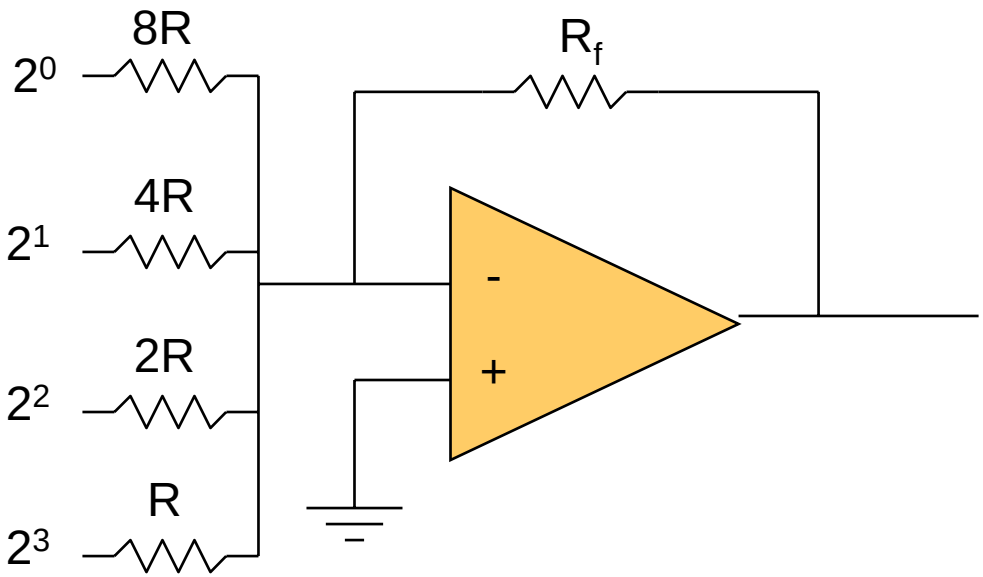
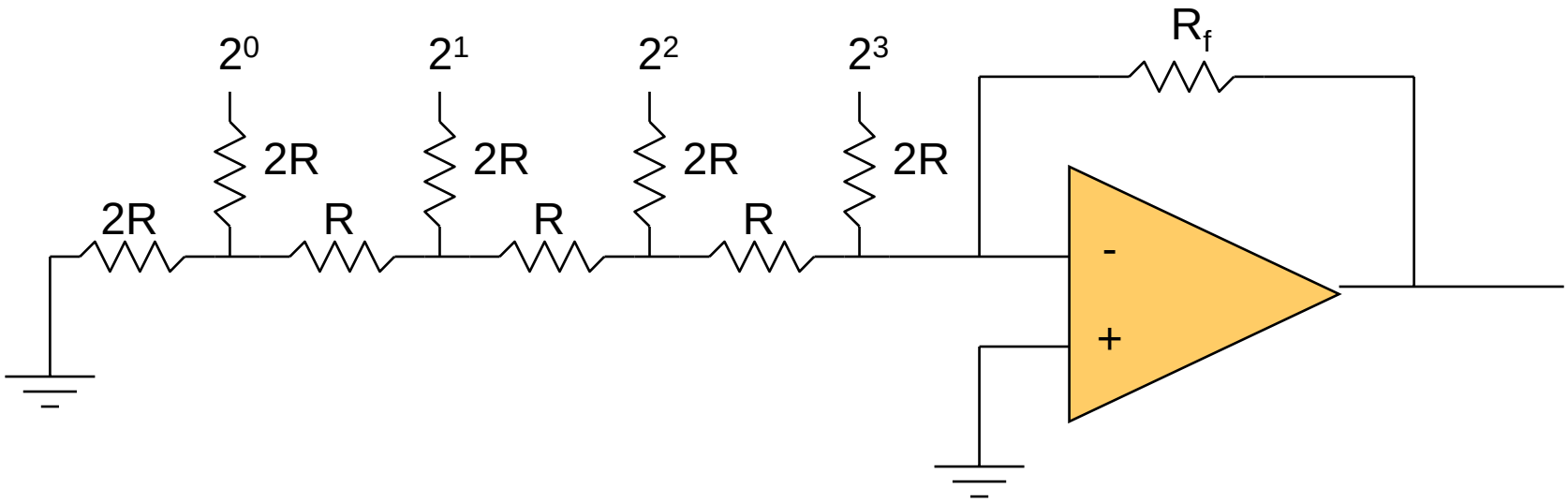
Interfacing

Digital-to-Analog (D/A) Conversion

- **Binary-Weighted-Input DAC**

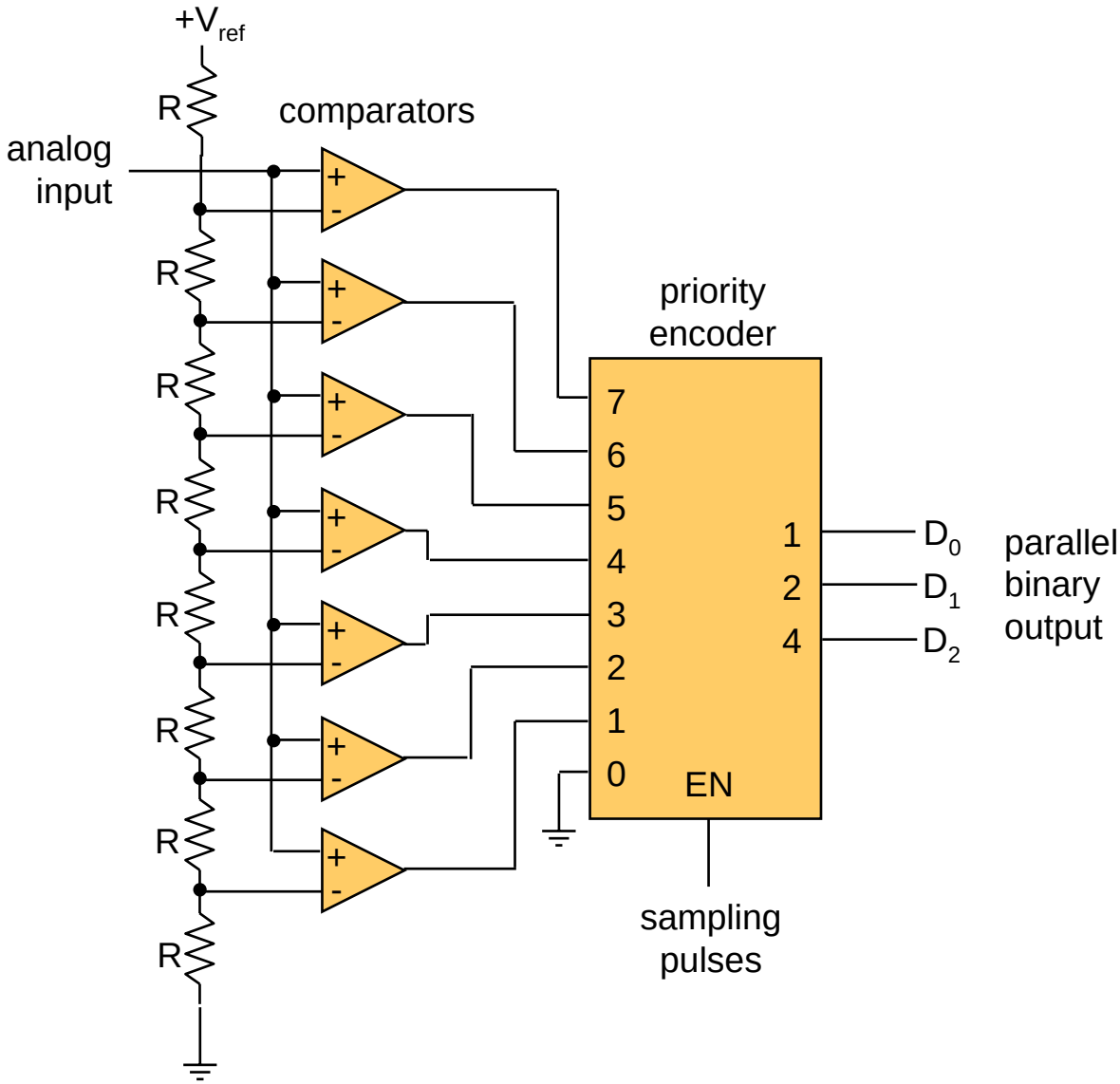


- **R/2R Ladder DAC**

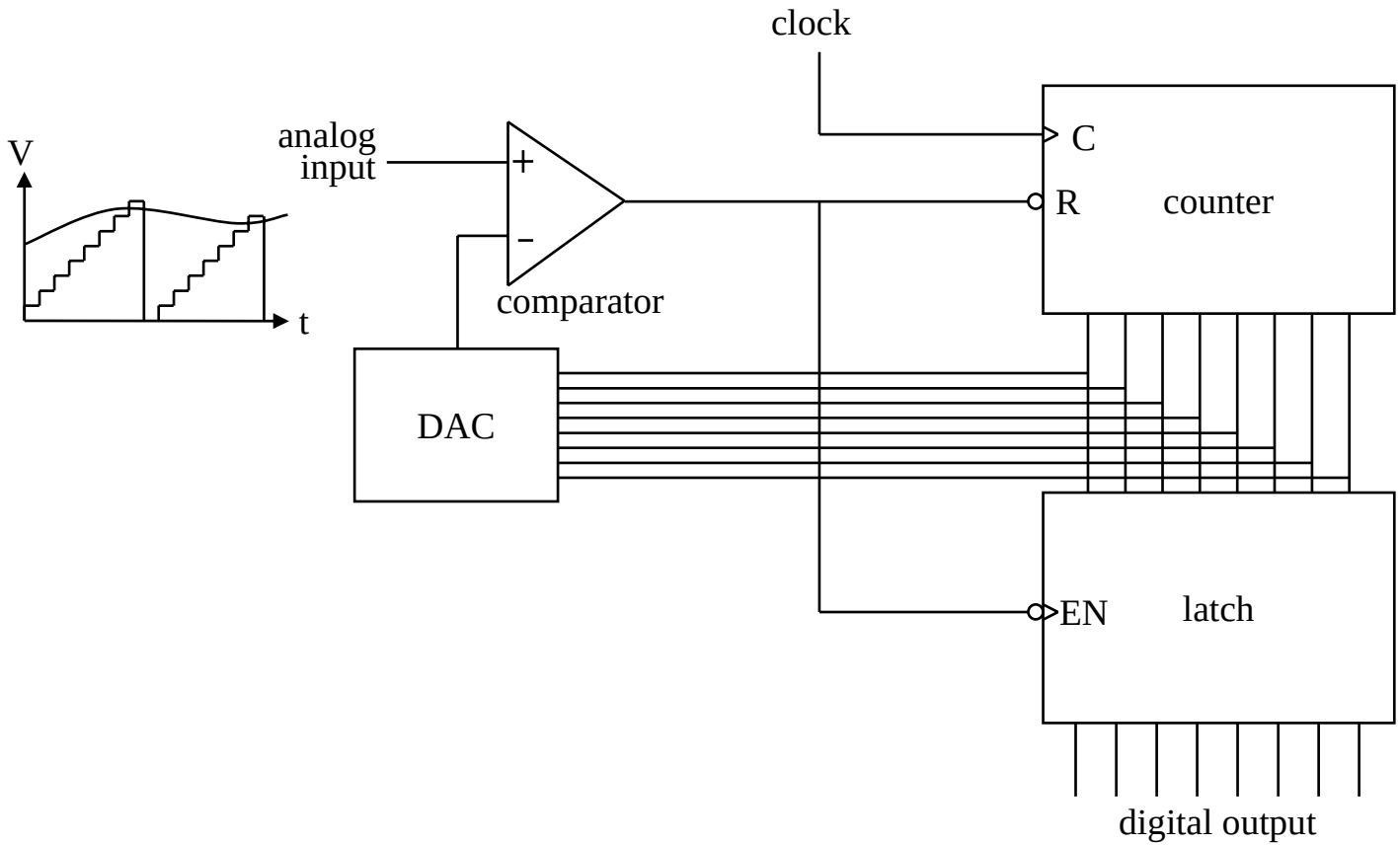


Analog-to-Digital (A/D) Conversion

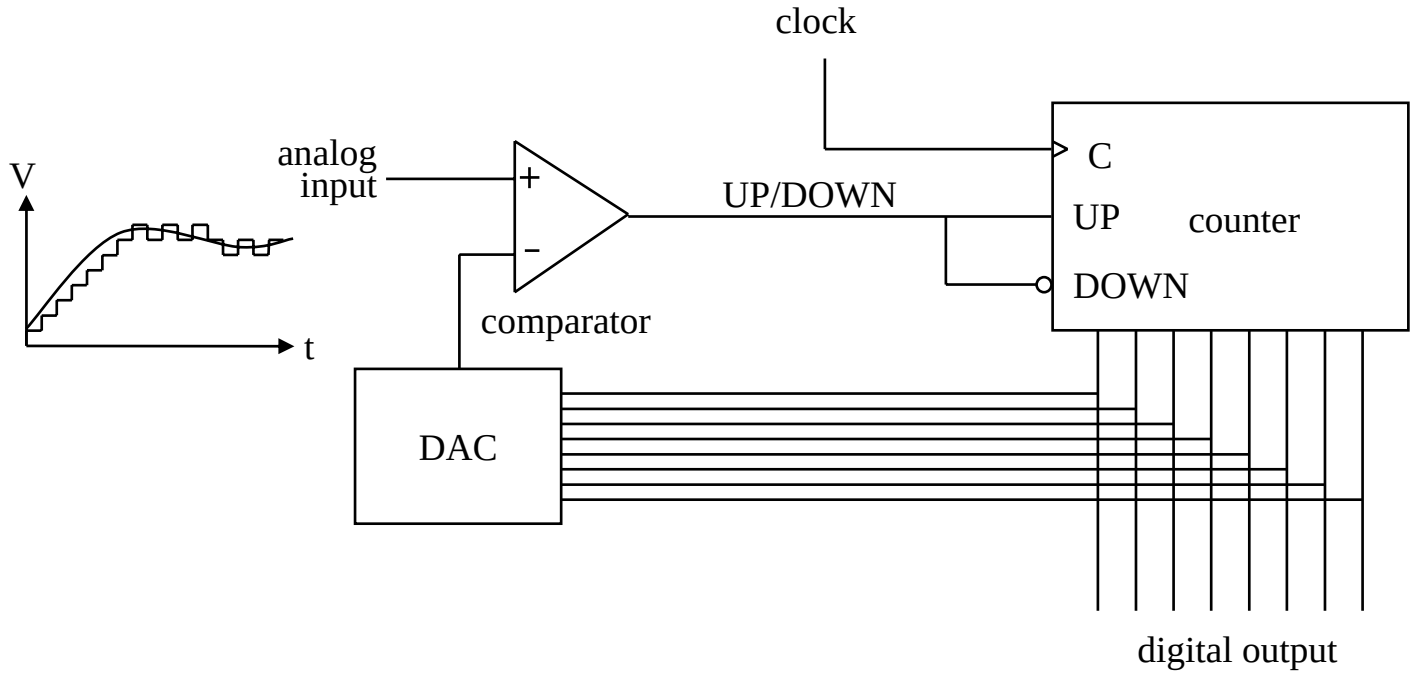
- **Flash (Simultaneous) ADC**



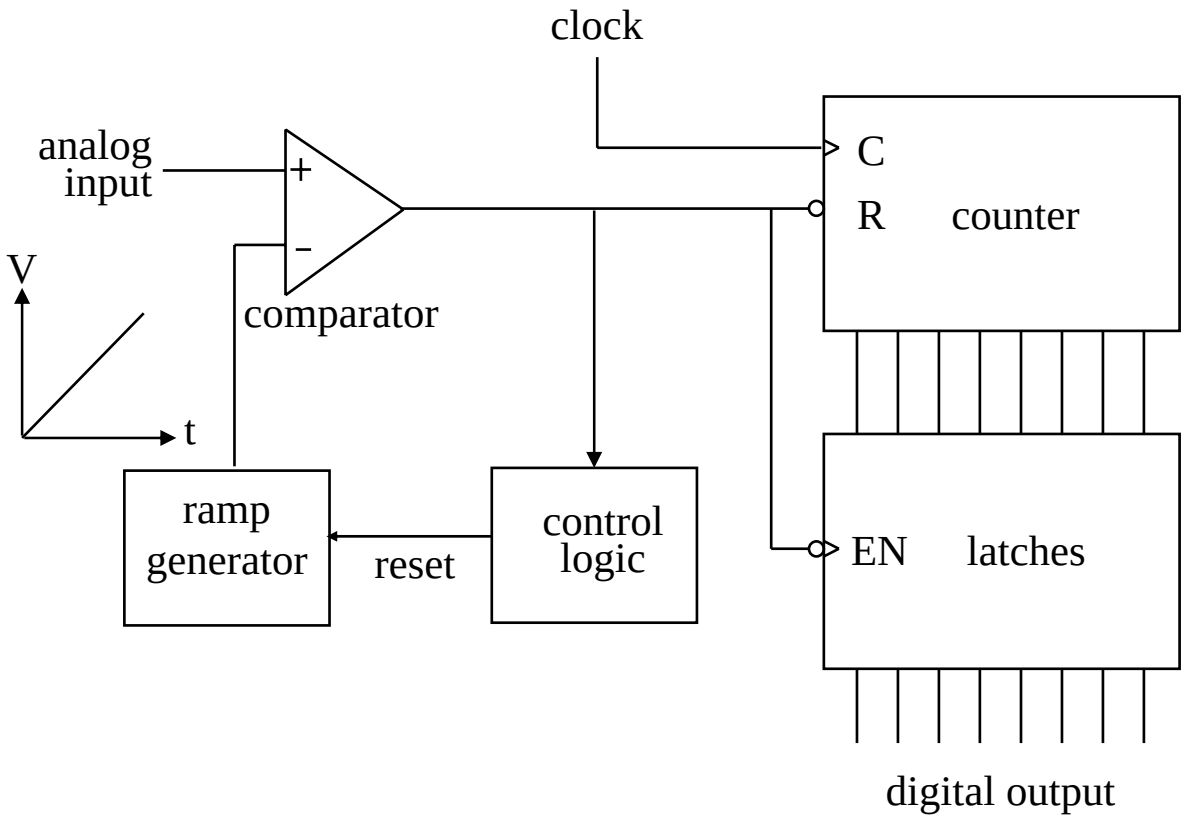
- **Digital-Ramp ADC**



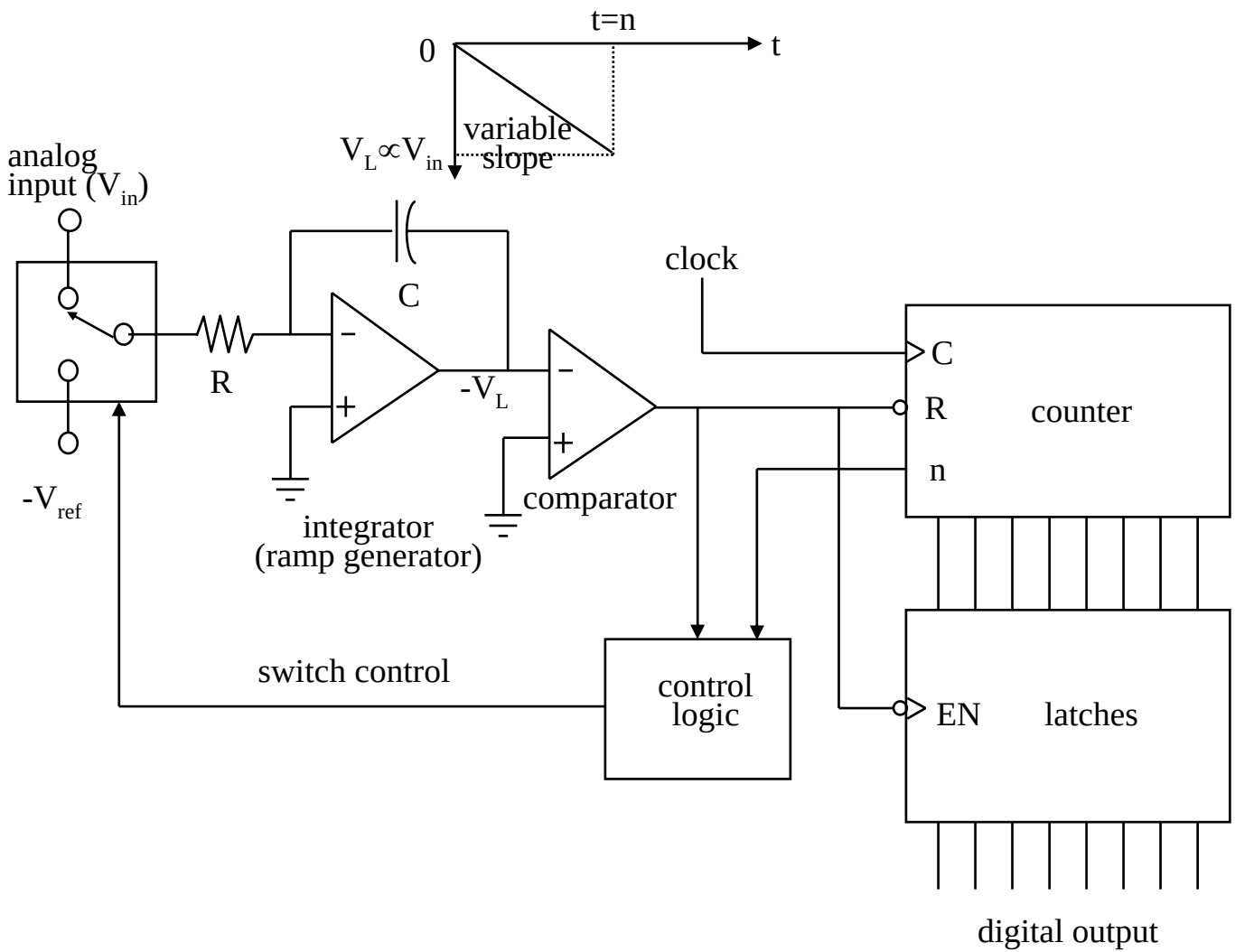
- **Tracking ADC**



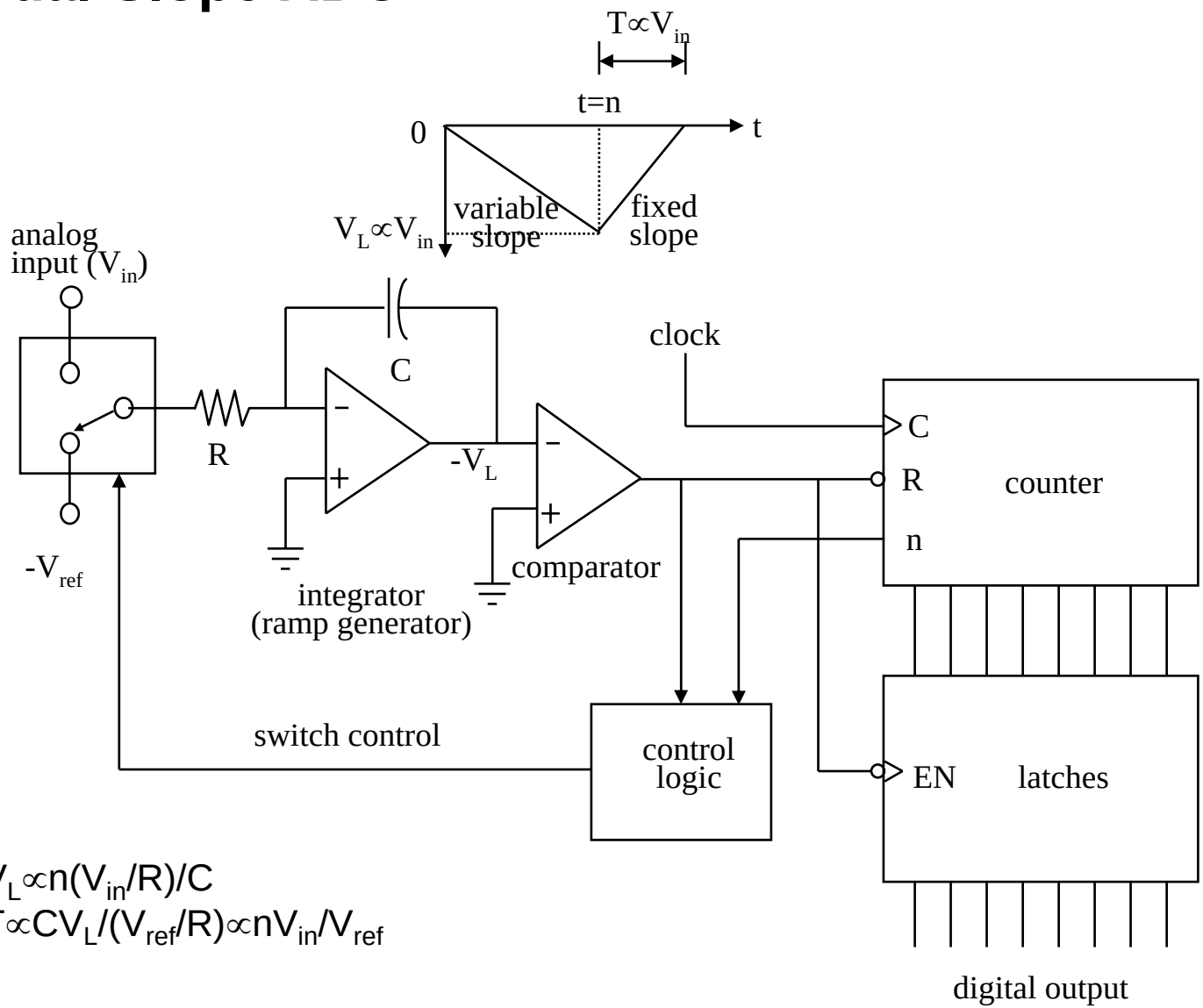
- **Single-Slope ADC**



- **Dual-Slope ADC**



- **Dual-Slope ADC**

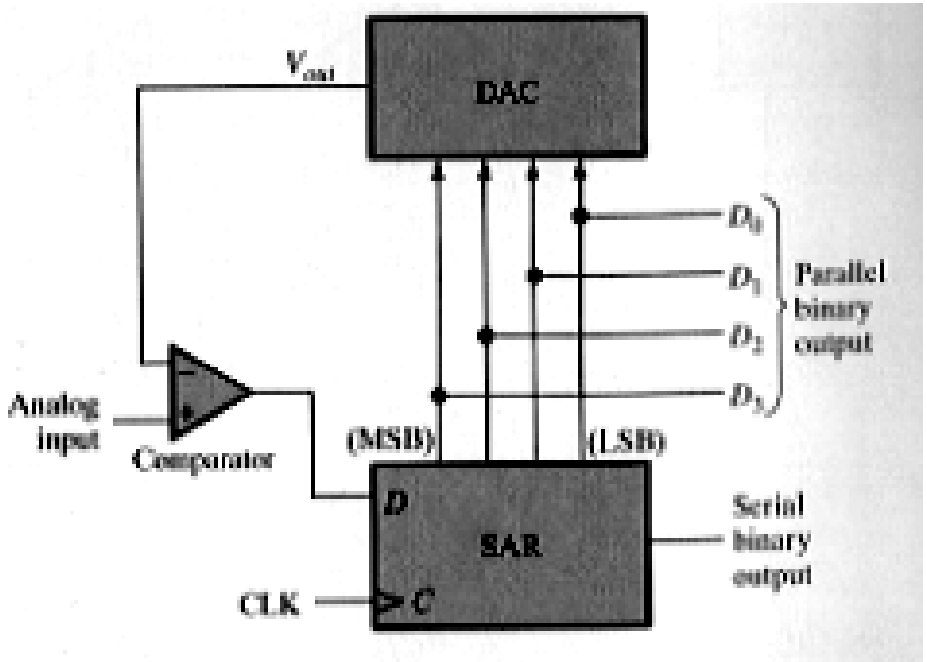


$V_L \propto n(V_{in}/R)/C$

$T \propto CV_L/(V_{ref}/R) \propto nV_{in}/V_{ref}$

- **Successive-Approximation ADC**

FIGURE 13–22
Successive-approximation ADC.



- **Successive-Approximation ADC**

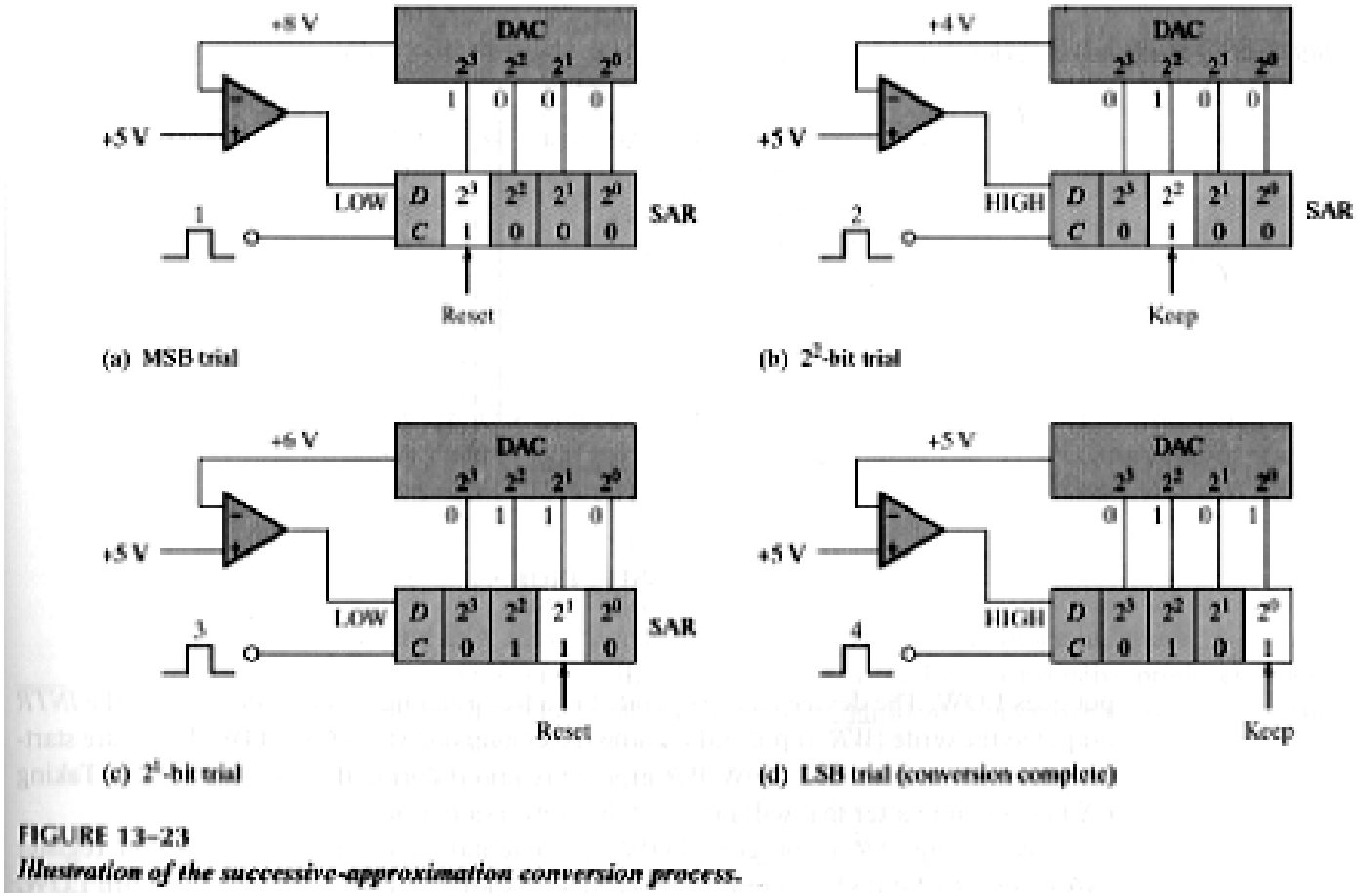
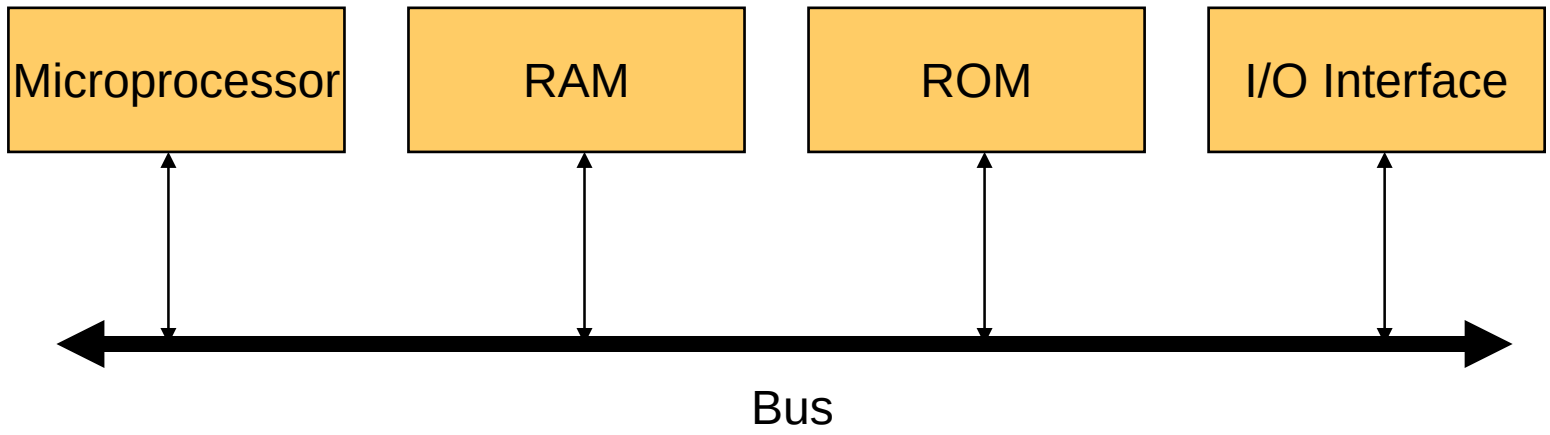


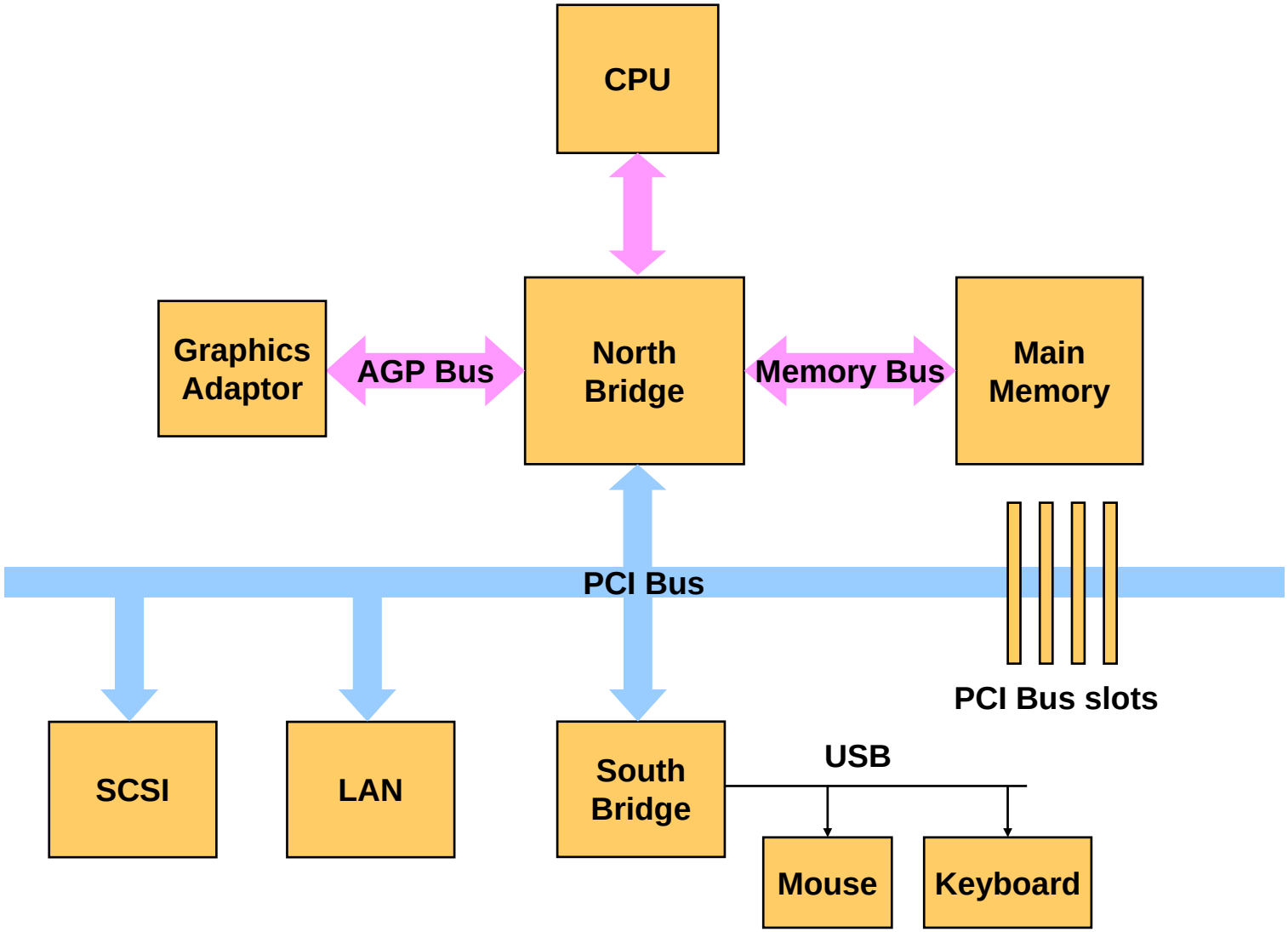
FIGURE 13–23
Illustration of the successive-approximation conversion process.

Internal System Interfacing

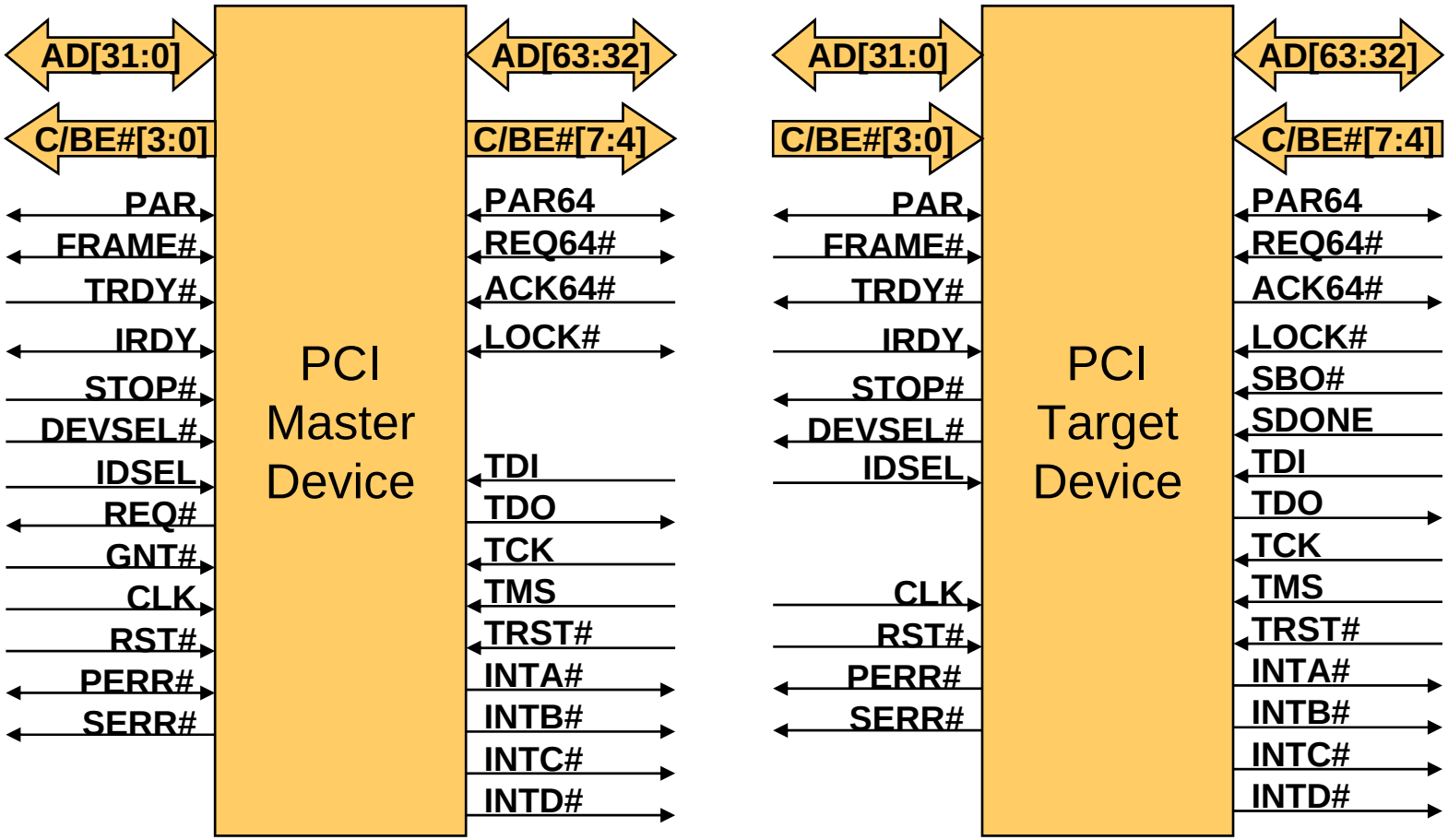
- **Basic Multiplexed Buses**



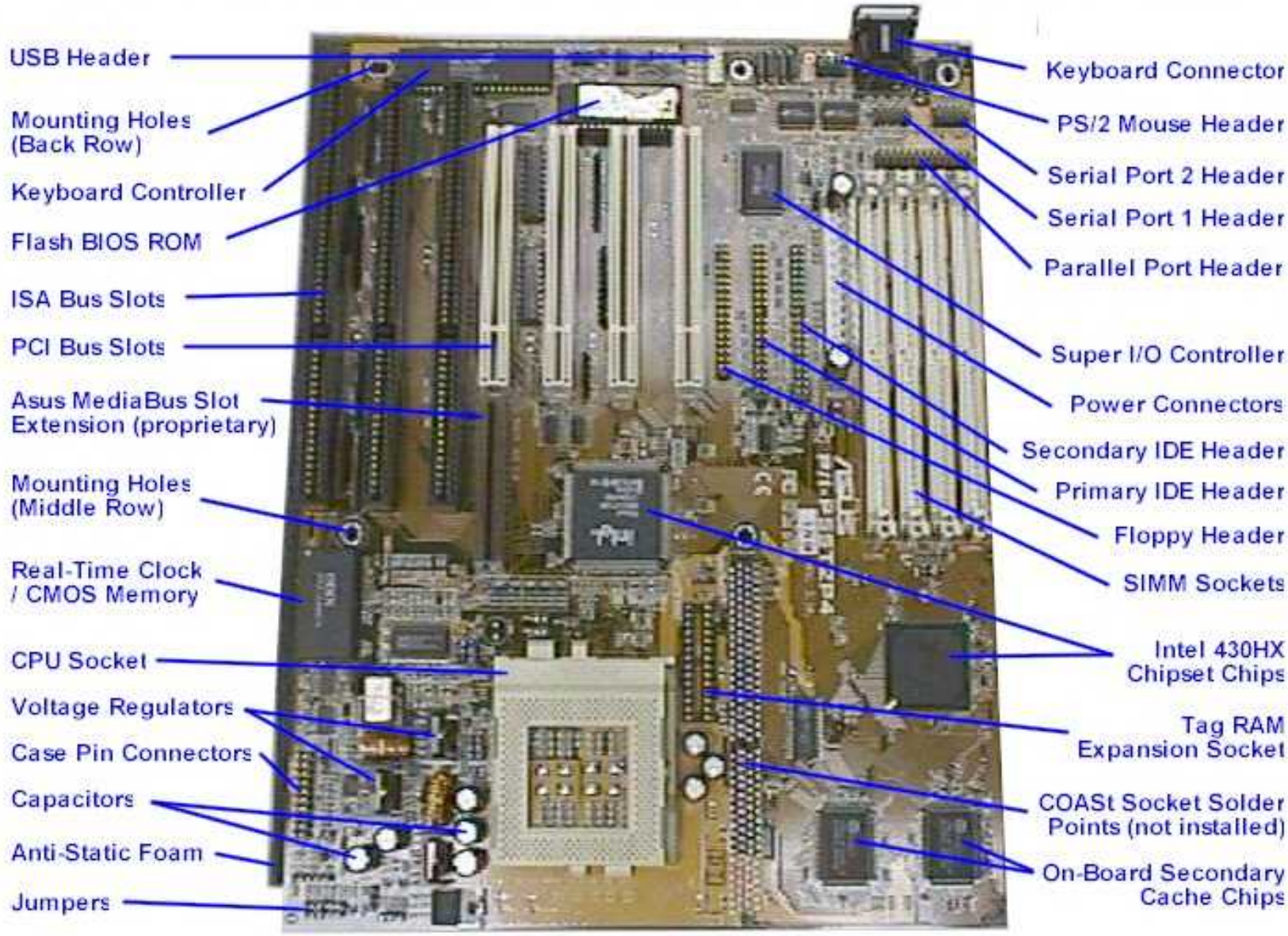
- **PC Bus Architecture**



- **PCI (Peripheral Component Interconnect) Bus**



- **PCI (Peripheral Component Interconnect) Bus**



- **RS-232C Serial Interface**

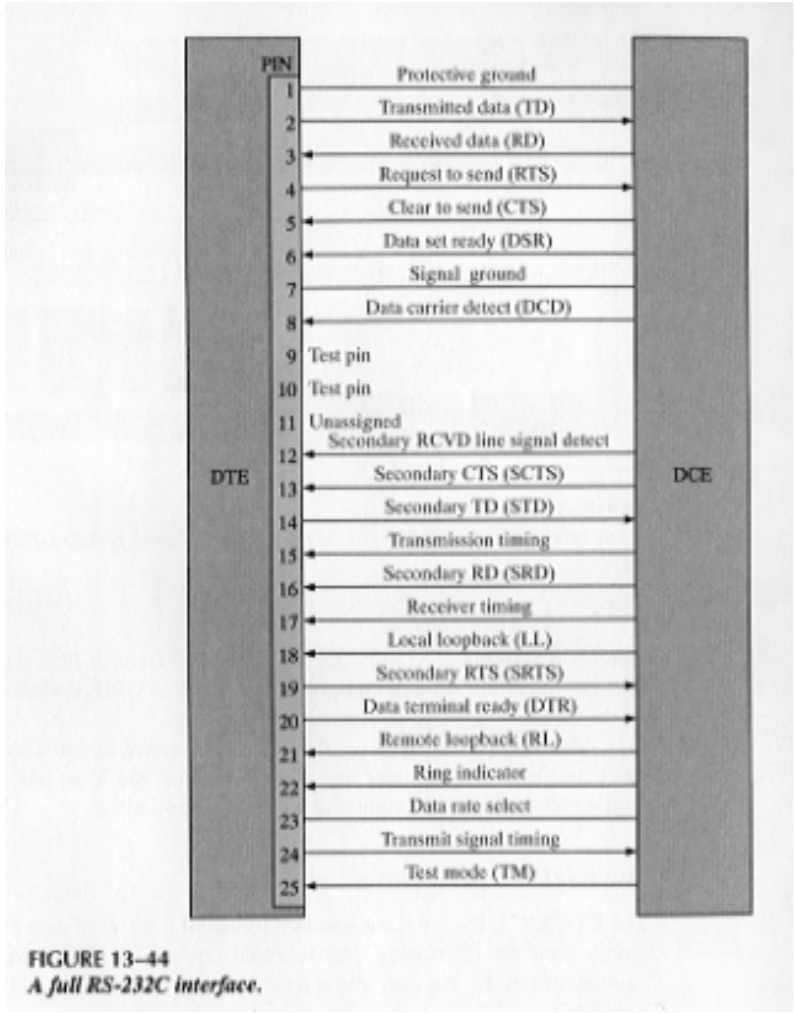
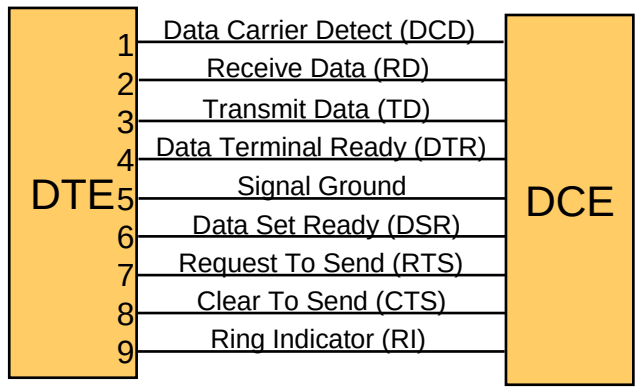
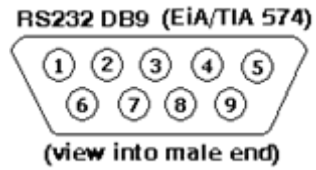


FIGURE 13–44
A full RS-232C interface.





- **USB (Universal Serial Bus)**
  - **Replacement to the RS-232 serial interface**
  - **Higher bandwidth up to 12 Mbps (480Mbps for USB2.0)**
  - **Ability to chain serial devices to one port**
  - **Token packet, data packet, and handshake packet**