

# Open-Apple

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**Releasing the power to everyone.**

## An Apple II for the student

Now that the Macintosh has become established in the university market, Apple's anxiety about the Apple II stealing away Macintosh sales is slowly starting to fade. According to a letter we've received from Betsy Pace, Director of Apple's K-12 Education sales, the Higher Education group at Apple has finally introduced an Apple II resale program for students. The program is an addendum to Apple's long-standing Macintosh resale program.

The program covers only the Apple IIgs and is open only to full-time education majors and education faculty at schools that Apple has resale agreements with, however. Pace said that the program would make Apple IIs available to students at nine of the ten top Colleges of Education in the U.S.

Many education experts think the key to computerized improvement of K-12 education is to get computers on the teacher's desk. Since the Apple II is the leading computer in K-12 education, it's good to see Apple's new willingness to sell next year's teachers Apple IIs for their personal use.

Pace also assured us that any College of Education or University can purchase Apple IIs for institutional use off of Apple's Education Purchase Program price list.

**Apple has also announced changes to its Educator Buy Program**, which provides a way for educators in schools, colleges, and state and local governments to buy Apple IIs at a discount. Previously, participants were limited to one lifetime computer purchase. Now participants can purchase more than one Apple system, provided that at least two years have passed between purchases and the same model is not purchased more than once. The Apple IIc-Plus, IIe, IIgs, and ImageWriter II are all available under this program. In addition, VISA, Mastercard, and Apple Credit cards can now be used to pay for computer purchases.

To qualify, an educator must be a full-time (30 hours or more) employee directly involved in the instructional process. To participate, a teacher must complete an order from Apple; Apple will make equipment delivery arrangements with a nearby Apple dealer. For an order form, call 800-538-9696, extension 480.

**Apple Developer Services has a new monthly publication for developers called *Apple Direct***. More effort seems to be going into remembering the Apple II in this publication than in others from Apple Developer Services, but the road is long. For example, in Lisa Raleigh's introductory "Editor's Notes" column in the December issue, she says Apple declared 1988 the Year of Networking and Communications and proceeds to tick-off a long list of new Apple networking products that help Apple and its developers participate in a multi-vendor environment. AppleShare for the Apple II, however, by far the most important networking announcement in the Apple II kingdom in 1988, was not among those she remembered to mention. What is it about the Apple II that prevents it from getting any attention at Apple itself?

The November issue of *Apple Direct*, incidentally, included a report of a survey given to everyone who attended an Apple Developers Conference held in San Jose in late February 1988. About 60 per cent of the attendees filled out the survey; about 17 per cent of those were Apple II developers. Of those who said they were Apple II developers, only 30 per cent were Apple II-only developers; the rest also produced

Macintosh products.

The most interesting statistic in the survey resulted from developers being asked what operating systems they used. Although only 114 developers claimed to be Apple II developers, 127 of them said they use Apple DOS 3.3. This compared to 81 using ProDOS 8, 76 using ProDOS 16, and 25 using Apple Pascal 1.3. And you thought DOS 3.3 was dead.

**If you get an I/O ERROR while trying to delete a file** under ProDOS 8, 16, or GS/OS, you're in bigger trouble than you think you are. If you try to delete the file a second time, whether you get an I/O ERROR or not, you'll have prepared your disk for slow but sure destruction, file by file.

In ProDOS 8 versions through 1.2, the file-delete command zeroed the deleted file's index block. This made implementation of an "undelete" command impossible. Starting with v1.3, file-delete was changed so that rather than filling the index block with zeros, the block's high and low halves were reversed. This allows deleted files to be recovered with special software. However, as the code was written, the index-block reversal is done *before* the file is marked as deleted in the directory.

Consequently, situations can occur where the high and low halves of a file's index block can be reversed and its blocks have been freed, but the file isn't deleted from the directory. If you try to delete one of these partially deleted files a second time, ProDOS, as usual, will use the reversed index block to mark as "free" the blocks owned by the file. But since the index is reversed, none of the blocks it frees will be the right ones. As you continue to use the disk, new files will over-



"LET ME GUESS - NO SURGE PROTECTORS...RIGHT?"

write old ones and the disk will gradually self-destruct.

The delete command, for reasons unknown, also tries to read the first data block of the file to be deleted (after reversing the index block, but before removing the file's directory entry), so attempting to delete a "bad block" file is a particularly good way to corrupt a disk.

Why does the index-block reversal occur at all? "Undelete" utilities only work if you use them immediately after deleting a file. If you save something else on the disk between the time you delete and the time you try to recover, parts of the deleted file are likely to be overwritten and the file is likely to be useless. Apparently Apple's idea was to move ProDOS from an operating system that didn't allow undelete at all (zeroed index blocks) to an operating system that allowed fairly sophisticated full-disk repair—the reversed index block is supposed to indicate to a full-blown disk-recovery program that the file has been deleted. In my opinion, the tiny benefit from this added full-disk functionality is too great a price to pay for the added complexity of reversing the index block. Why not just do what would have been simplest from the start—don't mess with the index block at all; just remove the deleted file from the directory entry and free up its blocks for other files.

*Exploring Apple GS/OS and ProDOS 8*, by Gary Little, is scheduled for publication by Addison-Wesley in late December. This is the follow-up to Little's earlier book, *Apple ProDOS*, which is out of print.

Yes, you can do a low-level format of SCSI hard disks with an Apple II. Here are the program lines I promised last month that change our SmartPort identification program from the January 1987

issue into a SCSI hard disk formatter.

Note carefully that these lines have the ability to erase everything on a hard disk and should be used with utmost care. In addition, they only do a *low-level* format; after using this program you'll also have to format the device with a standard ProDOS formatting program to make the disk bootable and to give it a directory.

```
548 add to end of existing line 548 : F = 0
549 add to end of existing line 549 : F = 1
575 :: IF TYPE > 3 THEN PRINT "<unknown>"
607 :: IF TYPE = 7 AND F = 1 THEN GOSUB 2000
```

```
2000 REM * Routine to put a low-level format on SCSI drives *
2010 PRINT : PRINT "FORMAT this device (Y/N)? ";
2020 INPUT " "; AS: IF AS < > "Y" AND AS < > "y" THEN 2099
2030 PRINT "Formatting will destroy all the files now on this device."
2040 INPUT "Are you sure you want to do this (Y/N)? "; AS
2050 IF AS < > "Y" AND AS < > "y" THEN 2099
2060 CMD=4 : SUBCMD=21 : POKE 784,0 : POKE 785,0 : GOSUB 1000
2070 IF ERR THEN PRINT "ERROR-"; : GOSUB 1900 : GOTO 2099
2080 PRINT "A low-level format of this device has been completed."
2081 PRINT "Before using it, you MUST also initialize/format it"
2082 PRINT "with ProDOS. Use your ProDOS System Utilities."
2083 PRINT
2099 RETURN
```



## Ask (or tell) Uncle DOS

Mistakes in *Open-Apple* are discovered around the world. Izidor Lichtman in Beer Sheva, Israel points out that in our October issue, page 4.71, line 10 of the program segment in the first column should say "E\$=CHR\$(27)" to make the variable match the rest of the program. In the original I started with the name "ESC\$" for that variable, but then called it "E\$" in lines 30 and 60.

Our sources on the engineering team and in technical support at Apple say the reason Reset doesn't work under GS/OS ("Reset vs GS/OS," December, page 4.88) is because allowing Resets would risk corruption of data stored on disks. Apple's engineers are very concerned that if they allow Reset at all, people will expect to be able to press reset while GS/OS or the IIgs toolbox are active. This would leave the active toolbox or GS/OS procedure half-done, which could easily lead to all kinds of trouble. (On the other hand, pressing Reset while the disk operating system has control of the computer has been a sure way to damage disks since DOS 3.1: Nothing new there. What many programmers want is a way to Reset their own programs while neither GS/OS nor IIgs tools are active, particularly in a development environment. I continue to think GS/OS should provide application software a Reset hook. If the application software doesn't use the hook, or if GS/OS or tools are

active when Reset is pressed, GS/OS can warm boot the system just as it does now. If the application software does use the hook, however, and if neither GS/OS nor the tools are busy, then control of the computer should return to the application via the hook.)

### Apple Writer news misleading

(I very much like the implications of your new name! It makes me wonder with excited anticipation where we'll all be in this Apple world in yet another five years.)

As an *Apple Writer* aficionada, I read with interest your Miscellanea column in last month's issue. I had also heard about the availability of *Apple Writer* from Sun Remarketing and called to inquire about the \$25 offer. The following is the essence of my conversation with Sun:

I was told that, yes, they did indeed have *Apple Writer* for \$25. I asked if it was the ProDOS version complete with Apple documentation. I was told yes. I asked if the person would check on that for me. She did, coming back to the phone to say she'd made a mistake, they only carried the DOS 3.3 version. I asked if that came complete with Apple documentation. She said yes, again. I asked her to check that for me, again. She returned to the phone to say that no, it didn't come with Apple documentation, it came with a short print-out of commands.

In short, the rumor that Sun Remarketing carries *Apple Writer* for \$25 seems to be false, at least if you consider *Apple Writer* to be a ProDOS program complete with original documentation, as I do. Sun's catalog does indicate they have *Apple Writer 2.0* (Cat. No 032) available for \$75, but they apparently don't have it in stock on a regular basis.

With high hopes blown, I remain your ever-faithful reader,

Sandy Brockmann  
Kansas City, Mo.

Thanks for the information. "If your mother says she loves you," my editing professor used to say, "CHECK IT OUT!" I did call Sun to check out the rumor before printing that item, but it

didn't occur to me that they might not know what it was they were selling.

### "Open-Apple" eulogy

I don't understand why you feel the need to change the name of *Open-Apple*. After reading the section on this in the last issue (page 4.84), I don't think you're sure either. You did not give a reason for the name change, just an explanation of some changes that have occurred. The current name of the newsletter refers to the Apple II series of computers, the name is specific to the only computer with an open-apple key. By changing the name to *A2-Central*, you are removing any reference to the product from the name of the newsletter. I don't see what the name *A2-Central* has to do with Apple II Computers. Why not just call it *Open-Apple: a journal and exchange of Apple II discoveries* and leave things like they were. This makes much more sense.

The name *Open-Apple* refers to many things:

First, to the open-apple key; an integral part of the Apple II computer, which makes it very versatile. Reading this key is one of the first things an assembly language programmer learns. This is a key that sets this machine apart from many others.

Second, to the open architecture of the machine, the very reason it is popular. None of the mystery and confusion that accompanies a computer from Big Blue.

Third, to the company that manufactures this multi-faceted machine, Apple Computer. Without this reference, the name does not imply the type of subject matter contained within.

I have no problems with the changes in *Open-Apple* that have come about in the last few years. I appreciate the fact that you have added a catalog of hardware products and books. I have always felt that you were making this publication worth more than its weight in gold. I don't know of any other base of computer users that has a reference available like yours. I still don't see why you feel the need to

change the name. You don't need a flashy, commercialized name; just stick with the name we have come to know and respect.

John Wargo  
Akron, Ohio

*I appreciate your eloquence. I really did do a good job when I chose the name **Open-Apple**. Didn't I?*

*What I purposefully and deliberately under-emphasized in my announcement of the upcoming name change of **Open-Apple** to **A2-Central** is a little matter regarding Apple's legal department. While my lawyer's shaky opinion is that the name **Open-Apple** doesn't infringe on Apple's trademarks, Apple's lawyers vehemently disagree. They threatened me with court action three-and-a-half-years ago and would have forced me to change the name then if it had not been for the intervention of some Apple II champions at Apple and of John Sculley's office.*

*While I could probably get away with using the name **Open-Apple** indefinitely, the current situation is that Apple's legal department still considers my use an infringement of Apple's rights. This clouds my relationship with Apple. And the chains that are holding back Apple's legal department could wear out or break at any time.*

*I'd rather change the name on my terms than on Apple's. And I've wanted to do it in a way that would have more meaning than a simple bowing to Apple's legal wishes. Now is a time when a name change can clarify our past growth and our future direction. If it also clarifies the cloudy relationship we've always had with Apple, so much the better.*

## Trouble in Desktop City

The world has to unite to make **AppleWorks** GS print faster. This one thing will kill it for sure. I don't have 15 minutes to print one-and-a-half pages of downloaded bulletin board notes.

Tom Hesselman  
Appleton, Wisc.

Am I missing something? Everywhere I keep reading about the IIgs system disks. I keep seeing information about the latest desk accessories and tricks to using **Finder**.

I have a 1 meg memory card with **RamKeeper** battery back-up. Ninety per cent of the time my wife or I turn on the computer we use **AppleWorks**. We are also using quite a few of the **TimeOut** add-ons. My ROMdisk doesn't have room for both **AppleWorks** and the IIgs system disk. If I put **Finder** on the ROMdisk, I have to wait while **AppleWorks** loads from my 3.5. If I put **AppleWorks** on the ROMdisk, I have to wait while the **Finder** boots from the 3.5.

Alternatively, I can just skip the **Finder**, put **AppleWorks** in my ROMdisk, and boot straight into it. Using the **Program Selector** from **TimeOut PowerPack**, I can use **AppleWorks** as a program selector. Most of the time, a normal exit from the other program returns me immediately to **AppleWorks**. When it doesn't, I just warm boot. It accomplishes the same thing. We are very happy with this setup.

It seems to me that the IIgs system disk is only a good idea if you've got tons of RAM or a hard disk. At work I have an AT-clone with a 40-meg hard disk and Microsoft Windows for an operating environment. This gives me an idea what **Finder** would be like with unlimited memory, and it's wonderful. At present, however, I find it rather cute, slow, and useless. Am I

doing something wrong?

Daryl C. Morgan  
Turlock, Calif.

*Printing under GS/OS-style programs involves sending graphics commands, rather than text, to your printer. This takes much longer whether you're using an Apple II, a Macintosh, or an MS-DOS machine. You pay for the fancy output with slower speed. Try printing things like downloaded bulletin board notes at "draft" quality. This is much faster because it bypasses the graphic output.*

*I think the **Finder** is best considered as an excellent program selector and disk maintenance utility for neophyte computer users. Few experienced Apple II users I know of, however, actually use the **Finder**. In the Macintosh kingdom everyone sticks with the Mac **Finder** because users have few alternatives. What makes the Apple II attractive is its flexibility and the choices it offers users—not only **Finder** for novices but also **ProSEL**, **TimeOut's Program Selector** and **FileMaster**, **Copy II Plus**, and many other similar programs.*

## Trouble locally, GS BASIC

I have a couple of concerns over the trend at **Open-Apple**. I'm more than happy to purchase products from you to support your outstanding newsletter. On the other hand, your outstanding newsletter is no longer outstanding when half of its content is advertising for **TimeOut** (or **GEnie** or **Cirtech** for that matter).

In addition, your recent praise of the 'new' Apple IIc is totally out of character for you. The machine confirms that Apple's Apple II strategy consists solely of attracting unsuspecting parents whose children use Apples at school and want one at home. Reading your article on the IIc announcement made me wonder if you were really in the hospital and someone from Apple Marketing was now writing the newsletter.

Finally, and this has nothing to do with you, I joined the Apple Programmers and Developers Association a little over a year ago to be able to get **GS BASIC**. For \$70 I got a membership and a beta version of the program. As you know, the program was so bad one had to be a subscriber to **Open-Apple** even to find out how to print with it. And it stupidly changed command names from Applesoft for no reason at all. Now I find I have to renew my membership in APDA again if I am going to have any hope of getting the final version of **GS BASIC** for less than full price. This means I'll have \$90 invested already with nothing to show for it and I could have ordered **Micol Basic** from you for \$99. I wish I hadn't heard of APDA.

Larry O. Graves  
Falls Church, Va.

*The latest issue of the **APDAlog** (October) lists **GS BASIC** in its **Ye Olde Curiosity Shoppe** (page 43, 'old junk, mostly,' according to that section's introduction), so it's unlikely there will ever be a final version.*

*In my opinion, the IIc-Plus catches the essence of the Apple II as perfectly as any machine released by Apple since the original. Yes, it's aimed squarely at the home market. I, for one, am enthused to see an Apple II that can compete there again. Before its IIc-Plus announcement, Apple's cheapest home-market machine was the **Macintosh-Plus**. It was like having Santa come early to find Apple positioning a brand new color IIc in the home market at just a little over half the price of the low-end*

monochrome Macintosh.

*The IIgs qualifies as a home-market computer, too, but it's Apple's most expensive machine in that market. Apple has positioned it as a machine that can command this high price because it can run both Apple II and Macintosh-like software. The IIgs is the best Apple II ever built, but it makes a mighty weak Macintosh. If it didn't have a turbo-charged Apple IIe inside of it, the IIgs would have floundered in the marketplace just as the original Macintosh did. I think we'll eventually see a version of the IIgs from Apple that can run Macintosh-like software acceptably, just as we eventually saw some Macintoshes that could do it.*

*Meanwhile, if what you want to do is run Macintosh-like software, then buy a **Macintosh**. But give me the instantaneous response and personal control I get from Apple II software. The fastest and cheapest Apple II of them all is the new IIc-Plus and I think it's an **insanely great machine**. (So do buyers, apparently—in its December 5 developer newsletter, Apple said IIc-Plus orders were above forecasted levels. How much? Two units we bought went on back-order at Apple Nov 1 and weren't shipped to us until Dec 1. They arrived with Japan Air Lines stickers on the boxes that made it clear that Apple had shipped them by air freight from Singapore to San Francisco.)*

*As for the contents of this newsletter, the limitation is that I write about what I know about and I know about what I explore during the free days between newsletters. When I get interested in something as big as **TimeOut** or **GEnie**, the following newsletter will reflect that simply because there was no time to investigate anything else. I am still looking for a program that will allow me to clone myself on any Apple II (see November 1986, page 2.76); as soon as I find one this problem should be alleviated.*

## What about the Agat?

What information do you have on the Agat computer? It is a Soviet clone of the Apple II-Plus, I think. I've been told that the Commodore 64 uses a 6502 microprocessor. It's actually a 6510. Would you be able to refer me to a book that would tell me the differences between the two chips?

John C. Warren  
Oklahoma City, Okla.

*The only information we've ever seen on the Agat was an article called 'AGAT: A Soviet Apple II Computer', which appeared in the November 1984 **Byte**, page 134.*

*The 6510 is a customized version of the 6502. Howard Sams publishes a book called the **Commodore 64 Programmer's Reference** that you may find helpful.*

## Graphics help

After a considerable investment in time, reading, and dealing with stress, I still don't fully understand graphics. It's starting to make sense but I'm desperate to learn more. Can you suggest some books on Apple II graphics?

Perry Holman  
Dixon, Mo.

*Apple's machine-specific hardware reference manuals are good descriptions of what is*

where and how graphics work from a hardware standpoint.

From a software standpoint, several books on Apple graphics have been available in the past, but they all seem to be out of print now. We're still looking for a decent graphics book or two to offer in our catalog.

Other good sources of information if you can find them would be old issues of **Softalk**, which had a graphics column written by Mark Pelczarski and a later, unfinished one by Bill Budge, and **inCider**, which once had a graphics column written by Don Fudge. A nuts-and-bolts non-Apple-II-specific reference on graphics programming is **Microcomputer Displays, Graphics, and Animation**, by Bruce Artwick (author of the original Sublogic flight simulator programs), published by Prentice-Hall.

## TYMAC parallel cards

Apple IIe owners using TYMAC PPC-100 parallel printer cards may have heard that adding the IIe enhancement kit causes printer problems. The rumor is true, but does not call for a new printer card. TYMAC Controls has an enhanced ROM that fixes the problem. It's available from Pypelyne, P.O. Box 399, Vernon, N.J. 07462 (201-827-8485) for \$16 plus shipping. My enhanced IIe, PPC-100, and Apple DMP now work fine together.

While trying to isolate the problem with my card I tried dumping a listing of the card's ROM to my printer. I found that the code at \$C180-BF was repeated at \$C1C0-FF, which did not seem right. I then moved a copy of the ROM code down in memory and examined it; no repeat now. I observed the same erroneous code repeat when I tried it on an Apple parallel card on another machine; moving the code cleared up the problem. Does anyone know why reading the ROM code on the card will cause this aliasing?

Why does ProDOS 8 correctly identify the TYMAC or Apple printer cards even though neither one follows Apple's Pascal 1.1 interface protocol?

Gary Welsh  
Naperville, Ill.

The Steve Wozniak-designed Apple Parallel Interface card re-mapped a portion of the ROM addresses based on printer status; this caused the ROM software to be "held" in a loop until the printer was ready to receive the next character. The TYMAC card is probably a clone of Wozniak's card and uses a similar remapping. When you **print** the ROM contents you'd be getting a picture of what the ROM looks like when the printer is busy. When you move the contents first, you'd get a picture of what it looks like when the printer is ready for another character.

ProDOS 8 and Apple Pascal specifically check for the Apple Parallel Card, even though it doesn't follow the Pascal 1.1 protocol, for compatibility reasons.

## More on disk interleave

You recommended (November, page 4.77) a 2:1 interleave for an Apple 3.5 drive and the GS/OS System Disk. But for commercially distributed software, you recommended 4:1 as the optimal interleave because it produces a large gain for the UniDisk 3.5 but only a slight penalty for the Apple 3.5 drive.

The *Getting Started* manual for *AppleWorks* GS (page 8) recommends a 2:1 interleave for

the Apple 3.5 and 4:1 interleave for the UniDisk 3.5. Claris appears to disagree with your recommendation. Do you consider *AppleWorks* GS in a special category from other 'commercially available' software? Do you agree with Claris' recommendation?

Jerry Saale  
Overland Park, Kans.

In my comment in November I meant that it appears publishers should use a 4:1 interleave on the original disks they sell you. When you copy the originals to make working backups, the copies should be formatted with whatever interleave is best for **your** own system. This will depend on what type of drives you have. The information provided by Claris is correct in this regard.

Incidentally, tests we've done with the Apple 3.5 drive built into the IIc-Plus indicate it works fastest at most tasks with the normal 4:1 interleave rather than with the new GS/OS 2:1 interleave—which reconfirms my opinion about the interleave publishers should use.

## Logo update

I'm impressed by the quantity and quality of information that has been published in **Open-Apple**, however, I am somewhat dismayed at the lack of Logo coverage. Logo is very much an Apple II language. The best Logo implementations are now and have always been on the Apple II, from the original MIT implementation up through the windowing Logo's available today.

Back in volume two (page 2.62), you told a reader that Logo is too slow for traditional applications, and I agree. But it isn't too slow for non-traditional applications. I've written two papers describing non-traditional work I've done with Logo implementations on my Apple IIc.

REFTOOL is a hypertext system that I implemented in Apple Logo II. *Moo* Logo is an object-oriented extension to LCSII Logo II. Neither of these applications are blindingly fast as you might imagine. REFTOOL isn't as fast as HyperCard nor AppleWorks, but it's faster than *Word Perfect* on a IIc and it's plenty fast enough for composing stories and exploring hypertext.

Logo on my Apple II has served me well, both as a prototyping language in my work at Bell Communications Research and as a language for my graduate students in computer science. Sure, Logo is great for teaching kids about squares and triangles, but it's also great for exploring hypertext, object-oriented programming, compiler construction (I've written two compilers and a LISP interpreter on my IIc with Logo), and theoretical computer science.

These sorts of applications might surprise many of your readers who may have thought of Logo as a kids-only or graphics-only programming language. Perhaps they're not aware of some of the new Logo implementations that have been released for the Apple II in the last year.

For example, the *Phantom Fish Tank* is a version of Logo that, instead of Turtle Graphics, has *Life*—Conway's *Game of Life* with gliders and blinkers and rest. Brian Silverman of Logo Computer Systems, Inc. (LCSI) developed this Logo, which combines a world where users can study *Life* and similar games with a Logo interface that includes the editor, debugger, and list-processing facilities. *LogoWriter* is a paned-window programming environment that combines a word-processor and Logo to create a pro-

grammable word-processor with graphics. *LogoWriter* adds to Logo commands to switch windows, SELECT/CUT/PASTE/FIND/INSERT text; and to control four turtles with user-defined shapes. *Lego TC Logo* includes a hardware attachment for the Apple IIe and IIgs so that programmers can write Logo programs that control Lego motors and read sensors.

Most of the Logo implementations available for the Apple II today are developed by two companies: Terrapin and LCSII. Here are their addresses and phone numbers:

Terrapin Inc.  
376 Washington St  
Malden, MA 02148  
617-322-4800

LCSII  
330 W. 58th St, Suite 5M  
New York, NY 10019  
212-765-4780 (800-321-LOGO)

Mark Guzdial  
1302D School of Education  
University of Michigan  
Ann Arbor, MI 48109

Each time I've looked at Logo I've come away thinking it was a rich and interesting language. Yet we get very few questions or comments about it, so we haven't given it much emphasis here in **Open-Apple**. But our minds are open.

Terrapin's Apple II products run on 64K machines and include versions that take advantage of 128K. Terrapin's Apple II product line includes **KinderLogo** at \$49.95, **Terrapin Logo** at \$99.95, and **Logo Plus** at \$119.95.

LCSII's Apple II products require 128K machines and include **Phantom Fish Tank** at \$29.95, **LCSII Logo II** at \$99, **LogoWriter** at \$169, and **Lego TC Logo** at \$485. The last product includes an interface card, motors, sensors, and more than 400 other Lego pieces as well as a version of Logo. "I've just seen pictures of the ultimate Lego set," in our July 1987 issue, page 3.43, has more information on this product.

## The dumb UniDisk

I understand that a 3.5 UniDisk can be rendered "dumb" by disconnecting one of its circuit boards. Does this procedure turn it into an Apple 3.5 drive or does the Apple 3.5 have other separate circuitry?

If I could modify my UniDisk 3.5s, I could use 2:1 interleaving (see November, page 4.77) and I'd have a drive that could be connected to a PC Transporter. But I am loathe to try it without some expert advice.

Can the new Mac IIx 1.4 megabyte 3.5 drives be used with an Apple IIe?

Dr. John Mamutit  
Kellyville, NSW

My understanding of the UniDisk 3.5 is that **theoretically** it can be rendered dumb. Having just taken one apart to look inside, however, I'm not sure how easy it would be to turn theory into practice. First there's the little matter of getting access to the extra circuit board. I couldn't figure out how to do it (I removed the plastic exterior case, but inside was a metal case that wouldn't come apart as easily). Even if you knew how to get it apart, however, you'd have to rig some way to keep the in-use light and disk-eject button working—both plug into the "extra" circuit board.

It might be feasible for a company to create

a 'kit' of some type that would include disassembly instructions and the necessary connectors for turning a UniDisk 3.5 into an Apple 3.5, but we haven't heard of such a thing yet. Since the IIGs and the IIC-Plus can use either type of drive, and since the Apple 3.5 is faster on the IIGs, I think there might be a market for a kit like this. Anyone want to try it?

Apple hasn't announced availability of a stand-alone 1.4 megabyte drive. At the moment, in fact, the only way to get one is to buy one that's built into a Macintosh IIX (prices start at just \$7,769). Logic would indicate that Apple will eventually develop a stand-alone IIGs/IIC-Plus-compatible (but not IIE-compatible) 'Apple' 1.4 megabyte drive—however, logic also indicates that the Apple SCSI Tape Backup system would be available for the Apple II. Logic indicates Apple would write a GS/OS printer driver for the ImageWriter LQ. So much for logic.

## Icon editors

Some commercial software, such as *Multi-Scribe*, comes with customized program icons. I read that Apple released an icon editor to developers at one time. I have tried to obtain this through APDA but it is not available. Is there an alternative way to achieve a 'personalized' look on the desktop?

Nigel Harrison  
Singapore

Apple's very buggy icon editor was available at one time to certified developers directly from Apple Developer Technical Support. It was never polished enough to be released through APDA, and according to our sources, never will be.

Alternatives are available, however, in the form of at least two shareware editors available on most of the online information services:

DICED (shareware fee \$15)	TIE (shareware fee \$5)
David Lyons	Chris Budewig
DAL Systems	457 Harr Dr, Apt G
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## Basic.system aux type patch

Here's a patch I came up with to make Basic.system display the aux type of all types of files, rather than just TXT and BIN files:

```
BLOAD BASIC.SYSTEM,TSYS,A$2000
CALL -151
2EF6:13
2F13:11
3D0G
BSAVE BASIC.SYSTEM,TSYS,A$2000
```

The above patch can help out a lot when trying to decipher the various types of IIGs picture files (April 1988, page 4.24), among other things. A lot of other files have interesting information here, too.

Jerry Kindall  
Grove City, Ohio 43123

## Stocks, fonts

Is there an AppleWorks program or template that would allow me to track stocks graphically? A friend of mine has a program for his MS-DOS computer that allows him to enter the name of

the stock, date, and price and the program plots the up/down movement on a graph automatically. Is there a template or something that would allow me to do the same thing with AppleWorks?

Second question—I have nine 5.25 disks with SuperFonts and Apple IIGs fonts on them. I would like to put them all on a 3.5 disk. However, when I try to put them on a 3.5 disk, I can only copy so many files and then my copy program tells me the disk is full. I know that the 3.5 disk capacity is greater than that of the 5.25 disk—how can I get around this problem?

Melvin C. LaBree  
Herndon, Va

If you're already comfortable with AppleWorks, your best choice for the stock-graphing might be Beagle Bros' **Timeout Graph**. If you enter the name of your stock, the date, and the price in an AppleWorks spreadsheet, **Timeout Graph** can quickly give you a picture of the price movements in either a line or a high-low-close format. For more on this program, see last month's issue, page 4.82.

ProDOS disks almost always have a limit of 51 files in their 'root' or 'volume' directory. This is the 'main' directory on the disk—the one you see when you catalog the disk by slot and drive numbers. To put more files on the disk, you have to use subdirectories. There is no theoretical limit to the number of files you can have in a subdirectory (however, once you have more than 200 or so file operations slow way down).

To solve your problem, take a 3.5 disk and create a subdirectory on it. Copy your fonts into the subdirectory. If you have more than a couple hundred fonts, things will work best if you put them in several subdirectories, each with fewer than 150 or so font files.

## GS/OS and "torn" graphics

Under the new GS/OS operating system, if you boot into ProSEL and run SuperCalc, the graphics are messed up. But if you launch SuperCalc from the (ugh!) Finder instead of ProSEL, it is okay. How come?

William A. Coleman  
Oklahoma City, Okla.

The problem with the graphics screen is that GS/OS does not properly shut down Super High Graphics after booting but leaves the graphics screen in 'linear' mode, which will make double-high-res graphics look 'torn'. If you run another SHR application, such as **Finder**, after booting, however, it usually fixes the problem. (Once again we find Apple software not following Apple's own rules.) The newest version of ProSel, 3.9, also solves the problem.

Another interesting solution is to keep the GS/OS startup procedure from activating the SHR screen in the first place. Glen Bredon discovered that if you use a disk editor to change the aux type of a backup copy of the file START.GS.OS to \$5254, it has the same effect as pressing Escape while GS/OS is booting. That, if you haven't tried it, puts up a text screen that lists GS/OS modules as they are loaded, along with their version numbers. Since the graphics screen isn't used in this case, the screen isn't accidentally left in linear mode (other values of the aux type are used as a speed parameter for the thermometer, but only this one special aux type will defeat the thermometer altogether).

## AppleWorks easy access

I have a request from a local independent living center to write an AppleWorks patch that would allow persons with disabilities to do single key presses for open-apple commands. In other words, they need a 'press and release open-apple, press and release command-key' sequence. Can you guys help?

Steve Greve  
Augusta, Maine

We don't know of a patch, but we do know that Beagle's **Timeout UltraMacros** supports this. After installing **UltraMacros**, select 'Macro Options' from the Timeout menu, then 'Other Activities,' then 'Reactivate Key-Lock'. After this, when either open-apple or solid-apple is pressed, an inverse 'O' or 'S' will appear in the bottom-right corner of the screen. The next key press will be processed as if the open-apple or solid-apple key were being held down.

## Yorkshire ribbons

Regarding the Cirtech memory cards, I can only endorse everything you say about them in your publicity material. Before its demise, I wrote about 50 articles and product reviews for the British magazine *Apple User*, including reviews of a number of memory cards. In all these reviews, Cirtech's cards proved to be the best value for the money, so much so that I bought a 1 megabyte PR-1 for my Apple IIe and 512K StatDisk for my IIGs. On the latter, I have AppleWorks with several Timeout applications and also the utilities from Copy II Plus.

I run seminars for managers, mainly on spreadsheet applications. Most people use Lotus 1-2-3 or SuperCalc on PC's but when they see AppleWorks start up in less than 2 seconds on my IIGs, the easy-to-understand commands, 12 files in the massive memory and the ease with which I can cut and paste between the applications, they are quite disappointed when I have to tell them that it won't run on their machines. Unfortunately, Apple UK is preoccupied with the Macintosh so corporate buyers never hear about AppleWorks and the IIGs.

If any of your readers would like copies of my reviews of the Cirtech cards, I would be pleased to send them. In turn, can anybody help me with a problem on my ImageWriter LQ? Normally, it uses only the top quarter of the expensive ribbon but software written to print out colours uses the full width. I want to know what codes to send the LQ to get it to print on the other sections of the ribbon. As a fully paid up Yorkshireman, I am loath to throw away ribbons that still have three-quarters of the ink left in them.

E.G. Wood  
27 Towncliffe Lane, Marple Bridge  
Stockport, Cheshire SK6 5AW

Single-color (usually black) ImageWriter II ribbons have a 'twist' in them so that both the top and bottom edges of the ribbon are used. As you know, the ImageWriter LQ uses a very different ribbon cartridge from the ImageWriter II, but I would have expected those ribbons to include a twist as well.

You should be able to get more out of your ribbons by tricking the printer into thinking it's using color. Try the following control codes for adjusting which part of the ribbon the print-head will use:

```
ESC K 0 black
ESC K 1 yellow
ESC K 2 magenta
ESC K 3 cyan
```

You and your fellow Yorkshiremen might like to know we've had good results with reinking ribbons here at **Open-Apple**. We have a little machine called a Maclnker that will pull an ImageWriter ribbon around a rolling felt ink reservoir. It works well as long as you don't use too much ink. It's much better to err on the side of not enough than too much. Too much ink makes the ribbon slippery and the gizmos can't pull it through the cartridge anymore (it also causes you to get ink all over your hands—from there it migrates to your face, clothes, and paperwork.) I have yet to throw away a ribbon because the fabric wore out (usually the cartridge jams first). I have a few ribbons that have been reinked six or seven times and are still going strong.

A Maclnker that handles ImageWriter I and II ribbon cartridges costs \$42. It's available from Computer Friends, 14250 NW Science Park Dr, Portland, OR 97229, 503-626-2291, 800-547-3303. Computer Friends also has an Epson Maclnker for \$42 and Universal Cartridge and Spool inkers at \$68.50 each. The Universal Cartridge inker is the one you'd need for the ImageWriter LQ. Be sure to specify what printer you have if you order it so they can send you the right adapter. Each inker comes with a small bottle of ink. You can buy more ink from Computer Friends; a pint bottle, which is enough for about 100 inkings, is \$18.50.

## Cirtech questions

Will a StatDisk give me an expanded AppleWorks desktop? Since Cirtech products are made in Europe, what does one do if service should be needed? If the European supplier should go out of business?

W.S. McClenahan  
Appleton, Wisc.

What happens if I have problems on installation? What technical support is available?

K. Strain  
Fayetteville, N.C.

What is the warranty on the Cirtech GS-2 and GS-8 memory cards? Do these cards work with Applied Engineering's RamKeeper or with Checkmate's Memory Saver? If so, will they attach to the back of these cards or only with the extender? Which slots are blocked by using a one-megabyte StatDisk with the above?

David Kessel  
Arvada, Colo.

You seem to favor the StatDisk over products like RamKeeper. Is there a reason for that?

Daryl Morgan  
Turlock, Calif.

The warranty on all Cirtech products is one year. If the product fails under warranty we will fix or replace it at no charge. If it fails after the warranty has expired, we will fix or replace it, but we'll have to charge you something. If you have problems on installation, call us at 913-469-6502. Although our order form says we don't answer technical questions by phone, that's to keep you from asking us to solve other company's problems. If you're having trouble with something you purchased from us, by all means, give us a call and we'll make it right.

Memory cards tend to fail within the first few days of operation or never, unless you physically damage them somehow. Once you've had a working card in your computer for a few days, the chances of its ever needing repair

work are much less than 1 per cent. No matter who you buy from, you take some risk that they won't be in business at some time in the future. I can't predict the future, but I can say that Cirtech is an established company that has been in business lots longer than we have. Combine that with the anticipated failure rate and you are taking very little risk, whether you buy from Cirtech or any other vendor.

The StatDisk, PR-1, and PR-16 cards follow the Apple standard for memory cards used in slots 1 through 7. Any software that will use this type of card will automatically work with Cirtech's cards. AppleWorks versions 1.3 and higher, used on a IIe, automatically use this type of card for desktop expansion—no AppleWorks patches or modifications are necessary. On a IIgs, however, AppleWorks refuses to look for this type of card (the next letter explains how to get around this problem and solve some others besides). A 512K StatDisk doesn't block any slots but its own. Larger StatDisks require a piggy-back expander that physically blocks any other card from fitting in the next higher slot. On a IIe, we recommend using slot 7. On a IIgs, we recommend using slot 2 (3 blocked) or 6 (7 blocked). Neither of these combinations conflicts with a Memory Saver.

The GS-2 and GS-8 cards follow the Apple standard for memory cards used in the IIgs memory expansion slot. We have tested them with Checkmate's Memory Saver and they work fine but require Checkmate's "extender" to solve clearance problems (note that the extender may not fit over the keyboard connector pins on IIe retrofit motherboards). The GS-8 cannot be combined with most other memory cards using the Memory Saver because you can't mix 1-meg chips and 256K-chips in a two-board system. We have no reason to think Cirtech's cards wouldn't also work with Applied Engineering's RamKeeper (with extender) but we haven't actually tested it.

RamKeeper and Memory Saver are devices that do three things: provide power to the RAM chips on IIgs memory cards even while the computer is turned off; allow you to use two IIgs memory cards at one time; allow you to allocate a portion of IIgs internal memory as a "ROMdisk" (it's really RAM, but the IIgs is tricked into thinking it's ROM). These devices come with external power supplies that must be turned on at all times. And they have rechargeable batteries that will provide emergency power for a few hours in case of a power outage.

The StatDisk uses a standard slot, rather than the IIgs memory slot. Because it uses a different kind of RAM chip than other cards ("static" rather than "dynamic") it requires no external power supply. A battery on the card is recharged when your computer is on; when your computer is off the battery can keep the data on the card safe for months rather than hours. You can completely remove a StatDisk from a computer and plug it in another without losing data.

Another way to get much of the functionality of either type of device is to use any kind of memory card in your computer, plug your computer into an Uninterruptible Power Supply, and leave it turned on all the time (you can turn the monitor off when you're not using it). If you have a hard disk, you should probably have a UPS anyhow, because if the lights go out while you're saving something, permanent

darkness can descend over all your data.

The RamKeeper/Memory Saver, StatDisk, and UPS are all viable solutions to the problem RAMdisk addicts face—the time it takes to load the RAMdisk when you sit down to use your computer. Each has its own advantages and disadvantages in terms of convenience, reliability, cost, and compatibility with other features of your system.

## IIgs defeater revisited

You mention in your mini-review of SoftSwitch (November, page 4.75) that one of the program's limitations is that you can't run a ProDOS 16 application in one workspace while AppleWorks is suspended in another. But you can. Not only that, you can boot up your IIgs and have AppleWorks with a 1012K desktop restored into a SoftSwitch workspace with files just as you left them when you last turned off your machine.

Here's the hardware requirement: a IIgs with a respectable main memory (at least 1 meg) and a 1 meg or larger RamFactor with battery backup. You could also use any other slot-based memory card without battery backup, but this would necessitate backing up the card before turning your computer off and restoring it at bootup.

Here's the patch. It tricks AppleWorks into thinking it's running on a IIe, not a IIgs, so it doesn't try to mess with IIgs internal memory:

POKE 768,44

```
BSAVE APLWORKS.SYSTEM,TSYS,A768,L1,B5031 (v1.3)
BSAVE APLWORKS.SYSTEM,TSYS,A768,L1,B5408 (v2.0)
BSAVE APLWORKS.SYSTEM,TSYS,A768,L1,B5475 (v2.1)
```

I applied the patch to a virgin AppleWorks 2.0. I then modified AppleWorks with Applied Engineering's expansion software and with Timeout and ran it after setting up two work spaces in SoftSwitch. From here you rule the world. From anywhere, at anytime, while in AppleWorks go to SoftSwitch and save the workspace. Switch to another work space and do what you will there, when you return, AppleWorks and your desktop will be just as you left it.

It makes sense, as the memory that AppleWorks allocates to itself is confined to the RamFactor (in fact, it holds the space on the RamFactor as a type \$00 file called SYS.DESKTOP) and, of course, with a battery backup that memory survives power down.

To save the AppleWorks workspace while the power is off, use the Keepsake program from SoftSwitch. Each time I leave AppleWorks to run a P16 program (that may crash), or for any other risky behavior, I save my SoftSwitch AppleWorks workspace with Keepsake. Try this if you've got the hardware and need or like to have AppleWorks available all the time. It is amazing! It's like having an AppleWorks machine built into your IIgs.

Bill Krinsky  
New York, N.Y.

I tried it, and I agree, it's great. Instead of a RAMfactor, I'm using one of Cirtech's PR-16 cards with two megabytes of memory, although I already want to expand it to the full four megabytes. My system has a UPS for backup, so I'm using it both as a RAMdisk and for desktop expansion. AppleWorks 2.1, incidentally, will use up as much memory as you have on cards like this (earlier versions would stop at 1 megabyte). Since it's almost impossible for IIgs

programs that have gone amuck to tramp on data stored in slot-based RAM cards (while it's almost guaranteed they'll tramp on the internal IIGS RAMdisk), I feel much more secure leaving the internal RAMdisk set to OK and using this one.

## UltraMacros articles

In last month's comments on *UltraMacros* (page 4.83-4.84), you say the program's biggest weakness is the lack of detailed, comprehensive documentation and that a few good articles giving an overview of *UltraMacros* programming are badly needed. The National AppleWorks User Group's newsletter, *AppleWorks Forum*, has been running my Macro Primer series since September. It started with the basics of macros and is working its way up to programming.

And just when you thought it was safe to go back and use *AppleWorks*, another patch! This one can prove quite useful. After you make the patch, *AppleWorks* won't mark your file as 'changed' if all you've done is print it or calculate page breaks. Thus, if you save a file and then print it, you'll be able to remove it from the desktop without the extra 'you made changes to this file, do you want to save it' questions.

POKE 768,234 : POKE 769,234 : POKE 770,234  
BSAVE SEG.M1,T0,A768,L3,B\$A119 (v2.0)  
BSAVE SEG.M1,A768,L3,B\$A19D (v2.1)

And if you'd like *AppleWorks* to constantly show you the 'K avail.' on the desktop instead of the 'OA-? for Help' message, here's a patch to force *AppleWorks* to do that. This patch works for both v2.0 and v2.1:

POKE 768,76 : POKE 769,71 : POKE 770,208  
BSAVE APLWORKS.SYSTEM,TSYS,A768,L3,B\$846

Mark Munz  
Fort Lewis, Wash.

## Foreign accents, cont

I'm amazed at how much mail we've received on the issue of accented characters. This all started with a couple of letters in our October issue, page 4.71. The first, 'French accents', asked how to get accented characters within *AppleWorks*; the second, 'More characters, more tongues', pointed out that some IIGS software doesn't check to see whether the user is holding the option key down and consequently can't access the accented characters embedded in most IIGS fonts.

In November, 'French accents, cont', page 4.80, told of a program called *EuroWorks* that brings accented characters to *AppleWorks*. In December, 'Foreign accents, cont', page 4.87, included a letter from the author of *EuroWorks* specifying what equipment is needed to run the program, as well as long critique from Michael Janosek analyzing the international character sets built into the IIGS.

First, to follow up on *EuroWorks*:

Thanks for printing my letter and the follow-up in the October issue. I called S.A. Auteur in Portland and spoke at length with Frank Wells. He was very helpful, clear, and thorough in his explanation to me of how the program worked and how easy it was to install (he offered to do it gratis if I had trouble). On that basis I sent off an order, received the disk in a few days, and have been delighted with the results.

*EuroWorks* has complete and detailed documentation on-disk in 'cookbook' style, which is perfect for non-techies like me. The program is written using *TimeOut UltraMacros* at a level I

wouldn't even contemplate at this point. I don't need to sacrifice any of the English keyboard, and indeed, get an extra eight special symbols such as plus-or-minus in addition to accented characters. It works from within *AppleWorks*. To watch the screens flash by as it's getting ready to print is fantastic.

Dorothy Nesbitt  
Winnetka, Ill.

Two of our French subscribers wrote to say that in the French version of *AppleWorks*, you can get circumflexed vowels. Not all Frenchmen actually use them, however:

To print the circumflex accent with the French version of *AppleWorks*, it is sufficient to hit the caret key before the letter you wish to be circumflexed. When printing, the caret will be over the following letter. I suppose that when the caret is sent to the printer, it is followed by a backspace command. It is possible that this feature doesn't exist in the USA version (e d note: it doesn't).

Now let me talk about a very funny feature of the French version. In old Europe the decimal point is a comma, but we are used to the decimal point because all the computers and the pocket calculators have it. But *AppleWorks* decided to keep high the banner of good old Europe and the spreadsheet has numbers with decimal commas, not points. I wrote a program that has to collect a lot of data from analog-to-digital converters and all the numbers were, of course, in floating point with decimal points. Well, it was not possible to put them into the spreadsheet. I phoned the Apple Club and they said, 'Ah! sure! We know you can't. You have to just put your data in the word processor and replace all the points with commas.'

My opinion: accents are stupid and when I write in French I use only acute and grave accents because they are often necessary to avoid confusion between two words. I never use circumflex accents or dieresis (two points over a vowel). French urgently needs a written language without accents and there are also other languages with the same bugs.

Guido Belliol  
Saint Gilles, France

In addition to *EuroWorks* and the French version of *AppleWorks*, a third way to get accented characters out of *AppleWorks* is to use *TimeOut SuperFonts*, as several subscribers pointed out. For example:

Beagle Bros *SuperFonts* endows *AppleWorks* with the power to display and print the high ASCII characters in any font and will provide anyone with the accented characters they need. After defining your font(s) at the top of your document, you can print ASCII characters 128-191 with an <x2> command and ASCII 192-254 with <x3>. <x1> returns you to low ASCII.

Accented characters are present in the <x2> set within the fonts that come with the IIGS system disk and most other fonts. You don't need a IIGS to do this, however—*SuperFonts* allows you to print from *AppleWorks* using IIGS fonts on a IIGS or IIGS as well as a IIGS.

Incidentally, the *SuperFonts* manual doesn't mention it, but you can define a font with its pathname, which can be handy for IIGS users:

```
<1=/HARD1/SYSTEM/FONTS/SBASTON.16>
```

The printed copy is much clearer if a font double the size of the one being printed is also present. In high-quality print mode, *SuperFonts* will scale the double-size font down to the spec-

ified size and give you more resolution.

Bruce Ristow  
Rochester, N.Y.

Beyond *AppleWorks*, we have *AppleWorks GS* and other IIGS desktop programs. All the accented characters you could possibly need are already in most IIGS fonts. You access them by pressing and holding down on the option key while pressing another character key. Several subscribers wrote in to recommend a desk accessory called *MECC Key Caps*, which is included in the *MECC Calendar Crafter* program. Unlike the IIGS software that doesn't check option key status, *MECC Key Caps* can access every character in a font. You can use it to see what keys to press to get the character you want. With software that doesn't watch the option key, you can use *Key Caps* to type the character you want, then cut or copy it and paste it into your document.

Other desk accessories are floating around Europe that make it easier to access the characters you want. Yvan Koenig sent us a copy of one called *KEY.FR* optimized for French, which is a modified version of another desk accessory called *KEYUTIL* that was apparently distributed by Apple in Germany. I'm also under the impression that a desk accessory could be an 'option-key watchdog' for programs too stupid to do it themselves, but I'm not certain whether one has been written yet.

In addition to accented versions of the Roman characters found in the ASCII character set, other languages have completely different characters. The desktop interface provides an easy way to create documents that include text in totally different alphabets:

I, too, have had a need to produce some foreign character text, in my case it was Hebrew. This not only has a different character set, but reads from right to left. In Israel, where the language is used daily, the Apple keyboard and video ROM on the main logic board are replaced. There is a company in the USA (Davka Corporation in Chicago) that installs such chips and also offers *AppleWorks* in a bilingual Hebrew/English form.

In my own use, I need to use only a limited amount of Hebrew, usually mixed with English text. I've tried several solutions to the problem, but when *MultiScribe* made its appearance, it seemed that this would offer a practical and economic answer. Most important is that it is a true WYSIWYG program. It still, of course, prints Hebrew 'the wrong way', but it is not too much of a chore to use the left-arrow key after each letter for small amounts of text. A disk of ten Hebrew fonts has been produced commercially by Davka and before being taken over by Claris, Styleware offered a foreign character font disk. Together with *MultiScribe*, these produce a very respectable bi-lingual word processor.

There is a further problem if it is necessary to use (as in poetry or children's texts) vowel pointing with the Hebrew text. These are usually placed below the characters and present similar problems to producing accents above characters. It is possible to type the marks on a separate line and use zero line spacing to bring the two parts of the character together.

Harvey L. Nyman  
Harrow, Middlesex, England

Finally, I should mention that if only Dennis

