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New World Expeditions —— March 14, 1491
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COVER
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See us at the MacWorld Expo January 19-22
ad about my Mac II already? Maybe I am. When I first got my hands on a II, I was naive enough to think of it as a fast computer. What a disappointment, when it seemed to slow down over the course of the first six months I had it.

Just what had happened? Simply the inauguration of a new world of capabilities made possible by the Macintosh II. I had begun working with advanced image-processing applications, 24-bit color, databases, and music applications. As a result, I began manipulating huge data files, making ever greater demands on RAM, slipping my disks, tapping out my cache.

Ah, speed, where was thy zing? If I cared to look, I might have reminded myself that the compatible applications I ported over from my old Mac Plus ran like the wind on the 68020-based Mac II. But somehow I was no longer interested in those applications. Only the new CPU-intensive, math-intensive, RAM-intensive, color-intensive, storage-intensive applications interested me. An old adage was proving itself.

The more you get, the more you want. They don't call us power users for nothing.

The Macintosh is now capable of handling the most demanding of number crunching, and with that potential comes a thirst for speed, power, and storage. That's what this issue is about. Our features team looks at the kinds of upgrades you'll want to think about when the time comes. We've included a NuBus tour and a hands-on, graphical tutorial on RAM installation. This month, MacUser Labs gives you an objective look at accelerator boards, evaluating the performance boosts they are capable of providing. Creating your own dream machine will be easy by the time you've read this issue.

Steve Jobs has unveiled his own new dream machine, and it's fair enough to say that—at least for the time being—it's about 75 percent dream, 25 percent machine, as I noted last month. But the hype surrounding it has become a real driving force. No matter how vaporous the NeXT computer is right now, it's ironic to note that, as he did once before, Steve is once again shaping the agenda at Apple. Thanks to NeXT, Apple (and every other computer manufacturer, for that matter) will investigate erasable optical-disc storage. Thanks to NeXT, digital signal processing will become an important desktop technology. Thanks to NeXT, Apple will have to reevaluate its pricing strategies.

And the fact that Apple has already begun to respond to Steve's challenge is a good thing. Let's face it: The Mac is based on older technology. But in a shoot-out between NeXT and Apple, there stands to be one big winner: the Mac user. Even though the NeXT machine is extremely fast on paper, you can't buy one right now, no matter what you're willing to pay. And even if you could, there would be precious little real software you could run on it.

So "Two cheers!" for NeXT, for rousing Apple from its comfortable position high atop its laurels. Basically, Apple can respond with one (or both) of two different strategies: It can boost the power of the SE—with more slots, a faster processor, and color capabilities—or it can sacrifice some of the goodies on the II to come up with a more affordable version.

Given a choice between a Mac II and an SE, I'll take the II any day. But wouldn't it be nice if I didn't have to choose? Imagine the processing power of a II in an SE chassis. Imagine getting the best of both worlds: The color and open NuBus architecture of a II and the portability of a one-piece box. The inexpensive, built-in monitor plus the option to expand to a big-screen color monitor for presentations or detail work back at your desk. The beauty of a self-contained system with the upgradability of an open system. By the time you read this, Apple will probably have gone public with its decisions. Let's hope Apple doesn't forsake its roots—or its future.

Meanwhile, Mac users don't have to be left behind in NeXT's dust while Apple ponders its next move. The trick is to keep an eye on the third-party add-in market for accelerator boards, memory, disk drives, NuBus boards, mass storage, and so on. Third-party manufacturers can move faster...
WE PUT PERSONAL SCANNING WITHIN YOUR REACH.

Announcing LightningScan, the new hand-held scanner for Macintosh. From Thunderware.

Now one quick pass is all you need to scan any image up to four inches wide. With resolution settings up to 400 dots per inch, LightningScan makes almost any scanning job easier to handle. And because LightningScan is controlled by the software that helped make ThunderScan® famous, you have the powerful tools you need to enhance and edit your images. As for graphics compatibility, you name it: from PageMaker® and Illustrator® to ImageStudio* and Digital Darkroom.*

At its suggested retail price of $549, LightningScan makes the benefits of personal scanning very easy to grasp.

The UltiMac, unlike the NeXT computer, is not a promise but an available solution that can start boosting your productivity today.

Together the most powerful third-party add-ins — the UltiMac, if you will. It'll have all the muscle you could ask for and a base of thousands of Mac applications that run on it.

Here are the specs we're aiming for with our souped-up Mac IIx: a 33-megahertz CPU, 24 megabytes of RAM, a 24-bit color monitor, 2.5 gigabytes of mass storage, a 20-megaflop DSP, and a 10-mips transputer. After we finish adding in all these goodies, we'll have a machine that not only outperforms the NeXT computer but also makes a microVAX look like a creeper. This ultimate Mac, unlike the NeXT computer, is not a promise but an available solution. All those add-ons are costly, but they can start boosting your productivity today. When we've finished building our Maximum Mac, we'll report back to you. In the meantime, I hope the performance suggestions in this issue help you take your Mac to the max.
If you design on a Mac II, a screen that's too small will cramp your style. That's why you should be looking into a SilverView from Sigma Designs.

At 21" this landscape monitor offers the biggest viewing area anywhere. A full 16" x 12" 2-page spread including rulers and margins.

Which means you can finally work in actual size. A fact that's also made possible by SilverView's 72 dots per inch typesetting standard.

Something else should weigh in our favor.
The gray scale.

Besides black and white, there are SilverView models offering 16 or all 256 different shades of gray. So what you used to leave up to the imagination can now be in all your work: like subtle halftones or delicate shadings.

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1016 Tempo II 1.0. $89.

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1330 Freehand 1.0. $49.
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1470 Omnis 3 Plus/Express 3.25. $129.
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2514 MacServe 2.4 ................... 155.
4595 Liaison 1.0 ..................... 185.

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2425 Quicken 1.0 ..................... 33.

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4211 DataDesk Professional 2.0 .... 289.
3014 GeoQuery 1.0 ................. 295.
3013 Double Helix II 2.0R40 ....... 339.

Olduvai Software ... NCP
3029 DA-Switcher .................... 25.
3033 Art Clips ........................ 35.
3031 IconIt 1.0 ....................... 39.
3030 FortiShare 1.0 ................. 149.
3035 Read-RITS 1.08H6 .............. 79.
3034 Read-It 1.06H .................. 199.

Ideaform Inc. ... NCP
MacLabeler Plus 5.0, the Label Construction System- Customize your disk labels. Place fields anywhere. Icons, Graphics, Fonts, Color, Print queuing, Image Writer and Laser Writer support .................. $42.
it was good.

Fifth Generation Systems ... NCP
Suitcase II 1.0—Allows unlimited fonts & DAs without having to install them in your system.
Load them on startup or on the fly ...... $45.
Special—Through Feb. 28, purchase Suitcase II and you may also purchase Pyro! for just $12.

3305 Typing Tutor IV 1.2............. 35.
Smethers-Barnes ... NCP
1478 Prototyper 1.0 ............. 72.
SoftStyle ... NCP
3282 Printworks (Dot Matrix) 3.23 .... 43.
3281 Printworks (Daisywheel) 3.0 .... 56.
3288 Printworks (HP laser) 3.0 .... 85.
SoftView ... NCP
3471 MacInUse 2.0 ............. 42.
3961 FormSet Business Forms Edition 1.1 .... 55.
3470 MacRate ... NCP
Software Discoveries ... NCP
3374 Merge Write 1.0 ............. 34.
3378 Recalculator Plus 3.0 .... 45.
Software Ventures ... NCP
3455 Microphone II 2.0 ........... 225.
Softworks, Inc. ... NCP
4601 Stack Cleaner ............. 29.
4599 HyperTools #1 ............. 59.
4600 HyperTools #2 ............. 59.
Solutions, International ... NCP
3448 SmartScrap & The Clipper 1.05 ........ 46.
3449 SuperGlue 1.05 ............. 52.
3446 The Curator 1.05 ............. 79.
4308 BackFAX (reqs. Apple FAX modem) ........ 129.
Spinnaker/Hayden ... CP
2329 SAT Score Improvement 1.0 .... 58.
Springboard ... CP
3530 Certificate Maker 1.0 ........... 24.
3531 Early Games ............. 28.
4485 Family Matters ............. 28.
4492 Works of Art Assortment Series .... 23.
4494 Works of Art Education Series .... 23.
4496 Works of Art Holiday Series .... 28.
4498 Works of Art Laser Art Business .... 59.
4499 Works of Art Laser Fonts Vol. 1 .... 59.

4497 Top Honors .................. $59.
4500 Springboard Publisher ........... 109.
SuperMac Software ... NCP
3333 SuperSpool 5.0 ............. 54.
3332 SuperLaerSpool 2.0 ........... 82.
3378 Multi-User SuperLaerSpool 2.0 .... 199.
3377 DiskIt! 1.4 ............. 54.
3379 Network DiskIt! 1.4 ........... 199.
3381 Salonite 2.0 ............. 155.
3380 PixelPaint 1.1 ............. 190.
4086 Acknowledge 1.0 ............. 349.
Survivor Software ... NCP
3299 MacMoney 3.01 ............. 62.
Symantec ... NCP
3982 MacSQ21 1.05 ............. 49.
3983 U.M. 1.02 ............. 59.
3422 More II ............. 225.
3423 HFS Navigator 1.0 ............. 34.
3419 LaserSpeed 1.6 ............. 55.
3421 Lightspeed Pascal 2.0 ........... 65.
3420 Lightspeed C 3.01 ............. 93.
3415 CAPP's for Lightspeed C 1.0 ........... 49.
3416 CAPP's for Lightspeed Pascal 1.0 ........... 49.
Symmetry ... NCP
3318 HyperDA 1.1 ............. 38.
3317 Acta 2.01 ............. 46.
4504 Acta Advantage 1.0 ........... 69.
4160 PictureBase-WetPaint ............. 99.
Synergy ... NCP
3130 VersaTerm 3.20 ........... 69.
3129 KaleidaGraph 1.10 ........... 125.
3131 VersaTerm-PRO 2.20 ........... 195.
3G Graphics ... NCP
3942 Images with Impact!! Graphics and Symbols 1 .... 59.
4583 Images with Impact!! Business 1 .... 75.
Think Educational ... CP
3615 MacEdge II 1.0 ............. 27.
3616 Mind Over Mac 1.4 ........... 27.

Farallon ... NCP
Timbuktu 2.0.1—A versatile network application that allows you to observe or control another Macintosh from your own over any LocalTalk network. ... $65.
### A heavenly array.

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<td><strong>TOPS</strong></td>
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<td>TOPS Teleconnector (DIN-8)</td>
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<td>TOPS Repeater (90 days)</td>
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<td>TOPS Flashcard (90 days)</td>
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<td>The Hobbit 1.0</td>
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<td>Fellowship of the Ring 1.0</td>
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<td>Hardball</td>
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<td>Mean 18</td>
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<td>4th &amp; Inches</td>
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<td><strong>Discovery Software</strong></td>
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<td>Arkanoid—Test the limits of your strategic thinking and quick reflexes as you break through level after level of mesmerizing brick formations. An entertainment classic.</td>
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<td><strong>Avalon Hill</strong></td>
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<td>MacPro Football 2.0</td>
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<td>Shufflepuck Cafe (air hockey)</td>
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<td>Ultima III</td>
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<td>Where in World Carmen San Diego?</td>
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<td>Ancient Art of War</td>
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<td>PS1 Mustang Flight Simulator</td>
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<td>Electronic Arts</td>
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<td>Scrabbble 1.0</td>
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<td>Reach for the Stars</td>
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<td>Chuck Yeager Flight Simulator</td>
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<td>Life &amp; Death (surgery/simulation)</td>
<td>$32.</td>
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<td>Epix</td>
<td>NCP</td>
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<tr>
<td>Sub Battle Simulator</td>
<td>$29.</td>
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`SoftView` | NCP

MacInTax—A sophisticated income tax preparation program that allows you to organize, store, and print out tax information. Includes 74 IRS forms and schedules. $69.
My prayers have been answered!

"Dear MacConnection,

MacConnection has been my favorite source for Macintosh products since January, 1985. Some clergymen are skeptics about advertising claims, but you made a believer out of me! I phoned in my last order at 4:30 PM on Friday afternoon. My order arrived before 10:00 AM on Saturday morning! My prayers have been answered!

"In addition, MacConnection's usually fine advertising has consistently offered the best selection of software and accessories for the Macintosh, and at prices that make ordering from anyone else unreasonable.

Thank you and congratulations!"

Rev. C. H. Readout, Jr.
Pastor, Apostolic Church
Enfield, CT

MacConnection
1-800/622-5472

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/622-5472 603/446-7711 FAX 603/446-7791

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Just for the record, all the ads in this series feature real live MacConnection customers and the real live letters they wrote us. Really!
without delay.

Nutmeg Systems ... 90 days
2962 15" Monitor for Mac Plus ............. 1195.
2994 15" Monitor for Mac SE ............. 1195.
2983 15" Monitor for Mac II.............. 1295.
4002 19" Monitor for Mac Plus .......... 1395.
4003 19" Monitor for Mac SE ............ 1395.
4004 19" Monitor for Mac II .......... 1495.
Nuvotech ... 1 year
3001 TurboNet ST (DB-9) .................. 30.
3000 TurboNet ST (DIN-8) ................ 30.
Orange Micro ... 1 year
4488 Grappler Spooler .................... 39.
3036 Grappler C/Mac/GS .................. 79.
4076 Grappler LQ ......................... 92.
4487 Grappler LS ......................... 92.
PCPC ... 2 years
3177 HD-W5I (Apple HD-20 to SCSI) ... 269.
3180 MacBottom HD 21 SCSI ............. 659.
3188 MacBottom HD 21 w/Modem ........ 759.
3185 MacBottom HD 32 SCSI ............ 699.
3184 MacBottom HD 32 w/Modem ........ 829.
3189 MacBottom HD 45 SCSI ............ 859.
3188 MacBottom HD 45 w/Modem ....... 979.
Practical Peripherals ... 5 years
3100 1200 baud External Modem .......... 79.
3102 2400 baud External Modem .......... 181.
3089 Mac Communications Pack .......... 229.
Sharp ... 90 days
3453 JX-450 Color Scanner (includes IEEE card and cable) ... 5895.
4347 NetBridge ................................ 279.
3444 NetSerial X232 ....................... 269.
3443 NetModem V2400 ..................... 479.
Summagraphics ... 90 days
4268 BitPad Plus AOB ..................... 329.
Thund erware ... 90 days
3648 ThunderScan 4.0 with PowerPort .. 199.
3649 MacPlus/SE Power Accessory ..... 29.
3645 Mac II Power Accessory .......... 42.
DISKS
2214 Fuji 3½" DS/DD Disks ............... 18.
2297 Sony 3½" DS/DD Disks ............... 18.
3772 Verbatim 3½" DS/DD Disks .......... 19.
2792 MAXELL 3½" DS/DD Disks .......... 20.
I/O Design ... lifetime
2378 MacLuggage HDware ................ 49.
2379 MacLuggage Imagingware II ....... 49.
2376 MacLuggage Macinware Plus ........ 64.
2381 MacLuggage Macinware SE ........ 75.
MacConnection
4623 Solid Oak Disk Case, made by New England craftsman (holds 90 disks) ... 29.
Moustrak
2694 Moustrak Pad (standard 7"x9") .... 8.
2692 Moustrak Pad (large 9"x11") ....... 9.
2693 Moustrak Pad L/F (9"x11") ......... 9.
Moustrak Designer Series (Features selected photos from the book, "A Day in the Life of America.")
4077 Window Washer 1 .................... 12.
4006 Thunderstruck 2 .................... 12.
4007 Old Cajun 3 ........................ 12.
4008 Vietnam Memorial 4 ............... 12.
4009 Dance Class 5 ....................... 12.
4010 Tea Lesson 6 ......................... 12.
Ribbons
3261 ImageWriter II 4-color Ribbon .... 9.

INFORMATION SERVICES
CompuServe
1676 CompuServe Information Service $24.
1671 Grolger's Online Encyclopedia .... 32.
1673 CompuServe Navigator 2.045.
1674 Standard Service Navigator Bundle 59.
Dow Jones
1789 Dow Jones Membership Kit ....... 24.
1765 Desktop Express 1.03 ............ 95.
1768 Market Manager Plus 2.0 ....... 189.

ACCESSORIES
Bantam Books
1403 Complete HyperCard Handbook ... 23.
Computer Coverup
1723 ImageWriter II Cover ................ 8.
1722 ImageWriter LO Cover ............. 8.
1720 Mac Plus Cover Set ................. 10.
1725 Mac SE Ext. Keyboard Cover Set ... 10.
Goldstein & Blair

Targus
Mac SE & Extended Keyboard Carry Case—Made of a special water-resistant material that's as strong as Cordura but much smoother so it won't wear out your clothing. Closed-cell foam protects against jolts $69.

INFORMATION SERVICES
Cutting Edge ... 1 Year
800K External Disk Drive—Sleek, new drive features the latest in technology. Compatible with 512KE, Plus, and SE. Includes LED disk access light. $175.

3270 ImageWriter II Rainbow Six Pack ... 20.
3260 ImageWriter LO Black Ribbon ...... 17.
3248 ImageWriter LO 4-color Ribbon .... 20.
Sopris Softworks ... lifetime
4017 ImageWriter II Cover ................ 11.
4019 Mac SE & Ext. Keyboard Cover .... 15.
4018 LaserWriter II Cover ............... 17.
4014 High Trek ImageWriter II carry case ... 49.
4013 High Trek Mac Plus carry case .... 59.
4014 High Trek Mac SE & ext. kybd. case ... 69.
Targus
3618 ImageWriter II Carry Case ........... 49.
3617 Mac Plus/SE Carry Case ............ 59.
4015 Mac SE & Ext. Kybd. Carry Case ... 69.

OUR POLICY
- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped 1st Class Mail, charged by weight.
- If we are unable to ship your order within 90 days, we will refund your money.
- We always ship the same day your order is received, unless noted otherwise.
- No returns or exchanges, except for damaged goods.
- No surcharge added.
- We reserve the right to make changes in products, prices, and policies without notice.
- No sales tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped 1st Class Mail, charged by weight.
- Allow 2-4 weeks for personal and company checks to clear.
- COD max: $1000. Cash or certified check accepted.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices subject to change without notice.
- To order call us anytime Monday through Friday 9:00 to 6:00 EST, or Saturday 9:00 to 5:30 EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30 EST.

SHIPPING
Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all non-C.O.D. orders placed into MacConnection by 8 PM EST will ship Airborne the same night for next day delivery, except for those within UPS Ground Zone 1 (which is also an overnight service). The total freight charge on any order placed with MacConnection is now $8. Cardholders will also ship Airborne overnight at no additional charge. Some areas require an additional day delivery.
Hawaii, Alaska and Outside Continental US: Call 603/446-7711 for information.

Practical Peripherals ... 5 years
3394 King's Quest I 
3395 King's Quest II 
3396 King's Quest III 
3398 Space Quest 
3400 Space Quest II 
3405 Space Quest IV 
3413 Silicon Beach Software 
3459 Falcon 2.0 
3460 GATO 1.42 
3815 NFL Challenge 
3816 Pro Challenge 
3347 Mac Wizardry 
4589 InterFax Modem 
4175 Solitaire Royale 
4001 Solitaire Royale 
4002 MAC-101 Keyboard 
4003 King's Quest II 
4004 Police Quest 
4005 Enchanted Scepters (CP) 
4006 Dark Castle 1.1 
4007 Beyond Dark Castle 
4008 Apache Strike 1.1 (MacSE & II) 
4012 Simon & Schuster 
4033 Star Trek-Kobayashi Alternative 
4034 Promethian Prophecy 
4061 Sir-Tech 
4062 ADB version 
4063 Masterstrokes, to assign keystrokes and mouse 
4064 to 
4065 (above 3 Wes) 
4070 X(wlad) 
4072 The Solitaire DA 
4078 1 Meg SIMMs 
4079 call for availability Abston ..•
4082 3·Button QuickStick ADS 
4088 CE 105ADB Keyboard w/QuickKeys 
4114 800k Disk Drive 
4116 The Wedge XL 30 + SCSI Drive 
4123 The Wedge XL 45 + SCSI Drive 
4125 MAC-101 Keyboard (beige) 
4126 MAC-101 Keyboard (platinum) 
4127 MAC-101 Keyboard (ADB) 
4131 Dove Computer 
4132 1024 Option 
4137 MacSnap 524E 
4138 MacSnap 524S 
4139 MacSnap 548E 
4140 MacSnap 548S 
4141 MacSnap 2SE 
4142 MacSnap Plus 2 
4143 MAC-101 Turbo Mouse 
4144 MAC-101 Accelerator Boards 
4145 1024 Option 
4146 MacSnap 524E 
4147 MacSnap 524S 
4148 MacSnap 548E 
4149 MacSnap 548S 
4150 MacSnap 2SE 
4151 MacSnap Plus 2 
4152 MAC-101 Turbo Mouse 
4153 MAC-101 Accelerator Boards 
4154 SuperMac Software 
4155 SuperLaserSpool 2.0—Fastaest spooler around 
4156 Temporarily routes files to your hard disk for 
4157 efficient background printing. Works with 
4158 LaserWriter, LaserWriter II, and all 
4159 Image Writers. 

**HARDWARE**

Manufacturer's standard limited 

warranty period is listed after each 

company name. Some products in their 

line may have other warranty periods. 


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<tr>
<th>Product</th>
<th>Warranty Period</th>
<th>Price</th>
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<td>1 Meg SIMMs, call for availability</td>
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<tr>
<td>ProPoint ADB</td>
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<td>InterFax Modem</td>
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<td>4264 PocketHammer80</td>
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<td>3998 Hammer91</td>
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<td>4000 Hammer200</td>
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<td>2300 Smartcom II 3.0B</td>
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<td>2304 Smartmodem 1200</td>
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<td>2307 Smartmodem 2400</td>
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<td>2563 Mouse Pocket ADB</td>
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<td>2577 Mouseway (mouse pad)</td>
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<td>2569 Mac Plus or SE Cover</td>
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<td>4126 LaserWriter II Cover</td>
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<td>2589 Universal Printer Stand</td>
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<td>2562 Mouse Cleaning Kit w/Pocket</td>
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<td>2550 Disk Drive Cleaning Kit</td>
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<td>2566 Extra Long ADB Keyboard Cable</td>
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<td>2556 Maccessories Anti-glare Filter</td>
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<td>2579 Mac II Monitor Cable Extension</td>
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<td>2559 Apple Security System</td>
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<td>2568 Maccessories SuperBase</td>
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<td>2585 Printer Muffler 80</td>
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<td>2566 Printer Muffler 80 Stand</td>
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<td>2553 Printer Muffler 132 Stand</td>
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<td>4070 System Saver SE</td>
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Thanks, Diane Cheklich of Birmingham, Mich., for your concern about the environmental impact of the plastic wrapping bags (that we had been using to protect your issues of MacUser from the perils of transportation). Diane notes that "while my issues are less likely to be damaged if they're delivered in plastic, I believe that this benefit is heavily outweighed by the adverse environmental impact of regularly generating a significant volume (how many subscribers are there to MacUser now?) of plastic that is not biodegradable. The earth is rapidly approaching its capacity to contain all the garbage that is being created." We share your concern for the environment, and you'll be happy to know that—because of the environmental concerns as well as for other logistical reasons—we've stopped using the plastic bags. If this results in excessive damage to the magazines in transit, we may be forced to reconsider. But we hope we can find solutions that keep both our readers and our planet happy.

Keep those cards and letters coming (preferably on recycled paper). Send them to Letters to the Editor, c/o MacUser, 950 Tower Lane, 18th floor, Foster City, CA 94404. All letters become the property of MacUser, and we reserve the right to edit letters we print.

SAFETY IN ALPHANUMERICS

Naturally no list of passwords could possibly specify all the ones that users should disqualify, but Joel McNamara's list (in "For Your Eyes Only," September '88) was a little too short. Some obvious passwords are not simple words but are personal, and users should be warned against them, too. For example, it's not a good idea to use your own name, your spouse's name, or the names of any of your kids for a password-protected file. Anyone who is motivated will eventually run through the whole list—both backward and forward.

CompuServe requires passwords that include at least one nonalphabetic character. Including one somewhere in a password makes sense because it decreases the chances that it can be easily guessed. The most easily remembered passwords are the ones that are obscure but personal.

Too little time and space is spent on data security by Mac users. My theory is that they are generally open types who don't feel the need to be suspicious. Maybe that's one reason why viruses came so late to the Mac, and that when they did, the first was a "peace message."

MARION DELAHAN
BARTLESVILLE, OKLA.

II LITTLE II LATE

Maybe it's just because we Mac II owners aren't the top of the heap anymore, but it seems to me that the Mac IIx is about the least exciting "new" model that Apple has ever introduced. Sure, the 1.4-megabyte floppyfies are great, but it's a crime to run a 68030 at 16 megahertz when 33-megahertz versions are available now.

And when (if?) Apple does produce a 25- or 33-megahertz Macintosh, the IIx will certainly become one of those mysterious "in-between" models like the Mac 512KE or Apple III. Wouldn't it have been nice if Apple had used some of those recent price increases to make some slight modifications to the Mac II motherboard, pop in the 030/882, and keep the name (and price) the same? Then the "real" 030 machine to be announced soon, running at 33 megahertz, would be a worthy successor to the Mac II.

My frustration was similar when Apple presented the Apple IIGs, running at 3 megahertz when it could have run at 8. Apple fans will take any speed increase they can get, but to keep the Macs competitive with IBM (and the II series with Atari and Commodore), Apple has to use all the technology that is available.

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Second, our technician had no luck fixing the severe border pin-cushion effect (which also affects the shapes of objects on the screen: circles look like ovals, etc.) by following the article's instructions. The dealer's technician was able to square up the screen.

Third, be sure to ask the technician to focus the monitor at the same time that he or she fixes the pin-cushion effect, thus avoiding yet another trip to the dealer.

I now have a monitor that works fairly well but a dealer who despises me.

DAVID L. FRANK
FRESNO, CALIF.

While it doesn't mention the Macintosh or even Apple by name, the recent novel Time Pressure by Spider Robinson (Ace Books, 1988—and, no, I don't know the author or work for the publisher) contains an immensely amusing fictional account (I think it's fictional... I hope it's fictional... ) of the birth of the graphical interface and other assorted concepts that we all hold near and dear.

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Letters
tale by one of my favorite science fiction writers (it's also R-rated — reader beware), but if sci-fi is not your thing or if you just have to cheat, check out pages 99 through 105 in the paperback. A passing remark later in the book assigns literally cosmic importance to the invention of the Mac operating system (again without mentioning any names) and speculates about a brain/computer interface that uses a language called MindTalk. Know of any companies that use nomenclature like that? Finding these last two tidbits is left as an exercise for the reader.

Scrapbook has already become, in its brief tenure, my favorite part of your magazine. It is yet another reason, along with Dvorak, to read the book like a New York tabloid: back to front.

BILL DAUPHIN
CHERRY VALLEY, N.Y.

And bear in mind Douglas Adams’ Dirk Gently’s Holistic Detective Agency (Pocket Books, 1988), which tells the tale of a hapless Mac programmer for WayForward Technologies, publishers of the unreleased program Reason, the program used by the Pentagon to back-construct a logical-sounding rationale for virtually any desired conclusion from any set of premises.

Not to mix sci-fi and fantasy, but we understand that the unpublished fourth volume of the Lord of the Rings trilogy reflects the author’s late-life interest in data-communications technology. The working title: The Tolkien Ring Network. — JZ

ON WIDOWS...

Your response to Randy Gamage’s question about the Widow Control option in Word (in the September ’88 issue) was that a widow, in word-processing terminology, is “the last line of a paragraph when it ends up all by itself at the top of a new page or column.” I believe, however, that that is called an orphan. A widow is the first line of a paragraph left at the bottom of a page. Check your dictionary of word-processing terminologies.

PETER LAU
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Letters

Well, we did check — but unfortunately we checked the Word manual. You’re right: Microsoft’s definition differs from standard usage. — JZ

... AND ORPHANS

Fred Davis’ Ode to MacJoy (in the November ’88 issue) may seem warranted from where he sits, but it fails to consider the situation of the small, individual Mac users who supported Apple through its lean 1984-85 period. Our reward has been Apple’s continuing back-of-the-hand disinterest in providing us with reasonably priced ancillary equipment and upgrade paths beyond the Plus.

HARRY S. HALL
ARCADIA, CALIF.

Frederic Davis has too much money and is completely out of touch with the difficulties that many less wealthy computer users have with Apple’s greedy pricing policies. Fred, I’m sure very few people are tickled by your eager confession that you were “one of a select group of people who paid $15,000 for a Mac Plus.”

The acceptance of the Macintosh in the business community increasingly means that the community will dictate the direction of development and marketing at Apple. I don’t expect to see Apple’s Mr. Pepsi losing sleep over such considerations. Yet the Mac press should realize that Apple’s mission, as a now-mature corporation, is to make money. Nothing more, nothing less.

JOLYON WURR
OAKLAND, CALIF.

8 MAIL

I have trouble believing that John Dvorak (“The Disk 8 Disaster,” November ’88) was inexperienced enough to keep only one (count ’em: one!) type of backup for all his files, especially a hard-disk backup, when he knew he was receiving a new, more advanced model of Mac.

It is evidence that he reads your magazine less than he writes for it. The impatience he exhibited attempting to reload his files was an entertaining little tantrum, to be sure, and worthy of someone who has just bought his first computer or someone who does not
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Letters

have the persistence to weasel his way into an invitation-only party without an invitation. Too bad he has such a limited imagination. The Mac is suited to those who have a different approach to problem solving than to fly into a tizzy at the first sign of trouble (the second or third is the trick).

I personally threaten to throw my Mac out the window only once or twice a week. My brother (who owns an IBM) has actually done so, though he is noted for his mild disposition.

ALEX WHITNEY
FAIRFIELD, CONN.

WIN, LOSE, AND DRAW

The MacDraw II review in the November '88 issue was unfair! MacDraw II is a very smooth-running program with many features I had wished for in MacDraw 1.9 (like arrow keys to move objects). The interface is almost perfect, and the big font trouble is a thing of the past. Customizing the program is really well thought out. The zoom in and out works very accurately. Compared with its rivals, MacDraw II wins on all counts.

DANIEL VALEEE
RIVIERE-DU-LOUP, QUEBEC

GULLIVER'S TRAVAILS

I'm writing about your ho-hum review of Beyond Dark Castle. Yes, in a way it looks similar to the original Dark Castle, but BDC has some new and more challenging levels. They have very good sound effects, and the animation is really hot — the best. Here's my review:

What I found good about Beyond Dark Castle was the practice mode that can take you to any level for a good fight. The Black Knight's brew-ery is one of my favorites. After that level, I think they shouldn't have labyrinths, which I found purely boring. Also, when you get knocked out, your enemies should freeze and not be able to kill you. And I think there should be an easier way to get to the Black Knight. There should be many more new villains, and the orbs should have some kind of twinkly animation. Also, the Big Bird should have a more realistic sound, like the gargoyle has in the original game.

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But I still think it’s excellent play. The quality of the game is what impresses me. I always go back to it. It’s the best game I have ever played. I would give it five fat mice — no, rats.

GULLIVER PARASCANDOLO (AGE 9)
SAN MATEO, CALIF.

BLIGHT SPIRIT
When MacUser’s Scrapbook first appeared, I dismissed it as a self-indulgent bit of nothing edited by twelve-year-olds who thought they were clever. I now believe that assessment was too generous.

The November ’88 “Top Ten” list by Jane Berliss about the few remaining uses for a 128K Mac is the most blatant example of fatheaded smugness I have yet to see in a Macintosh publication. Like all of the Mac rags, MacUser perpetuates the fiction that newer is better and that anyone who doesn’t immediately dump yesterday’s configuration in favor of today’s glitch-ridden model is a hopeless case.

Generally this wrong-headed and just plain wrong bias is subtle — seldom showing anything other than Mac IIs on the covers and inside illustrations — but, then, the third-grade humor that permeates “Scrapbook” is about as subtle as Pee-wee Herman.

A tool that performs the user’s task well is a good tool. A tool that does not is a poor tool. Age, platinum cases, or color monitors have nothing to do with it. For example, my four-year-old Imagewriter justifies itself by being a good tool — that is by reliably doing the job I demand of it. I sit at user-group meetings and listen to others complain about problems with their ImageWriter IIIs and LQs, and I smile.

And I haven’t missed the point that Scrapbook is supposed to be funny. But this kind of “humor” makes Gilligan’s Island” look like Noel Coward.

WILLIAM J. REYNOLDS
SIOUX FALLS, S.D.

The technological imperative, while seemingly motivated solely by the elitism of the user, is nonetheless also inextricably linked to the factor of consumer-available software products, the contemporary majority of which are incompatible with the more primitive incarnations of the machines. Or, to cite the vernacular of the aforementioned Mr. Herman, “I love my 128K Mac, but I wouldn’t want to marry it.” — Jane Berliss

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For My NeXT Trick

The long-awaited formal announcement of the NeXT computer, to which Steve Jobs invited around 4,000 of his nearest and dearest — and the press — was greeted with the kind of hysteria and ticket scalping you might associate with the return of the Beatles. It was certainly the event of the Silicon Valley season, and everyone with the possible exception of a few professional cynics was there to see Jobs try to pull off the third major coup of his career. The jury is still out on whether he succeeded.

On settling into their assigned rows, attendees were greeted with a huge black-and-white NeXT logo on a screen. When Jobs walked to the microphone (about 45 minutes late), the logo changed to color — an obvious indication that the transition to Oz was successful. As the presentation went on, one thing became abundantly clear: About the only thing the press had been right about in its prophecies about the machine was its black color.

The $6,500 NeXT system includes a 17-inch screen; a keyboard; a mouse; a one-foot cube with 8 megabytes of RAM standard; and a read/write, 256-megabyte optical disk (see the box for full technical specs). The 400 dot-per-inch (dpi) laser printer, which uses the same Canon engine as the 300-dpi LaserWriter, comes as a $2,000 option, as do 330-megabyte and 660-megabyte Winchester drives. Everything — the display and the printer — is PostScript, and nothing is in color. Put all together, the system looks like Bloom County's Banana Jr. as designed by Darth Vader's tailor.

The CPU runs off Motorola's 68030 memory management chip; the 68882 math chip (both at a 25-megahertz clip); and the Motorola 56001 digital signal processor, which supports the high-quality sound. The most interesting components are two proprietary very large-scale integration (VLSI) chips, referred to by Jobs, in what many see as a fit of hyperbole, as "mainframes on a chip." One of the chips handles data throughput, and one controls the optical disk. The boards are manufactured entirely by robotics in NeXT's Fremont, Calif., factory. The whole thing has an almost irresistible science-fiction flavor to it.

This is a machine with a software "platform" as well. The operating system is Mach, a UNIX variant. Both users and developers are served by NeXtStep, an object-oriented environment that supports both the user interface and the development of third-party applications. Included on the optical disk are WriteNow, Mathematica, Allegro Common Lisp, a version of Sybase, an E-mail application, and "Digital Library."

The library is made up of the full text and graphics of Webster's Ninth New Collegiate Dictionary, Webster's Collegiate Thesaurus, The Oxford Dictionary of Quotations, and the Oxford University Press edition of William Shakespeare: The Complete Works, as well as all the NeXT manuals and technical documents. (It's like those lists of "Books You Want on a Desert Island"; the only things missing are the Bible and an obstetrics textbook.)

The two big surprises of the announcement were the use of an erasable optical storage medium from Canon and NeXT's licensing agreement with IBM. Together, they show Jobs as both a visionary and a hard-core pragmatist. The IBM announcement seems to indicate that even if the machine itself doesn't catch on, there will be a market for the technology. And while Jobs quietly focuses his efforts on the higher education market, third parties will be writing IBM business software that can be recompiled to run on NeXT if — no, when — Jobs decides to broaden his scope.

The most impressive thing about the machine and the event was the technology and the excitement generated by the technology. For several hours, everyone present was surrounded by people who were more interested in possibilities than in corporate...
cost effectiveness. Even so, what’s new is the combination, rather than the components.

The bottom line is that here we have a machine that is so tightly targeted for one market — education — that the company has no staff or procedures in place to sell to individual users — or to any other markets. And even within the target market, the NeXT machine is clearly oriented more toward the sciences than toward liberal arts. Equally clearly, the machine is not ready to go out to all those eager students of whatever departments. As I write this in October 1988, the first machines are due to ship next month — to developers. And a lot of those developers have already adopted a firm wait-and-see attitude.

Look at it this way: By the time you read this, there will probably be comparable optical storage for your Mac. With that and a can of black spray paint, you’ll be ahead of the game.

— Louise Kohl

### STacks On Atari

You’re looking at HyperCard’s Home Card, so naturally you figure you’re working on a Mac. Wrong. It’s an Atari ST. That’s right, Gadgets by Small, the people who brought you Magic Sac, have now produced Spectre 128, a Macintosh Plus emulator.

Using the 128K ROMs, the Spectre 128 boasts improved compatibility with Mac programs. An earlier iteration of this emulator, Magic Sac, supposedly let the ST run Mac software, but there were some compatibility problems — it used the 64K ROMs. The Spectre 128 turns your Atari ST into a Mac Plus, only it gives you a bigger screen (30 percent bigger than the Mac Plus). So now you can run not only HyperCard but also such programs as MacPaint 2.0 and MacWrite 5.0. It also supports the Hierarchical File System (HFS) format (the 128K ROMs have HFS built into them) and Apple hard disks.

Don’t expect the Spectre Mac to have any of the sound capabilities that you’re used to, however. Spectre 128 doesn’t even support Apple MIDI. Spectre 128, now shipping, sells for $179.95, but this doesn’t include the 128K ROMs, which you need to purchase from computer resellers. For more information or to order your Spectre 128, call Gadgets by Small at (303) 791-6098 between 8:30 a.m. and 2:30 p.m., mountain standard time, or write them at 40 W. Littleton Blvd., Suite 210-211, Littleton, CO 80120.

— Kristi Coale

### Touch ‘n’ Go

If using the mouse to press a button on a Mac screen has ever seemed peculiar to you, what you’ve really been waiting for is a touch screen. (If you’ve never pondered this before, perhaps you should.) Fortunately for those of you who have been losing sleep over this issue, MicroTouch Systems has been making Mac touch screens for over a year, has a couple of new models.

The Mac ‘n Touch Add-in Kit (don’t they know ‘n’ has two apostrophes?) is a $695, dealer-installable package that mounts to the CRT face and behind the Mac bezel. With the controller mounted internally and the unit drawing power via the ADB port, a Mac outfitted with Mac ‘n Touch looks indistinguishable from a regular Mac — except that you can do all your mouse actions just by touching the screen. The Add-in Kit is an ADB device that comes in sizes for the SE and Apple RGB monitors. MicroTouch also offers a 10-inch diagonal model for larger displays.

And for those users who don’t want anyone monkeying around with their Macs’ insides, MicroTouch has the Mac ‘n Touch Snap-on Kit (sigh — only one apostrophe again). The Snap-on Kit fits only the SE and costs $595, but its major advantage is that everything mounts externally. The glass screen fits over the SE display, and the controller resides in a box that plugs into an ADB port.

The Mac ‘n Touch systems are available from MicroTouch Systems, 10 State St., Woburn, MA 01801; (617) 935-0080.

— Russell Ito

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**EDITED BY GIL DAVIS**

**Cheaper Color Coming**

BEAVERTON, ORE — Tektronix has announced a family of new color printing hardware that represents a significant price breakthrough. The QuickDraw-compatible Color-Quick Ink-Jet Printer, priced under $3,000, prints at 216 dots per inch (dpi) and can be coupled with a (non-Adobe) PostScript controller that includes a 40-megabyte hard disk, between 8 and 11 megabytes of RAM, and spooling software for a total of $16,000.

**Paperless MacUser**

COLUMBUS, OHIO — MacUser, MacWEEK, and data from 143 other computer magazines are now available on-line through CompuServe. You can identify articles by searching for specific words or by searching for a magazine, author, date, subject, company, product name, featured person, or ticker symbol. This service is supplied by Information Access Company and Ziff Communications Co. To reach this computer library from within CompuServe, type GO COMPLIB.

**Super Memory**

Memory makers are breaking the Mac II memory barrier of 8 megabytes by stacking four 1-megabyte SIMMs where one 1-megabyte SIMM used to be, allowing a Mac II to hold a whopping 32 megabytes of RAM. Micron Technology of Boise, Idaho, charges $14,500 for 16 megabytes of its SuperSIMMs, while Pinnacle Sales in Santa Clara, Calif., charges $7,500 to $8,000 for the same 16 megabytes. But beware: You must have the correct ROM for the memory to work properly — check with the manufacturer.

**Thin Bits...** How to connect Macs to PCs is explained on a free 5.25-inch disk available from Apple dealers...

**Sun Remarketing** has announced a national program in which it will buy used Macintoshes from computer dealers who want to accept customer trade-ins... The Software Publishers Association reports that Mac software sales for the first nine months of 1988 were up 87 percent over the previous year, compared with PC software sales, which rose only 45 percent... Julian Systems and MacroMind have agreed to bundle MacroMind's VideoWorks II software with Julian's NTSC Converter hardware to enable users to create animated presentations for video viewing... gigaPIX, from Genius, provides a missing link between Mac and video output. Any 8- to 24-bit Mac color image can be transferred to a Genius 8-millimeter tape unit, which records a video image one frame at a time. On receipt of the tape, Genius converts it to broadcast-quality color videotape in the D-1 format... DacSoftware, which publishes Dac-Easy Light accounting software, has entered into a joint venture agreement with Personal Computer Support Group...

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Speaking Out: Reactions to Apple's Price Increase

Apple recently raised the list prices for its Macintosh SE and II computers. A Mac II with no internal hard disk rose 29 percent to $4,869, and a bare SE with a standard keyboard rose 14 percent to $3,169. Mac Plus pricing remains at $1,799. Apple cites the rising cost of memory chips and increased demand as its reasons for the price jumps. We asked representatives of different parts of the Macintosh community for their reactions.

"I found the Mac price hikes pretty disappointing, considering that memory prices are decreasing and IBM has actually reduced some computer prices. People I know who were leaning toward buying a Mac are now leaning toward DOS machines because they find the pricing unrealistic and above their machine's performance. "

"We have a shade under 1,200 members, and they were shocked by the price increases because they were totally unannounced. But they've recovered from it, as feelings tend to die down rather quickly."

Brian Setigungnn, president of the Portland Macintosh Users Group

"Almost all of my sales are into the corporate market, which buys mostly Mac IIs. Since the price increases, I've seen no decline in demand, and price doesn't even come up as a subject unless somebody hears about Macs that were ordered before the price hike. People are willing to pay because the Mac is such a great product. After all, if it's saving you $10,000 a month in typesetting costs, a $400 extra initial expense doesn't really make any difference."

Heather Dunfield, Senior Sales Representative for ComputerLand in San Francisco

"My thesis is that Apple is growing so fast it's running out of parking lots, telephones, and space for employees. It also has a hiring freeze. I think they realize they're growing too fast but that slowing down sales would adversely impact their stock prices. So their solution is to raise prices, keep their income up, and then to reorganize, refocus, and increase their staff to position themselves to become a $10 billion company. That's a help to third-party suppliers like us, because we also need some breathing room to come up to speed."

Steve Edelman, President of SuperMac Software

"We're a government agency that purchases a large number of Macs each year. Since we pay much lower prices than walk-in customers, Apple's price hikes don't impact us as much. In addition, we often need additional, high-end capabilities. This added hardware and software can easily cost more than the basic Mac, even if it's a IIx. And since we pay for them over a 24-month period, a few hundred dollars more isn't a major consideration."

George Saunders, Computer Information Consultant with the Washington State Department of Transportation
When Apple boosted prices on the Macintosh II last September by nearly 30 percent ($1,100 per system), higher memory prices were blamed. Apple senior vice president Charles M. Boesenberg said, "To continue fulfilling the increasingly high demand for our products, we are required to pursue more costly channels for dynamic random access memory (DRAM) acquisition, thereby increasing the component costs of our products."

The explanation seemed plausible. After all, hadn’t there been a lot of press coverage of the chip shortage over the summer? Not just computer-oriented publications, but even The New York Times and The Wall Street Journal were writing about the DRAM drought. It was even discussed on network television news. Demand for semiconductors generally and DRAMs in particular exceeded supply during the first half of 1988. The U.S.-Japan trade agreement over the pricing of memory chips had curtailed supply and boosted prices. Strong demand did the rest of the job. Apple was merely responding to increased parts costs, wasn’t it?

Well, if you believe that one, then I’ve got a bridge between lower Manhattan and Brooklyn, N.Y., that I can sell to you cheap. Just sign here and it’s yours! I recognize you. Old P. T. Barnum said there’s another one like you born every minute!

If, however, you can’t help wondering whether something other than DRAM costs might have had something to do with Apple’s price increases, let me congratulate you on your intuition and basic common sense. For the claim that DRAM prices drove Apple to raise prices does not hold up to even casual scrutiny. In fact, memory prices were actually falling again by the time Apple raised prices in September.

But even at the height of DRAM prices early last year, the $1,100 tacked onto the Mac II would have bought nearly 4 megabytes of memory. The base configuration of the Mac II included only 1 megabyte of memory, however, so it’s a little hard to see how memory costs justify a price hike of that size. What’s more, both the Mac Plus and the SE come standard with the same 1 megabyte of base memory. Yet the price hike on the SE was a more modest $400 (about 14 percent), and Apple didn’t raise the price on the Plus at all.

Clearly Apple’s explanation of the decreases doesn’t hold water. Were higher memory costs really the issue, then the prices of all models would have been increased in proportion to the memory they contained. Instead, we saw increases for the Mac II well out of proportion to the amount of memory it contains.

The real reason is that given strong demand and somewhat constrained production for the Macintosh II, Apple simply chose to charge what it thought the market would bear. The DRAM drought was an excuse to distract attention from Apple’s desire to put more of the customer’s money into its own pocket. The price increases were dictated not by memory costs but by the ratios of demand to supply. The Mac II, shortest in supply relative to demand, got the biggest boost. The price of the Mac Plus, with the lower demand of a soon-to-be-obsolete model (but still in great supply) remained unchanged.

The subsequent introduction of the IIx, of course, was as much a new price hike as it was a new model. The enormous success the Macintosh has had in businesses over the past year has owed a lot to the Mac II’s ability to deliver the Mac’s original ease of use combined with color graphics and a powerful, expandable system. The Mac II was able to deliver what, for the most part, the IBM PS/2 and compatible systems could only talk about. The reason Apple was able to raise prices substantially, however, was that the Mac’s architecture remains proprietary. Unlike the MS-DOS world of the past and the OS/2 world of the future, the Macintosh world has only one vendor, hence no price competition.

All that is likely to change over the year ahead, however. A Mac-like graphics user interface is gaining momentum in the MS-DOS and OS/2 worlds in the form of the Windows Presentation Manager. At the same time, other vendors are starting to get serious about possible Mac clones. UNIX-based alternatives, too, are emerging, from the standards of AT&T or OSF to the proprietary innovations of NeXT. Intensified competitive pressures on all sides are eroding Apple’s ability to engage in the kind of pricing practices that long characterized IBM’s mainframe systems. The result is that Apple’s price increases of late 1987 are likely to be the last of their kind for some time.

By William Zachmann
**Streching Canvas**

With its recent release of Canvas 2.0, Deneba Software has taken its first major evolutionary leap. To its nicely featured draw/paint application, Deneba has added full support for the Mac II’s 16.7 million colors, a much-improved transition between its paint and draw modes, new power tools, and unlimited draw/paint layers.

Canvas 2.0’s working window and tool palette have retained their basic look, but pressing the Option key when clicking on most tools now reveals pop-out choices for various effects and modes.

Among the new features are full-blown multipoint Bezier curves; automatic tracing of bit maps to produce editable object outlines; sophisticated polygon editing that includes path cutting and multiobject splicing; and the ability to skew, distort, and add perspective to anything from bit maps to text objects.

Precision tools and features include line thicknesses from 0.003 to 127 points, numerical scaling, rotating, positioning, auto-dimensioning lines, custom arrows, viewpoints that you can name and save, area and perimeter calculation, and an information window that tells you everything about a selected object.

Canvas’s paint tool improvements include a customizable airbrush; the ability to jump instantly into paint mode the moment you use a paint tool; and a cropping operation that shrinks bitmapped objects to eliminate unused white space. Unlike PixelPaint or Studio/8, Canvas 2.0 limits a given paint item to only two of 16.7 million colors — one for the foreground (the ink) and one for the background. To get more colors, you must layer paintings and objects.

Canvas 2.0 is a free upgrade to registered Canvas owners. Owners of the version 1.0 DA will receive a free upgrade to the new DA, or they can upgrade to the full 2.0 package for $100.

First-time buyers can buy Canvas 2.0 for $299.95 from Deneba Software, 7555 N.W. 12th St., Suite 202, Miami, FL 33126; (305) 594-6065.

— Salvatore Parascandolo

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**See Deese Pictures**

Stock photography has long been available to traditional publishers, but until the advent of CD-ROM, desktop publishers generally didn’t have easy access to the catalogs of photos many agencies offer. That’s where Comstock comes in. Comstock Desktop Photography is a CD-ROM with 449 gray-scale TIFF images culled from the agency’s extensive collection of stock photos.

Purchasers of this CD-ROM, however, should know that these 75-dot-per-inch images come with some legal restrictions. The photos are only licensed for use in noncommercial in-house publications, comprehensive renderings, or rough layouts. They can’t be used as clip art or as the basis of derivative works that will be sold commercially unless you pay additional royalties.

Even with these restrictions, though, Comstock Desktop Photography ($500) should help improve those dreary company newsletters and announcements we’ve all come to know and love.

To get your CD-ROM, contact Comstock, The Comstock Building, 30 Irving Place, New York, NY 10003; (212) 353-8686.

— Russell Ito

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**The NISUS One So Far**

With all the brouhaha that has attended programs such as FullWrite Professional and any new version of Word, it’s sometimes hard to realize that there may be other word processors out there. It’s equally hard to believe that any word processor could live up to the hype preceding its appearance. Well, there’s not only another excellent word processor to come, but it’s been more or less unhyped so far.

Paragon Concepts, the company that developed and publishes QUED/M, is now developing a word processor called NISUS. A recent hands-on demo of the product has led to love at first sight. NISUS not only has all the bells and whistles, but they all work in the same key — and they work (for at least) just fine on a 1-megabyte machine.

Here’s a partial list of the features you can expect: ten editable clipboards, integrated text and graphics, multiple windows, a replace function that works in all open files at once, font- and stylesensitive search and replace, and multiple columns.

You’re going to love the indexing. Highlight the word you want to include in the index, choose the index command from a menu, and the program opens a new document and adds all the relevant page numbers. (OK, you’ll probably have to do some editing afterward, but how much of that do you have to do now?)

NISUS supports macro functions and comes with 50 macros already in place. It also comes with an extensive spelling checker, a thesaurus and an integrated glossary. One of the more impressive things about NISUS is that the programmers have consistently given you more than they had to. For instance, the “choose column” function lets you change font, point size, and so on in a single column, whether the manuscript has been set up in columns or not.

NISUS could be out by the time you read this, but if you can’t find it, get in touch with Paragon Concepts at 4954 Sun Valley Road, Del Mar, CA 92014; (619) 481-1477, or outside California (800) 922-2993.

— Louise Kohl

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![Diagram of Comstock Desktop Photography CD-ROM](image)

Pretty as a picture. Comstock Desktop Photography is a CD-ROM with 449 TIFF versions of photos culled from their stock photo archives.
MANAGING YOUR MONEY... NO OTHER PROGRAM DOES MORE FOR YOUR MONEY.

Managing Your Money® is the most comprehensive, easy to use money management program available on the Macintosh™! Fully integrated and updated for the new tax laws, MYM Mac is everything you'll ever need to master your personal or small business finances:

- CHECK WRITING AND BUDGETING
- TAX PLANNING
- INSURANCE PLANNING
- FINANCIAL PLANNING
- PORTFOLIO MANAGER
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And there's more:

- POWERFUL SMALL BUSINESS FEATURES
- EXTENSIVE GRAPHICS & REPORTING
- EXPORTS TO EXCEL® AND MACINTAX®
- NOT COPY PROTECTED

Let Andrew Tobias become your financial advisor and find out why year after year, Managing Your Money is rated the outstanding program in its class.

"...Managing Your Money is the Mercedes of personal finance programs."

— Macweek, 9/13/88
Economy. Mirror's great looks in a zero-footprint design that brings mass storage within anyone's budget, yet includes—free of charge as with all Mirror hard drives—Mirror's hard drive value package*. And with Mirror Technologies' return policy and one-year warranty, you can't go wrong.

*Mirror Technologies' Hard Drive Value Package.

Again, your choice: high speed or lower price. We'll double our usual one-year warranty on the 19ms "Plus" drive to two years. 80 Mb is enough for highly complex networking and accounting applications. Shop the price on other 80 Mb drives. Ours is less expensive, and you still get all of the Mirror extras! 

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M80 + : Call for price.

Our numbers look as good as our products.

It's because you buy directly from the manufacturer. No commissions. No markups. Just prices up to 40% less than you'd pay in a computer store. You still get all of the extras like our hard drive value package. And friendly, intelligent people who understand the Macintosh.

*Mirror Technologies' hard drive value package.

M100, M200 – 100 & 200 Mb Externals

Mega-memory at a micro price. And talk about speed! The M100 is fast, but the M200, at 15ms, is awesome! Fan-cooled reliability, and Mirror's conservative philosophy means you can't find a more secure storage medium. Preformatted. Just plug and play!

*Includes Mirror Technologies' hard drive value package.

M200: Call.

*Mirror Hard Drive Value Package:

- Preformatted
- Embedded SCSI
- NTX compatible
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- Rear-panel AC outlet
- External SCSI address selector
- SCSI cable
- Whisper-quiet cooling fan
- Hard Driver® formatting and diagnostic utility
- LaserSpeed® LaserWriter spooler
- Numerous other utilities
- Backup utility
- 10 Mb of Public-domain software stacks
- 2-year warranty

We set the standards for low-cost removable storage. This little drive packs 8 Mb (800K) of data on each 3½ disk! MacWorld says of our RM.8, "So quiet it would be unobtrusive anywhere except a library on a Friday night. "Try it for 30 days, and if you don't like it, we'll take it back. You won't find a similar brand-name product for less!

Quality is always a better value. Especially if it costs less.

Lost data can put you out of business. That's why Mirror Technologies uses only the best. And why we build in those extras that mean greater data security. When integrated with rugged power supplies and whisper-quiet cooling systems in our steel chassis, you can double-click "Save" with confidence.
You won't find a brand-name 60 Mb drive for less. And you still get Mimr’r’s EMI/RFI protection, heavy-duty power supply, AC convenience outlet, whisper-quiet cooling fan, rear-panel SCSI address, and other standard Mimr’r features. Compare. Then give us a call!

Includes Mirror Technology hard drive value package.

M60 – 60 Mb External

$757

You’ll get better help than from a computer store salesman.

If you need to know about any product, ask its maker. At Mirror, our Mac experts have been hand-picked and trained to be able to answer your questions. Better help than you’ll get from salesmen in most computer stores. You simply can’t find better products, with better service, at a better price—anywhere. Call today.

You could be using a Mirror Technology drive tomorrow.

We almost always ship within 24 hours. If we don’t ship within 24 hours of credit approval, we’ll pay the freight! And with optional express shipping, you could be up and running by noon tomorrow. You simply can’t find better products, with better service, at a better price—anywhere. Call today.

RM20 Removable Flexxy Disk Drive

Think of it as a huge floppy disk. Using media developed by Kodak and Verbatim, the flexxy disks carry a lifetime guarantee! Speed? Our RM20 is as fast as most 20 Mb hard drives! An extremely low cost per MB for backup, for archiving, or for your primary storage medium. And we sell our RM20 for over a hundred dollars less than the competition, complete with Hard Driver™ formatting and diagnostic utility, Symantec’s LaserSpeed™ LaserWriter printer spooler, and numerous other utilities, including a backup utility, External SCSI address selector, our whisper-quiet cooling fan, built in AC EMI/RFI noise filter.

You’ll get better help than from a computer store salesman.

If you need to know about any product, ask its maker. At Mirror, our Mac experts have been hand-picked and trained to be able to answer your questions. Better help than you’ll get from salesmen in most computer stores. You simply can’t find better products, with better service, at a better price—anywhere. Call today.

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We almost always ship within 24 hours. If we don’t ship within 24 hours of credit approval, we’ll pay the freight! And with optional express shipping, you could be up and running by noon tomorrow. You simply can’t find better products, with better service, at a better price—anywhere. Call today.

VisionScan 200

$597

A VisionScan scanner— an unlimited supply of art & graphics! Anything you can lay on the flatbed can be quickly and easily entered into and manipulated with your Mac at half the price of competing flatbed scanners! A BYTE reviewer wrote, “If it were my money, I’d buy the Mirror Technology VisionScan. Its price/performance ratio is unequalled”.

Includes Mirror Technology hard drive value package.

Vision Scan 300

$797

A Mirror exclusive: either works as a DA so you don’t have to exit the application you’re using. Get the 300 dpi VisionScan 300 for excellent line art and affordable halftones, or the 200 dpi VisionScan 200 for excellent line art and excellent halftones, and we’ll send you Zedcor’s DeskPaint, free! Optical character recognition software available.

Includes Mirror Technology hard drive value package.

Internal Hard Drives: 30, 40, 80, 100, 200

$497

Only Mirror Technologies allows you to add an internal hard disk in an SE already containing either two floppies or a floppy and a hard disk! Up to 200 additional MB in your SE! And Mac II users can add two of our drives; up to 400MB of internal storage, another Mirror exclusive! Includes Mirror Technology hard drive value package.

Another number you’ll love.

30 days at our risk.

We know you can’t get a better value anywhere. It’s up to us to prove it to you. Try a Mirror product for 30 days; if you don’t think it’s a great value, call us, send it back, and we’ll refund the price of your unit. We’re confident that you will like our prices, our products and our service.

Another number you’ll love.

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We know you can’t get a better value anywhere. It’s up to us to prove it to you. Try a Mirror product for 30 days; if you don’t think it’s a great value, call us, send it back, and we’ll refund the price of your unit. We’re confident that you will like our prices, our products and our service.
**NEW ON THE MENU**

**Play It Again, Mac**

Sometimes a little knowledge can be an annoying thing - like when you're the only one in the office who knows how to transpose Excel rows and columns. For those occasions when you're tired of giving demos, Farallon Computing has introduced ScreenRecorder, a program that records your screen actions to disk and then, just like a videotape, lets you play back the sequence at various speeds.

ScreenRecorder is a DA, so it's always available, and recorded sequences can be played back regardless of whether the application being demonstrated is present. It also includes a Looping Tape option that continuously records the last several minutes of a user's current session.

Because ScreenRecorder's on-screen controls look like those found on any tape recorder or VCR, using the package shouldn't require any extensive training. ScreenRecorder lists for $195 and is available from Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704; (415) 849-2331.

— Russell Ito

**Digital Acrobatics**

Just when you thought it was safe to return to your desktop, AlSoft gives you two hands to juggle with — Font/DA Juggler Plus and MasterJuggler. More than a mere mover of DAs and fonts, Juggler Plus lets you play Mac II sounds and select system sounds to play in place of the standard beep. You also have an FKey/Sound Mover for copying, renaming, renumbering, and removing Fkeys and sounds as well as having a Font/DA Utility to rename and renumber fonts and DAs.

MasterJuggler does all that Juggler Plus can do and more. For one thing, it's multiserver. You can assign sounds to specific functions through the HotSounds option, and you can play and convert any sound files from SoundCap, SoundWave, or SoundEdit to Mac II or HyperCard sound resource files. Beyond sound, MasterJuggler lets you configure or reconfigure operations for the application without having to use programs like ResEdit. You can also create a pop-up menu listing applications from your desktop, and you can open these without going back to the Finder.

Both programs work on any Mac from the 512KE up. Neither program is compatible with Suit-
case. Font/DA Juggler Plus sells for $59.95, MasterJuggler for $79.95. For more information, contact Al.Soft at P.O. Box 927, Spring, TX 77383-0927; (713) 353-4090.

-Kristi Coale

CD-ROM: Alive and Twitching

When Steve Jobs unveiled the erasable optical disk drive in the NeXT machine last October, a lot of pundits immediately pronounced the death of CD-ROM—why would anybody invest in a still-unproven read-only medium now that Canon’s read/write optical technology was suddenly close enough to touch (if you distracted the security guards)?

The pundits may have a point. I wouldn’t say the mood at the CD-ROM Expo ’88 in Chicago a month earlier was comatose, but the joint was not exactly jumping. The biggest news was the announcement of yet another optical media format—CD-ROM XA—to join the ranks of CD-ROM, write once, read many (WORM); Digital Video Interactive (DVI); Interactive Video Disc (IVD); et al. CD-ROM XA—being developed and supported by optical media bigwigs Microsoft, Sony, and Philips—is actually intended to reduce the fragmentation rather than increase it. The idea is that if you follow the specifications of this extended architecture (hence the name XA) for CD-ROM discs, the discs will be compatible with Compact Disc Interactive (CD-I) players in the future. CD-I and CD-ROM are similar technologies for developing interactive systems for accessing data—both put hundreds of megabytes of data, sound, and video on a single optical disc. The difference between them is that CD-ROM is designed to be used as a computer peripheral (with the computer running applications like HyperCard or VideoWorks), and CD-I is intended as a standalone that will run on an inexpensive, self-contained player. CD-I applications will be less sophisticated and less flexible, but they’ll be more widely distributed. Meanwhile, CD-ROM XA provides a path for today’s applications developed for the more specialized world of CD-ROM to move seamlessly toward tomorrow’s potentially bigger world of CD-I.

At least that’s the theory. There are still no CD-ROM titles that have galvanized the marketplace—we’re all still waiting for the 1-2-3 of CD-ROM. There were a couple of new CD-ROMs for the Mac on the show floor, including a demo disc that Apple is now shipping with every AppleCD SC drive. The disc is aimed mostly at developers—who presumably constitute most of the market right now—and shows examples of how to use HyperCard as a front end for CD-ROM applications. Quantum Access (which can be contacted at 1700 West Loop S., Suite 1460, Houston, TX 77027; (713) 622-3211) also had a new version of its ClubMac disc of public domain software out.

The product everyone was talking about, though, was the new DynaBook from Scenario (which can be reached at 225 Holland St., Somerville, MA 02144; (617) 625-1818). Despite the Apple/PARC heritage of the name, DynaBook is an MS-DOS laptop that’s designed specifically for CD-ROM applications. DynaBook has a built-in CD-ROM drive but no keyboard and no mouse; all commands are entered via a touch screen. (Resellers can port existing applications to touch-screen operation by using conversion software from Scenario.) CD-ROM applications usually don’t have many commands, anyway; the goal is to combine simplicity and portability of massive amounts of data. The $4,995 DynaBook looks a lot like Apple’s mythical Knowledge Navigator—it’s a sleek, high-resolution, portable window on the world. Although Scenario hasn’t ruled out the possibility, unfortunately there are no plans to develop a Mac version. We’ll have to wait and see what Apple’s laptop has to offer.

-Jon Zilber
NEW ON THE MENU

Terp the Lied

Fantastic

To many people, Mac music means the occasional beep, boing, or kiss goodbye. Sure, there's a four-voice synthesizer in there somewhere, but when was the last time you heard anything worth listening to a second time?

If you happen to own a copy of ConcertWare+ (or ConcertWare+ MIDI), one solution is to boot ConcertWare+ Music. In volumes 1 through 7, which list for $15 each, you can sample everything from music of the Renaissance to popular music from 1900-1930 to jazz with a French twist. There's even a disk of Christmas favorites for those who like a taste of the holiday spirit all year round.

Or, if you'd rather go for baroque, try some switched-on Praetorius. Terpsichore, which lists for $49.95, is a beautiful collection of music arranged and transcribed by Richard Rae. You can play the music either through the Mac's internal sound generator or ideally via MIDI to an external synthesizer (a multitimbral machine works best). The manual is nicely put together and supplies program notes as well as technical information. Why, it even tells you that you can learn more by contacting Great Wave Software, 5880 Scotts Valley Drive, Scotts Valley, CA 95066; (408) 438-1990.

Prerecorded MIDI sequences from other publishers (such as Soft-Drop and Syn-Comp Productions) are proliferating. Because of the complications entailed in licensing contemporary music for publication or performance, many sequence publishers are sticking with older material (for which the copyrights have expired) or with original music (commissioned with the sale in sequenced form in mind). One music publisher who owns the rights to a vast amount of contemporary music—Warner Brothers—has indicated that it plans to begin issuing prerecorded sequences by the end of 1988 in a new compact-disc format called CD+MIDI. Both digital music and digital sequences will be included.

—Christopher Breen

Amazing Numbers

Little Junior needs to work on math but would rather be playing games. Well, parents and teachers, sit Junior down in front of a Mac, turn on NumberMaze, and set Junior loose to wind a way through the maze to reach the castle.

NumberMaze by Great Wave Software gives children aged 6 to 12 the fun of solving mazes while giving them practice in basic math skills. Your progress
through the maze depends on your skills in solving numerical and word problems in counting, addition, subtraction, multiplication, and division. When you drag your playing piece (horse, car, and so on) to a doorway, the screen changes to a doorway, and a math problem appears. After solving several problems, you return to the maze, move through that doorway, and on to the next and the next set of problems. Numerous doors, disappearing and invisible walls, and keys and books to collect make the mazes more challenging. The problems get harder as the student's skills increase.

The NumberMaze curriculum is based on five major math textbook series for grades one through six.

CustomMaze, included with NumberMaze, lets the parent or teacher personalize word problems by adding familiar names, choosing problem types and difficulty, and choosing mastery levels. The student's progress is monitored in the statistics window, and there's even a certificate of achievement that can be personalized and printed.

List price for NumberMaze is $49.95. For more information, contact Great Wave Software at 5353 Scotts Valley Drive, Scotts Valley, CA 95066; (408) 498-1990.

—Laura Johnson

**Interplanetary Mac**

Have you ever stared at the dusky evening sky and wondered whether that twinkling star gleaming above was Venus or Mars? Owning a telescope might help, but there is a new way to discover what's up above without using one. Voyager 1.0, the Interactive Desktop Planetarium from Carina Software, will take you where no one has gone before.

Designed and developed by a professional astronomer, Voyager lets the user explore the universe from a Mac. Click on any one of the many thousands of objects found on the Sky Chart, and Voyager will feed you plenty of scientific information. Find out how far Planet X (the supposed tenth planet) is from Earth, or find out how hot the Sun really is. Explore Aquarius and Pisces. View the galaxy from another planet, center on a specific constellation, or recreate the motion of the sky. Voyager's database holds all of this information and more. (A future version will even include satellites.)

Travel to distant galaxies might only be a fantasy for now, but with Voyager 1.0, which retails for $99.95, learning about the stars hanging above is easy and fun. For more information, you can reach Carina Software at 830 Williams St., San Leandro, CA 94577; (415) 352-7328.

—Michele Stokol
The road to success will always be paved in triplicate. But with new SmartForm" software and Macintosh personal computers, it's no longer the tollway it once was.

The SmartForm concept is simple: you can't reduce the paperwork, so reduce the amount of paper. And the printing, shipping and storage costs that go with it.

SmartForm Designer" includes all you need to whip out crisp, professional forms in a hurry. Fields, lists, check boxes, grids, combs, lines, ovals, rectangles—everything. And their sizes and locations can be pinpointed to the exact inch, centimeter, point or pica.

Type flexibility is almost unlimited. You can reverse, condense and expand fonts, adjust leading and

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NEW ON THE MENU

RUMOR MANAGER

The entire rumor-managing department of a sister magazine was replaced in one fell swoop last fall. Their downfall wasn't that they were getting too close to the truth or even that they were straying too far. They just let their internal bickering get out of control and very visible. So they were replaced.

We'd never let that happen to us. By the way, that's only a rumor.

Now that you can buy a an LCD printer that has laser-quality quality, far quicker performance, and a lower price, are you satisfied? You shouldn't be. The Casio folks, who are the actual developers of the LCD shutter printer engine that is the guts of the Jasmine/Qume printer, have just gotten started. They should soon be ready to show a 1,000-dot-per-inch (dpi) engine that combines LCD shutter technology with some major advances in precious-metal microgrid technology. The new engine will be as fast as the current LCD shutter engines (which is to say very fast) and should be available in sample quantities by the time you read this.

The modular software trend recently introduced by Silicon Beach Software (SuperPaint) and Select Micro Systems (Exstaxtix) is about to spread like wildfire.

Two more major publishers will announce modular products just about by the time you read this. And at least a dozen other publishers, both large and small, are looking into the technology. This certainly looks like the bandwagon to jump on.

The recent software quality control problems that have, umm, afflicted Apple appear to have been solved. No heads rolled, although the problems are blamed for a reorganization or two, and several of the recent group office moves. Anyway, the rather innovative new Apple testing programs (those involved already know the details) should prevent a recurrence of the problems. Now if only Microsoft looks at Apple's solution and takes notice.

Apple is considering a new series of hardware upgrades. No surprises there. However, do look for a late surprise: a Plus-to-SE upgrade, complete with a 30-megabyte hard disk (there are lots of leftovers) and 2 megabytes of RAM (but in 256K SIMMs). Price? Probably $899. Why? Large corporate customers tend to have lots of Pluses, and they're calling in some markers to keep their machines from falling too far behind the leading edge.

Color XCMDs for HyperCard will appear in reasonable quantity in 1989. But they won't be too spectacular, as Bill Atkinson isn't committed to color in HyperCard yet.

One of the fastest-growing segments in the Mac marketplace is computer-aided design and manufacturing (CAD and CAM). New programs by yet another French company and two very large California-based companies will help keep things boiling. And some soon-to-be-announced CRT technology breakthroughs will involve not only picture quality, as you'd correctly expect, but also physical dimensions (greatly reduced depth).
You can even give your forms “intelligent” features like automatic calculating and instant help.

Then, SmartForm Assistant lets everyone else in your company fill in your forms on a Macintosh. Quickly and accurately. But it won’t let anyone tamper with your designs.

With the SmartForm system, all your forms are stored on a Macintosh. You don’t print a copy until you’ve filled one out.

That can save you a bundle in shipping and storage costs. And when you move to a more prestigious address, the price of success won’t include thousands of dollars’ worth of outdated forms.

Finally, SmartForm will integrate with your other Macintosh software. So you can easily transfer information from forms to spreadsheets or databases.

If all this sounds like great form to you, call 800-3CLARIS, ext. 500, for more details. And learn how you can turn a paper loss into a real gain.

and weight (much, much lighter). Who’s responsible? Well, it isn’t Sony, Mitsubishi, or Toshiba.

We recently saw a program that we don’t hold out much hope for. It’s called Boss, and it’s supposed to be a very advanced personal time manager (PTM).

But the version we saw gave us so much grief and was so persistently unfriendly that Nag would be a better, and certainly more accurate, name for the program. We hope that you never run across it.

On a more positive note, Apple’s new Customer Satisfaction Group has proven to be such a success that at least three (and very possibly more) large software publishers have formed similar groups. Virtually every hardware and software company involved in the Mac market is thinking about forming such a group. It looks like Apple’s little push is about to turn into a very large snowball. And that’s great.

Have you heard any good rumors recently? Started any yourself that you’d like to take credit for? Can you share your knowledge with us? Does your legal department agree? Will you share anyway? 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 mailing address is Rumor Manager, c/o MacUser, 950 Tower Lane, 18th floor, Foster City, CA 94404. Our electronic addresses are MacUser (on MCI Mail), 72257,2671 (on CompuServe), and X0259 (on AppleLink). No calls please — the Rumor Manager has an unlisted number and much prefers it that way.
“Although this category, unlike spreadsheets and word processors, had a lot of new players this year, one seemed to us to be the clear leader. 4th Dimension, the powerful first product from ACIUS, takes the kudos.”

MacUser, February 1988

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Jonathan Sacks, InfoWorld, April 1988

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Steve Mann, Macintosh Today, August 11, 1987

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David Brandt, MacWEEK, January 19, 1988

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Jan I. Harrington, MacUser, November 1987

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Don Crabb, InfoWorld, January 11, 1988

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Can you say hacker? Suurrre you can! But do you know what you mean? CBS News thinks they do. So do the attendees of Hackers Conference 4.0. Unfortunately, about the only thing their definitions have in common with each other is that computers are involved. It's sometimes difficult for us to remember that not everyone in the world (or even in California) is a computer fiend (or even a computer user). The Mac community in particular is prone to this kind of amnesia. (It is not unique to computer people; I know a number of actors, for example, who can't believe that not everyone doesn't at least want to act.) Sometimes this just makes us bad conversationalists at cocktail parties. Sometimes it boomerangs in a less-than-pleasant manner.

Remember when hacker was a favorite with writers of sensational headlines? Remember when it was associated with inadvertently starting World War III — or inadvertently cleaning out someone else's bank account? Bet you thought that those days were over, right?

The Hacker's Conference found out the hard way that vocabulary changes more slowly out there in the real world — and that there are always media people to take advantage of the resulting ambiguity. The lesson came via CBS News, which ought to have known better.

In fact, they probably do know better; it's just that good guys make bad news.

The Hacker's Conference rarely lets press in on their gatherings, but this past October they made an exception for a CBS camera crew. I don't know how much film they ended up with, but about a minute of it appeared in the actual report. It consisted of panning shots of people standing in line and talking, with the usual unctionous voice-over.

Without any segue or reason — except the continued use of the word hacker — the report moved on to several very serious gentlemen talking about people breaking into sensitive military computers and generally undermining the American way. One of them demonstrated a certain amount of talent with a yo-yo.

I have two things to say about this: One, I'm sure there are still a few computer whizzes whose idea of fun is to break security codes. But I think this says more about shoddy procedures on the breakee's side than it says about the sociopathic tendencies of computer users. Two, I am prepared to guarantee that none of the attendees at the Hackers Conference 4.0 are among this group. CBS cannot claim ignorance as defense; they are a news organization, and it's their responsibility to find these things out.

The hackers at the conference were not precocious kids who want to play war games. They are the core of innovative, talented, often brilliant computer experts who drive new hardware and software technologies. You'd recognize almost every name there. Some of them are written inside the Macintosh case. A lot of them appear on your screen every day on the title screens of telecommunications software such as MicroPhone II, or utilities such as QuickKeys. A few more appear on the covers of your sci-fi collection.

There's a warning here for all of us who make a living, one way or another, with technology. We get so wrapped up in what we're doing that we forget that it is incomprehensible or irrelevant to much of the rest of the world. The ongoing battle between the Macintosh and MS-DOS, for example, is not of general interest. Most people are still not comfortable with computer technology, and news coverage reflects that to a large degree. Computers that fail, computer users who break the law — that's news. The good news will be reported only when it is perceived to be too good to ignore. News like that comes from people like hackers.

A Broadside View

Having a monthly column has been a goal of mine for some time. And while I am delighted to be here, thank you, the process of getting started is fraught with problems I had not foreseen. I expected to run into the universal problem of "Arrggghh! What do I have to say this month?" I expected to start seeing deadlines in my sleep. (After editing the columnists for MacUser for over two years, I have the world's most imaginative list of excuses. The best, however, came when I worked for Electronic Fun. A writer called to tell me his material would be late because the daisywheel on his Coleco Adam printer melted in the sun.)

What I didn't expect was difficulty with the peripheral stuff — for example, the picture and the column title. The first title I came up with was "A View from a Broad." My male colleagues, in an unprecedented show of
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If you're not using *The NightWatch & MacSafe* to protect your hard disk files, you're leaving your work naked. Anyone with access to your Macintosh can browse freely through your files — even changing them without your knowledge, or innocently leaving a virus behind. And it could be tonight!

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heightened consciousness, informed me that the column name was sexist. After a number of other suggestions, ("Put Mac in the title."
"OK, how about 'Danse Mac-Cabre'?"), we came up with one we could all live with (see above). OK, so it puts me in mind of JC Penney's lingerie department; at least it's not — God forbid — sexist.

The picture was a humbling lesson in vanity. Peter Gould, our staff photographer, is very good, but he just can’t seem to make me look tall, blond, and 25. You have to choose the shot carefully when you know your parents might show the thing to everyone in the Central Florida area. (And, of course, there's always that secret wish that my high school classmates will see this and eat their hearts out.)

So, in an attempt to generate letters to the editor as well as to poll readers, I'd like to hear comments on column names; any column names, any column. Please send your suggestions to What's in a Name, c/o Louise Kohl, *MacUser*, 950 Tower Lane, 18th floor, Foster City, CA 94404.
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HARDWARE

Apple Scanner

Not all scanners are created equal. They may all look similar and generally do the same things, but the physical package often hides some big differences. If your scanner experience has been limited to watching a slick demo or two, then the Apple Scanner is likely to be a real treat. It's a snap to set up, and the basic software is simple and intuitive—two attributes that don't necessarily go together.

If your ulti­mate output device is a 216-dpi (dots per inch) fax device or a 300-dpi LCD shutter or laser printer, then a total of 16 levels of gray is sufficient. But it's inadequate for professional work that is to be printed on Linotronic-type (1,270-dpi and up) printers. Even the 216-dpi output of the ImageWriter LQ wasn't very good (and was plagued by the "normal" dot-matrix-printer striping effect in black and very dark areas).

The software comes in three parts: AppleScan, HyperScan, and a Guided Tour (each on its own disk). Unless you're a newcomer to the Mac, just dive into AppleScan and try things out.

HyperScan is a stack written by Bill Atkinson that lets you scan and enhance images and then place them on HyperCard stacks. It's pretty impressive stuff, but the final results are severely limited by HyperCard's environment. Image size is restricted to the standard card size rather than the actual page size the hardware is capable of, and images can't use gray scales at all (2-bit black-and-white bit maps are all HyperCard currently supports). While HyperScan's effects are very impressive, you'll want to use HyperScan only when the final destination of your image is a HyperCard stack. All other work will involve AppleScan.

The AppleScan software is fairly simple and straightforward. It has many nice, easy-to-use touches built
Quick Clicks

in. The first step is always the Preview scan. This is a quick test scan that you use to adjust the controls. To start, select any of three scanning modes: line art, halftone, and gray scale. Then preview the image.

The next step is to fine-tune the image. This is exceptionally easy since you can try many combinations of threshold, contrast, and brightness to see which produces the best final image.

Screen updates showing your changes take less than one would a full rescan, since only a small area must be modified. The controls show both the current settings and the previous settings (in a dotted outline), thus making it easy to go back if a change is for the worse rather than the better.

The software can also generate test prints, with the center strip of an image showing the actual settings, and the portions above and below the center displaying the settings one step away in either direction. This way, you can see if any adjustments need to be made. In Preview you can save only your settings, not the actual image.

Once you've decided on the optimal settings, you actually scan the image. This takes considerably longer than a preview, but even at its slowest it takes less than a minute. The scanned image comes up in a document window, generally under the various control panel and palette windows.

One minor AppleScan problem is that it is sometimes difficult to remember which window to activate to allow a particular operation. Since each control panel and palette is actually a window, creating and manipulating images often involves a lot of switching around.

When the image is scanned, you can use AppleScan's fairly limited Tools menu, or you can save the image in a format readable by a more advanced program. If you have advanced graphics-manipulation software, you're much better off doing your work there rather than in AppleScan, which is really suitable for only the smallest touch-up jobs. Images can be saved in PICT, TIFF, or MacPaint format. AppleScan can open only PICT documents, but that's not too much of a drawback unless you have no other image-manipulation software.

AppleScan's greatest weakness is its speed. It's slow; there's no kinder term to describe its pace. And if you try to use its drawing tools on a large scan, it's also imprecise. In its Fatbits and Chubbybits (smaller than Fatbits but big enough to pick out pixels) modes, I sometimes had trouble getting exactly the point I wanted to modify. That seemed to be the result of a slight control delay.

Another problem is AppleScan's propensity for creating temporary files that do not always close properly. Such files, which may be large, can't be thrown away until after the application is restarted. This appears to be a rather intractable problem, as the File menu has a command called Restart AppleScan.

The Apple Scanner handles line art as well as most scanners. Since you can easily optimize the scanning parameters, images that require minimal cleanup can be created quickly and easily.

The Apple Scanner is also very good on halftones, especially those that are intended for output on 300-dpi devices. It handles these very well. When creating halftone images, you have a choice of several halftone patterns. If none of them works, you can create your own.

Where the Apple Scanner falters slightly is on gray-scale images. These days, 4 bits (16 levels of gray) just isn't enough. Apple-Scanned images suffer by comparison with any 64-gray-level images. Also, the software has no gray-scale-editing ability whatsoever.

The manual is excellent — one of Apple's best in a long time. The tutorials are well done, and the rest of the manual maintains this high standard.

Overall, the Apple Scanner is a good deal for light-duty use. A few dollars more will buy a lot more scanning power, but at considerable cost in ease of use. If you scan regularly but not often enough to justify one of the heavy-duty units with 64 or 256 gray levels, or if user convenience is a paramount consideration, the Apple Scanner is for you.

— Steven Bobker

Apple Scanner

List Price: $1,799
Manufactured by: Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010.
Software version: 1.0
Requires: System Software 6.0 or later; hard-disk drive needed for full-page work; SCSI connection cable(s) and SCSI terminator (if at the end of a chain); HyperScan requires HyperCard 1.2 or later.
Compatibility: Mac II and MultiFinder friendly.
Hardware Size: 13.6 inches wide by 21.6 inches deep by 4.4 inches high; 20 pounds.
Application Size: AppleScan, 267K plus 2K Preferences file; HyperScan, 112K plus HyperCard.
Copy Protection: None
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HARDWARE

DATA•PAK

The MASS MICRO DATA•PAK is a mixed blessing. The 45-megabyte removable Winchester hard disk may be the best of its class from a hardware perspective. Unfortunately, the utility software can easily allow you to format an internal hard disk. Software like this may be the strongest argument I’ve ever encountered for backing up.

The basic idea of the removable cartridge drive is excellent. On the hardware level, I have absolutely no complaints about its performance. The unit I have been using has worked reliably for over two months now, and I know several other people who are thoroughly satisfied with it.

If you want to use the 45-megabyte cartridges as oversized floppy disks, there’s really nothing to it. Stuff a cartridge in the drive, and it appears on the desktop like any other disk. When you want to take it out, drag its icon to the trash, push the eject button on the drive unit, and wait for the red light to go off. Simple. It won’t even let you eject a cartridge from the drive until you have trashed its icon on the desktop — a feature that I appreciate about 95 percent of the time and curse the other 5 percent.

It serves equally well as a backup device — a welcome change from backing up to a gazillion floppies — or as a “temporary” hard drive — allowing you to expand your storage capacity indefinitely at roughly $150 per 45 megabytes. If you simply must have more storage, several other configurations are available: It comes in two-cartridge and one-cartridge/one-fixed-hard-disk combinations of 40, 80, and 120 megabytes.

The manual, however, is poorly organized, not thorough, and sometimes confusing. For example, no distinction is ever made between the PAD•LOK chooser file (named PAD•LOK) and the PAD•LOK utility, named, appropriately, PAD•LOK utility. In fact, the manual consistently refers to the utility simply as PAD•LOK. MASS MICRO says it is revising the manual for future releases of the product.

The PAD•LOK utility can be used to partition a cartridge into up to ten virtual hard disks, each of which can be separately password-protected. Volumes can then be mounted by selecting them from the Chooser — a handy feature. Other PAD•LOK functions include testing the drive, installing new drivers, and changing partition passwords.

PAD•LOK has one serious flaw. Some drives might be placed in danger when you are formatting the DATA•PAK. The dialog stating “Do you really want to format the drive? This will destroy all existing data.” is not an adequate warning. Why? Because a question remains: Which drive is “the drive” that the dialog box is warning you about? Any utility that can scan new drivers, and changing partition passwords.

PAD•LOK has one serious flaw. Some drives might be placed in danger when you are formatting the DATA•PAK. The dialog stating “Do you really want to format the drive? This will destroy all existing data.” is not an adequate warning. Why? Because a question remains: Which drive is “the drive” that the dialog box is warning you about? Any utility that can scan the SCSI bus, update boot blocks with new drivers, and format and partition hard disks should be able to tell you the name of the hard disk it’s about to deep-six. (MASS MICRO says it will fix the problem in a future release of its software.) Even knowing the SCSI bus ID numbers of your drives — a very Mac-like thing to keep track of, right? — won’t necessarily save you. PAD•LOK rescans the SCSI bus after each activity it performs and, without warning, automatically sets the selected device to the lowest number it finds. In my case, that was my internal drive. Even though I had carefully selected device 4 (my DATA•PAK) before doing a drive test, PAD•LOK switched to device 2 (my internal drive) when it finished the test. My next activity was to format “the drive.” It wasn’t a pretty sight.

You’re probably wondering about speed. I didn’t run any benchmarks, but I have some subjective ideas. I noticed a consistent sluggishness when the Finder reads the directory of a newly inserted cartridge. But for normal operation, it seemed to keep up with both my internal and external SCSI drives.

With all the negatives I have mentioned, you might think I have a low opinion of this product. Quite the contrary.

I recommend the DATA•PAK highly to anyone short of storage space and tired of backing up on floppies (which is most of us). In fact, with a little work, this could be a five-mouser. Most people won’t ever need to even open the PAD•LOK utility. But considering that it wiped my internal drive twice (yes, twice — some people learn slowly) and given the poor state of the manual, it’s not ready to compete for top scores.

— Henry Bartman

Quick Clicks

The drive mechanism, made by Syquest, is very fast (less than 25 milliseconds access time) in addition to being sturdy. The cartridges are not much larger than a 5.25-inch floppy disk.

List Price: drive, $1,799.95; cartridges, $149.95 each or tri-pack for $419.95.
Manufactured by: MASS MICRO Systems, Inc., 550 Del Rey Ave., Sunnyvale, CA 94086-3258; (408) 522-1200, (800) 522-7979.
Requires: SCSI connector and System 4.1, 5.5, or later.
"The best backup solution should offer reliable, fast, convenient, affordable storage of data..."

—MACWORLD, November 1988

"The 45MB removable drives are among the fastest backup solutions I tested. In fact, they're so fast that it is tempting to use them as hard disks—which is what they are..."

—Rob Hahn, MACWORLD, November 1988

"The DataPak is a first-rate drive that I recommend without hesitation."

—Jim Heid, MACWORLD, September 1988

"I've had good luck with the many (45MB DataCarts) I've been using..."

—Rob Hahn, MACWORLD, November 1988

"...the medium (DataCarts) offers better value for your money than the MegaDrive (Jasmine) or the Total (Iomega Bernoulli) cartridges."

—Rob Hahn, MACWORLD, November 1988

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—Rob Hahn, MACWORLD, November 1988

"This technology will revolutionize the way people look at hard disks."

—Thomas L. Mesić
MASS microsystems founder
MACWEEK, Jan. 26, 1988

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COMMUNICATIONS

FAXstf Modem

There are times when transferring information by modem just doesn’t cut it. Unfortunately, not everyone uses a computer as a vital part of everyday business. One solution, of course, is to fax your documents to standard fax machines. In truth, fax machines are a pretty good solution to a lot of common business problems: They send hard copy over the phone lines at a fraction of the cost of overnight mail. Several good fax machines are now priced at less than $1,000.

Recently, a new computer-hardware category has emerged: the fax modem. Fax modems enable you to send Mac-generated documents to standard fax machines and, in turn, to use your Mac to receive documents from fax machines. STF Technologies recently introduced one of the first fax modems for the Mac, the FAXstf Modem.

The FAXstf is sleek and smaller than most modems. Hardware installation is simple: You connect it to your Mac just as you would a modem. Software installation, though, is more complicated. You have to run a gauntlet of dialog boxes before the software knows where to store incoming and outgoing fax documents. Although the manual is far from a model of clarity or brevity, it does guide you through this installation.

Once everything is in place, sending faxes with the FAXstf is straightforward. With the FAXstf selected as your output device in the Chooser, you just print documents. After the print driver spoons your fax to the fax folder, a dialog box lets you choose the destination and time to send the fax. If you’re a MultiFinder user and you’re running the FaxMonitor application, the fax will automatically be sent at the proper time. If you’re not a MultiFinder user, you’ll have to open either the FaxMonitor or the FaxManager application to send your document.

Receiving a fax from another machine is even easier. If FaxMonitor is running in the background under MultiFinder, then FaxMonitor will automatically come to the foreground to receive and store the document. If you’re not using MultiFinder, however, you’ll have to be in either FaxMonitor or FaxManager.

There’s no option to print incoming documents automatically. In fact, you have to view documents on the screen before you can print them. Viewing and printing documents can be time-consuming. Currently, no way exists to translate incoming documents into native Mac file formats like TIFF or PICT, so analysis with an optical-character-recognition program or manipulation with a graphics program is impossible. Basically, the only thing you can do with an incoming document is view it or print it. Printed output from a laser printer, however, is far superior to the usual product from regular fax machines.

In tests with several brands of fax machines, the FAXstf reliably sent and received a number of multipage documents. Image quality was at least commensurate with that of normal fax machines.

The FAXstf is slower than most fax machines; its maximum speed is 4,800 baud. Most fax machines and other fax modems, including Apple's, communicate at a top speed of 9,600 baud. The FAXstf adheres to Group III fax specifications, but many manufacturers deviate from this standard to one degree or another, so compatibility may be a problem. Some users have reported problems communicating with certain brands of fax machines, so you may want to check with STF Technologies if you intend to communicate with one particular machine.

The FAXstf makes it difficult to alternate using the fax modem and a regular modem. Some fax modems perform double duty as a regular modem, or at least provide a pass-through port with a switch to alternate between devices. Each time you want to switch between a FAXstf and a regular modem, though, you have to change plugs at the back of your Mac. This is a serious drawback for anyone with regular telecommunications requirements as well as fax requirements on the same machine.

If you absolutely require fax capabilities on your Mac, the FAXstf might be a worthwhile purchase, although you should investigate Apple’s own fax modem as well as products from other vendors. If, however, you don’t have an immediate need for a fax modem, you might do well to wait. The FAXstf, and especially its software, appear to have been rushed to market. Since this field is evolving rapidly, both this product and others like it are sure to improve significantly soon.

—Larry Husten

FAXstf Modem

List Price: $695
Marketed by: STF Technologies, P.O. Box 247, Higginsville, MO 64037; (800) 426-1679; in Missouri (816) 584-7727
Version: 1.03
Requirements: 1 megabyte; hard-disk drive strongly recommended.
Compatibility: Mac II and MultiFinder friendly.
Application Size: FaxMonitor, 58K; FaxManager, 125K; FaxPrint, 66K.
Copy Protection: None

PETER A. GOULD
"For convenience, flexibility, and speed, …the 45MB removable is the clear winner."
—MACWORLD, November 1988

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Modern Artist 2.0

Mac II users live in the land of the $500 paint application. Is there room in the market for a color paint program at half the price of its competition? You bet there is. The original Modern Artist, priced at $199, had a shot at being that alternative. Any well-constructed product in that half-price range might grab some significant market share. Will it be Modern Artist? Not any more. Version 2.0 is priced at $495. Do its new features and improvements justify the price hike, and can Modern Artist 2.0 hold its own against its similarly priced competition? It would seem that the answer is no.

First, let's take a look at Modern Artist 1.0. In addition to the familiar painting implements, Modern Artist has four special tools: Shading (produces gradational shades), Sunglasses (act like colored filters), Stain (tints a selected color with another), and 3D (enables you to create three-dimensionally shaded objects in one operation). The 3D tool is the most interesting. It simulates spheres and three-dimensional boxes by varying the shading and adding a light source. The shaded spheres look great, especially in Expert mode. Gradational fills don't keep you waiting long, and 3D boxes pop up almost instantaneously, although they lack vanishing-point perspective.

Version 2.0 is a marked improvement in stability over its predecessor, and the program is now comfortable in MultiFinder. A Revert command restores the original picture, autoscrolling, and rulers are among the added features. Also, three levels of zoom (version 1.0 offered only normal and fat bits) are now possible, and more functions are accessible from the keyboard. And ColorSep, a color-separation utility, has been bundled with the program. Still, Modern Artist 2.0 is not that different from version 1.0. The core of the program and its rather modal and “bulky” interface remain essentially unchanged.

The palette in Modern Artist 2.0 is something of an enigma — it holds only 92 colors. In Expert mode, this is partially explained by the four Color Bands controlling gradations. These bands are defined by clicking on light and dark colors (in conjunction with the 3D or Shading tool), from which the program calculates 32 intermediate shades. To produce them, Modern Artist 2.0 reserves 128 palette choices. Still, even when you add these, you come up short of 256.

Modern Artist 2.0 claims exceptional dithering capabilities and indeed does deliver them. The bottom line is that, in either mode, you have only 92 colors to choose from at any time. Although Modern Artist 2.0 includes some advanced features, sometimes their utility is curtailed by less-developed functions. For example, the lasso can be configured to precisely select complex shapes or to lift separate areas of the same colors, but there's little you can do with the selection. Such functions as rotation, flip, distortion, and swapping-in complementary colors work only with a marquee selection.

Files produced in standard mode are saved as PICT documents. In Expert mode, files are best saved in rPIC. A variation of the PICT format, rPIC was developed along with Modern Artist 2.0 at Reed Institute and preserves gradients and the subtle hues possible with custom palettes. Although this combination would seem to have covered all bases, it does have its limits. Expert mode rPIC files can be transferred only to programs that support this format. When saved as PICT files, Expert mode paintings are automatically transformed into standard-mode documents. Interestingly, PICT files of Expert mode documents appear to possess all the requisite information to be properly reconstituted — if the target applica-
tion is intelligent enough to read them. Studio/8 (from Electronic Arts) recognizes the custom palettes and opens these documents with gradations restored. Reopened in Modern Artist 2.0, such documents can exhibit color shifts and color banding. It's unfortunate that the program can't convert a former Expert mode PICT back into a true Expert mode document.

File importation falters on the same point. Modern Artist 2.0 opens all PICT documents as standard-mode files, losing whatever gradient information they possess. Modern Artist 2.0 has the ability to read but not write EPSF files. But this only partially mitigates the problem of getting out high-quality documents—a serious weakness, especially for professional users. The greatest single improvement to Modern Artist 2.0 would be full import and output support of the PICT2 format.

Modern Artist 2.0 works well enough and is suitable for most painting projects. On the other hand, professional artists may find some of its limitations troublesome. Not as full-featured as Studio/8 or PixelPaint, the original Modern Artist 1.0 was, at least, a decent value at its old price. Now, even with ColorSep thrown in, Modern Artist 2.0 compares unfavorably with its competition.

—Carlos Martinez

Modern Artist 2.0

List Price: $495
Published by: Computer Friends,
14250 N.W. Science Park Drive,
Portland, OR 97229; (503) 626-2291.

Version: 2.0
Requires: Mac II with 1 megabyte of
RAM (2 megabytes recommended) and
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Compatibility: Mac II and MultiFinder
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Apple Computer - Inside Macintosh:
Volume IV

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**Quick Clicks**

**ORGANIZATIONAL TOOLS**

**ArchiText**

ArchiText is a text processor — a software genre that goes a step beyond mere word processing. Text processing is computer-assisted reading in the way that word processing is computer-assisted writing or databasing is computer-assisted filing. Closely related conceptually to hypertext, text processing lets users search, comprehend, share, and communicate text with unprecedented effectiveness.

Long documents or large sets of documents can be searched with great efficiency, and the search process itself generates a context and structure for the information when it is found.

Further, text processing gives the reader command of the structure of the document, allowing different users to share the same textual information while maintaining their own respective views of it. They can readily import, export, and copy each other's view of the subject. In this way, text processing becomes a powerful communication tool, making it possible to send, receive, and access information in the form as well as the content of the document, so that people can share and exchange structures along with data.

Until now, true text processing has been available only in the PC environment. BrainPower's ArchiText makes text processing available on the Mac, but it accomplishes more than that. ArchiText's graphical expression of text-processing concepts mates text processing and hypertextual communication better than any single product to date. And unlike any other text processor I've seen, ArchiText can handle graphics through the same procedures as text.

ArchiText documents can be entered directly or created from imported text. The user — either manually or by automatic procedures based on text strings, Boolean operations, or paragraph breaks — divides the text into nodes. Nodes are units of text consisting of a word, list, graphic, entire journal article, or almost any length or kind of text.

The user then connects the nodes into maps that represent the relations between the pieces of text. Any number of users may create any number of maps for the same set of nodes. A crude example: A chemist's map would put apples, onions, and watermelon into a close relationship based on water and sugar content, while a chef's map would differ considerably. Map connections can be specified automatically by keywords or Boolean operations on keywords, or the user can impose them with a set of simple drawing tools through the graphic interface.

The reader selects one map as the driver map, which specifies paths through the text, determining which nodes can be selected from which other nodes. The reader can switch maps as well, and can look at a map in graphical representation to get an overview of the information.

Experienced users of text processors will be delighted. The ArchiText commands naturally and intuitively express the common text-processing functions in graphical form. On the other hand, if you're not so experienced, ArchiText's problems in documentation and Mac implementation will make things difficult.

As is the case with so many other path-breaking products, version 1.0 is burdened with documentation that explains how to do everything without really telling you why you would want to do it. Further, the tutorial's trite sample data make it easy to miss important features and capabilities. And the node/map terminology is defined only by a clumsy, self-referential glossary. I often resorted to penciling in conventional terms next to the ArchiText ones in my manual.

Weak documentation can be overcome at the cost of user frustration. But there is a bigger frustration for experienced Mac users: the occasional use of not-quite-orthodox commands. For example, sometimes double-clicking an item means the same thing as clicking the Open button; sometimes it doesn't. Similarly, clicking the close box means close the current window, but close in the File menu means close the document.

ArchiText is the most advanced text processor on the market and could well make the Mac the platform of choice for text processing. It is highly recommended for people with extensive experience in text processing and for those willing to endure considerable frustration to learn.

— John Barnes

**ArchiText**

List Price: $349.95
Published by: BrainPower, 24009 Ventura Blvd., Suite 250, Calabasas, CA 91302; (800) 345-0519, in California (818) 384-6911.
Version: 1.0
Requires: 1 megabyte
Compatibility: Mac II and MultiFinder friendly.
Application Size: 196K
Copy Protection: None
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**Quick Clicks**

**MUSIC**

**Cue: The Film Music System**

Grizzled Mac veterans may occasionally curl a lip at the blithe praises computers get for making complex tasks simple. (Remember your first experiences with telecommunications?) But Opcode Systems has a package that can really do the trick for those who compose music for film or video. Sure, playing and composing music can be creative and intuitive fun stuff (no letters, please). But determining the length and tempo of the music you’re paid to put behind a four-and-a-half-minute battle with the hideous alien forces from Galaxy K-30, complete with a musical “hit” timed exactly to every laser shot, tentacle slash, and spaceship crash takes time.

Multiply that by every scene in the film — from touching romance to gripping tension — and you’ve got a job that needs one old-fashioned no-kidding attention span, brother.

Written and documented with intelligence and a real knowledge of the industry, Cue takes much of the drudgery and guesswork out of the tedious task of synchronizing cues — short bits of music — to a film’s various parts. Cue automates two of the toughest chores in film scoring. The first is spotting and logging not only each point in a film where you want a cue to start and stop but also scene cuts and other noncued reference points as well. The Input window provides a stopwatch that times events in the film and displays them (in any of the American or European SMPTE, 35- or 16-millimeter formats you might need) next to a 24-line field where you de-

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scribe the action. The software automatically assembles each set of times and comments in a nice, readable list on the cue sheet, which you can print out in a number of different formats, depending on what you want to see. If you don't like what you've got in the cue sheet, there are a number of simple ways to change or delete any one or a range of your entries.

The second big job the software accomplishes is to search for a tempo. Once you know all the points you want your cue to accent, the trick is finding a tempo that will put musical beats on the hit points.

Cue presents you with a list of tempos and the number of hits each one catches. It then lets you zoom in to see just which hits a tempo catches and which it misses.

To better its score, it calculates accelerandos and ritardandos — minuscule or large — that catch more hits. In addition to its two main functions, Cue has many more features than can be mentioned here. It creates streamers and punches that help the orchestra conductor follow the score; lets the user tap in a tempo on the Mac keyboard; generates music-notation scratch paper with cue-sheet information already written on it; and sends out MIDI clock data for synchronizing to a sequencer.

And in order to assist you at the business end, Cue generates a Performing Rights Cue Sheet listing the title of the production and its cue and reel number and name; the percentage and affiliation (BMI, ASCAP) of the composer and publisher; and the way the music will be used in the production (background, on camera etc.).

With Cue taking care of the details — synchronizing hits, taking care of the business end of things — you'll be able to concentrate on the more important things (like creating music or schmoozing with producers).

As they say in Hollywood: Cue baby, you're beautiful.

— Tim Tully

Cue: The Film Music System

List Price: $595
Published by: Opcode Systems, 1024 Hamilton Court, Menlo Park, CA 94025; (415) 321-8977.
Version: 2.0
Requires: 512KE
Application Size: 227K
Compatibility: Mac II and MultiFinder friendly.
Copy Protection: Key disk protected and two hard-disk installations allowed.

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ORGANIZATIONAL TOOLS

For the Record

There are times when we all wish we had our lives better organized. This is as true of the compulsively organized as it is of the haphazard, file-it-in-piles people. Our lives are intimately tied to the papers and forms that document our possessions, plans, wishes — our very existence.

Since organization is what computers are all about, you could create a database outlining what things are and where they lie in the general scheme of things. Creating such a database is a fairly straightforward but extremely time-consuming project. Not only will you need to be well-organized (so that you cover everything) but also you’ll need plenty of time — both to design and fill in the database.

Fortunately for us, For the Record exists. For the Record is a database specifically designed to keep track of your legal, financial, and personal records. It’s by Nolo Press, the publisher of many excellent books and programs on legal advice that are useful to both lay people and lawyers.

For the Record consists of a program disk and a book that is both manual and text on personal-record keeping. It’s obvious that a tremendous amount of effort went into the design of the program and the writing of the manual.

This program is not very advanced as Mac databases go, but it’s superb for the job it was designed to do. And it follows the Mac interface well; operation is intuitive. There’s also a Help menu that lives up to its name.

Start by selecting an entry screen from a master screen that lists 27 major record categories. These range from Emergency Information to What’s Owed You, Burglar Alarms, and Estate Matters/Will. Filling out the screens and moving between them is simplicity itself. Each screen can have a pop-up notecard attached. That’s useful if you run out of room in any of the fixed-size fields.

Much of the data you’d enter in For the Record is sensitive and should not be stored openly. To ensure confidentiality, the program allows simple password-locking of all screens. The manual warns you that a determined hacker could break the passwords, but casual (or nonhacker) browsers will be kept out. The passwords seem reasonably secure to me; it took more time than it would normally be worth to get into a locked screen.

One of the strengths of the program is its printing abilities. You have no choice of report style, font, or formatting; you just specify what to print, and For the Record prints it rapidly and nicely. Since these reports are for you or people who are handling your affairs, that’s just what you need.

The program is weak when it comes to linking your records. Each screen has a cross-reference button, but clicking that merely brings up a dialog box suggesting other categories to check. You’ll find yourself entering the same information in several screens, having to retype it all in each time. There’s no way to import or export data. There’s also no Save command. The program saves automatically every time you leave a screen, which seems safe enough, but I’d like a manual Save option.

The manual, which is divided into four sections, is as much a reference book on record keeping as a manual. The very large first section not only covers record keeping in depth but also frequently gives legal advice. One of the authors of For the Record is a practicing attorney, and the legal advice is of the same high quality found in all Nolo books. An attorney friend of mine took a long look at For the Record. She said that while she didn’t always agree with the advice given, it was never wrong. Being a lawyer herself, she would approach some things slightly differently.

The manual focuses mainly on explaining to you what records should be stored where, and why. The next section of the manual is on estate planning, a Nolo specialty. This is an excellent treatment of a sobering subject. The last two sections of the manual are a well-written but rather ordinary computer-program manual.

Filling out a database in For the Record takes a lot of time and effort. But it’s time and effort well spent; your records will be in order and easily accessible. You can rest assured that your affairs can be well handled if something happens to you. — Ellen Hirame

Quick Clicks

This is For the Record’s main screen. Choosing a category on the left brings up the appropriate list of subcategories. Double-click on a subcategory to go to its screen.
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“FoxBASE +/Mac proved to be as easy to use as any Mac relational database we’ve tested.”

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Richard Skrinde, *MacUser*, September, 1988:
“FoxBASE +/Mac is a racehorse that will outrun the other Macintosh databases.”

Arthur Fuller, *Computing Canada*, June 9, 1988:
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Michael Masterson, *MacWEEK*, June 7, 1988:
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Charles Seiter, *Macworld*, October, 1988:
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As programs become laden with more features, the ability to easily perform complex action sequences becomes vital. Some programs—such as Excel, WordPerfect, and most major telecommunications packages—offer such abilities. The action sequences are generally, but not always, called macros.

AutoMac III lets users create and use macros from within virtually every program. It's a small, well-designed, well-behaved INIT, which means you simply drag it into your System folder and restart your Mac to install it.

In that respect it's similar to Apple's MacroMaker (included with System Software Update 6.0.2) and Affinity Microsystems' Tempo II. Of the three, I found the AutoMac III interface the most intuitive. However, all are easy to use. If a program works with one of these macro applications, it most likely works with all of them.

You normally access AutoMac III's main control panel by clicking on a tiny A that is always in your menu bar to the left of the Apple. Most macros are created using a very simple recording process. You assign a name, add (if you wish) a set of keystrokes that will play the macro, and turn on the macro recorder. Then do exactly what you want the macro to do. Finally, stop the recording. That's it. The excellent manual offers good advice on creating and fixing macros. Read it, especially if your macros don't behave the way you expect.

Unlike its competition, AutoMac III offers a powerful macro-editing feature. It's up to the user to decide whether to make the macro editor available (it consists of two files, and you'll save 35K by not installing it). You can use the macro editor to create a macro from scratch, correct or fine-tune existing macros, combine two or more macros, and design alert boxes without having to record them.

While that's easy enough, your recorded macro might not work for many reasons. The macro may be designed to react to a particular environment, with, say, an icon in a specific place. If the environment is altered (the icon is moved), the macro might fail. Another example of how AutoMac III normally works and how that might not be the way you want it to work is the way it tracks the position of the mouse. The normal (default) method doesn't record the details of the path. Only the mouse's positions when it's clicked and when it's released are recorded. This can speed up playback, as the macro simply moves the cursor from point A to point B via a straight line. And in most cases, the path simply doesn't matter.

However, if you're using a macro to create, say, a graphic signature, the path followed by the mouse is what counts. And a normally recorded macro will just give you a straight line (not too unlike some people's signatures). To get your signature into a macro, turn on AutoMac III's Record Full Drag. AutoMac III isn't without some flaws—none of these macro programs are. It depends a little too much on the exact mouse position when recording a macro. This problem is particularly noticeable when your macro involves selecting items way down long menus or on submenus. There are two things you can do to minimize this problem. First, when recording macros, be as careful as possible to center your clicks on menu items and buttons. The second improvement requires that you get familiar with, and use, the built-in macro editor. It's powerful and not at all hard to use. Simply replace all menu-selection-by-mouse-position with direct menu and item calls.

The program generally works when MultiFinder is running, but there are some problems. Considering that Microsoft is distributing AutoMac III as a bonus to Word 3.0x purchasers and will distribute it with Word 4.0, I was surprised when AutoMac III sometimes caused Word to quit.

I found AutoMac III slightly better than Tempo II and much better than MacroMaker. It's more accessible, has a nicer interface and a great macro editor, and is a bit easier to use. It works (almost always) and does things that no other type of program (including keyboard enhancers like QuicKeys) can do. If you already use Tempo II, there's no overwhelming reason to switch. But if you're in the market for a macro program, AutoMac III deserves a good hard look.

—John Langston

**Quick Clicks**

This is the basic AutoMac III work area. Create, delete, and run macros from this nonmodal dialog box.
Now Macintosh And Wang Can Communicate And Nothing Gets Lost In The Translation

Transferring files from one system to another is somewhat pointless if you spend most of your time re-formatting the data. Which is why we introduced MacLinkPlus for Wang. Whether you're running a Wang VS system, an OIS or a Wang PC, MacLinkPlus provides a complete solution for document transfer and file conversion.

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MacLinkPlus doesn't stop there, however. It offers full Wang VS Workstation capabilities, allowing easy access to Wang word processing, data processing and electronic mail. All 32 Wang Workstation functions can be executed through familiar Macintosh menus or command keys, and you'll even be able to use the mouse on Wang displays.

Software for the Macintosh, software for the Wang (8" or 5.25"), software for the PC and a direct connect cable (you can use a Hayes or compatible modem if you prefer), is included in the MacLinkPlus package; everything you need to be up and running in minutes.

So call (203) 268-0030 for your nearest DataViz dealer, because no matter which Wang system you're using, there's a MacLinkPlus solution to connect it to the Mac.

Who says you can't have the best of both worlds.
**Quick Clicks**

**UTILITIES**

**DiskFinder**

If you frequently find yourself looking through dozens of disks to locate a particular piece of clip art or a missing spreadsheet template, then DiskFinder can help. But you'll have to be highly motivated — it's a lot of work.

DiskFinder does its job and does it well. It helps you catalog all your files spread across many disks. With a little bit of effort, you'll be able to access any file on any disk in your collection in a few seconds.

Install DiskFinder in your system as you would any DA. If you have a hard-disk drive, DiskFinder keeps a catalog of all your floppies in a Library Folder. If you're running a floppy-disk system, the manual suggests you designate a separate floppy the Library Disk.

Cataloging your disks is easy but not very intuitive; for some reason, you must unclick the Use Library check box to enable the Catalog This Disk button. However, once you've figured this out, DiskFinder will catalog your disks very quickly. On my hard-disk drive with about 45 megabytes worth of data in over 1,000 files, DiskFinder created a catalog in 22 seconds. Floppy disks take only a few seconds to catalog. After you've cataloged a disk, the program prompts you to label the disk with a number.

Once you've cataloged all your disks, finding a file is easy and quick. Simply call up DiskFinder and fill in the Search dialog box (an Options window allows you to set search criteria, including file type or creator, creation or modification date, and size of file). Because the program needs to search its library only and not entire disks, results are almost immediate.

DiskFinder, however, is not always the most convenient program to use. To keep the library current, you must manually update it every time you finish a session in which you've added, deleted, copied, or renamed files. Users with hard-disk drives who mainly use floppies to archive files may find this acceptable. Users without hard-disk drives, however, are likely to do an awful lot of disk swapping, due to the necessity of cataloging all the changes on the library disk. Whether it's worth it or not depends on the size of your file-management problems and how much effort you want to expend to solve those problems.

The program lacks some of the niceties we've all come to expect from well-behaved Mac programs. Check boxes and other accoutrements of the Macintosh interface are used in a nonstandard, nonintuitive manner. On every disk it catalogs, DiskFinder creates a data file on the root level of the disk. Such files should either be made invisible or placed in the System folder, if there is one. On the other hand, DiskFinder's on-line help is excellent. This, combined with the HyperCard Help stack, means that you will not need to open the manual, which, though complete, is poorly organized.

Although DiskFinder performs as promised, the program lacks that extra dimension that would make it a must for the serious user. Any utility program requiring constant user vigilance to retain its usefulness has limited appeal. For hard-disk users, at least, this need not be the case.

One can easily imagine an INIT that would automatically catalog all file changes. DiskFinder may find its niche with some users, but it still needs refinement before it appeals to the masses.

— Larry Husten

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DiskFinder will search on-line disk volumes for files, or it will search through a previously created catalog so you can search off-line disks, too.

DiskFinder offers many options to narrow the search, or you can just search by name.

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List Price: $49.95
Published by: Williams & Macias, S. 3707 Godfrey Blvd., Spokane, WA 99204; (800) 752-4400, (509) 458-6312.
Version: 1.07
Requires: 512K
Compatibility: Mac II and MultiFinder friendly.
Application Size: 51K
Copy Protection: None
"Clearly in a class by itself."
That's how MACazine judged the MAC-101, our advanced keyboard for the Macintosh.
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Which means that anyone who's used to an AT or PS/2—or a Selectric—for that matter—will instantly know the MAC-101 like the back of their hand.
And type on it accurately with the confident touch that comes only from tactile, positive-response keys.

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Only one menu lets you have a burger

rare, 

barbecued, 

with Chile, 

over easy
or just plain.

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Turbo Mouse

Hardware

Turbo Mouse ADB

Mice are fine pointing tools. However, I've never been convinced that they are the ultimate cursor-control device. And so I've tried every alternative tool that I've seen. I've gone through regular mice, optic-tracked mice, touch screens (not on a Mac), trackballs of all shapes and colors, the Felix, graphic-input pads (both with hard-wire connections and wireless), and more. Only the original Assimilation trackball (later marketed by Kensington) and the Felix proved superior to the standard Apple-supplied mouse.

Kensington has totally redesigned its trackball, the Turbo Mouse ADB, to make it compatible with the Apple Desktop Bus, the input standard for SEs and Mac IIs. This new entry, which can do far more than simply position the cursor, is the finest Macintosh pointing device available.

No matter how many extra features a pointing device offers, the most important criteria are pointing speed and accuracy. Does it let you put the cursor where you want it quickly and without overshooting? In simple terms, is its pointing ability equal to that of the Apple mouse? The answer, for the Turbo Mouse ADB, is a resounding yes. At 200 dots per inch (dpi), it positions the cursor with more accuracy than the original mouse, which delivered at 80 to 90 dpi.

Trackball feel is as much a matter of practice and device cleanliness as anything else. Once you get used to the Turbo Mouse (and that took me a surprisingly short time), it has excellent feel. One feature that takes some time to get used to is its automatic acceleration. The cursor moves at the speed you are moving the ball. As you move the ball faster, the cursor moves even faster, moving several pixels for every one it would move at lower ball speed. Normally, you control the Turbo Mouse's response by setting the Mouse section of the Control Panel DA. That's enough for most users.

However, if you want more control or wish to totally customize the response, you can get (from Kensington, by direct mail only, for $15) a control panel device (cdev) that lets you use your Control Panel DA to set and customize your Turbo Mouse ADB's settings. The cdev is nicely done. It changes the actual settings as you change them, so you can experiment without quitting the Control Panel DA or rebooting. I've used this to change my Turbo Mouse's response to something very like the original mouse with the mouse scaling feature turned on.

The Turbo Mouse ADB has a 4.5-x-5.75-inch footprint. The curve of its top surface matches the curve of both regular and extended keyboards, so you can butt the device right up against your keyboard. It also matches Apple's platinum color exactly. Trackballs that have a loose ball, like this one and the Abaton ProPoint, are much easier to keep clean. Just remove the ball and wipe out the cavity.

The Turbo Mouse ADB has two buttons. One transmits a normal mouse-down event (Click) while the other locks the button in the down position (Click Lock), which is very useful when making extended selections and in creating graphics. Pressing both buttons simultaneously (the manufacturer calls it chording) transmits a Command-key equivalent you've preselected. You can pick from Command-N, -O, -W, -S, -P, -Q, or -Z. In many programs, these commands are equivalent to New, Open, Close, Save, Print, Quit, and Undo. Just be aware that the Turbo Mouse sends a Command-key combination, not a real menu choice. Options are selected when you set a series of Dip switches on the back. While setting the switches isn't hard, these options should have been software settable. There also should be a setting that disables Click Lock, making both buttons function identically.

Kensington also provides a stick-on mouse pocket, so you can retire your mouse in style. And you will, once you try the Turbo Mouse ADB.

— Ellen Hirame
From the company with a famous name...

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What a guy that Marco Polo. The original traveling man. Went over to the court of Kublai Khan, opened up the world and brought back paper, spaghetti and Polo shirts. All major breakthroughs in Western civilization.

We at EMAC like to think we’ve one-upped Mr. Polo. Sure we’re both voyagers for better worldwide communications. Marco gave us his trade routes to the east and we give you the MD2400 modem. But Mr. Polo’s friends grew old waiting for a postcard from him. With our 2400bps modem, no one’ll have to wait for word from you.

And with all its features, it’s as convenient as fast food. Which brings up another thing. If Marco brought spaghetti back from China, was it cold when he got home?

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Quick Clicks

HARDWARE

Mac-105 Keyboard

Cutting Edge's Mac-105 Keyboard is a good alternative to Apple's standard Apple Desktop Bus (ADB) keyboards. Its size and configuration are the same as those of the Apple Extended Keyboard, and it has the same basic key layout. It has (surprise!) the same 105 keys that are found on the Apple Extended Keyboard, including the 15 function keys.

This keyboard is distributed by both Cutting Edge and Ehman Engineering (they're actually two parts of the same company). The unit distributed by Ehman is bundled with CE Software's QuicKeys, so it is a terrific bargain. The Cutting Edge version is available for substantially less and is an excellent keyboard. If your choice is between the standard Apple keyboard (no function keys) or the Mac-105, go for the Mac-105.

— John Langston

Mac-105 Keyboard

List Price: $179; with QuicKeys, $199.
Manufactured by: Cutting Edge, P.O. Box 1259, Evanston, WY 82930; (800) 443-5199, (307) 789-0582.
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Compatibility: Mac II and MultiFinder friendly.
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A recent tracking study performed by Numerical Understanding Methods Bureau, Inc., has determined that constant and prolonged exposure to spreadsheets output may result in cases of extreme dryness and lethargy. Contributing factors have been numbers with no context, lack of graphic elements, and limited abilities in the measurement of text.
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A product so friendly, it turned novices into experts. So sophisticated, it became, in the words of MacUser, a power user’s delight.

MicroPhone is a legend. One of those precious software creations that single out the Macintosh as a superior computing machine.

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Stewart Alsop, P.C. Letter:
“MicroPhone . . . sets the standards that general-purpose communications software will have to follow.”

The New York Times:
“MicroPhone is a breakthrough in communications software . . .”

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Supports import and export of scripts as text files. Allows control of PBX’s, Hayes and non-Hayes modems through flexible modem drivers. Runs at 50 to 57,600 baud. Emulates DEC VT52, VT100, and TTY type terminals. Mac II and LaserWriter compatible.

Works with all Mac large screen monitors. Supports the extended keyboard. Built-in text editor. Includes Glue, licensed from Solutions, Inc.

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See us at the MacWorld Expo Booth #535
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monitor, the Motorola 68030 chip (which you’ll also find in the Mac IIx and soon in many other machines),
a keyboard and a mouse, a bunch of RAM, and some very nice cabinetwork.

I’m not about to knock that nice cabinetwork: I’ve been screaming for better design in computers for a long time, and the NeXT stuff is the best I’ve ever seen. The frogdesign people (ex-Apple IIc, Logitech mouse, and so on) did a great job.

But that sexy little black cube and the nice big monitor and, oh yes, a $2,000 400-x-400 dot-per-inch (dpi) printer — a predictable advance in printer resolution at a price that simply means Jobs expects to make his money on the computer — house little new technology. This is a bolt-it-together box of nice components with hardly anything fundamentally new in the way those off-the-shelf components are put together.

Mach, the NeXT operating system, is yet another UNIX variant. It has a nice graphic shell. Period. Unfortunately for NeXT’s customers and the UNIX development community, Mach is sufficiently different from standard UNIX — whatever that is — that moving an application to it isn’t just a matter of recompiling, nor even of a few days’ work fixing errant code by hand.

That may be just as well from Jobs’ and NeXT’s viewpoint — it increases their control over the software market for the machine and lends an air of exclusivity to the product by excluding so many programs and developers.

But in the end every great computer succeeds because of great software. I’m perfectly ready to say Stephen Wolfram’s Mathematica, bundled with the NeXT computer, is great software. And T/Maker’s WriteNow, playing soon on a NeXT PC near you, is mighty nice too. But what about other programs?

While Jobs & Co. say they’ll deliver a nifty reference library on those magneto-optical disk drives in NeXT machines, the intriguing question is just how other software will be distributed for the machine. Without a built-in floppy-disk drive, it’s going to be tough to write new programs into the machine’s mass storage

The Next NeXT Question

Here’s an idea: Let’s bring out a hot new personal computer. Let’s give it a brand-new operating system incompatible with anything that runs on any other computer. Let’s make anyone who wants to write software for it write us a nice high school theme-style essay about why they want to and why they think we’re so swell ourselves. If they write a winning essay, we’ll not only loan ‘em one of these computers, we’ll let them bring their finished products back to us for possible distribution. They’ll have to come back to us because we won’t put a floppy-disk drive in the machine. That way there won’t be any easy way to distribute software for it!

And let’s not set up any commercial distribution for the machine. Who needs it? We’ll sell to . . . college students! At, say, $6,500 or so per computer. Plus maybe $2,000 for a printer. Business Week and Newsweek and Almost Every Other Week will put us on their covers and write glowing stories about our technological wizardry and marketing genius.

I give you the NeXT computer from Steve Jobs.

Listen: I think the NeXT machine is a masterpiece — a masterpiece of design, of packaging, of marketing, of orchestration of the public’s expectations, of . . . hype. I even think it’s going to be an important machine and will begin to change our minds about tightly controlled standards for computers, operating systems, and software.

But what the NeXT computer definitely is not is a technological tour de force. Which is a large part of what has me on my high horse about the machine. Not quite universally, but nearly so, the business press and large chunks of the trade press have treated Stevie’s New Wonder as a technological marvel, a big leap forward to the edge of tomorrow.

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unless you've been shipwrecked on a desert island or in a coma for the past several months, you have been deluged with information about the long-awaited NeXT machine. From the coverage this company and product have gotten in the press, you'd think that it was the Second Coming. Well, it is a second coming of sorts — only it's the second coming of Steve Jobs and not of a savior (although there are those who confuse the two).

Admittedly, the saga of NeXT and its founder is a fascinating tale. Steve Jobs, wunderkind of the computer industry, changed the face of computing forever with the Apple II and repeated his triumph with the Macintosh. He started in a garage and ended up with a Fortune 500 company, only to lose control of his creation in a power struggle with the man he had brought in to take the company into the 1990s. Not content to sit on his laurels, lick his wounds, and count his money, Jobs then started another company with the intention of changing the world yet a third time.

Even though the company started with nothing more than money and Jobs' vision, NeXT, Inc. was news for a long time. People just loved to speculate about what Steve was up to, and what little information did make it out of the company kept the interest of the computer press. When Ross Perot, founder of EDS (famous for rescuing its employees from Iran) and recent thorn in the side of General Motors, threw some of his money into the venture, interest in the company became widespread among the press at large and on Wall Street. And since NeXT was working on a machine for the educational market, the company was on the minds of many in the academic community as well.

Finally, in October 1988, the curtain of secrecy was raised, and the media circus began. At the announcement press conference, savvy veterans oohed and aahed like schoolchildren at a magic show. And not without reason. The NeXT machine is indeed an impressive blend of the latest technology, a showpiece for Silicon Valley's finest work. From its high-speed processor to its custom chips to its multimegabyte erasable optical disk, the NeXT machine takes the state of the art another step forward.

But what does this machine mean to the business market? Nothing; not directly, anyway. To begin with, volume shipments won't begin until well into 1989. Even when the machine does ship in volume, it won't be heading for corporate desktops; this machine is intended only for the educational market, at least for some time to come. Originally the restriction to the educational market was part of Jobs' severance agreement with Apple, but that agreement has expired. It turns out that Jobs was serious about his intention to make a workstation for education. NeXT is committed to education, so it may be a while before the company even begins to consider attacking the business market.

The impact of the NeXT machine will be felt in the commercial marketplace, however. Once someone blazes a technological trail, many companies will follow. IBM has already licensed some of the software NeXT developed. Companies such as Apple that enjoy technological leadership will be striving just a little harder in the technology race now that there's a new entrant in the field.

So while you may not end up with a NeXT machine on your desk, your next Macintosh may well be the better for the added impetus that Apple (and the rest of the industry) has gotten from Steve Jobs and NeXT. The competition will, as always, be good for everybody, especially the users.

Steve Jobs has already hit two out of the park in an industry where striking out is commonplace. Even Steve has struck out (anyone remember the Apple III?). If the NeXT machine turns out to be only a single or a double — or even another strikeout — he still has plenty to be proud of. And he's not done yet. Steve Jobs has demonstrated that he came to play, and he won't be retiring anytime soon. So keep your eye on the ball.

**Pinstripe Picks**

Here are some products worth a look if you use your Macintosh for business. If a product picked here interests you, check the
## Programs & Peripherals

### Networking Software & Hardware

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<td>VersaTerm-Pro</td>
<td>195</td>
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<tr>
<td>TelnetWorks LIP-LINK</td>
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</table>

### Word Processors & Desktop Publishing

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
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<tbody>
<tr>
<td>Access Technology Mind Writer 2.0</td>
<td>95</td>
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<tr>
<td>Mind Writer Express</td>
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<tr>
<td>Allan Bonasio Associates</td>
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<td>Expressions 2.0</td>
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<tr>
<td>Aldus Corporation</td>
<td>399</td>
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<tr>
<td>PageMaker 3.0</td>
<td>114</td>
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<td>Ashum Take</td>
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<tr>
<td>FullWrite Professional</td>
<td>269</td>
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<tr>
<td>BrotherDTP Advisor</td>
<td>49</td>
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<tr>
<td>Corel Ominigate</td>
<td>389</td>
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<tr>
<td>Claris MacWrite 5.0</td>
<td>105</td>
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<tr>
<td>Letraset</td>
<td>112</td>
</tr>
<tr>
<td>ReadySet, Get! 4.5</td>
<td>379</td>
</tr>
<tr>
<td>Letra Studio</td>
<td>369</td>
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<tr>
<td>LetraFonts (Various Vol. 1-4 ea.)</td>
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<td></td>
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<tr>
<td>Microsoft Word 4.0</td>
<td>249</td>
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<td>LaserSoft Laser Writer</td>
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<td>LaserWriter</td>
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<tr>
<td>Quark, Inc. QuarkXPress V2.0</td>
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<td>Silicon Beach Software</td>
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<td>Silicone Press</td>
<td>41</td>
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<td>Symmetry II</td>
<td>21</td>
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<td>Symmetry Acta V2.0</td>
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<td>Acta Advantage</td>
<td>69</td>
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<td>T/Maker Company</td>
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<td>WhiteWrite V2.0</td>
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<td>WordPerfect Corporation</td>
<td>185</td>
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<td>Working Software Quit Letter</td>
<td>79</td>
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</table>

### Images With Impact! Business I by 3G Graphics

Images With Impact! Business I is the exciting, useful series of EPS clip-art images for business and industry. You’ll have more than 175 images to use with your PostScript compatible programs. Import them into PageMaker or Ready Set, Go! to enhance your desktop publications. Open Images With Impact! with Aldus’ Freehand or Adobe Illustrator where you can add color or customize them for your specific needs. Categories of images include symbols, computer and office equipment, people in business, and much more. Everyone can add emphasis and style to any document with Images With Impact! Images With Impact! Business I: 75.

### Spelling & Grammar Checkers

<table>
<thead>
<tr>
<th>Product</th>
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<tbody>
<tr>
<td>Aegis Development</td>
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<tr>
<td>A.L.P. Systems MacProof 3.0</td>
<td>115</td>
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<tr>
<td>Deneba Software</td>
<td>159</td>
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<tr>
<td>Coach Merriam Webster’s Thesaurus 2.0</td>
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<tr>
<td>Spelling Coach 3.0</td>
<td>109</td>
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<tr>
<td>Word Finder (Synonym Finder)</td>
<td>33</td>
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<td>Sensible Software</td>
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<td>Sensible Grammar</td>
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<tr>
<td>Working Software Spellswell 2.0</td>
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<tr>
<td>LookUp (Makes Spelling Suggestions)</td>
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### Accounting Packages

<table>
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<td>Astra Software</td>
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<tr>
<td>Astra TimeMinder</td>
<td>195</td>
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<td>Astra Payroll Plus</td>
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<td>Bedford Software</td>
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<td>Simply Accounting</td>
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<td>Chang Labs</td>
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<tr>
<td>North Edge Software Timeslips II</td>
<td>219</td>
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<tr>
<td>Peachtree Back To Basics Professional</td>
<td>159</td>
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<tr>
<td>Software Taxview Planner</td>
<td>45</td>
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<tr>
<td>Softwiz Taxview Planner</td>
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<tr>
<td>Deluxe Software</td>
<td>120</td>
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<tr>
<td>Survivor Software</td>
<td>45</td>
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<tr>
<td>MacMoney 3.0 (Enhanced Version)</td>
<td>62</td>
</tr>
</tbody>
</table>

### MetaDesign by Meta Software Corp.

MetaDesign is the ideal graphics and text processor for systems designers, systems analysts, project managers, and anyone who needs to display complex relationships in systems of every type. MetaDesign understands that objects in a diagram are related and keeps track of them for you. When you move, change, resize an object, MetaDesign automatically updates associated items, putting an end to time-consuming redrawing! Its hierarchical structure lets you manage complex systems in workable modules. Hypertext support allows you to link text across multiple levels and pages, and the case-sensitive Search feature lets you locate what you need no matter which level it resides in. Use MetaDesign early in a project to create a basic sketch, and update it easily and quickly as the project evolves.

MetaDesign: 199.
Game Software

- Access World Class Leader Board Golf
- Accolade Hard Ball or Mean 18
- 4th & Inches
- Activision Shanghi or Jamter
- Compton
- Universal Military Simulator or Manhole
- Might & Magic
- Sky Travel
- Artwork Bridge 5.0
- Avalon Hill Mac Pro Football
- Bradford 1st Art of War or At Sea
- Shuffle/Cuck Cale or Ultima IV
- Poster Maker Plus
- Bully Software
- PS1 Mustang or Ferrari Grand Prix
- Cassady & Greene, Inc. Crystal Quest
- Crystal Quest w/Critter Editor
- Centaur Crapsmaster
- Roulette Master or Blackjack Ace
- Discovery Software Arknoed
- Electronic Arts ChessMaster 2000
- Chuck Yeager Flight Simulator or Life & Death
- Starfleet I
- Scrabble
- One-On-One, Pebble Construction Set, Seven Cities of Gold, SkyFox, or Patton vs Rommel
- EPYX Sub Satatulator (Mac or Mac II)
- Hayden Software Sargon IV
- Infinity Software, LTD.
- Go or Grand Slam Tennis
- Infocom Leather Goddesses of Phobos or Hichthiker's Guide
- Beyond Zork, Zork Trilogy or QuarterlyStaff
- Zork Zero

---

Modems

- Abaton InterFax 12/48 349.
- Anchor Automation 179.
- MacPac 2400E w/ software & cable 315.
- Epic 2400 Int. SE 315.
- Epic 2400 Int. Mac II 315.
- Epic 2400Mini Ext. (Hayes Compatible) 155.
- Everest Emax 2400 Baud 225.
- Hayes Microcomputer 1200 299.
- Smartmodem 2400 449.
- MID/Express Commlink 2400 169.
- Mignet
- Mignet Pocket Modem (ext. 300/1200 Data) 115.
- Novation Novacon Parrot 1200 109.

---

Rags to Riches ‘3-Packs’ by Chang Labs

- Rags to Riches ‘General 3-Pack’ (G/L, A/R, A/P) 289.
- Rags to Riches ‘Pro 3-Pack’ (G/L, Pro. Bill., A/P) 359.
- Rags to Riches ‘Retail 3-Pack’ (G/L, Inventory, A/P) 359.

---

Rags to Riches is the flexible and powerful modular accounting system that’s winning praise from accountants and reviewers nationwide. Now, Chang Labs offers its popular Rags to Riches ‘3-Packs’ at a special price and with a special bonus! Each ‘3-Pack’ offers the user flexible reporting, batch totals for any time period, user definable accounting cycles, and impressive speed. When you need to analyze, graph or present your accounting information, just export it to your favorite program! As a special bonus, if you choose the ‘3-Pack’ that suits your needs before February 28th, 1989, Programs Plus will send you an Aatrix Payroll program, absolutely FREE!!

---

Customer Service (203) 378-3662 • FAX (203) 381-9043
Monday thru Friday 9 A.M. to 9 P.M.
Saturday 10 A.M. to 6 P.M. (Eastern Time)

OUR POLICIES
- We accept MASTERCARD and VISA with no added surcharge.
- Your credit card is not charged until we ship.
- If we must ship a partial order the shipment that completes the order is sent freight free.
- If you are ordering by mail, we accept private and company checks. With MASTERCARD and VISA orders include card number and expiration date.
- Connecticut residents add 7.5% sales tax.
- Locations more than 1 day away shipped via Federal Express Standard Air service.
- Federal Express Priority I service also available.
- Sorry, we cannot accept COD orders.

SHIPPING
- Continental United States: Add $3.00 per order to cover Federal Express Standard Air service. APO/FPO orders shipped 1st Class Mail (add 3%, $3.00 Min charge).
- Alaska, Hawaii and Outside Continental US: call or write for information. All items subject to availability. Prices subject to change without notice. Mail-in orders (especially from foreign countries), please furnish telephone number.

---

Positively A Plus

Programs Plus

75 Research Drive, Stratford, CT 06697
800/832-3201
Please circle 62 on reader service card.
Utility Software

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>ALSold Disk Express</td>
<td>35</td>
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<tr>
<td>Font/DIRDigger Plus</td>
<td>49</td>
</tr>
<tr>
<td>Berkeley System Design Stepping Out II</td>
<td>52</td>
</tr>
<tr>
<td>CE Software QuickKeys (Macro Program)</td>
<td>53</td>
</tr>
<tr>
<td>Central Point Software Copy II Mac</td>
<td>29</td>
</tr>
<tr>
<td>PC Tools Deluxe Mac</td>
<td>43</td>
</tr>
<tr>
<td>Emerald City Software LaserTalk</td>
<td>187</td>
</tr>
<tr>
<td>Fifth Generation Systems Suite II</td>
<td>44</td>
</tr>
<tr>
<td>FastBack For The Macintosh</td>
<td>54</td>
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<tr>
<td>Power Station</td>
<td>32</td>
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<tr>
<td>HAC Special Edition</td>
<td>24</td>
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<tr>
<td>Icom Simulations On Cue</td>
<td>36</td>
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<td>TMON</td>
<td>85</td>
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<td>Infosphere Liaison</td>
<td>129</td>
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<tr>
<td>Microlytics, Inc. GOFiler</td>
<td>45</td>
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<tr>
<td>Microcedes Redux</td>
<td>65</td>
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<tr>
<td>ScreenGems</td>
<td>49</td>
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</table>

Oldsvil Software Icon-It MultiClip Read-It TS (For Thunderscan)       | 39    |
| (Digitizer)                                                          | 199   |
| Software Stock Cleaner                                              | 31    |
| HyperTools 1 or 2                                                   | 66    |
| SuperMac Software SuperSPOOL 5.0                                    | 54    |
| Super LaserSPOOL 2.0                                                | 82    |
| DiskIt 1.4                                                          | 54    |
| Sentinel 2.0                                                        | 155   |
| Syntanet MacSQU2                                                   | 48    |
| Utilities for Mac (S.U.M.)                                          | 55    |
| Williams & Maccas                                                  | 31    |
| myDiskLabeler w/Color                                              | 31    |
| LaserWriter Option                                                | 34    |
| Working Software                                                   | 36    |
| Finditroll 2.0 (Document Finder)                                    | 36    |

Printers & Digitizers

<table>
<thead>
<tr>
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<tr>
<td>Digital Vision Computer Eyes-Mac</td>
<td>209</td>
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<tr>
<td>Kola Table Design Co.</td>
<td>223</td>
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<tr>
<td>MacVision 2.0 (Digitizer)</td>
<td>223</td>
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<tr>
<td>Kurs A 5D ABB Terminal</td>
<td>255</td>
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<tr>
<td>Cordess 4 Button Cuson</td>
<td>49</td>
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<tr>
<td>Compact Series SC30</td>
<td>235</td>
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<tr>
<td>Pocket Graphics Brt Pad Plus</td>
<td>329</td>
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<tr>
<td>ThunderWare</td>
<td>199</td>
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<tr>
<td>ThruderScan V4.0 with Power Port</td>
<td>199</td>
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<tr>
<td>Mike II Power Accessory</td>
<td>42</td>
</tr>
</tbody>
</table>

Macinware SE Ext. Carrying Case by I/O Design

The Macinware SE Ext. Carrying Case protects your Mac SE, Plus, or 512K and its extended keyboard in safety and style. It's made of rugged 1000 Denier Dupont Cordura nylon, and surrounds your machine with a full half-inch of high-density foam padding. There's room for an external hard drive, a mouse, cords, and disks, so your complete system travels with you in one compact unit. All stress points are cross-box stitched for added safety. A convenient shoulder strap is included, and you can choose platinum grey or navy blue colors.

SE Carrying Case ............................................ 76.

DataBase Management

<table>
<thead>
<tr>
<th>Item</th>
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<td>Acan 4 Dimension</td>
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<td>4D Runtime</td>
<td>239</td>
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<tr>
<td>Activewear Reports for Hypercard</td>
<td>75</td>
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<tr>
<td>Focal Point &amp; Business Class Bundle</td>
<td>63</td>
</tr>
<tr>
<td>City To City</td>
<td>30</td>
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<tr>
<td>Apple Computer HyperCard</td>
<td>42</td>
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<tr>
<td>Ashton Tale Disk Drive 1.0</td>
<td>265</td>
</tr>
<tr>
<td>Blythe Software Omni 3 Plus/Express</td>
<td>129</td>
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<tr>
<td>Boreland Reflex Plus</td>
<td>45</td>
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<tr>
<td>Clear FileMaker II</td>
<td>239</td>
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<tr>
<td>Fox Software Fox Base Plus</td>
<td>263</td>
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<tr>
<td>Microsoft Microsoft File 2.0</td>
<td>119</td>
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<td>Nordic Hyper/CONTROL</td>
<td>89</td>
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<tr>
<td>Odetta Double Helix II</td>
<td>339</td>
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<td>DataDesk Professional</td>
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<tr>
<td>Software Discoveries RecordFinder Plus</td>
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<tr>
<td>TE!point 0 FocusPoint II</td>
<td>125</td>
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Educational/Creative Software

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<td>Are Neave Practice Medicine</td>
<td>75</td>
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<tr>
<td>Barron's Barron's SAT</td>
<td>35</td>
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<tr>
<td>Bible Research The Word (KJV or NIV)</td>
<td>165</td>
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<td>Begg Begue Production Studios</td>
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<td>Shing Quartet Country or Heavy Metal</td>
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<tr>
<td>Super Studio Session</td>
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<td>Bright Star Technology Alphabet Blocks</td>
<td>63</td>
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<td>Taking Titles</td>
<td>69</td>
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<td>Broderbund Clip Scores</td>
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<tr>
<td>Jam Score &amp; Black &amp; White Movies</td>
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<td>Sensei Geometry Calculus or Physics</td>
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<td>Typy</td>
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<td>Where is the World in Carmen San Diego</td>
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<td>Ceda Mac Drums</td>
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<td>Perception</td>
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<td>Davidson &amp; Associates Speed Reader II</td>
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<td>Mather Blasser or World Attack</td>
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<td>Electronic Arts Mavis Beacon Typing</td>
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<tr>
<td>Venture's Business Simulator</td>
<td>39</td>
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<tr>
<td>Deluxe Music Construction Set V2.0</td>
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<td>Electronic/Arts/Electronic Arts/Teens/Station/Bea. First Shapes, or Main Talk.</td>
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<tr>
<td>Great Wave Software KidsTime</td>
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<td>Winning Company Reader Rabbit</td>
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<td>Mindscape Perfect Score SAT</td>
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<td>w/The Perfect College</td>
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<td>Nokia MacKids Educational Programs (cal)</td>
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<tr>
<td>Simon &amp; Schuster Typing Tutorial IV</td>
<td>35</td>
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<td>SpringBoard Top Honor.</td>
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<tr>
<td>Family Matters or Atlas Explorer</td>
<td>28</td>
</tr>
</tbody>
</table>

Sensible Grammar by Sensible Software

**Sensible Grammar** takes the drudgery out of proofreading your documents, so you can devote more time to creating perfect documents. It's simple to check your documents for thousands of common grammar and style errors. Informal, overly formal, vague, wordy, chichi and sexist are detected. So are punctuation, capitalization, verb tense, verb agreement, and many other types of errors. All are displayed on screen, along with suggested corrections, and an editing window so you can make corrections quickly. **Sensible Grammar** also allows you to customize its checking so you can adapt it to your needs with just a few keystrokes. Make the sensible choice in proofreading software, **Sensible Grammar**.

**Sensible Grammar** ............................................ 54.

Disk Drives/Hard Disks/Upgrades

<table>
<thead>
<tr>
<th>Item</th>
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<td>Applied Engineering MacRAMS</td>
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<td>(1 MB SIMMS Mac SE, SE II)</td>
<td>499</td>
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<tr>
<td>AST Research</td>
<td>749</td>
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<tr>
<td>MacRAM Co-Processor (Mac II)</td>
<td>559</td>
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<td>CMS</td>
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<td>Compact Series SC30 (Mac SE II)</td>
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<td>Compact Series SC45 (Mac SE II)</td>
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<td>SD Series MMack Stack SD20 (Mac SE II)</td>
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<td>SD Series MMack Stack SD60 (Mac SE II)</td>
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<tr>
<td>Cutting Edge Cutting Edge 80k Drive</td>
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<td>Cutting Edge XL 50</td>
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<td>Plus SGI Hard Drive</td>
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<td>Cutting Edge XL 30 Internal Hard Drive</td>
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<td>Cutting Edge XL 45 Internal Hard Drive</td>
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<td>Cove Computer Corporation</td>
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<td>Marathon 200 Accelerator</td>
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<td>MEE 1 (16 Mhz w/1MB)</td>
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<tr>
<td>MEE 2 (16 Mhz w/1 MB) Special 1059.</td>
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<tr>
<td>MEE 3 (16 Mhz w/Math Co-processor)</td>
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<td>MEE 4 (16 Mhz w/1 MB &amp; Math Chip)</td>
<td>1256</td>
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<td>MacSnap 524 (512E to 1MB)</td>
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<tr>
<td>MacSnap 524E (512E to 1 MB)</td>
<td>305</td>
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<tr>
<td>MacSnap 524S (512E to 1 MB w/SCSI)</td>
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<td>MacSnap 548 (512E to 2MB)</td>
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<td>MacSnap 548E (512E to 2MB w/SCSI)</td>
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<tr>
<td>Laser 800k External Drive</td>
<td>185</td>
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</tbody>
</table>

Marathon MSE-2 by Dove Computer

Marathon MSE-2 is the accelerator and memory expansion board that brings speed and power to your Macintosh SE. Because the Marathon MSE-2 features a 68020 32-bit 16 MHz microprocessor, your favorite programs will run up to 400% faster! And the 1 Megabyte onboard memory expands the existing memory, so you'll be able to run MultiFinder and many other memory-hungry applications! The software programmable on-board CMOS LCA controller chip, on-board expansion slot, and optional 68881 math co-processor option allow future expansion and ensure compatibility. When productivity and flexibility are important, go the distance with Dove's Marathon MSE-2!

**Marathon MSE-2** ............................................. 1059.
Virex by HJC Software

Virex is the solution to the threat of Macintosh computer viruses. Virex is the only program that detects and repairs infected programs and system files! If you need to eradicate an existing virus from your infected system, or want to protect your system from future infection, Virex is the safe, effective product that does the job. Its icon driven approach and on-line help make it easy to learn and use. Virex combats all known Macintosh viruses and HJC Software plans to upgrade the program to combat new viruses. Registered users will be notified of updates and can subscribe to HJC's inexpensive upgrade service.

Virex

69.

Blank Media

Single Sided 3.5" Disks

- Sony 3.5" DD/DD Disks (box of 10)
  - 10

- Fuji 3.5" DD/DD Disks (box of 10)
  - 10

- Maxell 3.5" DD/DD Disks (box of 10)
  - 10

- Verbatim 3.5" DD/DD Disks (box of 10)
  - 10

- Sony 3.5" DD/DD Disks (box of 10)
  - 10

- Fuji 3.5" DD/DD Disks (box of 10)
  - 10

- Maxell 3.5" DD/DD Disks (box of 10)
  - 10

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Know how to build a better mousetrap? Adopt a cat. Know how to build a better Mac? Now that's more complicated.

From desktops nationwide, there emanates a yearning. More. Better. Faster. You, yes, you, may be among the afflicted. Watch for the warning signs. Have you gnawed your fingernails to the nub waiting for documents to print? Do you talk to your Mac while you're waiting for it to finish some lengthy operation? Have you ever tapped on the screen, as if to admonish the electrons to run along?

BY
JOHN J. ANDERSON
AND
KRISTI COALE

FEBRUARY 1989 MACUSER 113
You long for memory, storage, speed, color. If you have these things, you long for more of each. Some day soon now, you're going to make that next big jump. You're going to add, expand, improve, enhance. You're going to have the biggest, hottest, coolest, toughest Mac on the block.

Enhancing your Mac can develop into an obsessive pastime. It indulges the desire for power, while providing the satisfaction of mowing down deficiencies, whether real or imagined.

And then there's the fact that some people really and truly do need to upgrade their Macs.

**I COULD ENHANCE ALL NIGHT**

Enhancement is a good thing, but it does have its shortcomings. And there are more mundane concerns than the mere exhaustion of one's financial reserves. Certain enhancements actually conflict with each other, causing potentially nasty results. On the software side, you might find your Mac actually runs slower or that it crashes periodically because of an overdose of cdevs, DAs, or INITs. On the hardware side, enhancements might be incompatible, or simply physically unable to occupy the same space at the same time. We're reminded of Daniel J. Boorstin's admonition that although technology is fun, we can also drown in it.

**COMPOUNDED CONFUNDITY**

It's uncommon to reflect on 1984 as the Mac's Good Old Days, but Mac users don't sufficiently acknowledge some of the advantages we had back then.

Yes, it was a closed machine, underpowered and overtaxed. But there were advantages as well as disadvantages to that. There was one machine and one version of System software. Hardware expansion was a nonissue. A scant 128K of RAM enforced Spartan discipline: Programmers had to carefully allocate resources and economize code.

Now, with a megabyte as the minimum RAM standard for the Mac Plus, SE, and II, programmers have become less conscientious. Do we see a trend toward memory-hungry, feature-laden programs that don't make full use of all their own components? It sometimes seems that way. We wonder whether most programmers still consider what the user really needs, in contrast to what they can contrive to stick in.

But there is more than enough blame to go around. Compounding the problem are the countless revisions to System software that Apple has churned out in the past two years. Certain versions of programs work only with certain versions of the System and certain versions of the Finder. Many packages that work with System 5.0 and its predecessors won't work with System 6.0. Conversely, some new packages have been designed to work only with System 6.0. So if you have an earlier System, you're out of luck. This kind of problem used to plague only the other (blueish) guys. Now it's our problem too.

It's hard to blame a programmer for not following rules that have changed so often and in some cases so radically. And let's not forget that the more complex any system becomes, the more likely it is to fail.

**YEARNING YOUR KEEP**

So much for the hymn to simplicity; enriching your machine is where it's at in today's Mac community. This is not to endorse, however, system expansion as a macho end in itself. Enhancement should never be a matter graded solely on whose Mac has more under the hood. The goal is to make the Mac the best machine for your specific needs. Only then are you justified in reaching for whatever groovy gadgets are available to help you do just that.

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The first name in disc drives
Making the Upgrade

carried away, however, given enough monetary resources. It can be difficult to “just say no” to 8 megabytes of RAM, a Mitsubishi 35-inch color monitor, or an image-capture board, if you can swing it. We’re talking state-of-the-art technology, after all, where improvements come to market practically every day. That’s right, every day. Remember that accelerator board you bought last week? History. It’s a snail alongside the card that will ship tomorrow. Need to find a quick way to go broke? If you really come down with the yearning, it’s nearly as effective as an arms race.

CLOGGED ARTERIES

When finally committing to upgrade, you’ll need to look carefully at potential bottlenecks in system operation. Say you want to speed up an inherently slow operation like printing. Your Mac, and therefore you, gets tied up waiting for a document to print (time to gnaw the paws). You’d like to have your computer free to work on one project while printing another. Installing a spooler in your printing system is the way to placate your fingernails — sending your document to a print buffer, thereby freeing your Mac for your continued use. If you’re running MultiFinder, you can print in the background while working on something else.

Another frequent pinch comes with disk I/O (input/output). A RAM cache can boost performance in this respect, quickly and dramatically. Cache memory is a small, fast bed of memory that serves the CPU. The CPU can dispatch interim operations in this buffer, which is more easily and quickly accessible than conventional RAM, and immensely preferable to reading or writing from disk. Apple includes this option in the Control Panel of the Mac, and some applications (especially graphics programs) sport their own versions of this feature. However, you should note that by defining a RAM cache, you subtract directly from available conventional RAM. Like our government, the Mac sometimes has budgetary problems, such as allocating too little RAM for too many functions. And like our government, the most attractive solution involves throwing money at the problem.

Cache or no cache, if you’re working with graphics or audio files of a megabyte or more in size, you need more RAM. Along with adding a hard disk, upgrading RAM memory capacity is probably the most common way to beef up a Mac. You’ll have to shop around, but the SIMM (single in-line memory module) market is finally loosening up ($375 to $400 per megabyte in the San Francisco Bay Area at press time). Make sure you buy from legitimate SIMM dealers. Stay away from “pay now, ship later” operations. (For more on upgrading your memory, see “The Persistence of Memory” in this issue.)

Even the humblest of hard disks are indispensable Mac performance boosters. Time, in relation to hard disks, is dependent on more than one variable. Though it might seem counterintuitive, the larger hard disks perform the fastest. A Jasmine Direct Drive 160, from Jasmine Technologies, San Francisco, is among the fast-

The Apple color monitor may be too small for the graphics work you’re doing. Remedy this by adding, say, a SuperMac big-screen monitor. And don’t forget to put the SuperMac color video card on your motherboard.
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Making the Upgrade

rest of the big disks (see the MacUser Labs report in the June '88 issue). It sells for a stiff $2,899. If that's more than you need, try the Jasmine Direct Drive 80 for $1,399 or the Mass 40 from Mass Micro Systems, Sunnyvale, Calif., which lists for $899.

Bear in mind that the way you yourself operate affects hard disk speed, too. Over the course of a hard disk's lifetime, you'll write, delete, and rewrite many files. This causes fragmentation, a condition where pieces of files are scattered all over a disk — which slows normal reading and writing operations significantly. There are special utilities designed to overcome the problem of fragmentation. Alternatively, back up your drive to another device, erase the drive in question, and then rewrite its contents.

BUILDING FOR SPEED

If you really want your Mac to patch out, you'll want to consider an accelerator board. A real boon to productivity, not to mention to the antsy Mac user, an accelerator board can make operations such as compiling or sorting a humongous database much less painful. Accelerator boards can build strong Macs four ways: by providing a speedier CPU, by making that CPU more fully featured, by adding more memory, and (if the board includes a bundled math coprocessor) by giving a boost to floating-point math operations. (For more information on accelerator boards, see this month's MacUser Labs report, "Maximum G-Force").

We can't fail to mention muscle building in the realm of displays either. You can hook up a large-screen monitor, such as one from Radius (San Jose, Calif., $1,995 for full-page display; $2,295 for two-page display) for a better view of things.

If you have a Mac II or IIx and want more color capabilities, you can upgrade to 24-bit color. With 24-bit color, your screen is capable of displaying 256 colors simultaneously from a palette of more than 16 million. To get 24-bit color, you'll have to get not only a monitor capable of displaying it but also a video card structured to provide your Mac II with the power to generate it. PCPC, Tampa, Fla., has a 19-inch monitor (the PCPC II) that comes with its own custom card (CGC/2) that sells for $4,995. But why stop there? Follow through with color hard copy: Consider a QMS ColorScript 100 ($24,995) from QMS, Mobile, Ala., or the more moderately-priced 4693D Color Printer from Tektronix, Beaverton, Ore. (a mere $8,495).

SOCIAL ACCELERATION

If you're on a network, you'll have to dodge some more monkey wrenches during your efforts at acceleration. One such wrench results from the network growing too large. You can improve the situation by upgrading your file server, moving, say, from a Plus or SE to a Mac II. You can choose to split up your network into zones among several servers. This reduces the work load of an individual server. You can also divide your network and join the parts with a local bridge. One such product is the Netbridge from Shiva, Cambridge, Mass. ($499), which helps to expand an AppleTalk network. The Interbridge from Hayes, Norcross, Ga. ($799), will do the same thing.

Using a different network system can also resolve bottlenecks. Although many have knocked AppleTalk for being too slow, by itself it's not a major blockage for a network system. On the contrary, when used with the right signal-generating hardware, AppleTalk can speed things up considerably. When you're struck down by node-to-node combat, consider CheckNET ($59.95) from Farallon Computing, Berkeley, Calif., or Q-Talk from Laser Connection ($59), which is a subsidiary of QMS.

Transmitting information over phone lines is another networking concern. For example, consider two university departments on campuses hundreds of miles apart. How do they get information to and from each other? They can use a standard modem with typical telecommunications software, such as Smartcom II or Red Ryder. Another solution might be a CO-LAN (Central Office Local Area Network) system. Through ordinary phone lines, parties can transfer data at a rate of 19.2 kilobits per second. Note that...
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transmission at this speed usually requires a conditioned line, which can be expensive.

The advent of fiber optics makes possible a whopping advance in the transfer rate of data over small cables. Du Pont's Fiber Optic LAN Extender ($350) can transfer data at a rate of 230.4 kilobits/second. The system is immune to electromagnetic or radio frequency interference, and the signal doesn't dissipate over distance. If it's speed you seek in a LAN, nothing's faster than networking with light.

PLAYING THE SLOTS
The jacks-of-all-trades on the Mac II are its NuBus slots. NuBus gives the Mac II a convenient, solid expansion platform that ensures the continuing ability to adapt to evolving technology. (For more information on NuBus, please see the feature, "Hop on NuBus, Gus," in this issue.) You can slip in, say, an image-capture board (such as one from Data Translation, Marlboro, Mass., for $995) and work with NTSC (National Television Standards Committee) video. Color-capture boards let you do the same thing, only in color. There are even boards to enhance your Mac's communication capabilities with IBM mainframes (MacIrmia from DCA, Alpharetta, Ga., and MacMainframe from Avatar, Hopkinton, Mass.).

Speaking of endless capabilities, NuBus can handle up to 16 boards. But how to do that when the Mac II has only six internal slots? With the Expanse II ($1,995) NuBus expansion chassis from Second Wave, Austin, Tex., you can. The Expanse II is an eight-slot chassis that hooks up to an interface board that you plug inside your Mac II. That eats up one Mac II slot, but you're still left with 13 free slots for various cards. Shipping by the time you read this, Expanse II also has three internal and two external SCSI ports.

A SMALL MATTER OF MONEY
So far, we've emphasized the cash-intensive enhancements for your Mac. But if dollar signs block the path toward souping up your machine, you might consider these economical alternatives.

Lose the Finder. There are other file-management applications, some used in conjunction with desk accessories, that can replace the Finder and reduce the number of anxiety attacks you experience waiting to move to and fro. PowerStation from Fifth Generation Systems, Baton Rouge, La. ($59.95), is a solid Finder alternative. It has startup capabilities and can launch other applications. With one click, you can get right to your most important data files, as PowerStation automatically groups applications with the files they create. DiskTop from CE Software, Des Moines, Iowa ($49.95), is a DA that will also let you launch programs from within it. You can also make new folders and copy files from within other programs. Probably the best feature of this DA is that you can find other files on any drive.

For those who don't want to shell out a couple of grand for a larger monitor but who feel that nine inches simply is not enough, there's a software alternative: Stepping Out II from Berkeley System Design, Berkeley, Calif. For $95, you can extend your screen as far as memory allows, creating a virtual screen within a screen.

PRACTICAL MAC'S PERFECT
Enhancing your Mac is hot, it's cool, it's wet, it's dry, it's sweet, and it's bittersweet. It should also emphasize what's practical. Having more horsepower means nothing if your Mac continually crashes or flakes on you. Enhance gradually. Solve problems by finding the bottlenecks, the real deficiencies, and ironing them out one by one. Your additions should make your Mac, and you, more efficient, more powerful, and quicker on the draw. They should give your fingernails a fair chance to grow back, and your coworkers renewed faith in your sanity. But wait. What about the 68040? Real soon now.

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Hop on NuBus, Gus

There may be fifty ways to cleave your buffer, but NuBus is the bridge over troubled waters.

It stung. The Macintosh — in all its glory, its heady promise for the future — was closed shut, locked up like a medieval virgin. The Lord of Cupertino had taken steps to ensure his loved one's chastity.

A mistake. A mistake made all the more stinging by the fact that the Apple II built its success on its very expandability — six expansion slots, each patiently waiting for some third-party manufacturer to leap into the breech. But no, no expansion slots for the Mac. And, we were told, there never would be. If it was expandability you sought, then the Lisa was the machine for you.

Then we lost our Jobs.

In 1987, the sting was over. The Mac II reopened Pandora's box. The Macintosh had finally, irrevocably, and officially lost its innocence. Documentation of the Mac II's nonproprietary expansion-slot architecture was shared freely, encouraging outside support for expansion and enhancement of Macintosh computers.

When Apple decided to reopen the case, it first considered how best to do so. This involved getting behind a bus, and by this we don't mean sucking on an exhaust pipe. The multiconnector jack into which you plug an accessory card is also called a bus: a mechanical and electrical linkage system used to connect auxiliary processing, storage, and control devices to a computer. New input/output (I/O) capabilities, processing functions, disk controllers, video input and output, and extra RAM are just a few of the possible means of expansion.

GETTING PRETTY ANSI

After arduous study, Apple chose an industry standard bus, known formally as ANSI/IEEE Std. 1196-1987, aka NuBus. The NuBus was conceived in the late 1970s at the Massachusetts Institute of Technology (MIT) and was developed with 32-bit machines specifically in mind. Since then, Western Digital and Texas Instruments corporations, as well as the IEEE itself, have pursued the standard's further development.

Today's bus standards reflect attempts to redress the problems of earlier-generation buses, notably that of the original IBM PC (which itself...
was modeled to some degree on that of the Apple II). High on the list of technical objectives are simplicity, performance, processor independence, and ease of use. As we'll see, achieving a balance of simplicity and performance can be tricky.

Comparison of competing bus standards is a reasonable means of moving along the learning curve, and that's what we propose to do here. Specifically, we'll be building toward a face-off between NuBus and the Micro Channel Architecture (MCA) of the IBM PS/2 line.

PHYSICAL ENDOWMENT

Electrical engineers have a saying: "The bigger the board, the bigger the bang." Generally speaking, this is true, though application-specific integrated circuits (ASICs) such as gate arrays, and surface-mount technology have shown that there's more to satisfaction than size alone. Even so, a card must be big enough to accommodate all of the required components but still small enough to fit within a desktop machine.

If we compare the maximum sizes of plug-in cards in the PC, PC/AT, Micro Channel, and NuBus formats, the most striking statistic is the size of the Micro Channel card — it's drastically smaller. A growing lament from plug-in board manufacturers is that it's too small. There isn't enough room to put sufficient functionality on a Micro Channel card. The answer lies in going with ASICs and surface mounts. Doing so lets a manufacturer use fewer and more compact components. Unfortunately, this usually increases development time — and costs. Surface-mount technology is also more expensive in all but the very highest of high-volume boards. For the user, this means either less functionality using conventional parts or the higher price of surface-mount devices (SMDs). Or both.

The clear advantage of a smaller board size is that you can build a smaller computer. And in high-volume situations, such as those in which IBM most likes to envision itself, cost differentials would tend to equalize. However, in its rush to miniaturize, IBM may have shot itself in the footprint, at least for the short term.

STICKY FINGERS

All the IBM buses use edge-card connectors, which employ small, conductive areas on the edge of the card, sometimes called fingers. These fingers plug into the computer's backplane: a printed circuit board with connectors and signal paths that connect to corresponding connector pins. Each backplane connector defines a single card slot, where a single plug-in card may reside. (The Mac II backplane is the logic- or motherboard itself.) Receptacles on the IBM backplane accommodate these fingers by using a loaded-spring-type pin to make contact with the conductive area on the edge of the plug-in card.

In contrast to the IBM-style buses, NuBus uses a single, industry-standard 96-pin DIN connector. Each slot is capable of accommodating 8-, 16-, or 32-bit cards. The DIN connector was developed specifically for backplane applications and is generally considered more reliable than edge card connectors.

FORM FOLLOWS FUNCTION

The number of different card sizes now available for a particular PC-bus computer causes confusion for IBM's third-party manufacturers as well as for users. Every manufacturer designs its board to plug into as many computers as possible — which, for IBM PC-type machines, usually means a low-performance 8-bit card, since the 8-bit slot is the lowest common denominator. With NuBus, however, a single connector style services every board. Another physical problem that
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many manufacturers have with all of the PC-style designs — including NuBus — is the area available on the back panel for I/O connectors. The small area limits the number of signals and the types of connectors that can be used.

**SO GO CONFIGURE**

Are you still with us? Take a deep breath. It's easy enough to understand why all the cards in a computer's backplane must be configured properly: They have to function without interfering with the operation of any other cards or devices that share the bus. Cards need to be flagged to their slots, and a CPU needs to be flagged to its resource cards.

Configuration for a PC or PC/AT card usually means manually setting the base address for that card, as well as indicating what interrupt lines and direct memory access (DMA) channels it uses. This is normally accomplished through DIP switches or jumpers on the card. A user usually has to refer to a detailed set of instructions (and perhaps a pair of bifocals) in order to configure a card properly. A great way to kill time.

But let's be fair. IBM has its own "new bus." The Micro Channel uses a new mechanism called Programmable Option Select (POS) to establish a plug-in card's base address, interrupt, and DMA channels. Add-in card-configuration information is stored on the computer's motherboard in a special nonvolatile memory. At power-up, the central processor (80286 or 80386) reads the configuration information from nonvolatile RAM and writes it into the registers on each card. Pretty hot stuff. The processor gets to each card using a special set of I/O addresses, which each card has to recognize. But this critical configuration information, stored in nonvolatile RAM, is programmed by the user each time there is a card change on the bus, using a special boot-floppy and POS utility program. Typically, card manufacturers supply with each card a diskette that can be used to help in the configuration process.

Micro Channel, therefore, merely transforms hardware-controlled configuration into software-controlled configuration. You can drop your pencil, but the ghosts of those DIP switches will still appear on-screen.

With NuBus, you don't need to flip a DIP to tell a card what slot it's in. NuBus uses a technique called geographic addressing, in which each card slot simply carries a unique address. The address is communicated to the plug-in card using four designated pins on the NuBus connector.

Sounds simple, and it is. Each board, when it is plugged in, inherits the address of the geographic card slot in which it resides. Then it's Miller time — no special utility needed. The connectors on that backplane have their identification information built right in.

NuBus also provides an autoconfiguration mechanism that goes far beyond establishing the base address for each card. Upon power-up, the configuration of the system is comprehensively and automatically determined by simply reading and interpreting configuration ROMs. This method of autoconfiguration ensures slot independence, so boards aren't restricted to any particular address or slot.
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STRIKE UP THE BANDWIDTH

The bandwidth of a communications channel can be thought of as the size of a pipeline between two reservoirs. The larger the diameter, the more gallons per minute can pass between the reservoirs. Similarly, the larger the bandwidth, the more information can pass between two devices.

Bandwidth in modern buses is measured in millions of bytes per second (megabytes per second). It is proportional to how long it takes to perform a single read or write operation across the bus, which is called a bus cycle. The longer the microprocessor takes to communicate with the cards plugged into it, the more slowly the overall system runs.

By today's standards, the original IBM PC and PC/AT buses were quite slow (1.2 megabytes per second and 4 megabytes per second, respectively), while the maximum transfer rates for the MCA and NuBus are 20 megabytes per second — ten times as fast. NuBus also offers a special 37.6-megabyte-per-second block-mode transfer capability that the other three buses do not have. That capability remains untapped in the current generation of Mac IIs.

Actual bus-cycle time, however, may be much slower than these maximum rates, since actual speed is dependent on how fast the microprocessor is running, how fast the RAM is, how efficiently the microprocessor is interfaced to the bus, and whether the data path is 8, 16, or 32 bits. Remember also that brute speed does not tell all. A Harley-Davidson may be quite fast, but that doesn't mean you'd want to use it to haul freight.

INDENTURED SERVICE

The modern bus can service multiple master devices as well as multiple slaves. A master can be a general-purpose microprocessor, an application-specific processor such as a digital signal processor (DSP), or a DMA controller, among others. Master devices can assume complete control of the bus when their cycle comes around, or even retain control of the bus through several cycles. Slaves are normally memory cards and I/O devices that serve their masters.

When several master cards are simultaneously plugged into the bus, they will compete for its use. All buses have a mechanism for dealing with this contention, called arbitration. Masters use arbitration to determine which one shall win the bus for what period of time. Methods used for arbitration vary from bus to bus, as does the period of time that a single master may retain ownership of the bus.

Both the NuBus and the MCA are true multimaster buses. Each allows up to 16 master cards per backplane. The standards differ in one significant respect, however. Apple NuBus is a
full system bus; the Mac II logic board itself can be said to occupy a virtual "seventh slot" on the bus. In contrast, the Micro Channel bus — as the progeny of earlier PC and PC/AT buses — retains a semblance of CPU dependency. It is a modified local bus.

The original PC bus allows no masters other than the main microprocessor on the backplane. The IBM PC/AT bus allows up to seven masters.

EQUAL OPPORTUNITY DEPLOYMENT

The NuBus was designed to ensure that any processor could be interfaced to the bus — unlike the Big Blue world, which was constructed specifically for Intel's chips.

Processor independence is important in bus architecture, because by the time any microprocessor is in production, it's obsolete. A tough fact to face, but a truth of this wacky industry of ours. A robust bus architecture must be designed with the future in mind — and that means next-generation processors.

The IBM PC bus is essentially designed to support the 8088, and in some cases, the 8086. The PC/AT bus supports the 80286, and in some systems, the 80386. Other non-Intel processors face real difficulty interfacing to these two buses, since the signals and timing are custom tailored to the Intel family. Sounds rather like discrimination.

In this respect, IBM's MCA is similar to the IBM PC and PC/AT buses.

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The signals, and to some extent the timing, remain tightly coupled to the family of Intel processors. It is possible to interface other families of microprocessors to the MCA bus, but not without great effort.

The NuBus already interfaces with a broad range of microprocessors from several different manufacturers. It was built with just such flexibility in mind.

GROUP HEX

Thanks to ever-more-powerful microprocessors, personal computers today have the performance and capabilities of yesterday’s mainframe computers. But nearly all applications today are implemented to run on a single processor. What if that were to change?

A close look at the cards that you plug into your machine will reveal that a good number of them are already equipped with their own microprocessors. These CPUs are typically dedicated to performing application-specific tasks, usually relating to some I/O or peripheral control function.

More powerful versions of these micros sport the ability to take complete charge of the backplane bus and access memory themselves, without having to ask for help from another central processor. This is one reason why a Mac can do such a fair imitation of a PC.

Now imagine multiple microprocessors running simultaneously, all plugged into the same backplane and all communicating with each other and sharing the computational load. This is the promise of multiprocessing.

As NuBus was designed with the future in mind, it supports multiple processors. NuBus incorporates a fair arbitration scheme to prevent resource and computation starvation (when one or more cards “hogs” the bus to the detriment of other cards). NuBus also incorporates virtual interrupts, which allow bus access to be dynamically configured and shared among several microprocessors.

This dynamic configuration is one of the shining areas where the geographic addressing and automatic configuration of NuBus really come into play. NuBus also offers bus locking and resource locking, two critical mechanisms that fully empower multiple master CPUs while preventing them from corrupting each other’s data. Bus locking allows a master card on the bus to hold the bus for a specified number of cycles. Resource locking prevents shared resources, such as RAM, from being interfered with by competing processors.

Micro Channel lacks a defined method of resource locking. Whether this omission from the MCA standard will inhibit its future remains to be
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## Mac II Software

**Hardware**

All hardware items with memory chips - Prices are subject to change on a daily basis.

### External Hard Drives

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NuGroup on the Menu

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— John J. Anderson

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seen. Its current specification undeniably inhibits true multiprocessing capability on the PS/2 system.

Today, however, there are only a few experimental applications that utilize multiprocessing on the Mac II — for example, digital-signal-processing microprocessors that help perform vector math computations. But the Mac OS itself does not currently make use of any NuBus multiprocessing capabilities.

So why give a hoot about multiprocessing? Because it represents an irresistible way to increase performance significantly, without having to move to more advanced (and more costly) microprocessors. It’s also an excellent means to provide application-specific computation power to a main computer. For example, by adding an 80386 card to your Mac II, you could run OS/2 code in a window alongside your Mac applications. Now there’s a concept.

IF U CN RD THS, YR STL RDING

It’s probably safe to assume that only the hard-core hot rodders have stayed with us up to here, so we’ll let out all the stops and spill the beans about DMA. A DMA controller is a device that is designed specifically for moving data within a computer. It can typically perform multibyte transfers from memory to memory or between I/O devices (cards) and memory. The alternative to using a DMA controller is to program the microprocessor to do the transfers using fetch-and-deposit instructions. Microprocessors are usually significantly slower at these tasks than a DMA controller. Most DMA controller designs also allow the data transfer to take place simultaneously with microprocessor execution (this is called cycle stealing), thereby allowing the microprocessor to continue servicing the keyboard, mouse, video screen, and so on, while simultaneously improving overall performance of the system.

All of IBM’s personal computers have a multichannel DMA controller on the backplane that plug-in cards can use to transfer data independently of the microprocessor. The IBM PC bus provides cards with three 8-bit DMA channels. The PC/AT has four 8-bit and three 16-bit DMA channels. All of the MCA computers have an 8-channel DMA controller capable of 8-bit or 16-bit transfers.

The Mac II, however, has no DMA controller on its backplane, and whether this is a deficiency depends on just what you are trying to accomplish. If you must have it, full-bore DMA can be performed, however, using a plug-in NuBus card (see sidebar, "Right Nowlin") or by designing the DMA controller and the associated bus master circuitry onto any card that needs to perform DMA transfers.

Bear in mind that the ADB (Apple Desktop Bus) standard allows keyboard, mouse, and all manner of input peripherals to continue polling independently at all times. Implementing the special 37.6-megabyte-per-second block-mode transfer configuration will obviate some needs for DMA as well. On balance, this is one of those areas in which simplicity is preferable to hardwiring into specification new features that burden as well as bless.
Both the Micro Channel and the NuBus represent fresh thinking about bus architecture. Both support high-speed 32-bit microprocessors, memory, and I/O devices; automatic card configuration without jumpers; and multiple cards. And both have open, published specifications (though MCA’s is proprietary). The older PC and PC/AT buses undeniably fall into the category of stale technology.

There is, however, a downside to NuBus. DMA is a standard feature on the Micro Channel but an option on the NuBus.

It should be noted that, based on current prices, implementation of a simple slave card in NuBus format is more costly than one designed for the PC, but it’s roughly equal in price for MCA. And while NuBus is gaining ground, the PC bus has a big lead in availability, which goes a long way in some folks’ minds when determining winners. There are, however, currently over a hundred suppliers/developers of NuBus cards, and that number is growing. There is also a NuBus manufacturer/user group called NuGroup that has compiled a list of NuBus board developers and manufacturers (see sidebar, “NuGroup on the Menu”).

Let’s tally the score: Micro Channel offers a custom edge-connector; multiple versions of its bus; smaller board area; integral DMA on the backplane; and no specification for resource locking. NuBus offers an industry-standard pin connector, a single standard bus, larger board area, no integral DMA, and both bus locking and resource locking.

It’s clear to the authors, at least, that, in a showdown between MCA and NuBus, NuBus wins. Neither of us can claim complete objectivity, for we both have an interest in the furtherance of the NuBus standard. But we’ll say it anyhow: NuBus is superior. If you disagree, we heartily recommend you go out and purchase a PS/2.

**Bill Nowlin is a left-brained Vice President of Engineering at National Instruments Corp. in Austin, Tex. John Anderson is a right-brained MacUser editor. Together they nearly equal a normal human.**
The Persistence

Whatever you do, wherever you are, you'll never have enough RAM. Here's a guide to the paths you have available to you.

If your idea of surrealism is trying to run FullWrite on a 1-megabyte Mac Plus, you're ready for a memory upgrade. How much you'll need depends on the kind of work you do, but regardless of your situation, one rule will definitely prove true: You'll never have enough. Given that fact, here's what you should know about memory and the upgrades available to you.

THINGS ARE WHAT THEY SIMM

In the Mac Plus and up, the Mac's temporary memory, or RAM (random access memory), resides in single inline memory modules (SIMMs). They're installed on the Mac's motherboard, and since a standard 1-megabyte Mac always has four of them, they're pretty easy to spot. When you look at a SIMM, you'll see a narrow circuit board about 3 inches long with eight dynamic RAM (DRAM) chips on one side and a row of metal contacts along one of the long edges.

The DRAM chips can come in 256-kilobit or 1-megabit capacities, so, depending on the type of DRAM on the SIMM, the SIMM's total memory could be 256K or 1 megabyte. You can tell which you have, because the type

BY RUSSELL ITO

140 MAC USER
will be embedded in the part number on the DRAM chips. If you see the number 256 somewhere in the part number, you've got a 256K SIMM. Unfortunately, things aren't so cut-and-dried for 1-megabyte SIMMs. If you check the part number and you see 1M, 1024, 1100, or anything similar — but not 256 — you're looking at a 1-megabyte SIMM. (Unless you buy your SIMMs from some guy in a bus station bathroom.)

However, not all SIMMs come with only eight DRAM chips. IBM-compatible SIMMs actually have nine. You can install these in a Mac, but you'll be paying for an extra chip that the Mac can't read, and frankly no one needs something that does nothing — especially at today's prices.

The contacts, or fingers, along the SIMM's edge look like little metal teeth, and the main thing you have to worry about is making sure they're pointing in the right direction when you install the SIMM. If you look into a SIMM socket, you'll see a row of springs sticking out along one edge. The SIMM's fingers must make contact with these springs, so, when you insert the SIMM, make sure you've got it turned the right way.

SLIM SIMM VERSUS THICK DIP

In addition to their memory capacities, SIMMs also come in two physical sizes: surface mount, or low profile; and dual in-line package (DIP), or high profile. Surface-mount SIMMs are generally more popular for the Plus and SE, because they take up less room inside the Mac. These SIMMs use DRAM chips that mount directly to the surface of the circuit board, which reduces their bulk. And since slim is in, surface mounts are the SIMMs everyone wants, but that also makes them more expensive. DIP SIMMs are cheaper, but because they use DRAM chips with leads that have to pass through the circuit board, they
The Persistence of Memory

also take up more room. You can install either type in any Mac, but DIP SIMMs may get in the way if you have a Mac Plus or SE with other internally installed hardware, such as accelerators or hard disks. Since the Mac II has lots of room, however, you can save some money by buying DIP SIMMs when upgrading it.

SOCKET TO SIMM

To this point, we've been talking about standard SIMMs, but there is another configuration available: socketed SIMMs. Several companies offer these 256K models, and they look and function just like regular SIMMs, except that there's a socket on the edge opposite the fingers. The idea is that you insert the socketed SIMMs into the Mac motherboard, then insert the Mac's SIMMs into the open sockets on the expansion SIMMs.

Since it uses the cheaper 256K SIMMs, this piggyback method is economical, but it does have some limitations. First, socketed SIMMs may come in surface-mount or DIP versions. Depending on how much stuff you've packed into your Mac, the DIP versions may not fit, so make sure you've got enough room before you buy. Second, some of these kits can't be expanded further, so even though you may have reached only half the computer's maximum RAM, you could be stuck. As always, it pays to plan ahead. Piggybacks can be an economical long-term solution, but they can just as easily turn into an expensive stopgap.

FASTER THAN SIMM

Just like hard disks, DRAM is rated for speed, although dealers will usually refer to the SIMM, rather than the RAM chips themselves, as being rated at a particular speed. RAM speed is listed in nanoseconds: The lower the number, the faster the SIMM, but the speed rating isn't necessarily an absolute value. A SIMM's actual speed is usually faster than the stated number — what the number tells you is that the SIMM you're buying will be no slower than the reported value. For example, a 120-nanosecond SIMM may actually be running at 100 nanosec-

S1MMs come in two types: surface mount (low profile), and DIP (high profile). Either type can be installed in any Mac, but DIP SIMMs may not fit in a loaded Mac Plus or SE.

To open a Mac Plus or SE, you'll need a Torx wrench (available at most computer stores). Before cracking the case, make sure you've removed the programmer's switch. Once the case is off, disconnect the ribbon cable (or cables, depending your configuration) and the white multiple-wire connector from the motherboard. On the SE, carefully disconnect the speaker wire, which is right next to the white connector. You should now be able to slide the motherboard out. (Be patient; it may not slide out smoothly.) Remember: DON'T TOUCH THE VIDEO TUBE OR CIRCUITRY.
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The SIMMs in a Mac Plus are arranged in a vertical array of two pairs of two slots each, limiting the memory expansion to a maximum of 4 megabytes. Each of these pairs is called a row.

THE PLUS PLUS

The SIMMs in a Mac Plus are arranged in a vertical array of two pairs of two slots each, limiting the memory expansion to a maximum of 4 megabytes. Each of these pairs is called a row, and there are a few rules that govern them:

1. All the SIMMs in a row must be of the same speed. You can, however, have differing speeds between the rows.
2. All the SIMMs in a row must be of the same size. You can't mix a 1-megabyte SIMM with a 256K SIMM within a row.
3. A row must be completely filled or empty — it can't contain only one SIMM.
4. Larger SIMMs must be installed in the first row, so if you're going to mix 256K and 1-megabyte SIMMs, make sure the 1-megabyte units are in the first row.

Because rules 2 and 3 impose specific restrictions, the upgrade path for a Mac Plus is as follows: 1 megabyte (the standard configuration is four
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The Mac II's memory is arranged in two banks of four SIMMs each. The SIMMs are numbered in pairs, 1 through 4. This is a 2-megabyte configuration, using eight 256K SIMMs.

256K SIMMs), 2 megabytes (two 1-megabyte SIMMs), 2.5 megabytes (two 1-megabyte SIMMs and two 256K SIMMs), and 4 megabytes (four 1-megabyte SIMMs). You can't have a 3-megabyte machine. The only trick in installing SIMMs, assuming you follow the rules, is getting the Plus to recognize how much memory it has available. To do this, look at the resistor on the logic board in the area labeled RAM SIZE. For a 2-megabyte machine, using two 1-megabyte SIMMs, the resistor (150 ohms) that's normally installed at R8 (labeled 256K BIT) must be moved to the socket marked R9 (labeled ONE ROW). For a 2.5- or 4-megabyte Mac Plus, it should be removed.

THE SE PLUS

The upgrade path for an SE is identical to that for a Plus, and in fact, the SE even follows the same rules governing SIMM types, position within a row, and so on. Like the Plus, the SE's memory banks are arranged in two sets of two rows. But, unlike the Plus, the SE's rows are arranged and read horizontally. As with the Plus, the resistor must be properly positioned for the Mac to know how much RAM it actually has. In the SE's case, the pertinent resistor is located at R35 (256K BIT). For a 2-megabyte SE, the resistor (150 ohms) should be moved from R35 to R36 (ONE ROW). For 2.5- and 4-megabyte SEs, it should be removed entirely.

THE MAC II EIGHT

While the Mac II has twice the memory capacity of either the Plus or SE, some of the same types of rules governing memory management apply. In the Mac II, SIMMs are installed in two banks of four (Banks A and B), instead of in rows of two. But interestingly enough, the SIMMs are numbered in pairs, so while you may have eight SIMMs installed, the Mac reads them as SIMMs 1 to 4. Not only that, SIMM 1 is actually in Bank B (don't ask; I don't know why). As with the Plus's and SE's rows, you can't mix SIMM types within a bank. Doing so will cause the bank to default to the lowest capacity SIMM, so don't shuf-
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fle them before installation.

Because the banks must either be full or empty, your choice of configurations is this: 1 megabyte (again, the standard configuration is four 256K SIMMs), 2 megabytes (eight 256K SIMMs), 4 megabytes (four 1-megabyte SIMMs), 5 megabytes (four 1-megabyte and four 256K SIMMs), or 8 megabytes (eight 1-megabyte SIMMs). Because of the Mac II's rule of fours, you should give a lot of thought to how you want to upgrade your system before you do it. For example, 2 megabytes may sound like all you'll ever need. But if you choose this route and subsequently decide to upgrade further, you'll have to sell or trash the four additional 256K SIMMs you installed for the upgrade. The same holds true for the 4-megabyte model; except in this case, you'd actually be pulling the SIMMs that came installed in the Mac II. For these reasons, the conventional upgrade path for a Mac II is 1, 2, 5, and 8 megabytes — and in fact, most users skip right to 5 megabytes, if they can. Unlike the Plus and SE, the Mac II is a plug-and-go machine — you don't have to make any resistor changes.

MEMORY LANE

So now that you know what you can do, here are some things you should do. Before you touch a SIMM, make sure you've discharged any static you might have built up from walking across the carpet or rubbing your acrylic sweater with a balloon. All it takes is one spark, and your precious treasure will be turned into the computer equivalent of a pet rock. And when you're working on a Plus or SE, make absolutely sure you don't touch the video tube or circuitry. Even if you've got the machine unplugged — which you definitely should — these goodies can retain enough voltage to turn you into the equivalent of a pet rock. So be careful, and the only melting circuit boards you'll see will be in your dreams.

RUSSELL ITO BOUGHT HIS MAC AS A 512K, UPGRADED IT TO A PLUS, AND AROUND THE TURN OF THE CENTURY SHOULD HAVE ENOUGH SAVED TO BUY A COUPLE OF SIMMS.

When installing a SIMM, make sure the metal fingers are facing down and that you've got the SIMM positioned so that the fingers are in contact with the little springs in the SIMM socket. Insert the SIMM vertically; then push it back until it snaps into place. Make sure you don't touch the SIMM's metal fingers — a layer of finger oil can cause oxidation and prevent good contact.

To remove a SIMM, take out the most exposed SIMM first (this will either be the first or the last in the bank). Push the end clips away from the SIMM and simultaneously push the SIMM out. It will flop over, loose, and you can remove it. If you're worried about breaking the little hooked clips that face the SIMM, don't be. Chances are that you will eventually break these, but this won't have any effect on the SIMM's ability to function.
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Which Macintosh II graphics card offers the widest range of capture and display resolutions—NTSC, PAL, Apple® Monitor, hi-res, interlaced, non-interlaced and other modes?
a) NuVista 2M  b) NuVista 4M  c) All of the above

Name the only videographics card which provides true-color, real-time capture and broadcast-quality display while occupying only a single slot in a Macintosh II.
a) NuVista 2M  b) NuVista 4M  c) All of the above

Which videographics card offers full QuickDraw™ compatibility at 1,2,4,8,16 or 32-bits per pixel?
a) NuVista 2M  b) NuVista 4M  c) All of the above

If you chose (c) on all three questions, congratulations! You know that the NuVista series from Truevision is the answer to all your advanced videographics needs. The NuVista is available with either 2Megabytes or 4Megabytes of video memory, and creates professional video effects and computer graphics using any QuickDraw compatible software, now and in the future. No patches, no gimmicks, no hassles.

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You may now return to your regular reading.
Getting Wired

Cables are unexciting and unsung. But for those times when your life, job, or sanity hangs on a few strands of copper, here's what you should know.

In nature, knowing the subtle distinctions of the markings of snakes can mean the difference between life and death — the same principle applies to your computer's cables. Equipment cables are neither as innocent nor as standard as they appear. For them, the paradox "same but different" actually applies. Two cables that look the same don't necessarily do the same things. Under the circumstances, the best course is to be completely paranoid.

When buying from a mail-order house, be certain and specific about your needs. If your purchase includes a cable, find out which Macintoshes the cable will fit. With computer cables, as with snakes, a little prior knowledge can be a lifesaver.

BY SALVATORE PARASCANDOLO

FEBRUARY 1989 MAC USER 155
CABLE CONSCIOUSNESS

Typical cables have from 2 to 50 small wires running through them, and each wire can carry electrical power, data pulses called signals, or nothing. Many times, only a few of the cable's available wires are actually used. Devices, such as your computer or printer have ports to which various cables connect. The size and shape of a port and how signals flow in and out determine the kind of cable you'll need. If the business end of a port or cable connector shows rows of holes, or sockets, it's a female. If it has rows of pins, it's a male. Each pin or socket of a cable connector is labeled with a number that usually appears on the plastic wall in which it's embedded. When discussing what's connected to what, we call connector positions pins regardless of whether they're male or female.

Equipment cables aren't usually wired so that a given pin at one end is connected to the corresponding pin at the other end. Connector shapes or genders can also be deceiving. Some cables can fit in totally inappropriate ports. Without a testing device and wiring charts, you'd never know what goes where, or whether it was right or not. If you intend to build, adapt, or test cables yourself, it's imperative to have pin-out charts, which describe which wire carries which message.

GAIN THROUGH CABLE

The prime concern, and mandatory final check when making cables, is to ensure that the two ends of a cable are connected like the book says. To save yourself countless hours of frustration, invest the time to check several times every step and every bit of information you read. Even then, question your own assuredness. For some hookups, this pin-out research will take longer than the actual construction.

Equipment usually comes with pin-out charts. If you can, compare the charts that come with any two devices that you wish to connect. Get supporting information from several sources like connectivity literature (see the sidebar "Parts and Charts") and manufacturers. Some diagrams may refer to the same signal name differently and may even depict subtly different pin connections — some of which may be harmless, or functionally identical, and some of which may be outdated or simply wrong.

Be especially careful of how you identify a connector's or port's pins. Referring to the charts in this article, you'll notice that the male and female versions have their pins numbered in reverse order. Looking square into the face of a male connector, the upper left pin is number 1. On the female connector, that's pin 13. When wiring, go strictly by pin numbers, and not by relative location. Some wiring diagrams show the connections viewed from the back of the connector, which can easily confuse you into a backward hookup. Luckily, most crossed-signal errors for printers and modems aren't harmful.

Adopting Adept Adapters

You can use these lifesavers to change the gender of a connector, convert 25-pin to 9-pin interfaces, or reroute the signals to a different pin layout. If you do a lot of traveling, you should keep several with you. A well-stocked arsenal should include: a DB-9 to mini DIN-8 for adapting your Mac Plus, SE, or II to cables for equipment originally designed for the Mac 128, 512K, and 512KE; a DB-9 to DB-25 modem cable for Hayes and compatibles; a Mac to DB-25 serial printer cable, which can also serve as a communications link between a Mac and PC-type computer; and, finally, a DB-25 gender changer for the odd modem or printer that's got matching pin-outs but the wrong gender.

There's even a serial cable that can adjust itself for the job. It's called the SmartCable, and it's made by IQ Technologies. You can use it with a printer, modem, computer link, and equipment with various pin-outs; and it will configure itself electronically. But for most non-Apple-compatible printers, a cable alone is not enough. You'll also need the appropriate printer driver. You may be able to get the driver you need from the printer manufacturer, but if not, SoftStyle sells a variety of drivers, including those for Epson, Toshiba, IBM, HP LaserJet, and some popular daisywheel printers.

Parts and Charts

You can find cables and cable components by reading the ads from mail-order houses and specialized suppliers throughout MacUser. You should also have pretty good luck at any local computer dealer that carries a variety of hardware. They usually have ready-made cables for most standard needs. Some common and even rare tools, parts, and cables can be found at your local Radio Shack or an electronics hobby shop.

IQ Technologies
11811 N.E. First St.
Bellevue, WA 98005
(206) 451-0232
SmartCable: $49.95

SoftStyle
7192 Kalakauaaoa Highway, Suite 205
Honolulu, HI 96825
(808) 396-6368

Reference books:
American National Standard X3.131-1986 (defines the SCSI interface).
Some wiring diagrams show the connections viewed from the back of the connector and can easily confuse you into a backward hookup.

(although shorting power to ground can be damaging).

SHE WORE A RIBBON CABLE

A ribbon cable has its wires arranged side-by-side, like lanes on a highway. It's great for tool-free construction, because it needs no solder. Instead, you use special connectors that press on, cutting through the insulation, and remain solidly and reliably mounted. The ribbon can be flexed and routed easily, unlike some conventional cable that can be as flexible as an aqueduct. Connections can even be undone and rearranged with your bare hands, although occasionally you'll also need a common tool, like a vise.

Because of its relative position in the ribbon, a wire is easy to trace. But be careful: Ribbon cable wires are not sequentially numbered. Instead, the wires are interleaved horizontally, just like a connector's. For example, on a 25-conductor cable, the wires read like this: 1, 14, 2, 15, 3, 16, 4, 17, and so on until 13, 25. With reasonable care, ribbon cable connectors will automatically align their pins with their corresponding wires. Just make sure that the ribbon end is trimmed square, enters at a right angle, and is not squished to one side of the insertion slot.

Pressing 25 or 36 or 50 wires in place requires considerable force. The best method is to squeeze the connector in a vise. If you haven't got a vise, you can lay a wood block or a book on the assembly and use a second block or book to tap the unit together.

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FREE subscription. Call 1-800-221-6071.
You can put any number of connectors anywhere along a length of ribbon cable, as long as there’s space. You can even move or remove a connector with no ill effects. This enables you to make gender changers, extenders, splicers, adapters with different ends, Y-adapters for hooking up multiple devices to one Mac, or one cable that fits several devices, each with a different connector, pin-out, or gender.

Unfortunately, ribbon cable isn’t shielded. That’s of little consequence for serial connections to modems and printers, but an external SCSI ribbon cable might produce significant noise in computer peripherals or in household radio and TV receivers — and not necessarily in your own house. Slip-on shields are available, but you can make one for a lot less by simply wrapping the cable in aluminum foil and connecting it with a short wire to any cable connector screw hole on the Mac.

For special hook-ups, or if you have 25-wire ribbon cable and plan to use 9-pin connectors, you can cleanly strip away the unneeded wires. Special connectors can also accept the inner wires of flat telephone cable, which is cheap, reliable, and compact. Long cables for modems and printers, extensions, or adapters can be made this way. True, some of the homemade jobs look messy, but I’ve used such cables and adapters for several years without a problem.

**Ribbon cable is great for tool-free construction, because it needs no solder.**

**Wired on Heavy Metal**

For soldered cables, you’ll need connectors of the proper shape and gender, cable with at least as many wires as your equipment demands, rosin core electronic solder, and a set of connector shells (or substitutes) for enclosing your handiwork at each end. In addition, you’ll also need needle-nose pliers, one or more needles, pins, or thin, stiff wire to reach the inside sockets of female connectors for continuity tests, a low-wattage pencil-tipped soldering iron, or gun, desoldering braid, and a holding tool like a vise, locking pliers, a clamp, a clip, or even adhesive tape.

You can check a connection in one of four basic ways: by actually using the finished cable; by using an ohmmeter, which measures resistance between two points (zero resistance is a good connection); by using an inexpensive light-the-bulb tester; or by using a 9-volt battery, some wire, and your

---

**A head-on view of male and female connectors.**

MAC USER FEBRUARY 1989
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If you missed MacUser Labs' color...
# Mac Plus/SE/II Pin-to-Pin Reference Chart

## Male mini DIN-8

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<th>Device</th>
<th>Cable end</th>
<th>Mac-side pins to device-side pins</th>
<th>Special notes</th>
<th>Apple cable no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ImageWriter</td>
<td>male DB-25</td>
<td>2, 3, 3, 4, 5, 2, 8, 7</td>
<td>on Mini DIN-8 connect 4,6/on DB-25 connect 2,20</td>
<td></td>
</tr>
<tr>
<td>ImageWriter LQ</td>
<td>male mini DIN-8</td>
<td>1, 2, 2, 1, 3, 5, 4, 4, 1, 5, 3, 6, 8, 6</td>
<td></td>
<td>590-0340</td>
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<tr>
<td>LaserWriter Plus</td>
<td>male mini DIN-8 localTalk or PhoneNET-type adapter on Mac/Male DB-9 LocalTalk or PhoneNET-type adapter on printer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LaserWriter II</td>
<td>male mini DIN-8 localTalk or PhoneNET-type adapter on both ends</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple Personal Modem</td>
<td>male mini DIN-8</td>
<td>1, 2, 2, 1, 3, 5, 4, 4, 1, 5, 3, 6, 8, 6</td>
<td></td>
<td>590-0340</td>
</tr>
<tr>
<td>Hayes Smartmodem</td>
<td>male DB-25</td>
<td>1, 4, 2, 3, 5, 4, 4, 1, 5, 3</td>
<td>on mini DIN-8 connect 4,6</td>
<td></td>
</tr>
<tr>
<td>Mac Plus/SE/II</td>
<td>male mini DIN-8</td>
<td>3, 5, 4, 4, 1, 5, 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBM PC-type serial port</td>
<td>female DB-25</td>
<td>1, 5, 2, 3, 3, 4, 7, 5, 2</td>
<td>on DB-25 connect 6,8,20</td>
<td></td>
</tr>
<tr>
<td>IBM PC/AT or PS/2 serial port</td>
<td>female DB-9</td>
<td>1, 8, 2, 4, 3, 2, 4, 5, 3</td>
<td>on mini DIN-8 connect 4,6</td>
<td></td>
</tr>
</tbody>
</table>

## Adapter cable

<table>
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<tr>
<th>Cable ends</th>
<th>Mini DIN-8 pins to DB-9 pins</th>
<th>Special notes</th>
<th>Apple cable no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini DIN-8 to DB-9</td>
<td>male DIN-8, female DB-9 1, 6,</td>
<td>2, 2, 3, 3, 5, 4, 6, 8, 8</td>
<td>on DB-9 connect 1,3</td>
</tr>
</tbody>
</table>

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## Report, here's a condensed version.

As with other E-Machines models, the T19 screen image is very sharp and has excellent color quality and gray purity. Image quality is comparable to the T16, and for those who want a larger screen, the T19 is the way to go. E-Machines has once again produced a winner in the color monitor market.

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tongue. The latter method is illustrated in Figure 6.

Strip about 1/4 inch of insulation off each wire and lightly coat the exposed ends with solder. Also apply solder to throughs on the wire side of the connector's pins. For each connection, heat the pin and simultaneously insert its wire into the trough, then let the connection cool. Don't be generous with the solder, or you'll inadvertently bridge some pins, which might corrupt the connection and turn your equipment into a toaster oven.

If you don't have a shell for your connectors, you can fabricate your own by encasing the wired pins with silicone rubber or five-minute epoxy. Before you start sliming, though, protect the business end of the connector by wrapping it with tape. The finished product is rather permanent, so before you encase everything in epoxy, make dead sure that your cable works.

**WIRE YOU HERE**

If you can't get the proper connectors, you can make a special cable from a suitable spare by rearranging its connections—not at the ends, but in the middle. Just cut into the outer sheath to expose all the available wires, and reconnect them as needed—either by soldering or twisting. You can even combine two cables, each with a valuable end, into an electronic lifeline. Even if a cable's connectors are molded on, you can map the pin-to-wire connections with a continuity checker.

**PULLING THE PLUG**

With new devices introduced so frequently, the world of cables remains a snake pit. Monitor cables seem to be the worst at consistency of pin-outs and connector types, and nearly require a dedicated book. The basic checking and construction tips in this article apply to just about any cable. We do apologize that the pin-outs for the Macintosh SE, Laser Writer NTX just didn't reach us in time.

Salvatore Parascandolo is a Senior Staff Writer who once made a cable so complex that no signals ever found their way out of it.

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**HARDWARE**

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| Rodime 45 Plus | 874 |
| Rodime 60 Plus EXT | 989 |
| Rodime 140 Plus EXT | 1,246 |
| Rodime 450 Fx | 768 |
| Rodime 1000 RX INT | 955 |
| Rodime 1400 RX INT | 1,086 |
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| Mac 40 MB Tape Back up | 999 |
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| LaserView 15" for MAC II | 1,609 |

**KEYBOARDS**

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# Software

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| Mac Serve                            |                               |                |                           |                        | $22           |                 |                     |                      |
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| Tops for Mac                         |                               |                |                           |                        | $22           |                 |                     |                      |
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Accelerators can speed up your spreadsheets, databases, and graphics and, in the process, give you some of the power of the Mac II and IIX.

To have and have not. Since the introduction of the Mac II, that about sums it up for those on either level in the hierarchy of Macs. By any calculation, speed envy is on the rise. One coworker is reluctant even to look at your spiffy new database (cooked up on your Mac II) on his Plus or SE. Another has given up the mathematician in her soul because she can’t bear to wait while the numbers re-calculate. Derogatory phrases like “toaster with a window” can be heard in the corner cubicles where the Pluses and SEs reside, while those with the sickness can be observed walking around the office with a shuffling gait, as if wearing slippers. No question, the envious ones are a sullen breed: round-shouldered, spiteful, given to excluding Mac II owners from luncheons, as if by instinct. Mac II owners have become pariahs of the portable-Macintosh society.

Fortunately, there’s a remedy for all this: the accelerator. The mere word suggests strange, kinetic, almost curative powers. With accelerators installed in...
a few of the SEs around the office, the lame walk upright and swiftly; artists appear in our midst; databases and spreadsheets flourish; and Mac IIs can be over-taken. In short, the accelerator board is good for morale, for health, not to mention productivity.

All joking aside, the facts as they've come in are pretty clear: Accelerators can speed up operations in spreadsheets, graphics programs, and some databases in significant ways. But in what ways and with what boards? Here at MacUser Labs we decided to find out.

Last year we reported on accelerator boards in “Pedal to the Metal” (March '88). This time, we retested accelerator boards to include a number of new products and to see if Apple's recent price increases made it more attractive to upgrade Macs rather than purchase new ones. We also wanted to benchmark Apple's newest and most powerful Mac, the IIx, to see if it was as fast as Apple claims.

So the MacUser Labs subjected 16 accelerator boards to a battery of benchmark tests. These same tests were run on the standard Macs—the Plus, SE, II, and IIx—so you could compare the performance of Apple's stock machines with accelerators ranging in list price from $395 to $3,995. All tests were performed with the optional Motorola 68881 floating-point unit (FPU) installed, with one exception: AOX's DoubleTime-16 does not use an FPU. We found that, for the average user who does not rely heavily on math-intensive programs, this discrepancy does not significantly affect test results. The test results (see Table 1, “Performance Comparison — Normalized”) should be judged in relation to a "bare-bones" double-floppy-disk SE with 1 megabyte of memory and no internal hard-disk drive (although a Jasmine external hard-disk drive was used in all tests).

The board, computer, and FPU prices cited in this report are manufacturers' suggested list prices. When presenting total prices, including additional memory required, we considered $400 to be the street rate for 1 megabyte of RAM. But shop around. With a little extra effort, you may be able to accelerate your computing at a discount.

Our conclusions? Before we report our findings, let's take a step back and refresh our understanding of how accelerators work.

**How It Happens**

Accelerators improve computer processing using four major methods: speeding up the CPU, upgrading the CPU to one that's more efficient, adding memory, or adding an FPU that computes floating-point math (see sidebar, "Whizzes at Whestones").

Virtually all our accelerators race their CPUs at 16, 20, or 25 megahertz, which is two to three times the normal 8-megahertz rate of a Plus or SE.

'A more thorough way to boost speed is...
Whizzes at Whetstones

It’s not just the Jones’ envious neighbors who want to accelerate their calculations. Anyone running spreadsheets, graphic artists sitting through recalculations of their on-screen objects, architects drafting buildings with CAD programs, and scientists solving mathematical equations and plotting scatter charts—all can find themselves twiddling their digits while waiting for the Mac to complete its math. It’s not surprising that their posture immediately improves when they hear about an M68881 or M68882 floating-point unit (FPU) that performs floating-point math possibly up to 200 times faster than their CPU. And they find their muscles they didn’t know they had when they hear that SEs with accelerators and Standard Apple Numeric Environment (SANE) patches run Whetstones, a math-intensive floating-point benchmark test, nearly 50 times faster than on an SE. But it’s just the siren’s song, right? The seduction of a journey conducted at unimaginable speeds in exotic locales. Passing through the sieve of Eratosthenes.

Well, it’s not just mythology. MacUser Labs benchmarked Motorola’s new pin-compatible M68882 floating-point chip (used in the new Macintosh llx) against the M68881. The M68882 benchmarking procedure was to place the chips within a Macintosh II and run an in-house benchmark program (“ErikStones”) that performed 50,000 loops of floating-point multiplies, divides, square roots, sines, and logarithms. In order to benchmark Apple’s SANE also, our benchmark program was able to route its calls either directly to the M68881 or M68882 or through SANE.

The results were exciting. Routing the calls directly to the 68881 gave a speed 143 times as fast as SANE, while the 68882 performed 1.5 times as fast as the 68881, or 213 times as fast as SANE. Here is the obvious case for routing floating-point calls directly to the 68881/68882. We applaud Motorola for improving the speed of its floating-point processor while preserving pin compatibility (see Table A, “Apple SANE versus M68881 and M68882”).

These results also confirmed our suspicion that some of the accelerator benchmarks were being substantially aided by the use of a SANE patch. A SANE patch is an INIT that traps some or all floating-point calls and routes them to the FPU, thus bypassing Apple SANE. We saw test results that were 2.3, 5.6, 6.9, and — hard to believe — 43.4 times as fast as the SE. Boards with FPUs were out in space, while others running SANE patches along with an FPU were out in hyperspace when measuring Whetstones.

Exaggerated results can indicate an oversight. In this case, we reminded ourselves that even the most math-intensive programs utilize the FPU only 10 to 30 percent of the time. And realistically speaking, a user doesn’t sit in a tiny program loop executing hundreds of thousands of floating-point multiplies (see Table B, “SANE Patch Effects on Math-Intensive Programs”). Thus we determined that the Whetstones results skewed the accelerator rankings, which would be misleading for non-math-intensive users.

Consequently, in Table 1, we’ve provided two “Total Normalized” performance values. One value is based on all of our tests, including Whetstones, and is useful for people who perform floating-point-intensive calculations often and/or who write their own code and can take advantage of the potential speed improvement of 213 times (burst speed from direct FPU routing to an M68882). We also provide a “Total Normalized” value that does not include the results from the Whetstones benchmark, for those who don’t use floating-point math.

— Erik Ramberg and Chris Schaefer

### Apple SANE versus M68881 and M68882

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<td>Mac II directly to M68882</td>
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<tr>
<td>Mac II using Apple SANE</td>
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*ErikStones is an in-house benchmark program that performs 50,000 loops of all the floating-point calculations that Motorola’s M68881 FPU is capable of performing.*
to upgrade the CPU. All our accelerator boards switch off the 68000 CPU in a Plus or SE and turn on their own CPU. In most cases, that new CPU is a 68020 from Motorola, which has the following advantages over the 68000: a larger (32-bit versus 16-bit) register, an on-chip instruction cache, and the ability to interface directly to a 68881 FPU and to a 68851 Paged Memory Management Unit (PMMU).

All but 4 of the 16 accelerator boards we tested use the 68020. Three of the cards—SuperMac's SpeedCard, AOX's DoubleTime-16, and SiCLONE's Turbo SE—have the same Motorola 68000 that's found in the Plus or SE but double its clock rate from 8 to 16 megahertz. The

### Marathon 020

**Requirements:**
- Apple Mac SE
- Memory: 2 megabytes
- RAM: 1 megabyte
- CPU: 68030
- FPU: 68882

**Features:**
- Faster memory access
- Improved performance
- Supports all Macintosh applications

**System Requirements:**
- Mac SE
- Memory: 2 megabytes
- RAM: 1 megabyte
- CPU: 68030
- FPU: 68882

**Price:**
- $599 (optional $6881, $799)

**Performance:**
- 20% faster than a standard Mac SE
- 20% faster than a standard Mac II
- 20% faster than a 68030-based Mac II

**Comparison:**
- **Mac SE vs. Mac II:**
  - Faster memory access
  - Improved performance
- **Mac II vs. Mac IIx:**
  - Faster memory access
  - Improved performance

**Pros:**
- Faster memory access
- Improved performance

**Cons:**
- Requires additional hardware
- More expensive than standard Mac SE/II

**Conclusion:**
- The Marathon 020 is a great addition to any Mac SE owner's system. It provides a significant performance boost without requiring a complete hardware overhaul.

-John Rizzo
Most of the test software ran without any problems. Initially we encountered a problem with the Marathon 020. All applications that tried to access the 68881 resulted in an ID=16, which is a floating-point error. After contacting Dave, we were sent a beta release of new software that allowed us to use the floating-point package without a hitch. All tests of SE accelerators were run using the Jasmine Direct Drive 100. Because none of the Mac Plus accelerators functioned with the Direct Drive 100, we opted to use the comparable DataFlame XP 60 for those tests.

Whenever we performed a test that wrote back to the hard disk, we went to the Finder to delete this file before executing another application. This procedure should not have affected the performance of any of the future tests because we did not fragment the hard disk. All tests were performed a minimum of three times, and in some cases many more if we thought there was a problem with a specific test. All the times shown represent the average of all the test results, with the final results normalized to those of the Mac SE.

In all tests, the time interval was measured from the time when we executed the initial command to the time when the cursor changed back from a spinning watch cursor to an I-beam or arrow. All results in Table 1 are in seconds except for Whetstones and Dhrystones, which are presented as the number of Whetstones or Dhrystones per second.

The Tests

- MS Word Load (version 3.02). This test was conducted to show the amount of time that elapsed from the Open command of a 100-page Microsoft Word document to the time that the document was fully displayed on-screen.
- MS Word Scroll (version 3.02). This test was designed to measure the amount of time used for scrolling a large text document. The time interval started on the Mouse Down command in the scroll bar in the lower-right-hand corner. The timing stopped when the cursor stopped flickering, that is, when the body of the test completed scrolling.
- UnStuff Test (version 1.5.1). In this test we unstuff ed our System folder (System Tools Version 6.0), which took up 468K. We used version 1.5.1 of Raymond Lau’s Stuffit program. We selected the folder that has previously been stuffed. The stopwatch started when we selected Save All and ended when the Mac beeped, signifying that the test was completed.
- Excel Load (version 1.5). In this test we loaded a 235K Microsoft Excel loan-amortization spreadsheet from a cold start and measured the time it took to load the application template.
- Excel Recalculation (version 1.5). We ran this test after completing the Excel Load test. We took the same 235K spreadsheet, entered a load amount of $200,000, and measured the time it took to recalculate.
- FreeHand Open (version 1.6). In this test we observed the time needed to open a 60K document created in Aldus’ FreeHand. The stopwatch was started when the Open command was executed from the File menu.
- FreeHand Actual Size (version 1.6). After completing the previous test, we had the open document on our desktop and then tested to see how long it would take to resize the same image. Instead of fitting it into the window, we chose to display it at actual size. The timing began with the Actual Size command and ended when our watch cursor changed back to an arrow.
- Macintosh Programmer’s Workshop (MPW) Compile (version 3.0A2). In this test we measured the time it took to compile code equivalent to 500K of disk space. The timing began when we executed the Full Build command in Apple’s MPW and ended when the spinning beach-ball cursor changed back to an I-beam.
- Whetstones Test. This test gave us on-screen results, so no external timing was required. Of these results, we reported only the number of Whetstones per second.
- Dhrystones Test. This test gave us on-screen results, so no external timing was required. Of these results, we reported only the number of Dhrystones per second.
- Orbits Test. This test gave us on-screen results, so no external timing was required. Of these results, we reported the time involved to completely recalculate drawing the orbit of one object around another.
- Curves Test. In this test we chose a 2-bit C curve and measured the time required to draw it. The timing began when the Mouse Up command was given to the type of curve we wanted and ended when the document was completely redrawn.
- 4D Sort (version 1.0.6). This test was designed to examine a large database sort. We chose a 2,000-card name-address file created in ACDIUS’ 4th Dimension. It consisted of 14 fields. The records were initially sorted by company name, and we tested the amount of time required to sort by phone number. The timing started at mouse-up with the phone number selected and stopped when the end-of-test card appeared in the window.
- MacDraw Redraw (version 1.9.5). This test was designed to test the amount of time required to redraw a large graphic image. For this test we used a 51K document created in Claris’ MacDraw. We loaded the test document and displayed it on the screen. We then selected New from the File menu to cover the initial document with a blank screen. We started clocking the time on mouse-up after clicking on the close box of this blank screen. The timing stopped when the original document window outlined itself again.
- HyperCard Sort (version 1.2.1). We used the same 2,000-card file used in the 4th Dimension sort to time a HyperCard sort. The file occupied 636K of memory. Before the test began, we sorted the records by company name. The sorts were started in order every time we performed the test (a total of three times). Then we were ready to start the timing of the phone-number sort. The timing started at mouse-up with the phone number selected. The timing stopped when the Sort icon turned into the Hand icon.
- FileMaker Find (version 4). In this test we used FileMaker 4, from Nashoba Systems (now available from Claris). We sorted a 5,000-record database that had 16 fields per record. We did a Find for all dates later than 10/01/88 and measured the time required to find all records meeting this criterion.

— Tom Santos
Quit wasting time.
Be quick on the draw. You can draw this on the Mac SE in about 42 seconds. Or under 6 seconds with the Excelerator XL25 board.

Enough of this dillydallying. If you’re doing business with a Mac, you’re spending time you don’t have to spend.

Starting now, you can put a new fleet of power products from Irwin to work on your Mac.

And fly through all sorts of productivity tasks like never before.

If that’s beginning to sound like blue sky, just take our Excelerator™XL25 board as hard and fast proof.

It drives a Mac SE up to eight full times faster.

That’s right. Faster than a Mac II. Or faster than you can clap your hands.

And not just on Excel and MacDraw like we’ve shown you here.

But on data bases like FileMaker II. Where a 1,500-record sort that takes almost 2 minutes on a Mac SE is wrapped up in less than 12 seconds with the help of the Excelerator.

On word processors like MacWrite II. Where a 46-page report is opened in less than 30 seconds instead of over 2 minutes.

And on and on. Because with an onboard math coprocessor, the Excelerator moves things even faster. Up to 100 times faster on all those number crunching jobs that make a Mac dawdle.

Or for that matter, you can access up to 8 megabytes of high speed memory. In no time at all.

And with that, we’re back to our time-saving point.

The Excelerator XL25 is just one of the new MacPower™ products from Irwin. Products that include high-performance accelerators, flicker-free monitors and no-hassle tape backups.

From the people who already back up more people than anybody.

Any and all of which can make you many times more productive.

To see for yourself, take a walk over to your local computer store.

Or just call 1-800-222-5871 for the name of the dealer nearest you.

So. What are you waiting for?

IRWIN®
### Table 1: Performance Comparison — Normalized

<table>
<thead>
<tr>
<th>Configuration as tested</th>
<th>MS Word load</th>
<th>MS Word scroll</th>
<th>UnStuff</th>
<th>Excel load</th>
<th>Excel recalc</th>
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*Preproduction; the only Mac II accelerator board tested.

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**Performance Not Including Whetstones**

In this price/performance graph, Whetstones have not been factored into test results. Performance is plotted on the horizontal axis, price on the vertical. Boards in the right area of the graph offer higher performance, while boards at the top of the graph are more expensive. The most desirable boards (with high performance and low cost) appear in the lower-right area. The diagonal line represents the average price/ performance values. Boards below the diagonal line have better-than-average price/performance ratios, while those above the line have below-average ratios.
In this price/performance graph, Whetstones have been included. Performance, represented by total normalized values relative to a Mac SE, is plotted on the horizontal axis (the SE has a value of 1). Price is plotted on the vertical axis. Some boards, such as the Radius boards (V and Y), move to the better-than-average side of the diagonal line when Whetstones are factored into the test results.
fourth board, DayStar Digital’s 33/030 Accelerator II, is based on the 68030 CPU — the same one used in Apple’s fastest Macintosh, the new Mac IIx (see sidebar, “Taking Care of IIx Envy”). Accelerator boards also gain speed by adding more memory than is normally available on the motherboard. For example, with the MacPEAK Orion SE boards, your Mac can hold up to 8 megabytes, doubling the capacity of a standard SE. This additional memory can be a real benefit because an entire program, and all its associated files, may be stored in the CPU’s main memory, which is a good deal faster than disk-based memory.

Another speed gain comes from on-board memory caches, which typically consist of 16K to 32K of fast, static RAM. Using this cache, the CPU obtains data in a fraction of the time it would take from a Mac’s normal RAM (see sidebar, “Cache On Delivery”). The fourth method of gaining speed is through a Motorola 68881/68882 FPU, which can reportedly improve floating-point–math operations 10 to 200 times over a lone CPU. Since there’s no way to add an FPU to a normal Plus or SE directly, an accelerator board is needed to make this improvement.

**Cautionary Notes**

When using MacUser Labs’ benchmarks to assist you in buying an accelerator, you need to weigh averaged, normalized results against what a specific accelerator does best. Take a close look at Table I (see sidebar, “The Controlled-
HyperCharger 020

Requires: Mac SE. Pros: Fast and affordable. All RAM on daughterboard and motherboard is contiguous and accessible from the Finder (up to 4 MB). Can operate in native 68000 mode. Can copy ROM into fast RAM. Allows use of full-page display. Also allows use of either surface-mounted SIMMs or the larger DIP SIMMs. Cons: Minimum configuration is 1 MB each on the motherboard and daughterboard.

GCC Technologies
580 Winter St., Waltham, MA 02154
(617) 999-9890
$995 (optional $68881, $400)

Use Tests,” for an explanation of the 16 tests performed). For example, loading a Microsoft Word document with an accelerator installed increased the speed of the operation only 1.6 to 1.7 times that of an SE (about a 60- or 70-percent improvement).

Is it worth spending $1,000 to $3,000 for that gain in speed? Is it worth the money if all you do is word processing? And if you find yourself on a lower rung of the Macintosh ladder — with your 128K, 512K, or 512KE Mac — is it worth paying a fortune for RAM to climb up to a Plus, and which accelerator should you buy once you get there?

Furthermore, we suspect lots of people buy accelerators hoping to see blinding-fast spreadsheet recalculations. So we tried Excel, since it’s the current leader of the pack of Macintosh spreadsheets. But Excel failed to address the FPU (see Table B. “SANE Patch Effects on Math-Intensive Programs,” in sidebar “Whizzes at Whestones”).

We contacted Microsoft, which promised to supply registered owners of Excel with a free upgrade that will utilize any FPU mounted on an accelerator. If you’re a CPA and your bread and butter is using Excel along with your accounting package, but you still need the portability of an SE when visiting clients, you might take a look at the Mac20MX-25. This accelerator was originally engineered by NOVY Systems and is now available from both NOVY and DayStar Digital. It uses up to 4 megabytes of memory ($3,995 with 4 megabytes and the optional FPU; $1,695 for the board alone) and recalculates our Excel spreadsheet 4.8 times faster than a stock SE. But don’t overlook the lower-priced offerings. Even SiCLONE’s $398 Turbo SE improves Excel recalculations by 1.92 times (a 92-percent gain), without using the optional FPU ($298). Adding the FPU and the revised version of Excel could add another 30 percent.

How We Tested for Speed

MacUser Labs conducted 14 applications tests and 2 standard benchmark tests (Whetstones and Dhrystones) using two different board configurations: 1 megabyte of memory and 4 megabytes of memory. This test a combination of floating-point processing power (Whetstones) and CPU performance (Dhrystones).

Each test was conducted three times, and the results were averaged. We then picked the best-performing configuration, which generally turned out to be 4 megabytes with cache turned on, and used those test results in Table 3, “Performance Summary.”

Note that Table 1 contains a recalibration (normalization) of the original results so that, in all cases, the SE’s test results equal 1.0. If, therefore, a particular test or price has a figure of 3.1, that means the combination of that particular computer and accelerator board performed 3.1 times as fast as an SE or costs 3.1 times as much as an SE. This method makes it relatively easy to compare our test results.

Prodigy

Requires: For Prodigy SE, Mac SE; for Prodigy 4, Mac 512KE or Mac Plus.

Pros: Have built-in FPUs and true 68000 emulation mode for programs that are incompatible with the 68020. Configuration software is as available as a cdev. Motherboard memory is accessible as a RAM disk. Documentation is excellent. Cons: Daughterboard memory uses custom memory modules available only from Levco. Motherboard and daughterboard RAM are not contiguous.

Levco
6160 Lusk Blvd., Suite C-100, San Diego, CA 92121; (619) 457-2011
What's the connection between everyone in your organization, all your customers, and thousands of other strange and creative minds around the world?

On CONNECT, I distribute updated pricing, sell systems, and support my customers without leaving the pool.

On CONNECT, I share graphics with all our 24 branches and swap sweet nothings with Tony in Tucson.

CONNECT keeps me in constant contact with my employees at far less cost than my brainwave amplifier.

Sally Nompish, Manager Corporate Communications
User Name: MANGA
Routes copy, shares files and graphics for in-house PR and desktop publishing.

Fred Frankston, inventor and entrepreneur
User Name: BOFO
CONNECTs with his employees and thousands of other strange and creative minds, galaxy-wide.

Connect charges: 18/hour peak time. 4/hour off peak. Including 120,000 characters. System requirements: MacNET* software or PC/MacNET* plus MS-DOS® Windows, a dual-drive Macintosh or MS-DOS® computer with hard disk, and a modem (use your own or buy a bundled package from us). CONNECT supports 1200 to 9600 baud. Service Mark: Connect—Connect, Inc. Registered Trademarks: MacNET—Connect, Inc.; Macintosh—Apple Computer, Inc.; MS-DOS, Microsoft—Microsoft Corporation.
Last week on CONNECT, I ran 400 software demos, sold 200 packages, and bought a pet iguana.

CONNECT gives me business news today you won't see until tomorrow.

Roger Ashthweat, CFO
User Name: DOREMI


Please circle 12 on reader service card.
### Table 2: Hardware and Software Features

<table>
<thead>
<tr>
<th>Computer</th>
<th>Clock speed</th>
<th>Motherboard memory</th>
<th>Maximum accelerator memory</th>
<th>Static RAM</th>
<th>ROM sockets</th>
<th>CPU</th>
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<tbody>
<tr>
<td>Macintosh II</td>
<td>15.67</td>
<td>1 Mb</td>
<td></td>
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<td></td>
<td>68020</td>
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<tr>
<td>Macintosh IIx</td>
<td>15.67</td>
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<td></td>
<td></td>
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<td>68030</td>
</tr>
<tr>
<td>Macintosh Plus, 1 Mb</td>
<td>7.83</td>
<td>1 Mb</td>
<td></td>
<td></td>
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<td>68000</td>
</tr>
<tr>
<td>Macintosh SE, 1 Mb</td>
<td>7.83</td>
<td>1 Mb</td>
<td></td>
<td></td>
<td></td>
<td>68000</td>
</tr>
<tr>
<td>ADX DoubleTime-16</td>
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<td>15.67</td>
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<td>68000</td>
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<td>DayStar Digital 33/030</td>
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<td>33.33</td>
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<td>Levco Prodigy SE (2Mb)</td>
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<tr>
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<td>SICLONE Turbo SE</td>
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</table>

*The cost of memory is included in the base price of this configuration.
**These products come with nonstandard 1-Mb memory modules. Memory on these boards cannot easily be removed and put into another machine.
***"Not necessary" means there is no functional reason for this option to be implemented.

---

**Orion**

- Requires: Mac SE. Proc: The 25-MHz version is the fastest SE board available.
- Daughterboard RAM can be upgraded to 6 Mb. ROMs can be copied into fast RAM. PPMU option allows use of AUX. Cons: Minimum configuration is 1 Mb each on motherboard and daughterboard. Unclear manual.

---

**MacPEAK Systems**

1201 Spyglass Drive, Austin, TX 78746; (512) 327-3211
SE 16; $796 (optional 68881, $296). SE 20; $995 (optional 68881, $495).
SE 25; $1,596 (optional 68881, $695; optional 68882, $795).
<table>
<thead>
<tr>
<th>Option</th>
<th>Warranty</th>
<th>Price without memory</th>
<th>Price with memory</th>
<th>Control Panel cdev</th>
<th>8-MHz 68000 mode</th>
<th>SANE patch/INIT</th>
<th>RAM disk software</th>
<th>Formatting software</th>
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<td>$3.099*</td>
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<td>yes</td>
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<td>yes</td>
<td>12 months</td>
<td>$1,295</td>
<td>$2.895</td>
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<td>yes</td>
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<td>yes</td>
<td>no</td>
<td>no</td>
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</tbody>
</table>

Accelerator
Requires: Mac Plus, Mac SE. Pres: Requires no additional memory. Uses a static RAM cache that enables high-speed access to ROM loaded into RAM.
Radius SANE is the fastest SANE patch currently available. Can hook up only Radius Large Screen Displays as secondary-devices. Cons: Mac Plus version has compatibility problems with a variety of hard disks. Contact manufacturer for list of drives. Neither PC drive card nor EtherTalk connector can be attached.
Radius, Inc.
1710 Fortune Drive, San Jose, CA 95131; (408) 434-1010
16 Plus; $995 (optional 68881, $300). 16 SE; $995 (optional 68881, $300).
25 SE; $1,695 (optional 68881, $500).
Anatomy of an Accelerator Board

Also note that the total normalized values in Table 1 are given in two columns: one with Whetstones and one without. Whetstones is not a regular Mac application. It's a laboratory-created test that consists almost entirely of floating-point calculations. Since even the most math-intensive program uses these calculations only 15 to 30 percent of the time, we left out Whetstones when giving you overall figures about a board's performance. We think the resulting units of performance more accurately represent what you will experience when you install an accelerator board and run regular applications. Another reason we omitted Whetstones was to avoid skewing the total values on board performance. Whetstones resulted in figures ranging up to 42 times the speed of an SE because of the FPU, compared with other tests that yielded figures around 4 or 5 (see sidebar, "Whizzes at Whetstones").

Test Results

Overall, the results show that it took a bare-bones SE a total of 25.7 minutes to complete our battery of tests, compared with 6.5 minutes for an SE running any of the fastest accelerator boards. That's a savings of nearly 20 minutes, with a speed rating averaging 3.9 times that of an SE. And the fastest SE accelerator —
MacPEAK’s Orion SE 25 — tops that. It uses a 68020 CPU operating at 25 megahertz, and with 4 megabytes of RAM it gave an overall performance 4.33 times as fast as an SE (and .53 times faster than a Mac IIx). Look at Table 1 to see how much of a speed improvement it is over the SE: Scrolling a Word file, 3.26 times; recalculating an Excel spreadsheet, 4.29 times; drawing an orbit, 12.73 times; sorting a 4th Dimension file, 3.70 times; redrawing a MacDraw file, 3.50 times; and sorting a HyperCard stack, 9.53 times.

That’s an impressive performance, but for a price. The Orion SE 25 will put you out $3,890 for the board, optional FPU, and 4 megabytes of memory ($1,595 for the board alone). When the board is installed inside a new floppy-drive SE (which lists for $3,169), the total price becomes $7,059. Such considerable expense raises that million-dollar question, “Should I buy an SE and install a fast accelerator board or purchase a Mac II or IIx?” A similarly configured Mac II — with 4 megabytes of memory, a 12-inch monochrome monitor, and video board — costs $7,367, which is only $308 more than the Orion-equipped SE. If you buy the Mac II, you’ll have six expansion slots, the potential for color, and speed that’s 3.13 times faster than the basic SE. But if you install the Orion SE 25 in an
Table 3: Performance Summary*

<table>
<thead>
<tr>
<th>Fastest accelerator board</th>
<th>Board speed</th>
<th>SE speed</th>
<th>Speed increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS Word load</td>
<td>Marathone</td>
<td>2.6</td>
<td>6.1</td>
</tr>
<tr>
<td>MS Word scroll</td>
<td>Orion SE 25</td>
<td>64.0</td>
<td>208.9</td>
</tr>
<tr>
<td>UnStuff load</td>
<td>Radius 25 SE</td>
<td>30.7</td>
<td>112.9</td>
</tr>
<tr>
<td>Excel load</td>
<td>Hypercharger 020</td>
<td>16.8</td>
<td>51.5</td>
</tr>
<tr>
<td>Excel recalculation</td>
<td>Mac20MX-25</td>
<td>6.3</td>
<td>30.4</td>
</tr>
<tr>
<td>FreeHand actual size</td>
<td>Orion SE 20/16</td>
<td>5.0</td>
<td>18.5</td>
</tr>
<tr>
<td>MPW compile</td>
<td>Mac II, 4 Mb (PMMU)</td>
<td>136.4</td>
<td>377.2</td>
</tr>
<tr>
<td>Orbit</td>
<td>Orion SE 25</td>
<td>6.8</td>
<td>86.5</td>
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<tr>
<td>Curves</td>
<td>Mac IIx</td>
<td>7.3</td>
<td>46.8</td>
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<tr>
<td>4D sort</td>
<td>Mac20MX-25</td>
<td>33.2</td>
<td>159.6</td>
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<tr>
<td>MacDraw redraw</td>
<td>Mac20MX-25</td>
<td>24.5</td>
<td>98.4</td>
</tr>
<tr>
<td>HyperCard sort</td>
<td>Mac20MX-25</td>
<td>20.5</td>
<td>208.1</td>
</tr>
<tr>
<td>FileMaker find</td>
<td>Mac20MX-25</td>
<td>13.3</td>
<td>61.2</td>
</tr>
</tbody>
</table>

*All times given in seconds.

SE, you'll blast through applications at an average rate 4.33 times faster than the basic SE. Could be a tough decision.

Two other hot boards for the SE as shown in our tests are the NOVY/Day-Star Digital Mac20MX-25 and Radius' Accelerator 25 SE. Both were run with 4 megabytes of RAM. Their performance was 4.30 and 3.82 times that of an SE for $3,995 and $3,795, respectively; the prices include 4 megabytes of add-on memory.

(Note: The Radius itself doesn't hold any RAM.) Notice that the Mac20MX-25 did especially well at recalculating the Excel file, sorting a 4th Dimension file, and sorting a HyperCard file. Nor should you overlook the Radius 25 SE from another perspective: Not only is it very fast if you add 4 megabytes of memory to the motherboard, but it's also our fastest board at 1 megabyte of memory on the SE. At $2,195 with the optional FPU and 1 megabyte of memory, combined with performance 3.53 times as fast as that of an SE, the Radius 25 SE moves into our Best Buy category. (Add another $1,600 to this price for the 4-megabyte configuration.)

The Radius 16 SE is another Best Buy, costing $1,295 with the optional FPU and giving you 3.00 times the speed of an SE. Also in the Best Buy category for SE owners are SuperMac's SpeedCard and SiCLONE's Turbo SE, which both provide approximately 1.80 times the speed of an SE for prices under $800, including the price of the optional FPU.

No matter how your Mac is configured, look over the results of our lab tests — you may find just the right combination of price and performance for your Mac applications.

**Turbo SE**

Requires: For Mac 512Kc or Mac Plus, MacAdapt expansion chassis and Turbo SE accelerator; for Mac SE, Turbo SE. Pros: Requires no additional memory. Allows the use of motherboard memory on the daughterboard by using two 32K video SIMMs installed into SIMM slots 3 and 4. Appears to work well with most programs generating sound. Cons: Four 256K SIMMs are required for the Mac 512Kc — an expensive upgrade. But you'll notice a considerable speed increase and get a SCSI port out of the deal.

SiCLONE
1169 Borregas Ave., Sunnyvale, CA 94086; (408) 734-8151
MacAdapt; $298. Turbo SE; $398 (optional 98851, $289).
Highest Performance

For Plus owners:
Radius' Accelerator 16 Plus (1 megabyte)
Gives 2.92 times the performance of an SE.
Price: $3,094, board, FPU, and computer: $1,295, board and FPU.

For SE owners:
First Place (Tied):
MacPEAK's Orion SE 25 (4 megabytes)
Gives 4.33 times the performance of an SE.
Price: $7,159, board, FPU, and computer: $3,990, board and FPU.

First Place (Tied):
NOVY's/DayStar Digital's Mac20MX-25 (4 megabytes)
Gives 4.30 times the performance of an SE.
Price: $7,164, board, FPU, and computer: $3,995, board and FPU.

For Top-End Purchasers:
Mac II with DayStar Digital's 33/030 Accelerator II (4 megabytes)
Gives 6.56 times the performance of an SE.
Price: $14,367, board, FPU, and computer: $8,600, board and FPU.

Best Buys

For Plus owners:
Radius' Accelerator 16 Plus (1 megabyte)
Gives 2.92 times the performance of an SE.
Price: $3,094, board, FPU, and computer: $1,295, board and FPU.

For SE owners with 1 megabyte:
First Place:
Radius' Accelerator 25 SE (1 megabyte)
Gives 3.53 times the performance of an SE.
Price: $5,364, board, FPU, and computer: $2,195, board and FPU.

Second Place:
Radius' Accelerator 16 SE (1 megabyte)
Gives 3.00 times the performance of an SE.
Price: $4,464, board, FPU, and computer: $1,295, board and FPU.

Third Place (Tied):
SICLONE's Turbo SE (1 megabyte)
Gives 1.80 times the performance of an SE.
Price: $3,865, board, FPU, and computer: $596, board and FPU.

Third Place (Tied):
SuperMac's SpeedCard (1 megabyte)
Gives 1.79 times the performance of an SE.
Price: $3,967, board, FPU, and computer: $798, board and FPU.

For SE owners with more than 1 megabyte:
First Place:
MacPEAK's Orion SE 16 (4 megabytes)
Gives 3.65 times the performance of an SE.
Price: $8,959, board, FPU, and computer: $2,690, board and FPU.

Second Place:
MacPEAK's Orion SE 25 (4 megabytes)
Gives 4.33 times the performance of an SE.
Price: $7,159, board, FPU, and computer: $3,990, board and FPU.

Third Place (Tied):
NOVY's/DayStar Digital's Mac20MX-25 (4 megabytes)
Gives 4.30 times the performance of an SE.
Price: $7,164, board, FPU, and computer: $3,995, board and FPU.

For New Purchasers:
Macintosh Plus with Radius' Accelerator 16 Plus (1 megabyte)
Gives 2.92 times the performance of an SE for slightly less than an SE's price.
Price: $3,094, board, FPU, and computer: $1,295, board and FPU.

Note: Total prices are based on Apple's suggested list prices of $1,799 for a Plus and $3,169 for an SE. If 4 megabytes of RAM is indicated, an extra $1,600 is included in the total price. All prices are suggested by the manufacturer. Discounts may be available.

SpeedCard

Requires: Mac SE. Pros: Great low-cost alternative. Requires no additional memory. Allows full use of memory on the motherboard and full compatibility with all programs that don't work with the 68000. Alows use of many different large-screen displays (except Radius). You can use either the Apple PC drive card or the EtherTalk card for the SE. Colorvue SE will also function on this card. Cons: Heck, we can't think of any.

SuperMac Technologies
285 N. Bernardo, Mountain View, CA 94043
(415) 964-8884
$399 (optional $110, $399)
How to speed up your accounting cycle

Whether you're shopping for your first computerized accounting system or making do with some other "solution", you owe it to yourself to see why Bedford's Simply Accounting is the fastest way to get your small business from transaction to report.

"Simply Accounting is one of the best all-in-one programs"
Macworld October 1988

Quick to setup...
Installation is as easy as copying the program onto a working diskette and double-clicking the icon.

Easy to learn...
Within minutes you will be moving easily through the six fully integrated functions using only your mouse. The sample accounting records and self-paced tutorial allow you to get comfortable with the program before entering your own company's data.

A snap to use...
With Simply Accounting you'll need to enter transactions only once. Payroll, Payables and Receivables data are instantly transferred to General Ledger, Inventory and Jobcost as required.

On-screen lists of your chart of accounts, suppliers, customers, employees and inventory pop up with a simple click and drag of your mouse.

If you need your bottom line in a hurry or a quick check of a client's payment status, a few clicks is all it takes to display any report instantly.

"Small businesses owe it to themselves to give this product a hard look"
MacUser September 1988

If you require additional help, our exclusive Comfort Guarantee provides free technical support and program updates for your first thirty days.

Stop wasting time...
Blast down to your nearest Bedford dealer or Apple® reseller today and, for only $349 complete, let Simply Accounting show you the easiest way to speed up your accounting cycle.

Call 1-800-255-8361 for more information.

Unlike software that was never built for speed, Macintosh™ based Simply Accounting has been optimized to give your small business the boost it needs.

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Please circle 15 on reader service card.
Got a Mac problem? Something you'd like explained? Something you can't find the answer for anywhere else? Apple's Chris Espinosa will answer your questions every month in this space. When the questions are too tough or too esoteric for him, he'll get the answers from other members of the Mac team. So ask what you need to know and get your answers straight from the source!

Send your questions to Chris, c/o MacUser, 950 Tower Lane, 18th floor, Foster City, CA 94404. Chris will read all your questions, but, unfortunately, he may not be able to answer individual queries.

ULTRA SECURE WITH HYPERCARD

Q. Help! I have a big problem, and I really hope you can help me. The problem is simple — I have a HyperCard stack that I foolishly protected, and I forgot the password. Yes, I know that the HyperCard manual states that there is no way to gain access without the password. Correct me if I'm wrong, but it can't be encryption. I would think it is only a "locked door." Is it then possible to use some editor to change some simple 1 to a 0 and have there be no more password? I have tried three programs so far. ResEdit and FEdit both didn't work; they said that neither the resource fork nor the data fork had sectors allocated. MacTools was at least able to view my file, but it couldn't remove the protection. You're my last hope! GIDEON TURNER MORMISTOWN, N.J.

A. There's no hope. Sorry. When you protect a stack with HyperCard, it uses your password as a key to scramble the first couple of blocks in the data fork of the file that contains the stack. While this could be an extremely small percentage of the information in the file, it's an extremely important percentage: It's a list of "pointers" to the rest of the information in the file. With those pointers scrambled, no program (or programmer!) has a chance of finding out which parts of the file are valid and which are just artifacts of previous edits.

When you open a protected HyperCard stack and supply a password, HyperCard uses the password to descramble the first few blocks. If the password is right, then the descrambled pointers come out correct; if it's wrong, the pointers are meaningless, and HyperCard can't understand the file.

There's no simple bit to set to remove the password, because HyperCard never stores the password anywhere. I don't understand why FEdit and ResEdit wouldn't let you see the file. The entire file, including the few encrypted blocks, are fully accessible to both those programs. (Using FEdit on a protected file, you can read the text in the fields and scripts of the protected stack. This will help you recover some of the text, especially if the stack was compacted before it was protected.) Perhaps your protected file was damaged in some other way, and you really didn't forget the password?

Some advice: Make an unprotected backup copy of a stack before you protect it, and lock up the backup copy in a secure place, such as a safe-deposit box or a locked desk. And don't lose the key.

HOW SERIAL IS SERIAL?

Q. Many times I have gotten excellent tips from your column. But in your October '88 "MacBottom Up" response, you replied to Mr. Harris that "... no Mac is able to start up off a serial device without the help of a floppy disk." I have a Mac 512KE with one of the original Apple HD20 serial drives, and when I start the HD20 first, wait 20 seconds or so, then turn on the Mac, it fires right up. Is my Mac possessed?

PATRICK COLLINS SAN FRANCISCO, CALIF.

A. Yours was one of many letters I got this month about "serial" disk drives (some letters a little nastier than others). And even my good old editor at MacUser questioned the answer when I first wrote it. So maybe I'd better explain...

The original Apple HD20 disk drive connected to the floppy disk port of the Macintosh 128 and 512. This port is connected to a chip called the IWM (Integrated Woz Machine), which does most of the work of decoding the information from the disk. So the floppy disk mechanism is pretty simple; its electronics don't do much but communicate the data to-and from the disk-drive head.

And that information comes off the head serially — that is, one bit at a time — so I guess you could call the floppy disk a serial device. Since the original HD20 looks like a very big floppy-disk drive, to the Macintosh hardware, you could call it a serial device
too. And the 128K ROMs in the Mac 512KE and Macintosh Plus can indeed start up from this serial device.

But when I said serial I meant printer or modem port. The people who designed the original Macintosh hard disk realized that the two serial-interface ports on the Macintosh could transfer information just about as fast as the floppy-disk port, and it was a lot easier to put a small microprocessor and serial-interface chip inside their hard disk drive than to make it fool the Macintosh into thinking it was a large hard disk. And it's this kind of serial hard disk, the one that connects to the modem port, that doesn't automatically start up a Mac.

**TIRED OF TELEVISION?**

**Q.** I have a Mac SE and would like to know if it is possible to use a color television as a monitor. Will the television give me the benefits of a large screen monitor? Do I need a graphics card, and is color a possibility? Will it ruin my television? Where can I purchase cable extenders for both the keyboard and mouse?

**A.** Your second question is at the heart of the matter. Most of the functionality of a monitor is determined by the graphics circuitry inside the computer. The Macintosh SE has graphics circuitry that produces a black-and-white image 512 dots wide and 342 dots tall, and to get anything else — such as color or more resolution — requires additional circuitry. So color and large screen are possible only if you buy a graphics card, which can be more expensive than a monitor.

Unfortunately, even the video image produced by the built-in circuitry is too complex for the average television set. It's not interlaced like a television image is, so common Mac graphic elements like the thin lines in title bars will appear to jump up and down every thirty-eighth of a second. And the Mac's horizontal resolution is much higher than a color TV is equipped to handle, so text characters, thin lines, and patterns would be illegible.

**MISSING FONTS? NO, MISSING KEYS**

**Q.** I own a 512K Mac that has the Apple ROM upgrade. My Mac also has a 2-megabyte memory upgrade done by a local MacMemory dealer. This year I had MacMemory add a SCSI port in order to add a Jasmine hard-disk drive.
Since the return of my machine, my Mac periodically loses its ability to “remember” fonts. I’ll be in a program, any program from Dark Castle to Word 3.01, when the keyboard becomes nonresponsive or only types out blank squares or numbers. What’s the story? If I restart my Mac, the fonts come back. Also, if I replace my System the problem doesn’t come back as fast, but it always comes back.

Any suggestions?

RICHARD J. WIANECKI
LOS ALAMITOS, CALIF.

This one took a bit of figuring out, but the screen dump of Key Caps you supplied told me the whole story (see Figure 1).

First of all, your fonts are fine. You can see them in the appropriate menu bars. So there’s nothing wrong with your fonts or System file.

What’s wrong is your keyboard. Key Caps shows exactly what character will be typed when you press each key. And what it’s showing is what you’re getting: boxes and numbers, with the occasional funny symbol (the Apple, the check box from menus, the Command-key symbol, and the diamond).

Those characters are known as control characters. Their ASCII code is between 0 and 31, and they’re generated by holding down the Control key on the keyboard.

But your keyboard doesn’t have a Control key.

Key Caps agrees. It shows the picture for the keyboard you have. And when a key is being pressed, it highlights it. But the diagram shows the Mac Plus keyboard, which has no Control key, and nothing’s highlighted!

I can guess what’s happening. The Mac 128K, 512K, and Plus keyboards have a key-down, key-up cycle. When you press a key down, it sends a signal to the

The hard drive with the Apple label is a Quantum ProDrive™, shipped by Apple Computer.

The other is ours, also a Quantum ProDrive™, but with a Maxcess label.

Two identical drives.

Five big differences:

1. Maxcess is 50% less expensive. Compare buying a Mac II and adding Maxcess to buying a Mac II stock with Apple’s drive.
2. Our warranty is 2-years; Apple’s is 90-days.
3. We have a toll-free technical support line; Apple has dealer support.
4. Maxcess can be mounted in the SE while keeping both floppy drives; Apple’s drive mounts by replacing a floppy.
5. We add FWB’s Hard Disk Partition™ and Hard Disk Deadbolt™ software; Apple uses system software common to all Macs.

Identical drives have never been so different.

Tech Spec: 19ms avg. access-time, 4-mb/sec. transfer-rate, 50,000 MTBF, auto-head park.

| Maxcess-40 | $647  |
| Maxcess-80 | $977  |

30-day money-back guarantee

ProDrive is a trademark of Quantum Corporation. Apple is a registered trademark of Apple Computer, Inc. Hard Disk Partition and Hard Disk Deadbolt are trademarks of FWB, Inc. Maxcess is a division of Hardware House, Inc.

Please circle 26 on reader service card.
Mac saying so; when you let the key up, it sends a different signal. That helps the Macintosh handle "rollover," which lets you type more quickly by letting you press a second key before you've completely let up on the first. And it lets the Mac control things like the keyboard repeat rate.

But if the keyboard isn't working correctly, it can send a key-down message to the Mac and never send a key-up message. If this happens, the Mac will think the key is still being held down.

For some strange reason, your keyboard is occasionally sending a key-down message for the Control key (a key that's not really on the keyboard) and never sending a key-up message. The Mac quite happily assumes that you really mean to continue to hold the Control key down, so all it types is Control characters—which, as you've noticed, are not very versatile.

The solution is to get your keyboard repaired or replaced (see "Chairman of the Keyboard," June '88, for some do-it-yourself tips). Whenever this problem occurs, a temporary fix is to disconnect and reconnect your keyboard. That'll reset the keyboard, causing it and the Mac both to forget that the nonexistent Control key was ever mistakenly pressed down.

SIMM CHIPS REVISITED

Q. I was surprised to read the "With or Without" item in your October '88 column, in which you concluded, "the chips that Apple builds into the Plus and SE cannot be popped out and put into a Mac II."

A. Our law firm switched to Macintoshes last spring. We bought a Mac II for the word-processing center in each office, plus a few SEs. The SEs each received a 2-megabyte memory upgrade, which left a number of 256K SIMMs for which we had no use.

The dealer suggested that we could use the four of them to supplement the four 256-megabyte SIMMs in each Macintosh II and create a 2-meg computer.

So now our Mac IIs are running fine, using the memory chips Apple installed and those we swapped from our SEs. Is something wrong?

JACKSON S. WHITE, JR.
ABINGDON, VA.

If it's working, then nothing's wrong, except for my mistake. Macintosh SEs have always been shipped with 120-nanosecond SIMMs, which are appropriate for use in any Macintosh. Only the Macintosh Plus was originally shipped to customers with 150-nanosecond SIMMS.

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which may be used in a Mac Plus or SE but not in a II. When Apple shipped the SE and II, the Plus was given 120-nanosecond parts as well. So unless you have an older-than-January-1987 Macintosh Plus, you can use any Apple SIMM in any Macintosh.

Your dealer was right — and smart!

AREN'T 30 MEGS ENOUGH?

Q I have a Mac SE with a 30-megabyte hard drive. If I try to run Microsoft Word and PageMaker under MultiFinder, I get a “not enough memory” message. Why is this happening and what can I do to fix it?

A There's an important difference between System memory and disk memory. System memory is contained in chips called RAMs or DRAMs (dynamic random access memory). RAM is fast — its speed is measured in nanoseconds (billionths of a second). But it's rather expensive and is available only in relatively small quantities: The basic unit is a SIMM (single inline memory module) with either one-quarter or 1 megabyte of memory, and it loses its information when the power is turned off.

Disk memory, however, is cheaper, is available in larger quantities (up to 300 megabytes), and remembers what's stored after the power is turned off. But it's slower: Access time is measured in milliseconds (thousandths of a second).

So computers use the different kinds of memory for different things. System memory is used to store the current application and parts of the document you're working on, and disk memory is used to store documents you've saved or applications you may want to use later. When you open an application or document, the computer copies it from the disk memory into System memory, and uses the copy in the much faster System memory.

That's why you're running out of room. You have only 1 megabyte of System memory, even though you have 30 megabytes of disk memory. (Choose About the Finder from the Apple menu: It shows how much System memory you have...)

"If all you care about is spreadsheet performance and value, just buy MacCalc."

—John Dvorak, MacUser
THE HELP FOLDER

total, and how much is in use at the moment by applications. The applications you're using, especially PageMaker, are pretty big, so they use a lot of System memory (select the PageMaker icon in the Finder and choose Get Info... from the File menu to see how much memory PageMaker wants).

The only way to run more applications under MultiFinder is to install more System memory. Your Macintosh SE can hold up to 4 megabytes of System memory, which should handle PageMaker, Excel, and Word, maybe with Works thrown in. Adding more disk memory is like adding a luggage rack to a two-seater car: You can haul around more luggage, but it won't help you carry more passengers.

A technique called virtual memory lets a computer substitute disk memory for System memory. The Macintosh Resource Manager is a simple form of virtual memory. It brings fonts, dialog boxes, and desk accessories into System memory from disk memory automatically when they're needed. More complete implementations of virtual memory can help eliminate System memory restrictions and blur the distinction between System memory and disk memory. But to work well, virtual memory systems usually need what's called a memory-management chip, like the one that's optional on the Mac II and built into the Mac IIX. When your Mac has a memory-management chip and a virtual-memory operating system, your question will be valid. But for now, the answer is the standard one: Buy more RAM.

IBM PRINTING ON A LASERWRITER

QI have a Macintosh SE and a LaserWriter II INT, which work great together. But I also have an IBM Model 50Z that I would like to connect to the LaserWriter. I know that I can connect the IBM Model 50Z and LaserWriter II INT through a network like TOPS, but I would rather go the inexpensive route by using the serial port on the IBM and LaserWriter. I can make my own cables and I am looking for the correct pinout for the connectors.

None of my local dealers has any idea what the cables should be. Besides the cable, what should the DIP switches on the LaserWriter be set on? The LaserWriter is set to XON/XOFF, N, 7, 1; should these be changed? I thought N, 8, 1 would be the common setting.

I am using PC Excel and Lotus, mostly. Can I use the

COMMUNICATIONS SOFT THE INTELLIGENCE

It's gotten raves from just about every software reviewer. It's powerful, reliable and easy to use.

It's Smartcom II® from Hayes for the Apple® Macintosh™. Designed to take full advantage of the Mac's power and ease of use as well as of your Hayes modem. And if you're a Macintosh user, you ought to know about it.

Eight icons control most of the program functions. Like getting on-line, transmitting and receiving a

For your nearest Hayes Advanced Systems Dealer. call 800-635-1225.
First, the cable. The 25-pin port on the back of the LaserWriter IINT is a standard RS-232 connector (for aficionados, it's a Data Terminal Equipment, or DTE, device with a socket). To connect it to the IBM PC, use a standard serial-interface cable with a modem eliminator. Connect one end to the 25-pin connector on the Macintosh and the other end to the COM 1 serial port on the IBM.

Once the cable is connected, there are three ways you can use the LaserWriter IINT or IINTX with an IBM PC (or clone).

- If you have PostScript applications, you can print with PostScript, with the full fonts and graphics ability of the LaserWriter; if you don't, you can use the Diablo 630 emulator built into the IINT.
- Set DIP switch 1 to the Down position and switch 2 to the Up position to use Diablo 630 mode. Restart the LaserWriter IINT and check that the test page says RS-232 9600 Baud. (It'll be 7 bits; the IINT does not support Diablo emulation in 8-bit mode.) Start up the PC and, when you get the C> prompt, type MODE COM1: 96 , N, 7, 1, P MODE LPT1: = COM1: (You can put these commands in the AUTOEXEC.BAT file if you're going to be doing this often.)
- Run your PC application, and configure it to print to a Diablo 630 using XON/XOFF protocol. Then you should be able to print typewriter-quality documents or use the MS-DOS command PRINT /D:COM1.

There are a lot of other things you can do too. You can set ETX/ACK or DSR/DTR handshake, or use PostScript protocol, or if you had a LaserWriter IINTX, you could use Hewlett-Packard LaserJet+ emulation to get output better than the Diablo emulation (but not quite as good as PostScript).

There's not enough space in this column to describe the options and how to set them. Luckily, there's an excellent book on the topic: it's Appendix C of the LaserWriter IINT/IINTX Owner's Guide, which came with your printer. Remember to remove the shrinkwrap before you try to open it.

SAME VERSION, DIFFERENT SIZE? I appreciate MacUser from time to time printing the table of System/Finder combinations and the recom-
mended use of them. Today I have been going through my disks, and I find that I have accumulated several different System/Finder/ImageWriter combinations. I'm concerned by my observation that systems associated with the same Finder do not always have the same number of kilobytes.

I have a lurking suspicion that perhaps some vendors may take the liberty of modifying some systems in order to make them more compatible with their software. If they do, would such systems be dangerous to use with other software?

ERNEST TAYLOR WINSFORD-SEALE, N.C.

A. Many software vendors (Apple included!) modify the System file on startup disks they ship with their products. But it's not as much a problem as you fear.

Because of the Resource Manager that's built into the Macintosh operating system, most Macintosh files (especially the System file) are modular. Instead of being one long string of code, they're broken into a few hundred "resources": fonts, disk accessories, dialog boxes, error messages, ROM patches, software packages, and so on.

The Resource Manager allows you to add or remove any of these components without damaging the file or compromising its integrity. So if you remove something you don't need, it should cause no problem.

Apple encourages software vendors to ship with no System file, thus assuming that you, the buyer, already have the System file you want — the one that's configured for your machine and customized for your tastes.

But the System file is big. And as Apple adds more functionality to the System and makes it run on a larger number of machines, the System file gets bigger. Often it's so big that it doesn't fit on a floppy disk with an application!

So some software developers trim down the System file to make it fit. They usually just reduce the number of fonts and desk accessories; sometimes they remove other resources. If the application needs a megabyte of memory, many developers — just assuming that the customer will have a Mac Plus or later — remove those resources that are unique to the Mac 512K and 128.

If you have a hard disk, just use one System file on your hard disk. If you don't, use the System file that came with the application, and use the Installer to add printers or other additions to that disk. Your System files will all be different sizes and probably different versions, but the trouble of trying to reconcile all of them is probably not worth it.

... BUT WHAT IF IT DOESN'T FIT?

Q. I have a Mac Plus with an 800K external drive. My problem: I want to update my System 3.2 and Finder 5.3 to 4.1 and 5.5, respectively. I use Works version 1.1 and Works Plus Spell version 1.1A as my main programs. Every time I try to install the new System, I get a message that says I don't have enough room on that disk.

Do I have to buy a hard-disk drive just to update my System? If not, would you please explain how to do it?

A. As I noted above, sometimes the System gets so large that it doesn't fit on a disk with the application. It's best to buy a hard disk, especially if you're planning to run more applications in the future. But if you're satisfied with what your Mac does and still want to upgrade your System, here's how:

First, make sure the only things on the startup disk are the application and the System folder. Copy any documents onto separate disks, then drag them from the startup disk into the Trash.

Next, open up the System folder and make sure it doesn't have things you don't use. At the minimum, you need a System, Finder, printer driver, Scrapbook file, and Clipboard file. If there's anything else in there, copy it onto a backup disk, then drag it from the System Folder into the Trash.

Then start up the Font/DA Mover and use it to remove any fonts you don't use often (especially the larger sizes, which take up more disk space). If you don't use desk accessories like the Puzzle, remove them, too.

Now you can use the Installer to upgrade your System.

WHERE DID THOSE NAMES COME FROM, ANYWAY?

Q. Why is it called the Macintosh? And who was Lisa?

A. In the early days, there were two major themes for project names: feminine names and varieties of apples. For example, there were projects named Annie, Sara, and Lisa, as well as Pippin, Golden Delicious, and Macintosh.

Jef Raskin, originator of the Macintosh project, says he picked the name because it was his favorite kind of Apple. (And it was Jef who misspelled it — the apple is called McIntosh — but the name stuck anyway.) It was always expected that the names would change before the products shipped. The Lisa was to be called the Apple IV (following the I, II, and III).

But both project teams were fiercely loyal to their project names, and both names stuck. There was one attempt to make the names actually mean something. Lisa was supposed to be Locally Integrated Software Architecture, and at one point Macintosh was shortened to just Mac, for Mouse Activated Computer. These quickly degenerated into Let's Invent Silly Acronyms and Meaningless Acronym Computer.

So in the end it was just easier to ship them with the names we knew them by and teach people what the names meant. It seemed better than calling it the Zipchip ZX8000.
The toughest reviewers agree about VersaCAD:

"An excellent piece of work with all the features professional users need while maintaining the intuitive feel of the best Macintosh programs." —MacUser

"VersaCAD packs more power than any other Mac CAD program and makes that power easy to use."
—Macintosh Today

"If you've gotten the impression that I like this product, you're right." —Macworld

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Macintoshes are showing up on desktops everywhere. Wouldn't it be nice to get your PC to show up on your Mac desktop? And would you sacrifice a little DOS speed for less than half the cost of a good PC clone? If so, read on, for this month we take a close look at SoftPC from Insignia Solutions of San Francisco, a program that lets you run DOS in a window on your Mac. Previous solutions, such as AST Research's Mac286 for the Mac II and PerfectEK's Mac+PC SE were hardware solutions, which actually put Intel processors in the Mac. The hardware solutions are certainly faster, but they don't match SoftPC for ease of use and low price.

Features

SoftPC emulates the Intel 8088 processor found in the IBM PC XT. The program has been available for several years on workstations like Sun Microsystems', MIPS, and Tektronix and has been ported to the Mac from the Sun version. Software emulation of DOS is common in UNIX environments, where the speed difference between software and hardware emulation is getting small — because of fast reduced instruction set computer (RISC) processors.

SoftPC is big: It requires at least 2 megabytes of RAM and a 32-bit Motorola microprocessor — the 68020 or 68030 found in the Mac II, Iix, or some accelerator boards for the SE. Two versions come with the package — one that takes up 2.4 megabytes of RAM for 4-megabyte machines, and one that uses 1.7 megabytes for 2-megabyte Macs. The standard version is about 10 to 15 percent faster than the small version.

SoftPC is easily installed in two or three minutes by copying software to a Mac's hard disk. When you double-click on the SoftPC icon, MS-DOS and GW-Basic are loaded in a window that looks and acts exactly like a DOS screen down to every detail, including a recording of the sound a PC floppy-disk drive makes upon boot-up. You can then type in normal DOS commands. SoftPC also emulates the Microsoft Mouse Bus so the Mac mouse can be used in DOS applications that employ the Microsoft mouse. But your Mac sees SoftPC as an ordinary application, so you have access to your normal Mac DA's.

We looked at SoftPC version 1.2, which supports CGA 16-color display. Most PC software is supported, including terminate-and-stay-resident software like Borland's Sidekick. Why would one want to use Sidekick when the Mac's DA's are available? Because SoftPC can be used by any PC-literate user with virtually no Mac training.

SoftPC is MultiFinder compatible, so a DOS task needn't take over your entire Mac. The on-screen DOS and Mac windows are handy for exporting data from DOS to Mac-compatible programs such as 1-2-3, Excel, PageMaker, and Word. You can also use the Clipboard to copy text from a DOS program using the Mac's mouse and the Copy command. DOS does not allow Mac-to-DOS transfers via the Clipboard. However, a Mac file saved in a format that DOS can read can be opened from within SoftPC.

Disk drives available to the DOS window are designated A:, C:, D:, and E: through a pull-down menu. Drive A: is reserved for the Apple PC 5.25 Drive, a 360K floppy-disk drive that you'll be able to use only with a Mac II. SoftPC requires a 32-bit accelerator to occupy the SE's expansion slot, which the drive also needs. Fortunately, Drive A: can also be the drive A: of an actual IBM PC compatible connected with a serial cable, which is accomplished using the SlavePC utility included in the SoftPC package.

DaynaFile, a DOS floppy-disk drive connected to the Mac with a SCSI cable, can be accessed as drive E: This is handy since DaynaFile is a SCSI device offering a variety of floppy-disk sizes and disk drives. Macs are already sometimes connected to external drives like the Mac's AppleDrive. You can keep a collection of DOS compatible floppy drives connected to your Mac while using the DaynaFile and SoftPC.

Clocking the DOS Alternatives

<table>
<thead>
<tr>
<th>IBM PC XT</th>
<th>IBM PS/2 model 80</th>
<th>Compaq 286</th>
</tr>
</thead>
<tbody>
<tr>
<td>SoftPC, small, 2.5-Mb SE with accelerator</td>
<td>SoftPC, std, 5-Mb Mac II</td>
<td>SoftPC, small, 2-Mb Mac II</td>
</tr>
<tr>
<td>DOS Boards</td>
<td>Mac-PC SE, 2.5-Mb SE</td>
<td>Mac286, 5-Mb Mac II</td>
</tr>
</tbody>
</table>

Overall speed is normalized to the IBM PC XT. Red arcs greater than 180 degrees represent lower speeds than the IBM PC XT; smaller ones represent higher speeds.
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Benchmarks

We ran PC Magazine Labs' standard suite of PC processor tests on both versions of SoftPC in a Mac II with 2 megabytes of RAM and again with 5 megabytes. We also tested the small version in a 2.5-megabyte SE with a Radius 25 Accelerator, which uses a 25-megahertz 68020. We ran the same tests on AST Research's Mac286 DOS card on a Mac II and PerfectEK's Mac+PC SE. For comparison, we also tested the IBM compatibles: the IBM PC XT, the Compaq 286, and the IBM PS/2 model 80.

The first four tests measure the speed of the processor routines, or in SoftPC's case, the emulation. The floating-point test measures the speed of floating-point math calculations without the use of a floating-point chip. The next test measures RAM access time, and the last measures the time it takes to write and rewrite characters to the screen.

On the average, the standard SoftPC was about 13 percent slower than an XT, 42 percent slower than AST research's card, and more than five times slower than a PS/2 model 80. However, the SE with the 25-megahertz accelerator helped the standard version a great deal, averaging about 16 percent faster than the XT and about 26 percent faster than the standard version on a Mac II. On a Mac II, the small SoftPC version averaged about 10.5 percent slower than the standard version.

Conclusion

Running DOS on a Mac isn't the only way to solve the Mac-PC connectivity problem. For instance, you can use programs on each side that can read each other's files, like Excel and 1-2-3. Many vendors offer compatible Mac and DOS versions of their programs, such as Aldus PageMaker, Microsoft Word, and a recently announced PC version of Adobe Illustrator. You can fit your Mac or PC with a floppy-disk drive that reads the foreign format, you can use a Mac IIX, which comes with a drive that reads DOS, or you can connect your computers using serial or network solutions. For noncompatible files, you can use file translators such as MacLink Plus, Apple File Exchange, and QuickShare software.

Unfortunately, these solutions might not be the most efficient if you frequently use DOS applications and data. Running DOS on a Mac is a good solution if you need to run multiple DOS applications or if you have personnel you don't want to train on a Mac and translation hardware and software.

Putting DOS on your Mac by adding hardware has one advantage — speed. SoftPC on an accelerated SE can give you performance a little better than that of a standard PC, but the Mac boards are almost twice as fast. If speed is important to you, or if your applications are numerically intensive, as very large databases are, a DOS board might be a better alternative.

But SoftPC has several advantages over installing a PC board in your Mac. First, SoftPC is easier to use and install than hardware, requiring a minimum of training for non-Mac users. Second, the ability to use any Mac disk or a slave PC is very useful. The AST card cannot use the DaisyFile floppy-disk drive, which is superior to Apple's DOS drive. SoftPC's access to drives is more elegant and flexible than either of the boards.'

A big advantage of SoftPC is its $595 price tag. The PerfectEK SE board costs $1,195, and the AST board costs $1,599 and requires you to own an Apple PC 5.25 Drive. But remember, SoftPC requires a 68020 or 68030 processor and 2 to 4 megabytes of RAM. Your savings over a hardware solution will drastically diminish if you have to buy RAM — but then, extra memory will also help you with your Mac applications.

If speed is your primary concern, MacUser Labs suggests you go with a hardware solution. If not, SoftPC's drive and user interface make it the most elegant, flexible solution for putting DOS on your Mac.
D Basic Bibliography

With bibliographic database programs like Pro-Cite and EndNote, you can organize all your reference material in short order. And it's actually a painless process.

Disorganization is a trait inherent in most writers. Sure. Try convincing yourself of this while sifting through piles of papers and various scraps looking for material to use in an article. Quite a painstaking process, no? If you own a Mac, you can make situations like this a little easier with one of the sophisticated bibliographic database programs now available.

What's the difference between bibliographic databases and the more general-purpose packages on the market? Different types of reference material require different categories of data fields not found in the general-purpose packages. For example, a reference library could include journal articles, book chapters, and speakers' notes. Each of these reference types has different field requirements (e.g., volume numbers are needed for journals but not for books, while locations are needed for speeches but not for journals).

Moreover, the stylistic requirements for a formatted bibliography will differ dramatically depending on where you intend to publish it. For instance, some journals require that the year of publication appear in parentheses after the author's name, while others require the year at the end of the reference without parentheses. Trying...
to accommodate this variability with an ordinary database is a sure road to frustration and disappointment. Hence the need for bibliographic database programs such as Pro-Cite (from Personal Bibliographic Software) and EndNote (from Niles and Associates), two of the best packages on the market.

WHAT’S THE USE?
Other than writers, who else has a use for these programs? Doctors, lawyers, and professors are constantly having to put together information from their own libraries. A comprehensive listing of the articles in their journals, subject matter in their books, and topics discussed in lectures is a great time saver for these profession-

als. Even students, particularly those at the graduate level, could use bibliographic databases to keep track of their research for dissertations and other research papers.

THE POWER OF PRO-CITE
In its first life, Pro-Cite actually was Professional Bibliographic System, or PBS (see review, February '87). Compared with PBS, Pro-Cite has (among other enhancements) much-improved flexibility for formatting output as well as more sophisticated search and sort procedures. The result is a powerful program that represents the latest in bibliographic database management.

As with other database programs, you enter records individually, viewing one screen at a time (see Figure 1a). The click of a button allows you to edit a record, select a record, or move to another record. The column of abbreviations along the left side of the display represents field names. Pro-Cite has 45 available fields, offering a range that includes authors, titles, dates, index terms, and abstracts, each variable in length. These fields are relational, too — you can pull in authors’ names and journal records from other authority lists. This not only saves you time in re-entering data, but also it reduces the chances of error.

Various subsets of the fields combine to create different reference types — Pro-Cite calls them workforms. Pro-Cite allows you to select from among 22 predesigned workforms, which can be as esoteric as music scores, motion pictures, and maps (see Figure 1b). Of course, each record in a data file may be assigned individually to any of the available workforms. This simplifies combining such different workforms as journal articles and musical scores into the same database. And if your needs are more specialized, you can even design your own custom workforms.

Another problem you’ll face in creating a bibliography is having to adhere to a particular style. Pro-Cite accommodates different bibliographic styles through its use of punctuation files. These are mini-programs (using Pro-Cite’s own built-in language) that
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How you to specify the style, punctuation, and ordering of output fields down to such details as whether authors' last names come first or last, and whether initials or full first names are to be used. Each workform has its own punctuation file, and these files are grouped together in sets according to how they relate to a particular publication's style. Pro-Cite comes with a collection of already created sets of punctuation files for common styles, such as that of the Modern Language Association (MLA) and the American Psychological Association (APA). You simply select the style you wish to use, and all output will be formatted to existing punctuation files or even create your own, though (thankfully) this will not be necessary for most users (see Figure 2).

**THE EXTRA CLUNKY VARIETY**

Despite its power (or perhaps because of it), Pro-Cite often appears unnecessarily complex, nonintuitive, and just plain difficult to use. For example, Pro-Cite has the useful option of allowing journal titles to be listed in full or abbreviated. But to take advantage of this option requires understanding an awkward procedure that involves authority lists, surrounding titles with special brackets, and selecting an obscure button in the Configure dialog box. Similarly, to sort the records in a database, you can't begin with the seemingly obvious step of selecting the Sort command from the Database menu. Instead, you must first access the Select Field Options dialog box to set the parameters of the sort, then...
choose from descending and ascending sort order in the Formatting Options dialog box. Then (finally) you are ready to select Sort.

Another problem is that Pro-Cite is anything but a speed demon when it comes to preparing bibliographies. If your reference list is a long one, consider a coffee break while you’re waiting.

Although Pro-Cite’s documentation is thorough, its style is unnecessarily ponderous (one should wonder, with 200 pages to the basic manual and 40 pages of appendices), and screen shots are sparse. This only adds to the general impression that the program is difficult to use; on-screen help is also limited. One other shortcoming of Pro-Cite is that it doesn’t work as closely with word processors as EndNote.

Figure 3: Pro-Cite uses this dialog box to set up search expression for selecting specified records. The records selected as the result of any search can be saved as a set.

Figure 4: Here’s an example of a formatted bibliographic output file created by Pro-Cite. Various formatting options were determined by Pro-Cite’s formatting commands and punctuation files, as well as by direct editing of the output file itself.

Figure 5: EndNote can work as a DA — you can use it in combination with many word processors, including MacWrite. The citations shown in square brackets within the MacWrite document were pasted there from EndNote. EndNote can now scan these citation format them, and create the matching bibliography at the end of the document.
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EndNote's approach to bibliographic database management is substantially different from Pro-Cite's. EndNote's primary function is to place in-text citations within a manuscript and create bibliographies derived from these citations. At this task, it far exceeds Pro-Cite.

EndNote is designed to work in conjunction with a word processor. As such, it works best when running under MultiFinder, with your word processor and EndNote open simultaneously.

If you do not have enough RAM to do this, a desk accessory version of EndNote is included that has most of the features of the full application. EndNote is compatible with MacWrite, Word, WriteNow, and interchange formats (as well as, of course, text-only files).

Whenever you wish to cite a reference in your word-processing document, you open the appropriate EndNote library (using either the DA or the application), select the appropriate reference, and paste it in to your document.

Initially, what will appear in your document is a special version of the pasted citation that is recognizable by EndNote (see Figure 5). When you are finished pasting in all your citations, you can then transfer to the EndNote application, open the same document you were just using, select the desired bibliographic style from the Style menu, and then select Format from the Paper menu (see Figure 6). When you return to your original document, you will find two significant changes: All in-text citations have been changed to reflect the format of...
the chosen style, and a complete
formatted bibliography now appears at
the end of your manuscript.
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every citation is referenced in the bibli-
ography or whether every reference
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ic chores of your writing task are fin-
ished. References can be added, de-
leted, or edited from the DA version as
well as from the application, minimiz-
ing the need for frequent trips between
the EndNote application and your
word processor.
HOW THE NOTES STACK UP
EndNote and Pro-Cite share the
ability to deal with different reference
types (workforms) and bibliographic
styles (punctuation files). EndNote
comes with more than a dozen prede-
fined reference types. In addition, you
can design new ones with the help of a
spreadsheet-like dialog box, which
adds a new column for each of the ap-
propriate fields. All fields can be given
new names if desired (see Figure 7).
Similarly, EndNote can handle var-
ious bibliographic styles. Rather than
using the programming language ap-
proach of Pro-Cite, you simply type in
a formatted “dummy” version for each
reference type. The dummy version
then serves as the template for format-
ting that particular reference type.
Unlike Pro-Cite, EndNote also al-
lows you to format the appearance of
in-text citations, since these, too, may
vary depending upon the particular de-
mands of a given publication. End-
Note provides a relatively full range of
style options, including different fonts,
and it gives you control over the order-
ing and formatting of authors’ names.

Figure 7: Through this
EndNote dialog box, you
can create a new
reference type or edit an
existing one. A subset of
the fields listed on the
left (in boldface) is
selected to form each
particular reference type.

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It even allows for superscripting and subscripting (which Pro-Cite does not).

Finally, EndNote is a paragon of simplicity. Its manual is clear, well-written, relatively complete, and contained within 130 pages (a few minor features, apparently added at the last minute, are not mentioned in the manual). Having perused through Pro-Cite's documentation, I was impressed with EndNote's straightforward technique for handling the complexities of varying reference types and bibliographic styles. Like all good Macintosh software, it impresses you not only with what it can do but with how easily it can do it.

**DECISIONS, DECISIONS**

Pro-Cite and EndNote share many features. Both can produce bibliographies formatted according to any number of stylistic requirements. Users of either program can easily create differently styled bibliographies from a single reference list. So, assuming you are in the market to buy one of these programs, which should it be: Pro-Cite or EndNote? This depends upon your needs.

If your needs are primarily to maintain a bibliographic reference library, then Pro-Cite is the better choice. EndNote has some serious limitations in this area. You cannot print out a formatted bibliography from within EndNote—it only produces bibliographies from citations appearing in a word-processing document. For example, if you simply wanted to select all 1987 references from your library and print them out, EndNote could not easily do it. EndNote also has much more limited search capabilities than Pro-Cite. For example, it does not have full Boolean search capabilities (e.g., it uses Boolean OR but not AND), it cannot search on selected fields (except for author and year), and it will not search for an exact match. Also, EndNote does not easily allow you to scan individual records in their full editable form.

Pro-Cite has all of these features and more, including superior sorting capabilities, the ability to create bibliographic indexes, and complete Boolean search functions on any field or combination of fields. It can also save "results sets" from searches for future retrieval. Pro-Cite's authority lists and its ability to preview and directly edit a bibliography are two more of its many conveniences. Basically, Pro-Cite has more muscle than EndNote in most areas of database management.

If you imagine using your database primarily to create bibliographies within manuscripts, however, then EndNote is the clear winner. Pro-Cite can only work with in-text citations from text-only files, while EndNote handles the files of three major word processors in addition to text-only files. EndNote also allows you to paste citations directly into a word-processing document. It then creates and formats both the in-text citations and the matching bibliography according to any designated bibliographic style. With Pro-Cite, you must type in the original citations yourself, and even then Pro-Cite can only format them to sequential numbers.

If, after all these considerations, you are still undecided as to which program is better suited to your needs, I would go with EndNote. It is a more elegantly designed program, simpler to use, and less expensive. But whichever one you choose, you will soon be wondering how you ever managed your bibliographic tasks without it.

**Bibliographies on a Budget**

Ted Landau is a professor of psychology at Oakland University in Rochester, Mich. When not teaching or doing research, he is either using his Macintosh or writing about it.

If your needs or your budget are especially modest, two desirable alternatives may be Publish or Perish (from Park Row Software) or Bookends Mac (from Sensible Software). Publish or Perish is simple, straightforward, easy to use, and costs only $29.95 (see Figure A). The entire documentation is less than a dozen pages (and is mostly duplicated by on-screen help). The program itself is only 65K in size and runs on any Macintosh. It allows for keyword indexing and provides an optional Notes window for the entry of more lengthy text (such as an abstract). On the plus side, it can format output based on different bibliographic styles. However, only two predefined styles are available (MLA and APA), although you can design your own custom formats. Unfortunately, with only the single generic template available, Publish or Perish has no ability to handle different reference types. Its searching and sorting functions are similarly limited, and printed output is restricted to a single font and style. Also, you can only save your work as a text-only file (which cannot be previewed from within Publish or Perish). This means that final touch-up will require extensive use of a word processor. Still, this program is adequate for simple cataloging, where formatted output is not important.

If your database management needs exceed the capabilities of Publish or Perish, you might want to consider the middle-level option of Bookends Mac ($99.95), an application designed in HyperCard (see Figure B). Notably, it can handle different bibliographic styles (e.g., APA versus MLA) to some extent. If formatted output is not important, this program may be adequate for your needs.

Figure A: With Publish or Perish, what you see is what you get. The program has no ability to vary reference types, though it can handle different bibliographic styles (e.g., APA versus MLA) to some extent. If formatted output is not important, this program may be adequate for your needs.
Pro-Cite  
Follows Mac Interface  
Printed Documentation  
On-Screen Help  
Performance  
Support  
Consumer Value  

EndNote  
Follows Mac Interface  
Printed Documentation  
On-Screen Help  
Performance  
Support  
Consumer Value  

Comments: Complete database management for bibliographies. Best Feature: Almost unlimited flexibility in the formatting of bibliographies. Full-featured search and sort capabilities. Worst Feature: Overly complicated and nonintuitive way to set up different bibliographic styles. Its search and sort functions are superior to those of EndNote. It has some unique conveniences such as a glossary for journal names and a routine that automatically detects and deletes any duplicate references that may have crept into a reference list.

On the down side (and I'm looking at a beta copy — the program hadn't been released at press time), Bookends Mac has no ability to format in different font types, sizes, or styles. As in Publish or Perish, this means that you may spend much time with a word processor, adding underlines to titles and so on. Also, Bookends Mac cannot do any form of in-text citations. In a problem related to the HyperCard connection, each separate data file must start as a duplicate of the master stack — a reference list starts at 230K even before the first name is added. Also, its printing capabilities are limited by HyperCard's less than stellar features in this area.

For more information, contact:
Publish or Perish 2.2, Park Row Software, 1135-C Garnet Ave., San Diego, CA 92109; (619) 581-6778. Minimum hardware requirements: Macintosh 512K. Not copy protected.
Bookends Mac, Sensible Software, 335 E. Big Beaver Road, Suite 207, Troy, MI 48083; (313) 526-1950.

Figure B: The Bookends Mac Classification box indicates that this is a journal reference type (1). A separate routine, called Format Manager, is used to set up different bibliographic styles. The MLA style is to be included with the program.
Something Less Than Perfect

WordPerfect may be the perfect connectivity solution, but it's a good deal less than that for the average Mac user.
In Oliver Sacks' recent book, one of Dr. Sacks' patients literally mistakes his wife for a hat — an event that most of us would consider as unlikely as mistaking a DOS application for a Mac program. But then along comes WordPerfect, and suddenly that identity confusion doesn't seem so implausible.

WordPerfect for the Macintosh is WordPerfect Corporation's first Mac product, but in the DOS/IBM PC world, WordPerfect — now version 5.0 — is the best-selling word processor. It overtook and dethroned WordStar in the mid-1980s, when MicroPro left its aging superstar withering on the vine while promoting WordStar 2000. WordPerfect gained further popularity on the strength of its superb support staff and distinctive user interface with its dynamic on-screen page breaks, what-you-see-is-what-will-print display, and a system of function-key command combinations that cleaned the screen of menus.

WordPerfect was also one of the first companies to recognize the increasing importance of connectivity and compatibility as selling points in the Fortune 1,000 world. The program comes in a multitude of versions that run on everything from the DEC Rainbow to the Amiga, and it offers built-in conversion routines for files created with other popular business word pro-

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cessors. The program’s interface is itself an important part of its connectedness. It retains its own, consistent look and feel on each system to which it migrates.

That is not the only rub with WordPerfect for the Macintosh. The fact that it retains its own look and feel accurately predicts where WordPerfect is aimed as it enters the Mac software market — at any business user in a mixed Mac and IBM PC environment where WordPerfect is already the PC word processor of choice. If your main criterion in determining the suitability of a Mac word processor is that it share a common file structure and interface with PC WordPerfect, then WordPerfect for the Macintosh is probably a good choice. If, however, you simply are selecting a word processor as the most effective software tool you can find for writing on a Mac, then WordPerfect quickly fades from the front-runner position.

THE FAMOUS INTERFACE

Software packages can become prisoners of their own history. In 1983 and 1984 WordPerfect offered a clear and interesting alternative to WordStar, MultiMate, and Microsoft Word on PCs. I have used all these programs at various times on my PC and still prefer WordPerfect. On the Mac, however, it simply looks out of place.

Its hierarchical menu system is a good place to start arguing this point. On the PC, you enter a function-key combination, such as Shift-F8, and WordPerfect presents you with a menu of numbered choices. Your selection from that menu leads to another menu, and so on, until you reach the point where you have specified exactly what you want the program to do.

With WordPerfect for the Macintosh, that concept has been translated into pop-out hierarchical menus that are not as elegant a solution as the command-driven hierarchical menus were on the PC. To set double-spacing, for example, you pull down the Format menu, highlight Line, and, if the system is to work to its maximum effectiveness, slide the mouse over to select Spacing from a submenu that pops out to the right. But if, as it often seems to happen, you don’t slide and click in just the right way, the main pull-down menu retracts, and you’re back at square one. In theory, it’s a cute idea. In practice, you need the fine motor coordination of Minnesota Fats to move the mouse quickly and still keep it right on track.

A frequently used feature like line spacing should be much more easily accessible than that. As it is, after you get through the two menus, you still have to click twice on an arrow in a dialog box to get things set. That’s just too much work. As partial compensation, WordPerfect for the Macintosh, like WordPerfect in all its other incarnations, includes a very sophisticated macro-making system.

MACROS GALORE

Anything WordPerfect can do, you can do better with its user-definable keyboard equivalents or its macro maker. The program starts out with 100 Command-key combinations and 60 function-key combinations (for extended keyboards), but if that doesn’t satisfy you, you can pull down the Apple menu and open WP Help or press Command-? for help. Any function listed as a topic can be attached to a keyboard command that you define as Enter-letter or Enter-Enter-letter. (See “Perfect Secrets,” November ’88, for tips on using this feature.)

If you want to automate a multistep procedure rather than a single command, WordPerfect offers a very good built-in macro facility. Once macros are defined, you can set them in motion by selecting their names from a list or by pressing a user-assigned Command-Option-letter combination. This feature was also covered in detail in “Perfect Secrets,” November ’88. As the author, Daniel Rosenbaum, pointed out, the macro facility would be an even more productive tool if there were a macro editor. Without an editor, you must completely recreate any macro that doesn’t work correctly, or start over if you make a mistake while setting up a macro.
Macros can be made to repeat so that, for example, you can create a macro that automatically indexes all occurrences of a certain word — something that can't be done by any of the Mac word processors without macros that I've seen. You can also create a macro delay to display screen text and prompts during the execution of a macro.

WordPerfect has a pause feature that works while you are creating or executing a macro. Finally, macros can be nested and chained to automate entire document preparation procedures.

It is probably safe to say that a master WordPerfect user can customize this program to bypass much of what is not right with it to start. But not everyone wants to train for a ninth-degree black belt in word processing just to get along on a day-to-day basis, so it is fair to examine WordPerfect as it comes out of the box — especially since you can use third-party macro makers to build into any word processor many of the advantages WordPerfect's macro system offers.

REAR SCREEN ACTION

One aspect of its interface that helped WordPerfect compete successfully with WordStar was taking the codes WordStar put on-screen and hiding them "behind" the screen in a system of hidden codes. For example, when you made a word boldface with WordStar, you saw a 'B' before and after the word on-screen. WordPerfect secretly inserts a similar <BOLD> code before and after a boldface word, but you can't see it until you press Command-7 to split the screen and reveal, in the bottom half, all the formatting codes you have inserted for boldface, underlining, indenting, font changes, page numbering, and other features you want in your printed document.

In a visually oriented environment like the Mac's, this is really overkill. Who cares what is going on behind the scenes when the document looks the way you want it to on-screen? When WordStar used visible codes, the codes were needed because you were not working on a WYSIWYG display. But the more formatting changes take effect on-screen, the less useful the codes become, hidden or not. If WordPerfect for the Macintosh's codes were kept permanently hidden, they would be a curiosity and not an annoyance, but at times, you're forced to deal with them.

If, for example, you have indented an entire paragraph a half inch from the left margin of a document and then change your mind, it would be easiest to have a way to select the paragraph quickly and unindent it. With WordPerfect you must move back to the exact position of the code on the Show Codes screen and delete the code. Then you have to hide the codes again. Or, if you have inserted a page-numbering code to start numbering pages in a particular way beginning with the second page, you cannot simply bring up a dialog box and change the order if you decide on a different way to number. You must search out the page-numbering code and either delete it or make sure you are inserting the new code after the old one. Whichever code comes last affects everything following it in the document. That means that a formatting change — even a margin change on a ruler — does not automatically restrict itself to the paragraph for which you intend it. To keep it from affecting all paragraphs after that, you must turn it off or reset it at the end of the paragraph you want to change.

PERFECT CONNECTIONS

There are a number of reasons why WordPerfect created such a Mac hybrid. First, the codes are not entirely useless. If, for example, you've indented twenty paragraphs in a report and then you want to realign all those paragraphs, it is easy to use a search-and-replace operation to get rid of them all at once. Mostly, however, the codes represent WordPerfect's desire to stay well connected with its DOS users and to be able to exchange files back and forth between Macs and PCs, although it seems to me that WordPerfect could have accomplished that...
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without forcing Mac users to deal with the codes.

Even with Mac users using the codes, however, you would expect that if the Macifying of WordPerfect were going to be limited in an effort to keep it in the already-existing family of WordPerfeclts, then the trading of files would have been thoroughly checked before the product shipped. It may be asking a lot to expect a program to trade files perfectly with a competing program, but why not with its own blood relative? Unfortunately, when I tried to move a document I had written on a PC through a DaynaFile disk drive and over to the Mac, the footnotes did not all display appropriately.

So I fixed them and then sent the document back to PC WordPerfect. Page breaks were inserted after every footnote. I had to create a search-and-destroy macro to avoid tediously removing each page break manually. WordPerfect knows about the problem and is working on it, but that should have been caught in-house. According to the technical support person I called in October, WordPerfect still had not even tried the PC-to-Mac translation with footnotes yet! That's not the high-quality control I have seen from WordPerfect on the PC side of the product line.

Most but not all other formatting worked well in both directions. Once there was an extra space at the beginning of each paragraph. Again, a search and replace of all double hard returns followed by a space with double hard returns and no space cured the glitch, but it's a problem that shouldn't occur.

ALL'S WELL THAT SPELLS WELL
The WordPerfect spelling checker has always been the best in the PC world, and it's definitely in the running for most-valuable feature of WordPerfect for the Macintosh. To begin with, it starts right up. No waiting for the entire file to be processed before checking begins. And it flies through the document after that. When it finds a misspelled word, the program almost always provides, among the suggested corrections it draws from its 115,000-

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WordPerfect's spelling checker shows you the flagged word in context on the top half of the spelling screen, but it also lets you enter the document and make other changes you might see along the way without requiring you to exit the spelling checker. Just click where you want to make the change and move around within the document as if you never had left it. Then double-click on the flagged word to resume the spell check.

The thesaurus is also a winner. There are 10,000 headwords that you
can look up, linked to 100,000 synonyms and antonyms. The system allows three levels of cross-referencing to be displayed on the screen at once.

FIRST-CLASS MANAGEMENT

Another shining feature of WordPerfect is its comprehensive file-management system, which is accessed from the File Management dialog box. No other Mac word processor comes close in this category. You can copy a file, delete and rename files or folders, and create new folders — all without going outside the program. You can even have WordPerfect search through a disk or folder to find all the documents that contain a specific text string of up to 20 characters.

WordPerfect also allows you to peek into a file or another folder without opening it. If you are using the document search feature to locate a file and, even after seeing the list of files containing the keyword or key phrase, you still are not sure which document you want, you can use the Look File/Folder feature to examine all of them quickly. The two features used together give WordPerfect a unique built-in text database capability, lacking only AND, OR, and NOT qualifiers.

With the Print command from the File Management dialog box, you can open and print a file in the background while you are editing another, and the opened file will be closed automatically. Password protection for files is also available.

TO PUBLISH OR NOT TO PUBLISH

That is a very different question in the Macintosh environment than it is in the PC world. WordPerfect 5.0 for IBM-standard computers boasts of its ability to integrate text and graphics, display newspaper and parallel columns on-screen, and mix fonts without ruining your line formatting. That's just not big-time page layout stuff on the Mac. MacWrite mixed text and graphics in 1984. Flowing text around graphics is the hot topic in the Mac environment, but WordPerfect can't do it.

WordPerfect lets you have as many as 24 columns on a page. Both newspaper and magazine editors will find this feature a huge boon!
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per and parallel columns appear side by side on the editing screen. Unfortunately, you must balance the bottom of snaking columns manually if they don’t end up even. There is no automatic balancing feature.

IS 1.0.1 ≥ 1.0?
As far as I could tell, WordPerfect 1.0.1 clears up the program-crashing bugs that plagued the succession of reincarnations of version 1.0. It never crashed on me except when I tried to use it with System 6.0. Then it crashed infrequently but unpredictably. Some features performed erratically with System 6.0. At times various keyboard commands stopped functioning normally. At one point pressing Command-S selected superscripting rather than saving the file, and I had to exit and reenter the program to return to normal functioning.

Version 1.0.1 does not include built-in drawing features as once was expected. It does include enhanced freehand and proportional graphics scaling, the capability to turn off the WordPerfect interpretation of the function keys on the Extended keyboard if it conflicts with a macro or keyboard mapping utility you use, and an easier method for opening WordPerfect 4.2 files without having to change the type and creator of the files. When a word is selected by double-clicking, you can extend the selection a word at a time rather than a character at a time if you hold down the mouse button on the second click.

The new Copy Ruler selection in the Format menu will copy a collection of settings from the current ruler to the clipboard, after which they can be pasted into your document at other points. Ruler sections that can be copied include left and right margins, hyphenation zone, page number position, tabs, justification, and column definition.

WHO’S SATISFIED?
When I first started writing with WordPerfect for the Macintosh, I was pleased to see some of the features for which I had developed an affection on PC WordPerfect over the years. The auto-paginating, spell-checking, and

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file management systems did not disappoint me. The multiple headers and footers that can be suppressed on individual pages are a plus. The Auto-Save

**WordPerfect** for the Macintosh is a decent program that nonetheless borrows itself from PC WordPerfect and fails in the process to develop a viable Mac personality of its own.

option works reliably and with minimal interruption of your work. The unique Insert Literal feature provides you with a chart of the complete character set for the font currently in use and, as the name implies, you can insert any foreign or special character on the chart with just a click. The manual is clear and comprehensive. The toll-free telephone support service is competent, and available on Saturday mornings.

Perhaps I’m ungrateful, but there was much that still did not satisfy me. In addition to the drawbacks covered already, the outliner remains the same dull paragraph-numbering system that I have ignored in PC WordPerfect. The screen has this horrible habit of rippling while it refreshes itself after you enter any string of text and then stop typing. If you decide to use the on-screen snaking columns, you will find that you can out-type it at the right margins with one hand tied behind your back.

Beyond these specifics, the program appears to be aimed primarily at people in offices where WordPerfect has already captured the PC desktops and where visually oriented Macs are rap-

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WordPerfect for the Macintosh makes little attempt to capture any segment of the Mac writing audience on its own merits as a Macintosh program — as usual, close only counts in horseshoes.

WordPerfect lies uncomfortably on the border between compact writing tools like MindWrite and WriteNow and the "almost desktop publisher," document-preparation systems like Word 4.0 and FullWrite Professional.

Psychologists sometimes use the term "as if" personalities to describe patients who behave as if they had a distinctive character of their own, while in fact they borrow opinions and personal features from people with whom they identify. WordPerfect for the Macintosh is a decent program that nonetheless borrows itself from PC WordPerfect and fails in the process to develop a viable Mac personality of its own.

CHARLES SPEZZANO, PH.D., WRITES ABOUT PSYCHOLOGY AND PERSONAL COMPUTERS. HE IS THE AUTHOR OF TWO BOOKS AND NUMEROUS ARTICLES ON IBM AND MACINTOSH HARDWARE AND SOFTWARE.

MAC USER RATING
WordPerfect for the Macintosh ★★★½

Follows Mac Interface

Printed Documentation

On-Screen Help

Performance

Support

Consumer Value

Comments: Best-selling word processor in the IBM world minimally transformed for the Mac. Best Features: Internal file management system, spelling checker, and macro maker. Worst features: Hidden codes, complex hierarchical menu system, outline that only numbers paragraphs, and screen that ripples when refreshing after any amount of text is entered. List Price: $395. Published by WordPerfect, 1555 N. Technology Way, Orem UT 84057; (801) 227-4288. Version 1.0.1 reviewed requires Mac 512KE, 512K of memory and System 4.1 or later. Two 800K disk drives or a hard disk recommended. Not fully compatible with System 6.0. Not copy protected.

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Multilingual Mac

In this era of international glasnost, it's nice to know that the Mac has linguistic capabilities. But knowing other languages is only one hurdle on the track to developing systems and applications for international markets.

Ethnic is in. Even if you're not considered ethnic, you can participate in "ethnicity" by dining at the latest Cambodian or Ethiopian restaurant and learning a bit about the culture. The Mac is a participant in this latest trend of using foreign languages. Realizing the Mac's potential for selling in foreign markets, Apple has branched out to such countries as France, Belgium, and Japan, to name a few. Because of this move, software companies have had to be more concerned with understanding foreign languages and cultures.

Some companies like Symantec and Microsoft have already followed Apple into the foreign markets. They have embraced the notion that the Mac should be accessible to everyone.
regardless of the local language, and they have been working hard to accommodate these complex language needs. The relationship between Apple and these companies is symbiotic. To push more Macs into foreign markets, software must be readily available. Similarly, for these companies to sell any software, the Mac must be present in the market.

The most common packages available on the international market are word processors and page-layout programs. Word, MacWrite, PageMaker, Ready.Set.Go! and QuarkXpress are all available in international versions including French, Swedish, Norwegian, Danish, and Spanish. Aldus recently came out with a Kanji PageMaker, and by the time this issue hits the stands, Quark will enter its addition to the Kanji line of page-layout programs. And they are not the only players in the move toward Mac internationalization. Even you small developers (relative to the major companies) can put together a foreign package, but you have some issues to consider.

How would you accommodate non-Roman alphabets? Does Apple have some provisions for differently scripted alphabets? If so, how can you, as an independent developer, obtain them? If you’re a prospective developer or just interested in foreign software, you should know about things like localization, the Script Manager, Script Manager compatibility, and translation, to name a few. But there’s more. What is Apple doing to help developers with their foreign-language packages? If you do have a foreign-language software package, how will it be distributed abroad?

LINGUAS EN LAS MAQUINAS?
The Mac is certainly not the first computer to embrace foreign-interface systems. In point of fact, development of foreign-language software has a history dating back prior to the Mac’s beginnings. Since 1978, software developers have been concentrating on bringing Japanese packages to computers. Reasons for this include the push within U.S. companies to enter the Japanese market as well as the demand in Japan for software. The challenges presented by the alphabet also kept developers focused on Japan. And they still are — Apple is using Kanji as a test case for its non-Roman alphabet System software.

The first language-system software was developed by Xerox PARC for its personal computer workstation, Star.
Multilingual Mac

Text was seen as a universal concept, encompassing any language no matter what the alphabet or character width. Flexible encoding lets users work on Roman and non-Roman alphabet languages. In this system, each character in a particular language was represented as a sequence of bytes based on ASCII codes. From this base, binary code numbers were assigned to each of the world’s alphabets, creating shift alphabet signals. This concept of character representation was carried over to the Mac.

Since this method of handling different languages has existed for ten years, why is there such a fuss over the Mac’s facility with foreign languages? For one thing, thanks to foresight in the architecture of both Macintosh hardware and software, the task of adapting to other languages is much easier on the Mac than on other computers. Instead of having to tear up the actual code of individual programs, Macintosh programmers can take advantage of a modular, “blanket” system for creating foreign versions of software.

THE LOCALIZER

Localization is akin to reverse engineering — you have all the menus, dialog boxes, and windows in English, and you must customize them for a specific language, keeping in mind how the foreign user will understand the program. For example, if you’re shipping your product for use in France, all the aforementioned items, along with documentation and packaging, should be in modern French.

The Lingo of Learning

Among the few language-software programs available is Conjugate! Spanish, a verb-conjugation tutorial from Macadamia Software of Tennessee. This program is an effective tutor. A user clicks on the program icon and is given an exercise window. At the top is the infinitive of a given verb. Another window indicates the tense and person the drill wants. If you’re wrong, you get one chance to redeem yourself; otherwise, the program tells you the right answer. As you run through a list of verbs determined by the program, Conjugate! redrills you on the ones you missed.

Through the menu bar, you can choose the verb form (-ar, -er, and -ir) and tense. This is good if you need to work on a specific tense of verbs. If you want to test your vocabulary, you can choose to view the drills in Spanish. You can also select not to see the English translation of the verb.

Through Kinko’s Academic Courseware Exchange, you can get another language program called MacLang. The idea of this program is to let language teachers inexperienced in computers write “computer-assisted language learning” exercises on the Mac.

Though MacLang is geared toward teachers, any individual user interested in learning languages can use it too. You’ll write all your own lessons. It comes with two disks, one for the “Author” of the lessons and the other for the “Students.” You have your choice of writing lessons for French, Spanish, German, Italian, Portuguese, Rumanian, Russian, or Greek. Exercises are of three types: vocabulary, fill-in-the-blank, and paragraph. For vocabulary, the student will be tested on word-identity translation, synonyms, and matching words with a definition. The fill-in-the-blank and paragraph exercises test the student’s ability to understand a language well enough to guess words as a result of knowing the context.

For all exercises, the student can choose how many tries are allowed at each drill before the answer is given. When you end a session, the program lets you know how you’ve done by tabulating the attempts and showing the number of correct and incorrect answers. Teachers can also keep track of how individual students progress.

Probably the best way to learn a language is to practice it orally. Realizing the effectiveness of this method, Articulate Systems of Berkeley has produced Voice Navigator, a speech-recognition system that should be out by the time you read this.

Voice Navigator, working with a HyperCard stack, enables you to teach your Mac

Localization is not the same as translation. You can translate manuals and other such documents through interpreters, but interpreters aren’t necessarily programmers. To localize the application, you must maintain the Mac interface and the format of the program while incorporating the language.

Because localization is more technically involved, companies tend to keep this process close to their offices in the United States (or near their foreign subsidiaries, if they have any) while...
a list of foreign words, which it then uses to test your pronunciation and vocabulary. Drills come in three modes: learn, test, and practice. The user sees a Home Card with objects labeled in English.

For the purposes of testing Voice Navigator, Articulate Systems has chosen Japanese for its tutorials. In the test mode, different objects will be highlighted on the Home Card. At each object, the user will be expected to give the Japanese word. If your pronunciation or guess is wrong, a voice tells you and gives you another chance. If you don’t know the word, you can say it in English and the computer will give you the Japanese.

For more information on any of these language tutorials, contact the following:

Articulate Systems
2380 Ellsworth St.
Berkeley, CA 94704
(415) 549-1013

Kinko’s Academic
4141 State St.
Santa Barbara, CA 93110
(800) 235-6919, or in California.
(800) 292-6640

Macademia Software
2503 Essex Place
Nashville, TN 37212
(615) 383-2413

sending documentation abroad for translation.

To localize software, you must consider how the intended user will view the application. Everything from the Get Info box to any on-line help you offer in a package should appear in the language of the intended user.

For the ad hoc user, there are ways to get around localization problems. With software like Key Caps and various fonts, accents and other specialized foreign-language characters are readily available. But another problem arises when you want to create a document in a language such as Arabic, Russian, or Japanese. With only fonts and Key Caps available, creating a document in these languages is a cut-and-paste process. Localized software is a sophisticated solution to this problem.

A MANAGER FOR ALL SCRIPTS

To the layman, a script manager may be someone who works on the set of a movie. Actually, the Script Manager is a standard part of System software from Apple. It is the low-level code that extends the text-manipulation capabilities of the Mac beyond those needed for Roman scripts.

The Script Manager works within an application by calling on the Script Interface System. The Script Interface System provides the Script Manager with fonts for a particular language; keyboard-mapping tables; special routines for character input, conversion, sorting, and text manipulation; and a desk accessory for system maintenance and control.

The Roman Interface System is always present in the System file on the Mac. Other Systems can be purchased either directly from Apple or through the Apple Programmers and Developers Association (APDA). Currently available are KanjiTalk (version 2.0 was available at press time) for Japanese applications, the Arabic Interface System (2.0), the Hanzi (Chinese) Interface System (1.0), the Hebrew Interface System (2.0), and the Korean Interface System (1.0). These systems work just like the standard System software, but their menu bars, Apple menus, and dialog boxes appear in the alphabet of the specific language.

Though it’s useful for European languages, the Script Manager is a necessity when working with languages that have non-Roman alphabets. Working in concert with the Script Interface System, the Script Manager allows, for example, an Arabic-speaking user to input text that will advance, wrap, and read from right to left. All non-Roman alphabets present problems in kerning, justifying, and delimiting.

In Kanji, the characters are 2 bytes
Script Manager, the byte size of character that is different from the together in a word, they form a new text entry.

Arabic characters are modified almost others, are 1 byte wide. As long as wide - Roman characters, along with most others, are 1 byte wide. As long as an application is compatible with the Script Manager, the byte size of characters makes no difference in terms of text entry.

As with Kanji and Hanzi, individual Arabic characters are modified according to surrounding letters. For example, when you place two letters together in a word, they form a new character that is different from the individual letters that made it. Another problem associated with this characteristic involves word boundaries. To take care of such difficulties, the Script Manager will intercept TextEdit calls. It then calls the interface system routines to perform functions like selection and word wrapping for a given script. This is also important for languages like Arabic and Hebrew that read from right to left — the algorithms in the Script Manager tell the Mac to enter text in the given direction. However, the Script Manager does not yet acknowledge this form of text entry for Chinese and Japanese, which read vertically.

Overlooked features in this multilingual process include the way dates and times are displayed. For these, you need to use International Resources included in the International Utilities package. Because Script Manager allows for multiple formats, new international (INTL) script resources (ordinarily with ID numbers 0 and 1) are added. They are now identified as itl1, and so on. You can use these within a field for timeCycle or dateOrder to format time and dates for the specific country.

**IT'S COMPATIBILITY THAT COUNTS**

Whether you're creating your own application or using one of the commercial ones available, it should be compatible with Script Manager. Script Manager is helpful in terms of hyphenation and keyboard layout, even for European languages. This is not to say that the Script Manager has a hyphenation dictionary — it doesn't. Just as the Script Manager manipulates text to allow for word-wrapping in such alphabets as Arabic and Japanese, it manipulates text to allow for logical hyphenation in different languages, depending on the Script Interface System in use.

Not all commercial packages are compatible with the Script Manager, however. PageMaker's European versions, for instance, are not. Hyphenation is taken care of within their internal systems. The same is true of Word — Microsoft incorporates a hyphenation dictionary of its own. Other packages, like QuarkXPress, base their hyphenation on Apple's foreign System software.

And speaking of Apple's foreign System software, can the average user get a Script Interface System from Apple? Well, it would probably be easier to go to the actual country for a specific language System. Apple has determined for now that they will not sell Script Interface Systems commercially in the U.S. You can, in certain instances, get one on special order, but it will surely take a while to arrive.

Do you really need the foreign System to run, say, the Spanish version of Word? The answer depends on what you expect to accomplish with the package. If you need it just for making address labels, creating restaurant menus, or other small word-processing jobs, no. But if you're planning a job of the magnitude of staging a revolution in a country, say, and you need to write up the new constitution and other charters, or if you have other large word-processing projects, you'll probably want a language-specific version of the System software. You'll also want the keyboard specific to the language. Apple offers all its Macintosh models in popular foreign configurations. These come with custom keyboard layouts to handle a given language.

**MAC'S SCHIZOPHRENIA**

With all the Script Interface Systems available, the Mac can take on a number of personalities. Just as easily as toggling through desk accessories, the Mac can process text in Kanji, Hangul (Korean), or Arabic. Some developers have realized the potential of combining several systems on one machine.

MultiTalk, a multilingual operating system for the Mac, is one such byproduct of Apple's Script Interface Systems. Devised by a company called Write Approach, MultiTalk is based on and incorporates Apple's operating systems.

Using Interface Systems for Hanzi, Hangul, Kanji, and Arabic along with fonts supported through the Roman System for Cyrillic (Russian) and Greek among other alphabets, a user can take advantage of the Mac's capabilities, independent of language. MultiTalk can be customized to incorporate any language desired. Under one localized system, you can add any other language in which you want to work.

**APPLE'S HOUSE CLEANING**

Because foreign-language systems and script management are so closely tied to the internal workings of the Mac and the System software, Apple really holds the keys for developers of foreign packages. Until recently, developers big and small have had no clear path toward putting together their packages. Getting the most current versions of KanjiTalk, HanziTalk, and HangulTalk has been difficult. Why even APDA, Apple's designated distributor, has had this problem.

Thanks to a heated discussion regarding problems with availability of foreign System software at the Spring '88 Developers' Conference, Apple did some spring cleaning. Under its new
The Berne Convention

One of the factors affecting software developers is international copyright laws. Included in the international patent and trademark treaty is the Berne Convention, a "moral rights" clause meant to protect intellectual creations. Nations signing the Convention have a "moral obligation" to observe Berne's copyright laws with respect to works originating in other countries.

In terms of U.S. software, a company may send its package abroad for localization. The country in question cannot change the package in any way, save for localization. The software is still the property of the U.S. author, not the localizer.

While its trading partners have signed, the U.S. has not, citing minor incompatibilities with its own Copyright Act. For the time being, U.S. software products abroad are receiving the same treatment as European products, despite the United States' failure to sign the pact. There may come a time when European nations will tire of our receiving a free ride in this respect, and they may cease to honor the Convention for an unsignied country.

organization, Apple will offer business and technical information and help a developer to establish a chain of contacts in a given country through its Developers' Services department. The System software, packaged as Tool Kits, will be distributed through APDA.

GETTING THE PRODUCT OUT

Following Apple's lead into the international marketplace is a safe route to take — Apple can offer support. You're on your own if you choose to blaze new trails. And you should be aware of obstacles you may face.

Because Apple and so many developers are already established in Europe, distribution there isn't much of a problem. However, if you're a small company with no exclusive distribution channels and no foreign bases, you will encounter some barriers to entry just because you're an outsider. Aligning yourself with a major distributor is a great help in penetrating foreign markets. Even better, if your company has a lot of capital and personnel, you can set up your own foreign base.

Unlike Europe, Japan — with its strict import regulations — tends to make distribution of a software package a nightmarish task. Again, it would be wise to develop a contact through Apple or through one of the major software manufacturers already established in the country. Otherwise, a software package will bounce from distribution channel to distribution channel, losing money along the way.

A common scenario: You sell your package to one distributor at one price. The distributor turns around and sells it to another distributor at a higher price. This distributor sells it again at a higher price. By the time your package reaches the store, it has been through 10 or 15 channels. The price is exorbitant and your profits are gone.

With the right contacts, however, you can avoid several of these channels and perhaps see your product actually sell. If it does, you'll also actually see a reasonable profit.

IT WOULD BE NICE TO SEE

While its adventures abroad have brought the technology to more people, the Mac still has a long way to go. With the difficulties users face in obtaining foreign-software packages and System software, Apple is missing out on potential users within the U.S. In the Hispanic community alone, demand is high for Spanish versions of software.

Other potential users are in the university community, where many language packages would be excellent learning tools and stepping stones for specialized applications. Up to now, the Macintosh has offered us so much in terms of engineering, graphics, and text handling. The Macintosh can now teach us a little about language and a little about culture at the same time.

"Bienvenidos a Macintosh!"
Patchwork

Editors and librarians can be a synthesizer's best friends. They'll organize and enhance all your batches of patches.

Time was, the most likely place to find an editor or a librarian was with his or her nose stuck in a filing cabinet somewhere. But in this increasingly anthropomorphized, computerized world of ours, that's no longer the case. The wisecracking cynic and the shushing spinster have been transformed into a new class of music software: the editor/librarian.

Most synthesizers can store a bank of instrumental sounds. To create a new sound, you have to enter a few dozen parameters that shape the distinct musical timbre that characterizes a particular instrument or effect. This set of parameters is called a patch, so named because you used to have to do this with actual patch cords.

Most synths can hold a few dozen different patches in memory at the same time, but you can also download this bank of patches and store them on a cartridge that slips into the synth. RAM cartridges can be used like floppies, storing the banks of patches you created earlier or that you bought from your synth's manufacturer (or a third party). With a library of RAM cartridges, your synth can create a multitude of sounds.

It can also create a multitude of headaches. If you're programming your own patches, you'll have to enter all the parameters through your synth's particular arcane interface, and that may be only the beginning of your problems. If a song calls for more
Patchwork

After you click on Edit in Opcode's program, a window containing global D-50 patch data appears. Other sections of a patch can be called and edited using the pull-down View menu.

There are two ways to edit a time-based envelope in the Opcode system. Clicking on the small envelope graphic once replaces it with level and rate numbers, for numeric editing, while clicking on the graphic twice calls up a large window for graphic click-and-drag editing.

Passing patches between your synth and your Mac is the easy part. So easy, in fact, that pretty soon you'll have so many sounds stored up, you'll want to start tweaking them, while struggling to keep them organized at the same time. Fortunately, technology has a way of expanding to fill the gap, and that's exactly what editors and librarians do. Editors let you massage your patch data, altering it to suit your specific need. Librarians let you store your patches in a way that keeps them organized and available. Some librarians can handle lots of instruments; some can handle whole families of related instruments; and others, only one.

Editors and editor/librarian combinations are typically instrument-specific because of the different features different instruments offer, even within related families. The Roland D-50 is currently the world's best-selling synth — and one that's almost impossible to program from its own front panel, making it an ideal candidate for software control. The packages discussed here come from Opcode Systems, Dr. T's Music Software, Valhala Music, and Beaverton Digital Systems. They're designed to work with the D-50, but comparing and contrasting the way these programs handle their six basic tasks — storing, sending, auditioning, rearranging, editing, and creating patches — should help you in choosing the programs you'll want to use for your own synths, whatever they may be.

OPCODE BE-BOP

Opcode Systems is the first name in MIDI editor/librarians, offering more programs for more instruments than any other company. Because they lead the field in sales, their patch data format is becoming a de facto industry standard.

After you load Opcode's D-50 Editor/Librarian and select the appropriate port and frequency for your MIDI interface, a small piano-style keyboard marked MouseKeys, appears at the bottom of the desktop, along with a window for selecting which type of file to edit: D-50 patches, D-50 reverbs, or Bundles. There are separate files for D-50 patches and reverbs, because that's the way the instrument handles them (loading patches and reverbs together is done with the bundle file). The standard starting choice would be the default, D-50 patches. Click on OK, and you'll see another window with simple instructions on how to set up your synth's interface, a small piano-style keyboard marked MouseKeys, appears at the bottom of the desktop, along with a window for selecting which type of file to edit: D-50 patches, D-50 reverbs, or Bundles. There are separate files for D-50 patches and reverbs, because that's the way the instrument handles them (loading patches and reverbs together is done with the bundle file). The standard starting choice would be the default, D-50 patches. Click on OK, and you'll see another window with simple instructions on how to set up your synth's interface, a small piano-style keyboard marked MouseKeys, appears at the bottom of the desktop, along with a window for selecting which type of file to edit: D-50 patches, D-50 reverbs, or Bundles. There are separate files for D-50 patches and reverbs, because that's the way the instrument handles them (loading patches and reverbs together is done with the bundle file).

Once everything is set, clicking OK opens up a bank with 64 blank patches. These correspond to the 64 voices in a D-50's internal memory and are numbered, just as in the instrument, in octaves: 11-18, 21-28, 31-38, and so on up to 88. If you find this confusing, you can select View by Program Numbers in the Load/Send menu and see the patches listed as 1 through 64 instead.
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Patchwork

This is the Opcode MouseKeys window, used for playing the D-50 without getting up from your Mac. It has a ten-octave range, is velocity-sensitive within a specified range, and can send notes out over either single or multiple MIDI channels.

Here for program numbers starts at 0, not 1. (Unless you're Philip Glass, you're probably confused, but don't worry; it'll all make sense when you do.)

The Load/Send menu has the choices you need to start work: getting and sending banks and individual patches. The Get Patch Bank from D-50 command does exactly that, loading the 64 patches in the D-50 into the Mac and displaying them on-screen. The transfer takes about 25 seconds, the same time it takes to send a bank the other way. This is slower than some other programs. The D-50 must be in Play mode when uploading to your Mac. Otherwise, instead of the full bank, you'll get 64 identical copies of whatever voice is active at the time.

Clicking on a patch selects it for editing, name changes, cutting, copying, pasting, and other manipulations. With the exception of editing, all of these operate in keeping with the standard Mac interface, so renaming sounds and shuffling them into new orders or from one bank to another is simple. Opcode's manual says that up to eight bank windows can be open at one time, but in my tests, the program would hang with more than seven. Pressing Option before clicking lets you grab and drag a patch to any other location. Finally, if Send on Select in the Load/Send menu is on, clicking on a patch automatically sends it out to the D-50's edit buffer so you can listen to your edited patch.

Auditioning is done in any of several ways: playing the D-50's keyboard, using the commands in the Play menu; tapping the Mac's keyboard (Z is middle C); or playing the keyboard graphic in the MouseKeys window, which sends MIDI note data out to the synth. The Play menu commands let you record an original sequence or play any previously recorded sequence that has been stored to disk in the standard MIDI file format. The only length limit is available memory, and playback can be set to repeat until turned off. Other commands set playback to begin automatically whenever you select a new patch or edit a patch setting. In the case of the latter command, you can save your sanity by using it only when you're working with very short sequences.

The MouseKeys window is the most flexible way to explore new sounds and test patch edits without getting up from your Mac. It has ten octaves of velocity-sensitive keys which, as the name implies, are played with the mouse. Only 3/8 octaves are available at a time, but the octave shift arrows let you pick ranges. Clicking higher on a key produces a softer note; clicking lower produces a louder one, with the range from lowest to highest velocity adjustable through changes in the Key Velocity display at the top center of the window. Click on LazyKeys, and notes will trigger automatically as the mouse slides across the window. Repeat causes the most recently played note to retrigger at a selected rate until Repeat is shut off. Another useful feature is the capacity to send notes out on more than one channel at a time so that patches can be auditioned in combination with other instruments.

D-50 banks have 64 patches and so do Bank files. Opcode also offers another kind of file, called a Library, that is limited only by available memory. Libraries can hold thousands of patches, making them useful for organizing sounds by kind, such as saxophones, strings, or spacey stuff, or by project. Libraries are organized alphabetically, and patches can be cut, copied, and pasted between them and Banks at will. Opcode's Libraries also have settings that let you cut out patches that are duplicates in either name or data.

Now for editing. In the upper-right corner of both Bank and Library windows is an Edit button. Select a patch and then click on Edit, and you'll see a new Patch window and two new menus: Patch and View. In the window, which is jammed with a clutter of little boxes, numbers, and symbols, are most of the D-50's "global" parameters: that is, the settings that affect the instrument as a whole. The Patch and View menus contain the commands that let you select which patch, or portion of a patch, you want to edit.

Each D-50 sound has more than 400 possible settings, a number big enough to hamper even computer-based editing. Without turning this overview into a D-50 tutorial, suffice it to say that there are seven basic structures within each patch — the Upper and Lower settings for Partials 1 and 2, the Upper and Lower Common settings, and the global Patch settings. A good D-50 Editor must provide access to these structures in a useful way.

Opcode subdivides patches differently, into Upper and Lower Tones, each consisting of two Partials and their associated Common settings. These are combined into two windows, one marked WG/Com (for Wave Generators and Common data) and one marked TVF/TVA (for Time Variant Filter and Time Variant Amplifier). This means that you can ask for Upper Tone in the View menu and see Upper Partial 1, Upper Partial 2, and Upper Common all together in these two windows; or you can ask for Wave Generators and just see the WG/Com windows for both the Upper and Lower Tones. Since all these settings are interactive, and since there are times when you'll want to come at
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Germany: miro, Gifhorner Str. 28, 3300 Braunschweig, Phone: 49-531-30091-0, Fax 49-531-30091-99, Apple Link GER.XSE0012

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them from a nonstandard angle, this is good. But because they're all on the screen at once, overlapping other windows that can't be put away without canceling the editing session, the resulting visual clutter is initially as daunting as that of the D-50 itself. Opcode's strong point is not clarity of graphics. In addition, choosing to organize the settings differently from Roland means that cross-referencing to a D-50 manual or third-party instruction book will be more difficult.

Actual editing is easy enough, though, once you find the function you want to edit. Numerical values can be changed by clicking on them and then either by entering new numbers from the Mac's keyboard or by positioning the mouse so that the cursor turns into an up or down arrow and then clicking to increase or decrease the value. Time-based envelopes like the TVF and TVA settings can be edited as numbers (click once) or as graphic envelope displays (click twice). In these special Envelope windows, changes are made by clicking and dragging on boxes at the juncture points of the envelope segments. For settings with lots of nonnumeric choices — like picking which Partial to use among the many stored in the D-50's memory — Opcode has chosen to use pop-up windows. If you click on the PCM Partial name, for example, and hold down the mouse button, you can highlight the partial of your choice. Once you've got it, simply let go to complete the change. And, finally, you can edit by copying and pasting Tones, Partials, or Envelopes within patches.

Beyond editing lies patch creation. Most editor/librarians contain one or more ways to generate raw material in the form of randomized or shuffled patches. Under the Factory menu, Opcode provides four such tools. Constrained Random lets you pick upper and lower numeric setting limits in the form of any two patches from an active Library or Bank and then generates a specified number of random patches within those constraints. Shade Two creates patches that are a smooth blend from one selected patch to another. Shuffler scrambles all the parameters in your active bank or library but doesn't change their location within a patch; it just moves them around at random to the same place in a different patch from the one they started from. Library Sampler, the last tool, doesn't actually generate patches — instead, it pulls patches at random out of a Library, creating new source material for the other patch-generating tools or for experimental MIDI orchestrations.

**DOCTORING YOUR DATA**

Typically, musician/programmers write MIDI software, but the balance isn't always even. Opcode leans to the programmer side; the folks at Caged Artist, whose programs are distributed through Dr. T, lean the other way — in this case much to their program's benefit. Dr. T's Roland D-50 Editor/Librarian is a solid, useful program written with the same natural sense of humor and reasonably clear organization as the short, easy-to-read manual that accompanies it. The stated goal of the programmers was to make the user's left-brain activity optional, and they very nearly succeed. It doesn't have as many features as the Opcode package, especially in terms of randomizing patches, but it is faster to learn, easier on the eye, and lighter on the wallet.

The program handles up to four banks of D-50 sounds (each with 64 patches and 32 reverbs) at once and lets you shuffle sounds around using the standard Mac techniques. It loads and sends banks much faster than the Opcode program (10 seconds) and has clearer editing procedures, with separate, well laid-out screens for each of the seven sections of a patch. In addition, the program offers a choice between Envelope and Keyboard Bias graphic displays for the TVF and TVA settings, simple ways to swap common data and change Partial tones (the two quickest and easiest ways to create usable new patches out of old ones), and the best approach to auditioning sounds I've found so far: Mouse Play.

At any time while you're editing, all you have to do is hold down the Command key, and the entire Mac screen becomes a playing field, with left/right cursor positioning controlling pitch and up/down positioning adjusting volume. In addition, holding down the Option key causes your choice of the D-50's controllers (such as modulation) to be played as well. This can create musically effective riffs that simply couldn't be played from the D-50's own keyboard. This is one of its strongest points. Its weakest is its randomizing, which works only on one section of one patch at a time, randomizing selected settings within percentages set in the program's randomization mask.

**PATCH OF THE VALKYRIES**

Valhala's D-50 Editor/Librarian offers four file types: D-50 Patch Banks, D-50 Reverb Banks, D-50 Libraries (similar to the Opcode approach), and Bulk Data files. Bulk Data files are used to load and send pure MIDI data, allowing the program to receive and send (though not edit) patches, sequences, and other instrument data. In theory, the program will open and edit D-50 patches in Opcode format as well as its own; but al-
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though I've verified that some people are using it that way, the copy I worked with wouldn't even recognize the presence of an Opcode D-50 file on a disk.

In general, this is a reasonably solid program. It offers more patch-generating functions than Dr. T (though fewer than Opcode), and clearer editing than Opcode (though not graphically as clear as Dr. T's). For auditioning, it offers sequence recording and playback plus a Keyboard window similar to Opcode's, with the addition of sending several types of controller data along with the triggered notes. The program's most innovative feature is called PatchSheet, which shows all patch settings in a list that can be scrolled through for editing. Since the cheapest way to buy D-50 patches is in printed form, PatchSheet provides a simple, if time-consuming, way to enter such printouts into your Mac.

My experience with Valhala's program made me think it could benefit from several small upgrades. It always opened disk files half-off the bottom of the Mac screen, even when there was nothing above, and if sequence playback was cut off before the end of the piece, it would occasionally leave notes stuck on. More importantly, for anyone trying to learn the program, its manual is inadequate, poorly organized (there isn't even a table of contents), and arrogant. The program and Valhala's customers deserve better.

**LEAVE IT TO BEAVERTON**

Be warned. The Beaverton D-50 Editor/Librarian is not a program that believes in the standard Mac interface. But also be eager: While this program is not at all Mac-intuitive and has documentation that ranges between occasionally useful and almost always confusing, it is also the most powerful of the four programs in terms of creating new and useful D-50 patches. If your purpose is to store and load the patches you buy or trade and to tweak them from time to time, this program is not for you. But if your purpose is to create astonishing D-50 sounds, take a good long look.

The Beaverton system is really two programs in one. The first, D-50 Bank Editor, is the program used for saving, loading, rearranging, and creating/randomizing new banks. The second, D-50 Editor/Librarian, is a screen emulation of Roland's PG-1000, the hardware programming unit for the D-50. Beaverton recommends that you jump between programs using Multi-Finder. It's a good idea, if you've got the memory, because shifting by other means takes 20 to 40 seconds.

These programs are wildly different from the competition, and this can be annoying. For example, to edit an individual sound you have to extract all 64 patches from a bank file, which creates 64 separate patch files on disk. Beaverton recommends putting related sounds into folders, thus turning the Finder's HFS into the equivalent of Opcode and Valhala's Library files. Editing individual sounds from the
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Patchwork

PG-1000 emulation is aesthetically satisfying (lots of screen sliders!) but also demands that you know the D-50 pretty thoroughly. Mucking about here and there won't teach you much about the instrument or how it makes sounds. The constant deviations from the standard Mac interface (like apparent pull-down menus on the PG-1000 screen that really aren't there and just beep when you try to use them) will drive a Mac loyalist crazy.

But I'm still impressed. Beaverton has come up with creative tools that are worth the headache. First, their approach to patch generation through randomization and masking of patch settings is the most extensive available. Second, their CrossTalk system not only lets you shuffle Partial, Common, and Patch data but also lets you filter the data through the randomization mask. Finally, Beaverton has what they call a Universal Algorithmic Slider that lets you tie together any of the hundreds of D-50 patch settings and adjust them all from one screen slider. Such adjustments can be absolute, reflecting the value of the slider position, or relative, taking the slider position and adding or subtracting it from the current value of the setting. Furthermore, the masks used in these three systems can be independently saved to disk for later use, letting you create an extensive toolbox of specific masks for specific tasks, such as brightening, lengthening, crossfading, or otherwise manipulating sounds. This is power beyond the scope of any other synth-editing program I'm aware of. But steel yourself for learning pains.

Patchwork IT ALL TOGETHER

The kind of librarian, editor, or editor/librarian combination you choose to buy depends on just how deeply you want to get into the workings of a given synthesizer. All four of the packages covered here offer value for the money, and all four have differences that will make them appeal to slightly different audiences. D-50 owners interested in librarian features and some mild sound tweaking will find the programs from Dr. T or Valhala most satisfying. Those who need more features will lean toward Opcode and learn to find their way around a mildly complicated (but well-documented) interface. Hard-core sound creators will settle for nothing less than the power in the Beaverton package and will probably love it as much for its variations from the Mac standard as in spite of them.

And for those who own a MIDI synth other than a D-50, you should still be able to find a package that fits your needs, although your choices in variety and features may be more limited. So introduce your synth to an editor or librarian — in no time at all, they'll be making beautiful music together.

MacUser Rating

Opcode D-50 Editor/Librarian

Follows Mac Interface 
Printed Documentation 
On-Screen Help 
Performance 
Support 
Consumer Value 

MacUser Rating

Dr. T's D-50 Editor/Librarian

Follows Mac Interface 
Printed Documentation 
On-Screen Help 
Performance 
Support 
Consumer Value 
Comments: Solid, reliable, and almost entirely intuitive. Doesn't have as many features as others, but better at those that it does have. Comes with one bank of factory patches. Best Features: Clear organization and great sound auditing. Worst Feature: Little in the way of patch generation. List Price: $175. Published by Dr. T's Music Software, 220 Bayston Street, Suite 306, Chestnut Hill, MA 02167; (617) 244-6954. Mac Plus required, hard disk recommended. Version 1.0 reviewed. Copy-protected; registered owners can get one backup copy for $15.

MacUser Rating

Valhalla D-50 Editor/Librarian

Follows Mac Interface 
Printed Documentation 
On-Screen Help 
Performance 
Support 
Consumer Value 
Comments: Program could use a revision to clean things up. Best Features: Clear organization and PatchSheet editing. Worst Feature: Documentation. List Price: $129 ($3.50 shipping and handling, available only by mail). Published by Valhalla Music, P.O. Box 20157-MU, Fernald, MI 48220; (313) 548-9360. Mac Plus required, hard disk recommended. Version 1.11 reviewed. Not copy-protected.

MacUser Rating

Beaverton D-50 Editor/Librarian

Follows Mac Interface 
Printed Documentation 
On-Screen Help 
Performance 
Support 
Consumer Value 
Comments: The most innovative and least intuitive package available. Also the most powerful tool for creating useful new D-50 sounds. Best Features: Savable randomization masks, CrossTalk system, Universal Algorithmic Slider. Worst Features: Poor documentation, lack of adherence to Mac interface, weak graphic envelope editing, separation of program into two components. List Price: $199. Published by Beaverton Digital Systems, P.O. Box 1626, Beaverton, OR 97075; (503) 641-6260. Mac Plus required, hard disk recommended. Version 1.01 reviewed. Copy-protected.
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Practicing What We Preach

You may be wondering, since we have a monthly section on DTP, whether MacUser itself has joined the ranks of the desktop published. Funny you should ask. Our goal is to produce the entire magazine from the desktop, and we are moving rapidly in that direction.

The production of a four-color magazine — whether traditional or desktop — is vastly more complicated than that of a newsletter. If you're not familiar with magazine DTP, take a look at the MacUser Labs report on databases in the December issue. "The Data Chase" was designed by Technical Art Director Michael Yapp and produced entirely on desktop except for the photographs, which were stripped into the negatives using traditional methods. The text was written in Microsoft Word 3.02 and placed in PageMaker 3.0 using predesigned style sheets. Color graphics were created in Adobe Illustrator 88 and imported to PageMaker; key lines were used to indicate the positions of photographs.

Once we were satisfied with the layout, text and graphics were separated into two files. The text elements were printed directly from PageMaker onto negative film using a Linotronic 300. The graphic elements were saved as PostScript files, their colors separated with Adobe Separator, and printed to film on the Linotronic. The printing plates were created from these films. Thus, the lab report went directly from computer desktop to film without any intermediate steps on paper (except for proofing).

As our DTP efforts progress, we'll share war stories and tips that may help your own efforts, starting with hints on doing page separations with Illustrator.

— Aileen Abernathy

In the Driver’s Seat

Both Cricket Software and Palomar Software have announced new printer driver technologies that will allow the Macintosh to use printers other than Apple's ImageWriters and PostScript devices. Both QuickDraw-based drivers will bring some of the benefits of PostScript — such as outline fonts and rotated text — to non-PostScript printers.

Cricket will "open" the technology on its Expression line of device drivers so that any Macintosh application can access it. To date, these drivers have worked exclusively with Cricket's graphics applications. Cricket is also developing drivers for thermal color printers from Calcomp and Seiko and for the Sharp JX-730 ink-jet printer.

Cricket first announced its Expression device drivers a year ago and currently markets drivers for the Hewlett-Packard PaintJet and Presentation Technologies' Montage Film Recorder. To put yourself in the driver's seat, contact Cricket Software at 40 Valley Stream Parkway, Malvern, PA 19355; (215) 251-9890.

Palomar Software and Mirus Corp., maker of the Mirus FilmPrinter, are jointly developing a competing set of printer drivers. Unlike Cricket, which markets its Expression drivers directly, Palomar's drivers will be shipped and supported by printer manufacturers who license the technology. The drivers will use URW's fonts and Nimbus scaling technology. At least four printer manufacturers have signed on to the new driver technology, with official announcements expected by January's Macworld Expo. For more information on the driver, contact Palomar Software at P.O. Box 120, Oceanside, CA 92054; (619) 721-7000.

— Henry Bortman

A Quick and Easy Read

When it comes to speed reading, the latest crop of Macintosh OCR products will make even an Evelyn Wood graduate jealous. The newest software and hardware is getting faster and more accurate in translating the printed page into electronic form. Three new releases stand out from the crowd.

Leading the pack is TextPert, which claims a 99.5-percent accuracy rate for both typeset and typewritten text. TextPert is learning-based, so you must spend some time teaching it the typefaces you want it to recognize. This means the program can be used with virtually any font — or even other character sets, such as Kanji (Japa-
Send us the best design using CG TYPE and FontLiner. Win an Agfa Scanner.

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FontLiner, an exciting new program by Taylored Graphics, lets you convert CG TYPE characters into PostScript® artwork. Use that artwork instantly with either Adobe Illustrator™ or Aldus FreeHand™. Then let your typographic creativity loose with any project, from memos to logos. So show us your stuff. Enter the CG TYPE Excellence Contest. For details, call 800-MAC-TYPE.


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TextPert automatically recognizes and retains column formatting, making it an ideal tool for forms processing. TextPert requires only 1 megabyte of RAM and sells for $995. It's available from CTA, Inc., 866 Second Ave., New York, NY 10017; (212) 759-6201.

On the hardware side is DEST's WorkLess Station II stand-alone scanner. The OCR system is geared toward high-volume processing of both typewritten and typeset material. DEST claims OCR speeds of up to 1,200 words per minute. The WorkLess Station II with a Mac interface costs $10,985. It's available from DEST, 1201 Cadillac Court, Milpitas, CA 95035; (408) 946-7100.

Read-It!, the low-end program that made OCR available to everyone, has gone through a major upgrade. The program now uses topological recognition — as opposed to strict matrix matching — to make for faster operation and fewer errors. The new version also supports plug-in drivers, which means that many more available scanners can talk directly to Read-It!. Version 1.0 users receive a free upgrade, which includes a new manual. Read-It! 2.0 sells for $395 and is available from Olduvai Software, 7520 Red Road, South Miami, FL 33143; (305) 665-4665, (800) 822-0772.

Look for more releases of scanning software in the not-too-distant future. Xerox has bought both Datadcopy and Kurzweil and formed Xerox Imaging Systems. We will probably see a transfer of their OCR technology to the Macintosh.

— Ben Templin

Mark It Up

If you're a manager or editor who's wished for a simple way to have several people review and comment on a document, Mainstay has a suitably named solution: MarkUp. This multiuser program lets your entire staff (or your bosses) make additions and corrections, or just highlight their favorite sections — all without altering the original text. You can then incorporate just the changes you want into the original document.

Through a Chooser-selectable driver, MarkUp can create an image of any Mac file, including text, spreadsheets, or graphics. You decide who sees the master image, which is placed in a multiuser database that can be accessed via AppleShare or modem. MarkUp keeps a record of editing activity, allowing reviewers to "sign off" on documents. Editing tools include freestanding text, pop-up notes, highlighting, lines, arrows, ovals, rectangles, and a lasso. MarkUp supports color, so you can highlight in yellow or use an electronic red pencil if that's your preference. Each person's comments are saved in a separate "layer." The master reviewer can consult individual layers or compile them on top of the original image like a series of transparent overlays. Edited images can also be printed.
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MarkUp has a retail price of $495 for a two-user database package and $995 for five users. Additional users can be added for $195 each. For more details, talk to Mainstay at 5311-B Derry Ave., Agoura Hills, CA 91301; (818) 991-6540.

— Aileen Abernathy

**Share and Share Alike**

It's not strictly a publishing application, but the Odesta Document Management Systems (ODMS) could be good news for those hardy souls trying to manage professional publishing on desktop systems. ODMS lets users organize, track, and retrieve work across networks of Macintosh and VAX computers. To accomplish this feat, it treats text, graphics, and spreadsheets as records in a database.

ODMS/DocuShare lets users on a network associate documents by type, project, category, date, or other keyword, and retrieve them quickly from a dedicated document server. The server can reside on either a Mac or VAX, and both Macs and VT terminals can access the documents.

ODMS/Matrix takes this document-management process a step further. Through Matrix, managers and supervisors can track the progress of documents through the production process, from writing and editing to final layout. They can assign documents to employees and specify both the required tasks and deadlines.

When a user selects a task, the appropriate document is copied from the server, and its application is launched automatically. When the document is saved, the updated copy is returned to the server, and the person who assigned the task is flagged.

ODMS/DocuShare costs $895 for the Mac and from $4,500 to $19,500 for the VAX, depending on system size. ODMS/Matrix sells for $1,995 for a Mac server and from $15,000 to $110,000 for a VAX. For more information, contact Odesta Corp. at 4084 Commercial Ave., Northbrook, IL 60062; (800) 323-5423.

— Henry Bartman

**Scoop on Scoop**

When we reviewed Scoop a year ago (see "Inside Scoop," February '88), it was a fledgling page-layout program with a promising future. Then its distributor, Target Software, abruptly closed up shop. For months the program remained in limbo, unsupported and seemingly without a future. But take heart, Scoop fans. The program has been rescued from the software dustbin by its developer, Lance Lewis of Foton Corp.

Unfortunately, the name Scoop and the documentation belong to Target, so Lewis has renamed the program Malibu (ugh) and can provide upgrades only to current owners (who have manuals, natch). He's putting the finishing touches on version 1.1e, which is compatible with System 6.0x and has several new features, including automatic table creation, easier placement of linked columns, improvements to the user interface, and bug fixes (the program no longer bombs unexpectedly). New keyboard equivalents for font size, kerning, and text stretching enhance the program's typographic features, which have always been its strong point.

Although Malibu's future remains uncertain, Lewis is discussing distribution rights with several publishers. Current users can receive a free upgrade to Malibu 1.1e by sending Lewis their original Scoop program disk along with a self-addressed, stamped disk mailer. If that's too tough, just send a check for $25, and you'll receive the upgrade anyway. For more information about Malibu, née Scoop, contact Lewis at Foton Corp., 5699 Kanan Road, Suite 318, Agoura Hills, CA 91301.

— Aileen Abernathy
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Kern Those Pairs

Hiding in the wings at the fall Seybold DTP conference was a new product from Pairs Software of Toronto. Pairs offers relief for those of you who are consistently disappointed with the limited set of kerned pairs built into the screen fonts that accompany Adobe's PostScript fonts. The company is creating a comprehensive kerning database for the entire Adobe typeface library. Kerning data for more than 223 typefaces has been completed thus far; in some cases, Pairs has added more than 500 kerned pairs to a typeface.

Each Pairs set installs in place of the Adobe- or Apple-supplied screen fonts and results in much tighter, more professional-looking type. Pairs sets work automatically with all software that supports Apple's standard procedures for invoking automatic kerning.

Prices range from $25 to $130 per volume, or you can obtain the entire 55-volume set for $2,453. Contact Pairs at 160 Vanderhoof Ave., Suite 201, Toronto, Ontario, Canada M4G 4B8; (416) 421-9900.

— Henry Bortman

Land, Ho!

Mansfield Systems is charting a new course in desktop publishing with TechScriber, the first application to focus specifically on "technical" DTP. TechScriber has seven separate components, called lands, that handle word processing, page layout, and document organization, as well as the creation of diagrams, tables, and mathematical equations. Output can range from a page of notes to books containing thousands of pages, and TechScriber should be especially well suited for scientific articles, manuals and theses.

PublishLand is the only required component. The rest of the real estate — TextLand, LayoutLand, StructureLand, DiagramLand, TableLand, and MathLand — can be mixed and matched as needed. A writer or scientist, for example, may need only a few lands, while a publication's editor will probably want the entire empire.

TechScriber's most innovative feature is From Within Shuttle, which lets you use Word, MacDraw, Illustrator, Excel and other programs as if they were built-in. The finished text or graphic is saved as part of your TechScriber publication.

TechScriber should debut in the second quarter of '89 and will run on all Macs with 1 megabyte of RAM and a hard disk. With a total-package cost of $990, it could be a worthy competitor for the ultra-high-end Interleaf Publisher ($2,495). Lands also may be purchased individually for $95 or $195, depending on the acreage you want. For your land needs, contact Mansfield Systems at 550 Hamilton Ave., Suite 200, Palo Alto, CA 94301; (415) 326-0603.

— Laurie Ochsner

The Speed of Light

The Lightspeed Color Layout System has received a facelift; version 1.5 sports improved scanning capabilities and rotation and skewing of all elements. It imports PICT2 and TIFF files, and supports full PostScript output to Scitex and Hell prepress systems. Lightspeed was recently bought by Crosfield; needless to say, a Crosfield interface will appear any day now. Version 2.0 of the design and production system, expected to ship this quarter, will offer significant improvements in text handling.

Introduced a year ago, the $39,500 turnkey system includes a Mac II with 5 megabytes of RAM and a 40-megabyte hard disk, a 19-inch color monitor with graphics card, a 300-dpi color scanner, color thermal printer, Bitstream fonts, and Lightspeed's software. The system is primarily used by designers for creating layouts and producing full-color comprehen-
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Playing the Field

You might call them "free agents": programs that were introduced first for one computer team, the MS-DOS Commandos, and later moved to the Macintosh Iconoclasts — or vice versa.

In the footsteps of WordPerfect, PageMaker, and Excel comes Adobe Illustrator, which first joined the big leagues in early 1987 as a PostScript-based drawing program for professional artists. It was upgraded a year later to Illustrator 88. Now Adobe is cloning a new PC player, called Adobe Illustrator, Windows Version. The PC version includes some of Illustrator 88's strengths: freehand drawing, autotracing, and DXF file compatibility (for exchanging files with many CAD programs). It ships this month with a retail price of $695, $200 more than the Mac's Illustrator 88. It requires version 3.01 or later of Windows and can exchange files with Illustrator 88. For more information, get in touch with Adobe Systems Inc. at 1585 Charleston Road, Mountain View, CA 94039-7900; (415) 961-4400.

Other programs are following the opposite route, migrating from other operating systems to the Mac. Some products to watch for:

• Ventura Publisher, the leading page-layout program in the PC world, is reportedly coming to the Mac. Its reputation is based on speed and the ability to handle long documents. Xerox Corp. won't comment on the product's future, but observers say the Mac version should be announced any day now. Xerox Corp. is located at 9745 Business Park Ave., San Diego, CA 92131; (619) 695-7700.

• VideoShow is a combined hardware and software system from General Parameters that produces slide and video presentations. The Mac version has a March shipping date. Its pricing will be roughly comparable to the PC version's, which ranges from $2,995 to $8,995. You'll find General Parameters Corp. at 1250 Ninth St., Berkeley, CA 94710; (415) 524-3950.

• Publishing Partner Professional, a page-layout program from Soft-Logik Publishing, is now running on the Atari but is being ported to the Mac and Commodore Amiga. It features integrated graphics, word processing, and typographic controls. The Mac version will support color, including the ability to produce four-color separations. It's expected to ship by June for an undisclosed price. For more information, contact Soft-Logik Publishing Corp., 11131 F South Towne Square, St. Louis, MO; (314) 894-8608.

• CorrecText, from Houghton Mifflin, is being ported from DEC computers. CorrecText identifies incorrect grammatical constructions, suggests changes, and provides contextual grammar lessons. It's expected to be bundled with another product and released in the latter half of 1989. Houghton Mifflin Co. is located at 1 Beacon St., Boston, MA 02108; (617) 725-5000.

• A program coming to the Mac from Sun workstations is FrameMaker from Frame Technology. FrameMaker is a high-end document processor similar to Interleaf Publisher that's expected to be released in spring '89. Pricing is still undecided. You can reach Frame Technology Corp. at 2911 Zanker Road, San Jose, CA 95134; (408) 433-3311.

If enough of these free agents are developed, users may be able to put together an all-star team of applications that will work on the computer of their choice.

— Gil Davis
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A Touch of Gray

Tired of seeing the world in black and white? This primer on digital halftones will help you add a touch of gray to your publication.

You've just bought a nifty gray-scale scanner. You aren't quite sure what gray scale means, but the salesperson at the computer store said the scanner will let you produce high-quality photographs with your desktop-publishing system. Being a trusting soul, you plunked down $3,000 for a device that promises to spice up your magazine or newsletter with flashy graphics. You set up the hardware, scan in your favorite photograph, maybe enlarge or reduce it a little, and print it out on your laser printer. What emerges looks like something you'd watch out for in a cow pasture.

Desktop publishers everywhere are clam-
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oring for ways to incorporate quality photographs into their publications, just like those they see in mass-market magazines and newspapers. But until recently, photographs and DTP were like oil and water — they just didn’t mix. You could design a publication with high-tech software, but you had to leave empty boxes where the photos should go. After printing the final pages, you would bundle them with the photos and send everything to the print shop, where the photos would be converted to halftones and manually stripped into the boxes. The resulting quality was good, but the advantages of desktop publishing — having control over your publications and seeing on-screen just how they will look — were diminished.

The advent of gray-scale scanners gives us the ability to add quality photographs to our publications from the electronic desktop. But the real impact of gray scale is seen at the output end, in the pages that roll out of laser printers and high-resolution image-setters. A better understanding of the process by which gray-scale images are scanned, manipulated, and printed will help you improve image quality and impress your readers.

The Old-Fashioned Way

What do we mean by gray scale? Look at a black-and-white photograph, and you’ll notice little that is actually black or white. Most objects contain varying shades of gray that provide detail and contrast. In general, the more shades of gray an image has, the more realistic it looks. A photograph is called a continuous-tone image because it has an unbroken, nearly infinite range of gray levels between black and white.

A printing press has only one color of ink — black — so it can’t directly reproduce a continuous-tone image. To see what would happen if you tried, photocopy a black-and-white photo. All the gray tones will drop out, leaving blotchy silhouettes. This process, called posterization, may be fine for special effects, but it won’t provide realistic photographs for your publication.

This is why published photos must first be converted to halftones. A halftone is basically a photograph of a photograph, shot through a fine screen (see Figure 1). The screen breaks the image up into a grid of evenly spaced dots. Multiple gray levels are simulated by variations in the size of these halftone dots. If you look at a photographic

Figure 2: Digital and traditional halftones differ in how they produce multiple levels of gray. A traditional halftone achieves nearly continuous gray tones by varying the size of its component dots. A laser printer can only produce spots of one size, however, so a digital halftone is created by grouping these spots into cells. Each cell equals one traditional halftone dot. The more spots that are turned on (black) within a cell, the darker the gray. The number of grays that can be represented is limited by the number of spots within the cell. Each 4-x-4 halftone cell shown above can mimic up to 16 shades of gray.
halftone through a magnifying glass, you'll see that a dark area has many large dots, while light areas have much smaller dots. To the unaided eye, the dots blend into continuous shades of gray, looking much like the original photograph.

The sharpness of a halftone — its resolution — is determined by how closely spaced the dots are. If the screen through which the photograph was shot has 75 lines of dots per inch, the resulting halftone has a screen frequency of 75 lines per inch (lpi). Newspaper photos typically have 65- or 85-line screens, and the halftone dots are visible to the naked eye. Magazines use higher quality paper and shoot halftones with 133- or 150-line screens, providing realistic-looking photographs with no discernible dots.

Digitally Speaking

You may be thinking: Since most desktop scanners and laser printers have resolutions of 300 dots per inch (dpi), they should have no problem rendering halftones with 85- or 150-line screens. All you have to do is scan the image and print it out, right?

Wrong. A laser printer's dots are not the same as halftone dots. Laser printer dots — which we'll call spots (as Adobe does) to avoid confusion — have a fixed size. Since true halftones consist of varying dot sizes, laser printers must "cheat" to get the same kind of output. PostScript (the language your Mac uses to communicate with printers) creates digital halftones using a technique called dithering.

In digital halftones, two or more spots are grouped into a cluster called a halftone cell, which simulates a single dot of a photographic halftone. One cell of a digital halftone might consist of 16 spots in a 4-x-4 array (see Figure 2). Through dithering — turning various combinations of spots on (black) or off (white) — this cell could approximate 16 different shades of gray (plus white). If all spots are black, the halftone cell is black. If 12 spots are black, the cell appears dark gray. If four spots are black, it mimics light gray.

A total of 16 gray levels fall far short of continuous tone, however. Unfortunately, enlarging the halftone cell — say to 8 x 8, which gives 64 gray levels — creates another problem. The more gray levels you have, the poorer the resolution (see Figure 3). If you have a laser printer that produces 300 dots (or spots) per inch and you use a 4-x-4 array for each halftone cell, the effective resolution is cut to 75 cells per inch, equivalent to a 75-line halftone screen. (Divide 300 dpi by the 4 spots per line of a cell and you get 75 cells per inch.)

This approaches the resolution of a newspaper photograph, but 16 grays don't permit the fine shading needed for realistic reproduction. Many areas will have distinct bands instead of smooth transitions between gray levels. On the other hand, increasing the number of gray levels to 64, the minimum required for newspaper reproduction, cuts effective resolution to an unusable 37.5 cells per inch.

In short, there's a trade-off between gray levels and resolution, and you will always have to compromise in a 300-dpi environment.

High-Powered Printing

It might seem as if we've run into a technological barrier that prevents us from producing quality halftones via desktop publishing. Fortunately, we aren't limited to the 300-dpi output of the LaserWriter. Any program that uses PostScript — including PageMaker, Ready,Set,Go!, and Quark-XPress — can communicate with high-resolution imagesetters like the Linotronic 100 or 300.

Linotype has long been the sole provider of high-resolution PostScript imagesetters. However, Compugraphic, Varityper, and Monotype have now entered the market (see Between the Lines, January '88). In response, Linotype has replaced its 1,270-dpi Linotronic 100 with the 200P, which offers increased speed and resolution.

Linotronics can print text or graphics with resolutions up to 1,693 dpi (the 200P) or 2,540 dpi (the L300). At $29,000 to $65,000, they are well beyond the reach of most desktop publishers, but many service bureaus have Linotronics and will let you generate pages for reasonable fees (see "Setting Up Shop," October '88). With a 2,540-dpi Linotronic, you can designate a 16-x-16 halftone cell (256 gray levels) and still get the equivalent of a 150-line screen. Thus, you have the best of both worlds: magazine-quality resolution and the semblance of continuous gray tones.

Scanning Prospects

What about the input end of things? Early desktop scanners couldn't transmit grayscale information from scanned images. They used only 1 bit of digital data to de-
Resolution versus Gray Scale

An 8-x-8 cell has 64 spots and thus can show 64 gray levels.

On a 300-dpi laser printer, you can't have both high resolution and continuous gray tones. You can achieve 64 grays with these 8-x-8 cells, but only 37.5 of them will fit in an inch, which means the image loses fine details (300 ÷ 8 = 37.5).

A 6-x-6 cell can display 36 gray levels.

An inch can hold 50 smaller 6-x-6 cells (300 ÷ 6 = 50). This 50-line resolution, which displays 36 gray levels, may be a reasonable compromise in many situations.

A 4-x-4 cell can show only 16 gray levels.

Using 4-x-4 cells improves image resolution to 75 cells (or lines) per inch, but only 16 grays can be shown, resulting in banding and abrupt transitions (300 ÷ 4 = 75).

An 8-x-8 cell at 1,270 spots per inch.

No trade-offs are needed on an imagesetter like the Linotronic, which can print 1,270 spots per inch. You still have more than 64 grays with a 133-line screen, since up to 159 cells of the 8-x-8 variety will fit in a single inch. However, you may have to adjust contrast and lightness, since the Linotronic tends to darken images.

Figure 3.
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In general, the scanning rate for gray-scale images shouldn’t exceed your expected screen frequency. For example, if you plan to use a 150-line halftone screen, it’s pointless to scan the photo at 300 dpi, since the printer will just discard the extra information. There are a couple of exceptions: Scaled images and those with strong diagonal lines may appear sharper (have fewer “jaggles”) if you scan at up to twice the output rate.

Keep in mind that the printer can’t produce more gray levels than are contained in the original scanned image. That is, if you scan an image at 6 bits (64 gray levels), you can’t print it with 256 grays.

Photographs with fine detail but little variation in tone look best printed at a higher resolution and lower number of grays. A little experimenting will help you determine the best resolution/grey-scale trade-off for a particular image. A handy formula for calculating the trade-off is $1 + \frac{(A/8)^2}{B}$, where $A$ is the printer’s resolution in dots per inch and $B$ is the screen frequency. If you print a 75-dpi halftone on a 300-dpi LaserWriter, you can get $1 + \frac{(300/75)^2}{B}$, or 17 shades of gray (white plus 16 grays).

Even though a LaserWriter and Linotronic can print the same PostScript files, the output is not always identical. A 10-percent gray shade on a Linotronic looks much darker on a LaserWriter, while a darker shade, like 80-percent gray, looks darker on the imagesetter. If you plan to print an image with many dark areas on a Linotronic, you may want to use the lightness and contrast functions of your software to adjust the image accordingly. Remember, the engine in the LaserWriter II prints darker blacks than the engine in the LaserWriter Plus.

Some offset-printing processes, and photocopiers as well, produce images somewhat darker than the original. Check with your printer, and if it turns out that the images will print darker, you may want to lighten them as described above.

If the printed image has a distracting crosshatch pattern, or moiré, you probably screened an image that had already been screened (for example, scanning an image from a magazine rather than from an original photograph). If you are using a high-resolution printer like the Linotronic, try changing the screen angle in 1- or 2-point increments until the moiré is minimized. (Screen angle/frequency combinations are too limited on 300-dpi printers for this to work.)

Gray-scale scanners currently on the market can store gray-scale information about each pixel. Some record four bits of information per pixel, meaning the pixel can be one of 16 shades of gray. Scanners capable of storing 8 bits per pixel can render images with 256 gray levels. (To figure
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the number of gray shades, raise 2 to the
nth power, where n equals the number of
bits per pixel. Thus, a 6-bit-per-pixel scan-
er can render images with $2 \times 2 \times 2 \times 2\times 2$,
or 64, levels of gray.) In most cases,
these images will be stored in TIFF (tag
image file format). Be forewarned: These
are very large files.

The Right Angles

Once you’ve scanned a gray-scale image,
you may want to retouch it before popping
it into a page-layout program and printing.
Several programs — including PageMaker
3.0, QuarkXPress 2.0, Digital Darkroom,
ImageStudio, and MacImage — let you en-
hance the quality of halftones, even on a la-
er printer. For example, you can adjust the
image’s contrast and lightness (see Figure
5). Besides choosing the screen frequency,
you can select the screen’s angle and pat-
tern.

Screen angle refers to the orientation of
the halftone screen, measured from the ver-
tical. The most common screen angle is 45
degrees, which produces the best visual re-
results. Although you can specify any screen
angle and frequency you want, the printer
may not give it to you. Why? Because only
several frequencies and angles are math-
ematically possible. In fact, in a 300-dpi en-
vironment, there are only 21 frequency/an-
gle combinations possible in a frequency
range of 50 to 150 lpi (see Figure 6). Pick
any other combination, and PostScript will
simply convert it to the closest available set-
ing.

For example, although the Laser-
Writer’s stated defaults are 45 degrees and
60 lpi, this combination is not actually available. With a 45-degree angle, the true
default is 53 lpi.

Screen angle also affects cell size and,
consequently, the number of gray levels
that can be represented. A 5-x-5 cell, for
example, can display 25 grays in its square
(0-degree) form. Tilt it at a 45-degree an-
gle, however, and the cell grows to 32 spots
— more grays to play with. At 26 degrees,
the cell contains only 20 spots, with a corre-
sponding drop in gray levels.

Some programs let you select a screen
pattern, which determines the shape of the
halftone cells. The standard pattern is a cir-
cular dot shape, but interesting results can
be obtained with screens composed of lines,
squares, or ellipses. In each case, PostScript
creates the desired effect by altering the or-
der in which the spots are turned on within
the halftone cells.

Choose Your Partner

A few programs go beyond the basics,
providing extensive control over gray-scale
output. MacImage, the scanning software
that comes with Datacopy scanners, has con-
trast controls that let you enhance selec-
ted portions of an image and use gamma-correction to fine-tune dark areas.
MacImage also provides a wide range of
dither patterns for output. For example,
you can actually determine the pattern of
spots within a halftone cell, which is useful
for producing special effects. Of course, you
will rarely print directly from a program
like this or deal with dithering until you’re
ready to print.

Silicon Beach Software’s Digital Dark-
room and Letraset USA’s ImageStudio
were created specifically for gray-scale
editing. Both have sophisticated features
for manipulating gray-scale images. The
finished products can be immediately print-
ed as halftones or exported to page-layout
programs. Digital Darkroom offers Ad-
vanced Halftoning, a unique dithering fea-
ture that randomizes the spot pattern and
provides superior output on a 300-dpi laser
printer (see Figure 7). Instead of grouping
spots into halftone cells, the program evenly
distributes them throughout a gray level. If
a particular object is 30 percent gray, 30
percent of the dots will be black. The result-
ing image has a greater range of grays —
especially lighter tones — and sharper de-
tails. Digital Darkroom’s manual has an ex-

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Figure 5: PageMaker’s Image Control dialog box lets you adjust contrast and lightness. For printing, you can select the angle, frequency, and shape (dot or line) of the halftone screen.

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</tbody>
</table>

Figure 6: This chart shows the 21 screen frequency/angle combina-
tions possible on a 300-dpi laser printer. A 45-degree angle provides the best results, followed by 0 degrees. Use other
angles sparingly, as they usually produce output of lesser quality.

Although this chart covers screen frequencies between 50 and 150, the upper limit for usable output
on a laser printer is around 75 lpi.
cellent section on halftones, with lucid explanations and great illustrations.

Future Shock

Emerging printer technologies offer new solutions to the gray-scale challenge. Rather than relying on expensive, high-resolution approaches, these techniques simulate gray scale in other ways.

DP-Tek's LaserPort, an $895 printer controller for Hewlett-Packard LaserJet printers, creates up to 36 grays by working in conjunction with the native controller to produce 70-, 85-, and 100-line halftones. LaserPort breaks the rules of how to drive the Canon SX engine inside the printer, en-

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abling it to vary spot size in increments as small as 1/1,200 of an inch. DP-Tek (Wichita, Kan.) recently announced LaserPort Gray Scale, a controller capable of producing 212-line screens and 256 grays.

A more direct approach would be a laser printer capable of varying the spot size itself, without external help. Lasermetrics, a New Jersey manufacturer of infrared lasers, has developed the technology to do this and has licensed it to Half Tone Management, Inc., which in turn is negotiating with three laser-printer companies. The new device may also be used in color laser printers and laser platemakers.

Another technique under development would allow for differing resolution/gray-scale trade-offs within the same image. Areas of constant gray, such as background, might be printed at 133 or 150 lpi, while transition regions could be rendered at 75 or 80 lpi, allowing for greater local variation in gray levels.

A third approach would be a printer that can actually vary the intensity of gray within each spot of a halftone cell. Seikosha (Mahwah, N.J.) already makes a $6,000 thermal printer for medical and industrial markets that prints 300 dpi with up to 64 gray levels per spot. By adding a special interface kit, the VP-3500 can be used with some microcomputers. Such a printer can render high-quality text and line art in addition to halftones, since its gray-scale capability lets it smooth out the "jaggies" that often appear in diagonal lines.

The quality of output and its reproducibility are still question marks for some of these technologies. But once the kinks are ironed out and the new devices reach the market, they will break yet another barrier to professional-quality publishing on the desktop. The process begins on the input side, but the important part is what comes out at the end.

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QuarkStyle

Didn't Steve Jobs crack wise about "designer memos" way back when desktop publishing got started? Well, it's happened. QuarkStyle — an inexpensive, scaled-down version of QuarkXPress — comes complete with 72 templates and accompanying style sheets ready for your immortal words and pictures. Among the templates are no less than five professionally designed memo formats.

The idea here is "instant publishing," QuarkStyle is supposedly for those who don't know — and don't want to know — the finer points of design and layout. In theory, all you do is pour your words and pictures in, and professional-looking stuff comes out.

There are templates for letterheads, reports, proposals, mailing labels, invoices, purchase orders, hourly billing forms, fax forms, calendars, display ads, invitations, business cards, books, magazines, catalogs, newsletters... whew! They really cover the gamut. Eight well-known designers — including Roger Black, Stephen Doyle, Douglas May, and Marjorie Spiegelman — created the templates. The latter three provide complete series of canned templates. The abstract for a report may not fit in the space allotted, requiring a major design change. Advertisements are even more specialized. Thus, you will find yourself doing some design work after all. There's also the question of utility. Do you really need a template for phone messages (it looks just like the ones you buy at office supply stores) or for fax forms?

When you bag the instant-publishing rhetoric and view QuarkStyle as an inexpensive page-layout program, it becomes more attractive. While it's missing several of XPress' sophisticated features, it provides most of the tools that the average business user needs. It imports text from most word processors and handles nearly all graphics formats. As with QuarkXPress, you can create test and graphics frames (if you don't like those provided with the templates), link frames for automatic text flow, and then fill them with text and graphics. Text automatically wraps around frames or irregularly shaped graphics. You can cut and paste page elements, adjust fills and borders, and do most other page-layout basics. QuarkStyle's word processor is adequate, with search-and-replace, automatic hyphenation, and a spelling checker. Finished documents can be output on any PostScript printer or an ImageWriter.

QuarkStyle is much leaner than big sister QuarkXPress, but Quark has chosen sensibly which features to omit. There's no color of any kind, but gray shading for frames, borders, lines, and type is available. Lines are limited to seven widths, and there are no arrows or dashed lines. As for typographies, you can't adjust horizontal scaling to condense or extend type, and there's no way to track or kern to adjust the space between letters, although automatic kerning does work. Also missing is the control over hyphenation and justification parameters. Unfortunately, some of the template styles use tracking and kerning. But the overall impression is that QuarkStyle is a well thought-out and well-composed program.
Adobe Publishing Packs

Adobe makes great typefaces. Let's face it: If you want the best, you'll eventually have to go shopping at Adobe's foundry. But its type products are expensive, ranging from $185 to well over $300 for the most desirable typeface families.

There is a cost-effective way to build your typeface collection, however, if you are willing to accept Adobe's word on what constitutes the proper set of typefaces for a specific DTP project. The company is now bundling three typeface families together in so-called Publishing Packs at a substantially lower price than the faces would cost individually.

The first collection, Newsletters, provides you with three typefaces thought appropriate for newsletters: Century Old Style, ITC Franklin Gothic, and ITC Galliard. The second pack, Forms & Schedules, contains three families that look good on forms: Lucida, News Gothic, and Univers. The third selection, Presentations, consists of faces suitable for overheads and flip charts: Helvetica Condensed, ITC Lubalin Graph, and ITC New Baskerville. Each trio includes all the variations of the given typeface (such as bold and italic) in a package that contains screen fonts, printer fonts, Adobe's downloader application, and AFM files. You also receive handy sample printouts of the character sets for each font.

The ads for these packages sport the words "How to use type like an expert" emblazoned across the top. This is a bit of an exaggeration. The Publishing Packs do include pamphlets (that fold out to the awkward size of newspapers) featuring a well-known typesetter or designer. But the people who think these booklets really teach you how to produce effective newsletters are probably the same ones that find the new look of Publish! attractive.

It's not that there aren't interesting tips and tidbits here — just don't expect too much. A fairly common misconception is that these collections contain templates or detailed advice on producing various kinds of typeset material. They don't. But the pamphlets, especially the one focusing on Roger Black and newsletters, do make for a good read. They are, in turns, urbane, witty, and chatty. One of their nicest features is a section pointing out the distinguishing marks of each typeface in the pack. This helps you become better acquainted with the typefaces — from the slight flare on the stem of the a in ITC Franklin Gothic to the saucy impertinence of the splayed italic Y of ITC Galliard. It's a welcome way to hone a skill often lacking among DTP'ers.

In the end, the main attraction of these packages is not the documentation or the enclosed opinions of publishing gurus — it's a simple case of "the price is right." You'd pay more — 30 percent more — if you bought the bundled typefaces separately.

Saving money is nice, but there's a downside. You pay a price for the pack discount: You lose freedom of choice. So, if you're so cheeky as to disagree with ITC's Allan Haley on what constitutes a proper mixture of typefaces for presentations, you'd better have the bucks to pay full price for your own selection. It might make more sense if Adobe provided similar savings to anyone who bought three typefaces at one time.

If you don't know much about typefaces and just want a good-looking mix of type for your particular purposes, by all means buy the Publishing Packs. And shop around, because the packs are discounted up to 25 percent by many mail-order companies and soft-
ware outlets. But if you stubbornly insist on your own selection of typefaces despite all the advertising hype, take heart. By buying a different triad of Adobe typefaces through discount houses or low-cost software retailers, you can almost match the lower cost of Adobe's pack deals. You'll end up paying a few dollars more, but you might gain in the long run by being able to purchase the faces you think are best for the job at hand.

— Gregory Wasson

MacGraphics


In general, the art is beautiful, but there are a few glitches. The Occupations images, in particular, suffer from traditional sex stereotyping. The male figures include a doctor, scientist, construction worker, executive, printer, baker, chauffeur, farmer, and cowboy. The featured females are a nurse, a waitress, and a couple of secretaries. At least not all of the characters are Caucasians, as was the case with version 2.0 of this collection.

You also probably won’t be able to use all of the images. Why? The size. Almost everything is full-page. That’s why the collection is so huge. What can you do with a full-page corkscrew? An 8-inch-wide tomato? An 11-inch-tall giraffe? A 7-x-7 Star of David? Of course, you can shrink them, but that’s where the problems arise. Those images that look good large aren’t so hot when they are shrunk down. There are very few pictures here that print cleanly if you shrink them beyond 25 percent of the original. On an ImageWriter, the results aren’t even worth it. The results are improved if you reduce the image and dump it to a Linotronic, but I suspect that few desktop publishers have access to such high-end typesetting equipment. To their credit, the MacGraphics folks have provided some images that lack substantial detail in the first place. This makes the reductions look that much better, but then the original large version doesn’t look good.

In short, while MacGraphics is a beautiful collection, you may have trouble fitting the pictures to your needs.

— Sharon Zardetto Aker
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FREEHAND

A Helping Hand

Aldus FreeHand comes with a special file, UserPrep, that contains predefined PostScript routines, procedures, and variables. UserPrep can enhance FreeHand's drawing tools by providing special access to the power of PostScript; unfortunately, it receives scant attention in the FreeHand manual. There are only six references to UserPrep in the entire manual, and these leave much to the imagination. Since UserPrep shows probably the most intelligent and sensible approach to interacting with PostScript among the major graphics packages, a closer look at its inner workings may be rewarding for both the PostScript-literate and not-quite-so-literate.

First, be sure you've set up FreeHand as instructed in the manual, with the UserPrep file residing unobtrusively in your System folder. There are a couple of ways to open UserPrep, which is a text-only ASCII file. One way is to open it directly, using a word processor like Microsoft Word. The other way is to create a new file in FreeHand, then do a Save and simultaneously hit Command-K as described in "Preppy PostScript" (MacUser, December '88, p. 241). This creates an ASCII version of your file that contains the PostScript (PS) codes normally sent to the printer.

Open this ASCII file, and you'll see the line %% "Laser Prep -- The Apple PostScript Dictionary (md)" at the top. The following 15 to 20 pages are Apple's LaserPrep file, which FreeHand uses. Search for the string %% EndProlog, and you'll find yourself at the beginning of UserPrep, which FreeHand appends to Apple's prep file. Every time you send a FreeHand file to a PS printer, these two prep files are downloaded first. LaserPrep is complex and obscure. UserPrep, however, is marked by a refreshing clarity.

The UserPrep file begins with a preamble of sorts, describing nine predefined PS procedures that can be called up by using the PostScript option in FreeHand's Line and Fill menus. The manual briefly covers and illustrates these on pages 9-64 to 9-66, but you really need to read at least the first two pages of UserPrep to fully understand their use. Nine customized line styles are provided, including lines made up of repeating patterns of wedges, stars, bows, or hearts. The six fills include random leaves, hatch marks, a very attractive marble or granite-like fill, and something that the manual calls random grass — it actually looks more like a microscopic view of a five-o'clock shadow. Following these descriptions come the PS definitions themselves — about five pages of them.

Prep School

What if your idea of the ideal line or fill doesn't quite mesh with FreeHand's? Perhaps you'd like a nice herringbone pattern, or a fence-like effect. Not to worry — you can write your own style definition, or modify a Postscript procedure in UserPrep. Here's how.

Make sure you're still in UserPrep and search for /wedge. It will read like this:

```
/wedge { %len width angle startx starty grayval gsave setgray newpath translate rotate scale 1 0.5 moveto 0 0 lineto 1 -0.5 lineto closepath fill grestore } def
```

Copy this entire definition. Paste it twice right after the original /wedge procedure, renaming the first copy /lherring and the second /rherring (Figure 1). In the second line of each, add

```
.05 setlinewidth
```

right after the word setgray. In the procedure /lherring, replace the words closepath fill with stroke. In /rherring, change the third line to read:

```
0 0.5 moveto 1 0 lineto 0 -0.5 lineto stroke
```

Figure 1: You can create customized line styles and fills by modifying the predefined PostScript routines contained in FreeHand's UserPrep file. Here, we've created procedures that will produce repeating patterns of left- or right-pointing herringbones, letters, or dingbats.
Save the UserPrep file so that your new procedures become part of it (make sure you save it as text-only). That's all it takes to create your first custom-made line styles. Both are herringbones, one pointing to the left, one to the right. The top graphic in Figure 2 shows them in a simple FreeHand drawing.

To use these new styles, open a FreeHand document and draw a line (or any shape for that matter). Select the line, pull down the Line menu, and choose PostScript. A dialog box appears, with the cursor blinking in an empty box. Type in {lherring} 10 10 0 rope. This tells FreeHand to look up the procedure /herring in UserPrep, sets the width of the pattern (the first 10, in points), the height (the second 10), the gray scale (0 = black, 1 = white), and then calls up the predefined procedure rope, which turns the thin black line on the screen into a string of herringbone marks when it prints out (no WYSIWYG here). Click OK and the line style is set.

ABCs

If this sounds too difficult, take heart — you don't have to rely upon your skills as a PostScript programmer. A vast store of PS images are out there, close at hand, that people seldom think of using: the Adobe fonts stored in your LaserWriter.

Open up UserPrep again, search for /rherring, copy the entire definition and paste it right after the original procedure (Figure 1). Rename it /letter, delete the words .05 setlinewidth, and change the third line to read:

0 0 moveto (H) show

Save UserPrep again and return to FreeHand. Draw another line, make sure it's selected, go to the PostScript window as before and type in {letter} 10 10 0 rope. Print the page and you should see something resembling the fence-like structure in Figure 2.

What's particularly interesting about /letter is that it makes no formal font declaration. The result is that the specified letter here an H is printed out in Courier, but the letters overlap one another in the complete pattern. Try substituting other letters for the H in the third line of /letter (you'll have to reenter UserPrep). Some of the patterns may be worth adding to your graphics repertoire.

You could draw this pattern with FreeHand's drawing tools, but doing it with PostScript lets you avoid a considerable amount of repetitious duplicating, aligning, and so on. Built-in procedures like /letter can do it faster and more accurately.

Dingbats

Zapf Dingbats provides the richest store of graphic images for routines like /letter. Open up UserPrep one more time and go to /letter. Copy and paste it as before (Figure 1). Rename the copy /bats and make the third line read:

0 0 moveto /ZapfDingbats findfont 1 scalefont setfont (\166) show

Figure 2: Customized styles created in UserPrep don't show up on the FreeHand screen (top). UserPrep will convert these lines to the new styles when they are printed. The two herringbones are at top; a series of overlapping H's form the "fence" in the center; and a line of Zapf Dingbats march across the bottom.
Can you see the difference from /letter? This time we've made a font declaration. The font is scaled to 1 so that when you type the first two numbers in the PostScript window back in FreeHand, you will in effect be typing in the point size of the given character. Also notice the odd words (166). Since UserPrep is a text-only file, you can't directly type in a dingbat. You must refer to it by its octal code, which is PostScript's character-coding scheme. The diamond-shaped dingbat we're using (the one used in Apple's manuals) has an octal code of 166. The backslash tells the PS interpreter that what follows is a code.

Save UserPrep and return to FreeHand. Draw or select a line, and in the PostScript window enter \( \texttt{10 10 0} \) rope. The resulting graphic is a line of nicely spaced diamond dingbats.

By storing UserPrep routines like the three we've worked through, you can have a much wider choice of line or fill styles in FreeHand — a sort of PostScript answering service waiting for your call. And you don't have to be a PS genius to do it. By simply studying and modifying UserPrep's existing procedures, you'll find that you can increase the diversity of your work tenfold. Have fun!

— Gregory Wasson

---

### High Octane

Octal codes may be unfamiliar to you, but they're part of the bread and butter of the PostScript environment. If you want to refer directly to a specific character in a PostScript typeface while programming, as in our /bats example for FreeHand's UserPrep (see "A Helping Hand"), you may need to know its octal (base-eight) code.

Octal charts for the regular alphanumeric typefaces (those composed of letters and numbers), such as Times, Palatino, or Avant Garde, are widely available. For example, you can look them up in Adobe's reference manual, the so-called "Red Book." But you're out of luck for graphic typefaces like Zapf Dingbats. Where to find them? Well, the documentation that accompanies QMS PostScript printers includes complete charts for resident typefaces, including Dingbats. But if you're one of those rare people who don't want to shell out several thousand dollars just for an octal chart, take heart. Help comes from an unlikely quarter — a shareware DA called WriteFontSize.

Originally, WriteFontSize provided a way to use point sizes in MacWrite other than the limited set available from within the program. As a great fringe benefit for PostScripters, it also lets you determine the decimal, hexadecimal, and octal code of a character in any typeface on your System.

Figure A shows the DA's main window. You choose a typeface and size, and click the radio button for the code scheme you want represented. Type any character in the text window (such as the snowflake dingbat shown), and its code number appears in the ASCII Char box at the top of the window. Or you can type a code number in the box, and the character will appear. Choose Grid (Command-G), and all characters of the selected typeface are presented, laid out in a grid. You determine the correct code from the numbers listed on the x and y axes, as shown in Figure B. If you hold down Option and click while your cursor is on a character, it will be pasted into the DA's main window and its code number will show up in the ASCII Char box.

WriteFontSize is a nifty little DA for people it was never meant for — namely, PostScript programmers, who should find it a real time-saver. If you can't find it lurking on CompuServe or other online services, contact the author, Jeffrey S. Shulman, at P.O. Box 521, Ridgefield, CT 06877-0521. The shareware price is $7 ($10 for non-U.S. users).

— Gregory Wasson
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In Word, the Return key is used to end a paragraph, while Shift-Return is used to end a line without creating a new paragraph. Shift-Return works fine as long as it isn't used in a justified paragraph. In the latter case, the line created with Shift-Return is justified — something most people will want to avoid. And you can avoid it by pressing Shift-Option-Return.

This undocumented method of concluding a line is very useful for lines within a justified paragraph that, for example, are to contain only a mathematical equation located at a center tab. It's also the only way to create the appearance of multiple justified paragraphs within a single box. Simply apply the boxed format to the paragraph and conclude each pseudo paragraph within the box with a Shift-Option-Return. The concluding line of each "paragraph" will not be fully justified.

Incidentally, the Shift-Option-Return symbol that appears when Show ¶ is active looks just like the Return symbol.

ROBERT G. DINITTO
CHELMSFORD, MASS.

After reading the Tip of the Month in the September '88 issue, I gave it a try. Although the suggestion on how to access the ImageWriter's built-in fonts works, Word provides an easier way.

In the lower-left corner of the Word window is a rectangular box that usually contains a shadowed page number. Click in this box and the word Code appears. This invites you to type a decimal (not hex) character code. Press Return to place that character in the text.

The decimal code for the escape character is 27 (this appears as a small box in your Word document). To access the variety of special fonts and font sizes built into the ImageWriter, simply add the escape codes at the beginning of your document and, if desired, at other points in your document. To do this, click in the Page box, type 27 in the place of Code, and press Return. Then in the main window, right after the small box that should now be showing, type the letter that will tell the ImageWriter what to do. Here's a partial list:

Esc e (Semicondensed = 13.4 cpi)
Esc p (Pica proportional)
Esc P (Elite proportional)
Esc f (Semi condensed = 13 cpi)
Esc q (Condensed = 15 cpi)
Esc Q (Ultracondensed = 17 cpi)
Esc A (6 lines per inch)
Esc B (8 lines per inch)

When you're ready to print, make sure that you have ImageWriter selected in the Chooser.

D.ALE L. COCKRUM
WALLA WALLA, WASH.

Sometimes Word puts too much space between italicized words (especially if each word is capitalized, as in subheads or titles). Simply condensing italicized type usually results in squished type. But if you turn on Show ¶ from the Edit menu, you can select the space markers between the words and condense only them by using the Condense feature found in the Character dialog box. You can condense by anything from 0 to 1.75 points. After you've highlighted the first space mark and condensed it, go on to the next space mark, highlight it, and press Command-A ("Again") so you don't have to reenter the values in the dialog box. See Figure 1 for examples.

A.M. CONCEPCION
CHICAGO, ILL.

In "Portraits of the Artists," October '88, Natasha Lessnik described how she sometimes has to split up a file too large to fit on an 800K Window.

Figure 1: Italicized titles often look too widely spaced in Word 3.0. The program's Condense feature in the Character dialog box can help you out. Here are three examples.
flop so that she can take it to a service bureau. Later she has to reassemble the artwork by manual pasteup. I have a related problem with scanned images. I frequently use a scanner at a local bureau and have often discovered after spending many hours and much money that the file won't fit on a floppy. So that she can take it home. The solution? If you have a program for backing up your hard disk, bring a copy of it with you the next time you visit the bureau. If a file becomes too large to save to a floppy disk, use the backup program to back up the file (the program will break the file up — you can restore the fragmented file on your hard disk when you get home). Natasha can do the same, except that she will have to restore the file at the bureau before printing it out.

DIANA SHANNON
PRINCETON, N.J.

PAGEMAKER 3.0

One of PageMaker 3.0's most annoying flaws is its occasional failure to update the screen (as when the print dialog box disappears). Most users just scroll off the page or area of the page displayed and then back to recover the portion blanked out. If you have Pyro!, there is a much faster way to force PageMaker to refresh the screen: Just move the cursor to the sleep corner. When Pyro!'s startup screen shows, move the cursor back to the document. Your fully updated page jumps up to greet you. This is a lot easier than dealing with scroll bars or the grabber. [PageMaker Version 3.0 fixes this frustrating "feature." Be on the lookout for it. — Ed.]

RAHUL SABNIS
SILVER SPRING, MD.

Users of Apple's Extended Keyboard can choose tools from the PageMaker Toolbox window by using the following undocumented key combinations:

Control-Shift-F1 = Pointer
Control-Shift-F2 = Line tool
Control-Shift-F3 = Horizontal/vertical tool
Control-Shift-F4 = Text tool
Control-Shift-F5 = Square rectangle tool
Control-Shift-F6 = Rounded rectangle tool
Control-Shift-F7 = Ellipse tool
Control-Shift-F8 = Cropping tool
John Altman
A L H A M B R A, CALIF.

Most service bureaus charge less for printing one 11-x-17-inch sheet of paper or film than they do for two 8.5-x-11-inch printouts. To take advantage of that price break, use PageMaker's wide tabloid page setup and lay out two pages on one page. This also lets you produce bleeds (graphics that extend across two pages). Here's an example of how to set up two three-column pages on a tabloid-sized page. Set the left and right margins to be the outside margin measurements (since neither one is an inside, or bound, margin, they should be equal). Next, choose the distance between columns and the number of columns, but choose seven rather than six columns. The columns will be evenly spread across the two-page spread. To rearrange them, you need to know the width of the column you want. For a three-column page, the formula is (8.5 - (2 X the distance between columns) - (outside margin + inside margin)) ÷ 3. Starting from the left margin, measure the width of your column and then drag the left side of the first column guide to that point. Zero the ruler to the right edge of the column guide and repeat the procedure for the second and third columns. Then move to the right margin and repeat the measurements for columns six, five, and four. The remaining "seventh" column (the one in the middle) and adjacent column divisions will be equal to the two "inside" margins. See Figure 2 for an example of this kind of setup.

When printing proofs on a LaserWriter, be sure that you change the options at the bottom of the print dialog box so that the paper is set at Tall. At that setting, with the tile feature set at automatic and the overlap set at 0, the LaserWriter will print your proofs as neatly as if your layout were in an 8.5-x-11 format. [You can also use a variation of this technique to print two pages on a single 8.5-x-11 sheet, provided that your layout is small enough, say 5 x 7. Just create two columns on a letter-sized page turned on its side — enter 11 x 8.5 in the Page setup box. The only disadvantage is that you cannot use PageMaker's automatic page-numbering feature, since autonumbering considers this setup as one page — place two tokens, one in each column/page, and both will read the same number. — Ed.]

CLARICE KEEGAN
SEATTLE, WASH.
**TIP OF THE MONTH**

**FREEHAND**

Aldus FreeHand can open Adobe Illustrator 1.1 files for editing, but it can’t open Adobe Illustrator 88 files—unless you do the following.

First, open the Illustrator 88 file with Illustrator 88 and Save As an Illustrator 1.1-compatible file to convert custom colors to process colors and defeat masking, as well as remove all patterns and placed or imported images. All objects will be retained. Next, if you have Illustrator 1.1, simply open the file with 1.1 and save it. It can now be opened by FreeHand.

If you don’t have Illustrator 1.1, open the file with a text editor capable of saving text-only files. Change the second line from

```
"%Creator: Adobe Illustrator 88 (TM) 1.6"
```

to

```
"%Creator: Adobe Illustrator(TM) 1.1"
```

(Note carefully the deletion of the space before Adobe.) Save as text only. Open the file with a resource editor and change the Creator from ARTZ to ARTY. The resulting file can be opened and edited in FreeHand.

**BILL WARE**

CLEBURNE, TEX.

---

**TIP SHEET**

**HYPERCARD**

An easy way for Mac SE and II owners to switch between user levels is to create Control-key combinations by inserting the following lines into the Home stack:

```plaintext
on controlKey x
  if x=49 then
    set the user Level to 1
  else if x=50 then
    set the user Level to 2
  else if x=51 then
    set the user Level to 3
  else if x=52 then
    set the user Level to 4
  else if x=53 then
    set the user Level to 5
  else pass controlKey
end controlKey
```

Now you can press Control and any number from 1 to 5 and be transferred to that user level.

**GIZUR BERGSTEINSSON**

REYKJAVIK, ICELAND

If you’ve ever wanted to make your HyperCard stacks like real Mac applications with an About… command in the Apple menu, copy the following resources (with ResEdit) to your stack from HyperCard itself:

- **DLOG**  ""About""  ID=2002
- **DITL**  ""About""  ID=2002
- **STR#**  ""About""  ID=2002
- **ICON**  ""Bill""  ID=1001

Once you’ve loaded the resources in your stack by means of the scary magic of ResEdit, you can alter them to your heart’s content without actually modifying the originals in HyperCard. To do so, make STR# read whatever you want; move, add, or delete any of the icons; or place your own text inside the DITL. You can even move the DLOG box elsewhere. Now, when you open your HyperCard stack, the About… command will really tell other users what your stack is all about. So if you’re tired of the same old HyperCard programming team, add a little spice, delete Bill’s lovely face—and put in whatever you want.

**BENJAMIN KUO**

SALT LAKE CITY, UTAH

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**IMAGEWRITER LQ**

When I saw the tip in the October 1988 issue for the ImageWriter LQ suggesting that LQ owners tear their ribbons apart to “double their life,” I had to respond and save a few LQ owners undue frustration.

If, as the tip’s author mentioned, the top edge of your ribbon is receiving the brunt of the printing load, it’s only because you don’t have the ribbon seated properly! I discovered this after many months of LQ operation and not a few $19 ribbons worn out at the top edge. A kind tip from a person on CompuServe set me straight. A well-worn LQ ribbon has four parallel wear lines spaced evenly up and down on its surface reflecting the up and down movement of the print head. An improperly seated ribbon defeats this motion, and the result is the characteristic top-edge fraying. In other words, you’re using only one-fourth of your ribbon.

Nowhere does Apple tell you this, and repair technicians seem unaware of the problem or its solution. If you set up the printer as the manual instructs, there’s every chance that you won’t seat the ribbon properly, because doing so requires a degree of force and thumb pressure that most people will not instinctively apply to a new $1,300 printer.

To seat your ribbon properly, you must apply very strong thumb or finger pressure to the extreme end of each of the little arms that extend out from each end of the cartridge. You will feel a very satisfying click when it is properly installed.

**KEN REESE**

LEBANON SPRINGS, N.Y.

---

**ADOBE ILLUSTRATOR 88**

You can cancel Preview Illustration by typing Command-period. This is useful if you are using patterns or color and the part you wanted to check has already previewed, since it can take several minutes for the entire illustration to preview in full.

**BILL PLAN EY**

FORT WORTH, TEXAS

---

**FEBRUARY 1989 MAC USER**

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Macworld editors named the original Acta their “favorite desk accessory.” MacUser gave it 4 1/2 mice as “one of the absolute best outliners available.” MacGuide presented it with a Golden Gavel award as the highest rated outliner for the Macintosh.

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For this month's news we went on the trail to bring you the happenings at the Boston HyperExpo. You'll find a HyperCard look-alike, a user-friendly book, and a stack for lawyers. We also review HyperAnimator. Check Michael Swaine's Card Tricks for more tricks of the trade.

Graphics and pointers make the text in HyperCard QuickStart easier to navigate and understand.

X: You Are Here

You've seen those maps scattered around shopping malls with all the stores listed and an x to indicate "You are here." Well, the book HyperCard QuickStart by Richard Maran is like one of those maps, only each topic has its own map (the book is made up of two-page spreads, or topics). Down the right-hand page you find the titles of all the sections of the book. Across the top are the topics for each section, and pointers show your current location by topic and section.

HyperCard QuickStart is a book for beginners who have some knowledge of the Mac but no knowledge of HyperCard. It covers four of the five user levels, leaving Scripting for the more advanced books. It takes you from the installation of HyperCard on your hard disk through using cards, fields, and buttons, to printing and authoring your own stacks.

The book is structured somewhat like HyperCard with themes, associations, and links. Just think of each spread as a card; the cards make up sections (stacks), and the pointers act as buttons to help you move to the desired topic. Key information is grouped together. Where more information or explanation may be needed, topics and page numbers are supplied, thus eliminating repeated trips to the index.

If a picture is worth a thousand words, then the more than 100 illustrations are worth millions. Most of the concepts are presented in both words and pictures, with important areas emphasized by red lines.

Yes, HyperCard QuickStart joins the myriad of books on HyperCard, but it is one you may find easier to use. Even experienced HyperCard
QUICK.
HOW MANY
FEET IN
A NARP?

Introducing HyperKit. An easy and fun-to-build project, revealing the nature of HyperCard and measurement.

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So convert, and have a good time doing it. Send for your HyperKit 2-disk set at the introductory price of $69.95 plus postage and handling.

Please send me __________ HyperKit Projects at $69.95 each plus $3.00 for shipping and handling.

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# Exp. date __________

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Address ____________________________

City __________ State __________ Zip __________

Phone ____________________________

To: SOFTEC, 6950 S.W. Hampton, Tigard, OR 97223

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Legal Aide

Would you pay between $1,950 and $4,450 for a HyperCard stack? If you're an attorney and/or you run a law office, that money, if spent on GLOSS, might be the best investment you make this year.

What's GLOSS? GLOSS is the Ghent Farm Legal Office Support System, a powerful vertical-market product for law offices. This versatile system can handle virtually all the needs of a firm of attorneys. GLOSS comes in single-user, site-licensed, nonnetworked multiuser, and fully networked multiuser versions. All versions can be purchased with installation, support, and either one or two days (depending on the number of users) of on-site training. All versions of the package feature one-time entry of client data, very powerful billing and reporting options with Unbill and Rebill features for making corrections to bills, and much more.

Since GLOSS was designed to be friendly to non-computer users, as
THE SECRETS OF WRITING BUSINESS LETTERS

As far back as biblical times, businessmen have used powerful communication to achieve wealth and position. “How forcible are right words!” cried Job.

Even today the right message at the right time can lead to sweet success.


Letter writing is not a lost art, just a forgotten one. The principles still exist. If you try them, you’ll see improvement in your very next letter.

TO BEGIN WITH

1. Start from the end. Decide what you’d like to happen as the result of your letter.

Make a list of all the things you’d like to say. Look them over. Find any that don’t support your main cause, and cross them off without remorse.

Remember, the best letters have a strong sense of purpose.

2. Get to the point early. If your reader wanted a mystery, he’d be reading Raymond Chandler. A letter should tell who and why your reader wanted a mystery, he’d be reading Raymond Chandler. A letter should tell who and why.

Address your reader by name: “Dear Ms. Hartman.” And if you can fit it in naturally, use Ms. Hartman’s name once or twice in the body. You want her to know you wrote the letter just for her.

Whenever you can, use pronouns like I, we, and you. Especially you—it’s an arrow straight to your reader’s heart.

NO BUSINESS-ES

4. Say it plainly. There is no such thing as a “business language.” Phrases like “in compliance with your request” and “enclosed herewith” will only make you seem like a robot. Write the way you talk, naturally.

Keep your sentences short—one idea in each. Any sentence longer than two typed lines is automatically suspect.

5. Clear the deadwood. Chop out words, sentences, and even whole paragraphs if they don’t contribute. Work hard so your reader won’t have to.

In particular, cast a questioning eye on adjectives. They can sap the strength from your words, or stretch your credibility. As Voltaire put it, “The adjective is the enemy of the noun.”

6. Use active verbs. Face it, the passive voice is wimpy. “A decision has been reached by the committee” wouldn’t last three rounds in the ring with “The committee has reached a decision.”

Also, your reader will sniff a coverup if you write: “Your order has been misplaced” instead of “I misplaced your order.” Courage!

7. Be human. Your letter should read like a conversation, not a decree.

Address your reader by name: “Dear Ms. Hartman.” And if you can fit it in naturally, use Ms. Hartman’s name once or twice in the body. You want her to know you wrote the letter just for her.

Whenever you can, use pronouns like I, we, and you. Especially you—it’s an arrow straight to your reader’s heart.

BE POSITIVE

8. Never write in anger. Your anger will evaporate; your letter won’t. Harry Truman often vented his fury in letters. He also had the sense never to send them.

Devise a way to handle the problem in an upbeat manner. Your chances of success will multiply tenfold.

9. End it with an action step. The last sentence of your letter should suggest the reader’s next move. Or your own next move.

 Resist the hat-in-hand, shuffling type of exit: “Again, thank you for…” or “If you have any problems, please don’t hesitate to call.”

Instead, try closing with a plain and simple “Sincerely,” and your signature. It may be the perfect ending.

10. Be professional. The strongest business letter in the world can’t survive a bad presentation.

Set up a clean, logical format for your letter. A crowded or overdesigned page will distract from your message.

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The easiest way to more powerful correspondence is QuickLetter, from Working Software.

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And the list of features goes on. QuickLetter is a desk accessory, so it’ll always be there when you need it, no matter what other program you’re working in. It even lets you keep several windows open at the same time.

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Please circle 132 on reader service card.
most attorneys are, it's a totally interactive system. And it uses HyperCard. The basic modules include Client Data, Client Billing Information, Client Matter Information, Financial Details, Matter Billing, Billing Parameters, Billing Rates, and Flexible Reporting.

Access to the various modules can be restricted to certain users or left open to all.

Unlike many of the stacks you've seen to date, the cards have a lot of power buried within them. Most cards actually call upon fairly substantial traditional programs, but users don't have to deal with anything other than the clean accessible HyperCard interface.

This program has the power and flexibility of a mainframe legal program with the advantages of a well-thought-out HyperCard-based interface.

If that seems just what your law firm or your lawyers need, contact Ghent Farm — whose motto is "where ideas grow" — at RD #1, Box 181, Lower Post Road, Ghent, NY 12075; (800) 527-9199. New York City residents should call (212) 255-6754; other New York residents should call (518) 828-9637.

— Steven Bobker

On the Freedom Trail

The second HyperExpo, held in Boston in October, brought no spectacular new software, no exciting HyperCard birthday parties. Rather, it seemed a quiet celebration of the business of hypertext.

Yes, hypertext (nonlinear writing) — HyperCard has gotten all the hoopla, but there were hypertext systems out there long before Atkinson's baby appeared (NoteCards, Guide, and Hyperties, for example). Some of them even run on IBMs and other systems.

The real excitement came in the panel discussions, as educators, other professionals, businesspeople, and musicians shared their applications and their hopes and dreams for the future of hypermedia (hypertext that incorporates text, graphics, video, and sound).

There were visions of vast amounts of knowledge made easily accessible through hypertext media; of learning systems where the student has much more control over what and how to learn and in what sequence to learn it (interactive hypermedia); and visions of the integration of computers, video, and television. Imagine people in different locations sharing files and working on the same documents at the same time, electronic marker boards and electronic hallways to
Let your Mac do the walking along the Boston Freedom Trail disk.

Walk you through an architect's concept of an unconstructed building.

Some of these things are happening now, with education in the forefront. The Perseus Project, Harvard's interactive curriculum on classical Greek civilization, is an ongoing project; there's a history of astronomy with animated models of orbits from Dartmouth, a biology program on molecular genetics, and a Chinese language program that draws characters. We also saw a stack from the Berklee College of Music that lets you use a Tripp-Strip controller for a Yamaha synthesizer.

On the corporate side, there's Xiphias' National Telephone Directory ($150), which should be out by the time you read this. Other hypertext applications include Cameo II, an emergency responder to chemical spills, and Broderbund's DTP Advisor ($79.95), a training tool and project management system.

While dreams and large systems dominated the panels, small companies and special interests were well represented on the show floor. There were RDAide by Pages ($84.95), a nutrient analysis database; Tax Stacks ($69.95), a HyperCard income tax preparation program from StackWorks; and a foreign-language series for Russian, Greek, Spanish, and French, ($19.95 to $39.95), from HyperGlot. Contacts ($99.95) by Applied Imagination is a networking tool for managing contact information that has mail-merge capabilities. Of use to most everyone is Softworks' Stack Cleaner ($49.95), a utility kit that substitutes HyperCard's standard abbreviations into scripts, lets you merge and duplicate stacks, and create and modify menus. HyperCom ($99.95), introduced by GAVA, allows communication through HyperCard over AppleTalk. For Mac II owners there was ColorCard (to be released in December) from Drexel University, a multiwindow environment for HyperCard that supports gray-scale and color images. And, appropriately, from the Boston Computer Society comes The Boston Freedom Trail ($4 to members, $10 nonmembers), a guide to this historical area.

The honeymoon may be over — HyperCard hasn't become the ultimate all-purpose application for everyone — but it has found its niche and has focused attention on other hypermedia. And together, HyperCard, hypertext, and hypermedia are bringing a freedom to computer users that they have never before known.

— Laura Johnson

### Directory

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<td>17 Paul Drive</td>
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<td>Somerville, MA 02144</td>
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<tr>
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<td>Huntington, CT 06484</td>
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Laura Johnson
HyperAnimator

HyperAnimator is not an animation program, though it does use simple animation to achieve its effects. Nor is this the infamous Knowledge Navigator, though it might be a distant relation. HyperAnimator provides an easy way to plunk a talking head into a HyperCard stack, where it can say whatever you want it to.

HyperAnimator enables you to create actors, which are crudely animated digitized or cartoon heads, to mouth the text you want them to speak. Each actor has a set of 16 expressions. Half of these are used to mouth phonemes. In other words, when the script calls for a “w” sound, the actor makes like a fish. The rest of the expressions are used for attitudes like “smirk,” “smile,” and “sleep” and for facial motions like blinking or looking to one side. All these expressions can be programmed with simple commands, and the phonemes are automatically generated when speech synthesis is used.

Though the animation is crude, that doesn’t mean it’s not effective. If an actor is based on a digitized photograph, the effect is even reasonably realistic.

Only one of the eight actors provided with the program looks like a real person, though. The others are cartoon characters ranging from a nutty professor to a Cecil-and-Beanie-type sock.

How much use you can get out of HyperAnimator depends on several things. For instance, because this program really is a supplement to HyperCard, you won’t get far if you’re not comfortable with that program. If you want to create your own talking head (which itself involves a fair amount of work), you’ll probably want to author a HyperCard stack to put it in (or you can put it in an existing stack). That doesn’t mean that you need to be an expert HyperTalk programmer — just that you have to be able to create and modify stacks. HyperAnimator’s language is simple and should pose no problem.

If you want the best sound quality
possible, you must supply HyperAnimator with sound resources instead of synthesizing speech from the Macintosh driver. This is a limitation, since sound resources don’t lend themselves to long-winded addresses. A series of short phrases shouldn’t be too difficult, though. You can use MacRecorder, from Farallon Computing, to record them. The HyperAnimator documentation comes with good instructions on how to lip-sync your actor to the recorded sound resource (this keeps your actor from looking like he’s fresh from a Godzilla movie).

If you choose to use Macintosh there’s no limit to how long the voice can drone on. It will, however, sound like a computer. This might be convenient if your animated talking head is a robot, but otherwise you’ll probably want to spend some time fine-tuning the sound with phonetic spellings and explicit intonations until it sounds more like human speech. The documentation gives enough information about how to do this, but it seems to be one of those skills that’s best gained through practice.

HyperAnimator looks and feels like a HyperCard stack, but its level of polish is comparable to such popular applications as Business Class and Focal Point. How people will use this new capability in HyperCard stacks is anybody’s guess.

Bright Star provides examples that range from a talking calculator (Professor Calculator) to a HyperSecretary. The company also markets a separate application called Talking Tiles, which demonstrates how the idea can be applied to education — in this case teaching reading phonetically.

Is this a gimmick or is it the future of computer interfaces? Imagine a refinement of the technology — better animation, better speech synthesis, more expressive actors — it’s clear that people will soon be creating whole new actors who will be indistinguishable from your average Burt Reynolds Dinner Theatre graduate.

HyperAnimator is still a long way from that, but it does point the right way, and you can put it in your HyperCard stacks today. It’ll be interesting to see where and how the results turn up.

Desktop acting, anyone?

— James Bradbury

HyperAnimator

List Price: $149.95
Published by: Bright Star Technology, Inc., 14450 N.E. 29th, Suite 220, Bellevue, WA 98007; (206) 885-5446
Version: 1.0
Requires: 1 megabyte, System 6.0 or later.
Compatibility: Mac II friendly (in black and white only).
Application Size: 342K
Copy Protection: None

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I hope that no suggestion of any strange land that may be conveyed by the title will scare readers away from this book; for, though some chapters do tell of Elfland, in the greater part of them there is no more to be shown than the face of the fields we know, and ordinary English woods and a common village and valley, a good twenty or twenty-five miles from the border of Elfland.” —Preface to The King of Elfland’s Daughter by Lord Dunsany

When you’ve sojourned for a time in the land of HyperCard, you eventually fetch up with a jolt against one of its borders. Names of things can’t exceed 31 characters. The entire card is loaded into memory, so the size of your cards is limited by available memory, which is a function of various factors. And no matter how good a typist you are, you can’t key more than 29,997 characters into a field. HyperCard fields are limited to 29,997 characters.

When you begin writing scripts in HyperCard’s programming language, HyperTalk, you run up against more barriers. You can have only 512 variables active at one time. Scripts can be no larger than 30,000 characters. You can’t read more than 16,384 bytes at a time from an external file. The first script I wrote for MacUser ran into a barrier: It generated a lot of information, storing it automatically into a field; but HyperCard fields are limited to 29,997 characters.

There are ways to live within the borders. Thirty-one characters are enough for naming things if you name wisely. If you have too many variables, you can probably combine some of them: The limits on the size and complexity of individual variables are much less restrictive than the limit on the number of variables. You can read repeatedly from files. Dealing with oversize scripts can be a difficult problem, but often the solution is to move some of the script’s handlers elsewhere in the hierarchy. I solved my field-size problem by simply using more than one field; this is the obvious solution to the problem of storing bodies of information that exceed 29,997 characters while still working within the boundaries of the fields we know.

You can see the problem with this field-size solution, though: It is not general. I’d have to create it anew for every stack that needed it, and my scripts would have to be written in the knowledge that there were several fields for them to deal with. What I yearned for was a general approach, a new kind of field that could be as big as I needed.

HyperTalk lets me refer to “chunks” of fields — individual characters, words, items, or lines — so I should be able to refer to a chunk of my imaginary monster field, asking for the 100,000th character or the 100,000th line. Or the 100,000th character of the 100,000th line. Since actual fields don’t work that way, let’s use the term virtual field for this magical entity that would take us beyond the fields we know.

This month’s script is a simple implementation of virtual fields. It consists of five main functions: vField, vChar, vWord, vItem, and vLine; plus several auxiliary functions. These functions let you treat any HyperCard field as a virtual field. They let you refer to the virtual chunks of fields — or, if you prefer, the chunks of virtual fields. You can retrieve a particular virtual chunk or put data into it, just as you can with ordinary fields, except that virtual fields can be as big as you like.

To make these functions available to your HyperTalk scripts, install them in the Home stack script or in the script of any stack or background to which you want them to apply. Using them in your scripts amounts, basically, to substituting the virtual-chunk function for the corresponding HyperTalk function (vLine for line, vWord for word, and so on) and applying the vField function to the name of the field. Unfortunately, it’s a little more complicated than that, because the syntax for my functions is not as Englishlike as HyperTalk’s. For such normal field references as these:

```
get char 100000 of field theField
put char 5 of line 100 of theField into {- theChar
put "hello" into word 3 of theField
put "goodbye" after line 300 of theField
```

...you must substitute virtual-field references like these:

```
get vChar(100000, vField(theField))
pit vChar(5, vLine(100, vField(theField)))
into theChar
get vWord(3, vField(theField), "hello")
got {-
vLine(300, vField(theField), "goodbye", "after")
```
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The `vField` function takes one parameter: the name of the actual HyperCard field. Think of it as turning the actual field into a virtual field. The other main functions take from two to four parameters. Their first parameter is the number of the character, word, item, or line. Their second parameter is the virtual object in question: either a virtual field, such as `vField(theField)`, or a virtual chunk, `vLine(10, vField(theField))`.

The third and fourth examples above demonstrate the syntax for putting information into a virtual field. Supplying a third parameter to one of these virtual-chunk functions signals that you want to write whatever is contained in the third parameter to the field at the chunk specified. The fourth example adds as a fourth parameter a proposition (before, after, or into) to specify further where the text is to go, just as you can do in HyperTalk. Why I implemented the functions in this way is a boring story of programming prejudice and coding compromise, but the effect is that your scripts can more or less do with virtual fields whatever they can do with ordinary fields, but without the size limitation.

In short, any field that you access with these functions will become a virtual field, capable of holding as much information as the memory capacity of your machine will allow (beyond every border there lies another border). What's the magic? Extra "actual" fields, the same method like ordinary fields? No. Extra virtual fields, the same method I described at the beginning of this column, but applied automatically for you.

The main thing you need to know about what these functions are doing behind your back is that they create extra (hidden) fields as needed, and that they name those extra fields by appending one or more underscore characters (_) to the original field name. A virtual field named BigField and containing 80,000 characters may be implemented as three actual fields named BigField, BigField_, and BigField___. Mess with those extra fields at your peril.

These virtual fields have their own boundaries and limitations. The most important is that they are not bulletproof commercial products. They probably have bugs, and you should not rely on them blindly for any important purpose. If you try them and like them, consider taking them apart and putting them back together again. Scripts are much safer if you know you can fix them yourself when they break. Second, although HyperTalk chunk expressions such as `word1 of line1` can be used with any container, these virtual chunks work properly only with fields (in fact, only with background fields), so you can't "virtualize" the message box or a variable, although I don't know why you'd want to. Third, the functions' propensity for creating new fields is incompatible with any script that assumes something about the number of background fields. And not every HyperTalk field reference can be transformed into a virtual-field reference directly; `add1 to item100000 of field1`, for example, won't.

Finally, these functions are intended for the programmatic manipulation of fields: if you type directly into the fields, you may run into trouble, though with fields of this size I'd recommend doing data entry through small data-entry field or dialog box anyway.

And in the final analysis, why should we expect virtual fields to behave exactly like ordinary fields?

"For the twelve that were of the parliament of Er...gazing over their familiar lands, perceived that they were no longer the fields we know."

--- Final sentence of *The King of Elfland's Daughter* by Lord Dunsany
-- be aware of the following:
-- • This script is far from bulletproof.
-- • If you intend to make serious use of virtual fields, consider this script a re- search tool.
-- • The maxField parameter, set in function vField, is a hedge against my sloppy programming.
-- Actual fields can hold 29,997 characters; you should limit the actual fields comprising your virtual fields to far fewer characters, just to be safe(r).
-- • Reads can be nested; writes can't. That is, you can retrieve the second character of the third line of a virtual field with:
  vChar(2,vLine(3, (vField(obj))),
-- but writes can involve only one chunk type:
  vChar(2, (vField(obj)), "X", "before")
-- • There are other ways of accessing actual fields that are not supported in this implementation of virtual fields. The most serious lack is a delete function. Although you can write empty into any chunk of one of these virtual fields, you can't easily delete chunks.

function vField fieldName
-- "Virtualizes" the field whose name is given.
-- Stores the field's name in a global variable and returns the contents of the field.
global fieldName, maxField
-- MaxField = maximum actual field size you allow.
put 25000 into maxField
put fieldName into fieldName
do "put" & fieldName & " into theField"
return theField
eend vField

function vWord w, obj, text, preposition
-- Accesses word w of virtual object obj.
-- 2-parameter version reads, 4-parameter writes.
if the paramCount=2
then return vWordR(w, obj)
else
  if the paramCount=3
    then return vWordW(w, obj, text, "into")
  else
    if the paramCount=4
      then return vWordW(w, obj, text, preposition)
    end if
  end if
end vWord

function vItem i, obj, text, preposition
-- Accesses item i of virtual object obj.
-- 2-parameter reads, 4-parameter writes.

The same goes for your Macintosh. Leaving your computer on when not in use can lead to screen burn-in.

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then
   -- Then recurse to it.
   put vFieldName & "_" into vFieldName
   do "put" & vFieldName & " into obj"
   return vWord(w-numChunks, obj)
else
   -- Otherwise, read fails; return empty.
   return empty
end if
end if
end vWordR

function vItemR i, obj
-- Returns item i of virtual object obj.
global vFieldName
put (last char of obj is " ") into continuedFlag
if continuedFlag then delete last char of obj
put the number of items of obj into numChunks
   -- Is it on this page?
   if (i <= numChunks)
      -- Then perform the read operation.
      return item i of obj
   else
      -- Is there a continued page?
      if continuedFlag
         then
            -- Then recurse to it.
            put vFieldName & "_" into vFieldName
            do "put" & vFieldName & " into obj"
            return vItem(i-numChunks, obj)
         else
            -- Otherwise, read fails; return empty.
            return empty
         end if
      end if
   end if
end if
end vItemR

function vLineR 1, obj
-- Returns line 1 of virtual object obj.
global vFieldName
put (last char of obj is " ") into continuedFlag
if continuedFlag then delete last char of obj
put the number of lines of obj into numChunks
   -- Is it on this page?
   if (1 <= numChunks)
      -- Then perform the read operation.
      return line 1 of obj
   else
      -- Is there a continued page?
      if continuedFlag
         then
            -- Then recurse to it.
            put vFieldName & "_" into vFieldName
            do "put" & vFieldName & " into obj"
            return vLine(1-numChunks, obj)
         else
            -- Otherwise, read fails; return empty.
            return empty
         end if
      end if
   end if
end if
end vLineR

---

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---

function vLineR(l-numChunks, obj)
  -- Otherwise, read fails; return empty.
  return empty
end if

function vCharR c, obj
  -- Returns char c of virtual object obj.
  global vFieldName
  put (last char of obj is " ") into continuedFlag
  if continuedFlag then delete last char of obj
  put the number of chars of obj into numChunks
  -- Is it on this page?
  if (c < numChunks) then
    -- Then perform the read operation.
    return char c of obj
  else
    -- Is there a continued page?
    if continuedFlag then
      -- Then recurse to it.
      put vFieldName & " " into vFieldName
      do "put" && vFieldName && "into obj"
      return vChar(c-numChunks, obj)
    else
      -- Otherwise, read fails; return empty.
      return empty
    end if
  end if
end vCharR

function vWordW w, obj, t, p
  -- Puts text t into, before, or after word w of virtual object obj.
  global vFieldName,maxField
  put space into delim
  put (last char of obj is " ") into continuedFlag
  if continuedFlag then delete last char of obj
  put the number of words of obj into numChunks
  -- Is it on this page?
  if (w :: numChunks) then
    if p="before" then put delim after t
    if p="after" then put delim before t
    do "put" && p && "word w of" && vFieldName
    -- Adjust for overflow as necessary.
    if length(obj)+length(t)>maxField
      then adjust "word"
      return word w of obj
    else
      return vLine(l-numChunks, obj)
--- Else recurse to continued page.
put vFieldName & "_" into vFieldName
do "put" && vFieldName && " into obj"
return vWord(w-numChunks, obj, t, p)
end if
end vWordW

function vItemW i, obj, t, p
-- Puts text t into, before, or after item i
-- of virtual object obj.
global vFieldName, maxfield
put "", " into delim
put (last char of obj is "._") into continuedFlag
if continuedFlag then delete last char of obj
put the number of items of obj into numChunks
-- Is it on this page?
if (i ≤ numChunks) or (i ≥ numChunks and not(continuedFlag)) then
-- Then perform the write operation.
if p="before" then put delim after t
if p="after" then put delim before t
do "put t" && p && "item i of" && vFieldName
-- Adjust for overflow as necessary.
if length(obj)+length(t)>maxField
then adjust "item"
return item i of obj
else
-- Else recurse to continued page.
put vFieldName & "_" into vFieldName
do "put" && vFieldName && " into obj"
return vItemW(i-numChunks, obj, t, p)
end if
end vItemW

function vLineW l, obj, t, p
-- Puts text t into, before, or after line l
-- of virtual object obj.
global vFieldName, maxfield
put return into delim
put (last char of obj is "._") into continuedFlag
if continuedFlag then delete last char of obj
put the number of lines of obj into numChunks
-- Is it on this page?
if (l ≤ numChunks) or (l > numChunks and not(continuedFlag)) then
-- Then perform the write operation.
if p="before" then put delim after t
if p="after" then put delim before t
do "put t" && p && "line 1 of" && vFieldName
-- Adjust for overflow as necessary.
if length(obj)+length(t)>maxField
then adjust "line"
return line 1 of obj
else
--- Else recurse to continued page.
put vFieldName & "_" into vFieldName
do "put" && vFieldName && " into obj"
return vLineW(l-numChunks, obj, t, p)
end if
end vLineW
-- Then recurse to continued page.
put vFieldName & "_" into vFieldName
if "put" && vFieldName && "into obj"
return vLine(l-numChunks, obj, t, p)
end if
end vLineW

function vCharW c, obj, t, p
-- Puts text t into, before, or after character c
-- of virtual object obj.
global vFieldName, maxfield
put (last char of obj is "_") into continuedFlag
if continuedFlag then delete last char of ...
if (c :::;; numChunks) - , 
or (c > numChunks and not (continuedFlag)) 
then 
-- Then perform the write operation.
do "putt"
&& p
&& "char c of"
&& vFieldName
-- Adjust for overflow as necessary.
if length(obj)+length(t)>maxField 
then adjust "char"
return char c of obj 
else 
-- Else recurse to continued page.
put vFieldName & "_" into vFieldName 
do "put"
&& vFieldName 
&& "into obj"
return vChar (c-numChunks, obj, t, p)
end if
end vCharW

on adjust chunkType
-- Moves the last chunk of type chunkType
-- from one (full) actual field to the next.
global vFieldName
put "_" into continChar
-- Delete & keep the last chunk from the field,
-- then add a continuation character to the field.
do "put last char of" && vFieldName && "into cc"
if cc=continChar
then do "delete last char of" && vFieldName
and "into obj"
do "put chunkType && "of" && -
vFieldName && "into theChunk"
do "delete last" && chunkType && "of" && vFieldName
if chunkType = "word"
thern do "put space after" && vFieldName
and "put continChar after" && vFieldName
-- Put the chunk at the start of next actual field. 
put continChar after vFieldName
put "before" into p
and "put" && vFieldName && "into obj"
do "put v" && chunkType && "W(l, obj, theChunk, p)"
delete last char of vFieldName
end adjust

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Wishing Upon a StarNine

Life with A/UX becomes more livable with this inexpensive package of utilities from StarNine

BY JAMES FINN

This month A/UXiliary Information begins more in-depth coverage of A/UX with a review of StarNine Utilities for A/UX. In the coming months we'll present news, product reviews, and articles to help both power users and novices get the most out of A/UX.

Apple's first release of A/UX is a respectably solid UNIX System V, but there are several things you wish it could do that it doesn't, such as toggle between A/UX and the Mac operating system at will. But even without that — promised in an upcoming update — there are other small annoyances that could be addressed.

If you want to copy a Macintosh file to the A/UX file system, you must first put it on a Macintosh File System (MFS) floppy (that's right, remember MFS and 400K disks?) and copy it from there. There is no easy way to copy files from A/UX to a Macintosh disk, and launching a Mac application from within A/UX often results in a hung system. You cannot capture screen images, nor is there a screen saver.

StarNine Utilities for A/UX is a package of seven utilities that solves all of the above problems and more. This package became indispensable to me as soon as I installed it. It lists for only $99; everyone with A/UX should have a look at it.

The utilities come with a manual and a one-page cover sheet that explains how to install them "when you can't wait to read the manual." Installation is simple and takes just a few minutes.

There are several ways to access the utilities. The most convenient way is to run $9term, which is Apple's term program modified to include a StarNine menu. term gives you the facility to create multiple resizable terminal windows, each with its own shell; running $9term gives you the same plus the StarNine Utilities always at hand. If you prefer, you can run the utilities alone by typing starnine.

Both $9term and starnine provide a Macintosh interface, complete with menus, dialog boxes and on-line help in windows. Additionally, you can access many of the utilities through A/UX commands, and installation creates entries for man, UNIX's on-line manual, for the new commands.
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Son of CP
A/UX \(\leftarrow \rightarrow\) Mac, also known as the hierarchical file system transfer (HFX) utility, copies files between A/UX and Macintosh volumes and launches Macintosh applications that have been copied to A/UX. This utility displays a dialog that is reminiscent of the Font/DA Mover (see Figure 1).

A/UX files appear on the left with Macintosh files on the right. You can copy files in either direction. However, copying A/UX files directly to a Macintosh partition on a hard disk may trash the hard disk. Instead, you should copy A/UX files to a Macintosh floppy and later move the files to the hard disk when running the Mac operating system. The HFX utility does let you initialize Macintosh floppy disks.

Rusty Rahm, president of StarNine, explains that no problems have been reported with copying directly to Macintosh hard disk partitions, but even Apple recommends against it, principally because of potential incompatibilities with third-party drives.

When copying from A/UX to Macintosh, you have several options. For example, you can choose to set the Type and Creator of the target file. If you are copying a text file, you can translate newline characters to carriage return characters (in UNIX, newlines separate lines in a file, while carriage returns serve the same function in the Mac operating system).

Although it is not documented, you must set the permission bits on an A/UX file to be publicly readable before you can copy the file to a Mac disk. For UNIX techies, this is because the utility runs with user ID set to bin in order to have permission to access the raw disk devices.

When you copy a Mac file to A/UX, your options include setting the permission bits of the target file and translating carriage returns to newlines for text files (see Figure 2). The copy is in AppleDouble format. This stores the resource fork of the Mac file in a separate A/UX file from the data fork, adding a percent character (%) to the beginning of the name of the resource file. A/UX filenames are limited to 14 characters in length, so the filename may be truncated during copying. However, HFX stores the original name in the resource fork and will restore it if you copy the file back to a Mac disk.

What's for Launch?
With A/UX 1.0, you must reboot your machine to switch between A/UX and the Macintosh operating system. However, you can launch a single Mac program with the A/UX Toolbox if it has first been copied to the A/UX file system. Unfortunately, Mac toolbox support from A/UX is still weak, and only particularly well-behaved programs can be launched successfully. A/UX comes with a launch facility, but StarNine's HFX utility adds pleasant improvements.

Suppose you have an untested Mac application and don’t know whether it will run under A/UX. If there is a problem, it may hang up the terminal, forcing you to reboot the system. HFX lets you launch the application with a background timer set to regain control after two minutes, so you can test applications without danger.

Snap a Snapshot
When you select the Snapshot utility, you get a dialog box in which you set a timer to capture the screen image after a certain number of seconds or minutes. The image is saved in a compressed format that can accommodate any screen size.
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Please circle 172 on reader service card.
Afterward you can return to the utility and view the snapshot. From there, you can select a MacPaint-sized portion of the screen image to save in a MacPaint file. This file can then be copied over to the Mac and edited further. The screen shots for this article were made with the Snapshot utility.

As a bit of icing on the cake, StarNine’s launch facility will optionally take snapshots repeatedly at user-specified intervals after an application is launched. These images can be saved later as MacPaint files using the Snapshot utility.

**Blank to You**
The Screensaver utility blanks the screen and displays a roving StarNine icon after a chosen number of minutes of inactivity. Clicking the mouse or pressing any key restores the screen.

**RAM Disk a la A/UX**
StarNine includes a RAM disk utility to configure part of the memory as a disk. If you have enough memory to spare, storing frequently accessed files and programs on a RAM disk can improve performance dramatically. Installing the RAM disk generates a new UNIX kernel. The installation program lets you select from a list of common packages (C compiler, StarNine Utilities, and text processing programs) to include in the RAM disk.

The manual explains how system performance can also be improved by using the A/UX `kconfig` command to increase the number of disk buffers used by the kernel. Using a RAM disk is recommended only for systems of at least 8 megabytes.

**Disk Tamers**
The last three utilities help with disk management. Disk Admin gives a graphic view of the partitioning of your hard disks (see Figure 3). Look for Disks searches for unrecognized SCSI disks and makes them available. For example, if you power on a hard disk after booting A/UX, you can use Look for Disks to access it without having to reboot the system.

The final utility is Audit System. This works with configuration master list (cml) files, which is the file format used by A/UX’s autorecovery system. Audit System gives you a simple way to perform some of the checks and fixes supported by autorecovery.

A cml file stores certain information about a set of files. Audit System compares this information to the current state of those files, reports any discrepancies, and optionally changes the files to match the description. Some of the items you can check include file ownership and group ownership, permission bits, file type (whether it is a directory or link, for example), and what other files the file is linked to.

StarNine Utilities includes a cml audit file for the utilities themselves, and a `mkcml` command that will create cml files for any set of files you choose. The audit facility would be particularly useful for someone maintaining a database of files on a network. Running an audit would quickly show whether someone had altered the permission bits of any essential files.

**Wishing and Hoping . . .**
Most of the utilities can be used both with A/UX commands and with the Mac interface via the StarNine menu. Surprisingly, some functions can be accessed in only one way. For example, you must use the Mac interface to use the HFX copy facility, and you must use the A/UX `mkcml` command to create new audit files.

It would be preferable if all functions could be accessed with either interface. I prefer the Mac interface for interactive work. Having commands for all the functions would enable you to include the functions in shell scripts.

StarNine is a UNIX software development and consulting company based in Berkeley, California. Their other projects include a TOPS server for A/UX and Mail*Link, a Macintosh to UNIX mail gateway program.

StarNine Utilities is a great collection of programs at a very reasonable price. StarNine plans to have the utilities available as DAs once Apple provides support for DAs in A/UX.
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<tr>
<th>Size (Megabytes)</th>
<th>CMS Enhancements</th>
<th>Crate 20</th>
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**Internal Hard Drives for the SE**

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**Mac II Internal Hard Drives**

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**Removable Disks**

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**Tape Back-Ups**

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<tr>
<td>MicroNet 150</td>
<td>$1,349</td>
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**Hardware Accessories**

- Anchor: 5 year warranty (includes Cable & Software)
- Everex: 2400 baud modem
- Farrallon: Mac Recorder
- Radius: 16+ Accelerator
- Radius: 25 Accelerator
- Full Page Display +, SE
- Two Page Display SE, II
- Radius Color Monitor

**Memory**

- SIMMs in stock: All hard disk drives carry a manufacturer's one year warranty except for the Crate & Quantum drives which have a manufacturer's two year warranty.

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Like a good wine, software changes over time. Admittedly, it's hard to keep up with all the new versions coming out, but it is important — it allows you to get the most out of your software. For those in the dark, here's a list of the most recent versions (as of press time) of many popular programs.

To see if you have the most current versions, check the About... item at the top of the Apple menu whenever you run a program.

In the realm of Apple System software, owners of 128K Macs should have System 2.0 and Finder 5.1. For those with the 512K, 512KE, or XL, you should be running System 3.2 and Finder 5.3. Everyone else should be running System 6.0.2, which should be out by the time this hits the stands.

Some of the more significant updates as of press time are AppleShare 2.0 and QuarkXPress 2.0. Winging its way over AppleTalk networks is Falcon 2.0. QuickMail made some quick fixes with version 1.0.4.

All programs listed here are HFS compatible. From this chart, you can extract the following information: CP or NGP copy protected or not; //, programs we've found to be Mac II compatible (not yet a comprehensive list); and $, for shareware (try before you buy).

Changes and new listings are in bold. Programs that appear to be compatible with the Macintosh II may not actually perform 100 percent of the functions they do on other Macintoshes, nor do they necessarily take full advantage of the Macintosh II.
MINIFINDERS

Have you often wished for a personal assistant to help in picking software? These MiniFinders may not breathe and move, but they do tell you what products are hot and, better, what these products do. Each of these items has been carefully reviewed and selected by the MacUser editorial staff. Each has been rated in increments of half names indicate this month's additions. Letters at the end of the entries indicate whether a product is copyright protected (CP) or not (NCP). If a product has been reviewed or quickly clicked in MacUser, the date of the review is shown. Eddy (Editor's Choice) Award winners are noted with a star and the year in which they won prizes for an excellent product. Next time you have to find products you can count on, count on MacUser!

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BUSINESS ACCOUNTING

Accountant, Inc. integrates accounts payable, accounts receivable, general ledger, and inventory modules. Prints checks, purchase orders, invoices, customized reports. Bare-bones accounting system limited in size and scope, but ease of use and integration make it suitable for small businesses. Requires 512K+; Version 1.1, $399. SoftSync, 162 Madison Ave., New York, NY 10016. NCP (Oct '87)

Back to Basics Accounting is a powerful double-entry accounting software package for the small business user with GL, AR, and AP modules. Exhaustive manual with numerous examples. Report capabilities are excellent. $199. Peachtree, 4355 Shackleford Road, Norcross, GA 30093. NCP (May '87)

BPI General Accounting is an easy-to-use system. Six journals, AR, AP, Payroll, and GL on one disk. Offset amounts automatically post to ledgers. Up to 8000 accounts. Detailed records, wide range of reports. Requires 512K+; $249. BPI Systems, 3001 Bee Cave Road, Austin, TX 78746. NCP (Aug '86)

Insight is a high-powered accounting program for the small-to-medium-sized business. Modules include Accounts Receivable, Payables, and General Ledger; others are in the works. Requires 512K and hard disk. $959. Layered, 529 Main St., Boston, MA 02129. NCP (Dec '86) ★86 Eddy

Rags to Riches integrated accounting modules (General Ledger and Accounts Receivable) uses Mac interface to the host. Information entered in one window automatically transfers. Detailed, flexible report options. Very easy to use, but it can be confusing with several windows on-screen. Requires 512K+ — accountant, $199.55 per module. Chang Labs, 5300 Stevens Creek Blvd., San Jose, CA 95129. NCP (Dec '85)

Rags to Riches Professional Billing tracks and bills professional services. Batch-activities for individual timekeepers. Uses stand-alone, or integrates with R to R modules. CP (Mac 512K+), printer, $399.55. Chang Labs, 5300 Stevens Creek Blvd., San Jose, CA 95129. NCP (Feb '87)

Simply Accounting has six ledgers and eight journals to handle the needs of most small-to-medium sized businesses. Better Mac interface than most. Payroll tax labels can't be modified, which forces you to subscribe to Bedford's yearly update service. Version 1.03, Requires 1 megabyte. $349. Bedford Software, 15311 N.E. 90th St., Redmond, WA 98052. NCP (Sept '86)

Strictly Business General Ledger features clear, well-outlined setup procedures and operations. Very flexible, up to 99 profit centers with up to 100 departments each, and customized reports. Program print spools. Requires 512K+, printer, and external drive. $395. Future Design, 13681 Wellington Drive, Westminster, CA 92683. NCP (Dec '85) ★85 Eddy

Timesheets tracks billing and time. Requires 5 megabytes of space for people who charge by the hour. DA turns the clock on and automatically bills a client when a session is over. Version 1.06. Requires 512K and two disk drives. Mac II and MultiFinder friendly. $199.95. North Edge Software, 239 Western Ave., Essex, MA 01929. NCP (Sept '86)

PERSONAL FINANCE

Dollars & Sense is a bookkeeping program. Easy to use, with a good manual and excellent on-screen help. Will handle up to 120 separate accounts or money categories. Uses standard double-entry accounting techniques. Will work on 128K. $149.95. Monogram, 8295 S. La Cienega Blvd., Inglewood, CA 90304. NCP (Sept '85)

MachnTax is an excellent tool for preparing tax forms. Intuitive, easy-to-use. Accepts data from leading personal finance programs. Good built-in help. Liberal upgrade policy for current owners. California forms set also available. Requires 5 megabytes. SoftClix, 1119 federal, Esquivel, Vista, CA 92081. NCP (Sept '85) ★85 Eddy

MacMoney is a financial manager that uses information gleaned from your checks and deposit slips. Produces a variety of reports and graphs. Version 3.1 reviewed. Requires 512K and printer, $118.95. Survivor Software, 11222 La Cienega Blvd., Inglewood, CA 90304. NCP (July '86) ★86 Eddy

Quicken helps you write checks, then keeps a ledger showing you where all of your money goes. Tax information is automatically generated. Version 1.0. Requires 512K and printer, $49.95. Intuit, 540 University Ave., Palo Alto, CA 94301. NCP (Nov '88)


DATABASES

Business Filevision is a graphic database. Much more powerful than the original, accepts MacPaint graphics. $395. Maravelin, 3420 Ocean Park Blvd., Santa Monica, CA 90405. NCP (Feb '86)

C.A.T. is a dedicated relational database for managing contacts, activities and time. Links between types of data make it easy to keep track of important people and events. $399.95. Chang Laboratories, 5300 Stevens Creek Blvd., San Jose, CA 95129. NCP (Nov '87)

dBASE Mac is a relational DBMS that includes a structured programming language to develop stand-alone applications. Palette icons as alternatives to menu commands will help novice users. Requires 1 megabyte — $495. Ashton-Tate, 2101 Hamilton Ave., Torrance, CA 90502-1319. NCP (Feb '88)

Double Helix II is a powerful database that supports a multiuser environment with an upgrade. Uses an icon-based development system for easy creation of databases. $595, single-user version. Odesta, 5084 Commercial Blvd., Northbrook, IL 60062. NCP (Apr '88)

EndNote provides database management for bibliographies. Designed to work in conjunction with a word processor. Allows for formatted In-text citations to be pasted directly into a word-processing document and then creates a bibliography from the citations. Version 1.0 reviewed. $125. Niles & Associates, 2200 Powell St., Suite 765, Emeryville, CA 94608. NCP (Feb '89)

FileMaker II is a multiuser version of the all-time best flat file manager for the Macintosh. New features include more flexible layouts, hierarchical menus, and color on the Mac II. Version 1.0. Requires 1 megabyte with
MAC USER FEBRUARY 1989

MINIFINDERS

two 800K drives or a hard-disk drive. $299. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (Dec '88)

4th Dimension is a versatile tool that creates stand-alone relational databases.

Design and layout environments allow easy linking of information. Robust, Pascal-like procedure language. $895. Actus, 200 Stevens Creek Blvd., Cupertino, CA 95014. NCP (Nov '87) $87 Edyd

FoxBASE+/Mac is a relational database that can read unmodified dBASE III PLUS applications created in the MS-DOS world. Amazingly fast. Good implementation of dBASE IV on the Mac. Version 1.0. Requires 1 megabyte. Mac II and MacFinder friendly. $300. Fox Software, Inc., 118 W. South Boundary, Perryburg, OH 43551. NCP (Sept '88)

MacDewey is a cataloging program featuring the Dewey Decimal Classification system. Uses predefined fill-in-the-blank fields to create catalog cards. Suffers from initial steepness in understanding. Not for professionals; home libraries might benefit. Version 2.5. $79.50. Mossoopet Software, 336 Coleman Drive, Monroeville, PA 15146. NCP (Nov '87)

Omnis 3 is a powerful database featuring concurrent-multi-file management. Can handle 24 files, 12 at a time, and is fully relational. Create custom environments, including user-defined menus, commands, and dialogues. $495. Elbyhe, 2929 Campus Drive, San Mateo, CA 94403. NCP (Mar '86)

Omnis 4 is a powerful database featuring concurrent-multi-file management. Full of features, including free rotation and one- and two-point perspective views. Version 1.3 reviewed. Requires 512KX. $395. Personal Bibliographic Software, Inc., P.O. Box 4520, Ann Arbor, MI 48105. NCP (Feb '89) $87 Edyd

OverVue is a powerful relational database that uses an object-oriented storing, summarizing, and report generation capacity. Has macros, and a charting function. Good manual. It can exchange files with a very wide variety of other programs (including IBM software). $295. ProVue, 222 2nd St., Redmond, WA 98052. NCP (Jan '88) $87 Edyd

ProCite is a complete database-management system for bibliographies. Almost unlimited flexibility in the formatting of bibliographies. Full-featured search and sort capabilities. Version 1.3 reviewed. Requires 512KX. $395. Personal Bibliographic Software, Inc., P.O. Box 4520, Ann Arbor, MI 48105. NCP (Feb '89) $87 Edyd

Record Holder Plus is a flexible, easy-to-use, form-oriented data manager. Setups are particularly simple and the searches are powerful. $69.95. Software Discoveries, 137 Kawski Drive, South Windsor, CT 06074. NCP (Apr '89) $87 Edyd

Reflex for the Mac is a flexible relational database. Excellent report generator gives full control over appearance, style of output. Requires 512KX, second drive, or hard disk. $99.95. Borland International, 4585 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (Dec '88) $87 Edyd

Reflex Plus is a relational database with "smart" entry and report design, but no overall programming facility. Simple to set up, yet fast. Graphic capabilities are quite limited. Version 1.0 reviewed. $279. Borland/Analytica, 4585 Scotts Valley Drive, Scotts Valley, CA 95066-9987. NCP (Feb '89)

Writer's Workshop maintains orderly records for writers. It can track manuscripts, income, and publisher. Based on and includes Runtime Helix. $99.95. Futuresoft System Designs, P.O. Box 132, New York, NY 10012. NCP (Apr '87)

NUMBER CRUNCHING

data collection is the best package in terms of quality of art. Other packages available. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $129. Artware Systems, 3741 Benson Drive, Raleigh, NC 27610. NCP (Aug '89)

Canvas is a Draw and Paint program that uses QuickDraw as its output language. Full of features, including free rotation and one-and-two-point perspective. Also has graphics macro commands, unusual in a program this inexpensive. Fully compatible with a Mac II. Version 1.0. Requires 512Kx and 800K of disk space to operate. $349.50. BrainPower, 24099 Ventura Blvd., Calabasas, CA 91320. NCP (Dec '86)

StatView 512+ is a very intuitive statistical analysis program with tools needed to understand any set of data. Holds data in a spreadsheet-like form. Full-featured, fast, and accurate. Extremely wide range of analyses possible. Requires 512KX and 800K of disk space to operate. $349.50. BrainPower, 24099 Ventura Blvd., Calabasas, CA 91320. NCP (Dec '86)

StatView II is a remarkably complete data analysis package. Essential for any kind of - or - analysis. An integrated environment. Features include a powerful macro function (with a recorder to make creation simple) and elaborate charting facilities. $12KX and external drive required. $395. Microsoft, 16011 N.E. 36th Way, Redmond, WA 98073-9717. CP

Click & Clip offers seasonal graphic packages. Of the two quarterly editions released, the Spring '88 package is the better collection. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $39.95 per edition. Studio Advertising Art, P.O. Box 18432-52, Las Vegas, NV 89114. NCP (Aug '88)

Comic Strips Factory is an assembly package for creating comic strips. Includes a database of parts for various characters and backgrounds for panels. Good text editing in balloons. Can import and export in MacPaint format. $89.95. Foundation Publishing, 5100 Eden Ave., Suite 307, Edina, MN 55436. NCP (Dec '87)

Cricket Draw is an object-oriented drawing program that will produce stunning, high-quality output. Designed to print on PostScript-compatible devices, such as the LaserWriter. $295. Cricket Software, 40 Valley Stream Parkway, Malvern, PA 19355. NCP (May '87)

Cricket Graph easily generates 12 graph types. Multiple windows can be displayed. Graph prints in up to eight colors with up to 16 patterns. Self-generating macro formatting. Switcher, HFS, LaserWriter, and plotter compatible. $195. Cricket Software, 40 Valley Stream Parkway, Malvern, PA 19355. NCP (June '86) $87 Edyd

Cricket Presents is a presentation tool with strong emphasis on graphics. Good master template. Lacks import capability for text. Version 1.0. Requires System 4.2 or later. $695. Cricket Software, 40 Valley Stream Parkway, Great Valley Corporate Center, Malvern, PA 19355. NCP (Nov '88)

Crystal Point creates an electronic kaleidoscope. It is MacPaint's Brush Mirrors gone wild in a small, simple, yet wonderful application. Does not work in color on Mac II. MacFinder friendly. Requires 512KX +. $49.95. Great Wave Software, 5933 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (Feb '88)
MINIFINDERS

Curator catalogs your art and graphics so it's easy to see what's what and where it is. Supports PICT, TIFF, EPSF, PostScript, MacPaint, and more. Changes creator types. Requires 512K and an 800K drive. $139.95. Solutions International, 30 Commerce St., Williston, VT 05495. NCP (Sept '88)

DeskPaint is a full-blown drawing program as a desk accessory. Allows you to turn up a graphic while in another application. Imports and exports MacPaint and TIFF images. Great for DTP, but not enough features to rival the leader in paint programs. 2edarcor, 4500 E. Speedway, Tucson, AZ 85712-5305. NCP (Mar '86)

EPS Illustrations is a potpourri of illustrations with no real focus. As an art package, this one is not very useful as you cannot alter any of the drawings. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $129.95. 5/Marker, 1973 Landings Drive, Mountain View, CA 94043. NCP (Aug '86)

EZ Draft is a high-level CAD application. Does things usually only found on mini-computer programs. Uses "pop-up" menus to supplement a full set of pull-down menus. Comes with an additional set of printer/plotter/monitor drivers. A real powerhouse. $1995. $500 for IEGS module to link to other CAD programs. Bridgeport Machines, 500 Lindley St., Bridgeport, CT 06605. CP (May '87)

FastForms! Construction Kit is both a fast and efficient business forms creator (a drawing program) and a specialized application (and DA) to fill out the data fields in your forms. $149 (U.S.). Shana Enterprises, Advanced Technology Center #105, 9560-20 Ave. Edmonton, Alberta T6N 1G1, Canada. NCP (Nov '87)

Full Paint is a two-disk collection of fonts. Forty-nine different items are included. All install easily in user systems. Most are well executed and some are extraordinarily rich. This is a real bargain for font lovers. $49.95. Casaday-Ware, P.O. Box 223779, Carmel, CA 93922. NCP

Fontastic is a font editor that features a large editing window with a grid to make positioning easy. Select letters to edit by clicking on a matrix of the font. Allows scaling of existing fonts and previewing the various styles. $49.95. Altsys, P.O. Box 865410, Plano, TX 75086. NCP (Dec '88)

Fontographer is a complex, but excellent laser font creator. The fonts created have 300-bit-per-inch resolution. The fonts are actually downloadable PostScript files. $395. Altsys, P.O. Box 865410, Plano, TX 75086. CP (Dec '88)

FreeHand greatly simplifies the drawing of curves, the use of layers and text handling when manipulating PostScript graphics. And it works in color on the Mac II. Requires 1 mebyte and two disk drives. $495.4 Altsys, 411 First Avenue South, Seattle, WA 98104. NCP (Aug '88)

FullPaint is an expanded version of MacPaint. Features include full-screen drawing, up to four documents open simultaneously, brush editing, and movable tool palettes. $99.95. Ashton-Tate, 2011 Hamilton Ave., Tor­rance, CA 90052-1319. NCP (June '86) * Eddy

GraphicWorks 1.1 is a powerful drawing and painting program that creates high-resolution bit-maps. Ensell contains graphics, billboards text, and both reside on paper. Graphic sensitivities are new. Requires 1 mebyte. $1495. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. NCP (Oct '87)

Illustrator 88 is a professional-level graphics program from the people who defined the PostScript language. Uses templates for precise drawing and detailed artwork. Requires 1 mebyte. $495. Adobe Systems, 1585 Charleston Road, Mountain View, CA 94039. NCP (Oct '88)

Image Club is an overwhelming collection of EPS clip art available on disk and CD-ROM. Comes with a well-designed catalog of images. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $39. Image Club Graphics, 2915 19th St. N.E., Columbus, Alberta 727 62. NCP (Aug '88)

ImageStudio puts a photo-retouching lab on the desktop. Editable brushes let you modify digitized images In 65 gray levels. Version 1.0 reviewed. Requires 1 mebyte and two 800K disk drives. Macillan MultiFinder friendly. $495. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653. NCP (June '88)

Images with Impact brings clip art out of the turn-of-the-century woodcut style and into a modern graphic sensibility. "Graphics and Symbols 1" is the first in a series. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $99.95. 3G Graphics, 11410 N.E. 124th St., Kirkland, WA 98034. NCP (Aug '88)

Japanese Clip Art is a two-disk set of extraordinary Japanese clip art. Consists of MacPaint documents and separate fonts. Volume I, Heaven, covers mythical subject matter; Volume II, Earth, has secular subject matter. $79.95 each volume; $149.95 each set. Qualitas Trading, 6907 Norfolk Road, Berkeley, CA 94705. NCP (Apr '87)

Japanese Font 8 is a two-disk set of extraordinary Japanese clip art. Consists of MacPaint documents and separate fonts. Volume I, Heaven, covers mythical subject matter; Volume II, Earth, has secular subject matter. $79.95 each volume; $149.95 each set. Qualitas Trading, 6907 Norfolk Road, Berkeley, CA 94705. NCP (Apr '87)

LaserFonts are new fonts for the LaserWriter. Users download them to their machines. Very high quality and very simple to use. Willamette looks like Avant Garde. MicroFonts provides tiny, expanded, and condensed versions of the LaserWriter's own fonts. $34.95 to $44.95 each. Century Software, 2483 Hearst, #175, Berkeley, CA 94709. NCP

LaserPaint's clumsy interface makes it a slow program. There's good laser output if you persevere through the creation of a document. The support is scads better than the documentation. Version 1.1.4. $495. LaserWare, P.O. Box 668, San Rafael, CA 94915. CP (Jan '88)

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### MINIFINDERS

**LaserTalk** is a PostScript programming tool that establishes interactive contact with laser printers. Preview window and on-line help make it a powerful tool. Requires 1 megabyte + and a PostScript Printer. $249. Emerald City Software, P.O. Box 2103, Menlo Park, CA 94026. CP until registered (May '88)

**MacArt Dept.** is a collection of over 150 graphic images ranging from foods to hands holding signs to borders. Best suited for letterheads, memos, other business use. $39.95. Simon & Schuster, Computer Software Div., 1 Gulf + West Plaza, New York, NY 10023. NCP (Mar '88)

**MacCalligraphy** simulates brush painting, and enables you to design your own signature tool and the style of brush you use. Takes some getting used to. $175. Quillads Trading. 6907 Norfolk Road, Berkeley, CA 94705. NCP (Feb '88)

**MacDraft** is an object-oriented graphics program. It sports advanced features such as variable scaling, single-degree rotation, complex arcs, auto-dimensioning, and variable zoom/reduction. $249. Innovative Data Design, 2280 Bates Ave., Concord, CA 94520. NCP (Feb '86)

**MacDraw II** updates the venerable object-oriented draw program. Adds differing and color patterns in its own documents, but doesn't support color in the PICT II format. Version 1.0. Requires 1 megabyte, and two 800K disk drives or hard disk. $395. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (Nov '87, Nov '85 Eddy)

**MacGraphics** is an overwhelming collection of bit-mapped clip art—13 thematic disks containing 10 megabytes of art. Unfortunately, most pictures are full-page, and reproduction quality suffers when they are reduced. Version 3.0. Reviewed. $225. GoldMind Publishing, 1215 Magnolia Avenue, Suite 3-B, Riverside, CA 92503. NCP (Jan '89)

**MacPaint** hasn't lost its shine after all these years. Version 2.0 supports multiple windows, design templates, and a magic eraser for corrections. It lacks free rotation or distortion talents. Requires 512K and second disk drive. $125. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (July '88)

**Mac3D** is a feature-laden 3-D program with a MacDraw-like interface. PostScript resolution sharing with six variables, support of resources, and many more features. Clumsy interface to rotate objects and camera. Version 2.0. $249. Challenger Software, 18350 Kedzie Ave., Home- wood, IL 60430. NCP (Jan '87)

**MapMaker** is a digital cartographer that charts demographic and marketing information on a geographical basis. Wide variety of maps available, some at an additional cost. Version 3.0. Requires 512K. $349. Select Micro Systems, 40 Triangle Center, Yorktown Heights, NY 10598. NCP (Dec '87)

**MGMS: Professional CAD for Macintosh** offers more than 200 functions. Very complete, capable program. Groups, Dimension, Libraries, etc., are standard. Sometimes confusing — designed for experienced, professional CAD user, not the novice. Full plotter support. 512K+. $799. Micro CAD/CAM/3D, 1250 Overland Ave., Los Angeles, CA 90034. NCP (Nov '87) $85, 87 Eddy

**MiniCAD** is a pro-level CAD package. Various array features, many accessible only through Command/Shift/Option key combinations. Works in 2-D or 3-D with easy transition from one to the other. MacDraw-like interface makes it easy to learn and use. Version 3.0. Requires 512K+. Diehl Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043. CP (Oct '88)

**Modern Artist 2.0** is still an interesting color paint program and has added a few new features, but there's not enough here just to justify the substantial price increase. Requires Macintosh II, $495. Computer Friends, 14250 N.W. Science Park Drive, Portland, OR 97229. NCP (Feb '89)

**PictureEase** is a powerful graphic library. You can store paint and PICT formatted items and attach keywords for later search and retrieval. $69.95. Symmetry, 761 E. University Drive, Mesa, AZ 85203. NCP (Sept '87) $86 Eddy

**Pixel Paint** is a color paint program with customizable palettes and a lot of special effects. Slow Open and Save. Requires Mac II, 2 megabytes, and 8-bit video card. $495. SuperMac Software, 295 N. Bernardo Ave., Mountain View, CA 94043. NCP (May '88)

**Post Art II** is a collection of signed originals on disk. Overall, a pretty useless collection in terms of clip art. Mean for hanging prints on a wall. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $69.95. Oodua, 7520 Red Road, S. Miami, FL 33143. NCP (Aug '88) $86 Eddy

**PowerPoint** is an easy-to-use desktop presentation tool. Good color schemes. Can send presentations to Geniographics to produce color 35mm slides. Version 2.0. Requires System 4.1 or later, 1 megabyte and two 800K drives or hard disk. $395. Microsoft, 16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-9717. NCP (Aug '87)

The Print Shop makes it easy to create greeting cards, signs, banners, and letterhead. Uses its own special graphics and can import PostScript files. Hard drive users get version 1.02 or later. $79.95. Broderbund, 17 Paul Drive, San Rafael, CA 94903. CP (Sept '87)

**SpaceEdit** is a 3-D CAD program. Displays shows top, front, side, and axonometric views of an object, all at once or one at a time. Has standard CAD features plus zoom, exploded view, animated flyover. Suppression of hidden lines is very slow. Requires 1 megabyte +. $625. Advent, 9903 Santa Monica Blvd., Beverly Hills, CA 90212. CP (July '87)

**StandOut** is a presentation program built around a strong text and graphics support. Automatic text flow around graphics objects. Lacks good graphic examples. Version 1.0. Requires 1 megabyte and two 800K disk drives or hard disk. $395. Letraset, 40 Eisenhower Drive, Northridge, CA 91325. NCP (Dec '87)

**Studio/8** is a professional-level color painting application for the Mac II. Superior tool set, elegant interface, excellent performance, and speed. Version 1.0. Requires Mac II and hard disk; 2 megabytes of RAM recommended. $495. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. NCP (Jan '89)

**SuperPaint** is a powerful, easy-to-use graphics program with all the best features of MacPaint and MacDraw — and then some. LaserBits provides 300 dpi magnification, and there are 40 editable brush shapes. Requires 5 1/2K + $149.95. Silicon Beach Software, 9560 Black Mountain Road, P.O. Box 261430, San Diego, CA 92126. NCP (Feb '87) $87 Eddy

**Super 3D** is a high-power 3-D modeling program with an excellent integrated interface. Powerful time-saver. Features include animation, import/export, an excellent integrated interface. Version 1.0. Requires 1 megabyte. $295. Silicon Beach Software. 9560 Black Mountain Road, P.O. Box 261430, San Diego, CA 92126. NCP (Jan '88)

**Tracepy** is a powerful presentation worksheet that combines mathematical functions and graphic representation. The interface, which consists of an icon bar, is easy to use. Mac II and color supported. Version 2.0. $395. Access Technology, 5550 Heritage Harbor, Monterey, CA 93940. NCP (June '88) $125. Challenger Software, 2124 Main St., Huntington Beach, CA 92648. NCP (July '88)

**TrueForm** takes a scanned image of a paper form and turns it into an electronic equivalent, complete with fields for entering data. It can automatically sum numeric fields. Requires external 800K drive. $495; run-time version. Requires 1 megabyte, user-defined resources, and MacDraw-like interface. $149. Silicon Beach Software, 9560 Black Mountain Road, P.O. Box 261430, San Diego, CA 92126. NCP (Aug '88)

**Videoworks II** is an easy-to-use animation tool — the best available on the Mac. Has an Overview mode that acts as a slide show carousel for presentations. Works in color on the Mac II. $195. Requires 1 megabyte + and an 800K drive. MacroMind, 1028 W. Wolfram, Chicago, IL 60657. NCP (Mar '88) $85, 87 Eddy

**Videoworks II Accelerator** compiles Videoworks II movies to make them run more smoothly. Compensates for the QuickDraw screen display. Version 1.0. Requires 1 megabyte + and an 800K drive. MacroMind, 1028 W. Wolfram, Chicago, IL 60657. NCP (Mar '88)

**Videoworks II Clip Animation**. $149. Requires 1 megabyte + and an 800K drive. MacroMind, 1028 W. Wolfram, Chicago, IL 60657. NCP (Aug '88)

**WetPaint** consists of two three-disk volumes of very high quality clip art. Also includes the Art Roundup DA, a good art browser/editor. Volume 1, 2, $39 each; both volumes, $59. Available in PictureEase format for $15 extra per volume. Dub-Clip Software, 18201 Gresham St., Northridge, CA 91325. NCP (Sept '87)

**World Class Fonts** comes in two volumes of three disks each. Includes all the Mac's fonts and a lot more, including two useful utilities. This is now the best collection of ImageWriter fonts available. Each volume: $39; both volumes: $59. Dub-Clip Software, 18201 Gresham St., Northridge, CA 91325. NCP (Dec '88)

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**DESKTOP PUBLISHING**

**Interleaf Publisher** is a speedy multimaster layout system for producing large, complicated documents. Has strong global formatting ability but can’t use downloadable fonts. Requires Mac II with 5 megabytes of RAM and 40-megabyte hard disk, $2,495. Interleaf, 10 Canal Park, Cambridge, MA 02141. NCP (May '88)

**JustText** is a professional-level word processor and page makeup program that generates PostScript output. Comes with a set of LaserWriter utilities that allow total manipulation of art and text. Requires LaserWriter or other PostScript compatible output device. $195. Knowledge Engineering, G.P.O. Box 2139, New York, NY 10116. NCP (Dec '85)
MacTeX is the TeX environment of choice for hardcore TeX users on the Macintosh. Very intimidating for others. Painfully slow and visually unattractive. Version 2.0. Requires 1 megabyte +. $750. FTI Systems, 234 Eglinton Ave. E., Toronto, Ontario M4P 1K5, Canada. NCP (Apr '86)


Portfolio: Designs for Newsletters provides more than 20 templates for two-page newsletters with preset columns, headlines, graphics, and captions. Documentation provides excellent tutorial in page design. Requires 512K - PageMaker. $70.95, Aldus, 411 First Ave. S., Suite 200, Seattle, WA 98104. NCP (May '87)

Publishing Packs bundle together three Adobe typefaces that work well for a particular publishing project. The packages offer substantial savings over purchasing the typefaces individually, and the documentation has useful information on typeface characteristics. Newsletters, $395; Foms & Schedules, $475; Presentations, $475. Adobe Systems Inc., 1585 Charleston Road, Box 7900, Mountain View, CA 94039. NCP (Feb '89)

QuarkStyle is a collection of 72 designer-created templates for "instant" desktop publishing. The templates, which cover the gamut from business cards to newsletters, let you concentrate on a page's contents rather than its appearance. Version 1.0. Requires 1 megabyte and hard disk, $295. Quark, 1983 Landings Drive, Mountain View, CA 94043. NCP (Feb '85)

QuarkXPress is a powerful page-layout program, with 24-bit color, style sheets, and search and replace of text attributes. Also does four-color separations. Layout is done using text and picture boxes, which improves control but is difficult to master. Version 2.0. Requires more than 1 megabyte as well as a hard disk. $795. Quark, 1983 Landings Drive, Mountain View, CA 94043. CP until registered. (Jan '89)

Ragtime is an "Integrated Page Processor" with text, graphics, and built-in spreadsheet. Flow text automatically from one frame to another. Spreadsheet has a full set of functions. Excellent, easy-to-use program. Requires 512K +, $395. Orange Micro, 1400 N. Lakeview, Anaheim, CA 92807. NCP (Aug '88)

ReadySetGo! 4 has an elegant interface and excellent manual. Powerful text and paragraph features, fast word processor with hyphenation and spelling check and custom styesheets. Requires 1 megabyte +. $495. Letraset, 40 Eisenhower Drive, Paramus, NJ 07652. NCP (Feb '88) ! * 86 Eddy

TeXtures is an implementation of TeX, the big daddy of typesetting programs. Good for people trained on mainframes in the early days. Otherwise very sticky with a high learning curve. Version 1.0. Requires 512K +. $495. Blue Sky Research, 534 S.W. Third Ave., Portland, OR 97204. NCP (Apr '86)

** COMMUNICATIONS **

AppleShare is the file sharer marketed by Apple. Software-based, AppleShare requires you to dedicate a Mac and a hard disk to run it. Allows users on the network to protect things from other users on the folder level. Interface to network is provided at a revised Finder. $799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (May '87)

ComServe allows you to share a Hayes-compatible modem over an AppleTalk network. You can call out, but you can't call in. Works with most telecommunications packages. $185 per server. InfoSphere, 4730 S.W. Macadam Ave., Portland, OR 97201. CP (Feb '88)

Desktop Express is a simple-to-use, semi-automated program for using MCI Mail and Dow Jones News/Retrieval. Performance is traded off for ease of use. Requires 512K +, $149. Dow Jones, P.O. Box 300, Princeton, NJ 08543. NCP (Jan '88)

InBox is an easy-to-use mail interface. It's called up from a desk accessory. Has a very slick interface. Dedicated Mac not required. $350 for starter set, which includes one Administrator disk and three Connection disks. Additional Connections cost $125 each. Tops, 950 Marina Village Parkway, Alameda, CA 94501. NCP (May '87) ! * 86 Eddy

InTalk comes with its own communications command language able to do unsupervised sessions. Supports Xmodem and MacBinary. Has a macro key function. Many sample setup documents and command language files provided. $195. Palantir, 12777 Jones Road, Houston, TX 77070. NCP (Prem)

LapLink Mac quickly transfers data to and from the MS-DOS and Mac environments. Kit contains a cable and software. Control of transfer is on the IBM side. Version 1.2. Requires 512K. $139.95. Traveling Software, 19310 North Creek Parkway, Bothell, WA 98011. NCP (Aug '88)

MacTerminal provides basic telecommunications and terminal emulation. Doesn't have macrons nor any sort of auto redial/auto log-on capability. Best for those needing faithful VT100 or IBM 3278 emulation — it is superb at those. $125. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (Prem)
MINIFINDERS

MacWorkStation is a development environment and communications program that accesses custom mainframe applications through the Macintosh interface. Modular design allows for expandability. Mac II and MultiFinder friendly. Version 3.0. $2,500 for internal use license, $5,000 for commercial use license. Apple Software Licensing, 20252 Mariani Avenue, Cupertino, CA 95014. NCP (Oct '88)

MicroPhone is a high-powered terminal program that's easy enough for novices. Very powerful command language allows full automation of communications. Features: 128,295, Software Ventures, 2907 Claremont Ave., Berkeley, CA 94705. NCP (July '86) ★☆ 83 Eddy

Microsoft Golf is an electronic mail system that runs under AppleTalk. Supports file transfers across the mail system. Full on-line help facility. Also includes "What's Next" messaging. Desk accessory based. Not determined by number of users licensed. One to four users, $299.95, five to ten users, $499.95, 11 to 20 users, $749.95, 21 or more users, $949.95. Microsoft, 1801 N. 36th Way, Redmond, WA 98073-9717. NCP (May '87) ★☆ 87 Eddy

PC MacTerm/pcAnywhere Ill are two programs that work together to take control of an MS-DOS machine from the Mac keyboard. Versions: PC MacTerm 1.1, pcAnywhere Ill 3.0. Requires 512K, System 4.1 or later, 128K IBM-PC compatible and MS-DOS 2.1 or later. PC MacTerm, $99; pcAnywhere Ill, $149. Dynamic Microprocessor Associates, Inc., 60 East 22nd St., New York, NY 10016. NCP (Jan '89)

Red Ryder is a full-featured telecommunications program that supports MacBinary, Xmodem, and Kermit. Has big screen-support, auto procedure creation, and up to four users on same keyboard. The size of the frame is based on late '82. $80, Freesoft, 150 Hickory Drive, Beaver Falls, PA 15010. NCP (Dec '87) ★☆ 87 Eddy

Smartcom II balances power and ease of use. Capable of unattended operation and has a powerful command language. Supports MacBinary, Xmodem, and Hayes Verification protocols. The large-screen buffer can easily be archived. $149, Hayes, 5923 Peachtree Industrial Blvd., Norcross, GA 30092. NCP (July '86) ★☆ 85 Eddy

TOPS is a file server designed to network users with different operating systems. Supports Macs, MS-DOS compatible, and UNIX. Access to files and subdirectories is transparent to the user; they appear as Mac files. Only handles ASCII or Text files. $249 for Mac version. TOPS, 950 Marina Village Parkway, Alameda, CA 94501. Serial number protected. (May '87) ★☆ 87 Eddy

VeraTerm-Pro is a very powerful terminal program with several special features. Does one of the best VT100 emulations available and specializes in high-quality Tektronix 4014 and 4105 emulation. A pro's tool. Requires 512K+; $250. peripherals, Computers & Supplies, 2475 Perkins Ave., Mount Penn, PA 19065. NCP (Apr '87)

WORD PROCESSORS

ArchText is a text processor with many hypertext capabilities, as well as the ability to include graphics. "Nodes" of text are accessed by means of hyperlinks. Very powerful. Version 1.0 required. Reviews 1 megabyte. $345, Brainpower, 24003 Ventura Blvd., Suite 250, Calabasas, CA 91302. NCP (Feb '89)

Document Compare allows users to compare any two MacWrite 4.5, ASCII, or MDS documents. Differences in spelling, punctuation, formatting, and wording are identified. Documents can be printed out with differences highlighted. $99. Legalease, 33 Young St., Toronto, Ontario M5E 1S9, Canada. NCP (May '86)

Document Modeler can automate much of a professional office's correspondence. Comes in two parts: Template Maker and Modeler Maker. Initial setup requires time and is complex. $299.95. Legalease, 33 Young St., Toronto, Ontario M5E 1S9, Canada. NCP (May '86)

Doug Clapp's Word Tools is a useful punctuation and style-editing program. It would turn you into Proust, but it will help you make your writing cleaner and clearer. Word counts among different formats show discrepancies, but not to worry. Requires 512K+; $79.95. Aggis Development, 2125 Pico Blvd., Santa Monica, CA 90405. NCP (Sept '87)

Expressionist is a powerful DA that allows you to create complex mathematical equations from within an application. Equation manipulation has never been easier. $73.95. Alan Bonadio Associates, 1579 Dolores St., San Francisco, CA 94110. NCP (July '87)

FullWrite Professional combines outlining and word processing with page layout and drawing. Its many features translate into sluggish performance unless you have a lot of extra RAM. Impressive. Version 1.0. Requires 1 megabyte. Mac II and MultiFinder friendly. $385. Addison-Tate, 101 Hamilton Ave., Torrance, CA 90502. NCP (Sept '88)

Graham Speller is a desk accessory-based spelling checker. Includes macro features. Good guesser in interactive mode. Clumsy interface. Version 1.1. $44.95. Graham Software, 8620 Ingalls Circle, Arvada, CO 80003. NCP (Sept '88)

Kadmos Greek Font is a full character set of ancient Greek that prints on any PostScript printer. Requires learning new typing skills, but excellent quality makes it worth the effort. $85. Alphatype Typographies, 1600 Packard Road, Ann Arbor, MI 48104. NCP (Oct '87)

Laser Writer Speller is a third-party spell checker. Good matching capability. Has style sheets, word count, and page layout capability. $199.95. Firebird Licensees, P.O. Box 49, Ramsey, NJ 07446. NCP (Mar '87)

Liberty Spell Checker is a fast, effective, interactive checker. The dictionary is smaller than average, but well chosen. Unfortunately, it has a few misspelled words. $59.95. DataPak, 14011 Ventura Blvd., Sherman Oaks, CA 91423. CP (Oct '86)

Lookup! is a window-based word spelling checker. Designed for the way writers really work. Uses the 93,000+ word Spellcheck dictionary. $49.95. Working Software, 321 Alvarado, Suite H, Monterey, CA 93940. (Dec '87) NCP

MacGAS is a DA spelling checker with both a small and extended dictionary. Its best point is the excellent thesaurus. Provides antonyms and glossary. A slow checker. $99. EnterSet, 2380 Elsworth, Berkeley, CA 94720. CP (Oct '86)

MacProof is a grammar, style, and spelling checker that's like having your own personal copy editor. Grammar rules are fixed, and you may not agree with the choices. The program only suggests corrections, it doesn't make them for you. And the checking process can be slow if your document is long. $195 for stand-alone version; $2,500 for networked version. Automated Systems for Processing Text, 190 W. 890 North, Provo, UT 84604. NCP (Apr '87)

Macspell is a spelling checker that installs as a desk accessory. Works easily with MacWrite 4.5 and 2.2 and Word, but has some drawbacks. New version 1.3 just released. Requires 512K+; two drives or hard disk. $99. Creighton Development, 16 Hughes St., Irvine, CA 92718. NCP

MacWrite is starting to show its age. While still a good, basic program, it's outperformed by its competition. Probably enough for the occasional user. Version 5.0 includes command key equivalents, and spelling checker. Requires 512K+; $125. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (June '88) ★☆ 85 Eddy

MergeWrite is a mailbox merge program for MacWrite (also works with ASCII files). Conveniently combines names and addresses from a data file into predefined fields in a form letter. Also allows simple conditional IF-THEN-ELSE equations. $49.95. Software Discoveries, 137 Kawski Drive, South Windsor, CT 06074. NCP (Dec '87)

MiniWrite integrates outlining and word processing better than anyone. Version 1.1 fixes many problems of the earlier version. Sophisticated search and select options. Unimpressive speed. $295. Access Technology, 5550 Heritage Harbor, Monterrey, CA 93940. NCP (Feb '88)

QUED/M is an excellent text editor that saves documents in a form readable by Microsoft Word. Does not support graphics or multiple fonts. Programming language allows creation of database. Version 2.0. $129. Paragon Concepts, 4954 Sun Valley Road, Del Mar, CA 92014. NCP (Mar '88)


Sensible Grammar corrects some of the more glaring errors that writers make. Also analyzes the word count and structure of sentences to come up with a readability rating, Slow. Version 1.1d. Requires 512K. $99.95. Sensible Software, 335 E. Big Beaver, Suite 207, Troy, MI 48083. NCP (Dec '86)

Spelling Champion is a fast and accurate batch-type spelling checker. Back-up feature allows you to undo corrections in a paragraph. Works only with MacWrite 4.5. $99.95. Champion Software, 9617 Gettysburg Drive, Madison, WI 53705. NCP (Oct '86)


Spellwell is a stand-alone batch spelling checker. Also checks for punctuation and other errors. Good dictionary, thorough checking, simple interface. Version 1.0, $195. Working Software, P.O. Box 1844, Santa Cruz, CA 95061. NCP (Sept '88) ★☆ 85 Eddy

Thunder! is a desk accessory spelling checker. Includes macro features. Very fast, good guessing of misspelled words. Small dictionary. MultiFinder host. Version 1.1. $49.95. Electronic Arts, 1820 Gateway Drive, San Francisco, CA 94105. NCP (Sept '88)

Word Finder is an electronic thesaurus that won't replace your trusty Roget's, but is still useful for checking synonyms on the fly. Large, respectively Version 2.0. Requires 512K. Mac II and MultiFinder friendly. $59.95. Microlytics, 300 Main St., Rochester, NY 14645. NCP (Sept '88)
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Word 3.02 is the most feature-laden word processor around. Also has Microsoft's somewhat unusual view of what the Mac interface is. Esoteric command key combinations. Requires 512K+. $385. Microsoft, 1601 N.E. 36th Way, Room 3615, Redmond, WA 98052. NCP (Mar '88)

WordPerfect is a good choice for offices needing compatibility, but not so hot otherwise. Good internal file-management system and macro maker. Uses hidden formatting codes, hierarchical menu system. Requires Mac 512KE, System 4.1 or later. Two 800K disk drives or a hard disk recommended. Not fully compatible with System 6.0. $395. WordPerfect, 1555 N. Technology Way, Orem, UT 84057. NCP (Feb '89)

WorksPlus Spell is a speedy spelling and hyphenation checker for Microsoft Works. It includes a glossary for abbreviations and time/date stamping. The biggest drawback is its limitation to one program, $59.95. Lundeen & Associates. P.O. Box 30038, Oakland, CA 94604. NCP (Oct '87) ★★ $79 Eddy

Write is a "beginner's" version of Word 3.0. More features than some word processors in its class, but not all of the features work well. Poor value, and expensive upgrade path to Word. $175. Requires 512K+. Micro-soft, 16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-9717. NCP (May '88)

WriteNow for the Macintosh has many of the features of MacWrite and then some, including the ability to work in columns. Has built-in spelling checker with 50,000-word dictionary. $175. T/Maker, 1973 Landings Drive, Mountain View, CA 94043. NCP (Mar '87)

HyperCard is a totally unique program for the Mac. It uses an icon metaphor. HyperTalk. Requires 1 megabyte +. Free with new Macs and bundled with many HyperCard stacks, otherwise $49.95. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (Doc '87) ★★ $79 Eddy

SoftPC puts an IBM PC/XT inside your Mac without cracking the case to add any special co-processor boards. The emulation of an MS-DOS machine is done entirely in the software. Version 1.2. Requires Mac II or SE equipped with 68020 accelerator card; 2 megalobies of RAM. $595. Insignia Solutions, 1255 Post St., Suite 625, San Francisco, CA 94109. NCP (Nov '88)

System Tools 5.0 is the Apple System upgrade for Mac Plus, SE, and II owners. It contains MultiFinder (a multitasking environment), a LaserWriter spooler, and a Control Panel resource to add color on the Mac II desktop. Requires 1 megabyte +. $49. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (Mar '88)

System Tools 6.0 contains an improved version of MultiFinder and new features like CloseView (for visually impaired users), MacSp, and MacroMaker. Incompatible with many programs; lots of small bugs. Requires 1 megabyte +. $49. Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014. NCP (Nov '88)

HYPERCARD

Business Class is a HyperCard stack that contains world travel information and itinerary planning. Uses maps to locate countries of interest, but it lacks United States domestic travel information. Requires 1 megabyte + and HyperCard. $49.95. Activation, 3885 Bohnannon Drive, Menlo Park, CA 94025. NCP (Mar '88)

City to City imparts travel information on 31 U.S. cities including details on hotels, restaurants, and nightlife. Helps plan an itinerary. Requires HyperCard, two disk drives, and a printer. $49.95. Activation, 3885 Bohnannon Drive, Menlo Park, CA 94025. NCP (Sept '88)

Focal Point is a HyperCard stack that ties together a calendar, phone log, client accounts, and more in one easy-to-use organizational tool. Requires 1 megabyte + and HyperCard. $99.95. Activation, 3885 Bohnannon Drive, Menlo Park, CA 94025. NCP (Mar '86)

HyperAtlas is a collection of U.S. and World maps that are networked to stacks containing economic, political, and population data. Version 1.0. Requires HyperCard and second disk drive or hard disk. $99. MicroMaps Software, P.O. Box 757, Lambertville, NJ 08530. NCP (Oct '88)

HyperDA lets you browse through HyperCard stacks through a disk accesso­ry. A true equalizer for 512K Mac owners who cannot normally access stackware. Doesn't support global variables. Requires 512K+. $69.
HyperTutor is a stack that teaches HyperTalk, Hypercard's programming language. Uses an interactive Test Mac on each card to write scripts. A correct use of the language. Select a common command, and dialog Reports endows HyperCard stacks with the power to sort and impart information. VideoWorks II HyperCard Driver lets you play movies directly from a stack. One power of a stand-alone program, and then some. Can save files as Acta automatically depicts relationships between systems. Complex, detailed program Comment is an electronic version of Post-it Notes. A mini-word processor lets you become unwieldy when many criteria and examples are used. Over-priced. Version 1.4 reviewed, Requires $19.95. Softsync, 162 Madison Avenue, New York, NY 10016. NCP (July '88)

MacSMARt is a set of eight useful DAs and applications. Earlier version was not recommended for use with databases. $49.95. Magic Software, 1854 Fuller Road, West Des Moines, IA 50265. NCP (Dec '86)

ORGANIZATIONAL TOOLS

Acta is an outline processor in desk accessory format. It has practically all the power of a stand-alone program, and then some. Can save files as Acta outlines, MacWrite files, or text files. Version 2.0. $79. Symmetry Corporation. 761 E. University Drive, Mesa, AZ 85203. NCP (Oct '88)

Comment is an electronic version of Post-it Notes. A mini-word processor lets you attach notes to a spreadsheet cell, to words in a text document, or to a window on the desktop. Version 2.0. Requires $99.95. Daneka Software, 3305 N.W. 74th Ave., Miami, FL 33122. NCP (Dec '88)

Design is a powerful organizational tool. It goes beyond mere flowcharting. Graphically depicts relationships between systems. Complex, detailed program FlowMaster charts your ad dollars in print. TV, billboard, and other mediums. $249. Odyssey, 4520 Adored Lane, Suite D, Commerce, CA 90040. NCP (Jan '89)

For the Record is a database specifically designed for legal, financial, and personal records. Allows password locking of screens containing sensitive personal data. Version 1.0 reviewed. Requires $19.95. Nolo Press, 350 Parker St., Berkeley, CA 94710. NCP (Feb '89)

FormSet Business Forms Edition brings a wealth of business forms, such as expense reports and profit/loss statements, into the electronic arena. Fields are automatically calculated. Can't be customized beyond adding logo. Version 1.0. Requires $129 and two 800K floppy drives or hard disk drives. $199.95. SoftView, 4820 Adored Lane, Suite D, Commerce, CA 90040. NCP (Jan '89)

GeoQuery puts your database on the map by accessing zip code information. Comes with maps of the U.S. Other areas available. Version 1.0 reviewed. Requires 1 megabyte + and second disk drive. $349. Odyssey, 4520 Adored Lane, Suite D, Commerce, CA 90040. NCP (Jan '89)

Guide allows you to "cross reference" from within a document using hypertext. You can set up words or sections of the document so that double-clicking brings up explanatory material, graphics, and other useful items. The word processing and formatting functions, however, are limited. $135. OWL International, 14218 N.E. 21st St., Bellevue, WA 98007. NCP (Apr '87)

Inspiration's flowcharting tools let you free-associate ideas visually, then automatically dump the flowchart into a text outline. Version 1.0. Requires $129 and an 800K drive or a hard disk drive. $149. Ceres Software, 9495 S.W. Barbur Blvd., Suite 103, Portland, OR 97219. NCP (Dec '88)

Instant Expert is an expert system that infers rules from examples. The inference engine (that ultimately finds the answer) is visible. The Inference engine (that ultimately finds the answer) is visible. The Inference engine (that ultimately finds the answer) is visible. The Inference engine (that ultimately finds the answer) is visible. Requires $199.95. Symmetry Corporation. 761 E. University Drive, Mesa, AZ 85203. NCP (Oct '88)

MacProject allows a user to plan and track a project from beginning to end. Uses CPM to produce schedules with start and finish dates for each task. Can report on resource dependencies and generate all needed printed reports. $195. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (Mar '88)

MacSMARTs can create small, stand-alone expert systems. Features hypertext connections to Print, PICT, SYLK, and text files. Still a little buggy. Version 1.03. Requires $129.95. Cognition Technology, 55 Wheeler St., Cambridge, MA 02138. NCP (Jan '88)

Microsoft Works is an integrated application that includes word processing, database, spreadsheet, and telecommunications functions. The telecommunications module includes both background up- and downloading. $295. Microsoft, 16011 N.E. 36th Way, Redmond, WA 98073-9717. NCP (Oct '88) $89 Edu

MORE than this incredible power of an expert system with gobs of great features—instant charts, math capabilities, multiple windows, font and style control, templates, and more. Prints outlines in any of several standard formats, even in color. Requires $129.95. $395. Symantec, 117 Easy St., Mountain View, CA 94043. NCP (Jan '87) $69 Edu

QuickDraw DA is insurance against system crashes. Saves your work automatically at intervals from 1 to 99 minutes. Compatible with many applications, but not recommended for use with databases. $49.95. Magic Software, 1706 Galvin Road S., Bellevue, WA 98005. NCP (Jan '88)

CalendarMaker creates catchy calendars in a variety of formats. Users can incorporate their art and daily notes. Note files can be imported from a variety of DA calendars and outlines. Shareware and prelicensed versions available. $49.95. CE Software, 1854 Fuller Road, West Des Moines, IA 50265. NCP (Dec '86)

Capture saves any portion of a Macintosh screen to the Clipboard or as a PICT file. Version 1.0 reviewed. Requires $129.95. MultiFinder friendly. Note files can be imported from a variety of DA calendars and outlines. Shareware and prelicensed versions available. $49.95. CE Software, 1854 Fuller Road, West Des Moines, IA 50265. NCP (Dec '86)

Colorizer adds pigments to the desktop and black-and-white applications. Also colors PICT graphics. System resources include saving and printing color screens. A useful novelty that will run its course as developers add color to apps. Requires 1 megabyte + and a hard disk drive. $349.95. Okomor Software, P.O. Box 2635, Vista, CA 92083. NCP (Jan '88)

Copy II Mac does efficient sector and bit copies and in its latest version can back up virtually all Mac software. Features graphic displays of copy progress. Comes with MacTools, a multi-use utility that can recover many damaged files. $39.95. Central Point Software, 9700 S.W. Capitol Highway, Portland, OR 97219. NCP (Apr '88) $89 Edu

SphereXpress optimizes hard-drive performance by reorganizing fragmented files. A useful novelty that will run its course as developers add color to apps. Requires 1 megabyte + and a hard disk drive. $349.95. Okomor Software, P.O. Box 2635, Vista, CA 92083. NCP (Jan '88)

DeskExpress optimizes hard-drive performance by reorganizing fragmented files. $295. Softthis, 5100 S.W. 92nd Ave, Portland, OR 97219. NCP (Apr '88) $89 Edu

DeskFinder searches disks for files as well as cataloging disks. Requires $129.95. $49.95. Williams & Macias, South 3707 Godfrey Blvd., Spokane, WA 99024. NCP (Feb '89)

DeskFile is a utility for backing up and restoring hard disk files. Creates a "SmartSet" of floppy disks so incremental back-ups only update files modified since the last back-up procedure. Backs up to floppy or another hard disk. Requires $129.95. $49.95. Softthis, 5100 S.W. 92nd Ave, Portland, OR 97219. NCP (Apr '88)

Desk Ranger is a speedy cataloging program that doubles as an efficient label maker. Comes with printed labels. Works with regular and hard disks. Can catalog HFS systems. $34.95. Graham Software, 8609 Ingalls Cir., Arvada, CO 80003. NCP (Mar '88)

DiskTools Plus is a set of eight useful DAs and applications. Earlier version was sold as Battery Pak. The DA Disk Tools II is a Finder replacement. Also included are an RPN calculator, Phone Pad, and Calendar Manager. Requires $129.95. $49.95. Electronic Arts. 1820 Gateway Drive, San Mateo, CA 94404. NCP (Mar '88)
**MINIFINDERS**

DiskTop is a disk accessory Finder replacement of extraordinary power and ease of use. Comes with the useful LaserStatus DA and Widgets application. The extras alone are worth the price. Requires 512K+; upgrades from version 1.0. $7; $10 with new manual. $49.95. CE Software, 1654 Fuller Road, West Des Moines, IA 50265. NCP (Aug '87)

DubiCalc is a Calculator Construction Set lets users design personalized calculators with a variety of standard and special functions. Finished calculators can be saved as installable desk accessories or as clickable applications. $59. Dubi-Click Software, 18201 Gresham St., Northridge, CA 91325. NCP (Apr '86)

Eureka: The Solver is a free-form numerical equation solver. Standard trigonometric and logarithmic functions are available, as is treatment of imaginary and complex numbers. $195. Belford International, 4585 South Valley Drive, Scotts Valley, CA 95066. NCP (Mar '86)

Fastback for the Macintosh is hard disk back-up software that is very quick, if not very efficient. Doesn't automatically exclude applications. Creates a separate catalog disk. $99.95. Fifth Generation Systems, 1322 Bell Ave., Tustin, CA 92680. NCP (Apr '86)

Findswell is an indispensable utility that installs a new button in the Open Dialog box of virtually every Macintosh application. Press the button, type a search string, pinch it, and Findswell searches for any files that match. Click Open or double-click to open the correct file. Requires 512K+. $49.95. Working Software, P.O. Box 1844, Santa Cruz, CA 95060. NCP (Nov '87) ★ 87 Eddy

Font/DA Juggler Plus gives you unlimited access to almost any number of fonts. $59.95. Solutions International, P.O. Box 985, Montpelier, VT 05602. NCP (Dec '86)

Glue adds a print-to-disk capability to many programs. ImageSaver installs as a printer driver; Viewer allows copying and printing of Glue files. Handy utility for desktop publishers. $59.95. Solutions International, P.O. Box 985, Montpelier, VT 05602. NCP (Dec '86)

Hard Disk Util uses patch files to allow users to mount and run specified programs on their hard disks. The list of patches is constantly expanding. $89.95. FWB Software, 2040 Polk St., San Francisco, CA 94109. NCP (Sept '86)

HFS Backup aids one of the preferred hard disk back-up utilities. Back up by file/folder or last changes. Back-up specifications can be saved as templates. $49.95. PCPC, 4710 Eisenhower Blvd., Tampa, FL 33634. NCP (Dec '86)

HFS Locator Plus is the essential HFS desk accessory. It can search for a file by name or date of creation, create folders, move files from one folder to another, set a program to launch while in an application. $39.95. PBI Software, 1163 Triton Drive, Foster City, CA 94404. NCP (Sept '86)

Icon-It! lets you create icons to use as an alternative to menu commands. Comes with 47 icon templates or you can create your own. Version 1.0. $79.95. Olduvai Software, 7520 Red Road, South Miami, FL 33143. NCP (Feb '86)

LabView is a graphical programming environment that creates "virtual instruments" to perform calculations, acquire laboratory data, and control instrumentation. Slow. Version 1.1 reviewed. $1900. National Instruments, 12109 Technology Blvd., Austin, TX 78727-6204. NCP (July '89)

LaserServe is a printer spooler for AppleTalk networks. After installation all operations are done via a disk accessory. Works with both MacServe and TOPS. Requires 512K+ and 800K drive or hard disk. $95 per node. InfoSphere, 4730 S.W. Macadam Ave., Portland, OR 97201. NCP (Feb '87)

Mac Disk Catalog II is a utility that will quickly organize a moderate-size disk library. Easy to use with powerful reporting and label-making features. $49.95. New Canaan MicroCode, 136 Beech Road, New Canaan, CT 06840. NCP (Dec '85)

MacFlow is a design tool created for programmers. Traditional flowcharting symbols are linked together, and a symbol can be connected to a separate flowchart file. It also supports custom symbols. $125. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP (Nov '86)

MacInUse tracks time spent in applications and saves info as text files. Installs on any disk, works in background. MFS, HFS compatible. Extremely valuable for tax purposes, client records, etc. $79. SoftView, 4820 Adohr Lane, Camarillo, CA 93010. NCP (Jan '87) ★ 86 Eddy

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MINIFINDERS

MacLabeler lets users instantly index and print labels for all the disks in a burgeoning collection. Choose border type and orientation of your label, index by folder or documents. Starter set of labels is included. $49.95. Ideaform, P.O. Box 1540, Fairfield, IA 52556. NCP (Prem)

MacNose is a global disassembler. A very advanced user can use this program to look into the code of virtually any program. This advanced tool can take you places no other Mac program could take you if you have the skill to guide it. The documentation is sparse. For pros only. $170, SE and Plus. $350. Mac II. Jask Designs, 343 Trenton Way, Menlo Park, CA 94025. NCP

MacSafe is a data file security program that allows you to place multiple files into a "safe," and then you can further protect the safe through selection of appropriate encryption (including DES). Flexible and very easy to use. Allows for installation on hard disk. $149.95. Kent Marsh Ltd., 1200 Post Oak Blvd., Houston, TX 77056. CP (Mar '87)

MacServe converts a Mac and a hard disk into a disk and print server. Uses the MacTalk network and is easily hooked up. Users can partition the hard disk into multiple volumes. Runs in the background, so users can work on all machines in the network. $250. Requires 512+ Infosphere, 4730 S.W. Macadam, Portland, OR 97201.


MacZip is a three-part disk and memory utility. It can be used to recover some damaged files and disks, compare disks, analyze disk structure, and make back-ups copies of most disks. $60. Micro Analyst, 2506 Roxmore Rd., San Diego, CA 92123. NCP (Aug '87)

Menu Fonts displays the names of fonts in the actual font instead of standard Chicago. Won't work with programs that have a nonstandard Font menu or no Font menu. Comes with LookOut, a utility that gives password access to your Mac, and FontManager, a utility for managing multiple blank disks. Requires $512K+ $15. Beyond Software, 6069 E. Grant Road, Tucson, AZ 85712. NCP (July '87)

MockPackage is a set of extremely powerful DAs. Includes a text editor, text printer (supports LaserWriter), charter, terminal, and EZmenus. HFS compatible. $35. Sierra Software, 1854 Fuller Road, West De Sales, MA 02493. NCP (Mar '87)

myDiskLabel is an excellent label maker. It can read directories and use large or small icons or anything desired. Comes with 54 precut labels. $44.95. Now, with color printing ability (on the ImageWriter II), $54.95. With PostScript font capability (on the LaserWriter), $64.95. Williams and Macias, P.O. Box 19206, Spokane, WA 99219. NCP (Aug '87)

Cryptor is a simple, safe program that lets users protect-password their files. The same program is used for encoding and decoding. This is one of the best products in its category. $39.95. Mainstay, 5311 B Derry Ave., Minadoca Ave., Mountain View, CA 94043. NCP (June '87)

NightWatch locks up your hard disk by using a floppy start-up disk that acts as a key. Type in the correct password, enter into the code of virtually any program. This advanced tool can take you places no other Mac program could take you if you have the skill to guide it. The documentation is sparse. For pros only. $170, SE and Plus. $350. Mac II. Jask Designs, 343 Trenton Way, Menlo Park, CA 94025. NCP (Mar '87)

PowerStation is an extremely easy-to-use, versatile and powerful Finder substitute. Loaded with powerful features. Comes with Pyrol, $59.95. Fifth Generation, 1322 Bell Ave., Tustin, CA 92680. NCP (Nov '87)

Printworks for the Mac is a comprehensive software-based dot-matrix printer control system. Optimizes printing from different applications, and is easy to use. Requires $512K+. $75. SoftStyle, 7192 Kalaniouloa Highway, Honolulu, HI 96825. NCP (Aug '87)

Programmer's On-line Companion puts an abridged version of Inside Macintosh in your system for reference. Simply read the text or transfer some or all of it directly to your normal editing window. Non-Macintosh interface makes the program confusing, somewhat difficult to use. $34.95. Addison-Wesley, Route 128, Reading, MA 01867. NCP (July '87)

Quik & Dirty Utilities, New One is a disk utility that is a delight, considering all the good things you can do with it. QuikKeys lets you make full use of your keyboard. Assign any command (menu choices, DAs, etc.) or series of text blocks and/or command to any key or key combination. Enormously powerful, necessary for Apple Extended Keyboard owners. Requires $512K+. $99.95. CE Software, 1854 Fuller Road, West DeSales, MA 02493. NCP (Jan '88) $87. Edy

RamSnap is a RAM disk and disk cache in one easy-to-use package. Can store multiple configurations as files. Good product but a little pricey. $30. Dove Computer Corp., 1200 North 23rd St., Wilmington, NC 29605. NCP (June '87)

StuffIt is the best consumer value in optical character recognition software. Works with any scanner that saves images as a bit map, PICT or TIFF file. Comes with type tables that can be customized. Version 1.1. $395; ThunderScan version, $149.95. Oldkiva Software, 7520 Red Road, South Miami, FL 33143. NCP (Apr '88)

Sentinel encrypts data files (or sets of files) using a super-secure DES or a superfast SuperCrypt algorithm. Provides high-level security if you can keep your passwords secret. Requires 512KE. $295. SuperMac, 259 N. Bernardo Ave., Mountain View, CA 94043. NCP (Apr '88)

SmartAlarms is the best reminder system for the Mac. Easy to use, versatile, and... $495. SoftScrap is a major enhancement to the standard Scrapbook DA. TheClipper provides you with a transparent Clipboard window, allowing you to resize or crop a graphic to the area that it will be pasted to. $59.95. Solutions International, 30 Commerce St., Williston, VT 05495. NCP (July '87) $87. Eddy

SoundWave is a useful sound recording and editing utility. Works with waveforms; able to change sampling rates. Previously known as SoundCap. $199.95. Impulse, 6870 Shingle Creek Parkway, Minneapolis, MN 55430. NCP (Apr '88)

Stepping Out is a software alternative to a large-screen monitor. Lets you create a virtual screen (as large as memory allows) inside the Mac's 9-inch screen. Automation, Austin, TX 78723. NCP (Jan '88) $100-04 70 Ave.. Forest Hills, NY 11375-5133; also available on most electronic services. NCP (Dec '88)

Suitcase is a transparent program that automatically lets you use all your fonts and DAs. Foolproof and indispersible. Comes with Pyrol, the best screen saver. Requires $512K+. $59.95. Fifth Generation, 1322 Bell Ave., Tustin, CA 92680. NCP (Nov '87) $87. Eddy

SuperMacSpell is a LaserWriter spooler. Very fast because it does conversion to PostScript in the background, but doesn't print a faithful rendition of PageMaker documents as a result. $149.95 single user, $395.95 for up to five users on one network. SuperMac Software, 950 N. Rengstorff Ave., Mountain View, CA 94043. NCP (June '87)

Switcher is Andy Hertzfeld's contribution to Mac productivity. This program lets users run several programs at once (up to eight on a 1-megabyte or larger machine). Switching between the programs is nearly instantaneous. Requires a correct password entered into the hard disk is allowed. Version 1.02. Requires 512Kx, a hard disk, and an 800 drive. Mac II and MultiFinder friendly. $149.95. Kent Marsh Ltd., P.O. Box 408289, 1200 Post Oak Blvd., Suite 210, Houston, TX 77056. NCP (Sept '88)

On Cue lets you switch to and return to the Finder. Uncle John's Computer Book includes the Finder. Requires a Mac and MultiFinder friendly. active applications are listed on a pop-up menu. Can also launch directly to a specific document. Version 1.0. Requires 512Kx, Mac II and MultiFinder friendly. $59.95. IMC Simulations, 648 South Whelting Road, Wheeling, IL 60090. NCP (Sept '88)

Top Desk is a set of seven self-installing (and self-removing) DAs. Menu Key adds command key sequences to programs; View allows looking at and moving data between up to eight MacWrite documents, also included are BackPoint, Touch 'n' Go, Blank, Encrypt, and Launch. $59.95. Cortland Computer, P.O. Box 9916, Berkeley, CA 94709. NCP (May '88) $87. Eddy

TMON is the debugger for the Mac. This isn't open to question. TMON is simply the best. Comes with the latest version of Darin Adler's Extended User Area. $149. IMC Simulations, 626 Whealing Road, Wheeling, IL 60090. NCP

Turbo Desktop is a desk accessory designed specifically to increase the speed of Xmodem data transfers from national databases to your Mac. Speed increases range upward from 50 percent to over 300 percent at 2400 baud. $39.95. Mainstay, 5311 B-Derry Ave., Agoura Hills, CA 91301. NCP

Twelve-C Financial Desk Accessory brings all the power and functionality of a Hewlett-Packard 12C programmable calculator to your desktop. Can be programmed and all registers can be viewed while calculator is running. $49.95. Positive Works, 142 Cone Road, Ormond Beach, FL 32074. NCP

Read-It is the debugger for the Mac. This isn't open to question. TMON is simply the best. Comes with the latest version of Darin Adler's Extended User Area. $149. IMC Simulations, 626 Whealing Road, Wheeling, IL 60090. NCP
The portable keyboard for Macintosh computers.

The Cambridge Z88 is a versatile, hardworking computer that doubles as a portable keyboard for Lotus 1-2-3, Wordstar, WordPerfect, and Excel work files.

Work where you need it. Use a desktop or laptop or on your desk—or inside a PC—wherever you are. Simply transfer files from your desk or laptop to the Cambridge Z88 with the 88P CLink® or MacLink. Then take the Z88 down to the ball to a meeting, or on your next trip.

When you return, update the files on your PC. It's that easy.

The Cambridge Z88 is a fast standard Prolog with excellent debugging and error handling. Good for serious program development. Documentation is not as good as the program. Requires 1 megabyte + $505. ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108. CP (Aug '87)

ExperLISP is useful programming language for high-level programmers. More you use it, the more you'll figure out about it. $495. Requires 512K +. ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108. CP

ExperLogo is a version of the popular teaching language, LISP. Features three-dimensional graphics using "bunnies" rather than the usual "turtles." Very speedy, smooth program. Comes with an excellent manual, $149.95. ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108. CP

ExperProlog II is a Prolog based on the new Prolog II standard. Has the ability to handle infinite trees and allows user-defined functions that operate conditionally. Documentation is not the best and Mac interface is nonstandard. $495. ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108. CP (Mar '87)

LPA MacProlog is a much improved program that includes incremental and optimizing compilers, a graphics environment package, and C and Pascal submodules. Requires 1 megabyte +, $495. Programming Logic Systems, 31 Crescent Drive, Milford, CT 06460. CP (Feb '88)

MacC is a good, highly Mac-oriented implementation of this popular development language. Assembler and linker included. $425. Consulair, 140 Campo Drive, Portola Valley, CA 94025. NCP + $85 Eddy

MacExpress is a development environment or shell. Programmers use it to save time and effort when developing stand-alone applications for the Mac. $195. ALSoft, P.O. Box 527, Spring, TX 77383. NCP (Feb '86)

MacForth Plus is an excellent implementation of the popular Forth programming language. New, reduced price: $199. Creative Solutions, 4701 Randolph Road, Rockville, MD 20852. CP

Mach II is a multitasking implementation of Forth that allows local variables and text files. Can create stand-alone applications. Several windows can be up with different operations in each, operating concurrently. Execution is

The Cambridge Z88 features:

- CLink imports/exports Wordstar, Lotus 1-2-3, Excel and ASCII files
- No disks, or disk operating system
- 8.25" x 11.5" x 2.35" weighs less than 2 lbs.
- 160K of built-in memory, expanding to over 15 megabytes
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- QUIETLY keyboard with silent travel keys
- Operates on 4 AA batteries for 20 hours
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- Superbright LCD display, 8 lines x 16 columns

The Cambridge Z88 includes Z88, MacLink, Shipping, one year limited warranty, user manual, and lightweight carry case.

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1419 Lake Cook Rd. Deerfield, IL 60015 1-312-564-5512

The Z88 imports/export work files from both IBM and Macintosh

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MINIFINDERS

American Discovery is an interactive United States geography game that teaches states, capitals, and, in aroundabout manner, postal codes. Suffers from small clickable areas. Requires 512K+ +, 800K disk. Zenith, 5333 Scotts Valley Drive, Scotts Valley, CA 95066. (NCP '88)

ChipWits is a combination game and teaching tool. Players create programs to maneuver robots through a set of eight mazes. The programs are written in ChipWits's built-in high-level language which looks much like BASIC. Requires 32K +. Borland International, 24009 Venture Blvd., Calabasas, CA 91302. (NCP '85)

Course Builder creates stand-alone educational applications. An easy-to-learn compiler provides an integrated development environment and extensive library support. Available for Windows or Macintosh. Requires 512K+. (NCP '88)

Beyond Dark Castle brings back Prince Duncan in an encore performance to run, jump, and beat his way to victory. But really, just more of the same. Requires 512K+. $49.95. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126. (NCP '88)

ENTERTAINMENT

A Mind Forever Voyaging is a departure in text adventure games. It has a more extensive vocabulary and a more involved story than most of the genre.

The story is gripping, but there are only a few puzzles to solve. Requires 512K+. $39.95. Infocom, 125 Cambridge Park Drive, Cambridge, MA 02142. (NCP '86)

The Ancient Art of War gives users a chance to relight some famous campaigns and move easily between functions; however, use of the Return key or space bar are assumed but never explained. Version 1.0. Requires 512K. $49.95. Simon & Schuster, One Gulf Drive, St. Petersburg, FL 33701. (NCP '87)

BattleShip requires you to think strategically. Its graphical interface is especially effective. Requires 512K. $149.95. Simon & Schuster, One Gulf Drive, St. Petersburg, FL 33701. (NCP '87)

The story is gripping, but there are only a few puzzles to solve. Requires 512K+. $39.95. Infocom, 125 Cambridge Park Drive, Cambridge, MA 02142. (NCP '86)

Balance of Power is the world's first computer peace game. This simulation allows players to become either the President of the United States or the General Secretary of the Soviet Union. Extraordinary artificial intelligence routines and general play make this a classic: $49.95. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. (NCP '88)

The story is gripping, but there are only a few puzzles to solve. Requires 512K+. $49.95. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126. (NCP '88)
Beyond Zork is yet another installment in the famous Zork series of text adventures. Find the fabled Coconut of Quendor to restore falling magic in this expert-level game. On-screen mapping and the Mac's window environment are utilized. $39.95. Infocom, 125 Cambridge Park Drive, Cambridge, MA 02140. NCP (Apr '88)

The Chessmaster 2000 is a beautiful chess program that will appeal to both novice and master. You can view the board from 2-D or 3-D perspective and turn the board for a better look. Play is smooth and easy, and the program responds by voice. You may get tired of hearing "Gotcha," though. $39.95. The Software Toolworks, 13557 Ventura Blvd., Sherman Oaks, CA 91423. CP (July '87)

Chuck Yeager's Advanced Flight Trainer doesn't quite have the right stuff to hold interest for long. Simplistic controls. Looks features found in versions for other computers. Version 1.0. Requires 512K and two 8050 disk drives. $49.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. NCP (Nov '88)

Crystal Quest combines all the good elements of nearly every video game ever made. Move a piece around to gobble up points and crystals. Shoot the nasties and get through the goal before they get you. Excellent sound effects. In color on the Mac II. Requires 512K. $49.95. Casady and Greene, P.O. Box 223779, Carmel, CA 93922. NCP (Apr '87)

Dark Castle is an outstanding achievement in action games which integrates RealSound with superb animation and graphics. You'll need better-than-average hand/eye coordination, but it's well worth the effort. Requires 512K+. $39.95. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126. NCP (Mar '87)

Deja Vu: A Nightmare Comes True is a graphic adventure that breaks new ground. Innovative use of the Mac's interface in a truly playful and exciting game. A great introduction to graphic adventure games. $49.95. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. CP (Jan '86) $8.95 Edy

Falcon simulates an F-16 fighter jet with gut-tightening, sweat-making realism. Go against MiGs and dodge SAMs scenarios. Requires 1 megabyte+. $39.95. Spectrum HoloByte, 2061 Challenger Drive, Alameda, CA 94501. NCP (May '88)

Fool's Errand is an outstanding collection of 80 puzzles woven around a mythical theme of an evil priestess and the search for wisdom. Requires 512K+. $29.95. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. CP (Nov '86)

Gato puts players in command of an submarine in World War II. This superb simulation game uses all of the Mac's. graphic capabilities to nearly make you feel that "you are there." $49.95. Spectrum HoloByte, 2061 Challenger Drive, Alameda, CA 94501. CP (Oct '85)

GO is the Chinese equivalent of chess. Players plonk markers on a grid to gain territory and outwit an opponent or the computer. Requires 512K+. Mac II hostile. MultiFinder friendly. Version 1.0 reviewed. $49.95. Infinity Software, 1144 65th St., Studio C, Emeryville, CA 94608. NCP (June '88)

Handwriting Analyst produces a personality profile based on answers to questions about one's handwriting. It's simple and the results will amaze and astound. $49.95. Class, 2017 Cedar St., Berkeley, CA 94709. NCP (Apr '88)

Klondike is a version of solitaire that uses video game-like scoring to create a superb, totally addictive game. Simple to play, nearly impossible to stop playing. Version 3.3. Shareware: $10. Unison Software, 415 Clyde Ave., Mountain View, CA 94043. NCP Dec '87

Leather Goddesses of Phobos is another in the long line of witty and entertaining Infocom text adventures. This one lets you choose your sex and comes with a 3-D comic and a scratch·n·sniff card. It has three levels of play: easy, medium and difficult. $19.95. Infocom, 125 Cambridge Park Drive, Cambridge, MA 02140. NCP (Feb '87)

Lunar Rescue puts you in the role of a benevolent trader ready to save a moon colony from invasion. Blast the enemy while you travel from town to town trading goods for the supplies you need for your mission. Version 1.0. Requires 512K+. $59.95. Practical Computer Applications, 1305 Jefferson Highway, Champlin, MN 55316. CP (May '86)

MacGolf is a dynamic simulation of real golf, Players have a choice of courses and difficulty levels. Superb playability makes this a must for all golfers and gamers. Requires 512K+. $59.95. Practical Computer Applications, 1305 Jefferson Highway, Champlin, MN 55316. CP (Jan '89)

Mac Pro Football is a terrific sport simulation that gives you the chance to pit any combination of 38 Super Bowl teams against each other and direct team plays. It comes with 50 games, detailed (and necessary) documentation. Play selection can be got by 4-bit 8142. $49.95. Avalon Hill, 4517 Harford Road, Baltimore, MD 21214. CP (Mar '87)

MacRacquetball uses digitized videos and sounds of professional players for a realistic simulation. Has lots of control settings and can be played against someone else over a modem or between hard-wired Macs. Turn off hard disks before playing. $59.95. Practical Computer Applications, 1305 Jefferson Highway, Champlin, MN 55316. CP (Oct '89)

MoonMist is an introductory level text adventure game. This is a typical haunted English castle story, not quite up to Infocom's best. It has four versions, so it's good for more than one play. $39.95. Infocom, 125 Cambridge Park Drive, Cambridge, MA 02140. NCP (May '87)

MSFL: Pro League Football is a professional football league simulation that encourages people to play people, not the machine. Fast with lots of stats. Quirky MS-BASIC behavior. Spotty manual. No LaserWriter support. Requires 1 megabyte. $69.95. MicroSports, P.O. Box 15799, Chattanooga, TN 37415. NCP (Aug '88)

NFL Challenge simulates coaching and watching professional football. Comes on two disks, one with program and System, the other with statistical data. Play against either human or computer coaching. Plays are selected from pre-defined playbooks. $99.95. XOR Corp., 5421 Opportunity Court, Minnetonka, MN 55343. NCP (June '87)

Ogre is a strategy tank game played on a hexagon grid. The ogre is an intelligent cybertank out to smash your command post. Customize your defense. Excellently designed. Alamedal a CA 94501. CP (May '85)

Pinball Construction Set lets users create their own pinball games, as elaborate or as easy as desired. Uses game set for backgrounds and has lifelike sounds (on 512K+). $39.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. CP (Jan '86)

PT-109 by any other name is Gato, a WWII submarine simulator also put out by Spectrum. Three years old, but still on the hit parade. Requires 512K. Mac II friendly; MultiFinder hostile. $49.95. Spectrum HoloByte, 2061 Challenger Drive, Alameda, CA 94501. NCP (Sept '88)

Quarterstaff is a fantasy adventure game of the typical "good versus evil" variety. Ability to use characters in other adventures gives you this game a lot of potential for development. Version 1.2. Requires 1 megabyte+. $49.95. Simulated Environment Systems, 804 South Pacific Coast Highway, Redondo Beach, CA 90277. NCP (Oct '85)

Snake·Bar lets you guide a snake (or train or semi) through a maze, picking up objects that feed and make your snake grow. Options include changing languages, editing the maze, and an X-rated game. $15 (shareware). Georges Malmound, 37 Bis rue des Abbesses, Montmartre, 75018 Paris, France. NCP (Dec '87)

Solitaire Royale is a collection of eight solitaire card games. The Tour mode cycles through each game. Tournament deals the same hand for several players. $34.95. Published by Spectrum HoloByte, 2061 Challenger Drive, Alameda, CA 94501. CP (Mar '87)

Space Quest is a three-dimensional, animated adventure in which you play a janitor in a dicsey situation. All you have to do is get off your ship before it explodes and save the Emperor System. Runs on any Mac. $49.95. Sierra On-Line, P.O. Box 485, Gearsold, CA 93614. CP (Sept '87)

Star Fleet I: The War Begins is a space opera of the Star Trek variety. Rise through the ranks from ensign to admiral in this serialized adventure. Requires 512K+. $35. Interest, P.O. Box 57823, Webster, TX 77598. NCP (May '88)

Strategic Conquest Plus challenges you to discover an unexplored world and conquer it by manufacturing and deploying armies, ships, and planes. A two-disc game that doesn't support an external drive. Requires 512K+. $59.95. PBI Software, 1111 Triton Drive, Foster City, CA 94404. CP (Feb '88)

Trust & Betrayal: The Legacy of Sloop requires negotiating with six artificial personalities in a struggle for power. Not surprising considering that it comes from the maker of Balance of Power. Uses hieroglyphics to communicate in a fantasy world. Requires 512K+. Mindscape, 3444 Dun­dee Road, Northbrook, IL 60062. CP (Mar '88)

Unlimited is an icon-based adventure with a heavily haunted mansion. Graphic interface makes it easy to play. Animation and sound add to the thrill. $49.95. Mindscape, 3444 Dundee, Northbrook, IL 60062. CP (Sept '86) 88 Edy

Winter Games lets up to eight players compete against each other in Olympic events including figure skating, bob sledding, biatlon, and ski-jumping. Excellent animation, good graphics, good theme music. $39.95. Epy, 600 Galveston Drive, P.O. Box 8020, Redwood City, CA 94063. CP (Mar '86)

Wizardry is an outstanding dungeon exploration adventure pitting a party of up to six characters against the guardian monsters of the evil wizard Werdna. Capture his amulet to earn your reward. Even after solving the game, you'll want to go back into the dungeon. $59.95. Sierra On-Line, 1305 Jefferson Highway, Champlin, MN 55316. CP (May '87)

Your Personal Post creates personalized greeting cards on the Mac. Comes complete with four greeting cards and mailing envelopes. Requires 512K+. $29.95. Computer Post, 775 E. Greg St., Sparks, NV 89431. NCP (June '87)
MINIFINDERS

MUSIC

Alchemy loads and edits digitally sampled sounds from most commercial samplers. Works with 512K, but it eats up memory quickly. Requires MIDI or RS-422 interface, and sampler. $349. Blank Software, 147771 Som St., San Francisco, CA 94103. CP (Oct '88)

Apple MIDI Interface is a simple Musical Instrument Digital Interface with a 1 megahertz clock rate. Has only one MIDI input and one output. Works with all Macs: adapter required for 128K and 512K. $99. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (June '88)

ConcertWare + MIDI is a composition and transcription program that can record multiple notes from a MIDI keyboard. Easy to use if you read music. Handles eight tracks of eight voices each. Requires 512K. Version 4.0. $149.95. Wave Software, 5339 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (Dec '87)

Cue: The Film Music System is a powerful and versatile assistant for scoring films. Automates spotting and logging cue points and searching for matching tempos. Also performs many minor jobs, such as generating a performing rights cue sheet. Version 2.0 reviewed. Requires 512K. $595. Opcode Systems, 1024 Hamilton Court, Menlo Park, CA 94025. CP (Oct '89)

Deluxe Music Construction Set lets you enter up to 48 voices on eight staves, and play the music through the Mac's internal speaker and/or MIDI. Requires 512K+. Mac II and MultiFinder hostile. Version 2.0 reviewed. $99.55. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. CP (June '88)

Jam Factory is a program for performing complex manipulations on MIDI data in real time. Unique, entertaining, and very powerful, but requires lots of patience and practice. Requires 512K+, MIDI interface, and MIDI synthesizer. $199. Intelligent Computer Music Systems, P.O. Box 8748, Albany, NY 12208. CP (Oct '87)

Jam Session is a music program for those who think MIDI refers to the length of skirts. Without any skill, you can "Jam" with rock, jazz, rap, or country tunes. A sort of "Sing Along With Mitch" for the computer set. Requires 512K+. $49.95. Broderbund, 17 Paul Drive, San Rafael, CA 94903. CP (July '88)

Listen is an educational tool for ear training. It has both a piano keyboard and a staff for the student to input notes, and offers a wide range of exercises. $99. Resonart, P.O. Box 956, Menlo Park, CA 94026. (Jan '87)

M is a music composition and creation program that works with MIDI data in real time. Unique, entertaining, and very powerful, but requires lots of patience and practice. Requires 512K+, MIDI interface, and MIDI synthesizer. $219. Intelligent Computer Music Systems, P.O. Box 8748, Albany, NY 12208. CP (Oct '87)

Master Tracks Pro is a full-featured, second-generation MIDI sequencer that adheres to the MIDI interface very well. It's the first program to have graphic-controller editing. Needs patch chasing for professional use, but it's still a rock-solid program. $325. Passport Designs, 625 Miramontes St., #103, Half Moon Bay, CA 94019. CP (Dec '87)

MIDI Bank is a simple, but highly useful routine for writing MIDI software. Good stuff. Sketchy documentation. Works with both Microsoft and Apple Basic. Requires 512K+ plus Basic. $49.95. Attech Systems, 831 Kings Highway, Shrewsbury, N.J 08719. NCP (Aug '87)

Performer is the definitive MIDI sequencer, and is priced accordingly. Includes looping, SMPTE synchronizing, 32 simultaneous ins and outs, unlimited overdubbing, and compatibility with Professional Composer for transcription. Version 2.2. Requires MIDI interface and 512K+. $395. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. CP (Jan '88)

Practica Musica uses an interactive game and practice approach to teach music theory and ear training. Excellent training tool for the serious music student. It is also fun for anyone who wants to develop a trained ear for intervals, chords, and melodies. Requires 512K+. $125. ARS Nova Software, P.O. Box 40629, Santa Barbara, CA 93140. NCP (Nov '87)

Professional Composer produces performance-quality sheet music using Acock's Sonata font. Scores can be created from scratch or imported from Performer (and can be exported to Performer for MIDI playback). Requires 512K+. $495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. CP (Feb '88)

Softsynth creates sounds for additive synthesis samplers. Downloading from Mac to sampler is time consuming. Requires 512K, sampler, MIDI interface. $295. Digidesign, 1360 Willow Road, Suite 101, Menlo Park, CA 94025. CP (Oct '88)

Sound Designer sets the standard for editing samples on lower-cost samplers, but it still lacks real-time high-fidelity playback. Requires 512K, sampler, MIDI interface. Emac, E.I., 2000/2002, DSS-1, $900/495; all others, $295. Digidesign, 1360 Willow Road, Suite 101, Menlo Park, CA 94025. CP (Oct '88)

Studio Session consists of two programs, an Editor, and a Player, that produce music with six voices of digitized sound. Excellent program plus good manual make this a good buy. $89.95. Bogas Productions, P.O. Box 6699, Terra Linda, CA 94903-0699. NCP (Aug '87)


HARDWARE & ACCESSORIES

AppleCD SC reads CD-ROM optical discs that contain up to 856 megabytes of data. Also plays audio compact discs. Reads High Sierra format, an industry standard for CD-ROM. Requires SCSI port. $1,295. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (Dec '88)

Apple Scanner is not the state of the art, but is adequate for scanner neophytes. The 4-bit (16 gray levels) scanner comes with AppleImage software and HyperScan, written by Bill Atkinson. Requires System 6.0. Hard disk for full-page work: SCSI connection cables. $1,799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (Feb '89)

AST Turboxcan is a 300 dpi scanner with sophisticated graphics software. Scans at resolutions from 72 to 300 dpi. Super-Scan software offers halftone, line art, and mixed modes. "Virtual memory processing" lets you scan images too large to fit in RAM. $1,899. Requires 512K+. SuperScan software included. AST Research, 2121 Alton Ave., Irvine, CA 92714. NCP (Nov '87)

Classic Professional Graphics Display is a low-cost color monitor for the Mac II. $299. Good value, but has an IBM look about it. Green tint is annoying. Requires Apple video card. $549. Classic Components, 1490 Artesa Blvd., Gardena, CA 90247 (June '88)

CMS-S 140 SCSI Hard Disk is a very fast, high-capacity SCSI hard disk with a unity interleave and average access time of 18 milliseconds. Holds 140 megabytes. Has file transfer, and task handling commands built-in. Hard Disk Parasol is a useful DA. Comes with a 6-foot SCSI cable. $2,995. CMS Enhancements, 1372 Valencia Ave., Tustin, CA 92680. (July '87)

ColorVue SE is a video processor board for the Mac SE that lets you display 16 colors on an external RGB monitor. Slows up performance. $695. Orchard Technology, 43565 North Loop West, Fremont, CA 94538. (Oct '88)

DATA-PACK is a 45-megabyte removable Winchester hard disk. Great for backing up your main hard disk or transporting large amounts of data between office and home. Requires SCSI connector and System 4.5 or later. Drive, $1,799.95; cartridges, $149.95 each or tri-pack for $419.95. MASS MICRO Systems, Inc., 550 Del Rey Ave., Sunnyvale, CA 94086-3258. (Jan '89)

DaynaFile hooks up to a SCSI drive to read MS-DOS disks in the Mac environment. Use Mac applications to manipulate data created with an IBM PC. Comes in both 5.25 and 3.5 inch formats. $595 for single floppy. Dayna Communications, 50 S. Main St., Fifth Floor, Salt Lake City, UT 84144. (Jan '88)

DEST PC Scan 2000 is an 8-bit scanner that saves images in up to 256 levels of gray. Can be configured for IBM PCs. Requires 1 megabyte. Scanner, $1,495; Publish Pac software, $595; OCR text processor card, $955. DEST Corporation, 1201 Cadillac Court, Milpitas, CA 95035. NCP (Dec '88)

FAXit is an early entrant in the fax modem race. Adequate, but slower than most fax machines, and using it as a normal modem requires changing plugs. Requires 1 megabyte of memory, and a hard disk is strongly recommended. $695. STF Technologies, P.O. Box 247, Higginson, MO 64037. NCP (Feb '89)

Felix is an optical-tracking graphics tablet that replaces a mouse. Precision mode gives pixel-by-pixel control. Doesn't collect dirt like a mouse does. The 6-inch square device is designed primarily for right-handed people. Works with Mac Plus. $149. Lightgate, 6202 Christie Ave., Emeryville, CA 94608. (Sept '88)

Grapple II hooks Macs up to parallel laser and 24-pin letter-quality printers. A cable, driver software, and special fonts combine to make dozens of once-unfriendly printers now compatible with the Mac. Requires 1 megabyte and a parallel printer. $149. Orange Micro, 1400 North Lakeview Ave., Anaheim, CA 92805. NCP (Nov '88)

Hard Disk 2050 is Apple's 20-megabyte SCSI hard disk. Reliable, fairly noisy unit. $695. Good utility software, but no back-up yet. Requires cable and terminator. Macs with Mac Plus. $149. Lightgate, 6202 Christie Ave., Emeryville, CA 94608. (Sept '88)

Hewlett-Packard ColorPro Graphics Plotter is an eight-pen desktop plotter that requires third-party software to drive it. Fonts are limited to an optional Graphics Enhancement Cartridge that requires some BASIC programing. $1,295. Hewlett-Packard, 16359 W. Bernardo Drive, San Diego, CA 92127. (Feb '88)
**MINIFINDERS**

HyperDialer provides an interface between a phone and your Mac so you can dial numbers on one of the phone's keys. Features: Focal Point or QuickDex. Hooks up to the Mac's sound port and a telephone handset. Requires 128K. MultiFinder friendly. $39.95. DataDesk International, 7651 Haskell Ave., Van Nuys, CA 91406. (Sept '88)

ImageMaker is a 1200-baud modem that can be accessed by all users on an AppleTalk network. The modem's display lights and the dial tone are simulated on-screen. Requires 512K+ (64K).$, 599. Shiva, Suite 1200, 222 Third St., Cambridge, MA 02142-9919. (Feb '88)

Personal LaserPrinter is a non-PostScript laser printer using a flatbed scanner. Clumsy workarounds required in some applications. Printing can be slow. Requires 1 megabyte +. $1,999. Fonts Plus, $299. General Computer, 580 Winter St., Waltham, MA 02214. (Apr '88)

Personal Writer PW155 is a tablet-based handwriting recognition system that also allows graphics and macros. Number of missed characters is too high for general word processing. Requires 1 megabyte +. $895. Personal Writer, 1801 Avenue of the Stars, Los Angeles, CA 90067. Software NCP (Mar '88)

PhoneNET is an AppleTalk-compatible network. Up to can be used for 3000 feet in length. In- place, unused phone cabing can be used for network, and can be combined with AppleTalk on the same network. $59.95 per node. Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704. (Dec '87)

ProPoint replaces the mouse with an ADB trackball. Works better on the SE than on the Mac II. Lets find the button positions uncomfortable. Requires SE or Mac II. $139.95. Abaton, 48431 Millpond Drive, Fremont, CA, 94538. (Oct '88)

QMS Colorscript 100 is the first color PostScript printer that uses a four-color thermal wax transfer technology. Works on AppleTalk. Excellent typographic capability. Currently supports only a handful of applications. Requires 1 megabyte. $21,995. QMS, 1 Magnamum Place, Mobile, AL 36618 (Oct '88)


Radius Accelerator 25 can make your Mac SE run 50 percent faster than a Mac II. The add-in accelerator card has a Motorola 68020 CPU that runs at 25 megahertz, and an optional 25 megahertz 68881. Radius, 404 East Pluma Drive, San Jose, CA 95134. (Oct '88)

SpeedCard is an accelerator board for the Macintosh SE that more than doubles the speed of most applications. Emulates HP Laserjet, 7475 (HPGL), and Diablo 630. $5,495. Laser Connection, 7825 Schiller Park West, Mobile, AL 36608. (July '88)

ThunderScan replaces the ribbon cartridge in an ImageWriter, which is required to use it. Laser scans art that can be run through the ImageWriter, producing high-quality digital images. The images can be manipulated as they are created or afterward. $245. Thunderware, 21 Onyx Drive, Orinda, CA 94563. $85 Edy

TimeWand is a bar-code reader with a built-in time/date stamping clock. Can be used with TimeWand Manager software, a database that's extensive though difficult to use. Poor docs, but good support. Requires 1 megabyte +. TimeWand 2K version, $198. TimeWand Manager, $489. Videx, 1105 N.E. Circle Blvd., Coralvis, FL 33730-4285. (Dec '87)

TurboMouse adds an excellent mouse replacement, even if you're not a trackball fan. If you're seeking absolute control, you can buy the optional cdev that enables you to specify custom tracking and double-click speeds. $169.95; cdev $15 direct order only. Kensington Microcomputer, 295 North Bernardo Ave., Mountain View, CA 94043. (Nov '88)

V-series Smartmodem 9600 is the fastest modem you can get for the Mac. To achieve high speeds, you'll need a special cable and software that supports the format. Requires 128K, Mac-to-modem cable, and communications software. $1,299. Hives Microcomputer Products, 705 Westech Dr., Norcross, GA 30092. (Jan '88)

Microtek MSF-300C is a 300-dpi flatbed scanner. Really fast when used with normal Mac MS-DOS. Came with Laser Scan Plus software (NCP) to scan and manipulate image. Saves images in a number of formats including TIFF and MacPaint. $1,895. Microtek Lab, 16901 S. Western Ave., Gardena, CA 90247. (Dec '87)

NetModem is a 1200-baud modem that can be accessed by all users on an AppleTalk network. The modem's display lights and the dial tone are simulated on-screen. Requires 512K+ (44K). $599. Shiva, Suite 1200, 222 Third St., Cambridge, MA 02142-9919. (Feb '88)

Mac Recorder replaces the mouse with an ADB trackball. Works better on the SE than on the Mac II. Lets find the button positions uncomfortable. Requires SE or Mac II. $139.95. Abaton, 48431 Millpond Drive, Fremont, CA 94538. (Oct '88)
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MacUser

Editors absolutely reserve the right to publish none, some, all, or just the parts we managed to complete of the above, due to the inherent problems that occur when reviewing software, hardware, and the ever-elusive vaporware.
UNDER COVER

The great Macintosh cover-up is at hand. Hide your computer under a designer dust cover by Crosby Creations — you may not fool anyone into thinking you've brought your Cuisinart to work, but you can protect your Mac from dust and spills. And when you feel you just can't face that computer for another minute, you can easily put it under wraps.

Crosby Creations makes Computer Covers for over 300 computers and printers, with covers available for just about every CPU, monitor, mouse, and keyboard configuration. There's an SE-on-MacTilt set and even a Mac-II standing-on-end dust cover.

Made of anti-static, lint-free nylon, the covers come in either standard- or premium-quality material. Prices vary, but a typical computer set (monitor and keyboard covers) retails for $24.95 standard, $25.95 premium; a regular-size printer cover is $19.95. The dust covers come in gray, tan, driftwood, dark green, red, burgundy, and two shades of blue. Private-label logos and custom fabrics and colors are available.

Crosby Creations is located at West 529 Cleveland, Spokane, WA 99205; (509) 327-6884.

— Laura Johnson

20,000 LEAGUES WRITTEN IN C*

Like most football fans, I've dreamed about playing in the NFL. I can just see myself dropping back to pass with merely seconds to go in the game. I've sent Gayle Sayers on an end around pattern, but alas, he is not open. Right then, I spot Mike Ditka, who is wide open down field. With Dick Butkis in my face, I loft the ball toward Ditka — he catches it and falls into the end zone.

The Mac can, to some extent, make my football fantasy — and yours — a reality. I can be a member of the '85 Bears, the '72 Dolphins, or even the '76 Raiders whenever I play Micro Sports Football. Others like me have discovered this phenomenon — many have formed leagues, each with participants from all over the country.

And, with version 2.0, having participants in remote locations isn't a problem, thanks to a new modem play feature. A team in Huntsville, AL, can play the same game simultaneously with a participant in Pullman, WA — as long as they have a Mac and a modem. You can even download or upload plays to CompuServe. Don't worry too much about being charged for time, because you'll be on-line for only two minutes or so.

Suppose you want to study the stats from the game or see printouts of various plays. This new version is LaserWriter compatible, so you can see them in high resolution. There are more advantages to being a Micro Sports Football participant. Imagine being able to sign a new player for only $39.95 (Pro Draft disk) or buying the rights to O.J. Simpson or Joe Namath for only $49.95 (500 Great Teams disk). Yet another instance where fiction is certainly better than fact. However, participating in the league still proves to be as ulcer-inducing as the real thing (the Mac can't change some things).

Interested in forming your own league or participating in an existing one? For $49.95, you can have your own copy of MSFL Pro League Football. For more information on leagues, contact Micro Sports, P.O. Box 15799, Chattanooga, TN 37415; (615) 842-2098.

— George Gipp

*Well, it was written in MS-BASIC, but "20,000 Leagues Written in MS-BASIC" wouldn't have made any sense.
Tools of the Trade

QuarkXPress™ makes your Macintosh a powerful design and production system... with features and capabilities that address the real-world needs of today’s graphic arts professional.

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LUNAR RESCUE

Lunar Rescue brings to mind that light beer commercial. You know the one: "Tastes great!" "Less filling!" In the case of Lunar Rescue, somewhere two computer gamers must be endlessly going back and forth: "Exciting action!" "Intriguing strategy!" Furthermore, Lunar Rescue, like good beer, is an escape from mere earthly concerns and keeps you coming back for more.

Pop open a floppy and drink in the scenario: The moon is in big trouble. Raiders have stolen the five crystals to the vital Independent Computerized Ecosystem (ICE), which defends and maintains the moon's 26 cities and outposts and their connecting canyons. You are an interplanetary trader who wanders onto the scene and offers to help. You're going to have to zap the heavy defenses in the canyons, trade with the cities for money and supplies, and, most important, find and restore the ICE. Good luck. You'll need it.

Lunar Rescue's white-on-black vector-type graphics are reminiscent of Asteroids/Megaroids, though you have a much larger choice of weapons and a much more complicated game scenario. Best of all, the controls — without a joystick so often awkward on the Mac — feel great. For the first few minutes of play you'll probably just want to zoom around in your ship through the canyon at full throttle. After you've set-tled down, you'll spend more time mastering the intricacies of your different weapons and defenses, including space cannons, lasers, bombs, decoys, and cloaking devices.

But Lunar Rescue is not just another arcade-style game. What separates it from the dozens of dazzling but ultimately boring (for some of us, at least) action games is that it combines many elements of strategy games as well. The game stimulates not only your reflexes but your brain. A typical game runs not just a few minutes but a few hours (and, joy of joys, you can save your game in progress).

You start off with a ship and some money. In order to recover the ICE you'll need to do a lot of searching in the canyons, which will require lots of weapons, fuel, and, yes, new ships. To get these supplies you'll find wrecks of previous would-be lunar saviors containing these items and other valuable commodities such as chemicals, food, and robots. You can sell these items in the cities, where you can also buy supplies you need — if they're available. Prices of items vary by city, depending on local shortages and economic conditions. Smart players pay attention to the economic situation and try to profit from it. Buy cheap, sell dear: you were, after all, a trader before enlisting to save the moon.

To win the game you'll need to develop a pattern of play, alternating between exploring the canyons for valuables and the ICE and returning to cities for repairs and trading. Often you'll be faced with the dilemma of either risking going on to the next city without much fuel or returning to a nearby city you just left. If you're too conservative, the moon will continue to deteriorate and your task will become harder. On the other hand, if you're too adventurous you may find yourself losing a lot of ships and eventually running out of money.

While you're in the canyons, the main game windows are uncluttered and elegant. One large screen gives you a detailed picture of the action, while a smaller radar screen provides the larger context of what's ahead of and behind you. Although in general the graphics are excellent, it's not so easy to distinguish between the different kinds of attack turrets — important information, since the missile turrets are much deadlier than the others and must be eliminated first when on the attack.

Other windows tell you about your cargo, weapons, and fuel. There's a lot of information on the screen at one time, and it takes some time to get accustomed to keeping an eye on everything and decoding what you need to know quickly and efficiently. It will also take a fair amount of time before you develop a feel for the type and quantity of supplies you will need to carry with you. Patience is the best bet here.

The instruction manual includes everything you need to know to play, though its organization is somewhat confusing. Get a six-pack today and indulge.

— Larry Husten

Lunar Rescue

List Price: $59.95
Published by: PCAI, 1305 Jefferson Highway, Champlin, MN 55316; (612) 427-4789.
Version: 1.0
Requires: 512KE
Compatibility: Mac II and MultiFinder hostile.
Copy Protection: Key disk protected.
Micro/Removable Cartridge Hard Disk Drive
The Micro/Removable, 25 ms, 45 MB winchester hard disk is faster than some fixed hard disks. They are excellent for organizing related data or for fast back-up of fixed hard disk drives. The cartridges can be locked away for security or safely mailed to remote locations and have the reliability of a floppy diskette. You can boot from the removable, if needed, and the system is compatible with the Macintosh Plus, SE or Macintosh II. Utility includes password protection and a DA to mount volume.

Micro/Stack Series Fixed Hard Disk Drives
MicroNet offers 30, 46, 62, 91, 173 MB, fast access hard disk drives, as well as a 150 and 300 MB streaming tape backup system in a stackable cabinet. Internal brackets available for the Macintosh SE or II. Great care was taken in the design of these systems to ensure reliability. 150, 300, 600 MB, 16.5 ms, Wren II, IV and V Systems. MicroNet specializes in Control Data drives that are industry known for their reliability and speed. Internal and external systems with tape combinations available.

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ICON SEE CLEARLY NOW

Look at an icon on your computer screen. Are the images fuzzy? Can you tell an a from an e? If your eyes sting and your head aches, you may want to try the Sher-Mark Anti-Glare Magnification Screen by Sher-Mark Products.

The Sher-Mark screen has a circular polarizing filter (from Polaroid) that improves contrast and reduces glare. For ease of viewing, the magnification lens enlarges screen images to more than twice their normal size.

Made of lightweight plastic, the screen attaches quickly to your Mac or other 9-inch computer screen via an adjustable arm and space bar. The screen hangs from the arm and is easily removed for storage. As with a magnifying glass, you move the screen forward or backward (by sliding the arm at the top and adjusting the space bar at the bottom) for a comfortable image size.

The Sher-Mark Anti-Glare Magnification Screen sells for $89.95. Contact Sher-Mark Products, 521 East 83rd Street, Suite 2R, New York, NY 10028; (212) 249-0494.

On the other hand, maybe you’re just not blinking enough. Insufficient blinking — about once every three seconds is ideal, according to specialists — can lead to eye strain (especially for contact-lens wearers), which can lead to a host of other ailments. For a free booklet with tips on how to train yourself to blink more frequently, send a self-addressed, stamped business-sized envelope to Boston Equalens/Blink, Polymer Technology, 100 Research Drive, Wilmington, MA 01887. (Polymer Technology is a manufacturer of gas-permeable contact lens materials.)

— Laura Johnson

GOING FOR THE GOLD

It’s the best the world has to offer: athletes in their prime, the lighting of the torch, emotions running high. Only in these Olympics, the contests are computers and computer programs — cold and calculating machines with all their artificial intelligence primed for battle. The only emotions belong to the human operators and the spectators. Welcome to the first Computer Olympiad. It will be held at the Park Lane Hotel in London, England, August 9 through 15, 1989, so you and your Mac still have some time to hone your strategies.

The Computer Olympics, organized by David Levy, president of the International Computer Chess Association, will feature tournaments for 20 “thinking” games such as chess, bridge, Scrabble, Mah Jong, and poker. Also part of the Olympics will be exhibition games, pitting the best programs against human experts, and the first London Conference on Computer Games. For more information, contact David Levy, Computer Olympiad, 11 Loudoun Road, London NW8 OLP, England; (01) 624-5551.

— Laura Johnson

KEEPING 'EM IN STITCHES

If you’re bored with paper output and slides aren’t your thing, here’s something new. Aisin Seiki and Enzan-Hoshigumi have teamed up to create the Personal & Original Embroidery Machine (P.O.E.M.), a stitchery device that takes your Mac graphics and translates them into embroidery.

This colorful sewing machine (it comes in three colors) should connect to any Mac and is expected to begin shipping in early 1989, for around $1,000.

So throw away those old embroidery hoops. Contact Aisin USA, 333 Sylvan Avenue, Englewood Cliffs, N.J. 07632; (201) 569-7875.

— I. B. Singer

DO YOU KNOW ME?

A leftover from television’s “Golden Age?”
Goldie Hawn’s evil twin?

When Mac users went trick-or-treating at Egghead Discount Software last October, these were the goodies they emerged with most often:

1. Microsoft Word
2. Microsoft Excel
3. Claris TOPS
4. Microsoft PowerPoint
5. Microsoft

6. PageMaker
7. Cricket Graph
8. Cricket Software
9. MacWrite 5.0
10. Silicon Beach Software
The NeXT Grand Scheme

me. I write a simple computer column for the locals in the Examiner. This has been going on for years. Personally, I have no respect for a rich guy like Jobs who has nothing better to do than try to ruin the careers of those who don't agree with him.

I'm telling you all this so you can take with a grain of salt my opinions of the NeXT computer. Let's start by saying what's right about it. Two things. First, it's designed for throughput with so-called I/O processors attached to every process. This makes the machine fast. It had better be fast, because there's a tremendous software overhead. The second thing he did right was to improve the Mac interface. (None of the improvements are impossible to implement on the Mac, given time.)

Now let's talk about what's wrong with this thing. First of all, Jobs seems to have a penchant for wacky disk drives, and this machine uses an experimental 256-megabyte, optical read-write drive from Canon. There is no evidence that this drive works or will ever work. It did not work during the demo and nobody was even sure the machine did any reading from the disk. It reminds me of the screwball "twiggy" megabyte drive used originally on the Lisa. Designed by Apple while Jobs managed the Lisa project, the twiggy drive was a joke.

Jobs likes the Canon disk. He kept talking about how the owner will be able to take his whole life around with him on one of these disks. That should be funny when someone steals the disk or erases it.

I suspect, though, that the drive is a small part of a flawed but grand scheme. There had better be a master plan lurking, because if there isn't, then the machine is a strategic disaster.

Hear me out. Jobs insists that the NeXT computer, tentatively saddled with a $6,500 (university "discount") price tag, is for higher education. It's been tested by professors all over the country. It's obviously designed to be used by them as the students wisely use cost-effective Tandy and Apple computers. But the user isn't important. The environment has to be examined: colleges and universities. Folks, this is software bootleg country. No developer in his or her right mind will develop elaborate software for the NeXT computer because he or she won't be able to sell more than one or two copies before the software is networked all over the country. Jobs knows this.

So here's the game the way I figure Jobs will play it. First, he'll try to sucker some dopy third-party types into idiotically developing a few packages and let them try to sell them. Already he is using the bait of compatibility with the future IBM machines to lure them into the trap. (How he managed to put a deal together with IBM has everyone mystified, but he did it.)

A few eager beavers will bite and develop software for the machine. Once they try to market it in the educational community, they'll discover a black hole of piracy. Jobs will apologize for the problem. He'll then start a new program. It will go this way: NeXT will help developers write and/or port their code to the NeXT machine, and it will be bundled on one of the 256-megabyte disks and sold directly by NeXT. The idea is to pack the disk full of software. So much so that NeXT will claim to the vendors that it won't be worth it to bootleg the stuff.

If all goes well, NeXT will have disks loaded with every conceivable program. And if NeXT sells only a few copies of the software and everyone in the world bootlegs it like mad, who cares? Not NeXT — this technique moves hardware. It's the grand scheme. Everybody at NeXT gets rich, and the developers are fooled again. If, for some unknown reason, the professors decide to be honest and actually buy software (huh!), NeXT will have the market locked up. You buy a NeXT computer, a NeXT monitor, a NeXT laser printer, and NeXT-branded software.

You've got to give a guy credit for coming up with an integrated marketing scheme such as this, and you can be sure that this is the plan. But like other plans of mice and men, it can go awry — and Jobs has always shown a tendency to parade products with obvious Achilles' heels. We can remember the Apple III, with its nondetachable keyboard, incomplete upward compatibility with the Apple II, and a tendency to melt. By the time it was fixed, it was too late. We can remember the Lisa, with its dinged twiggy drive and a promised network that never worked. By the time it was fixed, it was too late. We can remember the 128K Mac, with its megabit port and single floppy drive. It was fixed in time (barely), thanks to new management. Thus Jobs quit to start NeXT. One has only to poke around this machine for a moment to realize that he's done it again, and the disk drive once more looks like the Achilles' heel.

There are probably other problems too. We'll see. Whatever the case, by the time it's fixed, it will be too late.
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