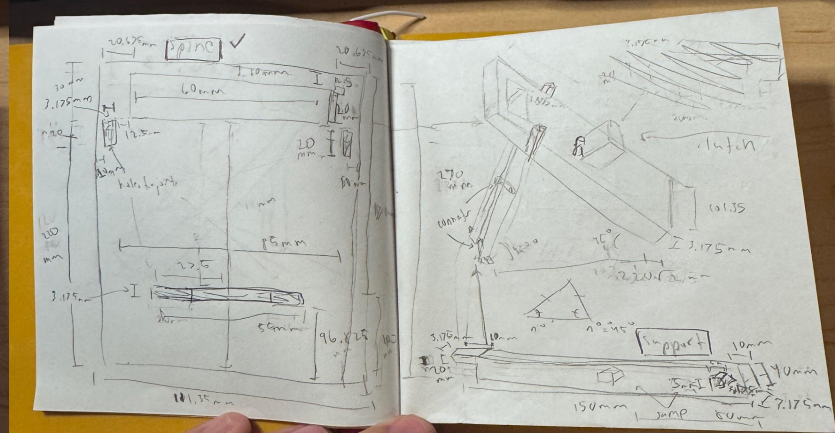
Rough 1: This sketch shows a perspective view of a box-like structure. The lid is hinged and is shown in an open position. Labels include:

- photo**: pointing to the top surface of the lid.
- clutch base**: pointing to the hinge mechanism.
- clutch spine**: pointing to the hinge mechanism.
- spine**: pointing to the central vertical support.
- support**: pointing to the base of the structure.
- spine**: pointing to the central vertical support of the base.

Rough 2: This sketch shows a perspective view of a box-like structure, similar to Rough 1 but with a different lid design. The lid is hinged and is shown in an open position. Labels include:

- clutch base**: pointing to the hinge mechanism.
- spine**: pointing to the central vertical support.
- base**: pointing to the bottom surface of the box.
- photo**: pointing to the top surface of the lid.



[illegible]

The Prototype



The Final Product



The Important Design Changes

Spine (diff: Sketch)

More Supporter Holes near sides

- Having only 1 option felt restricting
- So there are now more options for heights/angles of the iPhone flashlight

Phone Clutch (diff: Prototype)

Fixed dimensions

- Was slightly too wide
- Shrank it to 54mm width to accommodate the new support holes

Support Holes (diff: Prototype)

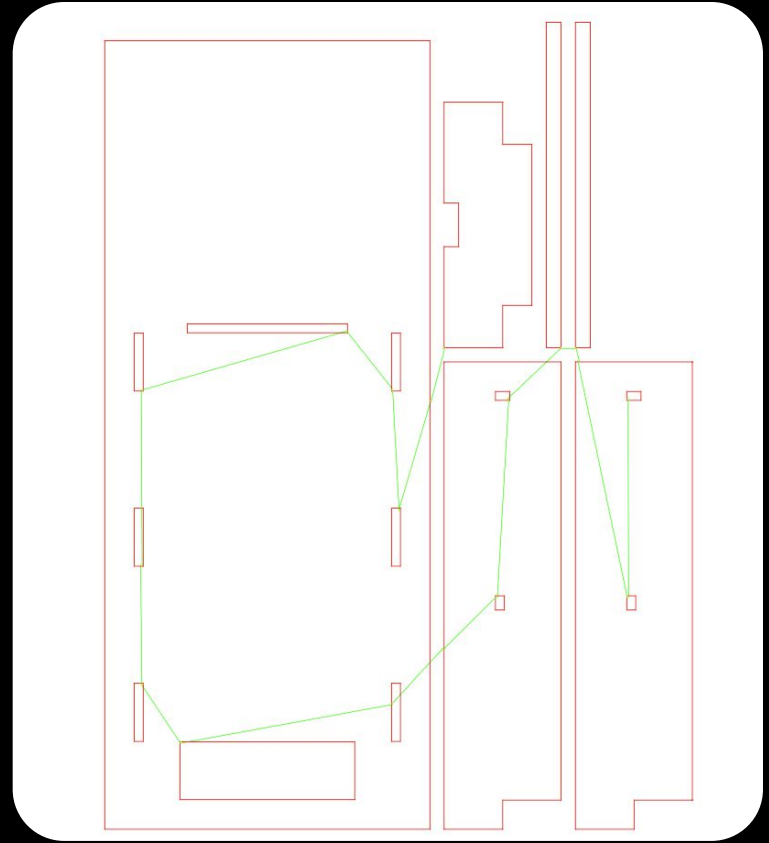
Fixed dimensions

- Was too large for proper connections
- Made smaller to fit dimensions of connector sticks

The Actual Fabrication

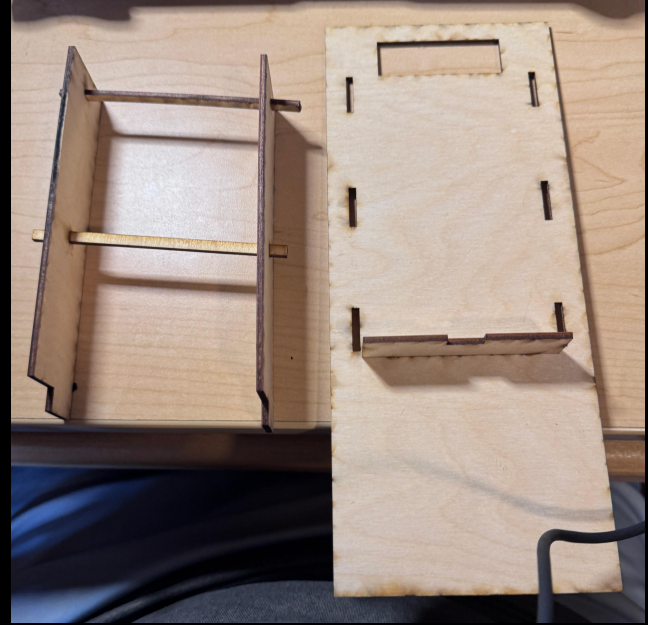
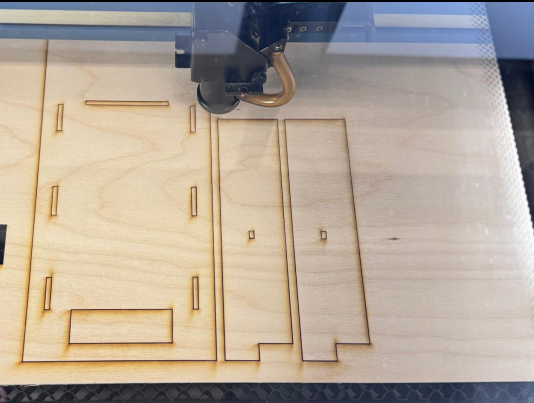
- Materials + Process

- Made from 1/8th inch (3.175mm) wide plywood generously supplied by Alejandro Aponte
- Laser cut using 2 cycles @ Makerspace laser cutting machine
- Dxf file on right >>>>



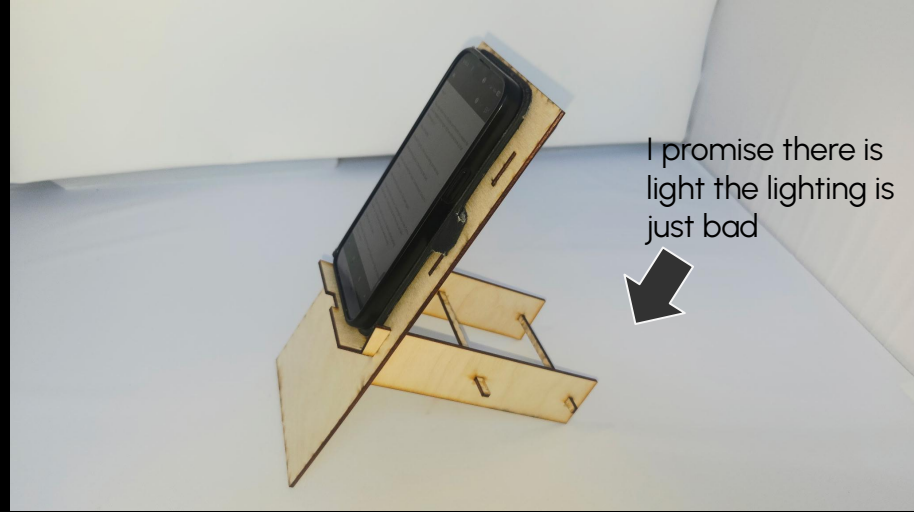
The Actual Fabrication - Assembly + Constraints

- Laser cut @ Makerspace
- Assembled wood pieces into 2 main parts - spine + clutch and supports + connectors
- Wood glued the wood pieces together into the 2 main parts (not gluing the 2 parts together)
 - Waited overnight to dry
- Completely assembled the day after



- Only knew how to laser cut pre-provided plywood, so everything had to accommodate the standard 1/8th inch width
 - Connector sticks were originally 5mm x 5mm x 3.175mm, now 5mm x 3.175mm x 3.175mm

The Proof That It Works (images)



The Proof That It Works

Yes, it could shine the flashlight through while securely holding the phone, and thus successfully meets my goal. Its multiple options work too.

One thing that worked particularly well was the supports - held up the phone across multiple heights.

The Reflection

- One unexpected challenge was gluing the pieces together, since they kept tilting during initial fabrication.
 - In the end, the supports still ended up a bit tilted; not perpendicular to the spine (more like 89 degrees)
- One thing I would change is the support holes positions in the spine
 - Move them closer to the sides by a few mm so the clutch has more space and can fit wider phone cases
- One takeaway from designing for fabrication is that Autodesk Fusion is great for simple objects, but gets complicated and time-consuming **really** quickly. So when designing for fabrication, especially laser-cutting, keep designs as simple as possible with as few circles and curves (since they're difficult to work with and design around from my experience) as possible.



Thank you for watching



Special thanks to
Roberto Ortiz for
letting me use his
phone to record
my phone being
used on the stand



Want to discuss further?

Let's yap ig

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