Robo CAD-2

Enhanced drafting software for Apple *IIe* and *II+*

Many new features

Robo Systems announces CAD-2, a new software package with all the features of CAD-1, plus **auto-dimensioning** and **numerical data entry** utilities which greatly simplify technical drafting work. These powerful new features enable you to:

- **Choose** English or Metric dimensioning, or both on the same drawing.
- **Enter** line length, arc, and circle radii with six-figure precision, direct from the keyboard or numeric keypad.
- **Set** angles to degrees, minutes and seconds.
- **Measure**, instantaneously, line length and angle, sweep of arc, arc and circle radii.
- **Annotate** lines and other features with their computed dimensions, automatically.
- **Define** the precision, or applicable manufacturing tolerance, of each measurement.
- **Find**, and draw connecting lines to, **any** previously-drawn element with a precision better than 1 **millionth** of an inch in 10,000 feet.
- **Specify** in inches the desired height of plotted text, regardless of paper size.

Find out more about CAD-2! It takes all the hard work out of architectural and engineering drafting with your computer.

Upgrade your CAD-1 to CAD-2

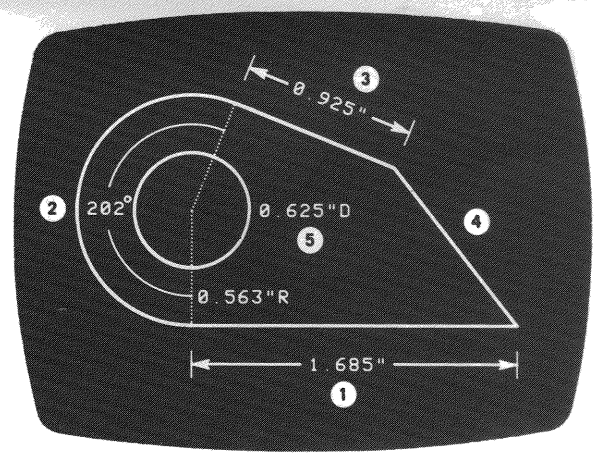
There's no need to re-draw your CAD-1 material! CAD-1 drawings are perfectly compatible with the CAD-2 system. Upgrade kits are available to convert CAD-1 systems to CAD-2 specifications.

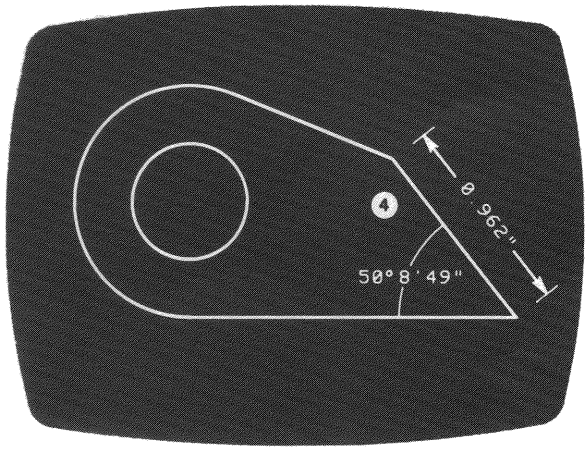
The CAD-2 package is available now

It includes:

- A **Precision Controller** (same as for CAD-1).
- CAD-2 **Interface Module** (locates in the Games I/O connector on the Apple motherboard).
- CAD-2 **System Software.**
- A **128K RAM Board** (locates in one of the I/O slots on the Apple motherboard).
- An **Introductory Library Disk**.
- Complete **Tutorial Documentation.**

You can buy CAD-2 (or the upgrade kit) without the extra RAM, but note that the system will only run with a Titan Technologies 128K RAM Board, or an exact equivalent. CAD-2 does not use the Apple Extended 80-column Text Card.





Design The Part

1. Specify this line with up to six-figure precision.
2. Specify sweep angle of this smoothly blending arc in degrees, minutes and seconds, if required.
3. Set the vector for this line with the 'auto-tangent' feature.
4. Make point-to-point connections like this, automatically.
5. Set this circle concentric with the arc, automatically.

Measure And Annotate

CAD-2 comes with powerful trig-function capabilities. Use them to calculate the missing data, instantly! To measure an unknown feature, such as 4, select the DIMENSION mode, then plant cursors at the line ends. You can now choose **any** of the following parameters: overall **length**; X or Y **components** of length; **angle** relative to the horizontal. In a similar way, you can measure **radius** and **sweep** angle of arcs, and **diameter** of circles. To enter the chosen value on the drawing, simply push one button on the controller! Draw in ft/ins, measure in m/mm, or vice versa.

Draw faster, more productively with CAD-2

Screen view
This is the width of the displayed 'window'. It can range from 0.001 inches to almost 100,000 feet, depending on your choice of base-page size, and the degree of ZOOM in effect.

Grid spacing
Reports the distance between adjacent grid points along the X (horizontal) axis.

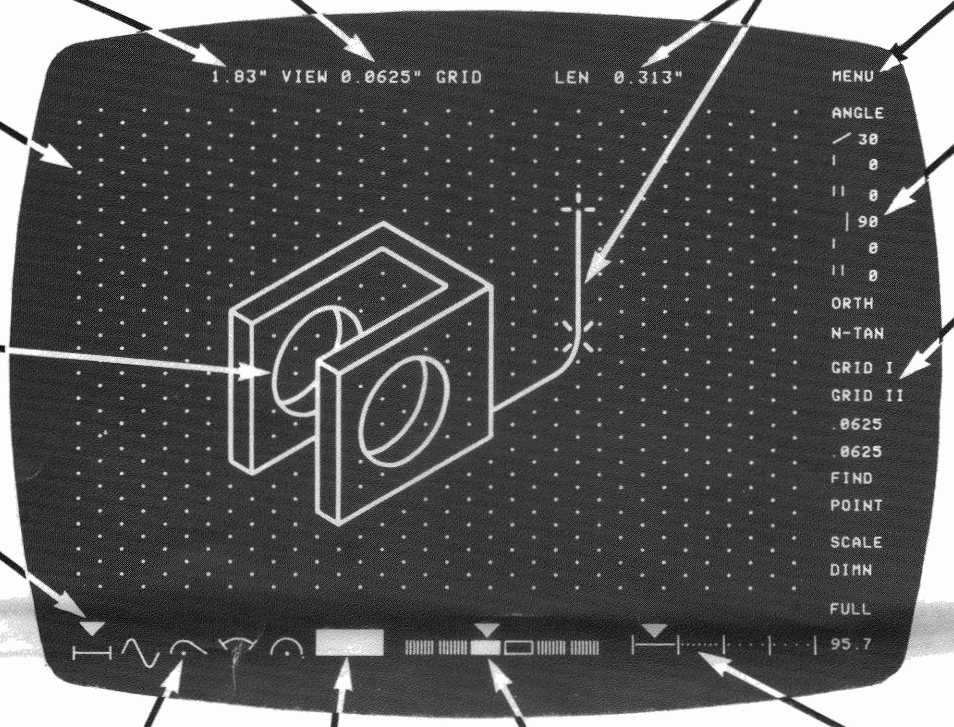
Line length
Dynamically reports the distance between the 'x' and + drawing cursors. + is the end-point; it moves as the joystick moves, pulling the rubberbanded line behind it. If the drawing element is an arc, radius and sweep angle are reported; if a circle, the diameter is displayed

Precision drafting aids
This is one of two 'on-line' menus. Switch from one to the other by pointing with the joystick.

Programmable snap grid
In this **isometric** example, the X (horizontal) axis has been rotated through 30°. With ANGLE locks the X and Y axes can be skewed independently or, with the N-TAN vector lock, rotated together.

Ellipses
Can be drawn directly on a skewed grid, using auto-blending arcs.

Mode selection
Point with the joystick to select from the drawing palette and menus. Bright-up tokens mark the chosen element or mode.



Angle locks
Two independent 'ramp' locks, each settable with second-of-arc precision.

Grid spacing control
Set the X and Y axis spacings **independently** Here, both are 0.0625" (1/16"). GRID II is **movable**; it can be bodily shifted to lock onto any chosen point.

5 drawing elements
Choose from straight line, blending arcs, compass arc, and circle. All are displayed **dynamically**, changing in size and position as the joystick is moved.

Area fill
Selectable-pitch cross-hatching.

Line color
Draw in 6 colors. When plotting, use these colors to program pen changes.

Line type
Choose from continuous line or variably-spaced dotted lines.

Dynamic reporting

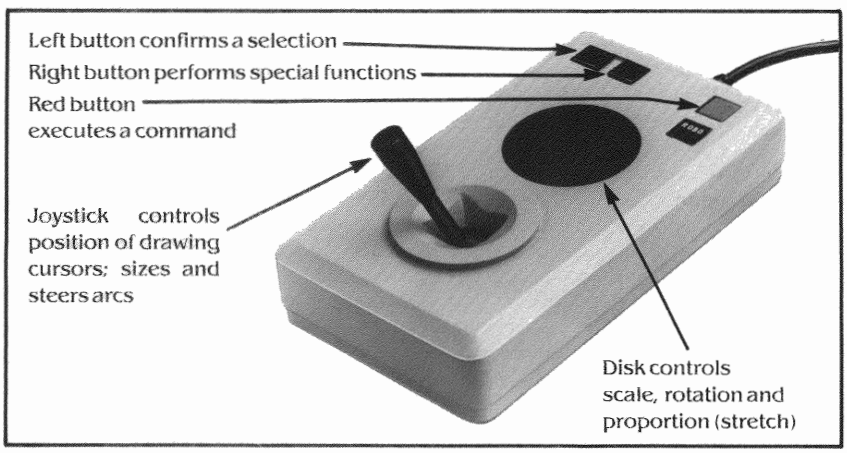
With CAD-2, the drafting tools you need are there in front of you, all the time. Check the system status at a glance. With CAD-2 you simply 'point to select' from the on-screen menu and drawing palette. There is instant feedback as your drawing progresses – all changes in line length, arc radius, sweep angle, etc., are continuously reported, allowing you to verify point-to-point dimensions as you go.

Interactive drawing

With CAD-2, **all** drawing elements are 'rubberbanded', changing in size and position as the joystick moves. This is true real-time image manipulation, a great aid in visualizing design changes and graphics effects. You can make as many trial constructions as you wish; then, when you have the desired effect on the screen, confirm it with a single button-push. That's drafting with CAD-2!

A powerful new way to draw

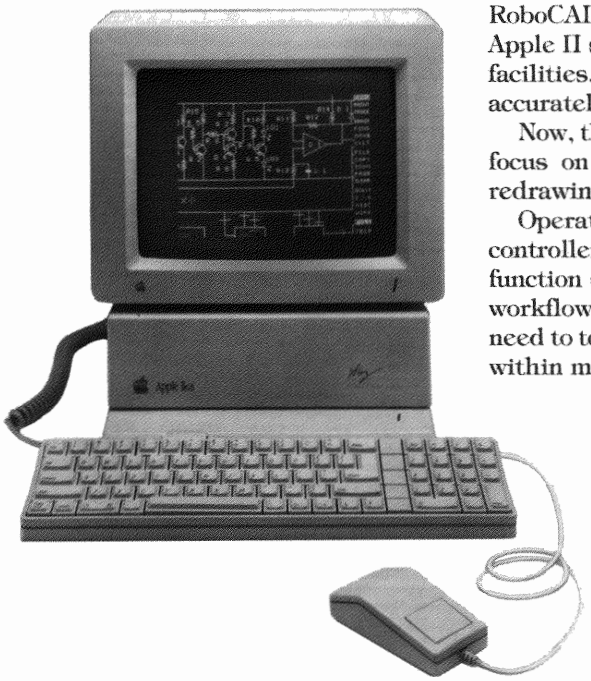
The Robo joystick controller, right, is a complete drafting instrument. It provides **all** the functions you need to generate precision artwork, faster and more fluently, than with any other CAD system. Because the joystick serves both as drawing instrument and menu function selector, you can draw – with snap-grid accuracy – entirely without keystroke commands. Anytime your project requires six-figure precision, you can place the drawing element freehand to visualize the effect, then enter line length, arc or circle specifications direct from the keyboard.



ROBO SYSTEMS CORPORATION / 111 Pheasant Run / Newtown, Pennsylvania 18940 / 215-968-4422

Robo CAD-2

Professional drafting and graphics system



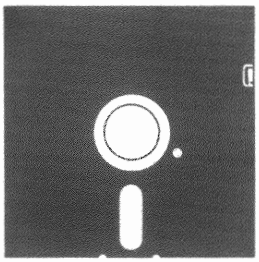
RoboCAD is a milestone in microcomputer technology. Installed in any Apple II series computer, it provides an outstanding range of technical facilities. It is functional, productive, and fast. RoboCAD draws accurately and effortlessly.

Now, the design engineer, architect, draftsperson and illustrator can focus on the creative design and leave the drawing, erasing, and redrawing tasks to the computer.

Operating RoboCAD is effortless. Use either the unique, precision controller, or the Apple Mouse, as both the drawing instrument and the function selector. There are no keystroke commands to interrupt the workflow. Once the program has been loaded, there is practically no need to touch the computer again. You can be creating perfect linework within minutes of installation.

Create the design, modify it anytime

Draw straight lines, arcs, circles, cross-hatch, add color... erase, re-position, erase again, add text, all without touching a pencil! RoboCAD is a drawing processor -- just like a word processor, it takes all the effort out of editing.



Store the image

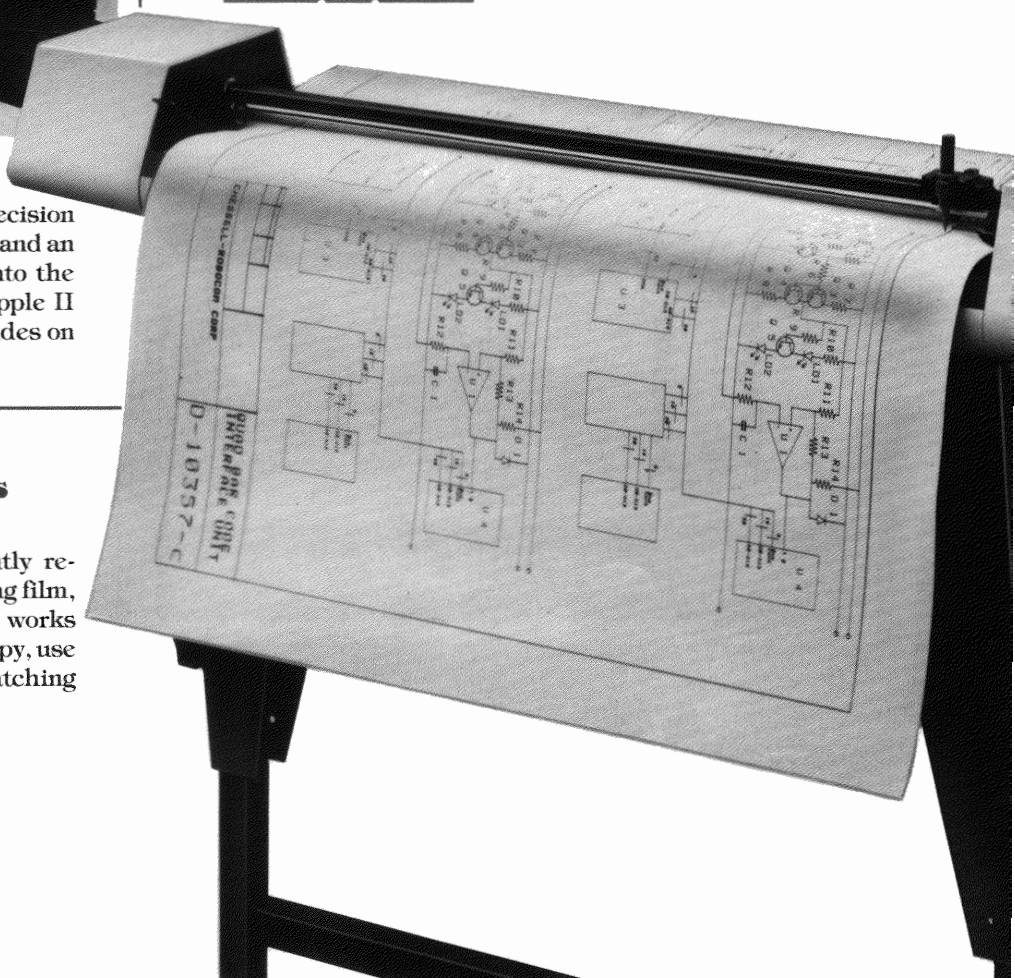
When your design is complete, save it on diskette. Display it time and again, now, next day, next year. Modify it if needed, then store it again. Like tape recorded music, the image remains on the diskette until it's purposely erased.

The CAD-2 package

The CAD-2 package includes a precision controller, software, user manual, and an interface module which plugs into the 16-pin games connector on the Apple II computer. The entire system resides on a single 5-1/4 in floppy diskette.

Output your drawings to a plotter

Your drawings can be permanently recorded on paper, vellum, or drafting film, using a pen plotter -- RoboCAD works with all popular units. For proof copy, use a dot-matrix printer with a matching "graphics screen dump" card.



RoboCAD-2

Professional Graphics Library Diskettes

Pre-drawn graphics for use with Robo CAD1, 1+, and 2.

The Robo Professional Graphics Library contains pre-drawn material for many drawing applications including sign making, engineering, schematics, and graphics for business and education. All the library elements were produced using the RoboCAD system for the Apple II series computers.

Robo pre-drawn library elements are a great time saver. Carefully drafted to a uniformly high standard, they can be instantly changed in size and orientation, stretched or compressed, and drawn in the color and line-style you choose. They can also be personalized to your exact requirements.

The Robo library gives you all the advantages of dry transfer lettering systems, without their one great drawback... because each library element can be used over and over again, you will never find yourself out of a crucial letter or symbol!

Each library diskette comes with a pictorial catalog of contents, and where necessary, instructions for use.

Several sample libraries are illustrated, right. The full range also includes:

Sample Drawings	Diskette Volume	Order Number
Introductory Library	253	2615
Sample Drawings	008	2616
Sample Drawings	009	2617
Sample Drawings	010	2618
Sample Drawings	019	2619
Sample Drawings	021	2620
Sample Drawings	253	2621
Typefaces		
Futura	221	2085
City	222	2086
Helvetica	223	2087
Times	224	2324
Schematic Symbols		
Analog & Digital	226 & 227	2236
Fluid Power	230	2091
Chemical Engineering	231	2092
Graphics		
Chart Symbols I&II	245 & 246	2093
World Maps	248	2094
Architecture		
Architectural I & II	250 & 251	2428
Electrical Symbols I&II	252 & 253	2432
Printed Circuit		
Printed Circuit Artwork	228	2090

Futura Alphabet

Library disk No. 221

A modern sans serif alphabet drawn in outline. The characters can be set at any size, rotation, compression and color.

ABCabc123&

City Medium Alphabet

Library disk No. 222

A modern sans serif alphabet in both outline and solid. The characters can be set at any size, rotation, compression and color

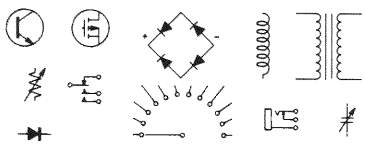
ABCabc123&?

ABCabc123&?

Analog Schematic Symbols

Library disk No. 226

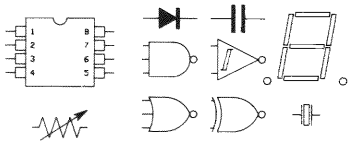
Analog schematic symbols in general use in the U.S.A. Includes transformers, relay contact sets and multi-way switches.



Digital Schematic Symbols

Library disk No. 227

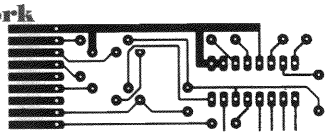
Logic symbols in general use in the U.S.A. Includes seven-segment displays and I.C. package outlines



Printed Circuit Board Artwork

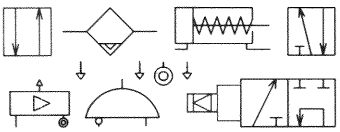
Library disk No. 228

A complete, easy-to-use system for preparing prototype P.C.B. artwork and silk-screen artwork for component references and solder-resist masks.



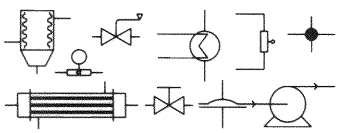
Fluid Power Schematic Symbols

Library disk No. 230



Chemical Engineering Process Symbols

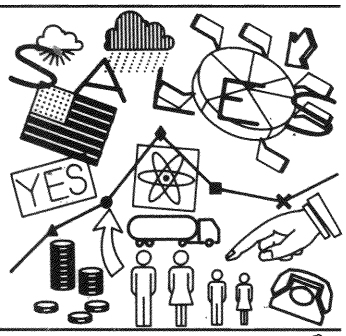
Library disk No. 231



Business Graphics

Library disk Nos. 245 and 246

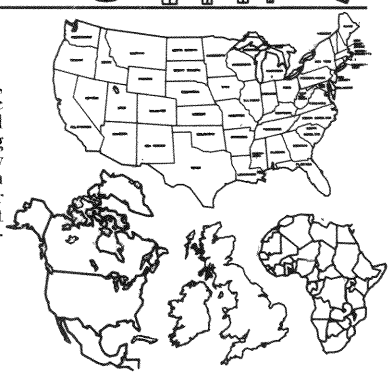
A large selection of symbols for added sparkle and impact in business and classroom presentations. The accompanying guide illustrates many new ideas for memorable, exciting graphics.



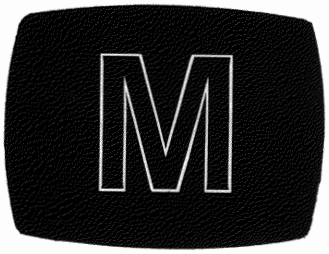
World Sketch Maps

Library disk No. 248

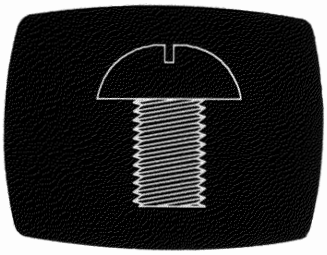
Sketch maps of Europe, the Americas, Africa, Australia and Japan. Each state in the U.S.A. is drawn separately, and can be combined with its neighboring states to produce a detailed map of any chosen region. The maps are drawn mostly to a level of detail suitable for plotting on B-size (11"x17") paper, but the user can add further detail by zooming.



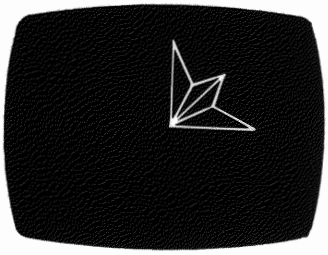
Draw it once! Store it! Use it again!



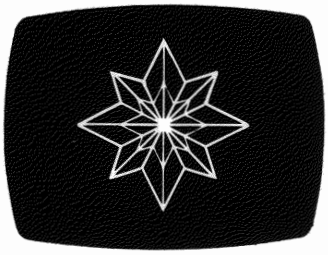
Create your own typefaces! Store them on the library disk.



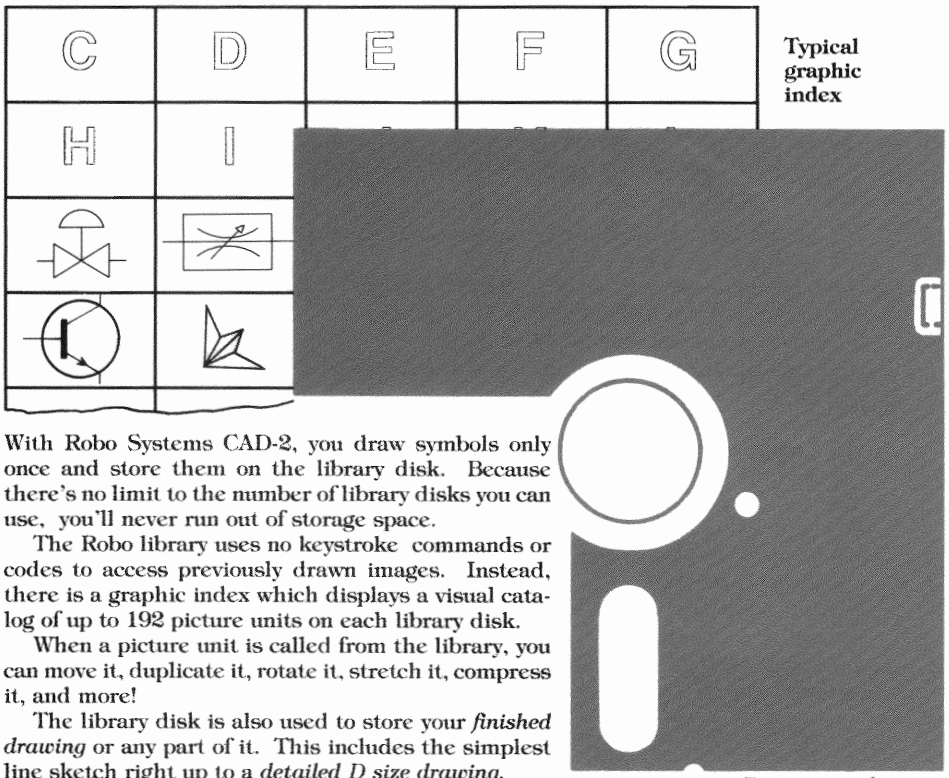
Draw each symbol once, then store it on the library disk. The library becomes your personalized drawing template.



For a symmetrical drawing, draw one quadrant only, then store it on the library disk.



Mirror images
Mirror an image around the X and Y axes for perfect symmetry.



Typical graphic index

With Robo Systems CAD-2, you draw symbols only once and store them on the library disk. Because there's no limit to the number of library disks you can use, you'll never run out of storage space.

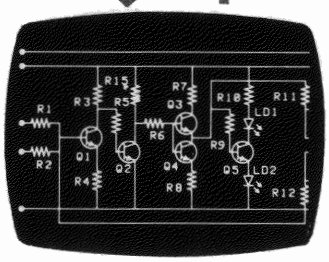
The Robo library uses no keystroke commands or codes to access previously drawn images. Instead, there is a graphic index which displays a visual catalog of up to 192 picture units on each library disk.

When a picture unit is called from the library, you can move it, duplicate it, rotate it, stretch it, compress it, and more!

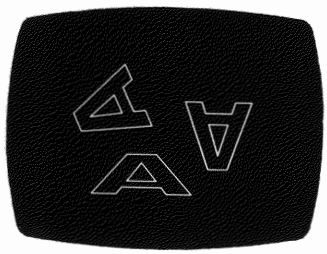
The library disk is also used to store your *finished drawing* or any part of it. This includes the simplest line sketch right up to a *detailed D size drawing.*

Recall symbols

File drawing



Assemble schematics
Assemble schematics by repeating symbols. Pan across the drawing for rapid, perfect interconnections.



Recall a picture unit
Select the size, orientation, and proportion of the picture unit recalled from the library.

CAD-2 System Features

Drawing functions:
Straight line, arc, circle, text, nib, and trace, cross hatch patterns or fill. Set color, and line style.

Editing functions:
Erase, find, move, duplicate, exchange, change color, change line style.

Library functions:
File, load, copy, and label.

View functions:
Zoom, shrink, pan, page.

Precision Toolkit functions:
Angle lock, orth lock, N-Tan lock, grid lock, X-flip and Y-flip.

Scale drawing functions:
Scale grid, page scale, copy scale.

Plotting functions:
Load, display, zoom, change line style, change color, set scale factor, plot to scale, to size, to fill the paper, or on a part of the paper.

Hardware:
Apple II+, Apple IIe, or Apple IIGS computer with at least 64K of memory, and a Titan Technologies 128K RAM card -- no substitutes! This can be purchased from your Robo Systems dealer. At least one 5-1/4" diskette drive, and either the Robo Systems precision 3-axis controller, supplied with the CAD-2 system, or an Apple Mouse. Slightly different versions are also available for the Apple IIc and Laser 128 computers.

To plot you will need a suitable serial or parallel card and cable, configured for your plotter.

To print, you will need a serial or parallel card, as required by your printer, with graphics screen dump ability. A "Grappler" or similar card will work well. A plain serial card, such as the Apple Super Serial, will NOT produce graphics on your printer from RoboCAD. Of course, your printer must have graphics capabilities.

Consult your dealer for more information.

RoboCAD-2

Enhanced drafting software for Apple II series computers

Many additional features

Robo Systems CAD-2 software package has all the features of our popular CAD-1 package, plus advanced auto dimensioning, numerical data entry, window-based FIND, and cross-hatch pattern fill. These utilities greatly simplify technical work, and enable you to:

- Choose either English or metric dimensioning,or use both on the same drawing.
- Enter line length, arc, and circle radii with six-figure precision, direct from the keyboard or numeric keypad.
- Set angles to degrees, minutes and seconds.
- Measure, instantaneously, line length and angle, sweep of arc, arc and circle radii.
- Annotate lines and other features with their computed dimensions, automatically.
- Define the precision or implied manufacturing tolerance of each measurement.
- Find, and draw, connecting lines to any previously drawn element with a precision better than 1 millionth of an inch in 10,000 feet.
- Specify in inches the desired height of plotted text, regardless of paper size.

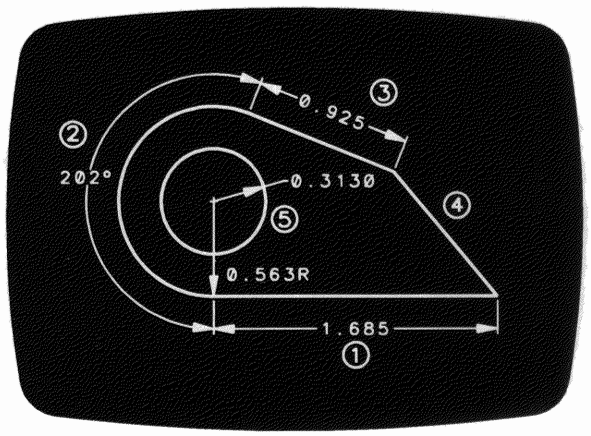
Find out more about CAD-2! It takes all the hard work out of architectural and engineering drafting with your computer.

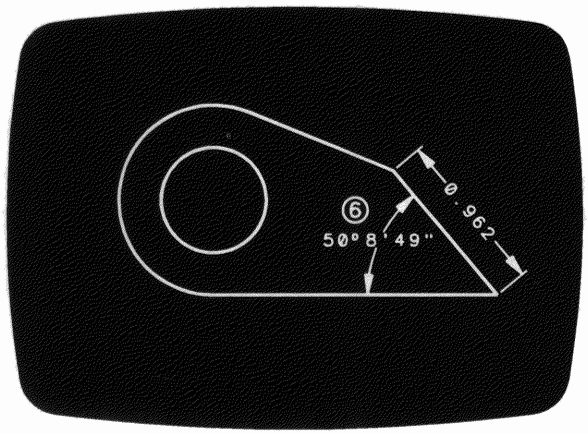
Upgrade your CAD-1 to CAD-2

If you already have a CAD-1 or CAD-1+ system, you can convert to CAD-2 specifications with an upgrade kit. Better yet, there's no need to re-draw your CAD-1 material - CAD-1 drawings are fully upwards compatible with the CAD-2 system. But note that CAD-1 cannot use CAD-2 drawings.

Moving from an Apple II to an IBM-PC or compatible?

Ask your dealer about RoboCAD and RoboSOLID for these computers. These are powerful, "industrial strength" design tools, widely used by leading manufacturers. By far the easiest to use CAD system available for the more powerful MS-DOS computers, RoboCAD can be learned -- fully -- in only a few hours. Your Robo Apple CAD drawings can be transferred and used, too. Also consider RoboSOLID - more than 3-D, RoboSOLID actually "constructs" a model of your design in the computer memory. The model is fully dimensioned, and can be weighed too! Best of all, RoboSOLID shares RoboCAD's easy to learn philosophy.





Design The Part

❶ Specify this line with up to six-figure precision.

❷ Specify sweep angle of this smoothly blending arc in degrees, minutes and seconds, if required

❸ Set the vector for this line with the 'auto-tangent' feature.

❹ Make point-to-point connections like this, automatically.

❺ Set this circle concentric with the arc, automatically.

Measure And Annotate

CAD-2 comes with powerful trig-function capabilities. Use them to calculate the missing data, instantly! To measure an unknown feature, such as ❻, select the DIMENSION mode, then plant cursors at the line ends. You can now choose any of the following parameters: overall length; X or Y components of length; angle relative to the horizontal. In a similar way, you can measure radius and sweep angle of arcs, and diameter of circles. To enter the chosen value on the drawing, simply push one button on the controller! Draw in ft/ins, measure in m/mm, or vice versa.

ROBO SYSTEMS INTERNATIONAL INC.

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RoboCAD-2
in education

RoboCAD-2 is the CAD system that educators choose four times out of five for the Apple II series computers. With over **50,000** installations in use world-wide, and estimated **1,000,000** students have received their introduction to CAD on an Apple running RoboCAD! No other CAD system is as widely used on the Apple as RoboCAD, and it's used at all levels - Intermediate, Junior High, and High schools; Vocational Education and Community Colleges; and Universities as well. When you choose RoboCAD-2 for your educational needs, you get a drawing system that's:

- **Powerful and complete** - all the functions you need to make your drawings are included, but in only two, carefully constructed, menus.

- **Easy to teach** - the small number of commands means a minimum of time is spent learning how to use RoboCAD. You can concentrate on teaching Computer Aided Drafting - not on learning how to program computers. And curriculum materials are available.

- **Easy to learn** - great care has been taken to harness the power of the CAD system, and present it simply. Students are drawing in the first hour, and have typically mastered the system in as little as three hours. Contrast this with other systems which are so complex that in an entire ten-hour semester not even the full command set can be covered.

- **Student work book** - a complete classroom text on mastering computer aided drafting, by two professors at the State University of New York.

- **Supported in the classroom** - self-paced audio cassettes, drawing exercises, High School CAD Implementation thesis, lesson plans, evaluation forms, pre-drawn library examples, and more. Useful both for learning RoboCAD, and for teaching it.

- **Backed by Robo Systems** - Robo Systems, and your Robo dealer, provide the best after-sales service and support in the industry - bar none. Just call your dealer, or Robo's toll-free technical help line, for speedy, sympathetic, service.

Other Robo Systems Products
to complement your CAD-2

RoboVIEW - is a 3-D wireframe modeling and visualization package for Apple II series computers. With RoboVIEW you can take a floorplan drawn in RoboCAD, define the heights of the walls, and create a house. You can make furniture too. View the wire-frame construction from any angle, and control the viewing angle and magnification with the "Zoom Lens" you view the scene through.

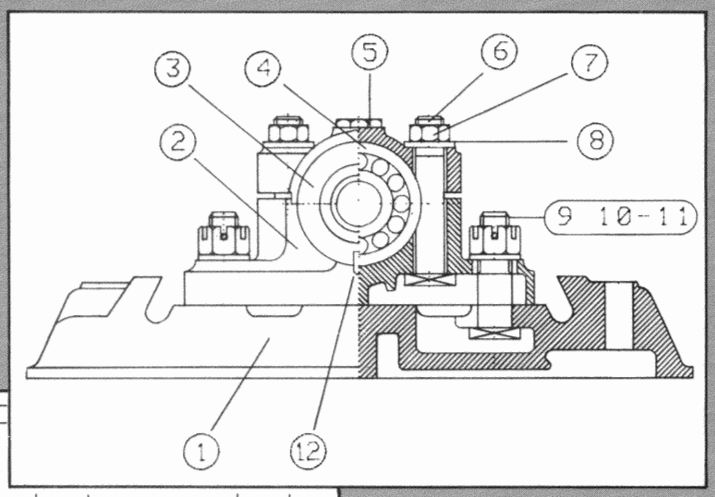
RoboDATA - is a program that lets you link text data to library drawings. Then, any drawing using those library drawings can be processed to extract, and report on, that information. Thus a drawing of an office, with chairs, tables, desks - even telephones - can be processed to give a report listing how many of each furnishing is present, and total how much it would cost to furnish the office.

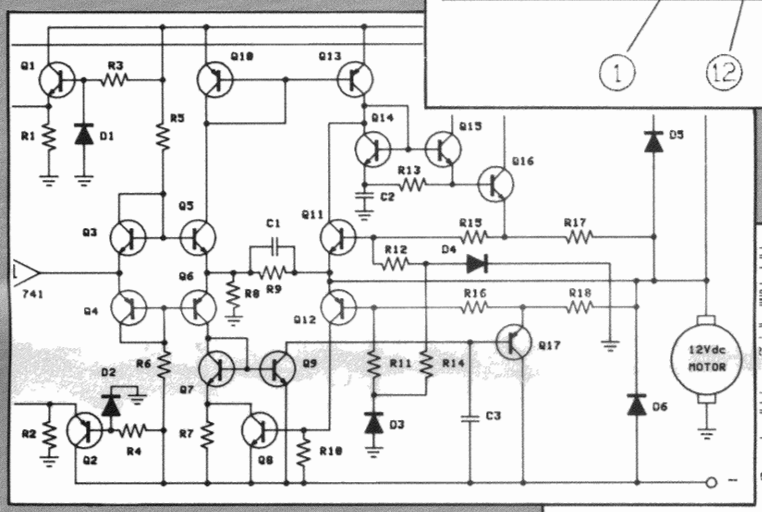
Note: RoboVIEW and RoboDATA do not work on the IIc or Laser 128 computers, and require the Robo 3-axis controller –not the mouse.

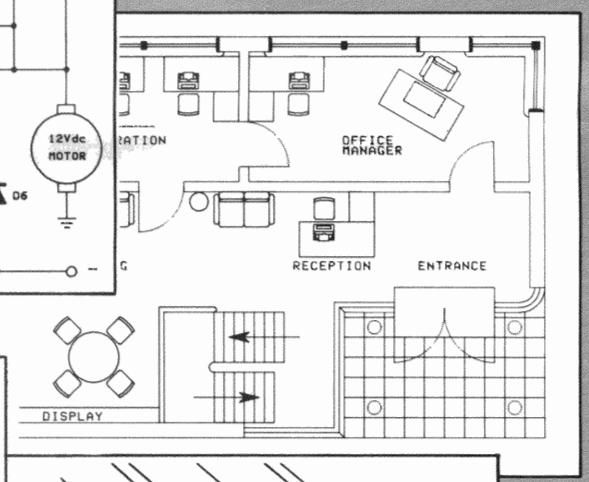
Now you can draw literally *anything* with your standard Apple* II computer

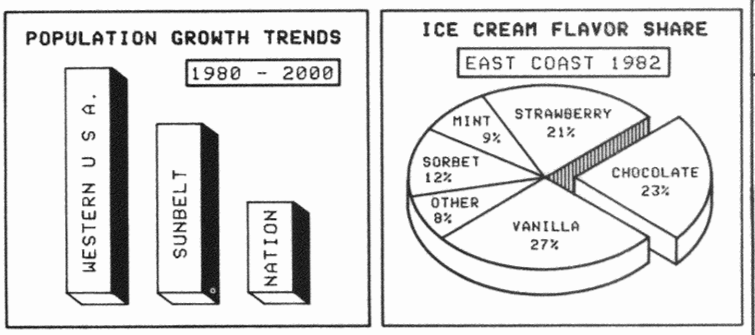
Robo Systems CAD: affordable computer-aided drafting and graphics

Robo Systems puts CAD within reach. With the Robo CAD package and a standard Apple* II+ or IIe computer, you can generate schematics, mechanical drawings, architectural layouts, and business presentations with speed and accuracy previously available only on expensive CAD systems.

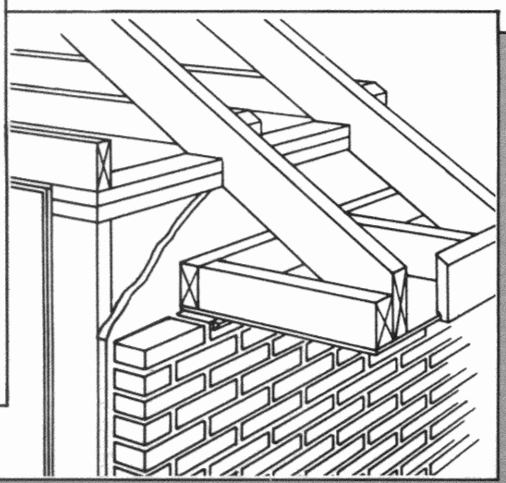








All line artwork in this publication was drawn using the Robo CAD system.



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