

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

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HAM RADIO UNIVERSITY 2026 EXCLUSIVE

# 3D Printing Cautionary Statement(s)



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:



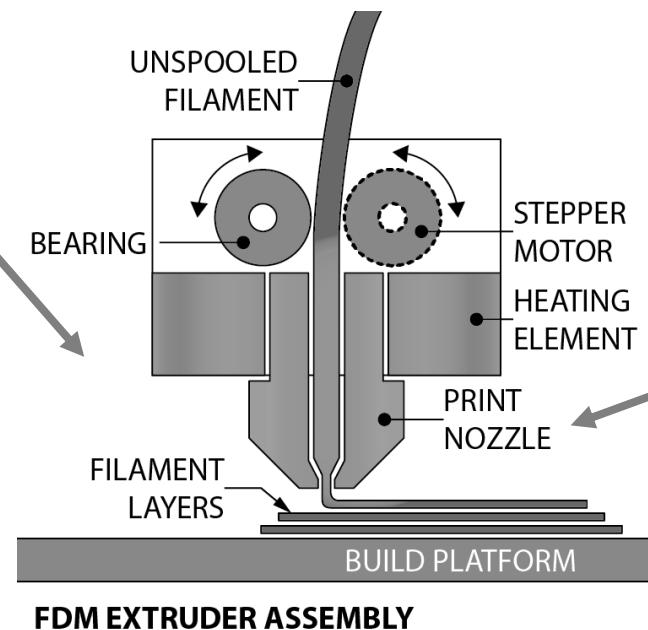
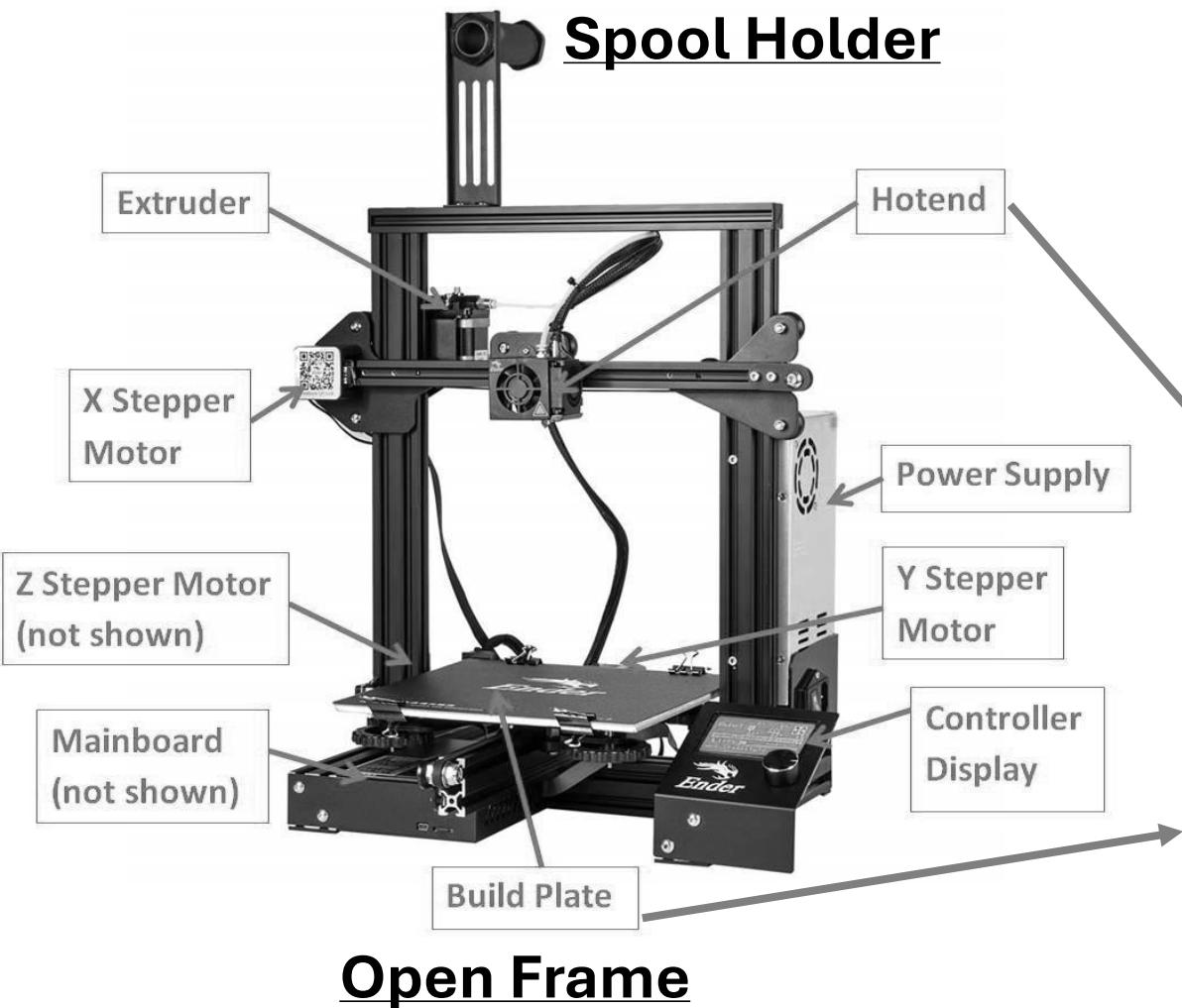
- 1. FDM
- 2. SLA

Differences on next slides



# 3D Printing Basics Part 1 - FDM

Fused Deposition Modeling or Fused Filament Fabrication

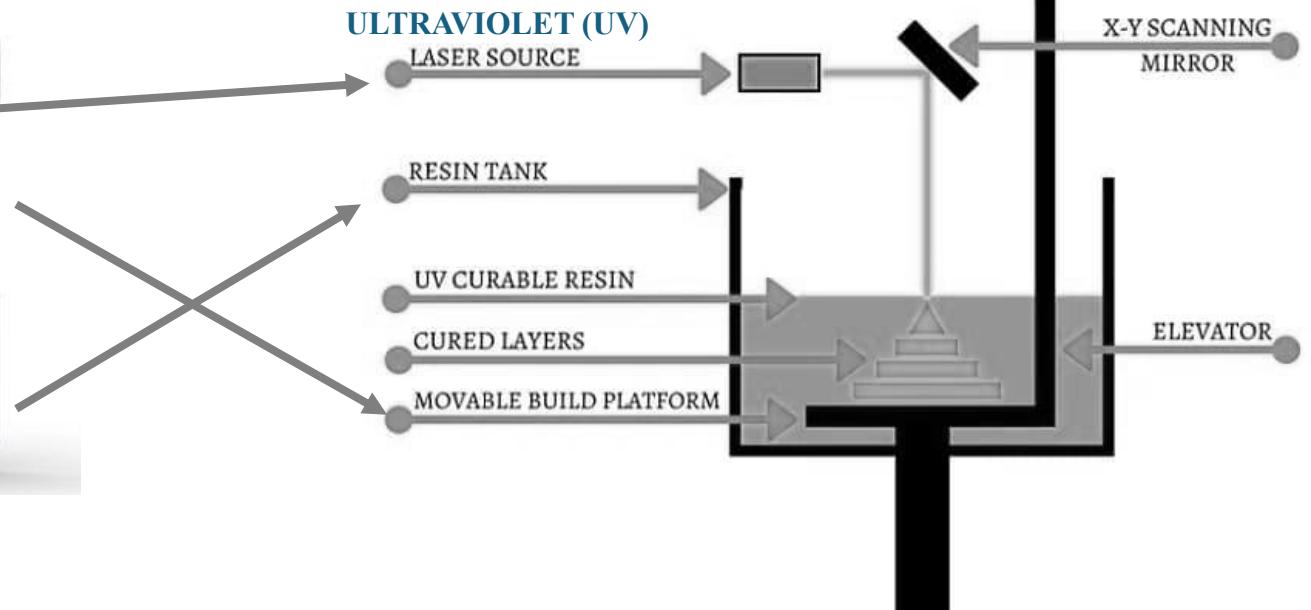


Open Frame

Closed Frame

# 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



**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.



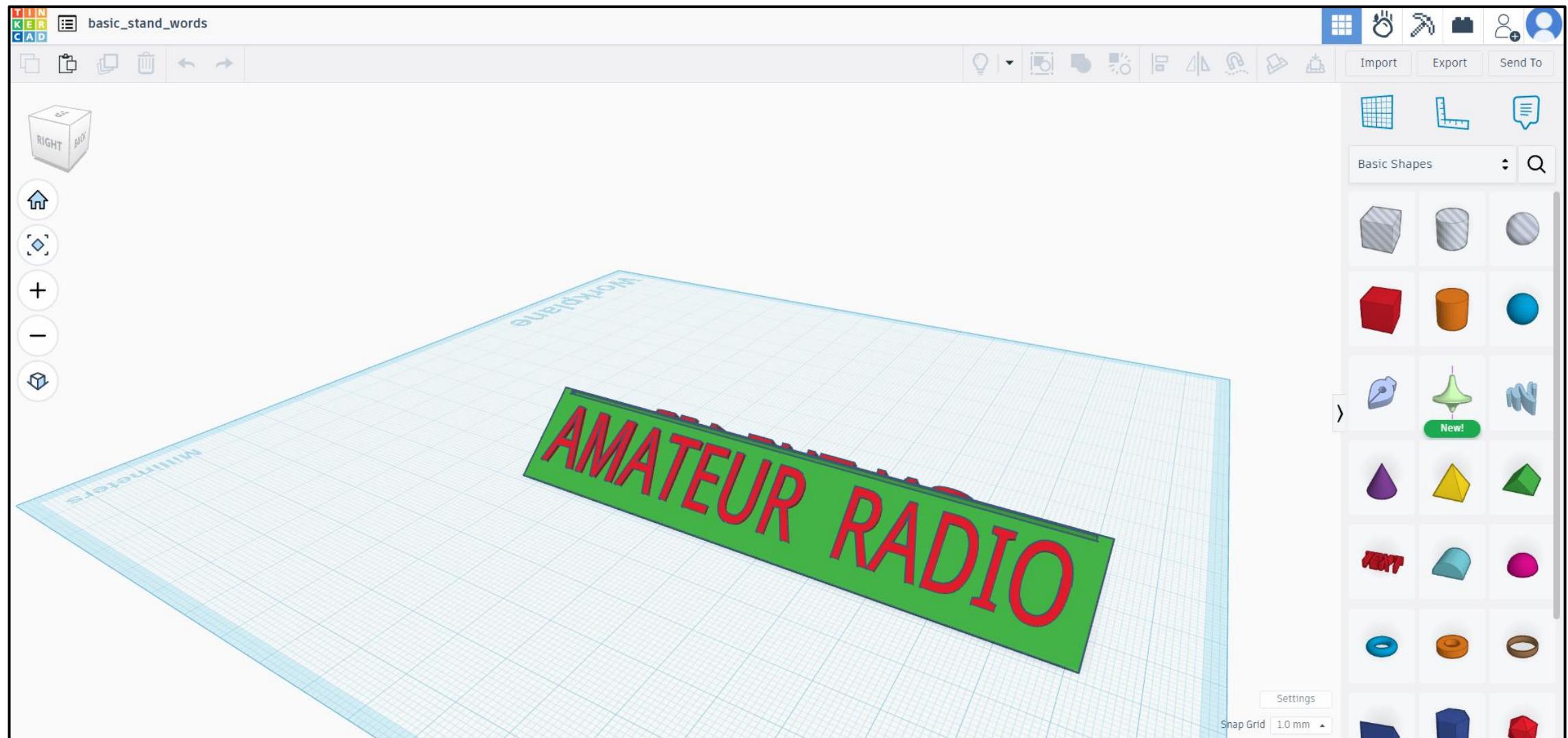
**G-CODE** = Is the language the 3D printer understands and sometimes is easier to modify in your slicer software for certain parameters.

# 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

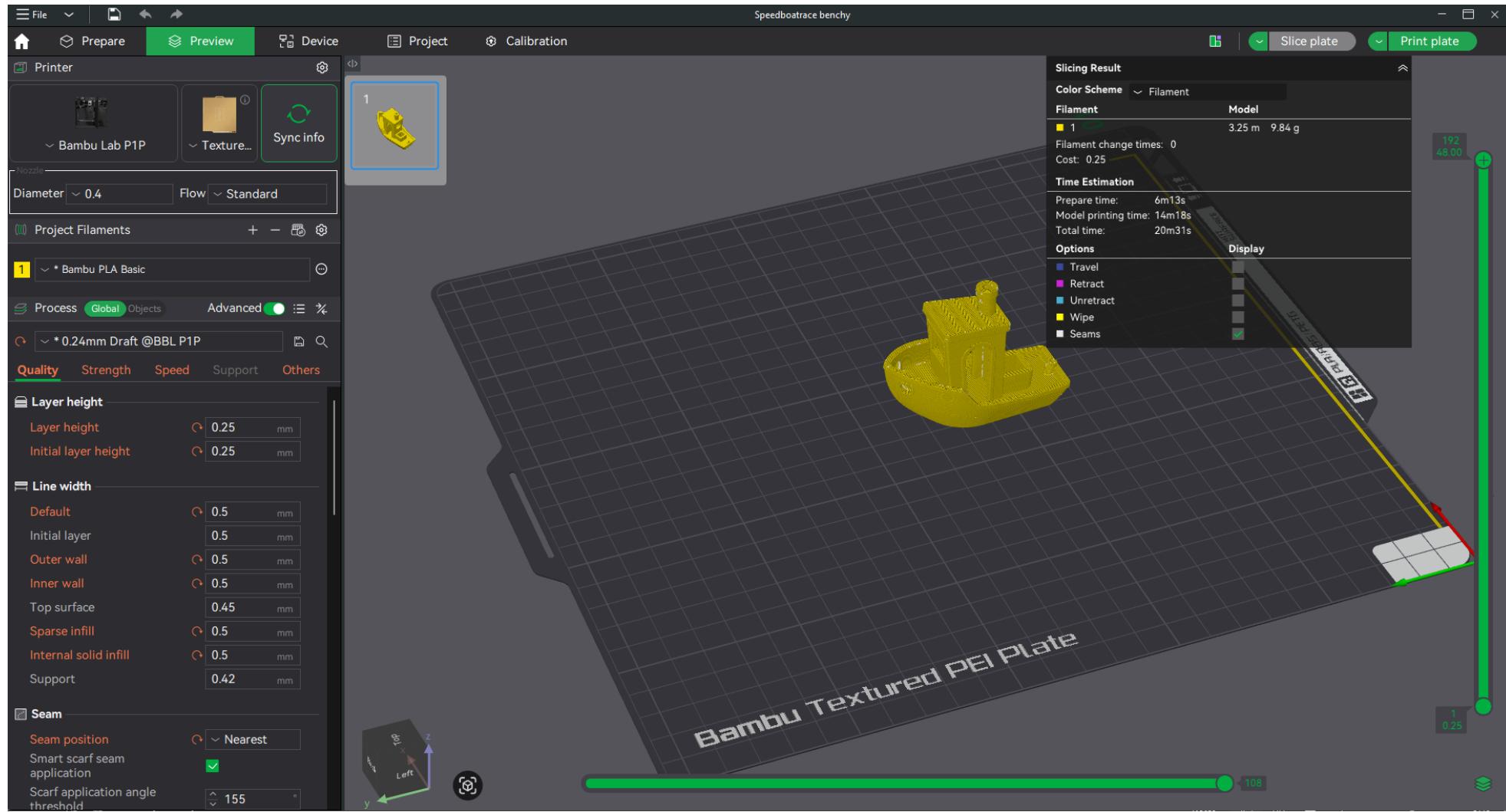


# 3D Printing Important Terms – Slicer Software

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



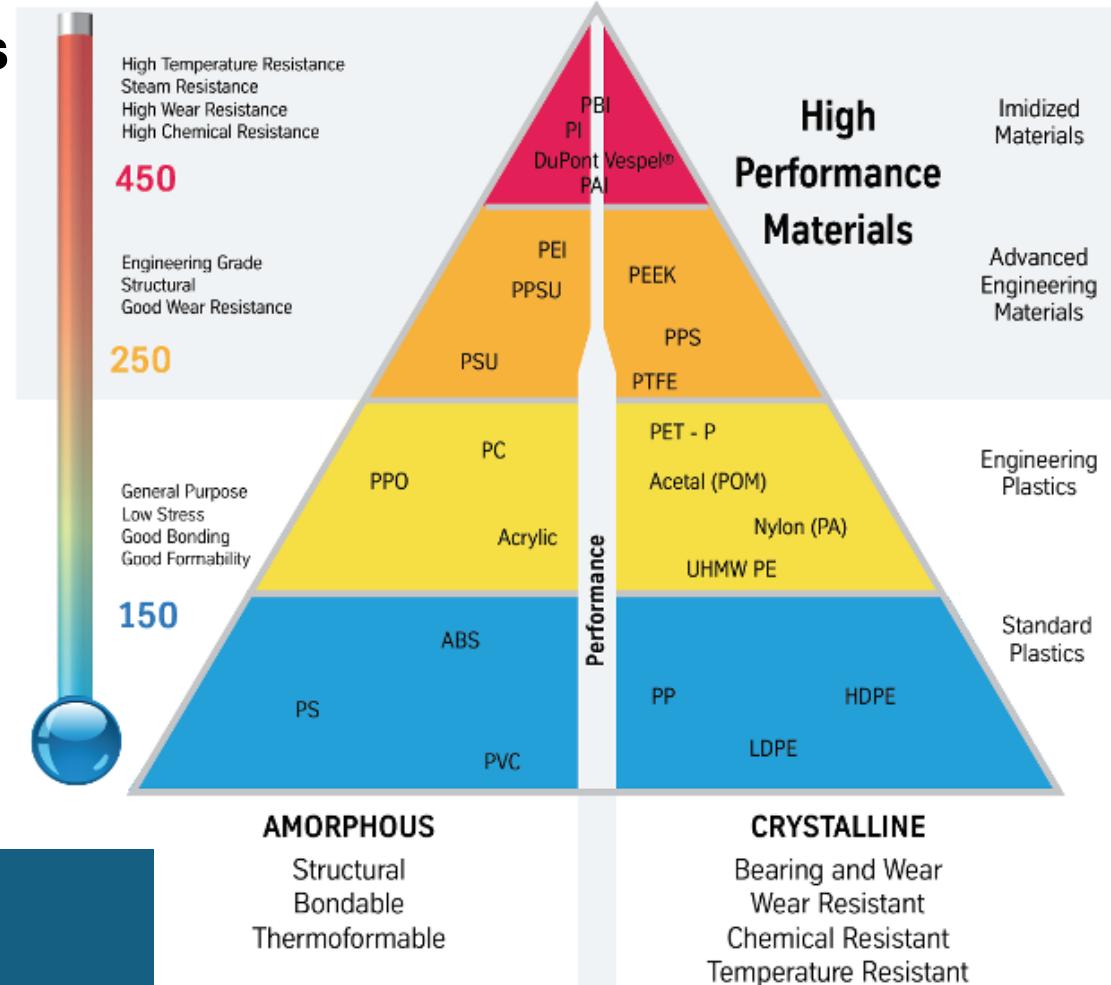
Anycubic  
Photon

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



## SUGGESTION

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

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

## Trusted Brands

Overture  
InLand  
Hatchbox  
Polymaker  
eSun  
Sunlu  
Prusament  
Bambu  
Atomic

## Useful Accessories

Filament Dryer  
Filament Joiner

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

## Common Filament Types

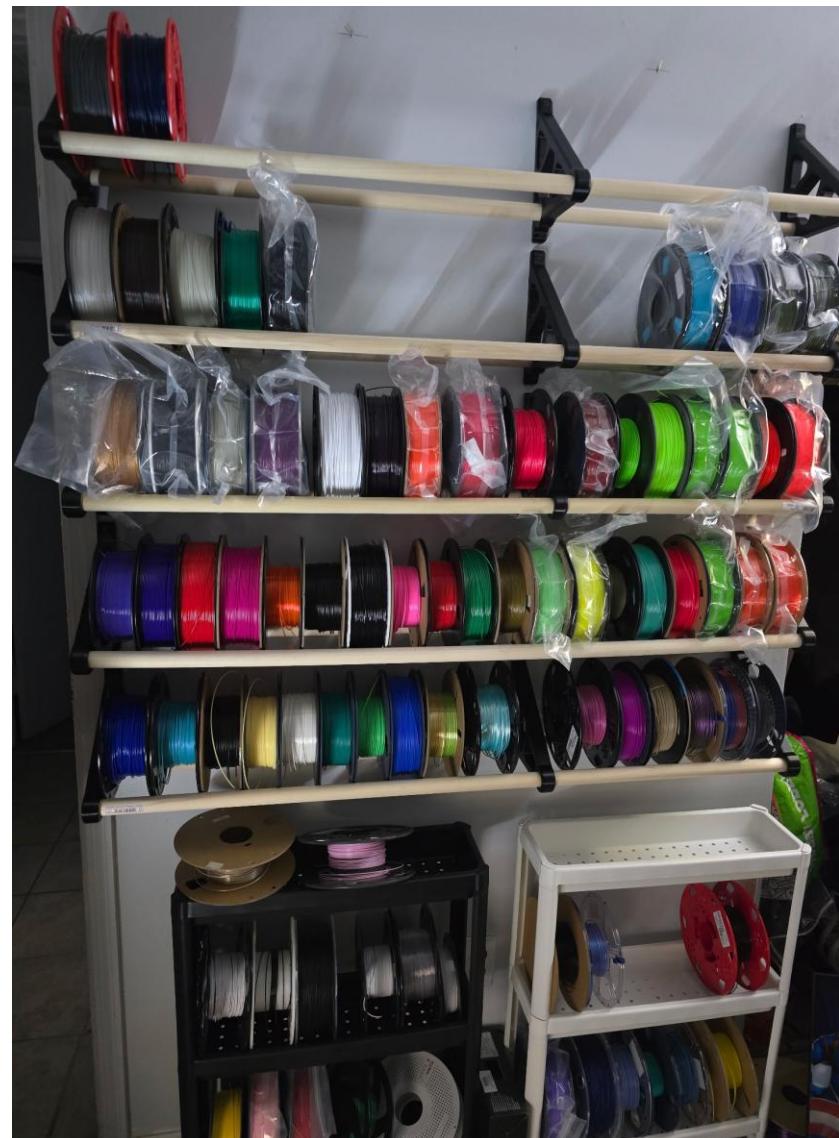
- PLA
- PLA PRO
- PETG
- TPU
- ASA
- ABS
- PC
- CF

## Filament Diameter

1.75mm (Most Common)

### SUGGESTION

TRY TO ALWAYS USE THE SAME  
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Attribution: Nicole AD2IM

## Trusted Brands

- Overture
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- eSun
- Sunlu
- Prusament
- Bambu
- 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/>

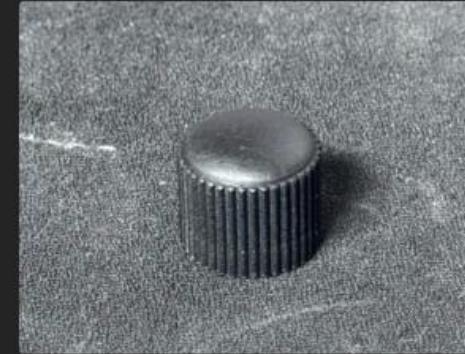
<https://cults3d.com/>



**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

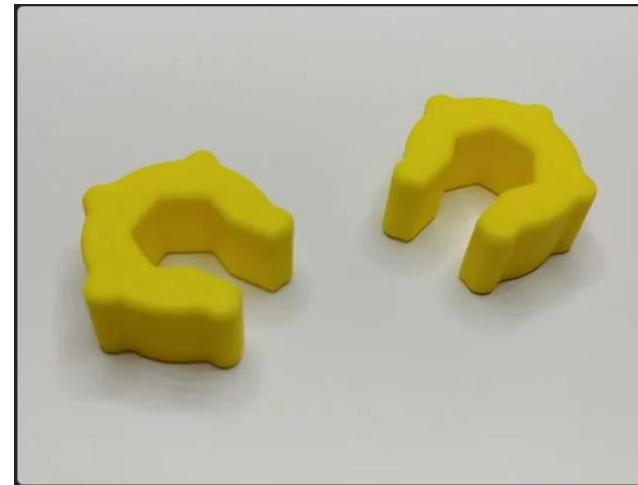
- ✓ Ever lose or break a radio knob?
- ✓ Ever want new or better feet or handles for a radio?
- ✓ Ever need a new belt clip?
- ✓ Ever need something not made in years?

# 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.

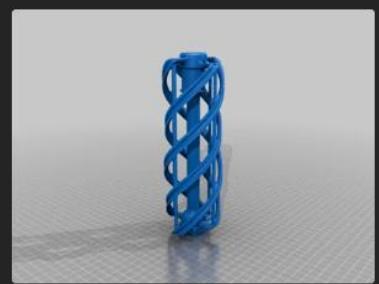


Finger-tight wrenches.



Non-conductive tools help in RF circuit alignments.

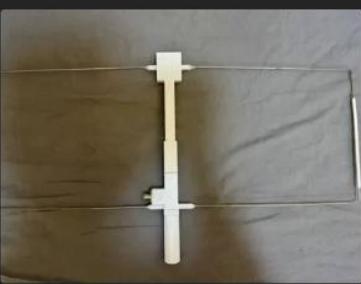
# 3D Printing Reason 3: Avoid costly antenna things



FullWave Compact QFH Antenna  
EMT  
13 44 160



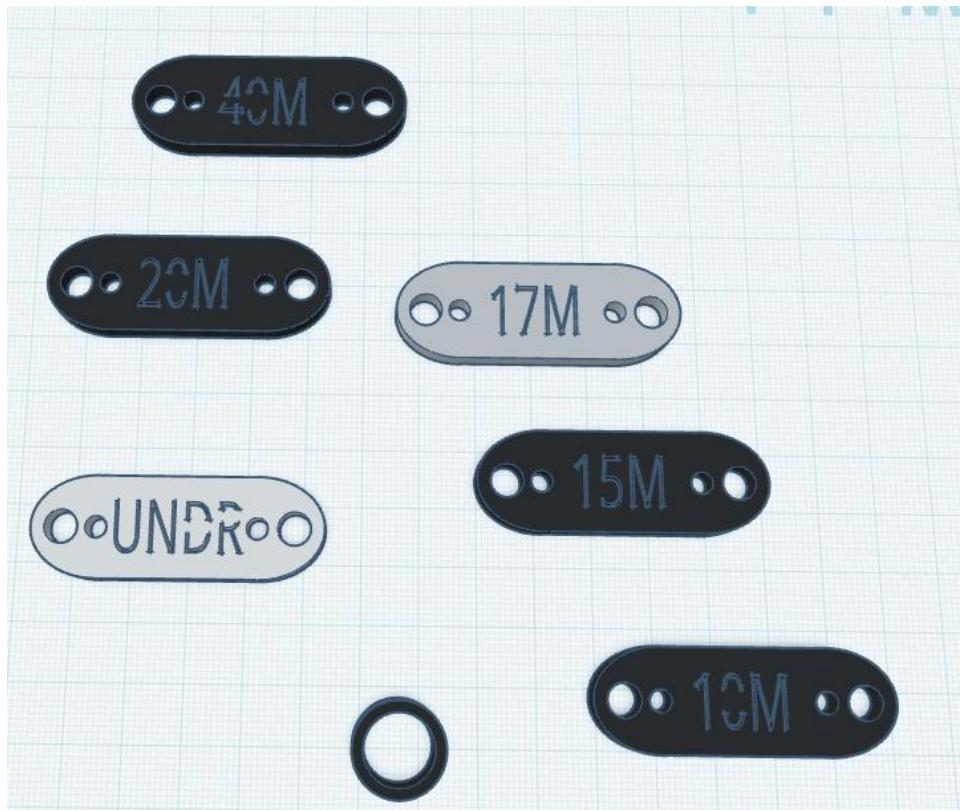
Dual Band Flower Pot Antenna  
Orhun Avdzhu  
0 4 8



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 Feed...  
Ryan1234  
2 20 91



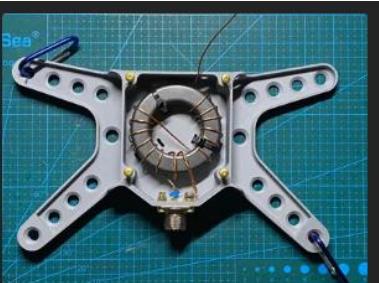
HF Antenna "Angle" Insulator...  
SunsetRider  
0 3 4



Dogbone Antenna Wire Elec...  
Seapickle  
0 3 34



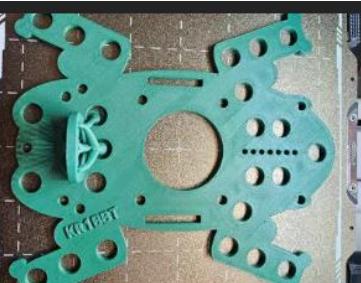
Ham Radio Antenna Wire to ...  
BDizzle  
0 9 0



End Fed Antenna EFW 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 EFWH Antenna (20w)  
Fluffyshotme  
1 15 16

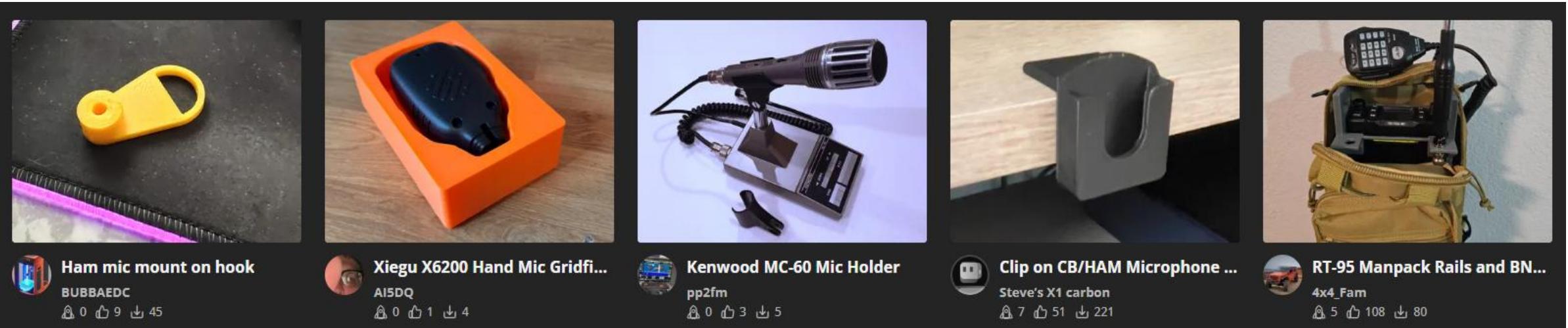
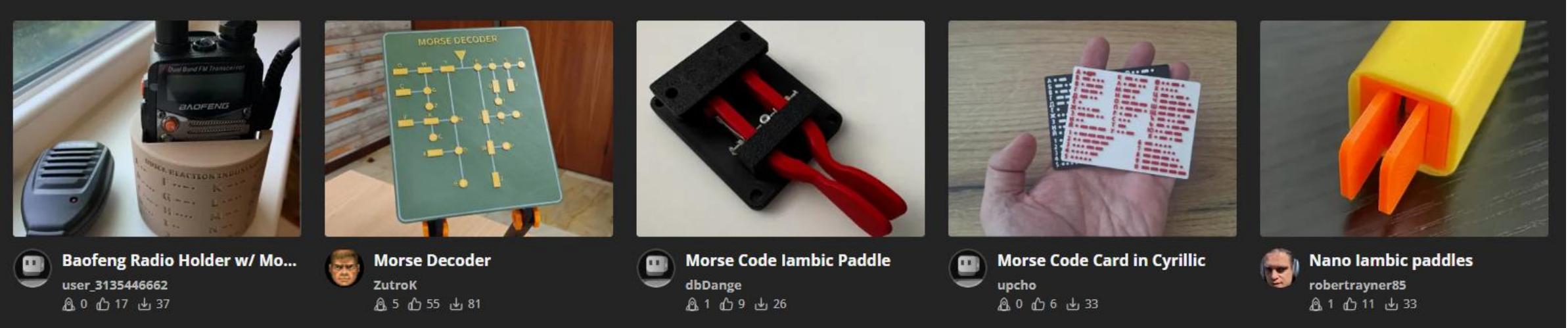
Linked Dipole Insulators



## 3D Printing Reason 4: Callsign Swag



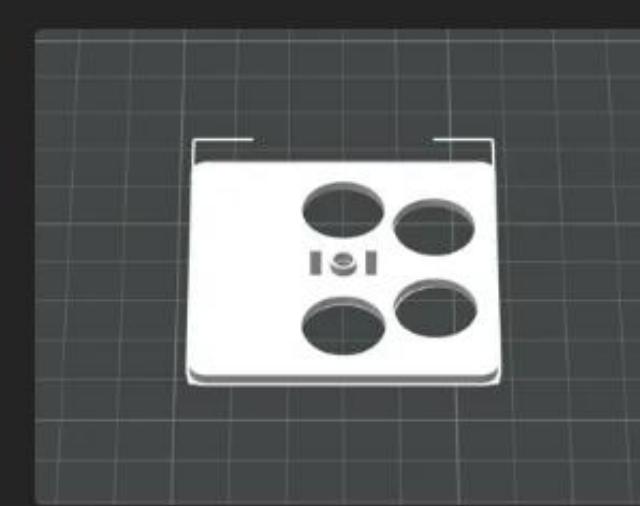
# 3D Printing Reason 5: Morse & Mics !



# 3D Printing Reason 6: Satellite Communications



Helix Antenna Housing



Sat Dose Ersatzabdeckung R...



omatthias

2 3 5

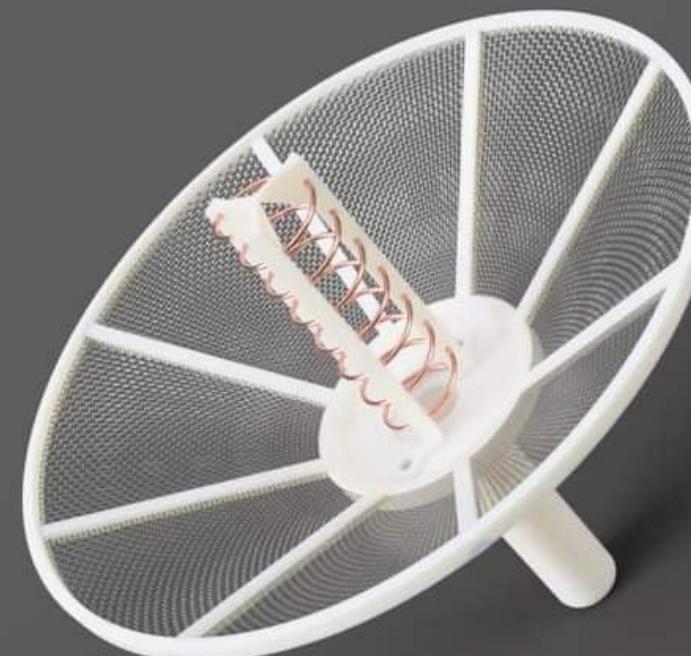


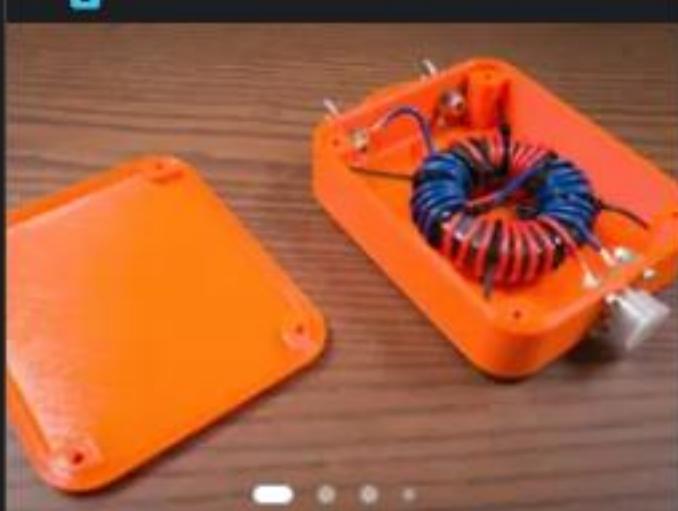
Taoglas G...



Cy The Photo

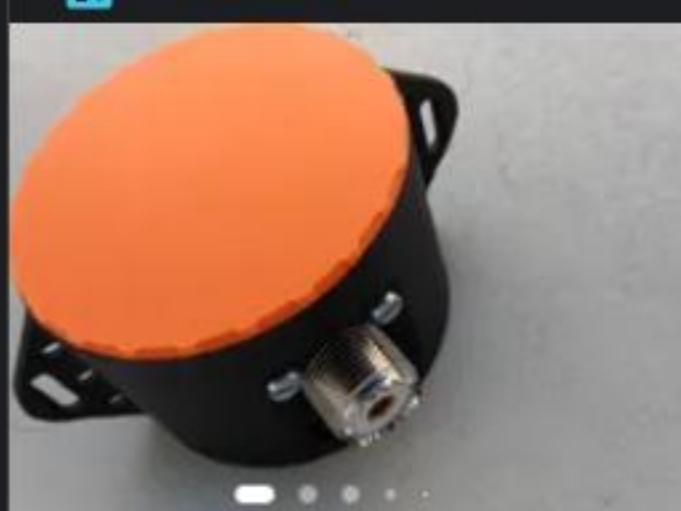
0 1





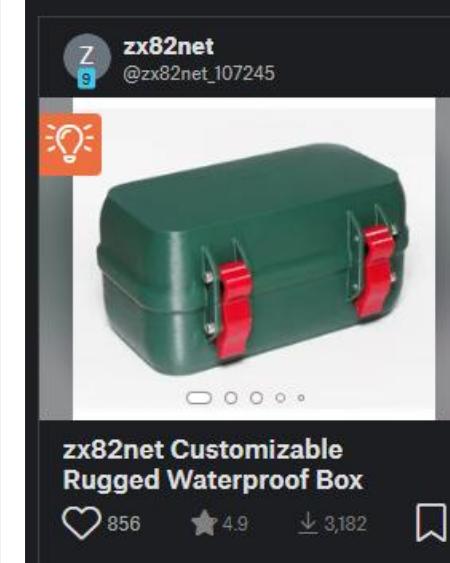
**Universal FT240 Balun / Unun Box**

37 5 274



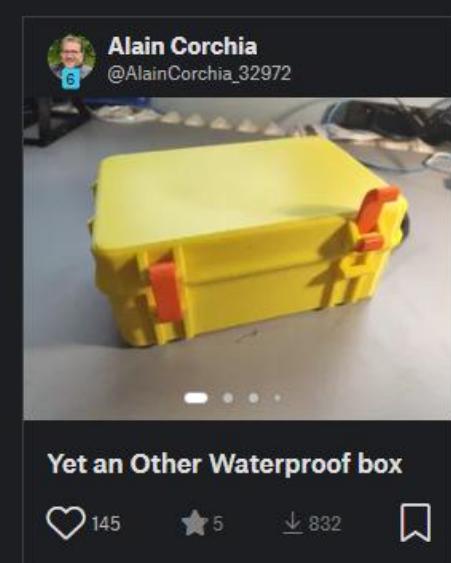
**Choke/balun case for center fed dipole antenna**

37 4.7 236



**zx82net Customizable Rugged Waterproof Box**

856 4.9 3,182

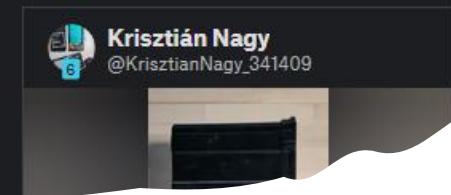


**Yet an Other Waterproof box**

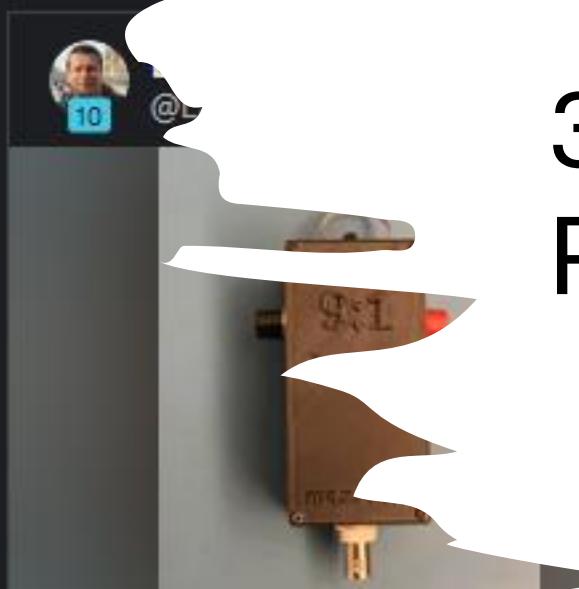
145 5 832



**Forgelab**  
@Albi27\_1918139



**Krisztián Nagy**  
@KrisztianNagy\_341409



# 3D Printing Reason 7: Project Enclosures

# 3D Printing Reason 8: Cable Organization



**Portable Cable Organizer / W...**  
squinn 5.6 k 14.5 k 69.5 k



**Retractable Cable Organizer ...**  
Matthew Ghost 572 6.6 k 17.7 k



**Cable Organizer**  
Adam 43 853 1.6 k



**USB cable organizer**  
FauFrames 112 1.7 k 5.2 k



**Travel cable organizer USB-C...**  
3D-Vizja 111 2.8 k 5.8 k



**Zip / Cable Tie**  
FollowForCoolModels 50 815 5.7 k



**Office lawn cable organizer**  
TheMiguelBi 105 2.5 k 4.1 k



**BedSide Table Lamp & Organ...**  
CherrysCollection 67 1.6 k 1.7 k



**Cable Organizer**  
Singh Design 1.2 k 7.4 k 32.3 k



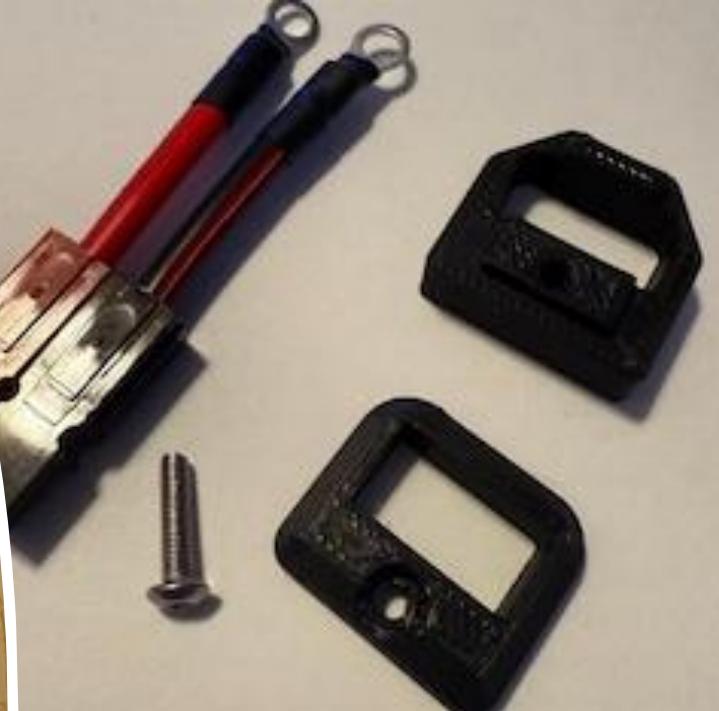
**Clean Cable Management Or...**  
elikoll 566 3.9 k 13.8 k

# 3D Printing Reason 9: Shack Safety Signage

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# 3D Printing Reason 10: POTA things



# 3D Printing Reason 10: Club Mascots



UNDR Group



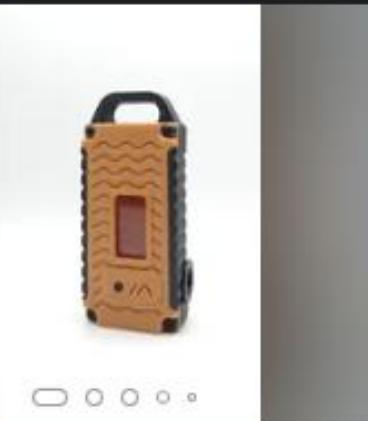
WCARC



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

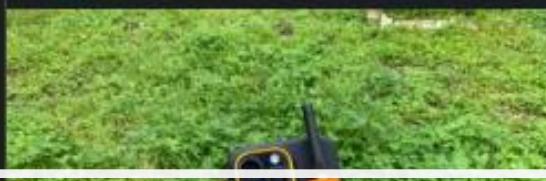
285 4.7 ↓ 3,552



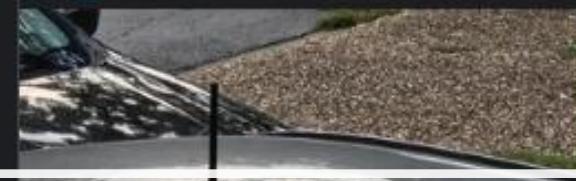
Alley Cat  
@AlleyCat



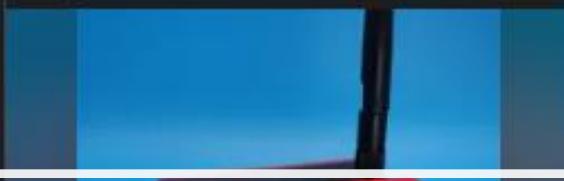
phspman  
@phspman\_486284



Blackout Concepts  
@JasonSeritt\_563476



zerofox3D  
@zerofox3d



# 3D Printing Reason 11: Meshtastic, etc

Heltec LoRa 32 V3 HT Slim  
Cases

Meshtastic with MagSafe

Low Profile Solar Meshtastic  
Car Node

Bender Battery Case for the  
Heltec V3 & Heltec T114



 **V2 Necklace Display Bust / H...**  
DjangoUnnamed  
88 1.1 k 2.7 k



 **Sloth bead, paracord, bracelet...**  
uzzii  
13 723 745



 **Ethereal Leaf Pendant**  
black3dworks  
65 1.6 k 2 k



 **Jewelry Organizer - Necklace...**  
Anton  
261 2.8 k 6.2 k



 **Cuban chain pendant clasp ...**  
ZenMaster16  
5 147 599



 **Custom Multicolor - Cuban Li...**  
LayerXLayer Creations  
A 411 1 241



 **Cuban Link Chain**  
LayerXLayer Creations  
A 411 1 241



 **Doggy Gold Chain**  
1004



 **jewelry box**  
1004



 **Golden Chain Remix with Bli...**  
Blik the Printer

# 3D Printing Reason 12: Gifts to offset radio habits

# 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.