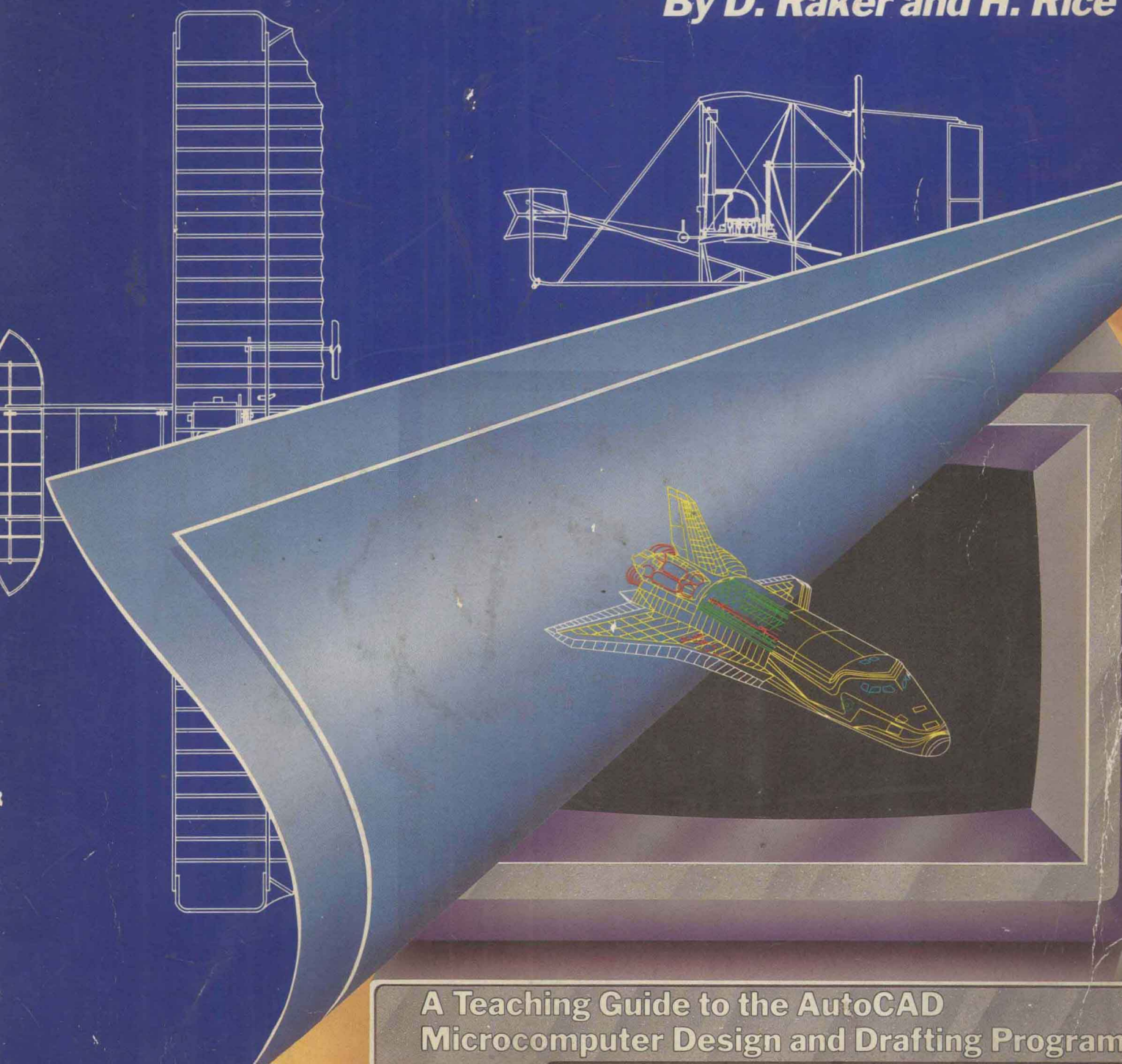


**INSIDE**

# **AutoCAD<sup>TM</sup>**

*By D. Raker and H. Rice*



**A Teaching Guide to the AutoCAD  
Microcomputer Design and Drafting Program**

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# INSIDE AutoCAD®

*A Teaching Guide to the AutoCAD  
Microcomputer Design and Drafting Program*

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**Daniel Raker and Harbert Rice**



**New Riders Publishing, Thousand Oaks, California**

## **INSIDE AutoCAD®**

*A Teaching Guide to the AUTOCAD  
Microcomputer Design and Drafting Program*

By Daniel Raker and Harbert Rice

Published by:

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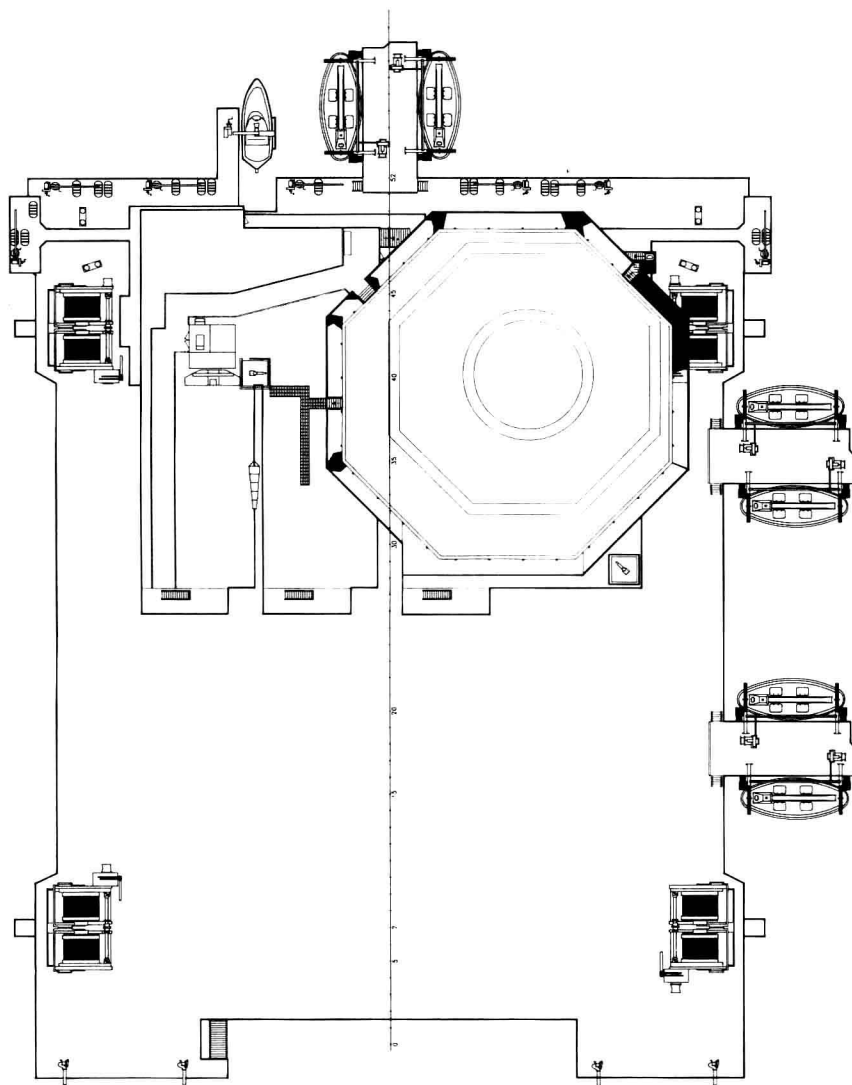
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*Floating Platform (Top View) Drawn with AutoCAD (Courtesy of Autodesk Inc.)*



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# INTRODUCTION

## LAY OF THE LAND—WHAT WE WANT TO DO

Presenting **INSIDE AutoCAD!!!** A Complete Teaching Guide to the AutoCAD Computer Aided Drafting and Design program.

Our aim in this Guide is to introduce you to AutoCAD, the most popular CAD program. We want to help you learn how to use AutoCAD and to understand its drafting and design power. We want to help you unlock AutoCAD's power to get your design and drafting work done quickly and easily.

**INSIDE AutoCAD** is organized to show you how AutoCAD works and how you can benefit from working with AutoCAD.

### The AutoCAD Program

You will find that the AutoCAD program is comprehensive. But the program is broken down and grouped into easily managed drawing operations. You can master each operational group in a few hours. At the same time you will find that AutoCAD's drawing capabilities are virtually limitless—bound only by your imagination and the skills that you develop using the program.

When you draw directly at your drafting table, your pencil and paper are all the tools you need. When you draft and design with AutoCAD, the program acts as an intermediary between your hand and the finished hard copy drawing. As an intermediary, AutoCAD will not slow you down. Quite the contrary—think of AutoCAD as a supercharger for your elbow.

The AutoCAD program knows a lot about drawing. It knows how to draw straight lines and right angles. It knows how to insert standard symbols for details that you want to use frequently. And it knows how to redraw entire drawings after you have made a simple correction.

Using **INSIDE AutoCAD**, you will learn how to operate the AutoCAD program. You will learn how to get AutoCAD to do work for you, and you will learn what you must do on your own to get your drawings done.

---

## HOW **INSIDE AutoCAD** IS ORGANIZED

**INSIDE AutoCAD** is organized for the beginner as well as regular AutoCAD users. The Book does not contain any programming and it keeps microcomputer jargon to a minimum.

The Book is organized in Twelve Chapters. The Chapters take you sequentially through building drawings with the AutoCAD program, starting with **Setting Up**, and finishing with **Customizing AutoCAD** for your own use.

The First Chapter, **Setting Up**, teaches the basics about turning the AutoCAD program on and off, and storing your work. It teaches you how AutoCAD communicates with you. By the Chapter's end, you will be able to create an AutoCAD drawing file on disc, add lines to the drawing, display the drawing on the screen, and save the drawing for future use.

Chapter 2, **Getting Around**, explains AutoCAD's electronic tools for controlling where you are in your drawing file, and controlling what you display on the screen. By the Chapter's end, you will have a "map" for getting around your drawings with AutoCAD.

In Chapters 3, 4, 5, and 6 you will learn how to create drawings using simple electronic elements like lines, arcs, and text. You will learn to use AutoCAD's drawing aids like grids. Chapter 3 will teach you the **Drawing Basics** and you will start some actual drawings.

These drawings are continued in Chapters 4, 5 and 6. Chapters 4 and 5 will teach you how AutoCAD's drawing editor works. You will learn how to move and copy pieces of your drawing, and how to use CAD techniques like creating and tracing over construction lines. Chapter 6 will show you how to create and store permanent drawing **symbols**. We call this drawing process "**herding objects into symbols**".

Chapters 7, 8, 9, and 10 will teach you how to save drawing time using AutoCAD's electronic bag of tricks. In Chapter 7 you will learn how to use AutoCAD's **drawing enhancement** tools. These are tools like automatic hatching to highlight drawings and special pattern libraries. Chapter 8 will teach you everything you need to know about plotting and getting good clear drawings onto **hard copy**.

In Chapter 9, you will explore AutoCAD's third dimension. AutoCAD has facilities for creating **isometric** and **3-D wireframe** drawings. You will learn how to create 3-D drawings and view these designs from any angle.

In Chapter 10, you will learn how to add **drawing intelligence** to your drawings by adding spatial dimensions and annotations.

The last two Chapters describe just how powerful AutoCAD can be in your hands. Chapter 11 will show you how to add non-graphic information to your drawing that you can later extract as Bill of Materials, specifications, schedules, or other data lists.

Chapter 12 will show you how to **Customize AutoCAD** using special AutoCAD tools and tricks to create your own drawing menus and automatic command sequences.

## Appendices

INSIDE AutoCAD is a hands-on Tutorial. If you just read the text and look at the drawing examples, you will learn a great deal about AutoCAD. To solidify your working knowledge of AutoCAD, you need to sit down at an AutoCAD equipped microcomputer and work through the drawing sessions.

Appendix A gives the **Workstation Configuration** assumed for this Book. We assume you are using an MS-DOS “work-alike” microcomputer. The AutoCAD program has a **Configuration Utility** that allows you to configure your workstation hardware to run with the AutoCAD software. You have to configure your system before you can use AutoCAD’s drawing editor.

In Appendix A, we run through the AutoCAD configuration for our “tutorial workstation configuration”. If your setup differs from Appendix A, take the time to get familiar with the differences between your workstation setup and ours.

Appendix B gives a map to the **AutoCAD Screen Menus** which the Book covers in individual Chapters. This map is a guide to AutoCAD’s screen menus and commands.

Appendix C gives a **Plotter Setup**. Plotters require some hardware setup and self-testing outside the AutoCAD program. Appendix C gives the Book’s assumptions for plotter setup and self-testing.

Appendix D gives procedures for setting up AutoCAD’s standard **Tablet Menu**. Appendix D gives the Book’s assumptions for tablet menus.

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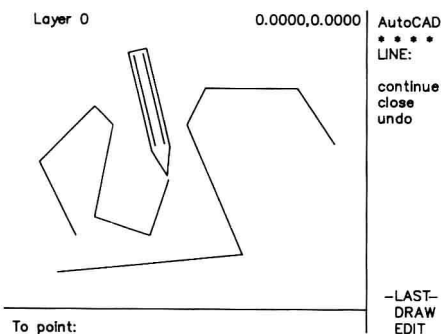
## HOW TO USE INSIDE AutoCAD

INSIDE AutoCAD is designed as a self-teaching Guide to the AutoCAD program. For your convenience, we separate working computer sessions and screen displays from text explanations. You can work through the teaching examples independently from the text.

### Drawing Examples

Each Chapter has one or more tutorial drawing examples. Each example is separated from the Book’s text. Screen display text is printed in computer-style type.

To help guide you through the tutorial exercises, each tutorial example has a target drawing. Example drawing screen displays are “illustrated” with drawings (made with AutoCAD!) to show the target drawing. Step-wise intermediate drawing displays, corresponding to the teaching steps used to create the target drawing, also are “illustrated”. An intermediate drawing is shown in the SAMPLE DRAWING. This drawing shows how the Book represents an AutoCAD graphics screen display and the use of a pointing device.



*A Sample Drawing. Graphics screen shows line being drawn. Pointer indicates drawing points.*

### The Book’s Assumptions

The Book assumes that you can:

- ☐ Load your MS-DOS operating system from a system disc, or have loaded it onto your hard disc.
- ☐ Load the AutoCAD program, having configured it yourself or had it configured to work with your hardware.
- ☐ Select your responses to AutoCAD’s prompts by typing from your micro-computer keyboard.



- ☐ Or select your responses from AutoCAD's screen menu or tablet menu by using a pointing device like a digitizer stylus, puck or a mouse.

If you are using your keyboard to enter responses to AutoCAD's prompts, you need to press **RETURN** (or **ENTER**), or the **SPACEBAR** after each typed response.

### How Teaching Examples Look

If you turn your machine on, load the MS-DOS operating system, and load the AutoCAD program, you will see the following prompt sequence on your display screen:

---

---

```
C>
C> ACAD (RETURN)
```

(Note. This is the Book's format for describing AutoCAD program prompts and your responses.)

---

---

### How "Illustrated " Example Displays Look

As soon as you type **ACAD (RETURN)**, AutoCAD will take over your micro-computer and display its **MAIN MENU**. The AutoCAD screen display is:

---

---

#### THE MAIN MENU

```

      A U T O C A D
Copyright (C) 1982, 83, 84, 85, 86 Autodesk, Inc.
Version 2.5 (06/15/86) IBM PC
Advanced Drafting Extensions 3
Serial Number 12-3456789
```

#### Main Menu

- ```

0. Exit AutoCAD
1. Begin a NEW Drawing
2. Edit an EXISTING Drawing
3. Plot a drawing
4. Printer plot a drawing

5. Configure AutoCAD
6. File Utilities
7. Compile shape/font description file
8. Convert old drawing file
```

Enter selection:

#### Main Menu

- ```

0. Exit AutoCAD
1. Begin a NEW drawing
2. Edit an EXISTING drawing
3. Plot a drawing
4. Printer plot a drawing

5. Configure AutoCAD
6. File Utilities
7. Compile shape/font description file
8. Convert old drawing file
```

Enter Selection \_\_\_\_

*AutoCAD's MAIN MENU*

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The **MAIN MENU** illustration shows how the Book represents an AutoCAD text screen display.

Selection 5 is AutoCAD's Configuration Utility covered in Appendix A.

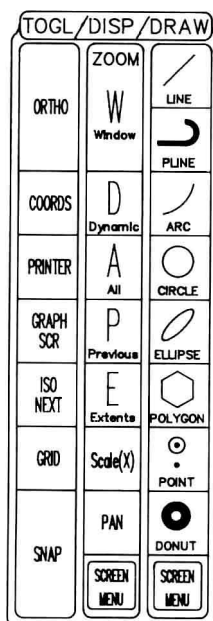
Selections 1, 2, 3, and 4 are where the drawing action is. This is where we will take up in Chapter 1.

### Learning AutoCAD Menus and Commands

Like any good microcomputer program AutoCAD uses menus and commands. You can get anywhere you want in the program by following the menus. Or you can execute individual drawing commands directly by using the keyboard or any input device without working through the screen menus. The SAMPLE TABLET DRAWING shows how the Book represents drawing commands on AutoCAD's standard tablet menu.

There are two basic tricks to learning AutoCAD. The first is to learn the AutoCAD menus and commands that you need for the drawings you want to produce. The second is to practice drawing by "playing around" with these AutoCAD commands.

We encourage you to play around with different commands. To help you learn the AutoCAD menus and commands, the first illustration in each Chapter contains a drawing of the AutoCAD tablet menu and the commands used in the tutorial exercises in that Chapter. To help you locate commands, portions of the screen menus also are repeated in the Chapters. Appendix B contains a complete screen menu map to AutoCAD commands.



Sample Tablet Drawing Menu

### AutoCAD Versions and INSIDE AutoCAD

This second edition of INSIDE AutoCAD is designed to be compatible with the AutoCAD release known as 2.5. In the Book we assume that you are working with AutoCAD 2.5 as well as the most up-to-date Advanced Drafting Extensions ADE-1 through ADE-3.

#### ► Means New and Revised Material

To help you locate new material in this updated INSIDE AutoCAD, we have marked new and revised sections with a "triangle symbol" = ►. You can find new material by looking for this "symbol" at the top of the page where the "running heads" are located, or in the INDEX.

If you have a different release of AutoCAD, don't be alarmed. INSIDE AutoCAD is perfectly useable with the earlier AutoCAD versions 2.0 and 2.1. If your AutoCAD version differs from the one assumed here in the Book, you will notice slight differences in screen displays, menus, and command prompting sequences. None of these differences will keep you from getting the full benefit of training and support that INSIDE AutoCAD provides.

If you are using an international release of AutoCAD, you will most certainly find minor differences among AutoCAD software versions, depending on the version number and the drafting extensions added.

In all cases, depending on your individual installation, you may find occasional differences in commands available (or absent) from screen menus. We