


CUTTING TIES OF A VINYL CUTTER



virtualabs@mamot.fr

/ME

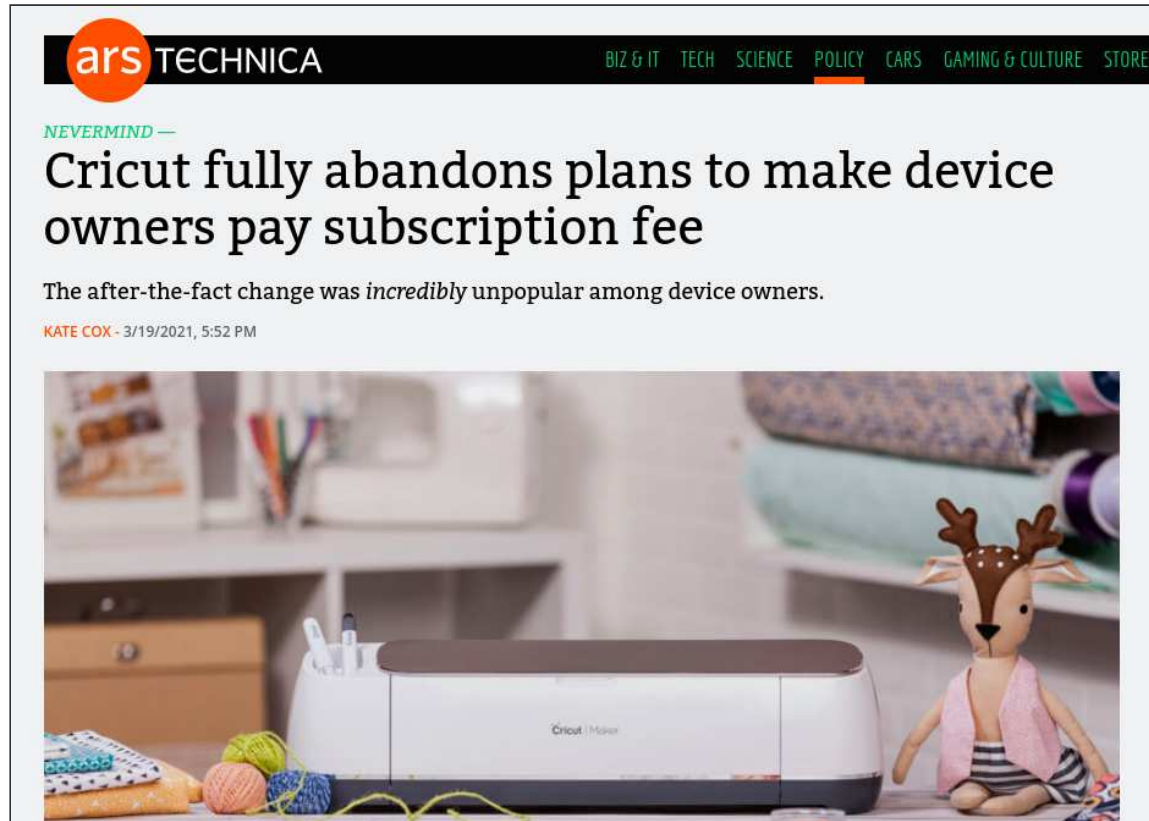
- Security engineer @ Quarkslab
- Hardware/software reverse-engineering
- Streamer on 

WHERE IT ALL BEGAN

CRICUT MAKER



CRICUT MADE A BAD CALL




source: [Ars Technica](#)

AND ROLLED BACK ASAP

The Verge / Tech / Reviews / Science / Entertainment / More +

TECH / CREATORS

Cricut promises unlimited lifetime uploads for existing crafting machines after user backlash



/ Machines registered before December 31st will have unlimited uploads without paying extra

source: The Verge

E-WASTE

cricut r/cricut • 2 yr. ago
by melliferamel

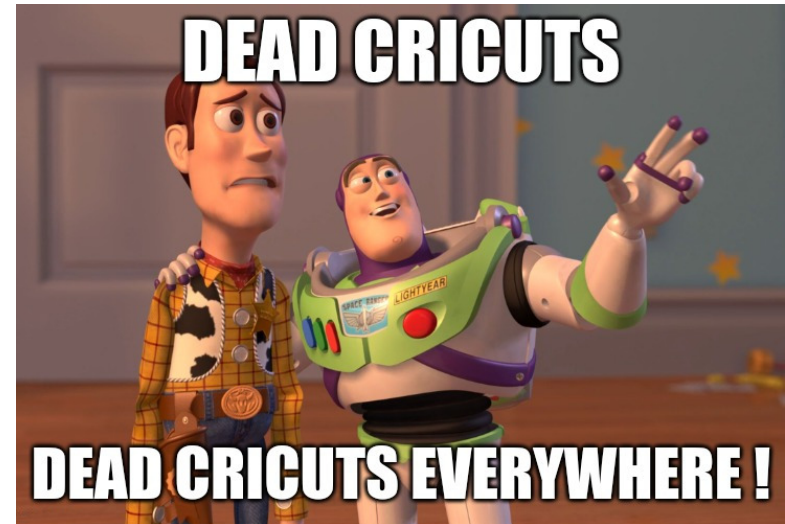
Join

Cricut deactivated machine and tell me to throw it away!

Major vent here about Cricut's customer and environmental policy. I got a Maker from my husband for Christmas and have really enjoyed using it for making cards. Early this month I tried to make some stickers with print and cut and was having so many problems. Recalibrated dozens of times and it would just be randomly off every time.

So I contact customer support and send them a video of my machine working, they deem it a faulty sensor and are sending me a replacement. Hooray! Right?

It takes a few weeks for replacement to be sent and ordered, my machine actually works fine for cutting and I keep making cards up until a couple of days ago when my machine suddenly stops working. I get a message saying "This machine has been deactivated" because it is faulty. Wtf? So they have used a DRM to lock me out of a functioning machine.



BUT IN THE MEANTIME ...


Cut Freedom ▾ # general


GENERAL

- # landing-pad
- # general
- # progress-updates
- # cricut-news
- # roles
- # introduce-yourself

SPECIFICS

- # software-info
- # hardware-info
- # usbbt-info
- # website-info
- # front-end-dev
- # file-dump


 **Discord Sucks** 13/03/2021 23:28
Hello!

 **Taynk** 13/03/2021 23:28
Hello. Have been programming hardware off and on for years. Saw your post. Interested in helping.
Cant chat at the moment but will stay up to date in this and hell where I can.
May want to recruit from this thread as well:
https://www.reddit.com/r/cricut/comments/m415ve/random_has_anyone_ever_considered_andor_attempted/?utm_source=share&utm_medium=ios_app&utm_name=iossmf

reddit
[r/cricut - Random - has anyone ever considered and/or attempted to](https://www.reddit.com/r/cricut/comments/m415ve/random_has_anyone_ever_considered_andor_attempted/?utm_source=share&utm_medium=ios_app&utm_name=iossmf)
...
13 votes and 14 comments so far on Reddit

This one too: https://www.reddit.com/r/cricut/comments/m3ywfi/can_you_cut_on_cricut_without_design_space/?utm_source=share&utm_medium=ios_app&utm_name=iossmf

reddit
[r/cricut - Can you cut on Cricut without design space?](https://www.reddit.com/r/cricut/comments/m3ywfi/can_you_cut_on_cricut_without_design_space/?utm_source=share&utm_medium=ios_app&utm_name=iossmf)
5 votes and 17 comments so far on Reddit





Same motor setup for the mat movement



SoftestVoid 15/03/2021 11:41



@crenn6977 @Brodie hq board picies incoming!



Wilson Sonsini Goodrich & Rosati
Professional Corporation

650 Page Mill Road
Palo Alto, CA 94304-1050

July 29, 2021

Via Online Dissemination

Re: Legal Notice from Cricut to “Freedom from Cricut” Discord Server Participants

Dear “Cut Freedom” (FKA “Freedom From Cricut”) Server Participants:

This law firm represents Cricut, Inc. and helps Cricut protect its computer systems, software, and intellectual property from unauthorized intrusions, misuse, infringement, and similar threats. We have learned that certain individuals participating in the discussions on this server are engaged in unlawful activity that poses a cybersecurity and infringement threat to Cricut’s systems and intellectual property. To avoid any confusion on your part about what activities are unlawful, we hereby give legal notice to you, and anyone acting on your behalf, to immediately cease and desist from the following unlawful activities that have been discussed on this server:

HOW TO HACK DESIGN SPACE FOR 30€



Tuto Cricut maker desactive
30 €

Réserver l'article

Description

Découvrez comment activer votre Cricut Maker désactivée sur Design Space grâce à notre tutoriel exclusif !

Suivez nos étapes simples et efficaces pour contourner le système et profiter pleinement de votre machine.

Avec My Sa, apprenez comment lancer la découpe sans rencontrer d'erreur.

Ne manquez pas cette opportunité de redonner vie à votre Cricut Maker. Obtenez dès maintenant notre tutoriel en français

Tutoriel écrit 30 euros

Tutoriel écrit + video 40 euros

THE PLAN

TWO OPTIONS

- **Keep the Cricut firmware and create a new open-source client**
- **Create a custom firmware compatible with existing cutting software**

OPTION #1: KEEPING THE FW

🙄 Communication is encrypted with a **secret key (IP)**

Cricut can update the protocol at any time

🙄 We cannot develop **new features**



DMCA STRIKE

This is an open letter to Cricut Inc.

Hello, and thanks for checking out this project!

I built this project to help with my specific use case: First: I wanted to easily use my Cricut offline, without any account. Second, I wanted to more easily iterate on cutting SVG-based files rather than repeatedly re-uploading to Design Space.

This project is not a threat to your services business model. To use this software, somebody has to download it from Github (which is not non-programmer friendly), **figure out how to extract AES keys**, accept the "doom and gloom" warnings this software presents, navigate this software's weird UI (which I deliberately made dark and vaguely hacker-y), and supply SVGs that they've created in some other software package (Some of this might improve over time, but it won't improve by much). And that's assuming that this program doesn't crash first. **The demographic who will tolerate all this is not the same as the demographic who is going to pay you a subscription for services.** This is software for tinkerers and people with ideological opinions about free software. It is not designed to compete with your services business (It's also GPL licensed, which is a poison pill for anybody *else* looking to use this commercially).

OPTION #2: OPENSOURCE FW

🤩 No encrypted communication protocol

We control everything

We can implement new features !

🤔 Programming interface must be available






NEXT STEPS


1. Reverse-engineer the **printed circuit boards**
2. Find a way to **program the micro-controller**
3. **Write some code** to drive motors, LEDs, buttons and sensors
4. **Customize GRBL** to fit the board

OH, AND I NEED A CRICUT MAKER



 **Lily**
12 annonces 
★★★★★ (42)

 Profil recommandé

 Répond généralement en 30 minutes

[Acheter](#)

[Message](#)

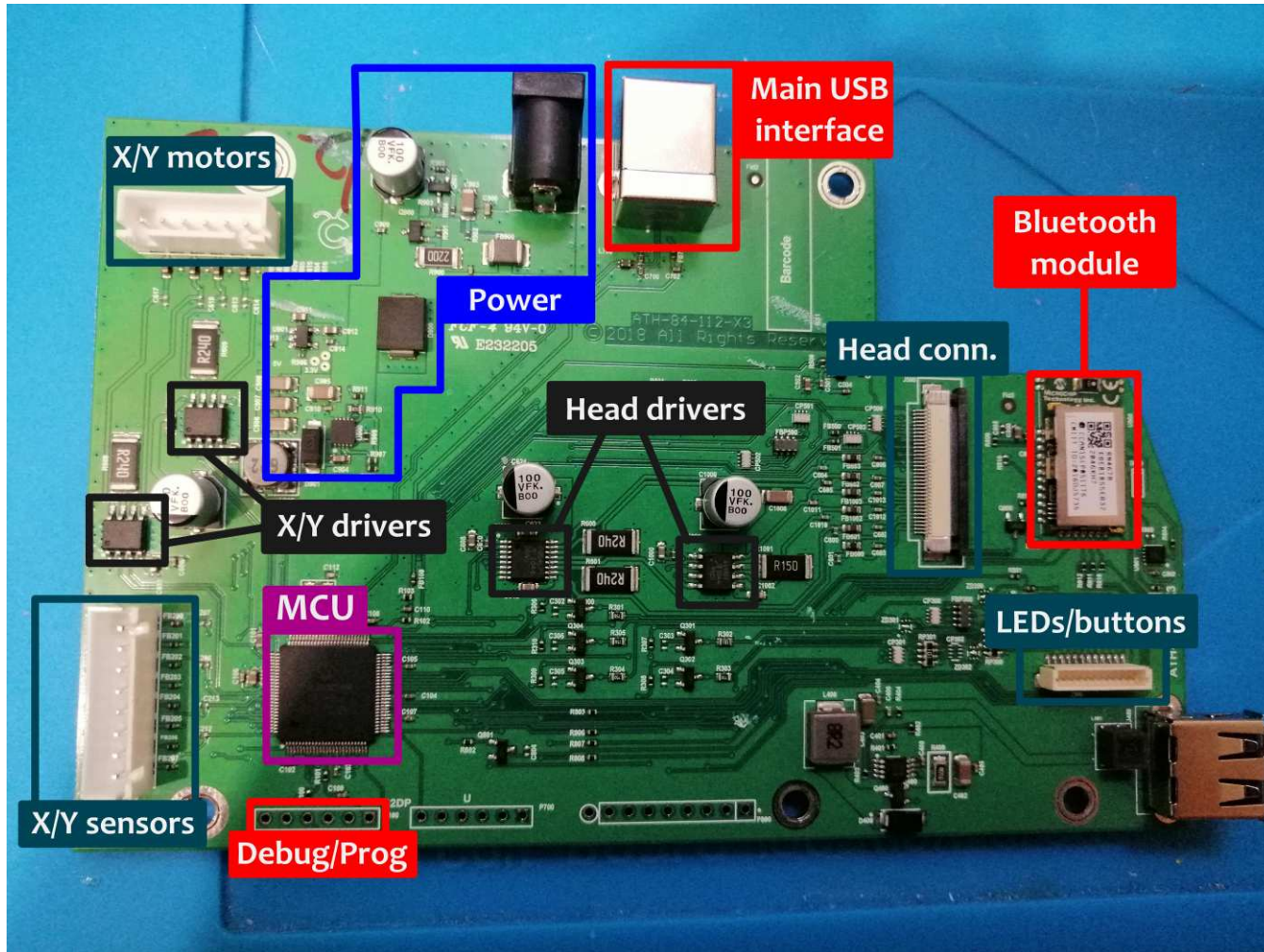
Machine Cricut Maker désactivée

100 € Livraison : à partir de 10,99 €

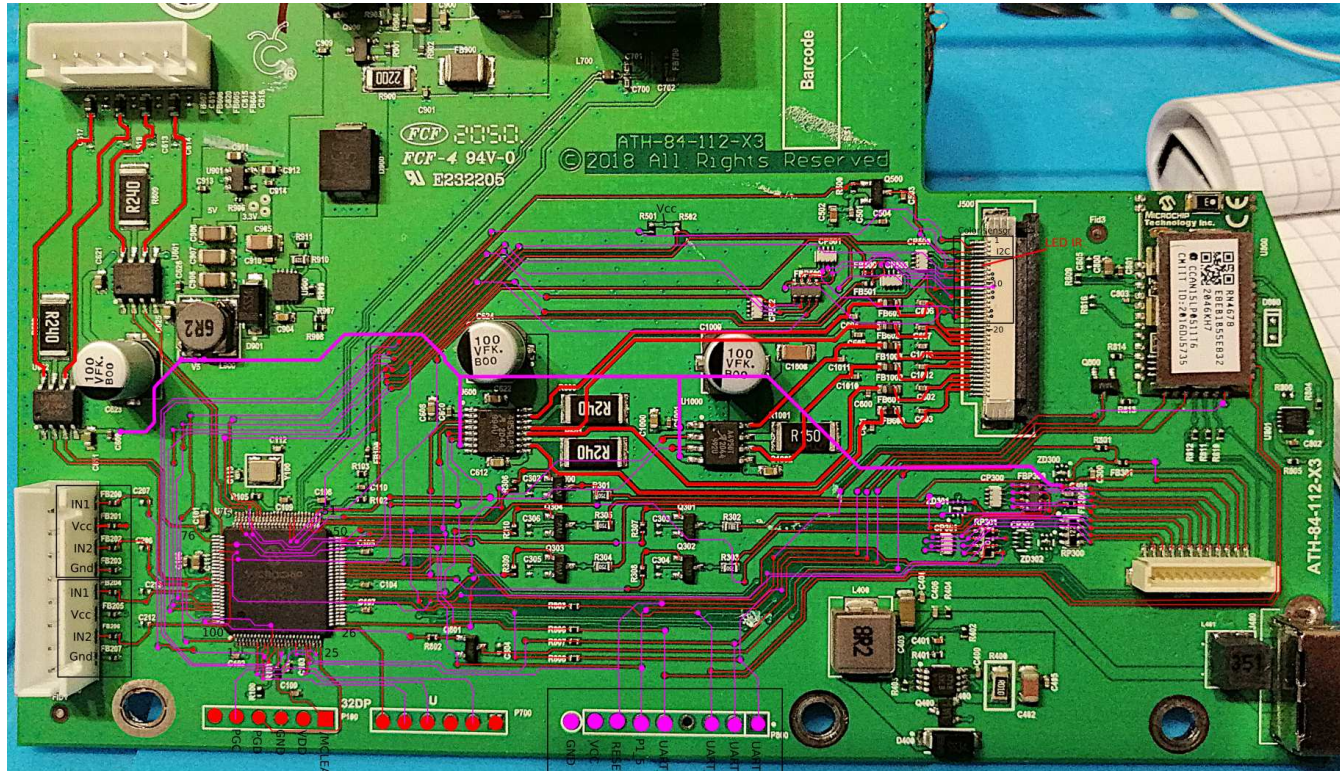
20/05/2023 à 11:22

REVERSE- ENGINEERING

PCB BREAKDOWN



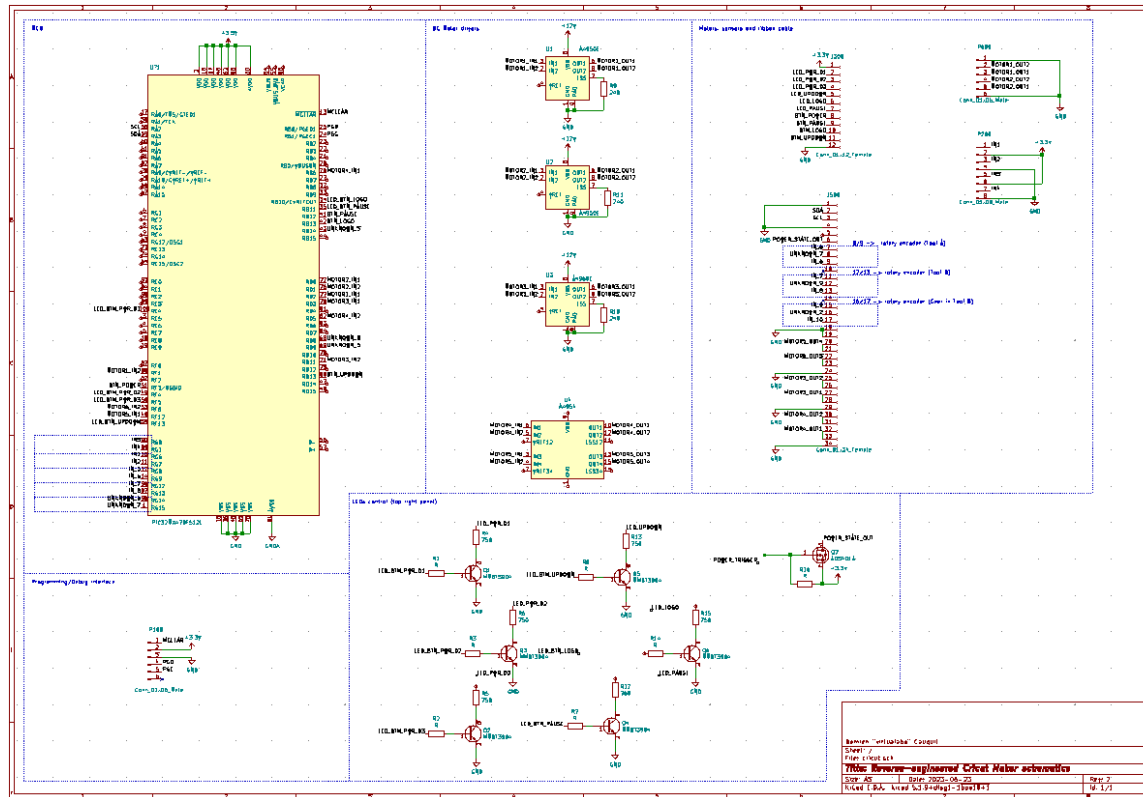
RECOVER ALL THE TRACKS !



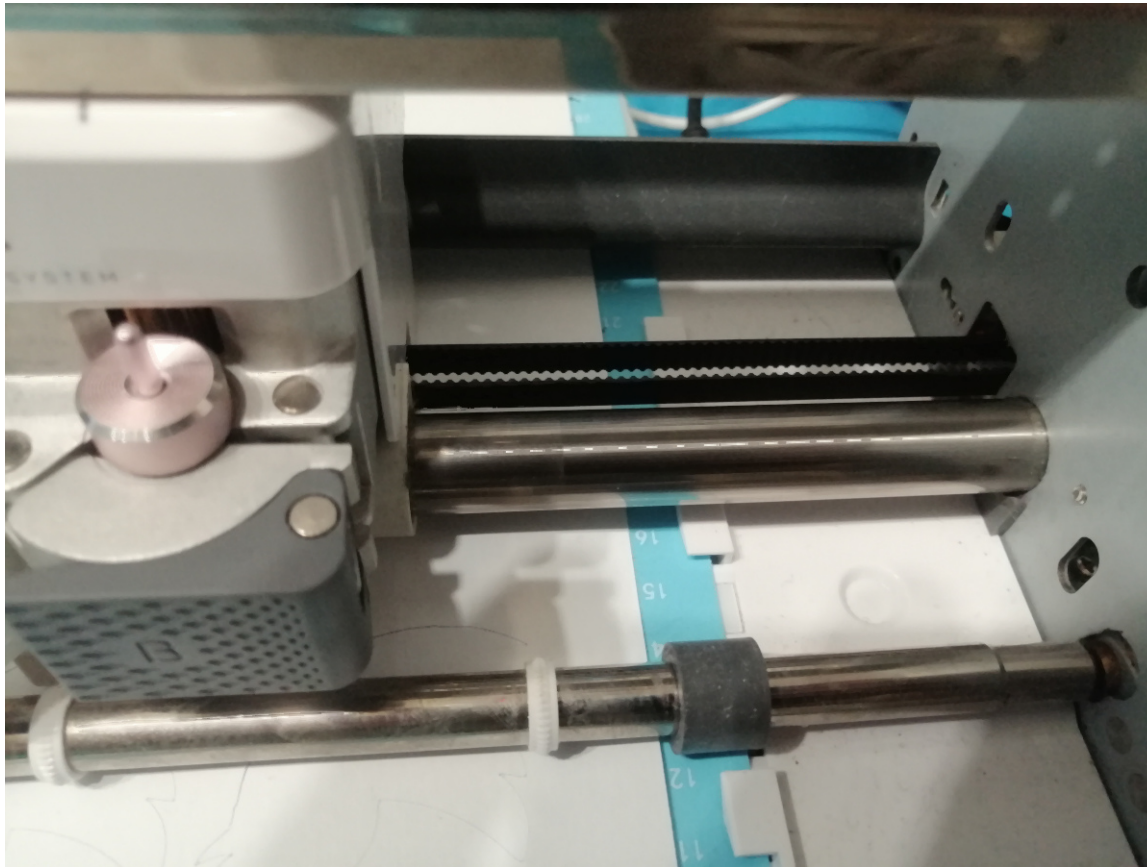
MCU IDENTIFICATION

- Custom markings
- Discord server mentioned a PIC32
- Matching MCU: **PIC32MX470F512L**

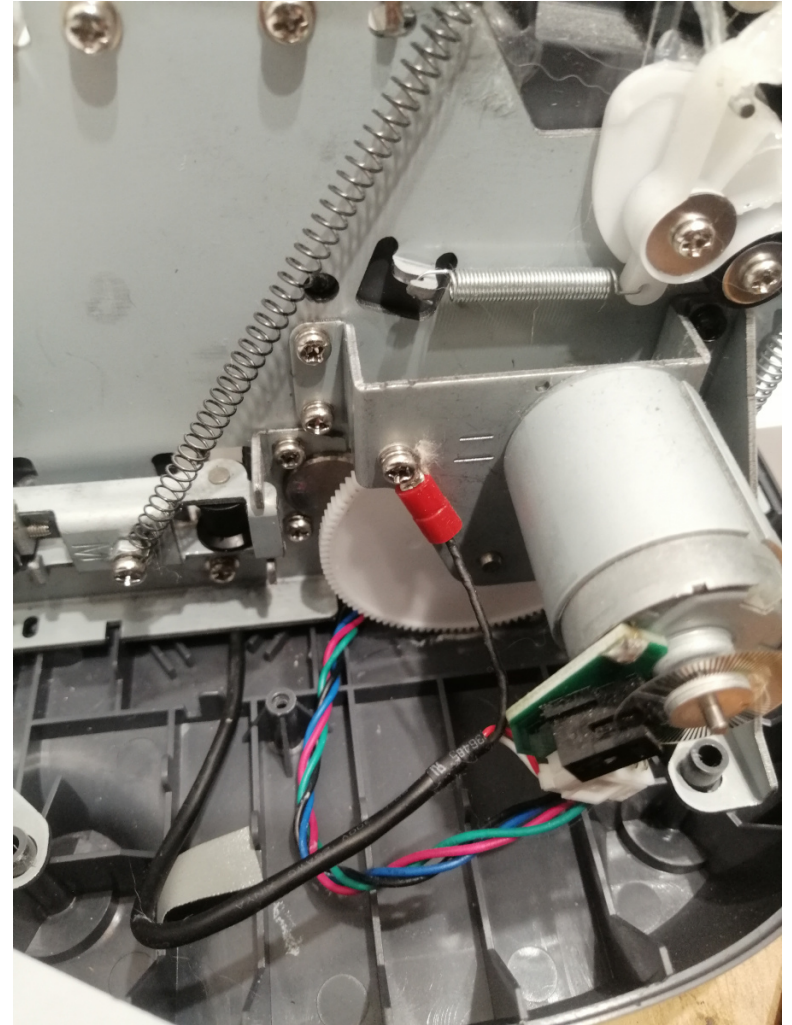
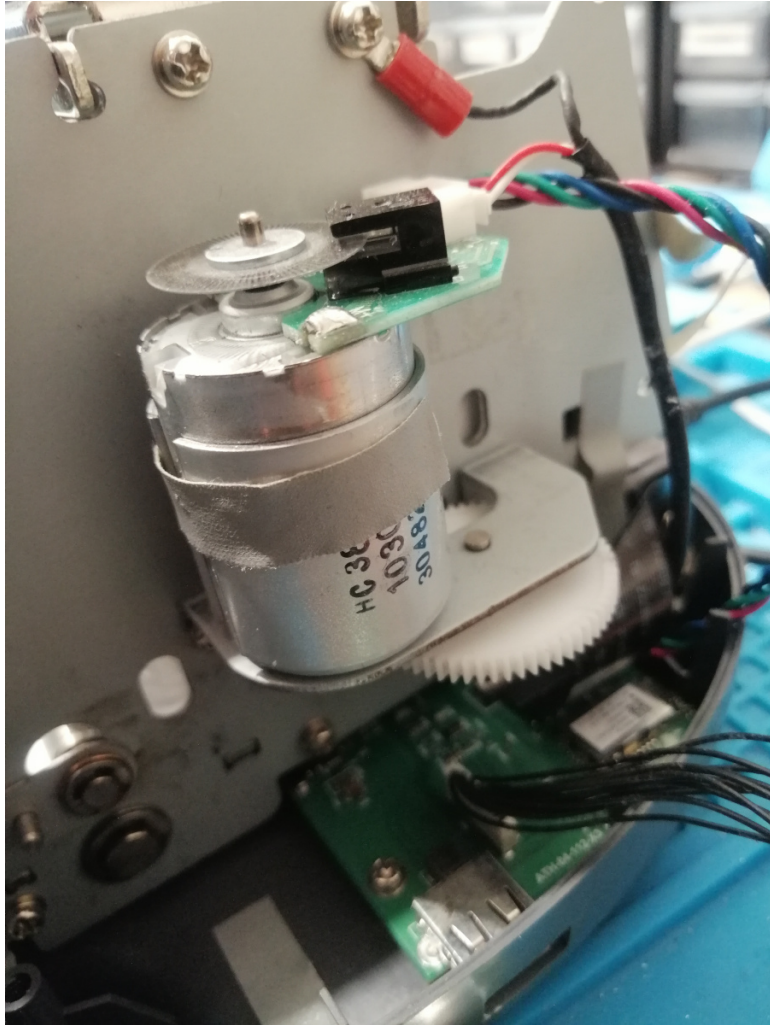
SCHEMATICS (PARTLY) RECOVERED



GEARS, BELT AND MOTORS

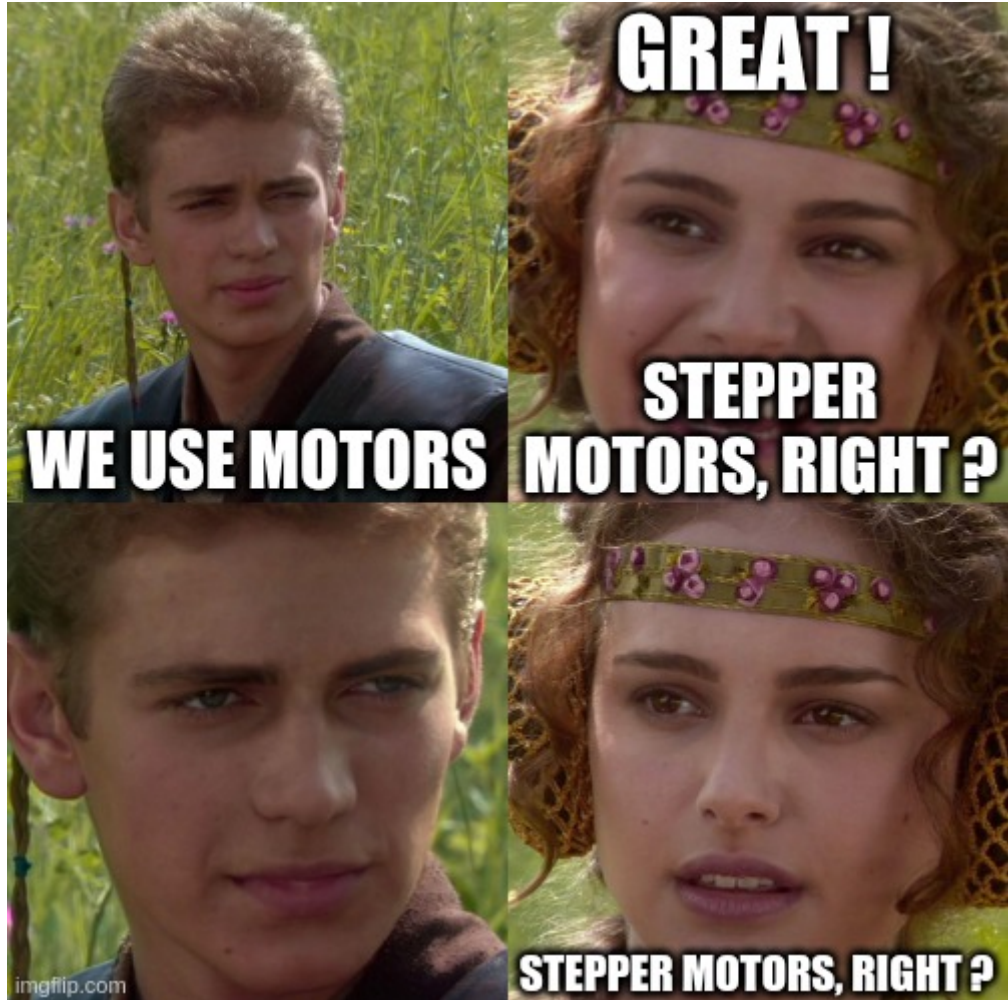


GEARS, BELT AND MOTORS



MOTORS





WE USE MOTORS

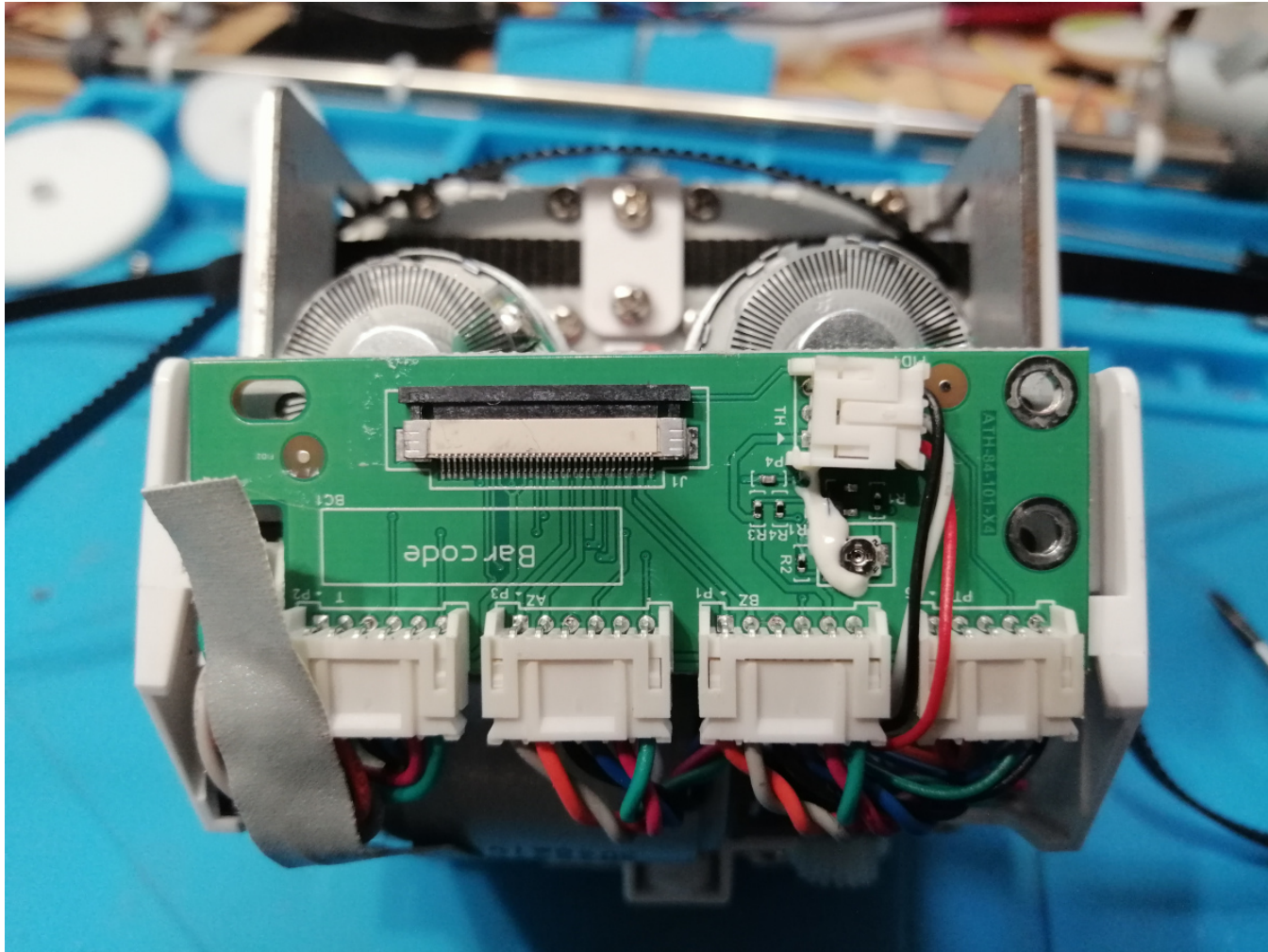
GREAT!

**STEPPER
MOTORS, RIGHT?**

imgflip.com

STEPPER MOTORS, RIGHT?

TOOL HEAD PCB

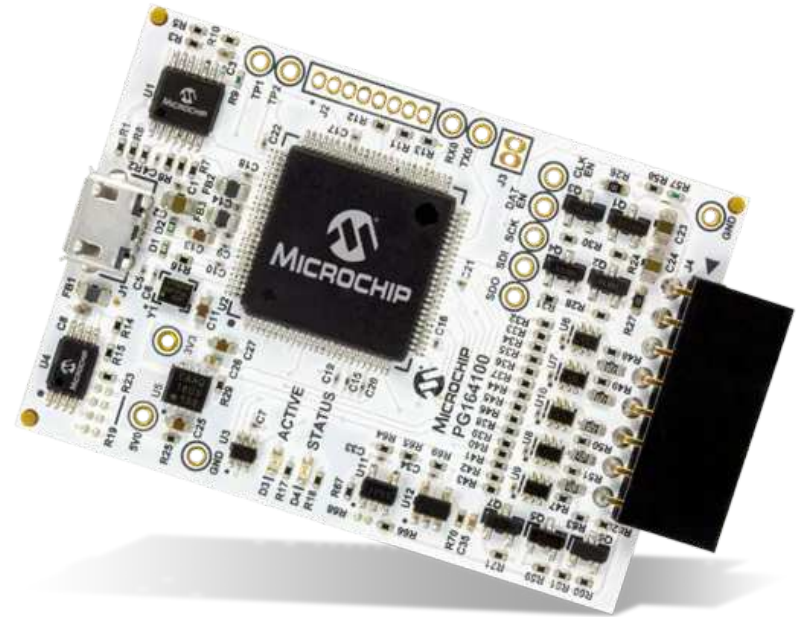


WE KNOW THINGS

- How **electronics work** on the Maker
- How **X and Y axes** are driven
- How the **tool head** works

PUTTING GRBL INSIDE THE MAKER

PROGRAMMING/DEBUGGING



PORTING GRBL TO OUR PIC32

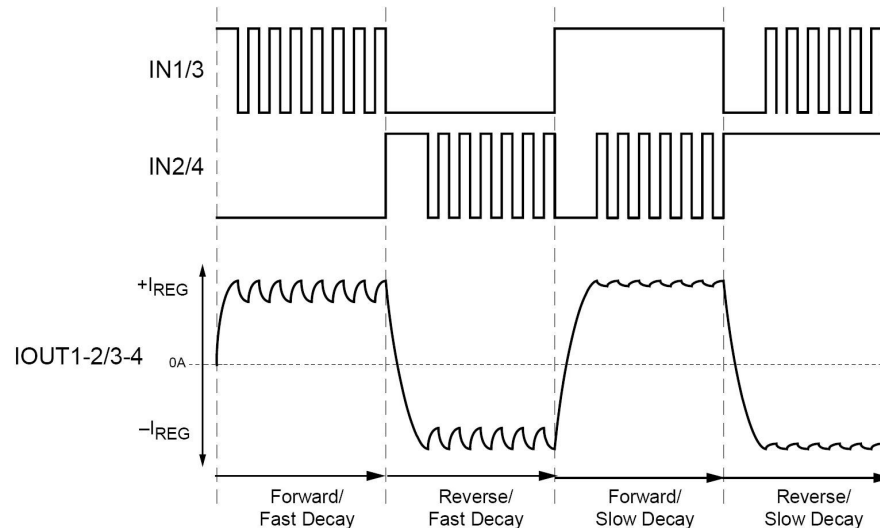
- GRBL supports almost everything
- Multiple challenges 😬
- Designed for AVR, not PIC32

SERIAL COMMUNICATION

- Microchip USB CDC ACM example is a PITA 🤬
- Did some hacks to interface with existing AVR's UART code
- Works pretty fine and allows easy debugging

DRIVING MOTORS

- PWM frequency is 20 kHz to avoid weird buzzing
- Driven through PWM in slow decay mode

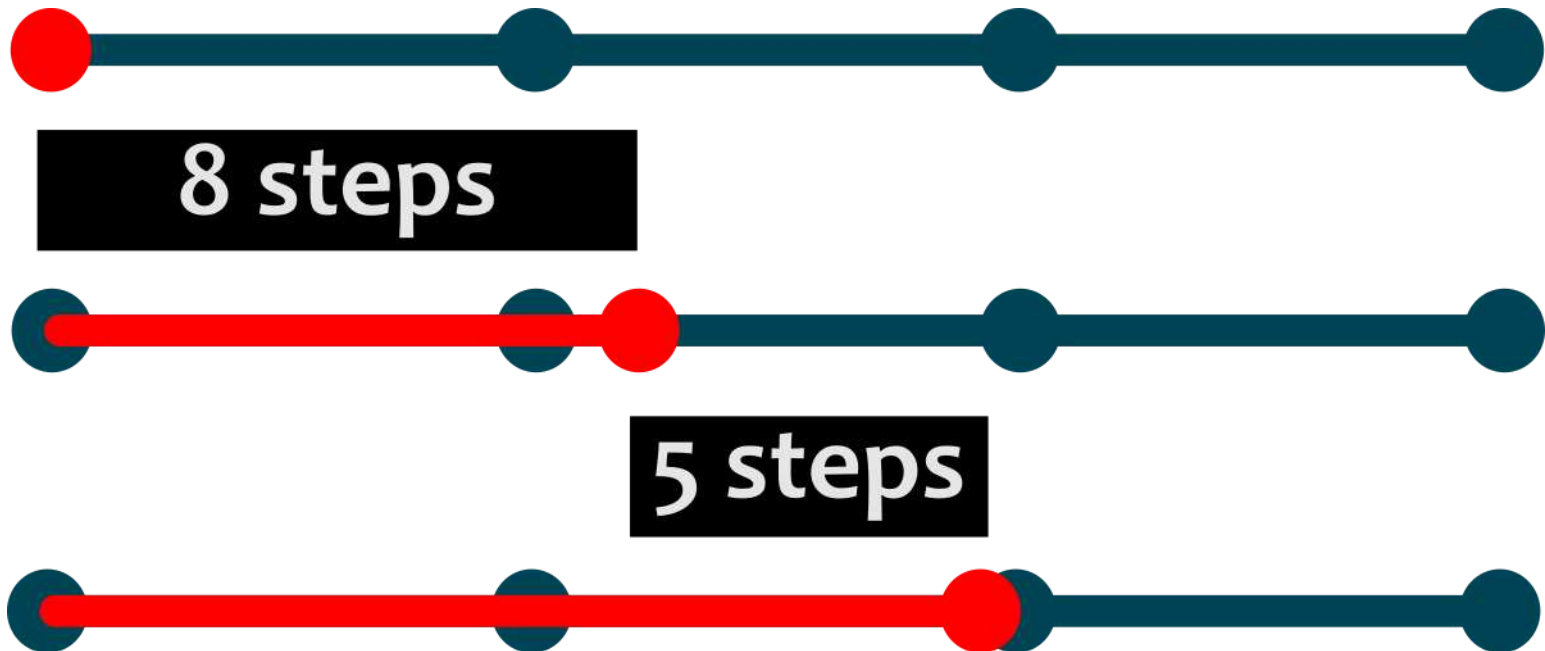


DC MOTORS AS STEPPERS

- Force small moves (steps) with DC motors
- We have to deal with inertia
- Precision is pretty bad (not real stepper motors 😡🔥)

POSITION HACK FTW

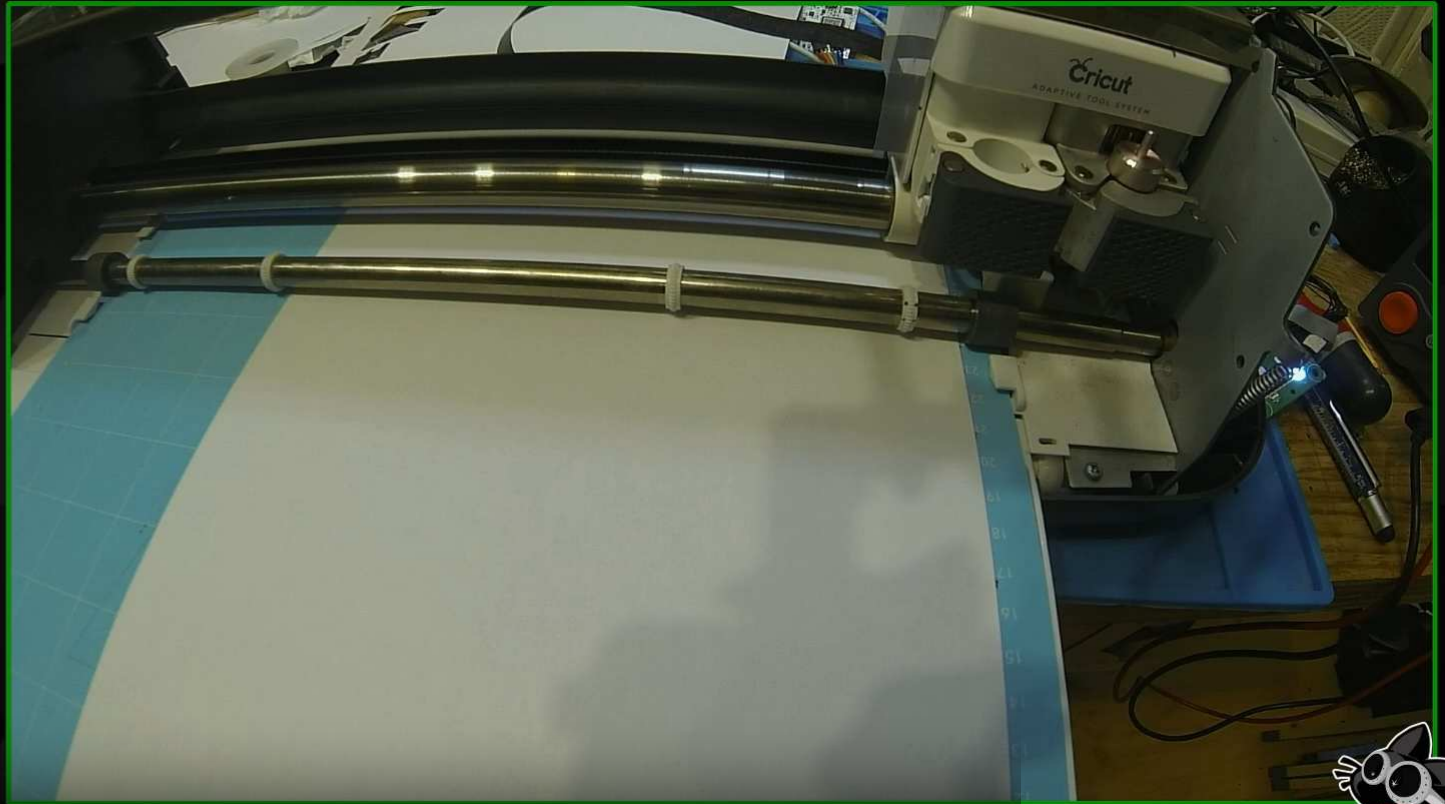
(POOR MAN'S PID)



DETECTING MOTOR STALL

- No endstops, deal with it
- We have quadrature encoders, that's neat 👍

AFTER COUNTLESS HOURS ...



mmu_man: il est camera-shy
Darkgeem: la cricUwUt
PDP_maker: ça va merci et toi ?
frenchraph: ah, la cricut crickutte !
theyodaben: Ouais c'est mieux en grand
theyodaben: tourne les feuilles
frenchraph: cricut has been successfully liberated !
frenchraph: pirates !
frenchraph: faut décaler la feuille plus à droite 🤖
frenchraph: euh, à gauche
lokiod1n: bonsoir tous le monde !
lokiod1n: Bah alors toujours pas couché pour leHack ?
treguy: bosoir, monde
jeremyv42: Hello ! il n'y a pas moyen de tourner à 90° ? sinon bien joué, ça marche !
buldo3: yo, bouger un peu l'éclairage ça brille sur le tapis
Rockman18: Tiens d'ailleurs une question ton tapis bleu, j'ai commandé le même mais le mien il colle tellement que la feuille reste collé dessus. Tu n'as pas eu ce soucis ?
treguy: du coup, la vidéo de demo tu découpe un sticker vinyl "le hack" que t'aura collé sur to pc pour la prez ?
ramsey5997: Du savoir faire est de la patience est voilà le résultat. Bien joué

▶ 0:00 / 2:21

frenchraph et la...
frenchraph et la...


♥ ratamok ★ darkgeem 🔊 🗄️ ⋮ ▶ lousonna - 10


A MATTER OF TIME

- Roughly **100 hours** spent on this project
- Streamed live on Twitch
- A lot of fails 🤦

**FREE ALL THE
HARDWARE !**

WE BUY, WE OWN !

MagasinComptePanier

Produits






[Accueil](#) > [Informatique - Tablette](#)

Machine de découpe **Cricut** Pack Maker 3 + 3 lames

Réf. 1190380

Produit neuf

★★★★★ (0)




549,99€
0.90€ d'éco-part.

Ajouter au panier

Ou payer en plusieurs fois par carte bancaire.
[En savoir plus](#)

3x **4x** Apport de **150.37€** puis **3x137.5€**.
Coût du financement: **12.87€**, TAEG Fixe de 21.01%.

 [Consulter la disponibilité en magasin](#)

✓ Retrait magasin ou drive - offert
[Choisir mon magasin](#)

✓ Livraison chez vous **dès lundi 03 juillet**
[Vérifier mes options de livraison](#)

LOCKING USERS IN

- Vendor can **remotely deactivate** any machine
- Machine is **damn expensive**
- Users must use some kind of **crappy software**
- This is **deliberate**, users are not well informed

VENDORS, WHAT YOU SHOULD BE DOING

- Sell hardware that uses well-known protocols
- Provide your official (**optional**) application
- Sell **quality** supplies and accessories

HARDWARE HACKERS, WHAT YOU SHOULD BE DOING

- **Reverse** popular closed-source hardware
- **Create and publish** compatible open-source firmware
- Use and improve **well-known communication protocols**

CONCLUSION

THE MAKER IS (ALMOST) FREE !

- Can be used **offline**, without subscription
- Could work on **Linux/Windows/Mac**
- **Community-driven** features and software

DOCUMENTATION / SOFTWARE

🏠 CutcutGo

Search docs

CONTENTS:

Introducing CutcutGo

Teardown of the Cricut Maker
Champagne

CutcutGo installation and configuration

Technical resources

🏠 / Welcome to CutcutGo's documentation!

[View page source](#)

Welcome to CutcutGo's documentation!

Contents:

- [Introducing CutcutGo](#)
 - [Origin](#)
 - [Why GRBL ?](#)
 - [Months of development](#)
 - [Current status of this project](#)
- [Teardown of the Cricut Maker Champagne](#)
 - [A low-cost CNC plotter](#)
 - [Main PCB breakdown](#)
 - [PIC32 micro-controller](#)
 - [Servo motors](#)
 - [Bluetooth Low Energy module](#)
 - [Mechanical details](#)

<https://virtualabs.github.io/cutcutgo/>

STILL A LOT OF WORK

- Modified version of **InkCut** in the pipe
- USB-based **firmware upgrade**
- **Bluetooth Low Energy module support**
- **Front LEDs and buttons support**

CONTRIBUTE !



REMEMBER:

HACK ALL THE THINGS !

THANKS, QUESTIONS ?

 @virtualabs@mamot.fr

 @virtualabs (DM only)

 virtualabs