

## 8.1 Communicating with Devices

**Notebook:** How Computers Work [CM1030]

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**Author:** SUKHJIT MANN

Cornell Notes	Topic:  8.1 Communicating with Devices	Course: BSc Computer Science
		Class: How Computer Work [CM1030]-Lecture
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Essential Question:		
What are peripherals and the various technologies that make their use possible?		
Questions/Cues:		
<ul style="list-style-type: none"><li>• What are peripheral devices?</li><li>• What is Controller?</li><li>• What is GPU?</li><li>• What is USB?</li><li>• What is Bluetooth?</li><li>• What is Memory mapped IO?</li><li>• What is DMA?</li></ul>		
Notes		
<ul style="list-style-type: none"><li>• Peripheral devices = not core of the comp, attached to the edge or periphery</li><li>• Peripheral devices also use bus for data transfer</li><li>• Controller = decodes what's happening on the bus and sends it down to device; bit of hardware between bus and peripheral device</li><li>• Graphics Card or Graphics processing unit (GPU) = highly powerful processor; highly optimized bit of silicon, different model from CPU. It is parallel programming chips which produce graphics at great speed. Very specialist bit of control hardware.</li><li>• USB (Universal Serial Bus) = type of controller that handles many different types of devices, allows data transfer between CPU &amp; device in a way that's independent of details of exact device</li><li>• Bluetooth = similar to WiFi, but designed to communicate over internet &amp; much shorter range. Designed to communicate between peripheral devices and computer. Controller inside that connect to main bus. Uses it's own wireless transmitter to communicate with devices; no wire.</li><li>• Type on keyboard -&gt; CPU uses load instruction to request data from keyboard -&gt; Send signal along bus to controller -&gt; Controller will then send character typed back along bus -&gt; Ends up in register (probably going via memory)</li><li>• Memory mapped IO (Memory mapped Input &amp; Output) = Each controller has a memory address, for example keyboard, if you read from keyboard's memory address you'll get last key that's typed to keyboard</li></ul>		

- DMA (Direct Memory Access) = allows certain devices like HDD to communicate directly with memory, faster access to devices without clogging up CPU with lots of loads & stores

## Summary

In this week, we learned about peripherals or external devices connected to the computer outside its core mechanism and the various technologies that go into making connections with external devices possible.