

Que!Fire CDRW CD Burner Model: QPS-525

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Introduction

We are the Awkward Cats. Our team number is 1069K and we are an elementary team from Berthoud, Colorado. For our project we chose an old CD rom RW player/burner model number QPS 525 from Que! Fire. The reasons we chose this were because we thought it would be easier to take apart than the Apple devices we had and it is unique for how old it is.





TEAC is the company that made the Que!Fire CD player. TEAC is known for making audio equipment.

The board has a sticker that says FIRMWARE: QPS Version: 2.14 and that date of 9-19 2000. We know what Firmware is because we use it to make updates to the software on our robot's brain for VEX IQ.



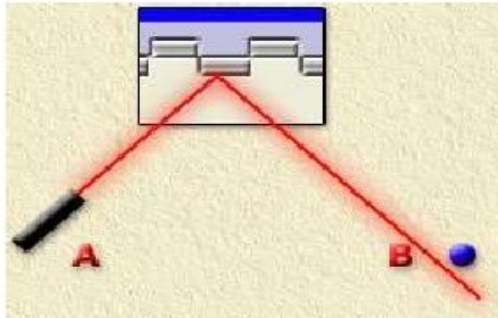
How do CD players work?

There are mini lasers called semiconductor diode laser beams and tiny electric light detectors called photoelectric sensors. These components work together to read the information from the CD. A CD has several layers. One layer is a shiny/reflective surface that holds the data. It has pits and lands that the semiconductor diode laser can bounce, reflect and shine off of. The photoelectric sensor converts the reflected light to an electrical signal. The electrical signal goes to the digital audio converter, takes the electrical signal and changes it to audio that we can hear.

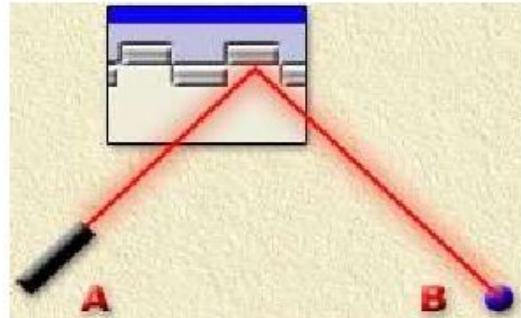
Pits and lands

Pits and lands

- The CD-ROM holds digital data.
- Data is stored in the form of lands and pits.
- **Lands** are flat areas on the metal surface.
- **Pits** are depressions or hollows.



Reading logic '0'



Reading logic '1'

The pits and lands are the way that CDs hold data. The laser and sensor work together to read the data as 1s and 0s.



Electrical Components

- AKM AK8567 0040TAH: This is the digital audio converter.
- ISSI IS62C25-45T : A low powered static RAM. A static RAM helps the semiconductor by storing info.
- Initio INIC-1410L: Helps to connect devices and transfer information by connecting it through USB.
- Texas Instruments 10824-09K, LV02A-04K, LM051A-03K: There are several tiny TI chips in the device. We had a hard time finding out what each did specifically.
- ESMT M11B1616A
- Winbond W29C040P-90: This is the flash memory chip that allows the device to write, erase, and rewrite the CDs.
- BSI BS62LV1024TC-70
- SST 89C54: Multi purpose microcontroller unit, processes input and output signals.

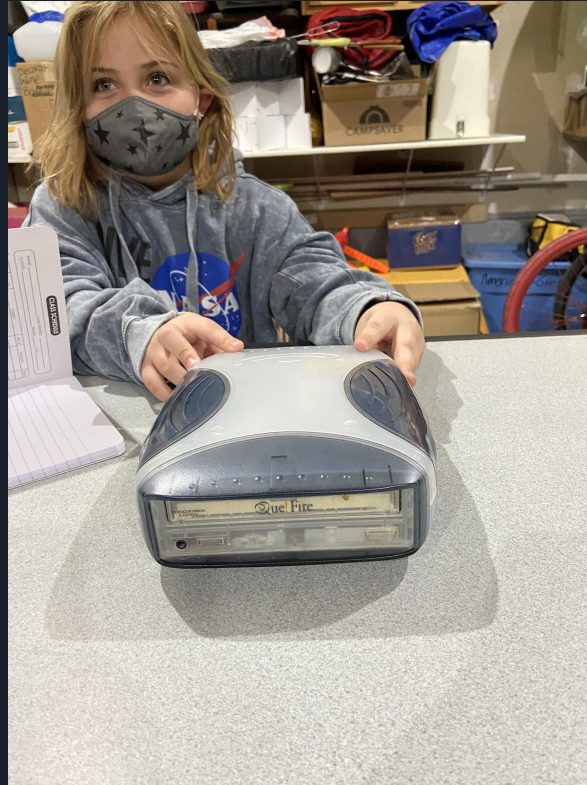


What we learned

The Que! Fire CD-RW is an electronic device that processes signals through electronic circuits. These circuits work together in a system. The ISSI chip in our device works to store information or gives power to the rest of the board. The Initio chip helps to move information from an outside device to the other chips. There are many small Texas Instrument chips in the device. We think these chips work as amplifiers to process audio information and may also help with things such as opening/closing the tray, and helping spin the disks. The Winbond chip is important because it is the memory chip that helps the device store information so you can burn a CD, erase it, and rewrite it again.

We learned the difference between a CD player and one that can burn and rewrite disks. We also increased our basic knowledge of electrical circuits to include the transfer of audio and other information.

What the Que! Fire Device Looked Like Before



Caption: This is what the Que! Fire device looked like before we took it apart.

The Main Board

Caption: This is what the Que! Fire looks like in it's main board.



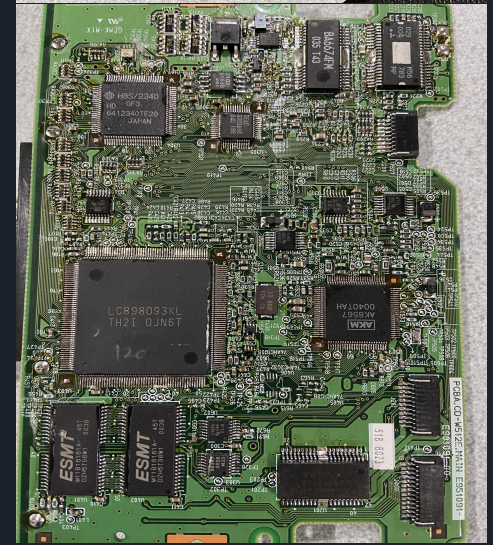
The Large Board

Caption: This is the large board, which you can see on the previous slide.

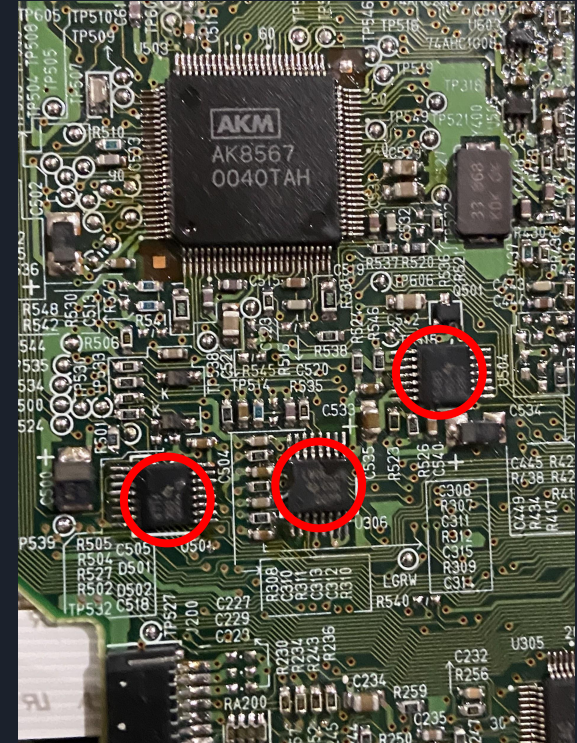
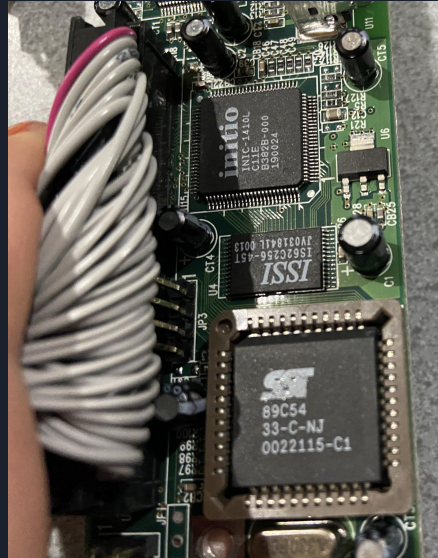
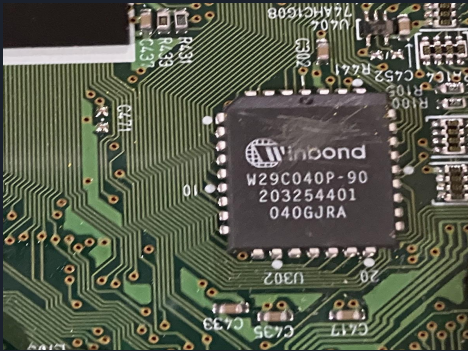
front---->



back---->



Important Chips



The chips in the red circles are the Texas Instrument chips.
There are several on both boards in the device.



References

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