

Making Everything Easier!™

AutoCAD® 2013

FOR

DUMMIES®

Learn to:

- Set up the AutoCAD environment and use the AutoCAD Ribbon
- Create your first drawing, add text, and manage properties
- Build amazing 2D and 3D models in no time

IN FULL COLOR!

David Byrnes
Bill Fane



Making Everything Easier!™

AutoCAD® 2013

FOR

DUMMIES®

Learn to:

- Set up the AutoCAD environment and use the AutoCAD Ribbon
- Create your first drawing, add text, and manage properties
- Build amazing 2D and 3D models in no time

IN FULL COLOR!

David Byrnes
Bill Fane



AutoCAD® 2013 For Dummies®

Visit

www.dummies.com/cheatsheet/autocad2013
to view this book's cheat sheet.

Table of Contents

[Introduction](#)

[What's Not \(And What Is\) in This Book](#)

[Mac attack!](#)

[Who Do We Think You Are?](#)

[How This Book Is Organized](#)

[Part I: AutoCAD 101](#)

[Part II: Let There Be Lines](#)

[Part III: If Drawings Could Talk](#)

[Part IV: Advancing with AutoCAD](#)

[Part V: On a 3D Spree](#)

[Part VI: The Part of Tens](#)

[But wait . . . there's more!](#)

[Icons Used in This Book](#)

[A Few Conventions — Just in Case](#)

[Commanding from the keyboard](#)

[Tying things up with the Ribbon](#)

[Where to Go from Here](#)

[Part I: AutoCAD 101](#)

[Chapter 1: Introducing AutoCAD and AutoCAD LT](#)

[Why AutoCAD?](#)

[The Importance of Being DWG](#)

[Seeing the LT](#)

[Checking System Requirements](#)

[Suddenly, It's 2013!](#)

[Chapter 2: Le Tour de AutoCAD 2013](#)

[AutoCAD Does Windows \(And Office\)](#)

[And They're Off: AutoCAD's Opening Screens](#)

[Running with Ribbons](#)

[Getting with the Program](#)

[Looking for Mr. Status Bar](#)

[Let your fingers do the talking: The command window](#)

[The key\(board\) to AutoCAD success](#)

[Keeping tabs on palettes](#)

[Down the main stretch: The drawing area](#)

[Fun with F1](#)

[Chapter 3: A Lap around the CAD Track](#)

A Simple Setup
Drawing a (Base) Plate

Drawing rectangles on the right layers
Circling your plate
Nuts to you

Getting a Closer Look with Zoom and Pan
Modifying to Make It Merrier

Hip-hip-array!
Stretching out
Crossing your hatches

Following the Plot

Chapter 4: Setup for Success

A Setup Roadmap

Choosing your units
Weighing up your scales
Thinking annotatively
Thinking about paper
Defending your border

A Template for Success
Making the Most of Model Space

Setting your units
Making the drawing area snap-py (and grid-dy).
Setting linetype and dimension scales

[Entering drawing properties](#)

[Making Templates Your Own](#)

[Chapter 5: Planning for Paper](#)

[Setting Up a Layout in Paper Space](#)

[Will that be tabs or buttons?](#)

[View layouts Quick\(View\)ly](#)

[Creating a layout](#)

[Copying and changing layouts](#)

[Lost in paper space](#)

[Spaced out](#)

[A view\(port\) for drawing in](#)

[About Paper Space Layouts and Plotting](#)

[Part II: Let There Be Lines](#)

[Chapter 6: Manage Your Properties](#)

[Managing Your Properties](#)

[Layer one on me!](#)

[Accumulating properties](#)

[Creating new layers](#)

[Manipulating layers](#)

[Using Named Objects](#)

[Using AutoCAD DesignCenter](#)

[Copying layers between drawings](#)

Chapter 7: Preciseliness Is Next to CADliness

Controlling Your Precision

Keyboard capers: Coordinate input
Understanding AutoCAD's coordinate
systems
Grab an object and make it snappy.

Other Practical Precision Procedures

Chapter 8: Along the Straight and Narrow

Introducing the AutoCAD Drawing Commands
The Straight and Narrow: Lines, Polylines, and
Polygons

Toeing the line
Connecting the lines with polyline
Squaring off with rectangles
Choosing your sides with polygon

Chapter 9: Dangerous Curves Ahead

(Throwing) Curves

Going full circle
Arc-y-ology
Solar ellipses
Splines: The sketchy, sinuous curves
Donuts: The circles with a difference
Revision clouds on the horizon

Scoring Points

Chapter 10: Get a Grip on Object Selection

Commanding and Selecting

Command-first editing

Selection-first editing

Direct object manipulation

Choosing an editing style

Grab It

One-by-one selection

Selection boxes left and right

Perfecting Selecting

AutoCAD Groupies

Object Selection: Now You See It . . .

Get a Grip

About grips

A gripping example

Move it!

Copy, or a kinder, gentler Move

A warm-up stretch

Chapter 11: Edit for Credit

Your AutoCAD Toolkit

The Big Three: Move, Copy, and Stretch

Base points and displacements

[Move](#)
[Copy](#)
[Copy between drawings](#)
[Stretch](#)

[More Manipulations](#)

[Mirror](#)
[Rotate](#)
[Scale](#)
[Array](#)
[Offset](#)

[Slicing, Dicing, and Splicing](#)

[Trim and Extend](#)
[Break](#)
[Fillet and Chamfer and Blend](#)
[Join](#)

[When Editing Goes Bad](#)

[Chapter 12: A Zoom with a View](#)

[Zoom and Pan with Glass and Hand](#)

[The wheel deal](#)
[Navigating your drawing](#)
[Controlling your cube](#)
[Time to zoom](#)

[A View by Any Other Name . . .](#)
[Looking Around in Layout Land](#)

Degenerating and Regenerating

Part III: If Drawings Could Talk

Chapter 13: Text with Character

Getting Ready to Write

Simply stylish text

Taking your text to new heights

One line or two?

Your text will be justified

Using the Same Old Line

Turning On Your Annotative Objects

Saying More in Multiline Text

Making it with Mtext

It slices; it dices . . .

Doing a number on your Mtext lists

Line up in columns — now!

Modifying Mtext

Gather Round the Tables

Tables have style, too

Creating and editing tables

Take Me to Your Leader

Electing a leader

Multi options for multileaders

Chapter 14: Entering New Dimensions

How Do You Measure Up? A Field Guide to Dimensions

The lazy drafter jumps over to the quick
dimension commands
Dimension associativity
Where, oh where, do my dimensions go?

The Latest Styles in Dimensioning

Creating and managing dimension styles
Let's get stylish!
Adjusting style settings

Size Matters

Details at other scales

Editing Dimensions

Editing dimension geometry
Editing dimension text
Controlling and editing dimension
associativity

Chapter 15: Down the Hatch!

Batten Down the Hatches!
Don't Count Your Hatches. . .
Size Matters!

We can do this the hard way. . .
. . . or we can do this the easy way.
Annotative versus non-annotative

Pushing the Boundary_(Of) Hatch

Your hatching has no style!
Hatch from scratch

Editing Hatch Objects

Chapter 16: The Plot Thickens

You Say Printing, We Say Plotting
The Plot Quickens

Plotting success in 16 steps
Get with the system
Configure it out
Preview one, two
Instead of fit, scale it

Plotting the Layout of the Land
Plotting Lineweights and Colors

Plotting with style
Plotting through thick and thin
Plotting in color

It's a (Page) Setup!
Continuing the Plot Dialog
The Plot Sickens

Part IV: Advancing with AutoCAD

Chapter 17: The ABCs of Blocks

Rocking with Blocks

Creating Block Definitions

Inserting Blocks

Attributes: Fill-in-the-Blank Blocks

Creating attribute definitions

Defining blocks that contain attribute definitions

Inserting blocks that contain attribute definitions

Edit attribute values

Extracting data

Exploding Blocks

Purging Unused Block Definitions

Chapter 18: Everything from Arrays to Xrefs

Arraying Associatively

Comparing the old and new ARRAY commands

Hip, hip, array!

Associatively editing

Going External

Becoming attached to your xrefs

Layer-palooza

[Creating and editing an external reference file](#)

[Forging an xref path](#)

[Managing xrefs](#)

[Blocks, Xrefs, and Drawing Organization](#)
[Mastering the Raster](#)

[Attaching a raster image](#)

[Maintaining your image](#)

[You Say PDF, We Say DWF](#)

[Theme and Variations: Dynamic Blocks](#)

[Now you see it](#)

[Lights! Parameters!! Actions!!!](#)

[Manipulating dynamic blocks](#)

[Chapter 19: Call the Parametrics!](#)

[Maintaining Design Intent](#)

[Defining terms](#)

[Forget about drawing with precision!](#)

[Constrain yourself](#)

[Understanding Geometric Constraints](#)

[Applying a little more constraint](#)

[AutoConstrain yourself!](#)

[Understanding Dimensional Constraints](#)

[Practice a little constraint](#)
[Making your drawing even smarter](#)
[Using the Parameters Manager](#)
[Dimensions or constraints — have it both ways!](#)

[Chapter 20: Drawing on the Internet](#)

[The Internet and AutoCAD: An Overview](#)

[You send me](#)
[Send it with eTransmit](#)
[Rapid eTransmit](#)
[FTP for you and me](#)
[Bad reception?](#)
[Help from the Reference Manager](#)

[Design Web Format — Not Just for the Web](#)

[All about DWF and DWFx](#)
[Autodesk Design Review 2013](#)

[The Drawing Protection Racket](#)
[Autodesk Weather Forecast: Increasing Cloud](#)
[Working Solidly in the Cloud](#)

[Free AutoCAD!](#)
[Going once, going twice, going 123D](#)
[Your head planted firmly in the cloud](#)
[The pros](#)
[The cons](#)
[Cloudy with a shower of DWGs](#)
[AutoCAD 2013 cloud connectivity](#)

Tomorrow's Forecast

Part V: In a 3D Spree

Chapter 21: It's a 3D World After All

Understanding 3D Digital Models Tools of the Trade

Warp speed ahead
Entering the third dimension
Untying the Ribbon and opening some
palettes

Modeling from Above

Using 3D coordinate input
Using point filters
Object snaps and object snap tracking

Changing Planes

Displaying the UCS icon
Adjusting the UCS

Navigating the 3D Waters

Orbit à go-go
Taking a spin around the cube
Grabbing the SteeringWheels

Visualizing 3D Objects

Chapter 22: From Drawings to Models

Is 3D for Me?

Getting Your 3D Bearings

Creating a better 3D template

Seeing the world from new viewpoints

From Drawing to Modeling in 3D

Drawing basic 3D objects

Gaining a solid foundation

Drawing solid primitives

Adding the Third Dimension to 2D Objects

Creating 3D objects from 2D drawings

Modifying 3D Objects

Selecting subobjects

Working with gizmos

More 3D variants of 2D commands

Editing solids

Chapter 23: On a Render Bender

Get the 2D Out of Here!

A different point of view

But wait! There's more!

AutoCAD's top model

But wait! There's less!

Do You See What I See?

[Visualizing the Digital World](#)
[Adding Lighting](#)

[Default lighting](#)
[User-defined lights](#)
[Sunlight](#)

[Creating and Applying Materials](#)
[Defining a Background](#)
[Rendering a 3D Model](#)

[Part VI: The Part of Tens](#)

[Chapter 24: Ten Great AutoCAD Resources](#)

[Autodesk Feedback Community](#)
[Autodesk Discussion Groups](#)
[Autodesk's Own Bloggers](#)
[Autodesk University](#)
[The Autodesk Channel on YouTube](#)
[The World Wide \(CAD\) Web](#)
[Your Local ATC](#)
[Your Local User Group](#)
[AUGI](#)
[Books](#)

[Chapter 25: Ten \(Or So\) Differences between AutoCAD and AutoCAD LT](#)

[Price](#)
[3D Abilities](#)
[Customization Options](#)
[Network Licensing](#)

[Express Tools](#)
[Parametrics](#)
[Standards Checking](#)
[Data Extraction](#)
[MLINE versus DLINE](#)
[Profiles](#)
[Reference Manager](#)
[And The Good News Is . . .](#)

[Chapter 26: Ten System Variables to Make Your Life Easier](#)

[APERTURE](#)
[DIMASSOC](#)
[MENUBAR](#)
[MIRRTEXT](#)
[OSNAPZ](#)
[PICKBOX](#)
[REMEMBERFOLDERS](#)
[ROLLOVERTIPS](#)
[TOOLTIPS](#)
[VISRETAIN](#)
[And the Bonus Round](#)

[Cheat Sheet](#)

AutoCAD® For Dummies®

**by David Byrnes and
Bill Fane**



John Wiley & Sons, Inc.

AutoCAD® 2013 For Dummies®

Published by
John Wiley & Sons, Inc.
111 River Street
Hoboken, NJ 07030-5774
www.wiley.com

Copyright © 2012 by John Wiley & Sons, Inc., Hoboken,
New Jersey

Published by John Wiley & Sons, Inc., Hoboken, New
Jersey

Published simultaneously in Canada

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at <http://www.wiley.com/go/permissions>.

Trademarks: Wiley, the Wiley logo, For Dummies, the Dummies Man logo, A Reference for the Rest of Us!, The Dummies Way, Dummies Daily, The Fun and Easy Way, Dummies.com, Making Everything Easier, and related trade dress are trademarks or registered trademarks of

John Wiley & Sons, Inc. and/or its affiliates in the United States and other countries, and may not be used without written permission. AutoCAD is a registered trademark of Autodesk, Inc. All other trademarks are the property of their respective owners. John Wiley & Sons, Inc., is not associated with any product or vendor mentioned in this book.

Limit of Liability/Disclaimer of Warranty: The publisher and the author make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation warranties of fitness for a particular purpose. No warranty may be created or extended by sales or promotional materials. The advice and strategies contained herein may not be suitable for every situation. This work is sold with the understanding that the publisher is not engaged in rendering legal, accounting, or other professional services. If professional assistance is required, the services of a competent professional person should be sought. Neither the publisher nor the author shall be liable for damages arising herefrom. The fact that an organization or Website is referred to in this work as a citation and/or a potential source of further information does not mean that the author or the publisher endorses the information the organization or Website may provide or recommendations it may make. Further, readers should be aware that Internet Websites listed in this work may have changed or disappeared between when this work was written and when it is read.

For general information on our other products and services, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

For technical support, please visit
www.wiley.com/techsupport.

Wiley also publishes its books in a variety of electronic formats and by print-on-demand. Not all content that is available in standard print versions of this book may appear or be packaged in all book formats. If you have purchased a version of this book that did not include media that is referenced by or accompanies a standard print version, you may request this media by visiting <http://booksupport.wiley.com>. For more information about Wiley products, visit us at www.wiley.com.

Library of Congress Control Number: 2012936846

ISBN 978-1-118-28112-3 (pbk); ISBN 978-1-118-33352-5 (ebk); ISBN 978-1-118-33465-2 (ebk); ISBN 978-1-118-39217-1 (ebk)

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1



About the Authors

David Byrnes is one of those grizzled old-timers you'll find mentioned every so often in *AutoCAD 2013 For Dummies*. He began his drafting career on the boards in 1979, and first learned AutoCAD with version 1.4. Dave is based in Vancouver, British Columbia, where he works as a civil/structural drafter. He taught AutoCAD for fifteen years at Emily Carr University of Art + Design and British Columbia Institute of Technology in Vancouver. Dave has authored or co-authored over a dozen AutoCAD books and was sole author of this title from *AutoCAD 2008 For Dummies* to *AutoCAD 2012 For Dummies*.

Bill Fane is a recovering doorknob designer. He was a product engineer and then product engineering manager for Weiser Lock in Vancouver, Canada for 27 years and holds 12 U.S. patents. He has been using AutoCAD for design work since Version 2.17g (1986), and Inventor since version 1.0 beta (1996). He is a retired professional engineer and an Autodesk Authorized Training Center (ATC) certified instructor.

He began teaching mechanical design in 1996 at the British Columbia Institute of Technology (BCIT) in Vancouver, including such courses as AutoCAD, Mechanical Desktop, Inventor, SolidWorks, machine design, term projects, manufacturing processes, and design procedures. He retired from this position in 2008.

He has lectured on a wide range of AutoCAD and Inventor subjects at Autodesk University since 1995 and at Destination Desktop since 2003. He is the AUGI CAD

Camp National Team instructor for the manufacturing track. He has written over 220 “The Learning Curve” columns for *CADalyst* magazine since 1986 and claims to be a close personal friend of Captain LearnCurve. He also writes software product reviews for *CADalyst*, *Design Product News*, and *Machine Design*. He is an active member of the Vancouver AutoCAD Users Society, “the world’s oldest and most dangerous.”

In his spare time he skis, water skis, windsurfs, scuba dives, sails a Hobie Cat, rides an off-road motorcycle, drives his '37 Rolls-Royce limousine, or his wife's '89 Bentley Turbo R, travels extensively with his wife, and plays with his grandchildren.

Dedication

From Dave: I left the bohemian lifestyle of the AutoCAD consultant at the beginning of 2008 and rejoined the engineering company I last worked for in 1988 (luckily they'd forgotten all about that chandelier). Working full-time (oh! the horror!) and keeping up with AutoCAD so I can revise this book has made me somewhat inaccessible for three months a year, and I'm forever grateful to Annie and Delia, still and always the two women in my life, who remind me there are other things besides keyboards and mice (and sometimes they have to try *really* hard).

From Bill: Back in the last millennium I wrote a book about AutoCAD 13, after which my wife Bev swore "Never again!" This time around she was smart enough to go on a two-week South Pacific cruise while I worked on the final author review files, and so our marriage stands a chance of surviving another 46 years.

Authors'

Acknowledgments

Dave thanks former author Mark Middlebrook for bringing him into the *AutoCAD For Dummies* world by asking him first to tech edit *AutoCAD 2000 For Dummies*, then to join him as coauthor of *AutoCAD 2006 For Dummies*, and finally to take over the title altogether.

Bill was both honored and flattered when Dave invited him to co-author this edition of the prestigious *AutoCAD For Dummies* title, with a view to his taking it over completely next year. Dave's support and assistance through Bill's teething period on this project know no bounds, and no matter where the book goes from here, there will always be parts of Dave's soul lurking in it somewhere.

We both thank colleagues and friends at Autodesk: above all Heidi Hewett and Bud Schroeder, who never seem to mind being asked even the dumbest questions. At Wiley, Acquisitions Editor Kyle Looper was a reliable source of calm but firm direction. It was a pleasure to work with project editor Mark Enochs, and copy editor Heidi Unger pointed out where we mixed up our Ps and our Qs. And thanks, finally, to Ralph Grabowski who did a sterling job of tech editing.

Publisher's Acknowledgments

We're proud of this book; please send us your comments at <http://dummies.custhelp.com>. For other comments, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

Some of the people who helped bring this book to market include the following:

Acquisitions and Editorial

Sr. Project Editor: Mark Enochs

Acquisitions Editor: Kyle Looper

Copy Editors: Heidi Unger, Teresa Artman, Amanda Graham

Technical Editor: Ralph Grabowski

Editorial Manager: Leah Michael

Editorial Assistant: Amanda Graham

Sr. Editorial Assistant: Cherie Case

Cover Photo: ©iStockphoto.com/-Vladimir-

Cartoons: Rich Tennant (www.the5thwave.com)

Composition Services

Project Coordinator: Sheree Montgomery

Layout and Graphics: Claudia Bell, Carl Byers, Joyce Haughey

Proofreader: Bonnie Mikkelson

Indexer: Infodex Indexing Services, Inc.

Publishing and Editorial for Technology Dummies

Richard Swadley, Vice President and Executive Group Publisher

Andy Cummings, Vice President and Publisher

Mary Bednarek, Executive Acquisitions Director

Mary C. Corder, Editorial Director

Publishing for Consumer Dummies

Kathy Nebenhaus, Vice President and Executive Publisher

Composition Services

Debbie Stailey, Director of Composition Services

Introduction

Let's get something straight upfront. You may have heard that AutoCAD is difficult, complex, or hard to learn and use. Well, it has been our observation that the easier any software is to learn and use, the sooner you bump up against the software's limitations. Yes, AutoCAD is complex, but that's the secret to its success. Some claim that few people use more than 10 percent of AutoCAD's capabilities. Closer analysis reveals that pretty much everyone uses the same basic 5 percent, but everyone else uses a different 5 percent after that. The trick is to find *your* 5 percent, the sweet spot that suits your particular industry.

It should also be perfectly clear that if your career path has put you in a position where you need to learn AutoCAD, then you're no dummy!

It's amazing to think that AutoCAD came into being more than a quarter of a *century* ago, back in the last millennium, at a time when most people thought that personal computers weren't capable of industrial-strength tasks like CAD. (The acronym stands for Computer-Aided Drafting, Computer-Aided Design, or both, depending on whom you talk to.) What's equally amazing is the fact that many of today's hotshot AutoCAD users weren't even born when the program first hit the street and the grizzled old-timers writing these words began using it! It's almost as amazing that, 29 years and counting after its birth in December of 1982, AutoCAD remains the king of the microcomputer CAD hill by a tall margin, making it one of the longest-lived PC programs ever, and it will probably be a year older next year. It's conceivable that the long-term future