

UNIT V

I/O ORGANIZATION AND PARALLELISM

Accessing I/O devices – Interrupts – Direct Memory Access – Buses–**Interface circuits** – Standard I/O Interfaces (PCI, SCSI, USB) –Instruction Level

Parallelism : Concepts and Challenges – Introduction to multicore processor – Graphics Processing Unit





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INSTITUTIONS

Recap the previous Class



Function of I/O Interface

Provide a **storage buffer** for at least one word of data;

Contain **status flags** that can be accessed by the processor to determine whether **the buffer is full or empty**;

Contain **address-decoding circuitry** to determine when it is being addressed by the processor;

Generate the **appropriate timing signals** required by the bus control scheme;

Perform any format conversion that may be necessary to transfer data between the bus and the I/O device.



Parallel Port

A parallel port transfers data in the form of a number of bits, typically 8 or 16, simultaneously to or from the device.

For faster communications

Parallel Port – Input Interface (Keyboard to Processor Connection)

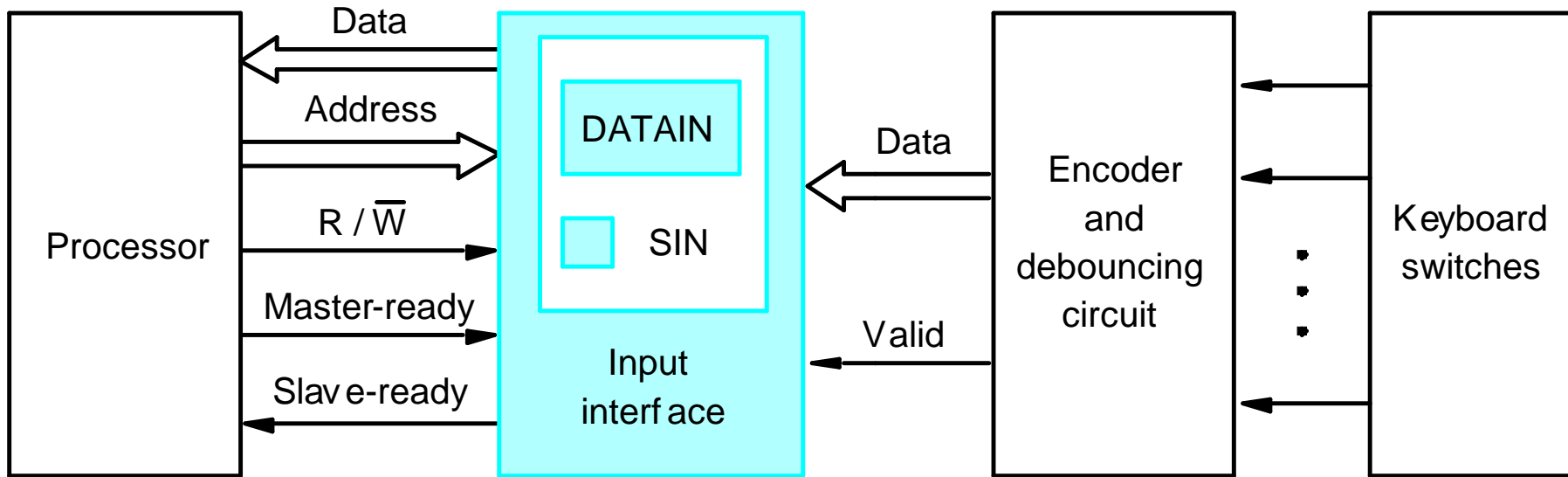


Figure 4.28. Keyboard to processor connection.

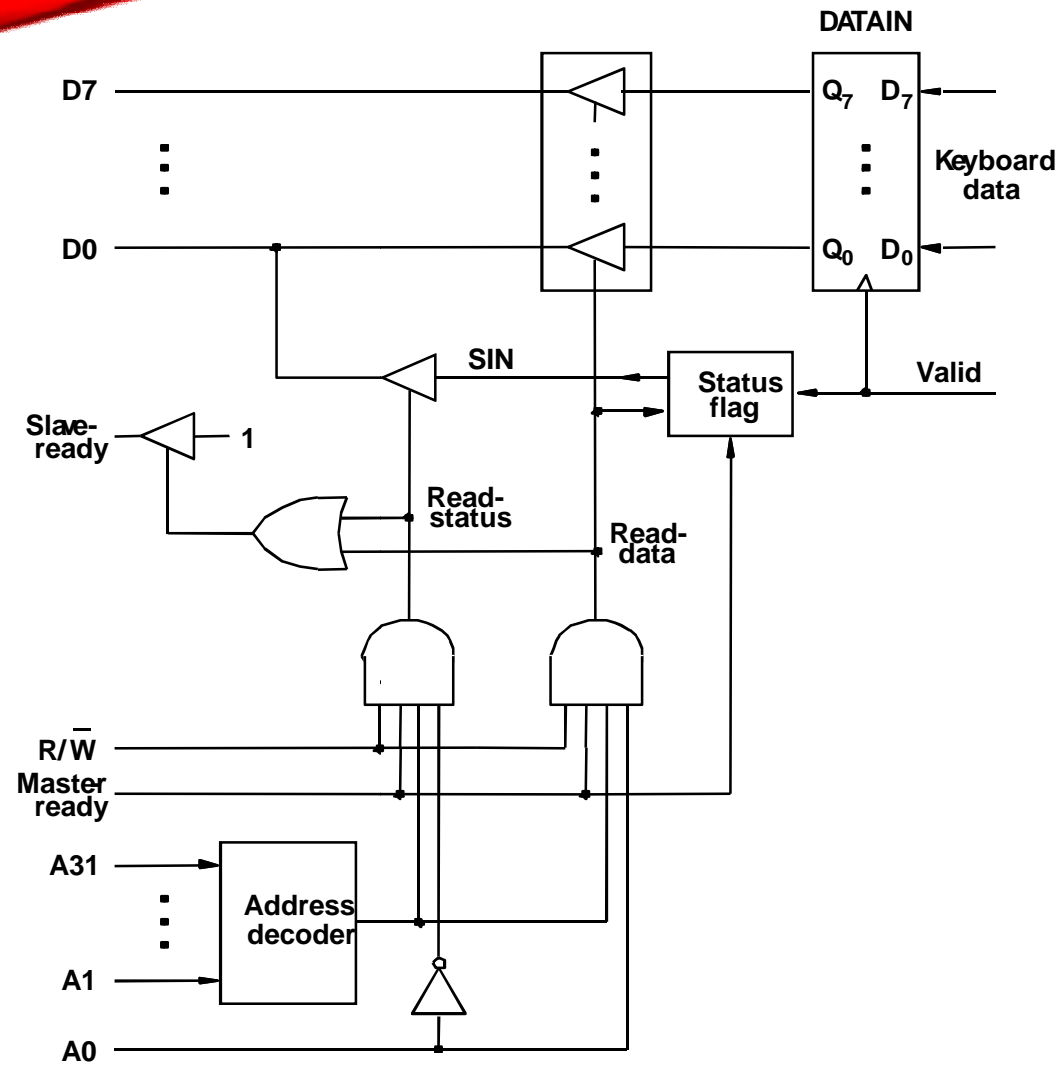


Figure: Input interface circuit.

Parallel Port – Output Interface (Printer to Processor Connection)

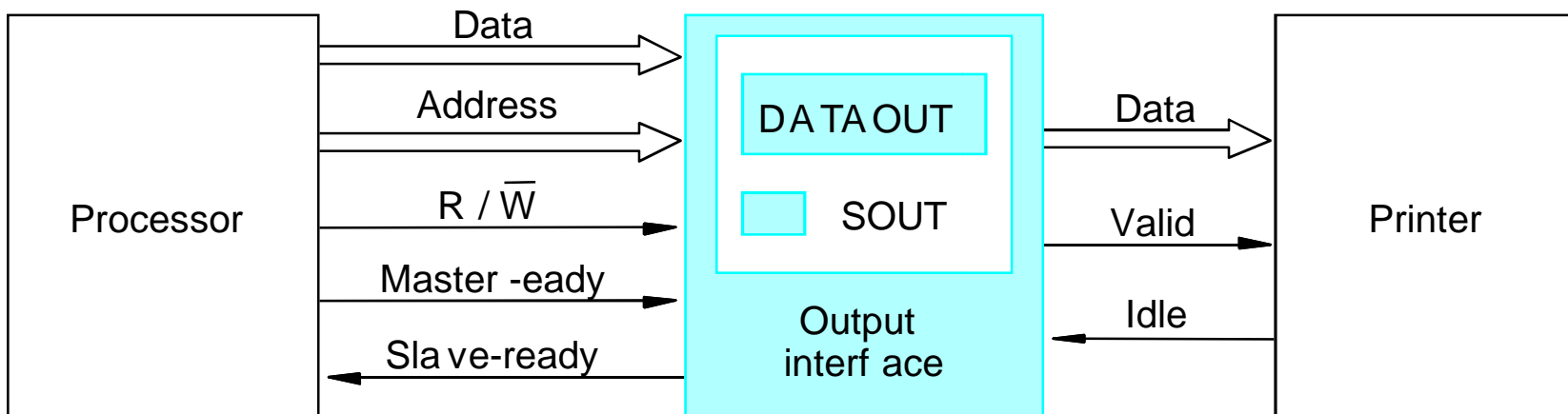


Figure: Printer to processor connection.

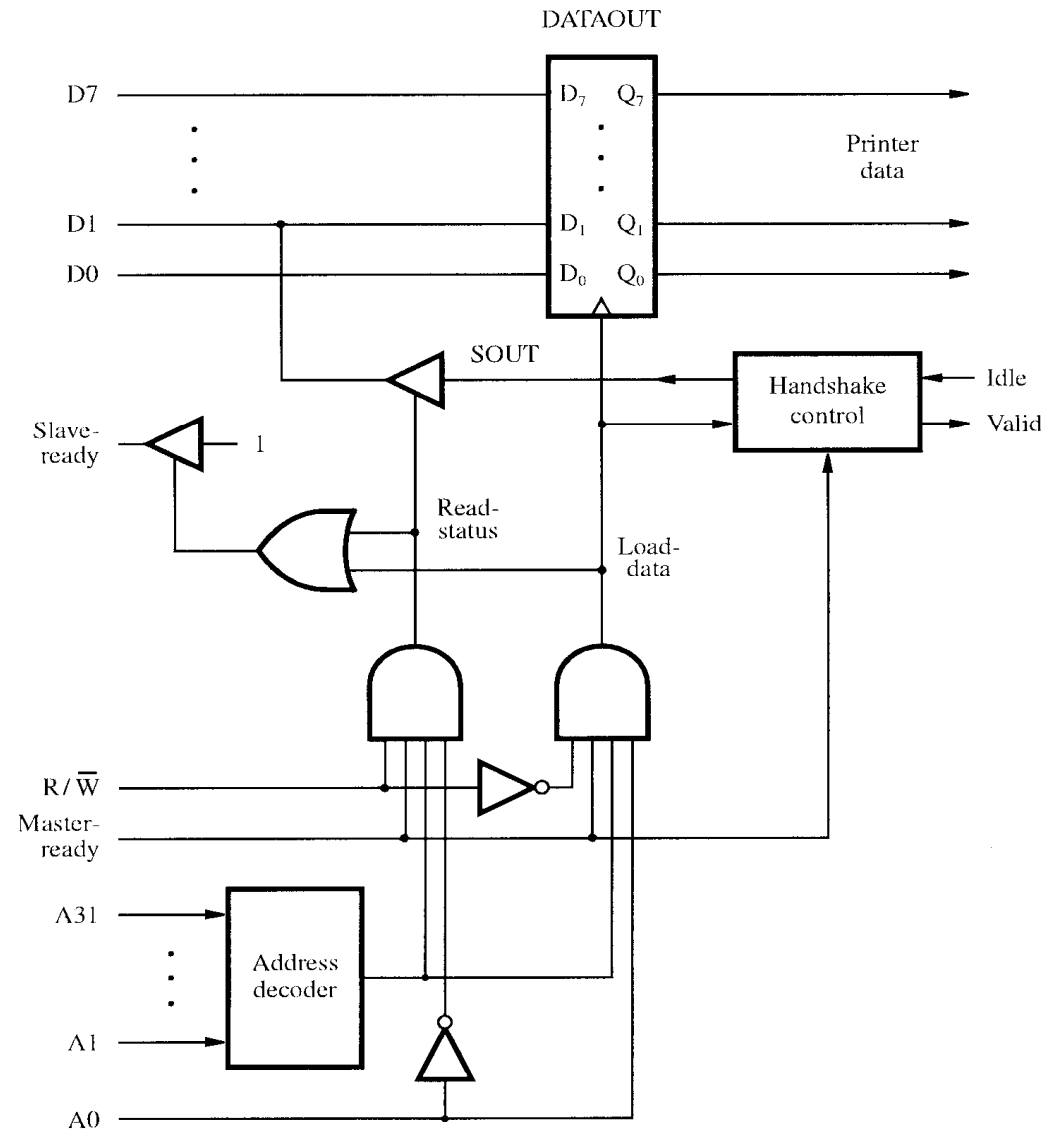


Figure 4.32. Output interface circuit.

Serial Port

A serial port is used to connect the processor to I/O devices that require transmission of data **one bit at a time**.

The key feature of an interface circuit for a serial port is that it is capable of communicating in **bit-serial fashion on the device side and in a bit-parallel fashion on the bus side**.

Capable of longer distance communication than parallel transmission.

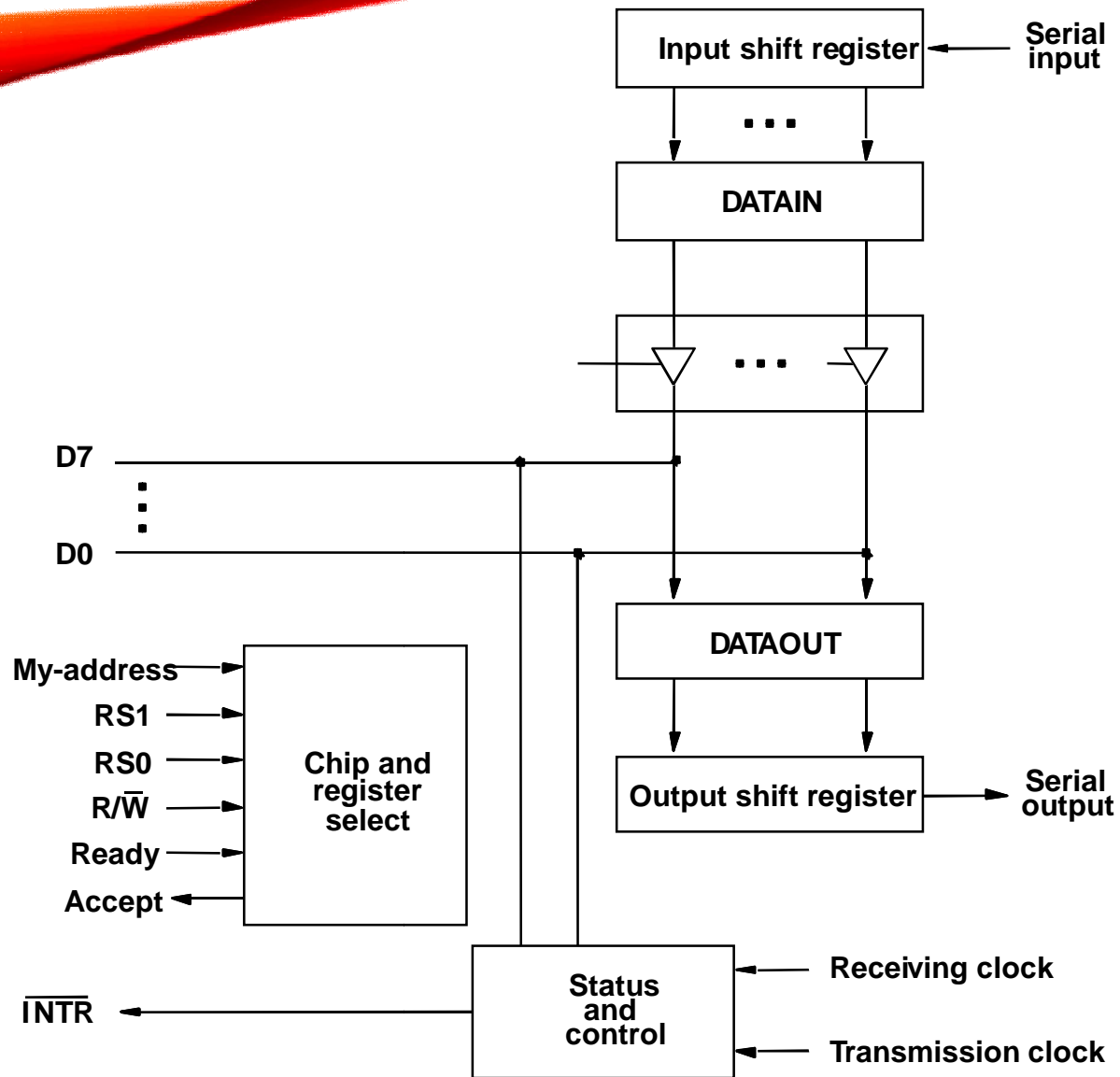


Figure :.A serial interface.



TEXT BOOK

Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", McGraw-Hill, 6th Edition 2012.

REFERENCES

1. David A. Patterson and John L. Hennessey, "Computer organization and design", MorganKauffman ,Elsevier, 5th edition, 2014.
2. William Stallings, "Computer Organization and Architecture designing for Performance", Pearson Education 8th Edition, 2010
3. John P.Hayes, "Computer Architecture and Organization", McGraw Hill, 3rd Edition, 2002
4. M. Morris R. Mano "Computer System Architecture" 3rd Edition 2007
5. David A. Patterson "Computer Architecture: A Quantitative Approach", Morgan Kaufmann; 5th edition 2011

THANK YOU