

# **12 Reasons why 3D Printing Matters:** **Amateur Radio Edition**

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Date: January 10<sup>th</sup>, 2026

HAM RADIO UNIVERSITY 2026 EXCLUSIVE

# 3D Printing Cautionary Statement(s)

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This is a 50-minute presentation, inclusive of 8-10 minutes of Q&A. Not everything can be covered at infinite depth in this time on this large topic.



If there is something you disagree with, that is ok. Only so much can be covered. This presentation is built around my views and not of anyone else or organization.



People new to this topic will gain the most information. I tried to balance this for as many audiences as possible based on survey data.



This presentation is meant to inspire continued discussion after its presented. This is not meant to be the only information available. Always be learning!

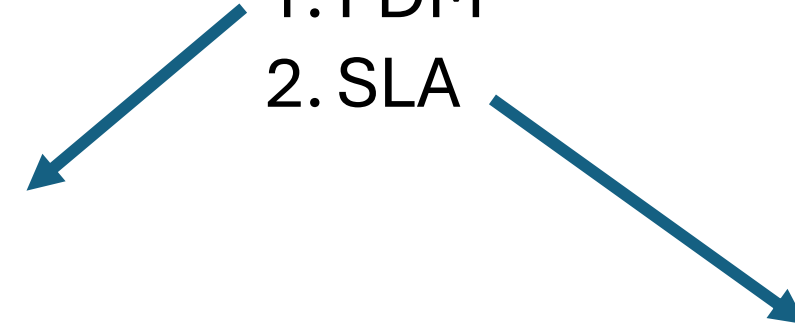
# **3D PRINTER HARDWARE BASICS**

# 3D Printing Basics Hardware Summary

TWO MOST COMMON TYPES OF ADDITIVE 3D PRINTERS ARE:



1. FDM  
2. SLA

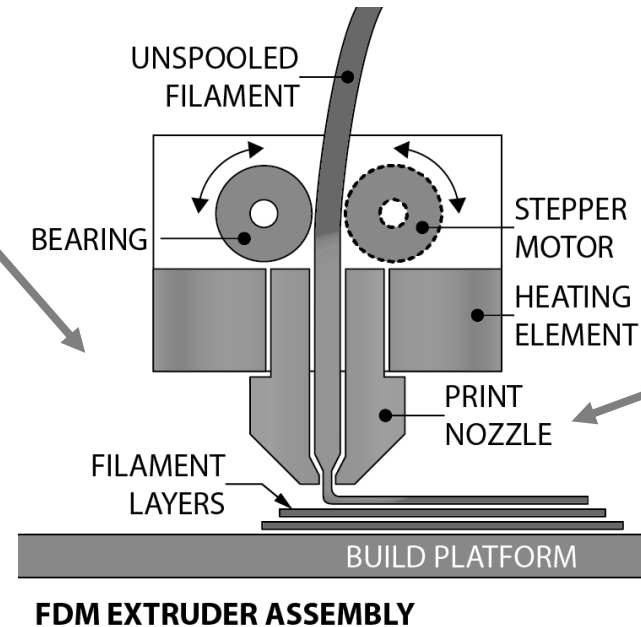
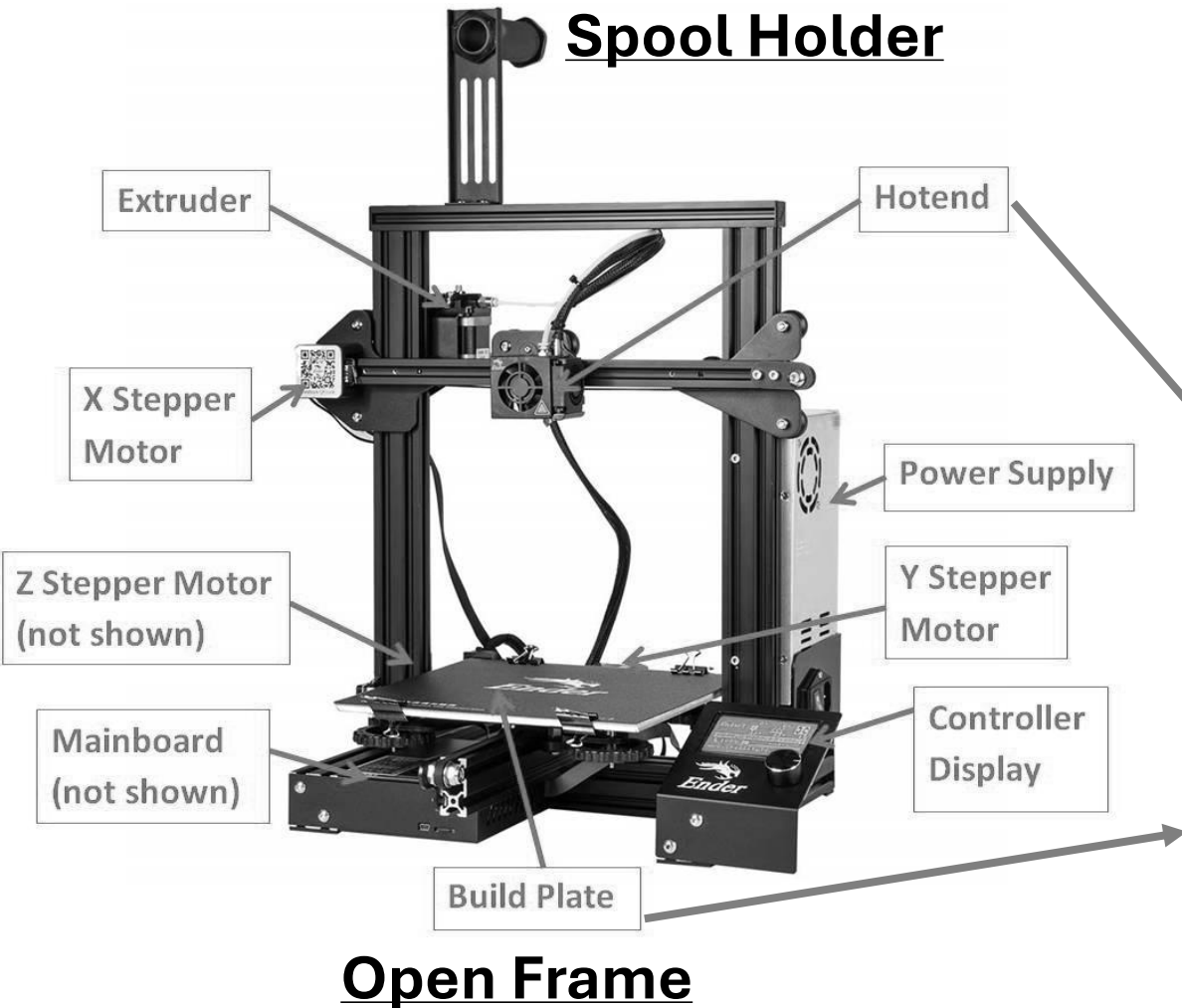


Differences on next slides



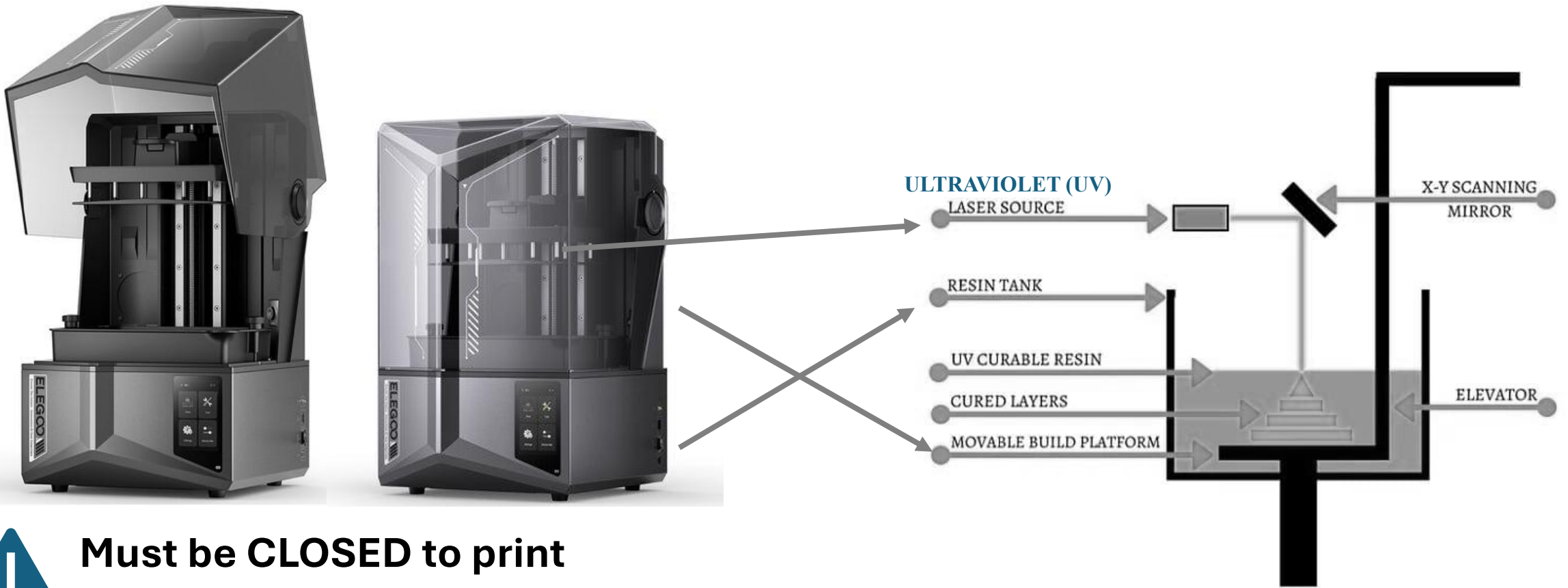
# 3D Printing Basics Part 1 - FDM

Fused Deposition Modeling or Fused Filament Fabrication



# 3D Printing Basics Part 1 - SLA

Stereolithography also known as a “resin” printer



**Must be CLOSED to print  
due to chemicals used**

# 3D Printing Hardware Summary

## BASIC DETAILS FDM COMPARED TO SLA

1. SLA printers need more ventilation and require chemicals during and post printing.
2. FDM printers use different types of filament and not liquid chemicals. Little post printing cleaning needed.
3. Finer print resolution can usually be achieved with an SLA printer. FDM has more use cases though.
4. FDM printers have more moving parts than SLA printers and may be noisier at times.

# 3D Printing Hardware Summary

## BASIC DETAILS COMPARING PRINTER PURCHASE VERSUS HAM RADIO

1. Both types of printers require a stable operating environment (temperature, humidity, no dust, etc)
2. There are many brands of FDM and SLA printers. The best printer is what you have. Upgrade later.
3. Spending more on a printer usually means less time fixing it. Fact. Avoid used equipment if starting out.
4. You do NOT need to spend a lot today to get a decent 3D printer of either FDM or SLA types.
5. There has been a lot of innovation in the last 5 and 10 years. Forget the past?

Just like amateur radio, right?

# **3D PRINTER SOFTWARE BASICS**

# 3D Printing Basics Part 2 – Software Terminology

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**CAM, CAD & MODELER'S** = Software used to create models. Computer Aided Manufacturing (CAM) and Computer Aided Design (CAD) programs are used to create models. There are many CAD/CAM options.



**SLICER** = A slicer is software which converts models to terminology your specific printer will use to print a model.



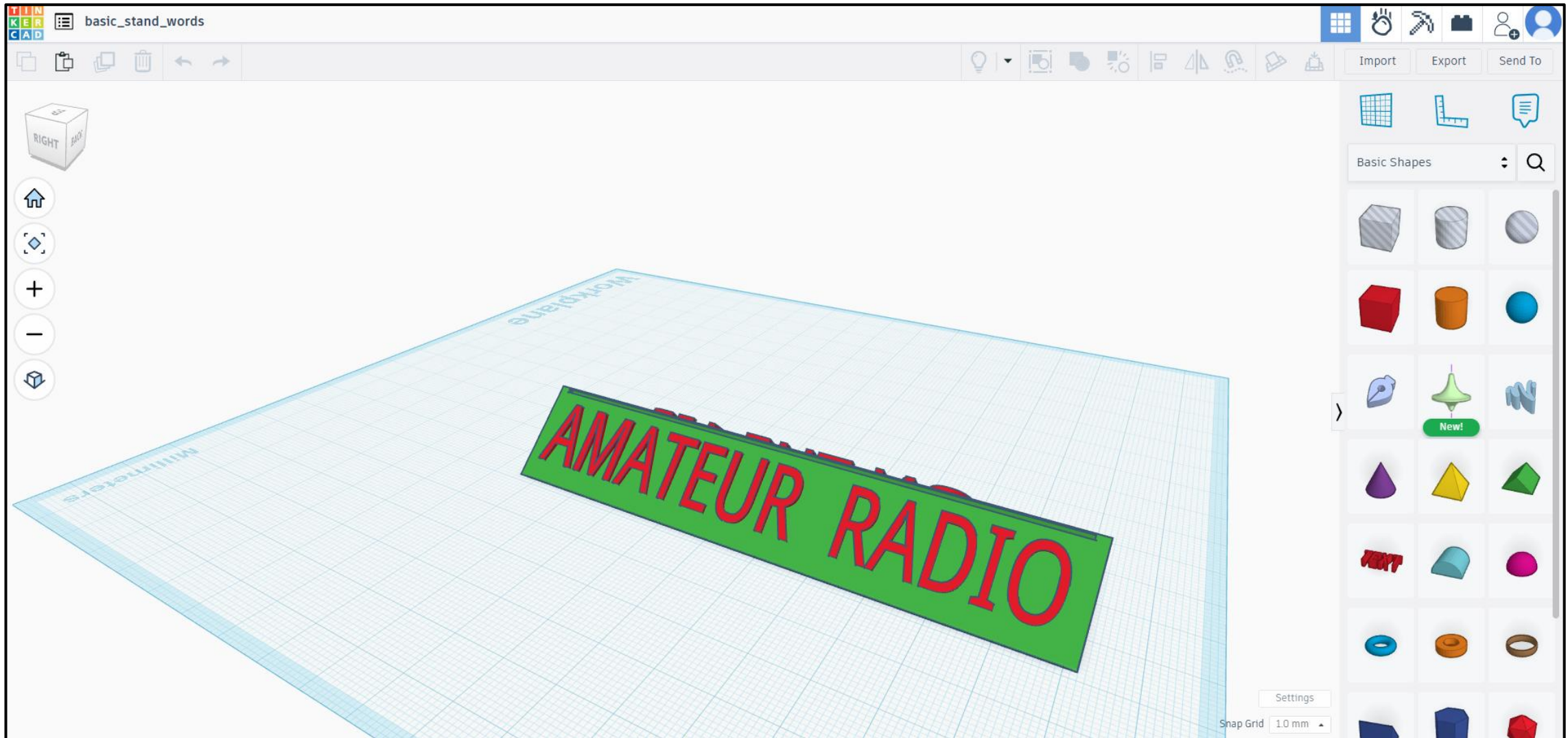
**G-CODE** = Is the language the 3D printer understands and sometimes is easier to modify in your slicer software for certain parameters.

# 3D Printing Important Terms – CAD Software

CAD Software Name	Ease of 1 <sup>st</sup> Use	Overall Capability
Tinkercad	★★★★★	★★★
FreeCAD	★★★	★★★
SketchUp	★★★★	★★
Fusion360	★★★★	★★★★
OnShape	★★★	★★★★★
SolidWorks	★★★	★★★★
Blender	★★★★	★★★★
Rhino3D	★★★	★★★★

For this presentation, **Tinkercad** will be the featured CAD/CAM software.

# 3D Printing Important Terms – CAD Example

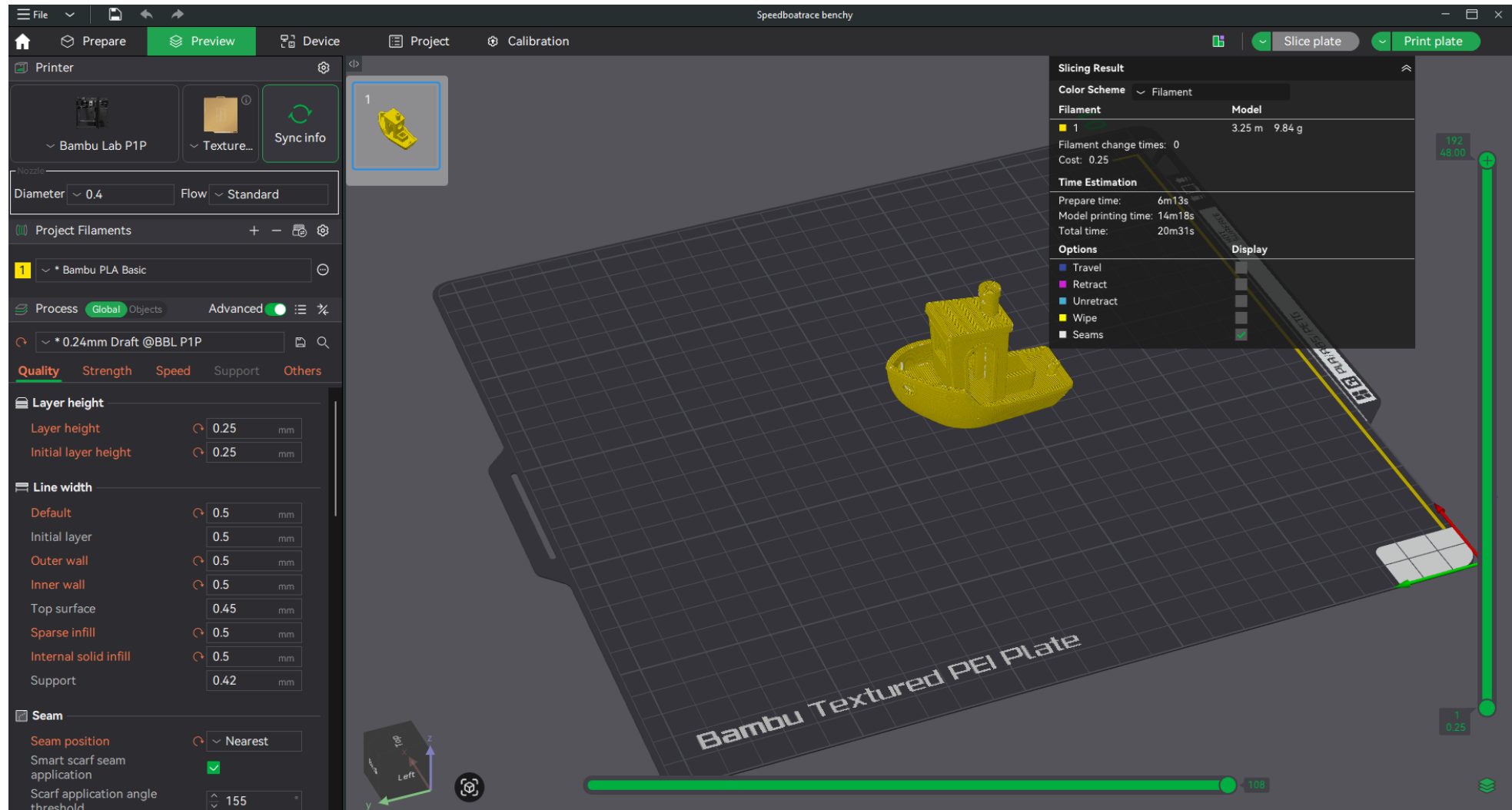


# 3D Printing Important Terms – Slicer Software

Slicer Software Name	Ease of 1 <sup>st</sup> Use	Overall Capability
Ultimaker Cura	★★★★	★★★
PrusaSlicer	★★★	★★★
<b>OrcaSlicer</b>	★★★★	★★★★
<b>Bambu Studio</b>	★★★★	★★★★
Lychee Slicer	★★★★	★★★★
ChiTuBox	★★★	★★★★★

For this presentation, **Orca** & **Bambu Studio** will be the featured slicers.

# 3D Printing Important Terms – Slicer Example



# 3D Printing System FDM Brand Recommendations

(These are examples, not endorsements)



Bambu  
P1S



Anycubic  
Kobra S1



Creality  
K2



Prusa  
CORE One L



Snapmaker  
U1

Models shown closed frame options popular currently

# 3D Printing System SLA Brand Recommendations

(These are examples, not endorsements)



Creality  
Halot



Elegoo  
Saturn



Elegoo  
Mercury



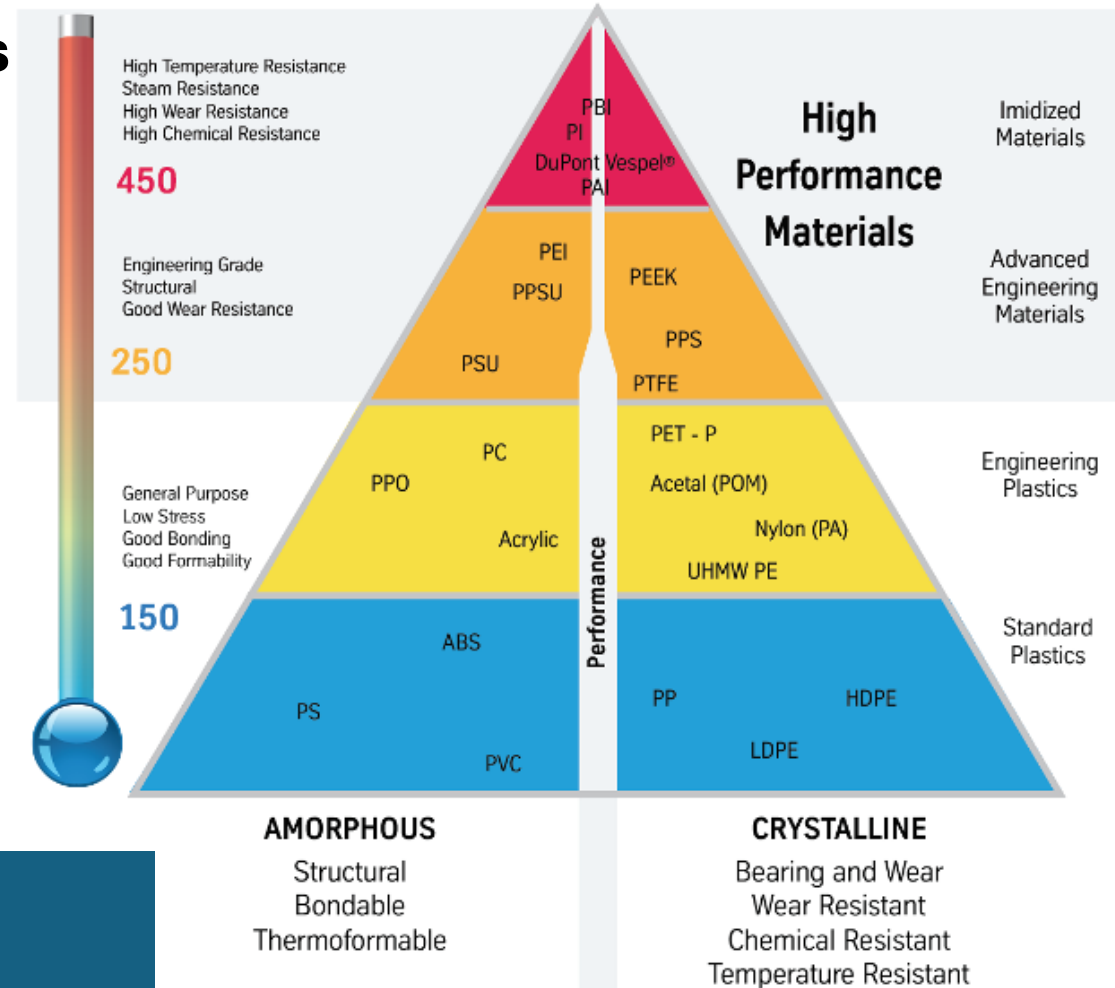
Anycubic  
Photon

Models shown are popular currently

# 3D Printing System FDM Materials (SLA Resins Excluded)

## Common Filament Types

PLA  
PLA PRO  
PETG  
TPU  
ASA  
ABS  
PC  
CF



## Trusted Brands

Overture  
InLand  
Hatchbox  
Polymaker  
eSun  
Sunlu  
Prusament  
Bambu  
Atomic

## Useful Accessories

Filament Dryer  
Filament Joiner

## SUGGESTION

TRY TO ALWAYS USE THE SAME  
BRANDS OF FILAMENT FOR COLOR  
MATCHING AND PRINTER SETTINGS

**Filament Diameter**  
1.75mm (Most Common)

# 3D Printing System FDM Materials (SLA Resins Excluded)

## Common Filament Types

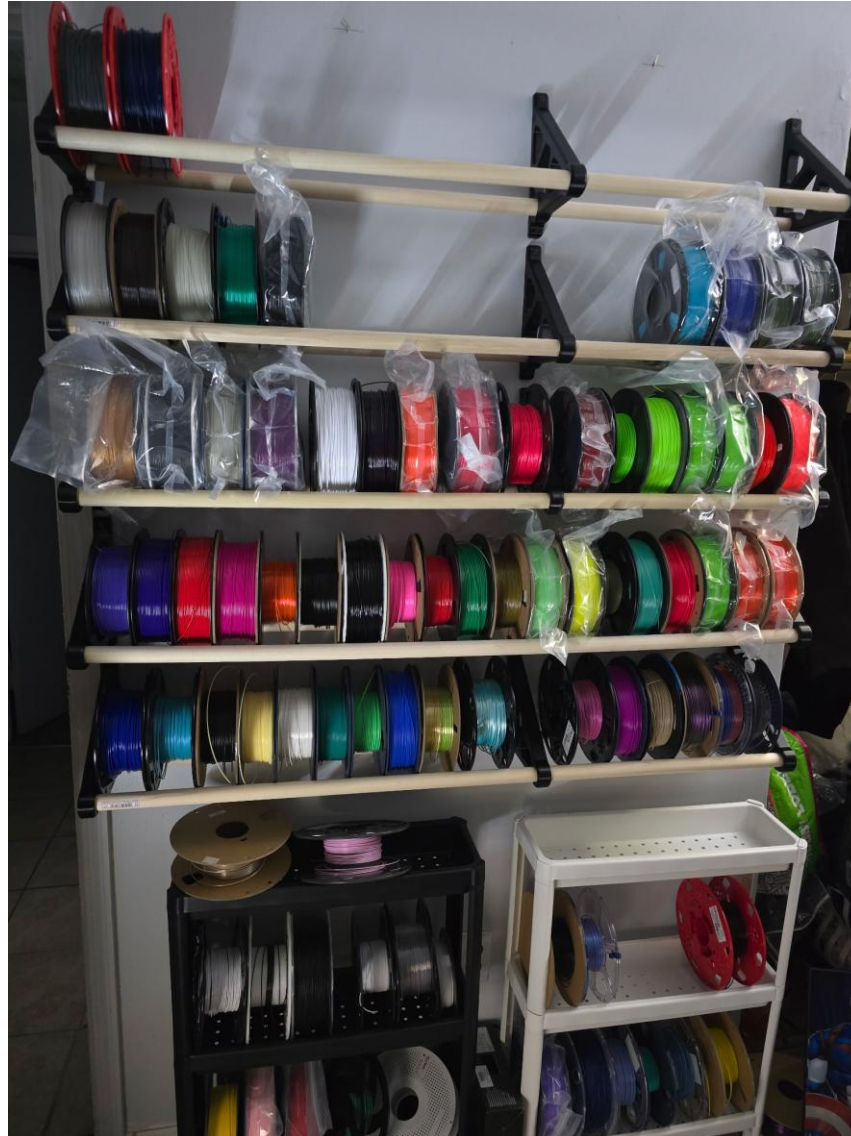
PLA  
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Attribution: Nicole AD2IM

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Atomic

## Useful Accessories

Filament Dryer  
Filament Joiner

# 3D Printing

## Reason 1: Finding models

Websites exist  
with both free  
and paid  
models

Examples On  
Next Slides

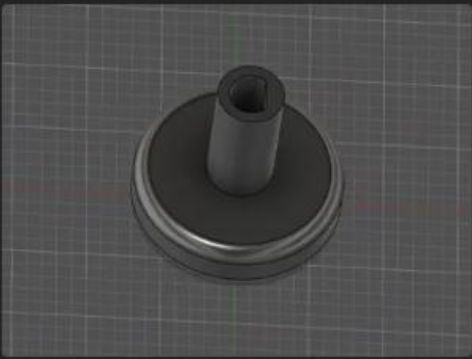
<https://makerworld.com/>

<https://www.printables.com/>

<https://www.thingiverse.com/>

<https://www.yeggi.com/>

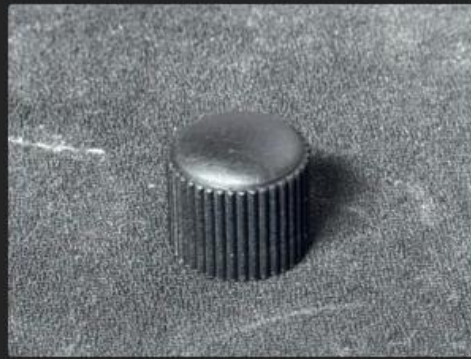
<https://cults3d.com/>



**Radio Knob Replacement**  
John Days  
0 28 162



**Radio knob for Volkswagen G...**  
DjipaAa  
0 15 73



**truck radio knob Chevy Silve...**  
Ivan  
3 28 210



**Baofeng Skeleton PTT and Vo...**  
JuanDeag  
17 141 353



**Tacoma Radio Knobs**  
Little Dino  
0 11 23



## 3D Printing Reason 1: Infinite Replacement Parts

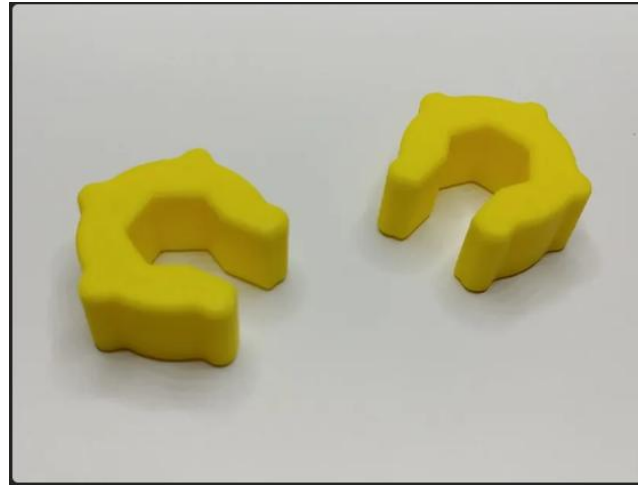
- ✓ Ever lose or break a radio knob?
- ✓ Ever want new or better feet or handles for a radio?
- ✓ Ever need a new belt clip?
- ✓ Ever need something not made in years?

# 3D Printing Reason 2: Making specialized tools

- Non-metallic tools are very useful to have in ham radio.



Adjustable wrench leaves no marks for certain tasks.

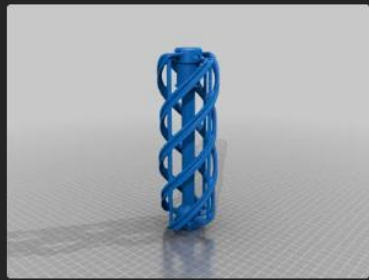


Finger-tight wrenches.



Non-conductive tools help in RF circuit alignments.

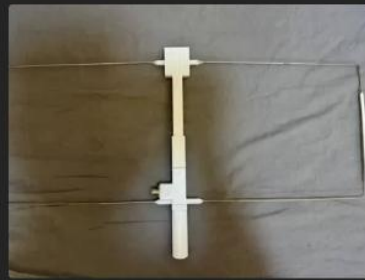
# 3D Printing Reason 3: Avoid costly antenna things



**FullWave Compact QFH Ante...**  
EMT  
13 44 160



**Dual Band Flower Pot Anten...**  
Orhun Avdzu  
0 4 8



**Moxon antenna for 2m band...**  
Sadiruldeen Sami  
0 1 9



**POTA Performer - 18 Gauge ...**  
SunsetRider  
3 2 21



**Antenna Guy Insulator (Guy ...**  
Majak  
4 7 58



**Amateur Radio Dipole Feedp...**  
Ryan1234  
2 20 91



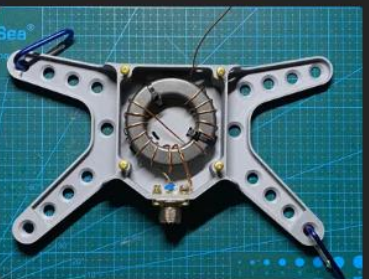
**HF Antenna "Angle" Insulato...**  
SunsetRider  
0 3 4



**Dogbone Antenna Wire Elect...**  
Seapickle  
0 7 34



**Ham Radio Antenna Wire to ...**  
BDizzle  
0 9 0



**End Fed Antenna EFHW Wind...**  
emics  
32 70 203



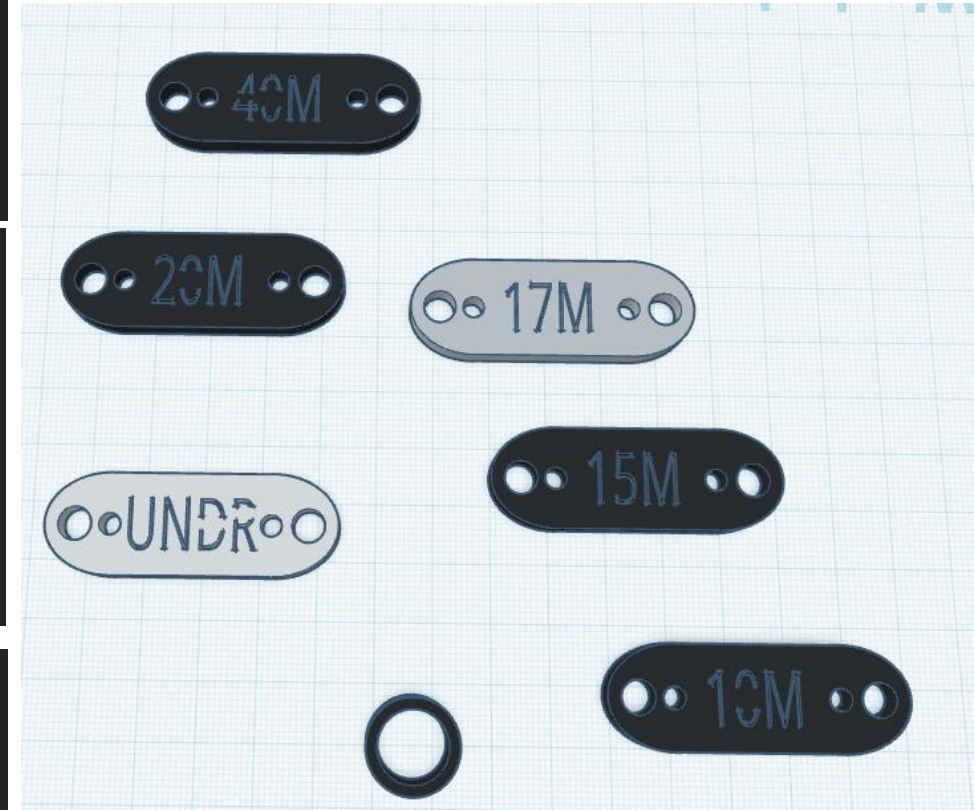
**End Fed Wire Winder integra...**  
waheiko81  
1 11 16



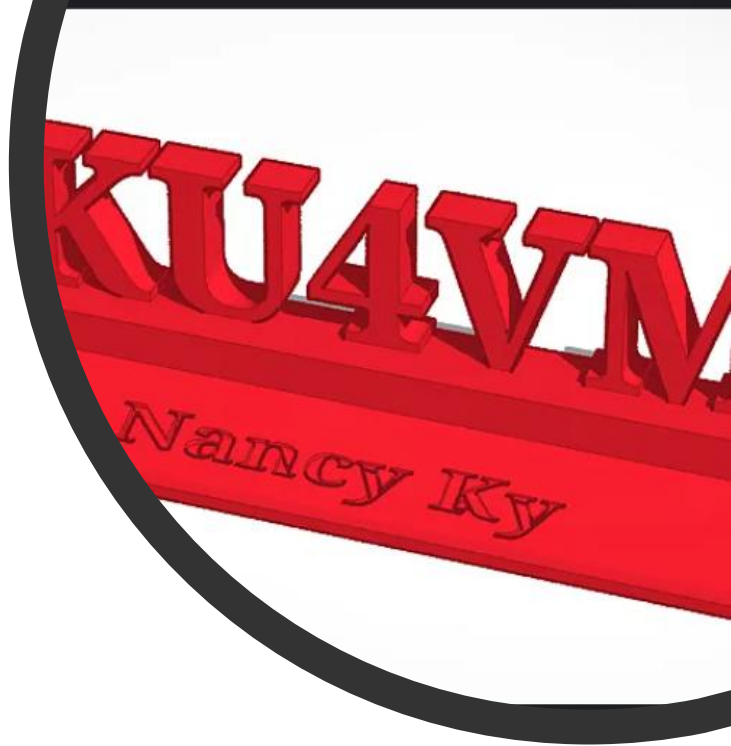
**FatEFrogHW - End Fed Half W...**  
KR1BBT  
2 9 11



**Tree Frog EFHW Antenna (20w)**  
Fluffyshotme  
1 15 16



## Linked Dipole Insulators



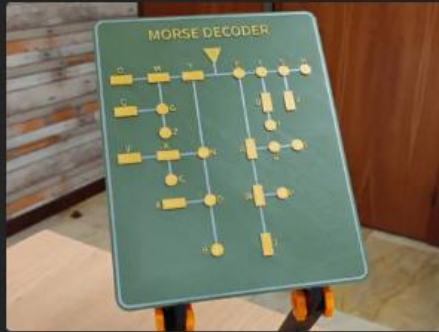
## 3D Printing Reason 4: Callsign Swag



# 3D Printing Reason 5: Morse & Mics !



**Baofeng Radio Holder w/ Mo...**  
user\_3135446662  
0 17 37



**Morse Decoder**  
ZutroK  
5 55 81



**Morse Code lambic Paddle**  
dbDange  
1 9 26



**Morse Code Card in Cyrillic**  
upcho  
0 6 33



**Nano lambic paddles**  
robertrayner85  
1 11 33



**Ham mic mount on hook**  
BUBBAEDC  
0 9 45



**Xiegu X6200 Hand Mic Gridfi...**  
AI5DQ  
0 1 4



**Kenwood MC-60 Mic Holder**  
pp2fm  
0 3 5

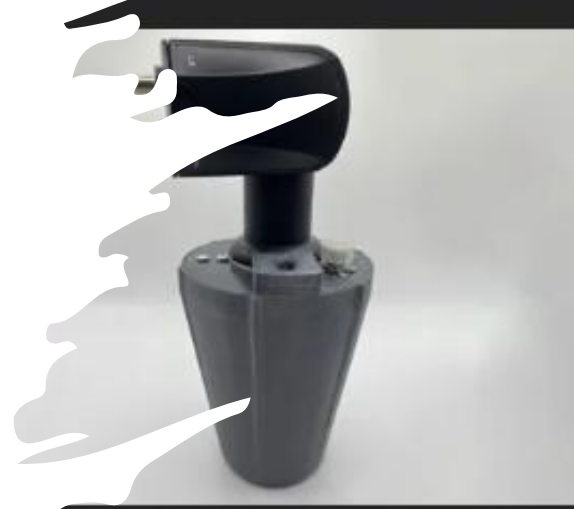


**Clip on CB/HAM Microphone ...**  
Steve's X1 carbon  
7 51 221

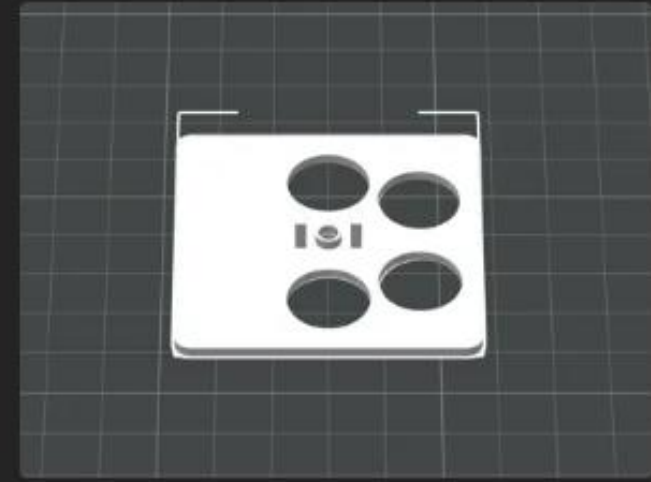


**RT-95 Manpack Rails and BN...**  
4x4\_Fam  
5 108 80

# 3D Printing Reason 6: Satellite Communications



Melix Antenna Housing



Sat Dose Ersatzabdeckung R...

omatthias

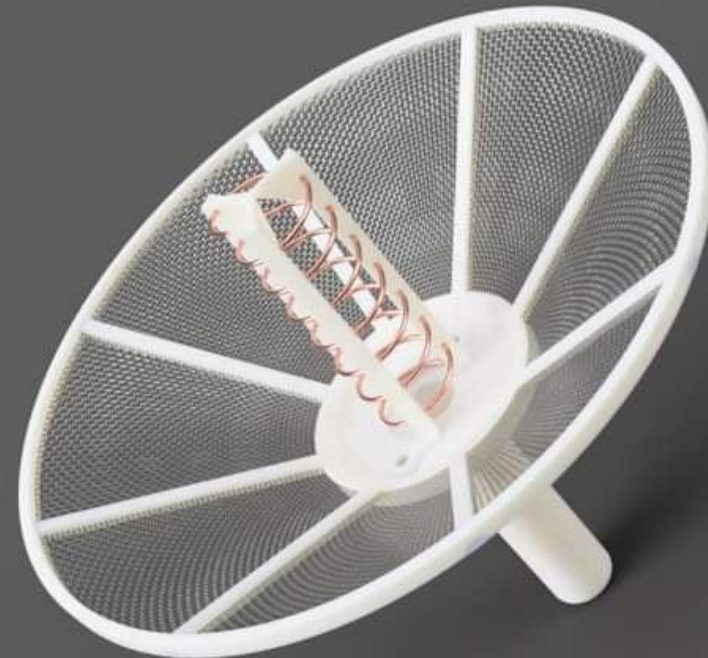
🔒 2 👍 3 ⬇️ 5



Taoglas G...

Cy The Photo

🔒 0 👍 1 ⬇️ 1





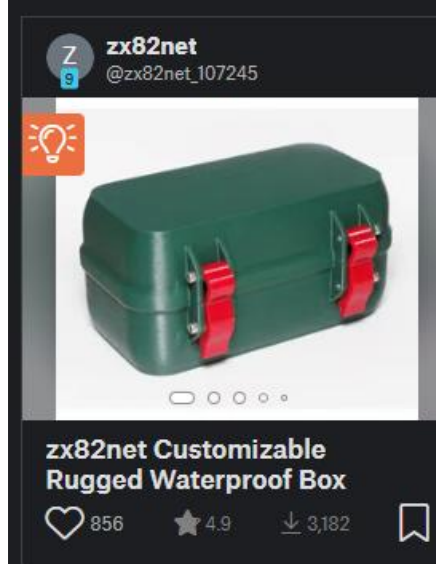
Universal FT240 Balun /  
Unun Box

♡ 37 ★ 5 ↓ 274 📖



Choke/balun case for center  
fed dipole antenna

♡ 37 ★ 4.7 ↓ 236 📖



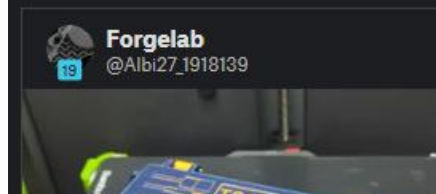
zx82net Customizable  
Rugged Waterproof Box

♡ 856 ★ 4.9 ↓ 3,182 📖

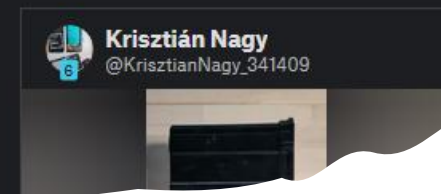


Yet an Other Waterproof box

♡ 145 ★ 5 ↓ 832 📖



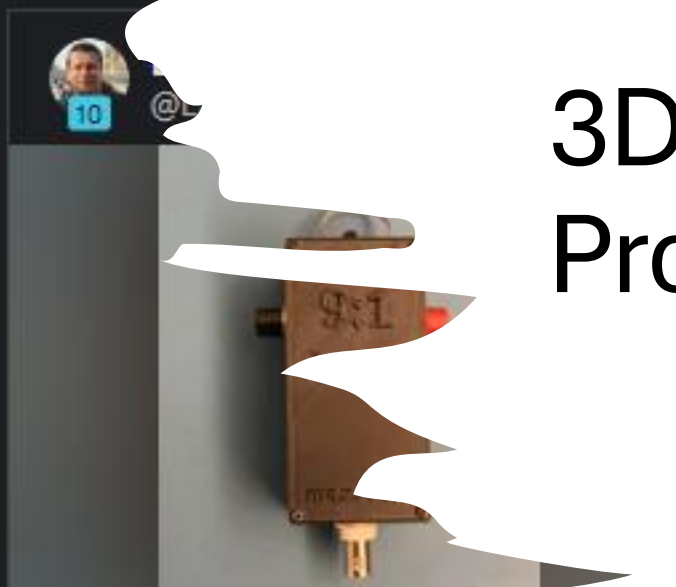
Forgelab  
@Albi27\_1918139



Krisztián Nagy  
@KrisztianNagy\_341409













sdh  
@sdh9



10  
@

3D Printing Reason 7:  
Project Enclosures

# 3D Printing Reason 8: Cable Organization

 <p>A green and blue 3D printed device designed to hold and organize USB cables.</p>	 <p>A grey 3D printed container with a lid, featuring a retractable mechanism for cables.</p>	 <p>A grey 3D printed device with multiple slots for organizing various cables.</p>	 <p>A stack of three 3D printed rings, each with a slot for a USB cable.</p>	 <p>A black 3D printed device with a slot for a USB cable, designed for travel.</p>
<p><b>Portable Cable Organizer / W...</b> squinn 5.6 k 14.5 k 69.5 k</p>	<p><b>Retractable Cable Organizer ...</b> Matthew Ghost 572 6.6 k 17.7 k</p>	<p><b>Cable Organizer</b> Adam 43 853 1.6 k</p>	<p><b>USB cable organizer</b> FauFrames 112 1.7 k 5.2 k</p>	<p><b>Travel cable organizer USB-C...</b> 3D-Vizja 111 2.8 k 5.8 k</p>
 <p>Three black zip ties of different sizes, labeled Small, Medium, and Large.</p>	 <p>A 3D printed device with a green lawn-like surface, holding a mouse and a phone.</p>	 <p>A 3D printed device that functions as a bedside table lamp and cable organizer.</p>	 <p>A 3D printed device with a slot for a cable, labeled V2.</p>	 <p>A 3D printed device with a slot for a cable, designed for clean cable management.</p>
<p><b>Zip / Cable Tie</b> FollowForCoolModels 50 815 5.7 k</p>	<p><b>Office lawn cable organizer</b> TheMiguelBi 105 2.5 k 4.1 k <a href="#">Maker's Supply</a></p>	<p><b>BedSide Table Lamp &amp; Organ...</b> CherrysCollection 67 1.6 k 1.7 k <a href="#">Maker's Supply</a></p>	<p><b>Cable Organizer</b> Singh Design 1.2 k 7.4 k 32.3 k</p>	<p><b>Clean Cable Management Or...</b> elikoll 566 3.9 k 13.8 k</p>

# 3D Printing Reason 9: Shack Safety Signage

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**ON AIR**  
**M7PGT**

A 3D printed sign with a red face and black border, featuring the text "ON AIR" in large white letters and "M7PGT" in smaller white letters below it. The sign is mounted on a black base.

**RUN**  
**HAM**

A 3D printed sign with a black face and red border, featuring the text "RUN" in large white letters and "HAM" in large white letters below it.

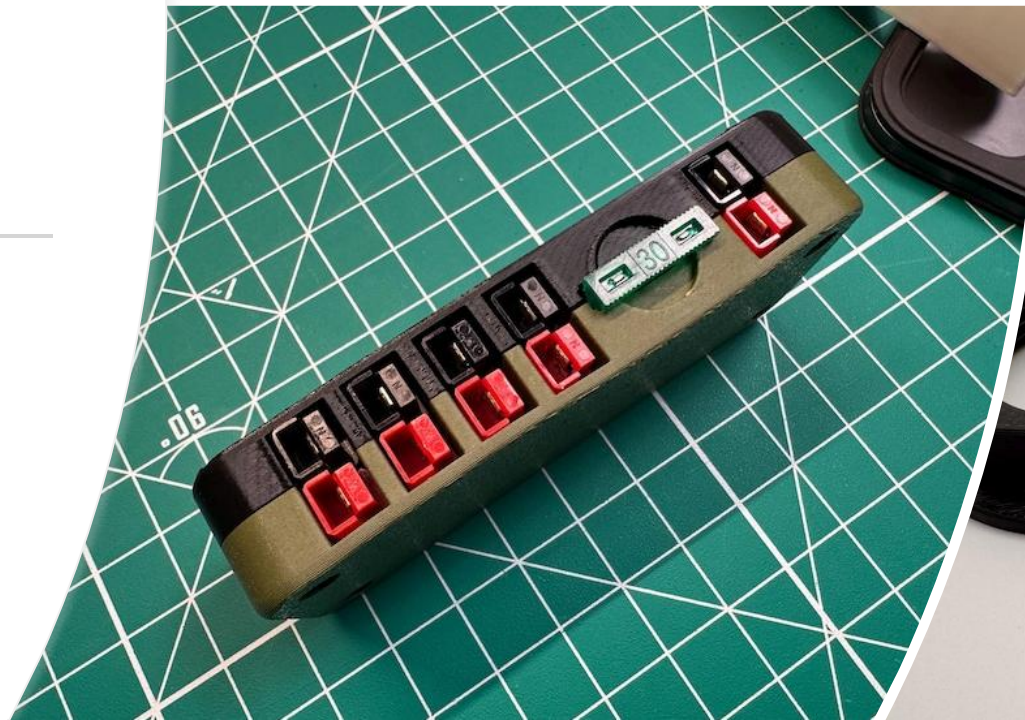
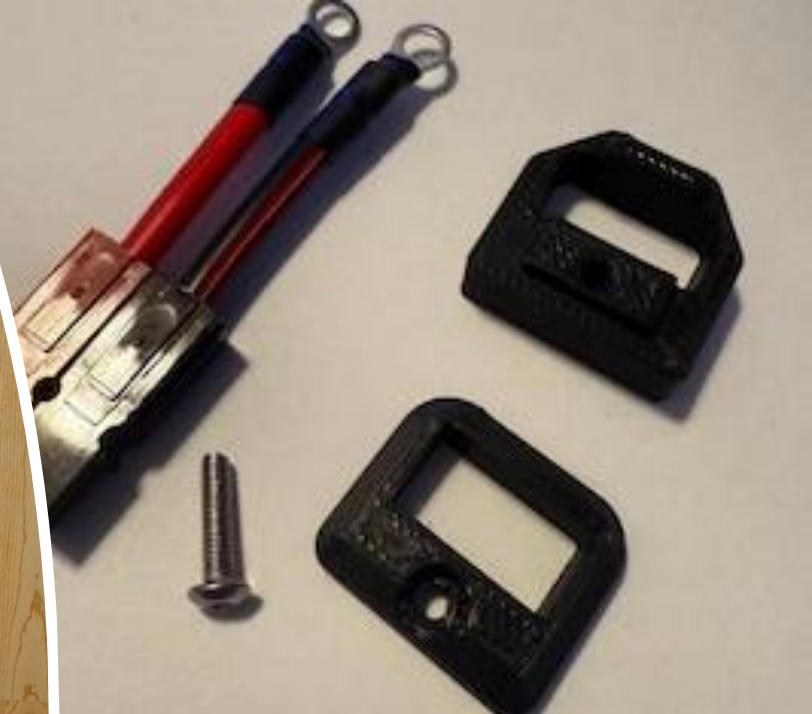
**WARNING**

A 3D printed sign with a white face and orange border, featuring the word "WARNING" in large orange letters.

**MAY START**  
**TALKING ABOUT**

A 3D printed sign with a white face and orange border, featuring the text "MAY START" in large black letters and "TALKING ABOUT" in large black letters below it.

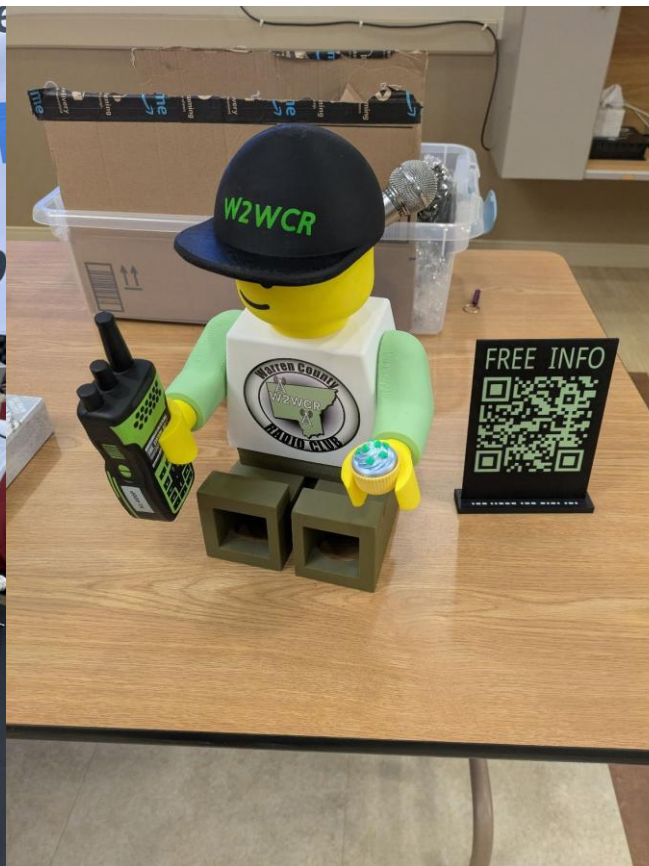
# 3D Printing Reason 10: POTA things



# 3D Printing Reason 10: Club Mascots



UNDR Group



WCARC



SCRC

TonyG  
@TonyG



TTGO LoRa32 v2.1.1.6 \*and\*  
T3S3 cases for Meshtastic

308 4.8 4,238

TonyG  
@TonyG



Heltec LoRa 32 case for  
Meshtastic

255 4.7 3,386

TonyG  
@TonyG



Heltec Wireless Tracker  
case for Meshtastic

303 4.8 4,061

TonyG  
@TonyG



T-Beam Supreme case for  
Meshtastic

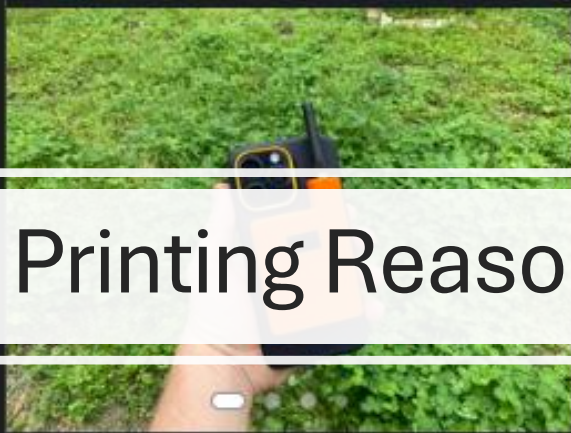
285 4.7 3,552

Alley Cat  
@AlleyCat



Heltec LoRa 32 V3 HT Slim  
Cases

phspman  
@phspman\_486284



Meshtastic with MagSafe

Blackout Concepts  
@JasonSeritt\_563476



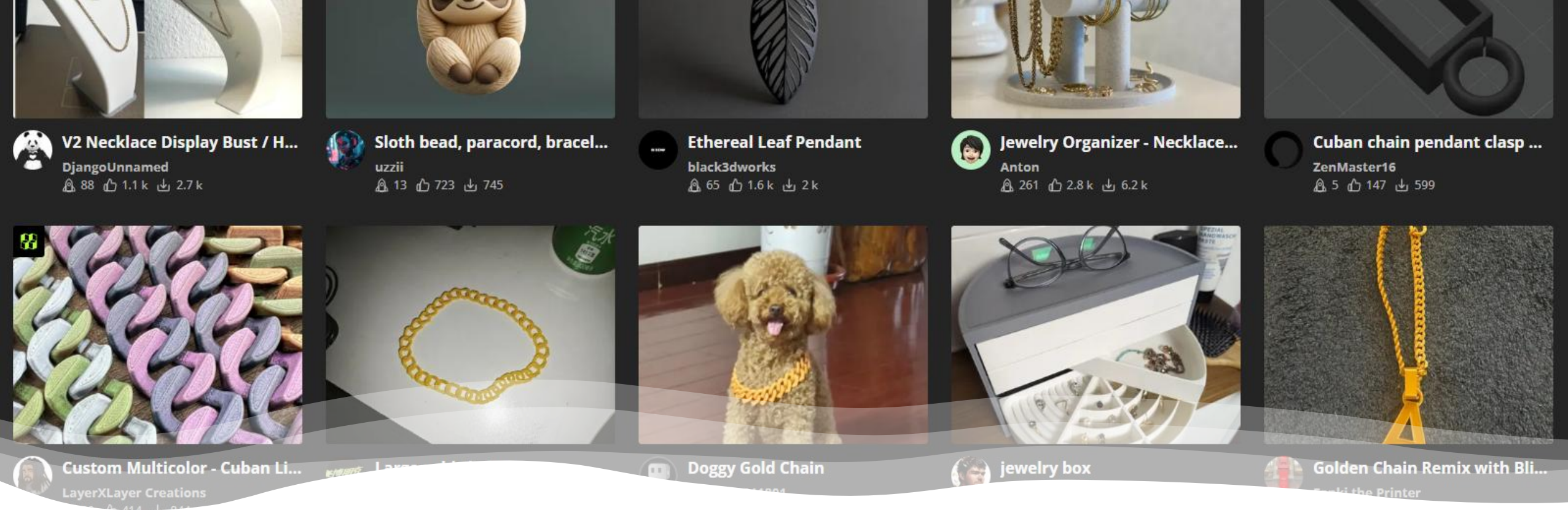
Low Profile Solar Meshtastic  
Car Node

zerofox3D  
@zerofox3d



Bender Battery Case for the  
Heltec V3 & Heltec T114

3D Printing Reason 11: Meshtastic, etc



3D Printing Reason 12: Gifts to offset radio habits

A red robot arm is shown holding a 3D printed gear. The background is a solid yellow color. The robot arm is red and has a silver-colored joint. The gear is a light gray color. The text '3D Printing Conclusions:' is written in white on the left side of the image.

## 3D Printing Conclusions:

- Many other things to think about after these 12.
- Learning CAD is not very hard. Anyone interested in a workshop?
- Great club related collaboration projects.
- Make your own designs and sell things.
- Learn and have fun. Show ham radio is not just about ham radio.