The need for speed

Although we have expounded on the virtues of Apple II speed-up devices in the past, here at the office **A2-Central** has managed to be an accelerator holdout. We've considered our IIgs units to be fast enough for our daily office routine and had hoped that Apple would follow the lead of third-party IIgs accelerator manufacturers with faster hardware of its own. At this point, that doesn't seem likely to materialize, so this month let's examine third-party acceleration options on the Apple II family.

Making an Apple II computer faster is as easy and as complicated as inserting the proper hardware device inside your computer and powering up. Easy–since the installation of such a device usually only takes a few minutes. Complicated–because there are diverse ways in which you can speed up your system, and the speed of the processor is only one of the issues.

Usually, we hear about the need for speed in a few select areas:

• disk access
• printing
• graphics (loading, drawing, and animating)
• large databases (searching and sorting)
• calculations

Solutions for these problems vary depending on how much money you want to spend and where you see the most need for an increase in performance. In most cases, users assume that a faster processor is the single most important aspect of getting more speed from their system. This may or may not true.

You have to break down the speed issue for each area (disk access, graphics, printing, and so on) into two components: how rapidly your peripherals can accept or return data to the processor and how rapidly the processor itself can handle the data. For example, in printing, the processor follows software instructions that convert the data into the format needed by your interface card and printer. Then the processor sends the prepared data to the interface, but only at a speed acceptable to all concerned (processor, interface, and printer).

If you sent data faster than the printer could physically accept it, some of the data would be lost. Imagine a juggler catching a series of clubs; if you throw the clubs to the juggler faster than he can catch them, some of the clubs will fall to the ground. With printers, "handshaking" protocols prevent data from falling to the ground, but these protocols can make your computer twiddle its thumbs while it waits for your printer to say it's ready for more data.

Thus, while many people think the microprocessor is the most important element in making a system faster, this isn't always the case. You might be able to find a faster juggler to throw clubs at you, but that may only mean that uncaught clubs pile up on the ground faster than ever before. Such problems usually don't occur with accelerators, but you should be aware that there are some bottlenecks that a faster processor simply can't overcome by itself.

And meanwhile, on the IIgs, Apple's engineers have made the processor *appear* faster by reducing and streamlining the code used by the IIgs System Software to perform time-consuming tasks. The most noticeable jump in performance was between System Software versions 4.0 and 5.0, when the speed of the graphics algorithms used by the desktop interface was improved by a phenomenal amount. We love this kind of acceleration, because every owner gets the benefits without having to trade in old hardware or buy new add-on hardware.

While increasing the efficiency of their software is something we wish all programmers would consider, in the real world programmers are as lazy as the rest of us and don't necessarily feel the desire to be perfectionists about their work. There is also the practical aspect that refining code to run as efficiently as possible is time-consuming. The managers of software companies pressure their programmers to move new products out the door. Apple's refinement of the system software took almost three years from the introduction of the IIgs; a time period that most manufacturers can't invest in their own products (though IIgs products that use Apple's system software enhancements will automatically see those improvements).

The solution for the rest of us, then, is faster hardware through the incorporation of a faster 65816, but this is something Apple doesn't see as practical at the moment. We have seen the fingers pointed in a circle; Bill Mensch, designer of the 65816, asks that Apple make a commitment by ordering enough fast 65816 parts (similar to the commitment made to Motorola for the 68000 of the original Macintosh) to make development economically feasible at his end while Apple says it can't build faster IIgs systems because the faster microprocessors aren't available in sufficiently large quantities to fill Apple's needs.

While this Catch-22 persists, there have been two third-party companies who have come up with solutions. Loosely described, each product operates by copying small segments of information from the IIgs memory into fast memory the accelerator maintains for its own use (a fast memory "cache"), using its own high-speed 65816 to process the information (program or data), and performing any necessary updating of the original information in the IIgs memory with any information revised in the accelerator's cache memory. The processing speed of the accelerator is high enough to offset the extra effort of moving information between the IIgs memory and the cache.

Applied Engineering's *TransWarp* was the first of the current accelerator products to appear. The original *TransWarp* for the Apple II, II Plus, and IIe followed two previous products (no longer being sold), the MCT *SpeeDemon* and the Titan *Accelerator II*, to mar-

@RICHTENNANT

YEAH, BUT YOU SHOULD SEE HOW NICELY IT CENTERED EVERYTHING.
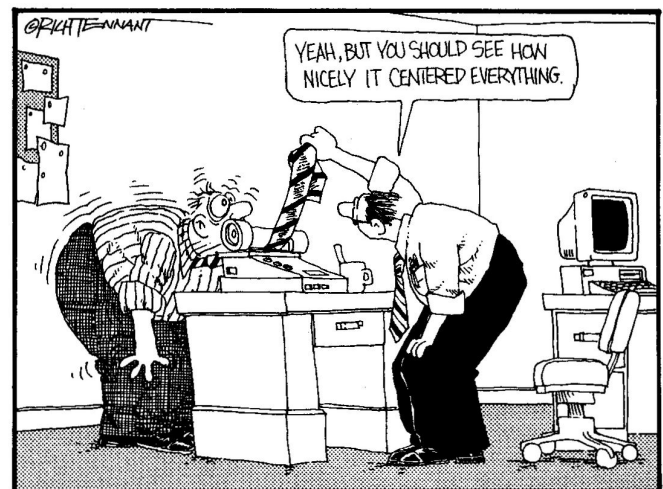
ket; the *TransWarp* has survived not only these two products but also two successive products (the *TransWarp II* and *III*) since discontinued by Applied Engineering (P. O. Box 5100, Carrollton, Tx. 75011, 214-241-6060).

The *TransWarp* is a slot-based card that can reside in any available standard peripheral slot (even slot 3) in your Apple II, II Plus, or IIe and raises the operation speed of these systems from the standard 1 megahertz up to 3.6 megahertz. The card's operation is very straight-forward; there are a set of switches that allow you to configure the card to slow down when accessing specific slots (necessary for proper operation of some peripheral cards), switches to allow the use of some older bank-switching RAM cards in slot 1-7, and two switches to set the operation speed of the *TransWarp* (1, 1.7, or 3.6 megahertz). Configuring the switches and installing the card in a slot (it has its own 65C02 processor) is all there is to operation.

Applied Engineering showed a prototype of the first IIgs accelerator at the spring 1988 AppleFest in Boston and started shipping working models by the fall of 1989. The original *TransWarp GS* was equipped with a 65816 running at 7 megahertz (compared to the IIgs's normal 2.8 megahertz); within a few months 65816 parts that would operate at that speed were in short supply and Applied Engineering was forced to drop the nominal operating speed to 6.25 megahertz (shipment of the 7 megahertz version has since resumed).

The *TransWarp GS* is installed by physically removing the 65816 from the motherboard of the IIgs and plugging in a cable that runs from a peripheral card installed in one of the IIgs slots to the now-empty processor socket. Typically, the cable is only long enough to reach slots 2, 3, or 4. The slot does not need to be reassigned for use with a peripheral card ("Your Card") in the IIgs Control Panel, so you don't surrender the use of the internal modem port (slot 2), 80-column display (slot 3), or mouse interface (slot 4). You have options accessible through the Classic (text) Control Panel to set the speed of the *TransWarp GS* (fast or slow), run a self-test, and to enable or disable a flashy startup sequence with graphics and sound. Herb Hrowal has written a Control Panel Device utility (available on GEnie) for the *TransWarp GS* that allows setup and control through the IIgs Control Panel New Desk Accessory.

We hear mostly favorable reports from those using the *TransWarp GS*; the only concerns we have generally heard voiced are the power demand of the card (usually offset by addition of a stronger power supply, a fan, or both), the lack of a higher-speed upgrade (though some users have done their own upgrades), and occasionally a wish that it didn't use a slot (some IIgs users have apparently managed to fill even their available "double-duty" slots). Applied Engineering did what Apple couldn't or wouldn't do; delivered a product that most Apple IIgs users desired at a time when it was sorely needed.

Chipping away at accelerator technology. The major drawbacks to the 8-bit *TransWarp* were that it required a slot for operation, and with 256K of RAM and the associated accelerator circuitry it tended to draw a lot of power and generate noticeable heat inside the computer. Most users could deal with the power and heat problems by buying heftier power supplies and cooling fans, but IIc users were trapped without accelerator technology. That is, until a new company, Zip Technology, demonstrated a compact accelerator designed to fit into the processor socket of an Apple II (including the IIc).

The *Zip Chip* is currently shipping in 4 megahertz and 8 megahertz versions. Unlike the *TransWarp*, these products physically replace the 6502 or 65C02 processor of your Apple II and do not use a slot; they resemble a broader, taller version of the 6502/65C02 processor chip. Assuming you don't have other internal expansion cards that will interfere, the chip will fit in the 65C02 socket of the older IIc computers (prior to the IIc Pluc, which has it's own accelerator circuitry already installed).

Since the *Zip Chip* has no room for switches, the accelerator is configured by means of software supplied with the chip. The software includes diagnostic testing, configuration to access requested slots at "normal" (1 megahertz) speed, and adjustment of the speed of operation of the accelerator. The options can be saved to disk so that the chip can be automatically configured by booting the disk (Zip's manual also explains how to program the chip yourself, if you're so inclined). In case you need to drop the system speed to 1 megahertz for a session, you can disable the *Zip Chip* by tapping the Escape key during a reset cycle.

Zip is also the only current competitor for the *TransWarp GS*. Zip makes three versions of its *ZipGS* IIgs accelerators. Two of these versions (which were not yet shipping as we went to press) fit in the 65816's socket and do not use a slot. They are called the *ZipChipGS Model 1500*, which includes 8 kilobytes of cache memory, and the *Model 1525*, which includes 16 kilobytes of cache. The 16K version also offers DMA compatiblity, which the 8K model lacks (plans are to allow adding DMA compatibility to the latter version with an upgrade kit). DMA stands for Direct Memory Access. It's used by some peripheral cards to speed up data transfer. (For reference, the *TransWarp GS* is DMA compatible, but none of the 8-bit accelerators are.)

The third version has been shipping since October of last year. The *ZipGSX Plus Model 1600* is a slot-based product that connects to the 65816 socket by means of a short cable; you carefully remove your 65816 (Zip supplies a tool to do this with), insert it into a receptacle on the *ZipGS* card, plug the supplied cable from the card into the now-empty socket on the IIgs motherboard, and then insert the card into an available slot. We installed one of these, which Zip loaned us to examine, in basically no time at all.

The slot-based unit is also DMA compatible, but the important difference between Zip's slot-based accelerator and the socket-based models is that the slot-based unit will be upgradable as faster 65816s become available.

You can configure Zip's IIgs card by means of two sets of switches on the card itself. The switch settings allow you to select the size of the cache (the card version of the *ZipGS* comes with an 16K cache that can be expanded to 64K for better performance), enable delays for certain conditions such as AppleTalk support, disable the use of the cache for certain areas of memory that may be speed-sensitive, and control whether the *ZipGS* will disable itself under certain conditions.

Zip also supplies set-up software in two forms; a Classic Desk Accessory that can be accessed from any program that lets you enter the IIgs text Control Panel, and a CDEV (Control Panel Device) that appears when you open the Control Panel NDA that is now (since System 5.0) part of the IIgs System Software. The *ZipGS* CDA and CDEV allow you to control the relative speedup of the card from 0 to 100 per cent (not switch selectable) and to override most of the switch selections.

The *ZipGSX* includes two status light-emitting diodes (LEDs) on the top edge of the card. A red one indicates when power is applied to the card. A yellow LED indicates how many accesses are being made to the Apple IIgs (rather than the card's cache) memory; the brighter this LED is glowing, the less efficiently the *ZipGS* is able to handle the current software.

The *ZipGSX* comes with two manuals; a small printed manual covering hardware setup and installation as well as an introduction to the supplied software and a hypermedia manual on disk (using the *HyperStudio* runtime package) that serves as an interactive pictorial manual. The combination is sufficient to get you up and running.

We have run into no noticeable compatibility problems with the *ZipGSX* on a ROM 01 or ROM 03 IIgs. Use of AppleTalk does require that the AppleTalk delay be enabled and that the maximum speed of the (8 MHz) *ZipGSX* be lowered to 87% for compatibility. Zip's paper manual makes note of this in a list of several common software and hardware products that have been tested with the *ZipGSX*.

We compared the speed of the *TransWarp GS* and the *Zip GSX* using a benchmark called a dhrystone test, using a version which was originally written by Reinhold P. Weicker and translated from Ada to C by Rick Richardson. A higher dhrystone result indicates a faster processor. We compared results between an unaccelerated Apple IIgs and one with the *TransWarp GS* or the *ZipGS* ; the results were 246 dhrystones for the unaided IIgs, 568 dhrystones for the 8MHz *ZipGSX*, and 649 dhrystones for the 7MHz *TransWarp GS* (7 MHz version). This appears to put the speed of a *ZipGSX* about 10 per cent below that of a *TransWarp GS*, for which we have no good explanation. The difference may be significant only in running this benchmark and not in normal use.

Zip Technology (5601 West Slauson Avenue, Suite #190, Culver City, Calif. 90230, 213-337-1313) is offering speed upgrades to the

ZipGSX card; such an upgrade also requires upgrading the cache RAM due to faster RAM speeds required for faster 65816 processors. Despite our report of proposed faster 65816-compatible chips from ASIC Technologies ("Miscellanea", December 1990, p. 6.84), when we spoke to Zip at AppleFest Long Beach they said they had yet to see a sample of the proposed ASIC chip, so the only source for faster 65816s at this time remains Western Design Center.

The issues of speed. We're often asked which approach will give the most speed improvement: accelerator, faster disk drive (or interface, or both), or floating point coprocessor. The answer is "yes," with lots of interaction from the exact type of program you are using most of the time.

An accelerator will speed up all activities of the computer except those which are bound by the speed of data transfer to a subsystem, such as a printer or disk drive. Even in those cases, the accelerator will speed up operations where data must be manipulated by the processor, but the accelerator can't do anything about the actual speed of transfer if the computer has to wait on the peripheral to provide or accept the next chunk of information.

If your program is primarily spending its time accessing the disk drive, then a faster disk is the first order of business. Your first move should be to a hard disk drive; the faster the drive, the better. The next jump is to get a fast, caching interface; for the Apple II family, the fastest answer is currently the *RamFast* SCSI card. It's a good choice unless you need support for devices it can't handle. A new version 2.0 ROM (currently in testing) adds support for SCSI CD-ROM and tape drives, and better support for removable media, to this card. If you do want broader device support, the Apple High-Speed SCSI Card is a low-cost option; it does not offer the on-board caching of the *RamFast* but it does show significant speed improvements in handling large files (see "More on DMA SCSI", p. 6.72, October 1990).

Similarly, if you are using a large number of mathematical calculations in your work, using a floating point coprocessor will speed up that specific aspect of operation. Notice that a floating point card will not speed up the *drawing* of a graphic image, however, it will speed up calculation of the screen positions used to render the graphic. An accelerator will also do this, but not as much.

There are conditions where an accelerator will speed up the apparent operation of a peripheral, such as a printer, by giving the computer more power to prepare data for the peripheral. Let's again use printing (a common complaint) as our example. On simple text printed from an 8-bit application, the time spent in preparing the data is insignificant in relation to the time needed to actually print the data a character at a time; printers are slow in operation relative to the speed of the computer. Therefore, even with an accelerator, you are bound to spend most of your time waiting for the printer to actually accept and print the data. An accelerator will not noticeably affect the speed of printing character-based documents.

Printing complicated graphics is a different matter, however. Computers print graphic images either by sending the printer a dot-by-dot image of the graphic in a form ready to render on the printer (this is why software has to be configured to print to a specific type of printer; all printers do not use the same format for their graphics data) or, in the case of printers using a "page description language", the image you want to print is converted into a series of commands that the printer understands and uses to render a copy of the graphic in its own memory. An Apple ImageWriter is a dot-matrix printer that uses the former method; Apple's LaserWriter uses the latter.

The work of converting a graphic image stored in the computer's memory into something your printer can understand is a job left to software usually referred to as a *printer driver*. This software converts the computer's graphic data into a form suitable to "drive" the printer it is designed for (see "Solving printer problems", **Open-Apple**, November 1985). With 8-bit programs, such as *Print Shop* or *Publish-It!*, these drivers are provided by the individual program publishers. If a specific program doesn't supply a driver for your particular printer you are out of luck. For native IIgs applications, on the other hand, GS/OS allows the incorporation of printer drivers as part of the operating system. All programs that use the GS/OS Print Manager toolset can print using a single driver installed as part of the operating system. Companies besides Apple (Vitesse and Seven Hills Software) are now offering drivers for specific printers that will work with any GS/OS program.

Whether for the 8-bit Apples or the IIgs, converting a graphics image in memory into a form that can be rendered on a printer may be quite labor intensive for the processor. In this case, you may be waiting on the processor to convert the image rather than for the converted data to get to or be printed by the printer. Users of the Apple II (II Plus, IIe, IIc) version of *Print Shop* have seen the "thinking" message displayed as the computer grinds on the data while printing. IIgs owners also will see messages from the ImageWriter driver while printing IIgs documents that indicate the driver is toiling to convert the data into the form the printer requires. Since the speed of rendering is dependent on the speed of the processor and since the printer is usually waiting on the computer when you're printing graphics, an accelerator can make a noticeable difference in the time it takes to complete printing.

For other peripherals, such as disk drives, the time spent in preparing data is negligible as long as the program manipulating the data uses it in a format substantially similar to its format on disk. If the program needs to convert the data to another form after reading it or before saving it, then the time spent in that conversion will be reduced by the accelerator. As an example, an accelerator will reduce the boot time of your IIgs system slightly since a lot of routines must be loaded and executed to start GS/OS and the tools; the *execution* of the routines loaded into memory will be faster with an accelerator.

Accelerators are not cure-alls for all conditions where you may feel the need for speed. However, the advantage of a faster processor is that all operations that we attribute to the computer's processor itself should be faster. These add up to a generally more responsive system. Next to a fast disk interface, they represent the greatest performance bang for the buck that you can add to your system.—DJD

Miscellanea

For those of you interested in more on the Apple II Achievement Awards, Apple has released a complete list of Apple II Achievement Award categories, recipients, and close seconds. I wanted to include the names and addresses of the companies cited (in addition to the winners mentioned last month) for achievement during the voting:

Best Freeware or Shareware Program: *ShrinkIt* for the Apple IIgs (Andy Nicholas, 1180 Reed Ave., Apt. 12, Sunnyvale, Calif. 94086). Also recognized: *SoundSmith* (Huibert Aalbers, Travesia Andres Mellado 3, 28015 Madrid, Spain), ShrinkIt 3.0.3 (Andy Nicholas), *Nifty List 3.0* (DAL Systems, P.O. Box 875, Cupertino, Calif. 95015-0875) and *WriteIt!* (Ravenware Software, RavenWare Software, 22045 McClellan Road, Cupertino, Calif. 95014).

Best Educational Software: *Katie's Farm* (Lawrence Productions, distributed by Brøderbund Software, Inc., 17 Paul Drive, San Rafael, Calif. 94903-2101, 415-492-3200). Also recognized: *World Geo-Graph 1.2* (MECC, 3490 Lexington Avenue N., Saint Paul, Minn. 55126-8097, 612-481-3500), *USA GeoGraph 1.0* (MECC) and *Hyper-Studio 2.1* (Roger Wagner Publishing, Inc., 1050 Pioneer Way, Suite P, El Cajon, Calif. 92020, 619-442-0522).

Best Apple II (8-bit) Software: *Proterm 2.2* (InSync Software, P.O. Box 22146, Phoenix, Ariz. 85028, 602-992-5515). Also recognized: *ShrinkIt 3.0.3* (Andy Nicholas), *DBMaster Professional* (Stone Edge Technologies, Inc., P.O. Box 3200, Maple Glen, Pa. 19002, 215-641-1825) and *Publish-It! 3.0* (TimeWorks, Inc., 444 Lake Cook Road, Deerfield, Ill. 60015, 800-535-9497).

Best Apple IIgs (16-bit) Software: *HyperStudio 2.1* (Roger Wagner Publishing). Also recognized: *AppleWorks GS 1.1* (Claris Corporation, 5201 Patrick Henry Drive, Box 58168, Santa Clara, Calif. 95052-8168, 408-987-7409), *ProSel 16* (Glen Bredon, 521 State Road, Princeton, N.J. 08540), *GraphicWriter III* (Seven Hills Software Corp., 2310 Oxford Road, Tallahassee, Fla. 32304, 904-575-0556) and *Platinum Paint* (Beagle Bros, 6215 Ferris Square, Suite 100C, San Diego, Calif., 92121, 619-452-5500).

Best Innovation: *RAMFast SCSI Card* (C.V. Technologies, 1800 East Whipp Road #200, Kettering, Ohio, 45440, 513-435-5743). Also

recognized: *Quickie* hand scanner (Vitesse Inc., 13909/2A Amar Road, La Puente, Calif. 91746, 818-813-1270), *HyperStudio 2.1* (Roger Wagner Publishing) and *GTv* (National Geographic Society and LucasFilm, Ltd.).

Best Multimedia Achievement: *HyperStudio 2.1* (Roger Wagner Publishing). Also recognized: *Tutor Tech* (Techware, Inc., P. O. Box 151085, Altamonte Springs, Fla. 32715, 407-695-9000), *GTv* (National Geographic Society and LucasFilm, Ltd.) and *Nexus* (Datasmith, distributed by Golem Computers, P.O. Box 6698, Westlake Village, Calif. 91360, 805-499-0197).

Best Development Tool or Language: *Genesys 1.2* (Simple Software Systems International, 4612 N. Landing Drive, Marietta, Ga. 30066, 404-928-4388) Also recognized: *ORCA/C v1.1* (The Byte Works, Inc., 4700 Irving Blvd. N.W., Suite 207, Albuquerque, N.M. 87114, 505-898-8183), *Design Master* (The Byte Works, Inc.) and *APW Tools and Interfaces v1.1* (Apple Computer, Inc., APDA, 20525 Mariani Avenue, M/S 33-G, Cupertino, Calif. 95014, 408-562-3910).

Best Debugging Aid: *GSBug v1.5* (Apple Computer, Inc.). Also recognized: *Nifty List 3.0* (DAL Systems), *ORCA/Disassembler* (The Byte Works, Inc.) and *Program Writer* (Beagle Bros).

Best Apple II Periodical: *A2-Central* (Resource Central, Inc.). Also recognized: *Nibble* (Mindcraft Publishing Corporation, 52 Domino Drive, Concord, Maine, 01742, 508-371-1660), *8/16* (Ariel Publishing; *8/16* was recently acquired by Resource-Central), *GS +* (Ego Systems, P.O. Box 15366, Chatanooga, Tenn. 37415-0366) and *A+/inCider* (IDG Communications/Peterborough, P.O. Box 50358, Boulder, Colo. 80321-0358).

Best Online Service: *America Online* (Quantum Computer Services, Inc.). Also recognized: *GEnie* and *CompuServe.*

Apple II Individual Achievement (special recognition for outstanding contribution to the Apple II community): Roger Wagner.

Hardware of the Year: Apple II High Speed SCSI Card (Apple Computer, Inc.). Also recognized: *RAMFast SCSI Card* (CV Technologies), *Quickie* hand scanner (Vitesse) and *ZipGS* (Zip Technology, 5601 West Slauson Avenue, Suite #190, Culver City, Calif. 90230, 213-337-1313).

Software of the Year: *HyperStudio 2.1* (Roger Wagner Publishing). Also recognized: Apple IIgs System Software 5.0.3 (Apple Computer, Inc.), *ShrinkIt* for the Apple IIgs (Andy Nicholas), *Genesys 1.2* (Simple Software Systems International) and *GraphicWriter III* (Seven Hills Software).

I have tried to include addresses and non-800 phone numbers (in deference to our overseas subscribers) for all companies where they were reasonably easy to obtain.

One correction to last month's comments: Apple's vote in the Apple II Achievement Awards **was** counted in the final ballot, and not used as a tiebreaker as I misunderstood. Apple's vote was recorded prior to obtaining ballots from the other participants.

Diversified Software Research (creators of Diversi-Tune and the Diversi series of utilities) has moved to 9312 Harvey Road, Silver Spring, Md. 20910.

Apple has created a Customer Assistance Center with a toll free customer relations number at 1-800-776-2333. The line operates from 6 AM to 5 PM Pacific Standard Time. All Apple customers are eligible to use the line, which is not intended as a technical support line but is a place where users can voice concerns regarding service and support provided by Apple dealers and service providers. When calling, be sure you can provide a description of the problem, a list of products used, any Apple authorized support organization previously contacted, and the result of the contact.

Apple II and II Plus (not IIe, IIc, IIgs, etc.) owners who are looking for information specific to their systems may want to contact the Windy City Wizards Computer Club, P.O. Box 2279, Darien, III. 60559. President Dan Herring says his is the only Chicago area computer club exclusively dedicated to these computers. Membership at this time is free.—DJD

Universal program selector

Menu Master, published by Electronic Learning Systems, is a ProDOS program selector for the Apple IIe, IIc, IIgs, and Laser 128. Once installed, it presents an extremely simple, easy to work with front end that supports DOS 3.3, ProDOS, and GS/OS programs. Using either the mouse or the arrow keys, you move a highlight bar (ala Appleworks) to run any program.

Unlike simpler selectors such as *Bird's Better BYE*, or the one currently built into ProDOS 8 (version 1.9), *Menu Master* requires you to construct your own menus. In anything but a very small, 5.25 disk

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Ask
(or tell)
Uncle
DOS

Time is Money past due

Help! I am still using *Time is Money* (version 1.01) to keep track of our home finances. I agree with your earlier (Vol. 1, p. 71) high regard for this program and have in the past wondered why it was not more popular. My satisfaction with this program is one of the reasons I have not felt a pressing need to "move up" from my II Plus. However, I may have finally found that reason.

When trying to carry data forward to a new book, starting with transactions dated 1/1/90, the year for the transactions in the new book becomes 1991. This occurs with user disks initialized to start in either 1989 or 1990. And, if I carry these "1991" transactions forward to a second book, the year of all the transactions is again incremented to 1992. (I did not delete any transactions from the original book, which I assume would not make any difference.) I found that if I used a starting date of 12/31/89, the dates are carried forward correctly, and I could then delete the 12/31/89 transactions and update the balances of the appropriate accounts manually. However, this will not work the next time I need to carry forward. Has anyone devised a fix for this problem?

Secondly, if I need to transfer to another home finance system, is there a utility available for copying the *Time is Money* data to a format readable by other programs?

William F. Murphy
Nepean, Ont.

We've been in the same boat with **Time is Money** *ourselves. Since the product is not undergoing timely (sorry) revision, we'd like to be able to recommend an alternative, but we haven't located one to our liking.*

One of the disadvantages of **Time is Money** *is that it runs under a proprietary operating and can't export files directly to ProDOS. As with most such programs, about the only workaround is to connect a second computer through a serial interface as if it were a printer (see "The IBM connection", p. 2.71-72, Octo-ber 1986), print all of the* **Time is Money** *data to the second computer, and then try to parse the data out of the resulting files on the second computer.—DJD*

User group in the Big Apple?

Can you help me find a users group around here? I called Apple (800-538-9696, extension 500) and they gave me two phone numbers, both of which were out of service. There must be an Apple II (IIgs) users group somewhere in Brooklyn or New York!

Rami Levy
Brooklyn, N.Y.

We don't have a compendium of all user groups, but maybe a reader in the area will have a suggestion.—DJD

ImageWriter printer basics

How can I adjust the left margin on the ImageWriter II from the keyboard directly, rather than via a BASIC program. According to the manual (page 76), "...if you were to type <ESC>L035 the printer would begin printing in the 36th character position...". It doesn't work. Am I misreading the instructions?

How do I print (on the ImageWriter II) with imported fonts? Do I need a graphics card?

based system, being able to design your own menus is a better way of handling things. *Menu Master* makes it easy to create attractive menus set up the way you want them. By simply hitting a key, you tell *Menu Master* how you want an item to look on your menu, where it's located, and what the exact file name is. To install any program on your *Menu Master* menu, you'd do the following:

Hit Open-Apple-M to enter the Management portion of the program. Hit Open-Apple-I to Install a new menu item; *Menu Master* will then present you with a list of on-line disks. Select the one you want. You'll then be given a list of runable programs on that disk. Select the one you want. Finally, you'll be asked for a program title (i.e. "DB Master V" or "Appleworks 3.0"). Type whatever you want.

That's it! You're done. The item is now on your menu. You can add as many applications as you want this way. You can easily edit any menu item later on, in case you want to change something.

If you have a lot of applications or just feel like getting fancy, you can also add sub-menus. Sub-menus can be created with only a few keystrokes and are configured exactly the same way your main menu is. This allows for an almost infinite number of menu selectable programs, though the main menu alone is probably large enough for most people.

You can put IIgs GS/OS applications on *Menu Master's* menus; even though it's a ProDOS 8 program it operates perfectly well as a GS/OS selector. The manual includes very simple instructions for setting it up as your primary IIgs program selector. Once installed, it's quite an acceptable alternative to the Finder.

Perhaps the nicest feature of *Menu Master* is its seamless, simple handling of DOS 3.3 programs. Copy protected software foils this system, but *Menu Master* can't be faulted for that. You can install any standard, non copy-protected DOS 3.3 disk onto a hard drive or 3.5 disk with it. While there are a number of other systems that do the same, *Menu Master* makes this process much easier than any other system I've ever seen. And, unlike some other systems, it provides a way for you to quit from DOS 3.3 back to ProDOS and *Menu Master*. This is a only a little more tricky than quitting from Pro-DOS programs. Four lines of Applesoft code must be run. You can either run them as a separate program or, if your DOS 3.3 program is in Applesoft and you know how to do such things, simply insert those lines where the program would normally end. This worked for me perfectly every time I tried it. This feature made working with old DOS 3.3 programs much more pleasant.

The program also includes a copy of Apple's *Backup II* software, for making backups of hard disks. This is a handy program; a crucial program, in fact, for anyone who doesn't have a hard disk backup program. It's included at no extra cost.

Previous versions of *Menu Master* were something of a chore to install. However, Electronic Learning Systems has significantly improved the installation process in recent versions and it's now completely automated.

Other features include the ability to use password protection to keep the mischievous or unwitting from changing menus, setting a file's ProDOS startup to allow execution of other programs (such as launching specific Applesoft programs after launching into Basic.SYS-TEM), viewing of text files, and a method for disabling the IIgs control panel on startup.

When all is said and done, listing features can't tell you everything important about a program. There are other program selector packages that provide a good deal more power than *Menu Master*, especially in the area of utilities. Some allow you to set up fancier screens or allow for more flexibility in general.

Yet *Menu Master* is by far the easiest-to-deal-with program selector I've ever encountered. Installation is brain-dead simple and anyone who can understand the point-and-shoot light bar interface and understands to hit Apple-? for help will be able to understand and use every feature of *Menu Master* within minutes. The manual, almost unneeded, is easy to read, short, and to the point. I wish more manuals were so well written.

The average "power user" like myself would probably be more inclined to use Glen Bredon's incredibly powerful *ProSel* package, or one of the IIgs selectors like *ProSel-16*, *Wings*, or *UtilityLaunch*. But *Menu Master* seems perfect for the classroom (a fully functioning network version is available, though I did not have a copy of it to review), computer novices in general, or people who want a quick and easy program selector with no hassles and simple, useful features.

Menu Master is priced at $49 for the single user version, and $169 for the network version (plus $3 shipping and handling). It's available from Electronic Learning Systems, Inc., 2630 N.W. 39th Ave., Gainesville, Fla. 32605, phone number 800-443-7971 or 904-375-0558.—DE

Where are the "Page Setup" and "Print" dialog boxes? (*A2-Central*, February 1989, page 5.3). I'm interested in printing with my standard IIgs issue RGB monitor and ImageWriter using imported fonts and am getting nothing.
B. Levine
Bethesda, Md.

It looks like a bad choice of words for the example. If you **type** *"<Escape> `035" while the Applesoft prompt ("]") is displayed Applesoft will trap the"escape" character, which is used as a prefix key for some Applesoft keyboard editing functions. In order to send the commands to the printer, you need to issue them just as you would within an Applesoft program; you can do this with a compound command that is typed without a line number.*

The command must enable the printer slot, print the control codes, then return control to your current output device (usually the screen). Three simple AppleSoft statements are required. Type them all on one line (don't hit Return until the end):

PRINT CHR$(4);"PR#1":PRINT CHR$(27);"L035";:PRINT
    CHR$(4);"PR#0"

Colons divide the three statements. The first enables output to a printer interface in slot 1 of the computer (standard on most Apple II computers, and the location of the internal printer port on the IIgs) by sending a control-D

character which tells BASIC.System that we''re about to issue one of its commands, and then using the BASIC.System command PR#1 (print to interface in slot 1) in quotes.

The second statement sends the Escape character (ASCII character code 27) and the remaining text of the printer command to the printer. Notice that this statement ends with a semicolon (";") so that we do not send a carriage return to the ImageWriter as we print the control codes (maybe you **do** *want to send the carriage return, in which case the semicolon can be left off).*

Finally, we send output back to the default output device (PR#0) in the last statement.

This margin setting can, of course, be overridden by other software, so if you're issuing the command in hopes of entering another program (such as another BASIC program, or a commercial program like AppleWorks) and having the tab setting recognized, it may not work (in the case of AppleWorks, which maintains its own tab settings and formats its printout with them, it definitely won't work). Such software settings for the printer are also lost when the printer itself is turned off.

If by "imported" fonts you mean the IIgs fonts or fonts used by a graphics-based program such as **TimeOut SuperFonts** *or* **Publish-It!***, these will print to the ImageWriter with your existing configuration. The software used*

to print the document will require you to tell it what printer and interface you are using. Pro-DOS 8 programs such as **SuperFonts** *and* **Publish-It!** *contain their own drivers and require you to tell each program what printer and interface you are using; GS/OS desktop programs generally should use the printer and interface selected via the IIgs Control Panel NDA (New Desk Accessory).*

To access the Control Panel NDA you need to be within a IIgs Desktop program which displays the menubar. To the far left of the menu bar is the Apple logo which identifies the system menu; pull down the system menu with the mouse and you should see an option labelled Control Panel. Pull down to select that option and in a few seconds the Control Panel window will pop up.

The main Control Panel window contains two smaller windows: on the left side is a vertical arrangement of one or more icons (a small graphic) each labelled with the name of a Control Panel Device (CDEV) it represents. On a typical IIgs, you will have more CDEV icons than will fit within the height of the Control Panel window, but the CDEV window can be scrolled via the scroll bar along the right edge of the window. If the CDEV icon you seek isn't

visible, you should scroll through the list of icons to see if it exists elsewhere.

The standard IIgs System Software assumes you have connected a printer either directly to the IIgs through an internal port or parallel interface, or via an AppleShare network. For non-AppleShare printers, the CDEV icon you want to locate is one named **DC Printer** (for 'Direct Connect Printer'). If this CDEV is not present anywhere in the list of devices, then you need to drag out your system software disks and use the Installer to add the ImageWriter files to your startup disk ("Direct connect ImageWriter" in the Installer options); then you can proceed.

Click your mouse on the DC Printer icon. The right side of the Control Panel Window will be filled with two lists; one labelled "Select a Port" and the other labelled "Select a Printer Type". From these lists you should select your interface type (probably the IIgs "Printer" port) and printer type ("ImageWriter"). Click on each to highlight it, then close the Control Panel window. GS/OS will remember and use the last printer selected whenever you print. In order to change the printer, just select the control panel again.

If you happen to use an AppleShare printer, the procedure is similar except you would look for the AppleShare printer's CDEV to select it. Apple supplies AppleShare drivers for the ImageWriter ("AppleTalk ImageWriter") and for the LaserWriter ("LaserWriter"). Again, you must install the required drivers on your boot disk with the Installer for the devices to appear in the Control Panel NDA (if the CDEV appears but no printer shows up in the selection list when the CDEV is clicked, you may have a network problem).

Most GS/OS desktop programs will have the "Page Setup" and "Print" items included in the selections of the "File" menu. Selecting Page Setup will bring up a dialog box allowing you to change any page definition variables for the document you are working with, such as paper size or type (US letter, A4 letter, and so on) and print orientation (the normal vertical "portrait" or the sideways "landscape"). When you are actually ready to print, selecting Print will bring up a series of printout options (number of copies, page range, and so on).

What some users seem to be having trouble grasping is that the IIgs is schizoid. **Native** IIgs applications written to use the standard desktop metaphor will follow the above design with only small variations. IIe and IIc applications that run on the IIgs in **emulation** mode were not written with the IIgs tools in mind and will not make use of the standard interface. If you are expecting to use IIgs fonts from a IIe-type application as if it were a IIgs application, that is the source of your confusion.—DJD

Fading image

A history: I have an Apple IIgs with the Apple RGB Monitor. About six months ago the picture on the screen began to fade so much that I couldn't read text. According to the local dealer, who charged $40.00, I need a new RGB motherboard, which will cost another $275.00 for him to replace and install. A bit high, I believe, but I do not have anything to compare it to so I am at a loss.

I called Pre-Owned Electronics—they haven't even got a monitor for sale much less a swap, nor can they repair the card. Shreve Systems said the same. Soft Solutions in Eugene Oregon

was helpful but said no dice; no one repairs the board, no one has the boards.

Therefore a question: do you know of any-place anywhere that I can send the RGB motherboard to swap or repair for a reasonable cost, or what chips I might try "messing" around with since the monitor is basically useless at this time. I am back to my faithful and true Amdek, which is over ten years old as now is my quiet Apple II Plus.

Bert Marian
Kailua, Ha.

Apple monitor repairs seem to be a sore point with many readers; we've had several requests for a source for schematics, for example. On the other hand, the inside of a color monitor is not a place to be poking around, even if you have schematics, unless you are properly trained about the hazards. It can definitely be a lethal experience.

We've also had an Apple IIgs monitor that required repairs and the cost took our breath away, too. That's part of the reason we found (and now sell) an alternative from Magnavox. Apple's cost of repair is probably not out of line for a computer company, but their "authorized dealer" network probably bears more overhead for genuine Apple parts than a third-party monitor would have to bear.

This is part of the decision that users have to make when buying a system; whether to put up with the possible compatibility problems of a third-party peripheral, or whether they would like to be less dependent on the computer manufacturer and its agents for parts and service. In this case, if you are likely to be hit with a $275 repair fee (plus $40 for the "inspection"), it looks as if a third-party monitor is a much more attractive option unless you prefer the aesthetics of the Apple display. And it probably wouldn't hurt to let Apple know what influenced your decision.—DJD

Daisy-chained audio

I already have a Sonic Blaster in my IIgs. How do I get the connector out of the sound plug to put in the HyperStudio digitizer board's plug? It's easy to put in, but I don't want to damage the Apple IIgs connectors getting it out.

Peter Hodkinson
Bendigo, Vic.

The motherboard connector uses a small overhanging 'catch' that locks over a ridge at the bottom of the cable connector to keep the connector from slipping off accidentally. I've found this to be a bit frustrating when trying to get the cable off on purpose. To ease the connector off of the pins, you need to pull the top of this catch back gently (to the right as you face the computer) from the top of the cable connector and lift the ridge past the catch. I've found it's easier to do this if you pull back and lift one side at a time rather than trying to wrench the whole connector free at once.

You're correct in assuming that too much pressure may damage the connector on the motherboard (in terms of prying it away from the motherboard). In order not to bend the pins on the connector, "walk" each side up slowly until both sides have cleared the catch and the connector can be lifted free.

I really enjoy having the stereo sound output of the Sonic Blaster on my IIgs. I originally tried to install it alongside the HyperStudio digitizer (which I had been perfectly pleased with for monophonic recording of voices, etc.)

in the IIgs.

The HyperStudio digitizer does not physically use a slot, though it requires the use of one of the IIgs slot access panels (on the back of the computer) so the microphone jack is accessible. As suggested in the HyperStudio instructions, I used the slot 1 access panel since I use the internal IIgs printer port and there is no card in slot 1.

The HyperStudio digitizer has two cables: a power cable that feeds on the 2-pin fan connector at the left rear of the IIgs motherboard and a connector that attaches to the Ensoniq's audio connector (the latter connector is the one with seven inline pins, located just to the left of the 40-pin Ensoniq DOC chip at the right front corner of the IIgs motherboard).

The HyperStudio digitizer card includes connectors to serve as functional replacements for the two it uses: a two pin power connector and an audio connector. I elected to daisy-chain the Sonic Blaster's audio connector to the HyperStudio digitizer rather than pry out the HyperStudio digitizer.

To digitize with the Sonic Blaster software the slot the card is installed in must be enabled to use "Your Card". I've also discovered you need to have the Zip GSX "AppleTalk Delay" option enabled to allow digitizing from the Sound Blaster software. All my internal ports on the IIgs are in use except slot 7, where my hard disk interface resides. So I installed the Sonic Blaster in slot 6; when I want to digitize, I enable that slot at the sacrifice of the use of my 5.25 drive for the duration of that session. The slot does not have to be enabled to enjoy stereo playback of sound.

HyperStudio will recognize and digitize input from the Sonic Blaster without requiring that the card's slot be enabled. You can also insert a microphone into the HyperStudio digitizer's input, which seems to disable the input from the Sonic Blaster.

Applied Engineering's Audio Animator duplicates the functions of the Sonic Blaster while adding an external mixer to adjust and control audio signals with more precision and a MIDI (Musical Instrument Digital Interface) connection to add that functionality for controlling MIDI devices. If you have a desire for all the buzzers and bells, the Audio Animator may be more to your liking.—DJD

Minor changes

A2-Central page 6.95: 'normal' Apple 5.25 disks hold 143,360 bytes, not 160K.

Only third-party 40-track drives give one 160K (163,840) storage. Sorry. People like me are just a pain in the posterior, but I just can't help myself.

In response to 'Not as testy' on page 6.95: the simplest way to skip the test page of an Apple laser printer is just to pull out the paper cassette for a couple of minutes after first turning the printer on. If the cassette is not ready when the test sheet is to be printed, it is just skipped. And this doesn't require any programming.

And... I cannot tell a lie, I know this trick because we have Macs connected to an Apple LaserWriter where I work. Although, as I write this, we still have 3 Apple IIs, 2 Macs, and 1 IBM

PS/2, (but no partridges in pear trees). Cheers.
Craig Peterson
Santa Monica, Calif.

The catridge trick worked on our LaserWriter NT; it just told us we were out of paper and lay in wait for us to replace the paper cassette. We did have to wait several minutes to make sure the LaserWriter had lost it's urge to print the test page.—DJD

No Slot Clock Fix

Richard Cheney's letter in the December *A2-Central* prompted me to review the No Slot Clock patch that was published in the November issue. Mr. Cheney stated he was getting a "Relocation Error" when using the patch. No wonder–unfortunately you omitted a crucial statement in the code during publication that will cause problems with ProDOS v1.9. The correct patch is as follows:

```
UNLOCK INSTALL
LOAD INSTALL
157 IF PEEK(X)<>76 AND PEEK(X)<>96 THEN
    X=20742: R=10294: IF PEEK(R)=0 THEN
    R=10341: IF PEEK(X)<>76 AND PEEK(X)<>96
    THEN PRINT CHR$(7);"I DON'T RECOGNIZE
    PRODOS - UPDATE ABORTED": END: REM PRO-
    DOS V1.8 AND V1.9
158 HOME
SAVE INSTALL
LOCK INSTALL
```

The omitted code was 'IF PEEK(R)=0 THEN R=10341". You will note that the patch was correct in my original letter.

Nigel Broder
Herndon, Va.

My eyes must have crossed at the wrong time; thanks for the correction.—DJD

Take stock of Apple

The January issue was very uplifting—especially coming as it did after the Apple Annual Report to Shareholders. I'll elaborate on that in a minute, but the January issue was full of promising new products and announcements regarding the Apple II. I am very happy with the Apple II Achievement Awards and I am especially happy with your reporting of these awards. The awards themselves show me that there are still plenty of exciting new products for the II coming out. And your comments were especially helpful in pointing out the good points of each, and the comparative advantages and disadvantages of similar products.

I said your issue was uplifting, but so was your Winter Catalog. That also was great. It didn't have just a listing of products and prices as is so common today, but it gave an analysis and commentary as well.

I am a shareholder of Apple, and so I get the Annual Reports sent to me. There has been a lot of concern that Apple is turning its back on the II and your observations about Ralph Russo's comments were interesting. I agree with his assessment that the Apple II was "the computing platform that started the personal computer revolution" and "the platform which propelled Apple into the ranks of the Fortune 500."

However, it has widely been reported that Apple's marketing and sales approach has been to overlook, denigrate, and/or ignore the II in place of the Mac.

And all this seems to continue, even in spite of Ralph Russo's appointment and some hopeful signs such as *HyperCard IIgs.* And so, it was especially disconcerting to receive the current Annual Report whose cover page has **only** the following statement:

> **Our goal** (emphasis in the original) is to put **Macintosh** (emphasis mine) computers in the hands of as many people as possible."

Notice, it didn't say "Apple Computers." It said "Macintosh" computers. That's a real kick in the behind, not only to all us Apple II users, but I would think to Ralph Russo as well. And inside, in the report itself, over the signatures of John Sculley (CEO) and Michael Spindler (COO) is the following paragraph:

> Sales of our long-established Apple II line continued to decline in 1990. Though educators at the kindergarten through twelfth-grade levels—our principal market for the Apple II—were keenly interested in moving to Macintosh technology, many of them also wanted lower-priced products and color support. In addition, education customers were asking for a way to bridge the Apple II and Macintosh, to protect their investment in Apple II software. Apple has a deep and long-standing commitment to education, and feedback from these key customers played a critical role in the development of the products we introduced on October 15. In 1990, however, while we remained the leader in our K-12 markets, we were disappointed by our performance.

Maybe Sculley doesn't know, maybe Sculley doesn't care what Russo is up to. Maybe Russo's whole department was set up only to appease the Apple II enthusiasts, while the rest of the real Apple goes about developing and promoting Macs??

In spite of all the uplifting things mentioned in the January issue, this Annual Report was not very helpful in terms of seeing whether Apple has a **real** commitment to the II. Apple **should** be disappointed in their performance in the sales of the II line. And of, course, the Mac "has been our major source of revenue for the last four years." If they examine their expenditures on marketing for the II during this same period they might find a reason for their declining market share and sales.

Keep us the good work. Hope we all have a good 1991.
Warm regards,

Stan Sztaba
Stamford, Conn.

Apple's statements to its stockholders continue to work on the image that Macintosh computers are being introduced into markets due to market pressures. Roger Wagner had this to say about that:

> "I've been to a lot of educational conferences in the last year, and I can say from personal experience that although the educators moving to the Mac may get a lot of press from Apple, there are a lot that are very interested in what an Apple IIGS can do, and feel more like Apple is doing a lot more pushing than leading.
>
> "Since most of the investment companies that get the Apple stock report don't go to an educational conference to see for themselves, they can only rely on what Apple tells them. I think the statements in Apple's reports about the Apple II are closer to the way Apple would like things to be, rather than how they are."

*Apple has sales of over 5 million Apple II systems; the majority of these systems have been sold since the introduction of the 128K Mac. Apple has released and promoted a multitude of substantially improved Mac systems in the past 6 years; I challenge Apple to present evidence in its corporate reports that the Apple II line has **ever** been given a proportion of marketing effort in its behalf equal to its revenues. The Apple II has persevered **despite** rather than **as a result** of Apple's marketing. Back before the Macintosh became Apple's main source of revenue (merely four years ago), Apple wasn't keen on promoting the computer that **was** its main source of revenue so why should we expect them to become keen on it now?—DJD*

Expectations versus reality

Help! I am at a crossroads and am really unsure which way to proceed. I have an old IIc with Applied Engineering 512K RAM card, two 3.5 UniDisk drives, an ImageWriter, and an old IIe monitor. A modest system to be sure, but with a family of six it has represented a significant investment through the years.

I am a user, not a programmer, even though I have been with Apple since my old II Plus days. I read *A2-Central* and despite 50 per cent of it being over my head I still get good information. I belong to NAUG and have stacks of *InCider* and *A+.* I say this because I have enjoyed reading about the Apple II culture.

My question: "Do I want to stay with the Apple II when I foresee less and less support from third party groups and abandonment from Apple altogether?" I know you can't answer my question, but I need honest, knowledgeable input.

My system can no longer handle my needs and I must make a change. I do not want to say "goodbye" to AppleWorks and my Beagle goodies and all the notes I have enjoyed collecting from various Apple clubs, but the future looks bleak. I know I am going to have to get a loan to get what I need, so I don't want to waste money on something that won't be viable, supported tool in five years.

So what are my needs? I do extensive research not as a job, but as a deep interest. My job takes an average 50-55 hours a week, so when I sit down to do what I want I need a fast, efficient system. Sound, graphics, and a small footprint CPU are nice luxuries but not needs. I need reliability, storage, and speed. I need a removable hard drive with tape backup. I need input besides a keyboard.

Yes, I see that Vitesse now has a hand scanner that I believe (with *InWords* from WestCode) would fit part of my input needs, but I also need the ability to record sound input. I am not speaking of music, but lectures. I'm talking about connecting a cassette player to the CPU or drive and having the lecture dumped into an ASCII or word processor file that could be imported easily into a program.

I will also need a paint program for touching up occasional map, graph, or other black and white scans that would be used in word

processor documents. My word processor documents are up to 600 pages in size. I need a large desktop with a word processor that can quickly scan such a large document.

Can the Apple II and third party products handle this or should I look elsewhere?

Rick Adams
East Wenatchee, Wash.

There are several questions here, not all of which are easy to answer. Basically your needs seem to fall into a few select areas.

Text input from printed matter. *The combination of the Vitesse* **Quickie** *scanner and* **InWords** *will beat anything you'll find on other computers anywhere near this price range, based on the demonstrations of* **InWords** *we have seen. However, you'd have to change to a different Apple CPU, because the IIc (having no slots) is not going to work with the* **Quickie***.*

Text input from audio sources. *At this point in time, this is speculation since there is* **no** *device that we are aware of that is currently available to do this. Researchers are working on this technology, but the number of words that can be recognized is limited to a few hundred; too few to be useful for the type of "transcriber" you describe. Don't abandon your Apple II on this basis.*

Storage of large documents. *This should be no problem. The question you need to answer is how much storage you anticipate needing available at one time. ProDOS 8 is limited to using a maximum file size of 16 megabytes and a maximum volume size of 32*

megabytes; you can anticipate being able to use up to two (and possibly four) hard disk volumes from ProDOS 8. If your needs do not ·immediately exceed those limits, then current Apple storage devices would fit your needs. If you buy a IIgs as your new CPU to support using the **Quickie***, then you eventually could grow into GS/OS's limits, which are* **4 gigabytes** *(4* **billion** *bytes) for either the file or volume size. All GS/OS is waiting on is a FST for a file system that supports volumes of that size. GS/OS already supports many more devices than ProDOS 8 through the ProDOS FST and SCSI Manager; it is possible to partition and use all of a SCSI rewritable optical disk drive if you have the money to purchase one (about $4000).*

If you see the ProDOS file and volume size restrictions as being immediately limiting, then you may have to look for an alternative system. Be aware that you may run into limitations of either flexibility or performance on another system you choose.

Tape backup is available for the Apple II. However, you should consider that (as implemented on microcomputers) tape is generally useful only for archiving data, not as an alternative form of mass storage. If you really need larger amounts of exchangeable data, then a removable hard disk device such as the SyQuest mechanism is a much better investment, and it can also become your backup device. There are alternative SCSI mass storage devices available, too; we just don't have any experience with them.

Word processor "desktop" size. *When you refer to the size of the desktop being an issue, I'm assuming that you're intending to use the system to load and revise a single file, or a small group of files. In this case, Apple-Works (for ProDOS 8) has shown that it is the choice for many users. However, it's word processor probably won't handle a file representing 600-pages of typed text due to a limit to the number of lines the word processor will normally handle. If you have a file of the size you want to work with, you want to try to get an estimate of the number of lines it will represent (count the number of bytes in the file and divide by the average number of characters in a line); if AppleWorks 3.0 won't handle the limit, then perhaps using an expander program such as Applied Engineering's on it will give it that capacity. You can even add graphing and painting features to AppleWorks with* **TimeOut Graph** *and* **TimeOut Paint***.*

As far as I've been able to determine, **AppleWorks GS** *has a much higher limit than AppleWorks. I have been able to load the entire text (minus tables and figures) of* **Pro-DOS Inside and Out** *into the* **AppleWorks GS** *word processor; performance (which is also an issue for you, I detect) did not suffer as much as I had thought it would. I found the file manageable on a 2.8MHz IIgs; obviously an accelerator would improve the situation even more. You should be able to handle a single file up to the limit of expansion memory; figure about four megabytes on a system with 5 megabytes (1 megabyte ROM 03 IIgs with 4 megabytes of expansion memory), the remaining space being used by GS/OS and the* **AppleWorks GS** *program itself. Performance of a graphics-based program will always be slower than that of a text-based program, though, which is something you may want to consider. The advantage of* **AppleWorks GS***'s integrated*

graphics capability (even including a paint module, and graphing capability in the spreadsheet module) and page layout functions may be something you desire in terms of managing the maps and graphics you mention. You can, with the **Quickie** *New Desk Accessory, even scan a graphic into the system without leaving* **AppleWorks GS***.*

The speed of searching a document within AppleWorks or **AppleWorks GS** *has always seemed adequate to us, but we seldom work with a single document of the size you mention. If you need to search a series of files for a word or phrase, then there are standalone utilities that will do this with various levels of sophistication (***ProSel** *and* **FastData Pro***). If someone out there knows of a desk accessory that can do such searches, that would probably be better in your application.*

What the above may indicate is that the Apple II is not as far away from an ideal system as you may think. Besides, it would be compatible with everything you have now, including data files. In any case, getting to the ideal system is likely to cost you some money, not necessarily because the Apple II is "behind the times", but because the IIc you currently use was not designed for such expansion. When you get your next system, expandability should be one of your major concerns. It's why Steve Wozniak put eight slots in that original Apple II.

The other issue, as you mention, is longevity. As Tom Weishaar has said, we expect to be supporting Apple II users well into the next millenium. Apple has repeatedly said and demonstrated that it will support the installed base of Apple II users. On the other hand, Apple has publicly stated that at this time it has no plans for new Apple II cpus.

Before you go looking for a new system, your description of your needs should probably be refined to include a more detailed overview of the exact operations you anticipate performing during a normal "research" session. Don't be in a hurry to switch until you find something demonstrably better than what you are using now. Again, this holds whether you buy an Apple or other computer. Your search should begin with the software component of your dream system; it doesn't matter how "powerful" the hardware is if the software you need isn't available for it.

It sounds to us as if what you are looking for may be unavailable today from any computer company at any price. Yet we encourage you to follow your dream and let us know about it if you find it. Meanwhile, we caution you not to throw everything you have now away tilting at computer windmills.—DJD

Lifetime subscription?

I am able to send you money because my wife didn't see me make the entry in our check record and she thinks *A2-Central* is a life insurance company.

Re Glover
Atlanta, Ga.

You may wish we did handle life insurance when your spouse finds out.—DJD