Course status
Course materials

• Lab access

• Everyone should have
  – lab book
  – proto board
  – voltmeter
  – jumper wires

• Write name on yours
  – maintain -- example battery in voltmeter
Electronics maintenance tips

• Voltmeter has battery
  – turn off when not in use
• Soldering iron corrodes if left on all night
Op amp debugging tips

• Check dc voltage at key pins of op amp chip
  – Pin 4 = -15 V, Pin 7 = +15 V
    • if not, check power supply, grounding
  – Pin 6 (output)
    • if greater than +/- 10 V -- saturated ? -- check inputs
  – Pin 2 (+ input) = ground (or reference voltage)
    • if not, connect
  – Pin 3 (- input) = pin 2
    • if not -- saturated, output load impedance, bad op amp

• Saturated ?
  – Check voltage at each resistor connected to summing junction
    • set to zero ?
    • Feedback path closed ? -- short integrator

• Check ac voltage at pin 6
  – MHz oscillation ? -- add capacitors on power leads
  – above 1 micro Farad -- electrolytic -- observe polarity
Far field test -- mirrors

- Deflect laser beam with mirror
  - send long distance
  - shine on card and mark position
  - test alignment and stability
Iris alignment

- Align optical sub-assembly
  - interferometer?
- Place irises in position
  - one close to second mirror
  - the other far from second mirror
- Disturb input laser beam alignment
- Reset alignment using only input mirrors and irises
  - first center on close iris (1) using mirror 1
  - then center on far iris (2) using mirror 2
  - iterate
Soldering

• Steps to get good joint
  – Melt drop of solder on iron
  – Contact work
  – Flow solder directly on both work pieces
    • can “tin” in advance
  – Last action
    • contact with fresh flux
    • can be in fresh solder

• Too much solder?
  – remove with pump or wick

• Learn to be fast -- heat damage can result