GCC *LaserPro*
Laser Cutter

Overview
- Reads Adobe Illustrator files
- Can cut:
  - along a vector path (for lines, contours, etc)
  - in a raster pattern (for filled areas)

- Can cut a variety of materials
  - Examples: mat board, foam board, balsa wood, plexiglass, some metals
    - **WARNING**: No shiny metals!
      - Laser beam will bounce off it – very dangerous
  - If material too thick, can't cut

- Material must be flat
  - not warped
  - because height of beam above material is important

- Laser beam cuts by heat
  - It burns its way through the material
  - So...
    - Ventilation is crucial!
  - If material burns too much,
    - need to hit red **Emergency** Stop button to stop machine immediately
  - Beam can leave a burn mark on material
    - especially for thicker materials

- Maximum size of material is 18"x24"

Produce your Illustrator file
- Artwork must fit within 18"x24" dimensions
  - Can gang several artworks/drawings together

- For vector cutting
  - Stroke Width = 0.025 pt
  - Fill = NONE
  - (Usually) Stroke color   = Black = 0,0,0

- Any other settings => other operations
  - For example: raster cut, score-but-don't-cut, etc

- You may position your artwork on an Illustrator artboard
  - E.G., in upper left corner
- Alternatively you can position artwork inside GCC menus
  - See details below

DDA Office
- Get keys from DDA office
  - (Deidre has them)
  - One key for door of room
  - One key for GCC machine
  - Ask DDA (Deidre) to call Building Management
    - to turn on the roof fan

Power on GCC Machine and Set up
- Insert machine key into GCC machine
  - top, right side
- Power strip on floor, turn on
- Power on GCC LaserPro
  - right rear, side

- Power on Macintosh

- Turn on ventilation fan by door
  - Turn knob to Hand/1

Position LaserPro
- Lift glass lid
  - Keep it open for now
    - until you are ready to cut
  - **SAFETY FEATURE**:
    Laser beam will not operate while lid is open

- On small GCC panel: down/up arrow buttons
  - to lower bed of cutter
- Manually move laser head out of way if necessary
- Place material on bed

- Manually move laser head over material
  - where you will want to cut
- GCC panel: press Auto Focus
  - Head height adjusts automatically
  - **TIP**:
    - If material too thin (e.g, paper or matte board)
    - Head height will not adjust properly
    - Solution:
      - Place a flat board on bed
      - Place your material on top of that
      - Hit Back button to undo
      - Redo the Auto Focus operation

Inside Illustrator
- Open your Illustrator or EPS file
- Define colors of your line work
    - (Several things I am not clear about here)
    - Color of line will determine how the cut is made
        - (This will be defined later inside GCC menus)
    - **TIP**: GCC seems not to recognize 0 (zero) as a valid number
        - For example, to get red use 255, 1,1 (not 255,0,0)

- **TIP**:
    - Text will be treated as a raster cut
    - To cut it as vector,
        - >Type >Convert to Outlines

- Select all the artwork you want to cut
- **TIP**: Do not group the artwork
        - (I believe groups don't work – not sure)
- With artwork selected, in the tiny "GCC Panel" window of Illustrator,
    - click Export icon
- This opens the GCC menu window inside Illustrator

Prepare the Cutting
- Inside that GCC menu window...

- At bottom left,
    - click Eye icon to see what artwork will be cut
        - as Vector or as Raster

- Top menus:
    - "Pen" tab:
        - Pen1 = Black, 0.025 width = vector cut
        - Set Speed and Power
            - Numbers are percentages
        - Speed: Slower speed = hotter cut
        - Power: Higher power = hotter cut
        - Examples:
            - Speed = 1, Power = 100 => a slow, hot cut
            - Speed = 60, Power = 100 => a quicker and therefore not so hot cut
        - PPI = 400 is a good setting

        - **TIPS**:
            - Can keep Power=100 and change only the Speed
            - Values can be fractional – e.g, 1.5

        - (See table at bottom of this document for suggested settings for different materials)

        - Other pen colors => different kinds of cuts
            - For example, a faster cut to score rather than cut

- "Advance" tab:
  - "Home" = Placement according to your Illustrator layout
    - Most useful when you gang artwork onto one sheet
  - "Center" = you manually position the head over the material
    - Your artwork will be cut there
    - Most commonly used, especially for testing

- When your settings are ready,
  - Hit the tiny Export icon (bottom menu icons)
    - You should get two messages about your file being successfully exported
    - On the GCC machine's panel,
      - the name of your Illustrator file appears

Do a Non-Cutting Test
- Keep the lid of the machine open
  - This prevents the beam from activating
- Confirm that your file's name is showing on the GCC machine panel

- Hit the Start/Stop button

- The cutter head moves over the material
  - at exactly the speed and in exactly the pattern as it will when it cuts,
    - but the beam does not go on, doesn't cut

- If you need to change something in your Illustrator file...
  - On the GCC panel, hit Delete to delete the old file you just tested
  - In Illustrator make your changes
  - In the Illustrator GCC window, hit Export again
  - Re-test

Cut the Material
- When you are ready to cut...

- Close the lid
- Hit Start/Stop button again
  - The head moves, beam is on, beam cuts material

- **WARNING:**
  - If too much smoke or if flames,
  - Immediately hit the round red **Emergency** Panic button
    - on right side of machine
  - This immediately stops the machine
  - To reset this Emergency button,
    - turn it

- If material is not cut all the way through...
  - Without touching your material or the head,
  - Hit Start/Stop again
    - to cut exact same pattern a second time

- and/or

- Change the setting in your Illustrator file, then...
    - ...export again, start again

Assigning different "pens" for different cuts
- (Not sure of the details here)
- Different pens can have different cut settings
    - Examples:
        - Pen1 = black = slow, cut all the way through
        - Pen2 = red = fast, only score the material
    - In the GCC menu:
        - Drag-select a section of your drawing
        - Bottom right, select the pen to assign to it

Finish Up
- When you are finished...
- Open the lid
- Remove your material
- On the little GCC panel
    - Hit Delete
        - to delete your file from GCC's memory

Shutting Everything Down
- Turn off the big fan near the door
- Shut down the Macintosh
- Power off button on the GCC LaserPro
- Power off power strip on the floor
- Return keys to DDA/Deidre

Some Suggested Settings for Cutting Speeds & Powers
- 3/16" FoamCore foamboard
    - To cut: Speed = 1.5; Power = 100
    - To score lightly: Speed = 60; Power = 100

- 1/16" matboard
    - To cut: Speed = 1; Power = 100
    - To score: Speed = 60; Power = 100

- Epson Enhanced Matte paper
    - To cut: Speed = 10; Power = 100
    - To score: Speed = 50; Power = 100