Six Hot Solutions
For Mac-to-Mainframe Connectivity

The Best Flowcharts
For Improved Management

Dvorak
On the Controversial Apple-Microsoft Pact

PostScript Clones
For (Almost) Any Printer

Forms Design
For Every Business

Swaine
On System Secrets

DTP Close-Up
THE BIG THREE SHOOT IT OUT

Can the king be dethroned?

Aldus' PageMaker has long been the program against which other DTP publishers measured their own efforts. After all, it was Aldus that coined the term desktop publishing, and PageMaker's word metaphor has captured the imagination of publishers like QuarkXPress.

Need total control?

Of the Big Three page-layout programs, QuarkXPress is the youngest, but it has grown up quickly. From the beginning, it offered the flexibility and professional features that PageMaker and Utopia lack. QuarkXPress has been the most popular for desktop publishing. Like PageMaker and Utopia, QuarkXPress can create Print Set, but its options are much more limited.
Then again, some same thing about

**Nobell Chem Revenue Potential**

*Product Portfolio Breakout*

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During the past twelve months, the Nobell Chem Corporation pulled far ahead of the competition, through the diverse and strategic marketing of its Nitro Glucos compound.

**Nobell Chem**

**Explosive Growth Potential**

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**Nobell Chem**
If you own a Mac® you may already know what a phenomenally powerful piece of software Microsoft® Word is. Likewise, you may also be aware of how powerful Microsoft Excel is.

Well here's something you probably don't know:

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We call this unprecedented feature “warm links.” But you'll be more inclined to call it the best thing for revising documents since white out.

Imagine it's the end of the day and tomorrow's the BIG presentation. You've been working with the sales manager to incorporate his Microsoft Excel projections into your report. You're finally done. But wait. Suddenly he makes one of his famous last-minute changes to the spreadsheet.

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Of course, because we are talking about the BIG presentation here, you'll want to go the extra step and blow them away. Enter Microsoft PowerPoint. It's the easiest way to create attention-getting overheads and slides in black and white or color. Just cut and paste data from Word or Microsoft Excel into your presentation, draw, color, shadow, and take a bow.

As you probably know, Microsoft and the Macintosh have an unusually close relationship. We've been involved with the Mac since the beginning. Which means we know how to get the most out of it, now.

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Some people think there's no particular advantage to combining Microsoft applications.
MacUser

StartUp

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Your telecommunications can never be too fast. Now that 9,600-bps modems are becoming both practical and affordable, is it time to invest in the future? MacUser Labs spent 500 hours testing every high-speed modem priced at less than $1,500. We simulated tough real-world conditions to find the fastest, cleanest, and best buys.

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What's really behind the Apple-Microsoft-Adobe scrap?
On October 17, 1989, two Mac User editors were among the casualties of the Bay Area earthquake. You may not have known their names, but their contributions were evident throughout these pages. This month, in lieu of our usual commentary from the editor-in-chief, the MacUser editors collectively present this tribute to John J. Anderson and Derek Van Alstyne.

In Remembrance

In 1984, the Macintosh was a puzzle: You had to fit in the missing pieces to read the hidden message. John Anderson got it immediately. He understood that this "insanely great" machine was really just an amplifier for insanely great people, and he set about using it and encouraging others to use it for the highest human purposes. In his writing, in the stacks he developed under the Acme Dot logo, and in his plans for MacUser's Media Labs, he was always on the human side of the human interface.

John "got it" in other ways as well—he always had just the right turn of phrase, the right comeback, the clever summation of whatever you were struggling to articulate. A visit to his office was likely to turn into an exhilarating brainstorming session from which you walked away feeling brilliant, even though most of the ideas were John's.

He could capture a trait in an instant one-liner: "She was a walking game of Pictionary." "He's so in touch with his feelings, he's got call waiting." John always stayed five steps ahead, an insightful observer and appreciator of life who turned everyday happenings into memorable events.

The fullness with which he lived makes our images of him all the more vivid: John at his desk, smoky-brown glasses, neatly cut hair, perfectly clipped mustache, looking like Central Casting's idea of a Damon Runyon bartender. The same scene, a year later: his hair grown out and tied back in a ponytail, son Peter perched on his shoulders as he types, bragging about Katie, his and Lauren's one-year-old. In a Boston hotel lobby at 2:30 A.M., wearing a baseball cap and chewing on a stale cigar, in a frenzied search for a 5-meg Mac II for a demo. On the beach, flying six of his kites simultaneously, his back to the wind.

When John became director of MacUser's Media Labs, one of his first decisions was to hire a brilliant and visionary young programmer named Derek Van Alstyne. At a dinner meeting at a Mac expo in Boston, Derek's idealism and enthusiasm struck a chord with John, recalling for him his own enthusiasm the first time he saw a Macintosh.

When Derek studied biotechnology in college, he wasn't satisfied with just growing tissues; he wanted to grow entire organs, to push the frontiers of the new science and create life. When he discovered computers, his ambitions were just as high. He wasn't satisfied with just writing programs; he wanted to create new ways of making information accessible, to push the frontiers of what computers could do for people. One key was an information engine that he was working on. When someone suggested that his dreams wouldn't be practical until computers became as ubiquitous as telephones, he disagreed: The way to achieve the dream was to create the engine now, without waiting for a market to justify it. That vision was what he was working on at MacUser.

Derek was a triathlete, and he had all the dedication and energy his goals demanded. He regularly worked 12- and sometimes 16-hour days. ("Oh yeah," he recently told an editor who was leaving the office before midnight, "you've got one of those 'life' things. I've got to get me one of those 'life' things.") But they weren't all 16-hour workdays. Those closest to him remember a sly sense of humor; a laugh that came naturally and easily; musical tastes that carried his day from Beethoven in the morning to speed metal as the evening wore into night; a smile that encompassed his face; an intelligent, intense, sensitive, caring man.

John and Derek were perfect complements to each other in the work they were doing. They also complemented and enriched our lives. We will miss them.

Derek Van Alstyne, 1967 – 1989

MacUser January 1990 5
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FROM THE DUBL-CLICK COLLECTION

About MacUser

Baud, bps, and Black Boxes

To most people, modems remain perfect black boxes. Plug a phone line into one socket and a modem cable into the other, and the box works its magic. It's simple, mysterious, and convenient — but it makes it tough to choose a product based on hard facts.

MacUser Labs doesn't believe in black boxes.

When the Labs attacks any subject — whether it's PostScript printers, hard-disk drives, or high-speed modems — it's not enough to leave no stone unturned. Each stone must be turned under systematic, controlled, and reproducible conditions.

When labs director Andrew Eisner and the MacUser Labs staff tackled high-speed modems, they knew they had to do more than plug in 11 black boxes and press the On switch. The V.32 modem standard represents a white-hot emerging technology — one that may or may not prove economical for present users. "We wanted to demystify and explain a technology that's only now becoming affordable and practical," says Andrew (all the modems tested were within a range of $800 to $1,500).

"Only then can we roll out the benchmarks." To get a handle on those benchmarks, Andrew relied on nearly 20 years of experience with telecommunications, dating back to when a Teletype with a 300-baud acoustic coupler was considered the state of the art.

The state of the art has come a long way since then, so the Labs set up the same kind of telephone-line simulation equipment that modem manufacturers buy. It's expensive, but the manufacturers understand — as the Labs does — that it's the only way to know how a modem will perform under a wide range of conditions. During 500 hours of testing, each modem revealed strengths and weaknesses, which the Labs meticulously recorded. The final result is this month's report: "Modems: 9,600 bps and Counting."

MacUser Labs' reports contain plenty of information, and not all of it relates directly to the product benchmarks. This month, for instance, you can find out what makes a modem tick ("How It Works"), what to expect from this technology in the near future ("On the Horizon"), and even how to tell the difference between baud and bps ("Same Highway, More Traffic").

Often, what the Labs learns spills out beyond the report. This month, for instance, Andrew discovered that standard Mac modem cables don't support the hardware handshaking that's essential for superspeed telecommunications. He wrote "Modem-Cable Rewiring" as a special Labs Brief to provide instructions on how to make an inexpensive jumper cable that solves the problem.

The data collected by MacUser Labs appears not only in its own reports and briefs but also in individual product reviews. It takes time, money, and sweat, but we think it's worth it. Because when it comes to hardware, software, or black boxes, you shouldn't have to judge the winner by its cover.
When we offered MacDraw II® users the chance to trade up to Canvas®, we had no idea what we were letting ourselves in for.

We've been buried in an avalanche of MacDraw II disks. Swamped. Inundated. Overwhelmed. The fact is, we've received thousands of disks, with more arriving daily.

If you've read the reviews, you shouldn't be at all surprised.

In awarding us 5 mice (versus 3¼ for MacDraw II), MacUser (April, 1989) called attention to many of Canvas' unique features, including much higher precision, a 16.7 million-color wheel (vs. only the basic 8 for MacDraw), full Bezier curves and auto-tracing of bit maps.

MacWeek (January, 1989) was no less enthusiastic. "Canvas 2.0 is loaded with drawing tools and tool enhancers that go beyond those of its more expensive object-oriented rival, MacDraw II ... Canvas is superior in color handling, the comprehensiveness of its drawing environment, support for a variety of file formats and its neat object library feature."

MacWeek went on: "Canvas can position objects extremely accurately - down to one sixty-four-thousandth of an inch ... a boon to technical illustrators and others with low-range drafting needs."

And all this was before we introduced such additional enhancements as 4-color separation capability, dashed lines and even a spelling checker.

Need we say more?

To preview the finest drawing/painting program available today, send $39.50 to receive a fully-featured Demo Copy. Or, if we've convinced you of Canvas' complete superiority to MacDraw II, send us your MacDraw Master Disk and $99, and we'll send you Canvas. Or you can purchase Canvas for just $299.95 (vs. $395 for MacDraw II) from your local dealer.

For additional information call us at 1-800-6-CANVAS. In Florida: (305) 594-6965. All payments by check or credit card (include card #, issue, expiration date & signature). Mail to Deneba Software, 5805 N.W. 74th Ave., Miami, FL 33122.
Letters

Dr. Tom Hertig of Ridgewood, New Jersey, likes the new format we inaugurated when we converted to desktop production. He writes that it’s “clearer, very informative, and best of all gives tips, help, and data (as in September’s lab report on PostScript printers). I applaud your efforts to make the magazine as useful as my Mac.” We may never be as useful as your Mac, Tom, but we hope that’s because we’ve made your Mac more useful.

PostScript Printers Revisited

In “Fit to Print” (September ‘89), you claim that the Qume CrystalPrint Publisher doesn’t work with Apple’s LaserWriter driver 6.0. This is simply inaccurate. This very letter was printed using that driver. Perhaps your network is the source of your problem, or perhaps the test system was not fully upgraded to System 6.0.3? Second, you claim that using downloadable fonts makes printing painfully slow. Again, I suspect that your network may be the problem. I have found the CrystalPrint to be an excellent printer, and the print speed of documents using downloadable fonts is close to that of documents using resident fonts.

Bryant Durrell
Lincoln, MA

We initially experienced problems using LaserWriter driver 6.0 with the Qume CrystalPrint Publisher. However, we have since retset them, using newer ROMs (which were not available when we completed our original tests), and the problem seems to be solved. If you recently bought your CrystalPrint, you may have the new ROMs. You also may be confusing the version numbers of the System and printer driver. LaserWriter driver 5.2 ships with System 6.0, which was the version we used. LaserWriter driver 6.0 supports color PostScript and was released in May ‘89 on Apple’s color disk, which contains 32-bit QuickDraw. The 6.0 driver is shipped with some color printers and is available from Apple dealers and user groups; currently, however, it is not included in the System software shipped with Mac CPUs. Finally, we avoided networking complications altogether — one Mac, one printer was the extent of our network.

— HB and AA

Overlooked Options

In her column “Bill of Writes” (October ‘89), Louise Kohl waxes nostalgic about three “intelligently planned function keys” on her Commodore 64 that she’d like to see in a Mac word processor: “One took you immediately (and without scrolling) to the top of the document, one took you to the bottom, and one went straight to the last active cursor position — actually to the last three cursor positions in rotation.”

Richard Theriault
Clearwater, Fl.

And all this time I thought the numeric keypad was for entering numbers. —LK

Disk Contents

Although the article “PC to Mac and Back” (October ‘89) was well written and informative, it described the PLI TurboFloppy 1.4 as an FDHD drive. Unfortunately, the drive reads only the Mac 1.4-megabyte format along with the DOS formats. PLI itself states in its manual that the drive doesn’t read Mac 400K or 800K formats but describes it as Apple FDHD-compatible. My understanding is that Mac FDHD drives should read all the Mac formats.

Donovan Whistler
Cochrane, British Columbia, Canada

As noted in October, we hadn’t received a PLI for hands-on evaluation at that time. A full review should appear soon. Although we agree that a truly compatible drive should read all the major disk formats, PLI is technically correct in describing its drive as FDHD, which simply means floppy drive, high density.

— JR

Shaking the XTree

I’d like to clarify some points made in Daniel J. Rasmussen’s review of XTreeMac (September ‘89). After he states that “the program is plagued by bugs that disqualify it from serious consideration,” the only true bug he mentions is the problem with locked and MFS disks. The MultiFinder-related bugs fixed in version 1.02 include this disk problem.

We made XTreeMac as flexible as possible when dealing with remote network volumes. The amount of data that must be transferred over a network to keep remote volumes up-to-date is substantial. We have been unable to find an acceptable alternative method of displaying the directory structure of remote volumes. We do allow users to unmount these remote volumes by dragging their icons to the trash, alleviating the wait for these volumes to be updated.

Robert Snyder
Custom Software, Inc.
Irvine, CA

As noted, the original shipping version of XTreeMac available at the time...
We found a measure they could both agree on.

Up on the hill it looked like another split along party lines. Both Macintosh and PC users fought for access to the same information. Until a TOPS network brought them together in bipartisan agreement, that is.

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To some it was just a game of intricate moves, sublime suggestions of intricate defenses. To him, it was a paradigm of life. An ever-sweet experience. He studied Clausewitz. He read Napoleon. He marvelled at Musters. He never stopped in his pursuit of the clock as if his life depended on hitting the button five seconds before the allotted time. They called him the King of Strategy. He called himself a Student of Life.
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So, if you’re looking for a display for your Macintosh, the first thing to do is visit a Radius Authorized Dealer. You can find one near you by calling 1-800-227-2795.”

It’s clearly the best move you can make.
As a rule, I don't purchase copy-protected software. And definitely not software from people with an attitude such as this. The person I spoke with at Maxis continued to state that SimCity was not a game but a simulation. Sorry if you hadn't heard, but business software and simulations don't require people to insert key disks anymore.

K. C. Cowan
McMurray, PA

Maxis originally intended to keep SimCity copy-protected until the program was well established in the marketplace. The program's success in the education market was probably as much a surprise to its publisher as to anyone else. Maxis told us last March that SimCity was designed for those who were "bored with other Mac games." — KC

Desktop Spelling

Your reviewers skipped the greatest plus of all in his review of Thunder II (Start Up, October '89). It can be used as a spelling checker for PageMaker files. That feature will keep a lot of DTP users from switching to QuarkXPress.

Nancy K. Molitor
Sacramento, CA

Caveat emptor: Only version 1.01 of Thunder II has the "PageMaker-compatibility module" that allows it to batch-check PageMaker files. — JB

OK Quarrel

Please encourage programmers and software publishers to conform to a single convention regarding the "Okay/Cancel" buttons in dialog boxes. The correct form is OK (both letters uppercase), not Ok, which always looks like zero kilobytes, which is scary enough anyway!

Ted Wicks
Palo Alto, CA

Pictures Imperfect

I don’t like the cute little pictures of yourselves at the beginning of each article. I hope it’s a late ’80s fad. I like making up my own mental image of what you people look like. God didn’t put a picture of Himself in the Bible, so why do you put your pictures in the mag?

Andrew M. Chisholm
Lincoln, NE

Actually, it’s an early ’90s fad. Although God didn’t include a picture, just think how many arguments it would have settled if She had. — JB
"Topping TOPS®! There's a new distributed-file-transfer program that's
the first direct challenger to TOPS and it has a lot going for it. Like TOPS,
Personal Server Network (PSN®), from Information Presentation Technolo-
gies (IPT®), passes files among computers without a dedicated file server.
MACUSER. September, 1989

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If you’ve been reading *MacUser* for some time, you’ve probably noticed some changes, both major and minor, going on in these pages over the past several issues. Whole sections of the magazine are moving about and changing their names. *MacUser* has plunged completely into desktop publishing. Layouts and designs are changing, and the art department has been working overtime (and to good effect too, if you ask me). Editor-in-chief Paul Somerset and art director Lisa Orsini are the chief architects behind most of these changes, and I think they’ve done a great job of keeping *MacUser* vibrant. I hope you agree with me.

This column is not immune to the changes sweeping the magazine. You may have noticed that the name Pinstripe Mac dropped off a few issues back. In this issue, an even more substantial change takes effect. For nearly three years, this column has been the home of Pinstripe Picks, a collection of minireviews designed to draw your attention to business-oriented products that you might otherwise overlook. Pinstripe Picks never had any pretense of being full-fledged reviews; they were intended as pointers that would enable you to determine whether you were interested enough in a product to look it up elsewhere in the magazine.

Over the past year, though, a disturbing trend developed. The Macintosh software market exploded with so many new products that some slipped through the cracks and never got formally reviewed. Business products selected as Pinstripe Picks might never get mentioned anywhere else in the magazine — making it impossible for readers to follow up and get more information.

Beginning with this issue, Pinstripe Picks has moved to *MacUser*’s StartUp section, tucked in with the other reviews. It’s been expanded too. It still consists of concise reviews, but they’re a little longer now, with more-specific information; they even have mouse ratings. The focus of Pinstripe Picks has also shifted slightly. Previously, I emphasized major products that were covered fairly well elsewhere and mentioned some smaller products as well — but all were products I wanted to make sure you knew about. With the greater business orientation of the “new” *MacUser*, major business-oriented products are going to be getting even more coverage. So now Pinstripe Picks will concentrate primarily on smaller products from smaller companies that might not receive coverage otherwise. That includes vertical applications, add-on products, and even an occasional book. And there will still be some picks of major products to let you know they’re covered elsewhere. One important criterion will remain in effect, though: They’ll all be products that you may be interested in if you use your Macintosh in business.

**Picking Pinstripe Picks**


You might wonder how I decide what products to pick. The hard part is just locating all the possible products to look at. I get lots of help from the *MacUser* staff, and I also do many of the same things you do to keep up with the ever-changing market.

I attend trade shows such as the Macworld Expos in San Francisco and Boston and Comdex in Las Vegas, scouring the aisles for new packages.

I read the industry press, although, like some of you, I recently had my subscription to *MacWEEK* canceled without warning when they increased their requirements for a free subscription. If you’re like me and no longer (or never did) qualify for a free subscription, *MacWEEK* does sell paid subscriptions for $75 a year. If you want to stay really current, it’s a good investment. You don’t have to keep requalifying, either; just send them a check every year, which is much easier.

*You might wonder how I decide what products to pick.*

*The hard part is just locating all the possible products to look at. I get a lot of help from the *MacUser* staff.*

**By Robert R. Wiggins**
ThunderScan is making page-one news with Macintosh owners. That's because it's the least expensive gray scale scanner available and it's also quite powerful.

Just snap ThunderScan into your ImageWriter and you're ready to scan a photo for your newsletter. A logo for your stationery. Or scan a chart to highlight a report. In fact, ThunderScan lets you import any image into HyperCard and all the Mac programs for desktop publishing and graphics.

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And now for the financial news. At just $249 suggested retail price from your dealer, ThunderScan will help you improve your next layout, without a big outlay.

Once the products have been located, I sort through them to find the ones I think you should know about. Some products are eliminated because they're just not good enough. Products that would earn only a one- or two-mouse rating are discarded. Some products turn out not to be business-oriented. These get sent on to Steve Bobker, whose Bobker's Dozen reviews also appear in the StartUp section of the magazine. New versions of existing products are not considered for review unless they include major changes or improvements. The products that survive this winnowing get a more thorough examination and go into the Pinstripe Pick Possibles file.

Once a month, I dip into the Possibles file and pull out the top products that I think will interest the greatest number of readers. If a major business product that has been reviewed elsewhere in the magazine deserves a special mention to draw it to your attention, that product will get a special Pinstripe Pick (without a mouse rating). And that's how Pinstripe Picks are selected.

So while it may seem like a lot of things have changed at MacUser, the changes in this column are actually pretty small. I'll still be giving you my opinions on issues that relate to the Macintosh and the business world, and I'll still be making Pinstripe Picks to keep you aware of business-oriented products. You'll just have to look in two places in the magazine to find me.
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"Best New Word Processor"
MacUser Magazine, May 1989

"Readers' Choice"
MACazine, January 1989

"Golden Gavel Award"

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WriteNow has all the power business users need, including: Mail merge; 100,000 word spelling dictionary; multiple columns; in-line graphics; format accelerators (style sheet equivalents); outline indenting, character and word counting, fixed and flexible line spacing, and much more. As important, WriteNow is the fastest word processor in the Mac world, whether you've got a small Mac 512KE or a loaded Mac IIcx.

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the Macs.

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A System to Fit. The Art Importer is a $179.95 wonder from Ahsys (Plano, Texas; [214] 424-4888), like a keyboard-macro program for custom PostScript-type characters. The Art Importer was initially called KeyMaster, under which name you may have seen it advertised (and reviewed in July '89). A conflict over that name led to the change.

Forget the name: The Art Importer is one useful program. You create your own letterforms, symbols, logos — whatever — in either Illustrator 88 or FreeHand as EPSF files or in MacDraw as PICT files and then read them into The Art Importer. There they're transformed into PostScript-font characters, which you can then insert into any document from the keyboard as you type.

That's right — The Art Importer creates "alphabets" of your own devising. Each character in those alphabets is a graphical symbol that you can insert into documents at the touch of a key and then select, scale, rotate, or treat as you would any other PostScript-font character. The Art Importer creates matching bit-mapped screen fonts too, so you can see on-screen what you're doing.

An obvious use for The Art Importer is to put product and corporate logos into an "alphabet" so they can be inserted with a keystroke rather than having to be imported as graphics files and then scaled to fit. I've put other odd little graphics into Art Importer fonts, such as end-of-story marks, or "end signs" — such as the Mac-style cursor arrow clicking in a Close box found at the end of every MacUser story.

You don't have to drop these characters into text, of course. The Art Importer can serve as a kind of one-keystroke macro program to insert art, which you can then scale to whatever size you wish. For example, I've digitized signatures, auto-traced them into FreeHand, saved them as EPSF files, and then converted them to PostScript characters with The Art Importer. Now I can drop those signatures into forms quickly and easily.

My second fave is Smart Art (reviewed in October '89), a $149.95 DA from Emerald City Software (Menlo Park, California; [415] 324-8080). It lets you apply the magic of PostScript manipulation to standard fonts — including the famous Adobe "hinted and locked" fonts.

Smart Art gives you a choice of 15 kinds of type manipulation, including simple rotations, curved text, drop-shadow and mirrored-shadow text, "movie title"-style receding text, and the ability to print characters in a screen of any density percentage. You pick the effect you want and specify the text, font, size, and other specs. Smart Art then writes and sends to your LaserWriter the PostScript code to achieve that effect — and tells the printer not to print the result but instead to send it to your Mac, where it's displayed on-screen. Every change requires a reimagining round-trip to the LaserWriter, but the benefits are worth the wait.

Some of Smart Art's effects are a bit far-out, but just its ability to print text in a screened pattern, rather than solid black, can liven up your documents.

FontSizer II, a $99.95 package from Speciality Software (Austin, Texas; [512] 327-8608), is the third item in this toolkit. It creates precise bit-mapped screen fonts that give you high legibility, not a mass of jaggies, when you're working with large or unusual sizes of fonts on-screen. (An earlier version was reviewed in April '89.) FontSizer also uses the LaserWriter's computer to create these images and ship them back to the Mac.

Type-Tools Trilogy

On IBM PCs and clones, manipulating type usually means such exciting things as changing a word to boldface or italic — or maybe, in a burst of creativity, using large and small capital letters in the same word. Mac users, of course, are accustomed to far more attractive documents and to far superior tools for building those documents — tools that are commonplace in the Mac universe. Among these are "real" typefaces with a typset look.

I'm going to wrap up this series of columns on new typefaces and type-related programs that began in October '89 with a look at three sensational programs for managing and manipulating PostScript typefaces on the Mac and a note on a utility you probably already have.

The Art Importer, a $179.95 wonder from Ahsys (Plano, Texas; [214] 424-4888), is like a keyboard-macro program for custom PostScript-type characters. The Art Importer was initially called KeyMaster, under which name you may have seen it advertised (and reviewed in July '89). A conflict over that name led to the change.

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It's time-consuming to create, say, a bit-mapped screen font of 92-point Eras Ultra, and the resulting bit maps take up a lot of hard disk space. But if you like to use 11-point type for correspondence or 67-point Antique Olive for the header in a stationary form — and you're tired of looking at an ugly screen — FontSizer II is the answer.

Finally, here's an extra type-management utility you probably already own. One of the joys of Mac applications running in tandem with PostScript printers is that those applications automatically download the fonts you've specified for each document. It's painless . . . and endless.

For example, waiting for PageMaker to send the seven fonts you've used in your four-page brochure to your LaserWriter is tedious enough. But worse by far is what happens when you're designing that printed piece.

If you work the same way most designers do, you use the laser printer for many interim proofing jobs, to see how a typeface works. Because these auto-downloaded fonts are handled by the LaserWriter as temporary fonts, they're flushed from the printer's memory after every print job. So, if you repeatedly print sample pages while you're developing a design, you have to wait while the whole font set is downloaded — again and again and again.

There's an easy way around that. Once you think you know the fonts you'll be using, Adobe's Font Downloader utility, which comes free with every Adobe font package, can download those fonts to the printer as "permanent" fonts. It's easy (if not especially quick), and you'll save an enormous amount of time when you print sample pages.

When you send those pages to the printer, make sure you remember to tell your application program not to download the fonts. In PageMaker, for example, hold down the Option key while you click on the OK button in the Print dialog box, and then click the Download PostScript Fonts box off.

Together with the programs I discussed last month, these three packages and one bundled utility program make up a powerful tool kit that can save you time and deliver better typographical results on your Mac.
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MAXIMUM PERFORMANCE FOR THE MAC II SERIES
Orange Micro’s Mac286™ 2.1 brings the power of an IBM® AT to your Macintosh II™, Multi-tasking of MS-DOS and Macintosh applications is now possible, with the help of on-board processing and RAM. The Mac286 rates an 8.2 on the Norton Computing Index. That’s 6 times faster than any software based solution. Only Mac286 matches the best DOS performance with the best Mac performance.

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Mac286 and Mac86 don’t just add DOS to your Mac, they blend the two environments to maximize your productivity. Mac286 and Mac86 are fully compatible with the TOPS™ network. With an optional utility, you have full use of Apple’s SuperDrive™ for DOS files and applications. Copy and Paste graphics and text from MS-DOS programs right into MacWrite™, PageMaker™, or other popular Mac software. Transport files between Mac and MS-DOS formats in two quick steps with Mac286. Whatever your MS-DOS application, Mac86 or Mac286 provide the performance and compatibility you need.

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ACCPAC Bedford Simply Accounting is a complete Mac accounting program with fully integrated G/L, A/R, A/P, Payroll, Inventory, and Job Costing modules. It can handle up to 1000 ledger accounts, vendors, customers, employees, and projects (that's 1000 each), and 2000 inventory items. Infoworld gave it a 7.9 rating and said that it "doesn't require a CPA designation to understand it. It's accounting for the rest of us."

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4977 ACCPAC Bedford Simply Accounting 1.5E .................. $219.

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Take stock of your stocks and everything else in your financial picture with Andrew Tobias' Managing Your Money. Use it to manage your budget and checkbook, calculate net worth, track investments, plan for retirement or college, and to analyze mortgage refinancing, IRA options, and future taxes. The latest version includes easier data entry, faster sorting and reports, improved menus, and all the new 1989 tax laws.

MECA … 60 day MBG
2796 Managing Your Money 3.0 $124.

$124

$289 3-Pak

One free with 3-Pak.

Buy the Rags to Riches 3-Pak by 1/31/90 and you'll also get your choice of either Inventory Control or Pro Billing absolutely free. The highly acclaimed 3-Pak includes the most important accounting components in one integrated system: Ledger for tracking account financials; Payables for tracking expenses, printing checks, etc.; and Receivables for managing invoices, statements, and payments.

Chang Labs … 60 day MBG
1622 Rags to Riches 3-Pak 3.1 w/free Pro Billing or Inventory. special $289.

Call 1-800/334-4444 to order.
Overcome the language barrier!

$319

Forget complex syntax. New Double Helix Version 3.0 lets you build any database application fast, because there's no programming to slow you down. It's all done visually. This new version lets you use buttons, macros, and even scanned images to develop applications that combine a friendly HyperCard-like interface with the power of a relational database. Plus, it's Mac/ VAX multi-user compatible. Special price through 1/31/90!

Odesta ... 30 day MBG
5621 Double Helix 3.0, special $319.

A brief history of Timeslips.

In the beginning, all was darkness. Then time started ticking and, before long, people started tracking what they were doing and how long it took them to do it. Well, things just kept on getting more complicated until Timeslips III was created. This highly-efficient time and billing program helps people turn time into money by making it easy to keep accurate track of every hour. You can use the DA from within any program to track time and expenses on up to 250 activities for up to 250 people, working on 128 projects per client, with a maximum of 2,000 clients. Then use the application to generate in-depth reports, including Billing History Report, Client Billing Worksheet, Client Fund Report, and custom work-in-progress or timesheet reports. You can customize bills by detailing services by activity, expense, or project, and incorporating flat fees and previous balances. And then print your bills in any font with imported graphics. MacUser gave Timeslips an Eddy award in 1989, and Macworld said it's "flexible enough to work well with many different organizations and methods of billing." As an added incentive, you'll receive a free upgrade to Version 2.0 (due early 1990) and a free Tempo macro disk for Timeslips. Offer good through 1/31/90.

North Edge Software
30 day MBG
2986 Timeslips III 1.1 ... .. ... ... $169.

The Fox enhances its base.

$469

The original FoxBASE +/iMac was named InfoWorld Product of the Year, MacUser Editor's Choice, and was a MacWEEK Top 10 product. Version 2.0 is faster than ever, and packed with new features. FoxReport creates custom reports and labels in seconds. Place objects representing fields, lines, boxes, text objects, and graphics where you want them—FoxReport does the rest. Enhanced XCMD/XFCN Support gives you access to up to 16 XCMDs and XFCNs written in a variety of programming languages. Most HyperCard XCMDs and XFCNs can be used without changes. Plus, you get an automatic application generator, complete dBASE compatibility, integrated graphics, and much, much more. The Network version is compatible with AppleShare, Novell, 3Com, and FoxBASE +/LAN. Multi-User and Runtime versions provide unlimited distribution of single- and multi-user applications.

Fox Software ... 30 day MBG
5572 FoxBASE II/Mac 2.0 . . . . . $295.
4580 FoxBASE +/Mac Runtime 2.0 . . .. 179.
4844 FoxBASE +/Multi-User 2.0 .. . . . . 399.
5579 FoxBASE +/Multi-User Runtime . . . . . . . . . . . . . . . . . . . . 295.

No Credit Card Charge Till We Ship.
The new way to Excel.

Version 2.2 of Microsoft Excel gives you full access to the 8 megabytes in high-powered Macs. That's room enough for remarkably large spreadsheets (and their graphics), documenting your company's financial condition for the past two centuries, and projecting into the next one (which is just around the corner). And, thanks to advanced intelligent recalc, your calculations will be 40% faster. This new Excel is also a visual delight: it lets you select up to 256 fonts per sheet, including up to six styles and eight colors, change row height, add shading, insert notes, and otherwise turn some rather ordinary numbers into some rather extraordinarily compelling visuals. And remember, all these features have been added to what was already the best selling spreadsheet for the Mac. Which could put a smile on the face of the most taciturn number cruncher.

Microsoft ... 30 day MBG
5454 The Microsoft Office (Includes Excel, Word, PowerPoint, and Mail) ........ special $499.

Microsoft ... 30 day MBG
2865 Excel 2.2 ............... $249.

$249

The singular solution for any business.

Wait! We take it back! Don't buy Excel! Buy The Microsoft Office. It's the budget-balancing way to buy all the Microsoft programs your office needs. It includes Excel, Word, PowerPoint, and Mail in a bundle that's priced significantly lower than all four combined. You'll be working with four full-powered and totally integrated applications, thereby transforming your very own office into a lean mean productivity machine. Look out!

Microsoft ... 30 day MBG
5454 The Microsoft Office ............. special $499.

Microsoft ... 30 day MBG
2884 Works 2.0 ............... $185.

$185

Okay, so you're sitting there thinking that all this power is impressive, but what you really need is one straightforward way to crunch some numbers, manage some lists, write some presentable proposals, and get on-line once in a while. Sounds like you need Microsoft Works—it gives you all the tools you need to run a small business or even a rather complex personal life, by combining word processing, spreadsheet, database, drawing, and communications into one powerfully integrated program. So you can keep track of your clients, create newsletters, do your projections, and log on to on-line services, all by learning just one program. Plus, the new drawing module (with page layout) lets you add pizzazz to all of the above. Works also comes with an animated training program written in familiar HyperCard format, and if you ever get confused, you can take advantage of on-line help and unlimited phone support.

Microsoft ... 30 day MBG
2884 Works 2.0 ............... $185.

$185

Call 1-800/334-4444 to order.
**Fast C.A.T.**

C.A.T. is the lightning-fast relational database that's perfect for managing all your contacts, facts, figures, events, and projects. Plus, it gives you letter writing and mail merge capabilities you need to stay current with all these Contacts and Activities in a Time-ly manner. Enter and look for information based on a contact person, activity (meeting, letter, phone call, etc.), and/or when it happened. It will constantly update your files, and generate reminders, schedules, memos, etc.

$229

Chang Labs ... 60 day MBG
1611 C.A.T. 2.0 ............. $229.

**Statistical winners.**

With StatView SE + Graphics or StatView II, you can perform sophisticated statistical analyses and present the results—all in one package! In addition to a wide array of statistical functions, StatView produces ten different types of graphs that are easily customized within the program. It's the only statistics software to be awarded 5 Mice by MacUser.

$145

Top of the charts.

This Mac power tool lets you import data, analyze it, and generate scientific and business graphics. KaleidaGraph is extremely fast, and features built-in graphing tools, curve-fitting functions, and user-defined macros. It has 14 types of graphical structures, lets you transform data mathematically, and create high resolution output. Pull-down and pop-up menus make selections and modifications fast and straightforward.

Synergy ... 30 day MBG
3129 KaleidaGraph 2.0 ........ $145.

**Database omnibus.**

Omnis 5 is a comprehensive program for developing business data management applications. This multi-user, multi-platform database for the Mac also features SQL connectivity to a VAX or mainframe. It supports full color graphics for "Mac-like" applications, and its HyperCard access allows stacks to read and write to Omnis 5 data files in both single-user and multi-user installations.

$349

Synergy ... 30 day MBG
4481 StatView II 1.0 ........ $349.

**MODEL WINNERS.**

From the developers of award-winning StatView statistical software comes SuperANOVA, a revolutionary new full-featured general linear modeling program designed specifically for the Macintosh. Ideal for researchers and engineers, SuperANOVA lets you easily perform ANOVA, ANCOVA, MANOVA, MANCOVA, and regression on your data.

$439

Abacus Concepts ... 60 day MBG

**30/60 Day Money-Back Guarantee.**
SuperCard, a HyperCard-compatible "software toolkit," lets you create simple stocks, full-color multimedia presentations, and standalone applications. It provides color Paint and Draw, animation, custom menus, full-screen windows, and the ability to open multiple stacks. SuperPaint combines Paint and Draw capabilities in one program. It features AutoTrace to convert Paint graphics into Draw objects, an Airbrush, and a Freehand tool to sketch Bezier curves.

SuperPaint... $125
Silicon Beach... 60 day MBG
3506 SuperPaint 2.0... $125.
3100 SuperCard 1.0... 125.

Power in the Flats.
Just because all you need is a flat-file database doesn't mean that all you can do is manage and sort lists. Panorama gives you extensive spreadsheet-like, semi-relational analysis features for finding what that data's trying to tell you. Fast? Its Clairvoyance feature will complete common entries for you, and you can easily record your own macros. It also features extensive mail merge, outline capabilities, and a full palette of form design tools.

Panorama... 60 day MBG
4582 Panorama 1.1.1... $199.

Dream It. Draw It.
IDD, creator of MacDraft, now also offers a powerful precision drawing program for professional scaled drawings, illustrations, presentations, and graphics. Dreams features zoom, rotation, layers, dimensioning, symbol libraries, an array of drawing tools, and many advanced illustration tools. You can merge shapes together, cut edges of objects using other objects as templates...even glue lines and curves together to form unique shapes to be filled with colors or patterns. If you can dream it, you can draw it.

Innovative Data Design
4707 Dreams 1.0... special $249.

Precision Drawing.
Enter the world of precision drawing and drafting with the two-time Macworld World Class award-winning program, MacDraft. Its precise, fast, and easy-to-use drawing tools are ideal for creating custom graphics, business charts, forms, illustrations, technical drawings, and schematic designs. You can draw both geometric and freehand shapes, and then rotate, zoom, scale, fill with custom patterns, dimension, or even calculate their area.

Innovative Data Design
2417 MacDraft 1.2B... special $135.

Call 1-800/334-4444 to order.
You can answer all your typeface needs with MacFontware Typeface Packages, no matter what Mac output device you use, including Apple Laserwriter IIN, and IINX, the Laserwriter IIISC, and any ImageWriter. The fonts in each package are scalable to any size (within application or device limitations) by PostScript PDL devices. They also provide bitmap fonts for QuickDraw printers, and true WYSIWYG fonts in 20 sizes from 9 to 96 point on your screen. So it's easy to proof type accurately in bitmap format before outputting to a laser printer or typesetter. The two Headline font packages include four typefaces each, and the text faces come complete with roman, italic, bold, and bold italic. MacFontware fonts are compatible with virtually all Mac applications.

**Bitstream**
- 5968 Baskerville ............ $89.
- 5969 Bitstream Charter .... $89.
- 5970 Futura Medium ......... $89.
- 5973 ITC Galliard ......... $89.
- 5974 ITC Garamond ......... $89.
- 5975 ITC Souvenir ........ $89.
- 5976 Letter Gothic ........ $89.
- 5977 News Gothic ........ $89.
- 5971 Headlines I (Bitstream Cooper Black, Broadway, Cloister Black, University Roman) .... $89.
- 5972 Headlines II (Brush Script, Libro Black, Haba, Windsor) .... $89.

**Non-Latin Scripts**

**Linguist's Software** 60 day MBG
- 2636 Konji, 2631 Hebrew, 2637 Korean, 5759 laserArabic & Farsi, 2627 Cyrillic, 2630 Greek ..... special each $49.
- 2625 Chinese, 2641 LaserHebrew, 2640 LaserGreek, 2639 LaserFrench/German/Spanish .. special each $69.
- 2647 Greek, Hebrew & Phonetics, 2642 LaserKorean, special each $99.
- 2630 LaserCyrillic (includes Russian, Ukrainian, Serbian) .... special $99.

**SuperMac Software** 60 day MBG
- 3380 PixelPaint 2.0 ........ $225.
- 3865 PixelPaint Professional 1.0 ....... $395.

**DeltaPoint**
- 6095 DeltaGraph ........... $99.

**PixelPaint**
- 5428 NuPaint 1.0.4 .... special $79.

**No Freight on Backorders.**
Very decent exposure.

Give yourself total creative screen control with Exposure, the System 6.0- and MultiFinder-compatible CDEV screen graphics utility with screen capture, painting tools and fonts, and the ability to format color and gray scale images. To keep track of all those graphics (and text) try Database, the full-featured desk-accessory database that MacWEEK called "one of those rare products we can recommend to all regular Mac users."

GIVE YOUR INTERFACE CHARACTER.

Preferred Publishers ... 30 day MBG
5751 Exposure 1.1 ............... $54.
4780 Database 1.12 ............ 69.

$229

Are your applications long on power but short on personality? Give them their very own talking on-screen character (agent) with interFACE. This sophisticated animation toolkit lets you develop full-color talking agents of various sizes and proportions (each with up to 120 total images). These agents are an excellent interface for business presentations, training programs, informational kiosks, and more. And, interFACE allows for the importation of color into HyperCard.

Bright Star Technology
6093 interFACE 1.0 ... special $229.

CLIP-ART MAPS.

$65

Add a new dimension to your proposals, periodicals, and presentations with MacAtlas. You get detailed clip-art maps of the entire world, world regions by country, USA by state, and all 50 states by county. MacAtlas maps are ready to customize with fill patterns, drop shadows, text, and more. Available in Paint, Draw (PICT), and Illustrator/Freehand (EPSF) format. Macworld gives it five stars.

MicroMaps ... 30 day MBG
5516 MacAtlas (MacPaint) 2.0 ... $45.
5514 MacAtlas EPSF
(PostScript) 1.0 ................ 105.
5513 MacAtlas Professional
(PICT) 1.0 .................... 105.


DeskPaint (with DeskDraw) gives you full graphic editing power from within any application. It can create, load, edit, or save any TIFF, MacPaint, or PICT image up to 4000 dots per inch. You get a complete set of bitmap graphic tools including AutoTrace, air brush, smoothing, scaling, halftone control, and special effects. Plus there's support for full LaserWriter resolution and huge poster-size printing on an ImageWriter.

Zedcor ... 60 day MBG
3986 DeskPaint & DeskDraw 2.01 $65.

You can be very persuasive.

For flip charts, overhead transparencies, slides, and audience handouts PowerPoint gives you the power to be your most persuasive. It makes it easy to develop coherent presentation formats (fonts, borders, titles, etc.) with text and graphics imported from a wide range of programs. You can visually rearrange slides, and create hard copy reproductions for memorable handouts. You also get word processing functions, on-screen slide show rehearsal, support for all 16.8 million colors on the Mac II, and support for many B&W and color printers and 35mm recorders. Plus, PowerPoint offers an easy interface to slide-production service centers—you can even send color presentations to Genigraphics via disk or modem, using the new Genigraphics Driver and Graphicslink.

Microsoft ... 30 day MBG
2878 PowerPoint 2.01 ........ $249.

Call 1-800/334-4444 to order.
Give yourself a FreeHand to develop high-impact illustrations and typography.

Combine Aldus' super powerful drawing program with their best-selling desktop publisher. And in one fell swoop you'll transform your Mac into a fully equipped design studio, ready to create sophisticated newsletters, brochures, ads, flyers, package designs, and anything else you can envision. Aldus FreeHand gives you the illustration power. You see your changes on the monitor while you work, so it's easy to refine a shape or apply Pantone colors while keeping the big picture in focus. It also gives you total typographic control for curving text on a path, rotating or stretching type, mixing sizes, fonts, and colors, and, in general, getting words exactly the way you want them before outputting to an expensive typesetter.

Aldus ... 30 day MBG
1330 FreeHand 2.02 . . . . . $345.

$345

Then Make your Pages come alive.

Once you've developed your graphics and display type, just place them into PageMaker to put your piece together. The two programs are completely integrated, so you can immediately start fine tuning the letter kerning and word wraps, add rules and spot color, and experiment with a multitude of ways of combining your text and graphics. You'll soon discover why this program has single-handedly enabled thousands of designers to make the transition from drawing board to Mac as natural as the one from waterbed to futon. When you give PageMaker a FreeHand you get a potent combination of advanced illustration, design, typography, and page layout capabilities that will give you a definite creative edge.

Aldus ... 30 day MBG
1331 PageMaker 3.02 . . . . . $385.
6149 PageMaker Color Extension 149.

$385

30/60 Day Money-Back Guarantee.
And pour on the persuasion.

Whether you have weeks or just minutes to create your next presentation, Aldus Persuasion will make it easy to assemble the materials, including totally professional black and white overheads, 35mm slides (either with a desktop film recorder, or via a slide bureau), and audience handouts. Thanks to Persuasion's AutoTemplate technology, it's as simple as selecting a design, and typing into the text outline—your ideas are transformed into a professional-quality presentation automatically. And, for customizing your work further, just use the built in word processing, drawing, and charting tools. When you're done, you can preview, or even show your entire presentation on screen. The new Version 2.0 can import PowerPoint and other files saved in Scrapbook format, and features 12 additional AutoTemplate designs (for a total of 36), automatic resizing, context-sensitive Help, and compatibility with Apple's new 32-bit color standard. Plus, you can now type notes directly on your outline and have them appear on your speaker notes next to a thumbnail image of the slide. InfoWorld said, "This may be the product that does for desktop presentations what PageMaker did for desktop publishing."

Aldus ... 30 day MBG
4751 Persuasion 2.0 ........ $339.

Call 1-800/334-4444 to order.

Springboard Publisher II can give any word processing document more pizzazz. With this easy desktop publisher you just point and click to add page layout, graphics, and special effects. Six SmartArt PostScript effects let you rotate text, add shadow or distance, make text arc or fade, or stretch text to fill the page. Plus, you get a coupon for 500 pieces of clip art or 36 newsletter templates free! Don't settle for ordinary pages. Start desktop publishing today.

Springboard ... 30 day MBG
4500 Publisher II ....... special $89.

LOOK GOOD. FAST.

Create a dazzling array of presentations, demos, mini applications, and more, quickly and easily with HOT-SPOT, by combining standard graphic and text files. No programming knowledge is necessary. FLEXFORM Business Templates is a business form- and data-management system that comes with professionally-designed business forms. Volume I includes A/R and Inventory; Volume II has Administration, Purchasing, and Personnel.

Antic Software ... 30 day MBG
6100 HOT-SPOT .......... $42.
5756 FLEXFORM Business Templates I ....... 49.
5760 FLEXFORM Business Templates II ....... 49.

Get into production.

The MacRecorder Sound System turns your Mac into a complete audio workshop with a built-in microphone, jacks for external lines, multi-channel mixer, mono or stereo recording options, and special effects. It comes with two applications, HyperSound and SoundEdit, which let you record directly into a HyperCard stack and make your own stacks that play and record sound.

Farallon Computing ... 60 day MBG
2199 MacRecorder 2.0 .... $162.

Call 1-800/334-4444 to order.

And pour on the persuasion.

Give your words a facelift.

$89

Springboard Publisher II can give any word processing document more pizzazz. With this easy desktop publisher you just point and click to add page layout, graphics, and special effects. Six SmartArt PostScript effects let you rotate text, add shadow or distance, make text arc or fade, or stretch text to fill the page. Plus, you get a coupon for 500 pieces of clip art or 36 newsletter templates free! Don't settle for ordinary pages. Start desktop publishing today.

Springboard ... 30 day MBG
4500 Publisher II ....... special $89.

$162

LOOK GOOD. FAST.

Create a dazzling array of presentations, demos, mini applications, and more, quickly and easily with HOT-SPOT, by combining standard graphic and text files. No programming knowledge is necessary. FLEXFORM Business Templates is a business form- and data-management system that comes with professionally-designed business forms. Volume I includes A/R and Inventory; Volume II has Administration, Purchasing, and Personnel.

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Farallon Computing ... 60 day MBG
2199 MacRecorder 2.0 .... $162.

Call 1-800/334-4444 to order.
Smooth those rough edges.

Adobe outline fonts. It installs in a couple of clicks and then works in any application. Adobe Type Manager comes with 13 popular fonts including Times, Helvetica, Courier, and Symbol. And, for even more variety, there's the Adobe Plus Pack, giving you the same 22 outline fonts that come with Apple's IINT and IINTX LaserWriters. Only now you can enjoy them on your ImageWriter. By the way, for a limited time, Adobe Illustrator 88 comes bundled with a free copy of Adobe Type Manager.

Adobe Systems
5750 Adobe Type Manager . . . . $56.
6053 Adobe Plus Pack . . . . . . 109.
6156 Adobe ATM/Plus Pack Bundle .162.
1137 Illustrator 88 . . . . . . . . 279.

Adobe outline fonts. It installs in a couple of clicks and then works in any application. Adobe Type Manager comes with 13 popular fonts including Times, Helvetica, Courier, and Symbol. And, for even more variety, there's the Adobe Plus Pack, giving you the same 22 outline fonts that come with Apple's IINT and IINTX LaserWriters. Only now you can enjoy them on your ImageWriter. By the way, for a limited time, Adobe Illustrator 88 comes bundled with a free copy of Adobe Type Manager.

Adobe Systems
5750 Adobe Type Manager . . . . $56.
6053 Adobe Plus Pack . . . . . . 109.
6156 Adobe ATM/Plus Pack Bundle .162.
1137 Illustrator 88 . . . . . . . . 279.

$49

SCRIPT IMPROVEMENTS.
Enhance your HyperCard scripting with the ScriptEdit DA. It lets you edit multiple scripts on screen simultaneously, even from different stacks. It also features global search and replace functions, a script compare feature, separate undo commands for each editing window, and pop-up HyperTalk command menus. You can access most HyperCard menus while editing, and customize the way you use the editor with the included XCMD.

Somak Software ... 30 day MBG
5897 ScriptEdit 1.0 . . . . . . . . $49.

$279

ALL-IN-ONE PUBLISHER.
Publish-It is the fully-integrated, completely self-contained Mac desktop publishing system that gives you the text, graphic, and page-layout power you need to create high-impact documents even if you have no previous graphic experience. Special features include text rotation and patterned text, and the ability to edit scanned images after they are placed into your documents. It comes with 70 professional sample layouts so you can get started immediately.

Timeworks ... 30 day MBG
5908 Publish-It! 1.0 . . . . . . . . $225.

$95

Beyond HyperCard.
Develop powerful, full-color, HyperCard applications with PLUS. You work in a familiar HyperCard-like environment with direct access to existing stacks. There you can create cards up to 32,000 x 32,000 pixels, with buttons of any shape, a multitude of colors (you can even import color graphics), database fields where you can pre-format data, word processing fields, and more. Buy at a special price through 1/31/90, and get a free upgrade to the next version.

Olduvai
5446 PLUS 1.11 . . . . special $95.

Order by Fax 1-603/446-7791.
Enhance your HyperCard productivity with these two collections: HyperTools #1 (16 tools for stack design) and HyperTools #2 (16 tools for stack enhancements). They let you perform many new functions, from modifying buttons to adding field validation, and they create their own scripts automatically. Also, try StackCleaner—a collection of stack management utilities for HyperCard.

$129

Develop yourself!

Packing 32-bit architecture, Smalltalk/V Mac has the memory and capacity to let you create full-blown applications at affordable prices. And its object-oriented development environment is ideal for letting the creative juices flow. It works under MultiFinder and gives you complete access to the Mac Toolbox, integration with other languages, a push-button source-level debugger, and portability to 8088, 80286, and 80386 computers.

Microsoft ... 30 day MBG
4471 QuickBASIC 1.0 ........ $65.

$65

Get with the program.

Here’s the fast direct route to your own programs. With Microsoft QuickBASIC you can write as super serious (or super-silly-ous) a program as you like, complete with music and graphics. The compiler and interpreter are all in one program so you can compile and execute at any time with a simple double click.

$47

FOR HYPERCARD HYPERNEEDED.

HyperDA is the DA that gives you access to HyperCard stacks anytime (complete with buttons and fields) from within any application or the Finder. It lets you print and phone dial, search stacks, and copy to the clipboard. Plus you can change your stack screen to an expandable, scrollable window for easy access to your background application. New Version 1.2 lets you add or modify text in existing text fields, and save to the original stacks independently of HyperCard. It works on any Mac from the 512K up.

Symmetry ... 30 day MBG
3318 HyperDA 1.2 .... special $47.
The ultimate prototyper, simulator, and code generator.

With Prototyper you can program your interface as fast as you can draw it. As Dan Shafer, author of HyperTalk Programming, put it, this completely integrated interface builder and code generator "makes the process of building a Mac application as easy as it's likely to get." Just click and drag items from a palette to give your program all the buttons, icons, pictures, text areas, check boxes, lists, rectangles, pop-menus, bells and whistles you want. You can run simulations anytime during the process. Then, once you're satisfied, Prototyper will generate all the C or Pascal source code and resources automatically. Your interface is complete. It literally couldn't be easier.

$169

THINKING SPEED? THINK C.

Why is THINK C used to create heavy-duty programs like FoxBASE+/Mac, PageMaker, and Illustrator? Speed. And more speed. This ultra-fast development system includes a multi-window text editor, compiler, linker, Mac-style source level debugger, and more. It's a programming powerhouse designed for the pros.

$149

It figures.

Prepare for exams with learning programs from the inventors of True BASIC. Let Mac do the calculations and graphing while you master the concepts. Algebra, Pre-Calculus, and Calculus are each available with a valuable workbook. Algebraic Proposer handles word problems in math, the sciences, economics, even real life!

True BASIC, Inc.
3571 Algebra plus workbook . . . $39.
3580 Pre-Calculus plus workbook . . . 39.
3575 Calculus plus workbook . . . . 39.
6110 Algebraic Proposer . . . . . . 45.

Beacon Technology ... 30 day MBG
3420 THINK C 4.0 .......... $149.

MAC REVIVAL.

Combine one of the world's oldest books with some of the world's newest technology and you get HyperBible. This computerized version of the Thompson Chain Reference Bible includes all its features and provides an easy link to any word processor. Use it to find verses, trace topical themes, study different characters, view an electronic atlas, study archaeological findings of Biblical sites, and more. It's 15 megabytes of timeless information.

$145

No Credit Card Charge Til We Ship.
MEGABYTES. NOT MEGABUCKS.

$195

**Virtual 2.0** from Connectix. Now you can afford more memory than you thought your Mac could have. This simple software package turns your hard disk into as much as 14 megabytes of internal memory. The Mac II version includes a PMMU chip—to make your Mac II System-7-ready today.

<table>
<thead>
<tr>
<th>Connectix</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>6123 Virtual 2.0 (for SE/30, Iicx, Ilx, and IicI)</td>
<td>$125.</td>
</tr>
<tr>
<td>6122 Virtual 2.0 (for Mac II, includes PMMU)</td>
<td>195.</td>
</tr>
</tbody>
</table>

To your Mac's health.

**SUM II** is your hard drive magician: it recovers files and crashed hard disks, and even improves disk performance. Its Volume and File Recovery programs use three superior algorithms for triple file recovery power. SUM's friend **SAM** protects your system from viruses, even monitoring peculiar activities that may indicate a virus, and scanning floppies to prevent a virus from infecting your system.

<table>
<thead>
<tr>
<th>Symantec</th>
<th>Price</th>
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<tbody>
<tr>
<td>5176 Symantec AntiVirus for Mac 1.1 (SAM)</td>
<td>$63.</td>
</tr>
<tr>
<td>5724 Symantec Utilities for Mac II (SUM II)</td>
<td>95.</td>
</tr>
</tbody>
</table>

Look ma, no program!

**Can Opener** lets you search for and open virtually any file (on a disk, hard drive or network) to check out its text, pictures, even sounds. Without the application that created it, plus, it lets you copy material into your current application, or archive it for future use.

<table>
<thead>
<tr>
<th>Abbott Systems</th>
<th>Price</th>
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<tbody>
<tr>
<td>5236 Can Opener 1.1</td>
<td>$65.</td>
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</table>

HOLISTIC MEDICINE FOR MAC.

The new version of **Virex** goes beyond the mere file repair that earned it 4½ mice from MacUser. Now, it actually monitors your system continuously and repairs infected files before they have the chance to spread their evil corruption through your helpless bits and bytes. There's also a new diagnostic tool for detecting previously unknown viruses. And the annual update service lets registered users get protection for new viruses within days of the first reports.

<table>
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<tr>
<th>HJC Software</th>
<th>Price</th>
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<tbody>
<tr>
<td>4803 Virex 2.1</td>
<td>$55.</td>
</tr>
<tr>
<td>5885 Virex 2.1 (10 Pak)</td>
<td>349.</td>
</tr>
</tbody>
</table>

WHAT'S APP, DOC?

**HandOff** eliminates the dreaded "Application Not Found!" message. No more searching for applications to open the documents that you borrow from your friends and co-workers. HandOff will let you assign their documents to your applications so you can open their files directly from the Finder. HandOff also lets you redirect files to any application based on the filename extension. Jean-Louis Gossee calls it "a nice, unobtrusive and very much needed extension to Macintosh."

<table>
<thead>
<tr>
<th>Software Innovations</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5869 HandOff</td>
<td>special $29.</td>
</tr>
</tbody>
</table>

Make it big. Play it safe.

Get big screen vision on a small screen with **Stepping Out II**. It lets you scroll across pages in a mouse click, zooming in to work on details, or zooming out for the big picture, via 16 levels of magnification and three levels of reduction. And to prevent screen burn-out, use **After Dark**. Choose from 12 wild images, including flashing lightning bolts, streaking meteors, and crawling worms, or create your own.

<table>
<thead>
<tr>
<th>Berkeley Systems</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>5737 After Dark 1.0</td>
<td>special $22.</td>
</tr>
<tr>
<td>1541 Stepping Out II 2.01</td>
<td>special 45.</td>
</tr>
</tbody>
</table>

Call 1-800/334-4444 to order.
POWER TWINS.

MacCalc is the easy-to-learn, easy-to-use, super-fast spreadsheet that's earned a MacUser Editor's Choice Award, and been called a "must-have" by MACazine. It features extensive formatting, and support for .WKS files, for compatibility with 1-2-3 and Excel. And, through 1/31/90, we’re bundling it at a special price with Bravo’s SPAMM, the automatic INIT utility that can double the speed of calculations for your graphics, CAD/CAM, statistics, database work, and virtually all arithmetic operations on your Mac Plus or SE.

Bravo ... 30 day MBG
5404 SPAMM 1.1 .......... $48.
1539 MacCalc 1.2D .......... 79.
6084 MacCalc/SPAMM .. special 115.

HOLY MACRO! FREE TEMPLATE!

Tempo II makes simply powerful macros, either from existing text and graphics or by recording unlimited keystrokes and clicks. An amazing time-saver, it can automate any routine, with pauses, conditional branch and repeats, “smart” features like window- or screen-relative recording, and “play-by-name” simplicity. Plus, through 1/31/90, you’ll receive a free keyboard template ($9.95 retail) to keep track of your macros.

TRUE ARCHIVING.

$152

With Retrospect, you can put inactive but still useful files where they belong: in an archive. Free valuable hard disk space by moving files into the archive—you can access them later via a catalog on your hard disk. Or copy files into the archive for backup. It supports disks, tapes, optical cartridges, file server volumes, etc.—if it can hold data, Retrospect can archive or backup to it. And it includes file compression and a calendar for unattended operation.

Dantz Development ... 30 day MBG
5255 Retrospect 1.1 .......... $152.

No Surcharge on Credit Card.
$79

**LABEL TEMPLATES. AT LAST.**

Formatting a document for label printing can make anyone yearn for a nice old-fashioned typewriter—unless, of course you have StickyBusiness, the program that gives you **preformatted templates** for labels, cards, and tags from Avery, MOORE, Rolodex, Inmac, NEBS, UPS, Dennison, and Williams & Macias. It includes tools for creating your own imaginative designs, and you can import graphics from other files. Plus, it’s compatible with text files from all leading applications.

Williams & Macias ... **30 day MBG**
4976 StickyBusiness 1.0.7 special $79.

**NO MORE ACHING BACKUPS.**

Anyone can trash a file or a disk. Which means that everyone needs a backup program that anyone can use. With Redux, two clicks (back) you up. For custom backups, just tell Redux what to do in simple English (!) commands. Need to perform a complex backup regularly (e.g. all spreadsheets in certain folders over 20K)? Redux will reduce it to two clicks so even a novice can do it.

Microseeds Publishing **60 day MBG**
2913 Redux 1.5 ........ special $46.

$35

**ICOM Simulations**
4084 On Cue 1.3 ............... $35.

On Cue whisks you quickly and smoothly from program to program without accessing the Finder! It lets you travel between documents and applications in record-breaking speed. No more waiting for files to open and close, or getting lost in the desktop maze. When running MultiFinder, On Cue allows you to switch applications simply by pressing the command-option combination. Compatible with all Macs from 512KE on up.

$39

**PictureBook** is a powerful Finder-like DA that organizes your clippings into multiple scrapbooks. You can name and annotate each clipping, track creator name and date, move clippings between multiple windows by simply clicking and dragging, and print scrapbook catalogs. Plus, the integrated editor lets you precisely crop or re-size. PictureBook can directly read PICT, MacPaint, and EPS files, converting all EPS to PICT. Rated five mice by MacUser.

Loop Software ... **30 day MBG**
5442 PictureBook ............... $39.

$107

**MacSafe II** lets you secure your documents and applications inside password-protected folder-like safes on a hard disk, diskette, or network. The latest version features exclusive LightningCrypt encryption, Control Panel access, and the ability to put multiple files into a safe at once. For nighttime protection put The NightWatch on duty. Your hard disk will be locked up until you turn it back on with the correct password. And only you have access to the override function (in case of forgotten passwords). When you leave your desk and want to keep anyone else from seeing your work or accessing your network connections, QuickLock darkens your screen, displaying only a moving image that protects your screen from burn-in, while allowing background processing. To regain access to your screen, simply type in the access password. Three simple, elegant, and secure solutions.

KentMarsh Ltd. ... **30 day MBG**
5457 QuickLock 1.0 ........ $57.
2591 The NightWatch 1.03 ... 87.
6134 MacSafe II ............... 107.

Call 1-800/334-4444 to order.
How much time do you spend tracking down references you’ve used before? How about re-typing the same bibliographic entries? EndNote lets you create and update a personal database of up to 32,000 references which you can access anytime, searching by author, year, or any word in the text. (Full logic searches are also supported.) The data from those references can be pasted directly into your word processing document as citations, just the way you need them. Then, the program will generate your bibliography automatically, formatted in any style. EndNote works either as a DA or as an application and is compatible with Word, MacWrite, WriteNow, and WordPerfect. Its companion program EndLink lets you import references directly from on-line services into your EndNote database. It works with MEDLINE, BIOSIS, Chem Abstracts, and other databases available on DIALOG and BRS Colleague.

Niles & Associates ... 30 day MBG
5048 EndLink ... $58.
4602 EndNote ... 75.

EndNote 4½ mice and said, “almost like magic, the bibliographic chores of your writing task are finished.”

Nisus has enough word processing power for even the most serious textpert. It boasts ten clipboards; extensive editing features like unlimited undos; and a lightning-fast search and replace facility that’s font- and style- (including color) sensitive, can search by matching patterns, and can even look through unopened files. You also get a spell checker and thesaurus, integrated graphics, versatile formatting, an edit-able page preview, useful macros (or write your own), and much more.

WriteNow is an elegant combination of simplicity and power, featuring WYSIWYG editing, 100,000 word spell checker, multiple columns, mail merge, and many other claims to fame.

T/Maker ... 30 day MBG
3639 WriteNow 2.0 ... $99.

Ultimate reference tool.

EndNote

$58

Compare and save.

EndLink

$58

$89

DocuComp is the fast and accurate way to show differences between two versions of anything from a contract to a book to source code. Even documents from different word processors can be displayed simultaneously, revealing insertions, deletions, replacements, and moves. The comparisons can be saved or printed as needed. A great time saver for technical writers, editors, lawyers, programmers, educators, and others.

EndNote gave EndNote 4½ mice and said, “almost like magic, the bibliographic chores of your writing task are finished.”

Niles & Associates ... 30 day MBG
5048 EndLink 1.0 ... $58.
4602 EndNote 1.2.1 ... 75.

Word processing heaven.

Nisus

$75

$225

$99

BUY RIGHT NOW. GET ART FREE.

Though 1/31/90, you’ll get a free copy of ClickArt Personal Graphics ($49.95 retail value) when you buy the word processor that’s been called “Best New Word Processor” (MacUser 5/89) and “Readers’ Choice” (MACazine 1/89). WriteNow is an elegant combination of simplicity and power, featuring WYSIWYG editing, 100,000 word spell checker, multiple columns, mail merge, and many other claims to fame.

T/Maker ... 30 day MBG
3639 WriteNow 2.0 (with ClickArt Personal Graphics) ... $99.
whether you’re a salesperson, scientist, secretary, or just writer of the occasional love letter, Microsoft Word has all the formatting, editing, and printing power you need. integrated outlining lets you get your thoughts in order before writing a single word and reorganize whole documents with a few clicks. store and summon your favorite formats with Style Sheets. Avoid nasty gaffes and faux pas with the 80,000-word spell checker. The QuickSwitch feature lets you go to other programs in a single keystroke and bring back graphics just as fast. The new and powerful Table feature lets you create columns, charts, lists, and forms without tabs. and simple to use? The menus are flexible and customizable to meet the needs of everyone from novice to expert.

Microsoft ... 30 day MBG
4969 Microsoft Word 4.0 ........ $249.

GRAMMAR & BIBLIO FILES.

Catch grammatical errors in any text file before your colleagues or clients do. Sensible Grammar flags awkward writing, jargon, inappropriate contractions, etc., and suggests corrections. To manage references for your newly improved writing, try Bookends, a sophisticated HyperCard database that stores all your reference data and then generates bibliographies in whatever format you need.

Sensible Software ... 30 day MBG
3375 Grammar 1.5.4 .... special $51.
4692 Bookends 1.1.7 .... special $51.

INCRECIBLE QUICKIES.

QuickLetter makes writing letters and printing envelopes a snap. you don’t even have to use pre-printed stationery—QuickLetter lets you print your own picture letterhead. Just write your letter, view it in Page Preview, and let QuickLetter address your envelopes automatically, even while you’re working in another program. This DA word processor also has full font and style control, and a built-in address book. MacUser 10/89 gave it 4½ Mice and said that it’s “quickly earned a place on my most-used DAs list.”

Working Software ... 30 day MBG
4699 QuickLetter 1.01 ........ $73.

LISTEN AND LEARN.

Become a power user at your own pace on your own Mac by listening to an expert talk you through the program step by step while you try each new skill. Each 90-minute tutorial includes an audio cassette, example flies on disk, and quick reference card.

Personal Training Systems
60 day MBG
(Note: Each series is available in beginning, intermediate, and advanced levels; see our complete product list for details.)

$249

$64

$39

$73

Call 1-800/334-4444 to order.
### PARLEZ POWER.

Now you can use your Mac along with the top-selling audio language program to master a foreign tongue. **VocabulLearn/ce** interactive HyperCard Stacks are available in two levels for French, German, Italian, Spanish, and Japanese. Each program includes two 90-minute audio cassettes, a complete word list, and a free copy of HyperCard V.1.2.  

<table>
<thead>
<tr>
<th>Penton Overseas</th>
<th>30 day MBG</th>
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<tr>
<td>5864 5887 French</td>
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<tr>
<td>5865 5889 Italian</td>
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<td>5867 5891 Spanish</td>
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<td>5868 5888 German</td>
<td>ea. 30.</td>
</tr>
<tr>
<td>5866 5890 Japanese</td>
<td>ea. 36.</td>
</tr>
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</table>

### Who Dunnit?  

Who put the fun into math equations, word problems, and logical thinking? No, the butler didn't do it, Davidson did. With Math Blaster Mystery, for ages 10 and up, Math Blaster Mystery is the exciting and entertaining way for children to master a variety of math and problem solving skills. It runs on a Mac Plus, SE, SE/30, Ilex, or II, and can be installed on your hard disk.  

**Davidson & Associates**  
1734 Math Blaster 1.0 (CP) . . . . $27.  
6128 Math Blaster Mystery (CP) . . .27.

### STARS IN YOUR EYES.

Your Mac can make music magic with Super Studio Session. You can compose using many instruments, tempos, and key signatures, and play it all back on your Mac or home audio system. No synthesizer is needed. Write and play back on eight tracks using over 90 instruments. The complete library offers over 320 different instruments and sound effects. Supports AppleTalk links.  

**Bogas Productions**  
4255 Super Studio Session 2.0 . . . $65.  

### COMPOSE YOURSELF.

Your Mac can make music magic with Super Studio Session. You can compose using many instruments, tempos, and key signatures, and play it all back on your Mac or home audio system. No synthesizer is needed. Write and play back on eight tracks using over 90 instruments. The complete library offers over 320 different instruments and sound effects. Supports AppleTalk links.  

**Bogas Productions**  
4255 Super Studio Session 2.0 . . . $65.  

### HYPER-ANIMATED LEARNING.

Learning letters and their sounds is far more enjoyable thanks to HyperAnimation, which combines real speech sounds, synchronized with correct facial motions. Children can improve their letter recognition by following the Talking Elf in Alphabet Blocks. To transform learning phonics into play use Talking Tiles whose on-screen tutor spells and pronounces words. Get both of Bright Star's two learning programs together at a special price through 1/31/90.  

**Bright Star Technology**  
6096 Talking Tiles 1.0 & Alphabet Blocks 1.0 special, both for $45.
MANIC HUMOR. LURID GRAPHICS.

$29

Guess what? It's 2004 and San Francisco is ruled by aliens. Your job is to work undercover "with" the aliens, in order to penetrate the hideout of a band of renegade Ninjas and defy the Pig-Monkey mutants to win freedom for all humankind. But it's hard when creatures out of your worst nightmares stalk the familiar streets and sights of the City by the Bay.

Sierra On-Line
5094 Manhunter: San Francisco . $29.

ARE YOU GAME?

The TaskMaker takes you through ten challenging tasks in which you fight off some truly nasty creatures in order to restore prosperity to the depressed, devastated world. NFL Challenge can make any Sunday super by pitting all 28 NFL teams against each other at varying levels of difficulty, taking into account different players' special talents. Or head for the links with MacGolf Classic. You get to use all 14 clubs on 108 different holes complete with awesome graphics and sound effects.

SOFTWARE TOOLWORKS...

6111 Cribbage King-Gin King . . . . $39.

ENTERTAINMENT GROUPWARE.

These two games transform your computer network into an action-packed battle field. Strategic Conquest is the realistic war game that dares you to explore and conquer an unknown, enemy-infested world. And, for adventures of another class, launch NetTrek and attempt galactic colonization in this real-time space battle simulator. Both allow you to challenge your Mac or other network users for hours of full color, networkable entertainment.

Premier Technology
5773 Strategic Conquest Plus 2.0 $35.
5774 NetTrek—The Real Version . . $35.

Jet

XOR
6152 TaskMaker (CP) ........... $27.
4320 MacGolf Classic (CP) ..... $3.
3815 NFL Challenge (CP) ..... $57.

GET JET. QUICK.

Take the controls of a carrier-based F-18 or a land- combat F-16 and pit yourself against your friends or your Mac. You can even fly with others (like in Top Gun). Jet lets you choose from a breathtaking array of Scenery Disks. And, to help you take off faster, we're bundling Jet with the Kraft QuickStick at a special price. The QuickStick plugs right into your mouse port, and features both auto-centering or free-floating operating modes. Offer good through 1/31/90.

SubLogic & Kraft ... 60 day MBG
4698 Jet ....................... $32.
2600 3-Button QuickStick ... 39.
4082 3-Button QuickStick ADB . . 49.
6113 Jet & QuickStick .... special 59.
6138 Jet & QuickStick ADB special 69.

Pursue Globally.

$32

Wondered what the Trilateral Commission's been up to lately? Moriarty's Revenge lets you join the Scotland Yard Irregulars in relentless pursuit of the world's most diabolical criminals, who belong to the ten secret societies that rule the world of crime and threaten the very fabric of civilization (what's left of it). You can travel the globe, unraveling the evil deeds of these nogoodnicks, visiting exotic locales, meeting bizarre new people, and save the world to boot... again.

Bull City Software ... 30 day MBG
5841 Moriarty's Revenge ........ $32.

Call 1-800/334-4444 to order.
Alexey Pajitnov's Tetris could challenge parts of your brain you didn't even know you had. Well, his sequel, Welltris will send you into another dimension altogether, where you'll spend many challenging hours staring deep into a four-sided well with grid-like walls while you try to position falling pieces quickly and accurately on the bottom grid.

Bomber is an intensely realistic action/adventure game recreating the sights, sounds, and split-second decisions of the young B-17 crews in the skies over Nazi Germany. You get digitized sound, animation, and a ten-man crew to talk you through the tough ones. It runs on everything from a Mac Plus to a IIci. HyperCard required.

Without doing part of your computing on a DOS machine and part on a Mac? Well, now you can put an end to such silicon schizophrenia. Because SoftPC gives your Mac II, IIfx, IIGS, SE/30 or 68020-accelerated SE true MS-DOS compatibility. So you can run any PC application, from best sellers to in-house programs, right on your Mac. Plus you can run PC and Mac programs at the same time, and even cut and paste between Mac and PC applications via MultiFinder. There's no hardware. No hassle. Just install SoftPC on your Mac, double click, and get the best of both worlds.

Your workgroup's productivity will soar when you start sending messages, files, even graphics created with other Microsoft programs via Microsoft Mail. This electronic mail system lets everyone on your AppleTalk network communicate easily with each other (even PC and VAX users), and provides a gateway to AppleLink and MCI Mail.
Take a look or take over.

The key to successful network training, troubleshooting, and file/peripheral sharing is the ability to actually observe and/or control another Mac. And that’s the power Timbuktu gives an AppleTalk network. Not only can two colleagues share files, compare notes and help each other out, but even multiple users can share screens for mass Mac meetings or training sessions. All you need is a copy of Timbuktu at each Mac. With a copy of Timbuktu/Remote and a modem at each location, you get the same power over dial-up lines, serial links, or ISDN services. Timbuktu/Remote also includes a chat window and file transfer for the ultimate in file management between two remote sites.

First, Shiva introduced NetBridge which let AppleTalk networks expand to hundreds of Macs, LaserWriters, and other network devices. Now two AppleTalk or PhoneNet networks can be connected over any distance, with a TeleBridge and modem at each end. You even get dial-in network access so a single Mac and modem can access any TeleBridge network resource from any phone.

Dial the Dow.
The Dow Jones News/Retrieval Membership Package brings current business and investment facts, figures, and full-text articles from over 50 Dow Jones Services directly to your Mac. It comes with the E-Z Online communications disk for easy access to those services and a User’s Guide for finding the facts you want fast. Plus, you get five hours of usage time and your first year’s annual service fee free!

Dow Jones ... 30 day MBG
5295 News/Retrieval Membership Package ... $24.

GO OVER THE TOPS.
TOPS transforms any Mac into a TOPS network station, able to share files, printers, and multi-user applications. As you add workstations, maintain your network performance by virtually tripling network capacity with the TOPS FlashBox. It installs in minutes. And, for communications software there’s TOPS InBox. Use it to send messages and memos just by pressing a few buttons, and to receive your messages whether your Mac is on or off.

TOPS ... 30 day MBG
4598 TOPS FlashBox ............ $123.
3723 TOPS Mac 2.1 ............ 137.
4714 InBox Starter Kit 2.2 .... 149.
4715 InBox Connection Mac 2.2 . 45.

THE INCREDIBLE EXPANDING NETWORK.
The new version of best-selling telecom software MicroPhone II lets you build front ends to information services and corporate mainframes. It also supports ZMODEM, XCMDS and XFCNs, European languages, icons, color, and sound. Using built-in modem drives, it works with any modem to transfer documents for you anywhere in the world... with super reliability at a super low price.

COMMUNICATION REVELATION.

Call 1-800/334-4444 to order.
With MacLink Plus, you don't just transfer data between Macs and PCs (at up to 57,600 bps), you retain all the correct styles and formats. And now it lets you do the same with Sun and NeXT systems too. The MacLink Plus/Translator library now includes over 100 translators. So, for example, you can send a MacWrite or Word document to your PC to appear correctly in WordPerfect, WordStar, MultiMate, XYWrite, etc. Or, you can send your PC's dBASE, 1-2-3, Multiplan, Symphony, or DIF file, with all formulas and formats intact, to your Excel, Multiplan, or other Mac application. All it takes is a couple of points and clicks between two familiar Mac file windows. MacLink Plus comes complete with a direct connect cable to your PC's serial port (or you can use a Hayes-compatible modem) and software for both the Mac and the PC. If your Macs and PCs already share a network or server, then you can buy the Translators separately. Welcome to the world of real file exchange.

DataViz ... 60 day MBG
1823 MacLink Plus/PC 4.1 (includes Translators) ... $125.
4842 MacLink Plus/Translators 4.1 ... 99.

Simplifying your file exchange.

White Knight 11 takes over where its popular predecessor Red Ryder left off. It supports four XMODEMs, three YMODEMs, three Kermit, ZMODEM, and Flash protocols, emulates TTY, VT52, VT100, and VT102 terminals, and supports Color QuickDraw and large monitors. The interface can be customized and its improved Host Mode and 200+ command Procedure language let you fully automate any session. And, for a limited time, it comes bundled with a free copy of Okyto 1.0—the revolutionary Mac-to-Mac file transfer program, and a free subscription to GEnie.

Freesoft ... 60 day MBG
6115 White Knight II ... $89.

Transferring data. Codes and all.

With MacConnecti, you don't just transfer data between Macs and PCs (at up to 57,600 bps), you retain all the correct styles and formats. And now it lets you do the same with Sun and NeXT systems too. The MacConnecti Plus/Translator library now includes over 100 translators. So, for example, you can send a MacWrite or Word document to your PC to appear correctly in WordPerfect, WordStar, MultiMate, XYWrite, etc. Or, you can send your PC's dBASE, 1-2-3, Multiplan, Symphony, or DIF file, with all formulas and formats intact, to your Excel, Multiplan, or other Mac application. All it takes is a couple of points and clicks between two familiar Mac file windows. MacConnecti Plus comes complete with a direct connect cable to your PC's serial port (or you can use a Hayes-compatible modem) and software for both the Mac and the PC. If your Macs and PCs already share a network or server, then you can buy the Translators separately. Welcome to the world of real file exchange.

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Freesoft ... 60 day MBG
6115 White Knight II ... $89.
KEYBOARD CONTROL.

Work as fast as a mouse without leaving the keyboard. The Datadesk Mac-101 is a full-size DOS-style keyboard that comes with 15 very functional function keys and the software for assigning them program commands, menu selections, and mouse movements. MacWEEK called it "the most important accelerator you can buy for a Macintosh."

$369

THE BIG PICTURE.

The full-page (15'') and two-page (19'') B&W Nutmeg Monitors deliver ultra-high resolution, flicker-free viewing for hours of desktop publishing, CAD/CAM, etc. Both feature 72 dpi resolution and come with a built-in tilt and swivel stand. And, through 1/31/90, we're offering special prices on the entire 19'' line.

$139

GET ON A ROLL.

The Kraft ADB Trackball doesn't use up valuable real estate on your desk, because it stays put while your cursor takes off. Three switchable cursor speeds let you choose the response range that's most comfortable for your applications. It plugs right into the mouse port, runs all mouse software, and delivers ultra-sensitive and accurate response. Plus, Kraft's opto-mechanical design and quality construction is backed by a five year warranty. Complete with foot pedal!

$79

SCAN WORDS AS WORDS.

It's no fun trying to edit text with drawing tools. OmniPage text recognition software can read virtually any font in sizes from 8 pt. to 72 pt. as scanned by any popular scanner, into any popular word processing format. Besides regular text, it can read spreadsheets and other financial documents, 11 of your favorite Indo-European languages, and even decipher pages with both text and graphics.

$549

Call 1-800/334-4444 to order.
The awesome productivity benefits of Moc software can be lost while you’re waiting for that spreadsheet to calculate, database to sort, or CAD image to arrange itself. An accelerator card from Dove can improve your performance by 55%. The Marathon 020 series gives 1 or 4 Megas of additional memory to your SE, along with a 32-bit microprocessor operating at 16 MHz (faster than a Mac II). And you can double the speed of calculations with the optional math co-processor. The Marathon 030 series enhances your Mac SE/30, II, or IIx’s performance with a 256K internal data cache, 256K instruction cache, and full 32-bit microprocessor operating at 32 MHz. And, new from Dove, is the Marathon Racer, the cost-effective way to take advantage of Dove’s cache technology to make your Mac II perform an average of 20% faster.

Crank your system memory to the max with MacConnection’s very own, very reliable 80ns SIMMs. These surface-mount 1 Meg SIMMs plug in easily, and are completely compatible with your Mac. Add 2 Meg at a time to your Plus or SE to a maximum of 4 Meg. For your SE/30 on up, add 4 Meg at a time to a max of 8 Meg. Every MacConnection SIMM carries a two-year warranty.

Now, if your storage needs are unlimited but your budget isn’t, you’ll want to check out the new 45MB Removable Hard Drive. You get all the benefits of the popular SyQuest mechanism without the high price. And whenever you need more storage, all you have to do is buy extra cartridges. It features automatic head parking, super fast 25 millisecond access time, and it can transfer data at up to 1.2 meg per second. Cutting Edge also solves your disk swapping dilemmas with this 800K External Disk Drive. It formats at 400K or 800K HFS, and is light enough to take home or across the hall. Plus, it’s so quiet you need to check the LED indicator to see if it’s working.

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From the folks who introduced the first SCSI hard drives for the Mac come four superior external drives, pre-formatted and ready to boot your Mac and store multiple Megs of data. All support the full SCSI command set including Apple's UNIX system and LaserWriter NTX printer. There's even a built-in second SCSI connector for daisy-chaining.

SuperMac Tech. ... 30 day MBG
5452 Dataframe 20 .......... $589.
5447 Dataframe XP 30 .......... 699.
5448 Dataframe XP 60 .......... 959.
5449 Dataframe XP 100 .......... 1279.

One of the first things that many of our customers say to themselves after placing an order is, "Oh my gosh, I forgot to order disks again. Well there's always next time." Sure, but what if you run out before next time? Hey, don't get caught short. We've got the Sony 3½" Disks you need—and they could be in your hands tomorrow.

Sony ... 60 day MBG
3297 3½" DS/DD Disks (10) .... $14.
6148 3½" DS/DD Disks-3 Pak (30) .... 35.
3298 3½" HD Disks-1.44 Meg (10) 25.

Always keep your SE safely under wraps with the Protection Pak. On the road, use the High Trek Travel Case, featuring ¾" high-density closed-cell foam, lined pockets, and a durable waterproof Cordura plus nylon skin. Keep up to 20 disks safely in the Gallery Disk Easel—designed to fold flat and fit into a pocket in the travel case. And, back home, cover your SE and keyboard with MacAttire Dust Covers, made from attractive, water-resistant, anti-static, washable rip-stop nylon.

Sopris Softworks ... 60 day MBG
4862 SE Protection Pak (ext. keyboard) ... special $75.
Avery Labels deliver guaranteed performance in Apple LaserWriter Plus and ImageWriter printers. They feed automatically from the paper tray and are available in address, shipping, file folder, and round sizes. New Laser Diskette Labels for 3½" diskettes feature a special adhesive designed to stay on your disk and not peel off in your disk drive. Avery List&Mail Labels feature a special adhesive to prevent them from peeling off in your ImageWriter. They are available in individual use and bulk pack sizes.

The Ultimate SE Carrying Case boasts two sturdy outside pockets for books, umbrellas, disks, pens, even 8½" x 11" notebooks. Inside there's a padded compartment for your extended keyboard and a 9" x 9" padded pocket for mouse, cards, etc. The super-sturdy construction features a water-resistant Cordura shell, nickel-plated chromium steel hardware, and ultra high-density foam.

Part of our Mac mail order business is located in the old mill in Marlow, NH (pop. 561). So, it's not really any surprise that some of the old-timers around these parts still think that chips come from trees. In fact, to prove it, they've designed and hand-made the MacConnedion Solid Oak Disk Case. It sports some solid New England craftsmanship and just-as-solid oak, and will hold 90 disks safely, securely, and in high style. Accept no substitutes.

FannyMac QT can greatly extend your Mac's life. Its ultra-quiet fan reduces operating temperature, and it has a built-in surge protector to foil those spiteful spikes. Plus, it sits in your Mac's handle, so your Mac can still sit in its carrying case. The Mobius Mouse delivers super-fast and precise cordless cursor control. It's 100% compatible with all Mac hardware and software and doesn't require a special pad.
PRODUCT INDEX

Most products we carry are covered by 30-60 day Money Back Guarantees (as listed here in red). If you're not happy with one of these products, call us for an authorization and return it with all of the original packaging within the guarantee period for a refund or credit on your credit card. We reserve the
right to limit quantities.

Version numbers in our ad are current at press time. We sell only the latest versions. Also, all software is not copy-protected, unless otherwise denoted by (CP). And finally, please refer to the four-digit number next to the product when ordering. Thanks!

ACCOUNTING & FINANCE

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- 1114 LaserWriter Plus Toner Cartridge ..... 111.00
- 1115 LaserWriter II Toner Cartridge ..... 116.00
- **Avery** · 60+6-60 MBG
- 4964 Avery Labels 3/4” x 3/4” (Qty. 4950) ..... 13.00
- 5392 Disk Labels—Laser 3/4” (Qty. 5300) ..... 20.00
- 5403 Address Labels 1 1/4” x 4 1/4” (Qty. 1000) ..... 9.00
- 4965 Avery Labels 3/4” x 3/4” (Qty. 3750) ..... 15.00
- 4811 Transparencies 8 1/2” x 11” (Qty. 50) ..... 22.00
- 4981 Round Labels 3/4” (Qty. 500) ..... 7.00
- 4982 Laser Labels 1/2” x 1 1/4” (Qty. 3000) ..... 20.00
- 4120 Laser Labels 1 1/2” x 4” (Qty. 1400) ..... 24.00
- 4989 Laser Labels 2” x 4” (Qty. 1000) ..... 24.00
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- **Basic Needs** · 60 day MBG
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- 2381 MacLuggage Macintosh SE ..... 75.00
- 6129 The Ultimate SE Carrying Case ..... 79.00
- **Kensington** · 30 day MBG
- 5301 Kensington Carrying case ..... 79.00
- **MacConnection** carries the entire line of Kensington’s accessories.

**Partial listing below.**

**STORAGE MEDIA**

**Verbatim** · 60 day MBG
- 3377 3/4” DS/DD Disks (10) ..... 15.00
- 3377 3/4” HD Disks 1.44 Meg (10) ..... 29.00

**Sony** · 60 day MBG
- 3397 3/4” DS/DD Disks (10) ..... 14.00
- 6148 3/4” DS/DD Disks 3 Pak (30) ..... 35.00
- 3394 3/4” HD Disks 1.44 Meg (10) ..... 26.00

**MAXELL** · 60 day MBG
- 2792 3/4” DS/DD Disks (10) ..... 15.00
- 2793 3/4” HD Disks 1.44 Meg (10) ..... 29.00

**3M** · 60 day MBG
- 3943 DC2000 Tape Cartridge ..... 21.00

**Call MacConnection 1-800/334-4444 to order.**
START UP

More than 30 hands-on reviews of hot new products await you in this month's StartUp. You'll find software that gives you full PostScript output of text and graphics on non-PostScript printers, an easy way to add digital sound to your stacks and applications, and an accounting package built entirely in Excel to lighten its debit entry on your accounts payables (to save you money, that is). Robert Wiggins' Pinstripe Picks scours the universe of business-productivity boosters — including everything from data analysis to mapmaking to the secret of Apple's success — and Bobker's Dozen contains reviews of 13 utilities that elevate the state of the Mac. Plus, there are Macintosh news, product updates, rumors, and — to start things off — our nominations for The Vaporware Hall of Fame.

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EDITED BY RUSSELL ITO

True or false?: "A watched pot never boils." If you ask the folks whose patience was tested waiting for the Mac Portable, Wingz, Finale, or the speed upgrade to 4D, they might concede that it eventually boils, but it sure steams up a lot of vapor along the way — and gets a lot of customers steamed up in the process. If you still believe that all things do, finally, come to those who wait, check out the rumorware residents of the MacUser Vaporware Hall of Fame. Here, in no particular order, are our nominees:

Knowledge Navigator:
Apple's videos of this ultimate portable computer raise eyebrows whenever they're screened at trade shows; they're intended to serve as teasers for what the future holds for the Mac. But no one inside Apple has actually said anything concrete about implementing the technologies of this high-concept notebook computer, which features voice input and output, universal (and cordless) telecommunications access, and an "anthropomorphic agent" that understands colloquial English (instead of computerese) and responds in a similar fashion. Maybe it will be released in time for everybody's favorite Vulcan to raise his famous eyebrow at the unveiling.

MITCH KAPOR'S 1-2-3

Lotus Mac:
If the answer is "1-2-3," the question must be "What are the three most popular guesses, in years, about how long it will be before the Mac version of Lotus' trademark spreadsheet ships?" Since its initial announcement in October '87, there's been no further word of a shipping date. But don't despair: Lotus acquired Mac-software-developer PS Publishing in January '89, so who knows? OK, Alex, next I'd like Great Expectations for $300.

On Technology:
Mitch Kapor (late of Lotus — remember?) started this company intending to develop system-software overlays for many computer platforms. Now the firm has scaled back its ambitions and will be starting off with a series of Mac utilities and applications. The first one is due "real soon now." (Really!)

Go Corporation:
Notice a pattern? Mitch Kapor is on the board of this startup company, which is rumored to be developing a notebook computer with handwriting-recognition capabilities so you can use a stylus to enter data and operating-system commands. This technology could influence Apple's future plans for laptop and notebook computers.

60 January 1990 MacUser
**Vaporware Hall of Fame**

**Microsoft:** Database? What database?

**Xanadu:** The undisputed king of vaporware (more than 15 years in the ruminating), futurist Ted Nelson’s vision of a standardized global data structure, compatible with all computers and all forms of electronically accessible information, is still just that: a vision. When Autodesk acquired the rights to Xanadu in April ’88, the company promised we’d be seeing the first products—probably for Sun workstations initially but designed for portability to other platforms, including Macs—within 18 months. The revised projected ship date is now “earlier than the fourth quarter” of 1990. The clock is ticking.

**WordStar:** Back in August ’88, this company (formerly known as MicroPro) went so far as to take out splashy two-page ads announcing that the Mac version of WordStar (code-named Zeus) would be unveiled shortly. The ads were a little premature: Since then, some legal wrangling between WordStar and developer Challenger Software has more or less killed off this product—at least as far as WordStar is concerned.

**XyWrite:** A Mac version of this power word processor for PCs is a perennial topic on the rumor circuit. No official word yet.

**Ventura:** Persistent rumors to the contrary, the official word from Xerox is that there is no official word on when (or if) a Mac version of this popular PC page-layout program will appear.

**Display PostScript:** Is Apple the odd man out in the PostScript sweepstakes? NeXT is using the same PostScript interpreter to drive both its screen and its printer, but Apple remains committed to using QuickDraw to create what you see on your Mac’s screen. In the meantime, Apple has aligned itself with Microsoft in an attempt to establish a standard to compete against Adobe’s de facto industry standard for output. Stay tuned.

---

**MAC II NOT TO BE**

CUPERTINO, CA—Apple Computer has ceased manufacturing the 68020-based Macintosh II. With the introduction of the 68030-based Macs, the phasing out of the first expandable Mac has been expected for some time. The elimination of the Mac II will leave Apple with two distinct Mac CPUs: those based on the 68000 chip (the Plus, SE, and Portable) and those based on the 68030 (the SE/30, IIX, IICx, and IIC). **APPLE OPTS OUT**

CUPERTINO, CA—In a blow to U.S. Memories, Apple Computer has decided against membership in the U.S. DRAM consortium. Although the consortium is in its earliest organizational stages, it had hoped to achieve support from as many DRAM consumers—especially computer manufacturers—as possible and had signed up IBM, Hewlett-Packard, and Digital Equipment. Although Apple would not officially comment, a spokeswoman for U.S. Memories confirmed Apple’s lack of interest but characterized the manufacturer’s response as “tentative.” Apple’s reason for deciding against membership was reportedly based on its currently steady and secure supply of DRAM from American, European, and Japanese sources.

**SYMMETRY SYNERGY**

SCOTTSDALE, AZ—Symmetry has merged with Teknon, the creator of various financial packages, including atOnce!, which is published by Layered. Symmetry, the publisher of Acta Advantage and HyperDA, will continue to support and develop its products. The new company will operate under the name Symmetry Software, and it’s expected that its future products will steer toward the business market and away from smaller utilities.

**KAWASAKI MOVES**

CUPERTINO, CA—Guy Kawasaki, one of Apple’s first evangelists and the founder of ACIUS, will leave the company as of December 1989. Marye Delbourg-Delphis, chairman and president of ACIUS, will assume Kawasaki’s former position.
**Bobker's Dozen**

**Good Things and Small Packages**

1. **Complete Undelete**

   System 7 notwithstanding, there are still several small, handy utilities with a purpose and usefulness so obvious that you can't quite believe they didn't exist before. Complete Undelete is, by far, the best of this type of program. If a file can be brought back — that is, if it hasn't been overwritten — this utility will recover it.

   And Complete Undelete doesn't stop where all other programs of its kind do: It can even recover fragments of partially overwritten files — often most of a file. Although you lose formatting, having the body of the text is what really counts. This program can recover all deleted files, not only those deliberately thrown into the trash. When you copy over a file and then decide you want the previous version back, just turn to Complete Undelete. Complete Undelete is a slick, unobtrusive performer. The ProView mode shows which files are still there, how much remains of partially destroyed files, and in some cases, what's actually in the file. This is great stuff.

   **Cost**
   $48.95. 1st Add Software, 42 Radnor Road, Boston, MA 02135; (617) 783-7118.

2. **Hot Keys**

   Hot Keys from K.I.S.S. is a set of MacroMaker macros designed for use with MacWrite II, Microsoft Works 2.0, and PageMaker 3.0. The version I've reviewed is the MacWrite II version. (Apple's MacroMaker comes with all current System software, and a copy is included with Hot Keys.) MacroMaker is by no means the best of the various macro-type programs, but Hot Keys makes the best use of it that I've yet seen.

   K.I.S.S. provides an overlay card for the function keys on any extended keyboard. That in itself is enough documentation, but there's also a sheet listing the various key combinations as well as a short manual packed with tips on using this set of macros and using MacroMaker. A useful little program called MacroMover, which extends the utility of MacroMaker, is also included. It is a new version for Microsoft Word 4.0 with macros for MacroMaker and AutoMac III was being readied at press time.

   At $45 per application, these macros might seem expensive, but considering the time it would take you to create and debug a similar set, and, in view of the added productivity, they are really a bargain. Now, if only they came as a set of QuicKeys.

   **Cost**
   $44.95 per version. K.I.S.S. (Keep It Simple Software), 324 Fuller, Suite E-3, Helena, MT 59601-9910; (406) 442-8448. $84.95 annual update service. $75. KJC Software, P.O. Box 51816, Durham, NC 27717; (919) 469-1277.

3. **HyperHIT**

   HyperHIT is a set of HyperCard XFCNs and XCMDs (external) that lets knowledgeable HyperTalk programmers build much better databases within HyperCard than was easily possible heretofore. Databases built with HyperHIT can be quite complex and can include several types of records, including both graphics (PICT) and sound (snd) records. The simple database I built also worked in SuperCard. Databases can be any size because the data is stored outside the database stack.

   As with all HyperCard-based applications, databases created in HyperHIT are slow. However, these better HyperCard databases can be designed to export data to faster, more powerful applications after entry and processing within HyperCard.

   **Cost**
   $125 plus licensing fees for commercial use. SoftStream International, 18 White Chapel Drive, Mount Laurel, NJ 08054; (809) 696-4373.
Capture 2.0

This latest version of the steadiest, most reliable screen-capture program for the Macintosh is in cdev form. Capture 2.0 works the same way as the original version, being activated by a key combination you choose. A cross-hair cursor lets you select the exact area for capture. The captured screen can be placed on the Clipboard or stored on disk. Material is always captured in PICT format. Color screens (even 32-bit QuickDraw) screens are captured in PICT2 format.

Capture is a tiny program (9K), which makes it an excellent choice if you don’t have a hard-disk drive. Captured screens must fit into RAM at least temporarily, and color captures can easily take up 300K of RAM or more. If there isn’t enough memory, Capture aborts, which does no damage.

Capture’s performance is nearly perfect. AppleShare users may not be able to capture the leftmost quarter inch of the screen at all times, and Capture conflicts with some other cdevs and INITS. Changing its name to -Capture should fix the problem.

$59.95. Mainstreet, 5011-6 Berryl Ave., Agoura Hills, CA 91301; (818) 991-6940.

Silverlining

If you need to partition your hard disk, Silverlining is one of the most powerful and useful hard-disk utilities you can find — most Apple engineers prefer it to Apple’s own partitioning software. It can create partitions around existing files and resize them without lost. Silverlining can also format most drives, increasing performance in the process. There are also useful disk-sector-detection and mapping-out facilities as well as other powerful tests.

Silverlining’s performance is excellent and caused no problems in my tests, although you must always back up in advance and be careful with software this powerful. The manual is clear.

The Silverlining package includes DS Backup, a program capable of full and incremental backups as well as full and selective restores. There’s a nice little disk duplicator and a DA utility to handle the partitions you create. Silverlining isn’t for beginners, but if you really want the most from your hard-disk drive, it’s the way to go.

$99.95. La Cle Ltd., 1626 S.W. 65th, Suite 306, Tigard, OR 97224; (800) 996-0143 or (503) 994-0143.

Family Matters

A diligently complete and current copy of Family Matters — a set of HyperCard stacks that allows you to record most aspects of your family’s history, life, and possessions — can be invaluable in an emergency. Family Matters goes beyond Nolo’s superb For the Record (see Quick Clicks, February ’89), with room for even more data (so filling in all the blanks will take considerable time and effort). The manual is only adequate, which contrasts with the superb and very useful For the Record manual.

$49.95. Springboard, 7808 Creekridge Circle, Minneapolis, MN 55438; (612) 445-4780 or (800) 445-4780.

XCAL

XCAL is a set of sophisticated HyperCard externals that creates spreadsheet-like capabilities within any HyperCard stack. Although the result isn’t a true spreadsheet — and you are restricted by the small card size — quite a bit of calculation and formatting power is available. Formulas are linked to HyperCard objects, not cells, although they can be one and the same. XCAL has two modules: the first creates the objects and cells, and the second performs the calculations. The calculation module of XCAL can be distributed in commercial stacks.

XCAL isn’t for beginners. Someone new to HyperCard could do some simple cards; however, to get the most from XCAL, spreadsheet-building and HyperTalk experience are necessary. The large manual is reasonably complete but could be better written and printed. If you need the sort of spreadsheet and calculation capabilities that XCAL offers, it will save you a lot of time.

$149.95. Trendware Corp., P.O. Box 2285, Huntington, CT 06454; (203) 926-9423.

DiskTop

Whenever I have to move things, rename things, find things — indeed, do any of the things that the Finder does or should do — I use DiskTop. Between the time this is written and the time you read it, a new, better, and more powerful version will have been released.

Based on the beta version I’m using, it looks as if nothing has been lost from the original and plenty has been added: Apple comments are supported, users can examine their AppleShare privileges, restarts as well as shutdowns are now possible, and volumes can be unmounted. The interface has been made more intuitive and easier to use. DiskTop is better than the Finder, and since it’s a DA, it’s always handy.

$99.95. CE Software, 1894 Fuller Road, P.O. Box 65580, West Des Moines, IA 50265; (515) 224-1895.
POWErmenus

POWErmenus is two programs for the price of one. The first gives you access to all the current applications’ menus, no matter where your cursor is located. This ability will be particularly welcomed by large-screen owners. A triple-click (or other user-settable command) pops up a menu of the menus, with submenus for each.

The second program, called Gadgets, is particularly well done and very useful. It includes a notepad; a good alarm clock; a telephone diller; the current date and time; a window selector; and instant access to user-selected applications, DAs, and Controls (the individual panels in the Control Panel DA). The Controls are particularly useful because they circumvent the normal slow trip through the Control Panel DA.

Users can elect to use either part of the package or both parts together on the same pop-up menu. The Gadgets can also be made to appear as a menu in every application.

POWErmenus’ performance is excellent. I found no conflicts nor anything that the program balked at. This is a well-designed and-implemented package, sure to be useful to nearly everyone.

37.95. Magic Software, 1602 Cascio Drive, Bellevue, NE 68005; (800) 342-0249 or (402) 281-0670.

Sonar Professional

This latest version of Sonar is faster and more expensive than previous ones, but no more recommendable. Most people who need the search capabilities Sonar Professional offers should get GOfer 2.0, whose list price is exactly 10 percent of this overpriced program. Both have extensive range of search capabilities. Sonar Professional now sports a standard Mac interface. Unfortunately, it uses the worst of each.

The program can search very fast; faster than anything else. But before you can search even a single page, all documents must be prepared in Setup, which is a slow process. The manual claims that Setup is MultiFinder-compatible, but that’s only marginally true. Most of the time, Setup keeps the Mac so busy that nothing else can be done. I wouldn’t use MultiFinder with this program.

To reach the fastest search speed, a second setup (Super Setup) is required! It’s about 15 to 20 percent faster than Setup (that is, it’s still slow). And if you want to search new or changed material, a full new Super Setup must be performed. Regular Setup, at least, is incremental.

Stay away from Sonar Professional unless you have hundreds of megabytes of archived (unchanging) data that needs to be searched. It might be somewhat useful with data CD-ROMs, but it’s still far too expensive.

S795. Virginia Systems Software Services, 5608 W. Bay Court, Midlothian, VA 23112; (804) 736-3200.

Front Desk MultiUser

This latest version of a very ancient Mac program — the first version was released in the fall of 1984 — still works well and has nearly its original interface. Front Desk MultiUser is a credit to its creators and keepers. This is an easy-to-use, high-quality schedule-and-appointment keeper, well suited for offices. It has no mechanism for tracking time, as does some of its competition, but it is a superior resource manager.

The new version supports color and the latest System software. Multiuser operation now allows one person to monitor and update schedules for everyone in a group (up to 25 users on AppleShare, up to 20 on TOPS; a copy is required for each station). Setup is simple because the options are few. The excellent basic design is easily adapted to small office situations.

99 (multiuser discounts available). Layered, Inc., 623 Main St., Boston, MA 02125; (800) 622-4438.

DeskPaint/DeskDraw

DeskPaint and DeskDraw put a reasonable amount of graphics power into two DAs. The interfaces are busy and sometimes less than intuitive (cleaner, improved versions are promised in early 1990), but don’t be put off from these extraordinarily useful tools. For most users, the graphics touch-up and manipulation powers are more than adequate, and the ability to touch up graphics as you look at the relevant text (in a word-processing document, for example) is priceless.

There are a few things that you can’t do with this DA duo: It doesn’t offer color (yet), and you can work on only one document at a time (although multiple copies of DeskPaint are provided and can be open simultaneously). Still, DeskPaint runs on every Mac but a 128K, and it behaves like a champ. These two hard workers will always have a home on my Apple menu.

S129.95. Zadco, 4500 E. Speedway, #22, Tucson, AZ 85712; (800) 482-4567 or (602) 881-8101.
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MapMaker

MapMaker can create maps of continents, countries, states, and even counties, separately or in almost any combination, with many options. Each area of a map can have up to 30 variables associated with it, which makes MapMaker a powerful tool for geographical data analysis. Once a map is drawn to your satisfaction, you can manipulate and customize it by using a tool palette that is similar to MacPaint’s or MacDraw’s and includes some special map-making tools such as straight-line and radius-measuring tools. MapMaker comes with more than 2 megabytes of boundary and data files. For serious researchers, dozens of additional boundary- and demographic-data files are available at prices from $50 to $2,000, extending MapMaker’s maps down to the Standard Metropolitan Statistical Area (SMSA) and even down to the 3- and 5-digit zip-code levels.

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Requires 512K and Microsoft Excel, Multiplan, or Works. $99. Halter Software, P.O. Box 232019, Pleasant Hill, CA 94528; (415) 943-7667.

Crystal Ball

Crystal Ball is a forecasting and risk-management package that applies Monte Carlo simulation techniques to models you build with Excel, Multiplan, or Works. A wide range of probability distributions can be used, including normal, Poisson, binomial, exponential, and many more. If none of the built-in distributions suits your fancy, you can create custom distributions. When running a simulation, you can stop it at any time and continue it later. The documentation includes a tutorial and explanations of all the statistical terms used.

One of Crystal Ball’s only shortcomings is that it comes with just one example, so you may initially have a little trouble when building your own models.

Requires 512K and Microsoft Excel, Multiplan, or Works. $395. Market Engineering Corp., 1676 Larimer St., Suite 500, Denver, CO 80202; (800) 289-2550 or (303) 898-9109.
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**DATA — Decision Analysis by TreeAge**

DATA is a Macintosh implementation of a decision tree, a form of decision analysis popular among Harvard MBAs. You create a chain of possible events arranged into a tree structure and assign probabilities to uncertain events and values to possible outcomes. You can then use DATA to analyze the tree to find the branches that will yield the highest profits or lowest expenses. If you’ve tried to perform this kind of analysis with a spreadsheet, you’ve probably found it difficult, if not impossible.

DATA is a fairly good implementation of the decision tree model but would benefit from additional examples and expanded documentation. If you’re familiar with decision analysis, you’ll appreciate this program. If you don’t already know decision analysis, you might want to study the technique to make sure you can work with it before investing in software you might not find that useful.

Requires 512K, $495. TreeAge Software, Inc., 23rd Floor, One Post Office Square, Boston, MA 02109; (617) 426-5819.

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**BizPlan Builder**

BizPlan Builder is a set of templates for creating a business plan. The actual business plan is laid out in a series of MacWrite documents and also in one Word document, broken into sections. It includes spreadsheets for budgets, income statements, balance sheets, sources and uses, cash-flow projections, and break-even analyses. The documentation consists primarily of a printed copy of all the templates, with only a brief introduction to get you oriented. While there’s nothing really wrong with BizPlan Builder, you might find a similar product that has better documentation (such as Tim Berry’s Business Plan Toolkit from Palo Alto Software) to be more useful. And no matter what templates you use, you’ll still have to do 90 percent of the work to create a business plan; the templates are only guides.

Requires MacWrite 4.5- or Word 3-compatible word processor and SYLK-compatible spreadsheet program. $99. JIAN/Tools for Sales, 127 Second St., Top Floor, Los Altos, CA 94022; (415) 941-9191.

**Interactive Population Statistical System**

IPSS is a statistical, simulation, and modeling program with some graphics capabilities that are designed to help demographers specialists project human populations. You enter information on age composition, fertility rates, survival rates, and/or migration, and you can even add a special rate to study its effect on the population (cancer rates are used in the example files). Once the data is entered, you can run projections and get results in tabular or graphic form. Some of the graphing methods available here are lexis surfaces, 100-percent surfaces, and 3-D population pyramids.

The one weakness in IPSS is data entry; IPSS includes no facility other than copy and paste for importing data to other programs. This is doubly odd because IPSS provides several ways to export data. Overall, IPSS is a good system with a strong quantitative background (the Pascal code for the projections and life-table analysis is even included in the documentation).

Requires Macintosh Plus or later, Plus or SE version, $295; 8020/68930 version, $295. PSRC Software, Population and Society Research Center, Bowling Green State University, Bowling Green, OH 43403; (419) 372-8648.

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**BUSINESS BOOKSHELF**

**The Macintosh Way**

Guy Kawasaki is a legend in the Macintosh community. One of Apple’s first “evangelists” for the Macintosh, he convinced a lot of people that writing software for a 128K computer with no hard disk was a smart idea. After the Mac became a success, he left Apple to start up a small company (AClUS) to market another legend, the database program code-named Silver Surfer, which became 4th Dimension. The Macintosh Way is Guy’s story, mixed with his views on the Macintosh market, flavored by anecdotes and exercises, and leavened with a lot of humor.

Kawasaki doesn’t tell a story so much as he tries to communicate an experience — the Macintosh experience — from an insider’s and an outsider’s point of view. Whether you’re looking for some marketing pointers or some belly laughs, there’s something in this book for you. Every Macintosh aficionado should read this book. Some of the jokes are a bit inside, and Kawasaki warns that the book is aimed at the “inner circle,” but even if you think you’re outside the circle, you can still enjoy the book.

EXERCISE: Read all of The Macintosh Way. Did you find a successful software company? $19.95. Scott, Foresman and Co., 1900 E. Lake Ave., Glenview, IL 60025; (312) 729-3000.
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Computerized Classic Bookkeeping

A spreadsheet-based accounting system 'Excels' as an alternative to bigger, dedicated packages.

One of the thorniest problems that has faced the accounting-software industry has been how to build a general-ledger system that is both structured enough to get the job done and flexible enough to support financial analysis. The most likely platform for this kind of product is a spreadsheet. But in the past, accounting-spreadsheet templates have been either too loosely defined or too rigid — the same problems users have faced with dedicated systems.

Computerized Classic Bookkeeping (CCB), from Absolute Solutions, is the first spreadsheet-based accounting template to really make a mark in the industry. CCB is built on Microsoft's Excel and passes on all of Excel's benefits and only a few of its disadvantages.

WHAT IT IS For first-time spreadsheet users, the system offers an intuitive feel to its accounting method. Mimicking the paper journals and ledgers that bookkeepers and accountants are accustomed to, CCB applies Excel's calculational power to the relatively simple task of maintaining a general-ledger system. Absolute Solutions has built a full menu-driven command system to control CCB's accounting functions. Users can stay within this system or can go directly into Excel at any time to do advanced analysis. Custom worksheets and analysis can be integrated easily into the CCB posting system, so virtually any type of account or business can be managed with CCB.

CCB should be considered an accounting tool kit rather than just a general-ledger system. This tool kit can be used to handle simple tasks or to create complex systems. For example, CCB provides a standard function that tests and prevents the posting of unbalanced journals. This utility is used throughout the CCB system because it automatically attaches itself to any custom worksheets you define.

CCB also provides a full, detailed audit-trail capability and password-protection options for all reports, journals, and ledgers. Another fail-safe system built into CCB prevents you from making common accounting errors, such as defining an accounts-receivable entry as accounts payable.

Because CCB runs under Excel, it provides complete reporting flexibility. Built into the CCB system is a financial-reporting module that produces any standard accounting report as well as a valuable cash-flow analysis for small-business owners.

CCB comes with a complete chart of accounts that can be easily edited to accommodate any business. The chart uses standard accounting numbering systems and account captions.

HOW IT WORKS The system can keep as many accounting periods as a user wants and on-line. Line-item details can be quickly recalled and analyzed at any time from any previous period. CCB can also generate the full complement of business graphs available from Excel. This graphics capability is vital for small-business owners and accountants who use the CCB system for write-up work — complex information can be summarized and displayed quickly and easily.

CCB can be run either as a consolidated ledger system or with subledgers. There's no program limit to the amount of information the system can track or to the amount of detail stored. In fact, one major advantage of using a spreadsheet-based accounting system is that it can be used not only for accounting but also for record keeping. Considering the inherent

Computerized Classic Bookkeeping (CCB) is an accounting system built entirely on Excel. The Income and Expenses Comparison graph is predefined and generated by a CCB command. Custom graphs can also be created, and CCB's Report menu lets users customize the format and display of their financial statements.
flexibility of Excel and the leverage that CCB provides, any small-business owner can consolidate all of the business's financial information into the CCB system with very little trouble.

Unfortunately, because of an Excel limitation, CCB does not provide context-sensitive help screens, which would be a major asset. [Excel 2.2 supports context-sensitive help, so CCB version 2.2, which should be available by the time you read this, will include on-line help. CCB version 2.2 will also take advantage of Excel 2.2's extensibility and will include job costing, via an external to FoxBASE. The package will include a run-time version of FoxBASE. — Ed.]

Absolute Solutions provides superior telephone support and has produced an adequate manual for the product.

CCB runs only in single-user mode (another Excel limitation), but it can share files across any network — provided no two users try to access the same file at the same time. In summary, the CCB/Excel combination provides a remarkable level of accounting, record keeping, and analysis in a simple, flexible product that can also be easily customized if necessary. CCB should be considered by any small-business owners or accountants who use manual write-up systems for their general ledger.

— Ken Landis

**Get Info**

**Computerized Classic Bookkeeping**

**REVIEWS**

**GRAPHICS**

**Fontographer 3.0**

The top font generator gets a classy face-lift.

Fontographer has long been the only game in town if you wanted to create your own downloadable PostScript fonts. When introduced in 1986, it was an impressive achievement — even with the nasty drawback of copy protection.

Altsys has now released a major new version of Fontographer, version 3.0. The basic look and feel of the earlier versions, with the straightforward ability to edit or create designs in any of the 256 character slots of any PostScript font you choose, Using Bezier control points, you design the characters and then have the program create both the downloadable PostScript font and the screen fonts. You install the fonts in the normal way.

Foremost among the new features are an integrated screen-font editor, auto-tracing, and a pen tool (the latter is similar to those in FreeHand and Illustrator 88).

The integrated screen-font editor is a great convenience in serious font production. In the old days, Fontographer generated rough-and-ready bit-mapped screen fonts, but you couldn't edit them (and they often needed editing) without switching to another program. Unfortunately, Altsys provides only a bare-bones bit-map editor in the new Fontographer. You get a pencil tool and a grabber, and that's it — barely enough to get by.

With the new auto-tracing feature, you can paste background images into a character cell and then have Fontographer trace it for you — providing points, curves, and fills as needed. This is a colossal time-saver if you want to convert a number of scanned images into PostScript.

The welcome pen tool conveniently combines the capabilities of tangent, corner, and curve tools into one. It relieves you of continually having to switch tools — something earlier versions made you do a lot. It seems odd, though, that Altsys, the developer of FreeHand, decided not to include a freehand drawing package and manual have been completely re-done, a few major features have been added, and scores of minor improvements have been made. There's hardly a dialog box that hasn't been touched up at least a little.

**WHAT IT IS** Originally, Altsys positioned Fontographer purely as a font generator. Now, in trying to reach a wider audience, Altsys is placing more emphasis on the logos and graphics you can create in specially fonts with the program — although their tools are pretty meager.

In any case, Fontographer 3.0 keeps
Introducing the ATASI 128MB MacServer. $799. Our factory direct price.

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tool in the Fontographer program.

**HOW IT WORKS** Version 3.0 adds many features that increase productivity, such as more keyboard shortcuts, optional snap-to guidelines, better printing options, and no more copy protection.

Fontographer has always been a professional tool, capable of sophisticated jobs such as creating kerning tables and building composite fonts based on fonts already in your printer. In keeping with this heritage, version 3.0 adds the feature of including PostScript “hints” in your fonts, which can improve the look of your fonts when you print them on 300-dpi printers in small point sizes.

Overall, the new version is worth the upgrade, even though there’s still room for improvement (especially in beefing up the bit-map editor). Although the manual is improved in this version, it still suffers from a poor index, typos, and several confusing illustrations. Finally, if Altsys seriously wants buyers to use Fontographer for graphics, it needs to include better drawing tools, including a freehand drawing tool and shape tools such as boxes. Considering Altsys’ history as FreeHand’s developer, these are glaring omissions.

— Dave Valiulis

**REVIEW**

**Freedom of Press**

Now you can get PostScript-quality output on non-PostScript printers at a fraction of the cost of using true PostScript systems.

The DTP revolution was made possible, in part, by PostScript. But PostScript printers are expensive. What is there for people with limited budgets or who already have a non-PostScript printer (such as an HP LaserJet II)?

Freedom of Press, from Custom Applications, has just brought them into the charmed inner circle for a fraction of the cost that previously secured membership. Freedom of Press takes PostScript code generated by Mac programs and interprets it so that a wide range of non-PostScript printers can render pages correctly. It sounds good, but does it really work? It does indeed — and well.

**WHAT IT IS** Freedom of Press requires a Mac II or SE/30 with at least 1.5 megabytes of RAM and a hard disk. Once you’ve installed the program (and assuming you’re already hooked up to one of the more than 30 printers and film recorders supported), you’re all set to go.

You first prepare files for use within Freedom of Press by saving PostScript versions of the files to disk. In most cases (PageMaker is an exception), you do so by opening the document within the parent program, selecting Print, clicking on OK, and immediately pressing Command-K. You enter Freedom of Press and select the printer.

An HP LaserJet running Freedom of Press (top) and an Apple LaserWriter Plus (bottom) produce nearly identical samples of Bookman, Helvetica Bold, and Palatino. But in the downloadable Greek font, called Kadmos, Freedom of Press incorrectly placed the accents.

**ONTOPORTER**

**List Price:** $495; upgrade, $70.

**Published by:** Altsys, 720 Avenue F, Suite 109, Plano, TX 75074; (214) 424-4888.

**Version:** 3.0.

**Requires:** System 4.2 and Finder 6.0 or later.

**Application Size:** 394K.

**Compatibility:** Mac Plus or later.

Altsys likes to remind users that they can do more than just create alphanumeric fonts with Fontographer. If you think of each character cell as a scaled-down Freeland (or Illustrator 88) drawing window, you’ll appreciate how useful Fontographer can be for creating specialty artwork fonts. You won’t find the full-featured drawing tools of Freeland in Fontographer, though.

**Get Info**

**Socratic Perspectives and Hellenic Thought**

**Socratic Perspectives and Hellenic Thought** ἀλλὰ γὰρ ἡδίς ὑπάρχει, ἐμοὶ μὲν ἀποθεματικῶς, ὑμῖν δὲ μεθοδεύοντος· ὁπότερον ἐν ὑμῶν ἐρχομαί ἐπὶ ἀμένον πρᾶγμα, ἄδηλος παντὶ πλήν ἢ τὸ θεῖο.

**Now is the hour, now at last long, for leaving — for me to die, for you to go on living. But which of us sets out for the better fate, that’s unclear to everyone but God alone.** — Socrates

**REVIEWS**

**Socratic Perspectives and Hellenic Thought**

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An HP LaserJet running Freedom of Press (top) and an Apple LaserWriter Plus (bottom) produce nearly identical samples of Bookman, Helvetica Bold, and Palatino. But in the downloadable Greek font, called Kadmos, Freedom of Press incorrectly placed the accents.
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Press next, select the PostScript file(s) you’ve generated in this manner (and yes, you can queue several to print in batch mode), and choose Print. Depending on the printer your Mac is attached to, the output can be virtually identical to what you’d obtain from a bona fide PostScript printer.

HOW IT WORKS Unfortunately, there are some disadvantages. First, in terms of Adobe fonts, you are restricted to the 35 fonts of the LaserWriter Plus. Freedom of Press supplies character outlines only for this collection of Adobe fonts (other Adobe fonts are encrypted, and you cannot use them). You can use downloadable PostScript fonts from other vendors, but problems can arise with these.

Second, the PostScript versions you create for use with Freedom of Press are always larger than the original documents — often more than double their size — which can clog up a hard disk in a hurry.

Third, I found using Freedom of Press to be even slower than printing with a standard LaserWriter Plus. Most files I tested took twice as long to process.

On the positive side, the savings can be astounding. For example, for less than $3,000, you can buy an HP LaserJet II with 2 megabytes of RAM and Freedom of Press. That combination gives you the rough equivalent of a LaserWriter Plus at half the cost.

Most importantly, Freedom of Press performs remarkably well. Its ability to deal with PostScript makes it superior to programs such as MacPrint and JetLink Express (reviewed elsewhere in this issue). So if you can live with Freedom of Press’ font, storage, and speed limitations, you can get PostScript quality without the exorbitant cost.

— Gregory Wasson

Freedom of Press lets you print PostScript files on non-PostScript printers. Its main window lets you select, queue, and print any PostScript files you have on-disk. The program can be set to delete files after they’ve been printed or to auto-select files placed in a certain folder.

Get Info

Freedom of Press

List Price: $495.
Published by: Custom Applications, Building 8, 900 Technology Park Drive, Billerica, MA 01821; (800) 873-4367 or (508) 667-8585.
Version: 2.1.
Requires: 1.5 megabytes of RAM, 800K floppy drive, 2.5 megabytes of hard-disk space, and any application that generates PostScript output.
Application Size: 382K.
Compatibility: SE/30, Mac II family, or any Mac with a math coprocessor.

These two panels compare the output of the same Illustrator 88 file from an HP LaserJet-Freedom of Press combination (top) and from an Apple LaserWriter Plus (bottom). The results are virtually identical, with some slight shifts in the way the gray scales were rendered in the leaves.
Are you one of those people who considers tax preparation only slightly less painful than childbirth?
Do you wait until the point of no return before doing yours? Or pay a lot of money to an accountant and evade the whole thing?
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**HARDWARE**

**MacRecorder 2.0**

Digitize and manipulate your favorite sounds, and enliven your Mac, stacks, and presentations.

Farallon Computing’s MacRecorder is really four elements — one hardware and three software — that let you sample (or digitize) any sound; modify and enhance it in various ways; and integrate it into a HyperCard stack, animated presentation, another application, or your System Folder. As such, it’s useful for serious Mac programmers; people who build HyperCard stacks; businesspeople who create presentations or training material; and your basic computer/audio/visual nerds, eager to eol their system and annoy their coworkers with their own puerile samples.

**WHAT IT IS** The hardware is a palm-sized analog-to-digital converter that accepts a sound and converts it to digital data that it sends to the Mac. It can pick up a sound with its built-in condenser mike or, via two 1/4-inch jacks, from an external mike or line-level signal that comes out of a CD player, tape deck, or VCR.

SoundEdit, the first of MacRecorder’s software elements, controls the actual sampling of a sound and then lets you edit the sample with some impressively sophisticated, yet easy-to-use, tools. You can add such effects as echo, flanging, and noise; modify a sound’s volume or brightness; bend the pitch of any part of a sound; or make a sound play backward. With standard Cut, Copy, and Paste commands, you can move chunks of a sample around to create, for example, embarrassing party versions of the messages your friends and associates leave on your answering machine.

**HOW IT WORKS** New to version 2.0 are the Sonogram and Spectrogram commands, which do two kinds of frequency analyses on your sounds to show you precisely what you’ve sampled and to guide your editing decisions. SoundEdit can generate sine, square, and sawtooth waves and do rudimentary frequency-modulation synthesis to create both musical and sound-effects tones. The program can even change the playback speed of a sample without changing its pitch, a feature I’d expect to find only in more specialized (and expensive) sample-editing applications.

To optimize storing your samples — they tend to get large — SoundEdit lets you choose from four rates at which to sample and four ratios at which to compress sound files. All this may sound numbingly technical, but it’s not. Anyone with a serious — or even frivolous — interest in audio can get up to speed quickly.

The other — and more mainstream — side of MacRecorder’s software consists of the HyperSound toolkit, a set of HyperTalk external commands and functions for using sounds in HyperCard stacks, and an example stack called HyperSound. Together, and with the help of the friendly, well-written manual, they let even HyperCard tyros build stacks that moo, meow, and moan.

Mac application programmers can use MacRecorder sounds in any program. Also, presentation programs such as VideoWorks II and MacroMind Director, and entertainment staples Jam Session and Studio Session, can all access MacRecorder sounds.

Especially at the price, MacRecorder offers a lot of functionality and a lot of fun. It’s a terrific add-on for any users who need to add some life to their stacks or just want to make working with a Mac more amusing.

— Tim Tully

**Get Info**

**MacRecorder ****½**

List Price: $249.
Published by: Farallon Computing, 2201 Dwight Way, Berkeley, CA 94704; (415) 849-2331.
Version: 2.0 (SoundEdit).
Requires: 512K RAM (1 megabyte recommended); HyperSound requires HyperCard version 1.2.1. or later.
Application Size: SoundEdit, 263K; HyperSound, 200K; HyperSound Toolkit, 234K.
Compatibility: Mac Plus or later.
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REVIEWS

GRAPHICS

Smart Art II and III

Two new volumes in the Smart Art series offer major improvements that let you put PostScript effects where they've never been before.

Smart Art is in the vanguard of the new generation of PostScript special-effects utilities that leave earlier programs such as Laser FX and LPText in the dust, primarily because Smart Art lets you place EPSF graphics where they've never been placed before (for example, in Word or MacWrite files).

With the release of Smart Art I, the distributor, Emerald City Software, promised that some new collections of effects would be forthcoming. Well, it was true to its word. And not only has it introduced two new collections of effects, but it has also begun to distribute a spiffed-up, revved-up version of the DA that makes it all possible.

WHAT IT IS The DA allows you to select any EPSF file on-disk and preview it in the Open dialog box. If the file is a prefabricated Smart Art effect, the DA's main Control Panel gives you several controls that let you modify the effect. You can then reimage the file if you are connected to an on-line PostScript printer and see the results on-screen. Smart Art II is a collection dedicated to graphic elements such as cubes and starbursts. Smart Art III contains new text effects, including kerning controls for many of the effects, which were lacking in the first collection.

HOW IT WORKS What really shines is the upgraded DA. It's a commendable piece of work worth every cent of the $149.95 list price, even without the effects files. It now supports printing from within itself — a feature oddly absent in the initial release. There is also a new Export command on the menu that lets you export Smart Art files as PICT or TIFF (in 72-, 300-, and 600-dpi resolution). TIFF, especially at 600 dpi, is excellent for use with tracing programs such as Streamline or with applications that can auto-trace imported TIFF files.

Smart Art is also a must-have tool for anyone who dabbles in PostScript, because you can create PICT screen images of your own PostScript programs or of the files created by earlier non-WYSIWYG programs such as Laser FX.

Smart Art II and III are significant improvements over the original Smart Art — which was itself a solid PostScript utility. With the addition of printing and graphic-exporting capabilities to its DA, Smart Art has now realized its potential and has become an essential tool for desktop publishers and PostScript experimenters who've always wanted a simple way to view their PostScript creations. If you've always wanted to liven up your documents with snappy PostScript effects, you really owe it to yourself to add these excellent utilities to your software collection.

— Gregory Wasson

List Price: $149.95 per collection.
Published by: Emerald City Software, 800 Menlo Ave., Suite 102, Menlo Park, CA 94025; (415) 324-8080.
Version: 2.0.
Requires: PostScript printer.
Application Size: 184K each.
Compatibility: Mac Plus or later.

50% OFF ON ALL ITEMS TODAY ONLY!
Virtual

If you’re looking for virtual memory, you don’t have to wait for System 7.

After the announcement of System 7, the term virtual memory became one of the most often used buzzwords in the Mac community. You don’t have to wait for System 7 to get virtual memory, though — Connectix’s Virtual gives it to you now.

Virtual is an INIT that requires a Mac II with an installed PMMU (Paged Memory Management Unit) chip or any 68030-based Mac (the 68030 has a PMMU built in). Pluses or SEs based on the 68000 (unaccelerated) cannot have virtual memory. Virtual makes your Mac think it has 8 megabytes of RAM even if it has only 2 or 4 megabytes.

Essentially, Virtual uses the hard disk to get your Mac to reuse “real” RAM several times, making it appear as though you have more than you really do. For a more detailed discussion of how virtual memory works, see the “Virtual Memory” sidebar.

Virtual version 1.05 makes 8 megabytes accessible to your Mac; it requires 8 megabytes of contiguous free space on your hard disk to swap with and at least 2 megabytes of real RAM.

With the current System, Virtual is most useful for opening multiple applications under MultiFinder. If you have an application that needs 8 megabytes and you have only 2 megabytes of RAM, your hard disk will be very busy swapping memory. Virtual memory is advantageous if it’s used correctly, but if misused, it can be more a hindrance than a help.

We tested Virtual with 2- and 5-megabyte machines, and performance was good in both cases. If you already have 4 or 5 megabytes, you can still benefit from Virtual because most of your work will be done in RAM and you’ll swap only when you switch applications. The time it normally takes to switch from one application to another under MultiFinder is far outweighed by the additional time it takes Virtual to swap data between the disk and RAM.

Version 2.0, which should be available by the time you read this, offers 9 megabytes plus 1 megabyte for every unused NuBus slot in your Mac. On a IIx with a video card installed, Virtual 2.0 lets you access 14 megabytes (9 megabytes + 5 free NuBus slots = 14). Other features of 2.0 are an installer that makes a contiguous swap file for you, and a Control Panel interface that lets you determine how much RAM you want to have (you don’t have to use 14 megabytes).

Virtual 1.05 is solid, and most incompatibilities with other products have been ironed out. Although the proliferation of 4-megabyte SIMMs may cut into the market for virtual-memory products that simulate the real thing, these new SIMMs are rare and expensive and are likely to stay so for some time. Real RAM will always be faster, but as a cost-effective way to extend the range of your Mac, Virtual is ideal.

— Stephan Somogyi

[As we went to press, Connectix announced a price change. Effective with Virtual version 2.0, the price for the product, including a PMMU, will be $275. —Ed.]

Virtual

List Price: $545 (includes PMMU); $199 (without PMMU, for all 68030-based Macs, or for Macs equipped with accelerators from Dove, DayStar Digital, SiClone, Levco, or Irwin). Published by: Connectix Corp., 125 Constitution Drive, Menlo Park, CA 94025; (415) 324-0727. Version: 1.05. Requires: 2 megabytes highly recommended; 8 megabytes contiguous hard-disk space; System 6.0.2 recommended. Application Size: 10K.

Get Info
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If you're looking for a fast, convenient, affordable way to unleash the power of your software, call us at 1-800-TEACH-99 or 408-559-8635 and we'll send you a complete catalog — at no charge.
Most laser printers sold are not PostScript printers. By far, the majority are either made by Hewlett-Packard or are compatible with the HP LaserJet or DeskJet series. It was only a matter of time, therefore, before someone developed a product that lets you print from a Mac to the ubiquitous HP non-PostScript printers.

**WHAT THEY ARE**

So now we have two products that do just that: JetLink Express, from GDT Softworks, and MacPrint, from Insight Development. Both products provide a special printer driver that you copy into your System Folder and then open in the Chooser DA. After that, the similarity ends, because each has its own strategy for printing Mac text and graphics to an HP printer.

MacPrint's approach to fonts is twofold. First, it has screen fonts for every imaginable HP font cartridge so that you can use an internal printer font just as you would any other. The advantage is extremely fast printing at top quality. The catches are that you're restricted to the installed sizes and that most of the Mac's special characters aren't available. (Missing characters appear as rectangles.)

If you need larger characters or special symbols, you must use MacPrint's second approach: Install and use any of the special Compugraphic screen fonts provided. These fonts are like any others, except that they come in a wide range of very large sizes. This allows the driver to use a size larger (ideally, four times larger) than desired and scale it down to achieve high resolution. The result is usually high quality but longer print times.

JetLink Express takes a different approach. It provides a set of four special outline fonts that it automatically uses when you choose the standard Adobe Times, Helvetica, Courier, and Symbol fonts. (You can pay $198 for seven more faces.) The outlines let you use any size from 3 to 127 points. If no outline is available, JetLink tries to use a quadruple-sized screen font to generate the characters needed. Only when you print in Draft mode does JetLink resort to using the HP printer's cartridge fonts — often with unfortunate results.

**HOW THEY WORK**

Both products include a cable, support landscape printing, work with SuperLaserSpool, and let you print envelopes. JetLink has a few more options — such as automatic font substitution, support of outline style (neither supports shadow), and flipping and inverting images — than does MacPrint.

The manuals are glaringly different: MacPrint's is detailed and helpful; JetLink's is just plain awful. It doesn't even tell you how to set the LaserJet's DIP switches (you have to run to your printer manual to figure it out). To add insult to injury, the JetLink manual has whole chapters of totally irrelevant material and then fails to provide an index.

**WHAT THEY ARE**

(a) Using the HP-resident fonts with MacPrint lets you print quickly and cleanly, but unusual characters (such as the curly quotation marks in this example) are not supported.

(b) MacPrint gives you screen fonts from Compugraphic in jumbo sizes to let you print high-quality Times, Helvetica, Courier, and Symbol. This method takes longer to print.

(c) MacPrint's lowest-quality printout matches the screen dot for dot. It's fast but ugly.

(d) JetLink substitutes a special outline Times font that looks good in sizes up to 127 points.

(e) JetLink lets you choose the number of dots per inch. At 75 dpi, you get a printout only as good as the screen, which is not so good.

(f) In Draft mode, JetLink uses the printer's internal-cartridge fonts and matches the screen size to the closest cartridge size. But because the 10-point HP cartridge font is larger than the 10-point Mac screen font, the words overlap.

(g) Printing at 12 point fixes the problem.

(h) For comparison, here's the same text printed on a LaserWriter Plus.
Comparing Writelmpact™ from GCC Technologies with the Apple* ImageWriter, you realize there simply is no comparison.

The difference isn't hard to pin down. The ImageWriter is a 9-pin printer. Writelmpact is a 24-pin. You can choose push or pull tractor-feed. For letters, you can print on single sheets and envelopes without removing your tractor feed paper. There's also automatic paper loading and parking, plus a paper tear feature with automatic repositioning.


In fact, with Writelmpact, you get incredibly high resolution — 360 dots per inch (dpi) horizontal x 180 dpi vertical.

Letter Quality, Plus Outline Fonts.

Writelmpact comes with something else the ImageWriter doesn't: 22 high-quality outline fonts. Writelmpact's outline fonts can be shaped, reduced or enlarged, rotated to any angle, and printed in a variety of point sizes — from 2 to 500 points (½" small to 7" high).

Writelmpact is just as versatile with paper. With multi-part invoices, you can choose push or pull tractor-feed. For letters, you can print on single sheets and envelopes without removing your tractor feed paper. There's also automatic paper loading and parking, plus a paper tear feature with automatic repositioning.

Ordering Writelmpact is pretty automatic, too. Just call the number below or visit your nearest GCC dealer.

To order Writelmpact direct, just call 800-422-7777 from 9 AM to 9 PM (EST) on weekdays, or 10 AM to 4 PM (EST) on Saturdays. Our trained staff will answer all your questions and offer advice on any of our products. (Be sure to ask for our free catalog.) Orders received by 8 PM (EST) for in-stock items will be shipped the same day via overnight delivery for only $9.

Or, you can order Writelmpact from one of our dealers. Every GCC dealer is a Macintosh professional, and if you call, we can give you the name of the one nearest you.

At GCC Technologies, we guarantee satisfaction. Order your Writelmpact directly from us, and if after 30 days you're not completely satisfied, return it to us and we'll cheerfully refund your money.

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encountered a mysterious incompatibility in an ordinary-looking System Folder when I first tried to use JetLink’s outline fonts.

A recommendation? It’s pretty much a draw. If you have a large investment in LaserJet font cartridges, you’ll probably prefer MacPrint, which makes better use of them than JetLink does. On the other hand, if you need lots of type sizes, JetLink’s outline fonts are a clear improvement over MacPrint’s fonts, which restrict you to the installed sizes. Both products get the job done; just don’t expect life to be as smooth as it would be if you had a LaserWriter.

— Dave Valulis

JetLink Express 

List Price: $149. 
Published by: GDT Softworks, 4664 Lougheed Highway, Suite 188, Burnaby, British Columbia V5C 6B7, Canada; (800) 663-6222. 
Version: 1.0.1a. 
Requires: LaserJet IID, LaserJet II series, LaserJet Plus, DeskJet Plus, DeskJet, or any printer fully compatible with these HP printers; hard-disk drive; 512K printer memory (1 megabyte recommended); System 6.0 or later. 
Application Size: Driver, 82K; outline fonts, 453K. 
Compatibility: Mac Plus or later.

MacPrint 

List Price: $149. 
Published by: Insight Development, 2200 Powell St., Suite 500, Emeryville, CA 94608; (415) 652-4115. 
Version: 1.1. 
Requires: LaserJet IID, LaserJet II series, LaserJet Plus, DeskJet Plus, DeskJet, or any printer fully compatible with these HP printers; 512K printer memory (1 megabyte recommended); System 5.0 or later. 
Application Size: Driver, 74K; Compugraphic screen fonts, 1.3 megabytes (about 20K of screen fonts per cartridge). 
Compatibility: Mac Plus or later.

Anatool

For software engineers seeking a data-flow-diagramming tool, this is it.

The point of CASE (computer-aided software engineering) is to remove the inconsistencies of hacking from software development. The first level of added sophistication is the DFD (data-flow diagram). With DFDs, system analysts describe the flow of data into and out of a system with a series of boxes that represent processes, files, or elements outside the system being designed. With a graphic depiction of a system, analysts and users can establish a common ground for future changes and discussions.

Once the pictures have been drawn, DFDs act as a bridge between design and coding by allowing analysts to include a central data dictionary and pseudocode specifications for software modules. In most CASE scenarios, DFDs are the glue that binds the design, analysis, and coding segments of the software engineering. Anatool does a splendid job of bringing DFDs to the Macintosh.

WHAT IT IS

Anatool’s DFD design window supports the Gane and Sarson DFD technique. This technique is primarily different from that of Yourdon and DeMarco, the other popular DFD methodology, in the design of symbols and consistency-checking rules. All DFD techniques were developed first for paper systems and have only recently become associated with CASE. It’s the computer’s ability to store and display complex information that has unleashed the recent boom in the structured-analysis and -design market. To begin a DFD with Anatool, the analyst must first draw the Level 0 diagram. Level 0, also known as a context diagram, acts as an overview. To place an element on a DFD page, you simply drag it off a menu. Each process block (a square with rounded corners) becomes a system component that the analyst explores. Double-clicking on a process block invokes a dialog box that requests a choice between Data Flow Diagram or Mini-Specification. Choosing Data Flow Diagram brings up a new drawing window with the input and output portions of the current process already visible. Selecting Mini-Specification displays a text-processing window into which you can enter structured English pseudocode.

The DFD tools include a process block, an external entity, a stores block, dataflow connectors, a text tool, a hand for moving around the window, and reduction and selection tools. Process blocks are used to represent the transformation of data in a system. These hierarchical elements can run many levels deep, with each level expressing a finer degree of detail. At the bottom of the hierarchy is the Mini-Specification window, which transforms the abstraction of graphics...
FOR THOSE OBSESSED WITH PERFORMANCE, A HARD DISK THAT MATCHES YOUR OBSESSION.

Today there are any number of peripherals designed to push the performance envelope of the Macintosh. But none pushes harder than an ingenious new series of hard disks from GCC Technologies:

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<th>MODEL</th>
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Up to Date

Changes New and Noted

WINGZ 1.1 adds more number formats and expanded surface-graph options to its spreadsheet as well as improvements in its HyperScript application-construction language. The upgrade also features new documentation—-including a comprehensive HyperScript manual—although registered buyers of version 1.0 (who will automatically receive the software update) must purchase the new manuals separately for $37. $399; upgrade, free to registered owners. Informix Software, 16011 College Blvd., Lenexa, KS 66219; (913) 599-7100.

PERSONAL LASERPRINTER, BUSINESS LASERPRINTER, AND WRITEMOVE PRINTERS from GCC Technologies have new driver software (version 2.2 for the PLP and 1.2 for the WriteMove), more fonts (Headliners and Publishers’ Choice for the PLP and WriteMove, priced at $239 apiece), and new factory-direct pricing options (PLP, $1,699; BLP, $3,299; and WriteMove, $579). Also due out by the time you read this is a new sibling (the $699 WriteImpact dot-matrix printer): support for the Adobe Type Manager, and several new utilities, including a font converter for Bitstream’s MacFontware and an envelope-handler/address-database DA. GCC Technologies, 580 Winter St., Waltham, MA 02154; (617) 890-0880.

PLUS, the German HyperCard “extension,” has been upgraded to version 1.11 and has a new American distributor. Spinnaker Software, One Kendall Square, Cambridge, MA 02139; (617) 494-1200. $199; upgrade, free to registered owners.

into concrete process descriptions. The system automatically numbers process blocks according to the Gane and Sarson rules.

The store block illustrates disk storage or other temporary files. The external entity describes things beyond a system’s control that somehow affect, or are affected by, the system’s actions. Single or bidirectional connections can be made among any objects in a DFD. The connectors represent data flow within the system.

Once you’ve done your design homework, Anatool checks your work. In the DFD methodology, every entity and link must have a name. These names are stored in the central data dictionary, which makes structured analysis and design a valuable systems communications tool by creating a central repository of data elements.

Double-clicking on a stores icon or a connector invokes the dictionary. The Anatool Data Dictionary holds data definitions for data structures such as files, basic data such as employee numbers and hourly pay rates, and known data (an accumulator for data elements that require no further definition, such as a robot arm or a letter).

The Data Dictionary contains all the names used in the DFD, including processes. If a Data Dictionary item is known by more than one name, it can have multiple aliases in the system that refer back to the original definition.

Anatool’s flexible data structures include basic data elements; sequences of items that describe a file; or repeatable elements, such as items on a sales check. Basic data elements can be assigned minimum, maximum, and typical values or a table of acceptable values.

The details of basic elements and files are an Anatool weakness. Low-level data descriptions should have a richer tapestry on which to hang the myriad data types, constraints, and file structures in modern languages. For large multidatabase projects, the Data Dictionary MIX application, which accompanies Anatool, merges data dictionaries from project teams or allows ASCII files to be imported from other products.

HOW IT WORKS Anatool’s components are well integrated. Double-clicking on any active element in the system immediately brings you to the detail behind it. But this is also an Anatool flaw. When you change a higher-level DFD description, the underlying diagram does not change, which makes fluid designs difficult to model. For top-level elements to be displayed accurately in a lower-level diagram, the complete lower-level structure must be removed and recreated as a new diagram. I would like to see future versions of Anatool add dynamic mapping of higher-level constructs to their detail levels.

The consistency-checking routines in Anatool keep you honest. Everything in a DFD must be defined by the Data Dictionary. Every process must have a name, and every data flow, a definition. Data elements, even those not directly on the diagram, must be properly defined: Anatool forces you to produce thorough documentation. If you haven’t finished your work, it has no qualms about telling you so.

Anatool’s documentation is compact and complete. Advanced Logical Software has included a chapter that covers structured analysis and design, but this cursory examination serves only as an appetizer for hungry systems analysts. (If you really want to sate your palate and see where this tool is leading you, get a copy of Alan Fisher’s book CASE [New York: Wiley, 1988].)

For those of you hoping for a graceful entry into CASE, Anatool is the right product. Advanced Logical Software has given the Macintosh a good DFD tool at a reasonable price. If you think $925 is expensive, take a good look at the market. Many other Macintosh tools make data-flow diagramming a frustrating experience. Anatool’s combination of simple menu structures and accessible features illustrates what good top-down analysis provides: very usable software.

—Daniel W. Rasmus

Anatool

List Price: $925.
Published by: Advanced Logical Software, 9903 Santa Monica Blvd., Suite 108, Los Angeles, CA 90212; (213) 653-5786.
Version: 3.1
Requires: Two 800K drives; hard-disk drive recommended.
Application Size: 364K
Compatibility: Mac 512K or later.

Get Info
"Two or three years from now, the typical laser printer will be a lot like the Business LaserPrinter": small, light, with a SCSI connector for a hard disk, and inexpensive."

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Language Master
A new dictionary-thesaurus DA redefines the meaning of 'look it up.'

You know those hand-held electronic dictionaries found in yuppy catalogs such as that from The Sharper Image? Well, the information they contain is now available in a DA called Language Master, a disk-based dictionary and thesaurus.

The original hand-held Language Master from Franklin Computer is based on linguistic code developed by Proximity Technology, the owner of the electronic rights to Merriam-Webster's dictionaries and thesauruses. Franklin Computer liked the code so much that it bought the company and founded Franklin Software to market its programs. The code has also been licensed to other software vendors for inclusion in their own applications, such as Deneba's Spelling Coach Professional.

**WHAT IT IS** Language Master is an on-disk dictionary and thesaurus — not a spelling checker. (If you want a spelling checker, see “Checking Spellers,” September ’88.)

The dictionary contains definitions, hyphenation points, and information about parts of speech for more than 83,000 English words. The thesaurus has 40,000 unique entry points with synonym information for different parts of speech.

Language Master comes on three 800K disks with a utility to install the DA and data files into the System of your choice. Because the files are so large, a hard disk is required.

After you select Language Master from the Apple menu, “LM” appears at the far right of the menu bar. From this menu, you can look up definitions or synonyms, change keys for commands, and specify the position of the Language Master window.

**HOW IT WORKS** Highlighting a word in a document and choosing Lookup Definitions from the LM menu brings up a modal dialog box with definitions in a scrollable window six lines deep. The dictionary and thesaurus share a fixed-sized window, so you can’t display both simultaneously or take advantage of larger screens to display longer entries in their entirety.

If a highlighted word is spelled incorrectly or can’t be found in the dictionary, alternative spellings are suggested, based on phonetic and typographic correction algorithms. To replace a suspect word in...
a document, you click on the replace-
ment word and then click on the Re-
place button.
Language Master is unique in that
the words in the thesaurus are properly
inflected to match the selected word's
usage. For example, if you ask for syno-
yms for *jump*, it shows you *leap*. If the
word is *jumped*, the response is *leapt*.
You can therefore rest assured that re-
placements make sense in context.
You can also copy complete defini-
tions and synonym lists into your doc u-
ments via the Clipboard. For students
of the English language, this feature is
a godsend because you can retrieve a
definition and then paste it into a word-
processor file that you can print to
create a simple flash card.
If you want to investigate further any
word in the definition or synonym box,
simply double-click on it and a new list
appears. This cross-referencing feature
makes Language Master ideal for in-
vestigating the richness of the English
language.

**mas-ter**

noun mas-ters
1: male teacher
2: holder of an academic degree between a bachelor's and a
doctor's
3: one highly skilled
4: one in authority

verb mas-tered; mas-tered; mas-ter-ing; mas-ters
1: subdue
2: become proficient in
   — mas-ter adjective
   — mas-ter-ful adjective
   — mas-ter-ful-ly adverb
   — mas-ter-ly adjective
   — mas-ter-ly adverb
   — mas-ter-ship noun
   — mas-ter-ty noun

Language Master is an on-line dictionary and thesaurus that packs the same technology as in
the hand-held models available from The Sharper Image. Language Master's windows can't be
resized, but the rear screen shows the complete text that's available through scrolling.

---

**VAX**, potentially Mac to whatever. And, for the first
time ever, you can send and receive mail directly from
Macintosh programs like Microsoft Excel and
Microsoft Word—it's never been *this* convenient.
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**Microsoft**

Making it all make sense
Announcing The Grappler LX®
Laser/24 Pin Printer Solution

✓ Leaves hair silky and bouncy
✓ Contains 100% oat bran
✓ A premium performance printer interface
✓ Cholesterol free
✓ Leaves no sticky film
✓ High speed, microprocessor driven, attractively priced

O.K. so it won't do all the above, but it is new and improved, and it will let you use the printer you want with your Macintosh™. Announcing the Grappler™ LX, the latest advance in Macintosh printer interfacing! Over the past 9 years, the Grappler name has been synonymous with innovation and excellence. This tradition has now created the pinnacle of Macintosh printer compatibility and performance.

Faster Print Speed
We've optimized the speed and efficiency of the Grappler LX to ensure that you get peak performance from your laser, inkjet, or 24 pin dot matrix printer. The Grappler LX adjusts to the printer in use to provide the best possible output in the least possible time.

Includes Free AutoInstaller!
To ensure quick, trouble-free installation, the Grappler LX includes a new AutoInstaller. Just point and click, and the Grappler LX will be ready to print from any Macintosh Plus, SE, SE/30, II, IIx, or Iicx computer in just a few minutes.

Enhanced Printer Compatibility
The Grappler LX provides you with the freedom to choose which printer is used on your Macintosh. The Grappler LX supports any HP®-compatible laser printer, DeskJet™ or DeskJet Plus™, even Epson®-compatible 24 pin dot matrix printers!

More Fantastic Fonts!
Five fonts are included as standard with the Grappler LX. You'll be able to enhance documents and clarify correspondence with new emphasis and flair. You can now use Swiss, Courier, Dutch, Garamond, and Zapf Chancery Medium Italic in a variety of sizes.

OrangePort™ and other Orange Micro Products
The new OrangePort allows Grappler users to print over AppleTalk networks. Now an entire network can share Grappler-compatible printers. The Grappler 9 Pin provides owners of Epson-compatible dot matrix printers a cost-effective method of printing directly from the Macintosh. For economy-minded Hewlett-Packard LaserJet and DeskJet Plus owners, the Grappler LS provides Macintosh printer compatibility. For additional fonts, try AlphaBits, a collection of seven popular typefaces.

With nearly 1 million Apple printer interfaces sold, Orange Micro sets the pace in compatibility solutions. Call a local Apple Authorized dealer or Orange Micro today to receive additional information or to order the Grappler LX.

Please circle 20 on reader service card.
Language Master has a wildcard feature that lets you search for words in which you’ve substituted question marks for any number of unknown letters. Unfortunately, you’re restricted to words that specifically match the number of characters you’ve entered, so ?? for example, finds only four-letter words that start with p.

As mentioned earlier, Language Master shares its lexicographical information with other programs, most notably Dennis’s Spelling Coach Professional. But Coach is a full-fledged spelling checker that costs $199, whereas Language Master is an on-disk dictionary and thesaurus at half the price. It presents information in a much more readable format than Coach does, and its thesaurus is more useful because it contains inflections, not just root words. On the other hand, Coach provides antonyms and Language Master doesn’t.

With a few minor improvements, such as the addition of antonyms, resizable windows, and a user-definable dictionary that could be particularly useful for businesses with specialized terms, Language Master would be a must-have for those who work with words. As it is, this is a useful, reasonably priced utility that’s worth looking into if you’re tired of constantly leaving your Mac to thumb through your old copies of Webster’s. Although I doubt that Language Master will ever replace the printed reference books it emulates, it may give The Sharper Image a run for its money.

— Owen W. Linzmayer

Rumor Manager

Gossip, Guesses, and Goings-On

By now you’ve had a chance to try out the Macintosh Portable. Don’t get too attached to it. There will be anywhere from two to four more Mac portables in 1990 — some may even be real laptops. The first one will show up very soon after Motorola figures out how to make CMOS (low power) 68030 CPUs in reasonable quantities at reasonable prices. Current samples are hard to come by and very pricey.

In the slightly longer term, you’re likely to see a really small notebook computer. Its arrival hinges on the new CMOS CPU and some new battery technology. The research that Rumor Manager previously reported on is coming along fine, and another interesting approach, being prototyped in Cupertino, California, at the time of this writing, is a portable powered partially by light and partially by wafer batteries. The light source can be as weak as a halogen-bulb penlight.

Color is a possibility by the end of the year, although the middle of 1991 seems more likely. Apple Computer is also doing lots of work on a low-power backlit screen. This could be available by midsummer and might also be sold as a retrofit (a very expensive retrofit to be sure) for current Portables.

And Apple may not be alone in its portable endeavors. Don’t be surprised if the folks in Cupertino team up with a certain Japanese electronics firm to come up with a truly portable laptop. The grapevine throughout the Valley is already buzzing with rumors of a small, light, powerful unit that will put DOS portables to shame and that could even put a big dent into the Mac Portable itself.

If this project proceeds as rumored, it’ll be interesting to see if Apple once again pursues its policy of competing with itself — even before its new CPUs get a chance to catch on.

The new decade will have much more going for it than lots of new entries in the portable line. The “transportable” line — Pluses and SEs — will be revamped, with the Plus and SE being dropped in favor of new machines. The low-cost replacement for the Plus, the IIgs, and all other cheap Apple computers could be out by the end of March. It will have a built-in monitor and will cost $995. The new high-end box will have video, EtherTalk, and more — all in a small case. The screen and internal video will be interesting, as they will support 24-bit color.

The middle-of-the-line machine is still being planned, but it’s most likely to be an SE/30 with much cleaner and better internal engineering.

The modular family will get several new and faster machines. The much-talked-about F19 should be first. Its speed will again depend on what Motorola can deliver: 33 megahertz is certain; 50 or 65 megahertz is possible.

This fastest Macintosh will look a lot like a lxx but will be more like a lcl in internal design. It will be able to use 100-nanosecond or maybe even 120-nanosecond RAM without affecting performance. Caching technology has really come a long way recently.

The on-again, off-again Tower project is on again. It’s now going to be a dedicated server machine with a built-in tiny screen (5-inch diagonal) and small integral keyboard.

Those are the predictions for the first half of the year. The end of 1990 could get really interesting.

Heard any good rumors lately? If we use your rumor, we’ll send you a token of our appreciation and promise not to use your name. Anonymous contributions are also accepted.

Our U.S. Mail address is Rumor Manager, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Our electronic addresses are MacUser (on MCI Mail), 70411,204 (on CompuServe), and MacUser.Edit (on AppleLink). No calls, please.

Language Master

List Price: $99.
Published by: Franklin Software, 3511 N.E. 22nd Ave., Fort Lauderdale, FL 33308; (800) 543-3511 or (305) 566-3511.
Version: 1.0.
Requirements: System 4.2 or later; Finder 4.0 or later; 800K disk drive and hard-disk drive.
Application Size: DA, 114K; Dictionary file, 1.1 megabytes; Thesaurus file, 352K.
Compatibility: Macintosh Plus or later.

Get Info
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by Micro Planning Int.

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NewletterMaker ........... .... ...............85.
Nine to Five .................... ...............85.
People .. ... ............ .......... .. ... ... .....85.
ReportMaker .......... ................ .......85.

i~:v~I s~.n~. ::::: ::::::::::::: ::::::: :::::::::~~

Weekend Sports ...... .. .....................85.
MacAllas Paint v2.0... ....... ..... .... .. ... ..45.
OuickMap... ........... .. ....... ....... .. ..... 55.
MacAtlas Professional
(PICT/MacDraw Version) ... ..... .. .... .. 105.
MacAtlas Presentation Pack .. ............ 105.
Microsoft Microsoft PowerPoint 2.1.. ...249.
Micro Sp_ot Maclnteriors ...... .. .......... 185.
MacPlol Color Thermal ..... ..... ... .... ... 339.
MacPlot OMA Electrostatic .............. 1715.
MacPlot OMA Color Thermal............ ..889.
MacPlot Electrostatic .. .... ....... .. .......685.
MacPlot Pen Plotter Professional .. .... ...259.
MacPlot Pen Plotter Standard ...... ....... 133.
Miies Computing
Mac the Ripper or Orchestraof Fonts ... ..32.
People, Places-Things or Taking
Care of Business .......... ................32.
Mlndscape Zing .. ...................... .. .125.
NuEquatlon Nu Paint .......................88.
Paracomp Swivel 30 ..... .. ...............245.

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Silfcon Beach Software SuperCard .... 128.
SuperPaint 2.0... .. ..................... .... 128.
Digital Darkroom ... ........................249.
Super 30 2.0 ...............................315.
SoftStream HyperHIT ..................... 123.
Solutions International The Curator .... 72.
Springboard Certtticate Maker...... ... ... 18.
Springboard Publisher II .. ................ ..89.
SuperMac Software
Pixel Paintv2.0 ... .. ........................225.
Pixel Paint Professional ................. ...395.
Synergy KaleidaGraRh .. ..... .. ........... 139.
Tactic Software Art Clipvol 2.............69.
Art Clip or ArtFonts 1. 2or 3................49.
T/Maker Christian Images ....... .. .........39.
ClickArt EPS Illustrations or
EPS Business Art... .......................85.
Zedcor DeskPaint 2.0 ......................65.

FAX: 203/381-9043
Inquiries: 203/378-3662
ft;s:S::tt:I Canada: 1/800/344-7753
75 RESEARCH DRIVE
:s:!~ttl STRATFORD, CT 06497

~~~~ 1/800/832-3201


45 MB Removable HDD by Cutting Edge

The Cutting Edge 45 MB Removable Cartridge Disk Drive offers the convenience of removable media with the reliability of Winchester technology. The new drive features the popular Syquest mechanism and includes one cartridge. ............... $899.

EDUCATIONAL/CREATIVE SOFTWARE

A Lasting Impression 39
ResumExpert 39
ResumExpert Cover Letters 39
ResumExpert Saxes & Marketing 39
ResumExpert Management 39
Ars Nova Praxica Musica 2.1 72
Bogas Productions 12
String Quartet, Country or Heavy Metal 12
Super Studio Session 65
Bright Star Technology 27
Talking Tiles 28
Alphabet Blocks 30
Brodereund Typpel 30
Sensor Geometry, Calculus or Physics 58
Where in the World is Carmen San Diego? 27
Where in Europe is Carmen San Diego? 27
Where in the USA is Carmen San Diego? 27
Jam Sessions 28
Carina Software Voyager 1.0 69

Two Page Monochrome Monitor by Cutting Edge

The Cutting Edge Monitor includes the interface card and matches just about all the features of other big screen display systems costing twice as much. It has a flicker-free refresh rate of 70 Hz and a high resolution of 72 DPI. Comes with a year warranty and 30 day money back guarantee. .......... $935.

EDUCATIONAL/CREATIVE SOFTWARE (continued)

Coda Mac Drums 31
Perceive 50
squeeze 50
Finale 399
Davidson & Associates 27
Speed Reader II 27
Math Blaster or Word Attack! 27
Electronic Arts 32
Mavis Beacon Typing 32
Deluxe Music Construction Set 2V.5 84
Deluxe Recorder 95
First Byte 27
Dinosaur Discovery Kit 27
Puzzle Storybook or Rhyming Notebook 27
Great Wave Software 26
KidsTime 26
Kids Math 26
Penton Overseas 30
Vocabulary/Chinese, French, German or Italian (Level 1) Special 30
Vocabulary/Chinese, French, German or Italian (Level 2) Special 30
Vocabulary/Learn Japanese (Level 1 or 2) Special 38
Primera Software 55
Different Drummer 55
Simon & Schuster 55
Typing Tutor IV 55
Springboard Top Honors 59
Family Matters 89
Atlas Explorer 28
Tactile Software 28
SoundClips 1 or 2 49

Hard Disk Drives by Cutting Edge

The hard drives range in capacity from 20 to 180 Megs. They are fast (aver. access time 20-28 ms), and each has quality and dependability built in as evidenced by an average 70,000 hrs MTBF. The streamlined design fits comfortably under the Mac.

ACCESSORIES

Advanced Gravis
MouseStick Plus or AD1 Special 69
Alto F hel ADB 125
Basic Needs Keyboard Flip 7
Hard Top Myd Cover 14
Hard Top Image II Cover 16
Laser Pointer Stand 28
Large Screen Monitor Stand 38
Cutting Edge Cutting Edge MCK-105QK BK 119

ACCESSORIES (continued)

Farallon MacRecorder Sound System (Mac SE or Mac II) 164
GDT Softworks Print-Link Collection 65
Goldstein & Blair 18
Macintosh Bled 2nd ed 18
PreSchool Disk 1 28
PreSchool Disk 2 28
Word Search 27
PreSchool Pack Special 49
Pelican Software 28

Bomber by Inline Design

Bomber is an intensely realistic action-adventure recreating the sights, sounds and split second decisions of young B-17 crews in the sky's over Nazi Germany. Digitized sound, animation and a 10 man crew. HyperCard required. Mac Plus-Mac Iicl .. $25.

ACCESSORIES

Mобius Fanny Mac GT (Beige or Platinum) 59
Mouset Systems 69
A+ ADB Mouse 83
Moustrak MousePad 123
Moustrak MousePad 7" x 9" 7
Mouse Magnet 15
Lynx Computer 30
Motorol Fax 1048 45
Mac Plus-Mac SE & Mac II 92
MicroSeeds WristMac 59
WristMac Executive 189

Micro TV by Aapps Corp.

Aapps Micro TV is a Nubus card that displays real time TV and other video sources in 128 gray scales on a window on a Macintosh II series in 128 gray scales. $275.
**PRINTERS, DIGITIZERS & MONITORS**

<table>
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<td>Digital Vision GCC Technologies</td>
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<td>Thunder1 II</td>
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<td>Writemove Printer</td>
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<td>Aapps Micro TV</td>
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<td>Complete PC</td>
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<td>Complete Hand Scanner 400</td>
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<td>Complete Hand Scanner OCR</td>
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<td>Complete Full Page Scanner</td>
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<td>Cutting Edge</td>
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<tr>
<td>Two-Page Display</td>
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<td>Monochrome Monitor</td>
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<td>Personal Laser Printer</td>
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<td>Mac II Laser Accessory</td>
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<td>Digital Vision</td>
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<td>Printers</td>
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**SPELLING & GRAMMAR CHECKERS**

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<td>Spelling Coach 3.0</td>
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<td>Professional</td>
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<td>Electronic Dictionary</td>
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<td>Sensible Software</td>
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<td>Practical Spelling</td>
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<td>Microlytics</td>
<td>$35</td>
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<td>Word Finder (Synonym Finder)</td>
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<td>Electronic Word Finder</td>
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<td>DataStar Personal Organizer</td>
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<td>Sensible Grammar or Bookends</td>
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<td>Working Software</td>
<td>$55</td>
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<td>Spellwell 2.0</td>
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**UTILITY SOFTWARE**

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<td>Abbott Systems, Inc.</td>
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<td>AlSoft Master Juggler</td>
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<td>Foni/DX Juggler Plus</td>
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<td>A.S.D. TWINS</td>
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<td>FileGuard v1.0</td>
<td>$95</td>
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<td>Berkeley System Design After Dark</td>
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<td>Stepping Out II</td>
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<td>Beyond Inc. Menu Fonis 2</td>
<td>$30</td>
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<td>Borld Sidekick 2.0</td>
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<td>Bravo SRAAM</td>
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<td>Central Point Software</td>
<td>$22</td>
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<td>Copy II Mac (Includes MacTools)</td>
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<td>CE Software</td>
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<td>QuickKeys (Macro Program)</td>
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<td>MockPackage Plus Utilities</td>
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<td>Dantz Software Development Retrospec</td>
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<td>DotMounter</td>
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<td>Dumb-Click</td>
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<td>Calculator Construction Set v2.0</td>
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<td>Fiddler Computing</td>
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<td>Fifth Generation Systems</td>
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<td>Dumblock</td>
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<td>Power Station</td>
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<td>Icon Simulations On Out</td>
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<td>Imageform MacLabeler Plus</td>
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<td>Insight Development MacPrint</td>
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<td>Kent Marsh QuickLock</td>
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<td>MacSafe or KnightWatch</td>
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<td>Loop Software PictureBook</td>
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<td>Lundeen &amp; Assoc.</td>
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<td>WorksPlus Command</td>
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<td>Magic Software Auto Save II</td>
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<td>POWERCUPS</td>
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<td>POWERnuke</td>
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<td>MainStay</td>
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<td>AntiVirus or Clickpaste</td>
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<td>Redex</td>
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<td>ScreenCount</td>
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<td>Oldviw Software MultiClip</td>
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<td>Read-It OCR Personal</td>
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<td>Read-It OCR Version 2.1</td>
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<td>PCFS Back-Up 3.0</td>
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<td>Peripheral Land TurboOptimizer</td>
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<td>TurboBack</td>
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<td>TurboCache</td>
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<td>TurboSpool</td>
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<td>SuperSpool 5.0</td>
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<td>SuperLaserSpool</td>
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<td>Symanitec</td>
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<td>Symanitec Utilities for Mac (SUM II)</td>
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<td>Symanitec AntiVirus for Mac (S.A.M)</td>
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<td>Sysgen</td>
<td>$65</td>
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<tr>
<td>TENpoint0 OpenFile</td>
<td>$49</td>
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<td>Williams &amp; Macis DiskFinder</td>
<td>$25</td>
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<td>myDiskLabeler w/Color</td>
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<td>myDiskLabeler w/LaserWiter Option</td>
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<td>StickyBusiness</td>
<td>$89</td>
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<tr>
<td>XTree Company XTree</td>
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</table>

**FILEGUARD EXTENDED EDITION**

FileGuard Extended Ed. & FileGuard 1.04 by A.S.D.

FileGuard Extended Edition ($129) protects your hard drives from unauthorized access (including security bypass with a system diskette), copying and erasure, applications and files from unauthorized access, deletion and/or illegal copying: desktop (including system folder) or other applications. The extension ($39.5) is for those who require file protection only (encryption/decryption that is quick and automatic).

**SUPERMAC SPPOOL**

Super/ SuperLaserSpool ($58) and SuperLaserSpool ($88) take control of printing in the background and return the Mac to your control in seconds. These best-selling print spoolers are the fastest available and include a special desk accessory that lets you delete documents from queue, re-order them, reroute documents to other printers (SLS) and preview or zoom on documents.

**SUPERMAC SOFTWARE**

Gravis MouseStick by Advanced Gravis

Gravis and Data East have joined together to create a sensational challenge by including Super Hang On with every Gravis MouseStick. The MouseStick offers incredible precision, versatility, and durability. As one MouseStick user states, "A definite must for the Mac user! Increases productivity in DTP and graphics, as well as making games much more fun." Available in ADB, Plus and Apple IIe versions. $69.
### BUSINESS SOFTWARE

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<th>Name</th>
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<td>Abacus Concepts StatView II (Mac+ SE, II w/68020 &amp; 68681)</td>
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<td>StatView SE+ Graphics</td>
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<td>A.E.C.</td>
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<td>FastTrack Schedule</td>
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<td>Antic Software</td>
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<tr>
<td>Flexforms Business Template 1</td>
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<td>Flexforms Business Template 2</td>
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<td>Ashton Tate</td>
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<td>DataLink Express</td>
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<td>DataLink Express Modem by Applied Engineering</td>
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<td>Palo Alto Software</td>
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<td>ParaComp</td>
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<td>DataSoft</td>
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<td>SoftView MacUser</td>
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<td>Micro Planner 6.1</td>
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<td>Micro Planning International</td>
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<td>Microsoft Works 2.0</td>
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<td>Microsoft Excel 2.2</td>
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<td>Micro Trading Software</td>
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<td>Stock Watcher</td>
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<td>Nolo Press</td>
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<td>Stillman</td>
<td>45</td>
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<tr>
<td>For the Record</td>
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### Rags to Riches 3-Pack by Chang Labs

Renowned for its Mac interface and ability to simplify accounting, **Rags to Riches** is a fast, powerful, and flexible financial management system. Modules include: General Ledger, Accounts Receivable and Accounts Payable. There's also Inventory Control featuring built-in POS, and to service the professional sectors there's Professional Billing, which allows for both time and material billing. **$265.**

### BUSINESS SOFTWARE (CONTINUED)

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<td>Claris MacProject II</td>
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<td>Smartform Designer</td>
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<td>Individual 101 Macros For Excel</td>
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<td>Nolo Press</td>
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<tr>
<td>Stillman</td>
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### ScriptEdit by SOMASK SOFTWARE

**ScriptEdit** is a powerful desk accessory for HyperCard. Edit multiple scripts simultaneously, global search-and-replace, custom editing with WMD, script compare feature and much more includes installation stack with tips. **$51.**

### ENTERTAINMENT SOFTWARE

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<tbody>
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<td>Accelade Hard Ball or Mean 18</td>
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<td>FastBreak</td>
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<td>Grand Prix Circuit</td>
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<td>Activation Maryland</td>
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<td>Manhole CD ROM</td>
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<td>Artwork QuallQuest or</td>
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<td>Daily Double Racing</td>
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<td>Bridge 6.0</td>
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<td>ShuttlePuck Cafe or Star Wars</td>
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<td>SimCity</td>
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<td>SimCity Supreme Pack</td>
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<td>Bull City Software Moriarty's Revenge</td>
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<td>PS1 Mustang or Ferrari Grand Prix</td>
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### BUSINESS SOFTWARE (CONTINUED)

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<tr>
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<td>Cutty &amp; Greene, Inc, Crystal Quest</td>
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<td>Crystal Quest w/Cricket Editor</td>
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</tr>
<tr>
<td>Seven Cities of Gold SkyFox, or Paton vs Romrell</td>
<td>15</td>
</tr>
</tbody>
</table>

### DataLink Express

**DataLink Express**, the first fully Hayes compatible 2400 baud modem designed specifically for the Mac. With the first comprehensive status byte array, "Line Engage" indicator and upgradeable design (add send-Fax capability and MNP error correction). Comes complete with a perfectly matched Mac-platinum case, a Macintosh-type serial port input, a DB-25 connector and communications software. **$189.**

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### ENTERTAINMENT SOFTWARE (CONTINUED)

<table>
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<td>Miles Computing Inc.</td>
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<td>P.C.A.K. (XOR) Task Master</td>
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<td>Premier Technology Jet Trek</td>
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**ACCOUNTING PACKAGES**

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<td>Aatrix Payroll v3.0</td>
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<td>Chang Labs Rags to Riches Professional 3pack</td>
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<td>Dae-Easy Light</td>
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<td>Components GL</td>
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**COMMISSION SOFTWARE**

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<td>Compuserve Navigator</td>
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<tr>
<td>DataViz MacLink Plus/Translator</td>
<td>99</td>
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<td>MacLink Plus with Cobble</td>
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<td>Freesoft White Knight x11</td>
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<td>Hayes Smartcom I1 3.1</td>
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<td>Infosphere</td>
<td>169</td>
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<tr>
<td>Insight Expert GL, AP</td>
<td>245</td>
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</table>

**WIN A JACKPOT BONANZA**

Programs Plus is making you an offer that you can't refuse — the chance to win a gift certificate for $500.00 in merchandise.

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Contest Rules
1) No purchase necessary to win.
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5) Winner selected by Independent Certified Public Accountant for Programs Plus in random drawing. All decisions are final.
6) Odds of winning depend on number of entries.
7) Winners responsible for taxes.
8) Programs Plus will announce winner on or about February 5, 1990.
9) Winner notified by mail. Prize must be claimed within 30 days of notification.
10) Winner agrees to sign and return an affidavit of eligibility and liability release.
11) Contest is open to U.S. residents except where prohibited by law.
12) Employees of Programs Plus and suppliers are not eligible.

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**ACCOUNTING PACKAGES (continued)**

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<tr>
<td>Rags to Riches GL, AR, or AP</td>
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<tr>
<td>Check Mark</td>
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<td>Payroll</td>
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**COMMUNICATION SOFTWARE**

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<td>Acuc-Weather Forecaster</td>
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<td>Software Ventures</td>
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<td>Microphone II v3.0</td>
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<td>Solutions, International BackPack</td>
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<td>Synergy Software VersaTerm</td>
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<td>VersaTerm-Pro</td>
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<td>Traveling Software LAP-LINK</td>
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Desktop Publishing

Page-Layout Play-offs

By Robert Virkus

Choosing just one page-layout program to handle your four-color publication is a difficult mission. If your publication is graphics-oriented, you may think all you need is a layout program that handles graphics with relative ease. If it’s text-intensive, then you may assume that typographic capabilities are of prime importance.

But when you’re working with editorial, copyediting, art, and production departments to produce a four-color publication, graphics and typography are only two of the many issues you must consider. Page-layout programs have some tall orders to fill.

In this article, I’ll walk you through the stages of the production process, using roughly the same order that many publications use. Layout programs must hook up seamlessly with word processors; let designers apply their own layout styles through master pages; place text and graphics; and handle hyphenation, justification, and font scaling. They must also let users place color, copyedit on the page, separate color elements, and crop graphic elements. But that’s not all — these programs must also interface with high-end output devices.

Looking at how all layout programs handle these tasks would be impossible — some of the more recent entrants to the market don’t yet have all the capabilities for producing a four-color publication. (For a look at the newer entrants in the page-layout race, see the “Sideline Contenders” sidebar). Instead, I’ll describe how each of the three most popular programs — QuarkXPress 2.12, Page-Maker 3.02 with Color Extension,
and Ready.Set.Go! 4.5a — stand up to the task of producing a four-color publication. At each stage in the process, I’ll tag the program that’s the leader in performing that task. Finally, I hope to help you make an informed buying decision based on your particular needs.

**Word-Processing Hooks**

Once a manuscript has left an editor’s desk, it should be formatted (that is, margins, fonts, and type sizes should be applied) according to the publication’s style. Many word processors let you apply these attributes through style sheets. Some large publications receive their manuscripts via modem as text files, and format information in this text is coded, with angle brackets surrounding each style call, resulting in so-called tagged text.

I looked at how MacWrite II, Word 3 and 4, WriteNow 2, and Nisus 2.02 worked with the layout programs. The job of the page-layout program at this stage is to accept all this styling information from the imported manuscript, and it should do so seamlessly. QuarkXPress recently incorporated Word 4 and MacWrite II filters, so it now reads these files directly, along with Word 3 and WriteNow files. About the only style shortcoming of QuarkXPress is that it doesn’t distinguish between native and imported style sheets. Knowing that a style sheet is imported can be useful in determining the cause of a problem if you have a troublesome document.

Nisus presents a problem for QuarkXPress and the other programs because, when you save a file, it stores its styling information in the resource fork. This means that the page-layout programs must bring Nisus files over as tagged text, without any styling attributes.

QuarkXPress reads and writes ASCII text with character formatting and style-sheet names. Character formatting includes kerning, boldface, italic, font, and line-break information. It also has information concerning point size, em space, figure space, nonbreaking space, discretionary hyphen, and even color.

PageMaker was the first layout program to read Word 4 files directly, and it’s still the only layout program to distinguish between native and imported style sheets. PageMaker accepts styles from WriteNow files the same way QuarkXPress does, but it can’t import MacWrite II files.

The Big Three page-layout programs battle it out to prove which is best at producing a four-color publication.
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Page-Layout Play-offs

directly. You must save MacWrite II files as WriteNow or Word 3 files before importing them.

Reading tagged text as style-name tags that format individual paragraphs, PageMaker implements its own definition of the style in each style-name tag. Paragraphs that are not preceded by a style-name tag are formatted in the style of the preceding paragraph. If a tag doesn’t match an existing style, PageMaker creates a new style based on the imported attributes.

Ready,Set,Go! handles tagged text files the same way PageMaker does. It reads WriteNow and Word 3 files directly but has no filters for Word 4 or MacWrite II. Ready,Set,Go! keeps Word 3 attributes, but it can’t create new style sheets. If, however, you create a new style while your cursor is still in an imported text block, Ready,Set,Go! will open the dialog box for the document with those attributes as the default settings.

With its Word 4 and MacWrite II filters, QuarkXPress is the leader in this category, though PageMaker comes in a close second because it distinguishes between native and imported style sheets.

Applying the Page Style

Page-layout programs have their own style sheets — boxes of preformatted text that can save you some time in page arrangement. These style sheets include basic font information, the track or pair kerning for a particular point size, and the width and depth of text elements such as headlines.

QuarkXPress and Ready,Set,Go! let you copy and paste preformatted text boxes between publications. PageMaker also supports style sheets. In all three cases, all style-sheet characteristics are carried forward.

Mastering the Pages

Master pages provide an overall style in page-layout programs, often including elements that are the same for several pages, such as layout grids.

QuarkXPress has what’s called a default page that acts as the master page, letting you specify the basic layout for a publication. All pages in a publication start with the default page’s layout format. Should you change this default page, all pages you create subsequently will take on the new attributes but these changes won’t affect the previous pages. QuarkXPress also lets you choose text attributes from the Style menu and apply them to the active text box (style sheet) or to any other text boxes.

glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color separation</td>
<td>The process of converting a design, publication, or image to four sheets of negative film. The film is exposed plates that, when run on a press, combine the four separate inks of cyan, magenta, yellow, and black (CMYK).</td>
</tr>
<tr>
<td>Leading</td>
<td>For typographers, is the vertical spacing between the baselines of two lines of text. Some word-processing programs and PageMaker define it as the vertical spacing between the tops of capital letters in two successive lines of text. This spacing is expressed in points (12-, 14-, or 24-point, for example).</td>
</tr>
<tr>
<td>Master pages</td>
<td>Contain the guides, column rules, running heads, and graphics that are common to every page in a publication. The name “master page” is specific to PageMaker and Ready,Set,Go!, but the concept is generalized for all layout programs. QuarkXPress, for example, calls the master pages default pages.</td>
</tr>
<tr>
<td>Pair kerning</td>
<td>Is when you adjust the spacing between two adjacent characters in a line of text. It usually moves them closer together.</td>
</tr>
<tr>
<td>Posterization</td>
<td>Is the process of averaging groups of grays, which removes gradations and, in their place, creates steps. The words in a document relative to point size.</td>
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<td>Is the process of averaging groups of grays, which removes gradations and, in their place, creates steps. The words in a document relative to point size.</td>
</tr>
<tr>
<td>Track kerning</td>
<td>Also called tracking, is the adjustment of white space either globally or between selected characters and words in a document relative to point size.</td>
</tr>
<tr>
<td>Vertical justification</td>
<td>Adjusts the spacing between lines of text, causing the text to fill in the space specified for a column. The result of this process is a page with text in all columns lined up across the top and bottom.</td>
</tr>
</tbody>
</table>

Solarization is the reversal or partial reversal of tones in a gray-scale image (caused by overexposure, in the case of black-and-white photographs). You reverse the tones by adding grays to whites in the image. This process lowers the contrast of a gray-scale image.

Stripping as assembling individual four-color film separations of each page element, such as a page of text, graphics, and photographs, into one final set of four-color film.

Style sheets are contained in word-processing programs that contain information for fonts, sizes, margins, and justification. In page-layout programs, style sheets consist of boxes of preformatted text containing information on fonts, track and pair kerning for a particular point size, and the width and depth of text elements such as drop caps.

Tagged text is ASCII text with code containing styling information enclosed in angle brackets — for example, <head1>, <body>, <caption>. You type tags in your word-processing file whenever you want the style to change. When you place the text in the page-layout program, the tags disappear and the text is automatically formatted as it flows into place.
Tympographic Functions

QuarkXPress

Figures 1a and 1b: QuarkXPress gives you complete typographic control over a document through such items as the Edit Hyphenation & Justification dialog box and the Style menu. You can, for instance, specify the amount of pair kerning and leading by entering a numerical value in the Kern and Leading dialog boxes. All hyphenation and justification controls can be included in QuarkXPress' style sheets.

Figures 2a, 2b, and 2c: Most kerning for individual sections of a document in PageMaker must be handled by keystrokes — you can enter a kerning value for the whole document only. PageMaker also lacks a vertical-justification command; you must manually move the text until it looks vertically justified. PageMaker does have an automatic hyphenation function that first checks the user-definable supplementary dictionary and then checks the built-in dictionary.

Ready,Set,Go!

Figures 3a and 3b: Ready,Set,Go! has more hyphenation controls than PageMaker does but not as many as QuarkXPress. After checking the user-defined dictionary, it relies on a hyphenation algorithm. Ready,Set,Go! also lets you specify a justification in which excess vertical space is evenly distributed among all lines.

on the default page. When you insert new pages, the text boxes will have the format of the default page's text boxes.

Every PageMaker publication has one or two blank master pages. Master pages include elements that repeat from page to page and are laid over the regular pages. Unlike QuarkXPress' default pages, PageMaker's master pages don't allow for intermittent changes within a document. If you change the master page in a PageMaker document, all pages will take on the new format. The only way around this is to selectively ignore the master page and either format the page manually or selectively cut and paste the master-page elements you want to keep on the new page.

Ready,Set,Go! has preconfigured default settings, which are independent of the master pages, that are automatically applied to every new document. You can change these settings, which include all the items in the Preference and Page Setup dialog boxes, the hyphenation specifications, the grid structure, and the default font. In addition, Ready,Set,Go! has master pages that you have to turn off if you want to deviate from the master format.

Choosing a leader in page styling is difficult because it depends on your preferences. If you're looking for precision in your layouts, you'll like all the controls that QuarkXPress offers. On the other hand, if you have more of an eye toward design and not so much for precision, you may prefer the WYSIWYG approach to page layout offered by PageMaker and Ready,Set,Go!. Of these two programs, PageMaker offers more freedom from the structure. But like Ready,Set,Go!, PageMaker has certain default settings that come with each new document.

Preliminary Page Layout

I'm going to divide page layout into two stages: one that happens before you place graphics on the page and a second that happens after this process. In the first stage, you pour
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Sideline Contenders

Nearly every comparison of page-layout programs features the Big Three: PageMaker (the reigning champ), QuarkXPress (the feisty challenger), and Ready.Set.Go! (the eternal bridesmaid). But contrary to popular belief, these aren’t the only options. There are a half dozen other programs at the high and low ends of the publishing spectrum. This time next year, expect to see some new blood in the DTP face-offs.

The Program Most Likely to Succeed against the entrenched trio is Letraset’s DesignStudio ($795), a newly released program aimed at graphic-arts professionals (see DTP section, December ’89). It uses an electronic pasteboard (as PageMaker does) in addition to text and graphics frames and offers several features many of its competitors lack: a choice of grids and guides for design work, a rotation tool for text and objects, editable thumbnails, object grouping, a “nudge” key for small movements, a polygon tool, vertical justification of text, a spelling checker, preferential hyphenation, and search and replace of style sheets. Add-on modules called Annexes let third-party developers supply new capabilities such as editors for kerning pairs and tracking. DesignStudio handles 24-bit color and supports spot-color separations that will be packaged as an Annex and sold separately. DesignStudio’s output can be sent to a variety of printers and imagesetters, including Optronics’ ColorSetter 2000 and the Crosfield prepress system. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07655; (201) 845-6100.

On the other hand, you may not need fancy typography, color separations, or the learning curves and price tags that come with them. Springboard Publisher supplies basic word-processing, graphics, and page-layout capabilities in one inexpensive ($199.95) easy-to-use package (see DTP section, May ’89). It provides such niceties as a typing window for text entry, a full set of painting tools, and independent page orientation within a document. Springboard Publisher II, just released, adds a spelling checker, limited grayscale control (there’s no color support), text wrap through graphics (for watermark effects), and six special text effects from Emerald City’s Smart Art series. Springboard Software, 7808 Creekridge Circle, Minneapolis, MN 55435; (612) 944-3915.

A step up the ladder is Silicon Beach’s Personal Press, scheduled to ship in early 1990. This $299 package pushes ease of use via “proxies” — page previews that inhabit nearly all dialog boxes. The proxies provide instant feedback on how changes in text, graphics, or layout will look before you click on the OK button. The innovative AutoCreate dialog box lets you select a template and place all text and graphics for a multipage document before you actually open it. Personal Press can import 8-bit color graphics, although output is limited to spot color. It includes drawing tools and gray-scale editing features, and its word processor has a thesaurus. The program’s other innovations include the Workbook (a scrapbook for storing text and graphics), Posted Notes, and Link Navigator (which guides you through linked text blocks). Silicon Beach Software, 9770 Carroll Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.

Publish It! is a midrange product in both price ($395) and features (see StartUp, December ’89). It’s small (it runs on a 512KE) and fast and can open multiple documents. It has a word processor, paint and draw tools; a plethora of templates; and several high-end features — text rotation, vertical justification, patterned and toned text, and editable thumbnails. It imports color PICT images but no other color or gray-scale graphics. You can assign up to eight colors within the program and do spot-color separations. Unfortunately, Publish It! has some problems with graphics handling and printing that keep it from reaching its full potential. Timeworks, Inc., 444 Lake Cook Road, Deerfield, IL 60015; (312) 948-9200.

There are a few page-layout programs that cater to specialized segments of the DTP market. Multi-Ad Creator ($955) is designed specifically for producing display ads, fliers, and other single-page layouts. It provides text and object rotation, numerous drawing tools, customized layout sizes, “design sheets” for storing formats, and a “suggest” feature that automatically generates alternative layouts. Multi-Ad Creator handles spot-color and four-color separations, and it can save files in PICT format so ads can be placed in other page-layout programs. It also comes with a CD-ROM containing more than 300 EPSF graphics and a year’s worth of free tech support and product upgrades. Multi-Ad Services, 1720 Detweiler Drive, Peoria, IL 61615; (309) 692-1530.

RagTime, a $595 European import, offers a unique method for handling spreadsheets, databases, and graphs. Version 3.0 performs all the usual layout chores (in color), plus it can import and edit data from Excel, Lotus 1-2-3, FileMaker, and 4th Dimension. RagTime’s business orientation includes the ability to create fully integrated spreadsheets and graphs; its graphing tools generate a variety of chart types. It can do spelling checks and hyphenation in 14 languages, and it has built-in scanner drivers. RagTime’s U.S. distributor is Migrant Software, 313 Iona St., Naberth, PA 19072; (215) 667-9781.

If you’re producing books or technical documents, take a look at Interleaf Publisher (see DTP section, April ’89). This $995 program focuses on the entire document instead of the page. It sports automatic generation of indexes and tables of contents, anchored graphics, CAD-like drawing capabilities, and multiuser support. Interleaf was ported from the workstation world, and fully formatted files can be swapped among its various platforms. On the negative side, it has hefty system requirements, font-management problems, and no color support. Interleaf, 10 Canal Park, Cambridge, MA 02141; (617) 577-9800.

— Aileen Abernathy
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Desktop Publishing: How It Works

**Spot color**
created on page in page-layout program or imported as EPSF file

**Continuous-tone image**
3 basic approaches
1) Master file on page
   Four separate EPS files
   for CMYK values in folder
   with page-layout file
2) Display file on page
   Link to file stored on high-end scanner
3) Imbedded PostScript file
   Continuous-tone file
   in EPSF format

Illustration
(imported EPSF file)

Text
(imported from word-processing program)

**1) Master file**
Replaced with 4-color separations

**2) Display file**
Replaced by original stored file

**3) Imbedded PostScript**
Contains CMYK PostScript description

Separation software
(within layout program or as separate utility)

To hi-res PostScript printer

To high-end scanner

PostScript conversion software

Linotronic

Cyan negative
Magenta negative
Yellow negative
Black negative

Illustration
(imported EPSF file)

Text
(imported from word-processing program)
text into the page-layout document. In the second (which I'll take up after the graphics discussion), you're concerned with typographic and justification considerations.

In this first stage, you're concerned with the flow of text among pages, the grid structure, and text-wrap-around boxes for graphic elements. When you import text from a word-processing program, you want to determine where the text will go and have the layout program flow the text automatically.

All the programs allow differing column layouts on the same page, with automatic text flow within each layout. They also let you place text over a graphic and vice versa. All handle text wrap in the same manner: You can run text around the rectangular graphic box, run text around an outline of a graphic, or run text behind a graphic box.

None of these programs have a menu-based grouping command. In QuarkXPress, you can group objects by manipulating parent/child relationships. PageMaker relies on Shift-clicking for temporary grouping, and Ready,Set,Go! uses the marquee tool for this purpose.

QuarkXPress has an Auto Page Insertion option in its Preferences dialog box. This option determines when and where pages will be inserted in the event of text overflow. The program inserts additional pages at the end of a story, at the end of a section, or at the end of a document. It also flows text onto the new pages automatically. Placement of objects is a very precise operation in QuarkXPress, but some designers find it cumbersome. The program lets you enter the coordinates for placing any item on a page. You can also specify the position and size of a selected text or graphic box.

PageMaker lets you flow text using one of three methods: manual, semiautomatic, and automatic. In manual, the text stops at the bottom of each column. Semiautomatic is similar to manual, except that the cursor remains as the text-placement box.
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icon, ready to place the next column. Automatic places the entire document. The precision you achieve in placing objects in PageMaker is only as good as your hand-eye coordination in working with snap-to guides on-screen.

PageMaker's automatic page insertion is truly automatic, unlike QuarkXPress, which is menu-based. Should your publication run out of pages before you've finished pouring text, PageMaker automatically inserts pages (up to a total of 128 pages, the maximum PageMaker allows) to finish the document.

Ready, Set, Go! uses linked blocks or text frames that require you to click on each frame to be included in a particular pour. Text blocks must be linked before you can flow your document, and if you run out of frames before your document is placed, the remaining text is stored as overflow text. To display this overflow text, you need to either change the size of the text block or create more blocks and link them to the last block of text. Like QuarkXPress, Ready, Set, Go! lets you enter the coordinates for an object when you're placing it on the page and specify the size and position of objects.

Ready, Set, Go! uses a grid structure to lay out pages. If you create an object such as a text or graphic block, the program snaps to fit one or more rectangles in the grid. When the grid is active, objects automatically snap to the nearest grid line.

I'll hold off on picking a winner in this category until I've discussed the second stage of page layout.

**Graphics-Handling Basics**

Graphics come in a variety of formats, and professional publishers need a layout program that can accommodate all of them or as many of the more-popular formats as possible. All the programs accept EPSF (Encapsulated PostScript Format), TIFF (scanned images), PICT2, and bit-mapped graphics, but they vary in the amount of control users have over contrast, resolution, and position.

All the programs come with the same object-oriented drawing tools, which include tools for creating lines, circles, squares, rectangles, and ovals. You can also shade these shapes. All the programs let you resize and crop graphics and even mask them with black-and-white shapes. Ready, Set, Go! is the only program that lets you flip a graphic (180 degrees), but none of the programs let you rotate them. None of the programs let you edit imported graphics much, except for contrast and placement. For extensive altering, you have to go back to the original program and

---

**The State of Color Separation**

As of this writing, the state of color separation as a feature of these page-layout programs is disparate.

QuarkXPress is currently the only page-layout program capable of separating its own files. From the Print menu, you select Separations, and the program prints out any EPSF illustration or QuarkXPress-generated spot color along with the page as four-color separations. As an added feature, Pre-Press Technologies, in conjunction with Quark, has developed SpectreSeps XP, a QuarkXPress extension that lets designers place continuous-tone color images from a desktop scanner or a screen-capture utility onto the page, to be separated along with the rest of the document.

Currently, PageMaker 3.0 with Color Extension can create CMYK color on a page from within the program. However, Aldus hasn't released a separation utility as of this writing. Many magazines, including MacUser, use Adobe Separator 2.0 to color-separate PageMaker files saved to disk as PostScript.

At the first release of Color Extension, Aldus said it would ship Aldus Separator, a utility that would color-separate PageMaker pages. A later version of PageMaker will also feature a Pre-Press Technologies product — SpectreSeps PM — that will let PageMaker users place continuous-tone images on a page and color-separate them, as QuarkXPress does.

Ready, Set, Go! 4.5a doesn't have color-separation capabilities. However, Letraset will be shipping its new high-end page-layout program, DesignStudio, by the time you read this. Among its features will be the ability to do full-page four-color separations (for more details, see the "Sideline Contenders" sidebar).

— Michael Yapp
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Page-Layout Play-offs

Graphics Handling

QuarkXPress

Figure 4: Placing graphics in QuarkXPress is similar to placing text. You have to enter the picture's coordinates on the page, its width, its height, its scale, text-wrap information, and background-shading information in the Picture Box Specifications box before bringing in the graphic.

PageMaker

Figure 5: PageMaker's pasteboard method forces you to rely on hand-eye coordination for placing graphics — you don't have to contend with dialog or graphics boxes. About the only element you have to pay attention to is the type of text wrap and flow you want.

Ready, Set, Go!

Figure 6: Like QuarkXPress, Ready, Set, Go! has a graphics-specification dialog box into which you enter a graphic's page coordinates along with dimensions and scaling information. Ready, Set, Go! also gives you freedom from this level of detail by letting you place a graphic on a page as you would in PageMaker. A nice feature of the Picture Block Specifications box is that it tells you the format of a graphic (for example, EPSF).

reimport the altered graphic into the layout program. (See the "Sideline Contenders" sidebar for information on Publish It!, a newcomer that has a wide selection of drawing and painting tools.)

As for ease of reimporting, PageMaker's Place option on the File menu gives you the option of replacing an entire graphic with an updated version. The reimported graphic contains the same geometry and cropping and reducing or enlarging information as the original.

Instead of providing you with a winner in each graphics category, I'll select an overall winner for graphics after the discussion of color graphics.

Gray-Scale Handling

When working with gray-scale scanned images, everything has to match perfectly, from the quality of your original scans to the quality and resolution of your output device. But even in ideal conditions, the halftone produced may not meet commercial production standards.

Through three predefined contrast settings — normal, high, and posterized — and one custom setting, QuarkXPress offers contrast controls for gray-scale and color TIFF images. (I'll take up the issue of color a little later.) The custom contrast setting represents a picture's contrast as input versus output. QuarkXPress' contrast tools let you change the contrast manually, draw freehand curves, make linear adjustments, return to the original contrast levels, flip the current contrast curve (an x,y-axes graph measuring the gray levels in the printed image over the gray levels in the imported TIFF picture), and create negatives.

PageMaker's gray-scale handling isn't as tool- or box-oriented as QuarkXPress', but with PageMaker you do have more-direct control over gray-scale images in terms of contrast — it's more WYSIWYG in its approach. You can modify scanned images in PageMaker by changing the gray levels in the image, changing the line screens for special
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Page-Layout Play-offs

effects, and increasing or decreasing the screen frequency of the image.

PageMaker also offers a virtual-memory-like feature for dealing with large (in terms of disk size) scanned images. For any image greater than 64K, PageMaker creates a low-resolution screen version that is stored with the publication and linked to the original scanned image on-disk. Any changes made to the on-screen version are updated in the original when the publication is printed.

Ready,Set,Go! can modify the gray-level information in TIFF files, either by adjusting the brightness and contrast of the image or by creating special effects such as flops, negatives, posterization, and solarization. Ready,Set,Go!’s “graymap” box shows the relationship of the shades available in the original image to the shades displayed on the screen when you print. You can manipulate this curve with the brightness or contrast sliders, with the Posterize button, or by editing directly with the mouse. You can also set the halftone screen.

Color-Image Handling

Color handling in layout programs varies. All programs display color images, but they don’t all let you edit them. QuarkXPress is the only one with color-editing and four-color-separation capabilities. You can make contrast adjustments to each color component or combination of components in a color picture. QuarkXPress also lets you adjust the CMYK (cyan, magenta, yellow, and black) components individually as well as in combination (for example, cyan and yellow together) via the contrast curve. The program screens an image electronically by using one of the four predefined screens or by creating a custom screen.

By the time you read this, PageMaker’s Color Extension will let you edit an image’s CMYK values. Color Extension already lets you place and display color TIFF images, but currently it can’t do color separations within PageMaker. You have to handle color separations by using the method outlined in "The State of Color Separation" sidebar.

Ready,Set,Go! also lets you place and display color images, but it doesn’t let you edit or separate them. At press time, Letraset announced its new high-end layout program, DesignStudio, which will have a host of color-handling capabilities (see "The State of Color Separation" sidebar for more details).

QuarkXPress is the leader in graphics handling because of its color capabilities, particularly its ability to do separations. PageMaker is a close second because of its edge in handling gray-scale images. PageMaker lets you see the results of your contrast changes directly on-screen (no boxes). The key to high-level graphics, gray-scale, and color is working with your service bureau. Inputting and manipulating these items on the desktop is easy; getting quality output isn’t.

Final Page Layout

At this stage, you have all the elements on the pages in place (roughly, anyway), and you’re ready to arrange and adjust them for the final layout. This fine-tuning involves the typographic issues of leading, pair kerning, track kerning, and hyphenation, along with vertical justification and font handling. Ideally, these typographic and justification considerations should be worked out long before you put together the final layout.

To be of any real use, a layout program should have user-definable controls for typographic adjustments.
Also, the program should let you incorporate this information into its style sheets.

QuarkXPress offers three typographic adjustments for word spacing — standard, spaces only, and uniform — which vary the amount of white space inserted between characters and between words. Standard inserts more space between words than between characters, spaces adds extra space only between words, and uniform distributes added space as evenly as possible among all characters. The program also gives you a custom pair-kerning feature. QuarkXPress doesn't have a vertical-justification command, but it does let you justify vertically through careful use of leading and baseline commands.

All hyphenation and justification controls can be included in QuarkXPress' style sheets, and the program lets you specify values for the number of consecutive hyphens, smallest word, pair kerning, leading, and track kerning. It also lets you edit the kerning table for each font size.

QuarkXPress' user-definable hyphenation controls let you determine the minimum number of characters in hyphenated words, the minimum number of letters that must precede a hyphen, and the maximum number of consecutive lines ending in divided words. It uses a combination of whole-word reference dictionary and logic-based hyphenation algorithm.

PageMaker has automatic hyphenation of text, but it doesn't provide any hyphenation-control options. The program checks the user-definable supplementary dictionary and then the built-in dictionary. PageMaker also lacks a vertical-justification command — it relies on hand-eye placement. For text justification, PageMaker lets you specify a desired word space and indicate minimum and maximum ranges within which PageMaker can justify a column of text.

For pair kerning, PageMaker considers the built-in letter space as 0 percent of the recommended space built in by the type designer. To compose justified text, PageMaker adjusts the spacing within the desired ranges and hyphenates to fit text into the lines. It doesn't include track kerning in its style sheets, but it does let you invoke pair kerning above a specified point size. Considering that there are almost 4,000 possible pair kerns in a given font and that the average number included in most PostScript fonts is about 100, this level of control is inadequate.

Ready, Set, Go! has Type Specifications and Type Control dialog boxes that let you specify the desired pair and track kerning. This program relies solely on a hyphenation algorithm after checking the user-defined dictionary. You can define the minimum size of a hyphenated word, the minimum number of characters allowed before and after a hyphen, and the maximum number of sequential lines that are allowed to end in a hyphen.

For vertical justification, Ready, Set, Go! uses a more sophisticated technique than the other programs do, in addition to the top, bottom, or center choices. You can specify justification with feathering, in which the excess vertical space is evenly distributed among all the lines, or with paragraphs, in which the excess vertical space is evenly distributed among the paragraphs in the text block.

PageMaker has a clunky approach to typographic functions such as hyphenation control.

For page layout, particularly this second phase, you need the precision of QuarkXPress for typographic and justification adjustments, so it takes the prize in this category. PageMaker and Ready, Set, Go! tie for second place — PageMaker for its WYSIWYG approach to layout and its automatic page insertion and...
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And, at just $99, it’s very affordable. In fact, at that price, Adobe Type Manager probably offers more value than any other Macintosh software.

It’s also very easy to install and operate.

You see, Adobe Type Manager is completely transparent to both you and your software applications.

So all you see is a better image. Once it’s installed in your System Folder, Adobe Type Manager recognizes and generates the screen bitmaps (at the requested size) from a PostScript outline font. So, whether your text is regular, bold or italic, it looks smooth and readable from the largest point sizes to the smallest.

Then, when you print to your Apple ImageWriter or Hewlett-Packard DeskWriter, Adobe Type Manager automatically generates the requested printer font bitmap to produce beautiful, letter-quality text from any application.

That’s because Adobe Type Manager is compatible with virtually all major Macintosh software—from programs for word processing and spread-sheets to page layout and presentations.

Which means it won’t change the way you work. Just the way you look.

And every Macintosh user can look better, because Adobe Type Manager requires just one megabyte of memory. That way, every Macintosh from a Plus to a Ilex can take advantage of its unique outline font technology.

Speaking of fonts, every copy of Adobe Type Manager includes high-quality outline versions of the 15 most popular fonts. They’ll enable you to produce the kind of high-quality text from your ImageWriter or DeskWriter you thought only came out of a laser printer.

If you want to add more fonts, you can pick up the ATM™ Plus Pack, giving you the 22 additional outline fonts from Apple’s LaserWriter.

Adobe Type Manager includes high-quality outline versions of these 15 most popular Macintosh fonts. You can also add any PostScript outline fonts, including those from the Adobe Type Library.

And, ATM Plus Pack is specially priced at just $198.

Adobe Type Manager also works with other Adobe PostScript language fonts, including the more than 500 typefaces from the Adobe Type Library. We could go on, but you probably have the picture by now. Suffice it to say, Adobe Type Manager is a lot better to look at than it is to read about.

Because, quite frankly, words don’t do it justice.

So call us at 1-800-344-8335 (outside the U.S.A. and Canada, call your local distributor) for the name of your nearest Adobe Authorized Dealer.

When it comes to improving your image, it doesn’t get any easier than this.

Adobe Systems Incorporated

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Now that Adobe Type Manager software has cleaned up your text, give it a change of face with new TypeAlign.

Because while ATM® gives you great-looking text, TypeAlign allows you to print any number of different ways—up and down, at any angle, even along arcs and complex curves. And you can do it using inexpensive printers like Apple® ImageWriters® and HP DeskWriters® and PaintJets®. So now you don’t need a laser printer to get professional-looking results.

You don’t need to be a professional designer to use TypeAlign, either. Since it’s a desk accessory, you install TypeAlign once in your Macintosh® computer, and then use it in just about any application. You’ll find it incredibly easy to create even complicated-looking effects—no special drawing programs or skills needed. So go ahead, put a new face on your reports, slide presentations, charts, whatever.

How does TypeAlign work? First, use a tool to draw an arc, straight line or freehand curve. The freehand

Introducing TypeAlign™—a new desk accessory exclusively

TypeAlign is a trademark and Emerald City Software is a registered trademark of Emerald City Software. Adobe and PostScript are registered trademarks and Adobe Type Manager and ATM are trademarks of Adobe Systems Incorporated.
tool is especially handy for wrapping type around any object or shape. Then, type a word or phrase—it appears automatically on the line you just drew. You can even adjust the spacing between the letters and words until it's just the way you like it. Will a shadow or outline look even better? Give it a try—you'll see the effect instantly on screen.

When you're satisfied, paste your creation into a document, then print it out on any ATM-supported printer or other device, including ImageWriters, LaserWriters® and DeskWriters. Of course, TypeAlign works with any Adobe® PostScript® font, too.

Let's face it. If you have ATM, you need new TypeAlign. Especially with a suggested retail price of only $99.95. To find out where you can buy it, call Emerald City Software at 1-800-223-0417, in CA 415-324-8080.

for Adobe Type Manager™ owners.

Please circle 16 on reader service card.

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The award-winning software
c package that transfers and trans­
lates files between Macintosh and
DOS or OS/2 programs now does
the same for Sun worshippers.
And for the NeXT world.

With MacLinkPlus/PC, you can
now send files in either direction
between Macintosh and virtually
any other desktop environment.
Files arrive in the new environ­
ment with the correct styles and
formats in place—just as if they
had been created there.

MacLinkPlus/Wang OIS and
MacLinkPlus/Wang VS pro­
vide the same bi-directional
connectivity between
Macintosh and Wang.

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TRANSLATES

The MacLinkPlus/PC package
arrives with everything you need
—software, manual, a direct
connect cable (a Hayes modem or
compatible also works), and our
full library of over 100 translators.*

If you don’t need file transfer
capabilities (maybe your Macs
and PCs already share a network
or server), then simply order
MacLinkPlus/Translators. It’s the
same package without the cable
and communications capabili­
ties. And, it’s the ideal software
purchase for anyone with a
Macintosh FDHD SuperDrive
or external drive that reads
DOS disks.

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TO EVERYWHERE

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the past with the MacLinkPlus
family of Databridge products. For
the name of your nearest DataViz
dealer, call 203-268-0030 today.

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MacWrite® II from Claris™
All product names are trademarks of their
manufacturers.
Page-Layout Play-offs

Ready, Set, Go! for its typographic and justification controls. I also have to criticize both — PageMaker for its clunky approach to hyphenation and Ready, Set, Go! for its arduous method of text flow (adding and linking text boxes) and lack of automatic page insert.

Final Preparations and Output

Once you’ve finalized the layouts and placed all the graphics and color, you’re ready to prep the publication for production. This includes cropping graphics, charts, and tables; positioning and scaling them; and doing color separations.

Although no layout program can do color separations of continuous-tone images, Quark and Aldus have laid the infrastructure for this task in QuarkXTensions and PageMaker Color Extension, respectively. Because color separation is such a problematic issue in desktop publishing, I’ve elected to cover it separately (see “The State of Color Separation” sidebar).

Traditionally, publishers have sent out their entire publication to a printer with instructions for four-color separation and stripping, cropping, positioning, and scaling. Now, however, page-layout programs link up to high-end prepress systems, which take care of all the prepress operations for entire pages.

The current high-end color prepress systems include Scitex’s Visionary, CyberChrome from the company of the same name, Hell’s ScriptMaster, and Crosfield’s StudioLink.

PageMaker can output to the ScriptMaster system, which will read Aldus’ OPI (Open Prepress Interface) PostScript files. OPI will be accessible to any page-layout program, and Quark and Crosfield have already announced they will support it.

Visionary and StudioLink have proprietary formats — StudioLink with Ready, Set, Go! and Visionary with QuarkXPress. To work with Visionary, designers must have a special version of QuarkXPress. They don’t have to have a special version of Ready, Set, Go! to work with the Crosfield system, however.

What’s Missing, What’s Ahead

Conspicuously absent from my previous discussion is editing on the page. Although all page-layout programs let you do simple editing, such as correcting typos, none are really set up for major editing on the completed page. To make changes on-screen in a page-layout program, you have to increase the point size to at least 30 points or work in 200 percent view to see what you’re doing.

You can do some editing in the form of spell checking and search and replace in QuarkXPress and Ready, Set, Go!, but PageMaker still lacks these facilities. Most importantly, there are no links back to the word-processing files. If you import an edited word-processing file, it won’t reflect any changes a designer may have made to the previous version placed in the page-layout program.

Another lackluster feature in these programs is graphics-handling and color capabilities. But since we’re asking a relatively inexpensive hardware/software combination to replace a million-dollar machine, being too critical of these programs in this area is unfair. QuarkXPress shows the most promise here, at least in terms of color. Quark also recently introduced QuarkXTras, which give QuarkXPress more high-end graphics capabilities such as scanning and substitution of Adobe’s recommended screen values for separated artwork.

In the next year, the competition for color and graphics handling should heat up, with DesignStudio from Letraset and Aldus’ improvements to Color Extension and the introduction of Aldus Separator.

Robert Virkus is president of MicroMedia, an electronic-publishing consulting firm based in Montclair, New Jersey. He started desktop publishing when he connected a LaserWriter to a Texas Instruments PC in 1984.

The Bottom Line

So which layout program should you buy?

Some publications work with two programs on a regular basis. One publication, for example, may use PageMaker for its feature pages, which change every issue, and QuarkXPress for its regular department pages, which remain the same through every issue. Other publications, such as MacWeek, have their art department use PageMaker for page design and the production department use QuarkXPress to implement these designs because of its precision in page element placement.

Forced to choose one program, however, I’d have to give the edge to QuarkXPress because of all its features. It does full-page color separations of its own pages, it has more text-editing capabilities, and it has more typographic control than the other programs. It also affords you more flexibility in working with different word-processing files. Typographers and others with typesetting backgrounds like QuarkXPress’ precision and control over all elements.

In a subjective comparison, however, PageMaker would come out on top because of its ease of use and Aldus’ installed training force, installed user base, and technical support. Designers prefer PageMaker because it automates the design process they’re used to — it best emulates the pastelboard paradigm.

Ready, Set, Go! is also excellent for producing quality publications, but it doesn’t afford you the graphics, text, and layout capabilities of the other two programs. It is easy to use and incorporates some of the box orientation of QuarkXPress and master pages of PageMaker. And it does have a big advantage over the others: It offers thumbnail views of documents, which let you add, delete, or rearrange the order of pages.

DesignStudio from Letraset should make this competition much more interesting in the months ahead.
If you’re looking for world class solutions to all your peripheral needs, ask for Microtech International products. Superior quality and reliability put them in a class by themselves.
# Table 1: Features Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>Aldus PageMaker</th>
<th>Letraset Ready,Set,Go!</th>
<th>Quark QuarkXPress</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Version</strong></td>
<td>3.02CE</td>
<td>4.5a</td>
<td>2.11</td>
</tr>
<tr>
<td>List price</td>
<td>$595 + $195*</td>
<td>$495</td>
<td>$795</td>
</tr>
<tr>
<td>Memory required</td>
<td>1 MB</td>
<td>1 MB</td>
<td>1 MB</td>
</tr>
<tr>
<td>Disk storage required</td>
<td>hard disk</td>
<td>two 800K drives</td>
<td>hard disk</td>
</tr>
<tr>
<td>System version required</td>
<td>4.1</td>
<td>4.1</td>
<td>4.2</td>
</tr>
<tr>
<td>Pages per document</td>
<td>128</td>
<td>limited by RAM</td>
<td>limited by disk space</td>
</tr>
<tr>
<td>Number of open documents</td>
<td>1</td>
<td>limited by RAM</td>
<td>7</td>
</tr>
<tr>
<td>Add-on modules</td>
<td>no</td>
<td>no</td>
<td>XTensions</td>
</tr>
</tbody>
</table>

## Page Layout

<table>
<thead>
<tr>
<th>Feature</th>
<th>Aldus PageMaker</th>
<th>Letraset Ready,Set,Go!</th>
<th>Quark QuarkXPress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum page size</td>
<td>17 x 22 inches</td>
<td>99 x 99 inches</td>
<td>48 x 48 inches</td>
</tr>
<tr>
<td>Maximum size of page view</td>
<td>400 percent</td>
<td>200 percent</td>
<td>400 percent</td>
</tr>
<tr>
<td>Thumbmll view</td>
<td>printed only</td>
<td>on-screen, printed</td>
<td>printed only</td>
</tr>
<tr>
<td>Editable thumbnails</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Interactive master pages</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Grids/guides</td>
<td>guides only</td>
<td>both</td>
<td>guides only</td>
</tr>
<tr>
<td>Columns per page</td>
<td>20</td>
<td>unlimited</td>
<td>unlimited</td>
</tr>
<tr>
<td>Adjusts text if columns change</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Automatic text flow</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Inserts/removes pages</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Rearranges page order</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Pastes object in same position</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Step and repeat</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Locks elements in place</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Multiple object selection</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Object grouping</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Text wrap around objects</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Text wrap inside objects</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Bleeds object across pages</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Rotates text/objects</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Undo command</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Headers/footers</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Automatic &quot;continued&quot; lines</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Automatic figure numbering</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Automatic bulleted paragraphs</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Precise numeric size/positioning</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Shows size of selected graphic</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Shows cursor position on ruler</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Shows cursor coordinates</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Ruler measurement units</td>
<td>inches, inches decimal, millimeters, picas, ciceros</td>
<td>inches, centimeters, picas</td>
<td>inches, inches decimal, millimeters, picas, points, ciceros</td>
</tr>
</tbody>
</table>

*PageMaker Color Extension is a $195 add-on for the PageMaker 3.0 family.
*Frames within frames are grouped as daughters of the outermost frame.
*Dictionary hyphenation with user-exception dictionary.
*Color separations will be performed by Aldus Separator, a separate utility that was not shipping at press time.
*"Color TIFF images can be separated with Pre-Press Technologies' SpectreSeps, available as a separate utility for PageMaker and as an XTension for QuarkXPress.
*Requires a special version of the program for Scitex; links to Alex and DEC TMS are available through third-party XTensions.

This table was compiled with the help of Electronic Directions, a New York-based training and consulting firm that specializes in electronic publishing and multimedia.
Microtek presents the MSF-300Z.

The one scanner that can do it all: color, gray-scale, drawings and text. All for a price that until now, could barely buy you gray-scale capabilities.

Hard to believe, but it's true. You can scan vivid color images into your computer for desktop publishing, presentation graphics or pre-press work. A full 16.8 million colors at a time.

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Images can be scanned in 256 gray-scale mode and then retouched, scaled or rotated. And printed on a laser printer or phototypesetter with outstanding results.

Charts and drawings are quickly scanned in single bit-per-pixel mode then imported into your favorite publishing or word processing program. You can even bring words into your computer without retyping by adding OCR software.

Interface kits include sophisticated color, gray-scale and black and white image editing software and are available for the Macintosh ($500) and the IBM PC or PS/2 ($400).

If you need a scanner for your personal computer, you need Microtek's MSF-300Z Color/Gray scanner. Call (800) 654-4160 or in California (213) 321-2121 today to find your nearest Microtek dealer.

After all, at this price, you can hardly afford not to.
# Table 1: Features Comparison (continued)

<table>
<thead>
<tr>
<th>Text Editing</th>
<th>Aldus PageMaker</th>
<th>Letraset Ready,Set,Go!</th>
<th>Quark QuarkXPress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style sheets</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Retains font, text attributes, indents, and tabs from word processor</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Retains word-processing style sheets</td>
<td>Word only</td>
<td>no</td>
<td>Word only</td>
</tr>
<tr>
<td>Maximum tabs per line</td>
<td>20</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Tab leaders</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Widow/orphan control</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Small caps, all caps</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Superscripts/subscripts</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Search and replace</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Spelling checker</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Thesaurus</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

| Typography | | | |
|---|---|---|
| Type sizes (points) | 4 – 127 pts | 2 – 327 pts | 2 – 500 pts |
| Size increments (points) | .5 pt | .01 pt | .25 pt |
| Maximum number of typefaces | unlimited | unlimited | unlimited |
| Reversed type | yes | yes | yes |
| Hyphenation (dictionary/logic) | dictionary | logic | both |
| Hyphenation control (on/off) | yes | yes | yes |
| Control over consecutive hyphens | no | yes | yes |
| Subparagraph hyphen control | no | yes | no |
| Discretionary hyphen | yes | yes | yes |
| Adjustable leading | yes | yes | yes |
| Leading increments (points) | .5 pt | .01 pt | .001 pt |
| Kerning (automatic/manual) | both | both | both |
| Kerning increments | .04 em | .001 em | .005 em |
| Adjustable tracking | no | yes | yes |
| Tracking increments | NA | .001 em | .005 em |
| Adjustable letter-spacing | yes | yes | yes |
| Adjustable word spacing | yes | yes | yes |
| Baseline shift | no | yes | yes |
| Vertical justification of text | no | yes | no |
| Font rendering | no | no | yes |

| Graphics | | | |
|---|---|---|
| Line widths (points) | hairline to 12 pts | hairline to 8 pts | hairline to 504 pts |
| Line styles | solid, dashed, double | solid, dashed, double | solid, dashed, double, arrowheads |
| Reversed (white) lines | yes | yes | yes |
| Rectangles | yes | yes | yes |
| Rounded corners | yes | yes | yes |
| Circles/ovals | yes | yes | yes |
| Polygons | no | no | no |
| Arcs and Bezier curves | no | no | no |
| Pen and fill patterns (choices) | 18 | 52 | none |
| Draw and edit bit-map regions | no | no | no |
| Scaling/cropping | yes | yes | yes |
Cricket Now Has Something No Mouse Can Resist.

Mac users in Business and Graphic Arts have long found the superior graphics of Cricket alluring. Now, Cricket Presents, Graph, and Draw have something you'll find even more irresistible. It's the promise of greater innovation and long-term backing that comes with the name Computer Associates.

With the addition of CA-Cricket® to its roster of Macintosh products that already includes such renowned programs as Bedford Accounting software, Computer Associates makes yet a further commitment to all Mac users.

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For more information about CA-Cricket's graphics packages and our new support program, SupportPlus™ call 1-800-531-5236. (In Canada, 1-800-663-6904.)

It's sure to be food for thought.

Please circle 147 on reader service card.
### Table 1: Features Comparison (continued)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Aldus PageMaker</th>
<th>Letraset Ready, Set, Go!</th>
<th>Quark QuarkXPress</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Numerical scaling</strong></td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Adjust gray-scale images</strong></td>
<td>brt, contrast, gamma</td>
<td>brt, contrast, gamma</td>
<td>brt, contrast, gamma</td>
</tr>
<tr>
<td><strong>Halftone control</strong></td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Graphic-import formats</strong></td>
<td>paint, PICT, PICT2, TIFF, color TIFF, EPSF, color EPSF</td>
<td>paint, PICT, PICT2, TIFF, color TIFF, RIFF, EPSF, color EPSF</td>
<td>paint, PICT, PICT2, TIFF, color TIFF, RIFF, EPSF, color EPSF, DCS</td>
</tr>
<tr>
<td><strong>Color Features</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creates internal color elements</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Colored text</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Pantone (PMS) library</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Color models</td>
<td>RGB, HSB, CMYK</td>
<td>RGB, HSB</td>
<td>RGB, HSB, CMYK</td>
</tr>
<tr>
<td>Spot-color separations</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Four-color separations</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Formats separated</td>
<td>EPSF, PICT, internal objects**</td>
<td>NA</td>
<td>EPSF, internal objects**</td>
</tr>
<tr>
<td><strong>Output Options</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop marks</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Registration marks</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>ImageWriter output</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>QuickDraw printers (incl. color)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>PostScript printers (incl. color)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
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<td>Imagesetters</td>
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### Report Cards

#### PageMaker 3.02CE

Through Color Extension, PageMaker offers users the ability to edit the CMYK values in a color image. The program also offers users flexibility in creating a publication through its pasteup approach to page layout. **Pros:** True WYSIWYG approach to layout; automatic text flow and page insertion; less structured in overall operation. **Cons:** No search-and-replace function; no color-separating capabilities; relies on hand-eye placement for vertical justification. **List Price:** $595. Aldus Corp., 411 First Ave. S., Seattle, WA 98104; (206) 822-5500.

#### QuarkXPress 2.12

QuarkXPress is a tool that emphasizes precision and control in page design and layout. The program offers users complete control over typographic functions such as hyphenation, pair kerning, track kerning, and leading. **Pros:** Menu-based color-separation capability that lets users do full-page four-color separations; user-defined controls for typographic functions; powerful search-and-replace feature. **Cons:** Control elements are too cumbersome; page-layout approach steps away from the true WYSIWYG approach of PageMaker. **List Price:** $795. Quark, 300 S. Jackson, Suite 100, Denver, CO 80209; (303) 934-2211.

#### Ready, Set, Go! 4.5a

Ready, Set, Go! walks the middle ground between precision and true WYSIWYG page layout. It combines word processing, typographic controls, gray-scale editing, and spot color with page layout. **Pros:** Strong editing capabilities such as search and replace; thumbnail views; ability to justify vertically by distributing excess white space evenly among all lines in a text block. **Cons:** Arduous method of text flow; limited color capabilities; control over typography isn’t as strong as QuarkXPress. **List Price:** $495. Letraset, 40 Eisenhower Drive, Paramus, NJ 07652; (201) 845-6100.
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Reasonable Solutions
2101 West Main, Medford, Oregon 97501
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Can electronic forms replace the paper variety? Here's a look at what the top forms-management programs can do.

By Ben Templin

Nobody likes to fill out forms. But forms are a way of life in government and business alike. The three forms-management programs reviewed here can make our forms-cluttered lives easier. They serve as a bridge to bring the paper world into sync with the electronic one. By using a computer to fill out forms, you harness the power of simple calculations; mathematical formulas; and, in some cases, databases to access names and addresses. This makes filling out forms easier and reduces the margin for error. Forms packages may be the best way for the traditional paper-based office to make that sometimes scary leap into using computers.
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Two of the three programs have been upgraded to new versions: Claris’ SmartForm is now in version 1.1 and Adobe’s TrueForm is in version 2.0. A third program, Fast Forms, was acquired by Power Up! from its Canadian developer, Shana, in 1989.

**Design Your Own**

These programs take two approaches to design — scanning the original paper form or creating one from scratch. Scanning forms is faster but often suffers from poor screen quality. Creating forms from scratch gives you more control over the final look of the form. SmartForm and Fast Forms have design environments (Claris’ is called SmartForm Designer) in which you create a form. Although SmartForm also lets you import scanned images (in PICT format), it provides drawlike tools for sketching out designs — similar to a page-layout program. Fast Forms lets you import images only through the Clipboard — a workaround solution at best — and has most of the draw tools you need to create simple forms. Both programs offer the usual Mac desktop-publishing options: You can define space in inches or points; a snap-to-grid aligns objects; and all the fonts, sizes, and styles you have installed are available.

The difference between these programs becomes clear when you boot them up. Anyone familiar with the Macintosh interface can create a basic form by pointing and clicking within SmartForm. Fast Forms has a non-standard Mac interface, however. Its Font and Style menus are inside a window, not on the menu bar.

Neither SmartForm nor Fast Forms is a great design tool. The largest forms maker of them all, the IRS, uses PageMaker, and if you primarily use paper forms, you’d be better off using a dedicated desktop-publishing program too. But DTP was never meant to be the first priority of forms-management programs. In fact, they have sacrificed some traditional DTP tools to give power to the primary utility in forms management — filling out the forms on the computer.

**Electronic forms processing lets you do simple calculations, use mathematical formulas, and access database address files.**

TrueForm has no page-layout capabilities. You need either a scanner to digitize a preexisting paper form or a design environment (Adobe recommends Illustrator 88, of course) to create the form. TrueForm scans documents from within its TrueForm Set-Up program. It supports numerous scanners from companies such as DEST, Sharp, Canon, Fujitsu, and Apple. A compression algorithm makes the scanned-image files smaller than normal TIFF files. (Otherwise, the TIFF file would make the form an unwieldy size.)

While scanning is a good way to retain continuity between a paper form and an electronic one, the on-screen results are not always the best quality. Forms are often designed in an 8-point type size or smaller. A scanned image with such small type can be pretty hard to read on a Mac monitor. A draw palette would be welcome for modifying some elements of the original form. It’s best to have a program with a design environment built in.

**Out in the Fields**

After page layout, the next step in forms design is to define fields for entering information. Field tools lay boxes down on a grid. In SmartForm and Fast Forms, you size a field box with a field tool as you would a rectangle in a draw program. TrueForm automatically sizes the field box to the form you’ve imported as a grid, a feature that speeds up field construction. The field box can be resized in all the programs.

Field boxes can be defined as text, numbers, dates, or other formats. Fast Forms lets you designate numbers as integer, decimal, or dollar amounts; SmartForm and TrueForm have more formatting options (this holds true for almost any element in a comparison of these programs). TrueForm goes the furthest in number formatting. You can customize the numbers, for instance, to separate the millions’, thousands’, and hundreds’ places with periods instead of commas (a European convention).

Once you’ve defined what type of information goes into each field, you can link the boxes to perform calculations. Common functions (such as multiplication, division, addition, and subtraction, as well as greater than, lesser than, and equals) are supported by all the programs. In SmartForm...
and TrueForm, even-more-complicated relationships can be defined. You can average several numbers or do a logarithm, which requires using the program’s scripting language. Formulas are convenient to build from lists that contain operators and functions (see Figure 1). SmartForm and TrueForm also support logical operators (IF, AND, OR, NOT) for formulas based on conditions. A time card, for example, can be set to automatically raise an hourly wage to time-and-a-half when more than 40 hours are reported.

Both SmartForm and TrueForm have functions that manipulate text. A concatenating function lets you define a field as a word and then join fields in a phrase. For example, you may want an entry form to yield the phrase “Meet (name) at (time).” (Name) and (time) are variables that the user enters.

**Function Follows Form**

The real power in these programs lies in the filling-out stage. SmartForm and TrueForm use separate applications, SmartForm Assistant and TrueForm Fill-Out, respectively, for this purpose. Fast Forms’ fill-out program is a DA — a good solution for a business that wants to run an accounting program or a database as its primary application.

When you fill out a form with any of these packages, the master form is not altered. Even though you open the master form within the fill-out application, any data you enter must be saved in a different format.

Automation is the key to filling out forms. How many rote tasks can the computer do? All the packages fill in the date automatically — you define the field and the way of displaying the date (1/5/90: Jan 5, ’90: January 5th, 1990; and the like) in the setup stage. SmartForm adds the option of changing the date to when the form is created, filled out, or printed.

Each program tries to reduce human error. If you enter information that doesn’t match the field type (such as a letter instead of a number), each program responds either by not accepting the data or by displaying an error message.

To further reduce the chance of incorrect data entry, SmartForm and TrueForm can automatically validate data. For example, you might want a field for a phone number to accept only 10 digits. If you type “911” as a phone number, SmartForm calls an error message.

**Forms and Database Management**

Forms-management programs are, in many ways, databases without the data. They make it easy to input information that was traditionally written on paper forms. But storing that information and manipulating it in different ways is not within the power of these programs. Why, then, use a forms package rather than a database manager?

Until recently, many database programs lacked well-designed forms capabilities. The front end didn’t look like traditional paper forms either on-screen or on paper. What’s more, you couldn’t easily set up a database that imitated the data-entry sequence of a complex form. This made it difficult for some office workers to make the leap from paper to computer — hence the intermediate virtue of forms packages. But breaking forms away from a database is like stripping the engine out of a sleek racing car. It looks nice, but it doesn’t go anywhere. The temptation is to return to upgraded databases such as Claris’ FileMaker II or ACCUS’ 4th Dimension, which have good forms capabilities and give you data management as well. You pay more for the increased power, however, and you have to deal with the complex, time-consuming process of database form building.

Adobe offers a compromise. TrueForm is the first forms program to link up with a database, 4th Dimension (somewhat ironic, since 4th Dimension 2.0 has a much improved forms capability). A printing module lets you print TrueForm forms from within 4th Dimension. You can also use 4th Dimension data to create a TrueForm stack or add to an existing stack. But this is a one-way approach to the database-link problem. You also want to be able to enter data into the TrueForm sheet and have it slide transparently into a database, which isn’t possible with this release.

To export data from any of the programs into a database, you must save the data in a text file. SmartForm also lets you save the data in SYLK, DBF, DIF, WKS, or tab-delimited files. TrueForm goes the extra yard by letting you designate which fields you want to export (see Figure A). Sets of export settings can be saved and chosen for different occasions. A tab, Return, or some other character can separate fields.

But exporting data is a workaround at best. If forms programs are not going to provide database capabilities, they need to be a transparent front end to databases so that you can harness the relational capability of databases such as 4th Dimension, FoxBASE+, Omnis, or Double Helix. The only other strategy is to build the shell of a form in a program such as SmartForm and then cut and paste it into your database, adding the entry fields from within the database itself — another workaround. Clearly, forms programs need to include more sophisticated features before they can be considered viable alternatives to databases that have good forms capabilities built in.

—Ben Templin and Michael Miley

![Figure A: TrueForm lets you import or export data (the process is called merging) from or to spreadsheets, databases, accounting packages, and other computers. A handy feature, Merge Sequence, lets you select the order of the fields to be merged so you don’t have to change the arrangement of data on the form to fit another format.](image-url)
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errors, SmartForm and TrueForm let you select information from a predefined list. For example, you might create a list from which to choose items for invoices. You can also include pop-up instructions for each field, a particularly useful feature in TrueForm, where the on-screen resolution of a scanned form can be difficult to read (see Figure 2). To further automate the filling-out stage, TrueForm and SmartForm can set up fields that depend on other fields. For instance, you can have the price of an item appear automatically when you type the product name.

Filling a form out on a large screen is not dissimilar to filling one out on

Beta Watch

1stSCAN
For now, stay away from 1stSCAN from 1stDESK. 1stSCAN, despite its name, does not scan forms. It does, however, open MacPaint or PICT files. The documentation (which is poor) says it also opens TIFF files (the standard format for most scanners), but the version sent to us for review (version 4.1) did not recognize the TIFF format. 1stSCAN has the same limited features as Fast Forms but none of its simplicity.

1stSCAN’s feature set is confined to calculations such as addition, subtraction, multiplication, and division. The Calculate command has to be invoked instead of being automatic. When searching for a particular form in a database of forms, you can easily wait a long time for nothing to happen. Even at beta time, 1stScan isn’t in the same class as the other programs.

$195. 1stDESK Systems, Inc., 7 Industrial Park Road, Medway, MA 02053; (508) 533-4925.

Informed Designer
Informed Designer, which was not released at press time, comes from Shana, creator of Fast Forms. Informed Designer is more Mac-like and more similar to a desktop-publishing tool than Fast Forms, giving precise layout controls. It has pattern menus, a specs palette, and “nudge” commands. In field calculations, it supports more sophisticated formulas, such as logarithms and concatenations, and its search function for a forms stack seems more sophisticated than SmartForm’s or TrueForm’s (see Figure B). Database links are added to the menu bar. Considering its projected price, Informed Designer may be the best value going.

$295. Shana Corp., Suite 105, 9650 20th Ave., Edmonton, Alberta T6N 1G1, Canada; (403) 463-3330.

SoftView FormSystem
At press time, SoftView, the maker of MachinTax (an excellent personal-income-tax-form generator that is approved by the IRS), was working on SoftView FormSystem, a forms generator that is scheduled to debut in January 1990. FormSystem promises a new concept in forms generation, graphics intelligence, in which every field and element on a form is aware of its relationship to all the other elements of the form. Thus, when one element is changed, the spacing and alignment of all the others are automatically adjusted—a godsend for creating complex forms.


— Ben Templin

Figure B: Informed Designer, soon to be released by Shana, promises precise tools for easy creation of complex forms. Sophisticated formatting options, an advanced search function, and on-line help are available on the menu bar.
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<td>Write Now</td>
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<td>ClickArt</td>
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| 30 Day Approved Credit
### HARDWARE

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<td>Interfax Fax-modem</td>
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<td>Quick Step Priner</td>
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<td>256 Grey Scale Scanner</td>
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<td>AoT</td>
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<td>CUTTING EDGE</td>
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<td>30 Meg Hard Drive</td>
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<tr>
<td>45 Meg Removable</td>
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<tr>
<td>800K Floppy Drive</td>
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<td>Monitor 19&quot; Monochrome</td>
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<td>DAYNA COMMUNICATIONS</td>
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<td>3.5&quot; Drive 1.44 M</td>
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<td>DaynaTalk Mac</td>
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<td>DaynaMail Mac</td>
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<td>Dual Drive 1.44, 360KB</td>
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<td>Desk Mounter</td>
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<td>Full line available.</td>
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<td>E MACHINES</td>
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<td>Color 19&quot;</td>
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<td>MacRecorder</td>
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<td>PhoneNet STAR Controller</td>
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### SPECIAL R

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<td>Desk Writer</td>
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<td>ScanJet Plus</td>
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<td>Benoulli II Single 44 Meg</td>
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<td>Benoulli II Dual 44 Meg</td>
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<td>Rapport</td>
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<td>KENSINGTON</td>
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<td>Turbo Mouse</td>
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<td>System Saver</td>
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<td>Mac II Stand &amp; Cables</td>
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<td>Masterpiece Mac II</td>
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<td>KEYTRONICS</td>
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<td>Ether Port II</td>
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<td>BEST DATA</td>
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<td>Smart One 2400</td>
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### SPECIAL R

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<td>MacSprint II</td>
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### ORCHID TECHNOLOGY

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<td>19&quot; Rival Mono SE/II</td>
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<td>19&quot; 256 Grayscale</td>
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<td>19&quot; 540 Color II, Icx</td>
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<td>MICROTEK</td>
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<td>Color Scanner MSF-300Z</td>
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<td>MacSync</td>
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<td>Intersect External CD Rom</td>
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<td>Clip Art 3D for CD Rom</td>
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### PERFECT TECHNOLOGY

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<td>WORDPERFECT</td>
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<td>$179</td>
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<tr>
<td>WordPerfect combines word processing features like parallel columns, macros, and merge with network compatibility. Use WordPerfect with DOS, VAX, CG, and UNIX.</td>
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### QUME

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<td>Crystal Print Publisher</td>
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### PRACTICAL PERIPHERALS

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<td>RASTEROPS</td>
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<td>ColorBoard 264</td>
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<td>ColorBoard 109+</td>
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<td>FrameGrabber</td>
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<td>JX-300 Color Scanner</td>
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<td>Hummingbird 33MHz Accel.</td>
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<td>Hummingbird 36MHz Accel.</td>
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<td>Hummingbird 40MHz Accel.</td>
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<td>Leprechaun</td>
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### SIMMS

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<td>1 Meg.Simms 100, 80.70 ns.</td>
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<td>2400 Baud External Modem</td>
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### SYSTEMMAGATE

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<td>Floppy Drive 800K</td>
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<td>Teac Tape Drive 155Mb</td>
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<td>TARUG</td>
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<tr>
<td>Mac SE Ext. Keyboard Case</td>
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<tr>
<td>ImageWriter II Carry Case</td>
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### THUNDERWARE

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<tr>
<td>Lightning Scan</td>
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</tbody>
</table>

---

**Merry Christmas & Happy Hannuka From Dr. Mac**

Dr. Mac Season's Greetings MAGIC COFFEE MUG Free With Orders Before December 25th

Please circle 169 on reader service card.
paper. On smaller screens, however, full-page forms scroll across and down the page as you tab to new fields. Multipage forms just scroll to the next page. You can define the order of the tab sequence in all three programs.

Fast Forms' interface gets in the way of filling out forms. The DA window has no scroll bar or close box (see Figure 3). You maneuver around within the form by using arrows at the bottom of the screen.

SmartForm and TrueForm let you group related forms. SmartForm has Form Sets, and TrueForm has Stacks (no relation to HyperCard stacks). Both Form Sets and Stacks save only one image of a form while keeping all the data behind it in a database-like file. You can perform common search functions within a Form Set or Stack. For instance, you can search for all the forms created within a certain time period. You can also search for text strings and for multiple criteria such as all sales totaling more than a hundred dollars made by a particular clerk. Each program is capable of grouping forms that meet your search criteria.

Fast Forms holds data for multiple forms in a text file. You use the Fast Forms DA to print forms as you fill them out, and you use the Export File function to put the information into a database.

None of these programs fill out forms particularly speedily. The more

---

**The Elements of Business-Form Style**

Good forms design requires a logical, visual arrangement of a form's components to help users supply or retrieve data accurately, completely, and swiftly. Unfortunately, none of the forms-management packages discussed here can ensure that users will design forms in such a manner. So novice forms designers should consider these basic tips:

- A good form is intuitively simple to fill out, but if instructions are necessary, they should be at the top of the form, where users will encounter them before they fill out the form. Only routing instructions should be at the bottom.
- Use upper-left-corner captions in boxes to prompt users, so that the captions are out of the way of the information being written into the data field (see the first form example).
- Without contrary knowledge, assume that any form may be filled out by using a typewriter or a computer. It should accommodate character fields in sixths of an inch vertically and tenths of an inch horizontally. Manually completed forms should allow at least one-fifth of an inch for each handwritten character.
- Use comb tick marks in only two circumstances: to remind users to supply every required digit in a field — such as a Social Security number — or to prevent them from entering an unlimited number of characters in a field that must be stored in a fixed-length database column.
- Use a sans serif typeface such as a medium-weight Helvetica or Univers for small prompting captions. A style with ornamental serifs may break up at low resolutions, and fonts with small x heights are harder to read at the small sizes of forms captions. Text with uppercase and lowercase letters is easier on the eyes than all caps.
- The data written on a form should not have to compete with the form itself for attention. Use headline (half-point) rules; occasionally you might use slightly heavier (1-point) rules to divide the form into distinct zones of related data. Avoid nonfunctional vertical rules that interrupt the horizontal flow of information.
- Use lightly tinted backgrounds to highlight related areas of the form, such as "for office use only" sections. Be careful, though — a coarse tint pattern produced on a low-resolution laser printer can obscure the legibility of any text written into a tinted field.
- Combine forms that are always attached and travel together. Allow extra-wide margins for forms with binding or hole-punching requirements. Do not preprint anything on a form that can change frequently — such as routing instructions to a specific person who may be gone the next day — when the same instructions can be expressed in a more permanent way such as routing to a department or title.


— Jay Zilber

---

*When the prompting captions of a form are in the upper left corner, they are out of the data's way and the entire space can be used more efficiently for data entry.*

---

*Other commonly used form designs are less efficient or, worse, more confusing and harder to fill out. Placing captions under a series of unconnected rules makes it unclear whether the data should be entered above or below the rule.*

---

*Captions with trailing rules waste considerable space. Such forms must be larger, or the data will be forced into truncated spaces or arranged haphazardly.*
Tomorrow's Upgrade For Your Mac Is Only $119.*

A MacWarehouse Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable, overnight service will have your Kit in your hands tomorrow!

MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spreadsheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. You don't even need a soldering iron. Just open your Mac, slide out the main circuit board, and plug in your memory card. Complete installation instructions are included with each memory kit.

WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2@ $119 ea.)

The chart explains exactly what you need to achieve the desired level of performance.

<table>
<thead>
<tr>
<th>To upgrade a 4-socket Mac Plus or SE to this amount of memory</th>
<th>Do this: (install in multiples of two only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 MB Remove all four existing 256K SIMMs, install two 1M SIMMs, leave two sockets for future expansion.</td>
<td></td>
</tr>
<tr>
<td>2½ MB Remove only two 256K SIMMs, install two 1M SIMMs.</td>
<td></td>
</tr>
<tr>
<td>4 MB Replace all four 256K SIMMs with four 1M SIMMs.</td>
<td></td>
</tr>
</tbody>
</table>

To upgrade an 8-socket Mac II, Iic, llex, or SE30 to this amount of memory

| To have all four 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion. |
|---------------------------------------------------------------|-------------------------------------------|
| 4 MB Remove all four existing 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion. |
| 5 MB Keep existing 256K SIMMs, install four 1M SIMMs in remaining sockets. |
| 8 MB Remove all four 256K SIMMs install eight 1M SIMMs. |

To open your Mac Plus or SE, you'll need a specially designed tool — it's available from us as part of a handy tool kit for just $15.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMs (Single In-line Memory Modules). Each one megabyte SIMM card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

*Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 100 ns Samsung kits is $119. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help make your choice an easy one.

SPEED

Do you need 80, 90 or 100 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor needs 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

OVERNIGHT DELIVERY

Place your order by 12:00 a.m. (EST), weekdays and we'll deliver overnight for just $3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

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24 HOURS A DAY
Inquiries: 1-201-367-0440
Fax: 1-201-905-9279
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MacWAREHOUSE 30 DAY MONEY BACK GUARANTEE
If, for any reason, you are dissatisfied with your MacWarehouse Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return the product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.
MacGolf Classic (XOR Corp.)

You won't be in the rough when you play MacGolf. This is the premium edition of MacGolf, featuring vivid full-screen color graphics with unsurpassed screen image detail. Contains the original 2 MacGolf courses and 4 additional MacCourses, for a total of 108 holes to play. New features include 5 enlargement options for close-up viewing, 9 practice greens, a driving range, installability on hard disks and much more. (entertainment) $53.

ACCESSORIES

Apple

Toner Cartridges LaserWriter .... 109.

Avery Labels (full line available) Color Coded 3.5 Diskette .... 4.

Laser 3.5 Diskettes ............. 23.

Laser File Folders ............. 6.

Laser Transparencies ......... 22.

Basic Needs, Inc.

HardTop Keyboard Covers .... 15.

HandTop ImageWriter Covers .... 17.

Keyboard Flip ........ 6.

Dust Covers - Grey Nylon Ripstop ImageWriter or LaserWriter .... 12.

Mac Plus and keyboard .... 11.

Mac SE and extd. or reg. keyboard .... 11.

Mac II and extd. keyboard .... 12.

Large Screen Monitor Stand .... 39.

Universal Laser Printer Stand .... 28.

Computer Friends, Inc.

MacTracker (IV & IV II) .... 41.

Curts

Computer Tool Kit (52 pc.) .... 49.

Curts Chip .... 6.

Disk Holder (holds 40) .... 9.

Jewel Surge Suppressors .... Cali.

Ergotron

MacTilt-SE .... 68.

MacFit-IL-RGB .... 75.

DiskFit 1.5 (SuperMac)

A handy utility for backing up your hard disk on a series of floppy disks. It saves time because it backs up only those files which have changed since the last backup. DiskFit can verify each floppy after copying files onto it, so you know that your files are safe. DiskFit also discards old versions of files so your backup set doesn't keep growing. Version 1.5 supports a variety of cartridge drive types, including the Apple tape backup system. (utilities) $59.

Polaroid

Circular Polarizing Filter .... 35.

Read-Write

ComputDuster .... 29.

Kleen & Dry CRT Pads .... 29.

Computer Care Kit .... 45.

MacInware Carrying Cases (UO Designs)

The UO family of carrying cases protects your Mac and its peripherals against damage whenever you need to take your Mac on the road. The outer covering is made of huggage quality lightweight woven nylon with web strap reinforcement. The SE Extended Case has an inside padded compartment that can accommodate the extended keyboard. The interior is padded to protect the equipment. Comes in Black or Navy (accessories) SE Extended Case $69.

Nolo Press

For The Record .... 29.

WordMaker .... 32.

Reality Technologies

WealthBuilder .... 165.

Shopkeeper Software

BillIt 2.0 .... 99.

Softview

MacIntax 69 .... 69.

Taxview 1040 .... 309.

Survivor

MacMoney 3.5 .... 60.

BLANK MEDIA

B.A.S.F. made in U.S.A

OS/DD (box of 10) .... 15.

OS/High Density (1.44 Meg) .... 115.

Turbo 40 Cartridge .... 115.

Sony

DS/DD (box of 10) .... 14.

Casino Master (Centron)

Become a Master of Casino Gambling! Five separate casino games include Blackjack Ace, Crapsmaster, Roulette Master, Pokermaster, and Baccarat Master. Exact table simulation, mouse controlled betting, selectable bankroll, stored win/loss statistics and complete manual included. Now available in dazzling color in the Mac II version!! Recommended and used by professional gamblers! (entertainment) Buy individual games for $27, each or get the 5 game Casino Master Package for $49, or the Deluxe Mac II color version for $55.
Aperture

Visual Information Manager (Aperture Technologies)
Aperture moves Macintosh graphics into a new dimension by integrating a powerful database manager. Aperture allows you to create detailed drawings, attach data to objects in your drawings, produce reports, link drawings together, and display data on your drawings to form complete applications. Whether you are an architect, engineer, designer, space planner, facilities manager, or someone who needs to communicate complex ideas and information, Aperture will become your program of choice. (business) $729.

Spectrum Holobyte
Tetris color version ........................ 24.
Springboard
Hidden Agenda .............................. 36.

The Software Toolworks
ChessMaster 2100 ............................ 32.
Cribbage & Gin King ........................ 59.
Life & Death ................................. 32.
The Hunt for Red October ................. 32.

FONTS

Adobe
A Sion Type Manager ....................... 57.
ATM Plus Pack ............................... 113.
Fonts (full line avail.) ........... 279.
Call, Forms and Schedules .......... 279.
Newsletters ................................. 279.
Presentations ............................... 279.
Texts, Fills, and Patterns .......... 129.
Altsy
tastic Plus 2.0 ............................. 52.
The Art Importer 2.0 ................. 82.
Letraset
LaipaStudio ................................. 275.
LaipaColor (various) ................. ea. 69.
Orange Micro
Alphasofts ................................. 69.
Tactic Software
ArtFonts Vol. 2 or 3 .................... 55.

GRAPHICS AND DESIGN

3G Graphics
Images for the Macintosh ............... 52.
Graphics & Symbols 1 ................. 52.
Business 1 ................... 65.
Adobe Illustrator 88.1.8 ............... 279.
Streamline ................................. 229.
Aegis Development, Inc.
Showcase F/X ......................... 159.
Aldus
Freelance 2.0 .............................. 345.
Broderbund
Drawing Table ......................... 75.
TypeStyler ................................. 129.

Casady & Greene
Vivid Impressions Vol. 1 ............... 67.
Claris
MacDraw II ................................. 295.
MacPaint 2.0 ............................... 99.

Cricket (Computer Associates)
Cricket Color Paint ....................... 179.

Dream Maker
Cipures, Business Images ............. 69.
MacGallery ................................. 27.

Electronic Arts
Studio/1 ................................. 97.
Studio/2 ................................. 299.

Innovative Data Design
Dreams ........................................ 139.

MacMind
MacroMind Accelerator .................. 149.
MacroMind Director ....................... 449.
VideoWorks II ............................. 175.

Metro ImageBase
Full Line Available ........................ 129.
Art Deco or ReportMaker ............. ea. 76.
Newsletter Maker or Business ....... ea. 76.
Mindscape
ZING ......................................... 139.

ThunderScan (Thunderware)
ThunderScan turns any printed image into a detailed, high resolution Macintosh graphic that you can change and enhance with ThunderScan's powerful set of software tools. Print out your flattened work on your ImageWriter or use ThunderScan's special PostScript printing effects on your LaserWriter. Rotation, framing, captioning, shaping, and other special effects let ThunderScan tap the full resolution of the LaserWriter, producing exquisite true gray scale graphics with up to 300 dots per inch, 24 bit colors and 32 shades of gray. For use with Mac II, Plus and SE. (A separate power accessory must be purchased for the Mac III) (hardware) $187.

Multi Ad Services
Pro! Illustration, Business, Sports or Holidays ea. 95.

Paracomp
Mode/Shop ................................. 399.
Swivel 3D ................................. 325.

Select Micro Systems
MapMaker 4.0 ............................... 245.
Silicon Beach
Digital Darkroom ....................... 249.
Super 3.0 ................................. 319.
SuperPaint 2.0 ......................... 128.
SuperMac
PixImagePaint 2.0 ...................... 299.
PixelPaint Professional ............... 399.

Tactic Software
ArtClix ................................. 51.
SoundClix ................................. 49.
Zedcor
Deskpaint 2.0 ......................... 65.

HARDWARE AND PERIPHERALS

Cutting Edge
Two Page Monochrome Monitor .......... 999.
DEST 1
PC Scan Plus SPECIAL 699.

General Computing Company
WriteMove InkJet Printer ............. 855.
Microflat ................................. 855.
Color Monitor 14" ....................... 535.

Microlytics
Datapac-9000 Personal Organizer ... 65.
Microtek
VideoCorder 3000 Scanner .......... 1589.

Rum
Crystal Print Publisher ............... 3445.

Seiko America
SeikoGraph Printer (dot-matrix) .... 235.

Guarantee
Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.

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Quick and easy resume composition. Effective for students to CEOs. 42 MS words or Works formatted resume templates. Highlight text and replace with your information. Manual identifies 30 special career situations, provides useful resume-writing tips. Four Mac Resumes. Cover letter editions available, (business) $39.

Publish-It!
Complete self-contained Desktop Publishing program. Allows both professional & non-professional business communicators to write, design, and produce dynamic, sophisticated documents. From simple in-house newsletters & business forms to full-length magazines and distinctive annual reports; do it faster and easier than before! (desktop publishing) $239.

Fanny Mac QT
Keep your Mac running cooler. If you’ve upgraded your Mac with extra memory or an internal hard drive, a hard drive accessory must be purchased and SE. (A separate power accessory must be purchased for the Mac III) (hardware) $139.

Desktop Help for Excel
For both novices and experts. Fills everything you need to know about Excel in one place and makes it all available on screen whenever you need it. Just open the Desk Accessory and leave its window open while you work. (Desk Accessory) $50.

For both novices and experts. Fills everything you need to know about Excel in one place — and makes it all available on screen whenever you need it. Just open the Desk Accessory and leave its window open while you work. Up-to-date coverage of Excel 2.2, (education) $50.

Carbon Copy Mac (Microcom)
Carbon Copy Mac is a remote control software package for the Macintosh. It allows one Mac to remotely access and operate another Mac's peripherals. Check, keyboard and mouse. Carbon Copy Mac can be used for training, collaborating, file transfer, troubleshooting and updating software. It is the ideal Macintosh network management tool. Carbon Copy Mac can run locally on a local area network or remotely with modems on both machines. (networking) $119.

Bull City Software
Morality's Revenge .......................... 36.
Bullseye
Ferrari Grand Prix or P51 ea. 32.
Foker Tri-plane ............................. 24.
Centron Software, Inc.
BlackJack or CrapsMaster ea. 27.
CasinoMaster (5 pack) ................. 49.
Discovery Software
Arcanoid ................................. 26.
Electronic Arts
Chuck Yeager Adv, Flight Trainer ... 32.
Miles Computing
Fool's Errand .............................. 32.
Puzzle Gallery ............................. 27.
Mindscape
Balance of Power, Deja Vu ea. 30.
Hostage ................................. 30.
The Colony of Queequeg ............... 30.
Nemesis
Go Master ................................. 49.
Japanese Tutor ........................... 30.
PCAI/XOR
Lunar Rescue or MacGolf 2.0 ................ 34.
MacGolf Classic .......................... 53.
Road Racer ............................... 33.
NFL Challenge ............................ 54.

Carbon Copy Mac (Microcom)
Carbon Copy Mac is a remote control software package for the Macintosh. It allows one Mac to remotely access and operate another Mac's peripherals screen, keyboard and mouse. Carbon Copy Mac can be used for training, collaborating, file transfer, troubleshooting and updating software. It is the ideal Macintosh network management tool. Carbon Copy Mac can run locally on a local area network or remotely with modems on both machines. (networking) $119.
Moriarty's Revenge
An intriguing detective game. Track a suspect around the world using clues you uncover in each city. Solve a case correctly linking the suspect to one of ten interesting worldwide cases. Games increase in difficulty as a player rises in rank. A "Master Sleuth" must track down gang leaders, including the famous Moriarty. (entertainment) $39.

Special Alert: Terrorists have invaded your Embassy and seized an undetermined number of hostages. Lives hang in the balance as high-ranking diplomats are held at gunpoint. Their safety requires immediate action. Prepare to infiltrate the Embassy, neutralize the terrorists, and rescue the hostages. (entertainment) $30.

Cribbage and Gin King
With Cribbage King, you can play against seven personalities, each with unique playing styles, in two-, four-, or five-handed games. Gin King's sophisticated algorithms also challenge your skill with seven AI opponents. Full-color, high-resolution graphics, and the traditional Bicycle design add realism to both. (entertainment) $59.

Portfolio Systems
DynoBase/Instant Address Book 85.
Address Book Plus 53.
Address Book Plus w/Binder 82.
Calendar Creator 38.
FastFaxes 80.
Preferred Publishers 54.
ProfPlus 49.
Wait Street Investor 449.
Kataro 45.
Bulk Mailer 3.2.3 78.
SoftMailer International 99.
End User Planner 245.
Symantec More II 201 245.
Symmetry 330.
KeyPlan 49.
Syrex 4.1 65.
MacEditor Plus 149.
Vertical Solutions 49.
FastLabel 49.

Multi-Screen Full Size Display (Mobius)
Expand your vision with a 14-inch monitor. The display combines a Princeton Graphics 14-inch monitor with the MultiScreen Video Card. Just slide the interface card into your Mac SE and connect it to the Princeton monitor. Enjoy the benefits of a larger screen that can display the full width of a letter-sized page, and over half its length. The software allows you to use your present SE screen in conjunction with your new larger one. You can optimize the display for either 72 or 85 dpi resolution. (hardware) $529.

CAD/CAE
Claris
ClarisCAD 599.
Generic Software
Generic TADD Level 1 285.
Graphisoft
Blueprint 349.
MicroCAD 519.
Innovative Data Design
MacDraft 144.
Dreams 269.
Precision 199.
Strata
StrataVision 3D 375.

COMUNICATIONS
CE Software
In/Out (1 to 5 Users) 129.
QuickMail 2.0 (1-10 Users) 249.
CompuServe
CompuServe Navigator 3.0 45.
CompuServe Subscription Kit 9.95.
DataVIZ
MacLink Plus w/Cable 1.45.
MacLink Plus/Translators 4.1 99.
Dow Jones
News/Retrieval Membership 24.
Freeway
Red Ryder 10.3 62.
Hayes
Smartcom II 3.1 87.
Infosphere
Liaison 175.
InSite Solutions
Soft PC (Mac II) 245.
MetaCemet
AccuWeather Forecaster 58.
Prodorph
Mac Starter Kit 3.0.

DATABASE SOFTWARE
Aclus
4th Dimension 2.0 469.
AEC Management Systems
AEC Information Manager 409.
Blyth
Omnis 5 369.
Claris
FreeMaker II 225.
Fox Software
FoxBASE/Mac 295.
Microsoft
File 2.0 125.
Odesta
Double Helix II 349.
GeoQuery 199.
ProVUE
Panorama 205.

DESK ACCESSORIES
Casady & Greene
QuickDEX 31.
JAM Software
Smart Alarms & Appt. Diary 48.
Smart Alarms (1-4 users) 98.
Smart Alarms (5-8 users) 149.
Smart Alarms (9-16 users) 199.
Preferred Publishers
Database 72.
Vantage 55.
Solutions
SmartScrap & The Clipper 2.0 45.

PS1 Mustang Flight Simulator
Fly the PS1-Cadillac of the sky. An incredible adventure in the skies over England and France in WWII. You'll dogfight ME109's, strike ground targets - even buzz the Eiffel Tower like the movies. Fight against another Mac via modem. View action replay from 13 different angles. (entertainment) $32.

Geualut
One of the most successful arcade games of all time has come home. It brings with it all the characters, dungeon tales, traps, terrors, and excitement you love in the arcades! Thor, Tyria, Questor, and Merlin are together again. Action, sound, and animation on your home screen. (entertainment) $30.
Managing Your Money
A fully integrated software package adding every aspect of personal and small business finance. Write and print checks, set up a personal budget, estimate your taxes and more. (finance) $124.

Dow Jones News/Retrieval
Up-to-the-minute news and financial data, plus extensive reference library. (communications) $24.

Address Book Plus / Address Book Plus with Binder (PowerUp)
Address Book Plus is the most complete and ready-to-use solution for managing names, addresses, phone numbers and other vital information. Users can input, edit and view business and personal contact information, and print it out in a variety of readable-use forms including address book pages, rotary-file or index cards, phone list, mailing labels, and envelopes. It also provides searching and automatic dialing capability in a separate Desk Accessory. (business) Address Book Plus & Address Book Plus w/Binder $99.

DESKTOP PUBLISHING

The Puzzle Storybook
Zug the Megasaurus is back with The Puzzle Storybook for children ages 3-8. Children create pictures, solve puzzles and write stories to combine language arts activities with geometric shapes to build early reading and writing skills. (education) $27.

Dow Jones News/Retrieval
Membership package comes with E-Z Online communications software, provides the new user with 5 hours of free online time. Connects with more than 50 databases, reference library. (communications) $24.

EDUCATIONAL/PERSONAL

Bootware Software
ResumeWriter Pro .................................. 58.
Alphabet Blocks 3.01 ................................ 30.
Talking Tiles ........................................ 27.
Math Blaster ......................................... 27.
Speed Reader II ..................................... 27.
First Byte ............................................. 27.
The Dinosaur Discovery Kit ......................... 27.
The Puzzle Storybook ................................ 27.
The Rhyming Notebook ............................... 27.
Fair Tide Technologies
Navigate to moro .................................. 199.
Help Software, Inc.
Desktop Help for Excel ............................ 50.
Learning Company
Reader Rabbit or Math Rabbit ..................... 31.
MicroTech
Elementary Signer .................................. 49.
Finger Speller ....................................... 29.
The Software Toolworks
Mavis Beacon Teaches Typing ..................... 32.
Visionary Software
Synchronicity ....................................... 39.
Voice & Video Instruction Videos
HyperCard or PageMaker 3.0 ..................... 35.
Word 4.0 Video Tape ............................... 35.

ENTERTAINMENT

Access Software, Inc.
World Class Leader Board ......................... 27.
Artwork
Bridge 6.0 ......................................... 24.
Daily Double Horse Racing ........................ 19.
Digit Quest ......................................... 19.
Broderbund
Ancient Art of War at Sea ......................... 27.
Shuffl epack Cafe .................................. 24.
Where in the World is Carmen .................... 27.

MacKNOWLEDGE
MacKNOWLEDGE is the latest communications software available for your Macintosh. Icon based scripts provide instant access to all major online services with just the click of your mouse. The TAL scripting language provides all the capabilities for customizing and automating your own online sessions or the record function will watch your session and create an icon based script automatically. Also provides support of 1600 bps and MNP modem. (communications) $149.

WealthBuilder (Reality Technologies)
Turn your Mac into your own financial planner. Taking into account your financial profile, the goals that you want to accomplish and the risk that you are willing to assume, WealthBuilder searches for the best investments available to fulfill your objectives. The program also allows you to change any information or assumption and immediately view its impact on your overall financial picture. WealthBuilder is your personal tool to a brighter financial future. (finance) $165.
Believe it or not, between now and December 22nd, you can place your order with MacWarehouse any-time up to 12:00 midnight (E), and still have your package delivered not long after the morning paper!* All for our amazingly low $3 overnight delivery charge!

How do we do it? We've set up a satellite warehouse at a former U.S. Strategic Air Command base in the midwest. And while you're fast asleep, we pick, pack and fly through the night to deliver your package.

Win the NEW Mac Portable!

It's here at last! It has all the power and convenience of your Mac in a 15.7 pound portable package. And you can win the new Macintosh Portable by entering the MacWAREHOUSE PORTABLE COMPUTER GIVEAWAY. Your name is automatically entered into the drawing when you order from MacWAREHOUSE, or when you fill out and send in the Official Entry Coupon below.

MacInTax (Softview)
MacInTax '89 guides you through the process of preparing your Federal Taxes (eight state tax modules also available). Just type in the requested numbers, and MacInTax does the rest. When finished, print the completed return on the LaserWriter or the ImageWriter. It reads last year's MacInTax files and brings forward relevant items. (license) $69.

SuperCard (Silicon Beach)
Your HyperCard compatible "software toolkit" for creating anything from productivity stacks to color multimedia presentations. Provides color Paint and Draw, animation creation, custom menus and windows, full screen support, and the ability to open multiple stacks. (hyperware) $128. Super 3D Convert 2D drawings into 3D models, easily with automatic commands in this powerful graphics program. Shade with multiple light sources, thousands of colors, then animate automatically. (graphics) $319.

Dreams (Innovative Data Design)
A powerful precision drawing tool for professionally scaled drawings and general purpose graphics. Dreams offers zoom, rotation, layers, dimensioning, symbol libraries and a vast array of drawing tools, as well as many advanced illustration features. You can merge shapes together, cut edges of objects using other objects as templates... even glue lines and curves together to form unique shapes to be filled with colors or patterns. $269.

OFFICIAL ENTRY COUPON  MUA0
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(low thousands of others) not long after the sun comes up.

And to make your holiday shopping even easier, we've opened up our phone lines twenty-four hours a day, seven days a week. No parking problems, no sore feet, no crushing crowds or heavy packages. Now there's no excuse for not ordering that hard drive for young Johnny or the much needed memory upgrade for yourself! Nobody gets it to you faster - not even Santa's little helpers!
HyperHit 1.0
Extends the power of HyperCard by giving it the ability to search for cards at lightning speeds. HyperHit creates structured HyperCard files with indexed sort keys, so that your Mac doesn't have to read every card in every stack to find the right one. It checks the index, which tells it which card has the information, and displays it on your screen. (hyperware) $125.

CanOpener
Information retrieval utility for the Mac. CanOpener will search anywhere, and lets you retrieve just about anything; including text, pictures and sounds. Locates text inside pictures, and gives you the whole picture! Anything you retrieve with CanOpener can be stored in its library, so the next time you need it, it's just a click away. (utilities) $85.

BrainPower
ArchText ..................................... 190.
Bright Star Technology ................. 399.
HyperAnnotator 1.5.1 .................... 99.
InkFACE ..................................... 250.
DataDesk International................. 29.
ICOM Simulations ......................... 59.
HyperTMON ................................... 59.
MicroMaps .................................. 50.
HyperAlias .................................. 50.
Power Up ..................................... 50.
TideTech ..................................... 20.
Silicon Beach ............................... 20.
SuperCard ................................. 128.
Softwear International ................. 125.
HyperTHYT ................................... 59.
Springboard .................................. 29.
Family Matters ............................. 29.
Symmetry ................................... 28.
HyperDA 1.2 ................................ 49.
TimeWorks ................................ 49.
HyperWorks Organizer ................... 60.

Practical Solutions
The Cordless Mouse ...................... 99.
Mouse Master ............................. 57.
Summigraphics ............................ 325.
Bit Pad Plus .............................. 325.

LANGUAGES
Digitalk, Inc. .................................. 129.
Smalltalk/V MAC ......................... 129.
Microsoft .................................... 57.
QuickBasic ................................ 65.
Shama Corporation Inside Out ....... 369.
SmethersBarns .................. ............ 189.
ProtoHyper ................................. 189.
THICKS C 4.0 .............................. 157.
THICKS Lightspeed Pascal ............. 85.
Zedcor ...................................... 85.
ZBasic 5.0 ................................ 85.

MEMORY UPGRADES/ ACCELERATORS
1 MEG SIMMS
Low Profile, 100ns High Quality Single In-Line Memory Modules for MacPlus, SE, II, IIx. 2 yr. Warranty. New low price $119.

Dove (full line available)
MaraThon 320 Accelerator ............. 969.
MaraThon 32X .................. ............ 969.
MaraThon Racer ......................... 969.
MaraSnap Help ......................... 400.
MacSnap 8S .................. ................. 499.
MacSnap 524E ......................... 187.
MacSnap 524S ......................... 239.
MacSnap 544S ......................... 499.

MODEMS/FAX
Abaton InterFax 1248 ................... 269.
Best Data Products SmartOne 2400/1200 .... 145.
Hayes Smartmodem 1200 ............... 295.
Smartmodem 2400 ....................... 425.
Smartmodem 9600 (V series) ........ 799.
Prometheus ProModem 2400 SE Int. ...... 209.
ProModem 2400M ....................... 199.

HyperDialer (DataDesk International)
Now you can connect your Macintosh to your existing business or home telephone for automatic dialing with Apple's HyperCard. DataDesk's HyperDialer is designed specifically for HyperCard's touch-tone dialing capabilities and works with any business phones without requiring a modem or dedicated phone line for automatic dialing. Automatically dials HyperCard, Sidekick, Focal Point, C.A.T., SuperCard and QuickDex phone numbers. Connects to Mac speaker port - not a precious serial port. (hyperware) $29.

Power Backer 360
(Kensington)
Takes over when the power goes off. The Power Backer 360 uses a rechargeable battery to provide continuous electrical power plus surge suppression and noise filtering. Have you ever lost data or damaged a System File when the lights flickered? Now, for less than the cost of a hard disk, you can keep your Mac humming. (accessories) Provides 360 VR. $269. Power Backer 600 $479. Power Backer 1200 $949.

INPUT/OUTPUT
Cutting Edge
CE-105 ADB Keyboard .................. 125.
DataDesk Intl.
Mac 101 Keyboards .................... 139.
Kensington
Koala
MacVision 2.0 ........................... 219.
Kraft
ADB Joystick Premium III (SE&II) ..... 49.
QuickStick .................. ............... 39.
Kypro
IS/ADS Tablet 8 1/2 x 11 .................. 255.
Mouse Systems
A+ Mouse (SE&II) ....................... 79.
A+ Mouse (512/Plus) .................... 63.

Mac-101 Keyboards (DataDesk Intl.)
Features 101 keys including a numeric keypad, a separate T-shaped cursor keypad, Cancel Key, Option and Command keys at both ends, definable function keys, plus scrolling, page control, and zooming keys. Manufacturer's two-year warranty. (input/output) $139. International versions also available.

HandOff
HandOff lets you open any document from the finder, even if it is a password protected or missing. You then either print, save, or search documents. A+ Mouse is compatible. (accessories) $29.
**Supra 2400 Modem**

*Cost:* $139.

**US Robotics Courier 9600 Modem**

*Cost:* $689.

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**MUSIC AND SOUND**

**Altech MIDI Interface**

*Cost:* $59.

**Boogas Productions Super Studio Session 2.0**

*Cost:* $69.

**CoDa MIDI Interface**

*Cost:* $479.

**MacDrums MIDI Interface**

*Cost:* $31.

**Perdua MIDI Interface**

*Cost:* $50.

**Electronic Arts Deluxe Music Construction 2.5**

*Cost:* $85.

**Deluxe Recorder**

*Cost:* $99.

**Esthetic Engineering Music Mouse**

*Cost:* $49.

**Farsallon Computing MacRecorder (records sound)**

*Cost:* $164.

**Screen Recorder**

*Cost:* $129.

**First Byte SmootherTalker**

*Cost:* $33.

**Great Wave Concertware-MIDI 4.0**

*Cost:* $78.

**HIP Software Harmony Grid**

*Cost:* $59.

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**Networking Products**

**Connect Inc.**

*Cost:* $47.

**Dive**

*Cost:* $749.

**FastNet II**

*Cost:* $376.

**FastNet SE or SE/30**

*Cost:* $375.

**Rapport (Kenett Technology)**

*Cost:* $95.

**TheSaurus Checkers**

**Deneba Software Big Thesaurus**

*Cost:* $59.

**Spelling Coach Pro**

*Cost:* $115.

---

**Deluxe Recorder (Electronic Arts)**

*Cost:* $52.99.

---

**STATISTICAL ANALYSIS**

**Abacus Concepts StatView II**

*Cost:* $295.

**StatView SE+Graphics BrainPower**

*Cost:* $325.

**StatView 512+ (requires 512k)**

*Cost:* $149.

**D2 Software MacSpin 2.0**

*Cost:* $189.

**Odesta Data Desk Professional**

*Cost:* $289.

**Panaramo**

*Cost:* $159.

**Select Micro Systems, Inc.**

*Cost:* $219.

**Wolfram Research Mathematica (SE)**

*Cost:* $450.

---

**UTILITIES**

**Abbott Systems CanOpener**

*Cost:* $65.

**Affinity Tempo II**

*Cost:* $79.

**Aladdin Systems Inc. Programmer’s Assistant**

*Cost:* $75.

**ShredIt**

*Cost:* $59.

---

**MaraThon 030 (Dove)**

*Details:* A fast running 68030 board. Features a 256K byte internal data cache, full 32 bit processor and includes a Motorola MC68030 microprocessor. (accelerators) $969.

**MaraThon 030X**

*Details:* Designed specifically for use in the Macintosh II, plugs into the existing 68030 socket and features a Motorola MC68030 microprocessor, operating at 32 MHz. (accelerators) $999.

---

**SECURITY AND VIRUS PROTECTION**

**ASD Software, Inc.**

*Cost:* $125.

**FileGuard**

*Cost:* $59.

**FileGuard Extend (office 5-pack)**

*Cost:* $399.

**TWINS**

*Cost:* $199.
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You can now contact MacWAREHOUSE or place orders with us in the Electronic Mall on CompuServe. The MacWAREHOUSE GO code is GO MW. As always, you'll get fast, dependable overnight service and you can leave messages for Kerry or any of our support staff.

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ALSoft
DiskExpress II ............... Call.
Font/DA Juggler ............ $47.
MultiDisk ................. $49.
Master Juggler ............ $64.
Berkeley System Design, Inc.
Stepping Out II ............ $50.
CE Software
DiskTop 3.0.2 ............... $32.
QuickKeys 1.2 ............. $65.
Caere
OmniPage ................... $55.
Central Point Software
Copy II Mac (with MacTools) $24.
PC Tools Deluxe For Mac $45.
Dantz Development
Retrospect .................. $155.
Emerald City Software
LaserStart 1.0 ............... $149.
Fifth Generation
DiskLock .................... $108.
FastBack II .................. $107.
PowerStation 2.5 ........... $34.
Pyro ....................... $15.
SleepyCat ................... $45.
GO Technologies
MacTree Plus ................ $46.
ICOM Simulations
On Cue ....................... $35.
Insight Development
MindPrint .................... $79.
Magic Software
AutoSave II .................. $29.
BackMate ..................... $50.
POWERPERS or POWERmenus $39.
Mainstay
Capture 2.0 .................. $49.
Microlytics
GOter ....................... $47.
Olduvai
ClipShare ................... $139.
MultiClip .................... $51.

PCPC
HF's Backup 3.0 ................ $54.
Peripheral Land, Inc.
TurboBack .................... $55.
TurboCache or Turbo Spool ea. $73.
TurboOptimizer ................ $39.
Preferred Publishers
Exposure ...................... $54.
Software Innovations
HandOff ....................... $35.
SuperMac
DiskFit 1.5 or SuperSpool 5.0 ea. $59.
Sentinel 2.0 .................. $89.
SuperlaserSpool 2.0 ........ $89.
Symantec Corporation
SUM II ....................... $95.
Tactic Software
FontShare ..................... $149.
Williams & Macias
DiskFinder .................... $27.
myDiskLabeler ............... $33.
StickyBusiness 1.07 ........ $89.
XTree Company
XTree Mac .................... $52.

WORD PROCESSORS
AND OUTLINERS
DeltaPoint, Inc.
MindWrite 2.1 ................ $85.
Ashton-Tate
FullWrite Professional .... $259.
Claris
MacWrite II .................. $165.
Microsoft
Word 4.0 ..................... $249.
New Horizons Software
WordMaker ................... $69.
Niles & Associates
End Note ...................... $75.
Symmetry
Acta Advantage w/DA .... $65.
T/Maker
WriteNow 2.0 ................ $109.
WordPerfect Corp.
WordPerfect .................. $185.
Working Software $39.
QuickLetter .................. $73.

Laser Printer Stand (Basic Needs)
Free up space on your desktop by raising your printer four inches. Store extra toner cartridges or supplies conveniently underneath. Attractive 2-piece steel construction fits any size printer $28.
Large Screen Monitor Stand raises your monitor four inches for easier viewing, allows you to store your keyboard and other supplies underneath. $39.
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STOP PRESS

NEW!
Price breakthrough Under the Mac Drives (Cutting Edge)
The Cutting Edge Under the Mac Drive hard disk drives are quiet and reliable with access times down to 20 milliseconds making it almost three times faster than most. Push button external SCSI address switch and removable SCSI terminators allow easy daily chaining up to 7 SCSI devices. Sizes available 20 meg to 80 meg (disk drives) $20 meg only $419. $30 meg only $489. $45 meg only $549. $65 meg only $629. $80 meg only $739.

ORDER TOLL-FREE
24 HOURS A DAY.

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Every Mac SE and II user can now justify the expense of a big screen with the new Cutting Edge 19" Two Page Monochrome Display System. The Cutting Edge Monitor includes the interface card and matches just about all the features of other big screen display systems costing twice as much. It has a flicker-free refresh rate of 70 hertz and a high resolution of 72 DPI. Like all Cutting Edge products it comes with a one year warranty and a 30 day money back guarantee. (hardware) $999.

Two Page Monochrome Monitor (Cutting Edge)

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Canada: 800-255-6447 Fax#: 201-905-9279

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In Good Form

complicated the form and the bigger the stack, the slower the program runs. I preferred TrueForm for filling in data. It ran faster for comparable tasks, and the instructions and choice lists were nicely handled. TrueForm is also the only program that smoothly imports complex information from a text file into a form's various fields.

The real power in these forms-management programs resides in the fill-out stage.

Printing in SmartForm and TrueForm is simple. You can print both the data and the image of the form or just the data if you want to output onto preprinted forms. You can customize the print area to a particular size of paper as well. In SmartForm you can print a part number (customer copy, store copy, and so on) on each respective page for multiple copies of a form. SmartForm also lets you shrink data to fit within a box. TrueForm lets you reverse the printing order.

Printing is slow with any of these programs. Fast Forms lives up to its name by being quicker than SmartForm or TrueForm. TrueForm is optimized for printing scanned images, thus sacrificing printing speed for PICT and EPSF images.

The Database and E-Mail Connection

Forms-management programs occupy a middle ground between graphics and page-layout programs on the one hand and database managers on the other. They address one need of computerized data collection — making the forms' on-line interface look similar to what you're used to — without going the whole distance to database management. But the future of forms management
is clearly tied to databases (see the "Forms and Database Management" sidebar): The more data you collect, the more you have to manage. Since the kilobyte overhead of a classy interface is high, you may not see forms managers as front ends to databases until 2 or 4 megabytes of RAM become common on most systems. (You're less likely to see database capabilities built into forms packages themselves.) Only TrueForm presently links up with a database program (4th Dimension).

The most intriguing future use of forms packages may be their tie-in to electronic-mail systems. (Both QuickMail and Microsoft Mail have rudimentary forms makers.) The store-and-forward engine of E-mail would let you route forms intelligently over a network, earmarked to follow a bureaucratic chain of people who sign off on the form, or to automate electronic invoicing. With features such as this, forms-management packages could bring us one step closer to the elusive dream of the paperless office.

Ben Templin is the former editor-in-chief of MacGuide magazine. He keeps in good form by running daily. One look at his desk tells you that he does not believe in the paperless office.

A Few Good Forms

If design isn't your forte, consider buying prepackaged forms. These packages contain commonly used business forms that you can print out and, in some cases, use in fill-out applications.

**FlexForm Business Templates, Volumes I and II**

This package comes with a copy of SmartForm Assistant. Volume 1 contains stockkeeping, production, sales, delivery, billing, and collection forms. Volume 2 has purchasing, receiving, accounting, disbursing, and personnel forms. Many of these forms are also available in PageMaker format. You can customize and print them for office use. $89.95 per volume. Antic Software, 544 Second St., San Francisco, CA 94107; (415) 957-0886.

**FormSet**

FormSet, from SoftView, the maker of MacInTax, is a collection of 65 forms — including job estimates, earning statements, credit memos, and time cards — that can be customized with company names and logos. This fill-out program has the usual features: date stamping, field calculation, etc. $99. SoftView, Inc., 1721 Pacific Ave., Suite 100, Oxnard, CA 93033; (805) 385-5000.

**SmartForm and TrueForm** run neck and neck, while Fast Forms is a distant third. _MacUser_ rated Fast Forms at five mice in November 1987. Back then it was the top program available. But it hasn't undergone any major changes, and other packages with better features have appeared. Thus, it is now downgraded to three mice.

That leaves TrueForm and SmartForm. For top honors, these two programs cancel one another out more for what they don't have than for what they do.

SmartForm is the easier package to use. A robust program that handles many different tasks competently, with a minimum of programming effort, it has everything you need except database capability. TrueForm links up with a database but has no design environment.

From a design perspective, if you have preexisting paper forms that you want translated onto the computer, TrueForm is your best choice. But if you want to start from scratch, or if you think you'll revise your forms often, choose SmartForm. From a management perspective, TrueForm has a lot more potential because of its database links.

Since I'm forced to use either a forms program that has no design capability but has a database connection or one with design capability and no database, I'd sacrifice the design capability and choose TrueForm. Like many other users, I already have a page-layout program that suits me well for forms design. Because most of my time is spent filling out, rather than designing, forms, I want the slight edge that TrueForm offers in management tasks.

**The Bottom Line**

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### Table 1: Features

<table>
<thead>
<tr>
<th>Design</th>
<th>Fast Forms</th>
<th>TrueForm</th>
<th>SmartForm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawing environment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Scanning within program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Import (file formats supported)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paint</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PICT</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIFF</td>
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</tr>
<tr>
<td>EPSF</td>
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</tr>
<tr>
<td>Field alignment</td>
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</tr>
<tr>
<td>Font/style formatting</td>
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</tr>
<tr>
<td>Check boxes</td>
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</tr>
<tr>
<td>Field-sequence change</td>
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</tr>
<tr>
<td>Magnification</td>
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<table>
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<th>Fill out</th>
<th>Fast Forms</th>
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<td>Lists</td>
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<td>Help messages</td>
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<td>Calculation fields</td>
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<td>Formulas</td>
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<td>Logical operators</td>
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<td>Password</td>
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<td>Custom print sizes</td>
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<table>
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<th>Forms management</th>
<th>Fast Forms</th>
<th>TrueForm</th>
<th>SmartForm</th>
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<td>Import capability</td>
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<td>Database link</td>
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<td>Export</td>
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<td>Form collection in stack</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Find command</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Logical operators</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Report Cards

**Fast Forms 1.2.1**

Once the premier forms-management program, Fast Forms is showing its age. It has only basic calculation ability and a limited design environment.

**Pros:** Uses a DA to fill out forms. This approach is helpful for users who want to run an accounting or database program concurrently and don’t have enough memory to run MultiFinder.

**Cons:** The interface is confusing and does not follow Apple guidelines for basics such as scroll bars.

**Requires:** Mac 512KE or later, System 3.2 or later, and Finder 5.3 or later.

**List Price:** $149.95

**Power Up! Software Corp., 2929 Campus Drive, San Mateo, CA 94403; (415) 345-5900.**

**SmartForm 1.1**

A full-featured design-and-management program that caters to the administrator in all of us. The only forms-design package that imports color graphics.

**Pros:** Easy-to-use design environment makes creating forms a cinch.

**Cons:** Performs extremely slowly when filling out forms. It’s easy to get ahead of the program. It lacks database links.

**Requires:** 1 megabyte of RAM and two floppy-disk drives or a hard-disk drive.

**List Price:** SmartForm Designer with a single-use copy of SmartForm Assistant, $399; additional copies of Assistant, $49 each or $399 per ten-pack.

**Claris Corp., 5201 Patrick Henry Drive, Santa Clara, CA 95052-8168; (408) 987-7000.**

**TrueForm 2.0**

Creates an electronic form by scanning a preexisting paper or importing files from another design environment. The only forms package with a database link.

**Pros:** Database link with 4th Dimension makes it, potentially, the most powerful forms-management system available.

**Cons:** Lacks a design environment.

**Requires:** 1 megabyte of RAM and second floppy-disk drive or hard-disk drive, System 6.0 or later.

**List Price:** TrueForm Set-Up and TrueForm Fill-Out, $395; Fill-Out four-pack, $295.

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There is a better way.
Charting a Course

From organization charts to procedures to programming, flowcharts can provide structural maps for the mind. Here are three smart programs that specialize in intelligent flowcharting powers beyond the ability of most draw programs.

By Salvatore Parascandolo
lines whenever you change your document. But spend a half hour or so with DiagramMaker, MacFlow 3.0, or TopDown — three good flowcharting programs for the Mac — and you’ll see just how easy and efficient flowcharting can be when you use the right tools.

A key feature in all three flowcharting programs reviewed here is their ability to keep objects connected (not just grouped) as you reposition them. Each program does its best to maintain symbol connections with lines that stretch, bend, and adjust as you shift elements around. What’s more, you can state your preference for the type of connectors you want or change one or more connectors after the fact. For example, you might decide to substitute all diagonal lines with right-angled paths, or you might manually route a link through or around some intricate slalom course.

Flowcharting programs do even more. They let you establish and maintain automatic hierarchical links — that is, perform HyperCard-like navigation from a symbol to the complex diagram it represents. With
MacFlow and TopDown, you double-click to travel to deeper levels; DiagramMaker uses document-to-document links. These programs also keep track of what’s linked to what and where each linked item is, so all you need to do is click or issue a command to hop through levels or even documents. Each program’s underlying database beats even the spiffiest drawing packages at the flowcharting game.

Another major headache-saver is these programs’ ability to replace any number of selected drawn symbols with any selected palette symbol, bypassing the surgical cutting and reconnecting you’d have to endure if you did it manually. Replaced symbols retain prior connections, dimensions, and contained text. This feature alone can have great value if you discover that one of your heavily used symbols isn’t quite up to your customer’s requirements.

The applications discussed here can be used for charting and program design. They are not intended to be high-powered CASE (computer-aided software engineering) tools, however, nor do they do any kind of calculation, summarization, or complex searching. But all three packages are rich with features. Table 1 presents features not mentioned in this article, so do examine it.

**DiagramMaker**

When you first open DiagramMaker, you may be stunned by its nearly empty tool palette. This palette is fully editable, however. You simply construct something in the drawing area, group the elements you used to construct it, and drag it to a spot in the palette to create a new tool, complete with its own icon. The program also includes a document full of standard symbols you can place in your palette to give you a custom tool set.

DiagramMaker manages the cursor for you. When it’s not drawing a shape, your cursor is either a grabbing hand, a text I-beam, or a point grabber—all based on where it is within a symbol.

Because the program lacks polygon and freehand tools, you’ll want to make some tools with imported PICT objects drawn with a full-blown graphics program. These foreign PICTs do well, and they can be scaled, but you cannot ungroup and edit them as you can DiagramMaker’s native objects. Object-tool icons are formed from a highly reduced version of the actual tool object. A single click on a tool deselects the tool after you’ve used it once. If you double-click, you can retain the same tool indefinitely. If you Option-click on a tool, you can simply click on the document to make a presized symbol appear.

Every object, except an arc or a line, has a text-entry area with an opaque white background centered within it. DiagramMaker has a tendency to install too large a text block into an imported PICT symbol. It’s not a problem for rectangular shapes, but with irregular concoctions, some details at the symbol’s edges may be obscured.

DiagramMaker’s handling of connecting lines is unlike what you might expect—grabbing a line along its length grabs the two symbols on each end, like a barbell. Grabbing the middle handle of a line bends it into an arc whose radius increases as you drag. Diagonal connections can be made from the center of an object, from the sides, or from the corners. The program has no provisions to maintain 90-degree connections, which really cuts down its efficiency rating for formal documentation work, but the arcs may be your ticket to network nirvana.

Line ends that touch automatically attach to each other. Lines that attach to one symbol also attach to each other. Unlike with the other flowcharting programs, if a symbol is deleted, the line connections are still maintained, so removing a symbol from the middle of a set maintains the link between the preceding and succeeding objects. These “sticky” lines also form a polygonlike tool with which you can produce a closed but unfillable shape.

You can use DiagramMaker’s background layer to create headers, footers, decorations, and templates. The background images can be edited, protected from editing, and hidden and can appear on all the pages of a document.

DiagramMaker also offers the establishment of a navigational link rather than a visual one. The link is independent of connecting-line linking. You Shift-select two symbols and then link them with Command-L or a menu selection. Each link can be assigned a name up to four characters long. You traverse a linked chain by selecting any object in it and going to the next or previous linked item. You can also establish a navigational link between two
RasterOps Monochrome

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In order to draw to the SEs monitor and produce sound, some DRAM must be present on the slow SE board which can create an access bottleneck. To improve performance, the ClearVue/SE incorporates a shadow copy of the SE board's DRAM in its high speed, optimized DRAM so that writes are executed to both, and reads are executed from the shadow copy. This feature gives you a 50% performance gain in accessing SE board DRAM.

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Charting a Course

Figure 2: DiagramMaker's Page Numbering and Printing options let you start page numbering where you like, print in a logically linked sequence, and skip blank pages in a large document.

objects in separate documents, which lets you click across documents as if they were parts of a single chart.

Overall, DiagramMaker's document-linking procedure is not as clean as the simple double-click that MacFlow and TopDown use, but the program's links can take you up and down a pile of documents, which may be exactly what you need. When you print your document, you can opt to number the pages according to the order of the logical links rather than to their physical proximity. You can also elect to bypass printing blank pages.

There's more, though — that is, DiagramMaker has one of MORE's talents: It can automatically create an organization chart from an indented text list. What's nice is that after it's been created, you can tweak it right there in the program and have automatic link maintenance to boot. If you've ever edited a MORE chart in a draw program, you will appreciate this feature. During such tweaking, you'll sorely feel the program's inability to maintain right-angled connections. But DiagramMaker raises the ante further by including a text-find feature that can locate a specified word or phrase anywhere in the document.

MacFlow

MacFlow has evolved into an elegant tool, having come a few parsecs from its earlier versions. It still has only one cursor, but this changes appearance and function depending on where you click relative to a symbol. When the cursor is on a symbol's border, it becomes an arrow that lets you resize or reposition the symbol. When it's inside a symbol, the cursor becomes an I-beam text tool. You can click and type with it, or you can drag beyond the borders of the symbol, which tells MacFlow you're forming a link. MacFlow draws a connecting line from the starting symbol to wherever you stop your drag.

To create a chart, you drag the symbol you want onto the drawing area. The new symbol emerges already sized, so you don't have to worry about sizing each new addition separately. If you change the size of a specific symbol type, then every time you drag that kind of symbol from the palette, it emerges at the previously set size. You can also select any number and kind of drawn symbols and force them into standard dimensions.

MacFlow allows you to assemble your own object-oriented symbols with embedded text fields. However, you must use a DA or a separate program to make the object, which you can then paste into MacFlow's Symbol Librarian window for customization. The Symbol Librarian lets you specify the number of attachment points on each side of the symbol and also how deep into the symbol they should be. Custom symbols with a rectangular structure generally work the best because their anchor points coincide nicely with their visible borders. The anchor points for irregular symbols may not always touch the symbol borders, but if you limit the number of points to one per side, you can rig up things so they look perfect. You can easily position and size a text-entry rectangle anywhere inside a custom symbol.

With MacFlow you can have lines that have special nodes at their bending points. You can then run connecting lines to these nodes as if they were tiny symbols. This option is especially useful for structured decision blocks, when several condition paths must merge back into one path at a point where there's no symbol. A well-placed node is invaluable for showing any kind of consolidation or divergence.

Multiple symbols can link to an identical lower-level flowchart. This excellent feature saves you from keeping multiple copies of a lower-level process; any one of which could become outdated. MacFlow's method lets you keep one copy whose changes will always be visible from all links.

MacFlow's connecting philosophy gives you workable and editable charts in much less time than if you were to make them by hand. Your line preferences affect the reconnected outcome when you shift or resize symbols. If your tweaks are within reasonable limits, the updated
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connections look amazingly good. If you push it past a certain point, however, MacFlow can lose track of things and run lines inside symbols, point arrows from the inside out, and generally convolute a line or two.

Part of the problem is that your connection preferences aren’t associated with each individual line. You often want right angles in some parts and pure diagonals in others. If you shift part of your diagram and you’re in the wrong mode, you can wreak major havoc that requires manual intervention to repair. You can, however, avoid most problems by examining your current line mode before you make a major position change. To correct small goofs, you can simply drag a connector to the proper face of the symbol.

Finally, MacFlow has the surprising ability to launch any application that you’ve previously associated with a symbol. For example, the launched program can be the executable version of a custom application whose function is described by the flowchart, or it can be a compiler that opens up the source code for a subroutine under development. You can even specify a document to be opened once the application launches. When you quit the launched program, you automatically return to MacFlow, at the precise document symbol you last used.

**TopDown**

TopDown’s forte is its ability to keep your flowchart objects neatly connected with your choice of diagonal or right-angled lines. It does much of the drudgery of rerouting and adjusting for you. You can override the automatic connecting lines manually by adding, moving, and removing vertices and line segments; however, you don’t always have control over the location of the anchor points on a symbol, whether you’re in manual or automatic-linking mode.

TopDown’s handling of right-angled connections is superb. In fact, this seems to be its specialty. Each line can have its own preferred mode: side-then-down, down-then-side, or org-chart-style (a down-side-down connection). But with diagonal lines in manual connection mode, with few exceptions, the program retains control of the lines’ anchor points, which can make a connection seem less well groomed than it should be. Kaetron will be providing the means for users to establish fixed anchor points in future releases of TopDown.

On the other hand, TopDown makes sure that all vertical or horizontal line segments stay that way when you reposition the attached symbols. The same is true for diagonal components of a connection. Whenever a physical relationship forces rerouting of connectors, however, and a connector vertex lands inside an existing symbol, TopDown will intelligently attempt one alternative path. This action won’t autosnake lines through cerebellumlike mazes, but it will save you a lot of cleaning up after you’ve shifted a
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### Table 1: Features

<table>
<thead>
<tr>
<th>Symbols</th>
<th>DiagramMaker 1.1</th>
<th>MacFlow 3.01</th>
<th>TopDown 1.1a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard flowcharting-symbol shapes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Hierarchically nest/link diagrams</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Substitute one symbol with another</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Create new symbols within program</td>
<td>yes, by combining existing shapes</td>
<td>imported art</td>
<td>no*</td>
</tr>
<tr>
<td>Make new symbols from imported graphics</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Paste in externally prepared graphics</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Auto-numbering of symbols</td>
<td>no</td>
<td>no</td>
<td>yes, with manual override</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Object-link management</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic right-angle connections</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Bind text to a connecting line</td>
<td>no</td>
<td>yes</td>
<td>no*</td>
</tr>
<tr>
<td>Link multiple symbols to same subchart</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Link symbol to a pop-up note; text capacity</td>
<td>no</td>
<td>yes; 32,000 characters</td>
<td>yes; 32,000 characters</td>
</tr>
<tr>
<td>Off-page connectors go to related page</td>
<td>yes</td>
<td>no</td>
<td>yes, on-and-off-document</td>
</tr>
<tr>
<td>Types of connecting lines</td>
<td>straight, arc, poly</td>
<td>straight, poly, right angle</td>
<td>straight, poly, 3 kinds of right-angles</td>
</tr>
<tr>
<td>Location of attaching points on symbols</td>
<td>center, corners, midside</td>
<td>anywhere, grid-based, centered</td>
<td>centered, manual, auto</td>
</tr>
<tr>
<td>Connect lines to nodes in other lines</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Hand-edit connecting lines</td>
<td>yes, vertices, any segment</td>
<td>yes, vertices, anchors, any segment</td>
<td>vertices, anchor points</td>
</tr>
<tr>
<td>Add/remove connecting line segments</td>
<td>yes, needs manual reconnection</td>
<td>yes, auto reconnects</td>
<td>yes, auto reconnects</td>
</tr>
<tr>
<td>Manually change anchor points</td>
<td>yes</td>
<td>yes</td>
<td>yes, but auto shifts as needed</td>
</tr>
<tr>
<td>Handling of anchor points when objects move</td>
<td>fixed on original point</td>
<td>fixed or optionally changes face</td>
<td>changes face, avoids collisions</td>
</tr>
<tr>
<td>Handling of anchor points when objects resize</td>
<td>fixed on original point</td>
<td>centered, spreads multiple points</td>
<td>may change as needed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Object-handling and precision</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Object-alignment options</td>
<td>full &amp; page/drawing centering</td>
<td>full</td>
<td>full</td>
</tr>
<tr>
<td>Grid-snap option</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Group/ungroup</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Display symbol size</td>
<td>yes</td>
<td>no</td>
<td>yes, in dialog box</td>
</tr>
<tr>
<td>Display rulers</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Symbol resizing method</td>
<td>from corner, no proportion help</td>
<td>from corner, proportion option</td>
<td>from corner, no proportion help</td>
</tr>
<tr>
<td>Select all symbols automatically</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Select all lines automatically</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Provide multiple views of same document</td>
<td>no</td>
<td>no</td>
<td>yes, via scrolling panes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Limits</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum number of predefined symbols</td>
<td>depends on monitor size</td>
<td>200</td>
<td>36 oriented, 24 bit maps</td>
</tr>
<tr>
<td>Maximum number of symbols per document</td>
<td>RAM-limited</td>
<td>32,000</td>
<td>32,000 per drawing</td>
</tr>
<tr>
<td>Maximum connecting points per symbol</td>
<td>unlimited</td>
<td>0 - 6 or unlimited</td>
<td>unlimited</td>
</tr>
<tr>
<td>Maximum document dimensions</td>
<td>112 x 108 inches</td>
<td>8 x 6-inch to tabloid</td>
<td>96 x 43 inches</td>
</tr>
<tr>
<td>Number of colors supported</td>
<td>8</td>
<td>256</td>
<td>8</td>
</tr>
<tr>
<td>Multiple drawings open</td>
<td>separate files, RAM limit</td>
<td>hierarchical, RAM limit</td>
<td>hierarchical, RAM limit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Import/export and printing</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Export chart as PICT file</td>
<td>yes, through Clipboard</td>
<td>yes, through Clipboard</td>
<td>yes, as an Export option</td>
</tr>
<tr>
<td>Export note text</td>
<td>NA</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Note-printing options</td>
<td>NA</td>
<td>selected symbol, whole chart</td>
<td>independent, by doc., by drawing</td>
</tr>
<tr>
<td>Page number/header</td>
<td>common background layer</td>
<td>logo, date, time, head, more</td>
<td>none, manually number pages</td>
</tr>
<tr>
<td>Structured reports</td>
<td>diagrams</td>
<td>diagrams, levels, comments, all</td>
<td>diagrams, levels, notes, reports</td>
</tr>
</tbody>
</table>

*TopDown 2.0 will incorporate this feature.
*TopDown 2.0 lets you grab any line segment not directly attached to a symbol.

These three flowcharting programs are feature-rich. This list of talents and limits presents the key elements that differentiate these programs from draw programs and from each other.
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large section of a chart. With TopDown's Note Card feature, you can attach up to 32K of text to each symbol, enabling you to write technical explanations or even live program code that you can print later and export as text with its indentation tabs intact. The Print dialog box lets you select the drawing(s) and symbol(s) for which to print note-cards.

TopDown's palette contains three banks of 12 symbols each. One bank holds the standard symbol set, and two hold rectangular symbols, each with a bit-mapped icon that's permanently grouped with it. The icons are editable in Fat Bits mode, and there's also a facility for capturing a 32-x-32-pixel icon-sized swatch from any MacPaint-format file.

If you need to return quickly to a particular view after doing some editing away from the current page, you can choose Drop Anchor before you change views and then go anywhere else in the same drawing. To

Figure 7: TopDown's bit-mapped-icon editor can import, create, or edit new icons that can serve as visual symbol enhancers.

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return, you simply use Go To An­chooser. Each nested drawing has its own anchor point to which you can zip. For faster navigation through nested drawings, you can choose to see the nesting hierarchy as a list of titles. Double-click on a title at any level, and you’re there — directly.

With TopDown’s Clustering feature, you have the power to send a collection of drawing elements instantly to a lower level. TopDown replaces the demoted symbol with a new, shadowed symbol that’s hierarchically above the symbol set.

The program is unique in that it generates reports that you can preview on-screen, save as text, and print. The Cross Reference report lists which symbols are attached to each symbol in the chart, regardless of the direction of flow. The Outline report shows you, by symbol number and title, the sequence of downstream symbols and the full details of any hierarchically lower drawings. The Errors report lists symbols that have data flowing in but none flowing out.

TopDown’s Undo command restores a deleted item or a set of items. In this, it does a very good job. Unfortunately, Undo recovers symbol deletions only. Fortunately, there’s a Revert To Saved option that can help, provided you save frequently. Beefing up the Undo command is a high

---

**TopDown 2.0 Beta Watch**

At the time of this review, I tested a beta copy of TopDown version 2.0, which should be shipping by the time you read this. It will incorporate significant enhancements in key areas. Its symbol palette will get two additional storage banks for custom symbols, full-fledged object-oriented symbols with a text-entry area. You’ll be able to create symbols within TopDown with any combination of imported art, existing primitive shapes, and built-in sophisticated drawing tools. It will be possible to add, move, and remove polygon vertices. Connecting points on custom symbols will be established precisely on their faces rather than at an object’s center or somewhere in space. Moreover, these will be master symbols that, when edited, will automatically reflect their changes in all places in the document where they’re used.

You’ll be able to grab line segments, as opposed to just vertices, and move them freely to make adjustments more easily, without handling two separate ends. TopDown’s already potent navigation facility will be enhanced with a pop-up scrolling menu that presents a selectable list of drawings everywhere in the hierarchy. You’ll also be able to bind text to a line, either overlaying the line or next to it. This upgrade could put TopDown at the head of the class.

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priority on Kaetron's list of improvements for the program.

Charting Your Course

Flowcharting packages have crossed the threshold from being naive time-consuming assistants in stick-figure drawing to serving as bona fide efficiency tools. All these programs could use some extra intelligence in the line-routing area, which each developer admits is the toughest part. But someday not far off, you'll be able to put your symbols roughly where you need them, draw a few lines just to clarify what should be connected where, click on the Spiff Up button, and let it flow.

Salvatore Parascandolo graduated from Flowchart U using MacDraw 1.9 exclusively. He majored in pseudoconnectivity and rectilinear tweaking and welcomes any objects that think for themselves.

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Modems: 9,600 bps and Counting

Now available and affordable, a new assortment of lightning-fast modems shatters the 9,600-bps speed limit.

By Gordon McComb, Rik Myslewski, and the MacUser Labs staff

ike people, new technologies tend to be messy and unpredictable at birth and expensive as they’re growing up. The successful ones develop standards and settle down. The lucky ones live to a ripe old age, retire, and are enjoyed by children.

Super speed modems — those operating at 9,600 bits per second (bps) and above — have just reached adulthood. In their youth, they were wildly extravagant, notoriously incompatible, and frequently finicky about how they were treated. Only recently have they matured into a technology that’s practical, affordable, and easy to use.

A 9,600-bps modem has the same purpose as its slower relatives: to let your computer communicate over the phone. Modems accomplish this by modulating, or transforming, your computer’s digital signals into analog ones, which are then transmitted across phone lines, bit by byte, as audible tones. At the receiving end, another modem demodulates the signals, transforming them back into digital data — the 1s and 0s that are the building blocks of computer communication. The term modem is an acronym for MODulator-DEModulator (see the “How It Works” sidebar).

One quirk of the early superspeed modems was their refusal to work over standard dial-up telephone lines. They required specially tuned — and specially priced — lines leased from the phone company. Over these nearly noise-free lines, a 9,600-bps modem used a variety of digital tricks to double its performance to a maximum of 19,200 bps.

Times have changed, and a harder class of these high-tech wonders has appeared. The newest superspeed modems are less affected by background noise, so they can communicate with each other over normal phone lines. Their prices have also dropped substantially, bringing them within reach of average business users.

To assess the state of the art, MacUser Labs examined eleven 9,600-bps modems costing less than $1,500, all of which adhere to the V.32 standard for superspeed telecommunications. Two of the modems — the CONNECT V.32 Service and Racal-Vadic 9632VP — are the same unit packaged with different accessories. Three others — the Computer Friends LightSpeed, Digicom V.32 9624LE, and Prometheus ProModem 9600M Plus — also use identical hardware. The remaining six — the Bitcom Strata V.32, FastComm FDX9696, MultiTech MultiModem V32, NEC N9631, Telebit T2500, and U.S. Robotics Courier V.32 — exhibit numerous differences in both features and performance (see Table I).

A superspeed modem is judged by how fast it can reliably transmit data over phone lines — its throughput. Accordingly, we tested each modem’s speed and its resistance to errors caused by noise on the phone line. The results confirm that today’s 9,600-bps modems are less finicky and more dependable than their predecessors. Even large amounts of noise had little adverse effect on most of them, and while none of the modems reached the ideal 19,200-bps limit, several topped 15,000 bps in certain situations.

The Need for Speed

At $800 to $1,500 each, the superspeed modems we tested are still costly enough to make you think twice before buying. Before joining life in the fastest lane, you should consider your communications habits, the type and variety of
computers you connect with, and the kind of data you send and receive.

The power of these modems is best for transmitting and receiving files, not for interactive communication. A 9,600-bps modem is a blessing for programmers, desktop publishers, and others who must transfer huge files, because it’s more than four times faster than a “high-speed” 2,400-bps modem. But if you use your modem mostly for real-time typing to exchange information with other computer users, you don’t need the power of a superspeed modem — unless you type 10,000 words per minute.

Another ideal use is remote-control communication. Applications such as Farallon’s Timpaktu/Remote and Microcom’s Carbon Copy Mac let you call a distant Mac by modem and operate it exactly as if it were your own (see “Remote Control,” May ’89). Using a Mac by remote control is a boon to consultants, who often need to access files and programs so they can determine the cause of a problem or configure a system for a client. Although you can use a slower modem for remote operations, you’ll suffer a distinct performance loss, as if you were working in slow motion.

With the appropriate networking hardware and software, you can also use a 9,600-bps modem to tap into a network from afar and access files and electronic mail. To your Mac, it looks just like a hard-wired connection. However, even though a 9,600-bps modem is vastly superior to slower modems for wide-area networking, you still won’t achieve network speeds; even slowpoke LocalTalk operates at 230,400 bps.

On the flip side, remember that it takes two to tango. A 9,600-bps modem won’t do you any good unless there’s one on the other end of the line, and superspeed modems are still relatively rare. For instance, don’t expect to hook up your new modem and immediately connect at supersonic speed to your favorite on-line or bulletin-board service. With the exception of CONNECT, no major dial-up service can handle these speed-burners — yet. Expect CompuServe, Dow Jones, and other popular services to add 9,600-bps service as V.32 modems become more popular. But don’t worry about losing touch with these and other slowpokes, because all the modems we tested can downshift to compatible speeds and do so automatically when they connect to a slower modem.

Finally, don’t expect to recoup your investment overnight with money you save on your phone bill. A good 2,400-bps modem can be picked up for around $200 — one-fourth the cost of the cheapest superspeed modem. Your files will zip across the country four times faster at 9,600 bps, but if you pay 25 cents per minute between San Francisco and New York, you’ll have to save a lot of quarters before you make up the difference.

Getting Up to Speed

You can’t just attach a 9,600-bps modem to your Mac and immediately reap the benefits. For one thing, standard modem cables don’t support hardware handshaking, which controls the flow of data between Mac and modem. This capability is a requirement for superspeed communications (see the “Glossary” sidebar).

The Computer Friends and Prometheus modems include the proper hardware-handshaking cable. Two others — the CONNECT V.32 Service and Racal-Vadic 9632VP — don’t require you to modify your cable. Instead, you make the necessary adjustment by sending a command to the modem through your telecommunications software. (The V.32 Service includes a cable that works fine after this adjustment is made.) For the rest of the modems, you must either find the correct cable or make a jumper cable (see this month’s Labs Brief, “Modem-Cable Rewiring”).

Next, make sure that the modem is configured correctly for your system. This will probably mean going through the manual — the FastComm FDX 9696 has an excellent one — to discover how to set the DIP (dual in-line package) switches on the back or bottom of your modem. Four of the modems can also be configured remotely, enabling you to set them up long-distance. But if you’re setting up the modem in person, you’ll be flipping DIPs to set such things as parity and start and stop bits. When you’ve finished, it’s time for the next step — installing your favorite telecommunications application.

You’ll need a program such as MicroPhone, Smartcom, or Red Ryder to manage the communications between Mac and modem and to access the Hayes Standard AT Command Set built into the modem’s ROM. Two of the modems include the necessary software. Computer Friends LightSpeed comes bundled with Quick Link II, which has a text editor that lets you create and save any sequence of passwords or log-on commands. When you launch Quick Link II, it automatically configures your modem to the settings you previously defined and stored. The ProModem 9600M Plus package from Prometheus Products includes MACKNOWLEDGE, a powerful program that’s smart enough to automatically configure all aspects of your modem for best performance on any line. One of our favorite features is a built-in log of all access numbers for the major on-line services — just enter your area
How It Works: 9,600-bps Modem

We opened up a U.S. Robotics Courier V.32, the fastest modem we tested, to identify the components that enabled it to reach speeds of slightly less than 16,000 bps.

Telephone jacks
Two RJ11 telephone jacks connect the modem to the telephone line and allow connection to one telephone.

Telephone interface
Analog signals are transmitted between the data pump and the phone line through the telephone interface.

Nonvolatile RAM
User-defined configuration settings remain in nonvolatile RAM when the modem is turned off.

Alternate-speeds microprocessor
This microprocessor takes over when communicating with a slower modem.

Status indicator lights
A row of LEDs provides information on modem activity.

Serial port
Digital signals pass to and from the computer through the RS-422 serial port.

Computer-interface microprocessor
This chip controls all communication through the serial port.

Control microprocessor
The control microprocessor performs all MNP error-detection and data-compression protocols.

Program ROM
Instructions for the MNP protocols and other modem activities are contained in two program ROM chips.

Data pump
The Rockwell R9696DP data pump is the heart of the modem. The integrated analog chip on the right converts the computer's digital signals into analog signals that can be transmitted over a phone line as audible tones. This chip also filters noise from the incoming signal. Trellis-code modulation is accomplished by three digital-signal processors on the left. The echo-cancellation chip at the bottom enables full-duplex communication. Two high-speed static RAM chips provide work space for the calculations necessary for V.32 modulation.

code, and a dialog box pops up with the appropriate numbers.

Although it doesn’t offer a full-fledged telecommunications program, the CONNECT V.32 Service includes Business Information Network software for accessing CONNECT’s on-line service. This may sound like a limitation, but the fact that CONNECT throws in a free subscription to the service and one free hour of connect time sweetens the deal considerably.

Now it’s time to switch on your new modem and face its bewildering array of red lights. All the models have at least 8 LEDs (light-emitting diodes) as status indicators. A few, such as the FastComm, NEC, and U.S. Robotics modems, have as many as 12. While LEDs tell you instantly what the modem is doing, they also make things look more complicated than they really are. Except for the Connect and Speed indicators, you can basically ignore the rest, because the telecommunications software should provide adequate feedback about the progress and status of your calls. The other LEDs do come in handy, however, when you’re troubleshooting a stubborn modem.

If you plan to use your modem not only to call others but also to allow them to call you, now’s the time to implement password security, which prevents unauthorized callers from accessing your computer. Your telecommunications program can access the modem’s security features to let you set passwords; check the modem’s manual for the proper procedures. The FastComm FDX 9696 has a simple but effective form of security—the caller is prompted for a password, and if it’s wrong, the FDX 9696 modem simply
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...desk or require constant... 

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...and high speed SCSI... 

...Macintosh or Image... 

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...Does your computer just... 

...mother board. One... 

...suites your needs. 

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Hi Density - Bulk (Min. 50)... 210.

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### Table 1: Features of 9,600-bps Modems

<table>
<thead>
<tr>
<th></th>
<th>Bytcom</th>
<th>Computer Friends</th>
<th>CONNECT</th>
<th>Digicom V.32 962/4E</th>
<th>FastComm FDX 9636</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$799</td>
<td>$799</td>
<td>$999</td>
<td>$795</td>
<td>$999</td>
</tr>
<tr>
<td><strong>Speeds (bits per second)</strong></td>
<td>300, 1,200, 2,400, 9,600</td>
<td>1,200, 2,400, 2,400, 9,600</td>
<td>2,400, 300, 1,200, 300, 1,200, 2,400, 9,600</td>
<td>300, 1,200, 2,400, 9,600</td>
<td></td>
</tr>
<tr>
<td><strong>Standards supported</strong></td>
<td>Bell 103, Bell 212A, V.22</td>
<td>Bell 212A, V.22, V.22bis, V.32</td>
<td>Bell 103, Bell 212A, V.22, V.22bis, V.32</td>
<td>Bell 103, Bell 212A, V.21, V.22bis, V.32</td>
<td></td>
</tr>
<tr>
<td><strong>Cables included</strong></td>
<td>power, RJ11 jack</td>
<td>power, modem, RJ11 jack</td>
<td>power, modem, RJ11 jack</td>
<td>power, RJ11 jack</td>
<td>power, RJ11 jack</td>
</tr>
<tr>
<td><strong>Software included</strong></td>
<td>none</td>
<td>Quic Link II</td>
<td>CONNECT Business Information Network</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td><strong>Error detection/reduction</strong></td>
<td>TCM, MNP 4</td>
<td>TCM, MNP 4</td>
<td>TCM, MNP 4</td>
<td>TCM, MNP 4</td>
<td>TCM, MNP 4</td>
</tr>
<tr>
<td><strong>Data compression</strong></td>
<td>MNP 5</td>
<td>MNP 5</td>
<td>MNP 5</td>
<td>MNP 5</td>
<td>MNP 5</td>
</tr>
<tr>
<td><strong>Volume control</strong></td>
<td>software</td>
<td>software</td>
<td>rear dial</td>
<td>software</td>
<td>rear dial</td>
</tr>
<tr>
<td><strong>Phone-number storage</strong></td>
<td>30 numbers</td>
<td>10 numbers</td>
<td>15 numbers</td>
<td>10 numbers</td>
<td>4 numbers</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>none</td>
<td>password-protected callback</td>
<td>none</td>
<td>password-protected callback</td>
<td>password, hardware check</td>
</tr>
<tr>
<td><strong>Remote configuration</strong></td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Status lights</strong></td>
<td>9</td>
<td>8</td>
<td>11</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td><strong>Data-pump supplier</strong></td>
<td>Rockwell</td>
<td>proprietary</td>
<td>Rockwell</td>
<td>proprietary</td>
<td>Rockwell</td>
</tr>
<tr>
<td><strong>Size (W x D x H, inches)</strong></td>
<td>7.5 x 12 x 2</td>
<td>6 x 9.5 x 1.5</td>
<td>6 x 10 x 1.5</td>
<td>6 x 9.5 x 1.5</td>
<td>6.5 x 10 x 1.5</td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>2 years</td>
<td>1 year</td>
<td>2 years</td>
<td>2 years</td>
<td>2 years</td>
</tr>
</tbody>
</table>

*The 300-bps Bell 103 protocol is available as a $109 option.

*Hardware handshaking is not supported.

*N.22 and V.23 are available for use outside North America.

*Can recognize an FXD 9696 at the other end of the line.

---

hogs up. The Computer Friends, Digi­
com, Multi-Tech, and Prometheus mo­
dems offer the double protection of call­
back security. If the caller provides the
correct password, your modem hangs up
and calls the other modem back, using a
preprogrammed telephone number.

As a last step, you may want to store
commonly used phone numbers directly
in your new modem. The modems' stor­
age capacities range from 4 (FastComm
and U.S. Robotics) to 30 numbers
(Bytcom). In any case, most telecom­
unications programs provide all the on­
disk number storage you need.

### Meeting the Standards

After you've finished getting the
modem ready to go, you must find some­
one to talk to. Unfortunately, afford­
able 9,600-bps modems are still few and far
between, and many don't conform to the
V.32 standard followed by the modems
we tested.

V.32 is an industrywide modulation
standard established by the Geneva-based
International Consultative Committee
for Telephone and Telegraph (CCITT) to
ensure compatibility among 9,600-bps
modems. A V.32 modem can commu­
nicate with other V.32 modems regard­
less of make or model. Superspeed modems
that don't comply with V.32 may not be
able to communicate with your new V.32
modem. This is a minor consideration if
you plan only to set up a private high­
speed link, but it's a crucial concern if
you want to communicate at 9,600 bps
with the rest of humanity. Don’t assume
that every 9,500-bps modem obeys
V.32's rules. There are plenty of modems
out there that don't, and most of them are
capable of communicating only with their
own kind (see the "Seeing Through the
Hayes' sidebar").

Most modems in use today comply
with two earlier standards: V.22bis, which
governs 2,400-bps modems, and Bell
212A, which provides guidelines for
1,200-bps modems (see Table 2). There
are even a few Bell 103 modems still
around, which are chugging along at
300 bps. Because of this, all the modems
in this report automatically check the
speed of the other modem in the link
and adapt accordingly. All 11 work just fine
at 2,400 and 1,200 bps, and all but 3－the
nearly identical Computer Friends, Digi­
com, and Prometheus modems－can
also communicate at 300 bps. (Computer
Friends offers 300-bps compatibility as a
$109 option.) While you certainly
wouldn't choose to communicate at 300
bps, there are still some connections,
including small computer bulletin boards,
that require such slow transmission.

### Bits and Baud

Slowing down isn't a matter of the
modem's simply reducing the number of
bits it sends over the phone line. Each
transmission rate uses a completely dif­
ferent type of modulation and demodu­
lation (see Figure 3). A V.32 modem that
can transmit and receive information at
300, 1,200, 2,400, and 9,600 bps is actu­
ally the equivalent of four modems in
one.
Modem speed is rated in bits of information sent or received each second (bps). This rating is determined by multiplying two numbers: how many times the signal is modulated, or changed, each second (baud rate) and how many bits of information are transmitted with each change. Although most people use baud rate and bps interchangeably, these two measurements are equal only for the slowest, simplest modems.

Not surprisingly, the faster the modem, the more complex the modulation. A 300-bps modem modulates the pitch, or frequency, of its signal at a leisurely 300 times per second (300 baud). The frequency goes up or down to indicate either a 1 or a 0; each change thus provides 1 bit of information to the receiving modem.

A 1,200-bps modem takes a somewhat different approach. It modulates signals at a rate of 600 baud and transmits 2 bits of information with each frequency change, encoding each bit by changing the signal’s phase — its position relative to the previous signal change — rather than by altering its frequency.

Modems achieve speeds greater than 1,200 bps by altering the signal’s amplitude, or strength, in addition to its phase. This scheme, called quadrature amplitude modulation (QAM), can transmit 4 bits per baud. At 600 changes per second (600 baud), the result is 2,400 bps. All the superspeed modems we tested use the phase-and-amplitude-modulation scheme, but they crank up the baud rate from 600 to 2,400. The resulting 9,600 bps leaves 2,400-bps modems in the dust.

However, at 9,600 bps, the limitations of the phone company’s lines and equipment begin to complicate matters. A telephone line can handle only frequencies between 300 and 3,000 hertz. This bandwidth, or useful signal area, is further reduced when you subtract all the frequencies the phone company needs for communicating with its own equipment. At 2,400 baud and with 4 bits of information per baud, the bandwidth is just not “wide” enough to allow two 9,600-bps modems to communicate simultaneously without interfering with each other. In fact, the transmission of the originating modem takes up most of the available bandwidth by itself — no room is left in the bandwidth for the answering modem to respond.

The most common industry standards for telecommunications — including V.32 — require simultaneous, or full-duplex, communication. That is, both the originating and the answering modem must be able to “talk” and “listen” at the same time. Lower-speed modems achieve full-duplex transmission by talking and listening at different frequencies. As mentioned, the telephone bandwidth is too narrow for this strategy to work at 9,600 bps, so how do superspeed modems achieve full-duplex communication?

The solution, echo cancellation, is simple in concept but devilishly difficult in practice. When two 9,600-bps modems talk to each other across the same line at the same time, the interference between the two signals scrambles both
transmissions beyond recognition. Each modem hears both the tones that it’s sending and the tones being received from the other modem. What’s worse, these tones don’t simply play together like a piano chord; instead, they combine into completely new tones with inappropriate meanings.

A V.32 modem makes sense of this cacophony by using echo cancellation. That is, it remembers the tones it has sent and subtracts them from the scrambled transmission it hears. The modem then passes on to its host computer what’s left — the data sent by the other modem. This degree of modem "smarts" requires onboard DSP (digital signal processors) capable of carrying out 25 million instructions per second. This is one reason why superspeed modems cost so much more than their slower relatives.

Make No Mistake

The V.32 standard permits — but does not require — an error-reduction scheme called TCM (trellis-code modulation), which adds yet another bit of information to each baud. The receiving modem checks this fifth bit against a complex coding system to see if an error has occurred in transmission; if it has, it attempts a correction. The Telebit T2500 is the only modem that doesn’t use TCM at 9,600 bps.

Two other features, error detection and data compression, are found in most modems of this caliber even though they aren’t part of V.32. Of the 11 modems, 10 provide MNP (Microcom Networking Protocol) Class 4 error detection and MNP Class 5 data compression. MNP classes are communications protocols licensed to each modem manufacturer by

Using our three simulated test lines, we fed each modem a random bit stream while increasing the amount of background noise. As the line quality worsens (left to right), the signal-to-noise ratio drops, and each modem begins to make errors. Each bar begins at the noise level at which errors begin and ends when they become so frequent that the modem disconnects itself. The NEC N9631 was the most error-free. The FastComm FDX 9696 produced the strangest results, tying for first place on satellite-noise tolerance after starting to make errors at extremely low noise levels.
Microcom (thus adding to the price of a 9.600-bps modem). These protocols are so popular that they have become inform-

The error detection scheme of MNP Class 4 is fundamentally different from error reduction as performed by trellis-code modulation. TCM is the first line of defense against transmission errors; it can find and fix an error anywhere in a packet of data. A modem using TCM attempts to make an educated guess after it detects an error—and it’s smart enough to be right a good percentage of the time.

If TCM doesn’t find or fix the error, MNP Class 4 takes over and asks the originating modem to retransmit the offending data packet. If the errors come too frequently, MNP Class 4 instructs the
Capsule Reviews


Bytcom Strata V.32

This low-priced modem finished in the top five for text-file throughput, although its performance with binary files was only average. It displayed good noise tolerance on our simulated local line but stumbled badly on both satellite and cross-country lines.

Cons: Worst noise tolerance on satellite and cross-country lines. No security features.

Bytcom, Inc.
2169 Francisco Blvd.
San Rafael, CA 94901
(800) 227-3254 or (415) 485-0700
$799

Computer Friends LightSpeed

The LightSpeed is really a Digicom V.32 9624LE with a different front panel. Its performance in our tests was only average, but it's inexpensive and ready for use right out of the box. It comes with Quick Link II, a fast and easy-to-use telecommunications program, as well as the proper cable.

Cons: 300-bps communications available only as a $109 option.

Computer Friends, Inc.
14269 N.W. Science Park Drive
Portland, OR 97229
(800) 547-3303 or (503) 626-2291
$795

CONNECT V.32 Service

Our all-around favorite, this modem is fast and error-resistant. It's actually a Racal-Vadic 9632VP with a different label. Although the two modems are similarly priced, the V.32 Service comes with a subscription to the CONNECT Business Information Network (a $149 value). The package also includes one free hour of online time and a modem cable.

Pros: Comes with software and one free hour of access to the CONNECT Business Information Network. Excellent throughput. Can be configured internally to support hardware handshaking.
Cons: Low noise tolerance on local lines. No security features.

CONNECT, Inc.
10161 Bubb Road
Cupertino, CA 95014
(800) 262-2638 or (408) 973-0110
$999

Digicom V.32 9624LE

This is the lowest-priced V.32 modem now available — by a margin of $4. The 9624LE was an average performer in both throughput and noise-tolerance tests. Digicom V.32 hardware is also sold by Computer Friends and Prometheus Products.

Pros: Lowest price. Callback security.
Cons: Low text-file throughput. No 300-bps mode.

Digicom Systems, Inc.
279 Sinclair Frontage Road
Milton, CA 95955
(408) 262-1277
$795

FastComm FDX 9696

Unlike other modems using the Rockwell data pump, the FDX 9696 was not a top performer in the throughput and noise-tolerance tests. It repeatedly showed considerable errors on the simulated satellite line at relatively low noise levels, although it held on to tie for highest tolerance in the same test. A new FastComm modem (not available at press time) will include a 20-megahertz control microprocessor, which should improve throughput.

Cons: Worst noise tolerance on satellite lines. Stores only four phone numbers.

FastComm Communications Corp.
12347-E Sunrise Valley Drive
Reston, VA 22091
(800) 212-2406 or (703) 212-3800
$999

Multi-Tech Multi-ModemV32

This Jekyll-and-Hyde modem was one of the top performers in text-file throughput, but its binary speed was the worst. It has a good assortment of features, but it's one of the priciest units.

Cons: Worst binary-file throughput. Low noise tolerance on satellite and cross-country lines.

Multi-Tech Systems, Inc.
2206 Woodale Drive
Clarksburg, MD 20871
(800) 235-8717 or (301) 855-3500
$1,195
NEC N9631
Since the NEC N9631 was one of the slowest modems, its excellent noise tolerance really surprised us. It hung on to each telephone line, especially local and cross-country lines, long after most of the other modems gave up. As a result, it seems an excellent choice if you're plagued by noisy phone lines.
Pros: Excellent noise tolerance on all phone-line types.
Cons: Low text-file throughput. No security features.
NEC America, Inc.
110 Rio Robles
San Jose, CA 95134
(800) 222-4832 or (408) 439-1277
$1,095

Prometheus ProModem 9600M Plus
The ProModem is really a Digicom V.32 9624LE with a different front panel, and it shares that model's average throughput and good noise tolerance. However, Prometheus sweetens the deal with the correct cable and MACKNOWLEDGE, a superior telecommunications application that includes ready-made login scripts for most on-line services.
Pros: Excellent telecommunications software. Hardware-handshaking modem cable. Good noise tolerance on all lines. Callback security.
Cons: No 300-bps mode.
Prometheus Products, Inc.
7255 S.W. Bonita Road
Tigard, OR 97223
(800) 477-9473 or (503) 624-6571
$995

Racal-Vadic 9632VP
With an easy-to-use front panel and a command set that speaks English, the 9632VP is the friendliest V.32 modem around. It's also sold by CONNECT as the V.32 Service, which offers more features for the same price.
Pros: Excellent throughput on all lines. Can be configured internally to support hardware handshaking.
Cons: No security features.
Racal-Vadic
1708 McCarthy Blvd.
Milpitas, CA 95035
(800) 482-3427 or (408) 432-8008
$995

Telebit T2500
The T2500 had the best binary-file speed, thanks to its proprietary Lempel-Ziv protocol for data compression. Unfortunately, it also had the worst speed for text files. It lacks both MNP Class 5 and trellis-code modulation, although the former should now be available as a free upgrade.
Pros: Best binary-file throughput. Remote configuration. Has 19,200-bps mode for talking to other Telebit T2500s.
Cons: Worst text-file speed. No MNP Class 5 data compression (to be available as a free upgrade). No trellis-code modulation. No security features. Expensive.
Telebit Corp.
1345 Shorebird Way
Mountain View, CA 94043-1329
(800) 835-5248 or (415) 969-3800
$1,495

U.S. Robotics Courier V.32
Big money sometimes delivers big performance, which is the case here. The Courier V.32 is the speed demon of V.32 modems, taking the checkered flag for text files and coming in second for binary transfers. Performance in the noise-tolerance tests was only average, and features are minimal.
Pros: Best text-file throughput. Excellent binary-file speed.
Cons: Stores only four phone numbers. Poor noise tolerance on local lines. No security features. Expensive.
U.S. Robotics, Inc.
8100 McCormick Blvd.
Skokie, IL 60076
(800) 342-6877 or (312) 882-5001
$1,495

Acknowledgments
MacUser Labs would like to thank the members of our advisory panel: Warren Henderson of Henderson Communications and Ken Krechmer of Action Consulting. We are also indebted to Processing Telecom Technologies and Compaq Computer for the loan of test equipment, to Brian Murphy of PTT for assisting in its setup and use, and to Software Ventures for copies of MicroPhone II.
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Modems

originating modem to assemble the data into smaller packets. The smaller packets take less time to retransmit when an error is found, and more make it through on the first try. By using both TCM and MNP Class 4, a 9,600-bps modem can provide essentially error-free performance even over noisy phone lines.

Cutting Down the Noise

The erratic noise levels on phone lines are a major factor in modem performance. Accordingly, we gave each modem a chance to prove itself on recreations of three common line types — a local call, a bounce off a single satellite, and a cross-country terrestrial link — using testing equipment designed by Processing Telecom Technologies (PTT) of Huntsville, Alabama.

We chose these three lines because they are probably the ones you use most in daily communications and because they present three clearly different — and increasing — sets of problems. A local line is the cleanest, but even it picks up an occasional pop when rerouted by a switching device in the downtown phone office or a little hum when someone turns on a vacuum cleaner. The satellite line suffers most from echo, caused by a bit of the transmitted signal bouncing back to the modem that sent it. A cross-country line is toughest for most modems to negotiate, because it includes both the switching noise of a local call and the decrease in signal strength inevitable when crossing long distances.

These phone-line gremlins are known as line impairments, and the more impairments that disrupt a line, the more errors that can occur. We used EZBERT software from PTT to synthesize local, satellite, and cross-country line impairments as defined by the Electronics Industry

To test throughput speed, we sent text and binary files between a pair of each manufacturer's modems, one at either end of a simulated dial-up connection. All the modems performed well above the 9,600-bps floor when transferring text, but only four could pass muster with binary files. The CONNECT, Racal-Vadic, and U.S Robotics modems excelled at both text and binary transfers across all three types of phone lines. The Telebit T2500 did particularly well with binary files, thanks to its Lempel-Ziv data-compression protocol.
### Figure 2: Throughput

<table>
<thead>
<tr>
<th></th>
<th>Local line</th>
<th>Satellite line</th>
<th>Cross-country line</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thousands of bits per second</td>
<td>Thousands of bits per second</td>
<td>Thousands of bits per second</td>
</tr>
<tr>
<td>Bytcom Strata V.32</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>![Graph]</td>
</tr>
<tr>
<td>Computer Friends LightSpeed</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>![Graph]</td>
</tr>
<tr>
<td>CONNECT V.32 Service</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>![Graph]</td>
</tr>
<tr>
<td>Digicom V.32 9624LE</td>
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<tr>
<td>FastComm FDX 9696</td>
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<tr>
<td>Multi-Tech MultiModemV32</td>
<td>![Graph]</td>
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<tr>
<td>NEC N9631</td>
<td>![Graph]</td>
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<tr>
<td>Prometheus ProModem 9600M Plus</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>![Graph]</td>
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<tr>
<td>Racal-Vadic 9632VP</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>![Graph]</td>
</tr>
<tr>
<td>Telebit T2500</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>![Graph]</td>
</tr>
<tr>
<td>U. S. Robotics Courier V.32</td>
<td>![Graph]</td>
<td>![Graph]</td>
<td>![Graph]</td>
</tr>
</tbody>
</table>

**Text files** | **Binary files**

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Glossary

Bandwidth
The width of a communication channel, measured as frequency (in cycles per second, or hertz). A channel's bandwidth is a major factor in determining how much information it can carry.

Baud
The number of signal (or state) changes in a carrier per second; also referred to as baud rate. The maximum baud rate of a modem is limited by the bandwidth of the phone line. Named in honor of J. M. E. Baudot, a 19th-century French inventor of telegraph code.

Bell 103
The North American standard for 300-bps modems, implemented by Bell Labs (now a division of AT&T) in 1963.

Bell 212A

Bits per second (bps)
The number of bits of data transmitted by a modem through a phone line in one second. To get the bps rate of a modem, multiply the number of signal changes per second (baud rate) by the number of bits of information carried by each change.

Carrier
An electrical signal that is used to carry information.

CCITT
A United Nations-sponsored organization, in Geneva, Switzerland, devoted to establishing worldwide communications standards. In English, it is known as the International Consultant Committee for Telephone and Telegraph.

Data compression
Packing data into a reduced format. Compressed data is in "shortform" and must be decompressed before it can be used by the receiving computer.

Data pump
The set of chips in a modem that modulates the digital signals supplied by the computer into analog signals for transmission through the phone lines as audible tones. The data pump of the receiving modem demodulates the analog signals into digital ones.

Dial-up line
Your average everyday home or business phone line. (See also leased line.)

Echo
(1) A faint return of the transmitted signal to the originating modem when a signal is relayed by a communications satellite. (2) The interference caused when a modem receives its own signal, experienced when two 9,600-bps modems communicate, each using most of the available bandwidth.

Error reduction
A hardware protocol that enables the receiving modem to examine incoming data for errors and to correct most of those it finds without requiring data to be re-sent. (See also trellis-code modulation.)

Error detection
A hardware or software protocol determining when a group of incoming data has an error. If one is detected, the receiving modem orders the transmitting modem to send the data group that contains the error.

Full duplex
Two-way communications in which each modem simultaneously sends and receives data at the same rate.
line. The NEC N9631 showed the best noise tolerance on all line types, while the Bytom Strata V.32 lost the phone connection on the satellite and cross-country lines with only moderate noise.

The most peculiar performer — so odd that we repeated the test several times to make sure it was true — was the FastComm FDX 9696. It showed better-than-average noise tolerance when tested over local and cross-country lines, but it began making errors much earlier than any other modem when we simulated a satellite transmission. However, the FDX 9696 hung in there as we worsened the line, and eventually it tied with the NEC N9631 and Prometheus ProModem 9600M Plus for highest satellite-noise tolerance. In short, it somehow managed to be both worst and best in the same test. Apparently, the gremlin most associated with satellite lines — echo — could make the FDX 9696 stumble but had a hard time making it fall.

Fast, Faster, Fastest

Data compression is what enables a superspeed modem to truly live up to its name. To accomplish transmission rates well over the modem's basic rating of 9,600 bps, MNP Class 5 data compression comes into play. This protocol shrinks...
Table 2: Telecommunications Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Year released</th>
<th>Bits per second</th>
<th>Baud rate</th>
<th>Duplex</th>
<th>Where used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bell 202</td>
<td>1961</td>
<td>1,200</td>
<td>600</td>
<td>half</td>
<td>North America</td>
</tr>
<tr>
<td>Bell 201</td>
<td>1961</td>
<td>2,400</td>
<td>1,200</td>
<td>half</td>
<td>North America</td>
</tr>
<tr>
<td>Bell 103</td>
<td>1963</td>
<td>300</td>
<td>300</td>
<td>full</td>
<td>North America</td>
</tr>
<tr>
<td>V.21</td>
<td>1964</td>
<td>300</td>
<td>300</td>
<td>full</td>
<td>outside North America</td>
</tr>
<tr>
<td>V.23</td>
<td>1964</td>
<td>1,200</td>
<td>600</td>
<td>half</td>
<td>outside North America</td>
</tr>
<tr>
<td>Bell 212A</td>
<td>1976</td>
<td>1,200</td>
<td>600</td>
<td>full</td>
<td>North America</td>
</tr>
<tr>
<td>V.29'</td>
<td>1976</td>
<td>9,600</td>
<td>2,400</td>
<td>half</td>
<td>worldwide</td>
</tr>
<tr>
<td>V.22</td>
<td>1980</td>
<td>1,200</td>
<td>600</td>
<td>full</td>
<td>outside North America</td>
</tr>
<tr>
<td>V.22bis</td>
<td>1984</td>
<td>2,400</td>
<td>600</td>
<td>full</td>
<td>worldwide</td>
</tr>
<tr>
<td>V.26ter</td>
<td>1984</td>
<td>2,400</td>
<td>1,200</td>
<td>full</td>
<td>worldwide</td>
</tr>
<tr>
<td>V.32</td>
<td>1984</td>
<td>9,600</td>
<td>2,400</td>
<td>full</td>
<td>worldwide</td>
</tr>
</tbody>
</table>

*All half-duplex modems can simulate full-duplex operation by using four-wire leased phone lines instead of standard two-wire lines.

*Used for facsimile (fax) machines and fax modems.

For our throughput tests, we used the same three simulated phone lines as before. The type of data being sent greatly influences a modem's speed, so we transmitted both binary and text files. Binary files such as Mac applications are difficult to compress because they're designed to be as small as possible in the first place. Our binary test used a resource file that had already been squeezed to 109K by StuffIt. On the other hand, our text file — a 104K Word 4.0 file saved with the Text Only option — had plenty of fat for the compression algorithms to trim.

Although none of the modems could send text at the theoretical maximum of 19,200 bps, five units consistently surpassed 15,000 bps, and one — the U.S. Robotics Courier V.32 — scratched the underside of 16,000 bps on every test.

**Seeing Through the Hayes**

No modem report is complete without mention of at least one Hayes product. Hayes is the market leader in modems for personal computers and the creator of the Hayes Standard AT Command Set, which is used in nearly every modem made today (see "Modem Speak," November '89). When we began our testing, Hayes offered two 9,600-bps modems, but neither fit the criteria we established for this report. Its inexpensive 9,600-bps model didn't meet the V.32 standard, and the V.32-compliant modem cost more than the $1,500 limit we set for "affordable" modems. Long after our tests were completed, Hayes announced a true V.32 modem for $1,199, the V-series ULTRA Smartmodem 9600. Although we were unable to test this new offering, we did test the older, non-V.32 V-series Smartmodem 9600, but we didn't include its results with those of the true V.32 modems.

Hayes admits that the older V-series Smartmodem 9600 is not a full-duplex V.32 modem and that it uses a ping-pong protocol (which Hayes calls V.32HX) to "simulate full-duplex V.32 operation." Ping-pong is a half-duplex protocol; that is, the originating and answering modems take turns transmitting instead of sending and receiving simultaneously (full-duplex) as required by the V.32 standard. Ping-pong's chief benefit — to Hayes, not to modem users — is that it eliminates the need for expensive echo-cancellation circuitry.

The ping-pong method works fine for file transfers on clean lines because a file is sent in only one direction. However, error detection and data retransmission are far faster in full-duplex communications. In our tests, the V-series Smartmodem 9600 held its own against the slowest V.32 modems on local and cross-country lines. But when it tried to deal with the echoes in our simulated satellite line, its text-file throughput sank to half the average speed of the others.

The V-Series Smartmodem 9600 follows some of the specifications of the V.32 standards, such as quadrature amplitude modulation and the ability to match speeds with slower modems, but this isn't enough to make it compatible with the other modems we tested. If you require compatibility, consider the new V.32-compatible Hayes V-series ULTRA Smartmodem 9600 or one of the V.32 modems we tested. Contact Hayes Microcomputer Products at 705 Westech Drive, Norcross, GA 30092; (404) 441-1617.

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transfer (see Figure 2). When it came to binary files, however, only four modems were capable of speeds greater than 9,600 bps.

The Telebit T2500 was the champ at binary-file transfers and consistently transmitted both text and binary files at about the same rate (around 11,500 bps). The Telebit modem uses a data-compression protocol known as Lempel-Ziv, which is clearly superior at compressing binary files. Unfortunately, the proprietary Lempel-Ziv scheme works only for file transfers to another Telebit T2500 modem. By the time you read this, the Telebit T2500 should also offer MNP Class 5 data compression. MNP Class 5 will handle compression below 9,600 bps, and Lempel-Ziv will take over at more rapid rates.

Lonely at the Top

Except for price, the 9,600-bps modems we tested share more similarities than differences. Each follows the V.32 standard, and all but one include trellis-code modulation for error reduction, MNP Class 4 for error detection, and MNP Class 5 for data compression. Even so, differences in performance do exist, so you should weigh the pros and cons of

---

**Figure 3: Same Highway, More Traffic**

*300 bps*

The cars are spaced far apart, and just 300 cars — each containing only a driver — are going by every second. This leisurely situation represents both 300 baud and 300 bits per second (bps).

*1,200 bps*

The amount of traffic has doubled to 600 cars per second (600 baud), and each car contains a second person.

*2,400 bps*

At 2,400 bps, the number of cars per second remains the same (600 baud), but there are four people in each car.

*9,600 bps*

There's no more room in the cars, and the highway is jammed with bumper-to-bumper traffic. With four people in each car, and cars streaming by at 2,400 per second, we have reached 9,600 bps.

Modem designers have recently learned to pack more and more data onto the same “highway” — the dial-up telephone system. To understand how the traffic has increased, imagine a two-lane highway with cars going in either direction. Each car represents a change in the signal sent by the originating modem. Expressed as changes per second, this measurement is called the baud rate of the modem. Each person riding in each car represents a bit of information being sent to the receiving modem. The speed of electrical impulses never varies, so our “baudmobiles” must always travel at the same speed down this data highway. The two-way traffic represents full-duplex operation across a phone line.
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And to make it even easier to begin telecomputing, the SupraModem 2400 comes with introductory packages for several popular on-line services.

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The SupraModem 2400MC combines the standard SupraModem 2400 package with popular telecommunications software and a Peripheral-8 to RS-232 cable for connecting the modem to your Mac. $249.95.

Compatible

The SupraModem 2400 is 100% compatible with industry-standard, intelligent "AT" commands and all commonly used protocols (including Bell 103/212A, CCITT v.22, and CCITT v.22bis). Since the SupraModem operates asynchronously at 300, 600, 1200, and 2400 baud, you can communicate at whatever rate you need to. All these features let you use the SupraModem 2400 to connect with most modems being used today.

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In addition to its low price, the SupraModem 2400 will save you money by letting you communicate at 2400 baud, thus decreasing your on-line time. The SupraModem 2400 incorporates the advanced Intel 89024MS chip set. This design utilizes fewer parts, assuring operation long after the one-year warranty period.

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And to give you more artistic license, we'll even throw in a free copy of Canvas 2.0 DA', a draw and paint accessory. Just buy the Microsoft Excel package before January 31, 1990. Now, we've left a lot out in this short discourse, but Microsoft Excel hasn't. So be sure to ask your dealer for a complete explanation of its capabilities. And you'll see how Microsoft Excel will make your job easier and better.
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MEMO:

TO: Shannon Pitts
FR: Peter Cohen
DT: November 13th, 1989
RE: Presentation to the Board

In preparation for the annual meeting, I've created a 20-minute slide presentation on our successful entry into the small printer market.
The presentation will explain to the shareholders that, on a basis of sound marketing strategy, reinforced with our knowledge of the printer business at other levels, we have been able to grow from a 2 percent share of market, to 9 percent in 18 short months.

To the right is an excerpt of the presentation which illustrates our growth. Anticipated concerns will probably center around quality of service and the ability to meet market demand over the next year.
We should be able to squelch any fears by explaining that our small printers have a very low (4%) field repair call requirement at present.
And our assembly resources here in the
each modem carefully and match them to your needs.

Consider how you will use your new superspeed modem. Will you be sending files down the street or bouncing them off a satellite? Do you plan to download highly compressed text files, or will you be tossing bulky applications and graphics files back and forth? Do you care what’s included for the price you pay, or do you already have all the cables and software that you need? Find the modem with strengths that match your needs, and you’re certain to be happy with your choice.

And remember, as with any other maturing technology, 9,600-bps modems will inevitably get less expensive as they become more common. In a year or two, they may be as inexpensive as 2,400-bps modems are today—and there will be far more modems for you to communicate with at super speeds. So is it really worth all that extra cash to be the first with the fastest? Sure it is... .

GordonMcComb writes frequently about computers and high technology and recently became a father for the second time. As a brand-new associate editor at MacUser, Rik Myselevski is concerned that hundreds of thousands of people will now mispronounce his name.

The Bottom Line

One man’s “affordable” modem is another man’s luxury. Before you shell out $300 to $1,500 for a superspeed modem, be sure that an inexpensive 2,400-bps model won’t meet your needs, and remember that you can talk at super speed only to other 9,600-bps modems. But if you want lightning-fast file transfer or remote-control communications, by all means pay the premium. Nothing beats a 9,600-bps modem for saving that most precious commodity—time.

Three modems scored high enough to be considered “best buys,” but we gave the nod to the CONNECT V.32 Service ($999). It has blazing speed, a good bit-error rate on the three line types we tested, and a generous two-year warranty. Its price includes a $149 subscription—with software—to CONNECT, the only major online service that offers 9,600-bps access (and the first hour is free). In addition, the V.32 Service doesn’t require you to modify the modem cable to support the hardware handshake needed for superspeed communications; it can make the necessary changes internally.

Close behind—very close—is the Racal-Vadic 9632VP ($995). There’s a reason for this neck-and-neck performance:

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Communications channels that range from 56 Kbps to 45 Mbps (megabits, or millions of bits, per second). Private fiber-optic transmission circuits are available that reach speeds as high as 600 Mbps. But even the relatively straightforward 1.54-Mbps communications service known as T1 requires interface equipment costing at least $5,000 at each end, and your monthly payments to the phone company can easily reach thousands of dollars.

If you can hang on until ISDN becomes available, an ISDN connection device called a BRI (basic rate interface) will provide you with two separate channels of 64-Kbps communications for a monthly charge of less than $50. Unlike some other superspeed solutions, BRI will keep you connected with the rest of the low-speed world. Your telephone company will also offer a higher-priced service called ISDN primary rate, which will have 24 communications channels totaling 1.54 Mbps—sufficient for voice, data, and compressed-video teleconferencing.

If you’re willing to convert to costly fiber-optic connections, broadband ISDN will let you reach 2.4 Gbps (gigabits, or billions of bits, per second). This speed’s phenomenally wide bandwidth will be capable of simultaneously carrying the equivalent of more than 20,000 TV channels. But don’t rush to sign up—broadband ISDN won’t become widely available until the next millennium.

—Reese Jones
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The right cable keeps your Mac and modem on speaking terms. The MacUser Labs staff shows you what to do if your modem cable can't keep up with the new breed of high-speed modems.

If you go to your local computer store and ask for a Mac modem cable, there's a very good chance that you'll get one that isn't wired right for hardware handshaking, which controls the data flow between your Mac and a modem. With the new generation of low-cost, high-speed modems and the widespread implementation of data-compression schemes, handshaking (or flow-control) hardware techniques have become a big issue. (See the glossary for an introduction to the language of handshaking.)

The problem is that the Apple modem cable has only enough pins to implement hardware handshaking in one direction. The cable is still usable, but it can't exploit the full impact of your high-speed modem.

Fortunately, there's more than one way to solve this problem. Although you can spend another $40 or so to get a properly configured cable, there are also several alternatives — from adapting the cable you already have to making a jumper cable. MacUser Labs has come up with the following three (and a half) suggestions.

1. Make your own jumper cable.
This is easier than it sounds: It'll cost less than $10 and take only about half an hour of your time.

You need about 6 inches of five-conductor shielded cable, preferably unpaired 22- or 24-gauge five- or six-conductor cable, such as Belden-type 9535 or 9536. (If you have a piece of six-conductor paired cable lying around, however, it will probably work just fine.) You'll also need a 25-pin D-connector plug and socket. You can buy these through your local electrical-supply store or mail-order from a firm such as DIA.

Hook up pin 1 on both ends to the shield. Pin 1 is normally the chassis ground. Then run pin 2 to pin 2, pin 3 to pin 3, pin 5 to pin 5, and pin 7 to pin 7.

On the plug (the one that goes into the modem), connect pin 6 to pin 20 so the modem will think that

By Andrew Eisner
and the MacUser Labs staff

Figure 1: Jumper Cable

To make a jumper cable, connect pin 1 on both ends to the shield. Run pin 2 to pin 2, pin 3 to pin 3, pin 5 to pin 5, and pin 7 to pin 7. On the plug that goes into the modem, connect pin 6 to pin 20. Connect pin 20 on the socket (the end that gets the Macintosh modem cable) to pin 4 on the plug.
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Glossary

Breakout box
A device that is placed in the serial data line so that all data lines can be monitored or rerouted. Usually LEDs in the box indicate the logic state of the serial data line, DIP switches open or close lines, and jumper cable interconnect lines.

Data compression/decompression
Modems compress the data they send and decompress the data they receive in order to get more than 9,600 bps out of the Mac and the modem. To achieve this higher throughput, the modem has to get the data from the computer at a rate faster than 9,600 bps (the next-highest rate of 19.2 Kbps is commonly used, as it is an integer multiple of 9.600).

Hardware handshaking
Hardware handshaking controls the data flow between Mac and modem. When the modem slows down because of noise and retransmissions or if the receiving Mac can't process the data fast enough, both the Mac and the modem must have some way of telling each other to stop sending it. This is referred to as flow control or handshaking.

CTS
Most modems toggle the CTS (clear to send) line to tell the Mac when to start and stop.

RTS
Modems monitor the RTS (request to send) line to see if the Mac wants data or not.

DTR
DTR (data terminal ready) is always on. To swap DTR and RTS (request to send), connect pin 20 on the socket (the end that gets the Mac modem cable) to pin 4 on the plug (see Figure 1).

2. Buy a cable.
Prometheus sells a properly configured cable (the same one that comes bundled with its V.32 modem) for $39. Hayes also sells one through its customer-service department for $32.95.

Other companies, such as Farallon and Computer Friends, are aware of the cable problem and now supply a hardware-flow control cable with their modems. Farallon's cable ($49.95) not only supports hardware-flow control but also includes a connector...
for the ADB (Apple Desktop Bus) port, where the carrier detect from the modem toggles the power-up line and turns your Macintosh on.


These cost about $30 and can be purchased from Global Computer Supplies or other mail-order companies.

Connect the breakout box so that the Macintosh is connected to the DTE (data-terminal equipment) side and the DCE (data-communication equipment) side goes to the modem. Place the DIP (dual in-line package) switches for pins 4, 6, and 20 in the open position, and use one of the jumpers to connect pin 6 to pin 20 on the DCE side. Connect pin 20 from the DTE side to pin 4 on the DCE side.

And what's method 3½?

Well, you can adapt the cable you already have. The problem is that while you're adding hardware flow control, you're sacrificing DTR, which the modem normally uses to tell if the computer is on or not. If DTR goes to an "off" logic state in some cases, the modem will hang up. This is a convenient feature that saves you the trouble of having to tell the modem to disconnect the phone line.

The Apple modem cable specifies that pin 2 on the Mac goes to pin 5 on the 25-pin RS-232 connector, which allows handshaking in one direction. The other control line on pin 1 of the Mac connector goes to pin 20 on the 25-pin connector, which is DTR. Since most modems want to use RTS (pin 4 of the 25-pin connector), it makes sense to move the line from pin 20 to pin 4. This works as long as you tell the modem to ignore DTR or set the control voltage high (see Figure 2).

Andrew Eisner is MacUser Labs' director and resident modem-cable expert. He has been working with computers longer than he cares to admit.

**Figure 2: Adapting the Apple Modem Cable**

- Leave pin 2 on the Macintosh connected to pin 5 on the 25-pin D connector.
- Connect pin 1 on the Macintosh DIN 8 connector to pin 4 on the 25-pin connector.
- You will need to tell the modem to ignore DTR or set the control voltage high.
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For example, to hide the cell grid with Excel macros would require:

```excel
=DISPLAY (false, false, true, true, 0)
```

To perform the same action in HyperScript:

```hyperscript
HIDE CELL GRID
```

It's that simple.

**WINGZ HAS HAPPY USERS.**

According to International Data Corporation (July, 1989), Wingz ranked number one in user satisfaction among Macintosh spreadsheet users.

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The same survey found Wingz an eye-popping two-to-one favorite when people were asked which spreadsheet they intend to buy in the next six months.

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Buttons can make your spreadsheet as easy and natural to use as the radio or the dishwasher. They're easier and faster than menus or typing in commands. (You can also put other Macintosh controls, including radio buttons, check boxes and slide bars, directly onto the worksheet.) Just as important, buttons unleash the power of HyperScript. So you can attach lists of frequently used commands to buttons, and then execute them with the click of a mouse.

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Just call toll-free 1-800-331-1763, ext. 1000, to find the Wingz dealer nearest you. In Canada call 416-566-7024.
Wingz gets much of its power from its versatile scripting language. Here we build a sample script from the ground up — gaining the ability to operate on every selected cell in a spreadsheet.

By James Finn

{ Template for script that handles arbitrary selections }
{ Written by James Finn, 8/8/89 }

DEFINE RANGENUM { number of ranges in selection }
DEFINE THERANGE { current range }
DEFINE FIRSTROW, FIRSTCOL { first row, column in current range }
DEFINE R, C { current row number, column number }

REPAINT OFF { for speed - don't redraw screen until the end }

FOR RANGENUM = 1 TO NRSELECTIONS() { for each selected object }
    IF SELECTIONTYPE(RANGENUM) = 1 { must be cell or range }
        THERANGE = SELECTION(RANGENUM)
        FIRSTROW = ROWOF(THERANGE)
        FIRSTCOL = COLOF(THERANGE)
        FOR R = FIRSTROW TO (FIRSTROW + ROWS(THERANGE) - 1)
            FOR C = FIRSTCOL TO (FIRSTCOL + COLS(THERANGE) - 1)
                { do what you want to do with cell R,C }
            END FOR
        END FOR
    ELSE { give error message, saying which selection was bad }
        MESSAGE "Selection " & RANGENUM & " is not a cell or range"
    END IF
END FOR

REPAINT ON { redraw the screen }
REPAINT WINDOW

Selectivity Is Everything

In Wingz and other spreadsheets, you can select multiple ranges by selecting one range and then pressing the Command key as you select each additional range. Most Wingz commands apply to all selected cells, even when multiple ranges are selected, so you can easily change the format, font, or style of all the cells in a complex selection. Our goal is to develop a format for custom scripts that work the same way.

We’ll develop a “template” script (see Figure 1) that shows how to work with selections and then use that template to write a working script (see Figure 2) that makes it easier to enter...
time values into a Wingz spreadsheet.

Operating on Selections

Remember, a selection may contain multiple ranges, each of which is a rectangular block of cells. To access each cell in turn, you have to use the control structures available in HyperScript — in this case, that means using FOR loops. HyperScript’s FOR loop is similar to those in other programming languages and is used to repeat an action a specific number of times. The loop uses a counting variable, called the control variable, that increases from an initial value to some final value. For example, the statement

\[
\text{FOR } I = 1 \text{ to } 10 \\
\text{whatever}
\]

repeats the command whatever ten times, using \(I\) as the control variable.

FOR loops can be nested, and our template uses three nested loops. The outer loop steps through each range in the selection, counting from 1 to the number of ranges that have been selected. The next loop steps through each row in a range, from the first to the last. The innermost loop steps through each column in a row, letting us process one cell at a time. The basic structure looks roughly like this:

\[
\text{FOR each range in the selection} \\
\text{FOR each row } R \text{ in the range} \\
\text{FOR each column } C \text{ in the row} \\
\text{Do whatever with the cell in the row } R, \text{ column } C
\]

Filling in some of the details gives:

\[
\text{FOR RANGENUM} = 1 \text{ TO NRSELECTIONS()} \\
\text{THERANGE} = \text{SELECTION(RANGENUM)} \\
\text{FIRSTROW} = \text{ROWOF}(THERANGE) \\
\text{FIRSTCOL} = \text{COLOF}(THERANGE) \\
\text{FOR } R = \text{FIRSTROW TO (FIRSTROW + ROWS(THERANGE) - 1)} \\
\text{FOR } C = \text{FIRSTCOL TO (FIRSTCOL + COLS(THERANGE) - 1)} \\
\text{THECELL} = \text{MAKECELL}(C, R) \\
\{ \text{do whatever you want to do with cell } R,C \} \\
\text{END FOR}
\]

Here’s some explanation: NRSELECTIONS() returns the number of ranges in the selection. RANGENUM is a control variable for the FOR loop.
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POWER TOOLS

loop and steps through each of these ranges in turn. The next three lines set other variables to useful values.

Most HyperScript functions that work with ranges require a range reference as an argument. A range reference is the standard way to identify a range and looks something like B7..G12.

SELECTION (RANGENUM) takes the range number RANGENUM and returns a range reference for that part of the selection (this feature of the SELECTION function is not documented in the Wingz manuals.) We assign this reference to the variable THERANGE.

The expressions ROWOF (THERANGE) and COLOF (THERANGE) return the number of the first row and first column, respectively, in the range. These values are assigned to the variables FIRSTROW and FIRSTCOL — they are needed for starting values of FOR loops.

We also need the final values for the FOR loops, which will be the numbers of the last row and column in the range, but HyperScript has no functions that provide these numbers directly. What it does have are the functions RONS and COLS, which tell us how many rows and columns are in a range. Given these values, it's easy to calculate the last row and column numbers: If THERANGE starts in row FIRSTROW and contains RONS (THERANGE) rows, then (FIRSTROW + RONS (THERANGE) - 1) gives the number of the last row. Calculating the last column is similar. 

Figure 1 shows the finished template. It adds some features to what we've done.

First, Wingz requires that all variables be declared, so the template begins with DEFINE statements.

Your scripts run faster if you don't refresh the screen until after all the cells have been processed. This is accomplished by the REPAINT OFF statement at the beginning of the script and the pair of statements REPAINT ON and REPAINT WINDOW at the end.

Last, we've added a bit of defensive programming to the template, anticipating possible user errors. We've been assuming that the selection contains only ranges, but a user might accidentally include a chart or some other object in the selection. The function SELECTIONTYPE returns the type of any part of the selection — a return value of 1 means it's a cell
or range. \texttt{SELECTIONTYPE(RANGENUM)} is used within an \texttt{IF} statement to check each part of the selection before it's processed— if it's not a range, we display an error message in a dialog box, using the \texttt{MESSAGE} function. The \& symbol represents text concatenation and is used to create a message such as "Selection 3 is not a cell or range".

Now we're ready to use this model script to solve a real problem: working with time values in Wingz.

**Time-Value Problem**

Typing time values in Wingz can be a chore. If you enter "10:30am" in a cell, Wingz doesn't understand that this is supposed to represent a time, and it formats your entry as plain text. The Wingz manuals tell you to enter times by using the \texttt{TIME} function—in this example, you'd have to type "=TIME(10,30,00)", where the three arguments are the hours (based on, ugh, a 24-hour clock), minutes, and seconds of the desired time. This is no fun. Life would be simpler if you could type "10:30am" and then run a script to convert the text to a time value.

In "5 Ways to Extend Your Wingz" (Power Tools, December '89), we gave a short script that does this—it converts the text in the current cell to a time value and then formats the cell to use the \texttt{HR:MN AM} format. Here's the script:

\begin{verbatim}
PUT TIMEVALUE(CELL())
INTO RANGE (MAKECELL(COL(),
ROW()))

FORMAT TIME 2
\end{verbatim}

This script, however, operates only on the active cell. It would be easier to enter several time strings into a worksheet, select the cells containing them, and convert the whole selection with a single command. We will modify the template of Figure 1 to create this script.

**The Working Script**

Figure 2 shows the script for fixing times. Let's look at all the changes we've made to the template. We've added one more variable, \texttt{THECELL}, to store a reference to the cell being changed. This reference is created by the statement

\begin{verbatim}
THECELL = RANGE (MAKECELL(C, R))
\end{verbatim}

This is similar to the way we made a cell reference in the previous script, except that here we use the control variables \texttt{C} and \texttt{R} to reference the column and row numbers that change with each iteration of the inner \texttt{FOR} loops. \texttt{TIMEVALUE} needs the contents of the cell, which we can get by using the \texttt{CELLTEXT} function. \texttt{CELLTEXT(THECELL)} returns the text contents of the referenced cell, and \texttt{TIMEVALUE(CELLTEXT(THECELL))} gives the converted time value.

We've added another bit of defensive programming. Before converting a cell's contents to a time value, we first check that the cell contains a string that can represent a legal time. If a cell contains a formula or a string, using the \texttt{TIMEVALUE} function will cause an error. HyperScript provides several mechanisms for dealing with errors. Here, we use the \texttt{ISERR} function:

\begin{verbatim}
IF ISERR (TIMEVALUE(CELLTEXT(THECELL)))
\end{verbatim}

causes an error, then

\begin{verbatim}
ISERR (TIMEVALUE(CELLTEXT(THECELL)))
\end{verbatim}

returns TRUE, otherwise it returns FALSE. These statements check that \texttt{ISERR} returns FALSE—meaning all is well—before attempting to convert the text string to a time value:

\begin{verbatim}
{ only convert good times }
IF NOT
\end{verbatim}

\begin{verbatim}
ISERR (TIMEVALUE(CELLTEXT(THECELL)))
\end{verbatim}

\begin{verbatim}
PUT TIMEVALUE (CELLTEXT (THECELL)) INTO THECELL
\end{verbatim}

Finally, the statement \texttt{FORMAT TIME 2} has been placed outside all the \texttt{FOR} loops. \texttt{FORMAT TIME} applies to all selected cells, so it needs to be executed only once for the whole selection.

**Putting It All Together**

Before you can use the new script, you must enter it in Wingz: Select New Script from the Script menu, type in the script, and save it. You can then run it by selecting Run Script from the Script menu.

If you prefer, you can access this script by adding a new command to Wingz's Format menu, which is easiest if you use a startup script—if you create a script named Startup in the same folder as Wingz, it will run automatically each time you launch Wingz.

Suppose you saved the script of Figure 2 in the same folder with Wingz, using the filename Fixtimes Script. Add the following lines to your Startup script (or create one if you don't have one already):

\begin{verbatim}
SELECT MENU "Format"
ADD MENUITEM "Fix Times"
COMMAND "RUN SCRIPT "Fixtimes Script"
\end{verbatim}

Happy scripting. You can use any of the techniques presented here in scripts that solve your own problems.
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Integrating the System

There is a system behind the System.
The operating system of the Macintosh is more than the file called System, more than the folder of the same name, and even more than the entire set of files in that folder and all the programs coded into ROM. It's all these things plus their ability to work together.

More than any single Startup document (INIT), Control Panel document (cdev), or System file, the integrated functioning of these tools defines the System. In fact, this integration is a tool by itself, and it's the tool most people, even those who use the individual tools well, don't use efficiently. The next release of the System software will be more integrated, but the real value comes in the integrated use of System tools by users. This requires learning to think about the System in new ways.

One good tool for developing an integrated approach to System tools is a macro utility. Macro utilities let you record sequences of keystrokes, mouse moves, and other actions to be played back later with a single keystroke that you assign. Last October, I suggested some ways in which you might want to use Apple's macro utility, MacroMaker. This month I'll suggest when not to use it, and take a look at how you can use some alternative third-party macro utilities to make your System more of a system.

Macro Misbehavior
MacroMaker is fine if it does what you want. It is easier to learn and is as easy to use as any of the alternatives, it performs its job as well as you could ask (as long as you don't run into incompatibilities), and it's free. It has some serious incompatibilities and limitations, however. It conflicts with many other products (Microsoft Works, for example). If you see signs of conflict (a new Startup document doesn't take effect, for instance), your first diagnostic step should be to take MacroMaker out of your System Folder and restart your Mac. Incompatibility with software that you need more than you need MacroMaker is the first reason to abandon the latter.

The second reason is to go beyond MacroMaker's limitations. MacroMaker is restricted to recording keystrokes and the screen coordinates of mouse clicks. QuicKeys from CE Software lets you specify applications to open and define mouse clicks relative to the current document's window rather than just the screen coordinates. AutoMac III from Genesis Micro Software lets you edit macros with a textual language. Tempo II from Affinity Microsystems lets you create dialog boxes that present you with a choice when the macro is playing back. The macro will branch to one or another sequence of actions based on your choice. These capabilities make all these third-party macro utilities more powerful than MacroMaker.

If you conclude that MacroMaker is underpowered, you're right. But this doesn't necessarily mean you should avoid it. As I said in October, a good use for MacroMaker is for producing personal and ad hoc macros, which cost little to build. If you follow the strategy I outlined (don't correct trivial errors; don't edit; record once; and if it works, use it), you can use MacroMaker to construct time-saving tools with a minimal time investment. If you have to discard those tools later, it will be a small loss, and the ad hoc macros will have served their purpose.

But you may decide to invest the time in building more complex or more timeless macros, developing integrated sets of macros that become a permanent part of the way your System operates. Using macros to build integrated structures that build on other System tools is the third reason to switch to a more reliable tool. Before you can use macros effectively in this way, though, you must learn to...
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take an integrated approach to the System.

**The Clipboard Mind-Set**

Making the System work as a system usually means shuttling data from place to place — the price of integration always involves some busying. The first step toward an integrated approach to System tools is to focus on the data to be moved rather than on the tool to be used. If you think of the Calculator DA and the Alarm Clock DA as a calculator and a clock, you'll tend to use them as a calculator and a clock, typing numbers into the one and reading the displays of both. But the Calculator is really a filter through which numeric data can be passed and altered in the passing. And the Alarm Clock is really a source of particular data: the current date and time. Thinking of them in this way will make it more natural to say, integrate a calculation into a business letter or place a time-and-date stamp on a work of computer art.

This is just a matter of using the Clipboard. These operations date back to at least 1984 and can be performed on any Mac, but the mind-set they presuppose is not widely held. Practically everyone knows you can store pictures in the Scrapbook and notes in the Note Pad File. Most people may know that you can paste numbers into the Calculator DA, perform a calculation, and copy the result back to the initial location of the original number. They may also know that you can copy the time and date from the Alarm Clock DA. Many people may realize that the user name in the Chooser dialog box and the file or folder information in the Get Info box are equally available for cutting and pasting. But few people fully exploit this simple cut-and-paste level of integration, because they are not in the habit of thinking in terms of moving data.

Here's a simple test of that mind-set. In the preceding paragraph, I refer to the "Note Pad File." I'd originally written Note Pad, but I wanted to get the name of the file right and MultiFinder was not active, so I couldn't just look at its icon. I highlighted the text Note Pad in my manuscript, copied it to the Clipboard, invoked the Find File DA, pasted the text, pressed Return to execute the find, and noted that the correct name of the file was Note Pad File. I'm not suggesting that this was a brilliant insight; in fact, I did it essentially without thinking. That's my point. The cut-and-paste action was more natural for me than retyping the text into the Find File window, but only because I have trained myself to think about the data I want to move before I invoke the tool.

Here's the test: Would you think of using this technique for checking the filename (or some other Clipboard-mediated technique), and if so, would you find it more efficient to paste the text than to retype it? Unless this kind of technique crosses your mind, and unless it seems perfectly natural to you, you haven't acquired the mind-set.

**Systematic Macros**

Why would you want to acquire this mind-set? First, because it will save you time. Second, because it will result in your doing things

---

**System-Minimizing Hints**

Last month, I asked readers to send in their attempts to create a minimum System. There's no single solution to this puzzle, so I'm relishing for more reader responses before giving a definitive answer — but here's one hint: If you have a Mac II or SE, the standard System fonts (Chicago 12, Geneva 9 and 12, and Monaco 9) are duplicated in the System file and in ROM, so you can safely delete all the System fonts from your System file. You can do this with ResEdit, but be sure always to work on a copy of the System file.

Several readers sent in the same tip for organizing the System Folder (or any folder). The basic tip is to alphabetize the icons in a folder; select all the icons (Command-A); choose View by Name; drag the icons to the desktop; and without deselecting them, drag them back and select View by Icon (or Small Icon). The icons will be arranged in alphabetical order.

The tip can be generalized: You can arrange icons by size or by kind or, if you have a color machine, by color. And you can record the sequence of steps as a macro so that you can clean up and arrange the icons in a folder with one keystroke.

**Figure A**

![System folder organization](Image)  

Here's a test to see if you've developed the System-beaters' macro mind-set: When you need to find some data, which do you think of first — the data or the tool for finding it?
Whether you write Ads, Articles, or Analysis, your face will match your Ideas.

A is for Any expression on your face. Type is made to express feeling. The more precisely you choose your type, the better you'll tell your story.

A is for Abstract, or Awesome, or Awful – Amazing the assortment of moods an A can say.

The typefaces from left to right: Goudy Old Style roman, Helvetica compressed, Brush Script, Park Avenue, ITC American Typewriter medium, Stencil, ITC Kabel bold, Helvetica condensed light oblique and ITC Tiffany demi.

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in ways that can usefully be automated via macros. A macro based on selecting text is more general than one based on typing specific characters. A macro that pastes your name and address at the insertion point in a document is the sort of simple macro for which MacroMaker is adequate. A macro that pastes whatever is on page 1 of the Note Pad File is a more general tool, and a set of eight macros that paste from each of the pages of the Note Pad File represents enough power to make it worth turning to a third-party macro utility.

The Note Pad File and Scrapbook File are convenient for storing text and graphics. You can keep your company logo in the Scrapbook File and your name and address in the Note Pad File and create macros for pasting them into documents. In cases in which you are prompted for a password, you can record a macro that lets you supply the password with one keystroke. (Because this defeats the purpose of the password, it may also be a foolish thing to do.) You can keep boilerplate elements of form letters in the Note Pad File (and visuals in the Scrapbook File) and paste them into word-processing documents independently of the particular word processor you’re using. You can do any of these things by recording a macro with any of the macro utilities.

Once you’ve created each macro, you need to assign a key combination to invoke it. This is also a lesson in integration. It’s important to choose key combinations carefully to avoid conflicts with those of other utilities and applications. At the Finder level, using both the Command and Option keys with another key generally keeps you out of trouble. But when you’re in a complex application such as Word, this type of combination is often already taken.

The Control key is generally a safe modifier. If you build a set of related macros, the keystrokes used to invoke them should be related. For example, you might use Control-1 through Control-8 for pastes from the eight Note Pad pages and Control-Shift 1 through 9 for up to nine Scrapbook pages.

The crowning touch would be to tie all these pastes to a single keystroke, with a dialog box that pops up to ask which page you want to paste. (Unfortunately, MacroMaker, QuickKeys, and AutoMac III can’t do this, although Tempo II, with its branching capability, can.) Go forth and integrate.

---

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**Power Tools Tip Sheet**

**Readers Share Their Tips and Tricks**

**Illustrator 88**

QuarkXPress lets you place and print patterned artwork created in Illustrator 88 if you save the Illustrator document as an EPSF file. On the Illustrator end, you'll face a bottleneck, though: Saving a single art file in EPSF can take several minutes. And if you're saving, revising, and resaving several files at a time, you'll be waiting for eons.

Part of the problem stems from Illustrator's tendency to create and show a Mac Preview image in its Print dialog box. You can stop this by unchecking the Preview and Print Patterns option in Illustrator's Preferences menu. Now when you save in EPSF, there's no waiting. The image will print out correctly through QuarkXPress but won't appear on-screen.

*Jeff White*
Chicago, IL

**PageMaker**

Switching from the Aldus printer driver to the Apple driver for background printing under MultiFinder is a hassle if you rely on the usual slow method of calling up the Aldus Print dialog box and selecting Change (see the resulting dialog box in Figure 1). This process is especially irksome if you have to switch back and forth several times during a session.

To bypass this snag:

1. Hold down the Option key while selecting Print from the File menu.
2. Click on OK in the two resulting dialog boxes (this takes two seconds).
3. Now you'll be at the familiar LaserWriter dialog box, where you can specify the number of copies and pages to print.

You've automatically switched drivers (see Figure 2).

*M. Bernadette Goering*
Minneapolis, MN

**SuperPaint**

To accurately eyeball the proportional resizing of rectangular objects in drawing programs such as MacDraw, SuperPaint, or Canvas:

1. Draw a diagonal line from one corner of the object to the other, and extend it, keeping it lined up against the two handles.
2. Grab a corner handle at the end of the diagonal line and resize the object while starting with the second document page as page 1.

But if you put the title page at the end of the document and turn off the Display Master Items option on the Page menu for that page, you can use automatic page numbering for the document and still have a title page without a folio (see Figure 3).

*Sue Hotovec*
Johnston, IA

---

**Compiled by Gregory Wasson**

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Figure 3: To get an unnumbered title page for a PageMaker document, put it at the end of the document and turn off the Display Master Items option on the Page menu for that page.
keeping the handle on that line.

3. Delete the line.
As long as the handle is on the diagonal line, the object is in proportion.

William Glass
Keene Valley, NY

Canvas 2.0

Although Canvas’ multiple layers and overlay modes let you superimpose bit-mapped objects over other graphics, the rectangular frame around each bit map whites out everything below it, ruining the desired effect. If you try to make the bit-mapped object transparent by using the Not Or option in the Ink Manager, the background will show through the white border but it’ll also show through any white inside your object (see Figure 4).

You’ll have better luck if you do the following:

1. Duplicate the bit-mapped object, and use the paint bucket to fill in the frame area of the duplicate with black. Be sure the outline of the picture is a continuous line so the paint won’t overflow into the image itself. If the background is solid black (no patterns), you can skip the next three steps.

2. Use the Ink Manager controls near the bottom of the tool palette to change the object with the filled frame from Copy to the Not BIC overlay mode. The object will be invisible unless it is in front of another graphic, so don’t lose track of its position.

3. Select the original bit map with the unfilled frame and change its overlay mode to Or with the Ink Manager.

4. Select Bring To Front from the Object menu to bring the object to the front of the display.

5. Select both objects, place them exactly together with the Align command from the Object menu, and group them before clicking the mouse anywhere else.

When laid over another object, the frame is transparent but nothing shows through the interior of the picture (check Figure 4 again). Note that PostScript doesn’t work with many QuickDraw overlay modes, so test printouts are mandatory with PostScript.

Portability drives

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5-1/4" Drives

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**Canvas 2.0**

Figure 4: Overlaying bit maps on objects in Canvas ordinarily whites out any background underneath the frame (above). You can make the object transparent, but then the background shows through everywhere (top right). Using Canvas' Ink Manager along with some Option menu commands, you can overlay bit maps on objects and avoid disaster, getting a result that looks like the figure on the right.

---

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Tip of the Month

Canvas has a great un-documented search-and-replace feature.

1. Hold down the Option key while choosing Select All from the Edit menu.
2. Make a selection from the Pen Pattern, Fill Pattern, Foreground Color, Background Color, Pen Shape, Line, or Transfer Modes pop-up menu. Canvas will then select all the objects that have that attribute.
3. You can now choose any attributes (such as fill patterns) that you want, to globally replace the selected attribute.

Alison Moore-Smith and Samuel M. Smith
Provo, UT

using either Illustrator 88 or FreeHand.
2. Print cyan, magenta, yellow, and black (CMYK) separations of the image, using the color-separation utility of either program. You will end up with four black images printed on your LaserWriter — three will have the color information for each of the process colors (cyan, magenta, and yellow), and one will have the black information.
3. Set the color copier to cyan only, print the cyan separation, and put the printed cyan image back into the paper tray. Be sure you have the correct side up and that it is oriented in the proper direction.
4. Set the copier to magenta only and print the magenta separation onto the cyan image.
5. Continue in the same manner with the yellow and black separations, each time carefully placing the printed image back into the paper tray until you have a full-color image.

Depending on which color copier you have, the image can be quite good. The most difficult part of printing color images in this manner is maintaining consistent registration of all four separations.

Thomas Hyatt
Baltimore, MD

Since the LaserWriter II's resolution is only 300 dpi, you can see a jaggedness at the edges of the type and graphics, especially on diagonal or curved edges.

If you set the LaserWriter's darkness control to the lightest setting and ask your printer (or copy shop) to shoot "on the light side," much of the jagged appearance washes away and the print looks crisper — but remember that this is a compromise. If you set the printer too light, the type can change from bold to medium or medium to light. With a little care, however, you can get output that appears to be from a higher-quality printer than the one you've actually used.

Darryl Lewis
Lauderhill, FL

If envelopes tend to jam when you feed them manually into a LaserWriter, give them a slight downward curve by drawing them lengthwise across the edge of a table or desk first.

Another trick is to run your fingernail along the upper edge of the envelope to make it smoother.

Ralph Jerome
San Diego, CA

Sang Chaul Shin: Software Engineer, Seoul, Korea
Business: Elex Computer, Inc.
Word Processor: Nisus™

I like the Nisus word processor very much. Many others must like it too, because Nisus will be supplied with every new Macintosh sold in Korea.

Nisus is replacing the word processors Koreans use now because it is so powerful. Desktop publishers and business people really like it. There are many menus so you can be complicated or easy.

The macros and Easy Grep are especially good because Koreans like to have as many functions as possible. Another thing Koreans like is the graphic support. With MS Word, there was no support. Nisus puts graphics right in the text.

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Sang Chaul Shin: Software Engineer, Seoul, Korea
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I like the Nisus word processor very much. Many others must like it too, because Nisus will be supplied with every new Macintosh sold in Korea.

Nisus is replacing the word processors Koreans use now because it is so powerful. Desktop publishers and business people really like it. There are many menus so you can be complicated or easy.

The macros and Easy Grep are especially good because Koreans like to have as many functions as possible. Another thing Koreans like is the graphic support. With MS Word, there was no support. Nisus puts graphics right in the text.

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Help Folder

Answers to Readers’ Questions

Putting Fonts onto a LaserWriter Plus

Q. We have a LaserWriter Plus and recently bought several fonts. At the same time, we found ourselves with a spare external 20-megabyte hard disk. Is it possible to use the hard disk to store the fonts and connect it to our printer?

Johnny Ordoveza
Daly City, CA

A. The only LaserWriter you can connect to a hard disk for font storage is the IINTX, because it’s the only one with a built-in SCSI port for that purpose. With a LaserWriter Plus (or its current equivalent in Apple’s product line, the LaserWriter II/NT), your only option besides waiting for fonts to download automatically each time you print is to manually download fonts to your printer’s RAM and then leave the printer turned on.

Not Enough Finder Memory

Q. I have a Macintosh SE/30 using System 6.0.3. When MultiFinder is running, I have trouble opening disks that contain more than about 100 files and folders. I get the error message “There isn’t enough Finder memory to work with the disk.” I have no problem opening the same 1.44-megabyte disks with MultiFinder turned off. Is there a way around this, short of reducing the number of files on my disks?

Steve Welons
Charleston, WV

A. The Finder comes set with a MultiFinder partition size of 160K, which is sufficient for most Finder operations. If, on the other hand, you do a lot of copying or have disks with a large number of files on them, the Finder may run out of memory.

The way around this is to increase the Finder’s MultiFinder partition size. To do this, locate the Finder in your System Folder. Do a Get Info...
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Upgrading a 512KE

Q. What are the options for upgrading my Macintosh 512KE? It seems that most software is now written for machines with more memory, and I'm left out in the cold.

Christopher Bender
Mt. Pleasant, SC

A. You have several options, depending on what programs you want to run. You can swap your 512KE with 4 megabytes of RAM, which is enough to run memory-hungry programs such as 4th Dimension, FullWrite Professional, Excel 2.2, and many graphics packages. If you don't use software that requires a lot of memory, you can comfortably run MultiFinder or HyperCard with 2 megabytes.

Your Apple dealer can install a 1-to-4-megabyte logic board and SCSI port for about $600 (this upgrades you to a Mac Plus).

Among the third-party vendors offering upgrades is Dove Computer (1200 N. 23rd St., Wilmington, NC 28405; [919] 763-7918), which sells MacSnap upgrades (with or without SCSI), which can take you to 1 or 2 megabytes of memory. An alternative is Brainstorm from MacDoctor Electronics (1145 Terra Bella Ave., Mountain View, CA 94043; [415] 964-2131), which can install yourself and which allows you to upgrade to 1, 2, or 4 megabytes.

Whichever route you take, consider whether you are going to want to upgrade your upgrade. Some upgrades allow you to increase memory as well as eventually add on such things as accelerator boards or video-interface cards.

Disk Life Expectancy

Q. I read an interesting (and alarming) statement that the shelf life of a disk is two to three years at most. What is the source of this statement, and what is the best way to protect archival disks?

Paul Leinbach
Winter Park, FL

A. The statement's probable source is personal experience: Most of what is written about this subject is confined to exhortations to back up your disks at least once a day. The bottom line is that magnetic media deteriorate over time. The length of time depends on several environmental factors.

You can make your disks' home life as healthy as possible by taking some commonsense precautions: Store disks out of direct sunlight and away from magnetic fields such as your stereo speakers, your phone, a fluorescent light, or a computer screen. In addition, stack your disks to keep them from warping, and avoid extremes of temperature and humidity. Another safeguard is to copy your archival data onto new disks every two years or so.

PostScript Text Files

Q. In MacUser's roundup of PostScript printers ("Fit to Print," September '89), it

Last September, a reader wrote that he had been unable to discover a cleaner that would remove the sticky residue left by old, out-of-date disk labels. The official Help Folder answer was to pile labels on top of one another a few times and then pull as much of them off as you can before starting all over again. Several readers, though, found that approach too messy for their taste and sent in their own techniques. If you absolutely must have a glueless disk, you can try these methods at your own risk — just don't blame us if you melt your disk or set your house on fire.

Slightly moisten a very small area of a clean absorbent cloth with the lubricant WD-40. Gently rub the sticky area of the disk, taking care that no moisture enters the edge seam. Within seconds, the disk is clean and-free from the glue residue.

Carol A. Hill
Duluth, GA

Quite by accident, I found that rubber-cement thinner works every time.

Bob Krueger
San Diego, CA

Judicious use of a hair drier softens the adhesive on even permanent labels and allows you to easily peel them off. Then a little lighter fluid on a cotton ball or paper towel removes all remaining traces of the adhesive.

Jim Thwaites
Tulsa, OK

I use a cleaner called OOPS! (New York Bronze Powder Co., Elizabeth, New Jersey). I bought mine in a one-pint can for about $5. Although advertised as a remover of dried latex paint, it does an outstanding job of removing adhesive residue, and there's no damage to the disk.

Bob Doehrmann
Huntsville, AL

Nothing can even come close to lighter fluid for removing adhesives. For less than a buck, you can get a supply that, depending on your age, may very well survive you.

Christopher Bender
Mt. Pleasant, SC

African Power Tools
became apparent that the clone printers were by far the best buys of the lot. The authors did warn of two problems: The clones take a long time downloading non-resident fonts, and they don’t work with Adobe’s Type 1 fonts, in which most service bureaus have invested heavily.

But isn’t it true that you can send any PostScript file to a service bureau, regardless of what fonts that bureau has in-house, simply by using PageMaker’s Command-F feature to print an ASCII PostScript text version of your file to disk? Granted, this can result in a lot of fonts besides the standard 35 resident LaserWriter fonts, the PostScript text file that you create will be substantially bigger than the original PageMaker file. By relying on the service bureau to provide the font information, you save a lot of space. And what if something goes wrong when you get your file to the service bureau? If the service bureau has only your PostScript text file, it will find it next to impossible to troubleshoot your job.

The font market is in the middle of some major upheavals right now, so most service bureaus may start to carry fonts from more than one supplier. In the meantime, Adobe remains the dominant standard.

Hard-Disk Repairs

Q. Nine months after I bought a Mac SE with a 20-megabyte hard drive, the hard drive failed. When I took my Mac back to where I’d bought it, the service technician told me that my Mac would need a new hard drive (at a cost of $650). When I picked up my Mac after the hard drive was replaced, all the information that was on the hard drive I took in was on the new hard disk. Is it possible to transfer from a damaged hard disk to a serviceable disk, or did I get ripped off?

A. Yes, it’s possible to transfer data from a damaged hard disk. What your experience most likely means is that the technician went beyond the call of duty by salvaging the data from your damaged disk. If your concern is that the drive was not replaced, you are perfectly within your rights to ask your dealer for the paperwork documenting the repair, which should give you the old and the new drives’ serial numbers and prove that a new drive was installed.

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Don’t you just hate the way font menus look once you’ve installed a lot of typefaces? So do I!

The system engineers who gave the Mac the ability to display different typefaces, styles, and point sizes had tremendous vision. They also had myopia. Their mission was to display fancy font work on the screen and to print it on the ImageWriter. This was a tremendous achievement for its time. But they never imagined that some day Macs would be front ends to high-resolution typesetting machines. (At least I hope they didn’t imagine it; surely no one would consciously create the mess I’m about to describe.)

The Font Manager (the part of the Macintosh operating system that controls how text is displayed) was designed to let you choose among italic, bold, condensed, expanded, outline, shadow, and underline styles. This made for some flashy screen displays that wowed users in the early days of the Mac. It was fine for fonts such as Geneva, New York, and Venecia. But when Apple released the LaserWriter, it opened the door to the lush world of typography.

Working with Weights

From a typographer’s point of view, the Mac’s set of styles doesn’t make much sense. Glomming the seven font modifiers together into a single Style menu causes more problems than it solves. Outline and shadow have no equivalent in the typographic world. Condensed and expanded are more meaningful entities, but I can’t think of a single Mac application that actually uses these style attributes to select the appropriate PostScript fonts at print time.

Even with bold and italic, Apple’s approach creates confusion. Italic is straightforward. A typeface is either italic or it’s not—a simple either/or choice. But bold cannot be handled quite so easily. Bold and roman (plain) are only two of many weights (or thicknesses) that type can have. A font’s weight can be thin, light, roman, medium, bold, black, or ultra—and that’s not even a complete list.

A family is a group of fonts that share a similar basic design. One of the Mac’s greatest shortcomings is how poorly it deals with typeface families that, rather than having only two weights (roman and bold), have three, four, five, or more. Futura and ITC Serif Gothic, for example, have six each. Adobe’s Helvetica Neue family has eight. In fact, more than half the type packages in the Adobe Type Library are part of families with three or more weights. Typically, each weight has both italic and nonitalic faces.

The Font Manager doesn’t handle this richness very elegantly. It simply wasn’t designed for the job. It handles italic just fine because there are only two choices. But in the description of a Macintosh font, there is only a single bit, the “bold” bit, that can be used to indicate the weight of a font. It’s either on (bold) or off (not bold). So within a single type family, no matter how many weights the family includes, the Macintosh can’t keep track of more than two at a time.

The result: interminable Font menus in which each styled face appears separately. Worse, rather than all the styles in a family appearing together, they are scattered all over the place (see Figure 1). For example, B Bodoni Bold is alphabetized under B, while I Bodoni Italic is listed under I. This is intuitive? Give me a break. To be fair, this latter annoyance is as much the fault of Adobe and Microsoft as it is of Apple. Adobe invented this user-hostile approach to screen fonts partly as a workaround for the non-standard Font menu in early versions of Microsoft Word. The menu was so narrow that an indication of the font’s style wasn’t listed first, it would be cut off and users couldn’t tell one font from another.

Apple Throws Us a Bone

NFNTs, relatively new Macintosh font resources, are supposed to alleviate this problem. (Adobe is now supplying all its screen fonts in NFNT form.) A Mac font family typically consists of four fonts: two weights (roman and bold), each with an italic and nonitalic version. Each font style has its own NFNT, and you can

By Henry Bortman

---

Figure 1: This is a typical Macintosh font menu prior to merging NFNT screen fonts. Font family members are sprinkled everywhere. Standards such as these cry out to be violated.
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merge the NFNTs in a Mac font family so that only family names (Bodoni, Garamond) remain on the Font menu. The nonroman style names disappear. They are still accessible, but only via the Style menu. For example, if you merge the NFNTs for the Times family, only Times remains on the font menu. B Times Bold, B1 Times Bold Italic, and 1 Times Italic simply vanish.

This scheme works quite well for simple families — those that contain nothing other than roman (plain), italic, bold, and bold-italic typefaces (or some subset thereof). For these families, merging the NFNTs eliminates font-families that scatter and cuts the Font menu down to as little as one-fourth of its premerged size (compare the Avant Garde family in Figures 1 and 2). This is particularly useful if you have a large type library. If you install all the fonts in the first 83 packages of the Adobe Type Library (some 400 typefaces) and don’t merge them, the Mac cannot display them all. The Font menu just poops out somewhere around the italics, leaving any font that starts with the letters J through Z inaccessible. Word 4.0 is particularly uncooperative under these conditions — it won’t even launch properly unless you first customize its Font menu.

Unfortunately, in the world of typography, type often comes in complex families — those with more than two weights — and merging styles in a complex family doesn’t work very well on the Mac. Even if you merge NFNTs, your Font menu is still a mess. There’s absolutely nothing you can do to eliminate this problem completely, given the current design of the Mac’s Font Manager. Mac font families can contain only two weights, period.

Helvetica, for example, has four weights: Light, Plain, Bold, and Black. (There are actually two different Helvetica families in the Adobe Type Library, one with four weights and one with eight. I’m talking about the four-weighted.) Without Light and Black, Helvetica is a simple family. If you merge the basic set of Helvetica Plain, Oblique, Bold, and Bold-Oblique NFNTs and then select Helvetica from the Font menu and Bold from the Style menu, you get Helvetica Bold — piece of cake.

But suppose you add the Helvetica Light and Black NFNTs to your System and merge them. What shows up on the Font menu? Helvetica’s still there, but now so is L Helvetica Light (see Figure 2). You thought you were going to get rid of that nasty L, didn’t you? And what do you do if you want Helvetica Black? Why, you select L Helvetica Light from the Font menu and Bold from the Style menu. Makes a lot of sense, doesn’t it?

What you’d really like to do is to get just Helvetica to appear on the Font menu and select any of the four possible weights from the Style menu. But you can’t. (For the technically obsessive, the Font Manager can handle only two weights per Mac font family, so you’re actually getting two Mac families, each with two weights.)

How do you go about merging NFNTs? You can use Font Harmony (a utility that comes with Suitcase), Font/DA Utility (part of MasterJuggler), or FONTastic Plus (a bit-mapped-font editor from Altsys). These utilities also can convert FONT resources, the old resources for screen fonts, to the newer NFNTs. (For more information on font resources and font management, see “Fonts by Number,” July ’89.)

The Hobgoblin of Little Minds

The relationships among fonts in Mac type families are called style links. We could live more easily with the Mac’s shortcomings if the style links for all complex families worked the same way. But they don’t. Clearface, for example, also has four weights: Regular, Bold, Heavy, and Black. If this family followed the Helvetica pattern, Regular (font) plus Bold (style) would give you Black. But no. If you merge all the NFNTs in the Clearface family and then apply a Bold style to Clearface Regular, you get Clearface Heavy. The Stone families work in yet another way. Eras in another. Bodoni in still another. (If this doesn’t make sense, try reading it while referring to the style-link information in Table 1.)

I could go on listing examples. But suffice it to say that the rules are “customized” (to put it politely) for each complex family. Until you merge the fonts in a complex family, there’s no way to tell which names will remain on the Font menu and which will disappear. And then you can’t tell which of the remaining fonts you should apply the Bold style to in order to access the fonts that are no longer there. You either have to memorize how each family works or...
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the presentation can
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Estimated Budget

• Remember to bow to Isabella and Ferdinand
• Congratulate them on their recent victory over the Moors
• Agree with their decision to start the Inquisition
• Remind them that a new world is waiting!!
Table 1: Style Links in the Adobe Type Library

Here are all the fonts in packages 1 through 85 of the Adobe Type Library. Screen-font names are shown instead of printer fonts, and the fonts are grouped alphabetically by family (in order of increasing weight) rather than by package or in the order they appear on the Font menu. If you merge styles, the names shown in heavy type will remain on the Font menu and those in lighter type will disappear. The arrows show style links among different weights — what you get if you select a font listed in heavy type and apply a bold style to it. Italic links (not shown) tend to mirror the links for the nonitalic styles of similar weight.

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POWER TOOLS

Helvetica
Helvetica-Black
Helvetica-BlackOblique
Helvetica-Bold
Helvetica-BoldOblique
Helvetica-Light
Helvetica-LightOblique
Helvetica-Oblique

Figure 3: Illustrator displays PostScript printer-font names rather than screen-font names. The Illustrator font list is long but logically organized, making it easy to access the desired font. (The program actually displays only four font names at a time; this image is doctored.)

keep a cheat sheet near your Mac.
What is Adobe’s official position on this state of affairs? A spokesperson said the company considered using a consistent set of style relationships across all the families in its type library but rejected the idea. Instead, Adobe designers made their decisions on style links based on “aesthetic” considerations. That’s a direct quote. Too bad they didn’t publish a users’ guide to Adobe aesthetics, since their choices are counterintuitive. Fortunately for you, Table 1 is just such a guide.

The Light at the End of the Menu
In an effort to overcome these problems, a few software developers have dared to violate the standard Macintosh interface. In general, I advocate strict adherence to standards, but I have to side with the heretics here. Interestingly enough, Adobe was the first company to stray from the path, with its Illustrator program. Its developers did away with the traditional dual Font and Style menus, which are based on screen font names, and provided a single menu based on PostScript printer font names (see Figure 3).

This still makes for a long font list, but at least all the styles in a family — even the most complex families — are grouped. Thus, it’s much easier to find the typeface you’re looking for and to know exactly what you’re getting when you make a selection.

Smart Art, a DA from Emerald City Software that does PostScript type effects, goes Illustrator one better. It retains the Font and Style menus familiar to Mac users but implements them in a nonstandard — and much-improved — way. In Smart Art, the Font menu is renamed Family. It displays a single name

PRESERVATION PLAN ON IT
Planning on restoring a house, saving a landmark, reviving your neighborhood?
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Department PA
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Washington, D.C. 20036

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Boulder, Colorado
80322-6986
Please allow up to 60 days for change of address to take place.
for each typographic family, regardless of the number of weights or styles.

When you select a family, the Style menu displays a list of all the styles available for that family (see Figure 4). The term user-friendly comes to mind.

Emerald City did a bunch of fancy programming to work around the limitations of the Mac’s Font Manager. I congratulate the company for showing the Mac community a more rational approach to font access. Too bad it works only in Smart Art.

The Mac’s handling of typeface selection is one of the most glaring examples of an interface that has outgrown its original design. The Font Manager is long overdue for an overhaul. NFNTs do not solve the problem. If Apple were smart, it would learn from Emerald City and use the Smart Art concept as a springboard for a redesign. Unfortunately, Apple has announced that although System 7.0 will include new outline-font technology for Mac screens and non-PostScript printers, it will not fix the font-family funk. That’s a real shame. I can understand how Apple got into this mess. But now it’s time to clean it up.

**Figure 4:** Emerald City’s Smart Art uses custom programming to create an easy-to-use font menu. You select true family names from the Family menu. All the weights and styles for a selected family appear together on the Style menu.

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Eavesdropping with Inter•Poll

Inter•Poll’s echo test can help you spot trouble on a shaky network.

People sometimes tell me that their network works fine during off-hours, but as soon as everyone comes to work, they start losing connections with servers and printers. This situation is a great mystery to them. Why should their network work only part of the time?

To unravel this mystery, we must expand our concept of reliability. We normally think of our network’s reliability in terms of whether it works or does what we want it to do. If we want to print a document, the network works if the document appears in the LaserWriter output tray, and it doesn’t work if the document doesn’t appear. Between works and doesn’t work, however, is a lot of gray area that I call shaky.

What does shaky mean? First let me provide some background. If you want to print a document or access a file on a server, many data packets must be successfully sent over the network. If your network is shaky, some packets will arrive intact and some will be garbled. In most cases, your Mac will figure out when the data in a packet is corrupt, and it will either request or wait for the distant device to resend the information. You won’t see any dialog box or blinking icons — the Mac will handle it all for you, typically in less than a second. However, it will give up after repeated tries if it doesn’t receive the required information correctly.

When a network isn’t busy, it’s easy for a device to resend a bad packet before the receiving Mac gives up waiting for it. But the busier a LocalTalk network gets, the harder it is for any one device to get access to it, because all the devices are constantly vying for that access. So it takes longer to resend each packet, and the time it takes to finally get a good packet through may exceed your Mac’s staying power. When this happens, you can lose your connection to AppleShare or the LaserWriter. A dialog box, at best, or a crash, at worst, informs you of the bad news.

In short, connections that seem solid when the network is not busy may appear shaky when it is busy.

Luckily, shakiness is something that can be diagnosed with Inter•Poll, the $129 network-management utility from Apple. Inter•Poll has many great features, including an echo test, which can determine the reliability of a point-to-point connection between two AppleTalk devices, such as a Mac and a server. In an echo test, the Mac running Inter•Poll sends a data packet to a distant Mac that has an INIT called Responder installed in its System Folder. (Responder comes on the same disk as Inter•Poll.) The receiving Mac sends a duplicate of the packet back to the originating Mac. Inter•Poll sends out several echo packets — you can tell how many to send — and counts how many of them come back. (Inter•Poll can also send status-request packets to printers, which respond with printer-status packets.)

If you send 100 packets out and only 97 come back, you’ve learned something about the network’s reliability between your Mac and the distant device. Inter•Poll also keeps track of the average and maximum times for packets’ round-trips, which gives

By Kurt VanderSluis

Figure 1: Inter•Poll’s echo test can help you spot trouble in a shaky network. You specify how many data packets to send to a distant Mac and at what interval; it counts how many packets are echoed back and how long the round-trip takes. If you send 100 packets out and only 97 come back, your network may have a problem.
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you an idea of how busy the network is.

To run an echo test, open InterPoll and choose Network Search from the Options menu. Click on the Start button, and you'll be shown a list of available devices. Pick one of the Macs, and select Test Device from the Special menu. In the dialog box that pops up, specify 100 long echo packets with a delay time of .01 seconds. Press Go, and wait for the results (see Figure 1).

In a perfect network, all 100 packets will be echoed back to you, with an average delay of .02 seconds and a maximum delay of perhaps .04 seconds. If the network is busy, the average delay will be longer, perhaps .04 to .06 seconds, with maximum times of around .12 seconds. If the network is broken, you won't even be able to test the distant device, because it won't appear in the device list. In a shaky network, most of the packets will get through, but you'll lose some of them. How many you lose depends on how shaky your network is. If the number received is 98 or 99, you should probably repeat the test a few times. If the number is consistently less than 98, you should investigate. If the number is less than 95, you definitely have a problem.

An echo test can determine the reliability of a connection between two AppleTalk devices.

Once you know there's a problem, you can isolate it by running the echo test with other nodes around the network. If, for example, all the nodes on a particular branch of the network appear shaky, that branch may be too long or it may be improperly terminated. Or better yet, you can follow Rule No. 1 of troubleshooting, established in the first installment of Trouble Shots (April '89): Know how everything is supposed to look. Test your network when it's healthy; don't wait until trouble appears. If you run the echo test, say, any time you add a new node to the network, you may be able to identify a problem before it affects users.
The Mac can connect to an IBM mainframe any way a PC can—only better.

By Ernest H. Mariette

Serial-Port Connections

**Direct serial**

- IBM mainframe with IBM 37x5 front-end processor
- IBM 7171 protocol converter

Any software supporting VT 100, 3708, or other terminals.

**Direct async.**

- IBM mainframe with IBM 37x5 front-end processor running SIM 3270 software
- IBM 7171 protocol converter

Simware Mac3270 Async software.

**Serial to cluster controller**

- IBM mainframe with IBM 37x5 front-end processor
- IBM 3174 cluster controller
- Avatar MacMainFrame software

Figure 1: The simplest way to connect your Mac to an IBM mainframe is through the serial (modem) port. You can make the connection directly or over a modem.
terminal screen. Data going back to the host (the mainframe) is translated into IBM format. The most common IBM terminals are the 3270 series, so this article focuses on software packages that emulate 3270 terminals.

The second piece you'll need is a hardware connection to IBM's Systems Network Architecture (SNA), the standard for IBM mainframe networks. There are three options for fitting your Mac into SNA connectivity schemes. The first possibility uses the Mac's serial port to make the connection through direct wiring or via a modem. On the mainframe side, this connection is made either to a protocol converter such as an IBM 7171, which translates the Mac's ASCII characters into the EBCDIC used on the mainframe, or to a third-party box plugged into an IBM 3174 cluster controller, which is a device that routes data between a mainframe and several terminals. A second option is to connect to SNA through LocalTalk, Ethernet, or token-ring networks. Finally, a coaxial cable can link your Mac directly to a cluster controller.

Which method do you choose? The answer depends on the mainframe-to-PC standards your company has already established. For instance, if your office has a token-ring network, you'll have to install a token-ring card in your Mac. If you have local cluster controllers, a coax card is the way to go. Let's take a closer look at the three ways to connect your Mac to SNA and then examine the features of 3270-emulation software.

Serial-Port Connection

The simplest mainframe connection starts at the Mac's serial (modem) port. You can plug directly from this port into the mainframe if it's nearby, or you can use a modem to access it remotely (see Figure 1).

If you want to communicate via the serial port, there are several terminal-emulation packages that will do the trick. MicroPhone II, VersaTerm-PRO, DynaComm, and Mac3270 Async can emulate terminals such as the VT100 or the IBM 3708, among others (see "Custom Calling," August '89). For 3270 emulation, however, you have only two choices: Simware's Mac3270 Async and Avatar's MacMainFrame DX. At press time, these were also the only serial-port 3270 solutions available for the Mac Portable.

Mac3270 Async, which connects your Mac to the mainframe by way of a protocol converter, costs a mere $250. Unfortunately, the host mainframe must be fitted with SIM3278, a software package that costs between $10,000 and $20,000, depending on the mainframe configuration. Overall, Mac3270 Async works well, but it has some minor bugs when it's used with the Mac Icx that prevent Mac keyboard commands such as Command-C from working. Simware is aware of the problems and plans to fix them in its next upgrade, due out by the end of 1989.

Avatar's MacMainFrame DX hooks
Of course there are other ways to connect an IBM mainframe to Macintosh.

Being able to connect your Macintosh computers with an IBM mainframe is one thing. Being able to do it the way MacMainFrame does it is quite another.

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into a cluster controller instead of a protocol converter. This solution is substantially cheaper; the $1,195 price includes both the Mac software and the hardware required for the mainframe.

**Network Gateways**

You can also link your Mac to a mainframe through a LocalTalk or Ethernet network or by adding it to a token-ring network, which is IBM's method for connecting PCs and mainframes (see Figure 2).

LocalTalk and Ethernet networks can be connected to an IBM mainframe by using Tri-Data's Netway, the most popular Macintosh-to-mainframe solution. Netway packages include both the gateway hardware and Macintosh software. The Netway 1000 ($3,995) connects a LocalTalk network of up to 16 users; the Netway 2000 ($9,995) supports up to 64 users on LocalTalk, Ethernet, and token-ring networks.

Netway's principal advantage is its low cost per connection because it replaces the need for a coax or token-ring card in each Mac. Netway also functions as a 3174 cluster controller on an SNA network, which saves the cost of buying one. The trade-off is speed, especially when transferring files. Netway uses a modem to connect to the mainframe, and its top speed is 56 Kbps (kilobytes per second), which is less than one-fourth the speed of LocalTalk. This can be a bottleneck to throughput, driving up on-line costs.

If your office uses a token-ring network for PC-to-mainframe connectivity, you can now attach your Mac directly to it. Apple's recently introduced TokenTalk NC Card ($1,250) makes the physical connection, and its MacDFT software ($245) can access the mainframe. However, installation of a token-ring node is not plug and play; it requires a system administrator for proper setup.

**The Coax Connection**

The third approach to making the mainframe connection is through an add-on card that connects directly to an SNA network through category "A" coaxial cable (see Figure 3). This solution usually costs more than $1,000 per Macintosh, but it offers a faster, secure connection.

There are three main players marketing coax boards for the Mac, all of which include 3270-emulation software: Apple (Coax/Twinax Card with MacDFT software), Avatar (MacMainFrame hardware and software), and Digital Communications Associates (DCA — MacMainFrame board and software). DCA's board also runs Mac3270 Master, a coax version of Simware's Mac3270 Async. (A fourth

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**Table 1: Terminal-Emulation Features**

<table>
<thead>
<tr>
<th></th>
<th>Apple MacDFT</th>
<th>Avatar MacMainFrame</th>
<th>DCA MacMainFrame</th>
<th>Simware Mac3270</th>
<th>Tri-Data Netway</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General features</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emulates 3278, 3279 terminals</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Emulates 3179G, 3192G terminals</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUT Mode</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>DFT Mode</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Extended Attribute Byte (EAB) support</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>MacWorkStation support</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mouse can simulate a light pen</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cursor positioning with mouse</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Supports full Mac II color</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

| **Macs supported** | | | | | |
| Mac Plus | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mac SE, SE/30 | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mac II family | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mac Portable | ✓ | ✓ | ✓ | ✓ | ✓ |

*Model 2 only.
+ An upgrade will add this emulation by late 1989.
+ MacMainFrame ($195) adds this capability.
+ MacMainFrame III version only.
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Apple's MacDFT software first shipped with only the CUT-mode emulator running, but it should be upgraded to full DFT support by now. If you're part of a network, Tri-Data's Netway software also works in DFT mode, providing this capability to all Macs on the network.

Popular 3270 terminals include the monochrome 3278 models 2, 3, 4, and 5, and the color 3279 models 2 and 3. These are all supported by every vendor except Simware, which supports only the model 2s. All vendors support Apple's Color Picker for defining on-screen color, but only DCA offers add-on software (MacIrma Graphics, $195) to emulate a 3179G or 3192G APA graphics terminal. (Avatar planned to have this capability by the end of 1989.) With MacIrma Graphics, you can use the Mac to display output from the SAS/Graph and Tellagraf mainframe programs as long as your mainframe has IBM's GDDM (version 2.1.1 or newer) and PCLK/F graphics system software.

Perhaps the most frustrating thing about working on a mainframe with a PC is keyboard mapping. Everyone has a different idea about where the Enter key should be. Having a friendly interface for mapping the keyboard is more than useful—it's essential. The software vendors provide icon-driven windows for dragging the various terminal functions to a picture of the keyboard's current map. Apple's MacDFT has the clearest representation of the keyboard and is the easiest to use. You simply drag a terminal function to the key you want to perform that function. MacDFT uses the familiar trash-can metaphor to clear a key for reassignment, whereas MacMainFrame and MacIrma require you to use an eraser tool to clear a key before reassigning it.

If you're used to working on an IBM terminal or a PC, you'll appreciate the floating keypad that the software packages provide for the Mac. It contains terminal-specific keys such as function keys, PA1, PA2, and Clear. In MacIrma and MacDFT, this keypad is a tear-off menu. At press time, the MacMainFrame keypad was a tear-off only in the DFT version (see Figure 4), but Avatar was planning to include it in an upgraded CUT version. Tri-Data uses a pop-up keypad in its Netway software.

MacDFT and MacIrma let you lock your terminal-emulation settings with a password. This feature doesn't prevent other users from having their own settings files, but it does solve the problem of someone changing the keyboard map that you prefer.
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<table>
<thead>
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<th>Item</th>
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<tr>
<td>Imagewriter I/II Mac Inker (model 234IM)</td>
<td>42.00</td>
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<tr>
<td>Multicolor Adapter (model M422)</td>
<td>40.00</td>
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<tr>
<td>Universal Mac Inker (model 234U)</td>
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<td>Extra ink bottle</td>
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<td>18.50</td>
</tr>
<tr>
<td>Shipping</td>
<td>4.50</td>
</tr>
</tbody>
</table>

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Mainframes for the Rest of Us

Mac users expect certain features (major and minor) in all their software, and 3270 emulation is no exception. The emulation packages can cut and paste a terminal image. They also can do an "intelligent" copy that puts tabs in the place of spaces on-screen — useful for cutting from the screen and pasting directly into a Mac spreadsheet. The selection area can be the normal line-by-line type or block mode. MacMainFrame's implementation is a bit more automatic because it assumes that if there are two spaces, they should be replaced by a tab. MacIrm requires that you specify the number of spaces that should be replaced by a tab.

Control over font size is another feature all the products support. Since a 3270 session window can be only 80 or 132 characters wide (depending on the terminal), changing the font size resizes the terminal window. MacMainFrame's DFT versions offer a handy on-screen option that has font sizes listed at the right of the window. Click on the size you want, and the window is resized.

The packages also provide a special font to display characters particular to the IBM mainframe environment. My favorite is MacMainFrame's Armonk font. (Armonk, New York, is to IBM what Cupertino, California, is to Apple.) The MacDFT font is a close second, while the MacIrm A and B fonts are not as nice.

Mac programmers will appreciate the application-program interfaces (APIs) each product offers. APIs let you create front ends for mainframe programs and are useful for automating file transfers, masking complex procedures such as log-on, and creating Mac-like interfaces to mainframe programs. All the vendors provide APIs, but DCA is the leader. (APIs will be covered in more depth in a future Bridges article.)

File Transfer

Moving files between a Mac and mainframe is much simpler than the methods used on DOS machines. All the vendors take full advantage of the Mac interface to provide built-in menus for file transfer. This sure beats looking up the procedure in a manual and typing it at the command line!

In addition to proprietary formats, all the products support IBM's standard INDSFILE protocol, and MacIrm also supports IrmaLink and ForteNet formats.

MacMainFrame has a batch-transfer mode, which can operate in the background under MultiFinder.

Apple's MacDFT can record a session's keystrokes for playback using a macro language. This feature is quite useful for automating log-on sequences and is a big plus for Apple.

Even more impressive is the scripting language that comes with Simware's Max3270. Its 120 commands and functions can automate repetitive processes such as log-on and log-off, network navigation, and file transfer. A script can be

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POWER TOOLS

compiled as an external script to be called when needed, or it can be stored as an internal script, part of the Session document created by Mac3270 to save user settings. You can assign a script to a key, using the keyboard-mapping feature. Double-clicking on a key opens the Key Script dialog box, which allows shorter scripts of up to 250 characters to be written for the selected key.

If that isn’t enough to make you smile, consider this: With only a few exceptions, the Mac3270 script commands and functions are the same as those in SIMPC, Mac3270’s sister program that runs on IBM PCs. This means that a single mainframe front end for both Macs and PCs can be developed and distributed on a companywide basis.

Conclusion

The obstacles that once prevented the Mac from working in an IBM environment no longer exist, thanks to advances in terminal-emulation software and the availability of coaxial and token-ring cards and gateways.

If you have more than a handful of Macs, Tri-Data’s Netway is the most cost-effective connection to SNA. For users on the road, a serial connection to the mainframe via modem gives you access from anywhere. Simware’s Mac3270 Async is an inexpensive solution only if you already have the mainframe software. Otherwise, the low-cost serial solution is Avatar’s MacMainFrame DX, which has more features than does Mac3270 Async.

If performance is your main concern, however, a coax card is your best bet. After working with all the coax products over several weeks, I was drawn to the look and feel of Avatar’s MacMainFrame DFT. It has more functionality and the most complete set of features. You really can’t go wrong with any of the boards, and you might need some of MacUser’s terminals, but overall, Avatar’s MacMainFrame DFT is the price/performance leader among coax cards.

Ernest H. Mariette is principal consultant for Mariette Systems International, which solves Macintosh-to-IBM connectivity problems for Fortune 1000 companies. Randy Killen of 4GL Consulting provided the review of Simware products.
For many of you, mail order is your primary means of purchasing Macintosh products and services. That's why MacUser has put together the following special section.

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**WARNING:** Beware of money-back offers on hardware! MacLan sells only NEW, NEVER USED merchandise. We will not send you re-packaged, slightly-used hard disks.

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- Cutting Edge 44 25ms | $1,149 | $849.

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- Irwin 40 Meg Tape | $1,100 | $799.
- Irwin 80 Meg Tape | $1,499 | $1,149.
- Cache 150 Tape | $1,599 | $799.
- CMS Enhancements 60 | $749 | $489.
- CMS Enhancements 150 | $999 | $489.
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**Ricoh**
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- PostScript Laser Printer | $3,299 | $2,829.

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  - MacSnap 548S | $529 | $472.
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  - MacLink Plus | 139 |
  - MacNet Starter Kit | 51 |
  - Microphone II | 225 |
  - Quick Mail (10 Users) | 215 |
  - Red Ryder | 56 |
  - Timbuktu | 99 |
  - TOPS (Mac) | 149 |
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  - Everex 2400 | 195 |
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  - Practical Peripherals
    - 2400 Bundle | 235 |
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- Dove SE Marathon 020 | 419 |
- Maccellerate SCSI Acc | 469 |
- Orchid MacSprint | 245 |
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- Radius 25SE w/68882 | 1419 |
- Radius 26SE w/68882 | 2650 |
- Microtek MS 300GS (256GS) | 1649 |
- Microtek MS 400GS (256GS) | 2959 |
- Microtek MS 300Z (Color) | 1979 |
- ScanMan | 399 |
- Sharp JX 300 Color | 4295 |
- Sharp JX 450 Color | 5895 |

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- Microtek MS II | 1129 |
- Microtek MS 300GS (256GS) | 1649 |
- Microtek MS 400GS (256GS) | 2959 |
- Microtek MS 300Z (Color) | 1979 |
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COMMUNICATIONS SOLUTIONS

- Software
  - LapLink Mac | 84 |
  - Liaison | 174 |
  - MacLink Plus | 139 |
  - MacNet Starter Kit | 51 |
  - Microphone II | 225 |
  - Quick Mail (10 Users) | 215 |
  - Red Ryder | 56 |
  - Timbuktu | 99 |
  - TOPS (Mac) | 149 |
- Hardware
  - Abaton Interfax | 329 |
  - Everex 2400 | 195 |
  - MacFax | 449 |
  - Practical Peripherals
    - 2400 Bundle | 235 |
    - Prometheus 2400 Bundle | 199 |
    - Prometheus 9600M Plus | 765 |
  - Shiva NetModem 2400 | 439 |
  - SmartModem 2400M
    - (Internal Mac II) | 459 |

ZOOM modem 2400 $119

ACCELERATORS

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- Dove SE Marathon 020 | 419 |
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WE’LL BUY IT BACK!

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E-Mach Z-21 IQ (GS) 2795
E-Mach Z-21 (Mac II) 1995
E-Machines Z-21 (SE)........... 1919
NEC MacSync...................... 1029
NEC Multisync (15")............. Call
PCPG Shadowgraph.............. 2049
Radius Solutions................. Call
Sony 1304........................ 1299
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SCSI Accel, 8 Mb RAM, 320 Mb Hard Drive, Mac 101 Keyboard,
300 dpi 24-bit Color Scanner,
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WORD & PAGE LAYOUT
Quark XPress $459
Adobe Postscript Fonts........... Call
Adobe Type Manager Plus........ 39
Adobe Type Manager.............. 39
Coach Professional................. 119
Fluent Laser Fonts ............... 50
FullWrite Professional........... 269
LeraFonts .......................... 59
Image 2.0 ........................... 255
OmniPage 2.0...................... 589
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Wet Paint vols. 1 - 16 .......... 45

PRINTERS
Mitsubishi G370 Color Laser 4995
Mitsubishi G650 Color Laser 6995
NewGen Turbo Lasers:
600x300 dpi .......................... 5690
400x400 dpi .......................... 5845
800x800 dpi .......................... 7640
Qume ScripTEN .................. 3395
Qume CrystalPrint ............ 3395
Sharp JX 730 Color ............. 2199

DATASTACK
Int SE/CX 20 ..................... 369
Int SE/CX 30 ..................... 409
Int SE/CX 46 ..................... 489
Int SE/CX 62 ..................... 609
Int II/Ix 80 ........................ 719
Int II/Ix 300 ..................... 2229
Ext 20 ............................ 479
Ext 30 ................................ 529
Ext 46 .............................. 599
Ext 62 .............................. 719
Ext 80 ............................. 829
Ext 105 ............................ 1289
Ext 173 ............................ 1679
Ext 300 ........................... 2399
Removable 45 MB ............... $849

EVEREX
EMAC 60T (Tape Back-up) ....... 665
EMAC 150T (Tape Back-up) .... 1120

PERIPHERAL LAND
1.44 Mb Floppy .................. 339
Infinity Turbo 40 ................ 1045
Infinity Dual Turbo 40 ....... 1979
PL 160 (II/IX) ................... 1350

QUANTUM HARD DRIVES
Int 40 MB .......................... 535
Int 80 MB .......................... 835
Int 105 MB ......................... 895
Ext 40 MB .......................... 730
Ext 80 MB .......................... 1035
Ext 105 MB ......................... 1085

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“We've been making Macintosh customers happy for four years! We were the first Macintosh mail order company to run its entire operation on Macs, so we understand just how important that technical answer can be to those of you who count on your Macs every day to help you earn a living. Our friendly staff of experienced Mac enthusiasts and computer consultants are always happy to answer your questions.”

—Réal Provancher
President

Featured on the previous page are several members of our management team: (l to r) Barbara, Jim, Lew, Réal.

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713-540-2300

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Seagate

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## POWERDrive

Hard Drives International is proud to carry the POWERDrive.

### EXTERNAL DRIVES FOR MAC Plus, SE & II

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<tr>
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<td>40ms</td>
<td>$299</td>
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<td>$399</td>
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<td>Quantum</td>
<td>19ms</td>
<td>$449</td>
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<td>POWERDrive 200</td>
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<td>$996</td>
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**INTERNAL KITS FOR MAC SE, II, IIcx & IIci**

<table>
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<tr>
<th>Model</th>
<th>Drive Size</th>
<th>Catalog No.</th>
<th>Preformatted</th>
<th>Pre-Tesed</th>
<th>Power Supply</th>
<th>Cables</th>
<th>UniMac External Case</th>
<th>Ontrack's &quot;Disk Manager Mac&quot; Software</th>
<th>High Quality Seagate, Micropolis, Quantum, Précis, Scribe or Conner hard drives available. Auto-parking heads - Low Power - Low Heat. No assembly required.</th>
<th>POWER UP and Go!</th>
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</thead>
<tbody>
<tr>
<td>POWERDrive 20</td>
<td>45Mb</td>
<td>Seagate</td>
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<td>Quantum</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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Comes complete with a pre-formatted, pre-tested hard drive, formatting & partitioning software, mounting hardware, cabling & How-To manual.

**EXTERNAL DRIVES FOR MAC Plus, SE & II**

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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Includes a pre-formatted, pre-tested hard drive, UniMac external case, power supply, cables, manual and formatting & partitioning software.

**Compare with Ehman and Mass MicroSystems!**

- Uses SyQuest™ mechanism
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All products come with a 30 Day "Worry-Free" Guarantee and Replacement Policy.
1. Please indicate which of the following computers you currently use in your company or organization:  
(check all that apply)
- Mac Plus
- IBM PC
- Mac SE
- Other
- Mac II

2. How many micro computers do you buy products?
- 1-4
- 5-9
- 10 or more

3. Your primary job function is:  
(check one)
- Administrative/General Management
- MIS/DP, Communications Systems, Programming
- Engineering/R&D
- Finance/Accounting
- Marketing/Sales
- Computer Dealer/VAR

4. For which of the following products are you involved in selecting brands/models to be bought by your company or organization?  
(Excluding all that apply)
- Software
- Hardware
- Accounting
- Spreadsheet
- Financial Planners
- Project Managers
- Word Processors
- Database Managers
- Graphics
- CAD/CAM
- Communications

5. Are you involved in the purchasing of microcomputer equipment at your company?  
- Yes
- No

6. If so, what function do you serve in the buying process?  
- Evaluations/Specification
- Recommendation
- Buyer/Purchaser

---

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- Spreadsheet
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- Word Processors
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- Graphics
- CAD/CAM
- Communications

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- Yes
- No

6. If so, what function do you serve in the buying process?  
- Evaluations/Specification
- Recommendation
- Buyer/Purchaser
How to Stay on Top of What's in the Mac Market

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(See other side)

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  - **Red Ryder** $54

**MAGIC DRIVES**

<table>
<thead>
<tr>
<th>Internal</th>
<th>External</th>
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<tr>
<td>20 megabyte</td>
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<tr>
<td>30 megabyte</td>
<td>$399</td>
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<tr>
<td>Quantum 40</td>
<td>$499</td>
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<td>$699</td>
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<td>Quantum 105</td>
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<td>45 mb Removable</td>
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<td>60 mb Tape Backup</td>
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<td>2.3 gig Tape Backup</td>
<td>$3995</td>
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**DISPLAY SOLUTIONS**

- **19" B&W Monitor - 2 Page Display. 72 dpi, 78 hz.**
  - **Includes card for +, SE/30, II, IIX, IIIc** $999
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- **Tracks your history and optimizes using 64 caching algorithms**
- **Write through cache for maximum data integrity**

**$99**

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<table>
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<tr>
<th>020/030</th>
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<td>16 mhz 68030 +, SE</td>
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<td>68881, 68882 Co-Proces.</td>
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<td>PMMU - 68851</td>
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The 1990 MacUser Marketing Conference will be held January 25-26 in Burlingame, CA. Attendance is limited, and the inside track belongs to those who register early. The fee is only $695 ($795 after December 1, 1989) — a small price to pay to ensure that you'll finish several lengths ahead of the competition. For more information, call 800/234-6434, and ask for the MacUser Marketing Conference Coordinator.
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"MacUser helps us identify and evaluate the product features that are important to our business."

As Director of Product Development Systems, Forrest Jerome helped bring the first microcomputers into Colgate-Palmolive.

"We were one of the earliest companies to adopt the Macintosh," Jerome remembers. "Originally, we bought them just for senior management. Now, almost five years later, the Macintosh is part of Colgate's standard hardware platform."

Jerome views the Mac as an indispensable tool. "It gives people in our company the ability and confidence to make a difference. I call it 'individual innovation.' Individuals throughout the company are discovering that the Mac changes their jobs in many small ways—ways that add up to a substantial competitive advantage for the entire corporation.

There's another tool Forrest Jerome finds indispensable—MacUser magazine. "Our Information Technology Group makes hardware and software recommendations that affect the entire company. But we can't possibly do an in-depth evaluation of every product out there. That's why we depend on MacUser to give us the information we need.

"The comparative product reviews are probably most important to me—though, actually, it's all important, from the features to the advertising. MacUser tests and reviews every available product in a given category, to make sure we don't miss anything. I count on the Lab Reports to tell me what works and what doesn't, and to help me identify the features that would mean the most to Colgate's business. MacUser helps us understand how useful the product will be once it's installed in our offices around the country."

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This is the kind of development tool professional programmers expect. It’s a fully integrated XCMD development environment composed of an editor, compiler, linker, and resource mover all rolled into one easy to use tool.

HyperBASIC includes 30 XCMDs with source code to get you started. These XCMDs are very useful just as they are (they’re even more useful than the ones you get in some XCMD packages), but you can use them as the basis for creating your monumental masterpiece.

And, HyperBASIC adds features which don’t exist in HyperTalk, such as: multiway branching, case statements, arrays, and a variety of numeric data types, just to list a few.

HyperBASIC makes it easy for your XCMDs to communicate with your HyperCard application. A feature of HyperCard named CALLBACKS lets you send and receive information with the greatest of ease.

There are advanced features that enable you to make use of the Macintosh ROM routines. And for those who feel comfortable using a Debugger (like MacsBug), HyperBASIC will generate an assembler listing of your XCMD as well as insert MacsBug symbols to ease the task of debugging those big, complex XCMDs.

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profittary software that would make it easier for Microsoft to improve the inferior graphical interface it sells to IBM and the world of clones. Does this sound like a good idea to you?

Adobe honcho John Warnock, visibly shaken by an attack on his small firm, then announced that all of Adobe's font-technology secrets would be made public domain.

Obviously Warnock felt that the superior Adobe PostScript technology was too important to the industry to be submarined by Gates, so he took the peculiar marketing tactic of essentially giving away the razor blades and selling the razors! All the while, the wily Steve Jobs was lurking in the background; he called the Gates maneuver "political." Jobs sees Gates as panicky and fearful of losing his privileged place at the IBM dinner table. Jobs was at the show with a slew of NeXT machines running Display PostScript. Perhaps seeing Jobs in bed with Adobe irked the powers at Apple, who perceive Steve and his peculiar IBM-Ross Perot-Canon axis as a genuine threat, even if he can't sell ten machines. So Apple will make a strange alliance with Microsoft, a company it recently sued over its Windows interface. So much for the lawsuit.

Supposedly this newfound alliance is arranged so the two companies can develop this new font technology together. But I ask you, has Microsoft ever developed except MS-BASIC, a mouse, and Excel? Everything else it bought from other companies that could do it better. Rather than developing products, Microsoft has become the world's biggest upgrade and maintenance programming house. Even MS-DOS was bought from Seattle Computer Products.

What Microsoft discovered from the MS-DOS purchase and the subsequent deal with IBM was that the big dough is made by finding something to license. To heck with database managers and accounting packages. Let Ashton-Tate and Computer Associates have those markets; they're too much work. Sure Excel, BASIC, and the like make money. But look at the dough you can make with licenses! Besides MS-DOS, what is the big money-maker in the world of licensing? PostScript, that's what.

Another characteristic of Microsoft is its constant upgrading of products that were never great to begin with. Upgrades are profit centers. Take Microsoft Word (please!). It must scare the pants off Warnock to see what a great job of marketing Microsoft does with a word processor that is hardly the best.

Fact is, Microsoft has become a superb marketing company, period. So if you can sell well, then sell what brings in the biggest bang for the buck: a license. Make other people manufacture and produce and even support your product while they pay you for the privilege. The company wants to license DOS, OS/2, XENIX, Windows, and now some sort of PostScript clone. If Apple goes along with the idea, Microsoft will get rich on PostScript. In the process, it will learn enough tricks from Apple to improve OS/2 and have even more licenses to sell!

Well, I still haven't answered the big question: So what's in it for Apple? Of all the computer companies in the world that don't need Microsoft for anything, Apple must be No. 1. Apple has its own operating systems. Most of the programs written for the Mac are done in THINK C or some non-Microsoft language. All Microsoft brings to the party is Excel. A revival of the old Crunch program or even a real Lotus clone would make Excel as expendable as Word on the Mac. Microsoft has no foothold, so why give it one when it feeds the world of the cheap PC power-clone? This, I thought, was the enemy! Whatever edge Apple has will be transferred to the competition in a minute. Apple loses sales while Microsoft, like a neutral arms dealer in a fomented war, profits from both sides of the battle.

I don't see what Apple hopes to gain from this alliance. It could have bought and developed a PostScript clone itself. Perhaps it's a trap of some sort designed to set up Gates for an unusual lawsuit. Maybe it's worth risking the transfer of Apple technology to the world of the PC if you can get deep enough inside Microsoft to discover something for which you can sue the pants off them — and IBM. You know how Apple loves to use the courts to protect its interests.

Apple doesn't want to stop supporting PostScript — that's for sure, since nearly all the high-end typesetters have taken the hint and offer support. There's no way a Microsoft-Bauer PostScript clone will do the job of Adobe's software, either. The Adobe stuff is terrific. But Apple needs some low-end relief so it can sell its $900 Mac of the future with a cheap laser printer. It can't afford to spend more than a buck per machine for PostScript on a low-end printer. It needed price relief, and obviously Adobe was too slow to move. Also, Adobe's Display PostScript is slow, and its inability to work adequately with color might be part of the problem. I'm sure Microsoft said, "Hey, look how big we are. Together we can lick these problems and own the code too!" If all works out, then Apple gets a cheap (and probably inferior) outline-font technology and Microsoft gets something it can license.

And the beat goes on. 

By John C. Dvorak
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