



# Reference Point

Volume 2, Number 1

Technical Resources for DataCAD®

Winter, 1992

## News

### **Cadkey & Soft-Tech: a Clarification**

An article in the November issue of *MicroCAD News* made a number of erroneous statements about the relationship between Cadkey, Inc. and Soft-Tech, the German distributor of DataCAD (DataCAD Spirit, in Europe). Some confusion has resulted from the publication of this article.

The following is quoted from an internal Cadkey memo circulated to all AEC staff by Lou Bodnar:

*The International section of the November issue of MicroCAD News stated that Soft-Tech will be responsible for the development of the DataCAD and 'Parthenon' products. This information is incorrect.*

*Soft-Tech is an additional development site for DataCAD and currently develops application macros for the German version of DataCAD, DataCAD Spirit. Soft-Tech is not jointly developing Parthenon with Cadkey, but may elect to develop applications for Parthenon at a future date. All development for the current U.S. version of DataCAD and the new Parthenon product is being done in the U.S. at Cadkey, Inc.*

Elaboration on the subject by a number of people at Cadkey has stressed the fact that the development of both DataCAD (U.S.) and the forthcoming Parthenon-based product is solely the responsibility of Cadkey.

### **Attention: DCAL Programmers**

On a fairly regular basis, Cadkey receives inquiries from users (usually large installations) seeking the names of people able to write custom DCAL macros for their facilities.

As a means of facilitating the referral process, I would like to compile a list of programmers interested in this type of work. I will keep Cadkey updated with the current listing and distribute it directly to users, either in direct response to inquiries or by publishing it in *Reference Point*.

DCAL programmers interested in having their names included on the list should contact me directly. Please include a brief description of your experience with DCAL, including the names of any commercially available macros, and all necessary information for contacting you. *Thanks, P.H.*

*News continued on page 2*

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## In This Issue

**Tech Support** covers a number of subjects:

- The erroneous default parameters in the AEC\_Model macro are listed.
- A problem that occurs with the LyrUtil macro is described.
- Some problem areas in Velocity are detailed.
- Installation procedures for the Logitech Mouseman mouse are provided.
- Installation procedures for the new Hewlett Packard Design Jet plotter are discussed.

An article on **Alias Upfront**, a highly touted Windows 3D sketching application, describes its use and examines its compatibility with DataCAD. Upfront affords some interesting possibilities to the DataCAD user.

**Configuring for DataCAD** discusses the topic of system optimization for DataCAD. The article details allocation of available system RAM to RAM disk, disk caching, and software display list.

**Doing Windows** discusses additional sources of information about Windows.

**Customizing DCAD.MCR** details the process of creating specialized keyboard macros. Two third party DCAL macros are discussed. For users who have not explored this, it is a highly recommended enhancement to DataCAD.

**Points of Reference** reviews a new training book, *Beginning DataCAD*, and its accompanying videos. The discussion of Users Groups started in the last issue is continued.





**BSA Board Back On-Line**  
After some teething problems associated with its move to new quarters, the Boston Society of Architects bulletin board is up and running again. It features a number of CAD topic areas, including one devoted to DataCAD. A message area for Reference Point feedback can be found under the DataCAD main menu. Phone #: (617) 737-8102 (8 bits, no parity, 1 stop bit).

In light of this series, and other forthcoming topics, user input is sought on the following software products:

- Draw, Corel Systems
- Deluxe Paint, Electronic Arts
- GRASP, Paul Mace Software
- Mannequin, HUMANCAD
- DR DOS, Digital Research

Users who have familiarity with these products are encouraged to share their experiences with fellow users through these pages.

### Reference Point now a Quarterly

As *3D World* will now be sent to users on a quarterly basis, so will *Reference Point*. To assure users of a continuity in the quantity of information provided, *Reference Point* has been expanded to twelve pages per issue.

Beginning with this issue, advertising for DataCAD third-party products will be included with *Reference Point*. Ads will be handled as inserts. Parties interested in advertising should contact Frank Simpson at Cadkey for rate schedules, procedures, etc.

### Marketing with DataCAD

An upcoming series of articles in *Reference Point* will examine software and hardware tools that enable the DataCAD user to utilize his/her skills more broadly. The articles will explore the integration of DataCAD and Velocity with other (non-Cadkey) software. Illustration and presentation products will be examined.

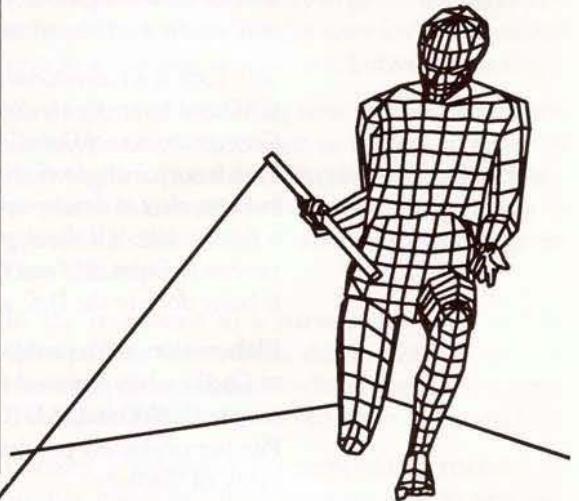
The concept of 'CAD-To-Go' will be investigated, focussing on the utilization of DataCAD in on-sight presentations. 'CAD-To-Go' will be examined as a tool for both marketing (*How can DataCAD skills be used to get new work?*) and project specific presentations (*How can DataCAD be used to sell a design to a client or review agency?*).

The goal of this series is to present to the user some insights into a broad range of possible applications for DataCAD and Velocity in the real-world practice of architecture.

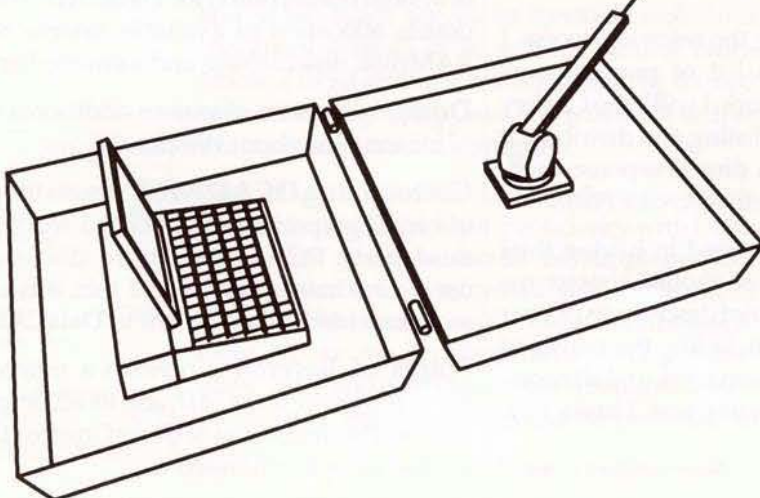
### ABC Draw Demonstrated

At the November meeting of the Boston DataCAD Users Group (DBUG) a very interesting new product was demonstrated. Tentatively named *ABC Draw*, it is comprised of hardware and software components which allow the user to field measure an existing structure, creating an accurate 3D model of the space.

The Modeler is run on a laptop computer contained in a briefcase. A mechanical measuring device located in the other side of the case is linked to DataCAD through proprietary software and a DCAL macro. A wire is fed out from the measuring device; its end, attached to a 'wand,' is held by the user to points in the space and, using a radio-controlled mouse, the user tells DataCAD what is being pointed at. Vertical and horizontal polygons are drawn in DataCAD.



Note: The ABC Draw 'user' illustrated at the right was created in Mannequin as a series of polygons and imported to DataCAD through DXF transfer. The rest of the 'model' was drawn in DataCAD; then a hidden line was run and cleaned up. The graphic was imported to Page Maker as an HPGL plot file. More on Mannequin in the next issue.



The measurements are calculated based on the length of the wire pulled out of the device and on the angle of the wire. Triangulation of points develops a series of 3D references from which the 3D entities are created.

ABC Draw was demonstrated by Dr. Michael Cleary, Chairman of Resources Engineering Systems, Inc. and members of the development team. The device is at an early stage of development and they are seeking input from the DataCAD community regarding its real-world potential. They may be contacted directly:

Resources Engineering Systems, Inc.  
One Cambridge Center  
Cambridge, MA 02142  
(617) 621-8555  
FAX (617) 621-6989





## TECH SUPPORT

## AEC\_MODEL Macro

As noted in the last issue of *Reference Point*, there are some errors in the default parameters set in this macro as shipped to users. If the macro is used with these settings, some unexpected results will be produced. Reset to:

Windows Menu Selection	Erroneous Default	Correct Default
Head Height	14'-8"	6'-8"
Sill Height	8'-4"	3'-4"
Trim		
At Head	Off	On
At Jamb	Off	On
At Sill	Off	On
Head		
Do Head	Off	On
Sash		
Offset	3'-4"	2"
Sill		
Thicknss	3"	1 1/2"
Muntins		
Slabs	Off	On
Munt Thk	1"	1/2"
Glass		
Do Glass	Off	On
Centred	Offset	On
<b>Doors</b>		
<b>Menu Selection</b>	<b>Erroneous Default</b>	<b>Correct Default</b>
Wall Thk	1'-4"	4"
Casing		
Extensn	0	1"
Trim		
At Head	Off	On
Extensn	3"	1"
At Jamb	Off	On
Header		
Do Head	Off	On
Jamb		
Do Jamb	Off	On
Stop		
Do Stop	Off	On

## Problem with LyrUtil Macro

**The Problem:** After importing a series of layers with the LyrUtil macro, placement of entities using keyboard entry (SPACE BAR) may result in the entities being placed in an unexpected fashion.

**The Cause:** When the Input Mode of the source drawing is set to either Relative Cartesian or Absolute Cartesian, the target drawing file is reset to Absolute Polar Input Mode by importing layers using LyrUtil, regardless of the previously set Input Mode. Source file settings of Relative or Absolute Polar reset the target file correctly.

**The Solution:** After importing layers, reset the Input Mode of the drawing file. Press the INS key to cycle through the options until the desired Input Mode has been selected.

## Velocity Tips

When batch processing a series of views saved in the source .dc3 file, an error results if the user has specified more than 100 views. This typically occurs when the user attempts to create a rendered walk-through presentation.

**Solution:** process in Velocity sets of less than 100 views, then combine the sets for the complete presentation.

**Voids:** A slab may only contain 36 rectangular voids. If 37 or more voids have been constructed in one slab, rendering will fail with the following error message:

SIZE OF ENTITY DATA EXCEEDS BUFFER SIZE.  
ERROR CREATING POLYGON FILE.  
CHECK DISK SPACE.

If horizontal slabs with more than 4 vertices were used to define the voids, fewer than 36 voids will process successfully. As the number of vertices increases, the number of voids must decrease.

**Divisions:** Entities such as the Torus and Dome will not render successfully with Divisions set higher than 24. If divisions are set too high, rendering will fail with the following error message:

TORUS OR ARC DATA EXCEEDS OUTPUT BUFFERS.  
ERROR WRITING TEMPORARY RENDERING FILE.  
ERROR CREATING POLYGON FILE.  
CHECK DISK SPACE.

## Logitech Mouseman Mouse

Users have been calling Cadkey's technical support line requesting assistance with the use of the Logitech Mouseman serial mouse in DataCAD. The Logitech C-7 serial driver supplied by Cadkey does not work with the Mouseman.

The reason for this is that, unlike previous Logitech mice, which were hardware compatible with the Mouse Systems mouse, the Mouseman is hardware compatible with the Microsoft Mouse.

**The solution** is to run the driver, MOUSE.COM supplied by Logitech with the Mouseman. Run it from AUTOEXEC.BAT or a batch file used to launch DataCAD, (RUNCAD.BAT or its equivalent). MOUSE.COM is a TSR that the user should, if possible, load to the high memory area to free conventional memory. Then configure DataCAD for the Logitech Bus mouse.

**Late Breaking topic:** Hewlett Packard DesignJet plotter. This plotter uses ink jet technology to produce large (up to E size) black & white drawings at 300 d.p.i. It runs from HPGL II command language at a much faster speed than pen plotters.

DataCAD has several HPGL device drivers but does not currently support HPGL II. Since HPGL commands are a subset of HPGLII, a device that runs with HPGL II should also accept HPGL commands. However, to get the DesignJet to plot using a DataCAD HPGL driver there are a couple of peculiarities that must be dealt with.

Cadkey has prepared an HPGL driver: HPGLS2.DVP for the DesignJet that addresses these quirks. It is posted on the Cadkey Bulletin Board [(203)298-6405; 8 bits; no parity; 1 stop bit] in the DataCAD area. To use the driver, copy it to the \MTC\DRV\ directory and configure DataCAD for the HP DesignJet.

It has also been reported that the DesignJet can be driven by the DataCAD driver for the HP LaserJet III.

More information next issue.

**Editor's note:** I have struggled for years with various mice and mouse-substitutes, trying to find one that is both accurate and comfortable. This is hands down (pun intended) the best mouse I have ever used. The Mouseman is available in both right and left handed models and is very comfortable to grip. Logitech software can configure the buttons so that left handed users may use their index fingers for "press the left button" operations.

I have been using the Mouseman for about six months and, for the first time in years, have been relieved of the aching hand syndrome resulting from long hours of working with a mouse. I can give the Mouseman my whole hearted and enthusiastic recommendation; it is well worth its relatively low street price.





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110 Richmond Street East  
Toronto, Canada M5C 1P1  
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Fax: (416) 362-0630

## Alias Upfront: a Front-End for 3D Modeler?

Upfront™, from Alias Research, Inc. has recently been widely reviewed in the Architectural press. It is touted as a user-friendly Windows application which allows the Architect to make 'napkin sketches' in any 3D perspective view. It was originally developed for the Macintosh platform and ported to Microsoft Windows last year.

One of Upfront's most powerful features is the ability to coordinate the perspective orientation of a scanned-in site photograph with the viewport orientation of the user. Resulting images may be generated that serve as views of the proposed design 'in place.' Upfront also supports shadow casting and surface shading. The resulting images, though not rendered, are very impressive.

As Upfront supports DXF import and export, DataCAD users have expressed interest in the possibilities afforded by Upfront as a 'front end' for the 3D Modeler and as a means of performing shadow studies on models created in DataCAD.

Using Upfront, for users familiar with both Windows and the Modeler, will be fairly straightforward. As a Windows application, installation is extremely simple. The user need only use the supplied INSTALL program and run Upfront from the Program Manager. Because it is a Windows application, there is none of the complexity that would be encountered in installing a DOS program of this sophistication (juggling parameters in CONFIG.SYS, installing drivers, etc.).

The user interface is, for the most part, simple and user-friendly, especially to anyone with familiarity with other Windows applications. The command sequence for the creation of entities is very easy to learn, especially if the user is familiar with 3D entity types based on DataCAD experience.

The menu controlling shadow casting (in which Latitude and time of day are set) is very clear. The menu options for controlling perspective views, though, are less than intuitive and require some study of the manual. Likewise, the manipulation of views relative to the previously mentioned scanned-in images requires a degree of familiarity with the software. The manual, by the way, is a model for other vendors to emulate; it is well organized, clearly written, and well illustrated.

The DXF transfer of a model from Upfront to DataCAD is clean and straight-forward, as can be seen from the illustrations at the right. Because of limitations in DXF transfer of 3D entities (see *R.P. vol. 1, no. 2*), one would not expect all DataCAD 3D entity types to translate to Upfront. One would hope, though, that simple entity types (conforming to DXF) might transfer. To date, success in this has not been achieved. Investigation with Alias research as to the cause is under way.

In an upcoming issue, the use of Upfront will be examined in more detail. For now, limited use of it indicates that it can, in fact, serve as a real enhancement to the use of DataCAD.

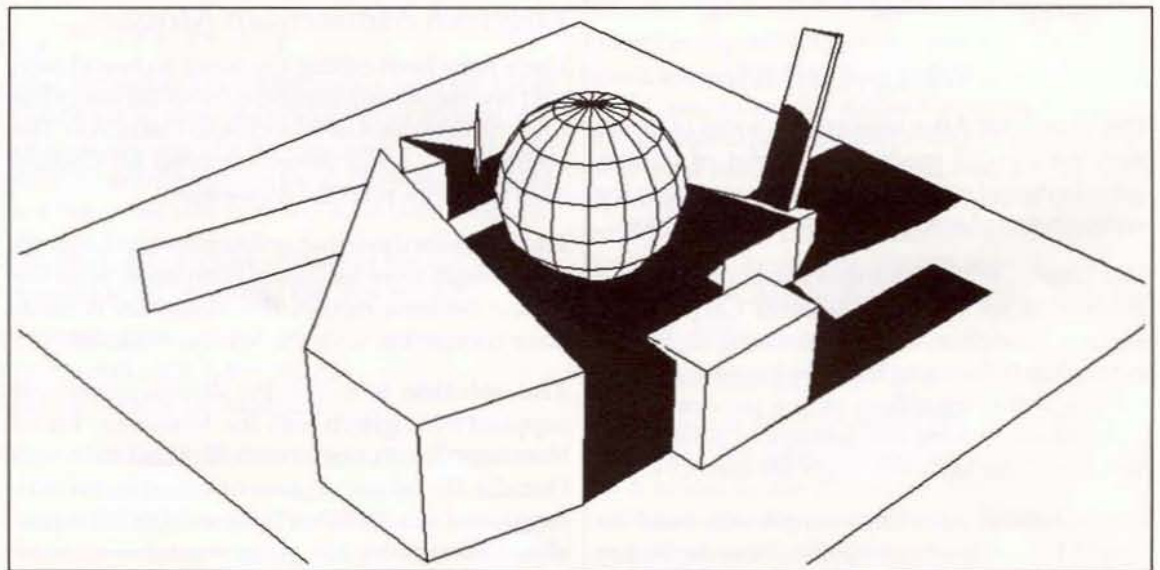
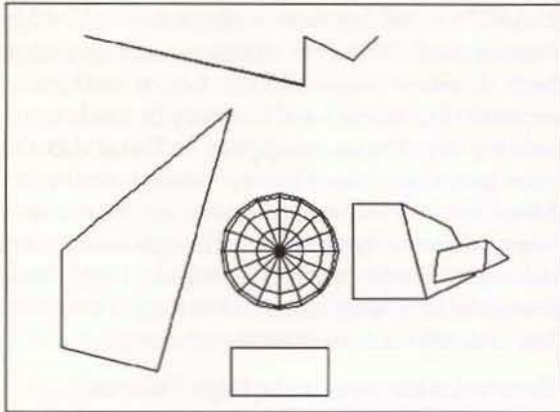


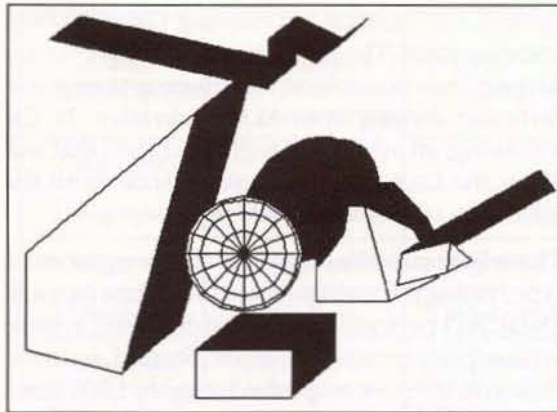
Figure 1  
Perspective view with shadows



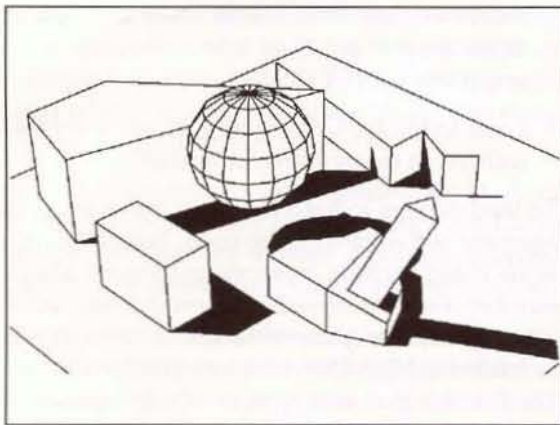
Due to limitations in the reproduction processes used in printing Reference Point, the Upfront illustrations presented here are based on screen images of a model displayed in a monochrome palette (all of the entities are shown with white surfaces and black edges). Surface shading of entities is thereby disabled. Note that the shadows cast by entities in this model fall on the ground plane (a horizontal polygon which had to be drawn) and on the surfaces of other entities, regardless of their orientation.



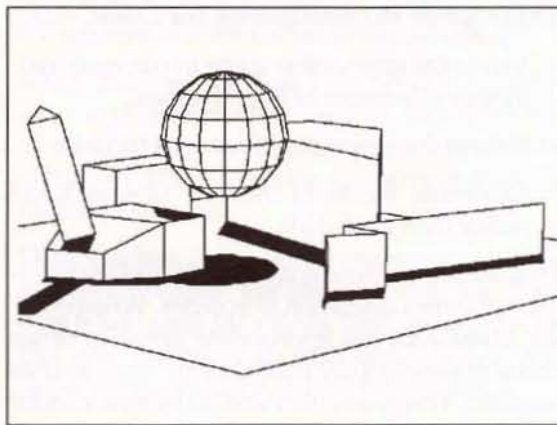
**Figure 2**  
plan view



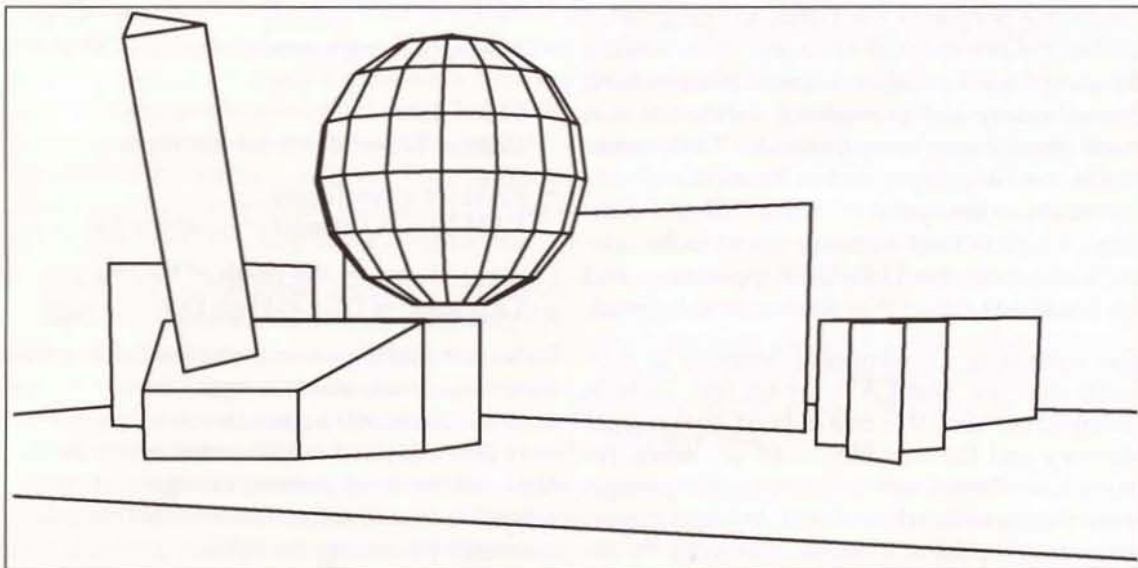
**Figure 3**  
plan view with shadows



**Figure 4**  
perspective view



**Figure 5**  
perspective view



**Figure 6**  
DataCAD HLR image

The DataCAD Hidden Line Removal image has not been cleaned up in any way. The transfer of entities through DXF translation is accurate dimensionally and no entities were lost in the process.





# Configuring for DataCAD: basic principles for speed

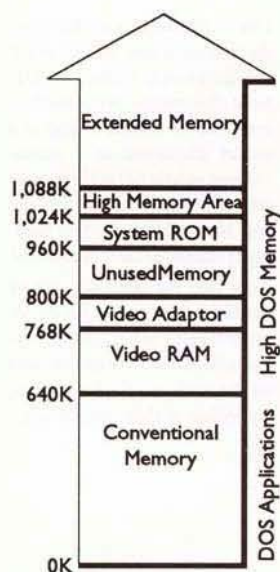


Figure 1  
Typical Memory Map

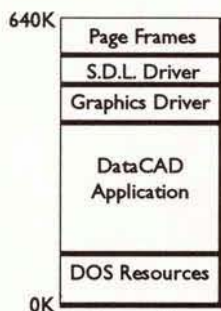


Figure 2  
Conventional Memory  
Before Optimization

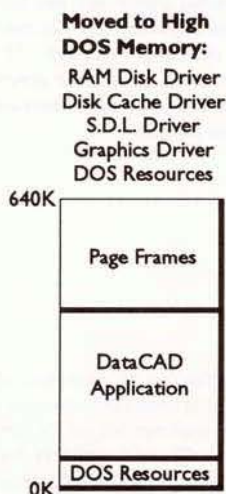


Figure 3  
Memory After  
Optimization

System optimization for running DataCAD is a complex topic. The goal is to get DataCAD to run as quickly as possible on any given system for the particular drawing tasks to be undertaken. In the following, an overall strategy is outlined that will allow the user to make basic choices about the allocation of system resources.

**There is no substitute for horsepower;** processor type/rating is the single most important factor in DataCAD performance. A 486-50 based system will outperform a 386SX-20, etc. Second, access to data in RAM is accomplished roughly 1,000 times faster than to hard disk. **The more DataCAD can be configured to use RAM resources, the better it will perform.**

### Three goals in configuring for DataCAD:

- Maximize application space in conventional memory (number of Page Frames).
- Relieve the processor of some of its tasks.
- Maximize access to the .SWP files in RAM, rather than hard disk.

To understand these goals, a brief explanation of the software's operation is in order. When entering DataCAD, the appropriate graphics driver and software display list driver (if used) are first installed. This is usually handled by RUNCAD.BAT or a user-defined batch file. In a 'vanilla' configuration these drivers are loaded to Conventional Memory (RAM below the 640K DOS barrier).

When the command 'DCAD' is invoked, the executable portion of the DataCAD program is loaded to Conventional Memory. Then, when a drawing file is loaded, it is copied from its hard disk directory and a 'working' version of it is made [the drawing swap (.SWP) file]. The location of the .SWP files is specified in the PATH menu of CONFIG under the option for 'virtual files.' At this point, Conventional Memory contains the core DOS resources, the DataCAD application, and the DataCAD driver(s) as illustrated in Figure 2.

The remaining Conventional Memory is then taken over by DataCAD for its use. Data is swapped between this area of free Conventional Memory and the .SWP files in 4K segments, referred to as 'Page Frames.' This swapping action is the means with which DataCAD operates on the data comprising a drawing .SWP file. By increasing the size of this 'work' space, DataCAD performance can be improved.

DataCAD can function with as few as 2 Page Frames available, but performance is marginal, at best. Cadkey recommends that a maximum amount of Conventional Memory be made available for Page Frame swapping. In DataCAD, the user can enter the DIRECTRY menu and select MEMCHECK. The message line reads 'Number of Page Frames allocated: \_\_\_.' Though some users run with fewer than 10 Page Frames, 18-22 Pages Frames on 286 systems and 30-40 Pages Frames on 386 and 486 systems is easily achievable.

### To maximize available Page Frames:

- Use a DOS version (MS DOS 5.0 or DR DOS 6.0) which allows a portion of itself to be installed in the High DOS Memory area. The result is more free Conventional Memory for applications. See R.P. vol. 1, no. 2 for a discussion of upgrading to MS DOS 5.0.
- Load to High DOS Memory all of the drivers utilized in the system configuration.

To load drivers to high memory, memory management software must be used. Both DOS versions listed include memory managers; also, a number of excellent third-party products are available. System components whose drivers should be loaded to High DOS Memory are listed below. The RAM region, and type, to which their data is stored is listed when applicable.

- Software Display List  
Display List in Expanded Memory
- Graphics Card
- Mouse (if using a vendor supplied driver)
- Disk Cache  
Cache in Extended or Expanded Memory
- RAM (or virtual) Disk  
RAM Disk in Extended or Expanded Memory

Figure 3 illustrates the result of loading drivers and a portion of DOS to High DOS Memory.

*Note: when using a memory manager to load drivers high, RUNCAD.BAT should be replaced with a different batch file. DataCAD's CONFIG re-writes RUNCAD.BAT every time it is exited and does not recognize the 'load high' statements of memory managers. A copy of RUNCAD.BAT, renamed, should be edited to include the statements for loading the software display list and graphics drivers to high memory. Use this alternate batch file to start DataCAD.*





Use the **Software Display List** to relieve the processor of some of its tasks. This feature is well described in the manual and will not be dwelt upon here. Two note on its use, though: First, it is recommended most urgently that the software display list *not* be configured to hard disk; performance degradation will result from doing this. Also, Cadkey recommends against configuring the Display List to the same RAM Disk to which the .swp files' path are set. The potential for conflicts between the two can lead to disaster.

The Software Display List should be configured to **Expanded Memory** for optimal performance.

**Maximizing access to .swp files in RAM**, the third goal for optimizing performance, is accomplished by using a Disk Cache and/or a RAM (or virtual) Disk. These utilize system RAM to accomplish specific tasks. Each has its own benefits and relative merits depending on the amount of RAM available to the user.

Figure 4 illustrates recommended RAM allocation for the Software Display List, Disk Cache, and RAM Disk for various amounts of system RAM; the following discussion will be based on it.

As described above, DataCAD operates by making .swp files to and from which data is swapped by the program for its execution. If the .swp files are located on hard disk, the process of reading from and writing to them is slow. If they can be located in RAM, through one means or another, DataCAD can access them much more quickly.

One means of accomplishing this is to install a RAM Disk and configure the path for the .swp files to it. Autosaves are made to the source drawing file directory so the amount of work lost in the event of a power failure or system crash is a function of the autosave interval. For a couple of reasons, the recommended minimum size for a RAM disk used for swap files 4 megabytes:

The drawing .swp file may grow to a size much greater than its parent .DC3 file. DataCAD operations which include an UNDO feature create buffers of data which enlarge the drawing .swp file. Other operations, as well, expand the size of the drawing .swp file as they execute. Second, DataCAD creates more than one .swp file. When a new font is added to a drawing, the message 'loading font file xx.chr' is displayed; a new .swp file is being created. Each font used has its own .swp file, equal in size to its parent .CHR file.

TOTAL SYSTEM RAM	RAM AVAILABLE FOR ALLOCATION	DISK CACHE	SOFTWARE DISPLAY LIST	RAM (VIRTUAL) DISK
1 Megabyte				
2 Megabytes	1 Megabyte	384K	640K	
4 Megabytes	3 Megabytes	2 Megabytes	1 Megabyte	
8 Megabytes	7 Megabytes	1 Megabyte	1 Megabyte	5 Megabytes
12 Megabytes	11 Megabytes	2 Megabytes	1 Megabyte	8 Megabytes

**Figure 4**  
Recommended RAM allocation for DataCAD

The Hidden Line operation creates a .swp file of its own, which can be quite large, depending upon the amount of information being processed.

RAM Disks smaller than 4 megabytes should be used with extreme caution and only with relatively small drawing files. Note that when the size of the .swp files exceeds the size of the RAM Disk, DataCAD crashes.

**Disk Caches** are an extremely beneficial tool in all configurations. For systems with less RAM than is adequate for a RAM Disk, where the .swp files are configured to hard disk, even a small cache improves DataCAD's performance.

In addition to caching reads from the .swp files (on hard disk), program support files accessed by the executing portion of the program are cached to RAM once they have been read the first time. *This is a must in all configurations.* Relatively large Disk Caches are recommended for all configurations.

In the configurations outlined in Figure 4, the one described for a 4 megabyte system relies upon a large Disk Cache for its speed of execution. Writes to the .swp files are to hard disk but, once a drawing file has been worked on for a short time, most reads (for swapping to the Page Frame area) should occur in RAM. The 8 megabyte configuration is an optimal one as swap file reads and writes are from and to RAM. Once the Disk Cache has picked up the program support data, working sessions in this configuration occur almost entirely in RAM.

System configurations with RAM in excess of 8 megabytes are not directly beneficial to DataCAD. However, Velocity and Windows performance is significantly improved by having large amounts of RAM available.

*A Disk Cache is a copy in RAM of the most recently read information that has been read from the hard disk. When a program calls for information from the hard disk, the cache is read first. If the necessary data is in the cache, it is read directly from RAM and the hard disk is not accessed. If the data is not in the cache, the hard disk is read and the cache is updated with new data. Mostly, disk caches are updated on a 'last in, last out' basis.*

*A RAM Disk is a portion of RAM that has been allocated as a logical drive. To DOS, it behaves like a disk drive (or a logical partition of one).*

*Drivers for disk caches and RAM disks are installed by adding statements to CONFIG.SYS, in which they should be loaded to high memory using memory manager commands. Disk caching software can usually be turned on and off (once installed) at the DOS command line and may be controlled from batch files.*

**One warning:** if both a RAM disk and a disk cache are used, make sure that the cache driver is configured to *not* read the RAM disk. It would slow the system by filling the cache with information already located in RAM.

*A very comprehensive discussion of configuring DataCAD was published in WindowIn on DataCAD at the point of 4.0's release (vol. 4, nos. 1, 2, & 3). They are available from:*

*C. L. Davis Consulting Assoc.  
P.O. Box 502  
Middlebury, VT 05753*





## DOING WINDOWS

### Sources of Information

Windows 3.0® is an immensely complex and sophisticated environment. The user is rewarded by the many features that the authors of Windows applications are able to incorporate. The user may, just as easily, spend many frustrating hours attempting to get something to work under Windows.

Regular users of Windows (and with the release of the Parthenon-based product, this includes those of the DataCAD user base who elect to switch to it) are encouraged to broaden their knowledge about Windows.

The two primary sources of information currently available are periodicals and books. Publications like *PC Magazine*, *Byte*, and *Infoworld* (to list only a few) run feature articles on Windows and Windows applications on a regular basis. Most of the magazines also feature regular columns devoted to Windows.

Though feature articles often focus on topics that would appear to be of little interest to the DataCAD user, they often contain gems of information about technical quirks in Windows. Similarly, Windows columnists may devote all of their space to apparently obscure areas only to mention something in passing that is relevant to the reader's Windows configuration.

There is real value in quickly scanning these articles and columns. At some future date, when facing a significant problem in running Windows, one may remember reference to a problem area in an article previously read. Instead of spending hours trying to unravel a mysterious conflict or waiting for a technical support call-back from Microsoft or a dealer, the solution may be traceable through topics covered in these publications.

For a more consolidated source of information, it is strongly recommended that the user purchase a good book on Windows. But which one? A quick glance through the computer shelves at any decent book store will turn up a staggering number of titles on the subject.

The publications that are available span a range of approaches. At the high end are technical references for Windows programmers. At the low end are the "Windows in plain English" books; these can be characterized as being simple re-hashes of Microsoft's manual and help files. While a decent explanation of icons and mice is useful, and al-

most automatically more easily understood than the Windows manual, something more is needed for the serious user of Windows applications.

In selecting the most appropriate book to purchase, a comparison of the coverage given to a couple of selected topics will quickly narrow the choice. The following is a short list of questions that might be asked:

*How extensive is the discussion of 386 Enhanced mode operation?*

*Are memory managers (QEMM 386, 386MAX, etc.) discussed individually? As a generic class?*

*Is the PIF editor discussed at length?*

*Are problems with COM port interrupts discussed and work-arounds suggested?*

My own search led me to the purchase of:

#### Windows 3 Secrets

Brian Livingston  
IDG Books Worldwide, Inc.  
San Mateo, CA 94402

Livingston is the Windows columnist for *Infoworld* and is a Windows consultant. His writing strikes a nice balance between the provision of basic information and detailed technical discussion.

Portions of the 838-page book may be used as a solid introduction to Windows for the new user. It includes many useful tips on Windows setup and configuration. Additionally, the book serves as a detailed reference guide to the running of Windows. The book also includes two floppies containing some useful (.ZIP compressed) Windows shareware.

By way of illustrating its usefulness, I was initially unable to get my modem to work under Windows. Livingston's discussion of modems and communications, to which he devotes 20 pages, helped me track down and solve the problem (conflicting hardware interrupts). The Microsoft documentation on this subject did not provide enough information for me to solve the problem.

This is not meant as a recommendation of this book over others, though I do think that it is a good one. Rather, it is an example of the *type and level of resource* that I feel Windows users should have available. A good book on Windows is expensive, but will pay for itself in increased efficiency and problem solving.

*The user might be well advised to wait until the release of Windows 3.1 for the purchase of a good Windows book. One can assume that the current crop of titles will be updated to cover 3.1, DOS 5.0, and the latest application software. 3.1 is scheduled for release in early 1992.*





## Customizing DCAD.MCR, Keyboard Macros Explained

The second most important customization within DataCAD (after default drawings) that the user is able to control is the modification of DCAD.MCR. This is the file which controls the 'meaning' of the keyboard macros, the ALT+LETTER combination which 'jumps' the user to a particular menu location in DataCAD.

DCAD.MCR is an ASCII file, normally installed to the MTEC\SUP directory. It is easily modified using a text editor like DOS 5.0's Edit command or one included with most DOS shell programs, or a word processor (saving the file to ASCII format).

**Reading DCAD.MCR:** Each line in the file corresponds to one keyboard macro command sequence. Figure 1 illustrates the contents of the file as shipped with DataCAD 4.0. The first line, beginning with the letter A is the command sequence corresponding to ALT+A, the keyboard macro that jumps to the CURVES menu. An examination of this line will serve as a means of describing the way in which keyboard macro files work.

When the user holds down the ALT key and presses the A key, DataCAD searches the file

```

A^u^l;^S5^j^f
B^u^l:^F4^F2^j^f
C^u^l;^F0^j^f
D^u^l:^F8^F1^j^f
E^u^l;^F6^j^f
F^u^l;^F9^F1^j^f
G^u^l;^F6^j^f
H^u^l;^F9^j^f
I^u^l;^S1^j^f
J^u^l;^F9^F5^j^f
K^u^l;^F8^j^f
L^u^l;^S7^j^f
M^u^l;^F4^j^f
N:^S6^F1
O^u^l;^S3^F8^S0^j^f
P^u^l;^S5^j^f
Q^u^l;^j^fS9
R^u^l;^S4^j^f
S^u^l;^F5^j^f
T^u^l;^j^fS6
U^u^l;^S8^S0^j^f
V^u^l;^S8^S9^j^f
W^u^l;^F9^F7^j^f
X^u^l;^F7^j^f
Y:^S7
Z^u^l;^F1^j^f

```

Figure 1  
DCAD.MCR as supplied by Cadkey

DCAD.MCR for the line beginning with A and executes the commands contained on that line. The commands are separated from each other by the CARAT (^) character (SHIFT+6 in the typewriter area of the keyboard).

*Any given line in DCAD.MCR may not exceed 128 characters, total.*

There are four basic types of 'commands': extended ASCII characters, keyboard interrupts, function keys, and text entry.

**Extended ASCII characters:** the keyboard macro file recognizes four extended ASCII characters and assigns to them special meanings. They are used to suppress and resume the display of the message and menu portions of the DataCAD screen during the operation of the command sequence. Without using them to suppress the display, the screen would flash through each of the menu operations, slowing execution.

Figure 2 illustrates the appearance of the characters as they display in a DOS ASCII editor. The characters are written by holding down the ALT key while typing the number on the numeric keypad of the keyboard (NUM LOCK on). The extended ASCII character is displayed after the ALT key is released.

*Note: some keyboard macros, ALT+N in Figure 1, for instance, require that the display be kept on during their execution. If the user finds that a particular keyboard macro is not executing properly, he/she might try removing the extended ASCII characters from that line as a possible fix.*

Returning to the line defining ALT+A, we understand that the first actions of this keyboard macro have been to stop the display of the messages and menus in the DataCAD screen. Next, the keyboard interrupt for the edit menu (;) is invoked.

**Keyboard interrupts:** any keyboard interrupt may be used in a keyboard macro. Generally, it is wise to begin any keyboard macro with a 'jump' to either the EDIT (;) or the UTILITY (: ) menu. This ensures that the user exits the current menu position and is placed in one of the two primary menus, from which he/she may then select menu steps using function key calls.

More advanced use of keyboard interrupts will be discussed later in this article. For now, ; has taken us to the EDIT menu, from which we will use function keys to enter the curves menu.

	ALT + 183 stop menu display
	ALT + 184 start menu display
	ALT + 200 stop message display
	ALT + 201 start message display

Figure 2  
extended ASCII characters  
used by DCAD.MCR

*Note: DCAD.MCR, as shipped, is missing the carat character in some positions in A, H, N, Q, and Y. The file works properly, but users should follow the practice of always separating commands with the carat.*





**Function keys:** simply by entering keystrokes equivalent to the appropriate Fx or Sx menu position, that command is selected. In the ALT+A line, S5 selects the menu option in the S5 position (CURVES) displayed in the EDIT menu, previously selected by the ; interrupt.

The line is closed with the extended ASCII characters created with ALT+184 and ALT+201.

*It is important to remember that any keyboard macro beginning with the suppression of menus and messages should conclude with turning them back on.*

### Modifying DCAD.MCR

Users with a fair bit of experience with DataCAD will be able to identify which of the keyboard macros he/she has little use for and which ones he/she wishes had been provided.

By way of example, let's say that the user never uses ALT+O (PERPENDICULAR toggle in the OBJSNAP menu) but wishes there was a keyboard macro for ONE LINE TRIM (in the CLEANUP menu).

First, enter DataCAD and write down the menu sequence that takes the user to the desired menu. In this case, it is: EDIT (;), CLEANUP (F9), 1LN TRIM (F4). Exit DataCAD to DOS and enter the directory containing DCAD.MCR (\MTEC\SUP in a standard configuration) and save a copy of the file to a different name:

```
CD\MTEC\SUP
COPY DCAD.MCR OLD.MCR
```

Then, using an ASCII editor, open DCAD.MCR and modify the line beginning with O to read:

```
O^ ^ ^ ^ ^ ^ ; ^ F9 ^ F4 ^ ^ ^ ^
```

Using the text editor's commands, save the file as DCAD.MCR and close the editor. Enter a DataCAD drawing file and invoke the modified keyboard macro by holding down the ALT key and pressing the O key. ONE LINE TRIM will have been accessed.

If desired, the original version of the file may be returned to by renaming the files in DOS:

```
CD\MTEC\SUP
REN DCAD.MCR NEW.MCR
REN OLD.MCR DCAD.MCR
```

Since DataCAD always reads the file named DCAD.MCR when accessing a keyboard macro, whichever file currently has that name is the one which controls the action of the keyboard macros within DataCAD. A macro which facilitates the use of multiple .mcr files is described on page 11.

### Some Refinements

There are a couple of additional wrinkles in the customization of keyboard macros.

**'Returnable' keyboard interrupts:** most of the DataCAD keyboard interrupts act in a 'positive' way; when they are invoked, the user is taken to a specific menu position. Exiting that menu steps the user back through the menu structure.

Some interrupts, though, are 'returnable.' When they are used, the user is taken to a menu position and, upon exiting that menu, is returned to the menu from which the interrupt was invoked.

If, for instance, the user is in the MOVE menu, has entered some of the MOVE parameters, and presses the X (upper case) key; he/she is taken to the OBJECT SNAP menu. After setting parameters in OBJECT SNAP, and exiting that menu, DataCAD returns the user to the MOVE menu, at the same place in the sequence as when the X interrupt was invoked.

The user may take advantage of this type of interrupt in a keyboard macro. The following sequence is one that I use:

```
Q^X^S5^S0
```

ALT+Q enters OBJECT SNAP, toggles LYRSNAP on/off and exits OBJECT SNAP. Because X is a 'returnable' interrupt, the user returns to the menu position from which the keyboard macro was initiated. In use, LYRSNAP is toggled within any command sequence. Note that suppression of menus and messages is not used; the message stating whether all layers or only the active layer will be snapped to is briefly displayed as user verification.

**Direct entry of text** can be a useful tool in a keyboard macro. For instance, access to a particular DCAL macro can be difficult to accomplish by calling a menu position; the position might change when new macros are installed (and get listed in alphabetical order). Entering its name at the user prompt line will call the macro, regardless of its position. A keyboard macro which calls a (fictitious) DCAL macro named EDDIE.DCX would look like this:

```
Z^ ^ ^ ^ ^ ^ M^ EDDIE ^ $ ^ ^ ^ ^
```

The M (upper case) interrupt enters the MACROS menu, 'EDDIE' is entered at the user prompt, and the \$ serves as the ENTER key. Regardless of its position in the MACROS menu, EDDIE.DCX will be loaded by this keyboard macro. A variety of uses for this ability are possible in DataCAD as there are many menus that accept direct entry of text.





## Multiple Keyboard Macro Files

The user may define any number of keyboard macro files, each particular to a specific type of drawing. Some users, for instance make a version for working in the **3D Modeler**. Others have versions for drawing wall sections, etc. The problem with multiple versions of **DCAD.MCR**, each stored with its own name, is that it is irritating to exit to DOS and rename the various files to make the correct one operative at any given time.

A solution is available. David Pendery of HMFH Architects, Cambridge, MA has written a DCAL macro, **NEWKYMCR.DCX**, which is available through Evan Shu's *Cheapware* for a very nominal price. When entered, the macro displays a list of all files

in the **\SUP** directory with a **.MCR** extension. The user selects the file to activate and the macro performs the DOS renaming process. Effectively, the user is no longer limited to the 26 characters available in a single keyboard macro file.

*Cheapware* bundles **NEWKYMCR.DCX** with another DCAL macro by Pendery: **EDITKEY.DCX**, which enables editing the contents of a **.MCR** file from within **DataCAD**. This macro works well but is limited by the display characteristics of **DataCAD's** user input line. The extended **ASCII** characters display as smudgy blobs or blank spaces; additionally, only one line of the file may be edited at a time. These limitations aside, **NEWKYMCR.DCX** and **EDITKEY.DCX** augment the use of keyboard macros.

*Cheapware*  
Shu Associates  
10 Thacher St.  
Boston, MA 02113  
(617) 367-9622

## An Example:

By way of demonstrating the possibilities available in a customized **DCAD.MCR**, the following is the basic 2D editing keyboard macro file that I use. I hope that the particular editing commands that it accesses might stimulate the reader to evaluate his/her own needs within **DataCAD**. The file, itself, utilizes all of the elements described in the

preceding discussion. Note that in **ALT+I**, **NEWKYMCR.DCX** is used to call a second keyboard macro file (**TEXT.MCR**). The macro **TEXT.MCR** resets **DIMENSION** and **TEXT** menu parameters relative to plot scale and includes an **ALT+I** command which recalls this (primary) keyboard macro file. See the note below about the **ALT+K** and **ALT+V** lines.

<b>ALT+A</b>	curves (Arc)
<b>ALT+B</b>	cleanup, weldline (Butt)
<b>ALT+C</b>	Change
<b>ALT+D</b>	architect, Doorswing
<b>ALT+E</b>	Enlarge
<b>ALT+F</b>	geometry, oFfset
<b>ALT+G</b>	Geometry
<b>ALT+H</b>	dimension, linear, Horizontal
<b>ALT+I</b>	switch to 'text' keyboard macro file
<b>ALT+J</b>	cleanup, 2 line trim (Join)
<b>ALT+K</b>	clear, activate, add to SelSet1, mask, color
<b>ALT+L</b>	cleanup, L intersection
<b>ALT+M</b>	Mirror
<b>ALT+N</b>	file i/o, New drawing
<b>ALT+O</b>	cleanup, One line trim
<b>ALT+P</b>	erase, Partial
<b>ALT+Q</b>	toggle layer snap on/off
<b>ALT+R</b>	polygon, Rectangle
<b>ALT+S</b>	Stretch
<b>ALT+T</b>	cleanup, T intersection
<b>ALT+U</b>	measUres
<b>ALT+V</b>	clear, activate SelSet2, toggle append
<b>ALT+W</b>	architect, Windows
<b>ALT+X</b>	cleanup, X intersection
<b>ALT+Y</b>	text
<b>ALT+Z</b>	change, text, contents

```

A^ ^L; ^S5^ ^ ^ ^
B^ ^L; ^F9^ ^F7^ ^ ^ ^
C^ ^L; ^F0^ ^ ^ ^
D^ ^L; ^S3^ ^F9^ ^ ^ ^
E^ ^L; ^F6^ ^ ^ ^
F^ ^L; ^F6^ ^F3^ ^ ^ ^
G^ ^L; ^F6^ ^ ^ ^
H^ ^L; ^D^ ^F1^ ^F1^ ^ ^ ^
I^ ^L; ^M^ ^NEWKYMCR^ ^S^ ^TEXT^ ^S^ ^S0^ ^ ^ ^
J^ ^L; ^F9^ ^F5^ ^ ^ ^
K^ ^L; ^S^ ^F0^ ^F8^ ^S0^ ^F4^ ^F1^ ^F5^ ^ ^ ^ ^F0^ ^F1^ ^S0^ ^F2^ ^F1^ ^F0^ ^F2^ ^S9
L^ ^L; ^F9^ ^S1^ ^ ^ ^
M^ ^L; ^F4^ ^ ^ ^
N^: ^S6^ ^F1
O^ ^L; ^F9^ ^F4^ ^ ^ ^
P^ ^L; ^F7^ ^F9^ ^ ^ ^
Q^ ^X^ ^S5^ ^S0^ ^
R^ ^L; ^S4^ ^ ^ ^
S^ ^L; ^F5^ ^ ^ ^
T^ ^L; ^F9^ ^F0^ ^ ^ ^
U^ ^L; ^F7^ ^ ^ ^
V^ ^L; ^S^ ^F4^ ^F2^ ^F5^ ^F0^ ^F8^ ^S0^ ^ ^ ^ ^F0^ ^F2^ ^S0^ ^F9^ ^S0
W^ ^L; ^S3^ ^F0^ ^ ^ ^
X^ ^L; ^F9^ ^S2^ ^ ^ ^
Y^ ^L; ^S6^ ^ ^ ^
Z^ ^L; ^F0^ ^S8^ ^S2^ ^ ^ ^

```

Bruce Kaplan, of Kaplan & Associates, Burke VA uses the following for **ALT+A** in his keyboard macro file:

**A^I^F2^S0**

With the cursor placed at an entity when this macro is invoked, **IDENTIFY** is used to make active the layer on which the identified entity is placed.

Note: the **ALT+K** keyboard macro includes a useful technique which may be applicable under other circumstances, as well.

If SelSet 1 were the active one at the point of initiating this keyboard macro and the command sequence simply tried to activate it, SelSet 1 would be turned off. To get around this, SelSet 8 is first made active, then SelSet 1. The user is thus assured that, no matter which SelSet is active, SelSet 1 will be made active.

**ALT+V** clears and makes active SelSet 2. However, the same technique does not work for toggling append - if it were already on, it would be toggled off.





POINTS OF REFERENCE

Book/Video Review

Beginning DataCAD  
The DataCAD Videos

Dr. Leonard O. Nasman

Microcomputer Education Systems, Inc.  
4900 Blazer Parkway  
Dublin, Ohio 43017  
(614) 793-3069  
FAX: (614) 766-3605  
book: \$29.95  
videos: \$25.00 & \$75.00

The video tape 'DataCAD Overview' is priced at \$25.00, the others are \$75.00 apiece. The complete set of videos is priced at \$650.00. Video titles:

- Beginning Drawing with DataCAD
- Intermediate Drawing with DataCAD
- Editing and Dimensioning with DataCAD
- Site and City Planning with DataCAD
- Creating Detail Drawings and Typical Wall Sections
- Creating Custom Template Symbols and Default Drawings
- 3D Modeling with DataCAD
- Using DataCAD Macros
- Creating DataCAD 'Slide Shows'

Beginning DataCAD and The DataCAD Videos are authored by Dr. Leonard O. Nasman, and intended as instructional tools for an institutional training environment.

The book is structured around a series of lessons in which the student creates drawings, gradually learning about new menu options in DataCAD.

The introductory video tape 'DataCAD Overview' provides just that. The other nine tapes coordinate with lessons defined in the book, serving to introduce the student to the new topic (and DataCAD menu) areas required for the completion of each lesson. As the student completes each lesson, his/her skill level with DataCAD is broadened.

The sequence of lessons is appropriate to the goal of instructing the new user in DataCAD. The writing style is clear and easy to follow; each new command is described simply and every effort is made to get the student to 'learn by doing.' The coverage of each topic is, therefore, rather cursory. No provision is made in the book for a comprehensive guide to each menu command, nor is there much exploration of alternative methods for the accomplishment of a given task.

In style and in form, this combination of text-book and video tapes serves its function well. In a classroom setting, or in an architectural office where a large group of users needs to be trained at one time, Beginning DataCAD will work well as the basis for a training program.

Particularly in the office setting, where new users must be brought quickly to proficiency with DataCAD, this program should be supplemented. Both particularized information in the form of more detailed resources (the DataCAD manuals, DataCAD for the Architect, third-party publications, etc.) and individualized attention to the progress of the trainees should be provided to ensure success.

Users Groups

Every Users Group is concerned with the subject of maintaining and expanding its membership. The single most important means of maintaining the participation of an existing membership is through responsive meeting agendas. Every Group will have its own needs, defined by the makeup of its membership.

Groups comprised mostly of experienced users may minimize the number of presentations on DataCAD commands, focusing on integrating DataCAD with other software. Groups with many new users, all trying to help each other expand their use of DataCAD, will have a very different series of presentations.

Groups with mixed membership, both new and experienced users, may try to present a variety of subject areas. Variation by user level may occur within a meeting or alternate between meetings.

As a means of attracting new members, Groups attempt to make themselves known to users in their regions. Local dealers can serve as a primary source of information; they are usually happy to provide lists of their DataCAD customers to Users Groups.

In the responses to a survey that was sent to Groups last Summer, a desire was voiced for more help from Cadkey in obtaining access to new (or previously unidentified) users of DataCAD.

Cadkey is reluctant, for competitive reasons, to simply hand out their mailing lists to anyone. They do, however, want to provide to Users Groups assistance in recruiting new members. A policy regarding this is currently being determined and will be announced through these pages.

PUBLICATION INFORMATION

Reference Point is published quarterly by:

Cadkey, Inc.  
4 Griffin Road North  
Windsor, CT 06095

Managing Editor:  
Editor:

Frank Simpson  
Philip Hart

Editorial Review Committee:

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Additional copies, changes in mailing address, and other business communications: Tel: (203) 298-8888; Fax: (203) 298-6401

Editorial Communication:

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