HARDWARE INSTALLATION

How to Install a Solid-State Drive in Your MacBook

Whitson Gordon — Solid-state drives (SSDs) come with all kinds of perks over your standard hard drive, not the least of which involves serious speed boosts for your computing. Here’s how I installed an SSD in my MacBook Pro.

One downside to using a laptop is that you only have one hard drive slot, so upgrading to a super-fast SSD is often either expensive or space limiting. Luckily you can bypass that by replacing your optical drive with a second hard disk.

Since the drives inside your MacBook are standard SATA, there’s actually quite a bit of tweaking you can do if you’re brave enough to venture on in there. Conveniently, a company called MCE Technologies makes a SuperDrive-shaped bay that fits a standard 2.5” notebook hard drive, which means you can use this kit to replace your optical drive with another fully-functional-and-bootable hard drive. This is perfect if you want the awesomely fast boot and launch times an SSD provides, but don’t want to store all your documents and music on an external drive (the whole point of a laptop, after all, is portability). MCE also packages an external enclosure for connecting your optical drive via USB, so you can still rip CDs and install software without having to buy anything separately.

This mod isn’t for everyone. If you use your optical drive often (or at least often while on-the-go), removing it may be inconvenient. Additionally, if you’re not comfortable digging around in your Mac and voiding your warranty, then you definitely don’t want to do this. You will void your warranty. However, if you feel that the benefits of an SSD outweigh these inconveniences and risks, then read on, because this will be the best upgrade you’ve ever made to your Mac. (Or at least it’s the best upgrade I’ve performed on mine.)
What You’ll Need

A MacBook or MacBook Pro (any generation), Powerbook G4, or Mac Mini. This particular guide was written using a late 2009 15” Unibody MacBook Pro as the guinea pig, but most Unibody MacBook owners should have very similar, if not the same, internals, and I’ve noted a few differences that I’m aware of on some earlier models. White MacBook, Powerbook G4, and Mac Mini owners, your mileage may vary (though some slightly outdated instructions do come with the kit that can at least help point you in the right direction).

- **An MCE OptiBay**, in which to put your new hard drive, available for $99.
- **A solid state hard drive**. I used the Intel X-25M, which has worked wonderfully. Any SSD should work as long as it’s compatible with and bootable on a Mac.
- **Previously mentioned Carbon Copy Cloner** to move your data, available as a free download.
- **Evel Knievel-caliber guts**. You’re about to defy Steve Jobs’ intentions for your computer, void your warranty, and (if you aren’t careful) possibly break something. Be sure you want to do this before proceeding.

Opening up Your Computer

Make sure your computer has cooled down for at least 10 minutes before you rush in, as MacBooks can get pretty darn hot. If you have a removable battery on your computer, you’ll want to open up the battery compartment first and take out the battery. If you have a newer unibody model, you won’t have to do this.

Next, unscrew the ten or so screws on the bottom of your computer, pictured above. A few of them will be longer screws, which in my model are the ones circled in pink. Note where these go and set them all aside. Lift off the bottom case and marvel at the internals of your computer because it’s pretty cool.

(Click the images below for a closer look.)

A note on screws and screwdrivers: while this doesn’t involve as much screwing as some projects, you’ll still want to have a few things handy to make your life easier. The kit comes with a little double-headed screwdriver, which is awfully nice of MCE, but honestly, it’s not of very high quality. I ended up using it anyways, because I left my screwdrivers at school, but while I got through the project just fine, I really wished I’d had my small, magnetic screwdrivers. If you don’t have some, I highly recommend you invest in some, especially if you ever see yourself opening up a computer again. Additionally, you may want something in which to hold your screws to make sure you don’t lose any of them, because those suckers are small. I used an empty ice cube tray, and it worked out quite nicely. You probably won’t need any fancy method to keep track of which ones are which, though, as we’ll only be dealing with two or three types of screws. Just don’t lose them.

Take Out the Optical Drive

Touch a piece of metal inside your computer to ground yourself. Pictured above are the internals of my Unibody MacBook, labeled for convenience. Your optical drive may be somewhere else (especially if you’re looking at differences that I’m aware of on some earlier models. White MacBook, Powerbook G4, and Mac Mini owners, your mileage may vary (though some slightly outdated instructions do come with the kit that can at least help point you in the right direction).

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models will have a Bluetooth board lying on top of your optical drive, in which case you'll need to unscrew it and disconnect the attached wires. My computer did not have this, though it did have a cord stuck to the top that I just needed to peel away before proceeding.

Your optical drive should be connected to the motherboard by a small black or red ribbon near the corner, circled in pink. You'll want to pull this out of its socket before continuing. On older unibody models, you'll also want to disconnect the two other connectors next to it that lead to the drive, one of which is a black ribbon and the other of which is a black and red wire (at least on the older 13 and 15 inch models).

Next, unscrew the drive from the case. There are two screws in the corners on the case edge and one in the middle of the side connected to the motherboard, circled above in orange (older unibody models will also have a screw in the top right corner). This is where you'll really want those magnetic screwdrivers. The two screws on the left side are set in a crevasse between the drive and the case, so once you unscrew them they're very susceptible to falling off their ledge and being lost forever inside your computer. So unscrew them very carefully, and pull them out with your magnetic screwdriver. If you don't have one (which, again, you really should), you'll need to use some tweezers or something to get them out after unscrewing them, because no matter how small your hands are, you really risk losing them by trying to pick them up. Put those three screws in your ice cube tray (or other screw receptacle) and carefully remove the drive from its bay. Check around for any protrusions or other obstacles that you may have to gently maneuver around to get it out. Once you've freed it from the case, remove the SATA plug attached to that black ribbon and put it aside.

**Connect Your SSD**

Grab your SSD and load it into the Optibay before screwing it into the computer. All you need to do is slide it into the Optibay and connect it to the SATA plug on the edge. It may not slide in as easily as you might be used to with SATA drives; I really had to shove mine in there for it to connect. Plug the SATA ribbon you removed from the SuperDrive into the slot on the side of the Optibay and then place the whole thing in the empty space left by the SuperDrive in your computer.

**Update:** It seems that connecting the SSD to the optical drive slot will give you problems waking from sleep, since the MacBook doesn't look to that SATA port for your main drive. I did not notice this before, as I don't sleep my computer. So, instead of installing your SSD in the Optibay, you'll want to disconnect your regular hard drive, install the SSD in that slot, and then install your old drive in the Optibay and continue as written.

Take the screws that held the SuperDrive down and screw them into the same places you got them to secure the Optibay into place. Again, take care not to drop them into the abyss of the MacBook's internals. Once it's secure, reattach the Black Ribbon to its socket on the logic board and put the bottom case back on your MacBook, making sure to put the long screws back in the right holes (it'll be pretty clear which ones they are, since the screws won't fit anywhere else). Flip your computer over, cross your fingers, and fire it up.

**Check to See If the Drive Is Recognized**

Once you start up your computer, your new...
SSD should pop up on your desktop and the Finder sidebar. Don’t freak out just yet if the drive doesn’t show up; there could be any number of reasons. First, open up Disk Utility (under Applications > Utilities) and see if the drive shows up in the sidebar there. If it does, you just need to format the drive by clicking on it, going to the “Erase” tab, and erasing the drive. If it doesn’t show up in Disk Utility, open your computer back up and check all the connections, especially the SATA connection to your Optibay and the connection between the black ribbon and the motherboard (this was a problem for me; it can come lose easily). If those are fine, make sure your drive is securely connected within the Optibay as well. If everything looks okay but it’s still not showing up, you may have a bum drive (or an incompatible one, if you didn’t check before buying it). Contact the manufacturer of the drive, explain your issue, and proceed from there. Alternatively, you can contact MCE as the problem could be with your Optibay. If everything works as expected, format the drive as Mac OS Journaled (as described above) and continue to the next step.

Transfer Your OS X to the SSD

If your SSD is up and running properly, there’s only one step left before you get to experience those blazing-fast boot times everyone’s talking about. Download Carbon Copy Cloner if you haven’t already and start it up. Set your source disk to your current boot volume (most likely named Macintosh HD) and set your target disk to your new SSD.

Generally, since SSDs are small and expensive, the way this works is that you store your operating system on the SSD for fast boots and application launches, while storing the rest of your data (such as documents, movies and music) on your second, magnetic drive. So, under Source Disk, you’ll want to scroll down and uncheck the box for your home folder (and any other home folders on your system, if you have multiple users) to exclude it from the cloning process. Hit the clone button and wait for it to finish. Once it does, go ahead and restart your computer, holding the option key at startup so you can select your SSD as the boot volume. Your OS will be up and running in record time.

Once you’ve wiped the drool from your face (I’m not going to lie, I restarted it three times just to watch it boot that quickly), you’ll notice a lot of your settings are missing in your apps. This is because a lot of those preferences are stored in your home folder, which we didn’t copy over. To fix this, head into System preferences and open up the Accounts pane. Click the lock in the bottom left corner and type in your password to make changes, and then right click on your user account. Click Advanced Options and look for the “Home Directory” box on the pane that pops up. Simply hit the “Choose” button and navigate to the home folder on your old drive. Log out and then log back in.

If you did everything correctly, you should see your preferences restored (except for a few things, like your wallpaper, which you’ll need to re-add). Do this for each user account on your computer. You can now go into your old drive and delete all the folders on it except for “Users”. This will not only free up the rest of the space on that drive, but make the drive unbootable, so your computer will default to your new SSD when booting. You don’t need to do anything else differently—saving files to your “Documents” or “Downloads” folder will automatically store them on your second drive, since you relocated your home folder.

Set Up Your External SuperDrive

The last thing you need to do is get your old SuperDrive back up and running. The enclosure that comes with the Optibay is pretty barebones, and certainly not pretty, but it will do the trick quite nicely—all you need to
do is take the two halves of the black plastic case apart, connect the chip on the inside to your SuperDrive's SATA port (you may need to unscrew a small bracket on the back of the SuperDrive to do so), and then put it in the case and close it up. There are a few screws that come with it that you can screw in the back for extra stability. Only one of mine fit; so if the center one doesn't screw in, that's fine. There's no front panel to the enclosure or anything; you just slide your CD in the slot (carefully) and it will suck it in. The enclosure connects via USB, and while it comes with an extra cord and A/C socket, it seems to run fine on USB bus power (at least for my computer), so you can just plug it in and go.

That's it! From now on, your computer will automatically boot from the SSD and save all your data to your old, magnetic drive. Your computer will boot insanely fast, apps will launch instantly, and everything will just feel a bit snappier. If you have Windows and/or Linux on your computer, you can also transfer the system files for those over once booted from the corresponding drive, using the cloning software The How-To Geek recommended in his hard drive upgrading feature. Enjoy your new, super fast laptop, and share your modding experiences in the comments.

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**DISCUSSION THREADS**

- **egoods**
  
  Knock-off "optibays" can be found on ebay for 1/4 of the insane $99 price MCE would like to get.

- **Ignignokt**
  
  Do they include the External Superdrive enclosure? See my previous reply, as I think this is actually a bargain (I'm thinking of doing this, the more money saved the better)

- **mtr0212**
  
  Exactly; there is an asian ebay seller who sell lots of diferent bays to substitute your laptop optical drive. They are available for most laptop brands. I bought one for my MBP 5,5 for about 9$, but i had to shave the bay with a saw for about 1.5mm. Works great!!

  I did not know that it was possible to locate the home folder on the big hdd though. This is great cause you can have now a small oxe instalation and 30gb ssd cost as low as 100$!!

- **utahnguy**
  
  I dunno man... I mean I guess there isn't too much to mess up but if I'm modifying my $2-3k computer I'm not going to skimp out on a few bucks to do so.

- **egoods**
  
  It's just a few pieces of aluminum. Not that much that can get messed up.
No it doesn't, but I don't think the external enclosure is worth $80.

Doesn't it also connect into your drive? One shoddy connection and you could pretty easily toast your drive. All the cost of the computer aside, the one thing I NEVER mess with is my data.

again, it's pretty hard to mess up. And where do you think the bays MCE makes are manufactured? I think its safe to assume they use practically all the same components. Spend your money how you want but I think it's a bit silly to spend $99 for a drive enclosure.

See 7 more replies by doyleman7, washingkant, Maveri2k, Maveri2k, nuclearbalm, aug26th, leohthom and more...