Microcomputer Buses

- Outline
  - What is a Bus?
  - Interfaces
  - Open Collector Buses
  - Tristate Buses
  - Bus Contention
  - Transmission Lines
- Goal
  - Understand bus basics
  - Understand bus analysis
- Reading
  - *Microprocessor Systems Design*, Clements, Ch. 10

What is a Bus?

- Bus functions
  - distribute power
  - distribute clocks
  - data transfer
- Standards
  - mechanical
  - electrical
  - protocol
- Challenges
  - cheap - use few wires
  - fast - over long distances
  - good - plug-and-play

Mechanical Interfaces

- Dominant cost factor
- Minimal performance factor
- Band/blade connector
  - gold-plated fingers on edge of PCB
  - push into socket with spring-loaded fingers
  - cheap, but unreliable, low density, board must be vertical
  - today used for daughter cards, e.g. memory modules
- Socket connector
  - half of socket on bus backplane, half on board
  - pin connections
  - reliable, dense, more expensive, variety of orientations
  - used for larger daughter cards, system bus, etc.