ALDUS

MAGAZINE

VOLUME 2, NUMBER 6 SEPTEMBER/OCTOBER 1991

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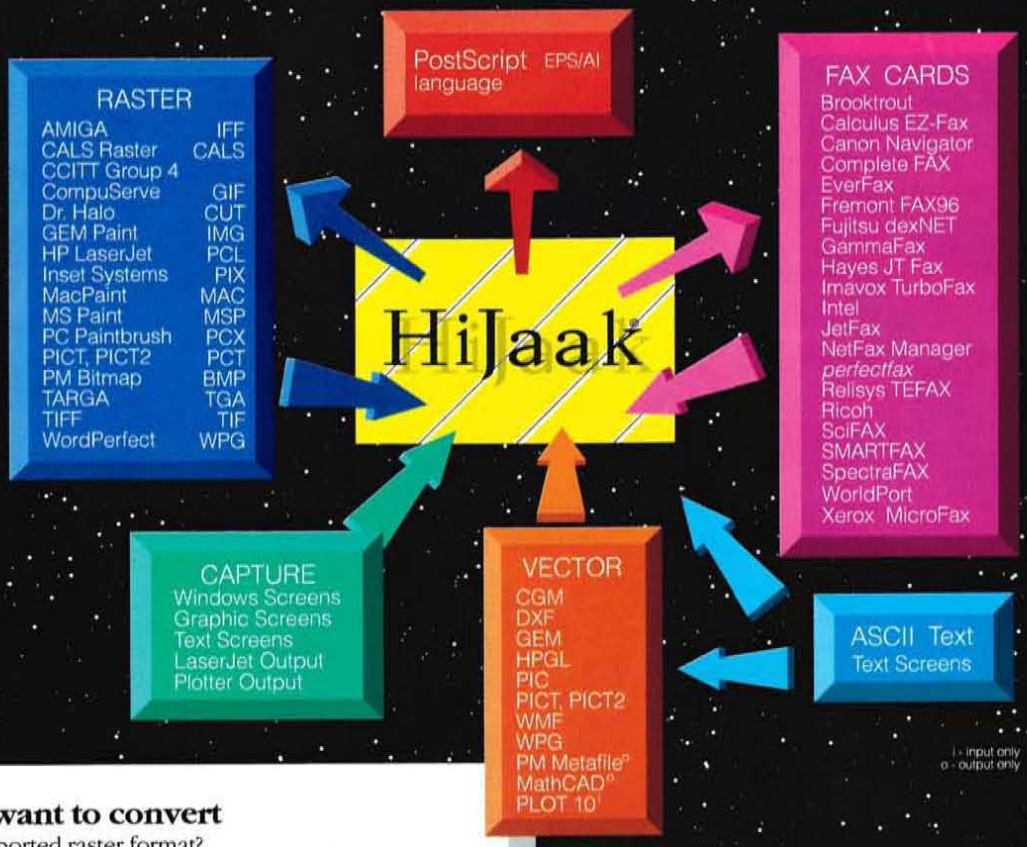
The Graphics Conversion and Screen Capture Utility



What do you use if you want to convert

- 34 raster file formats to any supported raster format?
- 11 vector file formats -- and their various "flavors" -- to supported vector or raster formats?
- MacPaint, MacDraw, or SuperPaint images to PC format -- and back?
- raster formats to viewable Encapsulated PostScript language and vector formats to Illustrator-type EPS?
- ASCII text to supported raster or vector formats?
- all supported formats to any of 21 Group III fax devices?

What do you use if you want to capture

- Windows screens, including Windows 3.0, at a maximum resolution of 1024 by 768 by 256 colors.
- text or graphics screens and only have 5K of memory to spare for a TSR?
- text or graphics screens cropped to the desired size and area before saving?
- text or graphics screens directly into the desired destination format?
- text screens that are resolution independent -- scalable without distortion?
- text or graphics screens from VGA, MCGA, EGA, CGA or Hercules graphics cards?
- text or graphics screen colors remapped to different gray scales?
- LaserJet PCL output to provide 300 dpi images for supported raster formats?
- HPGL plotter output for conversion to supported vector and raster formats?

What do you use if you want to fax

- formatted text with original attributes via your fax card?
- integrated text and graphics from PageMaker or your word processor via your fax card?
- documents via your fax card that arrive looking remarkably like LaserJet printed documents?

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FORM AND BACK TO FUNCTION AGAIN

Desktop publishing represents the biggest technical advance that the graphic arts have ever seen. All the tools a graphic artist needs—type, a pasteboard, drawing tools, color, and so on—can now sit on a desk and be controlled by a keyboard and a mouse. Anyone touched by the power of a desktop computer has been mesmerized by what it can do. Many in graphic arts are so infatuated with the computer that they have even discovered a new medium to work in—the computer itself. In addition to print design, designers are now adding things like multimedia to their repertoires.

This infatuation with the computer, however, has bothered some. One of those is Marcia Peoples Halio, who authors our Perspective column this issue (page 64). Last year, she stirred up quite a controversy when she noted that a character-based system (i.e., DOS) seemed to be more effective in teaching students how to write than a graphical one (i.e., Macintosh). She observed that students working in a graphical environment appeared to focus more on how their words looked than on what they said.

In the graphic design community as well, there seems to be a backlash against the computer aesthetic. Much has been written recently about how design has declined—partly as a result of the new technology—and even claiming that a new kind of designer has emerged, one who is in the service of technology when it should be the other way around.

In the history of arts and letters, graphic design is a relatively new discipline, made possible in part by advances in technology. For a trade that once relied on exacting, time-consuming processes, desktop publishing is a godsend. But like all infatuations, the one that graphic design has with the computer will end. And maybe then, instead of wondering about how a given piece was made, we'll focus on the work's purpose and how well that purpose is served. —*Harry C. Edwards*

CHEATING

The sidebar in the "Shrink to Fit" article, on page 31, describes dirty tricks to get your stories to fit. It's essential to have some of these tricks up your sleeve when working on a tight deadline with limited space. They won't eliminate all editing to fit, but might reduce it by 80 percent. On this page, I had to use all these tricks except hyphenation (trick 5). The numbers in circles call them out. 1: Tracking was changed from "Loose" to "Normal" on the first line to pull up the word "PrePrint," which was a widow in the last line of the paragraph. 2: The "set width" was changed to 97% on all the executives' names in order to squeeze in Stephen Cullen's title. 3: The space between columns was enlarged from one to two picas, to accommodate shorter-than-average stories. 4: The page uses two irregularly sized columns.

Some nuts and bolts

We laid out "The Picturing of Information" (starting on page 18) in PageMaker 4.0 for Windows, using the PC fonts Adobe Copperplate, Franklin Gothic, and Adobe Bembo. These pages were then printed from the Mac with PrePrint.

Marta Lyall created the cover from scrap images and scratch, using U-Lead's released version of PhotoStyler on the PC (see the story on page 13). This program seems to us to be extremely powerful and well designed. The articulated frog legs, for instance, took roughly 30 minutes to draw from scratch using a variety of copying, flipping, and pasting techniques. The airbrush tools work quickly, as does masking.

Once the cover image was finished, it was saved in .tif format and transferred to our central file server. From there it was pulled off to the Macintosh, placed in Aldus FreeHand, and printed to an Agfa 9800 as process color separations. There was a fifth color available to us: a metallic bronze, running on the cover form in the Xante ad on the inside back cover. We couldn't figure out how to use it on the cover, so we didn't (discretion is the better part of valor). —*J. Scott Campbell*

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Depending on your artistic ability, you can modify predrawn clip art, autotrace scanned images, or draw complex illustrations freehand. The *Arts&Letters Graphics Editor* includes over 5,000 clip-art images and 80 typefaces. Powerful drawing and editing tools use smooth Bezier curves for precision and flawless quality. For technical illustrations, you can specify size, position, length, angle, slant and rotation numerically as well as interactively. Advanced features include Warp/ Perspective, linear and radial fills, autotrace, text-along-a-path, hole cutting, clipping masks, calligraphic lines and polymorphic tweening.

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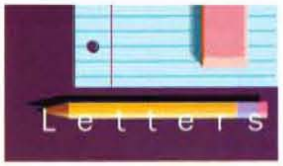


KEEPING IN TOUCH

Letters from our readers.

Have a question about *Aldus Magazine*? A gripe? A compliment, correction, or tip? Please let us know. You can reach us in any of the following ways:

- By letter. Write to Editor, *Aldus Magazine*, 411 First Avenue South, Seattle, WA 98104-2871.
- By phone. Leave us a message at (206) 343-3275.
- Via CompuServe. Send electronic mail to account number 76702, 1254, or leave us a message in the Aldus Forum's *Aldus Magazine* section.
- By fax. Call (206) 343-3273.

Please note that we'll treat all the above communications as letters to the editor unless otherwise instructed, and we reserve the right to edit for length or clarity.

Point of light

As the wife of an inmate at the Kansas State Penitentiary in Lansing, Kansas, I read with great interest "Publishing with Conviction" (July/August 1991, page 17). Jim Trappe expressed so eloquently the plight of the convicts, I thought I would cry. With the misunderstanding public, the oblivious bureaucrat, and the frustrated family, *Convictions* is a point of light. I could not read the article fast enough, I was so excited about the thought of a magazine published just for my husband. How can I get involved? Who can I tell I want to help? *Please*, will you send me an address?

Anita R. Weller, Parkville, Mo.

You can reach Convictions *magazine at P.O. Box 1749, Corvallis, OR 97339-1749. —Ed.*

A note from inside

I do not wonder that *Convictions* is the only magazine of its kind. Your article "Publishing with Conviction" described the problems well. As so-called "editor" of a prison newsletter, unconcerned about revenues, advertising, and subscriptions, I am well rehearsed in the frustration of dealing with the administrative mind-set. Prisoners here would welcome reading something other than the administrative line and leisure-time activities.

In case you're wondering, I read the article because I'm a PageMaker user and I have been for four years. When I get out, I plan to continue being productive with Macintosh and PageMaker, even if I have to do it on the side while making a living washing dishes.

Douglas Wells, Vienna, Ill.

Eroding graphic standards

The results of your choice to output the July/August 1991 issue on a 600-dpi machine are indeed unfortunate, especially for a company that has earned a fine reputation providing *high-end* graphics software.

The message that is sent when one goes "cheap" is that you can get away with poorer quality. In my copy of *Aldus Magazine*, type was breaking up all over the place. Cheap is interesting to me only when appropriately applied, and to use 600 dpi on glossy stock in a serif typeface is inappropriate. The availability of high-resolution type at extremely low cost is one of the joys of the graphic world today.

Our challenge as artists and graphic software advocates should be to raise the standards of production, to match technology and artistry in the most appropriate ways. There are plenty of ways you might have shown the use of lower-resolution output, but pretending you could produce the same product without changing the design is self-defeating, leading to the erosion of the very graphic standards your software is promoting.

Bruce Daniel, Santa Fe, N.M.

Wow

I just received my copy of your Cheap Tricks issue (July/August 1991). Wow!

After last year's issue, I've been looking forward to number two for months. I wasn't disappointed. I couldn't wait to try out a trick or two—so I didn't. I've been having so much fun making personalized Post-It notes, I've forgotten about the headache I have from trying to redesign a Government Form from Hell.

I hope you'll continue to publish more Cheap Tricks in the future. I enjoy and savor all my issues of *Aldus Magazine*, but it's especially affirming for me to know I'm not the only DTPer out there looking for ways to create neat stuff on a shoestring, and at times nonexistent, budget.

Annemarie Bogar, Greensboro, N.C.

Take the easy route

Sorry, folks, but your award to Jill Overton for her cheap slides (July/August 1991, page 30) was mistakenly given. Jill's technique costing "literally a few cents each" fails to factor in her *time*.

(continued on page 13)

How to design cool stuff.

From the pages of *Before & After:* How to draw glistening surface reflections! See back.

Fresh points of view help you think like a pro!

Subscribe to *Before & After*, John McWade's magazine of design and page layout—it has critics raving and readers saying, "Wow, I can design cool stuff, too!"

"A glittering jewel!"—Ezra Shapiro, *MacWeek*

Ever make a brochure with peekaboo panels? Design stationery that could pass muster at IBM? Wrap text and graphics around a 3-D box?

Do you know how?

If you were reading *Before & After* you would.

Fine embossing costs hundreds of dollars; do you know how to simulate it—free?

Can you design a newsletter in a few hours that your boss will be *pleased* to take credit for?

It's all in *Before & After.*

Desktop publishing came with a promise: that we could design beautiful pages—*ourselves.*

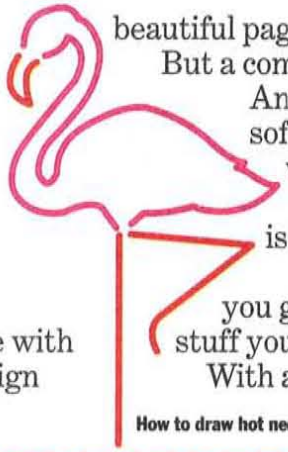
But a computer can't design.

And supercharged software doesn't know what's beautiful.

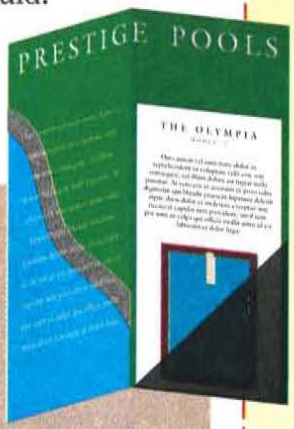
Which, actually, is just great.

Because it means you get to do all the cool stuff yourself.

With a little help from us.



How to draw hot neon in three easy steps!



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EXCERPT

From: *How to design a low-budget flyer that sells a product*

BEFORE What's for sale here?

AFTER Focused on the product

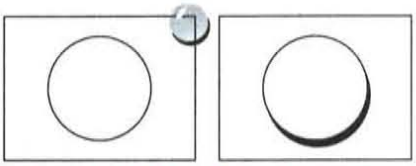
LOOK FAMILIAR? What's for sale here? A gazebo? A *more*? Furniture? A rental? It's hard to tell, isn't it? The problem with this flyer isn't that it's ugly (ugly ads can be very effective salesmen, which drives designers nuts) but that the product—the item actually for sale—is lost in the visual chatter. The retailer scrupulously avoided hype and carefully provided his store's location, phone number and even a map, but forgot that *the product must come first!* Makeover focuses all eyes on the product—a shopper who cannot clearly see your product *will not buy it.*

DRAWING TECHNIQUES!

FREEHAND STEP-BY-STEP:

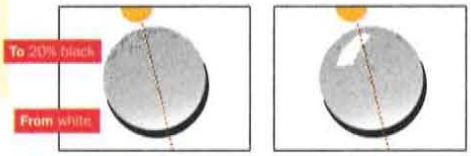
How to draw glistening surface reflections

Translucent water droplets are a combination of smooth blends and bright highlights:



1. DRAW A DROPLET Small water droplets are usually round; big ones are blobby. For now, draw a circle.

2. ADD A SHADOW Clone the droplet; offset the clone about *this* much and *send to back.* Fill with black.



3. GRADUATED FILL Droplet gleams where light *exits.* Fill *toward the light* **from** white **to** 20% black; Taper type: Logarithmic (it concentrates the white at one end); Taper angle: (in this case) 104°.

4. ADD THE HIGHLIGHT Droplet sparkles as light *enters.* Draw a shape like a curving square. Fill with white and place near the light source. Delete any lines you may have and you're done!

Against a background:

5. OOPS! A light gray droplet obscures a colored (or shaded) background. To appear translucent, the droplet (or any object) must be filled with its own color **plus** the background color:

6. MAKE A NEW COLOR Here, background color is 100% cyan and 30% magenta. Refill the droplet **from** white **to** 100% cyan, 30% magenta **and** 20% black (its own color). Cool, huh?

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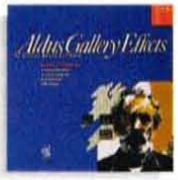

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ALDUS NEWS

The latest in filters, drivers, books, software, services . . .

FILTER/DRIVER PACK FOR PC PAGEMAKER 4.0

Aldus is shipping the new filter/driver pack for PC PageMaker 4.0. Filter/driver packs contain import filters, which allow PageMaker users to import files from other applications, and printer drivers, which let users print PageMaker files to certain printers.

The new pack includes the latest versions of the PS1 and PCL 4 and 5 drivers from Microsoft and Hewlett-Packard. Of the ten import filters included, seven—for the Table Editor, ASCII files, Word for Windows, WordPerfect, Lotus spreadsheets, Excel charts, and Excel spreadsheets—are updates of filters that originally shipped with PageMaker. Most of the new versions simply make PageMaker 4.0 compatible with PC Persuasion 2.0, although a few offer bug fixes (for instance, the new Table Editor import filter fixes a bug in the printing of multiple tables on a single page to a PostScript printer).

However, there are three new filters as well: for Samna Word, XyWrite III, and Ventura Publisher. The latter allows PC PageMaker 4.0 to import entire "chapters" (Ventura's equivalent of PageMaker "publications") that were created in Ventura Publisher from ASCII text files, without any loss of style information.

The filter/driver pack is available free to registered users through the Aldus Forum on CompuServe. It can be found in data library 11, under the name PC DRV/FLT/UTILS. It is also available through Aldus Customer Relations for a shipping and handling charge of $20. For more information, call Aldus Customer Relations at (206) 628-2320.

HIGH-TECH TECH SUPPORT

In August, Aldus began offering two new customer support programs, CustomerFirst Online and CustomerFirst OnlinePremier. The new programs, available for all Aldus products, are a pioneering joint effort of Aldus and CompuServe in providing comprehensive customer support electronically.

CustomerFirst Online and OnlinePremier offer Aldus customers a host of features via CompuServe's 24-hour electronic bulletin board. With a modem, the network software—customized to reflect Aldus standards for user interfaces—and 12 credited hours of network time, subscribers can receive fast answers to their technical questions from Aldus product specialists, participate in private Aldus forums and conferences on topics of interest, download productivity tools and resources, and access the technical database that Aldus support technicians use. After the 12 hours are used up, subscribers are billed on a per-hour basis. The Online documentation also includes a special rebate offer for a modem if you don't already own one.

In addition to the above, CustomerFirst OnlinePremier subscribers receive toll-free technical support calls, a 40-percent discount on upgrades, and free updates, filter/driver packs, and Aldus *TechNotes*. In addition, OnlinePremier subscribers receive a free annual membership to Design Line by Invision Inc., which allows them access to paid professional design consultation via fax (with the first one-page consultation free).

CustomerFirst Online is available for $249 per year for each Aldus product, and CustomerFirst OnlinePremier for $429 per year per product. (Note that both programs include a subscription to CompuServe Information Service, the electronic bulletin board most people call "CompuServe.") For more information about these and other Aldus support programs, call Aldus Customer Relations at (206) 628-2320.

TECHNOTES FOR PC PAGEMAKER

Aldus TechNotes for PC PageMaker 4.0 will be available in September, Aldus has announced. In addition to material from the Macintosh version of *TechNotes*—considered "a model of excellent supplementary documentation" by the editors of *Mac PrePress*—that has been revised to reflect the PC platform, there is also a great deal of new material to extend and supplement PC PageMaker's documentation.

TechNotes has been written to respond to customer requests for more information on specific topics, including the Story Editor, tabs and indexes, and transferring PC publications to the Mac and back. *TechNotes* also provides information on making changes to the way PageMaker works. Highlights include six new text effects, arrowheads and tailfeathers for lines drawn in PageMaker, and recipes for Recorder macros, includ-

How to create super graphics with Logo SuperPower

Example 1

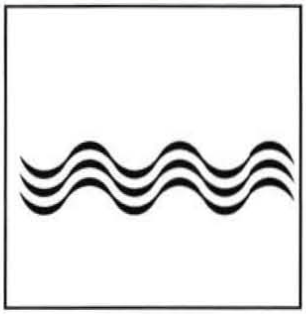
Begin with the Eagle Head, one of the 660+ elements in Logo SuperPower.

Draw a circle using the toolbox. Change the eagle to white.

Add Effect 148 (flag wave). Change shape of effect.

Change top of circle to red.

Example 2



Begin with Effect 08-3, one of the hundreds in Logo SuperPower.

Add element "Water Drop." Change shape of effect; change effect to white.

Example 3

Form a "B" in italic shape. Add element 66-1

Duplicate element and move to desired location.

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ing one to create true fractions automatically. Also featured are an indexing tutorial and much more.

Olav Martin Kvern, technical writer for the *TechNotes* program, commented, "*TechNotes* provides an opportunity for customers to learn from the most knowledgeable PageMaker users at Aldus."

Aldus TechNotes for PC PageMaker 4.0 and *Aldus TechNotes for Macintosh PageMaker 4.0* are available to registered users of PageMaker 4.0 for $39.95 each, and are free to subscribers to Aldus' CustomerFirst Premier program. For more information, or to order *TechNotes,* call Aldus Customer Relations at (206) 628-2320.

PhotoStyler Joins Aldus Product Line

In May, Aldus announced the acquisition of the exclusive worldwide publishing and marketing rights to PhotoStyler, a full-color image-processing program for Microsoft Windows 3.0 developed by U-Lead Systems Inc. of Taiwan.

In a June 1991 preview of PC image-editing programs *Publish* magazine wrote, "PhotoStyler is our favorite. . . . U-Lead has definitely upped the ante, bringing more color potential to beginners and pros alike."

Balancing the ease of use of the Windows interface with professional-level color capabilities, PhotoStyler provides Windows 3.0 users with the ability to scan, enhance, compose, retouch, and print 24-bit color, grayscale, and black-and-white images. Features include the automation of advanced capabilities, while also offering the special effects and powerful tools for color correction, conversion, and separation that professional graphic artists require. Many of these capabilities were previously available only on the Apple Macintosh or specialized hardware platforms.

Drivers to support a variety of peripheral devices, including the most popular desktop scanners and printers that are also compatible with Windows 3.0 or PostScript, will ship with the product. PhotoStyler will also support the TIFF, TGA, EPS, PCX, BMP, and GIF file formats, among others.

U-Lead Systems originally announced PhotoStyler in the United States in March, and initial shipments of the product began in May. Currently, Aldus and U-Lead are working together on a new version to enhance PhotoStyler's compatibility with other Aldus products. PhotoStyler will be available under the Aldus name later this year.

Letters *(continued from page 8)*

Jeez, after she's bought the acetate, cut up the pieces, mounted them, sprayed them, taped the color gels, and drawn on them with markers, she has spent an incredible amount of *time.* Jill, take the easy route and get them professionally output.

Jessie Newburn, Columbia, Md.

Right on the mark

Your "Mimics and Designers" interview in the July/August edition (page 22) goes to the heart of a concern shared by all who are devoted to the art of graphic design: How do we democratize design while discouraging the dilettantes?

I am a graphic design consultant; I work primarily with newspapers, helping to redesign them. More and more, however, I find myself helping to redesign the staff: redesign their thinking, their planning, their approach, their focus, their goals. Michael Manwaring was right on the mark: We must teach design in a cultural context.

To those I assist, I preach philosophy. How, I ask them, can a person design without having a design philosophy? And thanks for "Mimics and Designers." Please give us more of the same often.

Edward F. Henninger, Xenia, Ohio

Elitist nonsense

Every group of like-minded people is a bit elitist, I guess, but your Graphic Arts Advisory Board takes the prize ("Mimics and Designers," July/August 1991, page 22). I write for a living, and I could take the view that nobody can *really* write until they've been to writing school for a few years and studied writing "in a cultural context." I could look down on the idea that giving people "a new set of tricks" can turn them into better writers. I could insist that to write well "you must live your life well." What elitist nonsense that would be.

On the contrary: People can learn the craft of writing by reading books, learning rules (and how to break them artfully), and mimicking what they find appealing. Certainly they can do the same with the craft of graphic design.

Jon Voskuil, Milford, N.H.

People, not machines

Thank you for *Aldus Magazine.* Frankly, I am decidedly bored with most Macintosh publications. I don't need to read reviews of the latest high-tech gizmos that have no relation to the things that I'm doing with the Mac and that I could never afford anyway.

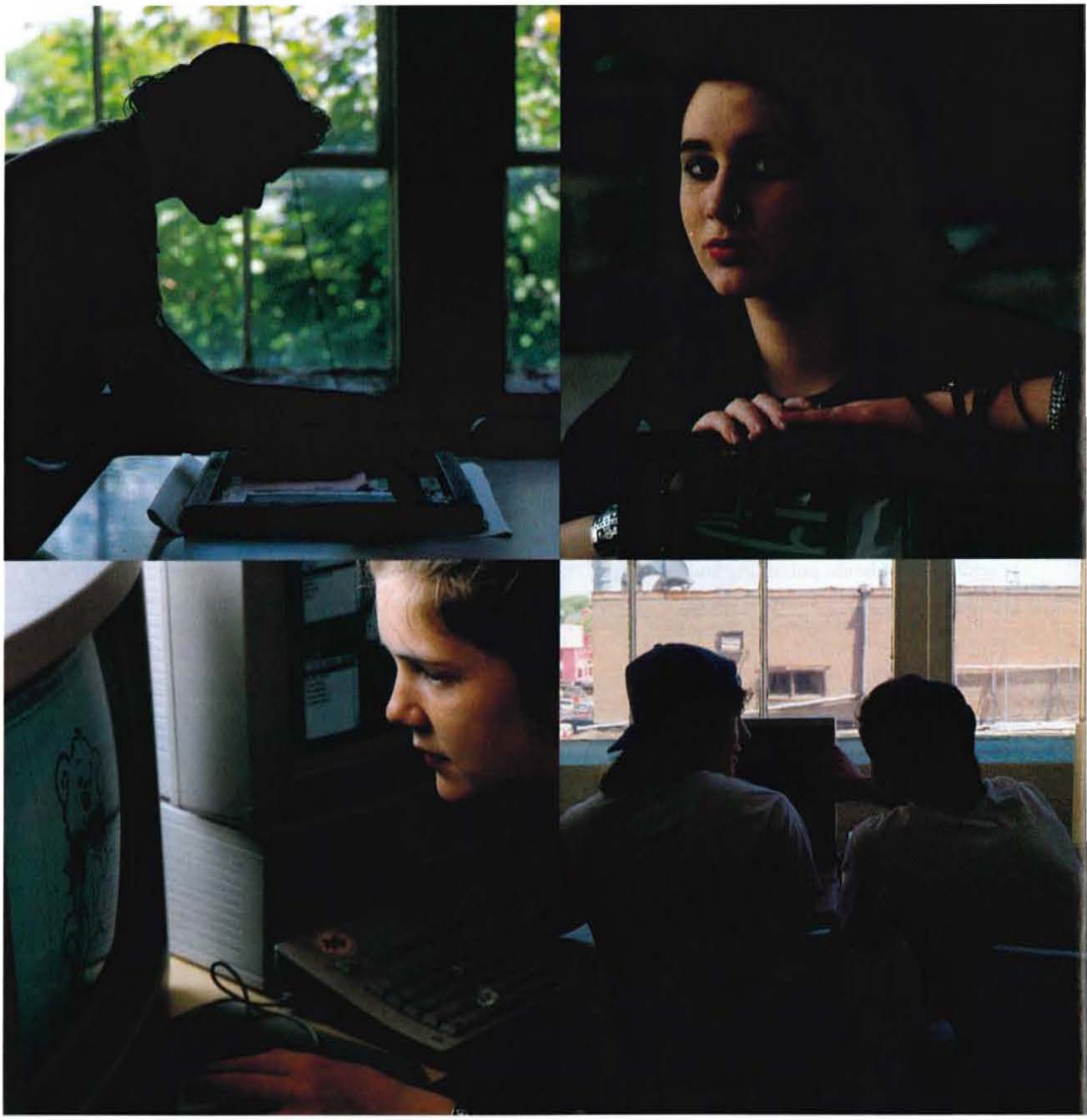
Your publication, however, seems to focus on people, not machines. This is the way it should be. I'd rather be reading about what people are *thinking* and *doing* than what machines are merely *doing.*

A. Craig Dickinson, Buffalo, N.Y.

Correction

On page 50 of the July/August 1991 issue, I noted an error. When making fractions on the PC, Control + \ should be used with the denominator selected, and Control + Shift + \ should be used with the numerator selected, instead of the reverse, as stated in the magazine.

—Harold Brooks, Fort Worth, Tex.



Clockwise from bottom left: WOC students Liz Perry, Laquetris "Kechie" Prowell, and Tecia Baldwin collaborate on a silkscreen logo for the center's parenting program. In the computer room (bottom right), two students work on English assignments.

second CHANCES

With the help of the computer, two educational programs offer a fresh opportunity to succeed.

By Averill Curdy

WORK OPPORTUNITY CENTER

Minneapolis, Minn.

The building cost a dollar. The chairs and desks are hand-me-downs from other schools. And in addition to the usual classrooms, Minneapolis' Work Opportunity Center (WOC) includes a print shop, a machine shop, and a dry cleaner. WOC is not exactly your average high school.

Part of the Minneapolis public school system, WOC is one of the largest alternative schools in the United States, with nearly 300 students in grades 9 through 12. It was begun in the late 1960s to provide vocational training for dropouts (hence the dry cleaner), but has since evolved into a school where students considered to be at risk of dropping out—because of absenteeism

or discipline problems—can complete their high school education. In addition, WOC offers an alternative to those students who simply prefer a nontraditional approach.

WOC's philosophy is built on "outcome-based education." Instead of receiving grades, students are evaluated on the basis of goals they establish at the beginning of each quarter. Every accomplishment is rewarded, from a week's perfect attendance to the completion of credits and graduation. Learning is self-paced, and contact between students and teachers is intensely individual. The aim is to create an environment where students can be successful.

For example, Angela Mihalow is a student who has often been absent due to various complications at home. WOC allows her to catch up at her own pace, rather than be left behind to take the beginning of the same classes over and over again. "I wouldn't graduate if I went back to my old school," she says.

In the last five years, computers have played an increasing role in WOC's success, especially in the area of writing. The school now boasts a sizable computer lab, which is coordinated by English teacher John King. A middle-aged man with a grin and a quip for every student, King has the slightly frayed-at-the-edges passion of the committed—but overextended—teacher. His delight in what the students create is endless. He's the one who built the lab and who has fostered the faculty's enthusiasm for computers, although he credits former principal Dr. Larry Zimmerman with the original vision.

King believes that a key benefit of the computer has been to help students overcome their fear of writing. Not only are editing and rewriting less burdensome, but he has observed that a student's ability to lay out a story in PageMaker contributes directly to his or her self-esteem. It provides them with a polished publication to show off to friends and family.

The size of the school's literary magazine has doubled in the last few years, and an astonishing number of the students are writing novels, stories, plays, and poetry. Mary Underwood, an English and Social Studies teacher, believes that their thinking process has also improved. Both King and Underwood tell of students who took no interest in school, or refused to write, until they were coaxed onto the computer—then couldn't be dragged away until the time came for them to graduate. One of those students, who spent most of the time with his head on his desk, asleep, has since written a novel.

WOC librarian Jean Sullivan helps a student lay out her work in PageMaker.

Not everyone at WOC welcomed the advent of the computer. Jean Sullivan, the WOC librarian and leader of the school's Junior Achievement program, remembers, "When the principal wheeled the first one in, I thought, 'I'm doomed.' And then when John was hired, that was it—the final nail in the coffin." Now, however, she's become a strong believer in the machines because she's seen how effective they are for the kids.

Besides her reputation as something of a character—she roller-skates to work, for instance—Sullivan is widely regarded as the "heart" of the school. Like all the teachers there, she performs miracles with slim resources and force of personality. Last year, Sullivan spent five months working with a small group of students to create a multicultural calendar as a Junior Achievement project. Using Aldus FreeHand and PageMaker, students researched, wrote, designed, and illustrated the calendar as a fund-raising project. Originally planning to sell 30 copies, they ended up selling 400. Sullivan observed that although these are kids who generally have a difficult time working in groups, the project required them to work together—with very successful results.

The faculty and staff at WOC are committed to the success of the individual, and they feel that computers have increased their ability to reach the students with whom other teachers feel they've failed. As Sullivan says, "Unless a student here bonds with somebody, they aren't going to make it. And the computer is a tool to help that bond."

CUYAMACA COLLEGE

El Cajon, Calif.

For the first time since he was a soldier in Vietnam 20 years ago, Pete San Nicolas is getting a regular paycheck. And his newfound success has a lot to do with a graphic arts certificate program for disabled students at Cuyamaca College in El Cajon.

San Nicolas stepped on a land mine in Vietnam, and spent three years in a San Francisco VA hospital recovering from his injuries. After his discharge, now permanently confined to a wheelchair, he'd supported his family with the help of his wife, Valerie, the

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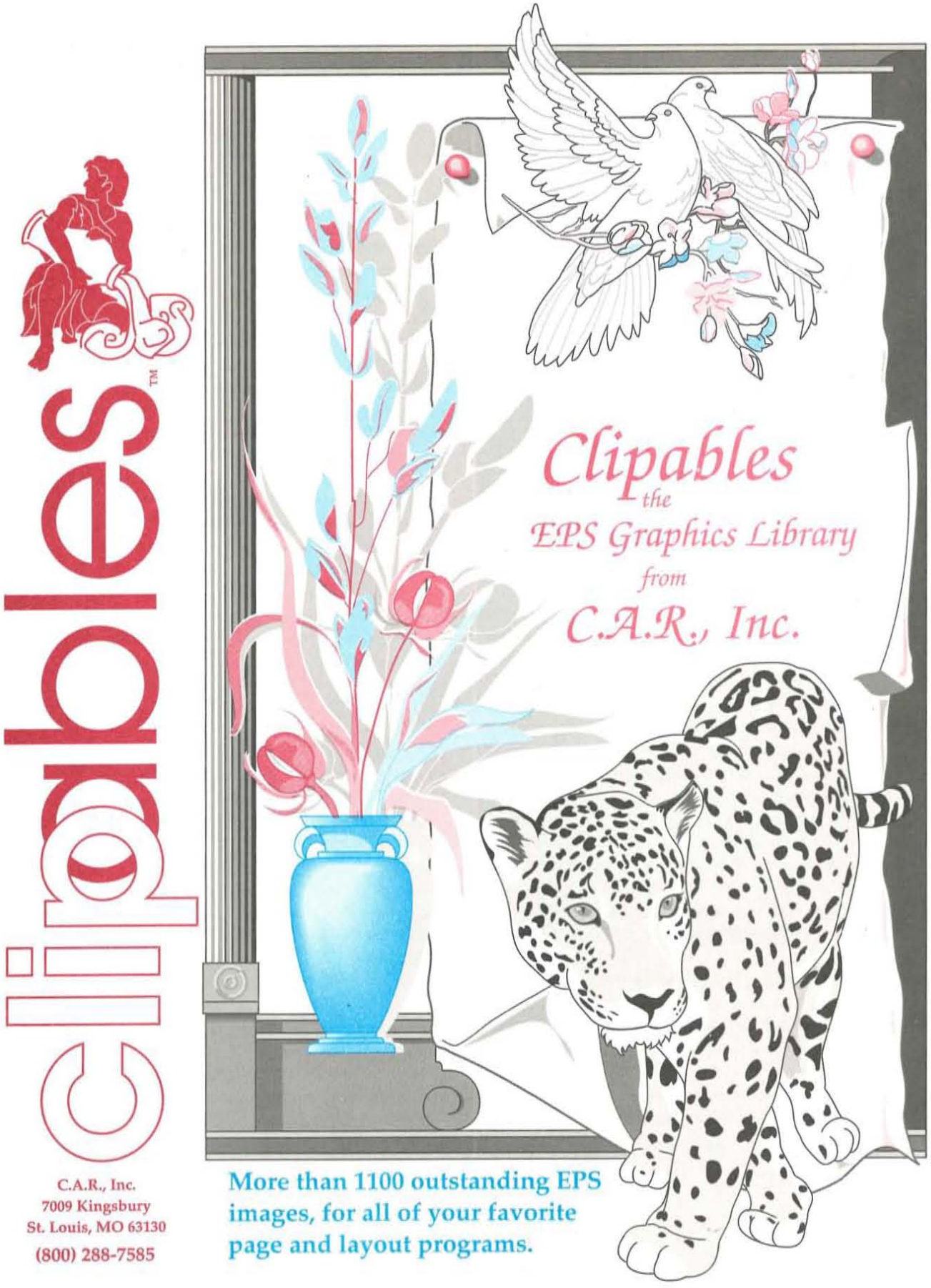

mountain community of Ramona, and goes into the office only about once a week. SAIC will soon be

Veterans Administration, and the occasional painting commission (he was once trained as an artist). In 1990, though, he graduated from the Cuyamaca program and was hired by Science Applications International Corporation (SAIC) last August, the day he rolled in the door to begin his internship.

Cuyamaca's program for disabled students is one of only two such programs in California. Started two years ago with a grant from the state, as well as over $500,000 in donations from companies like DEC and Apple, the program is a notable success story, and will be rolled into the regular college budget next year. The program's students—21 in the first year and 15 last year—have a variety of disabilities, ranging from orthopedic problems to deafness. The classroom tends to be a jumble of activity, as instructors roam the room, students intensively collaborate with and help one another, and interpreters and note takers assist the deaf.

In addition to graphic arts and computer training, all students receive eight weeks of job counseling, which includes career assessment, résumé writing, interview techniques, and other job search skills. Cuyamaca has an 85-percent placement rate, with students working for small design firms, newspapers, and local corporations. Most get entry-level production jobs, but since their computer skills are usually better than their new colleagues', they tend to move rapidly into positions of greater responsibility.

Pete San Nicolas was a member of the first class to graduate from the program at Cuyamaca, and his placement at SAIC was a piece of good fortune for both parties. SAIC is an international, employee-owned company with annual revenues of over a billion dollars. The firm specializes in providing a variety of technology-based solutions to some interesting problems—for instance, developing an antiterrorist system for the channel tunnel between France and England. With so much of SAIC's work coming from governments, its staff naturally has to produce innumerable proposals and presentations.

Dr. Clancy Hatleberg, San Nicolas's boss at SAIC (and a former Navy Seal), hired him immediately because of his veteran status, his fine arts background, and his computer graphics training from Cuyamaca. Hatleberg specifically wanted to hire someone not only with computer graphics skills but with the "artist's eye" as well, to create materials that would stand out from the competition.

San Nicolas's job is to design presentations and proposals that Hatleberg's division uses in soliciting work. However, because of a blood pressure condition that requires precisely timed medication, San Nicolas avoids the 90-minute commute to SAIC's La Jolla offices. He works primarily at home, in the small mountain community of Ramona, and goes into the office only about once a week. SAIC will soon be installing a fax machine in his home in addition to his impressive Mac setup, to make his telecommuting even easier.

The California mountain town of Ramona is home for Cuyamaca graduate Pete San Nicolas. He does most of his work for SAIC there, commuting to the firm's La Jolla offices only about once a week.

San Nicolas, a fairly animated guy anyway, positively lights up when he discusses the Cuyamaca program, and has served as its advocate in the state legislature. He himself is a living example of the personal benefits the program provides. He says that the students all work together as a team in the classroom, and as they begin their job searches they share contacts and tips. Nancy Davis, head of the placement program, observes that facing a job search is difficult for most people, but for these students it is particularly intense. And it's important for these students to be successful, not only for themselves but for each other.

Since it's easy for disabled people to isolate themselves, Cuyamaca's program creates an opportunity for students to work together and develop skills to take into the job market. Along the way, their self-esteem evolves as their skills increase. What makes the program important, according to Pete San Nicolas, "isn't just the design and desktop publishing that you learn, but the person you become."

The Picturing of Information

A conversation with Nigel Holmes.

BY STUART SILVERSTONE

Nigel Holmes is widely considered to be the father of contemporary journalism graphics. A transplant from England who brought a strong British visual tradition to this country, Holmes has directed the look of Time *magazine's graphics for the past 14 years. In doing so, he has popularized a unique pictorial style of displaying statistical information that influenced a generation of graphic designers and publications, including, most prominently,* USA Today. *While receiving many compliments from* Time *readers and some graphics professionals, Holmes has been strongly criticized by many information design professionals—most notably Edward Tufte, the subject of our May/June interview, which is why readers might notice a similarity in some of the questions posed to each. As part of his own personal evolution, and in response to these criticisms, Holmes has been revising his infographics style—seemingly formulating the changes even as this recent conversation took place.*

What was the evolution of your graphics style?

While freelancing in London, I became aware of a need for information display that wasn't illustration, wasn't photography, and wasn't writing—it was somewhere in the middle and contained a bit of all of those things. I had a job that required very fast drawings for articles that were very difficult to illustrate.

But, I didn't have what I could really call a style, until it occurred to me that what was making me nervous about drawing and getting into print—because I could draw quite nicely—was that my drawings looked like old-fashioned figure studies. I was trained that way as an illustrator. But they didn't look that good in print. So I developed a completely opposite way of illustrating, which was to do my hand drawing, then become like a machine and superimpose a purely mechanical rendering of those lines into the smoothest, tightest, finest lines that I could draw.

What influenced your work in England?

There was, and still is, a nonorganized "school" of information design in England. There were a lot of publications over there called "partworks," which were weekly serial publications that required lots of explanatory illustrations. The intention was to excite the public into understanding how things worked. I was never a contributor to one of those publications, but I loved looking at them. In 1969 I started at the *Radio Times*, a magazine with features and BBC program listings. There, I worked extensively on the 1972 and 1976 Olympics. Each day during the Olympics I was given a quarter of a page to explain the sport that was going to be watched that day—an explanation of the pole vault or a gymnastics exercise or how you lose oxygen when running or whatever else I could discover. The BBC commentators made themselves available to me as a resource. They would tell me things like, "Eight years ago, weightlifting had gotten to a point where a heavyweight could lift a small horse. Now they can lift a racehorse and its jockey." So, the pages of the *Radio Times* would have drawings of weightlifters, dates, and poundage, but instead of a dumbbell it would be a horse on one side and a racehorse with its jockey on the other. People liked this.

How did you happen to come to America?

In 1966 I won a scholarship that allowed me to travel wherever I wanted, and I wanted to come to America. I hated it. Eleven years later I came back to see if I could pick up some freelance work. On this trip I met [*Time* magazine redesigner] Walter Bernard, who offered me a job to replace *Time's* outside chart makers and "to make the statistical graphics look more interesting." I decided that if I didn't take the opportunity I'd always kick myself.

How did your work at *Time* evolve?

I was introduced to [business editor] Marshall Loeb—who went on to be the editor of *Money* and is now the editor of *Fortune* magazine. At first, he was resistant to

the idea of somebody messing about with the seriousness of his section. But, he soon changed when readers would write to say how much my graphics helped them to understand articles in the business section. Soon other editors wanted graphics in their sections too, and it spread to the rest of the magazine. I would talk to an editor and ask, "What does this story mean? Is this good news? Bad news?" Then I would go off and think about an appropriate way to show what was both true to the information and exciting to look at.

How would you describe the style you developed?

Very often it didn't look like a graphic at all. The best ones combined a picture of the subject with information about the subject. So, if you looked at the page you would know instantly what the subject of the graphic was—oil, for example. If it was successful, very soon after you saw "oil," you saw what the numbers were, whether it was good or bad, whether it was important, whether somebody was affected by this.

At its best, this style does three things—it tells you what the subject is, it gives you the information, and it tells you what the information means. I thought it was possible to do this in a general interest magazine because people are not intrinsically interested in the price of oil, but more in what the price of oil means to them. The interpretation is as important as delivering the information.

What kind of reaction did your early work at *Time* receive?

To begin with there was a lot of fan mail from readers. Professional designers, not in the information field, liked it as well. I got lots of prizes. Then a different sort of letter came: "You are messing about with the information." These letters took a more academic approach. They said that this kind of thing was detrimental and patronizing—epitomized by the things Edward Tufte said. He seemed to have focused the thoughts of a number of people who couldn't put into words what they had been thinking all along: "If you're going to do information graphics, do information graphics. If you're going to be a cartoonist, be a

***Time* magazine's graphics director—the father of the modern, whimsical infographic—discusses his methods, his critics, and his changing philosophy.**

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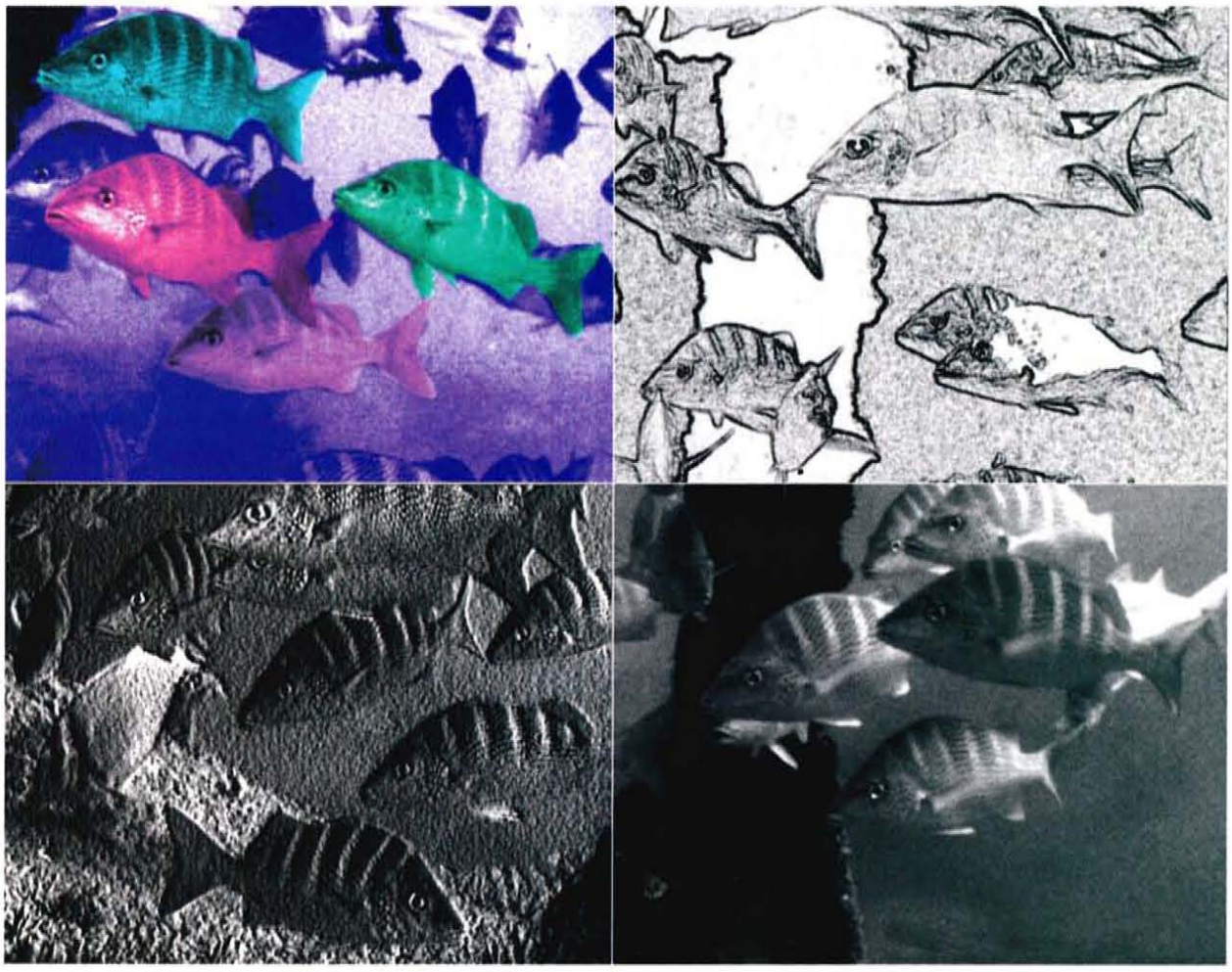

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cartoonist. And if you're going to be an illustrator, do that. But don't mix them up."

How did you respond to the criticism at that time?

I wanted to say, "Why don't you come and work at a weekly and see about the job you'd have to do?" When you do 100 graphics a year you are going to make a mistake once in a while. The critics' argument is that if the information is boring, then it's the wrong information. That simply doesn't work in the world of commercial publications. I can't, on a Thursday with one day left to produce a graphic, come up to an editor and say, "This information isn't good enough." There's such a thing as a deadline. You have to go to press. The commercial pressures are so different from the academic—they are two different worlds. But my principles are the same as their principles.

How has your thinking on this evolved?

Now I find it very difficult to lead other people to do the sort of work I was doing. If somebody does what I consider a cute little drawing around a set of statistics, I'm going to judge that more harshly than if I had done it myself. I find myself here at *Time* stopping people from doing such things and arguing that I can't see the information. I wonder, if somebody had been that tough with me, whether I would have done what I did in the first place. When I was first here, there was nobody above me—I was brought in as the new look in statistics. I look back now and shudder at some of the work I did then. I should have been edited a lot more than I was. Although I was trying to make things understandable, sometimes I wasn't successful. I'm much tougher on my staff here than anyone was on me. After a while I started to listen to what I was saying—"You're here to be an information artist, not an illustrator."

So, I'm changing my tune. Even as I talk to you, I find it odd that I'm saying this. Maybe I'm growing up and listening to myself and to others arguing, "Readers are intelligent and can pick out meaning from statistics if you give it to them. They will take the time to do it and don't need a picture." That's quite a change from what I'd been advocating before. This doesn't mean that if someone comes up with a brilliant visual metaphor, that I will not run it. If a graphic does those three things—tells people what it's about, gives them the information, and explains the information—you've got a winner. However, doing those three things is harder and happens successfully less often than I thought.

Does it seem that Tufte's criticism became your editor—the one you didn't have at *Time*?

Yes. But I wish he had called me to discuss things. Commerce is different from academics. It was very easy to criticize me, I could have done that myself. I could have picked apart the graphic [that I created and Tufte criticized] of a woman in fishnet tights and said, "This isn't a graph, this isn't a chart." Actually I don't think that graphic delivered the information too badly. He could have found a much worse example. I'm annoyed that he had to go into print about it instead of doing the courteous thing of saying, "I'm going to criticize you in print, do you have anything to say in rebuttal or defense?" Tufte would survive about ten minutes in the world of commerce. I'm trying to do good, honest, straightforward, practical work in a world that, at the moment, still expects trivia. I'm fighting that. And, I'm taking some of the lead for a new direction from Tufte.

"I defy people to recognize the difference between something I produced on a computer and something I drew by hand."

What today, then, do you think is the place for visual decoration in information design?

There is considerable value in a picture, as opposed to a daunting set of statistics. I purposely avoid the word "boring." Statistics are not boring—they are daunting. People are scared of statistical displays, they don't have the time to study them and don't think they will understand them. So, a picture may help. I don't think that's patronizing. The value of the picture, as opposed to decoration, is to help people understand. But, if the picture takes over and obscures the information, then it would be better not to have it at all even if you risk losing the reader.

This is where my thinking has changed. Before, I would have said it is paramount to get the reader interested and then deliver the information. Now I think that if you risk losing the reader because you've given him too *much* picture, then it's better not to give him the picture in the first place.

You've said that one of the biggest challenges for your design staff is to pare down the information in a graphic. Do you ever worry about paring too much out of a graphic?

Paring things down is absolutely relevant to *Time* magazine. That's not something that Tufte would agree with—he wants to pack as much information as pos-

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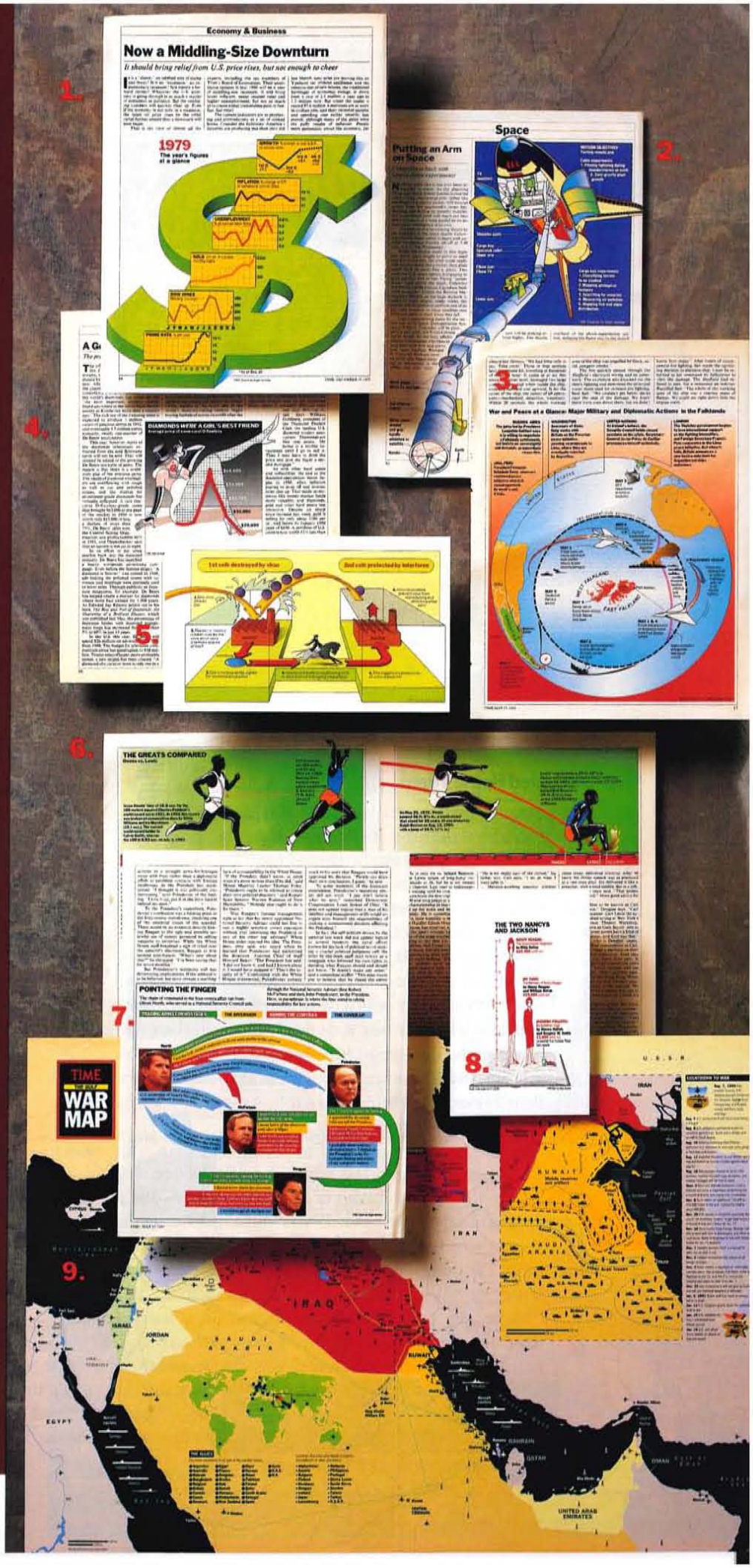
Back Through **Time** with Nigel Holmes

1. This was a breakthrough for me. It was my idea to do a roundup of the year's statistics and the editor gave me a huge space in which to do it. It was drawn by hand, at twice the printed size, and there were 11 amberlith overlays (one for each color, plus tints and type). The finished artwork weighed about 5 pounds! (Dec. 1979)
2. When I showed this to colleagues at *Time* they turned the drawing around, as though I made a mistake. People don't understand that the shuttle sometimes flies upside down, especially when they are pointing a camera back to Earth. Just in case there was any doubt that an error had been made in the chart or layout department, we printed the little subhead, "Columbia is back." (Nov. 1981)
3. This was a good balance of map, explanatory diagram, and text. The map attempted to show how far the Falklands were from England, and how small they were; the central, inner circle was a closeup picture of the action near the islands themselves; and the text at the top detailed the diplomatic maneuvers taking place around the world. (May 1982)
4. Too much has been said about this piece. (August 1982) *Editor's note: Here's what Edward Tufte wrote about it. "Consider this unsavory exhibit . . . chockablock with cliché and stereotype, coarse humor, and a content-empty third dimension. It is the product of a visual sensitivity in which a thigh-graph with a fishnet-stocking grid counts as a Creative Concept." From* Envisioning Information *(Cheshire, Conn.: Graphics Press, 1990).*
5. In this explanation of how interferon works, I really played up the visual metaphor. By making Paul Revere the chemical messenger (interferon) rushing between two cells, I hoped to give our nonscientific readers a "way in" to this difficult subject. The cells themselves were simply drawn as boxes, with little factories (nuclei) in them, and a connecting path between them, allowing Revere to ride ahead and warn that the viruses were coming.
6. For the 1984 Olympics, I wanted to show by how much Carl Lewis would have beaten the star of the 1936 games, Jesse Owens, in the 100 meters and the long jump. This graphic has simplified portraits of the two great athletes shown as though they were competing on the same day. (July 1984)
7. Although this is not a particularly elegant piece, it perfectly illustrates how an idea can come directly out of a conversation. To draw paths of type which literally point the finger of blame seems very obvious after it's been done, but there's an exquisite feeling of discovery when you first come up with an idea like this. (July 1987)
8. When we are having fun in the article, it's still OK to have fun with the graphics! We thought it was interesting to compare the print run for two recent books about Nancy Reagan (one by Kitty Kelley and one by Nancy herself), and the Pulitzer Prize-winning biography of Jackson Pollock. Although the comparison is a little unfair (pulp biographies vs. a "better book"), the figures are real, and carefully plotted. (April 1991)
9. A Persian Gulf war map with the black sea and red Iraq color scheme. (March 1991)

Graphics courtesy Time Inc.



"I was happier at *Time* when we had black, white, and one other color."

sible into a graphic. It has to do with space restrictions in a magazine like this—which has small pages, and not many of them, once a week—and the time that people will give to such a publication. *Time* has recently been criticized for being too much like "homework." I hope I'm able to resist the pressure to make things lighter or less substantive. That's a fear that I have. But, paring facts means editing them down to what matters, this week, in this magazine.

Can you identify any other publications that are producing good information graphics today?

U.S. News and World Report is very good. *Spy* magazine has done some very good graphics. They're always about things that they're making fun of, but the graphics themselves work very well. I think that the *Economist* does the best small charts that I see at the moment. They're completely undecorated and work out some very complicated information.

What about publications that are doing it wrong? What are they doing wrong?

They are overdecorating. They are assuming that the current trend for graphics means that you get an illustrator to do it. You get someone with a computer to produce some pie chart and then you just draw a line around it, or you look at the shape that the computer has given you for a line or a set of bars and you simply team it up with the nearest illustration you can think of. On the surface, that looks like what I did—but I considered the subject a lot more than other people do.

USA Today still can be faulted for what seems to be their own mandate—making things visual. They still force statistics into pictures. I presume they think that, because they've done it this way, they have to continue to—as opposed to letting the information be paramount and then from time to time producing a picture to go with it. If they only did pictures from time to time, you'd look at their best pictures and revel in their wit much more than you do now. Now you take it for granted and, unfortunately, I think it's pulled down their better graphics.

What is your approach to designing an information graphic?

It's not very organized, which is partly deliberate. I believe that ideas and ways of doing things are floating around inside your head. If you think hard enough about them, they'll come together in the end. Sometimes I'll think, "What's the space I've got to work with," or "What's the subject of this graphic," or "We've got huge pictures up front, three science diagrams and a graph in business—how on Earth am I going to make this different?" You can approach it different ways—as an art director, as an illustrator, as someone who is responding only to the information. And all of those things swim together, and out comes a way to proceed.

Could you touch briefly on the roles of some basic elements of information design—starting with typography?

Typography to me means being able to read the information clearly. I'm not interested in different typefaces. If there were only two typefaces in the world I'd be happy—Franklin Gothic and Times. We used the same two typefaces at the *Radio Times* in England that we use here. We used them in exactly the same way. There's a hierarchy—what you want people to read first—a headline, something that explains what the chart is about, or the figures in the chart.

What about color?

Color is terrifically overrated. I can say that I was happier at *Time* when we had black, white, and one other color. The thing now is to limit yourself. I don't necessarily use full color, although I have the capability of using it all the time. I often tell illustrators not to design in color, to work in black and white instead. Gone are the days when editors and publishers are saying, "I'm paying for full color for every page, I want full color on it." I urge restraint with color. In information graphics, I absolutely urge restraint—work the thing out in black and white and then add color for emphasis. It's like underlining what you want people to understand. Use color functionally, not decoratively.

What about layout?

In general, layout is very important. The layout of a printed piece helps the reader understand how they should read something. People usually read headlines first, then they look at captions, then they look at the pictures, then—based on their reaction to those elements—they may or may not commit to reading the article on the page. So you need to have a system in which there are signposts around the page that help people get into the story.

With a graphic, the same thing happens, except you're committing yourself to taking the time to understand what the graphic is about, rather than to reading the story. The layout of the graphic should be conducive to following it through. This is particularly true in whole-page graphics, where very often an artist had a scattershot approach to it—which is, "Let's put this in and this and this and this"—and the reader doesn't know where to start. When I start a graphic, I expect that the headline will probably be at the top, most likely at the top left, sometimes in the center. I hate giving rules, but I think people read a graphic the same way they read a written piece.

What about the design of informational maps?

I'm very interested in maps at the moment because that's the subject of a book that I'm writing now [*Pictorial Maps*, Watson-Guptill, due out this fall]. During the Second World War there were some amazingly

(continued on page 55)

"The only thing we have to fear is..."

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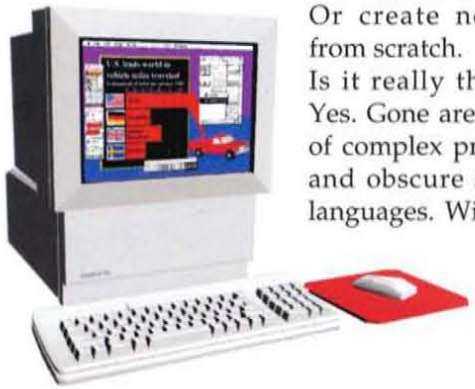

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The Art of Visual Computing

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1. This eight-page newsletter, produced in Mac PageMaker, is the publication for the three art museums at Harvard—the Fogg Art Museum, the Busch-Reisinger Museum, and the Arthur M. Sackler Museum. Begun in January 1989, the bimonthly has won several awards, including an Award of Merit from the American Association of Museums for the last two years. The editor is Evelyn Rosenthal, and the designer is Eleanor Bradshaw.

2. The Rochester City School District in Rochester, New York, prints and distributes 40,000 of these school calendars and directories every year. Mailed throughout the district at the start of the school year, the publication features the writing and artwork of students and includes pertinent information for all grades. It was designed in PC PageMaker by Lorene Mulhern, and was output to a LaserWriter.

3. When California's Cupertino Union School District wanted to publicize its innovative Guided Learning Centers—a cornerstone of the district's plan for education in the 21st century—they created this imaginative brochure to communicate the "windows of opportunity" the GLCs would provide students and teachers. Created in Mac PageMaker by Harvey Barnett, the district's technology support director, the piece is targeted at a variety of audiences, including students, faculty and staff, parents, and members of the business community.

4. Mary Parsons, of Gibson Parsons Design, created the 1989-90 annual report for the University of Virginia using both Aldus FreeHand and PageMaker. Shown are the cover and an inside spread; the document also includes tables of financial data. These were set by Jim Gibson, the other partner in the firm, who described the task as "a graduate study in typography."

5. *Project Communicate: Computer Aided Instruction for Handicapped Students* was created in Mac PageMaker by the personnel of the Mosinee (Wisconsin) School District, and was designed by Cindy Olson, the district's publications coordinator. In presenting Mosinee's experience, the booklet promotes computers as an effective way to improve instruction for handicapped students.

Gallery

Stacy West, of Florida International University's Instructional Media Services, created the Persuasion slides at top for FIU's Department of Biological Sciences, to assist graduate student Russell McFee in defending her thesis. West used Aldus FreeHand to create the waves along the bottom of the slides, and the colors were chosen to reflect the South Florida locale—the data come from a dolphin research station in Key Largo.

The bottom slides are part of an on-screen Persuasion presentation (which we imaged to slides for this photograph) created by George Bruehl, Tanya Flug, and Tara Kindes, graduate students at the University of Wisconsin-River Falls. The three collaborated on the presentation with a group of students and a teacher from Stonebridge (Minnesota) Elementary School, as part of their Technology Applications in Education course, under the direction of Dr. Carol Bagley. Stonebridge, which recently won the School of Excellence award from the federal government, will show the presentation to the many educators who will visit the school from around the world.

How to

SHRINK TO FIT

Basic tips on making the pieces of your newsletter fit.

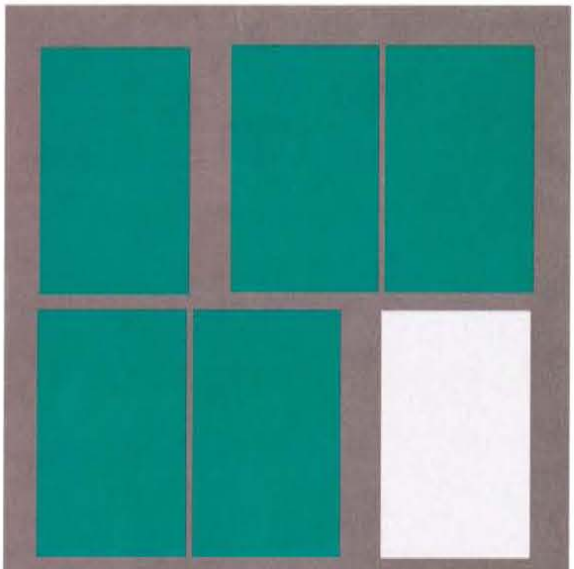
The biggest challenge in designing and assembling a newsletter is to create an attractive page while making your articles and graphics fit the space. Text and pictures fluctuate in size from issue to issue, making accurate planning difficult. The ideal way to avoid problems is to write articles to fit the space. And it's a rare article that, once written, can't be edited or rewritten to lengthen or shorten it (see the copyfitting sidebar on page 29).

Chances are, though, that you'll sometimes be forced to improvise ways of squeezing or stretching what you've got to make it fit the available space. Here are a few tips.

Building in extra space

When you're first designing and planning your newsletter, remember that it will be easier to work with if you have too much space instead of too little. If you can find it in your printing budget, plan on more pages than you think you'll need. Or consider planning at least one article in each issue that can be held over until the next one if necessary.

It's best not to use every square inch of your pages anyway—having plenty of white space makes your publication more inviting and easier to read. And if your design incorporates a flexible amount of white space, making things fit is far easier.



When planning a newsletter, build in extra space from the beginning. One user's rule of thumb: estimate length, then add one blank page to every five full ones.

Ragged columns

Ragged column ends are an extremely simple and effective way to take up space. You may even want to make them a regular part of your design.

If you find you have space left over at the end of a story, experiment with distributing it among the column ends. Pitfalls are too much symmetry (far left), too regular a progression (center left), and having only one column of odd length (center right). Try for a truly ragged look (far right).

Experiment with ragged columns by taking all the leftover space at the end of the story and dividing it evenly among the column ends. Then rearrange the spaces so that they're uneven and look intentional (which they now are). Make sure the look is genuinely ragged—don't have two columns bottom-aligned and only one of odd length.

Pull quotes

Besides being useful for taking up extra space, pull quotes can serve a valuable editorial purpose, drawing a browser into reading an article. Figure out how much space you need to fill, and pick an appropriate point size and leading. The type needs to be large enough to contrast with the surrounding text, but not so large that it overwhelms the page or looks like a headline. Then look for a pithy passage with some special impact or interest. (Slight rewording is usually considered acceptable, except when you're using a direct quote from a person, as in an interview.)

BESIDES BEING USEFUL FOR TAKING UP EXTRA SPACE, PULL QUOTES CAN SERVE A VALUABLE PURPOSE, DRAWING A BROWSER INTO READING THE ARTICLE.

Space beneath a pull quote can vary, making it a flexible way to take up space. Avoid using a pull quote to take up just a few lines, since it will be hard to spot and will look like an afterthought.

Varying the width of your pull quotes lets you take up the space you need, and provides graphic variation too.

The Art and Science of Copyfitting

Although most of the techniques presented in this article are graphic strategies for making newsletter articles fit, don't neglect simple, old-fashioned copyfitting—deleting or adding words to fit the space available. No matter how perfect a story may seem in terms of subject and word choice, sometimes the way it falls on the page demands that you make some alterations to its content. (And—strangely—changes forced by fit problems tend to improve the copy more often than not, probably because of the intensive attention it forces you to pay to the words.)

Many times, all you need to do is to cut a line. Or perhaps you have a widow (an unacceptably short line at the end of a paragraph) or an orphan (such a line that wraps to the top of a column) that needs to be lengthened or lopped off. Or, worse, maybe you have no choice but to cut out a third of what you thought was a tightly written article. In any case, don't despair. Editors face this dilemma all the time. Here are a few tips.

1. With the basic principles of sound writing in mind (a good reference book can help), look for redundancies, unclear phrases, unnecessary words, long ways of saying short things. If you're stuck, have a coworker or friend—someone who's never seen the story—read it and suggest cuts.
2. Ask your writers to use the "pyramid lead" technique that's traditional in the newspaper business: the article opens with the most important content, then fans out steadily to less and less important background matter. Besides giving the reader an instant clue to the story's thrust, this makes it easy to trim from the end.
3. If you don't want to change much except some line lengths, try to think of alternate phrases. Maybe "besides" will work for "in addition to," or "in fact" for "as a matter of fact." The possibilities are endless. Be careful, though; always read your new word or phrase in context, to be sure you're not sacrificing clarity or repeating words just used.
4. If major cuts are needed, try to isolate the major reason you're running the article, and then assess which parts are most critical to that purpose. Experiment with taking chunks out and reading the result (but save a copy of your original!).—*Nicholas H. Allison*

Crop a picture more tightly if you want more space for an article.

In a large area of text, a pull quote can span several columns. Avoid this, though, if vertical space is short, since the quote will chop the text into small segments.

Manipulating space with pictures

Pictures are ideal for adjusting space because they can be resized and cropped. Of course, the content of many pictures will limit you to either a horizontal or vertical crop, but you can still experiment with overall size and with where the crop is. When altering cropping, remember to pay attention to alignment, especially horizontal—a good rule of thumb is to align the bottom of a picture with the baseline of adjacent text.

Editing heads, kickers, and subheads

Don't overlook the obvious—adding or removing a line in an existing headline can make a crucial difference, if you can do it without violating the content. And you can add, delete, or alter the kicker (sometimes called a subhead), the smaller display type under a headline. Likewise, consider adding or deleting subheads, the small heads that break up sections of text.

Altering type specs

Generally, avoid altering basic type specs in an effort to change length. Variations in point size and leading tend to make a newsletter look clumsy and hard to read. (See the "Dirty Tricks" sidebar on page 31 for some less noticeable adjustments.)

However, as a last resort, you might try adding a point of leading to stretch a story—going up in point size looks odd and adds emphasis where none is intended. (Of course, if you do want to add emphasis to a short piece, like a note from the editor or a special notice, a larger point size may be appropriate.) However, if a story's too long, don't reduce the leading without a proportionate decrease in point size.

This article is adapted from PageMaker Portfolio: Designs for Newsletters, *by Carol Ramsay and Linda Urban. For information on the book's availability, call Aldus Customer Relations at (206) 628-2320.*

Adding internal subheads can help eliminate unwanted space.

From Baku to Samarkand

By Frank Vincent

On April 25, 1892, I left Baku for Asunada, upon the opposite shore of the Caspian, the westerly terminus of the great Central Asian or Transcaspian railway which leads to Bokhara and Samarkand. My steamer was one of the best of a large fleet belonging to the Caucasus and Mercury Company, and I was greatly surprised to encounter so fine a vessel in so distant and secluded a sea.

It was of iron, eleven hundred tons in burden, with paddle-wheels, and drew eight feet of water. The cabins, as well as the dining-saloon, were all upon the upper deck, the second-class forward, and the third in the extreme stern. The engines were of Belgian manufacture, and refuse petroleum was burned under the boilers, the steam-draft making a roar which quite drowned that of the paddle-wheels. This liquid fuel is the residual naphtha, the refuse left over from petroleum after distillation. Its economy is six times that of coal, and it possesses twice the efficiency in generating steam.

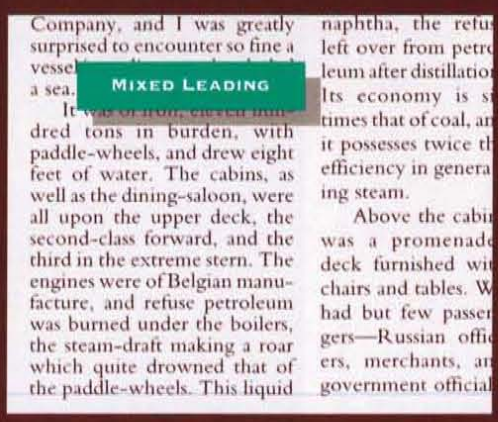
Above the cabins was a promenade-deck furnished with chairs and tables. We had but few passengers—Russian officers, merchants, and government officials. The were also perhaps a dozen Persians and Tartars, bivouacked upon the deck. The former were easily recognized by their black sheepskin hats, and their beards and finger-nails dyed a brilliant red. Our cargo consisted of cloths and provisions.

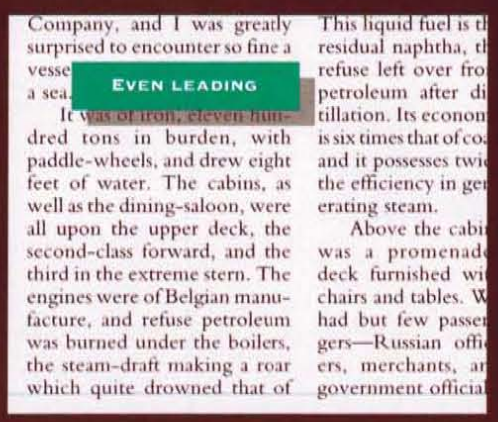
Setting out

A nefarious turn of events

Baku has a commodious harbor, though it is rather shallow. For such a great body of water as the Caspian—eight hundred miles long, and in the middle five hundred fathoms deep—it is rather surprising how shallow are its shores. The distance of two hundred and twenty miles from Baku to Asunada was covered in nineteen hours. The surface of the sea for a long way is spread with petroleum oil, which shines with iridescent hue; then the color

Changing type specs to compensate for too little or too much space is dangerous, as it can draw the reader's attention from the content of the story to the problems you had with layout.





Dirty Tricks in PageMaker

Near the end of the layout process, when push comes to shove, there are a few stunts you can pull in PageMaker to gain or lose a line or two. Many of them are kind of cheating—changing type specs in the middle of a story—but if you're careful, and use them subtly, no one will be the wiser. Always check your results on a printout as well as on the screen. And don't say you read it here.

1. *Tracking.* Select a line, a paragraph, or a whole story, and go to "Track" under the Type menu. The default setting is "No track"; try "Normal," "Loose," or "Tight" and see what happens. (This one isn't really even a cheat—in justified type, every line is spaced differently anyway.) For more precise control of the same thing, you can use the "Spacing attributes" dialog box—press Command + M, then click "Spacing...."
2. *Set width.* This gets a little dicey, but if you select some text and choose "Set width" under the Type menu, you can actually change the width of the characters. Any of the preset choices on the menu are too extreme for normal use, but pick "Other..." and enter 98% or 99%. Sometimes that's enough (try as low as 95%, in a pinch), and it's undetectable to most readers.
3. *Widening text blocks.* Make sure no one's watching. Then try pulling the sides of the text block out a point or so past the margin. Sometimes it will cause enough rewrapping to lose a line, without any text actually crossing the margin.
4. *Irregular column widths.* Most designs keep columns the same widths. But two columns of unequal width can work, especially if they don't face a symmetrical page. And, if you have a column of text on a page by itself, you can often get away with making it any width needed to make it end at the right spot.
5. *Widening the hyphenation zone.* In ragged-right copy, you can increase the raggedness—which stretches the vertical length—by widening the zone in which PageMaker hyphenates. Select the text in question, choose "Hyphenation..." under the Type menu, and type in a higher value.

If you overdo any of these techniques, they can ruin readability and make a newsletter look sloppy and inconsistent. But used judiciously, especially in combination, they can solve many a minor fit problem, almost invisibly.—*J. Scott Campbell*

Primarily, and in itself, photography is not an art, but a science. There are no circumstances in which a painter can paint well without using artistic judgement, but there are many circumstances under which a photographer may photograph well without using any.

1. Normal and loose tracking

Primarily, and in itself, photography is not an art, but a science. There are no circumstances in which a painter can paint well without using artistic judgement, but there are many circumstances under which a photographer may photograph well without using any.

In 1830, when a French army landed at Sidi-Ferruch, and raised its flag over the Kasba of Algiers, it rendered a signal service to civilization. Till then the Moorish pirates who infested the Mediterranean sea, and whose headquarters was Algiers, had remained unpunished.

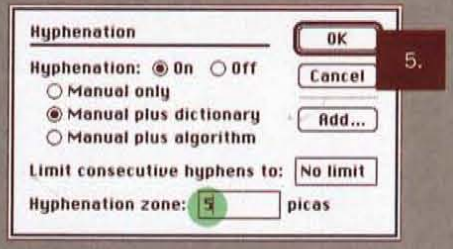
2. Normal and 97% set-width.

In 1830, when a French army landed at Sidi-Ferruch, and raised its flag over the Kasba of Algiers, it rendered a signal service to civilization. Till then the Moorish pirates who infested the Mediterranean sea, and whose headquarters was Algiers, had remained unpunished.

3.

4.

5.



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What Can I Do With This Thing?

If you've got PageMaker 4.0, you've got the Table Editor. But what's it for?

By Harry C. Edwards and Steve Aanenson

As an application, the Table Editor is something of an anomaly. It has some of the look and feel of PageMaker—several of the menus, dialog boxes, and keyboard shortcuts are the same—but it's not a layout package. It resembles a spreadsheet—it has rows and columns, and you can even do simple addition with it—but it's not Microsoft Excel. So what is it?

The Table Editor is designed to make it easy to lay out highly structured documents that have rigid underlying grids. This means not only tables but lots of other things as well. Like what?

Instead of trying to explain, we decided to show you a few "tables" that were created while the Table Editor was being tested here at Aldus, and some of the basic and not-so-basic techniques that were used to create them. Software testers created just about everything they could think of—some extremely clever and some you'd never want to try. However, looking over their shoulders at the kinds of tables they made, and at the techniques they used, might give you a few ideas on speeding up your next job that has lots of rows and columns.

A Basic Table

Creating a table like this in PageMaker would take time, lots of tabs, and probably a little frustration. The Table Editor, however, makes it simple.

Railroad Traffic of the World

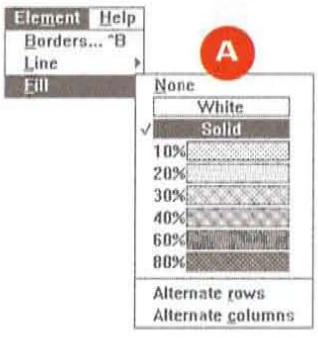
Countries	Miles of Railroads	Cost of Roads*	Passengers Carried*	Freight Tonnage*	Receipts*	Expenditures*
Europe	176,174	18335	2,460	1,043	$1,640	$945
America	249,906	14570	610	820	$1,305	$910
Africa	12,501	515	24	7	$46	$23
Asia	37,469	1375	226	38	$110	$55
Australia	14,922	725	60	12	$53	$31
Total	490,972	35520	3,380	1,920	$3,154	$1,964

* Millions

This table of statistics of the railroads of the world is by Mulhall, and represents the business of the year 1897.

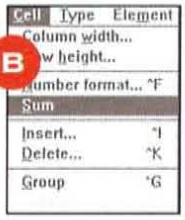
Automatic boxes

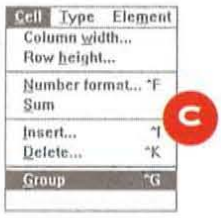
Shading a row of text is a lot faster than if you had to do it in PageMaker, and it's more precise. Just select the group of cells you want shaded, and pick a shade from the "Fill" submenu under Element menu (PC, letter A), or from the "Shades" menu (Mac).



Sums

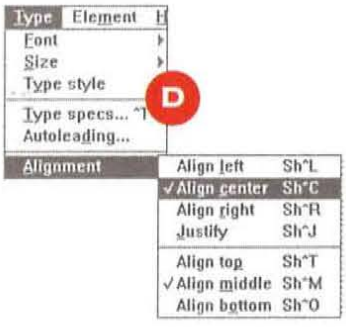
To add up the values in a row or column of numbers, select the column or row and choose "Sum" from the Cell menu (B). Then click the sum icon in the cell where you want the sum displayed.





Basic grouping and text aligning

To create and align a heading like this over seven columns, select the top row and choose "Group" from the Cell menu (C). Then with the text tool, click in the top cell and type the heading. To align the text, choose "Alignment" under the Type menu and select center and middle alignment (D).



Elements of the Elements

How would you create the table below on your computer? No matter how you do it, creating a complete periodic table of the elements is a lot of work. Don't use PageMaker or Aldus FreeHand—too many tabs, text blocks, and ruler guides. Use the Table Editor instead.

One cell = four = three

The key to creating a table this complicated is to start small. Don't try creating all 103 cells at once—instead, figure out how to do one cell, then duplicate that formatting for the rest. What looks like one cell in this table is actually four cells. The text in the top left cell is aligned top left, while that in the top right cell is aligned top right. The bottom portion is two cells that have been grouped together. Text in this cell is aligned center, with a line break (Shift + Return) inserted between the number and name.

SIDE 1

PERIODIC TABLE OF THE ELEMENTS

IA	IIA	IIIA	IVA	VA	VIA	VIIA	VIIIA	IB	IIB	IIIB	IVB	VB	VIB	VIIB	GROUP VIII
H 1															He 2
Li 3	Be 4									B 5	C 6	N 7	O 8	F 9	Ne 10
Na 11	Mg 12									Al 13	Si 14	P 15	S 16	Cl 17	Ar 18
K 19	Ca 20	Sc 21	Ti 22	V 23	Cr 24	Mn 25	Fe 26	Co 27	Ni 28	Cu 29	Zn 30	Ga 31	Ge 32	As 33	Se 34	Br 35	Kr 36
Rb 37	Sr 38	Y 39	Zr 40	Nb 41	Mo 42	Tc 43	Ru 44	Rh 45	Pd 46	Ag 47	Cd 48	In 49	Sn 50	Sb 51	Te 52	I 53	Xe 54
Cs 55	Ba 56	La 57	Hf 72	Ta 73	W 74	Re 75	Os 76	Ir 77	Pt 78	Au 79	Hg 80	Tl 81	Pb 82	Bi 83	Po 84	At 85	Rn 86
Fr 87	Ra 88	Ac 89	Unq 104	Unp 105	Unh 106												

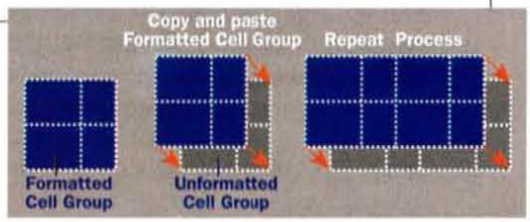
Ce 58	Pr 59	Nd 60	Pm 61	Sm 62	Eu 63	Gd 64	Tb 65	Dy 66	Ho 67	Er 68	Tm 69	Yb 70	Lu 71
Th 90	Pa 91	U 92	Np 93	Pu 94	Am 95	Cm 96	Bk 97	Cf 98	Es 99	Fm 100	Md 101	No 102	Lr 103

Lines and borders

Putting a border around each cell is easy, if you understand how the "Borders" dialog box works. Whenever you assign borders, remember that you need to do two things: first, in the dialog box, check those borders you want to change; then, select the line style you want applied to the borders you just checked.

To create the borders in this table, you must delete the default border that's applied to every cell. Select the entire table and choose "Borders..." from the Element menu (PC) or the Cell menu (Mac). Check all the line options, then choose a line style of "None." On the PC, select "None" from the "Lines" pop-up menu; on the Macintosh, click "OK" in the "Borders" dialog box, then choose "None" from the Lines menu.

Next select the three cells, choose the "Borders..." command again, check "Top," "Bottom," "Left," and "Right," then choose a line option.



Shortcuts to formatting

This is a lot of formatting to do for all 103 elements, but you don't have to do it for every individual cell. Instead you can "pyramid paste." Format one cell group exactly the way you want, then select it, copy it, select an adjoining group, and paste. Then select those two groups, copy, select two more, and paste. Next time do four, then eight, and so on. The formatted text in each pasted cell will then act as a placeholder which you can delete as you're entering the information you want.

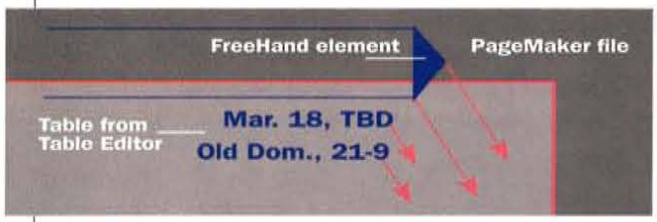
Note: You'll still have to manually group the two bottom cells. Wait until you enter text for these two cells, and use the keyboard shortcut Command/Control + G to group them.

Combining with Other Elements in PageMaker

As useful as the Table Editor is, it does have a few limitations—it doesn't support color or text rotation, nor does it have a palette of basic drawing tools. However, any table you create you must place in PageMaker anyway to print. So why not overlay color, graphics, and text elements in PageMaker (or Aldus FreeHand, or any other application that can import a PICT graphic on the Macintosh or a Windows Metafile on the PC)?

This table was exported from the Mac Table Editor as a PICT graphic and placed in PageMaker. The triangles in between brackets were drawn in Aldus FreeHand, brought into PageMaker as EPS files, and positioned on the table. The text that starts each regional bracket was rotated, reversed, and positioned in PageMaker. Finally the entire table was printed from PageMaker.

You can take this same approach in Aldus FreeHand, CorelDraw, or any other application that can import a Table Editor file.



Some assembly required

You can add variety to a Table Editor table by combining it with drawn elements from an application like Aldus FreeHand, or by adding graphics and manipulated type in PageMaker.

Double-click on the table

If you're working on the PC...

To edit a table after you've placed it in PageMaker, hold down Control and double-click on the table. PageMaker automatically launches the Table Editor and opens the table you clicked on. Make your changes, then return to PageMaker. If the "Link options" command is set to "Update automatically," the table you just finished editing will be the one you see when you switch back to PageMaker.

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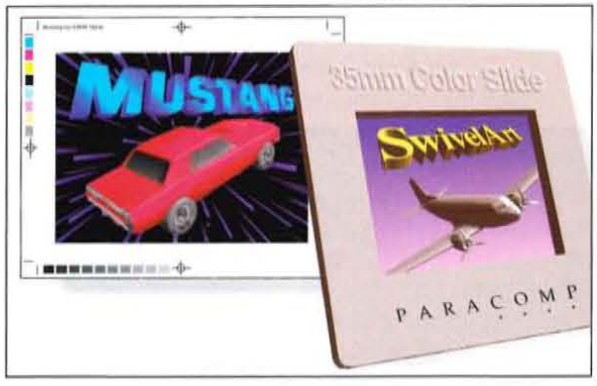

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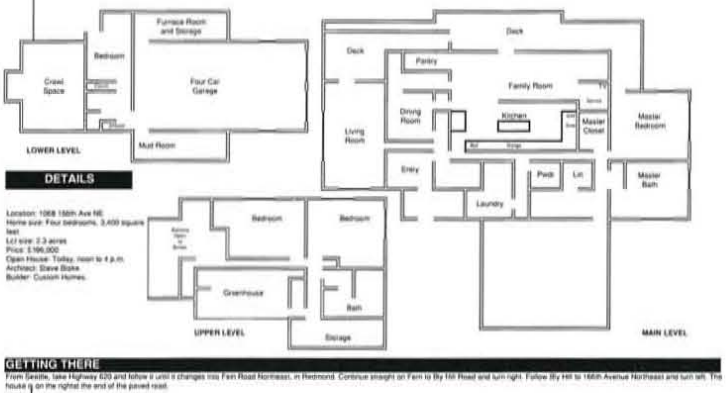
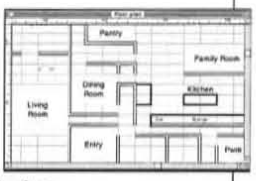
PARACOMP

The Art of Visual Computing

LINES, FILLS, AND UNDERLINES

OK, OK, Aldus FreeHand is better for drawing stuff like this, but these were so unexpected we just had to show you.



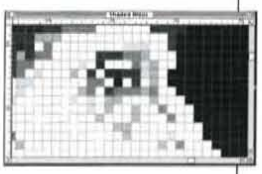


The Table Editor and home design

Believe it or not, this floor plan was done in the Table Editor. Fortunately, this house has nothing but right angles. Once a scale and grid were computed, creating the floor plan was pretty easy. The size and number of cells corresponds to the grid the house is designed on.

The Table Editor and music

The white line is actually the underline character, reversed out, and aligned at the bottom center of the grouped black keys.



The Table Editor and portraiture

The ultimate bitmap? This was created on 71 rows and 56 columns using all the shades on the Fill menu.

Hey, it's just like PageMaker!

Commands for getting around and keyboard shortcuts are, in most cases, just the same as in PageMaker. For example, to switch between Actual Size and Fit in Window (and vice versa), hold down Command and click (Mac) or click the right mouse button (PC). Here are a few other common shortcuts:

	MACINTOSH	PC
FIT IN WINDOW	Command + W	Ctrl + W
50% VIEW	Command + 5	Ctrl + 5
75% VIEW	Command + 7	Ctrl + 7
200% VIEW	Command + 2	Ctrl + 2
GRABBER HAND	Option + click	Alt + click
TYPE SPECS...	Command + T	Ctrl + T
LINE BREAK	Shift + Return	Shift + Return

Table Editor notes

- The Table Editor is included with PageMaker 4.0 for both the Macintosh and PC.
- If you haven't installed the Table Editor, you can do so by running the Aldus Installer utility. Once installed, the Table Editor is located in the PageMaker 4.0 folder (Mac) or PM4 directory (PC).
- To print a table, you must place and print it in PageMaker.
- To place a table on the Macintosh, you must first export it as a PICT file. You can also export tables as tab-delimited text-only files, but you will lose formatting.
- To place a table on the PC, you can save it as a .TBL file, or export it as a Windows Metafile or a tab-delimited text-only file.

Steve Aanenson, who created most of the tables in this article, was one of several software testers who worked on the Table Editor. He is currently a member of the Aldus Technical Support Team.

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ALDUS PAGEMAKER Q & A

Keeping calendars current, numbering book pages, and managing styles.

Here are the answers to some questions recently asked about Aldus PageMaker. If you have a question, or would like to share a tip, please write us: Editor, *Aldus Magazine*, Aldus Corporation, 411 First Avenue South, Seattle, WA 98104-2871. Please include your name and phone number in case we need more information. If we print your tip, we'll send you an *Aldus Magazine* sweatshirt.

PC/MAC (4.0 ONLY)

The calendar template that comes with PageMaker 4.0 is great, but it has dates for only one year. Is there an easy way to update it for, say, 1992?

You can make a calendar for any month of any year by reusing the date files that come with PageMaker. Find out what day of the week that month begins on, and then use the appropriate date file (see the table at bottom right). Here are the steps:

Open the Calendar template. Click the text tool in the text block containing the dates, and choose "Select all" from the File menu (A). Choose "Place...," select the appropriate date file from the "caldates" directory (PC) or the "Calendar Dates" folder (Mac), check "Replacing entire story," and uncheck "Retain format" (B)—you can ignore the other two check boxes. Click "OK," and then "OK" again in the "Smart ASCII filter" dialog box. Finally, add or delete days as needed at the month's end to make it the right length, and type a new month name at the top of the page (C).

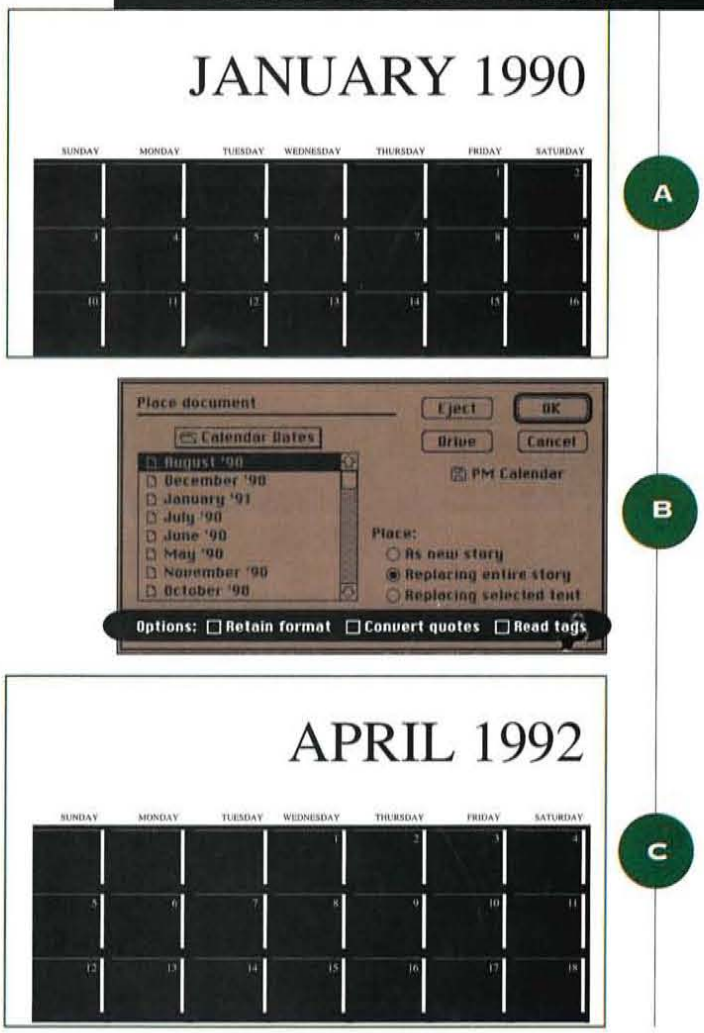
PC/MAC

Is there a limit to the number of styles I can create?

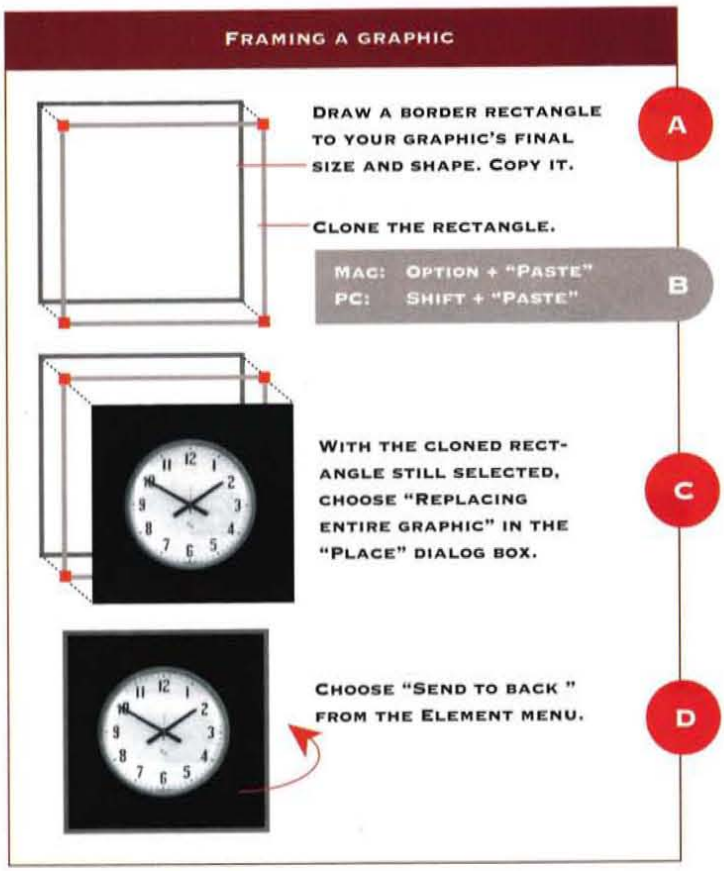
Practically speaking, no. (Technically the limit is over 30,000.) You'll be limited only by the amount of memory and system resources on your computer. However, the more colors, styles, and fonts you have in a publication, the longer it takes to load and run it. Styles are meant to make text management easier; if you create too many, they become counterproductive to use and keep track of. Additionally, if you're a PC user and you have more styles than will fit on your monitor's screen, you can't scroll through the list in the Style submenu (due to inherent limitations in Windows' hierarchical menus).

If you have a large number of styles that you use frequently, you can set them up in a publication and

UPDATING PAGEMAKER'S CALENDAR



IF THE MONTH BEGINS ON A . . .	USE THE FILE LABELED . . .	
	MAC	PC
SUNDAY	JULY 1990	DEC'91.TXT
MONDAY	OCTOBER 1990	APR'91.TXT
TUESDAY	MAY 1990	JAN'91.TXT
WEDNESDAY	AUGUST 1990	JAN'92.TXT
THURSDAY	NOVEMBER 1990	AUG'91.TXT
FRIDAY	JUNE 1990	FEB'91.TXT
SATURDAY	DECEMBER 1990	DEC'90.TXT



save it as a template, from which you open untitled copies for each new publication. Or use the "Copy..." button in the "Define styles" dialog box to copy an entire style sheet from one publication to another. Finally, if you want the same style sheet for all your publications, either create or copy your styles at the default level in PageMaker, so that they'll automatically be a part of every new document.

PC/Mac

When I draw a box around a rectangular graphic, I have trouble getting it aligned perfectly on all sides. Is there a way to automate this?

Yes, there is, although you need to know the graphic's final size beforehand.

Before you place your graphic into PageMaker, draw the border rectangle rectangle to your graphic's final size and shape, with the desired line weight and a fill of "None." Choose "Copy..." from the Edit menu. Then hold down the Option key (Mac) or Shift key(PC) and choose "Paste." This "clones" the box, superimposing a copy exactly on the original. Leave the newly pasted box selected. Next, choose "Place..." from the File menu, select the graphic you want to place, choose "Replacing entire graphic," and click "OK." PageMaker scales the graphic to fit

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the dimensions of the rectangle. Finally, choose "Send to back" from the Element menu.

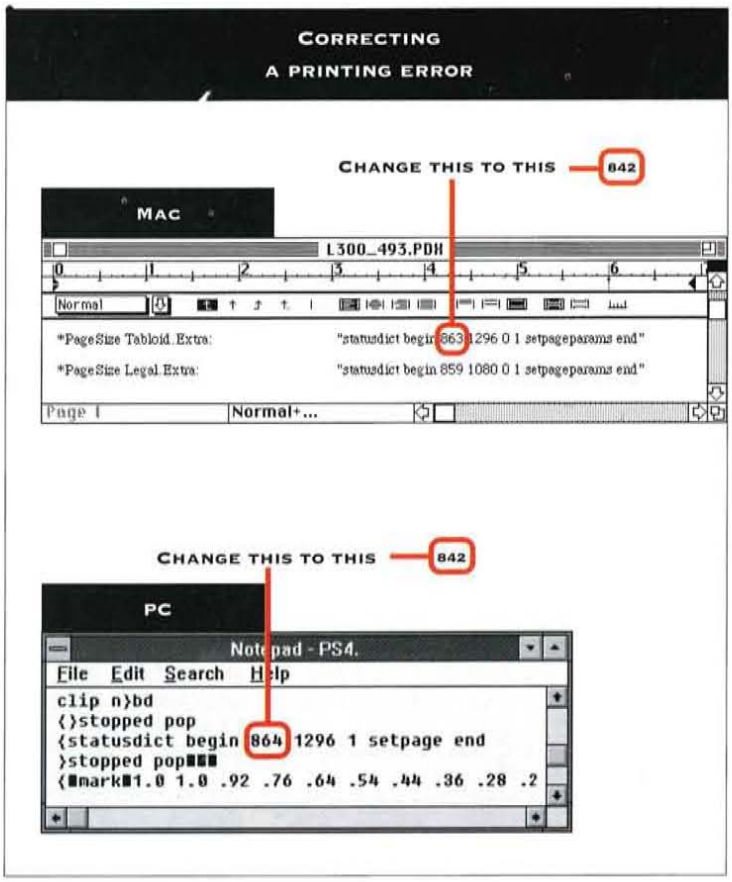
PC PageMaker/Mac PrePrint

Whenever I try to print to my Linotronic using TabloidExtra or LetterExtra, I get this PostScript error: "[%%Error: Rangecheck; Offending Command: setpageparams%%]." What's going on?

This error can occur with either of these "extra" page sizes on the PC, or with TabloidExtra when you're printing from PrePrint on the Macintosh (Mac PageMaker itself has no trouble printing TabloidExtra directly to a Lino). It may also appear as the error code "E2" on your RIP. It indicates that the imagesetter was sent an imageable area that's larger than it is set up to handle.

If your Linotronic has a control panel, and you have access to it, enter 12.2 inches as the media width (even though the film is only 12 inches wide). This "fools" the imagesetter into letting you have enough imageable area. If you need to solve it at your computer, the solution is different for the two platforms.

Macintosh: Find the PDX file for your imagesetter (in the folder called "PPDs," in the folder called "Aldus," in the System folder). Make a backup copy of it in another folder on your hard disk. Then use a



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word processor to open the original. Locate the lines that begin with "*PageSize," "*ImageableArea," and "*PaperDimension" for the "Tabloid.Extra" paper size. In each of these lines, look for the number 864, 863, or 859, which represents the width of the paper. Change it in each place you find it to 842. (842 is 11.7 inches, which your imagesetter should be able to handle, and it still leaves enough room for crop marks.) Save your changes.

Now, relaunch PrePrint. In the "Print options" dialog box, choose another PDX, then choose the one you just modified (this forces the program to reread the edited file). Now you'll be able to print.

PC: On the PC side, you must print your publication to disk as PostScript, and then edit the PostScript directly. Using a word processor, open the PostScript file and search for the command that contains the word "setpage." For example, a PostScript file for a portrait TabloidExtra page contains the line:

```
{statusdict begin 864 1296 1 setpage end
```

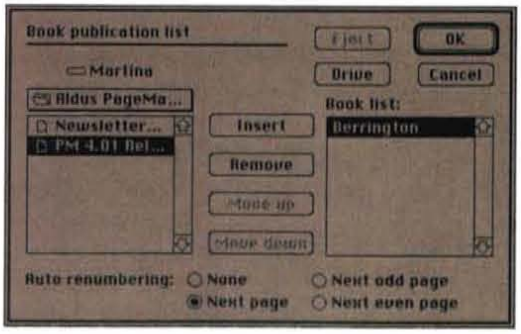
Change the number 864 to 842. Then save your changes and send the file to your printer.

PC (4.0 ONLY)/MAC (4.01 ONLY)

Why can't I get my pages to number properly over publications in a book list?

Several factors affect the renumbering sequence of publications linked as a book. In each publication's "Page setup" dialog box, "Restart page numbering" should be unchecked. Otherwise, the page numbers for each publication in the book list will start over from page 1. Also, in the "Book publication list" dialog box, you must select some form of "Auto renumbering" (that is, anything other than "None").

Finally, PageMaker renumbers a book only when you print, create an index, or create a table of contents. If you've had to correct either of the options described above, you won't see consecutive page numbers until you perform one of these three tasks again.



PC/MAC (4.0 ONLY)

When I convert publications from PageMaker 3.x to 4.0, sometimes the text takes up a different number of lines or pages than it did before. Why?

AUTOLEADING DEFAULT VALUE OF 120%

PAGEMAKER 4.0 11-POINT TYPE 13.2-POINT LEADING	PAGEMAKER 3.x 11-POINT TYPE 13-POINT LEADING
Things are really going to hell with Zardath out of the picture. He may have been over-bearing but they did listen to him.	Things are really going to hell with Zardath out of the picture. He may have been over-bearing but they did listen to him.

There are two reasons this can happen. One is simply that version 4.0 handles hyphenation and kerning slightly differently from its predecessor. If the number of lines has changed, compare versions to see where the changes are, and then manually adjust breaks and tracking as needed.

The other reason is PageMaker 4.0's greater precision in leading—tenth-of-a-point increments instead of half a point—which can make a difference in autoleading. For example, if you've specified autoleading at its default value of 120%, for 11-point type, version 4.0 sets the leading at 13.2 points, while version 3.x rounds it off to 13 points. Over a number of lines, that can make quite a difference in length. If you need to, you can always check your autoleading value in 3.x (in the "Spacing attributes" dialog box), multiply the point size by that amount, and round to the nearest half-point; then enter that as your leading value in 4.0.

PC

Whenever I import files from WordPerfect, I receive this message: "Error accessing USENGLSH dictionary." Being in Canada, I don't even have a USENGLSH dictionary. What is PageMaker looking for?

Some Canadian users receive this message when importing WordPerfect files into PageMaker. We're working on a solution. Meanwhile, though, it's easy to get around. Just click "OK" and PageMaker will import the text, with no dictionary assigned to it.

You can then assign the dictionary you want—in your case, probably the British English one—in the "Paragraph specifications" dialog box. Choose "Paragraph" from the Type menu (Control + M) to assign it to an individual paragraph, or make it part of a style by clicking the "Para..." button in the "Edit style" dialog box.

TIP

SUPERIOR SCREENS

PC/Mac

Here's how to get different black values than those offered in PageMaker's Fill menu (10%, 20%, 30%, 40%, 60% and 80%), or different screen rulings than PageMaker's defaults for the printer you're using.

If all you need is a different black value, choose "Define colors..." under the Element menu, click "New...," and create a CMYK color with the desired percentage of black and zero for the other tints. (Remember that if you're printing separations or spot color overlays, this new "color" will not print as part of the black plate.)

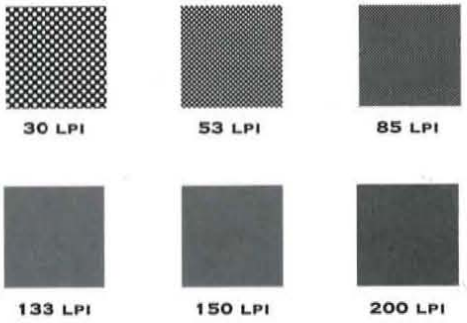
The tint you've created will still image at whatever screen ruling PageMaker determines is optimal for your printer. But here's a way to control screen ruling for each graphic individually. In a grayscale editing application like Aldus Digital Darkroom, create the smallest image you can (to keep down file size) and paint it the desired tint of gray. Then save it as a 4-bit TIFF. In PageMaker, place it and resize it as needed. Choose "Image control..." from the Element menu. Then you can exert complete control over its screen ruling and screen frequency.

Beware, though, of trying to force higher resolution from low-resolution printers; on a 300-dpi laser printer, the number of available gray levels drops as soon as you top about 60 lpi, and fine screens may also print blotchily. However, this trick can be useful if you're printing to a Linotronic, for instance, but want a coarse screen on one graphic for a special effect.

Paul Bergen Abbott, Indianapolis, Ind.; Bill Bricker, Charlottesville, Va.; Tom Fitch, Portland, Ore.; Steve Zmak, San Diego, Calif.

CONTROLLING THE SCREEN RULING OF TINTS WITH "IMAGE CONTROL" IN PAGEMAKER.

4-BIT TIFF IMAGE CREATED AND "PAINTED" 70% BLACK IN A GRAYSCALE APPLICATION.



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PC

Why is it that every time I call Tech Support, they ask me to recompose my publication?

Since PageMaker always assumes that the publication you are working on will be printed eventually, it's very important to make sure the printer you plan on using for your final output is selected under "Target printer..." (in version 4.0) or "Printer setup..." (3.x). When you click "OK" at the prompt to recompose your publication, you are making sure that the publication you're working on is set up correctly for that printer driver. This step alone can correct several printing problems involving fonts or graphics.

MAC

When I print pages containing many scanned graphics, the job takes a very long time to print. What can I do to speed up printing?

Grayscale scans can be very large, often a megabyte or more, and color scans can be even larger. When PageMaker prints the graphic, all this data must be sent to the printer and processed, which simply takes a long time. If you're using a PostScript printer, however, it is possible to speed up proof printing of scans saved in the TIFF format (which is the preferred format for scans). In the "Print" dialog box, click "PostScript" and select "TIFF for position only." PageMaker will send a screen-resolution (72-dpi) version of the TIFF to the printer, making the print job much faster. For your final printed version, uncheck this option and print with maximum resolution.

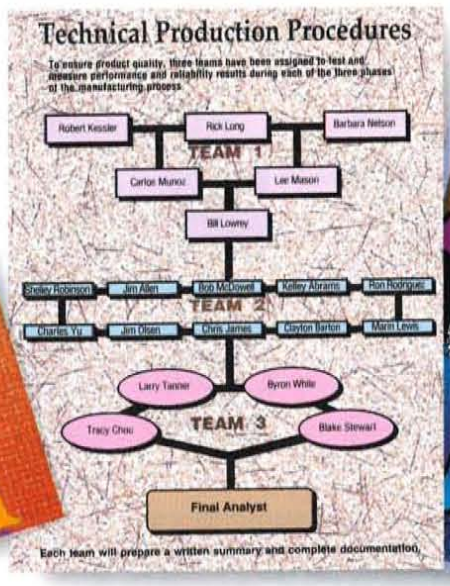
MAC

I need to print out my document mirror-fashion to a color PostScript printer so I can use it for a T-shirt transfer. However, in the "Print options" dialog box, "Mirror" is grayed out. How do I print mirrored?

The "Mirror" check box can be chosen only when you're printing spot color overlays. However, that means you'll get an overlay for each color you've used on the page. To get all the elements of your page on the same layer, you can create an EPS graphic of it (see procedure on facing page).

Another method—simpler to do but slower to print, especially if you have TIFF images or lots of fonts—is to use the Apple driver. Hold down the Option key while choosing "Print..." from the File menu. Click "OK," press the "Options..." button, and check "Flip horizontal." Then print.

It's a graphics program. It's a business program. Is not.



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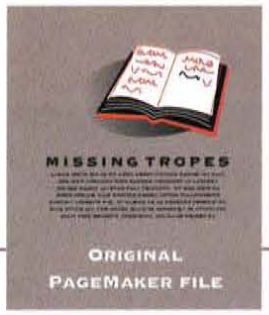
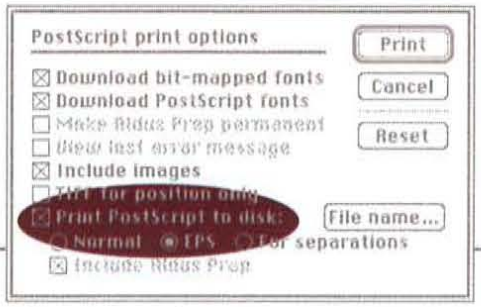
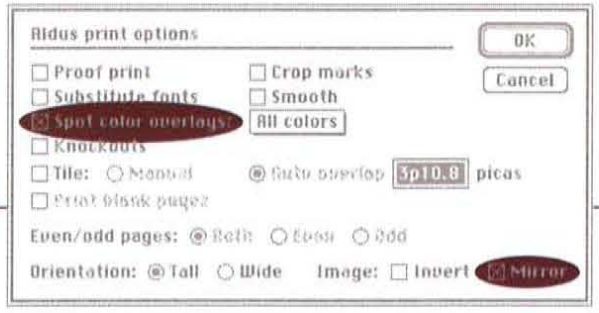




1. CHOOSE "PRINT..." AND TYPE IN YOUR PAGE NUMBER IN BOTH THE "PAGE RANGE" TEXT BOXES. CLICK "POSTSCRIPT..." AND CHECK "PRINT POSTSCRIPT TO DISK" AND "EPS." CLICK "FILE NAME..." AND NAME YOUR EPS FILE. CLICK "OK" AND THEN "PRINT" TO SAVE THE FILE.

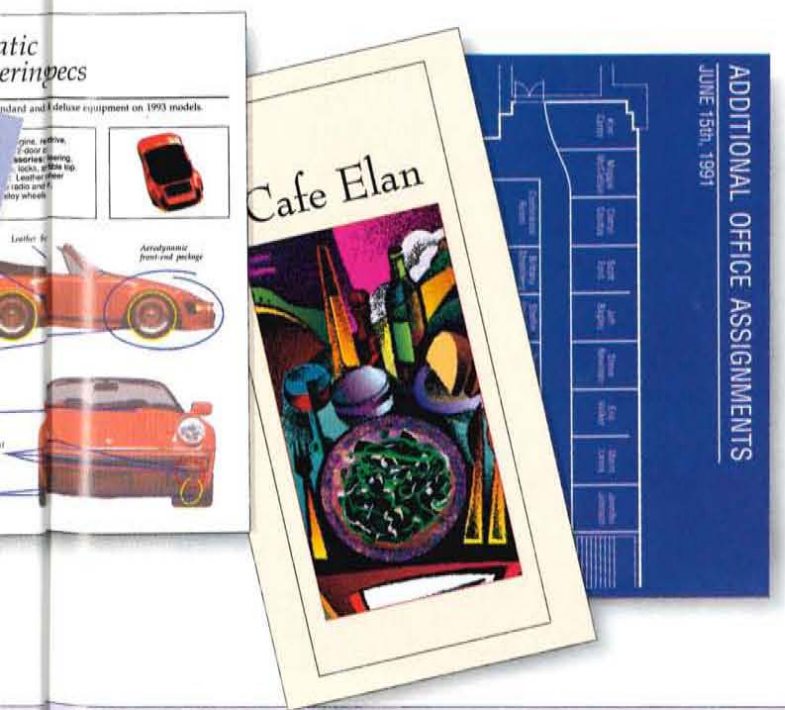
2. NEXT, CHOOSE "PLACE..." AND SELECT THE EPS FILE YOU JUST CREATED. PUT IT ON A BLANK PAGE.



PRINTING A MIRROR PAGE

3. CHOOSE "PRINT..." AND SET THE PAGE RANGE FOR THE PAGE CONTAINING THE EPS GRAPHIC. CLICK "POSTSCRIPT...," MAKE SURE "PRINT POSTSCRIPT TO DISK" IS TURNED OFF, AND CLICK "OK." NEXT, CLICK "OPTIONS..." AND SELECT "SPOT COLOR OVERLAYS" AND "MIRROR." CLICK "OK" AND "PRINT." YOUR PAGE WILL PRINT OUT REVERSED LEFT TO RIGHT.

Is so. Is not. Is so.



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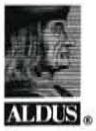

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SYSTEM 7 COMPATIBILITY QUESTIONS

MAC PAGEMAKER, ALDUS FREEHAND, MAC PERSUASION

When I run Apple's compatibility checker, it says my Aldus products are "mostly compatible." What does that mean? Will my programs run?

"Mostly compatible" means that all your Aldus products will run the same way under System 7 as they did under System 6.0. The only noticeable differences when running under System 7 are cosmetic ones—for example, the x in PageMaker's Toolbox is partly clipped. Aldus products automatically support aliases, file sharing, virtual memory, and (except for Persuasion) 32-bit addressing. Other System 7 features, such as Interapplication Communication (IAC), Balloon Help, and others, will be incorporated into future releases of Aldus products.

I'm trying to install my program, and when Disk 1 is finished, the Installer asks for it again. When I put it in, nothing happens. What do I do?

The current version of the Aldus Installer/Utility, which is used for installing all Aldus Macintosh products, sometimes has difficulties when running under System 7. If you're prompted for Disk 1 again after it's ejected, press Command + . (period) to cancel this message. If you've already inserted Disk 1, press Command + Shift + 1 to eject the disk. Put in Disk 2 and the installation process should proceed normally.

MAC PAGEMAKER

When I print TrueType fonts from PageMaker under System 7, they come out bitmapped and unreadable. Does PageMaker support TrueType?

To print TrueType fonts in PageMaker, you must use the Apple driver. To do this, hold the Option key down, then choose "Print..." from the File menu. Aldus is working on a solution to allow TrueType fonts to be printed with the Aldus driver, but no date has been set for its availability.

I'm running PageMaker under System 7 and am no longer able to place items from the Scrapbook file. Is there a way to get around this?

Yes. The Scrapbook file has a different file and creator type under System 7. Because PageMaker is looking for the old file type, it doesn't recognize the System 7 version.

It's fairly easy to change the file type using DiskTop, DiskTools, ResEdit, or any tool that allows you to edit a file's type or creator. Select and get info on the "Scrapbook file," located in the root level of the System folder. (Note: Be sure not to change the file in the Apple Menu Items folder named "Scrapbook.") Under System 7, both the type and creator will read "scbk." Change the file type to "ZSYS" (all caps) and leave the creator unchanged. Save the changes and you'll be able to place the Scrapbook into PageMaker.

FREEHAND Q & A

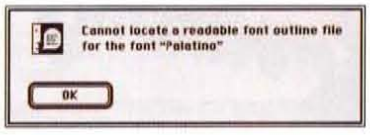
ltering arrowheads.

g box. The screen you set here does not override gs specifed with the "Halftone screen..." command. 'hen you export an illustration as an EPS file, n settings applied to objects using "Halftone n..." remain with that object. All other objects in :PS file print with the screen frequency specified ıe application you're printing from. Resizing an graphic does not change screen settings.

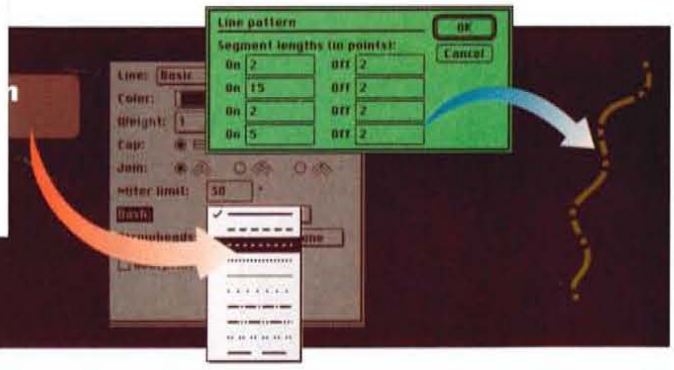
ɔw can I make a range of layers inactive in Aldus land 3.0?

ɔu cannot make a range of layers inactive in Aldus Hand 3.0 as you could in version 2.0. However, ecking "Multilayer" on the Layers palette in ɔn 3.0 makes only the selected layer active. This you can make all other layers visible and inactive.

an't convert my text to a path. When I try I get the error age "Cannot locate a readable font outline file." I know the font because it's built in to my LaserWriter. How can FreeHand 3.0 to read it?



order for the program to ert a font to a PostScript it must be able to read the er font file, which must be ed in the System folder (unless you're using ase II, in which case printer fonts should be in the folder as the screen fonts). Aldus FreeHand ot access and convert fonts that are resident on printer—you must purchase and install these fonts ately. Adobe Type Manager already includes the basic LaserWriter fonts, and the Adobe Plus Pack ıe 39 standard LaserWriter Plus fonts.



Key as you select one of the dashed lines. Experiment to find the line pattern you want. Aldus FreeHand 3.0 saves the new pattern in the pop-up menu.

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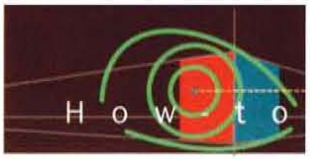


ALDUS FREEHAND Q & A

Selecting screens, finding font outlines, and altering arrowheads.

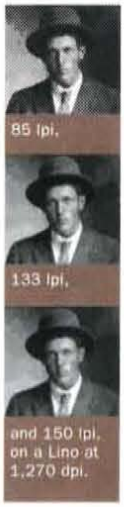
Here are the answers to some questions recently asked about Aldus FreeHand. If you have a question, or would like to share a tip, please write us: Editor, *Aldus Magazine*, Aldus Corporation, 411 First Avenue South, Seattle, WA 98104-2871. Please include your name and phone number in case we need more information. If we print your tip, we'll send you an *Aldus Magazine* sweatshirt.

Should I change the default lines-per-inch setting if I'm printing to a Linotronic at 1,270 dpi? Also, what happens to screen settings after I export a graphic as an EPS file, then place and resize it in PageMaker?

The lines-per-inch (lpi) setting, or screen ruling, you choose depends upon the paper stock you select and the plate material your printer uses. Recycled and coarse paper, like newsprint, spreads or "soaks up" more ink than a smooth paper does. The coarser the paper you use, the looser the line screen you need. A screen ruling of 85 lpi is the most that newsprint can hold accurately. *Aldus Magazine*, on the other hand, is printed on coated stock at 150 lpi. The plate material your printer uses also affects the screen density you should choose. Paper plates—typically used for short press runs—are fine for halftone screens up to 90 lpi. Metal and other long-run plates can accurately print screens up to 200 lpi or higher. It's best to check with your printer when determining halftone screen settings.

You can apply screens either to individual objects or to an entire illustration. Specify a screen for an individual object by selecting the object and choosing "Halftone screen..." from the Attributes menu (Element menu in version 2.0). Apply a screen to an entire illustration by entering settings in the "Print options" dialog box. The screen you set here does not override settings specifed with the "Halftone screen..." command.

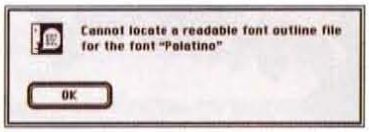
When you export an illustration as an EPS file, screen settings applied to objects using "Halftone screen..." remain with that object. All other objects in the EPS file print with the screen frequency specified by the application you're printing from. Resizing an EPS graphic does not change screen settings.



How can I make a range of layers inactive in Aldus FreeHand 3.0?

You cannot make a range of layers inactive in Aldus FreeHand 3.0 as you could in version 2.0. However, unchecking "Multilayer" on the Layers palette in version 3.0 makes only the selected layer active. This way you can make all other layers visible and inactive.

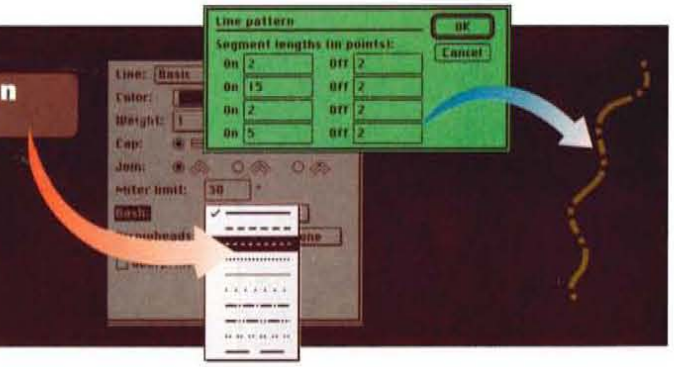
I can't convert my text to a path. When I try I get the error message "Cannot locate a readable font outline file." I know I have the font because it's built in to my LaserWriter. How can I get FreeHand 3.0 to read it?



In order for the program to convert a font to a PostScript path, it must be able to read the printer font file, which must be located in the System folder (unless you're using Suitcase II, in which case printer fonts should be in the same folder as the screen fonts). Aldus FreeHand cannot access and convert fonts that are resident on your printer—you must purchase and install these fonts separately. Adobe Type Manager already includes the four basic LaserWriter fonts, and the Adobe Plus Pack has the 39 standard LaserWriter Plus fonts.

ON-OFF, ON-OFF . . .

Do you wish you could change the patterns of dashed lines that appear in the pop-up menu in the "Fill and line" dialog box? You can by holding down the Option key as you select one of the dashed lines. Experiment to find the line pattern you want. Aldus FreeHand 3.0 saves the new pattern in the pop-up menu.



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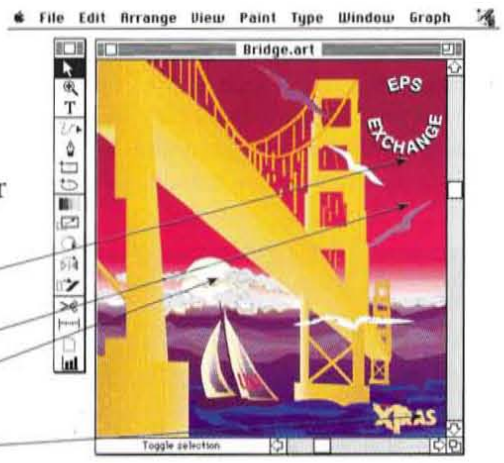

To add EPS Exchange to your design toolbox, call your favorite Macintosh software dealer or contact Altsys directly.

ALTSYS

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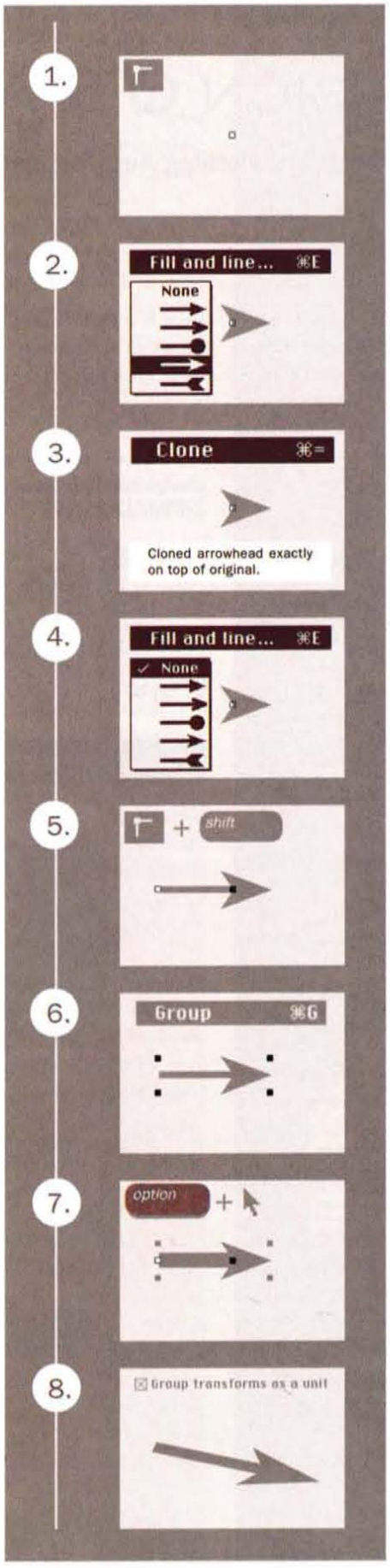
How can I get a different size arrowhead for a line?

The size of the arrowhead in Aldus FreeHand 3.0 is determined by the weight of the line the arrowhead is attached to. The only way to change the size of an arrowhead without changing line weight is to create two separate paths: a single point for the arrowhead, and a path for the line itself. For example:

1. With the corner tool, click once to create a single corner point for the arrowhead.
2. Choose "Fill and line..." from the Attributes menu (Command + E) and format the corner point with the desired weight and arrowhead style. Click "OK."
3. Clone the arrowhead (Command + =) to create a starting point for the line.
4. Choose "Fill and line..." again, choose "None" for "Arrowhead," and select the line weight you want. Click "OK."
5. Draw the line by holding down the Shift key and clicking the corner tool where you want the line to end. Holding down Shift makes the line shaft perpendicular to the center of the arrowhead.
6. Select both the line and arrowhead and group them (Command + G).
7. To change the line weight, hold down Option, click on the line, and change its weight in the "Fill and line" dialog box.
8. If you want to rotate, scale, skew, or reflect the line, choose "Element info..." and check "Group transforms as a unit" so that both the line and arrowhead transform together.



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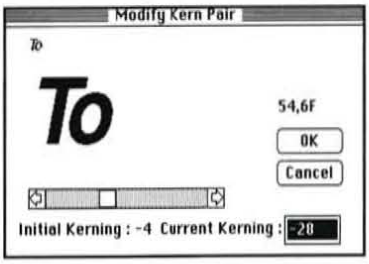

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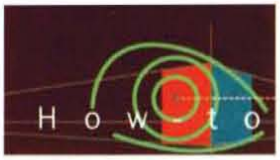


ALDUS PERSUASION Q & A

Font IDs, switching AutoTemplates, and placing charts.

Here are the answers to some questions recently asked about Aldus Persuasion. If you have a question, or would like to share a tip, please write us: Editor, *Aldus Magazine*, Aldus Corporation, 411 First Avenue South, Seattle, WA 98104-2871. Please include your name and phone number in case we need more information. If we print your tip, we'll send you an *Aldus Magazine* sweatshirt.

MAC

When I moved my presentation to a different Macintosh, Persuasion couldn't find the fonts I'd used, even though I could see them in the "Font" pull-down menu. What's wrong?

When you install fonts on the Macintosh, a font ID resource number is assigned to each typeface, style, and size. But because of the way these numbers are assigned, any two machines can have completely different ID numbers for the same font.

Some applications, like Aldus FreeHand and PageMaker, recognize fonts by name. Persuasion, however, uses the font numbers only. Therefore, when you open your presentation on a different machine than the one on which it was created, those numbers may reference different fonts—and your document will not display or print correctly.

The best solution for you depends on whether the computers involved—yours and the target machine—use a font-managing utility such as Suitcase or MasterJuggler. If they do, create a font file (using the Font/DA Mover) containing all the fonts used in your presentation, and bring it along to the target machine. There, close all open font files, then open the presentation's accompanying font file, and finally open the document. All fonts should display and print correctly.

If no font-handling utility is involved—that is, if the fonts on the two machines are installed directly in the System folders—then the simplest solution (though it can be tedious) is simply to reassign the fonts on the target machine. On the slide masters, select each text block (you can Shift-select several on one master, if they share the same font) and choose the right typeface in the "Font" pull-down menu.

When dealing with fonts on multiple Macintoshes, remember that screen fonts (those files that are installed using the Font/DA Mover) can be copied and moved from machine to machine without breaking copyright laws, but that printer fonts (PostScript-language outlines that are downloaded to the printer) are protected by license agreements.

MAC/PC

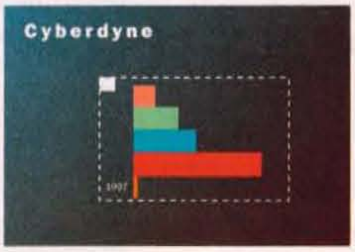
How can I tell what's going to happen to a chart when I change AutoTemplates? Sometimes they change format and sometimes they don't.

Whether and how a chart changes depends on whether it gets assigned a new chart placeholder. Knowing that, it's a little easier to sort out the possibilities.

When you change AutoTemplates or import masters in an existing presentation, you can choose whether to replace or append masters. (See *Aldus Magazine*,

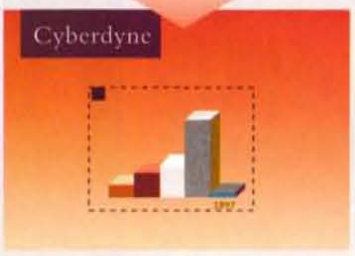
IMPORTING AUTOTEMPLATES

Your slide show



A chart will be reformatted if:

1. The original chart was created using a chart placeholder;
2. You choose "Replace" when importing the new AutoTemplate;
3. The new AutoTemplate has a slide master with an identical name; and
4. The new master contains a chart placeholder.



A new AutoTemplate

September/October 1990, page 55, for an explanation of these choices.) If you choose to replace, then masters in the new AutoTemplate will replace any identically named ones in the existing presentation. So two things can happen to your chart: it will keep its present master (if there isn't one with the same name in the incoming AutoTemplate), in which case it won't change format; or it will have a new master assigned.

If it gets a new master, two more possibilities arise. If your chart is based on a chart placeholder, and if that new master contains a chart placeholder, then your chart will get formatted according to the new placeholder. However, if the new master doesn't have a chart placeholder, then your chart will be unaffected.

Finally, charts that have been created without a chart placeholder are unaffected in any case.

PC

How do I import my Excel spreadsheets into Persuasion?

Persuasion can import Excel files in both the XLS spreadsheet and the XLC chart formats, although to bring in charts you must have Excel installed on your system (since Persuasion opens Excel to import the file).

To import a spreadsheet file, choose "Place..." from the File menu, select the file you want to place, and click "OK." The "Place an Excel Range" dialog box appears. You then specify the range you want to place, either by clicking one of the defined ranges in "Named Ranges" or by typing the names of the fields in "Range." Remember, though, that Persuasion does not retain text formatting, lines, shades, or column alignments specified in the Excel file; nor does it automatically update the imported spreadsheet if you make changes in the Excel file—the two are not linked.

PC

When I installed Persuasion, I didn't choose to install any of the Microsoft Excel or Lotus 1-2-3 filters that were already present on my hard disk. Are there any differences between the filters shipped with PageMaker 4.0 and the ones shipped with Persuasion 2.0?

Yes, there are. Both the Excel and 1-2-3 filters were changed to increase the number of columns of data that you can bring in. The filters that shipped with PageMaker 4.0 allowed you to bring in a maximum of 40 columns, due to the 40-tab-per-line limit in PageMaker—so if you wanted to bring in a year's worth of weekly data (52 columns), you had to do it in two pieces. With the updated filters, you can bring in up to about 90 rows by 90 columns (about 8,100 cells). Keep in mind that if you try to place a file through this filter into PageMaker 4.0, the 40-tab limit still applies, so an alert box warns you that data to the right of the 40th column will be lost.

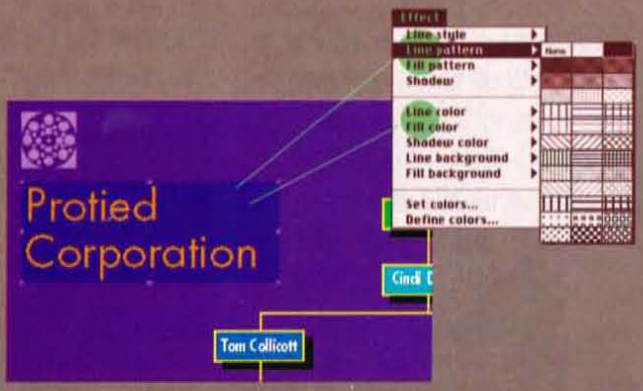
Another difference between the filters shipped with PageMaker 4.0 and those shipped with Persuasion 2.0

Persuasion Tip (PC/Mac)

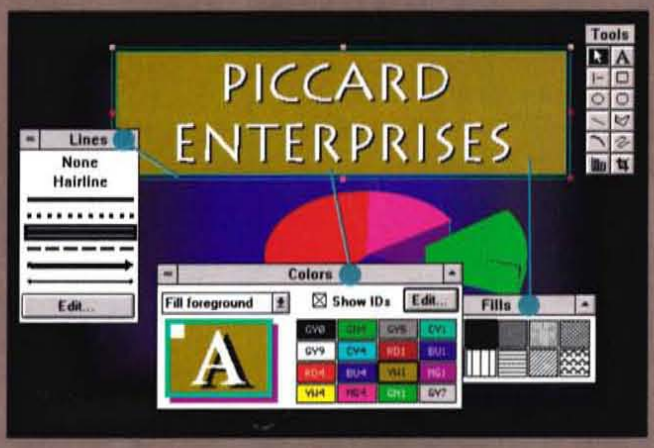
Living Text Frames

Here's a way to frame text with a rectangular box or border that will grow or shrink as the amount of copy in it goes up or down. Once you select a text block with the pointer tool, you can apply all the attributes to it—line style and color, fill pattern and color, and so on—that you could to a drawn box.

On the Macintosh, pick your attributes from the Effect menu. The type itself is not affected, only the box that it's in.



On the PC, use the Lines and Colors palettes, in combination with the "Character specifications" dialog box. You can control the color of the type and its shadow, as well as the box's characteristics. (You may need to play with the alignment and/or indents of the type, under "Paragraph...," to get it positioned in the box the way you want.)



On either platform, you can also apply these effects to a text placeholder on a master slide, to create dynamic text frames on a whole set of slides.

is in the filter interface. The "Place" dialog box for both Excel and Lotus 1-2-3 in PageMaker lets you choose the range you wish to import, set up tab alignment and decimal places, include style information, and import the data either as text or as a graphic. In Persuasion, though, the "Place" dialog box allows you to select only the range that you will be importing.

PC

I've received two kinds of error messages upon starting PC Persuasion. One tells me that the application can't find a whole series of .DLL files, starting with ALDVM.DLL. The other says, "Cannot find HPPCL.drv, Please insert in drive A:." What is happening?

The message about the .DLL files means that Persuasion cannot find certain key information files. This is probably because the ALDUS directory is not on your path statement. When you first install Persuasion, you can choose whether or not to update your AUTOEXEC.BAT. If you do update it, the path statement is changed to show both the ALDUS and PR2US directories (and then you need to reboot your computer so that the changes to the AUTOEXEC.BAT will take effect). If you choose not to have the installation program update your AUTOEXEC.BAT, you must manually add the "\ALDUS" and "\PR2US" directories to your path statement.

The second message, the one concerning the HPPCL.DRV file, means that you're trying to open an AutoTemplate that was created for a PCL4 printer (that is, a LaserJet II) and you don't have the driver installed. (You'll get a similar message if you try to open an AutoTemplate created for a PostScript printer without having the PostScript driver installed.) To correct this problem, quit Persuasion and install the correct printer driver through the Windows Control Panel (double-click "Printers," then press "Add Printer>>"). Then, back in Persuasion, choose "New..." or "Open..." from the File menu. When the "Slide setup" dialog box appears, retarget your desired printer. Then choose "Notes setup..." from the File menu and choose your printer again there. (It's necessary to retarget the printer in both places—otherwise you may run into font problems.)

PC

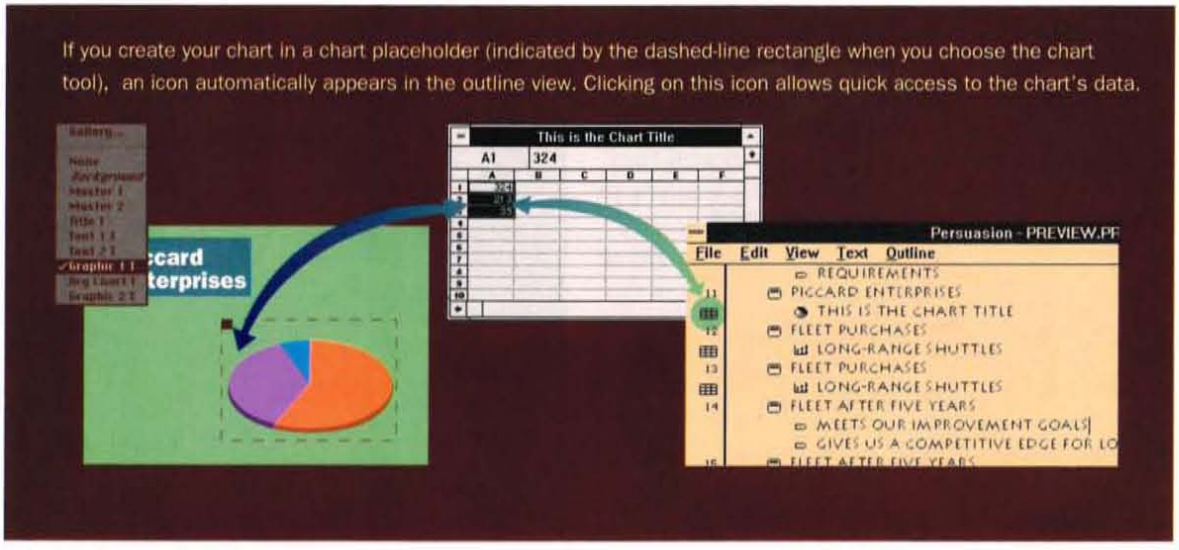
I often use the chart tool to create a chart right on my slide. It works fine, but sometimes I get a chart icon on the outline (which allows me to edit the data sheet from there) and sometimes I don't. Why is that?

You're probably creating some charts on slides that don't have placeholders for them. The chart icon on the outline—with its link to the chart and data sheet—appears only if the chart itself was created in a chart placeholder. In Persuasion's AutoTemplates, slide masters called "Text 1," "Text 2," and so on don't have chart placeholders; "Graphic" slide masters do.

When you choose the chart tool, the chart placeholder should appear as a dashed-line rectangle (see illustration below). If it doesn't appear, then there's no chart placeholder on that slide. You can still create a chart wherever you want, and it will be fully editable on the slide, but the dynamic link to the outline (represented by the icon there) will be missing. Also, a chart created this way has the default formats for that slide, rather than the chart placeholder's formatting.

If you've already created a chart this way but now want to put it into a chart placeholder, open up the chart's data sheet (double-click on the chart with the chart tool), select all the data, and choose "Copy" from the Edit menu. Next, delete the chart, assign a "Graphic" master to the slide, and click the chart tool inside the chart placeholder that appears. Now, with the cursor inside the new data sheet, choose "Paste" from the Edit menu. The resulting chart will have the placeholder's format and will be linked, via icon, to the outline.

If you create your chart in a chart placeholder (indicated by the dashed-line rectangle when you choose the chart tool), an icon automatically appears in the outline view. Clicking on this icon allows quick access to the chart's data.



Holmes *(continued from page 24)*
imaginative pieces of graphic design in the map field. Some quite considerable liberties were taken with geography in the service of graphic attention-getting. The mapmakers of that time overlaid onto the maps visual metaphors that were very striking, and the maps were beautifully done as well. They only had black and white and one other color, usually bright red. I'm currently very interested in the use of maps to explain things, rather than having them just sit there like a segment from an atlas. I want the map to clearly show what the subject is and why it is here this particular week.

What about the unusual colors you used for the Gulf War maps, with black oceans and a red Iraq?

The idea was to make the map different from any other map in the magazine. Traditionally maps have blue sea and green or brown land or they have a patchwork quilt of pastel colors for different countries. You don't have to do that these days. You can have whatever color you want. I thought a strong, stark, emotional map might indicate to the reader that there was something serious and stark going on. So I chose a very bright color for the target, which was Iraq, black for the sea, simply as a basis on which to sit everything, and then lighter colors for the countries around Iraq. So, I had maximum contrast between those countries that were on one side and Iraq—which was the center of attention—right in the middle, in the brightest color.

What influence do you think TV has on print media, and do you feel any direct competition from TV?

At *Time* we look over our shoulder all the time to say, "Is television the primary way that people get news and information—and, if it is, is there anything that we should be doing about it?" The obvious answer is to make things in the magazine shorter and more snappy. I disagree with that. Our sales doubled during the Gulf War. Either readers weren't getting what they wanted from television—and this was a television war—or they wanted as much information as they could get. Either way it's good news for us. They turned to print when they wanted to get more, or wanted to really understand something.

So I'm not sure that we should take too many leads from television. I would like to see *Time* not change in the direction of making things shorter, easier to read, and snappy. I would like to see *Time* not come down to the level of people that it thinks watch television. We should assume that people will read.

How do *Time* readers respond when you change the design of the magazine?

Changing design has much less to do with readers than we would like to think. It gives the marketing department a chance to go back to their clients and say, "We've changed, come back and advertise in us." I don't think anyone should be under any illusions about that. Readers will adjust to a new design and read *Time* magazine if it has the right information.

How has desktop computer technology affected your work?

I'll still do my "real" drawing straight from the brain to the paper, through the pencil—and then scan that in and do with the computer what I used to do with templates or Rapidographs. As far as the drawing is concerned, the software has made no difference in how I draw. I defy people to recognize the difference between something I produced on a computer and something I drew by hand.

What challenges do you see for yourself—new directions that you want to go with your design style, your career, your life?

That's a very tough question. I do think about it a lot. I've been here a long time. I have a great deal of fun here at *Time*, but I wonder if somebody else should have a go at what I do. When I first came here, I found that just by walking and thinking outside, ideas came to me, rather than by trying to force them to come. I guess what I really want is to give myself more time to think.

Stuart Silverstone is a graphics consultant and designer based in Washington, D.C. He is a frequent contributor to Aldus Magazine.

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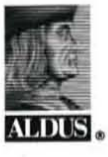

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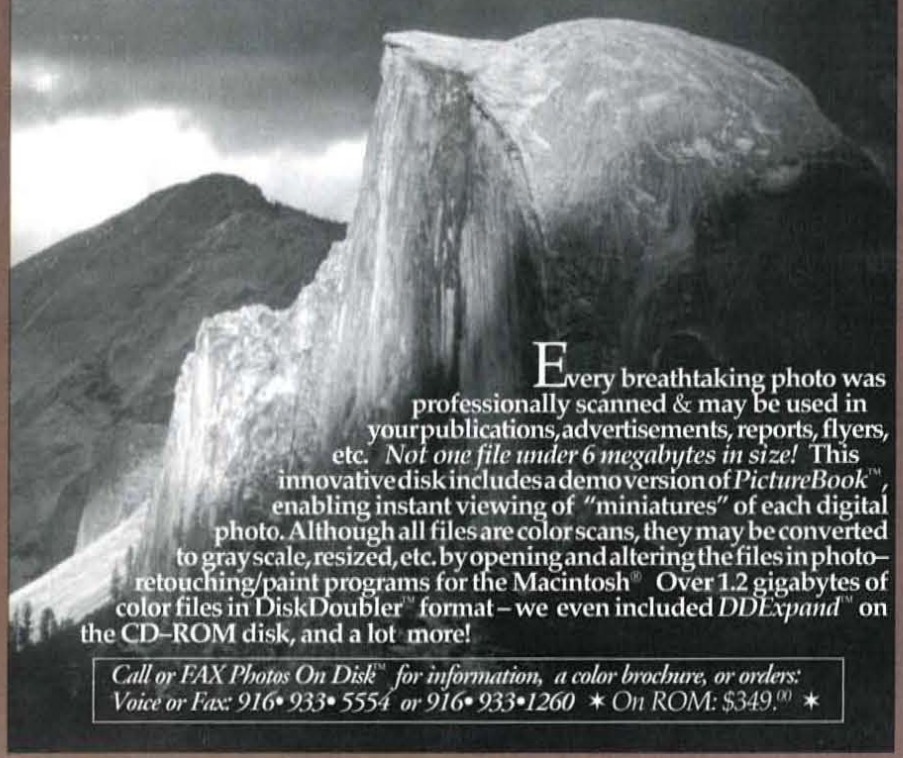

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Shrink to Fit (Newsletter fitting how-to) (page 28)	☐	☐	☐	☐	☐
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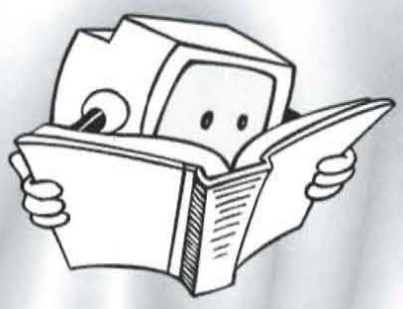

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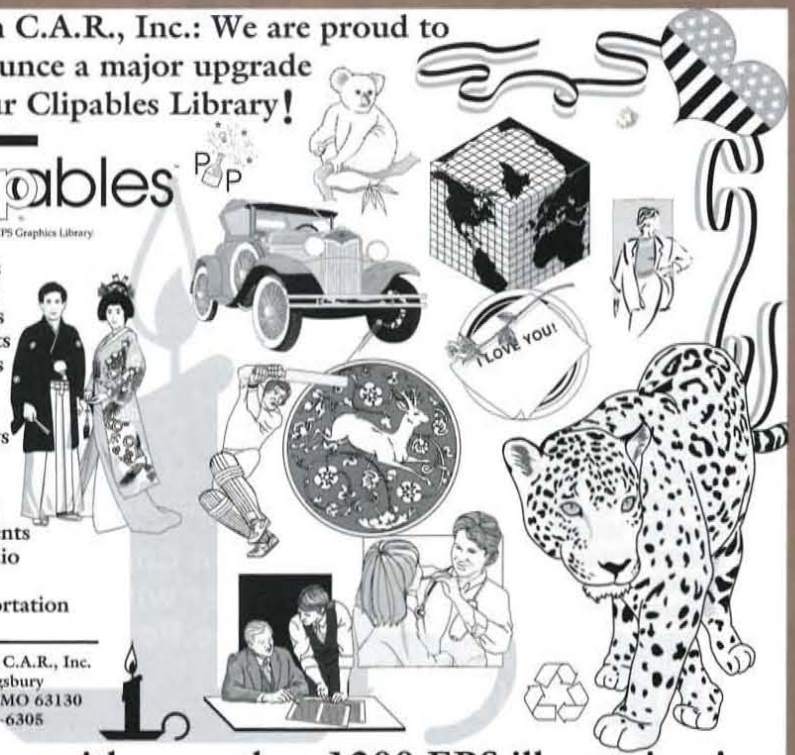

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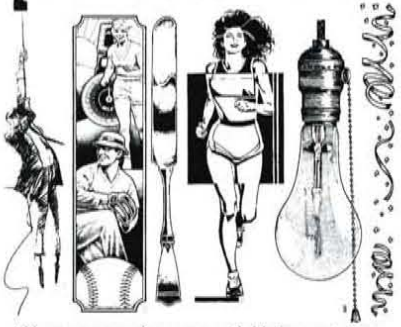

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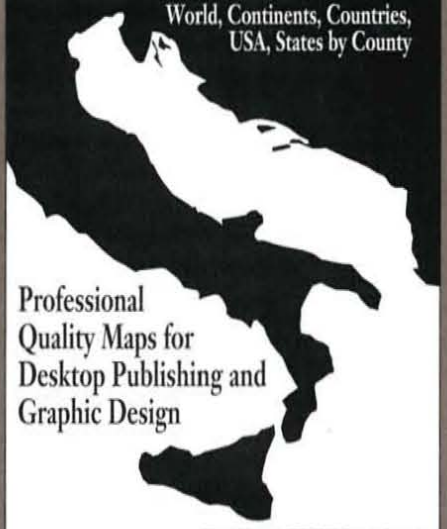

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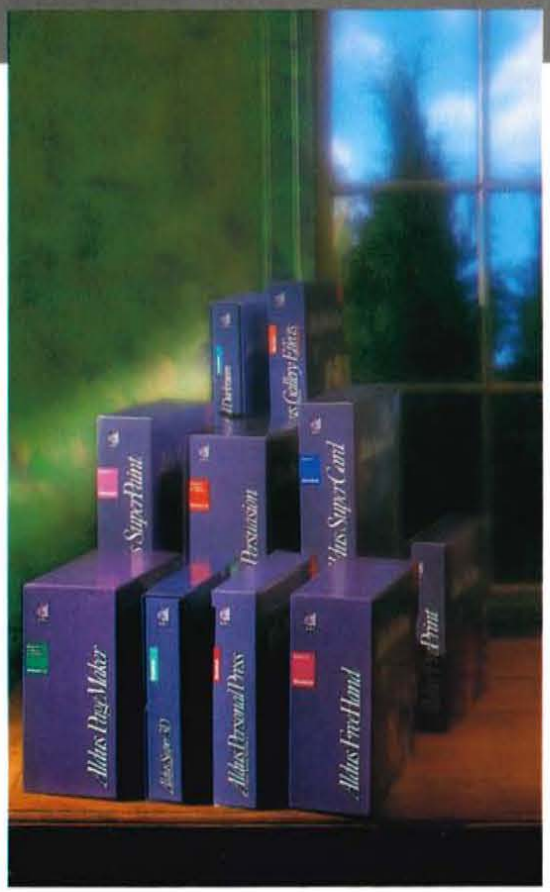

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WRITING VERBALLY

A writing teacher looks at how graphics can interfere with critical thinking.

BY MARCIA PEOPLES HALIO

Confess—when you open *Playboy* magazine, where do you turn first? To the fascinating, well-informed articles on politics, sports, or the arts? Or to the delightfully soft-porn visions of the nubile nymph next door? And what about *Life* magazine or *Sports Illustrated* or *Vogue*? Although their text may be terrific, it's not what you see first, not what draws you to the publication. Not what you remember.

In some cases, pictures do indeed speak more eloquently than words. When we want to provoke emotions—pleasant or sad, wrenching or restful—we use pictures, not words, to reach an audience. Who would deny that there are times when we want to speak with the language of visuals? Not me.

Yet I am troubled by the idea that writing teachers, in computer labs from kindergarten through college, are using software that promotes the use of graphics in writing. My own experience as a teacher (and a supervisor of teachers) shows me that students who use a lot of graphics in their texts tend to neglect the words.

Visuals are visceral, and words are cerebral. To succeed in college courses, students need to master the art of verbal argument before they learn the equally powerful language of graphics. By the time they reach junior or senior high school, students need to sharpen critical skills—to analyze, to define, to compare and contrast, to classify and divide, to see causes and effects. In short, they need to learn to articulate ideas. By putting thoughts into words, students conceptualize points of view that will help them to make choices, in their personal lives and in their professions.

Visuals communicate, but not in the same way as words. Consider the editorial page of any major newspaper. Next to the lead editorial, you will often find a cartoon on the same subject. Both communicate, but in entirely different ways. The written editorial makes you think; the editorial cartoon makes you feel. Both kinds of communication are needed, but they are vastly different.

Children's books are different from adults' books, primarily because they have many more pictures and much less text. "Coffee table" books are beautiful to look at—perhaps even moving and passionate. But they are the stuff of feeling, not of thought.

I acknowledge that graphics may help some students in the prewriting stages. If they are visual learners, they might well use graphic techniques such as pen and pencil sketches or drawing programs to help them get started writing. But if their doodles and scribbles stay at that stage, their thinking will never develop beyond the gut level. And if, as some teachers suggest, we teach students to use page layout to express their ideas, how will they learn to communicate unambiguously? Page layout is highly subjective and arguable. It is largely a question of aesthetics—not logic.

Since so many teachers now use software that makes it easy for students to add graphics to text, perhaps we should develop guidelines for software usage. At the early elementary level when students are primarily visual, they might use the software to prewrite and to illustrate their stories and themes. But as they progress toward junior high, students should develop the ability to think abstractly. High school and early college courses should emphasize mastery of verbal skills. Then, if students go on to take additional writing instruction during their junior or senior years to practice the kinds of writing they will use in their careers, they can learn the powerful techniques of graphics—particularly for business or technical writing.

I embrace the new technology, but I will think carefully about how best to use its power. I look forward to teaching students to use hypertext to create links between ideas, but I want to be sure they first have the critical thinking skills needed to make those links and to understand those texts.

I welcome the power of multimedia to create total-experience presentations that take viewers where they can't go on their own. But I also remember a correspondent telling me about the horrors her students created with the Next computer, when they added sound and graphics to documents full of softthink.

Marcia Peoples Halio is assistant director of the University of Delaware Writing Program in Newark, Del. She is currently at work on a textbook called Computer Writing: Using the Power of the Computer to Express Yourself in Print, *to be published in spring 1992 by Kendall/Hunt.*

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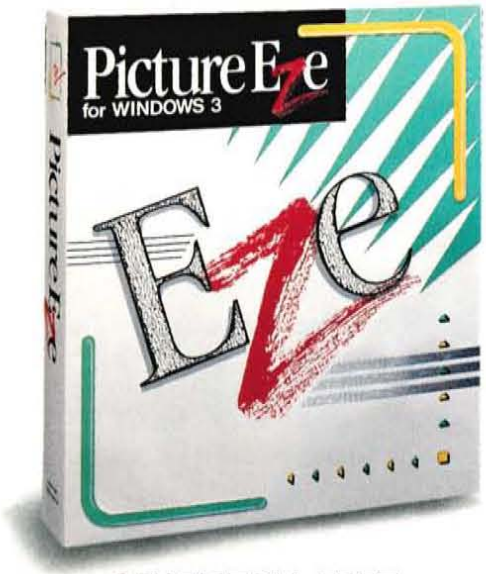

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Aldus Authorized Imaging Programs

To produce high-resolution output from the files you create with Aldus products, you may want to send your files to an imaging center. The following imagesetting service bureaus, slide service bureaus, and color prepress houses are Aldus Authorized Imaging Centers, working directly with Aldus to provide you the best possible quality and service.

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Palo Alto
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Boise
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Image Resolutions
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MicroPRINT
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Westford Graphics
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Stamford
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Autographix/Media Design Group, Inc.
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SlideImagers
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Mac/PC
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The Computer Software Workshop
PC
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MacGraphic Specialties
Mac
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The IconoClass
Mac
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Mac/PC
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PC Etcetera, Inc.
Mac/PC
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Spiegelman & Associates
Mac
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The Informative Edge
Mac/PC
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Training Works
Mac/PC
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Mac
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Mac/PC
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Mac/PC
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Mind Over Macintosh
Mac
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Mac/PC
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New Schools
Mac
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PC
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Mac
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MicroTraining Plus
Mac
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Center for Professional Computer Education
Mac/PC
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Personal Computer Learning Centers of America
Mac/PC
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Mac/PC
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Personal Computer Learning Centers of America
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Computer Savvy Workshops
Mac/PC
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Mac/PC
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Mac/PC
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Mac/PC
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Executive Development Group, Inc.
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