

Physics Day: November 9

- 11:30 am-7:00 pm Physics Fair (130 Ph)
- 11:30 am-1:00 pm Recent Graduates Discuss Jobs (Free Pizza) (130 Ph)
- 11:30 am-3:00 pm Lab Tours Start from 130 Ph
- 6:00 pm-7:00 pm More Tours. Cider, Cookies
- 7:00 pm-9:00 pm Physics Force Show (150 Ph)

Various Things

- Complaints about the second test: (a) letting some people not take it; (b) not getting the problems out before the weekend; (c) no problem sets returned
- Third test December 8; second set of problems by December 1

Schedule

- Nov. 6: Electronics
- Nov. 13: Nuclear Physics
- Nov. 20: Particle Physics
- Nov. 27: Particle Physics
- Dec. 4: Cosmic Ray Physics
- Dec. 11: Astrophysics and Cosmology

Analog Circuits

- Most analog circuits are built around amplifiers
- Oscillators use an RLC circuit followed by an amplifier; more precise oscillators use vibrational mode of a quartz crystal
- Sweep circuits use an oscillator to set frequency and then charge an RC circuit
- Modulator circuits use an amplifier. Demodulator circuits use bandpass filters followed by an amplifier.

Physics Instrumentation

- Current trend is to do everything digitally as much as possible
- Digital instrumentation is much easier to calibrate and control distortion: systematic errors at the A/D and D/A converters (quantization error, offset error, non-linearity error)

Phenomenon—Sensor—Preamp—A/D—Computer—D/A—Transducer

Digital Logic

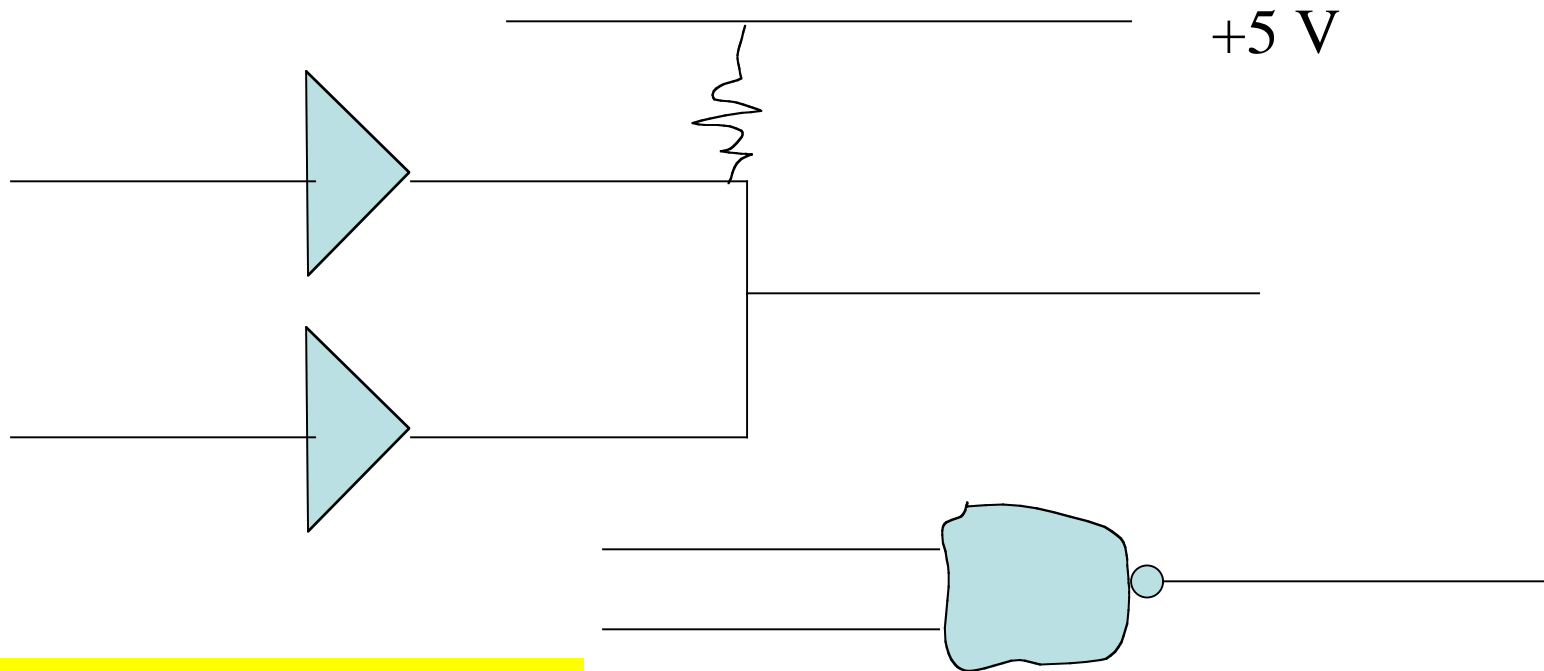
- Based on circuits having binary states:
- Logical States: TRUE and FALSE
- Electrical States: HIGH and LOW
- Different families of digital logic have different voltages defined as HIGH and LOW
- Connection between TRUE/FALSE and HIGH/LOW is arbitrary and can change within a device

Gates

- Whether a gate is a NAND gate or a NOR depends on whether HIGH is TRUE or FALSE.
- H H L T T F F F T
- H L H T F T F T F
- L H H F T T T F F
- L L H F F T T T F

Gates

One amplifier makes
A NOT gate



Gate provides amplification

NOR/NAND gate

RS Flip-Flop

