



**TEXAS  
INSTRUMENTS**

# 315J Paradigm



PARADIGM

School: The Harker School

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# Macbook Pro A1226

For the Texas Instruments Electronics Online Challenge, we have decided to disassemble a Macbook Pro A1226. After observing the changes in technology in the past decade, we thought it would be interesting to see exactly how much the internals of a Macbook, both of our daily drivers, have changed in these 10 years. Because this laptop was released in 2007, we thought it was the perfect candidate.



## Parts List

1. Lithium Ion Battery
2. CPU: T7500
3. North Bridge: Intel LE88CLGM
4. South Bridge: Intel NH82801HBM
5. Video Chip: Nvidia g84-602-a2
6. Memory: Hynix HY5RS5732258
7. WIFI Module: Atheros 5418 AR5BXB72
8. Optical Drive: Panasonic Superdrive
9. HD: Fujitsu 120GB drive
10. Firewire PHY: TSB83AA22C
11. Ethernet: Marvell 88E8058
  
12. Ports
13. Dvi
14. Ethernet
15. Firewire 800/400
16. USB 2.0 (2)
17. audio in/out
18. Magnetic pin power connections

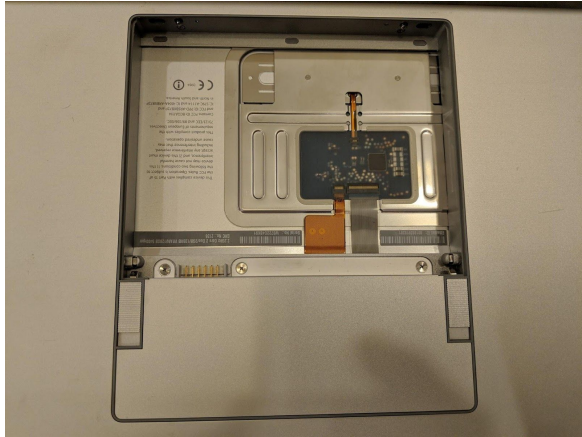
# Component Specs and Descriptions

Figure 1:

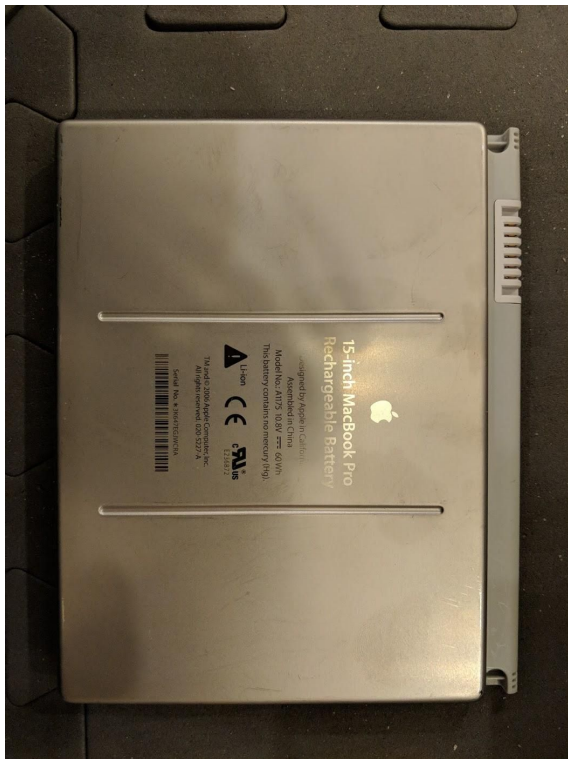


Externals

Figure 2:



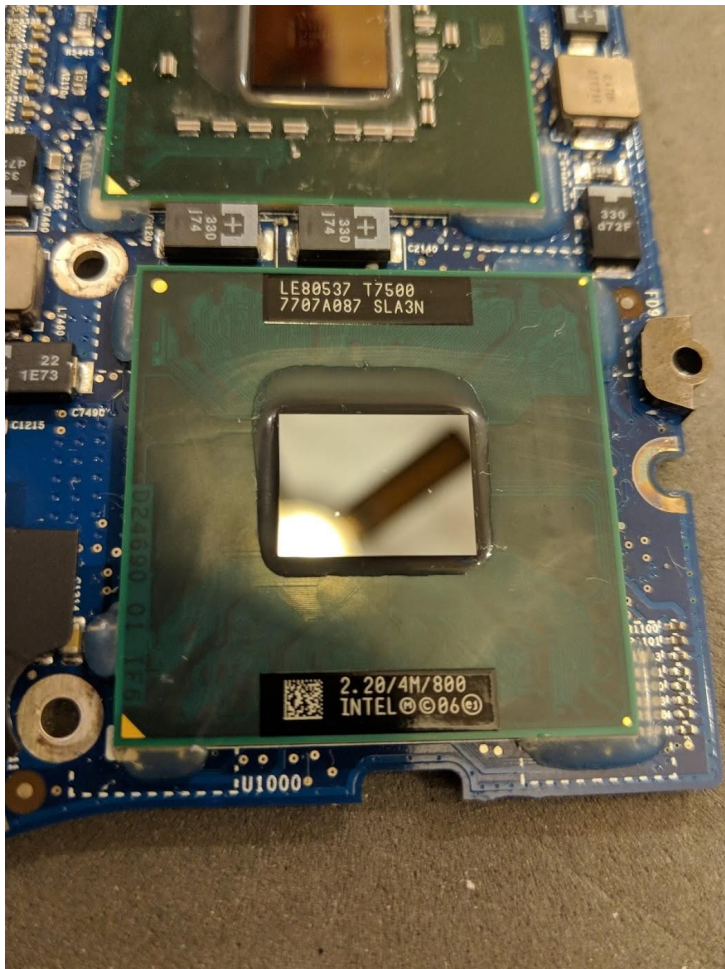
Battery Compartment



Lithium Ion Battery (5800 mAh, 10.8V)



Figure 3:



Intel T7500. Dual Core. This runs all the programs of the computer and uses the other chips and externals to support its functions.

Figure 4:



Intel LE88CLGM. Memory controller. This connects the CPU, South Bridge chip, memory, and graphics.

Figure 5:



Intel NH82801HBM. This connects the PCI, BIOS, and the Super I/O to the North Bridge.

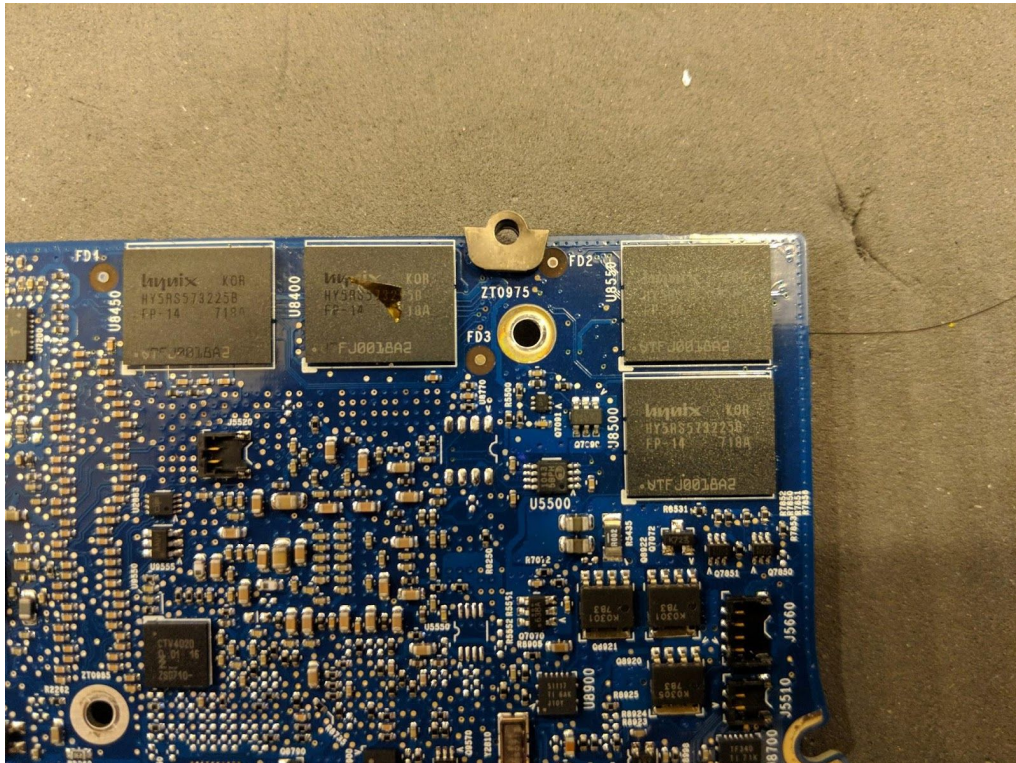


Figure 6:



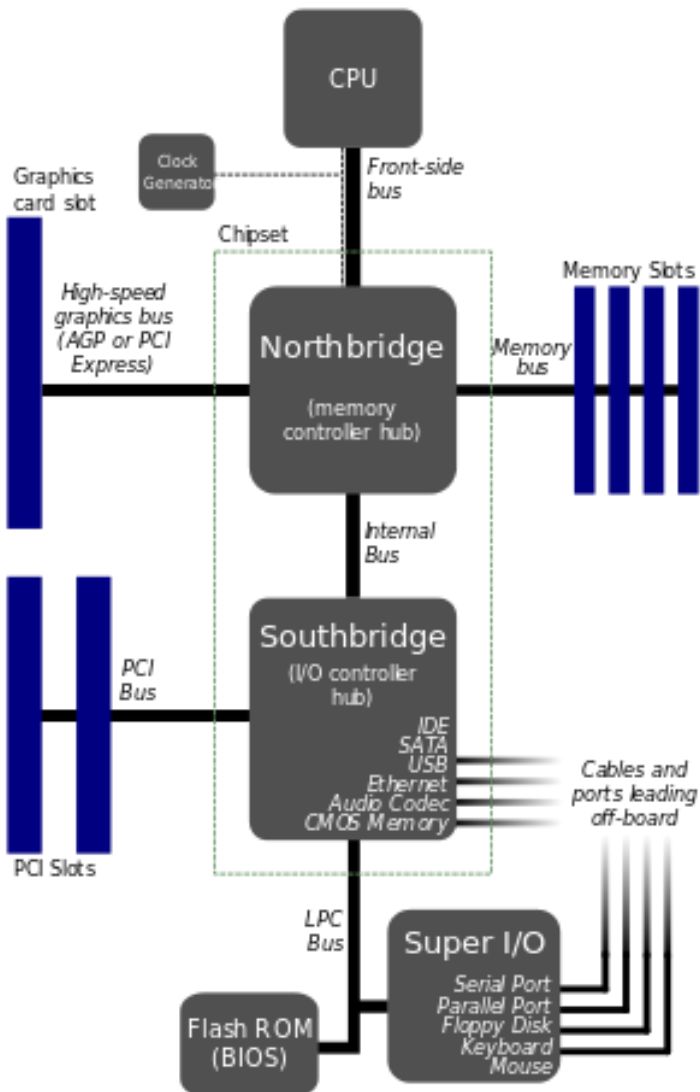
Nvidia g84-602-a2. This is an early version of a GPU, this is what drives the display and allows for a faster rendering of displayed images.

Figure 7:



Hynix HY5RS573225B. This is the RAM that is built into the laptop. This stores memory that allows the CPU to remember what tasks are running.

Figure 8:



This shows how the CPU connects to the Northbridge and Southbridge. These connections allow the CPU to access memory and information connected to the PCIe.

Figure 9:



Atheros 5418 AR5BXB72. This allows the computer to connect to wifi. It connects to a PCIe slot, which allows the processor to talk to wifi.

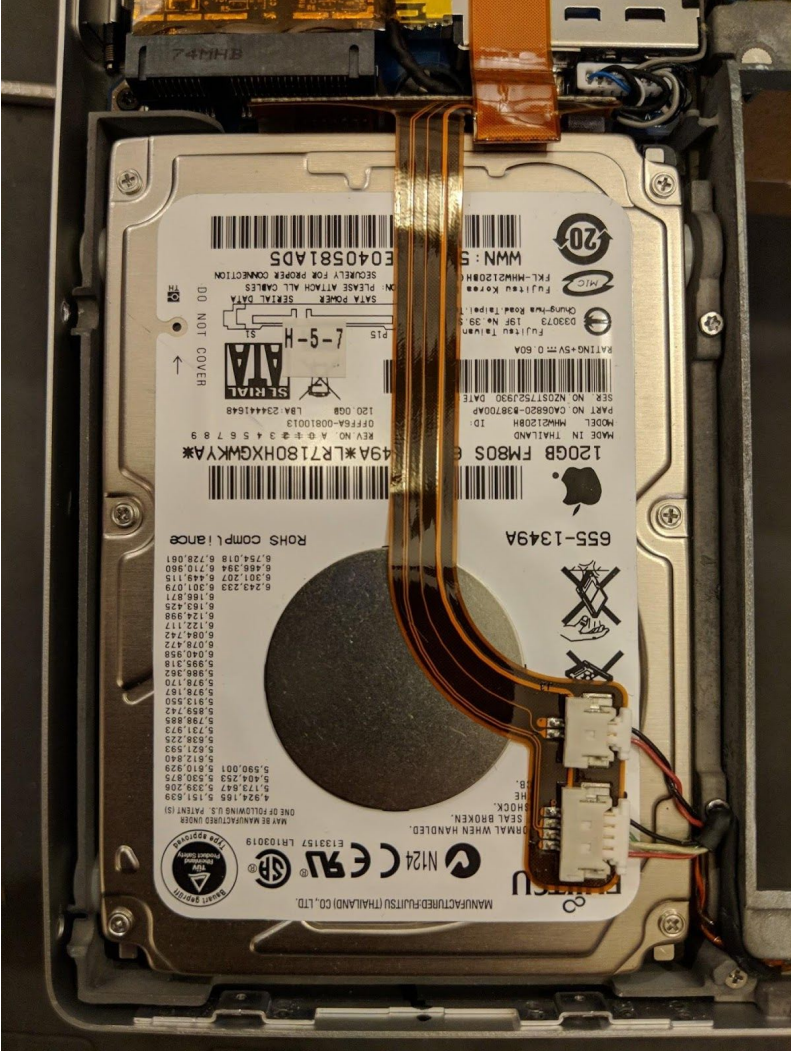


Figure 10:



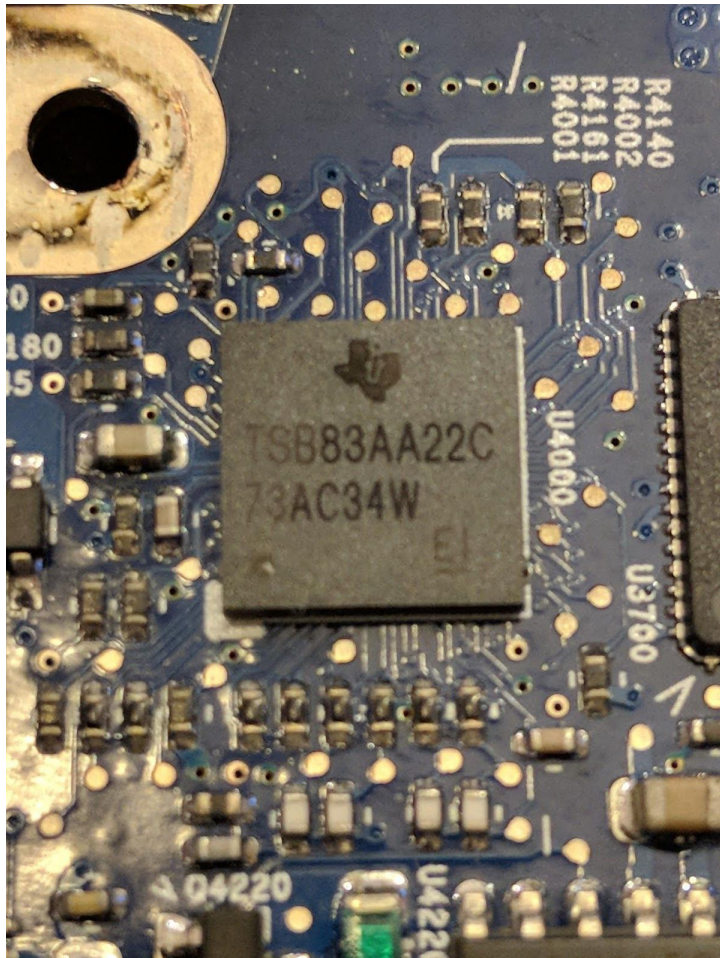
Panasonic Superdrive. This is a CD/DVD read-write drive. It is also capable of reading and writing CD's/DVD's, something today's laptops do not include.

Figure 11:



Fujitsu 120GB hard drive. This allows data storage while the laptop is off as opposed to RAM (only stores memory when the computer is on).

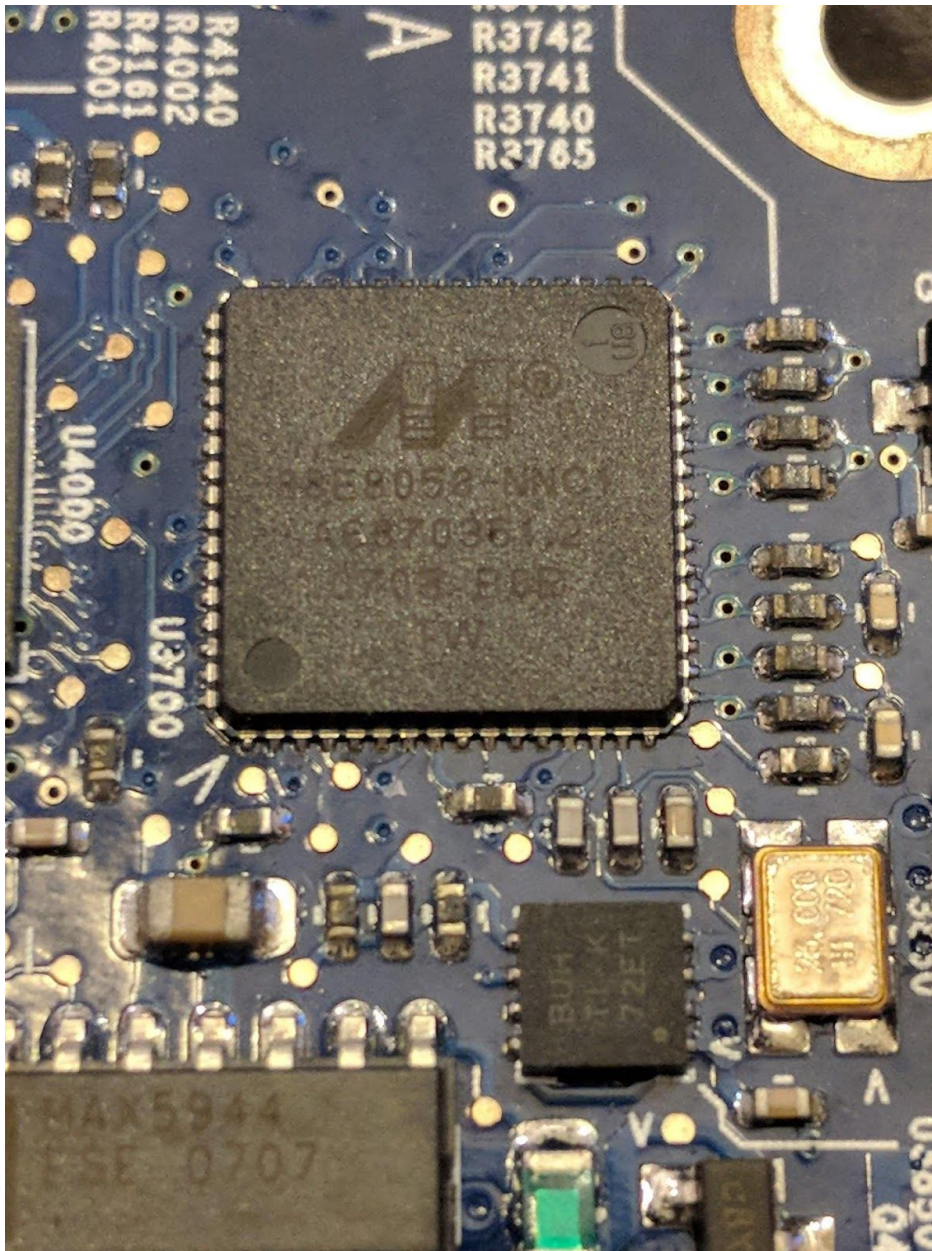
Figure 12:



Texas Instruments TSB83AA22C. This allows the CPU to meet the specs of the bus. This specific PHY is for the firewire port.



Figure 13:



Marvell 88E8058. This is the ethernet PHY. It allows the ethernet port to meet the specs of the CPU.



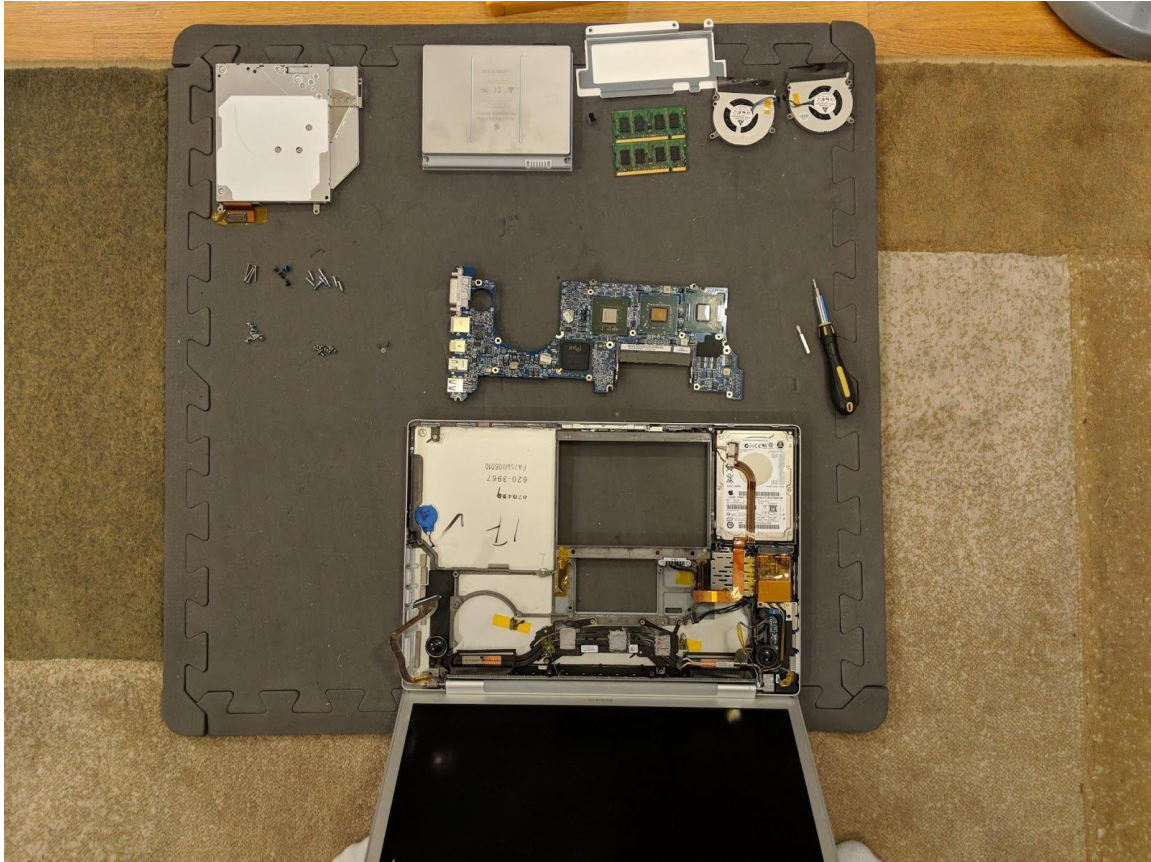
Figure 14:



These are external ports on the Macbook Pro A1226. Seeing the number of ports on this was particularly interesting when comparing them to laptops today.

## Conclusion

Through taking apart the Macbook Pro A1226, we were able to learn about the evolution of the internals of laptops in the last decade. One major change is in the ports. The ports in this laptop are: charging, USB-A 2.0, audio line in, audio line out (headphone jack), external PCIe card slot, DVD/CD reader/writer, DVI, ethernet, FireWire 800, FireWire 400, and USB-A 2.0, as well as a button to release the the display. Current laptops have two primary ports, both of which are USB-C; it takes extra dongles to get access to other ports which are provided on these older laptops. Two major improvements, however, are the use of SSDs instead of hard drives, which allows us to use less power and have it be more reliable, and the increase in cores in the CPU, which allows for quicker performance in multiprocessing. Despite the fact that the internals such as the design, memory, data transfer from ports, and longer battery life have improved throughout the years, we feel these are the most apparent changes to modern times. One step back in our opinion was the removal of the optical drive; the amount of information still stored on CDs and DVDs that is now unreadable on portables makes modern laptops somewhat inconvenient. After taking apart this laptop, we also have a newfound appreciation uniform screws because it was rather irritating having to constantly change screwdriver heads. By seeing how much laptops have changed, we finally realized exactly how much technology has developed in the past decade.



Macbook Pro parts listed left to right, top to bottom: optical drive, battery, external ram, fans, screws, motherboard, screwdriver (plus extra tip), and the frame.

## Work Cited

Instruments, Texas. *TSB83AA22C IEEE Std 1394b-2002 PHY and OHCI Link Device*. Technical report no. SLLS802. *Texas Instruments*, [www.ti.com/lit/ds/symlink/tsb83aa22c.pdf](http://www.ti.com/lit/ds/symlink/tsb83aa22c.pdf).

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"Northbridge (computing)." *Wikipedia*, [en.wikipedia.org/wiki/Northbridge\\_\(computing\)](http://en.wikipedia.org/wiki/Northbridge_(computing)).