EC-310 Microprocessor & Microcontroller based Design

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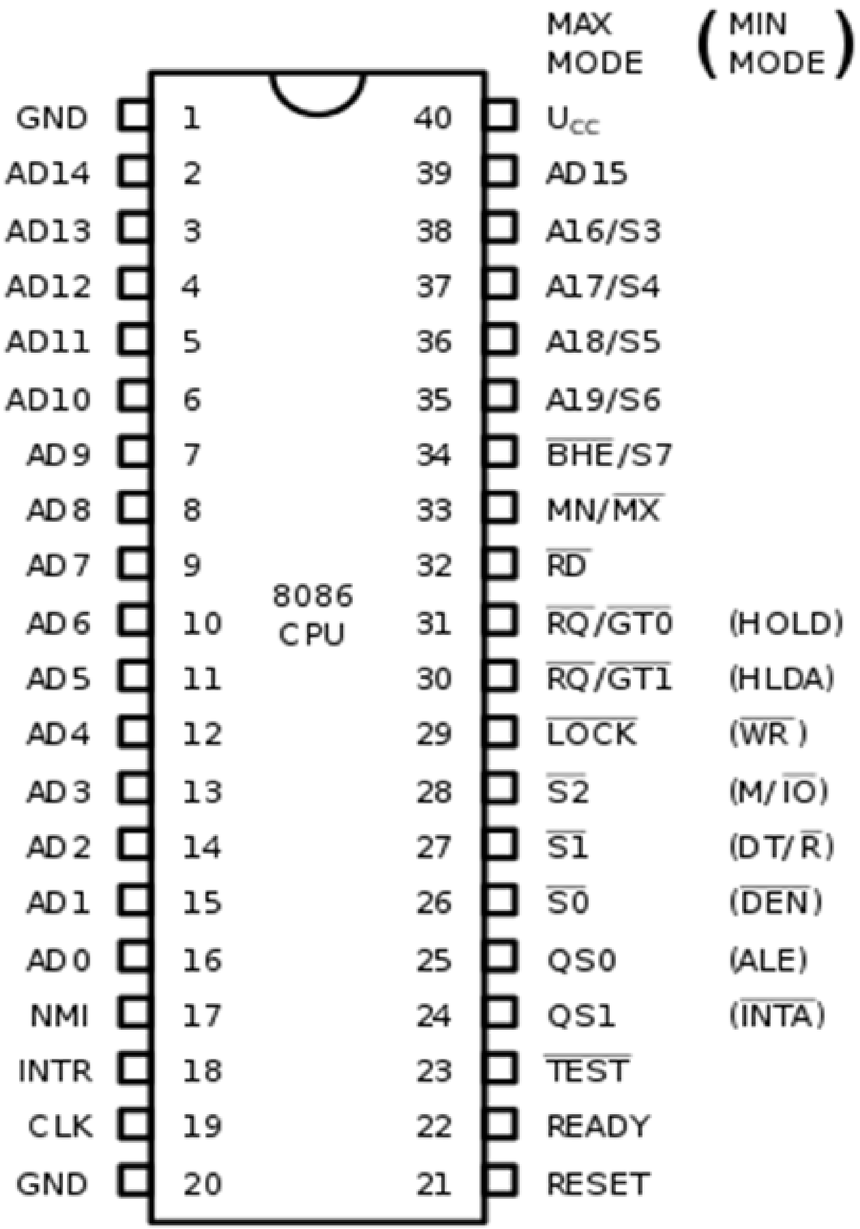
Week # 6

8086 Pin-outs and Functions

- NMI: Non-maskable interrupt
- Ready: to insert wait states
- INT: Interrupt request
- TEST: Input pin tested by WAIT instruction
  - Mostly used with 8087 co-processor connection
- RESET: FFFF:0000h
- BHE: bus high enable
- INTA: Interrupt acknowledge
- ALE: Address latch enable
- DT/R: Data transmit / rcv



8086 DC Characteristics

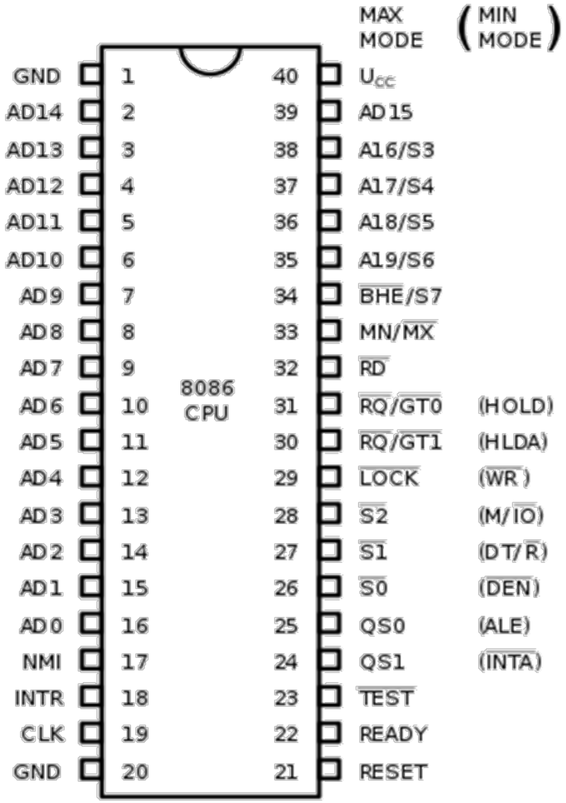
- Voltage and Current Requirement of input and out pins

Logic Level	Voltage	Current
0	0.8 V max.	± 10µA max.
1	2.0 V min.	± 10µA max.

Table: Input Characteristics

Logic Level	Voltage	Current
0	0.45 V max.	± 2.0µA max.
1	2.4 V min.	± -400µA max.

Table: Output Characteristics

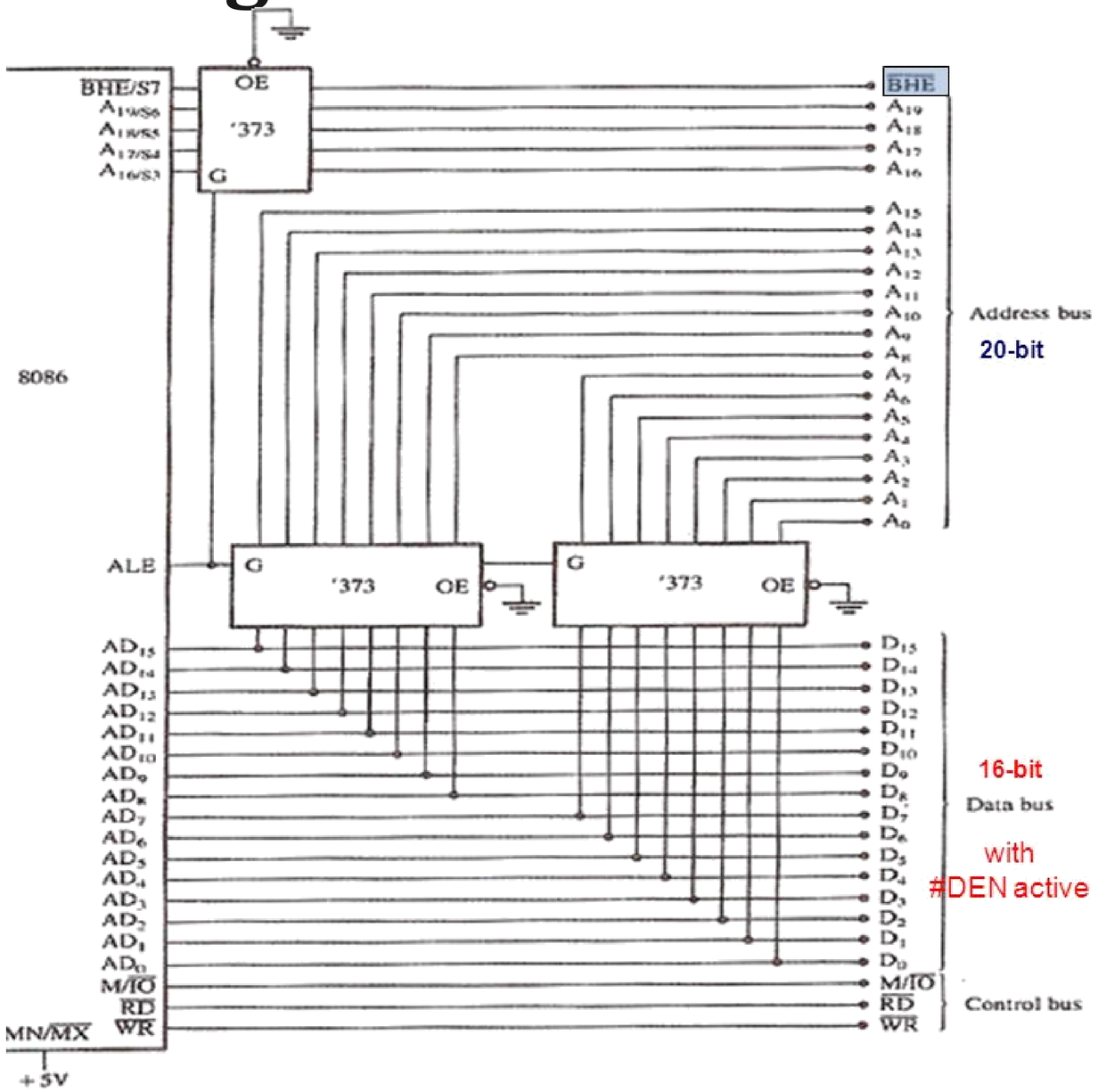


S4	S3	Function
0	0	Extra Segment
0	1	Stack Segment
1	0	Code or no segment
1	1	Data segment

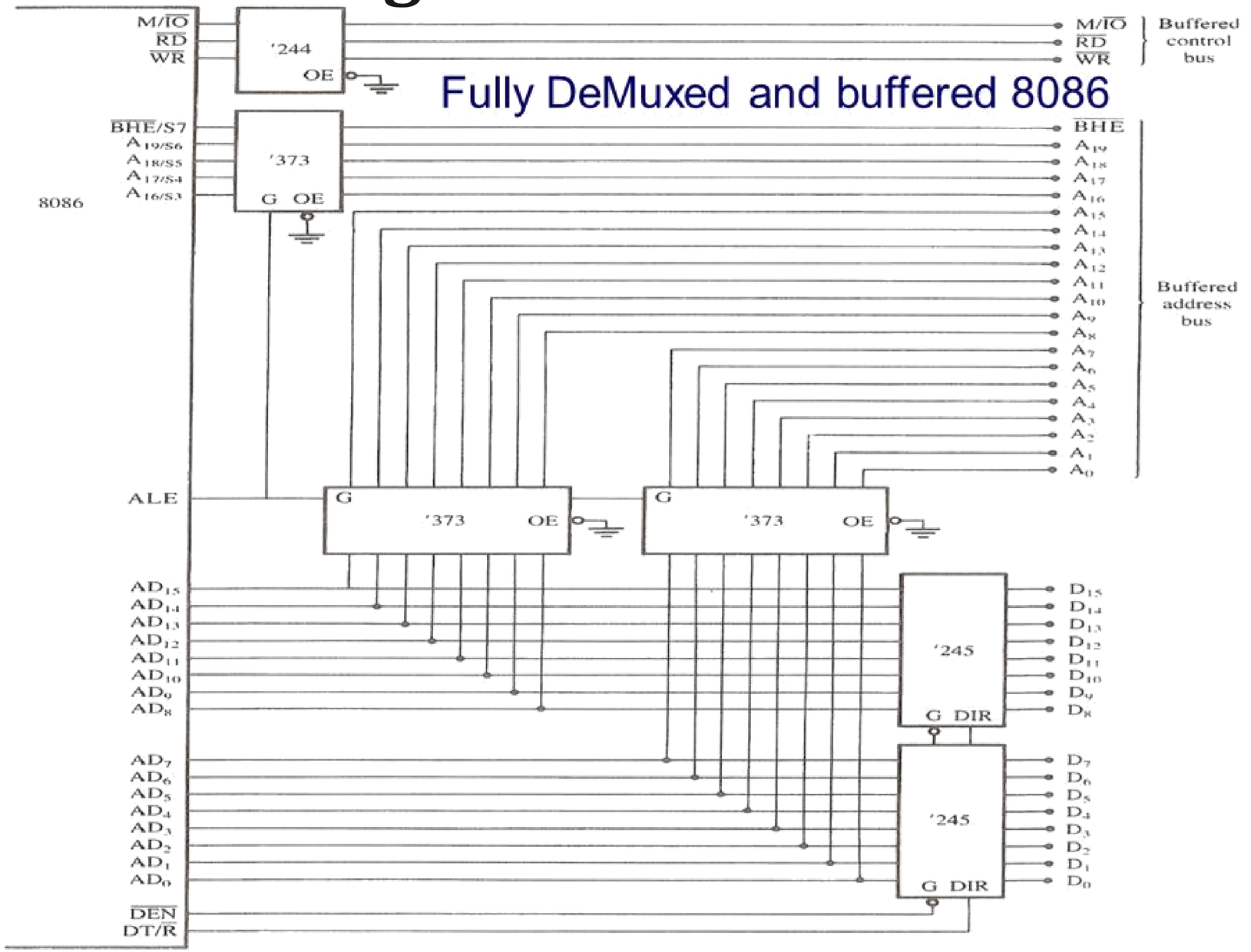
Table: Function of Status bits S3 and S4

Bus Buffering and Latching

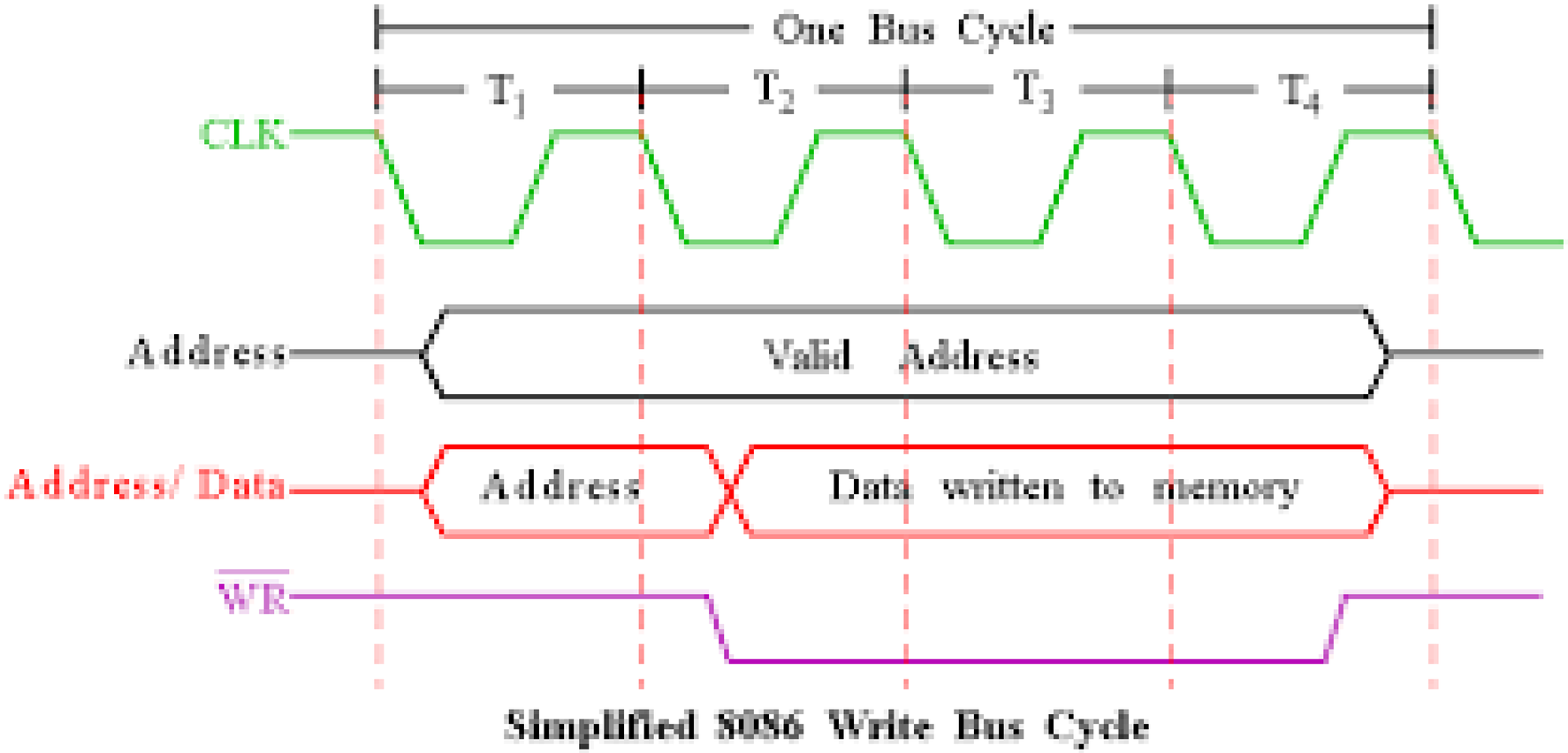
Demultiplexing the 8086 Processor Address/Data bus



Bus Buffering and Latching



Bus Timing



Simplified 8086 Write Bus Cycle

Project Ideas

- **Arduino**
- **PIC Microcontroller**
- **ESP**
- **Adafruit**
- NodeMCU
- Raspberry Pi
- Nvidia Jetson

Project Ideas

PIC Microcontroller based Projects

- Bluetooth Interfacing and sending data to Cell phone
- MircoSD card handling using PIC
- Touch Screen interfacing
- Biomedical Signal Acquisition and conditioning (leads, op-amp)

Project Ideas

- VIDEO: Arduino Vs Raspberry Pi
- Learn Arduino in 15 mins

- Sample Projects - MakerPro
- IOT enabled systems (e.g. sensor->Cloud->System/Device/Actuator)
  - Dot matrix Display, Running Text controlled by Cellphone for Cars
- Sensors: GPS, Biomedical (EEG, PPG, ECG, EMG, Inertial) based systems/ applications