Using Claris CAD To Develop a Floor Plan. High-Technology Training Module.

Medford Area School District, WI.

Office of Vocational and Adult Education (ED), Washington, DC.

15 Oct 89

Developed as part of the High-Technology Training Model for Rural Based Business and Industry, Technical Colleges and Local and State Educational Agencies.

Guides - Classroom Use - Teaching Guides (For Teacher) (052)

MF01/PC01 Plus Postage.

Architectural Drafting; Behavioral Objectives; Classroom Techniques; Computer Assisted Design; Computer Oriented Programs; Computer Science; Computer Science Education; Computer Software; Course Content; Grade 11; High Schools; Learning Modules; Microcomputers; Pretests Posttests; Student Evaluation; Technical Education; Test Items

This learning module for a high school architectural drafting course introduces students to the use of Claris CAD (Computer Aided Drafting) to develop a floor plan. The six sections of the module are the following: module objectives, content outline, teaching methods, student activities, resource list, and evaluation (pretest, posttest). Student activities include information sheets and contain numerous graphics showing symbols and methods. (KC)
High-Technology Training Module

Module Title: USING CLARIS CAD TO DEVELOP A FLOOR PLAN

Unit: SIX

Course: ARCHITECTURAL DRAFTING

Grade Level (s): 11TH GRADE

Developed by: BRUCE PAWLOWICZ & TOM JOHNSON

Date: OCTOBER 15, 1989

School: MEDFORD SENIOR HIGH SCHOOL

1015 WEST BROADWAY, MEDFORD, WI 54451

Developed as a part of the High-Technology Training Model for Rural Based Business and Industry, Technical Colleges and Local and State Educational Agencies under Grant No. V199A90151.
Description
An architectural drafting course in which the student will first develop skills in traditional drawing methods, they will then be used to introduce this module to develop a floor plan using Claris CAD.

Names and school
Bruce Pawlowicz & Tom Johnson
Medford senior High, Medford Wi.
Module objective-
Given a Claris CAD system the student will be able to create a floor plan using proper commands so it conforms to exact standards that were obtained on a standard drawing.

Specific objectives/competencies The student will be able to:
1. Identify the 3 parts to a CAD system.
2. Explain the key elements of miscellaneous input devices.
3. List all of the various manipulation commands.
4. Develop, store & retrieve drawings from a disc.
5. Set up a plotter for loading the media and give the plot command.

Content outline
I. Introduction
   A. Equipment
      1. Input
      2. Processing
      3. Output

II. Tools, methods, and modifiers
   A. Drawing with tools, methods, and modifiers
      1. Pop up choices
      2. Sensitivity ranges of modifiers
      3. Combining tools, methods, and modifiers
III. Dimensions
   A. Creating dimensions
      1. Dimensioning options
      2. Dimensions window

IV. Using Claris CAD to create an assignment
   A. Special Functions
      1. Zooming
      2. Layers
      3. Double lining
      4. Symbols libraries

V. Storing and retrieving
   A. Drawing and retrieval process
      1. Perform manipulation to create a floor plan
      2. Place in storage
      3. Retrieve from storage
      4. Program plotter
      5. Create the hard copy
Methodology:

1. Upon completion of all of the instruction on how to create a floor plan without using a CAD system, the students will be shown the Claris CAD tutorial video cassette.
2. A lecture demonstration will be used to further explain the use of the drawing commands.
3. Students will then be asked to work on the workbook lessons in pairs, using the tutorial program on the computer.
4. The instructor will assist in helping students having difficulty.
5. A written quiz will be given covering material learned from the workbook, video, and the lecture/demo.
6. An assignment will be given on creating a floor plan using the CAD system. Students will work in pairs to create a copy of the floor plan that they made earlier using manual drafting techniques.
7. The instructor will assist in helping students having difficulty.
8. The drawing produced with the CAD system will be evaluated using the same grading criteria as the manually produced drawing.

Activities:

1. Students will take notes during the lect./demo.
2. Students will view the tutorial video.
3. They will complete the workbook lesson on the computer, working in pairs.
4. They will produce a floor plan using the Claris CAD software.
Resources:

1. Claris CAD
2. Claris CAD video tutorial
3. Claris CAD workbook
   (Claris Corporation, 440 Clyde Avenue, Mountain View, California 94043)
4. VCR and Monitor
5. Macintosh II cx computer
6. Overhead transperancies

Evaluation

1. A quiz covering the lecture/demo and the tutorials.
2. Final evaluation of the floor plan.
1. What are the 2 methods for inputting information on a drawing?

2. What are the 2 output pieces of hardware called?

3. What is clicking?

4. What is dragging?

5. Define:
   - Pop up choices-
   - Tools-
   - Methods-
   - Modifiers-
   - Zooming-
   - Symbols libraries-

6. Describe how to store information on a disk.

7. Describe how to print a drawing that has been stored on a disk.
Tips

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Icon" /></td>
<td>Click to change layers</td>
</tr>
<tr>
<td><img src="image2.png" alt="Icon" /></td>
<td>Option-Click to select an object on another layer</td>
</tr>
<tr>
<td><img src="image3.png" alt="Icon" /></td>
<td>Click to switch between the last set zoom level and 100%</td>
</tr>
<tr>
<td><img src="image4.png" alt="Icon" /></td>
<td>Click to zoom out</td>
</tr>
<tr>
<td><img src="image5.png" alt="Icon" /></td>
<td>Click to zoom in</td>
</tr>
<tr>
<td><img src="image6.png" alt="Icon" /></td>
<td>Click then Drag to surround area to be zoomed</td>
</tr>
<tr>
<td><img src="image7.png" alt="Icon" /></td>
<td>Click to make an object transparent or empty</td>
</tr>
<tr>
<td><img src="image8.png" alt="Icon" /></td>
<td>Click to set the zero point</td>
</tr>
<tr>
<td><img src="image9.png" alt="Icon" /></td>
<td>Click to reset the zero point</td>
</tr>
<tr>
<td><img src="image10.png" alt="Icon" /></td>
<td>Shift-Click to select more than one object</td>
</tr>
<tr>
<td><img src="image11.png" alt="Icon" /></td>
<td>Shift-Click to deselect the object</td>
</tr>
<tr>
<td><img src="image12.png" alt="Icon" /></td>
<td>Option-Double-Click to prevent the angle from being smoothed</td>
</tr>
<tr>
<td><img src="image13.png" alt="Icon" /></td>
<td>Command-Drag to show outlines of objects while dragging</td>
</tr>
<tr>
<td><img src="image14.png" alt="Icon" /></td>
<td>Double-Click to zoom in or out on a document to a specific zoom level; type a number and press Enter</td>
</tr>
<tr>
<td><img src="image15.png" alt="Icon" /></td>
<td>Shift-Drag to draw a line at 0°, 45°, 90°, or custom angle</td>
</tr>
<tr>
<td><img src="image16.png" alt="Icon" /></td>
<td>Shift-Drag to draw a square</td>
</tr>
<tr>
<td><img src="image17.png" alt="Icon" /></td>
<td>Shift-Drag to draw a rounded-cornered square</td>
</tr>
<tr>
<td><img src="image18.png" alt="Icon" /></td>
<td>Shift-Drag to draw a circle</td>
</tr>
<tr>
<td><img src="image19.png" alt="Icon" /></td>
<td>Shift-Drag to draw a quarter-circle arc</td>
</tr>
<tr>
<td><img src="image20.png" alt="Icon" /></td>
<td>Shift-Drag to draw a line segment at 0°, 45°, 90°, or a custom angle</td>
</tr>
<tr>
<td><img src="image21.png" alt="Icon" /></td>
<td>Shift-Drag to constrain movement to 0°, 45°, 90°, or a custom angle</td>
</tr>
<tr>
<td><img src="image22.png" alt="Icon" /></td>
<td>Shift-Drag to resize an object proportionally or in one direction only (vertical or horizontal)</td>
</tr>
<tr>
<td><img src="image23.png" alt="Icon" /></td>
<td>Shift-Drag to rotate an object in increments of 0°, 45°, 90°, or a custom angle</td>
</tr>
<tr>
<td><img src="image24.png" alt="Icon" /></td>
<td>Option-Click to scroll through rulers</td>
</tr>
<tr>
<td><img src="image25.png" alt="Icon" /></td>
<td>Option-Shift-Click to scroll through rulers in reverse order</td>
</tr>
<tr>
<td><img src="image26.png" alt="Icon" /></td>
<td>Option-Click to scroll through pen patterns</td>
</tr>
<tr>
<td><img src="image27.png" alt="Icon" /></td>
<td>Option-Shift-Click to scroll through pen patterns in reverse order</td>
</tr>
<tr>
<td><img src="image28.png" alt="Icon" /></td>
<td>Double-Click a tool or modifier to use repeatedly</td>
</tr>
<tr>
<td><img src="image29.png" alt="Icon" /></td>
<td>Option-Click a pattern to draw objects with patterned lines or outlines</td>
</tr>
<tr>
<td><img src="image30.png" alt="Icon" /></td>
<td>Click in Preferences to draw polygons that close automatically</td>
</tr>
<tr>
<td><img src="image31.png" alt="Icon" /></td>
<td>Move an object one pixel at a time</td>
</tr>
<tr>
<td><img src="image32.png" alt="Icon" /></td>
<td>Move an object one gridpoint at a time</td>
</tr>
</tbody>
</table>

ERIC
## Using Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Text</strong></td>
<td>Click and type text (caption text)</td>
</tr>
<tr>
<td></td>
<td>Drag to set margins (paragraph text)</td>
</tr>
<tr>
<td><strong>Lines</strong></td>
<td>1. Drag 2</td>
</tr>
<tr>
<td><strong>Rectangles</strong></td>
<td>1. Drag 2</td>
</tr>
<tr>
<td></td>
<td>2. Drag 2</td>
</tr>
<tr>
<td><strong>Squares</strong></td>
<td>1. Drag 2</td>
</tr>
<tr>
<td></td>
<td>2. Drag 2</td>
</tr>
<tr>
<td><strong>Fillets</strong></td>
<td>Show Location R = radius</td>
</tr>
<tr>
<td></td>
<td>1. Drag 2</td>
</tr>
<tr>
<td></td>
<td>2. Release</td>
</tr>
<tr>
<td></td>
<td>3. Click</td>
</tr>
<tr>
<td><strong>Chamfers</strong></td>
<td>Show Location A = angle L = length</td>
</tr>
<tr>
<td></td>
<td>1. Drag 2</td>
</tr>
<tr>
<td></td>
<td>2. Release</td>
</tr>
<tr>
<td></td>
<td>3. Click</td>
</tr>
</tbody>
</table>
### Using Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rounded Rectangles</td>
<td><img src="image" alt="Rounded Rectangles Diagram" /></td>
</tr>
<tr>
<td>Circles</td>
<td><img src="image" alt="Circles Diagram" /></td>
</tr>
<tr>
<td>Concentric Circles</td>
<td><img src="image" alt="Concentric Circles Diagram" /></td>
</tr>
<tr>
<td>Ellipses</td>
<td><img src="image" alt="Ellipses Diagram" /></td>
</tr>
</tbody>
</table>
## Using Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Circulaz. arcs" /></td>
<td>1. <strong>drag</strong> 2. <strong>release</strong> 3. <strong>click</strong></td>
</tr>
<tr>
<td><img src="image" alt="Elliptical arcs" /></td>
<td>1. <strong>drag</strong> 2. <strong>release</strong> 3. <strong>click</strong></td>
</tr>
<tr>
<td><img src="image" alt="Freehand shapes" /></td>
<td>1. <strong>drag</strong></td>
</tr>
<tr>
<td><img src="image" alt="Splines" /></td>
<td>1. <strong>click</strong> 2. <strong>click</strong> 3. <strong>click</strong> 4. <strong>Double-click to stop drawing</strong></td>
</tr>
<tr>
<td><img src="image" alt="Polygons" /></td>
<td>1. <strong>click</strong> 2. <strong>click</strong> 3. <strong>Double-click to stop drawing</strong></td>
</tr>
<tr>
<td><img src="image" alt="Double lines" /></td>
<td>1. <strong>click</strong> Show Location ( W = \text{width} ) 2. <strong>click</strong> Double-click to stop drawing</td>
</tr>
</tbody>
</table>
Using Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular polygons</td>
<td><img src="regular_polygons.png" alt="Diagram" /> how Location = number of sides drag</td>
</tr>
<tr>
<td>Linear dimensions</td>
<td><img src="linear_dimensions.png" alt="Diagram" /> drag</td>
</tr>
<tr>
<td>Chaining dimensions</td>
<td><img src="chaining_dimensions.png" alt="Diagram" /> drag release click (dimension text appears at point 3)</td>
</tr>
<tr>
<td>Datum dimensions</td>
<td><img src="datum_dimensions.png" alt="Diagram" /> drag release click (dimension text appears at point 3)</td>
</tr>
<tr>
<td>Angular dimensions</td>
<td><img src="angular_dimensions.png" alt="Diagram" /> drag release click (dimension text appears at point 3)</td>
</tr>
<tr>
<td>Diametral dimensions</td>
<td><img src="diametral_dimensions.png" alt="Diagram" /> drag release (dimension text appears at point 2)</td>
</tr>
<tr>
<td>R dial dimensions</td>
<td><img src="r_dial_dimensions.png" alt="Diagram" /> drag release (dimension text appears at point 2)</td>
</tr>
<tr>
<td>Circle center marks</td>
<td><img src="circle_center_marks.png" alt="Diagram" /> click or drag (to rotate center mark)</td>
</tr>
</tbody>
</table>
### Using Tool Modifiers

<table>
<thead>
<tr>
<th>Select</th>
<th>Press</th>
<th>To Locate</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td></td>
<td>a point with <strong>No modifier</strong></td>
</tr>
<tr>
<td>📏</td>
<td></td>
<td>an <strong>End point</strong> on an object</td>
</tr>
<tr>
<td>🗺️</td>
<td></td>
<td>the <strong>Center</strong> of an object</td>
</tr>
<tr>
<td>⛔️</td>
<td></td>
<td>an <strong>Intersection</strong> of two objects</td>
</tr>
<tr>
<td>🧔</td>
<td></td>
<td>an invisible intersection (junction) of two converging objects</td>
</tr>
</tbody>
</table>

### Using Geometric Constraint Modifiers

<table>
<thead>
<tr>
<th>Select</th>
<th>Press</th>
<th>To Locate</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td></td>
<td>force a line to be <strong>Perpendicular</strong> to an object</td>
</tr>
<tr>
<td>T</td>
<td></td>
<td>force a line to be <strong>Tangent</strong> to an object</td>
</tr>
<tr>
<td>O</td>
<td></td>
<td>create an object that is <strong>Offset</strong> (parallel or concentric) to an existing object</td>
</tr>
</tbody>
</table>

### Using Selection Tool Modifiers

<table>
<thead>
<tr>
<th>Select</th>
<th>Press</th>
<th>To Locate</th>
</tr>
</thead>
<tbody>
<tr>
<td>🔨</td>
<td>Click</td>
<td><strong>Resize</strong></td>
</tr>
<tr>
<td>≈</td>
<td>Click</td>
<td><strong>Trim</strong></td>
</tr>
<tr>
<td>🔧&lt;R</td>
<td>Drag handle</td>
<td><strong>Reshape</strong></td>
</tr>
<tr>
<td>🔨&lt;N,R</td>
<td>Click</td>
<td><strong>Rotate</strong></td>
</tr>
<tr>
<td>🔧&lt;N,R</td>
<td>Hold down Command, position pointer, press mouse button, position axis, release mouse button</td>
<td><strong>Mirror</strong></td>
</tr>
</tbody>
</table>

*Hold down Command, position pointer, press mouse button, position axis, release mouse button*
Location Bar

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
<th>H</th>
<th>V</th>
<th>A</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>-2&quot;</td>
<td>-1.0139</td>
<td>-0.9861</td>
<td>224.204</td>
<td>1.4144&quot;</td>
</tr>
</tbody>
</table>

Location bar parameters that appear with tools, positional modifiers, or selection tool modifiers:

- **W**: Sets width for double line tool
- **S**: Sets number of sides for a polygon or the number of segments to be trimmed with the trim tool
- **R**: Sets radius for circle, circular arc, and fillet
- **D**: Sets the diameter for circle and concentric circle
- **%**: Sets the percent for percent tool modifier

Setting Up a Document

- **Change document size**: Layout
  - Drawing...
- **Select page size and orientation**: File
  - Page Setup...
- **Show or hide rulers**: Layout
  - Show/Hide Rulers
- **Show or hide page breaks**: Layout
  - Show/Hide Page Breaks
- **Show or hide gridlines**: Layout
  - Show/Hide Gridlines
- **Turn Autogrid on or off**: Layout
  - Turn Autogrid On/Off
- **Place grid in front of objects**: Layout
  - Preferences...
- **Change rulers**: Layout
  - Rulers...
- **Set mouse constraint**: Layout
  - Preferences...
- **Set Y axis**: Layout
  - Preferences...

- **Select an arrowhead style**: Pen
  - Arrows...
- **Select a dashed line style**: Pen
  - Dashes...
- **Select pen sizes**: Pen
  - Pens...
- **Add specific font and font size to Font menu**: Font
  - Set Style (Choose a font, font size, and style first)
- **Show or hide Show Location bar**: Layout
  - Show/Hide Location
- **Show or hide tool modifiers**: Layout
  - Show/Hide Modifiers
- **Show or hide pattern palette**: Layout
  - Show/Hide Patterns
- **Choose a drawing standard**: Layout
  - Drawing...
- **Choose dimensioning specifications**: Layout
  - Show/Hide Dimensions
Using a Symbol Library

Add an object to a document's library
Select the object
Arrange Library...

Open a library document
File
Open As Library...

Place a library object in a document
Click library object name in the Library window
Edit
Copy and
Click in document
Edit
Paste

Working With Layers

Work with objects on several layers
Layout
Preferences...

Create a new layer
Layout
Layers... New

Activate a different layer
Layout
Layers... Double-Click Layer Name
Or Click ▲ or ▼ layer controls

Display a hidden layer
Layout
Layers... Click a layer name Show

Hide a layer
Layout
Layers... Click a layer name Hide

Delete a layer
Layout
Layers... Click a layer name Delete

Select an object on a different layer
Option Click
**Tools With Pop-Up Choices**

- Selection Arrow
- Text
- Line
- Rectangle • Square
- Fillet • Chamfer • Rounded rectangle
- Circle • Concentric circle • Ellipse
- Circular arc • Elliptical arc
- Freehand shape • Spline curve
- Polygon • Double line • Regular polygon
- Linear dimension • Chain dimension • Datum dimension
- Angular dimension
- Diametral dimension • Radial dimension • Circle center

**Modifiers**

- Any point
- End point
- Center
- Intersection
- Invisible intersection
- Point on
- Corner
- Percent
- Perpendicular
- Tangent
- Offset

**Methods With Pop-Up Choices**

- End-point-to-end-point • Center-to-end-point • Construct:
- Corner-corner • Center-corner • Three-corner • Center-edge-corner
- Two-point • Three-point
- Two-point • Three-point
- Center-edge • Edge-edge • Three-edges • Radius-edge-edge
- Center • Lower • Upper
- Center-edge • Center-vertex
- Two-point • Three-point
- Three-point • Four-point

**Selection Tool Modifiers With Pop-Up Choices**

- Resize • Trim • Reshape • Rotate • Mirror