



Hi!

Talking about CD and DVD drivers, they are awesome! You can find many cool and valuable(for a hobbyist) things inside them to use in your projects. There are so many things that you can do with one or more of these drivers that you will be impressed.

This instructable is about this, reusing the parts from a old/dead CD or DVD driver. After disassembling many of these drivers i could learn its tricks and know what can be done with them, now I want to share this specific knowledge with you.

So, let's start!

Step 1: Finding your victim



You can find a dead CD or DVD driver in old computers, maybe you have one in your house. But if you don't have one don't worry. I got mine from a computer repair workshop, if you ask for one in the workshop next to your house they will possibly give you one, because this drivers when dead and being substituted are going to trash, asking don't cost anything.

Good luck!

Step 2: The tools



To get it open, you will need only some screwdrivers, for the most part i used only a philips screwdriver, But the ideal is to have a kit with many screwdrivers, because you may need a strange to disassemble the laser.

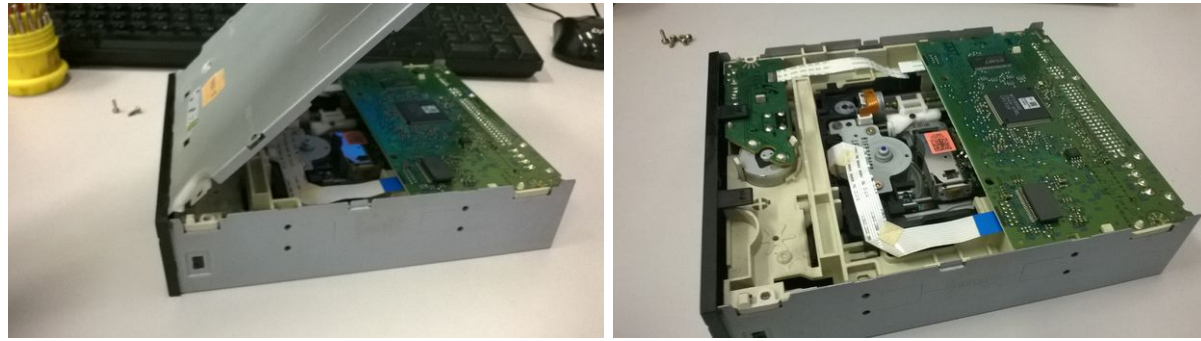
Maybe you will need pliers to pulling the magnets in the laser structure.

Ah, you may also need a solder iron and the skills in how to use it.

Step 3: Starting the surgery

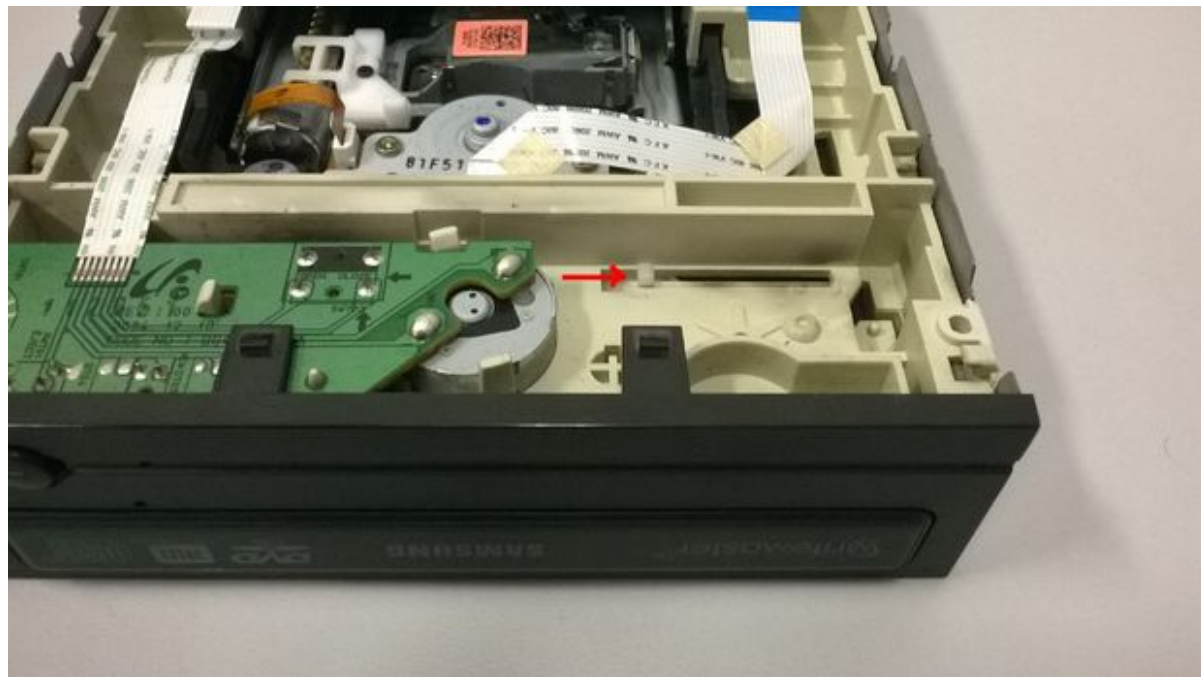




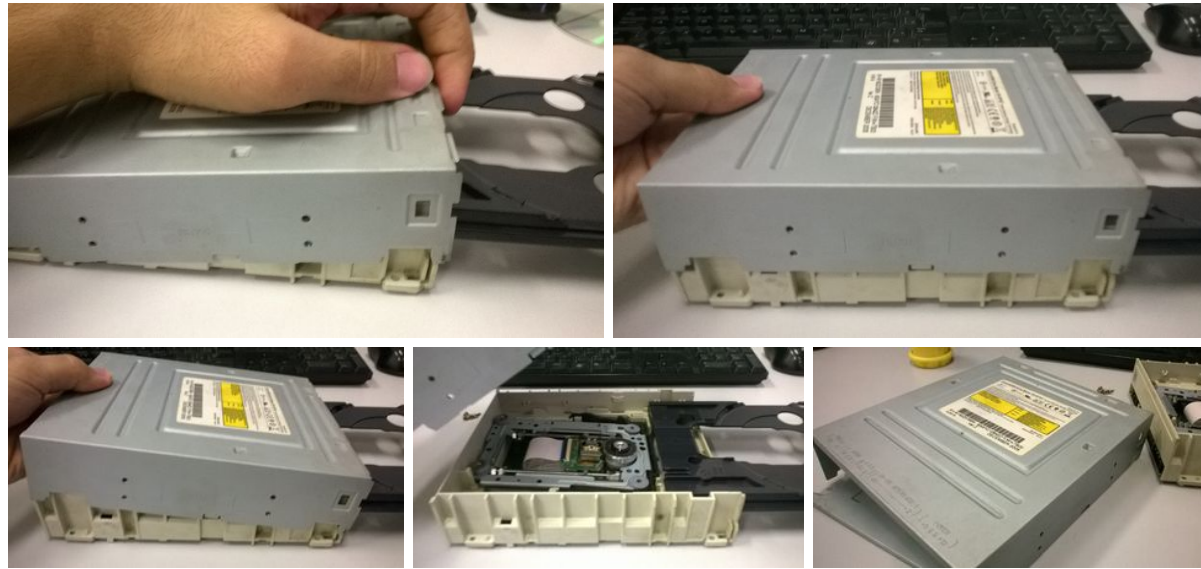


The first thing to do is to loose the four screws under the driver, after that you can pull the cover.

Step 4: Retiring the other part of the metal case.







Now on the sides of the press the marked parts on the images and pull the front of the driver, after that finish taking off the metal cover.

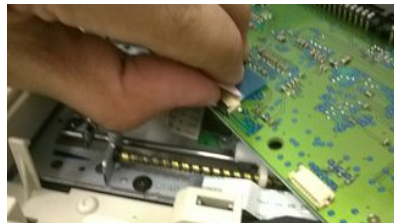
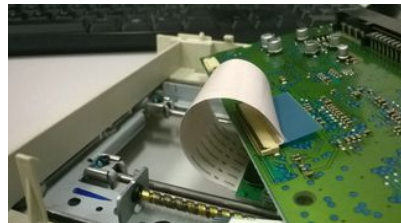
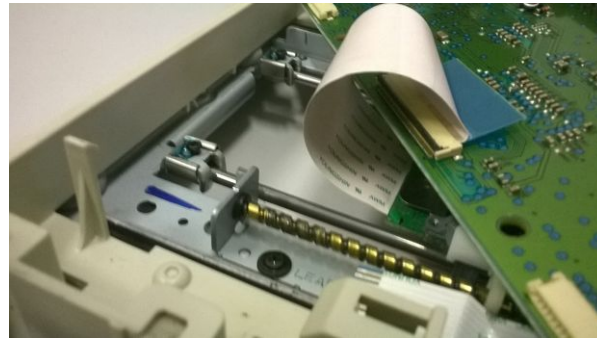
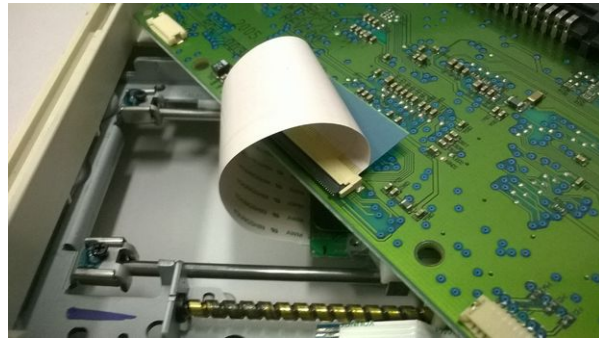
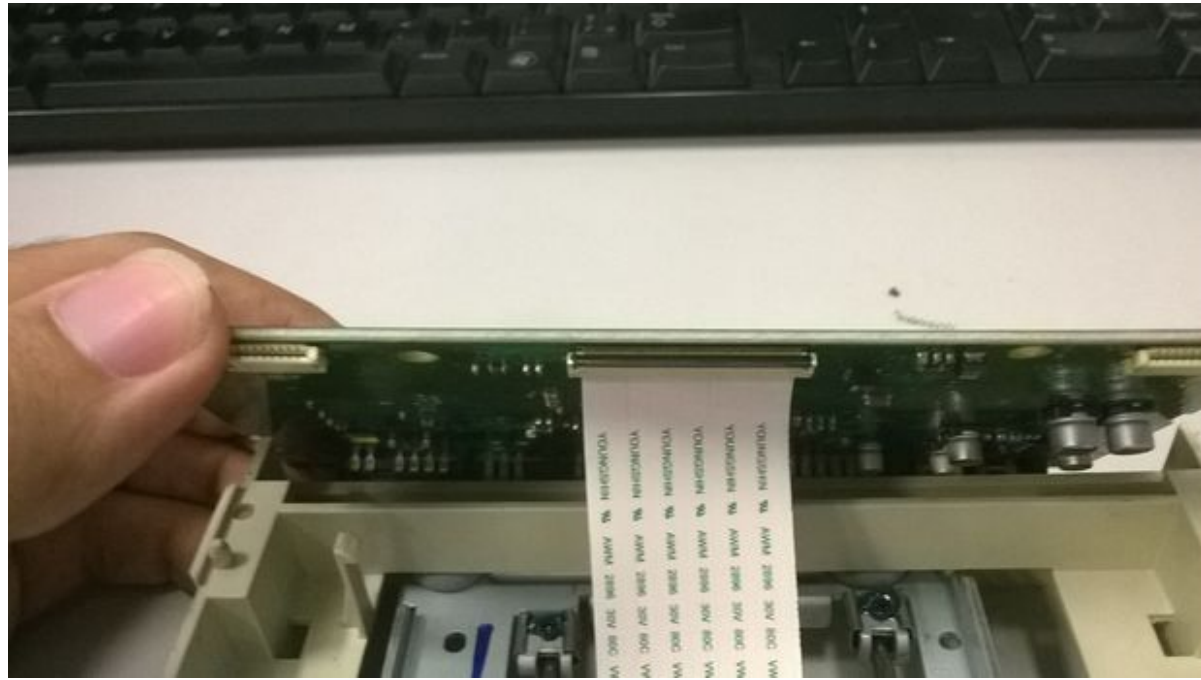
An error occurred.

[Try watching this video on www.youtube.com](https://www.youtube.com), or enable JavaScript if it is disabled in your browser.

Step 5: Retiring the electronic board







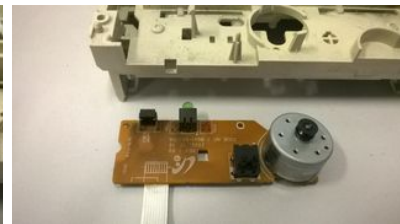
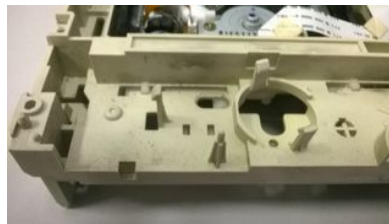
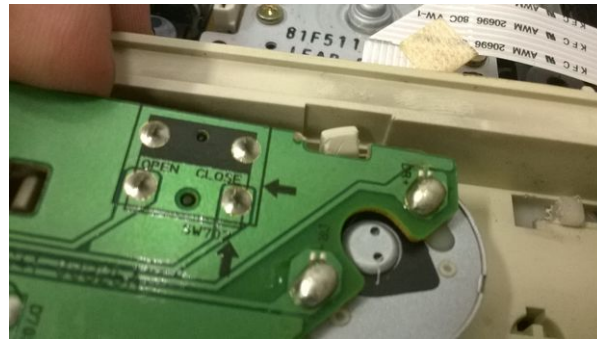
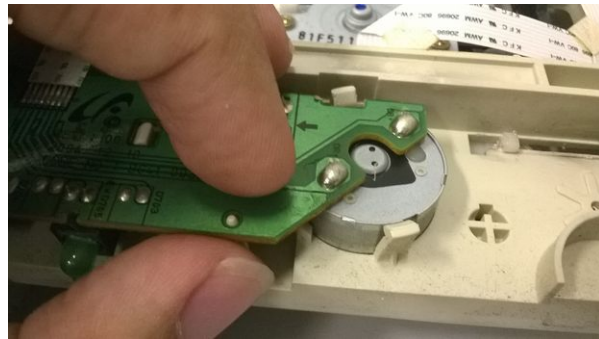
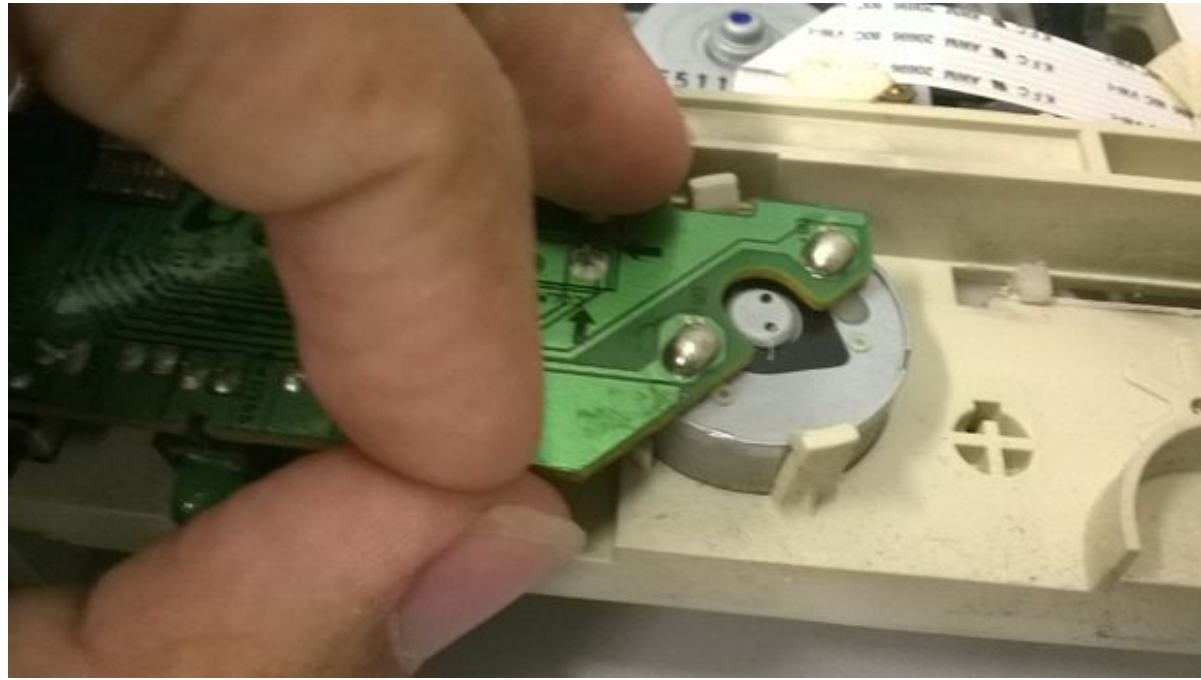


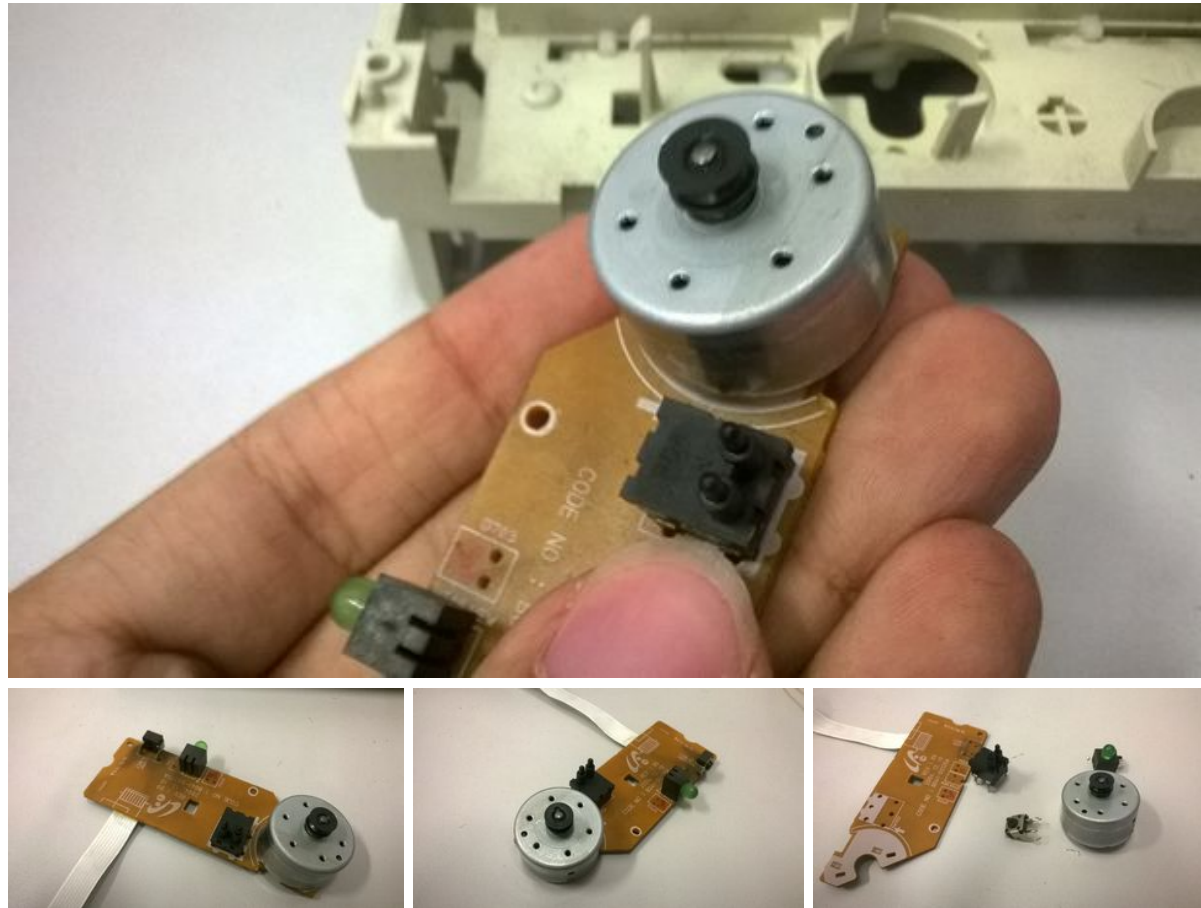
I don't use the electronic board, but it is standing in the way of our progress, see the images to know how to take it.
I recommend that you put these parts that don't have much value for us in a box/bag for discarding correctly later.

An error occurred.

Try watching this video on www.youtube.com, or enable JavaScript if it is disabled in your browser.

Step 6: The tray motor board





In the images, you can see how to take off the tray mechanism, there are some things that can be used here.

You will need knowledge in desoldering to retrieve the parts from the board.

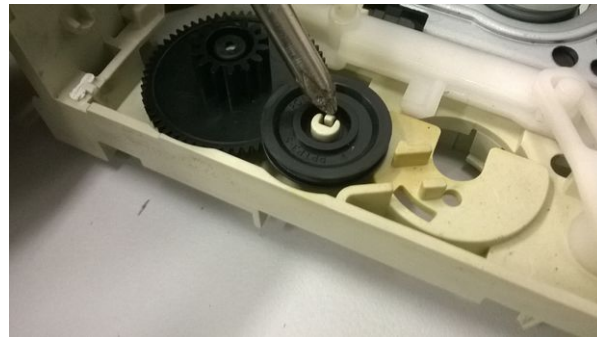
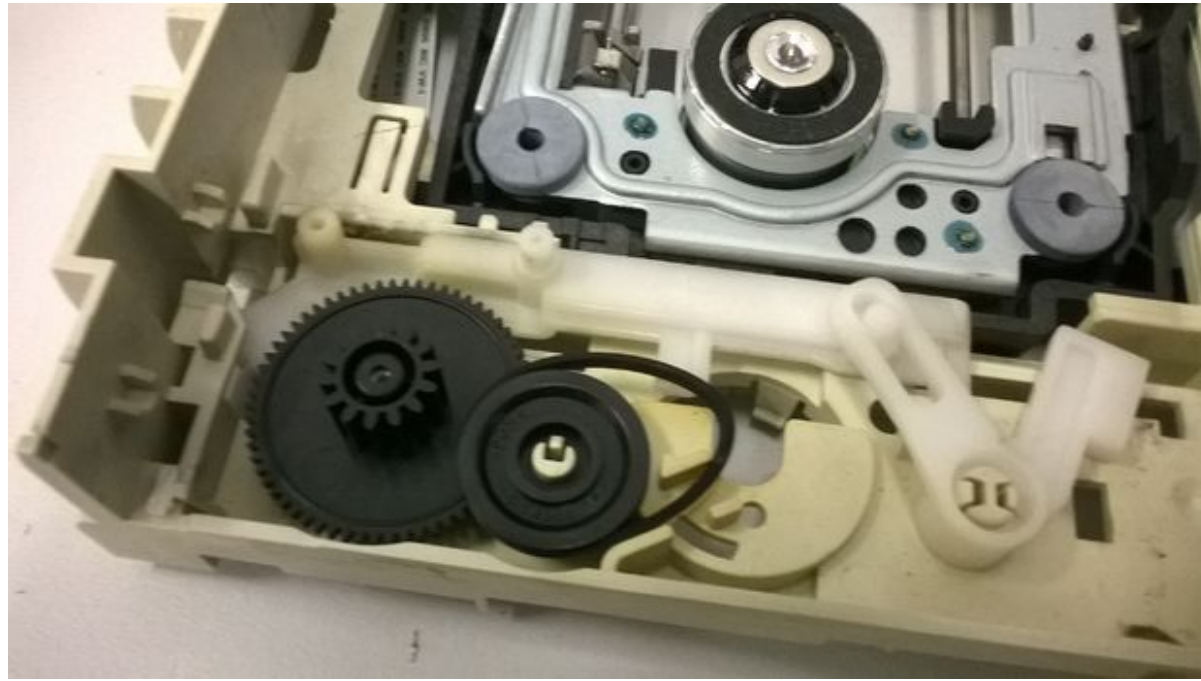
1 x Green diffuse LED.

1 x DC motor.

1 x push button.

1 x strange button.

Step 7: The tray mechanism

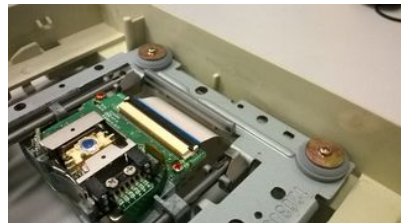
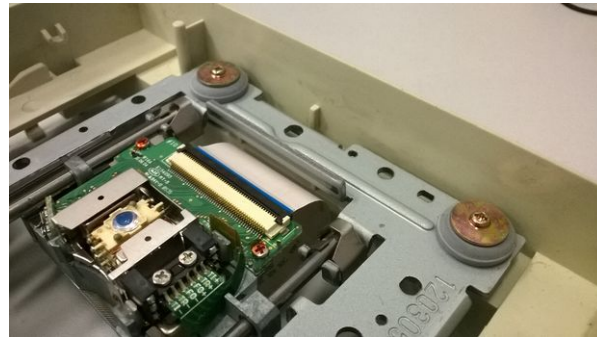
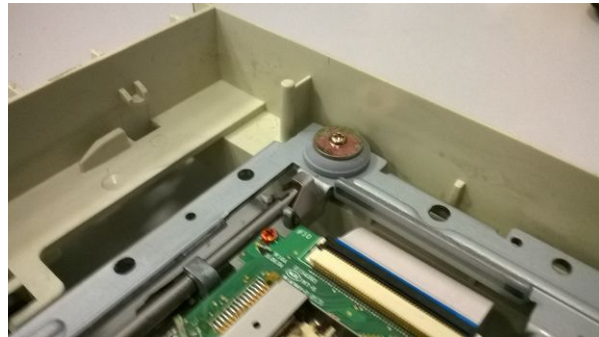
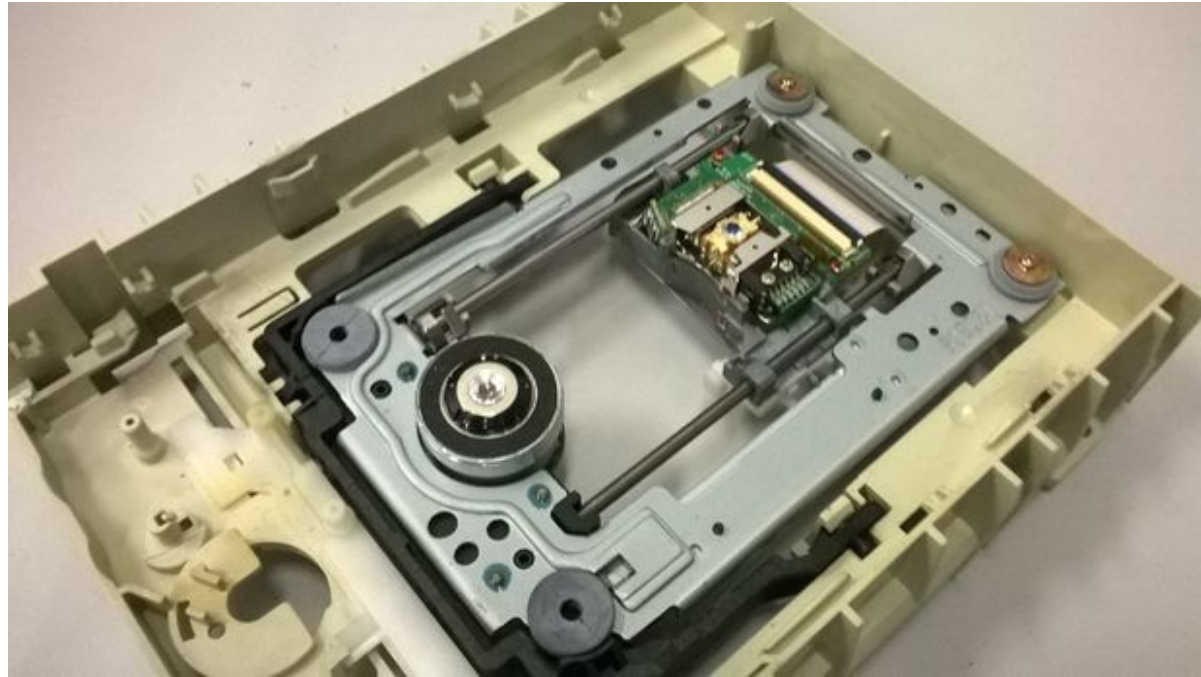


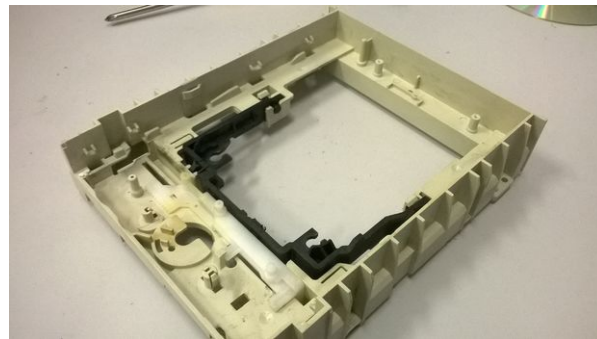
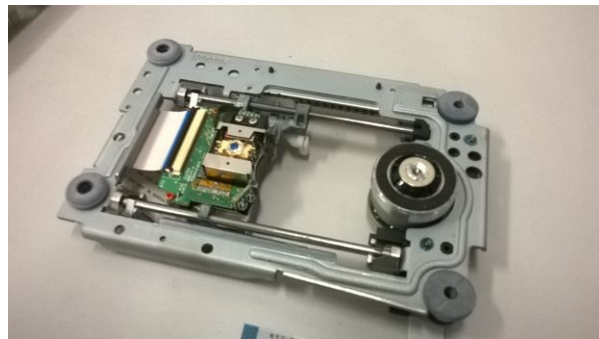
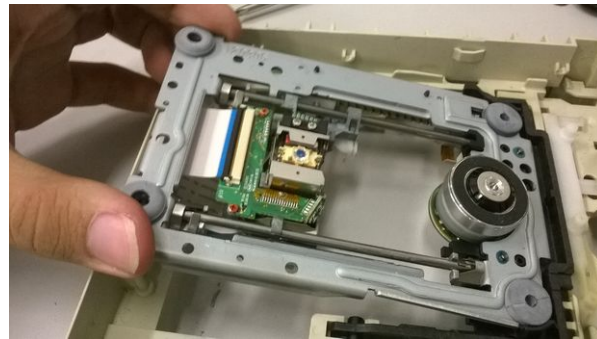
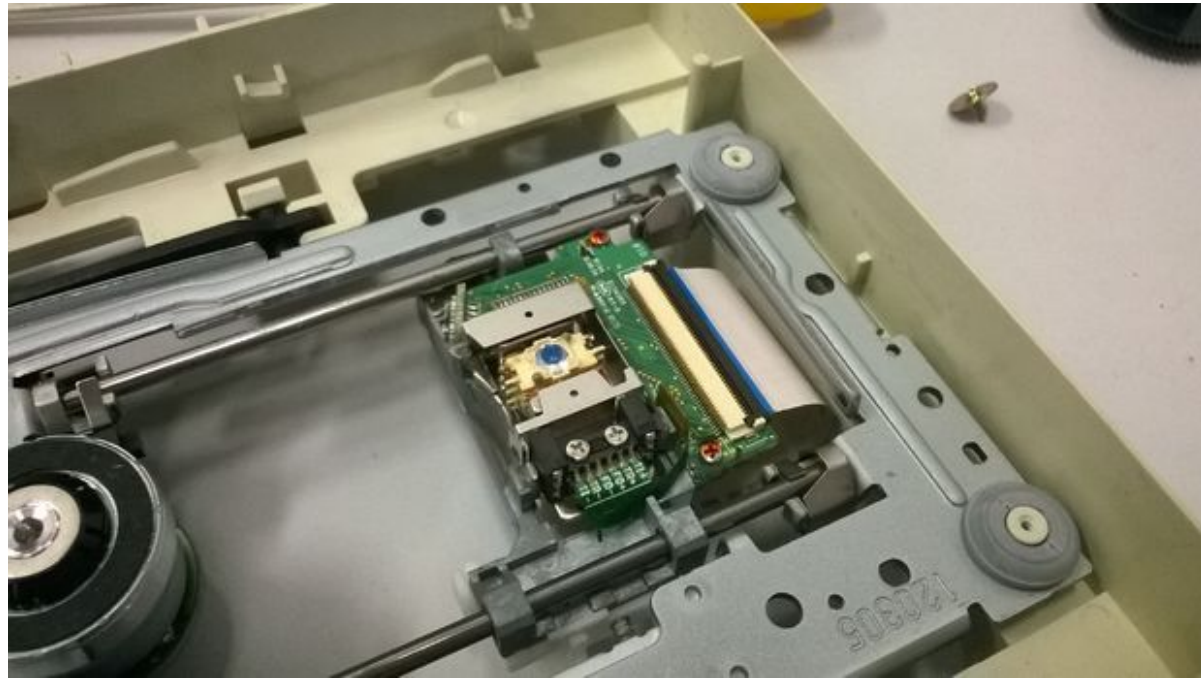


Here, there are some gears that you can use with the motor from the step before.

What you can make with this parts depends of your creativity, you can make a reduction to a robot or something like that, I usin some these in one of my projects, You will see it in Instructables in some time.

Step 8: That thing that I don't know the name.





Let's call it 'Laser movementing mechanism', ok?

For me, that is the real treasure inside these drivers, because I have seen people use them to make laser cutters, engravers, 3D printers and plotters.

Following are some projects that I like with that mechanism:

A Bio Printer.

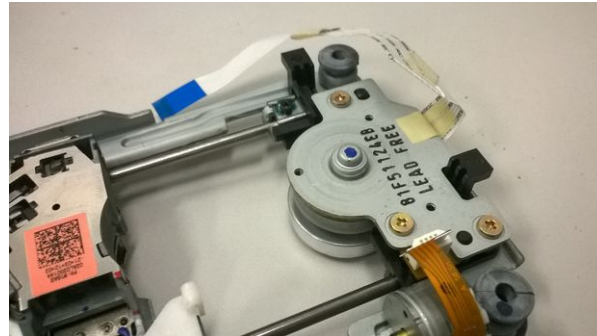
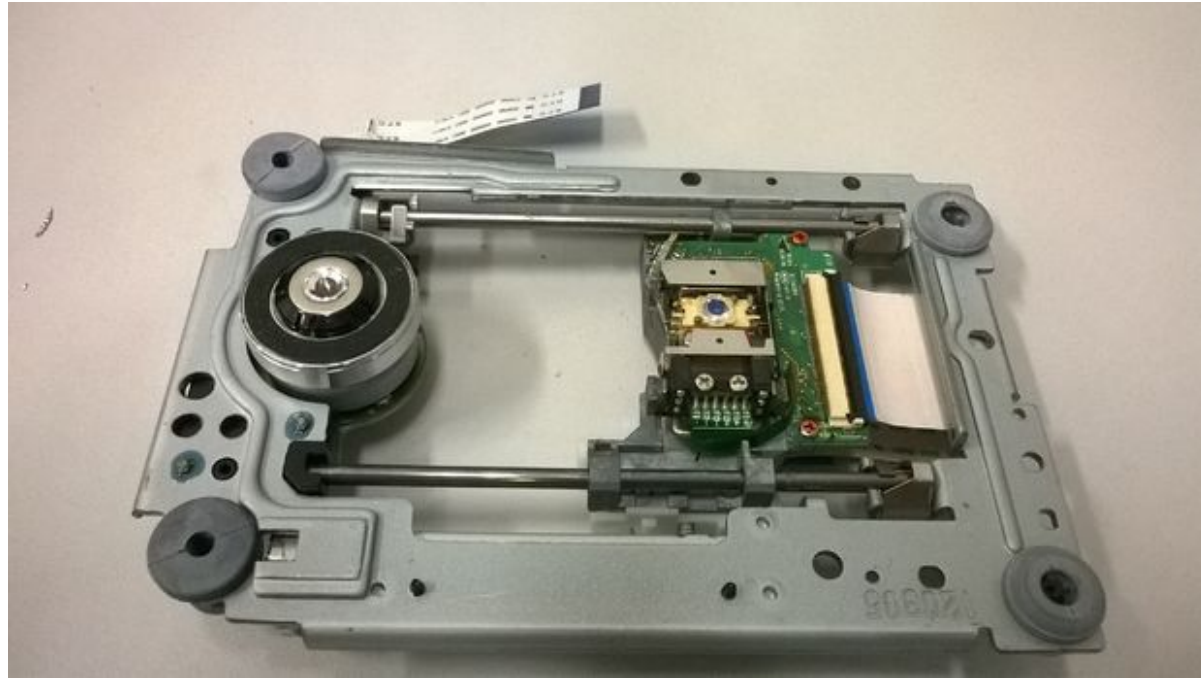
Poor Man's 3D Printer.

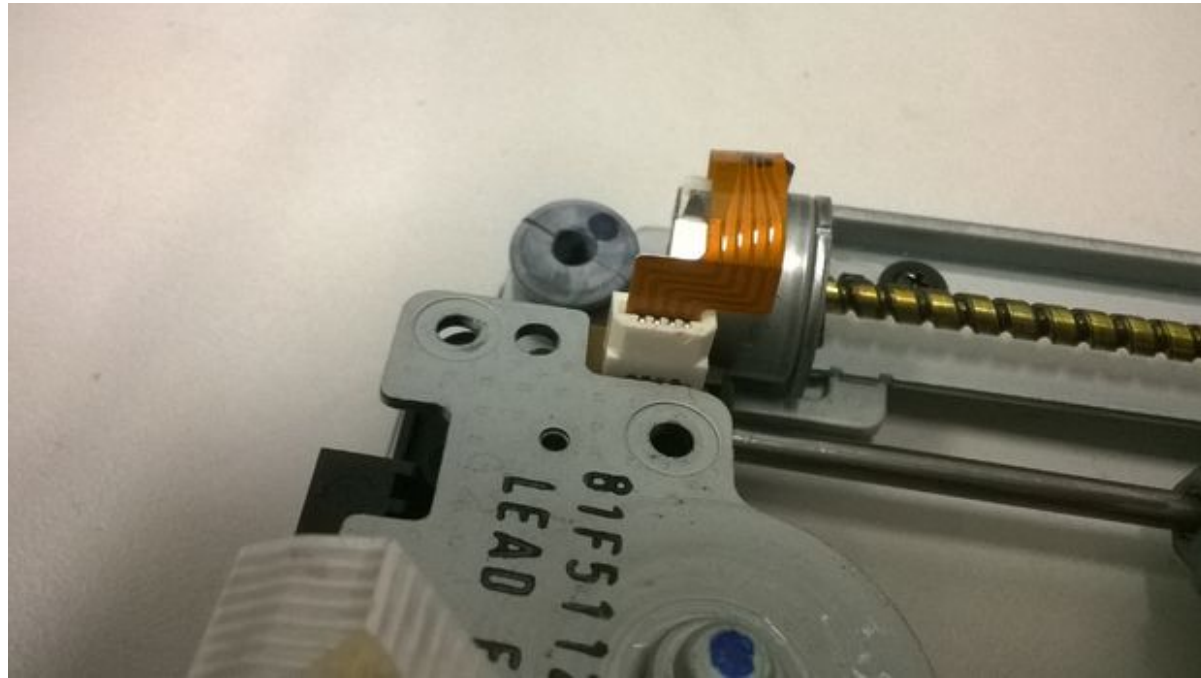
Pocket laser engraver.

And my favorite:

Printer from a CD reader.

Step 9: The brushless motor.





The motor used to spin the CD or DVD is a brushless motor, that means that you can't simply connect two wires in a battery and it will spin, for that, you will need a Electronic Speed Controller (ESC) and maybe some mods , following are some instructables with motors like this.

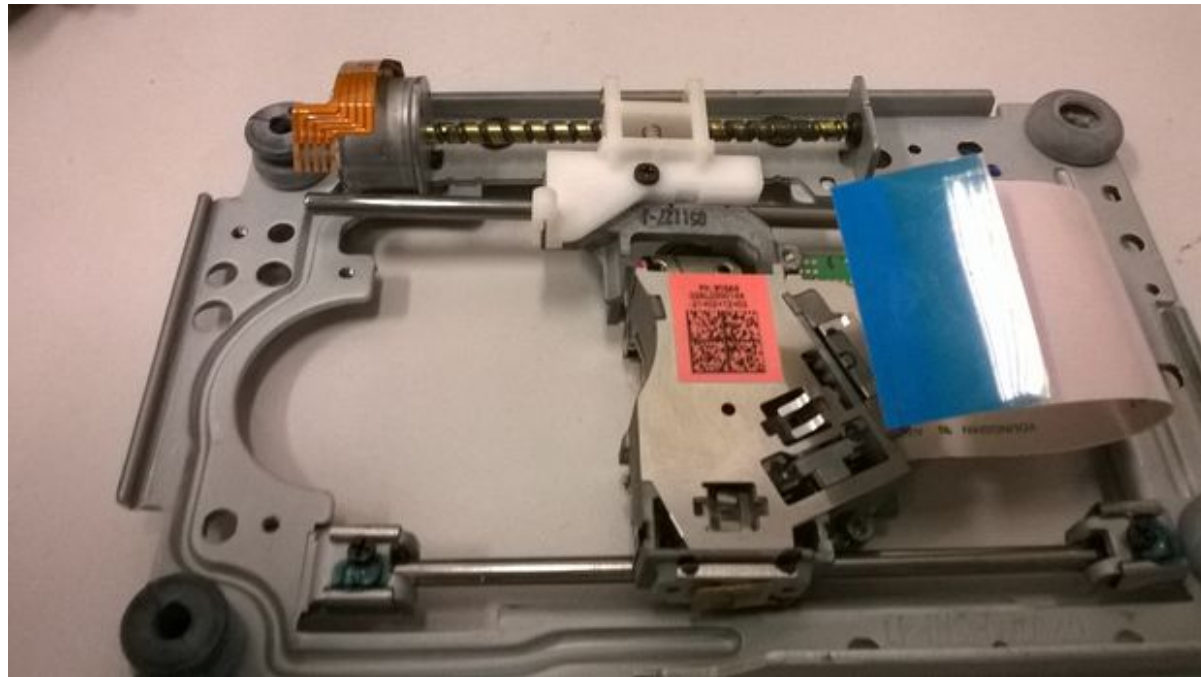
Some projects with these motors:

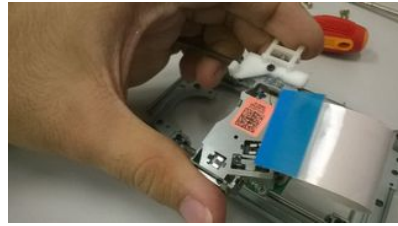
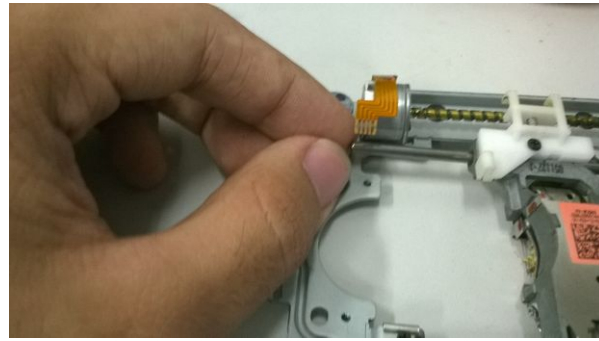
[Arduino CDROM BLDC Motor Driver](#)

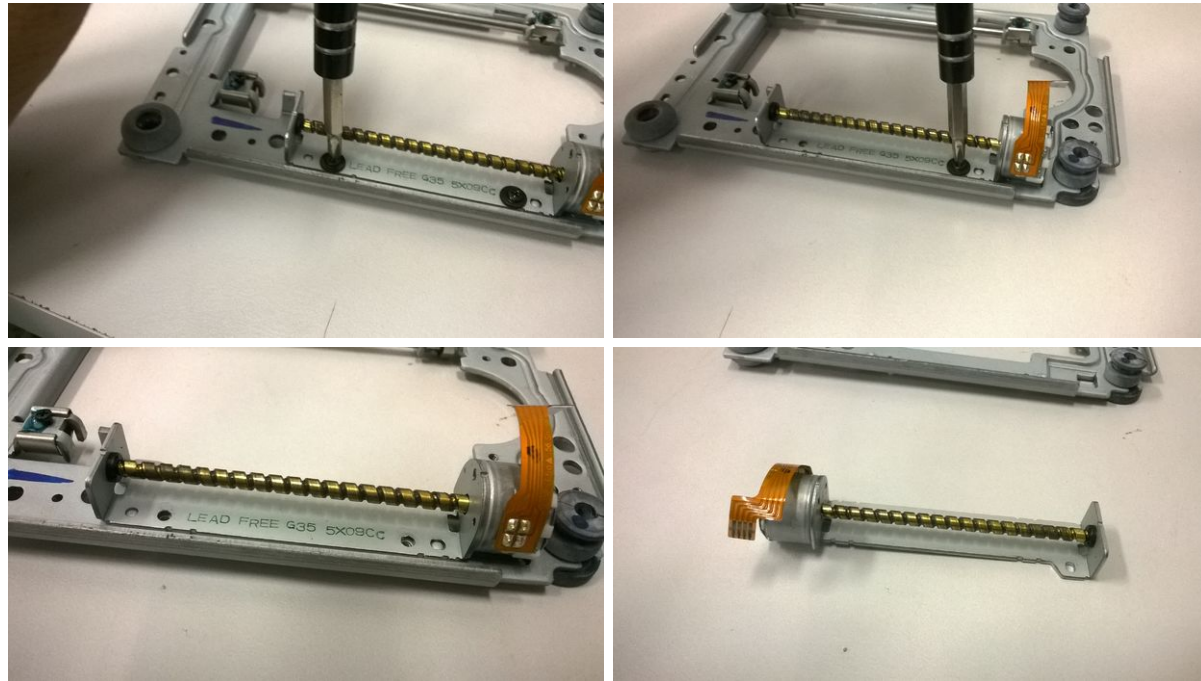
I saw people using these motors to fly RC planes with some modifications.

<http://www.flyelectric.ukgateway.net/cdrom.htm>

Step 10: The Stepper







The motor used to movement the laser is a stepper motor, stepper motors are very good to positioning, the signal sent to the motor makes it move to a determined position.

The stepper motor in these drivers is bipolar, and have to be used with H bridges , I use the L239D chip, a dual H bridge to driv them.

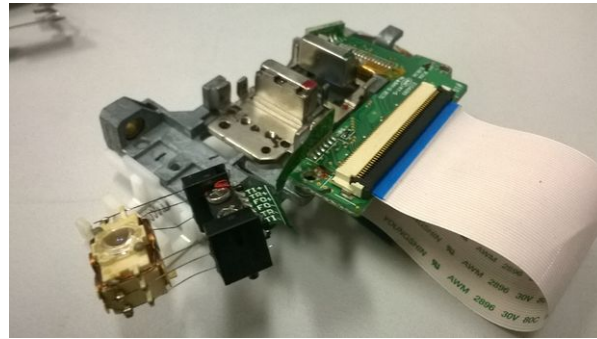
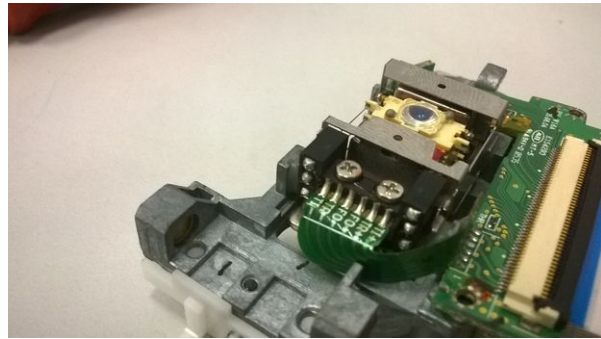
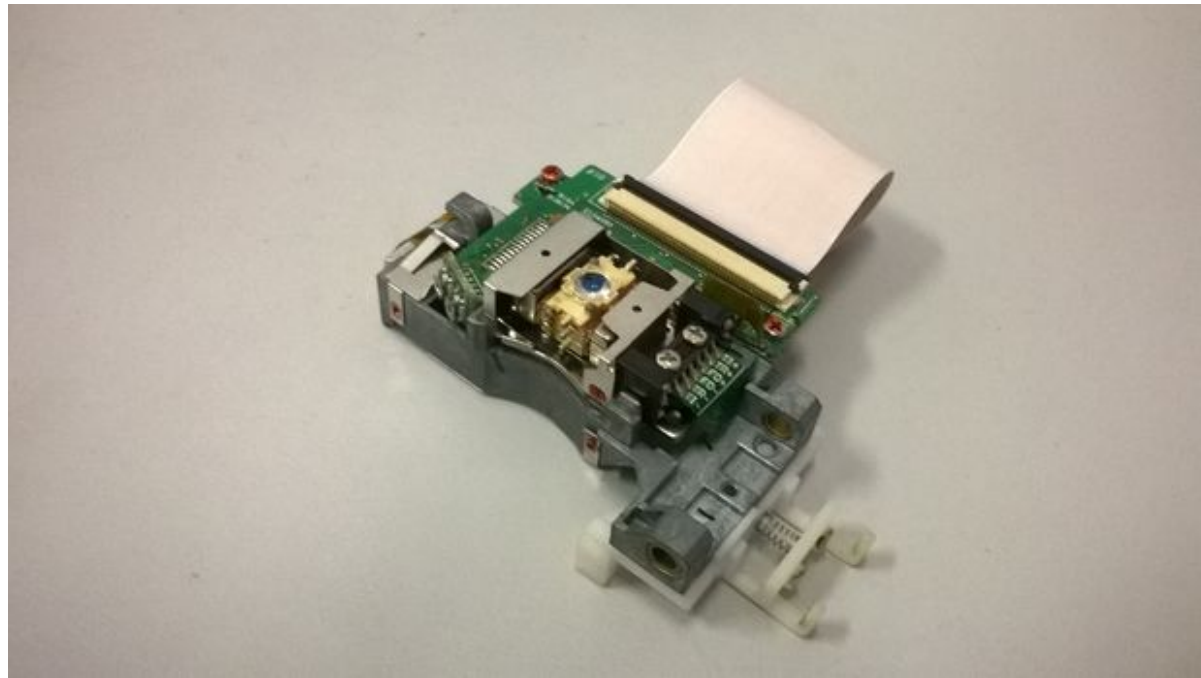
Nice projects with these steppers:

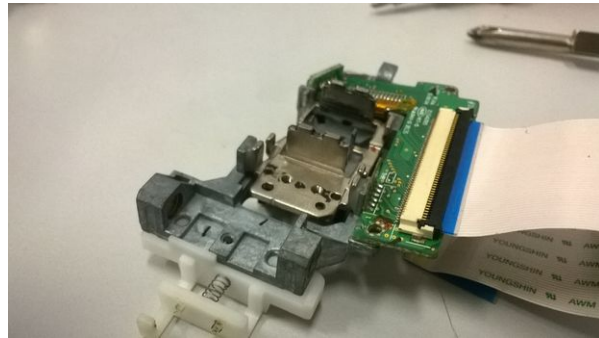
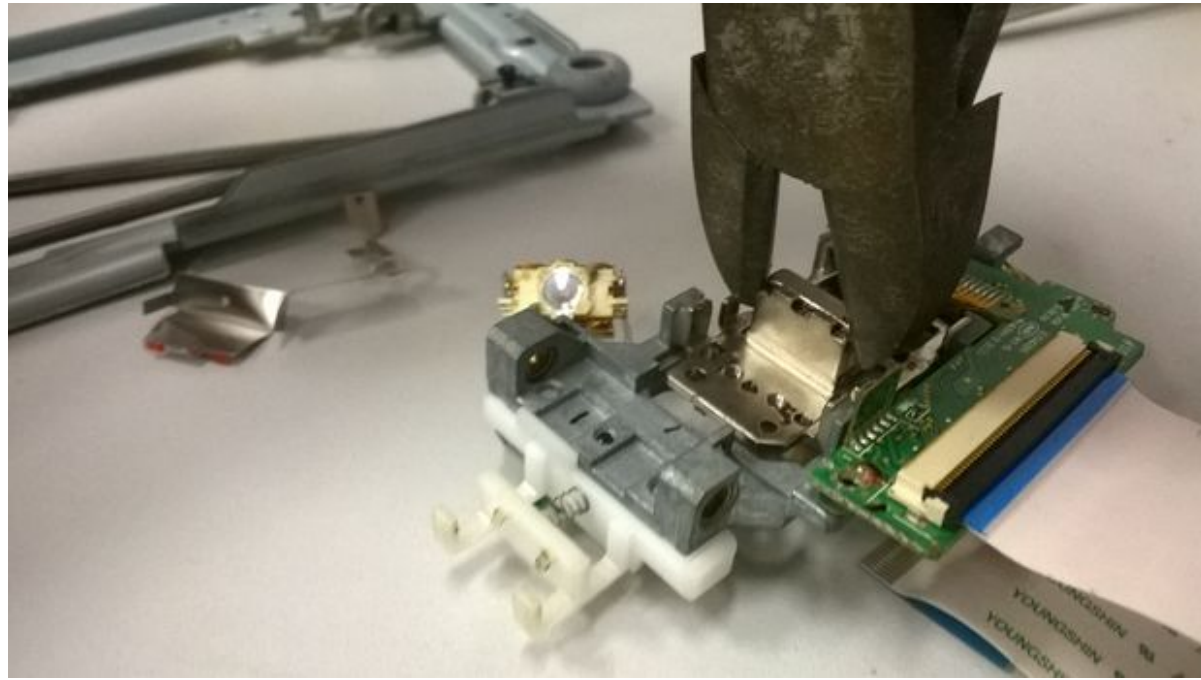
[Arduino Mini Laser Paper Cutter.](#)

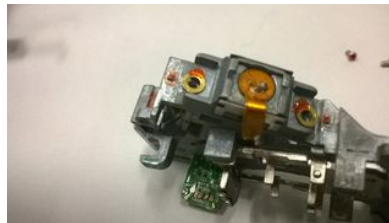
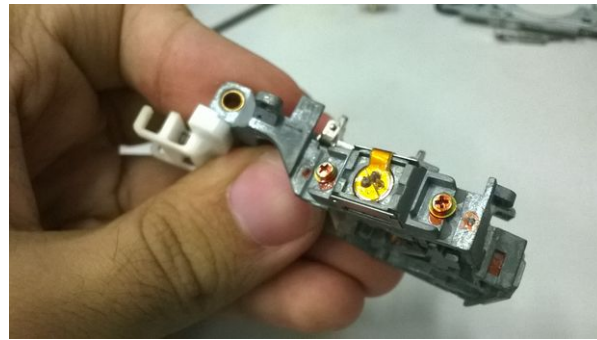
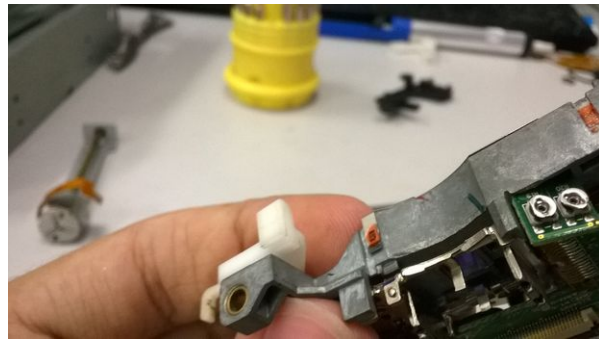
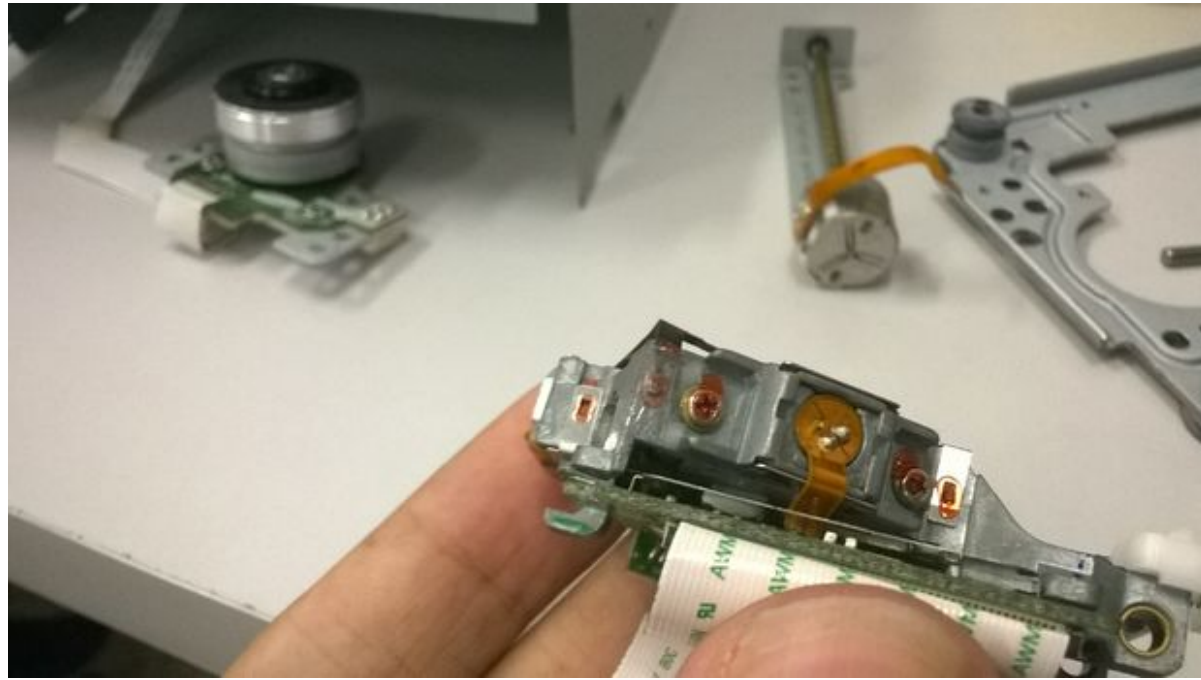
[Arduino mini pen plotter.](#)

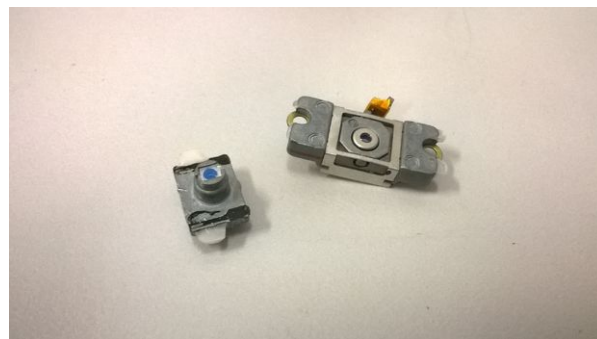
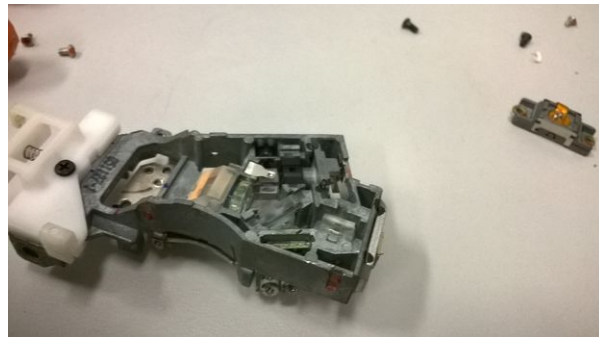
[The MicroSlice | A tiny Arduino laser cutter.](#)

Step 11: The Laser









The DVD/CD readers have two lasers, while the CD readers have only one, yeah... I think. The laser used to burn DVDs can be strong enough to burn matches and other things.

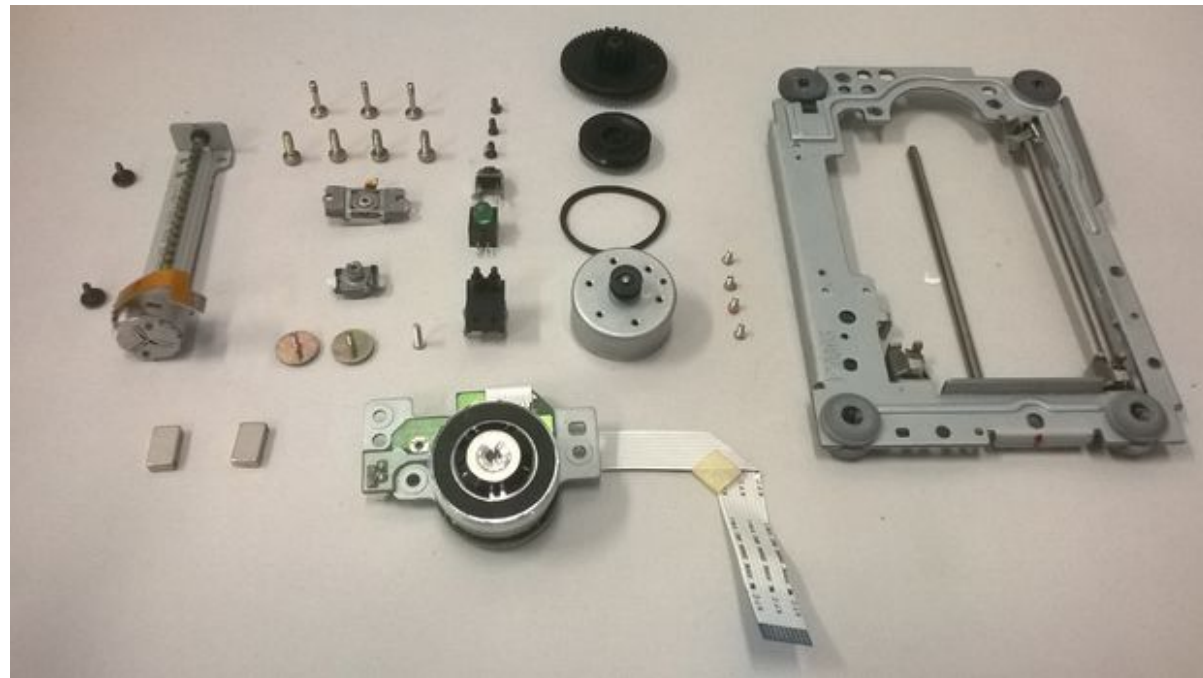
Following are some instructables using these lasers.

[A Homemade Laser Pointer.](#)

[Homemade Laser Module.](#)

Don't point the laser to your eyes, or to anyone eye or not,it can do serious eye damage or burn the skin, don't be stupid it's not funny.

Step 12: Well Done!





Hey, we can stop here.

I hope that you liked this Instructable.


Remember to discard the parts that you're not using within the regulation of your city/etate/country.


Now you have some things to experiment with, good bye and be creative!

In some days (or weeks) I will be here with something made with these drivers.

Please, if you liked my instructable, vote for me in the 'Teach it!' contest.

See you.





We have a be nice comment policy.
Please be positive and constructive.

I Made it!

Add Images

Post Comment



dintid

6 days ago

Just as an info, many drives use standard DC motors (2 wires) instead of Stepper motors (4 wires).
I got DC motors from all kinds of drives and also stepper motors... no pattern to it really.



jimmie.c.boswell dintid

6 days ago

well first you want to make sure they are not, two wire stepper motors. i, do have some old small two wire steppers. best to test, is to apply voltage and see if it runs or steps. only the motor that runs the read read/write on the slide rails head w possibly be a stepper. but two wire steppers, are very rare.



dintid jimmie.c.boswell

6 days ago

I really do not believe there are any 2 wire stepper motors in CD/DVD drives..

I created the instructables where I use CD/DVD drives to make a small 3d printer "Complete newbie step by step, 3D printer..." <http://www.instructables.com/id/Complete-newbie-step-by-step-3D-printer-with-all-p/>

I disassembled 30+ drives and all of them were either 2 wire DC or 4 wire stepper.

I had more DC than Stepper motors when I was done with it..

Stepper motor always needs 2 phases and each phase will need Vcc and Gnd, so at least 4 wires. You can have more wires though, like 6, which is also common.

I have never seen a 6 wire stepper in CD/DVD drive though.



jimmie.c.boswell dintid

5 days ago

maybe, maybe not i, do know two wire steppers did exist. though i never investigated how this is accomplished, whether there is a phase splitter internally or not. this is why i included, testing the motor to make sure it is a motor not a stepper. in fact it is a good idea, to test the motors, steppers, and parts to insure they are in working condition before you reuse them.

the fact is i do not have any old read only, cd, dvd, cd/dvd read only optical drives to verify what is in them. all i have is the more sophisticated r/w drives. and most of the failures, tend to be from excessively dirty read write heads or corrupted software drivers. i, even have old 50 pin ide drives that are still operational.



rafununu jimmie.c.boswell

6 hours ago

No, 2 wire steppers do not exist. You need at least 3 wires using a common, and normally 4 wires without common. A DC motor with 2 wires that doesn't turn is an electro magnet. Investigate before posting.



rafununu jimmie.c.boswell

7 hours ago

By definition a stepper motor needs more than 2 wires !



rafununu rafununu

7 hours ago

Or it's an electro magnet !



kimvellore jimmie.c.boswell

6 days ago

The only time I have come across a motor that is 2 wires and works like a stepper (if one can call it stepper motor) is the motors inside clocks. These motors just have a round magnet and a coil. The coil needs to be reversed for every pulse a the motor spin 1/4-1/2 turn for every pulse with very little torque.



dintid kimvellore

6 days ago

I disassembled 30+ to make my instructable on 3d printer build on CD/DVD drives and I got around 3 to 1 on DC vs Step ... meaning more DC than steppers.



jimmie.c.boswell kimvellore

6 days ago

well it is possible the motor could be the same, but these have a gear housing included. and it, does have quite a bit of torque for such a small motor. do not know how much the motor spins for each step since i never took it apart, to check the gear ratio. but the ratio can't be too great, since the action is fast.

the guy who wanted me to build the pulse controller circuit, gave me two and some solar cells to do the experimental design and fabrication work with for a solar tracking device. but that, was about 16 to 20 years ago when i was a jr scientist for SERI.



GavinF2 dintid

6 days ago

That makes me wonder if the difference is a burner to reader..

A drive for reading can just start reading wherever and disregard junk data before the data it needs but a burner would need



dintid GavinF2

6 days ago

If you google i'll bet you can find a wiki somewhere explaining it.

However, it is controlled a lot by software really, and not so much by firmware.



jimmie.c.boswell GavinF2

6 days ago

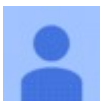
all disc data, and indexes are kept in the formatted executive portion of the disk. the executive index, tells which track the information is located. so the disk will first read and load, the executive dos program information. which gives the precise location of the data on the disk. as all the tracks, are labeled during the formatting.



GavinF2 jimmie.c.boswell

6 days ago

That is a fact but is not a fact which is relevant to this discussion.



BettyP3

4 days ago

That's a CD or DVD drive, not driver. A driver is software used to operate the drive, or someone who drives a vehicle.



cuyler1

5 days ago

Do to the nice policy for comments I can only say more background and homework will produce impressive instructables. Specialty screwdrivers, micro-switch, optical z drive tray are the missing names to help you mature in future publications.

Their descriptions are on the internet.



mddemina cuyler1

5 days ago

Perhaps spelling and punctuation will help cylert mature. ;)



BallscrewBob

6 days ago

Have also started to notice manufacturers moving away from steppers to regular DC motors more so in printers and scanners. These also need quite a bit of accuracy esp. the high dpi units so methinks they have found a way to use DC motors without losing the accuracy of a stepper.



RussellS8 BallscrewBob

5 days ago

I've tried to recover a stepper motor from a printer only to find that it was a regular DC motor that had a marked disk and optical sensor that kept track of the positioning.



jimmie.c.boswell BallscrewBob

5 days ago

well there is a way to count the cmef kickback of a dc motor or the use of optical encoding discs. or even lasers, to meas travel distance. so i, imagine it is possible with more sophisticated software and faster computer chips.



dintid BallscrewBob

6 days ago

There are lots of ways to get feedback from DC and Stepper motors by now. Same principle as Servos... combine it with cheap DC and you have your answer :)



Ggungaby

6 days ago

Cool, man.



This is good but will the bits and pieces help?

6 days ago



RajashriK

7 months ago



I opened old CD drive (Infra 48X creative) and found there is only two wire motor where I was expecting a 4 wire stepper motor. I have attached image. any idea how can use this as a stepper motor



SteveC60 RajashriK

6 days ago



If you want a cheap source for 4 and/or 6 wire stepper motors, check out used/trashed printers. I got a great husky 6 wire one from an OLD Epson printer. Nice toothed belts in those, too, btw.



kimvellone RajashriK

6 days ago



The ones that use the DC motors usually have an encoder. The encoder here looks like it is in front of the motor, the slotted wheel with an IR sensor.



IonizedCat RajashriK

4 months ago



I had the same discovery. I think the difference here is, that a normal CD/DVD reading driver (no burner) often uses normal DC motors, because they don't need a very high precision.

Burner or writer on the other hand have always a stepper motor. Perhaps because you need a higher precision for the writing process.



LesB

6 days ago

Just in case someone would like to save the drive: All the drives that have gone sour on me went bad because the hatch would not open. In all cases this was due to the rubber drive belt on the hatch motor drying up and losing its "grip".

This can be fixed by buying silicone O-rings on eBay or other sites. A silicone O-ring of the right size will work as a drive belt better than the original, and it will last much longer. Just open the case and pull out the drawer, and drawer drive motor and its dried up drive belt will be visible.

Can't figure why the manufacturers won't improve the reliability of their drives by utilizing a 20-cent O-ring.



SteveC60 LesB

6 days ago

Same reason car manufacturers use custom plastic connectors, like for instance in personal experience, a VW Passat wagon electric radiator fan connector. Connector failed, approx. \$200 motor/cable assembly junked and replaced. If they used a Cannon plug (maybe max. \$10 in bulk) it would outlast the car - that's why military and aircraft electronics use the Cannon or the equivalent from Amphenol, etc.



deswiger LesB

6 days ago

If they fixed it, making it last too long, they couldn't keep selling their "New and Improved" ones.



danloeser LesB

6 days ago

Easy: they'd sell way fewer drives that way.



I always disassemble them for some reason. I've got a box full of misc dc motors that came out of printers, cd/dvds, and laser units, among other electronic parts.

6 days ago



Interested in taking some off of my hands, get in touch with me, and we'll work something out. I'd like to get rid of them all by the box at the moment actually because I have too many other things going to put them to use.



deswiger

6 days ago



Good info, thanks.....Semper Fi



Ghostrider13

6 days ago



Really detailed INS. Great job! I've been wanting to make a laser cutter for thin birch plywood. I want to build some small builds for my slot car set. Anyone know if the BluRay laser would be strong enough for that?



Mário César1

6 days ago



Man, that brushless motor is like the HDD motor: a nightmare. I would just put it in the trash. It's not fast enough to buy expensive rc parts.



manujunaths

6 days ago



Thank you. It does help for other projects. I have taken lessons from instructables and done some small projects which is really useful.



toronja_rabiosa made it!

6 days ago



10 Years ago I was working on a Computer Workshop and I was disassembling hundreds of them...

In 2009 I build a Midi Controller, housed on a dead CD-ROM case
<https://www.youtube.com/watch?v=qJGdszcf9ng>



John T MacF Mood

6 days ago

Some brilliant ideas!

And good work. I'd suggest for pointers, use the laser from a READER. If you want to make a burning device (wood burning or paper burning laser device) a Blu Ray burner that has died, will have a stronger output (~ 300-400 mW.)

And if you go that route, make note of the nano-meter wavelength of the laser if you can (Blu Rays are around 405 nm.) and get some protective glasses in that range. Your eyesight can be destroyed quick with lasers.



eidolon1138

6 days ago

Very well done. I like how you took so many pictures of each step. Also, it is fantastic that you include links to resource for using some of the components!



FernandoD63

a month ago

Nice! I want to use the motor for a gyroscope, how can I plug it to a battery? It has a flex.



ammar Khalil made it!

a month ago

Thank you for your instructable.



emer_31 made it!

6 months ago

Great tutorial, very useful when you want to use those parts. I hope you continue whit others like this. congratulations.



Robson Couto (author) [emer_31](#)

6 months ago

Hi, Thanks!

I hope you can make good use of the parts you got ^^.



batuh12

6 months ago

what can be the sensitivity of step motor mechanism in micron in dvd writer.



falconsamad

8 months ago

That's such a helpful instructable.

It would be really helpful if you can tell me the exact dimensions of those two magnets you extracted from the lens.



tickl

11 months ago

Sir I just want to know how to switch on the laser with batteries



Butane Flame

11 months ago

This is outstanding.



gcamilo made it!

11 months ago

Thaanks :)



hemanthk13

11 months ago



HerbertD1

a year ago

Don't forget the SMD. When i occasionally need a Resistor or Diode I refer to an old Board, You get a lot of SMD in a small go to store package.



Jaikée

a year ago

This is a nice tutorial. I found it really easy to understand and the photos were very clear too. One other thing I have been wondering though. How do I take apart the motor in Step - 7? I would like the copper out of it but can't take it apart.



dineshkumares

a year ago

Nice going to experiment with this today



chintans

a year ago

Any1 have any idea on using the neodymium magnets under the focus lense assembly?



szeedijk

a year ago

Nice!

I was just at the point of throwing away an old drive!

But now I know how to use the parts... Experimenting with my Raspberry Pi



magiceye

a year ago

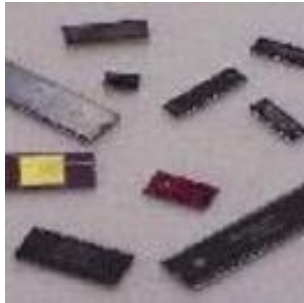
I would like to make a solar panel tracker out of these parts



Webmsater

2 years ago

By this experiment we can also get some other needed parts.



Robson Couto (author)

2 years ago

Thanks for all the people that voted for me in the Teach it! contest.

You're awesome!



cbolart

2 years ago

I have an old computer with one of these DVD. I am going to start doing something with it now! great instructable:)



Robson Couto (author) [cbolart](#)

2 years ago

Thank you!

You can see my instructable using parts from these drives to make a printer:

<http://www.instructables.com/id/Dot-Matrix-Printer...>

Don't forget to vote for me in the contests if you like.

Bye!



MoTinkerGNome

2 years ago ⌵

On the circuit board that you are not using. I use the molex power connectors for accessories for my bench top Power supply.

If you use a heat gun you can melt the solder and get the whole bar off, then with Carefully cutting you will have a 4pin molex connector. The rest of it is a good source for 90* pin headers, And there are a couple transistors that can be reused as well. No mention they are great for practicing soldering and desoldering skills.

I learned to solder by taking stuff off of and putting it back on old motherboards. Since they were already broke it was not like I could break them more. Good write up and have a couple contest votes.



Robson Couto (author) [MoTinkerGNome](#)

2 years ago ⌵

Thank you for the informations ;)

I'll remember them next time I open one.

Voted for you on the contests too, good luck!



Libahunt

2 years ago ⌵

I have used the motor that spins the CD to make an anemometer. I removed the part with windings on it to get rid of the magnetic drag. And attached a comparator (certain way of connecting an opamp) to one of the Hall sensors that are already in that motor. Hall sensor has analog output (varying voltage) but comparator turns that into digital levels which makes it easier for microcontroller to measure the speed of pulsating.

Compared to building an anemometer from scratch that motor provided me with following parts already assembled: axle and bearing, their attachment to base, Hall sensor, magnet. Removing windings and drilling the CD rest for the anemometer arms attachment was a bit of an hassle but I still find using this motor an amazing shortcut.
When I finish the whole project that this anemometer is part of I might publish more specific information in an instructable also.



a.steidl Libahunt

2 years ago

Awesome idea! Also would love to see an instructable on this! I'm going to try building my own. :)



Robson Couto (author) Libahunt

2 years ago

Nice project!

I would like to see your instructable when you finish it.



mküçükosman made it!

2 years ago

useful info Thank you



Robson Couto (author) [mküçükosman](#)

2 years ago

Well done!

Now you can use the parts in your projects.

Nice avatar.



SisiK

2 years ago

Just be careful with CD/DVD burners and laser stuff. If you are experimenting with those, never look directly into the laser beam although you think is "invisible" it can damage your eye vision in a snatch. That said, lasers are not toys.



Robson Couto (author) [SisiK](#)

2 years ago

Yep, thanks for remember.

I said something about this in step 11, but i will add more.



Juniortrd

2 years ago

Love this. Love to see stuff get repurposed. Nice job!



Robson Couto (author) [Juniortrd](#)

2 years ago

Thank you! Me too ;).



a.heidl

2 years ago

Laser diodes for reading DVDs and CDs are infrared, I think. If you want visible light lasers that are powerful enough to burn things, you will want to dig into DVD burners. There's two diodes, one infrared and one visible. The visible one is the powerful



Robson Couto (author) [a.heidl](#)

2 years ago

Hey! Thanks for the information, I didn't know that.

This explains why one of them "never lights up".



Eh Lie Us!

2 years ago

impressive. Props to you if you are using all the innards!



Robson Couto (author) [Eh Lie Us!](#)

2 years ago

Thank you!



magiceye

2 years ago

I have just taken out DVD /CD drives from my communal bins from my apartment .

I have now the movitation to take them apart,many thanks for your instructable.



You're welcome!

I'm glad to motivating someone.

Make something nice!

2 years ago



Winged Fist

Wow! Featured in the newsletter! Quite the honor!;-) Parabens!

2 years ago



Robson Couto (author) [Winged Fist](#)

Thank you Winged Fist! Didn't know until see your comment.

2 years ago



mrpi64

Just by the little laser-reader module, beside the little lens, there are 2 very strong (for their size) magnets.

2 years ago



Robson Couto (author) [mrpi64](#)

Yes, these magnets can be seen in the images in the step 11, in the yellow screwdriver.

2 years ago



ifoss

I call that thing in step 8 the sled assembly or simply 'the sled'. I have no idea if this is the correct terminology or not though.

2 years ago



Robson Couto (author) [ifoss](#)

Oh. that word is new to me. english is not mv mother lanuaae.

2 years ago





LesB

2 years ago

As a side note: See the little drive band shown in the Tray Mechanism pictures: Sometimes the reason the drive doesn't work is that this cheap little rubber band deteriorates over time and loses traction, which keeps the tray from moving.

If you can find a rubber band of the same size you can replace it and save the drive. Better yet, try getting a silicone rubber band which would last almost forever. Try looking for "silicone rubber band" or "silicone replacement band"



Robson Couto (author) **LesB**

2 years ago

Yes, that's true. Thank you for the information!



mcordoba3

2 years ago

I LIKED YOUR PROJET



Robson Couto (author) **mcordoba3**

2 years ago

THANK YOU!



Winged Fist

2 years ago

Parabéns Robson pelo seu primeiro Instructable em destaque!

O que um bem documentado e fotografado Instructable! Eu poderia ter usado isso há alguns anos atrás quando eu tirei um de para além de peças e acabou destruindo a coisa toda;-)



Robson Couto (author) **Winged Fist**

2 years ago

Haha, isso é comum, eu mesmo destruí vários até pegar o jeito e descobrir esses segredos. =)



Machine

2 years ago

Very nice instructable, nicely photographed and competently written and the references are good too. Thank you.



Robson Couto (author) **Machine**

2 years ago

Thank you!

Liked your avatar and name ;)



Raphango

2 years ago

AWESOME!!

Great ideas and great initiative! Keep up the good work on recycling things up! =D

Following you!

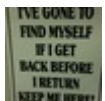


Robson Couto (author) **Raphango**

2 years ago

Thank you!

I will try my best!



kbc2

2 years ago

i have several of these contraptions in the garage, 5 disc changers of the cd and dvd varieties, and a few other drivers. the ideas you have are great! was tinkering on the thought of building a tank. thanks for the ideas and uses of these components.



Robson Couto (author) [kbc2](#)

2 years ago ⌵

Thank you!

I've been reading instructables for a long time, even don't having a account, maybe i'm a little shy.

Building a tank is a good idea, good luck!

If you make it, don't forget to show me.



apt1

2 years ago ⌵

;) nice



Robson Couto (author) [apt1](#)

2 years ago ⌵

Thank you ;)



seamster

2 years ago ⌵

Excellent! I like the idea of harvesting motors for rc planes.



Robson Couto (author) [seamster](#)

2 years ago ⌵

Thank you!

There is something cool to do with anything in your house, be careful next time putting something in the trash.



MikeyGSXR750

2 years ago ⌵

I wonder if you could use the lens and a Disc Camera for a mini projector? I am interested in the latest Disc Tech, they have you



Robson Couto (author) [MikeyGSXR750](#)

2 years ago ⌵

Pico screens?

Thats something new to me, but i'm googled it.

I think that these lens are too small, maybe with bigger lens that would be possible.



DanYHKim

2 years ago ⌵

Personally, I think that tech disassembly should be an activity in high school (maybe physics class). I mean, in biology, you dissect a frog. Why not 'dissect' a VCR or CD/DVD player?



Robson Couto (author) [DanYHKim](#)

2 years ago ⌵

Excellent idea!

Here in Brazil we don't dissect frogs in biology classes, but I was disassembling things my whole life, starting with my toy



gravityisweak

2 years ago ⌵

Great! I like how you linked to other instructables that can use these parts! I can't wait too see some new stuff!



Robson Couto (author) [gravityisweak](#)

2 years ago ⌵

Thank you!

I'm glad you liked.

In some weeks maybe I will post something new