

DataCAD 5 Introduced

Cadkey, Inc. formally announced DataCAD 5 at the A/E/C Systems show in Anaheim, CA. Due to be shipped on September 1, the new version features a number of substantial improvements and enhancements to the existing DOS-based product. Chief among them are:

- New Graphical User Interface
- Improved Hidden Line Removal
- Integrated 256-color Quick Shader
- Associative Hatching
- Improved DXF translation
- Ability to "shell out" to DOS

The new features of DataCAD 5 are examined in depth in this issue of *Reference Point*.

DataCAD 5 should not be understood to be a product based on the previously announced "Parthenon" technology, which is now known in-house as Cadkey New Technology (CK-NT). Rather, this release is a DataCAD upgrade based on the existing (version 4.06) product. These pages include an interview with Mark White, Cadkey's A/E/C Product Manager. In it, he discusses CK-NT, DataCAD, and Cadkey's plans for the A/E/C market, relating DataCAD 5 to those plans.

If you are current with your maintenance at that point, you should expect to receive your upgrade by the middle of September. The Fall issue of *Reference Point* should be in your hands in early October. It will cover installation and configuration topics in depth and provide more discussion of the operation of new features in DataCAD 5.



Graphical User Interface

The most immediately noticeable change to DataCAD is its new Graphical User Interface (GUI), which incorporates a more up-to-date look with a host of new features. The overall screen layout remains intact from earlier versions, but the menu and status areas are now displayed with a gray background; see the illustration on Page 1.

As in v. 4.06, you have three methods for making menu selections: Interrupts (keyboard macros and keyboard interrupts), Function Key selection, and Mouse selection. In DataCAD 5, menu items are graphically represented as **BUTTONS**; each button contains a Function Key label and a Menu Item label.



Figure 1
Typical Menu

When you move the cursor over the menu area of the screen, it displays as an arrow, in the active color (shown at F1 in Figure 1). When you place the cursor *over* a button, without clicking on it, the button border is highlighted in (user-assigned) color.

When you place the cursor over a menu button, the Status Line in the message area of the screen displays **Dynamic Menu Help**. You are given a one-line description of the menu's function *before* selecting it. In Figure 3, the cursor is over the **PERSP** button; the Status Line displays: "Drawing will be displayed in PERSPECTIVE projection."

When you click on a button, it is displayed "pushed in." Menu options at F7, F9, and S4 in Figure 1 have been selected. Their buttons are shown "pushed in."

Color is used to highlight menu selections, as well. Menu Item labels are usually shown in black. Function Key labels may be white or one of two user-assigned colors.

White labels indicate menu items that either initiate the execution of the menu or lead to sub-menus in the hierarchical menu structure. The user-assigned colors denote on/off status for menu items that "toggle," replacing the asterisk (*) used in earlier versions. Green and red are set as the user-assigned on/off colors in the menu illustrated on page 1.

The dollar sign symbol (\$) was used in earlier versions to indicate the active Layer or SelSet; it has been replaced by the use of color. The active Layer

and activeSelSet are now indicated by displaying the Layer or SelSet name, as well as its Function Key label, in (user-assignable) color.

Readers with sharp eyes will have also noticed that the Menu Item labels are now eight characters long. When you give a layer an eight character name, the full name is displayed.

View Control Buttons have been added to the GUI. Figure 2 shows this portion of the screen. The arrow buttons correspond to the keyboard arrow keys that you use for "panning" in a drawing.

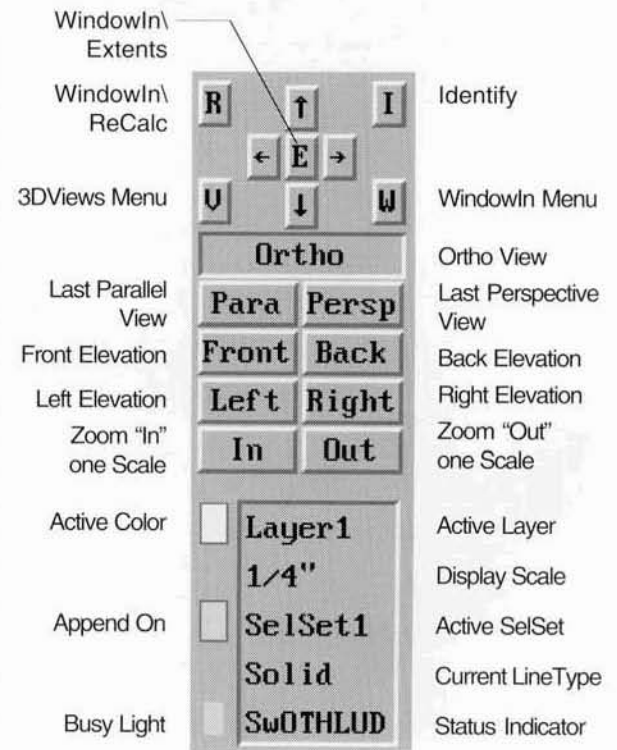


Figure 2
View Control Buttons and Status Information

Note that the new View Control Buttons *do not* replace any of the keyboard interrupt functions provided in earlier versions of DataCAD. Rather, they afford an *additional* means for quick access to commonly used functions. Additionally, Function Keys F11 and F12 (commonly provided on newer keyboards) are now mapped by DataCAD to jump to Left and Right Elevation Views, respectively.

F4 FreeZoom FREEZOOM is a new option in the WINDOWIN menu. When you turn it *on* and select WINDOWIN\EXTENTS, your view is scaled to fit your drawing to the edges of the drawing area of the screen. The scale value which is displayed in the Status Box is a decimal value of the



Compatibility with DataCAD v. 4.06

DataCAD 5 supports a new entity attribute, *associative hatching* (detailed elsewhere in this issue); the drawing database has been modified to support it.

Drawing files (.dc3) created in DataCAD v. 4.06 can be loaded directly to DataCAD 5, but .dc5 files created by DataCAD 5 cannot be loaded to DataCAD v. 4.06. When you are at the initial screen in DataCAD 5, a menu option allows you to load .dc3 files. Once they are saved, it is as .dc5 files.

The drawing file size limit in DataCAD 5 has been increased to 8 Megabytes.

Layer (.LYR) and symbol (.SM3) files are compatible in the same direction; those that you generate in v. 4.06 can be loaded to DataCAD 5, but you will not be able to transfer them from DataCAD 5 to v. 4.06. The only way to transfer drawing information from DataCAD 5 to v. 4.06 is through DXF translation.

Customization files that you have created for v. 4.06 are fully compatible with DataCAD 5. Customized LineType, Scale, Distance, Angle, Hatch pattern, and Keyboard Macro files can be read by DataCAD 5. If you have created custom Keyboard Macro files, you should carefully check their operation once you have copied them to your DataCAD 5 directory. The inclusion of new features has necessitated some menu restructuring, but you will find that most of the menu locations have remained the same as in v. 4.06. Some items have been moved for the sake of consistency; Yes/No options are now always at F5 and F6, for instance.

DCAL macros need to be recompiled to run with DataCAD 5. Cadkey will ship upgraded versions of its macros with DataCAD 5. You should check with the vendors of your third-party macros to ascertain the availability of upgrades. At this writing, Cadkey is completing work on the new DCAL compiler and expects that it will be available to third-party developers in August. They should contact Cadkey directly for more information.

Drawing will be displayed in PERSPECTIVE projection.

LAYOUT Select layout or function.



Figure 3
NEW RIGHT interface option

scaling factor, as in Figure 3. If you press the Page Up or Page Down keyboard button (or the In or Out View Control button), the view re-scales to the next higher/lower pre-set scale value. When you have FREEZOOM off, view scaling operates in a step fashion as in DataCAD v. 4.06.

User Interface Options are supported under the DISPLAY menu. A new menu, OPTION\MENUS, allows you to select between three available GUI's. NEW LEFT incorporates the features described above and illustrated on page 1. NEW RIGHT is identical except the menu bar runs along the right side of the screen instead of the left (Figure 3).

If you select OLD STYLE, your interface will be similar to that in DataCAD v. 4.06, but with some features of the new GUI incorporated. In OLD STYLE, the cursor changes to an arrow when it is placed in the menu area. A colored border appears around the Menu Item and Function Key labels when the cursor is over the menu selection, and Dynamic Menu Help is displayed on the Status Line. On/Off toggles and the active Layer and SelSet names are highlighted in the user-assigned "on" color, as in both versions of the NEW STYLE interface. Eight character labels are

supported. The OLD STYLE interface does *not* include the View Control buttons.

Two new Keyboard Interrupts provide access to GUI options. When you press ALT + PERIOD, you switch between OLD STYLE and (the last selected) NEW STYLE interface. When you press ALT + FORWARD SLASH, you enter the MENUS menu. Although these are initiated by an ALT + combination, they are not keyboard macros and are not controlled by DCAD.MCR.

A new option in the DispList menu allows you to toggle the software display list on/off from within DataCAD, provided that the software display list driver has been previously loaded from DOS.

Editor's Note: The information about DataCAD 5 contained in this issue is based on *alpha* versions of the software, i.e. Cadkey's internal development "builds." At press time (early July) the features list for the software has been frozen and *beta* testing has begun. As that testing progresses and final work on DataCAD 5 is completed, some functions may be modified. The release version may vary from that described in these pages, but any changes should be minor ones. DataCAD 5 will incorporate all of the major features described here.



Improved Hidden Line Removal

Hidden Line Removal (HLR) processing in DataCAD 5 has been improved in a number of ways. First, the algorithm (the software logic) defining the calculations performed in HLR has been improved. Second, a number of new controls have been provided which expand your ability to control HLR processing, tailoring it to the particular requirements of the model on which you are working.

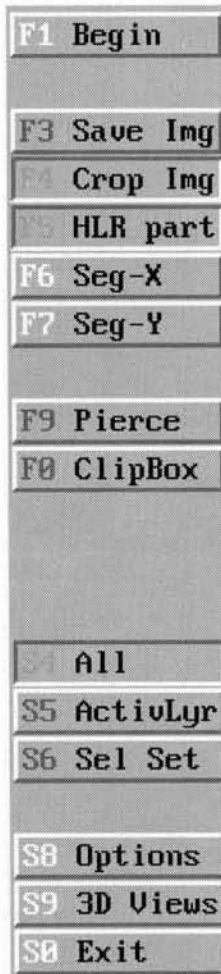


Figure 4
HIDE Menu

greatly speed up processing. Figure 5 shows the drawing area of the screen after the Calculation and Display Passes have been completed on the first segment when SEG-X and SEG-Y have each been set to 2. The model and view used are the same as that for the screen shot on page 1. The dashed lines have been added to describe the drawing area segments.

The chart in Table 1 shows the relative performance of HLR processing of this model/view with different combinations of available options toggled ON and OFF. The broad (vertical) grouping of timings

In the HIDE menu (Figure 4), you are able to invoke SAVE IMG (F3) after the HLR has been processed. You have this option both after the completion of processing and after a partial HLR, i.e. when the HLR has been interrupted by pressing the ESC key.

The CROP IMG (F4) and PIERCE (F9) options function as in earlier versions of DataCAD.

CLIPBOX (F0) is an ON/OFF toggle; CLIP CUBE is now supported in HIDE.

Another new menu under the main HIDE menu is HLR PART (F5). When you toggle it on, as shown in Figure 4, two additional menus are activated: SEG-X (F6) and SEG-Y (F7). HLR PART allows you to divide the screen into separate areas, defined by X and Y segments specified under SEG-X and SEG-Y.

When you start the HLR routine, it processes each of the defined areas separately, performing both a Calculation Pass and a Display Pass for each segment. Using this can

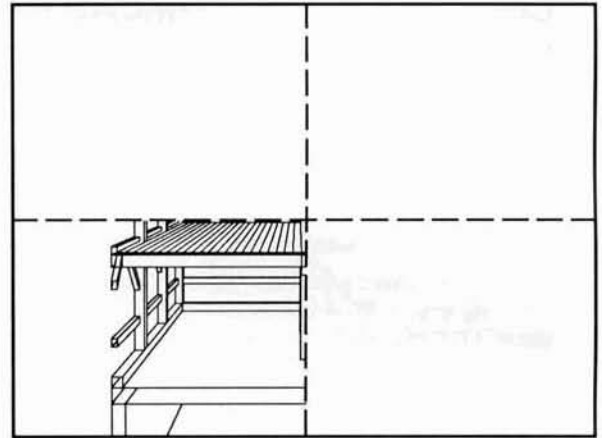


Figure 5
DataCAD screen after processing first segment

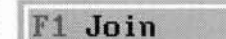
differentiates between processing with HLR PART OFF (above) and ON (below). The results will be discussed more fully following a description of new items in the OPTIONS menu.



Figure 6
OPTIONS Menu (part)

The OPTIONS menu, at S8 in the main HIDE menu, is shown in Figure 6. Some menu items [DRAWHIDN (F4), HIDNCLR (F6), HIDNSTYL (F7), HIDNSPAC (F8), CLOARC2 (F0), CLOELIP (S1), and DIVISIONS (S8)] provide the same functions as in earlier versions of DataCAD. They have been moved from the main HIDE menu to the OPTIONS menu.

New functions have been added: JOIN (F1), DELDOUBL (F2), IGNORCLR (F3), BACKFACE (F5), and NOEDGE (S3). Each of these is an on/off toggle and each has a different effect upon HLR processing. Generally, they have impact upon both the speed of processing and upon the "cleanliness" of the resultant saved image.



When you toggle on the JOIN option, contiguous lines are joined together; you can think of this as an automatic WELD LINE clean-up of the saved image. It is most effectively used when you have turned on HLR PART, as that process divides any lines which cross the segment barrier into two lines. It can save you a lot of work in the process of saved image clean-up.

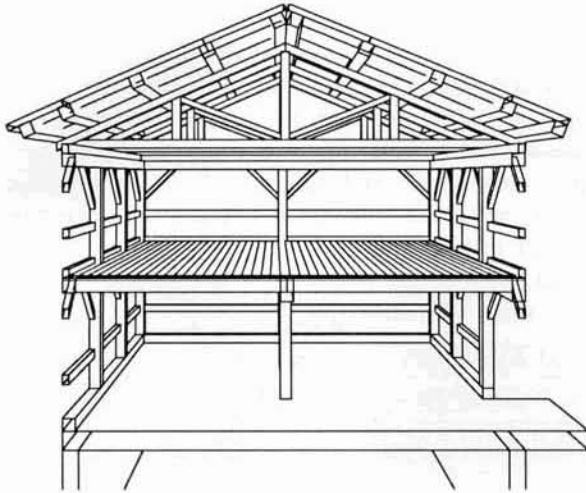


Figure 7
Completed HLR Image

HLR Part (2 x 2)	Join	Del- Doubl	Back- Face	Entities	Time
off	off	off	off	1780	2:51
off	off	off	on	1313	1:02
off	on	off	off	1780	3:01
off	on	off	on	1313	0:56
off	off	on	off	1043	3:57
off	off	on	on	957	1:45
off	on	on	on	957	1:48
on	off	off	off	1839	1:26
on	off	off	on	1368	0:48
on	on	off	off	1780	1:24
on	on	off	on	1313	0:47
on	off	on	off	1095	1:39
on	off	on	on	1006	0:57
on	on	on	on	957	0:59

Table 1
Relative Performance of HLR Processing

F2 DelDoubl When you turn *on* DELDOUBL (Delete Double), lines in the saved image which overlay one another are removed, leaving a single line. When two slabs or polygons abut one another, instead of two overlaid lines being generated, only one appears.

F3 IgnorClr When you turn *on* IGNORCLR (Ignore Color), the color of the entities processed by JOIN and DELDOUBL is ignored. If you turn it *off*, only lines of the same color as one another are recognized by JOIN and DELDOUBL. If you need to be able to recognize entities in the finished saved image by their color, this option should be turned *off*. Fewer entities will be generated when it is turned *on* and, hence, less "manual" clean-up of the image will be required.

F5 BackFace When BACKFACE is toggled *on*, HLR processing ignores the back face (side away from the viewpoint) of polygons (and the polygons exploded from slabs by the Calculation Pass). These faces are identified in the Calculation Pass and removed from consideration as the HLR is processed. When you choose to use this option, processing time decreases dramatically.

S3 NoEdge NOEDGE lets you control the display of facet edges in cylinders and tori in HLR processing; see Figure 8:

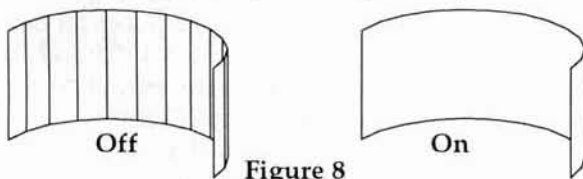


Figure 8

Table 1 shows the performance of the HLR routine with various combinations of OPTIONS items toggled *on* and *off*. The first line, with all options turned *off*, shows DataCAD 5 running with settings equivalent to those possible in v. 4.06. The 2:51 (2 minutes, 51 seconds) timing is a baseline to which the other times should be compared.

HLR processing performance is a function of two things: the software algorithm and the number of entities to be processed. The new HLR routine is clearly a faster one, showing substantial timing improvements over v. 4.06. Two of the new OPTIONS, HLR PART and BACKFACE, serve to reduce the number of entities processed at any one time, further increasing the speed of the HLR function.

There are trade-offs with both of these. You will find that toggling *on* HLR PART for a small model actually slows the processing time. Performing two (or more) sets of Calculation and Display Passes on a small number of entities *slows* processing. The optimum number of screen segments to set is a function of the size of the model and the view of it. When you use BACKFACE, there are situations under which some faces that you expect to be processed will not be. Because BACKFACE makes some assumptions about entities *not* to include in processing, some entities that you require may be excluded.

JOIN and DELDOUBL slow down processing to some extent, but lead to "cleaner" saved images. Particularly when using HLR PART, JOIN should be toggled *on*. Future issues of *Reference Point* will explore the use of these OPTIONS, based on the experiences of *beta* testers and, later, real-world users.



Quick Shader and .POF Files

Note: See the section *System Requirements for DataCAD 5* for further information (page 12).

The Quick Shader is an important new feature in DataCAD 5. With it, you can create in DataCAD 256-color shaded images from 3-D models. You need three things to run the Quick Shader: a graphics card that supports 256-color display, 2 Megabytes of available expanded memory, and a new Cadkey-supplied driver for the Quick Shader. Like your graphics card driver and the software display list driver, the Quick Shader driver must be loaded from DOS prior to entering DataCAD.

The Quick Shader is *not* a replacement for Velocity. Velocity incorporates a number of features that are not supported by the Quick Shader. Velocity supports sophisticated attribute assignment (including texture mapping), multiple light sources, control of backgrounds, and 24-bit color.

Export of shaded images generated by the Quick Shader is afforded through the `PIXELOUT` menu under `FILE I/O`. Full or partial screens may be sent to `.POF` (Pixel Output File) format or directly to any printer that supports Hewlett Packard PCL (Printer Control Language) input.

The Quick Shader supports 2-D extrusions of 2-D lines but, like the Hidden Line Removal process, you will obtain best results with models created with true 3-D entities. Since the Quick Shader works by filling surfaces, 3-D Lines are not supported by it. `CLIP CUBE` is not supported by the Quick Shader, although perspective view `HITHER CLIPPING` is.

S6 Q-Shader The `Q-SHADER` menu (S6 in the initial 3-D menu) is illustrated in the image on page 1 and in Figure 1, page 2. Through it, you are able to control the operation of the Quick Shader. Like HLR processing, the Quick Shader operates in two passes: a Calculation Pass and a Display Pass. It fills model surfaces in color shades based on the color of the original entity, i.e. a red sphere shades in tones of red.

F5 BackFace `BACKFACE` in `Q-SHADER` performs a similar function to the same-named option under `HIDE\OPTIONS`. When you toggle it *on*, back faces of polygons (and polygons created from slabs during the Calculation Pass) are ignored by the shading process. With `BACKFACE` toggled *on*, `Q-SHADER` operates more quickly.

It should be noted that the name *Quick Shader* is an apt one; the image illustrated on page 1 took 48 seconds to generate, with `BACKFACE off`. Compare that time with those listed in the table for HLR performance (page 5, Table 1). The same model/view was used for both processes.

F6 Light L
Light C
F8 Light R

Menu options F6-F8 control the light source for the shading process. You may select only one light source. Its placement is relative to the screen: Left (F6), Center (F7), or Right (F8). By experimenting with the light source you can control the output of the Quick Shader.

BlackEdg
F8 No Edge
S1 OrgEdge
S2 OnlyEdge

You have four options for the display of the edges of the entities, one of which must be selected. When you select `BLACKEDG`, the surfaces of an entity are shaded in tones based on its original color and the edges are displayed as black lines. This results in an image with strongly defined elements.

When you select `NO EDGE`, no line is drawn at the edge of an entity. Entities have a softer appearance; spheres, cylinders, and tori are represented most smoothly with this option.

`ORGEDGE` (original edge) draws the edges in the color of the original entity. When you choose this option, there is some contrast between the edge and the shaded surface, not as much as with `BLACKEDG` and more than with `NO EDGE`.

When you select `ONLYEDGE`, surfaces are shaded in the background color and the edges are drawn in their original color. This can serve as a quick HLR in the process of constructing a model, as the Quick Shader operates more quickly than the HLR process.

Screen Output

DataCAD 5 supports pixel-based output of the drawing area of the screen. Any screen content can be exported. It may be a shaded image generated by the Quick Shader, a 3D view of a model, a portion of a working drawing... You may send directly to a printer, to PCL (Hewlett Packard Printer Control Language) file, or to `.POF` (Pixel Output File).

F6 PixelOut

`PIXELOUT` is a new menu under `FILE I/O` through which you access these capabilities. The `PIXELOUT` menu is illustrated in Figure 9. When you select `ALLDWG` (All Drawing) (F1), the full screen is sent. When you select `AREA` (F2), you are prompted to define a rectangular area within the drawing screen for output. The options `TO PAPER` (S1), `TO PCL` (S2) and `TO POF` (S3) allow you to direct the output to the required destination. `LANDSCAPE` (S5) allows you to rotate the output from Portrait (default) layout to Landscape format. `INVERSE` (S6) allows you to invert

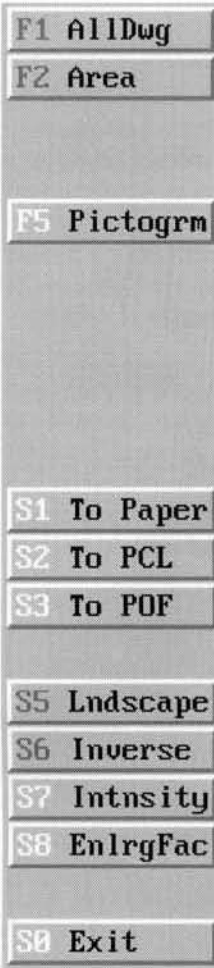


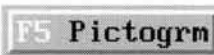
Figure 9
PIXELOUT Menu

the color mapping (grey scale on a b&w printer). This allows you to obtain a white background for your image. INTENSITY (S7) controls the contrast of the output image. ENLRFAC (S8) allows you to adjust the enlargement factor of the output, scaling it properly to your output device.

File conversion utilities provided by Cadkey with DataCAD 5 are: POF2PCX.EXE, POF2TGA.EXE, and POF2RN.EXE.

These operate off-line (in DOS) and translate .POF files to .PCX, .TGA, and .2RN formats. .POF files processed by the conversion utilities may be loaded into any paint-type software that reads .PCX or .TGA formats. Converted .POF files may also be loaded into Velocity for viewing.

Again, as with all of the new features of DataCAD 5, your experimentation with its capabilities will unlock new uses for those features. Those uses will be reported on in future issues of *Reference Point*.



The PICTOGRM (F5) option under PIXELOUT generates a special type of .POF file. When you select this option, you are prompted to locate a square box in the drawing area of the screen. The box is 100 pixels by 100 pixels in size; the area within it is captured to .POF format. As with any .POF file, you specify the name of the file and its location (using a NEW PATH command). Pictogram .POF files have four uses in DataCAD 5.

At the initial DataCAD screen, the list of available drawings is displayed in the menu portion of the interface. In the drawing area of the screen, a Pictogram border box is displayed. When the cursor is placed over one of the drawing file buttons, without clicking on it, file information for the drawing file is displayed.

In Figure 10, information for the file POST.DC5 is shown. Four lines of text are displayed in the upper border of the Pictogram box. The first line displays the file name; the second shows the last modification

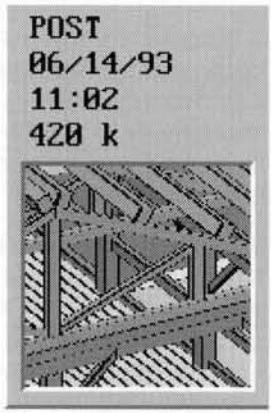
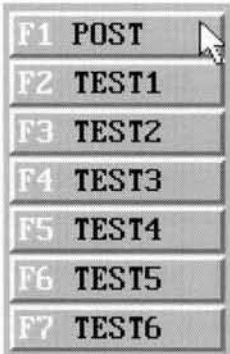


Figure 10
Drawing File PICTOGRAM

date. The third line displays the time of the last modification. The last line displays the file size.

The "window" in the Pictogram box displays the Pictogram .POF associated with the drawing file. In this case, a Pictogram .POF was generated from a Quick Shader image in POST.DC5. The .POF file was saved to the same directory in which POST.DC5 is stored. DataCAD 5 automatically associates a .POF file to a .DC5 file when they are stored to the same directory. If a .POF file of the same name as a .DC5 file does not appear in the drawing directory, the Pictogram "window" is left blank and the drawing file information is displayed in the upper border.

Since .POF files are user-defined and any information displayed in the drawing area of the screen may be captured to a Pictogram .POF file, a .DC5 Pictogram window can contain any type of information that you desire. It might be a relevant portion of a working drawing; it might be a text string containing an important note to yourself or to another user

Pictograms also display in the HATCH\ PATTERN, TEXT\ FONT, and LINE\ TYPE menus to preview your selection. In these instances, the upper border of the display box is smaller and shows only the name of the menu item that the cursor is over. These operate exactly as do the Pictograms for .DC5 files. When the cursor is over a hatch pattern button, that pattern is displayed in the Pictogram box. DataCAD 5 will ship with .POF files for Pictogram display for all standard text fonts, hatch patterns, and LineTypes.

Now you will be able to tell the difference between all of those ANSI hatch patterns!



Figure 11
TEXT FONT



Figure 12
HATCH PATTERN

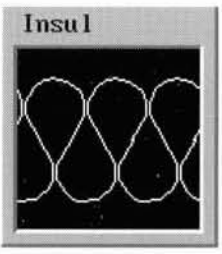


Figure 13
LINE TYPE

Associative Hatching

Associative Hatching is introduced in DataCAD 5. It is a new *attribute* which is supported by some entity types. It has unique properties which, under many circumstances, make it preferable to "normal" hatching. First, because it is an attribute of an entity, rather than a collection of individual entities, associative hatching consumes much less space in a drawing file. Second, when you modify an entity that is associatively hatched by using the MIRROR, ROTATE, STRETCH, or ENLARGE commands, the hatching retains its original orientation.

In Figure 14, the left column shows a "normally" hatched rectangle and the results of editing commands performed on it. Once hatched, 22 entities are acted upon by the editing commands; each is affected. The right column shows a closed rectangu-

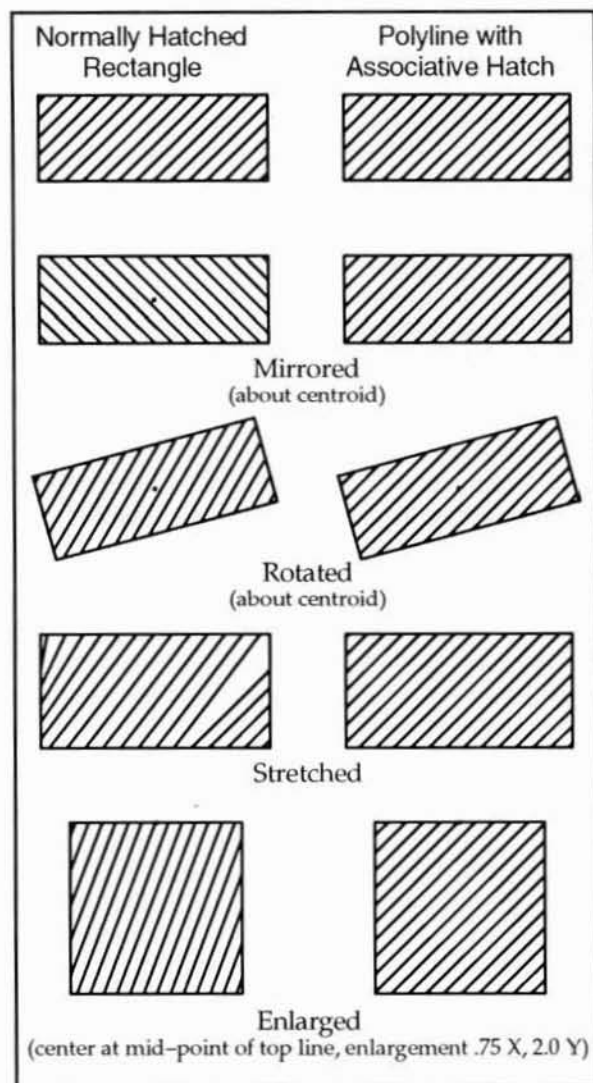


Figure 14
Effects of Editing Commands on "Normal" and Associative Hatching

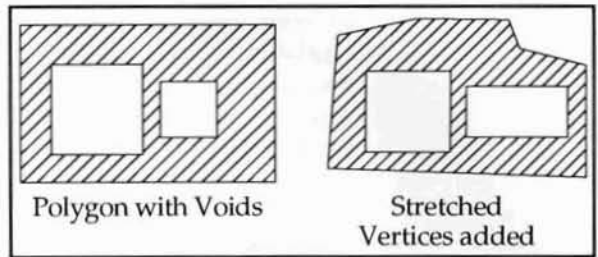


Figure 15
Polygon with Voids and Associative Hatching

lar polyline with associative hatching. Once associative hatching is added to the polyline, it remains a single entity. When you edit it, as shown, the associative hatching maintains its "as placed" orientation and consistently fills the polyline independent of the editing that you have performed on it.

Associative hatching is supported by closed polylines, circles, polygons, and slabs, i.e. single, closed entities. Figure 15 illustrates a polygon with voids and associative hatching before and after stretching and adding new vertices. Note that the associative hatching "flows" around the voids.

You will probably find that the most *practical* way to use associative hatching is with the strictly planar entity types: polylines and polygons. When you assign associative hatching to an entity that has a Z height, the hatching is displayed at the Z base of the object. Figure 16 illustrates this:

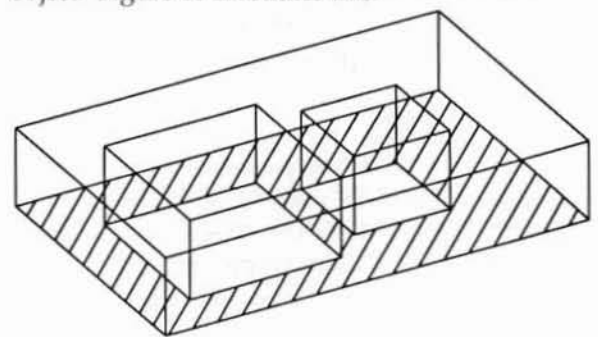


Figure 16
Slab with Voids and Associative Hatching

F9 Associat

There are two ways that you can create Associative Hatching. First, you can apply it to an existing (supported) entity. In the HATCH menu, you set PATTERN, SCALE, ANGLE, and ORIGIN as you would for "normal" hatching. You then toggle on ASSOCIAT (F9), select the entity or entities to be hatched and press the BEGIN button. Second, you can use Associative Hatching for an area that is not already defined by one of the supported entity types:

**F8 Boundary**

You can use the BOUNDARY (F8) option to trace the area, creating a closed polyline with Associative Hatching.

You can **change** the Associative Hatch attributes of a previously-hatched entity by entering the Hatch menu and re-hatching it. In essence, when you originally create Associative Hatching, you do so by assigning an attribute to an entity. If you want to change that assignment, you simply re-assign the attribute by repeating the original process.

S7 De lAssoc

DELASSOC (S7) allows you to delete the Associative Hatching from an entity without deleting the entity, itself.

The IDENTIFY menu in DataCAD 5 supports Associative Hatching. When you IDENTIFY an entity that has Associative Hatching, in addition to the normal information reported for the entity, a button labelled HATCH is displayed. When you press this button, a secondary menu opens identifying the hatching as associative and telling you its PATTERN, SCALE, and ANGLE.

Each of these, and the ORIGIN (of the PATTERN) may be selected and established as the current settings in HATCH from the IDENTIFY menu. This gives you the ability, for new hatching, to easily match the parameters of previously-placed hatching.

2-D Editing

New SelSet Mask Option

When you enter the SELSET menu and choose ADD TO (F2), MASK (F0), ENTITY (F1), and TEXT (F7), a new option is activated: TEXT MASK (S3). When you select this option, a new menu opens:

F1 TextSrch**F2 CaseSens****F3 FontSrch****F4 SizeSrch**

TEXTSRCH (F1): Text Search allows you to specify the text content of the MASK search. The content must be of the full text string. CASESENS (F2): Case Sensitivity allows you to specify that the Mask search should or should not ignore upper and lower case when matching a specific text string.

Figure 17
Text Mask

FONTSRCH (F3): When you toggle this *on*, you are able to specify that the MASK search should be confined to a single, specific text font. SIZESRCH (F4): You may specify that the Mask search is to look only for text of a particular size.

These four options may be used in any combination.

Golden Section

F6 GoldSect

In the DIVIDE menu under GEOMETRY in DataCAD 5, you have the option to divide by "Golden Section." Mathematically, the relationship is defined as the proportion of a line in which the smaller division is to the larger as the larger is to the full length of the line. In the example below, X is to Y as Y is to X + Y.



Figure 18

GEOMETRY\DIVIDE\GOLDEN SECTION

1Lin Trim & 2Lin Trim of Arcs & Circles

In DataCAD 5, 1LIN TRIM and 2LIN TRIM, under the CLEANUP menu, support arcs and circles. Figure 19 illustrates some examples. Because this feature is still being refined as this issue goes to press, a close look at its use is not presented here. The Fall issue will examine it in detail.

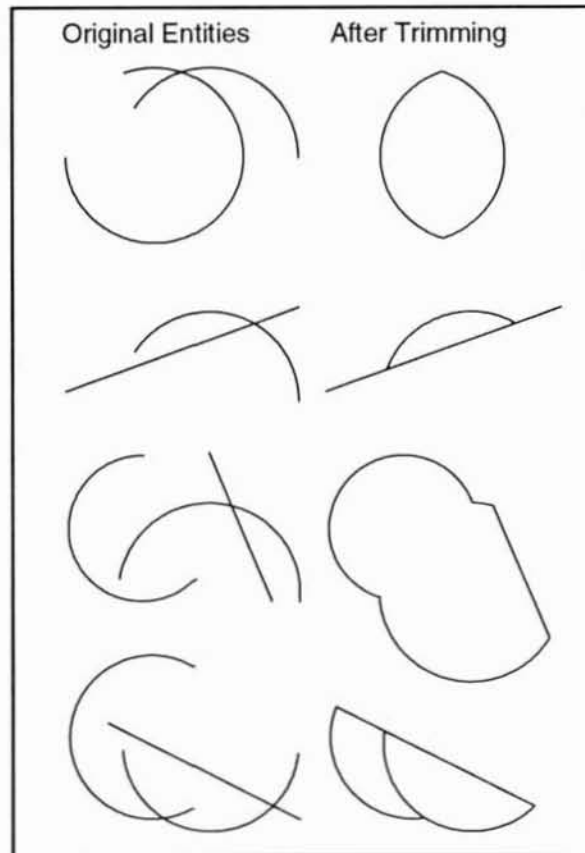


Figure 19

1LIN TRIM & 2LIN TRIM



And . . .

DXF Transfer

The DXF® translator in DataCAD 5 has been substantially rewritten. It complies with the DXF standard for AutoCAD Release 11. Some of the changes:

Spheres:

- Write DXF: Spheres become Meshes.
- Read DXF: Spheres become Polygon Groups.

Slabs and Polygons:

- Write DXF: Complex DataCAD Slabs and Polygons read out as multiple three- and four-sided DXF Polygons.
- Read DXF: DXF Polygons written from DataCAD Slabs read in as DataCAD Polygon groups with invisible edges.
- Read DXF: Other DXF Polygons read in as ordinary DataCAD Polygons.

Improvements:

- Multiple nested DXF symbols are supported when read in.
- Mirrored symbols are correctly written out and read in.
- Reading in and writing out correct text size is supported.

New Option:

- User-definable drawing origin when reading in a DXF file.

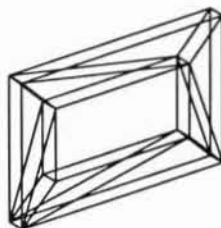


Figure 20
Slab with Void

Figure 20 shows a slab with a void cut into it after *exporting* it from DataCAD 5 via DXF and then *importing* that DXF file. Because the original source was DataCAD, when it was imported, it *looked* like a slab with a void in it. MARK VISIBLE under POLYGONS\PARTIAL was used to make all edges of the 24 polygons visible. 3-D models created in DataCAD 5 may be reliably exported to any software that reads DXF polygons.

View Globe

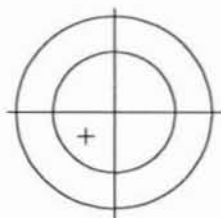


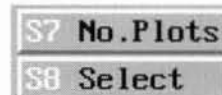
Figure 21
View Globe with "Last View" Cross-Hair

When you choose ISOMETRIC or PERSPECTIVE from 3D VIEWS, the View Globe displays. It now features a colored cross-hair indicating your last-set view. The Globe "remembers" both the last ISOMETRIC and the last PERSPECTIVE view. In ISO-METRIC, the cross-hair displays in red and in PERSPECTIVE, it displays in green.

Mouse Sensitivity Control

You can control the mouse tracking speed from within DataCAD 5. By pressing CTRL + UP ARROW, you speed the tracking. By pressing CTRL + DOWN ARROW, you slow the tracking. There is a five-step increment above and below the default setting.

New Plotter Options



Two new menu items appear in the main PLOTTER menu. NO.PLOTS lets you specify that multiple copies of a plot are to

be made. SELECT allows you to choose between (up to) three pre-configured plot devices. You can, for instance, have a Calcomp plotter on Com 2 set as Plotter 1, a LaserJet III printer on LPT 1 set as Plotter 2, and configure an HPGL driver for plotting to file set as Plotter 3.

Any of the Cadkey-supplied plotter drivers can be configured to any of three available menu positions. You can switch between the configured devices from within DataCAD 5 as needed.

DOS Shell

From the WINDOWIN menu, you are able to "shell out" to DOS. DataCAD 5 is suspended and you are able to perform DOS commands. When you type "exit" at the DOS prompt, you are returned to DataCAD in the drawing file, just as you left it.

Documentation

DataCAD 5 will feature all-new packaging. The product will ship in a slipcase with a single-volume, perfect-bound manual. A new introductory book, tentatively titled *Mastering DataCAD 5*, by Carol Buehrens, will also be included in the package.

Late Breaking News

As this issue goes to press, Cadkey, Inc. is exploring the possibility of including in DataCAD 5 two additional major features:

On-Line Help will be a Hypertext help system with embedded graphics.

Direct reads and writes between DataCAD .DC5 files and AutoCAD .DWG files will be implemented with an off-line program.

It is not certain whether these features will be included in the initial release of DataCAD 5.



An Interview with Mark White

R.P.: You have been demonstrating DataCAD 5 to dealers and end users since the end of May. What has been their response to it?

White: Generally, it has been positive. Everyone seems to like the new GUI, Associative Hatching, and the Quick Shader, of course. Some of the "smaller" features have also drawn people's attention, the Arc and Circle trimming, for instance.

R.P.: Why are On-Line Help and the .DC5/.DWG translator being described as "possible" features?

We have put lots of work into these but, even now, we are not sure that we will be able to include them in the initial release of DataCAD 5. There are a number of technical problems which we need to solve. We don't want to raise false expectations, but we are very well aware that the market requires us to have these features.

We want to let people know that we are exploring these requirements, but we don't want to make promises on which we may not be able to deliver.

R.P.: Why has it taken such a long time for this upgrade to be developed and released?

White: Let me begin by stating that Cadkey has a strong commitment to the A/E/C market; we are determined to see our position in that market grow by a substantial amount. We have put a tremendous amount of energy into the development of CK-NT (Cadkey New Technology, previously called "Parthenon") which provides to us the technological basis for a whole new generation of CAD products.

Frankly, we underestimated the amount of time that it would take to complete CK-NT and bring to market a product based on it. When it became clear that a first-rate CK-NT-based product would not be ready in 1993, and because of our commitment to DataCAD users worldwide, we recognized the need to develop and release DataCAD 5.

We are excited about development work that Soft-Tech GmbH, has been doing for DataCAD Spirit, the version of DataCAD that it distributes in Germany. We have combined their work with an in-house effort to create DataCAD 5. Beta testing is going well. At this point, the biggest factors affecting the actual shipping date are the detection of unknown bugs in beta testing and the production of the documentation. We will ship September 1.

R.P.: What can you tell us about the CK-NT product?

White: First, it is important to make a distinction between the *core technology*, which we are referring to as CK-NT, the *GUI*, and the *applications* we will develop based on the core technology.

CK-NT has been written in C++ programming language to be portable across many operating systems and hardware platforms. In Malcolm Davies' words, it is "totally buzz-word compliant." It is a modular core engine utilizing an object-oriented database. The database technology is based on ObjectStore, developed by Object Design of Burlington, MA. The core technology (CK-NT) represents about 80% of what comprises a finished product; we are tremendously excited about the power of CK-NT.

Because of the way that CK-NT has been constructed, the development of any *application* based on it represents about 10% of the finished product. In writing the application, we can act as our own third-party developer. The other 10% is the GUI which, with Windows 3.1 and Windows NT, is defined by Microsoft's standards. We are currently developing an *application* based on CK-NT; in-house it is referred to as Cadkey Architect.

R.P.: Cadkey Architect is an architectural CAD product?

White: Yes. And one that we think will be providing to our users the most powerful set of CAD tools in the A/E/C market. We are currently prototyping a new type of wall system modeler that provides integrated 2-D and 3-D representation of walls. With it, users will be able to select between different types of wall assembly systems and to designate materials assignments to them.

Our goal for the product is to create an intelligent, organized representation of a building in the database which can then be used and referenced by a variety of applications. We also clearly understand that the product must provide effective and efficient tools for the traditional architectural production environment, i.e. working drawings.

R.P.: What operating system is this being developed for?

White: For the initial release, we are developing for the WIN32s API running on Windows 3.1. Because the code is portable, we can compile later releases for other platforms, as warranted.

R.P.: What impact will Cadkey Architect have on the future of DataCAD? Will there be a DataCAD 6?

White: That depends entirely upon the reception of the new product and the strength of DataCAD sales once Cadkey Architect has been released. If our DataCAD users switch over to Cadkey Architect in droves and new sales of DataCAD slow down, then we will have to evaluate our continued development of DataCAD. If, on the other hand, the market tells us that there is still lots of demand for the DOS platform and for DataCAD, we will, of course, continue to upgrade DataCAD.

Mark White, AIA, is the A/E/C Product Manager for Cadkey, Inc. He has been responsible for product planning and management for both DataCAD and the Cadkey New Technology (CK-NT) development effort.



System Requirements for DataCAD 5

To run DataCAD 5 with all features operational, Cadkey, Inc. recommends the following:

- 386DX CPU
- DOS 5.0, DOS 6.0, or a DOS version + third-party Memory Management software for loading TSR's to High DOS Memory and for configuring Extended Memory as Expanded Memory
- Graphics Card capable of supporting 256 colors
- 8 Megabytes of RAM

Memory management is the main consideration driving this recommendation. To run DataCAD 5 with the Software Display List and the Quick Shader, you have to load your Graphics Card driver and the Software Display List driver to High DOS Memory. You need to do this to maximize the amount of Conventional Memory (below the 640k barrier) available for DataCAD's execution and for the Quick Shader driver, which Cadkey recommends loading to conventional memory. Also, in order to increase the maximum drawing file size to 8 Megabytes, DataCAD, itself, occupies more space in Conventional Memory.

Graphics Card compatibility with the Quick Shader is being tested as this issue goes to press. It is clear that, although the Quick Shader *can* be run with a card configured in 16 color mode, the output is unsatisfactory; 256 color display is required for good quality output. Drivers that have been confirmed to be compatible with the Quick Shader at this time are: 8514A.EXE, CK_911.EXE, and VESA256.EXE. Other drivers will be tested with DataCAD 5 during *beta* testing.

RAM requirements for DataCAD 5 are driven by the requirements of the Software Display List and the Quick Shader. A system with 8 Megabytes of RAM has 7 Megs of Extended Memory available. The Software Display List requires 1 Megabyte, the Quick Shader requires 2 Megabytes, leaving 4 Megabytes available for allocation to disk caching and RAM disk.

System requirements for DataCAD 5 will be covered in depth in the Fall issue of *Reference Point*. Articles in the Winter, 1992 and Summer, 1992 issues can provide you with configuration information for v. 4.06, much of which is applicable to DataCAD 5.

Forthcoming Publications

Carol Buehrens' *Mastering DataCAD 5*, which will be shipped with DataCAD 5, is an abbreviated version of a completely new DataCAD book on which she is currently working.

M. E. "Grizz" Wallace, of CADDWEST.SYS, is preparing a new publication for DataCAD users. *Jump-Start for DataCAD* uses a "problem-solving" format. Each page describes a typical drawing problem that

might occur in your use of DataCAD. A possible cause of the problem is suggested and tips for avoiding the mistake and/or repairing it are given. ±150 pages, available at the end of August

Len Nassman is updating his *Beginning DataCAD* book and tapes, based on DataCAD 5. They should be available in the Fall from Microcomputer Education Systems, Inc.

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