

July/August 2005



AUGI World

The Official Publication of Autodesk User Group International

CAD Manager Career Road Map

*Want to further your CAD
management career?
Then hit the road...but watch
out for these obstacles!*

Also in this issue

- The Secrets to Productivity - Revealed!
- Creating Falling Water
- What's Your Learning Style?

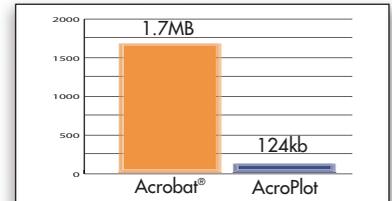


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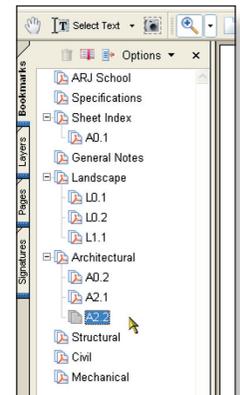
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Lower is better. File size results are based on independent testing by a leading CAD magazine product comparison using the Wilhome.dwg. See CADzation website for full story.

2 Intuitive Batch Conversion

- > Batch Conversion of files to PDF or DWF from one application.
- > Supports conversion of DWG, DXF, PLT, TIFF, CALS, GP4, DOC, XLS, and more.
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- > High quality Windows® printer driver creates PDF's from any program.
- > API controls allow you to create and convert the way you work.

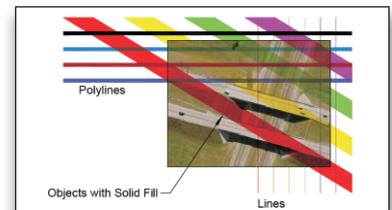


3 Advanced Bookmark and File Naming

- > Automatically create bookmarks using block attributes, layout or file names in the DWG for PDF or DWF conversion.
- > String together attributes from several blocks to create logical file names automatically.
- > Preview and modify bookmarks prior to batch file conversion.

4 Lines Merge Support and Control

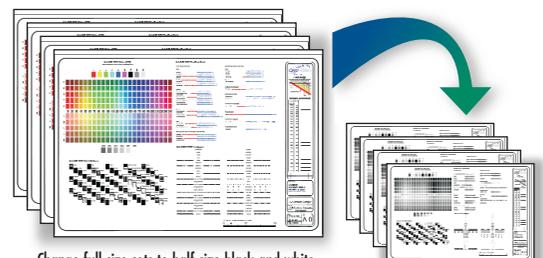
- > Create PDF or DWF that view and print exactly as they would from AutoCAD.
- > 12 modes of merge control and options for optimizing complex polygons that have solid fills make files smaller, view and print faster.



Lines Merge (If lines merge is enabled, then entities that overlap will be translucent when printed, regardless of draw order.)

5 PDF and DWF Modification

- > AcroPlot Matrix allows viewing, printing, markup, and editing (page insertion, deletion, reordering, etc.) of PDF and DWF files and now features the ability to resize pages, scale line weights, and switch the mode from color to grayscale or black and white, all without recreating the PDF or DWF.



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*Jimmy Nguyen
Corporate CAD & IT Manager
Kimley-Horn and Associates, Inc.*

"We chose Acroplot Pro out of 2 packages that integrate with AutoCAD due to file size and cost of ownership. The majority of our users are very happy, particularly with batch creating PDF's, but you always have one or two who don't understand how to use it."

*James McIntyre
Corporate CAD Manager
Hassell Pty Ltd
Australia*



www.CADzation.com

Corporate Headquarters USA
518 South Route 31 Suite 200
McHenry, IL 60050

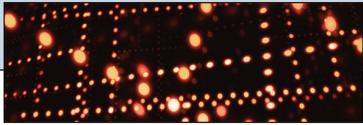
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Table of Contents



feature

8

CAD Manager Career Road Map

Want to further your CAD
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AUGIWorld

Editorial

Managing Editor

Marilyn Law
marilyn.law@augiworld.com

Technical Editor

David Harrington
david.harrington@augiworld.com

Contributing Editors

Lee Ambrosius
Dwayne D. Ellis
Eugene Evon
Nick Fuller
Daniel Hurtubise
Mark W. Kiker
David Kingsley
Bruce Madsen
Matt Murphy

Production

Tim Varnau
tim.varnau@augiworld.com

Advertising

Dan Teeter
dan.teeter@augiworld.com

Controller

Larry Teeter
larry.teeter@augiworld.com

Publisher

Rich Uphus
rich.uphus@augiworld.com

AUGI Board of Directors, 2005

Yoshi Honda, *President*
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Station A
PO Box 54
Windsor, ON N9A 6J5
Email: cpcreturns@wdsmail.com

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Table of Contents

4 The CAD Manager

Prove It or Lose It



6 Education and Training

How do you learn?

12 Falling Water



14 A More Efficient Way To Do Residential

16 The Project Navigator

*Part Two:
Bringing
it all
together*

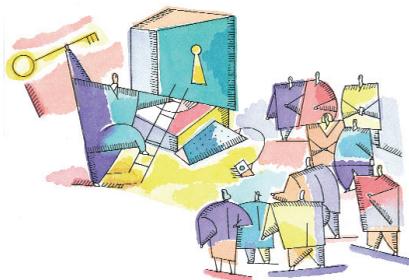


20 Formulas, The Autodesk Revit Family Secret

No cover up, just a pleasant surprise

22 The Secrets to Productivity – Revealed!

Manage your block libraries with Tool Palettes



24 Getting Started with the CUI

28 On the Back Page

Energy and the future

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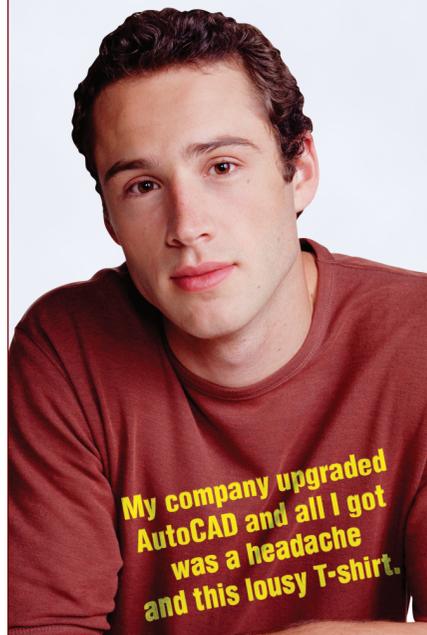
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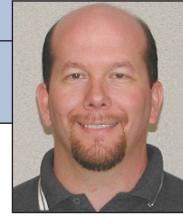


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The Cad Manager



David Harrington

Prove It or Lose It

Once again I feel compelled to touch on the subject of Autodesk product certification. My previous article on the matter spawned a number of replies from readers. In general they were very supportive of the ideas presented. A few questioned the actual costs of the testing. In that I think we just need to be realists—this stuff isn't free, after all. There is expense involved in developing a program, getting it going, and managing it. No matter how much we think it should just be available, that won't happen without compensation. Do you draw for free?

I did get an email on the subject, but with a twist. The reader thought that product certification was pointless and that we just need industry-focused certification. For example, a certification for an Architectural drafter, one for a Mechanical drafter, etc. Inasmuch as I don't disagree with this, it is fundamentally different from what I was talking about. If Autodesk is hesitant to make a certification for a product it manufactures, it certainly isn't going to do it for topic without clear boundaries. Frankly, who is Autodesk to say who qualifies to draw house plans? So let's stick with what is doable in the moment.

So in order not to drag this topic on and on, the next step is to collect raw numbers. I'm going to get with the web folks at

www.AUGI.com and set up a survey on the concept of certification. Via this survey form, you will be able to tweak your preferred certification system. We will then collate the data and formalize the issue into some type of scope document. From there we can make it available to Autodesk and the ATCs (Autodesk Training Centers) and see if it bears fruit. Enough said, onward ho!

Speed me up, Scotty!

"Sure thing, Captain. Have you loaded the latest software update into your chair?"

So my Scottish accent needs work, whatever. But does this happen to you? You upgrade as the good little user you are, but your clients or coworkers lag behind. So when you send your drawings to them you get pinged back, "Hey, sorry man, but I'm on R2000—could you redo your drawings in a format I can read?" GRRRRR!!!! Here you are doing them a favor to start with by sending them your work and then they have the chutzpah to ask you for more!

Well, obviously venting about it feels good, but in the end provides little improvement. But I'm certainly going to try to improve my work load. In the new ZIP file I send I have been including various Autodesk white papers and preview guides. Perhaps if they won't upgrade to save time/money, they will take a gander at the new features and realize

they are missing out. One of my ol' time favorites is the Batch Drawing Converter, for obvious reasons! But there are many new features the majority of users will find helpful. Oh, and I really like new OFFSET command options.

But what to do if you have an idea for a tweak, but it doesn't exist yet? Well then, you will have to write it yourself! Don't be scared—you can do it! Here's a quick example of what I personally find very useful.

A few years back I got fed up with using the BREAK command. I wanted a way of just using the mouse to answer the prompts rather than remembering the options or choosing a different custom toolbar button. So I wrote up the following code for a new BR command. Now you may operate differently so I can't say you would like it, but feel free to give it a try. The beauty of the program is that you can simply break an object at a point, or create a gap as needed, but just by using mouse clicks.

Now before all you hard-core programmers come after me for violation of some "rule," understand that I program generally for me and my personal use. I don't comment my code; I never have. Once a program works, I move on to using it and rarely go back. Yes, it does make my life tougher when I need to revise it years later. But that is my problem, isn't it, and I'm ok with it! Anyway, I've tested this and it works so here it is.

CAD Managers: Get on Track at AUGI CAD Camp

AUGI CAD Camp, the one-day learning and networking event held in cities throughout North America, now offers a course track devoted to CAD managers. This new CAD Management track joins AUGI CAD Camp's popular array of Autodesk product-specific courses.

Beginning in August and continuing through the Autumn events, AUGI CAD Camp will feature the following CAD management courses.

The CAD Manager's Handbook: A combination of best practices, useful utilities, outsourcing problems, learning and training strategies, upper management coordination topics, ideas for keeping overhead low, and more.

Product Migration - Managing the Upgrade Cycle: General guidance on upgrading from the standpoint of planning, training, and implementation and more specific advice for discipline areas such as architectural, mechanical, and civil users in a technical context.

Keeping Your Job as a CAD Manager: The focus is on the business parameters of the job and how to show your management why they should keep you. In fact, proving your worth as a CAD manager should be a key part of your management strategy.

AUGI CAD Camp attendees can come for the full day, mixing product- and management-oriented tracks, or for a

half-day, attending just these new CAD management courses. AIA credits*, discounts on Autodesk University, and other perks are available to AUGI CAD Camp attendees. For details, upcoming event locations and dates, and registration info, visit www.cadcamp.com.



AUGI CAD Camp is coming to a city near you...join us!

*Available at select locations

```

(DEFUN C:BR (/ ent x pt ept pt1 oldsmode)
  (setvar "CMDECHO" 0)
  (princ "\n Repeatable combined Break @ & F command.")
  (setq oldsmode (getvar "osmode") x 1)
  (while x
    (setq ent (entsel "\nSelect object: "))
    (setq ept (cadr ent))
    (setq lst (entget (car ent)))
    (if (or (= (cdr (assoc 0 lst)) "LINE")
            (= (cdr (assoc 0 lst)) "POLYLINE")
            (= (cdr (assoc 0 lst)) "ARC")
            (= (cdr (assoc 0 lst)) "LWPOLYLINE")
          )
      (progn
        (redraw (car ent) 3)
        (initget 1)
        (setq pt (getpoint "\nEnter first point: "))
        (initget 6)
        (setq pt1 (getpoint "\nEnter second point <right-click for first>:"))
        (if (not pt1) (setq pt1 pt))
        (setvar "osmode" 0)
        (COMMAND ". _BREAK" ept "F" pt pt1)
        (setq x nil)
      )
      (prompt "Object can't be broken.")
    )
  )
  (setvar "osmode" oldsmode)
  (princ)
)

```

Could you do this in VBA? Sure. Knock yourself out. I don't think it would be any faster and I doubt the code would be any shorter. Could it be done better? Absolutely. But the point of this is trying to convince the average user that AutoLISP is still gold and still good for tweaking out AutoCAD just that little bit extra. All it takes is a little idea and then a little more in time to write and debug it. But once that it is done you're rocking away!

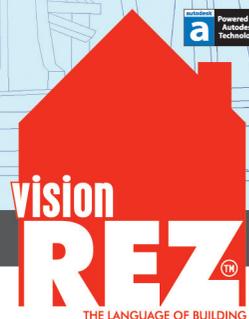
Okay, so here is your homework. My little example program is 30 lines of code so you have the same challenge. Send me a program under 600 characters that enhances some existing AutoCAD function. I'll test whatever I get and the coolest one will be printed in the next issue. I'll see what I can do to get all of them posted to the *AUGIWorld* website as well (no promises there, though). Where is this all going? Hehe, you will have to wait till the next exciting issue...

David Harrington, technical editor for AUGIWorld, works for Walter P. Moore and Associates in Tampa, Florida, USA. David is the author of Inside AutoCAD 2005, Inside AutoCAD 2002, and original programmer for REV CLOUD. He can be reached at david.harrington@augiworld.com.

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Education & Training



Matt Murphy

How Do You Learn?

The other day I was trying to figure out how to get to a new restaurant in the city. My first instinct was to go to the web, visit MapQuest.com, and print out step-by-step directions taking me from my house to the address of the eatery in question. My wife's preference was to call someone who she thought would know the answer and ask them. Her second option was to call the restaurant. My second choice, instead of firing up the home computer, was to find the place on a map.

Which one of us had the best solution to this learning situation? Both of us did, of course. There is no wrong way to learn this information. Everyone has their own way of learning—their *learning style*. We naturally gravitate toward the learning tools that suit us best. This applies to all types of learning and is especially important when figuring out how to master the ever-increasing capabilities of Autodesk® software.

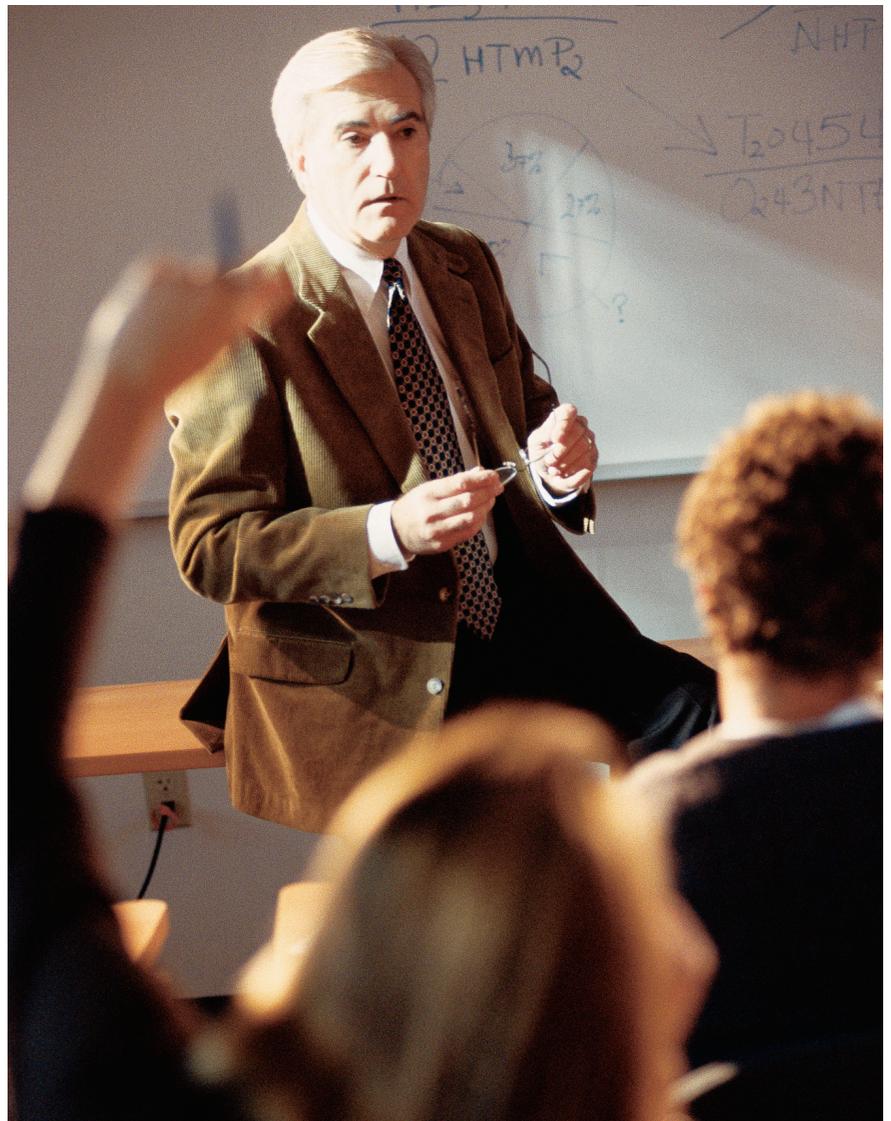
The three learning styles

According to learning theory, there are three basic learning styles, and most everyone has a dominant preference of one style over the others.

Visual Learners learn through seeing. You'll find visual learners sitting up front in a classroom to catch the teacher's expression and gestures during explanations. These learners prefer to study illustrations, charts, and diagrams, and often take detailed notes to absorb information.

Auditory Learners learn through listening. You'll find auditory learners tuning into the vocal nuances when listening to lectures. These learners prefer to hear information explained verbally and will often take notes with a tape recorder.

Kinesthetic/Tactile Learners learn by "doing." Kinesthetic/Tactile learners want



hands-on training. These learners are the most likely to be distracted during long lectures, so they are the ones clicking away doing other things in class while the Auditory learners listen intently and visual learners take notes.

Do you recognize any of your students or coworkers in one of these profiles? Do you recognize yourself in one of these profiles?

Determine your learning style

This short quiz can help to determine your learning style:

1. When you're talking, do you...
 - a. Talk little and dislike listening for a long time?
 - b. Enjoy listening but are impatient to talk?
 - c. Gesture a lot?

2. When you're spelling, do you...
 - a. Try to see the word in your mind?
 - b. Sound out the word?
 - c. Find yourself writing the word down to check it?
3. When you're reading, do you prefer...
 - a. Descriptive scenes?
 - b. Dialogue?
 - c. Action stories or better yet, TV or movies?
4. When you assemble something, do you...
 - a. Use the directions and study the diagrams?
 - b. Wish there was someone to explain what to do?
 - c. Ignore the directions and work your way through it?
5. When you interact at work, do you prefer...
 - a. Face-to-face meetings?
 - b. Phone calls from your desk?
 - c. Walking and talking?
6. When you run into someone you've met before, do you...
 - a. Often forget their names, but remember their face or where you met?
 - b. Often forget their faces, but remember their names or conversations?
 - c. Remember activities you participated in together?
7. When you are struggling with some software, do you...
 - a. Look for pictures or diagrams to make sense out of the situation?
 - b. Call the help desk or your local computer guru?
 - c. Keep hacking away at it, trying it on another computer?

If you answered mostly (a), then you have a Visual learning style. Answering mostly (b) means you have an Auditory learning style, and (c) answers mean you're a Kinesthetic/Tactile learner.

Pick the learning tools to fit your style

So, now that you've figured out your learning style, how can you use this knowledge to help you learn better?

Simply choose the learning tool that fits closely with your learning style.

Recommended Autodesk Learning Tools for Visual Learners

e-Learning – e-Learning lessons are web-based and typically include the conceptual diagrams that Visual learners demand, examples to see, and descriptive

audio. The flexibility of ad-hoc access through on-screen menus helps Visual learners quickly navigate to their topics of interest. Subscription customers to most Autodesk products have access to e-Learning. Contact your CAD manager, who manages access.

According to learning theory, there are three basic learning styles, and most everyone has a dominant preference of one style over the others.

Recommended Autodesk Learning Tools for Auditory Learners

Video-Based Training – A variety of video-based training (VBT) tools are available with recorded lessons demonstrating how to carry out different tasks with Autodesk software. Auditory learners will like the instructor's narration, verbally explaining different topics. The ability to use a menu system to dynamically select the topics you are interested in makes these tools especially useful for ad-hoc learning.

e-Learning – Much like Video-based Training, e-Learning can also work for auditory learners.

Webinars / recorded Webcasts – Unlike the other learning types, auditory learners can find quite a bit of value in listening to recorded webcasts and webinars.

Recommended Autodesk Learning Tools for Kinesthetic / Tactile Learners

Instructor-Led Training – Nothing beats Instructor-Led Training (ILT). Great instructors understand the needs of all three learning types and create a classroom environment with something for every type of learner. Visual learners are exposed

to conceptual diagrams to give them the context they need, auditory learners hear explanations and can ask for more detail, and kinesthetic learners get hands-on activity that solidifies their understanding. Your best bet for hands-on, instructor-led training on Autodesk software is to visit an Autodesk Authorized Training Center (ATC). You can find an ATC near you using the ATC locator on the Autodesk website: www.autodesk.com/atc.

Of course, we all know how hard it is to find the time to take training from an ATC for a couple of days. Besides, sometimes we only need some very specific knowledge. What other tools are available?

Autodesk Official Training Courseware (AOTC) – The same courseware designed for classroom use at ATCs can be very effective for hands-on, self-paced, stand-alone learning. With trial discs and exercises, Kinesthetic/Tactile learners who don't need or have time to take an instructor-led class will find learning with this courseware appealing.

Epicurean epilogue

As you may have figured out based on the restaurant situation, I am a Visual Learner. A map and step-by-step table is the best way for me to find my way around. Picking up the telephone to call someone and have them start spitting out verbal directions would just not work for me. On the other hand, my wife is an Auditory Learner, and a voice on the telephone is her most efficient way to absorb information. It's a good thing opposites attract, because between us, we made it to the restaurant just fine. Had we been a pair of Kinesthetic/Tactile learners, we might have needed to jump in the car and drive there first.

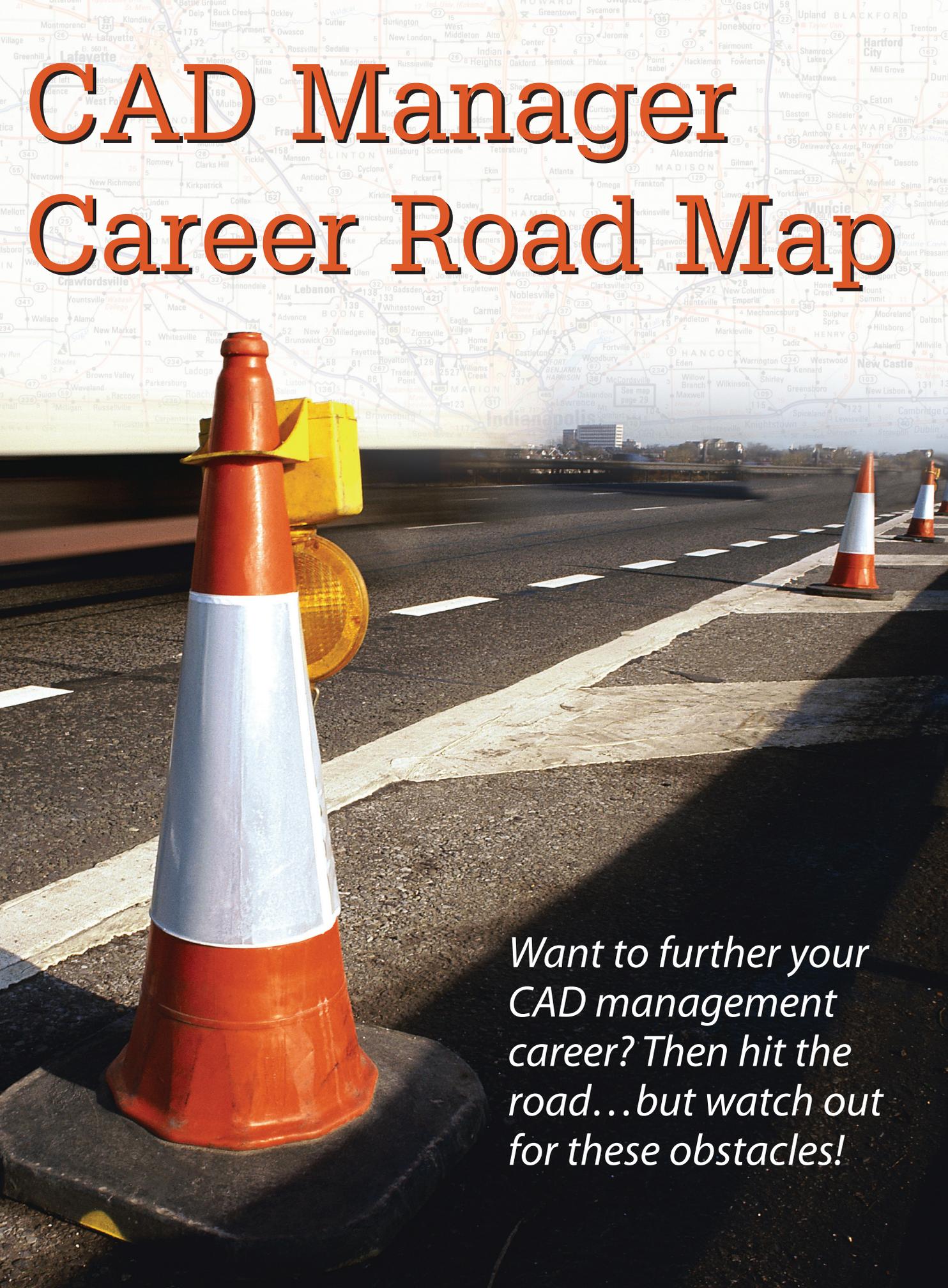
About the Authors



When he is not eating out at new restaurants, Eugene Evon is the Senior Manager for Courseware Programs at Autodesk. He can be reached at Eugene.Evon@autodesk.com.

Assisting with this article is AUGIWorld columnist Matt Murphy, chair of the Autodesk Training Center Advisory Board (ATCAB), is an Autodesk Certified Instructor (ACI). He teaches AutoCAD productivity seminars at ATCs, Autodesk University, AUGI CAD Camps, and private companies. He can be reached at matt.murphy@ACADventures.com

CAD Manager Career Road Map

The image features a road construction site with several orange and white traffic cones in the foreground. The background is a map overlay showing various cities and roads, including Lafayette, Crawfordsville, Lebanon, and Indianapolis. The text "CAD Manager Career Road Map" is prominently displayed at the top in a large, orange, outlined font. In the bottom right corner, there is a white text box with a black border containing the text: "Want to further your CAD management career? Then hit the road...but watch out for these obstacles!"

Want to further your CAD management career? Then hit the road...but watch out for these obstacles!

We go through many career stages as we advance in our chosen field. They can be categorized in many ways. Gene W. Dalton and Paul H. Thompson wrote a book way back in 1986 that outlined the basics phases of a career. The book, *Novations: Strategies for Career Management*, was instructional to me and I have adapted it to fit a CAD-related career.

Stage I: Depending upon others – CAD Drafter

This is the first stage in your career. You are fresh and most likely young. You are hungry for knowledge and seek out tech tips from those around you. You absorb information quickly and start reading books and talking to anyone who will share with you. You search the web for tricks and help files.

You may be hot on the hardware, smooth with the software, quick, sharp, dedicated, and eager, but you are dependent upon others to get information. As you near the end of this stage you are doing a lot more independent research and relying less on others around you. You begin asking fewer questions and start to provide answers to others.

Stage I road blocks

Moving into this stage can be a struggle for some. Here are a few things that might curtail your advancement.

Indecision about your next career move. Most of us in this stage could steer our careers in several directions. If you are not sure where you want to end up, you may never move toward the goal. I have seen many CAD whiz kids who stumbled in career advancement within their discipline

because they were pigeonholed into CAD production. Make up your mind if you want to pursue a CAD support role or focus on a sector of the industry as a designer or engineer.

Settling into your current role. Unlike the road block above, which is lack of movement, this one is an active option you create by locking yourself into your role as a CAD user. Keep your options open at this point. Ask for more assignments that expand your experience. Keep moving ahead.

Now, more than before, you have started to contribute to the CAD environment in your firm. You may be part of a committee that decides CAD issues and sets up training. You may have started programming and developing tools of your own. Maybe you learned LISP or VBA to create the small tools that you need to get the job done. Others may want to use your creations, which soon become standard tools. You create menus and scripts or decide which shareware or software to purchase.

Real super users like to share their knowledge, not hoard it.

Stage II: Independent contributor – CAD Super User

You press ahead and others have determined that you are a source for information about using the software. Now you are a provider of “know how” instead of a consumer. You now begin to gather others around you as you provide short demos of the tools you have mastered. You have influence over some of the areas of CAD standards development and methods of CAD production in your department or project team. You suggest new software tools and hardware needs. You help out with training of new users.

You are now considered a “super user” or “power user” by others and possibly officially have the title. If you are not part of the CAD support staff, you may be asked to make a career shift and hire onto the team. You may get a new job in which supporting others is part of your job description.

Stage II road blocks

You could suffer from a lack of technical competence in one area, which could bring on a lack of confidence. You could go the opposite way and actually be overconfident and stumble in an area in which you thought you were the best. I have seen quite a few people who have an arrogant, overblown self-image and no one likes to be around those kinds of folks. Keep a

Carving Out the Time to Lead

CAD Managers are pressed for time from every direction. Supporting the tools and talents of the user community in your office takes a considerable amount of time. While you may be the “bottom line” when it comes to support issues, your firm will also need to have someone focused on future technology and leading users there.

Here are seven ideas related to freeing up time that may work for you.

1

Plan and Organize

If you are like me, you have your agenda all laid out and think it through as you head to work. As soon as you arrive, it goes out the window. The latest server crash or system failure greets you as you open the office door. Don't chuck your agenda totally. Keep one handy in case you get some free time. Keep it in Outlook or any other tech tool you like to use.

2

Set Goals

Make sure that you have goals for each area of your oversight. Goals allow us to focus on the short and long term. Keep long-term goals within reason. Set short-term goals based on your long-term goals. Keep a list and update it every three months.

3

Prioritize

Now that you have an agenda and a list of goals, prioritize them. Be brutal in your efforts to keep the greatest impact items at the top of the list. The old 80-20 rule applies to your time. Eighty percent of your time will result in only twenty percent return. Manufacturing studies have determined that initial focus and designs are insufficient 88 percent of the time. So once you have prioritized, do it again the next day. I like to review my list after any major submittal, milestone, purchase, deployment, or hardware failure.

4

Make a To-Do List

Now that you have prioritized your goals and agenda, make a daily “to do” list. This could be on a slip of paper, in your head (not good for busy times), or in Outlook or another organization aide. Whatever you do, keep it simple and easy to create. Check off items as you complete them or at

5

Use Your “Best Time” for Critical Tasks

Decide at which time of day you are at your natural best. Are you an early go-getter? Get in early and start the toughest or best projects before others arrive. Are you a night owl? Stay late and clear your desk. Pivotal tasks are those that will influence the greatest number of users, projects, dollars, or deadlines. These are critical.

6

Be Flexible

If you plan out all of your time, you will obviously be frustrated by interruptions. Your job is to provide customer (user) service at all times. This means that you want to be interrupted so that you can provide the needed services. Try not to schedule more than 60 percent of your time. That way you can deal with interruptions, unplanned activities, meetings without notice, and other unpredictable events.

7

Make Big Tasks Smaller

Often the tasks you face require extended periods of time to complete. A big task may seem daunting and lead to procrastination. Slice and dice the job. This involves cutting the big task into small “slices” and then doing each of the smaller tasks in short, manageable time slots. Often it works to divide a task into eight time slots of 15 minutes, rather than in a two-hour block. By doing a little at a time, you will eventually get it done.

humble, appropriate perspective on your talents. Real super users like to share their knowledge, not hoard it. Give to others and they will support your advancement.

It may seem strange, but sometimes you struggle because you are a generalist, trying to know everything about every software tool ever made. This really equates to a lack of focus. It may be better to become an expert in one area before you add on more tools.

Stage III: Contributing through others – CAD Manager

You now have the title of CAD Manager or CAD Coordinator or CAD Supervisor. You may still be involved in production, but you spend more time making sure that the office CAD flow is working effectively. This is the stage that allows you to impact the company by overseeing

such things as the CAD standard, purchasing software and hardware, training, vendor negotiations, budgets, productivity, and more. You spend more time programming and developing. You interact with Project Managers to prep for CAD work on new projects.

Soon you may no longer be hands-on CAD production. You may not actually create any CAD design files at all now. You do use CAD, but it is mostly in a



support role. You create project border files and customize content for project use. You have a solid CAD standard in place and spend a lot of time policing the users for compliance.

As you progress in this position, you now have staff under you (or not) and you have made the transition to management. You now get things done through other people, usually by assigning tasks and managing the work efforts of others. You devise plans for new software rollouts while other people complete the individual tasks. It is difficult for you not to be so hands-on, since your hands-on skills are precisely what got you here.

Stage III road blocks

If you reach Stage III, it is a great achievement. Not many have come this far and not many will do the job effectively. But there are many things that can prevent you from breaking into Stage III. If you take a narrow focus on CAD work you may be undercutting yourself. Take a broad view of where CAD fits into the whole makeup of the firm. CAD is a vital tool to completing your tasks, but the firm's output consists of the designs that are produced.

If you won't assume responsibility for your actions or your decisions, you may never be considered for CAD Manager and you may even be forced to take a step back. If you think you have reached the top of your career, you may be short-changing your opportunities.

There are still places for you to go. If you do not focus on developing your interpersonal skills you won't be able to move in higher circles of influence. Management takes additional people skills along with your tech skills. You also need to let go of some of the details. Think bigger. Think beyond.

Stage IV: Leading through vision – CAD Leader

This is the final and, I think, prime place for you to be. You have done CAD and technology for so many years you are now a leader of others and not just a manager of tools, timetables, and standards. Now you inspire others on to great things. You still perform all of the duties of manager, though, because that is what you're expected (and paid) to do.

But now you think differently and you are motivating others to think globally about CAD. How it is pivotal to the operations of the company. How it is interwoven into the fabric of your design process. If CAD is ignored, it costs money and reduces the project bottom line. Ignoring CAD may include not setting up for a new project and not reviewing contracts for CAD catchwords that may require additional software tools.

You lead others by casting a vision and telling the story of how CAD should work and what is important to the proper use of the tool. You speak in conceptual terms and coach others to develop the step-by-step plans that make things happen. You

spend more time mentoring others than you have before.

You interact with upper management when creating a CAD budget. You are now planning for CAD expansions looking one to three years ahead. You have selected the next tool to buy before you have the dollars to buy it. You are creating teams of people to help get the job done. CAD committees, internal user groups, standards teams—you are in team building mode. Sure, you could do it alone, but by creating teams of people, you extend your influence by interacting with them consistently. You may even be involved in outside user groups and teaching events such as Autodesk University.

This is where you want to be: a CAD Leader. It does not really matter what your title is, how big your company is, or even if you are directly involved with CAD support. By becoming a leader, you have maximum impact on your firm and the industry at large.

Stage IV road blocks

You still maintain the title of CAD Manager, but you need to become a CAD Leader.

Some of the things that will stop you dead in your tracks include not knowing and working with the right people. You need to work well with users at all levels, but you also need to work well up the ladder with your CIO, CTO, CEO, and other "C" level leaders.

Another item might be a reluctance to use your power and influence. By being indecisive and not pushing technology forward, you may appear wavering or lackluster. Leaders know when to say "no" and when to make a decision.

Moving forward

By keeping your eyes and career focused on moving to the next level, you can avoid stalling out and keep progressing ahead. Rethink where you are and where you want to go. Steer your career and don't let it careen off the road to success.



Mark W. Kiker is a member-at-large on the AUGI Board of Directors. He is also a National CAD Standards Project Team Member (ver. 3.0 and 3.1) and president of the Core Technology

Group, (ctg-web.com) a consulting firm. Mark is editor of caddmanager.com, the CADD Managers Journal and the caddmanager.com blog. He is currently working as the Director, AEC Applications Division with KETIV Technologies Inc., an Autodesk reseller in Fullerton, California.

Falling Water

Falling water is one of those elements in 3D that can be relatively difficult to achieve. The Computational Fluid Dynamics (CFD) software for doing actual physical simulations is getting better, but it can still take a long time for the setup and calculation time. CFD software also leaves you with a canned solution without very much user control...at least not any easy user control. There are a few good ways of faking it within Autodesk® 3ds Max® and Autodesk® VIZ. Particle simulations are a great option and allow a high level of control in terms of collisions and overall splashing around, but are limited insofar as they are usually used on fast-moving, aer-

ated water. Because VIZ users do not have access to particle systems, I am going to demonstrate a technique that will use procedural materials to create a smooth, flowing waterfall similar to those found in most architectural water features, but is scalable right down to running tap water.

Setup

The basic idea here is to create an animated material(s) that we can then assign to a geometric object that will act as our waterfall surface. We can then add to the material(s) and adjust how that material is displayed on the object.

Open 3ds Max/VIZ and select the front viewport. Switch your viewport shading to

Smooth + Highlights and maximize the viewport. We need to make a temporary object to which we can assign the material so that we can make our adjustments and see what we're doing in the viewport. Go to the create panel and create a plane object that fills the extents of the viewport. Then zoom in until the viewport is completely filled by the plane object. At this point it's a good idea to do a test render to see if the viewport is covered (see Figure 1).

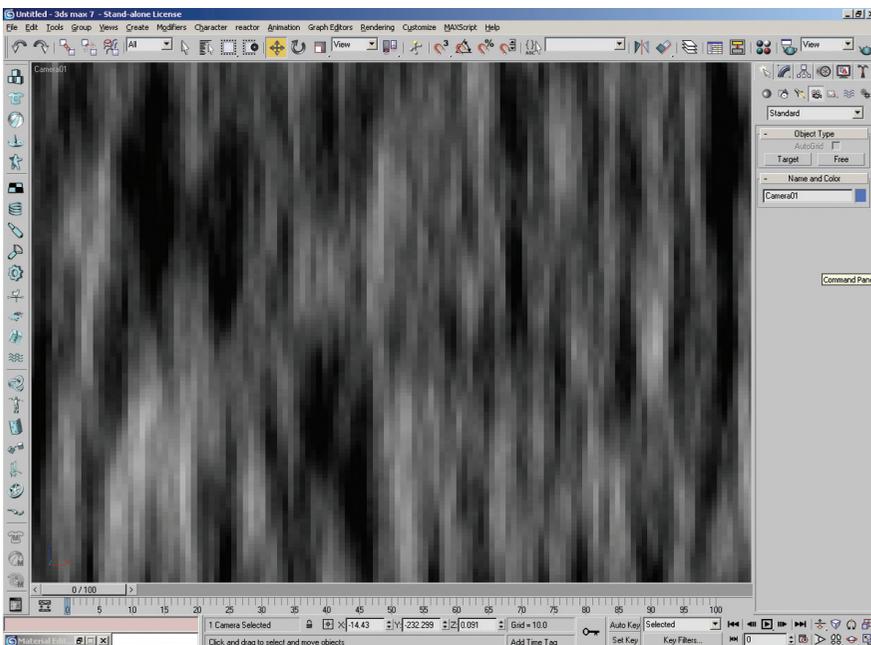


Figure 1

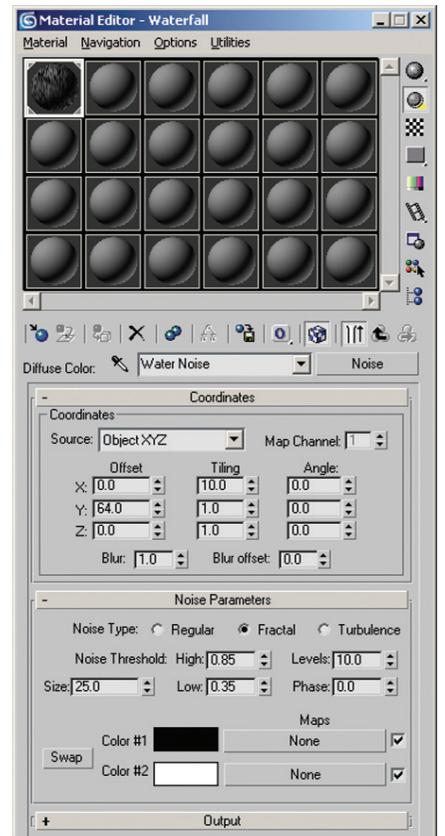


Figure 2

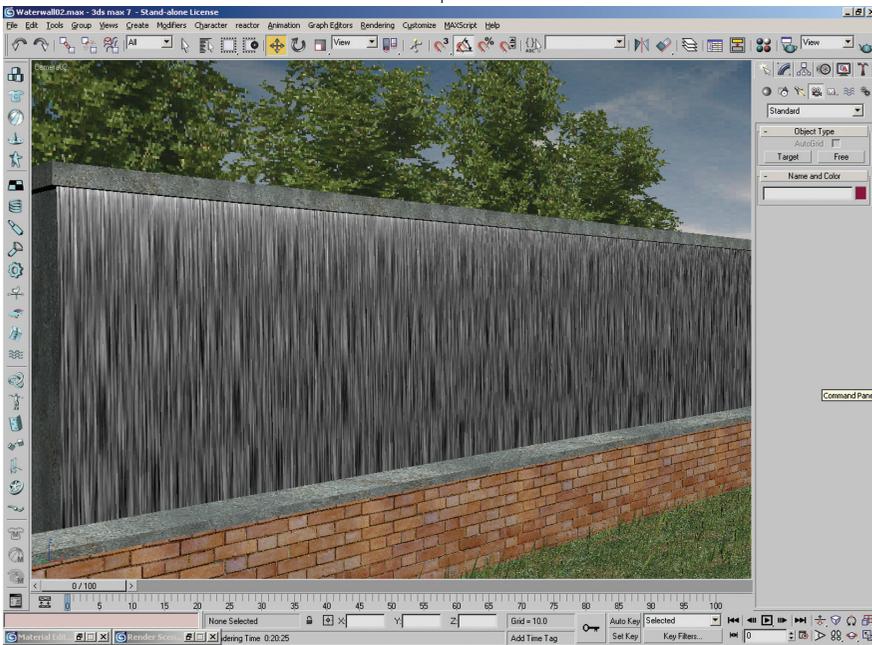


Figure 3



Figure 4

Building the material

Open up the material editor and pick an empty material slot. Name the material “Waterfall.” Click on the diffuse button next to the diffuse color swatch and choose a noise map from the material browser. Name that “Water Noise.” We don’t need any specular or glossiness, so set both of those parameters to zero (see Figure 2).

It is really important for us to see what we’re doing, so click the “show in viewport” button. You should see the procedural noise texture on the plane (see Figure 3). There are a few other areas that need to

be changed in the Noise Parameters rollout. Change the noise type to fractal and bump up the levels to 10. You will also want to change the high and low levels to .85 and .35 respectively. Next we want to make the noise map look a little more like flowing water, so we are going to tile the X axis by three or until you’ve reached the desired look of your flow. You will have to do test renders to actually see what the noise pattern will look like because there is some discrepancy between what the viewport shows and what actually gets rendered.

Animating the material

If you want to show the water actually falling, you will need to get it moving. There are a couple of different ways that you can accomplish this, but they all produce the same end result, so choose the method with which you’re comfortable. First, you can animate the actual plane object traveling in a downward motion through the front viewport starting from the top of the object to the bottom. This method requires that the plane object be large enough to cover the duration of the animated sequence. Second, you can use the offset controls within the material to animate the movement on the required axis. Turn on the animate button and go to the last frame. Now, if you animate the offset spinner value on the Y axis in the Coordinates rollout, the water will start to move downward. Animate the offset spinner for the Z axis roughly half as much as the Y axis. Animating the Z will generate some much-needed, random depth movement in the water. There will be a bit of trial and error to figure out just how fast you need it move. Be sure to change the In and Out tangents on the offset keyframes to linear to ensure that the water moves consistently.

Conclusion

After generating all the necessary maps, you will want to apply them as bump maps or better yet displacement maps. It is also a good idea to use some reflection and refraction with the proper Index of Refraction (IOR). Essentially, the core of this technique revolves around generating animated maps that can be rendered out into video files or image sequences to be applied as textures (see Figure 4). Creating animated maps is an effective way to simulate falling water...especially if you use procedural textures, which are easily editable. You could also combine custom painted maps or maps generated in other ways into the mix, building a far deeper material tree. The more complex and random the material becomes, the more it will resemble water falling. This technique should give a good starting point. Have fun!



Dwayne D. Ellis is the lead 3D computer animator at Hrycay Consulting Engineers, a firm specializing in Motor Vehicle Accident Reconstruction. He is also the founder of Lifeseyes Studios and can be reached at dwayne_ellis@yahoo.com.

A More Efficient Way to Do Residential

An Autodesk Architectural Desktop customization known as VisionREZ makes easy work of residential building tasks

The process of creating residential work with Autodesk® Architectural Desktop is a bit cumbersome. For all of you out there, a solution called VisionREZ is worth thinking about. In a nutshell, VisionREZ is a well-designed customization of ADT with the added bonus of some great features and a process for residential design and drafting. It can be run as a plug-in within ADT 2004, 2005, and 2006, or as a price-conscious, stand-alone product Powered by Autodesk Technology® and does not require the user to purchase a separate seat of ADT.

The interface

The use of VisionREZ in residential work really streamlines your workflow. The first step in this streamlining is the redesign of the interface.

You can access any of the tools from the standard Tool Palette of ADT, from the Content and Styles Toolbar group in VisionREZ, activating the appropriate set of tools faster. No customization is required, but users have access to the Var Manager to adjust variables for individual needs.

Dealing with levels

One major hiccup in ADT's workflow in a residential project is the Project Navigator. Generally, all work can be done within one file. VisionREZ's Layer sets feature tackles this task with simple flair. You access the levels by simply filling VisionREZ's Var Manager. The Var Manager establishes dimensions for the Exterior Wall Height and the Floor Elevation for all levels and the rest is taken care of by VisionREZ (see Figure 1).

To jump from one level to another, you simply use the color-coded Level Toggle toolbar. Everything related to a specific level is always using the same color. Intuitive....great idea!

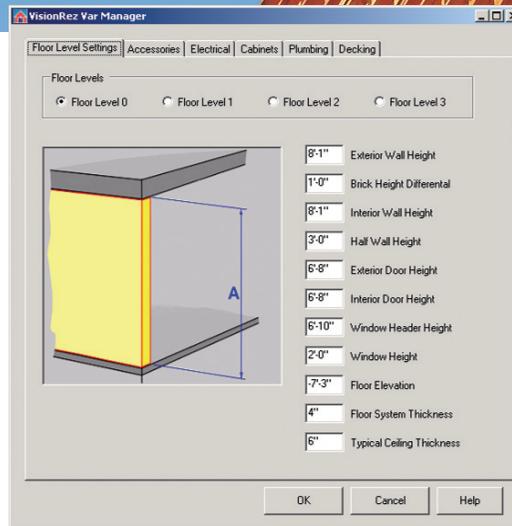


Figure 1 – VisionREZ Var Manager

Adding walls, doors, and windows

The process of creating walls is a bit different in VisionREZ than within ADT, which will also make your life a lot easier. The structure and exterior finish are two different wall types. This makes it a lot easier to create components such as brick ledge.

This process will also simplify the creation of Wainscot, Brick trim, or even Exterior Band.

Wall height will also be taken care of by the software, based on what you specify within the VisionREZ Var Manager. The walls automatically will be modified accordingly.

After creating the shell of your house, you then start adding doors and windows. Doors and windows behave exactly as they do within ADT. Created in the style manager, you can create any door or window type you can dream up.

VisionREZ comes with many fancy styles for doors and windows. Specialized styles such as doors that have glass pattern inserts and even windows (that were not so intuitive with standard ADT), such as bay

windows, box windows, or bow windows can now be created within their own interface. You simply have to fill in the dimension and specific conditions.

Adding trim to a door or window is another easy process. Change the shape or the dimension of your objects and then VisionREZ automatically adjusts accordingly. An additional bonus is trims, available in a variety of styles.

Adding other components

When designing residential projects you must add components such as casework and countertops. Once again VisionREZ streamlines the process of designing these. A quick example: When adding a sink to a countertop, VisionREZ will automatically cut the countertop appropriately for an accurate representation.

VisionREZ also offers a complete set of cabinets in various dimension and styles.

Components such as washer and dryer or freezer are among the objects you can add within VisionREZ to complete a more detailed floor plan. All of the associated electrical, plumbing, and text comes in automatically.

Roofs

One of the most painful things to do in ADT is add a roof. Within ADT, if you need a more complex roof you then switch to slabs breaking the link with the roof. With VisionREZ you get to deal with a new object: the VisionREZ roof. This object tool is a lot more flexible and intuitive; it actually comes with its own set of parameters (see Figure 2).

The VisionREZ Roof Style contains parameters such as Eaves Trim or Rake

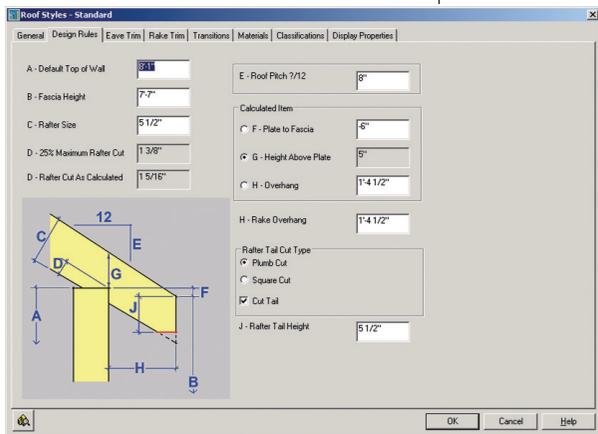


Figure 2 – VisionREZ Roof Object

trim and Transition. This again simplifies the process compared to the workflow within stock ADT.

Framing

VisionREZ version 2 includes a new set of tools for framing. The framing feature allows you to create rafters or hips and ridge by simply selecting the roof object.

Floor structures are also easily created with the same set of tools, as are ceilings (beams, joist).

Furthermore, you can modify these objects easily using well-known tools such as Trim, Extend or Break, a definite must-have for residential work (see Figure 3).

BOM

The last step in a typical project is to calculate every object and surface and give it some order. This process is called creating a bill of material (BOM).

Almost anything can be scheduled in VisionREZ, from the floor area to doors and windows. Even framing can be a schedule.

All items can be exported to Microsoft Access or Excel. From there you can link to your spreadsheet for estimating calculations.

Rendering

All objects have pre-assigned materials, which enables the model to be imported into VIZ Render, 3ds Max, or Autodesk VIZ for lighting and environment addi-

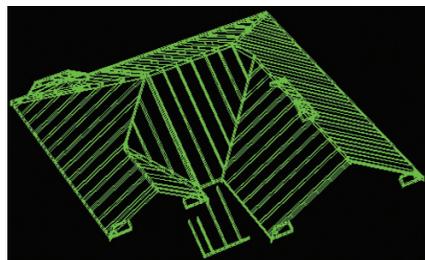


Figure 3 – Roof Structure

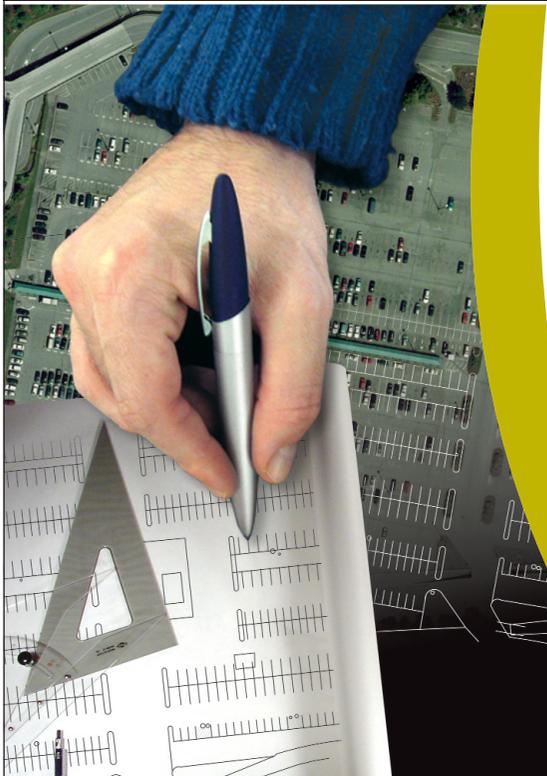
tions. Those materials can also be manipulated any way the user desires.

A must have

If you regularly perform residential work, VisionREZ is a must-have. It will save you a lot of time and money, but also a lot of headaches.

Give it a whirl—download a trial version from the VisionREZ website at www.VisionREZ.com.

Daniel Hurtubise works as an independent consultant in BSD technologies and also works with Autodesk Consulting. He is the founder of the Montreal AUGI Group and can be reached at daniel.hurtubise@adsk.biz.



SOMETIMES YOU HAVE TO DRAW THE LINE...

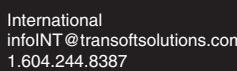
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The Project Navigator

Part Two: Bringing it All Together

Second in a two-part series on Project Navigator,
an Autodesk Architectural Desktop tool



In part one of this series we discussed building a project with the Project Navigator. We talked about the various folders that are in the project structure and their uses. We explored the functionality of fields and how they can be useful. Now we're going to dive into how to bring that information together to build a coordinated set of construction documents.

As mentioned in the first part of the series, your building floor plans are going to be created and stored in the constructs folder while repetitive aspects, such as typical room layouts, are stored in the elements folder. To prepare these plans to be referenced into sheets, it's a good idea to create views. It is not mandatory to create views; the constructs can be referenced directly into the sheets. The benefit of views, however, is the ability to create one plan for a building that may be divided into

to the sheet showing area B, the pipe is nowhere to be found.

To create views, click on the views tab. Right click over top of the folder icon on the views tab, hover over new view DWG, and select the appropriate view drawing type (e.g., general, section/elevation, or detail). After selecting the view type, a dialog box will prompt you to provide the var-

appropriate scale for the view. By default, the view is set to the current drawing scale. Lastly, define the view window by selecting the view window button.

Now that you have views created, you're ready to begin building the plot sheets. Assuming you already specified a template from which your sheets will be created, on the sheets tab of the project navigator

Before you go throwing
a party and thinking that
world peace is at hand,
here's one thing to consider:
your machine's performance
will be affected.

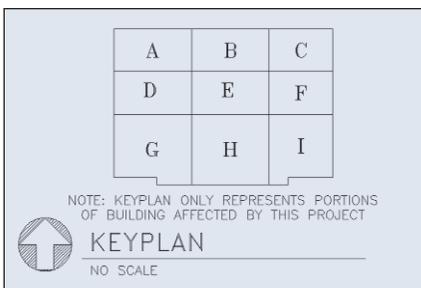


Figure 1

multiple sections. For instance, in the example shown in Figure 1, there are nine divisions, each labeled by a letter. A common problem when buildings are divided into multiple sections is that when utilities cross from one area to the next, they are not coordinated. So a note could say, "For continuation, see area B," and when you go

ious information about the view. The first window is where a filename is entered. I recommend choosing a name descriptive of what the view will be showing. For example, if you are creating an enlarged plan of an area, you might name the file "First Floor Enlarged Toilet Plan."

The next step is to define where the view exists within the drawing file. With the view drawing open, right click on the name of the view drawing in the project navigator palette and select "New Model Space View." The "Add Model Space View" dialog box will come up, giving you the opportunity to set a couple parameters. First, give the model space view a name and a description. If need be, select the

palette right click over the drawing subset under which the sheet is to be created and select new sheet. Provide a sheet number and title for the sheet and press ok. Unless you specified another location, the sheet is created under the sheets folder of the current project structure. To add views to a sheet, open the sheet where the view is to be shown. Simply click and drag the view into the drawing space of the sheet.

Once the view is loaded into the sheet you will be prompted to select an insertion point for the view. If you need to change the display scale of the view, you can do so by right clicking and selecting a different scale. When an insertion point is selected, Architectural Desktop automatically

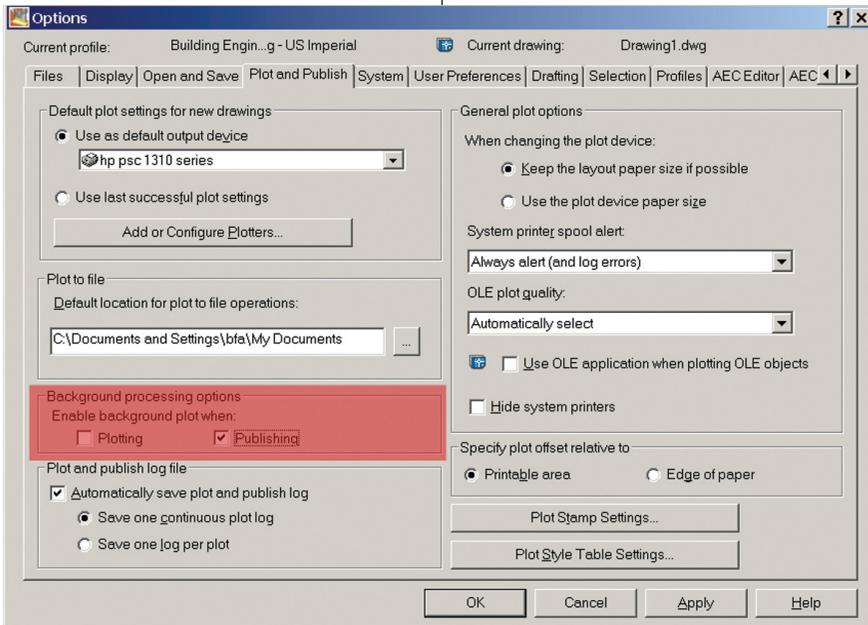


Figure 2

attaches the view to the sheet through XML code, x-references the view into model space at "0,0" and creates a viewport large enough to display the view at the scale specified. If you ever need to remove the view from the sheet, simply erase the viewport for the view and the view is detached from the sheet. One important thing to note, however, is that the x-reference is not detached from the sheet file, which I assume happens in case more than one model space view is referencing that x-ref.

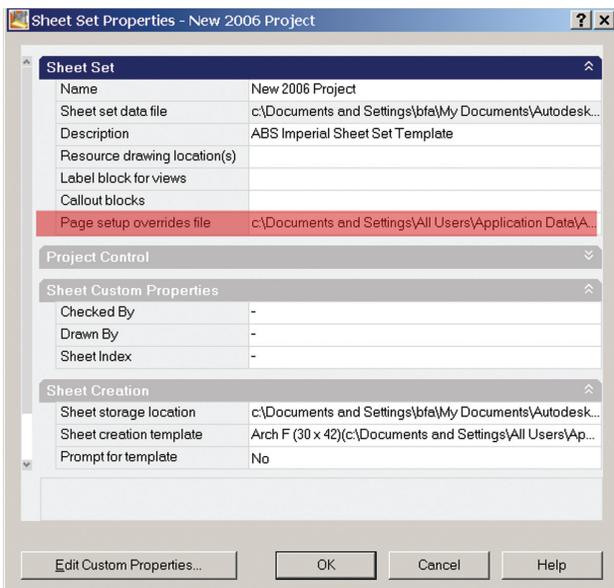


Figure 3

It is quite common for view-specific text to be placed in the view drawing. One drawback to this approach is that you may have more than one model space view in

the view drawing, maybe even at different scales. Getting the text to display everywhere the way it was intended can sometimes be difficult. I commonly have a view drawing containing the architectural background for an entire building that is too large to show on one sheet. So naturally the floor plan is broken into several divisions. In one view all the divisions for that floor are referenced. I then design the mechanical systems for the entire floor here, but steer away from plac-

ing all the text that will eventually be displayed on the sheet. It is common around the perimeters of the divisions that the sheet text may cross over into the next division. So if I had all the text in one view, text would inevitably end up having to be cut off in the sheet viewports. To avoid this I add the text to view in the sheets. This helps me keep the text displayed from one sheet to the next where utilities cross divisional boundaries.

So, you've created all your sheets and you have everything noted with the text looking nice. You need to get a check set to review. It used to be that you create a script file for plotting the sheets,

get the parameters set, and then go get a cup of coffee and chat while your machine hammers away for an hour plotting the sheets. Things improved greatly with the creation of the Publisher, but it still tied up your machine for an hour while plotting. Fortunately, this is a thing of the past. Now we have the ability to print a set of drawings in the background while we continue to work.

Before you go throwing a party and thinking that world peace is at hand, here's one thing to consider: your machine's performance will be affected. It only makes sense; you added yet another thing for your computer to think about while you attempt to continue doing the other more important things such as checking the latest stock quotes. To enable background printing, go to the Plot & Publish tab of the options menu. In Figure 2 you can see the background processing options.

You're also able to perform single-click publishing on your sheets. If your office is anything like mine, you work for more than one client and have to switch between plotting styles often. You are able to specify a "Page Setup Override" enabling the single click publishing. To do so, right click over the project title on the sheets tab in the sheet set view and select properties. As shown in Figure 3, you are able to specify a custom path for the page setup override file. You would need to create a DWT file containing the various page setups that your office uses. Once this file is specified you are then able to right click over any sheet, subset, or project title and select a page setup override to publish to.

The Project Navigator gives the ability to archive and e-transmit files or the entire project in a matter of a few clicks. At any given time you are able to archive a project. To do so, right click over the project name and select "Archive Sheet Set." All the files associated with the project will be included in the archive. By default, the project will be archived to a zip file. You can modify how the archive is created and what files are included by selecting "Modify Archive Setup." In the resulting dialog box, you can select various parameters such as whether the files will be written to a folder, an executable or a zip file. You can specify how the files are to be saved by making the selection between 2000 and 2004. The files can also be written with exploded AEC objects. You can choose to have the files written to an organized folder structure, have all the files placed in one folder, or keep the files and folders as is.

The last tool associated with the Project Navigator that we'll discuss is E-Transmit. For those of you who are unfamiliar with E-Transmit, it was originally called Pack n' Go. This tool does much the same thing as the Archive Sheet Set, but with a little extended functionality. The major difference between the archive and E-Transmit functions is that only the entire sheet set can be archived while any number of files, sheet subsets, or even the entire sheet set can be E-Transmitted.

As with other functions related to Project Navigator, to initiate the E-Transmit process, right-click over the project and select E-Transmit. The dialog box shown in Figure 4 will come up. You'll note in the file tree window that all the files you selected to transmit have been added in the window. In the right window pane any pre-defined transmittal setups are available to be selected. If need be, the standard setup can be modified or new transmittal setups can be created. This is a really useful feature for those of us who work with multiple clients or consultants. In the bottom window you can add notes related to the transmittal such as the contents of the transmittal or give information to the recipient about recent changes made to the project.

To modify the current transmittal setup or create a new one to use with the current transmittal, click the "Transmittal Setups" button. A new dialog box will come up with all the pre-existing transmittal setups listed in

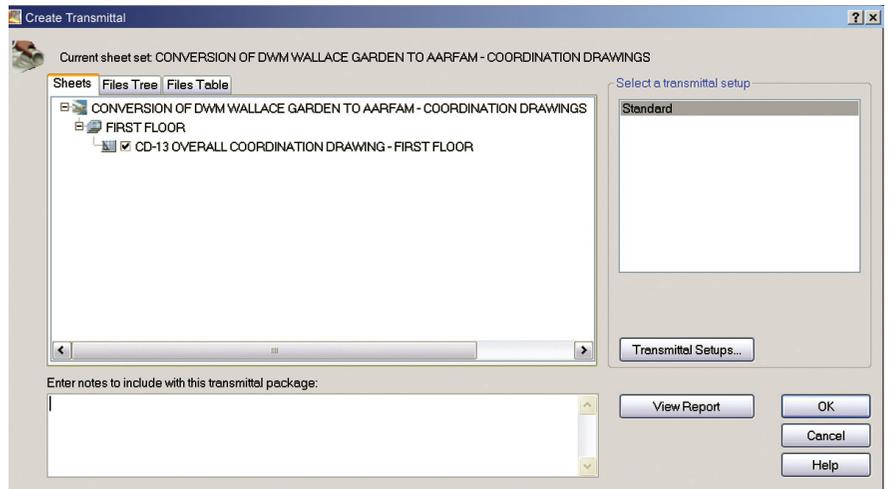
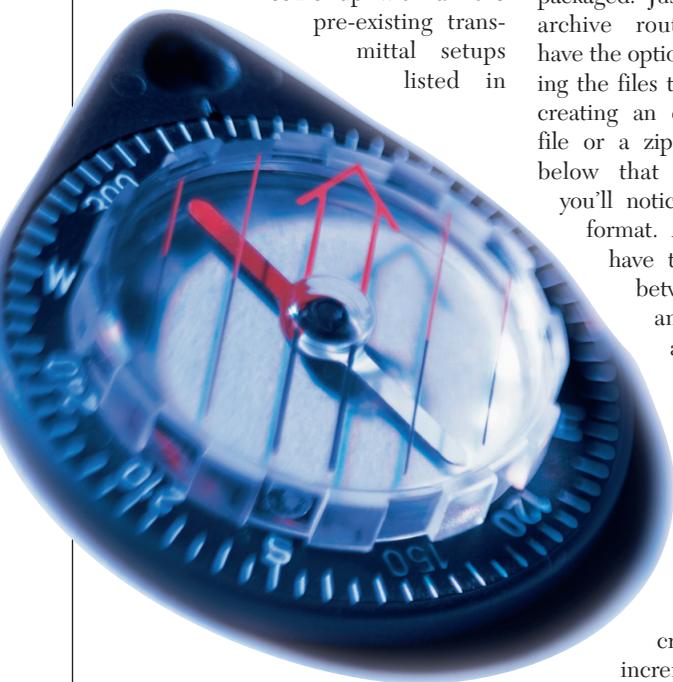


Figure 4

the window. To change any of these setups, select the setup and press "Modify." To create a new setup, press "New." The resulting dialog box will prompt you for the name of the new setup and allow you to base the new setup on the pre-existing one you select.

Once a name for the new transmittal setup is specified the dialog box in Figure 5 will come up. The first item in the dialog box deals with how the files will be packaged. Just like the archive routine, you have the option of copying the files to a folder, creating an executable file or a zip file. Just below that selection, you'll notice the file format. Again you have the choice between 2000 and 2004

and whether to have the content left as is or have the AEC content exploded to primitive geometry. The next item is the transmittal file name. You can decide to be prompted for a filename or specify a filename with option to overwrite a file or create the new file with an incremental filename.

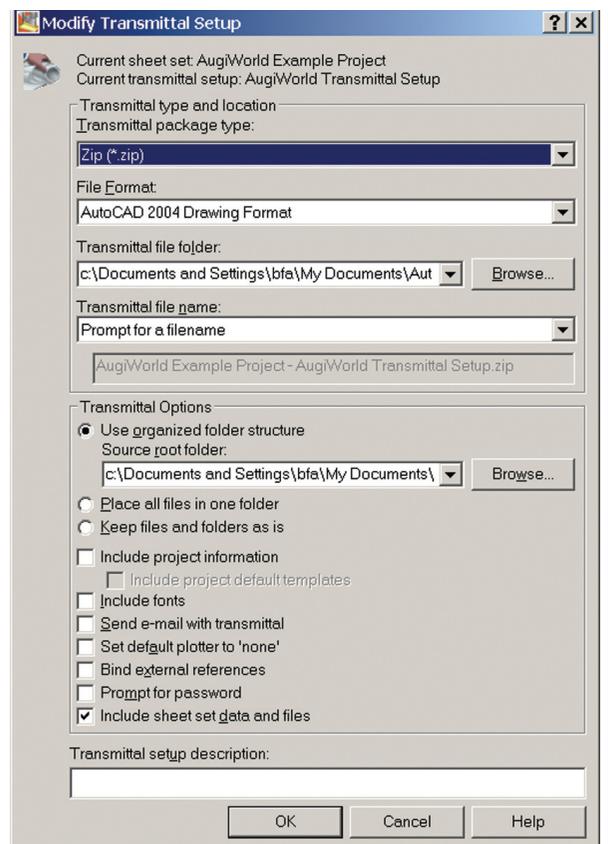


Figure 5

Next are the transmittal options. This area of the dialog box contains an array of options, the first three of which deal with the Project Navigator folder structure. You have the option of using an organized folder structure, placing all the files in one folder, or maintaining the existing folder structure. The next several options have to do with what files to include and whether or not to bind the x-references. Including the fonts and binding the x-references is a really good practice whenever the files are

Every time we allow ourselves to think that the products couldn't possibly be improved further, we are pleasantly surprised.

leaving the offices. Depending on how you handled the pathing of your x-refs, you may be setting yourself up for problems leaving them unbound. The last option for the transmittal setup is to include a description about the transmittal setup. Here you may specify for which client the transmittal setup is to be used.

After making your selections, press OK and the transmittal setup will be added to the available setups from which to create the transmittal. The last option on this tab of the E-Transmit dialog box is to look at

the report. The report tells what will be created based on the selections you made. The next tab is the report tree. This view shows what files are being included in the transmittal based on the transmittal setup. This is a way of excluding files you may not want included, such as the project information. This is also a place to include files that the Project Navigator would have no way of knowing about such as cut sheets on equipment included in the project. The final tab is the files table tab. This tab shows everything the files tree shows, only in a table

format. Files can be included or excluded just as they were on the previous tab.

The newest release of the AutoCAD® product family is the 2006 product series. In this release the Project Navigator is taken even further by allowing the user to build palette groups based on the project needs. There are options to build AEC design standards and even the ability to build drafting standards on a project level. Autodesk has consistently improved its products with each and every release. Every time we allow ourselves to think that the products couldn't possibly be improved further, we are pleasantly surprised.



Nick Fuller is a mechanical designer with Bowman Foster & Associates P.C. in Norfolk, Virginia. Nick has been using AutoCAD since release 12 for DOS and has been known to dabble in AutoLISP and customizations. For comments and questions, please feel free to contact Nick at somecadguy@verizon.net.

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Formulas, The Autodesk Revit Family Secret

No cover up, just a pleasant surprise

Many *AUGIWorld* readers know that Autodesk Revit® families are parametric. For example, just one furniture family (a table) with just three options (parameters) for length, width, and height, can contain 27 standard size tables. For AutoCAD® users, this is like a supercharged 3D block. But the parametric power of Revit families is even better—with the availability of formula-controlled parameters. While the use of parameters is well known, the uses of formulas within parameters are almost a secret.

This “Family Secret” is not the result of any cover up. Autodesk announced the availability of formulas several releases back, and has kept formulas on the list of Revit features. The www.AUGI.com discussion forums have talked about formulas, and some Revit user groups have had special presentations on the use of formulas. This “secret” is probably just the result of the feature being unexpected from architectural drawing software. It is something new in our experience, so we don’t know what it is and we don’t know how to use it.

Arithmetic formulas

To uncover this secret, let’s look at some examples to see where formulas would apply. Figure 1 and Figure 2 show two cases of a single family. In Figure 1 the side windows are set to one-half the size of the central window. In figure 2, we have increased the size of the central window and the side windows are automatically adjusted to keep the proportions the same. This also works in reverse—if we change the size of the side windows, the central window will adjust to be twice their size.

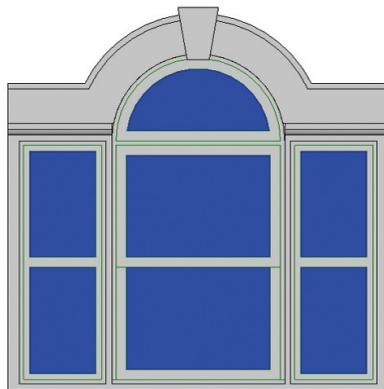


Figure 1

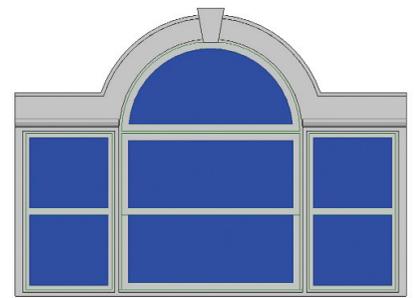


Figure 2

This behavior is created by using a simple formula ($\text{Width-side Pane} = \text{Width}/2$) to keep the proportions correct. The formula was entered in the Formula column of the Family Types dialog box. See Figure 3, Window Width Formula.

To explore this example further, refer to the tutorials included with Revit. This one is called “Adding Formulas to a Family.” You can find it under menu picks Help/Tutorials/Creating Families/Working in the Family Editor.

Adjusting window width barely scratches the surface of the power available from formulas. Revit provides for standard arithmetic functions:

- addition
- subtraction
- multiplication
- division
- exponents
- logarithms
- square roots
- Trigonometric functions are also supported:
- sine
- cosine
- tangent
- arc sine
- arc cosine
- arc tangent

When would you use the trigonometric functions? Let’s look at an example to see where. Revit comes with a construction crane. The problem with this crane is that it is not set up to change boom angle like a real crane. See Figure 4, Crane. One Revit user has modified this crane so that it can be set to “reach out” a specified distance. A trigonometric function is used in a formula to calculate the correct boom angle for the desired distance.

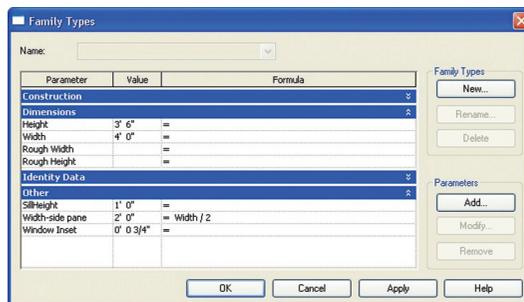


Figure 3 – Window Width Formula

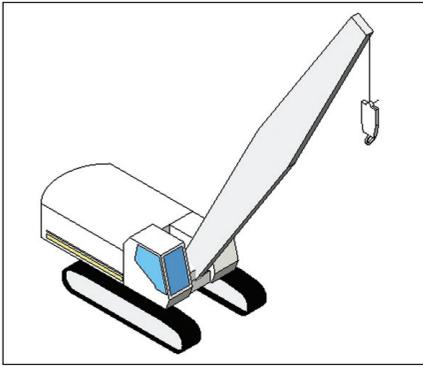


Figure 4 – Crane

In the simplest case, Revit parameters use ordinary numerical values to control parameters. At the next level of sophistication, parameters are controlled with formulas, as we have just seen. The next level is the use of logic to control parameters.

Conditional formulas

The example we will use to explore conditional formulas is a wall shelf with brackets. Our example is very similar to a tutorial included with Revit, so you can work through the details later. Figure 5, Shelf Option 1, shows the shelf at a shorter

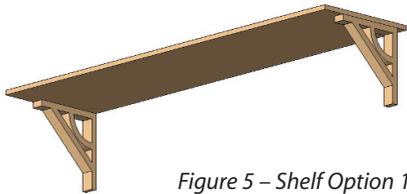


Figure 5 – Shelf Option 1

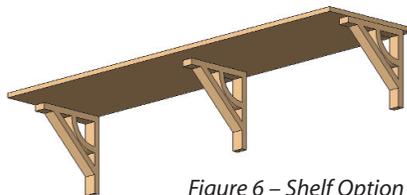


Figure 6 – Shelf Option 2

length using two brackets. Figure 6, Shelf Option 2, shows the shelf at a longer length that requires three brackets. This is a case where logic can be used to control the addition of a bracket when the shelf is too long to be supported by just two brackets.

First, we created a shelf with all three brackets. In our example this was done by creating a bracket family and a shelf family. Then the bracket family was loaded into (nested within) the shelf family.

Next, we define the logic desired. We want one middle bracket when the shelf is longer than 8'0" and no middle bracket when the shelf is less than or equal to 8'0"

The third step is to create a logical, “Yes/No” parameter. The parameter is called “Center Bracket.” The control we want is for the center bracket to show when the shelf length is greater than 8'0", so we enter “Length>8” in the formula field. See Figure 7, Family Types Dialog Box.

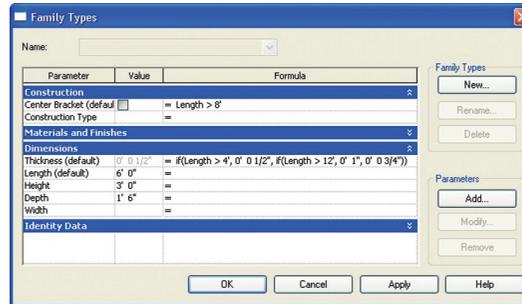


Figure 7 – Family Types Box

Next we add a visibility control to the central bracket. Select the central bracket, open the Element Properties Dialog Box and click the button to the right of the “Visible” parameter. See Figure 8, Element Properties Dialog Box. This opens the Associate Family Parameter Dialog Box (Figure 9), where we select the “Center Bracket” parameter. This step links the “Visible” parameter to the “Yes/No” logic of the Center Bracket” parameter.

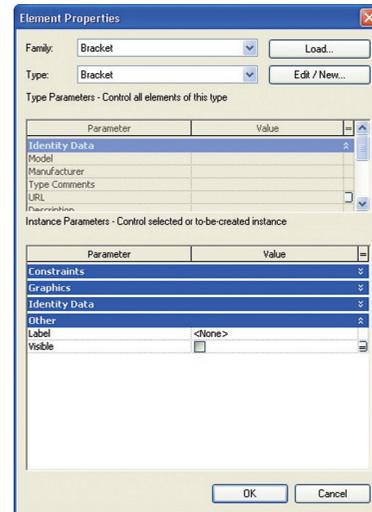


Figure 8 – Element Properties Box

We are not done yet. In addition to “Yes/No” logic, the current release of Revit allows “If, Then, Else” logic in the formula field. Continuing with our shelf example, we will create a control to increase the thickness of the shelf as the length increases. Since we know our shelf material (wood) comes only in certain thicknesses,

the control is not a simple proportion. We need a control select certain thicknesses for a range of lengths.

First we need to define our logic: If the shelf is less than 4' we can use a 1/2" board. When the shelf is longer than 12' we want a 1" board, and when the shelf is greater than 4' and less than 12' we can use a 3/4" board.

The format of the logical control within Revit is If (condition, condition_true, condition_false). The logical statements (not the actual controls) we want are:

- If (Length < 4') then Thickness = 1/2")
- If (Length > 12') then Thickness = 1")
- If (Length is between 4' and 12') then Thickness = 3/4"



Figure 9 – Associate Family Parameter Box

We must control these three conditions with one formula for the thickness. This is done by nesting the logical statements as follows: If (Length < 4', 1/2", If (Length > 12', 1", 3/4")). This formula is entered in the Formula column for Thickness in the Family Types Dialog Box. (See Figure 7).

To explore the shelf example further, refer to the tutorials included with Revit. This one is called “Adding Conditional Formulas to Control Family Parameter Values.” You can find it under menu picks Help/Tutorials/Creating Families/Working in the Family Editor.



Bruce Madsen is a project leader at aecContent (www.aecContent.com). He can be reached at 415-321-1117.

The Secrets to Productivity – Revealed!

Manage your block libraries with Tool Palettes



Tool Palettes have been incorporated into AutoCAD® since the 2004 releases. They were originally designed to provide an easy way to create, access, and insert blocks and hatch patterns. Since Autodesk released the Tool Palette Extension for AutoCAD 2004 and future-released AutoCAD 2005 and AutoCAD 2006, there is now increased functionality such as Command Tools, Object Tools, Content Tools, Table Tools, Fly-outs, Palette Groups, and true drag-and-drop creation from inside AutoCAD and outside AutoCAD with Microsoft directory sources.

I want to focus on just one aspect of Tool Palettes. I will introduce you to a technique that will streamline your libraries by eliminating hundreds of blocks and will make the “Insert” command obsolete! Let’s take a closer look.

Working with Tool Palettes

Before you create your own block tools, let’s examine the sample tools that come with AutoCAD. This way you’ll learn how to build your own perfect beast!

Modifying an existing tool

Making a change to any existing tool is always the same, no matter what type of tool is being edited. All tools share the same common properties. Follow these steps to edit a tool.

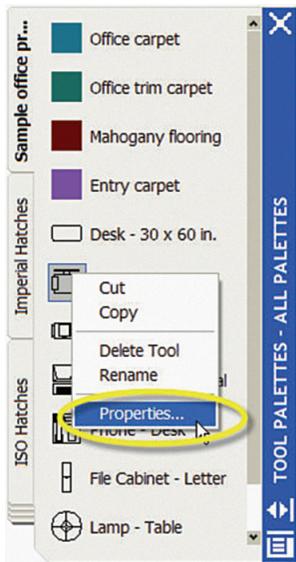


Figure 1

Simply locate the tool that you want to edit on the Tool Palette Window, right-click over the tool and select “Properties...” from the shortcut menu (see Figure 1). Now you can change the Properties for the tool. Once you’ve made the changes, click OK to accept the changes or Cancel to exit and ignore them.

You can change color, layer, linetype, and lineweight properties as well as the object properties. Once changed, the tool will now function with the new prop-

erties for all future uses. Prior instances of the tool within the drawing will remain with the previous tool properties. In other words, it doesn’t work like redefining a traditional block (see Figure 2).

SECRET: Renaming a tool does not redefine the tool. Changing the name under tool properties just makes the tool easy to identify on the palette.

Making a copy of an existing tool

Autodesk has implemented the Microsoft standards such as Cut, Copy, and Paste. To make a copy of an existing tool, simply locate the tool that you want to edit on the Tool Palette Window, right-click over the tool and select Copy from the shortcut menu, then right-click again and select Paste. You can also select another tab that is part of your current Tool Palette set and paste it to that tab.

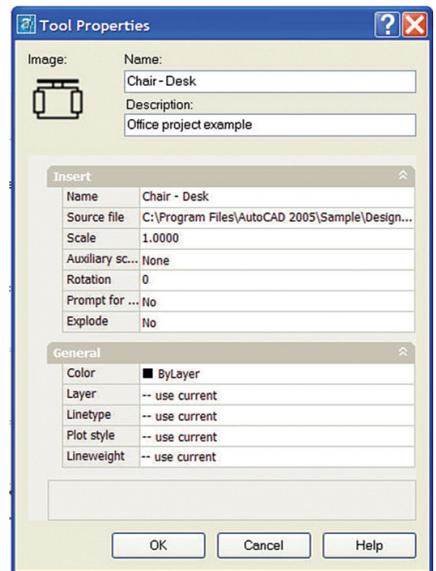


Figure 2

Moving a tool

You can Cut a tool to remove it from one Tool Palette and then Paste it to relocate it onto another tab in the Tool Palette set. The order of tools can be changed by holding down the left button on a tool while dragging it around on the current tab. You can tell where the tool will be relocated by the bold line that shows up in the Tool Palette area as you hold the tool and move the cursor.

Changing the look

Tool Palettes can be represented with several different looks and each tab can independently have a different look. To change the appearance of a Tool Palette or a set of Tool Palettes, simply select the tab that you want to change, right-click over the tab, or on an empty area of the tab, and

select the “View Options...” from the shortcut menu.

SECRET: You can apply the View style changes to the Current Tool Palette or to All Tool Palettes by changing the drop-down in the “Apply to:” window. This makes it easy to create consistency from one palette to another.

Making palatable tools

Following the lead of Microsoft, you can create a tool on a palette with the “drag and drop” technique. So what are the types of tools you can create by this technique?

Tool Palettes don’t make you go out of your way to create content, although you can go out of AutoCAD to find it. Tool Palettes allow you to tap into the content that has already been established. You’ll need to start thinking out of the AutoCAD box to understand the power of using this new style of interface. Below are many of the ways to populate your Tool Palettes with Content Tools.

Drag and drop

A finished drawing contains the guidelines and company standards that were used to create it. So the objects in the drawing can be used to build new tools to help adhere to these standards for future projects.

When some object types are added, they display a small black arrow just to the right of the tool button. If you click on the arrow, a small fly-out appears similar to the one that is associated with a Toolbar button.

Once the tool has been added to the Tool Palette, its properties can be accessed by a right-click over the button and selecting Properties from the menu.

If an object cannot be added to the Tool Palette the cursor will be changed to a circle with a line through it. This will also happen if you try to add a newly defined

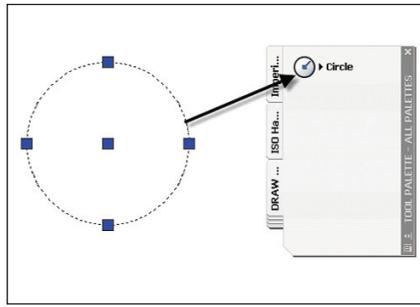


Figure 3

block and the drawing has not been saved (see Figure 3).

DesignCenter (ADC)

AutoCAD Design Center (ADC) was added as a way to re-use information from existing drawings. DesignCenter allows you to steal or cannibalize content from one drawing into another. Although powerful, it gives you almost no control. For example, blocks are placed on the current layer only.

Creating a block tool

Blocks are the most popular form of reusable content. They are also the most common tool that you might find on a Tool Palette.

The power of the Tool Palettes’ block tool allows you to assign properties such as layer, color, etc. to the blocks on a palette. There are even more powerful properties of the block tool that allow you to set rotation and scale and even whether the block should be exploded when it is inserted into a drawing.

The procedure for creating block tools from an entire drawing is easy. Right-click on any drawing file found in DesignCenter and choose Create Tool Palette. A new palette will be made from all the blocks within the drawing with the name of the drawing as the name of the palette. Simple! (See Figure 4)

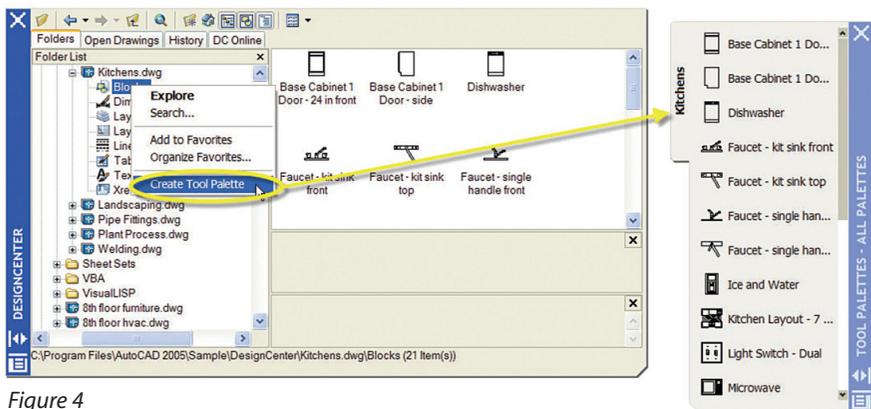


Figure 4

Reinvent your block libraries

Did you notice that the technique I just explained means that you no longer need a separate drawing file for each block in your library? Now you need only one drawing file for each category of blocks that you would use (see Figure 5).

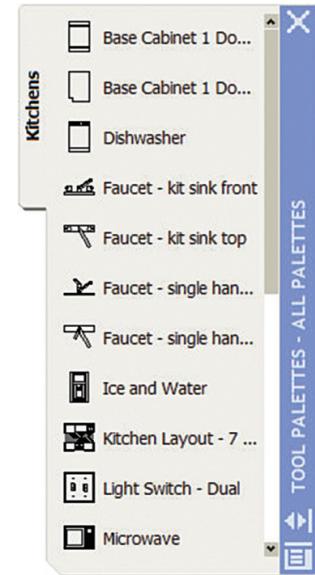


Figure 5

For example: in the past I would have a network drive that contained a folder for blocks and a subfolder for kitchen fixtures. In that bathroom folder I would have all my blocks as drawing files. Each drawing file would be one block. Every time I needed to make a change to the library I would have to find and open every single drawing file and change it. Now you only need one drawing file in that folder and you only need to open one file to make all the changes to that category of block. Isn’t this a better way to organize your block library?

If you’re looking for tips to deliver effective instructor-led training, go to www.AUGI.com and look for my Training the Trainer articles in *AUGI Hotnews*.

Until next time, don’t close that new dialog box!



Matt Murphy, chair of the Autodesk Training Center Advisory Board (ATCAB), is an Autodesk Certified Instructor (ACI). He teaches AutoCAD productivity seminars at Autodesk University, AUGI CAD Camps, and private companies. He can be reached at matt.murphy@ACADventures.com.

Getting Started with the CUI

A closer look at the Custom User Interface (CUI) in AutoCAD 2006

AutoCAD® 2006 is packed full of many new features and concepts. One of these new concepts revolves around customizing the user interface (or UI). For many years there were two ways to customize the UI. The first was what most users favored—the tools found in AutoCAD for creating Toolbars and Accelerator keys. For many users this was as far as customizing the UI went, but for those that dared to go outside the tools provided in AutoCAD they discovered untold riches (or productivity, in this case).

Outside of AutoCAD you could use a text editor such as Notepad to modify the menu file that defined many of the UI elements. This included things like Image and Screen menus, along with pull-down and shortcut menus. These were some of the items that couldn't be customized from within AutoCAD. This left users needing to know at times cryptic syntax and other things if they wanted to customize AutoCAD this way. So it became an untapped resource of productivity to many. With AutoCAD 2006, this is all going to change. Autodesk has introduced a tool called CUI or Custom User Interface, which allows everyone to quickly and easily modify the AutoCAD UI.

The CUI tool is truly a way for everyone to get involved with customization by making it very easy and visual. If you are new to customizing AutoCAD, your learning curve is going to be much shorter when compared to previous releases. If you are not completely new to customizing AutoCAD, you will be able to transition your knowledge to the new CUI tool very easily. However, the first thing that you need to understand is that creating a macro has changed and for the better as you will read in this article. If you are looking for a general overview of the CUI you will want to reference the article in the March/April issue of *AUGIWorld*. Without waiting any longer, let's get started on the road to a new level of productivity.

CUI, a tool, a file...

So what exactly is the CUI? The CUI is a tool to help customize the CUI file. Wait, so the CUI is the tool in AutoCAD and a file outside of AutoCAD? That is correct. The CUI tool has replaced some of the functionality that was found in the CUSTOMIZE command in previous releases and introduces a lot of new functionality. As a file, it replaces the MNU and MNS files, which should help reduce some confusion as to which file should be edited. The MNC and MNR compiled files still exist, as does the MNL file that is used to load customization on which the menu depends.

Understanding a command (or macro) in the CUI

A command in the CUI isn't the same kind of command you would enter at the Command Line. Rather it is a way to reference a macro and some additional properties that are associated with it. The syntax for a macro is no different between AutoCAD 2006 and previous releases of AutoCAD, but with one slight change. In

previous releases you might have duplicated a macro to use with a toolbar button and a pull-down menu item. The new CUI format and tool help to resolve this problem by introducing a new concept of creating a command that can be associated with the many different UI elements. This means that you will no longer have to hunt through a menu to find a specific macro and make a change to it, or worry about missing one of the places that you have duplicated the macro in the menu. The macros that you create for use on a Toolbar or elsewhere in the CUI are under the Command List pane located in the lower-left corner. Figure 1 (next page) shows a sampling of some of the commands located in the Command List pane.

Each command has a set of six properties associated with it and the two most important ones are the Name and Macro. Table 1 shows the different properties that are related to a CUI command (see Table 1).

To access the properties of a command in the CUI, first you need to locate the one you are interested in under the Command List pane. Once you have located the com-

Table 1: Command Properties

Property	Description
Name	The name associated with a Macro.
Description	The description that is displayed in the status bar. It is a help string for toolbar buttons, toolbar flyouts, and menu items.
Macro	The command sequence that should be run if the associated UI item is selected, such as a menu item or toolbar button.
Element ID	Unique identification string for a Menu macro. This string is automatically assigned through the CUI tool.
Small image	The image that is specified for toolbar buttons and menu items. The size of the image is 16x16 pixels.
Large image	The image that is specified for toolbar buttons when Use large buttons for Toolbars is checked under the Display tab of the Options dialog box (Tools>>Options...). The size of the image is 32x32 pixels.

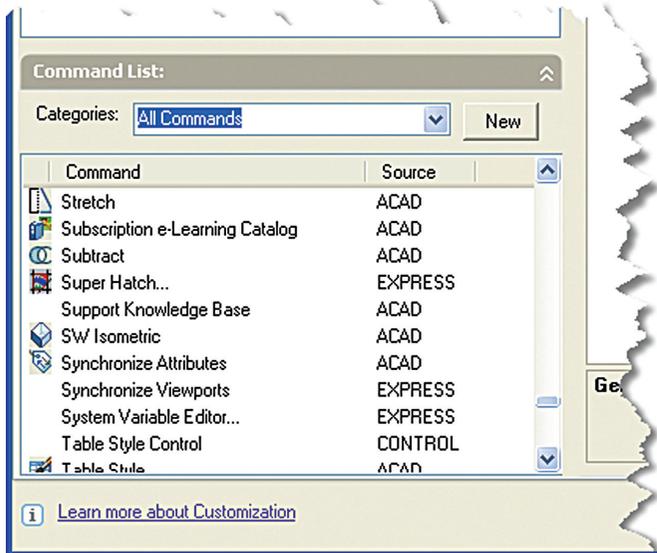


Figure 1: CUI – Command List pane

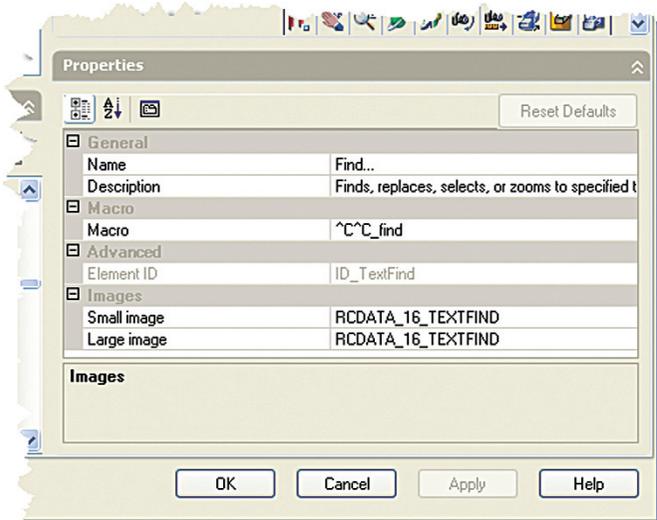


Figure 2: CUI – Properties pane

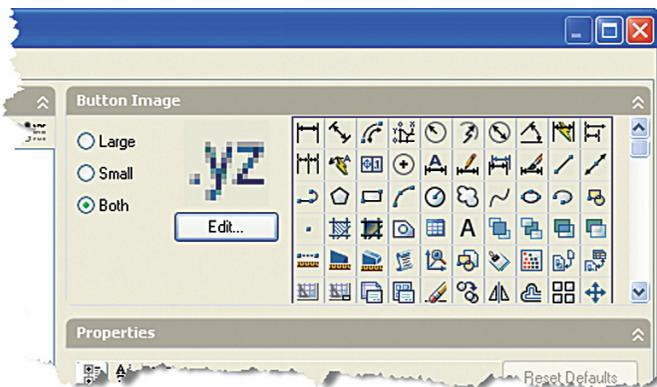


Figure 3: CUI – Button Image pane

mand that you want, simply select it and the Properties pane will display the properties for the selected command. The Properties pane is shown in Figure 2.

Just above the Properties pane you should notice that a new pane has been displayed. This new pane is called the Button Image pane and allows you to modify button images that are available to all the loaded menus. It also contains an Edit button that allows you to access the Button Editor dialog box. There have been no improvements to the Button Editor with this release. Figure 3 shows the Button Image pane that is located in the upper-right corner of the CUI tool.

Creating your first command with the CUI

Now that you have some background as to what a command is in the CUI, it is time to get right down to it. Let's create a new command and add it to a new toolbar that you will be creating. Follow the steps outlined below to first create a new command and then add it to the new toolbar.

1. Launch the CUI tool by typing in the command CUI at the Command Line or launching it from Tools>>Customize>>Interface...
2. Click the New button located under the Command List pane.
3. A new command called Command1 will be added and it should be highlighted in the Command List pane. If a command called Command1 already exists, a Command2 will be created, and so on.
4. The Properties pane will display the default values for the new command, which isn't much of anything right now (see Figure 4, next page).
5. In the Name field, change Command1 to MyCommand. Press the Enter key to commit the change. MyCommand should now be bold. The bold text helps you to identify what you have changed since the last time you clicked the Apply button.
6. In the Description field, enter "This is my first Command in the CUI." (Without the quote marks.)
7. In the Macro field, replace the current value with ^C^C_color;15;_line;\;
8. Leave the Element ID with the default value that it uses to populate the field.
9. Under the Button Image pane, make sure that radio button "Both" is selected. This controls how the properties for the Small and Large images are applied to the command.
10. In the listing of all the stock images find the one that looks like the image for the Line command and select it.
11. Once the Line image has been selected, click the Edit button to load the image into the Button Editor dialog box. Make a change to the image of your choice and then click the Save As... button.
12. Use the Save in drop-down list to browse to the location of the CUI file, typically C:\Documents and Settings\\Application Data\Autodesk\AutoCAD 2006\R16.2\enu\Support. This

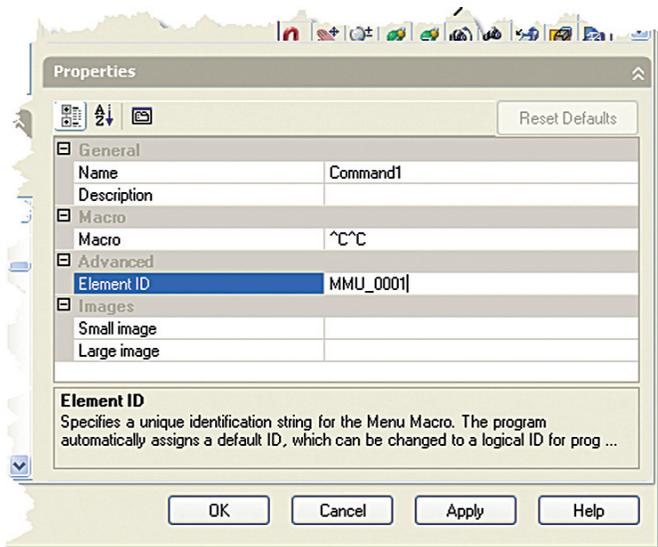


Figure 4

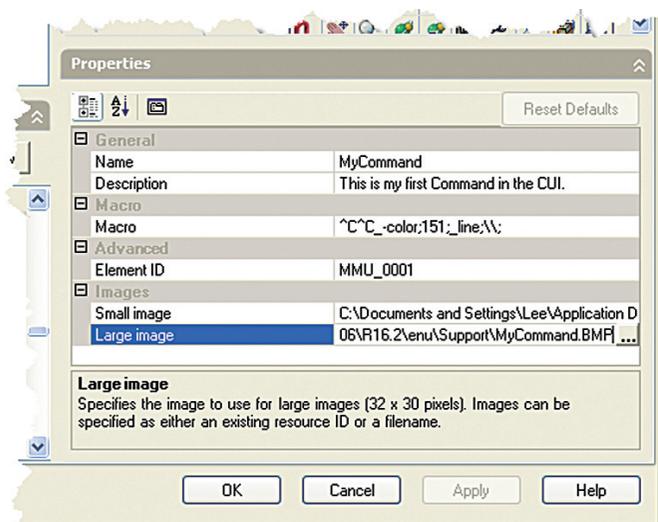


Figure 5

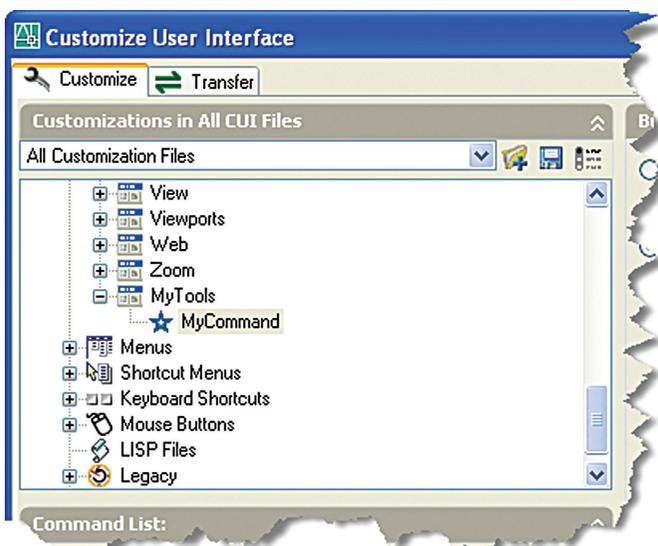


Figure 6

enables AutoCAD to locate the image when it compiles the MNR file.

13. Enter the File name MyCommand for the button image.
14. Click the Save button to save the new image.
15. Click the Close button on the Button Editor dialog box to return to the CUI tool.
16. Now select the Small image field for the MyCommand command. An ellipse button should be displayed. That is a button with three dots on it. Click this button to browse to the MyCommand.bmp button image that you saved back in Steps 11–14.
17. Repeat the process that you followed in Step 16, except for the Large image. You can also copy the value from the Small image field to the Large image field.
18. Click the Apply button to save the changes of the MyCommand command (see Figure 5).
19. Now go to the upper-left pane in the CUI tool called Customizations in All CUI Files. Open up the top level item so you can see the Toolbars item.
20. Right-click on the Toolbars item and choose New>>Toolbar.
21. Give the new Toolbar the Name MyTools. You already know how to change the Name field because you did it when you created the new command. Make sure you can see the new toolbar in the CUI tool called Customizations in All CUI Files pane.
22. Now you have an empty Toolbar and that isn't any good. Now go back down to the Command List and find your MyCommand command. Select and hold down the left mouse button over your new command.
23. Now drag the command onto the MyTools toolbar and let go of the left mouse button (see Figure 6).
24. Click the Apply button and then click the OK button.

Congratulations! You have just created a new command and added it to a toolbar. You are well on your way to being a customization wizard now.

The CUI simplifies

The new CUI tool takes many of the tasks and syntax that took time to learn before and simplifies the process. This tool will help many AutoCAD users who have never understood customization due to the many hoops that one had to jump through. I hope this article helps you to understand the new CUI tool a little better and I look forward to helping a new group of users take that next step forward into AutoCAD customization.



Lee Ambrosius works for HyperPics LLC an AutoCAD Consulting/Training company located in De Pere, Wisconsin, USA. He specializes in AutoCAD Customization/Programming and uses AutoCAD 2005/2006, along with some of the AutoCAD based vertical products. He can be reached via e-mail at lee_ambrosius@hyperpics.com; other contact information can be found on his Website at <http://www.hyperpics.com> or his Blog at <http://hyperpics.blogs.com>.

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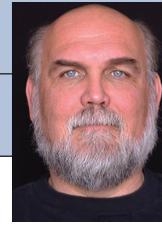
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On The Back Page



David Kingsley

Energy and the Future

They say one of the best ways to compose is to write about your passion. I'm going to continue in the last column's vein on renewable energy because I think this is going to be a subject of growing importance in the near future.

I realized a long time ago that significant portions of the technological advances that become our daily necessities are "spin-offs" of devices that were born of military needs. The technology in our digital cameras spun off from spy satellites so that reconnaissance images could be transmitted to earth electronically. The Internet itself was created during the cold war to serve as a decentralized and indestructible communication system in case we were nuked by the Soviets.

Distributed generation

The Internet is a prime example of a distributed system. Many servers are widely dispersed, making it difficult for the entire system to fail. Distributed systems are inherently more secure, but not necessarily more efficient. Regardless of the fact that your electricity bill is high and climbing higher, the "economy of scale" from a big power plant delivering 110AC to your outlets is still one of the best energy deals you can get. However, we now have to face the fact that our electrical grid, a somewhat centralized and rapidly aging system, is subject to attack. The loss of a very few key power plants or transmission lines could handicap us for years. We need to consider relying more on distributed power generation. I am a firm believer in deploying photovoltaic systems wherever practical. No, it is not cheap, but it is secure and reliable.

In today's combat theater, our troops need electricity as much as they need ammunition. Telecommunication devices have become as important as weapons. In the first Gulf War, batteries were the power source of necessity, but not of choice. Batteries are difficult to distribute, heavy to carry, have a very finite life, and need constant attention. Piles of dead batteries have revealed the presence and location of our troops.

The ultimate in distributed generation is now "on the CAD screens." Imagine the ubiquitous little "Bernz-o-Matic"™ torch on steroids, with the fuel canister carrying the same fuel as jets and helicopters. The tiny blue flame spins a miniature turbine-generator enclosed in a package the size of a 12 oz. can that kicks out up to 300 watts. This powers a multi-purpose computer the size of a paperback book. Fully fueled it weighs just a few pounds and is carried in a special purpose backpack providing several hours of portable on-demand power and telecommunication. The goal is to make it possible for the military to deploy one fuel source to meet the needs of vehicles and remote electronics. It is not difficult to imagine the commercial possibilities of such a device.



Hybrid vehicles

The reason we are all "hooked on hydrocarbons" is that it is simply hard to beat the energy density of a tank of gasoline. Nuclear fission is pretty good, but if you think tailpipe emissions are a problem... Still, I'd love to have 10,000 horsepower under my foot, or better yet, three years between refuels.

Toyota is clearly leading the field on hybrids. Even Ford is using Toyota running gear in the Escape hybrid. Next year's Toyota hybrids will let you recharge the batteries from an electrical outlet. This will have the effect of increasing your gas mileage to over 100. Granted, it will increase your electric bill, but as I said earlier, 110AC is still a good deal. Apparently someone crunched the numbers and the energy value is competitive with a tank of gas.

Photovoltaic developments

There are currently three types of PV cells, but there is a fourth one on the far horizon. The highest efficiency (and most expensive) PV cells currently available convert about 10 percent of the solar energy that hits them into electricity. About 100 watts falls on a square foot, so a PV system can produce about 10 watts per square foot. An installed system costs \$8-\$10 per watt.

I have worked on federally funded projects enough to know that they don't issue major requests for proposals without having some science backing it up. Recently, DARPA launched a program called VHESC (Very High Efficiency Solar Cell) with an RFP to deliver working hardware. The specification (which includes the phrase "nano-scale inorganic three-dimensional meta-structures with dimensional and assembly control not achievable with current technologies...") implies that efficiencies above 50 percent are possible. This means that a panel the size of your office door could produce 800-900 watts. But wait, there's more!! The material will be a flexible sheet such that it can be formed, or a thread such that it can be woven into a fabric. Never again will your cell phone or m3 player go dead.

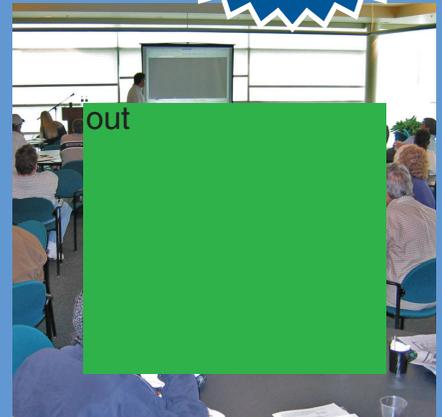
It will be at least 10 years before this technology is commercially available, assuming there are good results from the VHESC program. There is an underlying buzz in the photovoltaic manufacturing community that their current business plans may need revising.

As I said in the last column, in the late 1970s I was involved in serious research that yielded some promising results. For some inexplicable reason, we put it all to bed for 25 years. Had we kept our eye on the ball, we might have this wonder material today, along with energy independence, and perhaps world peace.

David Kingsley served from 1999-2004 on the AUGI Board of Directors and is the Director of Electrons at CADPlayer Web Courseware. He can be reached at djkingsley@cad-tv.com.



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