Parallel I/O

Uses	Requirements

Uses

Switches (input)

Keypads (input & output)

LED Displays (output)

LCD (input/output & output)

Motors (output)

D/A Converter (output)

Requirements

very application dependent

input, output, or both

ex: clock project
    3 inputs, 28 outputs

ex: AVR clock example
    8 inputs, 13 outputs

ex: blinking LED example
    3 outputs

μC Parallel Ports

Design Issue
  unknown number of inputs, outputs, input/outputs (depends on application)

Solution
  parallel ports have programmable direction
  maximize number of parallel ports

Design Issue
  limited number of pins on microcontroller
  other peripheral devices (serial, timer, SPI, etc.) need pins

Solution
  all multiple uses of pins - use determined by program/application

Examples

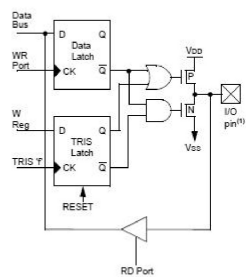| ATMega64	53 I/O pins	most are duplexed
AT91RM9200	94 I/O pins	most are triplexed
CC2652	32 I/O pins	any peripheral can go to any pin

μC Parallel Port Hardware
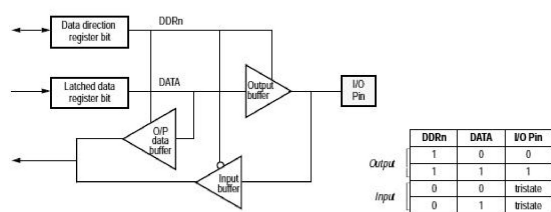
need programmable direction - bit or byte based
latched output
input reads either pin or output register

Examples

PIC I/O Port   68HC05 I/O Port

Parallel I/O Design