HardSID 4U user's guide

HardSID 4U Studio Edition
HardSID 4U Standard Edition

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Safety information

Don't touch the metallic parts of any cables. Possible difference in grounding potential of different equipments may cause electric shock!

- Carefully read this manual before connecting/using the unit.
- Before using the product, make sure SIDs are installed correctly and voltage jumpers are set up accordingly.
- Use working non-damaged SIDs only. Using damaged SIDs may cause damage to the unit.
- Before using the product, make sure all cables are correctly connected.
- To avoid short circuits, keep screws, paper clips, staples, etc… away from connectors, sockets and circuitry.
- Avoid dust, humidity and temperature extremes. Do not place the product in any area where it may become wet. Do not place the product in small closed places where air cannot circulate. (like a drawer or a case for example)
- Place the product on dry, stable surface with satisfactory air circulation.
- Always switch off the unit when not using it for a long time. (for more than a few hours)
- Always unplug the power supply from the AC connector when not using the unit for a long time. (for more than a few hours)
- If the device is broken, do not try to fix it yourself.

Introduction:

Read this manual carefully before trying to connect/use your HardSID 4U. All the configuration/installation steps apply to both HardSID 4U versions: Studio Edition and Standard Edition.

Package contents

- HardSID 4U (Studio Edition or Standard Edition with or without SIDs installed)
- Extra filter capacitors for 6581 and 8580 SIDs (two-two extra pairs for both versions; two-two pairs for both versions pre-installed into the unit)
- Power Supply (optional)
- USB Cable (optional)

System requirements

- IBM compatible PC (or notebook) with one free USB 1.1 (or higher) compatible high-current port (high-current USB ports are usually on the back side of the computer)
- Microsoft Windows XP or Vista (32bit or 64bit) OS
- (Mac OS X support is under development)

Key features

- Low latency VSTi synthesizer engine with 8000Hz SID update rate for ASIO driven VST hosts
- Cycle-accurate C64 music playback (digitized sounds, high-speed tunes, etc…) with very low CPU utilization
- Stunning C64 Emulator game play with real-time digitized sounds
- ..and more!

Upgrading from PCI or ISA HardSID

- Learn about removing SIDs at appendix “How to remove SIDs carefully” and remove the SIDs from your ISA/PCI card
- Read this manual carefully to learn about configuring your HardSID 4U
- Learn about installing SIDs into the HardSID 4U at appendix “Installing SID chips video tutorial”
- To notify applications about the removed PCI/ISA HardSID, you need to remove this registry key: HKEY_LOCAL_MACHINE\SOFTWARE\Hard Software\HardSID

About hardware

If you've received your HardSID 4U with no SIDs installed, you have to install the SIDs first before connecting and using the unit. Learn about installing SIDs and configuring the hardware at the "Installing SID chips" section.

Conncetors

DC-in

12V DC input connector. Connect the 12VDC power supply to this connector. The power supply must be able to provide at least 1A at 12VDC. If you've received the unit without a power supply, check the polarity before buying the PSU. (the inner pin is the positive) The unit is protected against wrong polarity. If the polarity is wrong, the color of the DC LED will become red after switching on the unit. Otherwise it will be green (correct polarity).
Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

USB connector

Connect the unit to a USB 1.1 (or higher) high-current port. High-current USB ports are usually located on the back of the computer. Front-panel USB ports are usually low-current. (USB ports on notebooks are usually high-current.)
If you're planning to use the unit in a professional studio, it is recommended to use high quality full-speed USB cables with short length. Using long USB cables are not recommended for professional use.
Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

Mixed output (black)

The mixed output is the easiest way of connecting the HardSID 4U to an amplifier, soundcard, etc... It combines the sound of all installed SIDs into one mono output (the same signal on both channels of the stereo jack).
Using the mixed output is recommended for hobby usage, not for professional use. If you have serious equipment (mixer, professional soundcard/amplifier, etc…), you'd better use the dry outputs.
Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

Dry outputs (green)

The dry outputs (green) are the best way of connecting the SID outputs to professional equipment in a studio (mixer, amplifier, etc…).
There are two dry output jacks on the HardSID 4U. Both jacks are stereo.
The mono outputs of SID 1&2 are on the same stereo jack (1=right, 2=left).
The mono outputs of SID 3&4 are on the same stereo jack (3=right, 4=left).

Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

Inputs (blue)

The SID has the ability of routing the incoming mono audio signal through its filter. This functions can be activated in a VST host application using the HardSID 4U VSTi.
There are two (blue) input jacks on the HardSID 4U. Both jacks are stereo.
The mono inputs of SID 1&2 are on the same stereo jack (1=right, 2=left).
The mono inputs of SID 3&4 are on the same stereo jack (3=right, 4=left).
Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

Other controls

On/Off switch

Please read the safety information (right after the table of contents) before switching on the unit.

- Always switch off the unit when not using it for a long time. (for more than a few hours)
- Always unplug the power supply from the AC connector when not using the unit for a long time. (for more than a few hours)

DC LED

The color of the DC LED must be green after switching on the unit.
The unit is protected against wrong polarity. If the polarity is wrong, the color of the DC LED will become red after switching on the unit. Otherwise it will be green (correct polarity).

MSG LED

The MSG LED must become lit shortly after switching on the unit. It keeps blinking in firmware update mode. (firmware update mode will be covered by the future version of this manual when/if an updated firmware will be released for the HS4U)

The Power Supply

If you've received the unit without a power supply, check the polarity and the DC plug dimensions before buying the PSU.

- The power supply must be able to provide at least 1A at 12VDC
- The inner pin is the positive
- Plug dimensions: Inner diameter = 2.1mm; Outer diameter = 5.5mm; Contact length >= 10mm

The unit is protected against wrong polarity. If the polarity is wrong, the color of the DC LED will become red after switching on the unit. Otherwise it will be green (correct polarity).
Always unplug the power supply from the AC connector when not using the unit for a long time. (for more than a few hours)

We ship various versions of this power supply: **Sunny SYS 1308-2412** (2A at 12VDC):

http://www.sunny-euro.com/HTML/PRODUCTS/POWERSPL/SYS1308_W2E.html

Installing SID chips

Always install perfect / tested SID chips! Using damaged SIDs may cause damage to the HardSID 4U.
If you've received your unit with installed SIDs from us, you don't have to configure the unit yourself, as we always send it properly configured.

Installing SIDs into the HardSID 4U is easy:

- **Install the SID in the right direction (learn about it below)**
- **Don't force the SID! You may brake some pins off otherwise..**
- **Check out the "Installing SID chips video tutorial" in the Appendix!**

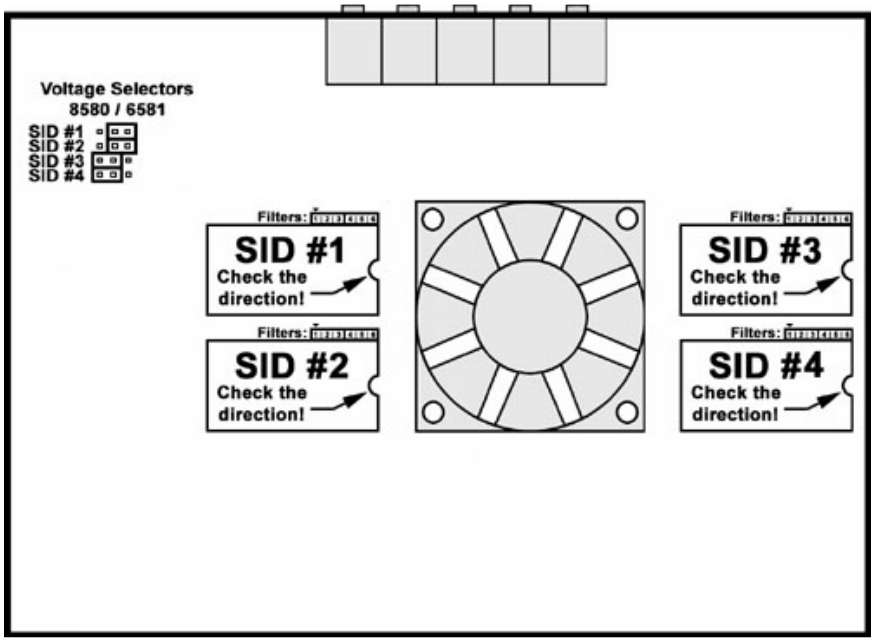
How to prepare the HardSID 4U for installing SID chips

After you've checked out the "Installing SID chips video tutorial" in the Appendix, start with the following:

- Switch off the unit
- Unplug all cables from it
- Remove the four screws from the bottom panel
- Remove the case from the board (the bottom panel will stay together with the printed circuit board!)
- Now, you're ready to install SIDs into the HardSID 4U

Socket numbering

Check the direction of the card (connectors on the upper side) and the numbering of the sockets before installing SIDs. Voltage jumpers must set accordingly for every socket. (1-4)



Supported versions, number of SIDs

The HardSID 4U works with any number of SIDs up to four. (1, 2, 3 or 4)
All SID versions are supported in any combination. (6581, 8580, 6582)

The right direction

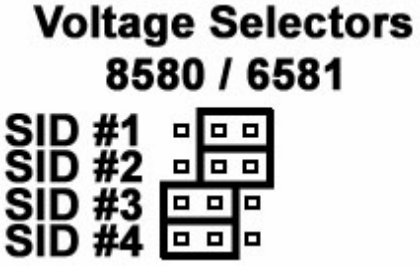
Always check the direction of the SID before installing it! Installing the SID in the wrong direction may cause damage to your HardSID 4U.

See the right direction on the picture:

Setting the voltage

You have to set the voltage of every SID chip you install depending on its version (8580 or 6581) by setting its voltage jumpers. Position “Left” is for the 8580, position “Right” is for the 6581.

You can see the voltage jumper layout on this picture:



The filter capacitors

The 6581 and 8580 versions of the SID chip are working with different filter capacitors.
The 6581 needs two 470pF capacitors. (four pairs / 8 pieces are included in your package)
The 8580 needs two 22nF capacitors. (four pairs / 8 pieces are included in your package)
Since you can install any SID version into any SID socket, you’ll have to choose/install the proper capacitors for every SID chip/socket.
You can find the filter capacitor socket at the upper-right corner of the SID socket.

Each SID needs two filter capacitors. There are six capacitor socket pins in the upper-right corner of each SID socket (2 capacitors * 3 pins). Pins 1-2-3 for the first and pins 4-5-6 for the second filter.
Pins 1-2 and pins 4-5 are the same, because you can buy the same capacitors with different widths. There are two-pin-wide and three-pin-wide ones. You have to install them aligned to the right.
If you install wide capacitors, you can install them into pins 1-3 and 4-6, but if you have two-pin-wide ones you can simply install them into pins 2-3 and 5-6.

Installing the device driver

Download the device driver for your OS from http://www.hardsid.com/drivers_apps_docs.php and extract to a folder before connection/turning on your HardSID 4U. Remember the folder (path) where you extracted the driver files. Your OS will ask for the device drivers after connecting and turning on your HardSID 4U. Please follow the following steps when installing the device drivers:

Installing the HardSID 4U 32bit or 64bit device driver on Windows XP

The very first dialog will ask you if you want to connect to Windows Update:

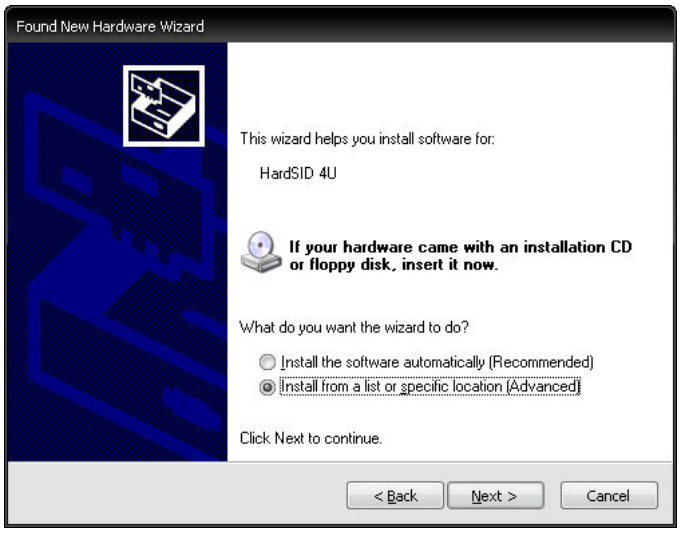
Answer: No, not this time.

Click Next.

The next dialog will ask you if you want to install the software automatically:

Answer: Install from a list or specific location

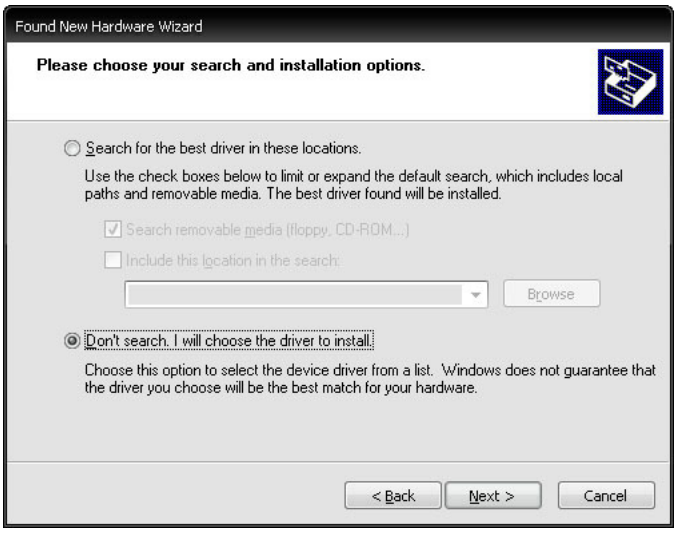
Click Next.



The next dialog will ask you if you want your XP to search for the drivers.

Answer: Don’t search. I’ll choose the driver to install.

Click Next.

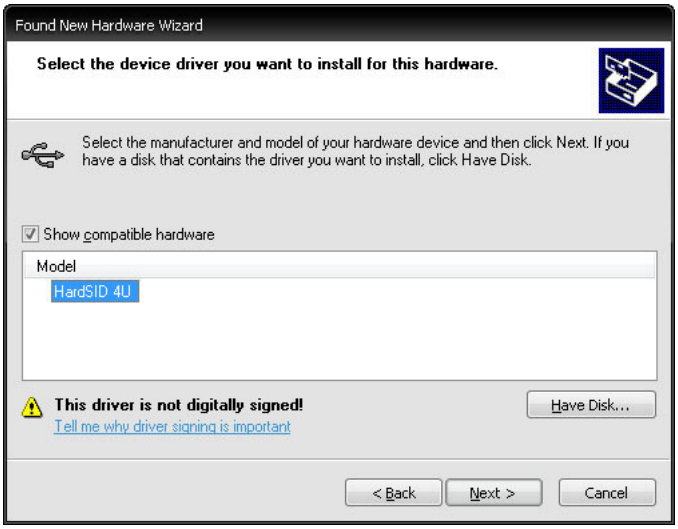


The next dialog will try to display a list of compatible drivers.

Answer: Click the Have Disk button. A new dialog pops up. Locate the folder where you extracted the driver files and press Ok.

Now the list contains the HardSID 4U driver.

Click on the driver’s name and click Next.



The next dialog will warn you that the driver has not been verified by Microsoft.

Answer: Click the Continue Anyway button.

The last dialog tells you that your HardSID 4U is ready to use.

Click the Finish button.

Installing the HardSID 4U 32bit or 64bit device driver on Windows Vista

Prerequisites for Windows Vista x64 Edition

Windows Vista x64 Edition doesn't allow to load unsigned drivers by default. You have enable unsigned driver installation before trying to install the HardSID 4U drivers on Vista x64.

- Download and install EasyBCD (it's free) from http://neosmart.net/
- Go to Advanced options, select your Vista x64 installation and make sure that "Allow unsigned driver installation on Vista 64-bit Edition" is checked/enabled.
- Click the Apply Settings button
- Reboot into Vista x64

Now your Vista x64 will let you to install the HardSID 4U x64 drivers.

The very first dialog on Windows Vista will ask you what to do with the new hardware:

Answer: Locate and install driver software

The next dialog will ask you if you want your Vista to search for driver online:

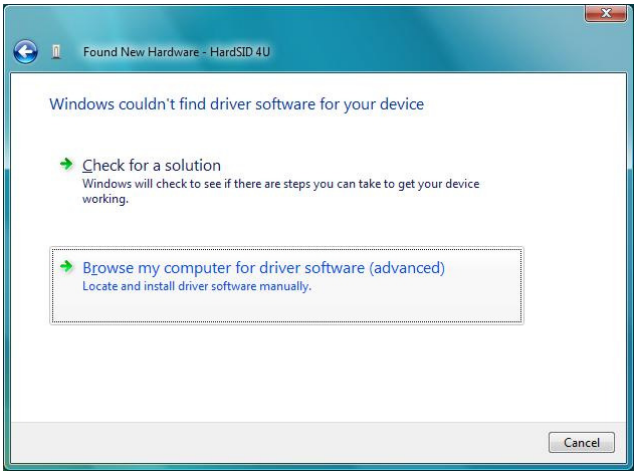
Answer: Don't search online

The next dialog will ask you if you have a driver disc.

Answer: I don't have a disc. Show me other options.

The next dialog will ask you if you want your Vista to find out a solution for you:

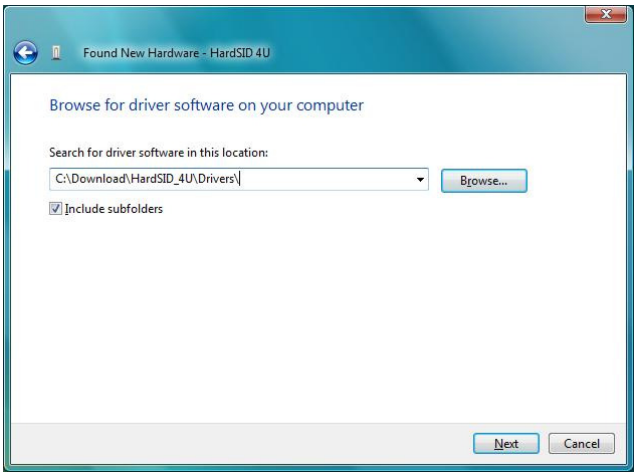
Answer: Browse my computer for driver software



The next dialog will ask you for the path to the driver files:

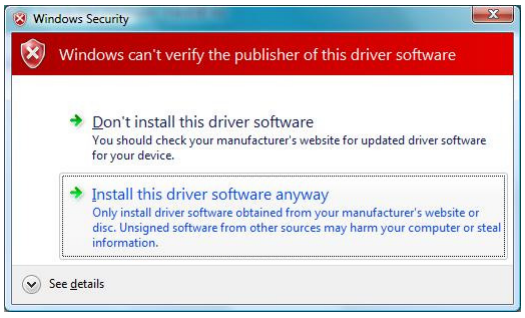
Answer: Browse the folder where you extracted the driver files.

Click Next.

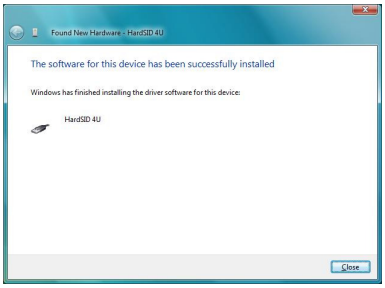


The next dialog will warn you that Windows can't verify the publisher of this driver:

Answer: Install this driver software anyway



The last dialog will tell you that your HardSID 4U is ready to use.



APPENDIX

Installing SID Chips video tutorial

The following video tutorial will show you how and where to:

- insert SID chips carefully
- insert / remove filter capacitors
- set the voltage for the SIDs
- handle / connect cables

The purpose of this tutorial is to help you to learn the proper way of handling SIDs, filter capacitors, voltage jumpers and cables in general.
The actual configuration process will be different for you, as you'll probably install different SID versions into the sockets.

About the tutorial:

The initial state of the HardSID 4U unit shown in the tutorial is the same as the initial configuration of your own unit (you've received it with the factory default configuration).
Factory default for HardSID 4U units without SID:
Sockets 1/3 are configured for 6581 and sockets 2/4 are configured to 8580.

In this tutorial we want to install one 6581 into socket 1 and three 8580 chips into sockets 2/3/4.
Since Socket 1 was already configured for 6581 and sockets 2/4 were already configured for 8580 chips as factory default, we don't have to touch the filter capacitors and voltage jumpers for those sockets.

Since Socket 3 was configured for 6581 as factory default, we'll have to replace the 6581 filter capacitors with 8580 filter capacitors. We'll also have to set the voltage jumper for Socket 3 accordingly to 8580 position.

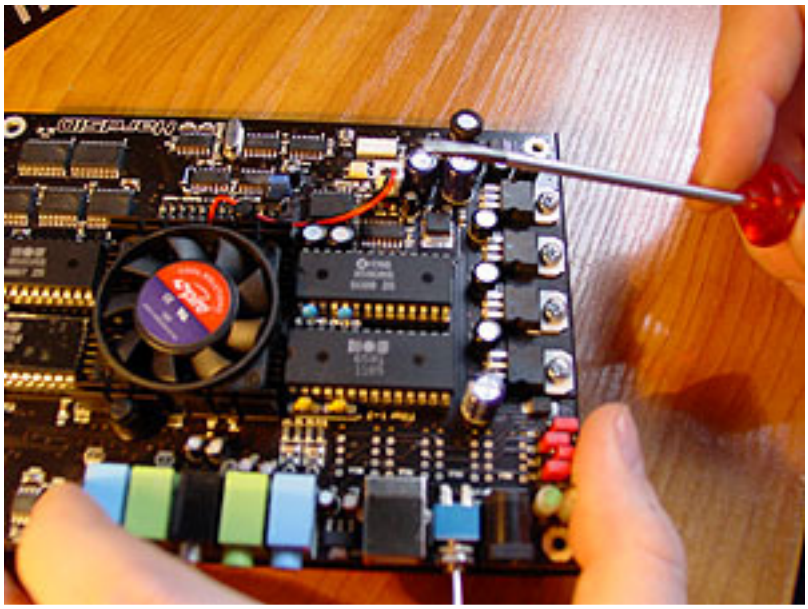
Now that you know what to watch for in the video tutorial, check it out on YouTube:

http://www.youtube.com/watch?v=A-7B9HPj1jc

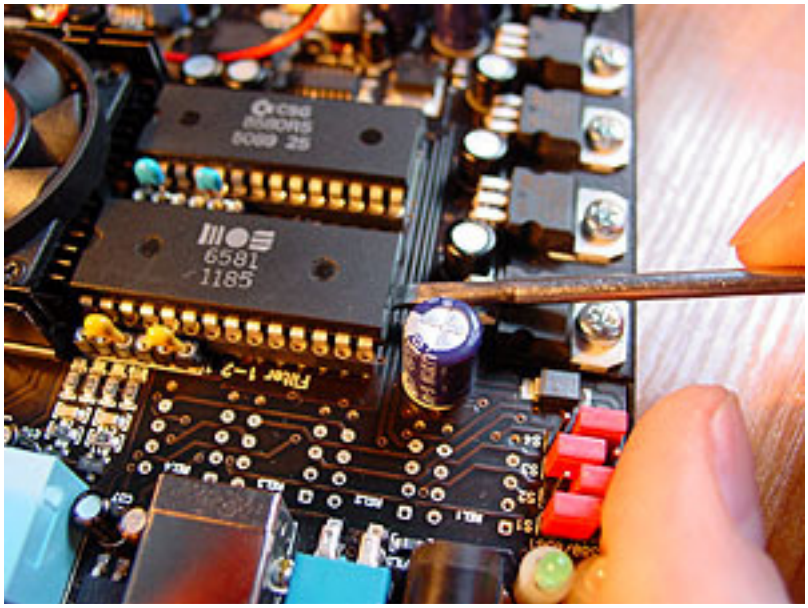
How to remove SIDs carefully

This tutorial shows you how to remove SIDs carefully.

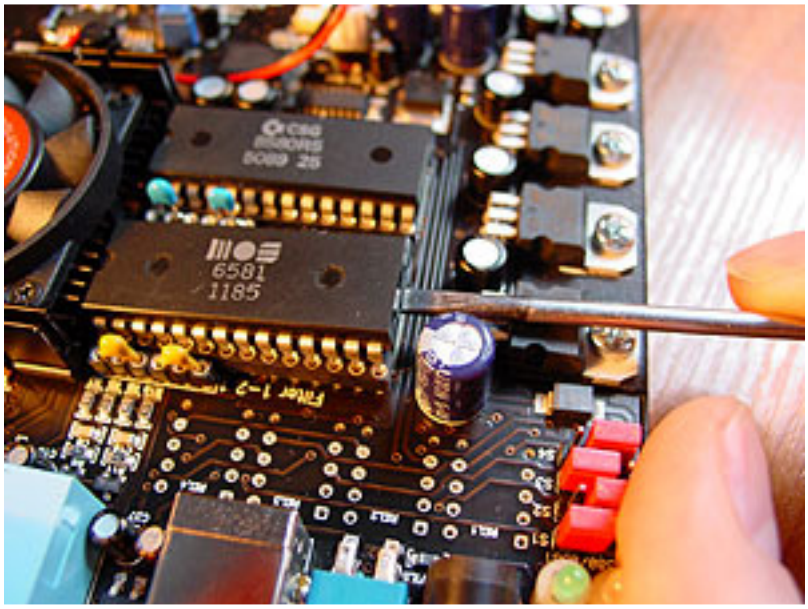
Step 1: Take a flat tip screwdriver
You can see the approximate size of the screwdriver on this picture:



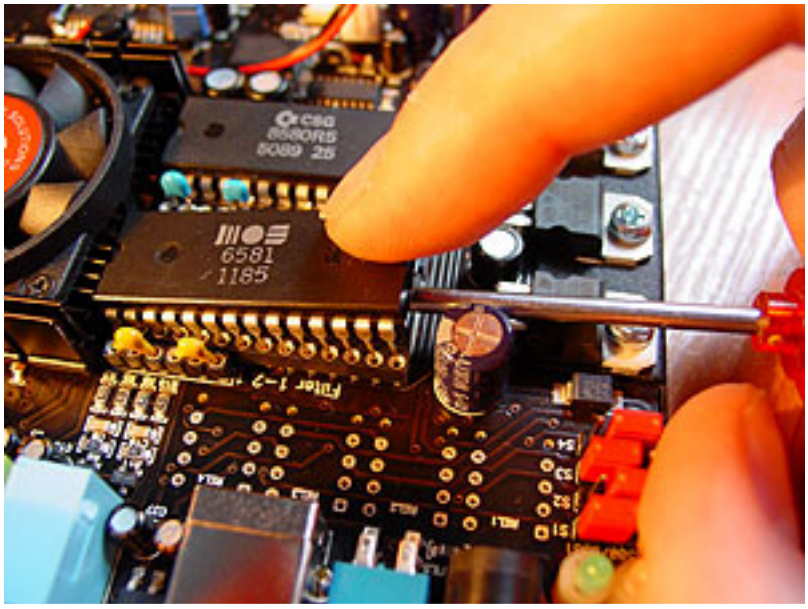
Step 2: Insert the tip of the screwdriver between the SID chip and the SID socket as shown on the picture. Don't push it further under the SID yet. Insert just the edge of the screwdriver's tip.



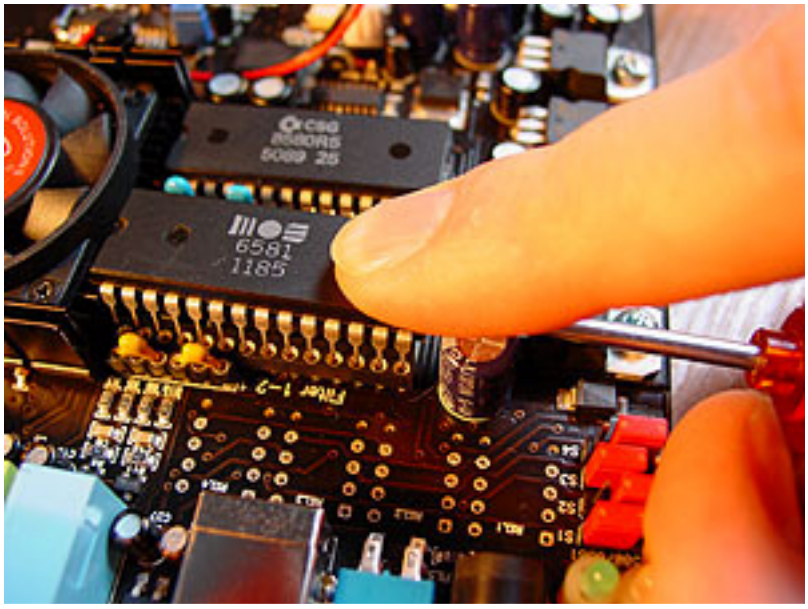
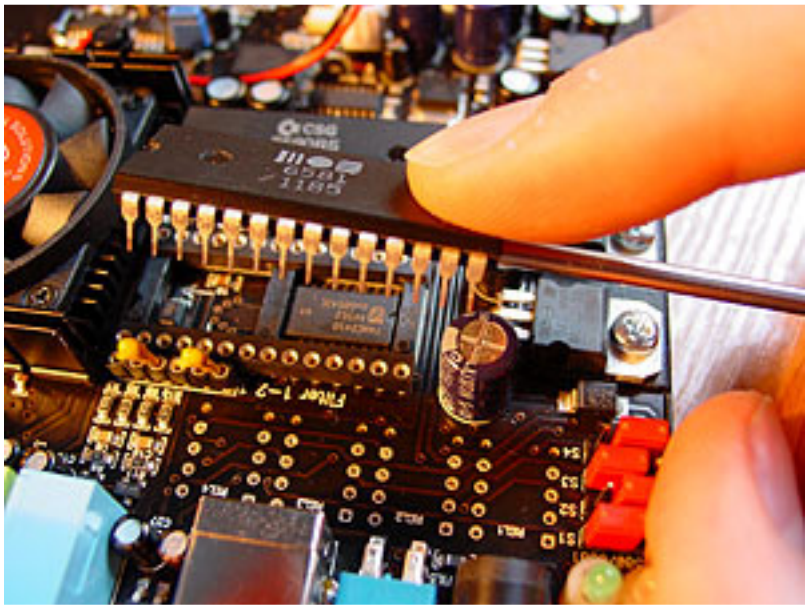
Step 3: Lift the SID a little bit, so the screwdriver's position will be almost horizontal.



Step 4: Push the screwdriver further between the SID and the socket.
Now that you have some place under the SID, you can push the screwdriver until almost the other end of the SID. The SID lifts a bit more so its pins are released from the socket at your end. The screwdriver's position is still horizontal.



Step 5: Start pushing down the handle of the screwdriver carefully to lift the other end of the SID. Lift it until the SID gets horizontal. Now all pins of the SID are released from the socket.



Step 6: You can now take out the SID.