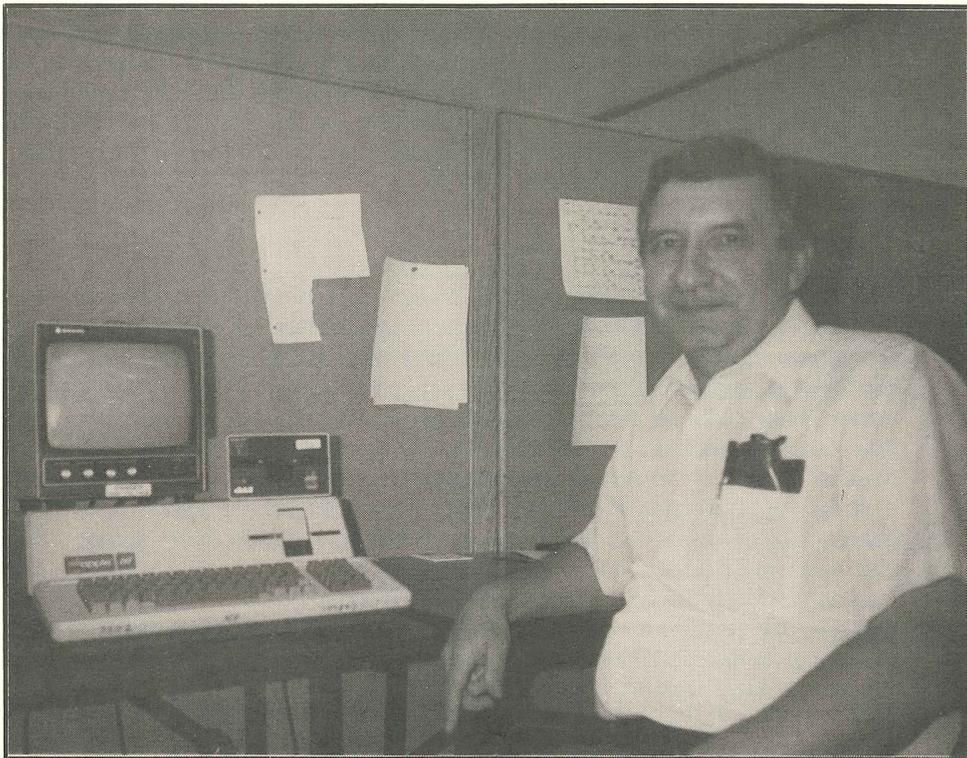


# THE /// MAGAZINE

NOVEMBER 1986 ISSUE



AN INTERVIEW WITH  
***WENDELL SANDER***

# OUR PREMIUM LINE PRODUCTS FROM D.A. DATASYSTEMS

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Item	Description	Order#	Amount	S/H
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MODULES :	Showtime	6401	19.95	1.00
	NotePad	6402	29.95	1.00
	PrntMgr	6403	19.95	1.00
	DiskMgr	6404	19.95	1.00
	QuikDial	6405	29.95	1.00
	AsciTbl	6406	19.95	1.00
	QuikCat	6407	19.95	1.00
	QuikScrn	6408	29.95	1.00
NEW	* QuikCalc	6409	29.95	1.00
	* FileScan	6410	19.95	1.00
	* TypeRite	6411	19.95	1.00
	* QuikCrpt	6412	19.95	1.00
	* LockOut	6413	19.95	1.00
	* FontLoad	6414	19.95	1.00
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	* ModLoad	6416	19.95	1.00

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The Retriever	A utility that can restore a delete disk file. A LIFESAVER!	6418	29.95	1.00
Power Print ///	SOS.DRIVER printer buffer. Uses system memory.	6419	29.95	1.00
Basic GTD	Partial Compiler for Business Basic. Increases program speed 45%-125%!	6420	49.95	1.00
Basic XREF	Program variable cross-reference utility. Prints list of all program variables	6421	19.95	1.00
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Basic Utils	System Utilities functions. Add to your Business Basic programs	6423	29.95	1.00
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Disk Window ///	Disk Block Editor allows inspection/alternation of any data on disk	6425	29.95	1.00
Data Window ///	File examiner produces formatted printout of any file	6426	19.95	1.00

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"The machine that would not die"

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### NEXT MONTH:

A NEW DOUBLE ISSUE!: The Cobol tutorial continues, The General I/O Unit, review on Versaform, installing the clock chip, FAN-IT and much more.

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# ON TOP OF THE APPLE TREE

by Frank W. Moore

**DOUBLE ISSUE NEXT MONTH**

To close out the year on schedule, our next issue will be another double issue. We still have a huge backlog of /// data and information to get out to our subscribers, and the greater size of a double issue will give us a chance to get it out to you. Since a double issue is at least twice as large as a standard issue, you will get more data for your dollar!! We will have some important articles in the November/December issue, so stay tuned!

## RENEHALS

If you have not already renewed, your subscription is slated to expire with the November/December 1986 issue. As you are aware, THE /// MAGAZINE is published on a year to year basis, our intention being that the first year an insufficient number of renewals come in will be the year we close down. Unlike some other publications, we do NOT intend to leave you without a fulfilled subscription.

If you have not already received the most

recent renewal notice, cash or check renewals can still be had at a discount (sorry, no discounts on credit card renewals)- \$38.00 (2nd Class), \$48.00 (First Class, Mexico and Canada) and \$58.00 (Foreign). Renew today!

## VISA/MASTERCARD AT LAST

Many of you have complained in the past that PAIR SOFTWARE did not accept VISA or MASTERCARD for purchases. Our delay in providing this service was mainly due to changes in the credit laws which made credit providers leary of granting VISA or MASTERCARD accounts to mail order houses, which PAIR SOFTWARE is at this time.

Well, after much arm twisting, we now can take VISA and MASTERCARD. If you wish to make any purchases this way, simply call 1-800-541-0900 (California 1-800-334-3030), tell the operator you are ordering from PAIR SOFTWARE (THE /// MAGAZINE is not on the account, but you can renew via PAIR SOFTWARE), give the item and, if you have it, the product number. Also be sure to give your correct card number (they verify each request), name, address and telephone number. THE /// MAGAZINE order numbers are #9000 (\$40.00, 2nd Class U.S.A.), #9001 (\$50.00, First Class, Mexico and Canada) and #9002 (\$60.00, Foreign). Sorry, no discounts on credit purchases.

## TITAN ///+///e UPDATE II

The word is in- TITAN ///+///e cards can now be purchased from Sun Systems Remarketing at the new low price of \$199.00!! This is a \$300.00 drop from the original \$499.00 price, and Sun is to be complimented for their efforts to get the price DOWN. Titan Technologies plans to continue to produce the card for the foreseeable future, but we do suggest that if you were planning to buy one of these card, NOW is the time- the price may increase again very soon. See the back cover for ordering details.

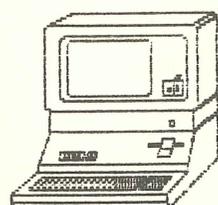
## PAIR SOFTWARE PRICES

As with the way of all things, increased production and labor costs are going to force us to increase prices for products from PAIR SOFTWARE. We regret the necessity, but we will point out that this will be our first price increase in 3 years! On the average packages will cost an additional \$5.00 to \$10.00. The old prices will apply until December 31st, so the time to order is now!

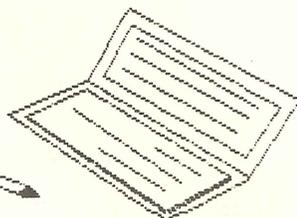
THE /// MAGAZINE

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# LETTERS TO THE EDITOR

Dear Frank,

What is the CATALYST RUNTIME DISK?

Roger F. Suchyta, MD  
Salt Lake City, UT

Dear Roger,

The CATALYST RUNTIME disk is a replacement boot diskette for your CATALYST system. It will not install a CATALYST system or protected software, but it will run an already installed CATALYST system as normal. All you have to do is transfer your SOS.DRIVER file from your CATALYST diskette to the RUNTIME diskette. Best of all, the CATALYST RUNTIME diskette is 100% copyable with System Utilities, so you can save your precious copy-protected CATALYST boot diskettes.

On the minus side, we have found that the CATALYST RUNTIME diskette will NOT work with installed KEYSTROKE or PFS programs due to special copy protections built into the software. We are working to correct these limitations. See Allan Bloom's letter below.

The CATALYST RUNTIME diskettes are a must for any CATALYST owner. See page 23 for ordering details. You must submit one of your original CATALYST diskettes for the upgrade.

Dear Frank,

I am not much surprised that you said your "Unlock Catalyst" does not work with PFS and KEYSTROKE. I ran into the same problem and have a fix. When I invoked PFS (File or Report) from the unlocked CATALYST main menu, I got a blank screen instead of the PFS menu. PFS is sincere about the serial number of the CATALYST under which it was installed. Mel Astrahan's unlocked CATALYST has a serial number of zero. I made a copy of my PFS disks (Copy II Plus, Copy Disk option) and re-installed same under the unlocked CATALYST.

I suspect that KEYSTROKE, being a "super PFS", has the same solution. The problem with KEYSTROKE is its sophisticated copy protection. If you've catalyzed your master disks, you do not want to do the same to your backup disks. If you can make a copy of an un-catalyzed KEYSTROKE diskette (I hear that EDD works sometimes), or that you can un-catalyzed KEYSTROKE with the FIXER program (ed.note: We have found it works on some KEYSTROKE versions and not on others), just re-install KEYSTROKE with the unlocked CATALYST.

Don't forget that a catalyzed KEYSTROKE can be "fixed". From Brock Software, parent of KEYSTROKE, comes the following suggestion. The copy protection is in the disk's formatting. Go to System Utilities, Device Commands, and copy your virgin (that is, un-catalyzed) backup KEYSTROKE disk into onto the catalyzed master diskette. The master disk will revert to its un-catalyzed, bootable state.

Allan M. Bloom, PhD CDP  
Blacksburg, VA

THE /// MAGAZINE

Dear Allan,

Thank you so much for the information, which I am sure will be of great value to all PFS and KEYSTROKE owners!

Dear Frank,

I recently learned that your great DATA BASE /// package will soon receive another upgrade. As your records may disclose, I presently own version 4.1.0.

Have you yet seen the new Apple RGB monitor for the Apple ///s? I wonder whether it will work with the /// and how it compares to your Teknika MJ-22?

Colonel Jerome X. Lewis  
West Point, NY

Dear Jerry,

The latest version of DATA BASE /// as of this date is version 4.2.0. No need for you to upgrade to this version! The 4.4.0 version will be released after the start of the year which will add several other REPORT features, including in report selection logic.

The new Apple RGB monitor is a great improvement the last Apple monitor. It is also rather expensive. While it has greater resolution than our MJ-22, your /// really cannot that advantage of that resolution. If you need a higher resolution monitor for another computer, our new MJ-305 is a better deal for the money. See page 18 of this issue.

Dear Frank,

In the BITS AND PIECES section of the August/September issue you recommended using integer variables "whenever possible". I assumed this applies particularly to loops so I wrote a little program to measure the speed difference using the Apple ///'s internal clock. I also compiled the program with D.A. DataSystem's BASIC.6TO compiler, assigned equal values to M and NX of 10,000, and obtained the following results (in seconds):

Language	Real	Integer	Abbr. Real	Abbr. Integer
B. Basic	21	27	13	21
Basic 6TO	16	23	13	20

Where:

```
REAL      FOR J = 1 TO M:  NEXT J
INTEGER   FOR IX = 1 TO NX: NEXT IX
ABBR. REAL FOR J = 1 TO M:  NEXT
ABBR. INTEGER FOR IX = 1 TO NX: NEXT
```

As you can see, what I call the 'real loop' is always significantly faster than a similar loop using an integer variable. There's also quite a bit of savings if you use 6TO compiled Basic. If you don't repeat the counter variable at the

end of the loop statement, and use just a NEXT, trusting B. Basic to keep everything organized for you, the speedup is quite noticeable.

Again, feel free to use any of this in THE /// MAGAZINE. The little KeyMap suggestion you published some time ago that allow automatic number of Basic program lines has been invaluable (ed.note: See 'BASIC AUTO-LINE NUMBERING', June 1986 issue). I can't get along without it.

Carlo Infante, PhD.  
Belmont, CA

Dear Carlo,

*For Business Basic, you are absolutely right. The reason that Basic real number variables are faster than integers is because of the way Business Basic is designed. It assumes that all variables are reals unless one of the other variable identifiers are attached to the end of the variable name (\$, % or &). If not, the variable is used immediately as a real. If not, Business Basic has to go to a lookup table to identify what kind of variable it is, and that the variable is legal as defined and used, before any execution occurs, and that takes time.*

*In other languages like PASCAL, where all variables are identified at compile time, integers are far faster because of the manner in which they are stored makes system execution easier.*

*Integers in all /// languages also take up less memory than all other variables (2 bytes), and should be used if memory space is a problem. Integers also give whole number results no matter what what they are equated to, and that is very useful in many numeric operations.*

Dear Frank,

As a 'user' I struggled a few months trying to figure out how to install Super Applewriter under CATALYST so that it would function without a hitch. Readers of THE /// MAGAZINE might find the following informative:

- 1) Create a sub-directory on your hard disk with System Utilities (Any legal pathname, e.g. .PROFILE/APPLEWRITER, etc.);
- 2) Copy the SOS.INTERP, SYS.TAB, SYS.PRT, and HELP files from the SUPER APPLEWRITER disk to your new sub-directory (ed.note: I suggest you copy ALL files except SOS.KERNEL and SOS.DRIVER);
- 3) Go to the Catalyst Editor and enter the following:
  - 1 - Display Name: Super Applewriter
  - 2 - Interpreter Path: .PROFILE/APPLEWRITER/
  - 3 - Extra Drivers: <as needed>
  - 4 - Character Set Path: <as needed>
  - 5 - Screen: Normal
  - 6 - Keyboard Path: Default
  - 7 - Initial Prefix: .PROFILE/APPLEWRITER/
  - 8 - Max Files Allowed Open: 3
  - 9 - Program Path:

Jack D. Wood  
Chico, CA

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A library of callable (from Pascal) procedures covers I/O and linear algebra, and problem solvers solve real general or positive definite symmetric matrix and matrix/vector arithmetic problems (no programming required). Profile required. Contact C. Abaci, Inc., 208 St. Mary's St., Raleigh, North Carolina 27605 (tele. 919/832-4847).

Dear Jack,

Thank you for your information. I am sure it will be of benefit to many Catalyst/Super Applewriter users!

Dear Sirs,

I just saw an announcement of the //gs! Could not the /// be used as I/O to the //gs CPU-board via the RS232 or Appletalk port, and then use the //gs expansion ports, memory, etc., with a suitable boot system disk?

I am sure you will run a series of articles on evaluating these possibilities.

Rudolf F. Wrobel  
Shawnee, KS

Dear Mr. Wrobel,

*If such a hardware kludge could be done, it would not be worth the trouble or cost. Better just to use the //gs and it's software. Appletalk is supposed to be available for the //e next year, and it is hoped that the //e board will fix in a ///, which means the simple development of a driver.*

*We are going to have a series of articles on the //gs and it's system. One interesting rumor we have heard is a //gs Toolkit option for it's soon to be released PASCAL system that will allow PASCAL program written in the /// environment to simulate the ///'s .CONSOLE driver on the //gs, making the porting of /// PASCAL programs to the //gs a snap.*

Dear Frank,

As you know, I took part in the 512K Board group purchase you recently did. How about making a deal with THE ENGINEERING DEPARTMENT for an Apple /// version of their 'LITTLE BLUE' IBM emulator card (ed.note: See 'ON TOP OF THE APPLE TREE' in recent issues of THE /// MAGAZINE)?

Bryan R. Davis  
Berea, OH

Dear Bryan,

*As of this date, if THE ENGINEERING DEPARTMENT does release an Apple /// version of the LITTLE BLUE card, Sun Systems Remarketing (see back cover) will carry it. Perhaps some sort of mass purchase agreement can be worked out with them. In the meantime, keep those cards and letters going to THE ENGINEERING DEPARTMENT!*

# LATEST IN POWER KEYS

by Frank W. Moore

Few programs have shook the Apple /// world like the POWER KEYS system. POWER KEYS DM+ is a fully modifiable 'KEYBOARD MACRO PROGRAMMER'. POWER KEYS DM+ also supports a 'Cut and Paste' facility for moving data between between applications, and a 'Module Manager' which allows you to add a number of utilities. All functions and additional modules are available as 'Background Utilities', i.e., sub-programs continuously running in a different part of computer memory than your application. This means that while running any other programs you may stop the program, jump into the POWER KEYS 'background', use any of the POWER KEYS utilities, then return to your program and continue working.

Present owners of the POWER KEYS system will be happy to learn that eight new system modules have become available, including one that allows you to make a POWER KEYS system as big or as small as you please. And now you can order them direct from PAIR SOFTWARE.

MODULOAD - Present POWER KEYS DM+ systems are limited to about 32K, or one memory bank, of computer memory for the POWER KEYS base module and any number of the utility modules. Generally other demands on system memory tend to make the practical size limit much smaller - CATALYST, large SOS.DRIVER files, etc., all take their toll. But even a 512K /// is limited to a 32K POWER KEYS system. Alas, better than 60K of POWER KEYS modules are already available, with more to come!

While that 32K limit cannot be extended, MODULOAD offers you an alternative - load other modules as you need them. With MODULOAD you establish another sub-directory under your POWER KEYS sub-directory called DYNAMIC. DYNAMIC is designed to hold your more seldom used POWER KEYS modules. MODULOAD itself and other often used modules (especially QuikCat) are left in the MODULES sub-directory. When you boot your computer MODULOAD reserves space for any module you want to load from DYNAMIC. To swap the module in, at the POWER KEYS command line type GM, then enter the name of the module. Remember that if you swap an module like NOTEPAD in and out, you are going to lose the data your were working with.

Since a number of new POWER KEYS modules are planned, MODULOAD is going to be a godsend! \$19.95, #6416.

QUIKCALC is a full-function calculator with

functions for Memory Store/Recall, sine, cosine, tangent, degrees, degrees-radians, percent, natural and base10 logs, exp and power along with the basic 4 functions. Unique features include an Undo/Backup Key, 19 decimal digits of precision, huge numeric range for 'scientific notation'. FastAdd using the <RETURN> key and automatic loading of results into a 'power key' for later use in your program. \$29.95, #6409.

FILESCAN is similar to the MSDOS and UNIX utilities named "more". It also allows you to 'page' through a document, viewing 22 lines at a time. It is designed for ascii text files but will actually allow the viewing of any type of SOS file by displaying only the text portions. Very nice if you are in the middle of your database and a client calls and you want to reference the letter you sent to him last week. \$19.95, #6410.

TYPERITE 'connects' your keyboard directly to your printer. Useful, for instance, if you want to quickly address an envelope while running your spreadsheet. Typing is entered a line at a time and each line may be edited before sending to the printer. \$19.95, #6411.

QUIKCRPT is a file encryption or encoding module. If datafile security is a concern at you installation this is a very effective solution. Files are encoded based on a 1-8 character password and can only be decoded using the same password. \$19.95, #6412.

LOCKOUT is a useful system security addon which can complement the data security features in QUIKCRPT. The module simply asks you for an eight character password and then 'locks' your machine from other users until the password is re-entered. \$19.95, #6413.

FONTLOAD allows you to switch system display fonts at will. Very useful for changing to another alphabet or using a denser font for color graphics. \$19.95, #6414.

QUIKMON is definately not for the faint of heart. It adds to the Apple /// the ability to jump into the system monitor (like Apple II programmers), play with the low level machine and return to your program. Great as a debugging tool, but use at your own risk! \$29.95, #6415.

All modules are available from PAIR SOFTWARE, 3201 Murchison Way, Carmichael, CA 95608. See inside back cover for ordering.

# WENDELL SANDER & THE /// by David Ottalini

To most observers, The Engineering Department would appear to be just another one of those Silicon Valley computer businesses you read about in Business Week or Info World. It's physically located in Campbell, California, in a modern one-story office building that's light tan in color. And many of its employees even jog at lunchtime, just like employees at other Silicon Valley offices do.

I'm not sure if Dr. Wendell Sander, the President and Chairman of the Board jogs, but I know that his mind seems to be "running" at a fast pace on a number of interesting projects, some of which might just find their way into our beloved Apple ///!

Why the interest in a "dead machine"? Well, Wendell Sander just happens to be the "Father" of our ///, the man who actually designed it. And as you will see, during our conversation it was obvious he (and some of his colleagues) still have a place reserved in their hearts for our wonderful computer. In fact, there are still a few ///'s being used at the Engineering Department even now.

It's interesting to note that Wendell Sander was Apple's 16th employee. He was originally hired to work on the Apple II before being given responsibility for the /// project. I won't dwell on its history here but would suggest "Fire in the Valley" as an excellent source of information about the development of the /// and its problems at Apple.

As you might imagine, Dr. Sander has some definite ideas about what happened to the Apple /// during its brief lifetime. And he was most open in this interview about what was wrong, and right, with the Apple /// project, not to mention Steve Jobs' impact. He also discussed with me some of the things his new company is doing now. Projects not only for Apple, but other companies as well. The most exciting is an IBM XT emulation card for the //. And as readers of The /// Magazine well know, with enough interest, the Little Blue Card could very well find its way into the /// sometime next year.

This interview was conducted with Dr. Sander in early September at The Engineering Department in Campbell, California.

///: Tell me about The Engineering Department.

The Engineering Department is really a collection of virtually all ex-Apple people. I should point out that we have three of the five original engineers who worked with Apple here. And our backgrounds range from the CPU design which I was responsible for for the Apple /// and many of the early revisions of the Apple //. I was responsible for or designed most of the early Apple // peripherals that were done.

And Dick Houston is here who did most of the early firmware projects for the peripherals and the early operating systems and then he was on the SOS team and finally wrote ProDos. So we have a lot of the old Apple engineering represented. (Author's note: The developer of Selector ///, Steve Smith is also working for The Engineering Department).

Our objective is to do product design. The fact that we are doing a card (the Little Blue Card) for the Apple II is simply one project that we decided we wanted to fund ourselves. But in actuality, that is less than half of our activity and our other activities include contracts with Apple and other individuals and corporations.

///: What other areas is the company interested in?

We are interested in and do work in entertainment electronics. One of our people, Dick Houston, before we started this, worked with a group that developed a video-disk based game that is highly interactive. So we have interests in entertainment areas and home electronics areas of all types.

///: How big is your staff?

Full and part-time about 15 people now. They're virtually all engineers except one person who is providing financial support and we do have one person who does marketing on a half-time basis.

///: How much interest has there been in Little Blue Card from the /// community?

Positive in general. We've gotten a lot of response from the Apple /// people. There have been postings on Bulletin Boards and things of this sort and we do get two-three letters per day from Apple /// owners who are interested in the Little Blue board for the ///. That is a project that we have some personal interest in here, but haven't put as a high priority. We are interested in putting our Apple II and Apple IIe version out first and then go on from there.

///: Is a /// version a possibility?

It's not a terribly difficult task, that's why it's kind of intriguing. It would be a matter of doing a relay out of the board. There's certainly adequate board space in an Apple /// and there would have to be some modifications to the software but they would be relatively small.

We have the people who know what those have to be. It's a fairly straight-forward task but it does take time and energy and at this point we can't make commitments as to how we will proceed. We have to concentrate on getting the II product out first.

///: One of the /// vendors (Sun Systems) has indicated an interest in working with you on this.

It's a matter of priorities right now. Getting our work done, getting our first one out, because we do need to get the II and IIe versions out before anything else can be done.

///: Do you like working outside of Apple?

Yes. In my case, I was essentially retired for two or three years. I was doing some consulting. But putting in time for another company is less interesting than actually getting projects and seeing them through to completion. And this is easier to do

# Programmers Power Tools ///

With PPT /// you can write sophisticated, advanced programs using Business Basic. PPT /// is a collection of machine language programs that you can transfer to your diskettes. When they are all loaded into memory, sixteen new commands are added to Business Basic. You use these commands the way you use "PRINT" & "VPOS"; but with far more impressive results.

TEXTIN	(Get an alpha-numeric value from the user)
TEXTGET	(Get an alpha-numeric value with cursor control)
INTIN	(Get a numeric whole number from the user)
INTGET	(Get a whole number with cursor control)
NUMIN	(Get a fixed-point numeric value from the user)
NUMGET	(Get a numeric value with cursor control)
DATEIN	(Get a date from the user)
DATEGET	(Get a date with cursor control)
SORT	(Sort a string array)
NUMSORT	(Sort a numeric array)
SEARCH	(Search a string array)
NUMSEARCH	(Search a numeric array)
UCASE	(Convert a string to all caps)
RESETOFF	(Deactivate the RESET key)
RESETON	(Reactivate the RESET key)
FORMAT	(Create a data diskette)

With your PPT /// package you will receive:

- The PROGRAMMERS POWER TOOLS /// program disk
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in a smaller environment where we can take a specification and work within it and we only have to communicate with each other about it. It goes more rapidly and we see our way to the end more rapidly and that's a much more satisfying kind of work.

///: Have you found Apple easier to work with now that the management has changed?

I don't think there's been a whole lot of difference. Remember we've seen Apple from the time where we were all sitting in one room to where it is now a very, very large corporation. At this point and for the last number of years, working with Apple is working with a large corporation that has its advantages and disadvantages. They are a large, solid company that when you send them a bill you know they are going to pay the bill; you don't have to worry about that. But on the other hand, the decision-making process in such a large organization is much more complex and goes through more bureaucracy than it does in a small organization, so it has its pluses and minuses. I don't think Apple is significantly different than other large companies in that respect to deal with.

We have an advantage because many of us here know many people inside or are known inside, so it's easier for us to make contacts. And we probably have a bit more credibility because of our backgrounds than someone who is trying to come in cold. So I won't say that we don't have an advantage working with them that way.

///: They seem to be making a real effort to listen to users these days.

They go through phases. All companies go through phases and growing pains. In the early days, one of its fortes was that Apple could be responsive. And it could, because it was small. As it gets large, it gets more difficult to respond and it takes time to get the mechanisms in place where it can listen again, so it's easier to do when they aren't growing so fast, I'm sure. And the marketplace has changed so radically, it's remarkable to me that anybody can follow it. It's still an extremely fluid market. Things seem to go in waves. There was the education wave, when the IBM PC came in there was the wave of the PCs. And now desktop publishing is the wave and everybody is into desktop publishing and the Macintosh seems to be the forerunner in that. So each person gets their turn on the wave, it looks like.

It's also been interesting to watch the difference in strategy to clones. Apple has always been very aggressive in that respect. IBM has not. They may not have been quite as able to for many reasons including they're a bigger company and have to be careful about how they get aggressive legally. But Apple has taken that as one of their forefronts, and it has probably helped them today as a company because they aren't faced with the same problem as IBM is where the bottom part of their market is being eroded away. You could argue whether that's good or not for the end customers, but IBM has tended in their large machine market to try and make an advantage for the end user because then they have portability and uniformity and all those wonderful advantages. It's really kind of interesting to watch this all go by.

///: Do you like the way Apple is going, bringing the // and Macintosh lines closer together?

They are trying to make the software more equivalent and look more alike and I think that's definitely the right direction. The Macintosh-kind of software approach aimed at the user is what is making it. For all the comments and pluses and minuses and arguments about many of Steve Jobs' philosophies, "By George it had to be this way and look this way", I think the current success of the Macintosh, much of the success of that philosophy has to be credited to him. He was right in many ways. So, I think bringing that concept and philosophies across to the Apple // are very important.

It's important to remember that computers are primarily program runners and what you want to do is have a machine that runs a large body of very useful programs. And exactly how you run them and what you run them with is less important than your ability to run them well. And this has many implications in terms of ability to create these standards and things of this sort. It's very difficult because you create a new machine that does not run any of the standard bases, it's very difficult to create a standard.

The Macintosh is truly remarkable because even in the face of the IBM being perceived as a sort of standard it was able to create itself a new software standard and that is quite a remarkable success story. And that software philosophy being carried across to the entire Apple line absolutely makes sense.

///: As the Father of the Apple ///, what do you think Apple has learned from its problems?

Well, I think the ///'s problems, there were probably several. It was probably introduced into the marketplace six to nine months too early largely because there was a great worry within Apple for

a long time that the Apple //, that its demise was just around the corner. I think maybe they've learned the Apple //'s demise is not just around the corner! There was this concern that "Wow, if we don't get this thing out next month, Apple // sales are liable to go down and we're really dead, we're in big trouble."

So there was probably too much push to get it out. That caused it to have some early reliability problems it would not otherwise have had. They were primarily mechanical and as a result, to a large extent, of growth pains in the company. We were growing, becoming a large manufacturer and there were supportive quality activities, component selection and things like that had not grown up with the company when it should have. Therefore we were not in a position to do adequate component qualification and things of that sort, and it caught up with us. I think if we had had another six to nine months those problems would never have appeared in the marketplace.

Secondarily, when those problems were corrected, by essentially a wholesale replacement of the existing (motherboard), the fact that that was done was really never highly publicized. There were some really dramatic efforts for Apple to follow up on its commitments on those things and the problems were genuinely corrected totally in the marketplace and yet (the word) never got out there very well. So maybe they learned a little about the fact that you beat your own drums sometimes when you do things like that.

///: Were there too many restrictions placed on you, while you were designing the ///?

I think we didn't know enough about what we were doing. In retrospect, it's clear we should have maintained total backward compatibility with the //, which we did not necessarily perceive as being essential. Because we were still coming out of the world where, well you design a new machine and you wrote new software for it and it was a new machine and nobody worried too much about the old stuff. That was an inaccurate perception. So we should have had complete Apple // emulation in it. And at the time the ///e was introduced there should have been a /// with complete ///e emulation introduced at the same time. I think if those had taken place, it would have been perceived as a more fully compatible product and big brother product and would have had more clout.

///: It's interesting that the Mac Plus came out with a hierarchical file system (HFS) that the /// had from the very beginning...

Yes, the /// software was exceptional. It really set the standard. Even to some extent the MS-DOS was, if you look closely at it, many of the concepts that were developed in SOS were carried through in MS-DOS. So it really has to be rated as a very important event in software for micros because it was the first really solid operating system. I still think it is probably one of the most professional and best done. That is in the sense of being able to get modules in and out of it and adapt to it and add to it and expand on it, SOS is still probably better than any of the popular operating systems on micros. So, that's certainly true that it set a standard.

In fact, many parts of the /// lived on in the ///e. I worked (on the ///e project) and many of the concepts done on the /// were carried across to get the 80 column mode; many of those aspects

showed up in the ///e design.

///: Is the new ///gs what the /// should have ended up being?

I can't comment on that. I think the fact that Apple is coming out with a new generation of ///s is what is important to recognize. They perceive the line as having breadth and depth to carry on. I really believe the ///e is going to have an amazingly long life in the educational world. The education world is not one that easily changes horses.

///: ProDos compatibility has really helped the /// a great deal, hasn't it?

That has helped the ///. Several of us here still use the /// quite a bit. Frankly, we mostly use AppleWorks and carry the file systems. And the /// EZ Pieces and the fact that that program is transmittable between the two has been a great advantage too because it provides a common media of dealing with text files. Also, I think your Basic on the /// is, I like it the best of the Basics that I get to work with.

///: What about Steven Jobs and his attitude about the ///? Did he kill the /// or was it simply the marketplace?

I think the marketplace had moved on. I wouldn't lay that on Steve Jobs. Steve, there's no question he was doing the Macintosh, that was his primary focus and as far as he was concerned it was the most important thing Apple was doing. And if he had to brush other things aside to make Macintosh go forward that was fair game to Steve.

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But that's not necessarily a bad sign for the manager of a group trying to make a successful product. It is very hard to create a new software standard. The task the Macintosh had to accomplish was extremely difficult in the marketplace and so he was very much pushing that way and at the same time he had perhaps disproportionately more clout than a usual product manager might have because of his history and position in the company. So it may have had some influence. But at the time the /// was dropped, it was not selling that well and the marketplace had by and large moved on. I would not lay that on him as well.

///: Are you surprised that /// owners are as loyal as they are to that machine?

I actually find it very interesting. There is a tremendous loyalty there. I think there's a little bit of that in many orphan machines. The /// seems unusually strong that way. It's interesting and a valuable lesson for people when they see a machine going orphan because there's such a panic about it because there tends to be quite a long lifetime. I think that's very true also of the people doing support designs and support programs. There's actually a good marketplace that can be developed that I think people miss because they think "Well, that's a dead end" and very often it really is not.

If anything, if you are willing to take the trouble to specialize in some of those type of machines, you can make a very good living and you're not in such a "slug-it-out" competition where it's a more stable and more long-lived environment to live in. I really think people are making some mistakes in there. That looks like a good place to be.

///: So overall, you are optimistic about the future of Apple?

They look very strong. As I say, it's gone in a cycle. It's really quite interesting, the IBM as a PC company has tended to have flattened and Apple is on a rise so to some extent things seem to have swung.

And a lot of it has to do with, much of Apple's future is tied in to the Macintosh world. You have to understand that companies like that have to work on their future products and that technology is probably their longer-term wave. And once they're in place it's very difficult to dislodge. So most small businesses are going to have a PC and a Mac both. That's the way it's going. And I think desktop publishing is going to be as pervasive as the optimists say because we use laserwriting and Macintoshes extensively for everything here. And for all practical purposes, any office that is using a typewriter is going to find that as soon as the first competitor is putting out letters on laserwriters that they are in an untenable position.

It's the same reason you didn't use a manual in the office. You always had an IBM Selectric because your letters had to look as good as your competitors. And the same thing is going to happen with laserwriters. They are going to become a necessity in every office and the result is going to be a massive demand for desktop publishing. So that leadership position is probably the most important thing in Apple's future.

## APPLE /// CONVENTION

You can start thinking about saving for a long weekend for a trip to the Chicago area in the Fall of 1987. We continue to get lots of indications of support and encouragement from Apple /// owners.

The convention plans of the Third Apple Users Group (TAU) of Chicago are proceeding well. They already have verbal agreements or other reasons to believe that all of the more well known names in the /// community will attend. TAU hopes to have seminars and classes covering everything from relatively novice topics thru a SOS class for experienced assembler programmers.

TAU plans to have some limited babysitting for younger children. For the older ones, TAU hopes to have a computer game room and videos. Of course, non-computing spouses will have facilities and sights of the grand city of Chicago to amuse themselves with!

TAU's biggest concern is still in the realm of attendance. TAU states that they have enough interest to support at least a conference of /// owners, but feels as requests continue to come in they may need an even larger facility (300+). Of course, the more the merrier!

Randall Jackson of the TAU Board of Directors has agreed to be General Chairperson of the conference. TAU is presently looking at dates in October and November of 1987. MR. JACKSON NEEDS YOUR INPUT TO MAKE THIS THE BEST COMPUTER CONVENTION YOU HAVE EVER ATTENDED. For more information on attending the convention, contact Mr. Jackson at Jackson Connor-Jackson, 1511 North Bell, Chicago, IL 60662.

# BITS AND PIECES

by Frank W. Moore

## ERRATA

In last month's issue we mentioned that THE GENERAL I/O UNIT and the VERSAFORM review would be in this month's issue. This was in error. They will appear in the November/December issue.

Also, the REB pinout diagram on page 43 of the August/September 1986 issue was attributed to Jim Bigwood of the University of Michigan. It should have been attributed to Bruce Bridges of North Central Community Health Center.

\* \* \*

A new language is available for the ///. FORTH /// is a powerful implementation of the FORTH language that is 100% SOS compatible. Apple //e and //gs versions are also planned. See page 20 for more details.

\* \* \*

The STARNET INFORMATION NETWORK has a variety of computer equipment available, and an on-line bulletin board to describe it. For more information, contact STAR COMPUTERS OF AMERICA at (800) STAR-800 or (312) 982-0700.

\* \* \*

Need data conversion done from one disk format to another? PORT-A-SOFT offers data transfer between over 500 different computer systems. Prices range from \$9.00 per disk. A free catalog is available. Contact PORT-A-SOFT at 555 S. State Street, #12, P.O. Box 1685, OREM, UT 84057 (801) 226-6704.

\* \* \*

Love to do EVERYTHING on /// EZ Pieces? How about your 1987 taxes? TAXWORKS is a set of Appleworks spreadsheets designed to enter, calculate and display your tax returns. While somewhat limited in application it can do the average person's tax return. Cost is under \$40.00. Contact Personal Financial Services, P.O. Box 1401, Melville, NY 11747 (516) 261-8652.

A superior tax preparation program for the Apple ///, SMARTTAX, will be reviewed in the November/December issue.

\* \* \*

A sad note: Charles McConathy of CMC Computer Systems has reported that CMC has merged with CMS (Complete Management Systems), and that they will no longer be making their fine line of hard disk drives for the Apple ///. They have parts for about 50 more in stock, so if you want one of these low cost 20 megabyte drives (under \$800.00) now is the time to buy one.

Mr. McConathy reports that the decision to discontinue the Apple /// line is due to the fact the controller for the drive will no longer be made by a supplier, and it is not economically feasible for them to generate new ones in small batches for the Apple /// market.

While we are sorry to see them go (and who knows, they may be back) we wish Mr. McConathy and his new firm great success in their latest ventures: building hard disk drives and SCSI cards for the //e and //gs line of computers.

A final note: Bob Gardiner of AV Industries will be handling the remaining stock of /// drives. For more information contact Bob at (213) 424-8141.

\* \* \*

A recent diskette crash reminded me to pass on a tip to you: During a READ cycle on your disk drive (cataloging, file reading, etc.) you can do little harm if you open the drive and remove the diskette, other than causing a SOS drive error to be reported. Not so during a WRITE cycle. NEVER, NEVER, NEVER place a diskette in a drive if a WRITE cycle has started. Wait for the computer to quit trying to write and generate its error message. To do otherwise is to risk the trashing of your diskette!

\* \* \*

A new super printer sharing switch is now available. THE LOGICAL CONNECTION is a hardware device that, like a switch, allows you to hook up a number of computers and printers together for sharing. We have reported on such devices before (Ed.Note: See 'METAPATH'S DDS-5 SWITCH' in the September 1985 issue), but THE LOGICAL CONNECTION is a lesson in simplicity.

First of all, you don't have to do any configuring of the switch to set it up. Plug in your /// or other computer, plug in your serial OR parallel printer, and the switch figures out what kind of setup is needed to make the connections correct!! No null modem cables, slot cards, etc. A printer buffer is included.

Next, with THE LOGICAL CONNECTION the various ports can be easily called via simple software generated printer setup string commands, available in most /// programs or via the Power Keys PrntMgr module! No need to boot Access /// just to lock on a printer port. And, if the port is busy, it just makes your computer wait until it is free.

Finally, each LOGICAL CONNECTION can handle up to eight devices, and you can connect up to a total of 45 LOGICAL CONNECTIONS via a twisted pair cable (cheap and available everywhere). Your printers and computers can literally be all over a building. It does not work with modems.

Then, there's the price. At \$495.00 it is a bit of an investment, but cheap if you need it's power- less powerful devices of this sort generally cost more than \$1000.00. For more information, contact FIFTH GENERATION SYSTEMS at 909 Electric Avenue, Suite 308, Seal Beach, CA 90740 (213) 493-4483.

\* \* \*

ON THREE has announced that it's SPELLING MANAGER is now available. The SPELLING MANAGER can spell check any /// EZ Pieces word processing or ASCII text document. It has 80,000 words

presently available (medical and legal dictionaries soon) and can be purchased in Desktop Manager or Standalone versions. For those of you tired of lacking a spelling checker for /// EZ Pieces, it looks like ON THREE finally has the answer. It is listed for \$79.95. Contact ON THREE at (905) 644-1055 for more information.

\* \* \*

CHEAP IBM COMPATIBLE DEPARTMENT: Hyundai, the folks who brought you the \$4,995.00 Excel sub-compact car, will soon be offering THE BLUE CHIP PERSONAL COMPUTER, an IBM compatible that the company claims can run all IBM XT software. It should be available via Federated Group Stores, Target Stores, Walmart and Toys R Us Stores (how apt!) very soon for under \$700.00.

THE (Thompson, Harriman and Edwards) Computer Products will soon be offering THE PC, a 8 megahertz 256K IBM clone for \$444.00! It is available directly from THE at 319 West Ontario Street, Chicago, IL 60610. (312) 642-9626.

Why mention these cheap clones here? Well, if you just have to have an IBM clone to keep your clients or boss off your back, why pay a bunch of money you could be spending on your ///? These computers work as well as any of the MS-DOS computers do, which ain't saying much.

One other item. THE does have a fantastic deal on Hayes Command set compatible modems- \$119.00! That is a price worth giving them a call.

\* \* \*

A new Apple /// users group has reported in. If you are a ///r living near Tulsa, Oklahoma, contact the:

Oklahoma /// Users  
Attn: Doug Embery  
2522 South 109th Avenue  
Tulsa, OK 74129  
(918) 663-5236

Mr. Embery also requests that he be added to our /// Help Page as a Titan ///+//e and Appleworks expert. Glad to hear from you Doug!

\* \* \*

Another I/O error has been spotted in BACKUP ///, this one occurring if you try to back up a damaged directory. It appears that under certain conditions bad blocks on a hard disk can direct file pointers to skip large segments of disk blocks WITHOUT causing a BACKUP /// failure. The result of a such a backup session is a listing that all the files have been backup up when only a small portion have been. For example, the program may list that '14 Volumes' are required for backup, but only 7 diskettes were actually used.

Since you all are using System Utilities to Verify and List (catalog) your media before backing up to detect block and directory damage errors (you ARE doing this, aren't you), a word of advice- If you detect directory damage, and want to try a backup to save your data (usually works if the damage is detected

early), do that particular backup on an alternate set of diskettes, NOT YOUR PRIOR BACKUP DISKETTES. It may save you a lot of trouble, time and heartache. Nothing could be worse than to have your data lost on the hard disk and then to destroy your only backup of your data!

\* \* \*

The MODEM DATA SPLITTER allows you to share a printer or modem without a data switch. The splitter electrically isolates the two sharing computers from each other, yet allows full contact with the your printer or modem (obviously, one computer at a time). Cost about \$44.95. For more information, contact B & B electronics at 1500N Boyce Memorial Drive, Ottawa, IL 61350. (815) 434-0846.

\* \* \*

VOTRAX offers a variety of text to speech synthesizer systems for computers, including an RS232 based system that should work just fine with an Apple ///. For more information contact VOTRAX, INC. at 1394 Rankin Troy, MI 48063-4074 (313) 588-2050.

\* \* \*

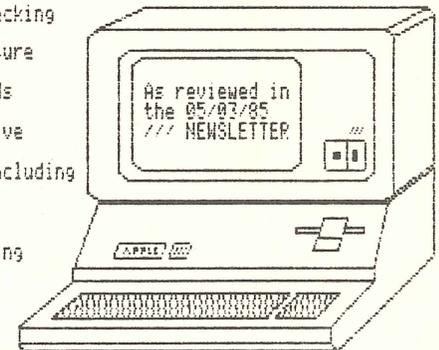
JAMECO ELECTRONICS sells a number of electronic parts, chips and accessories for many computer systems, including the ///. They have a catalog full of neat things to play with. For more information contact JAMECO ELECTRONICS at (415) 592-8097.

\* \* \*

## DATA BASE /// Version 4.2.0

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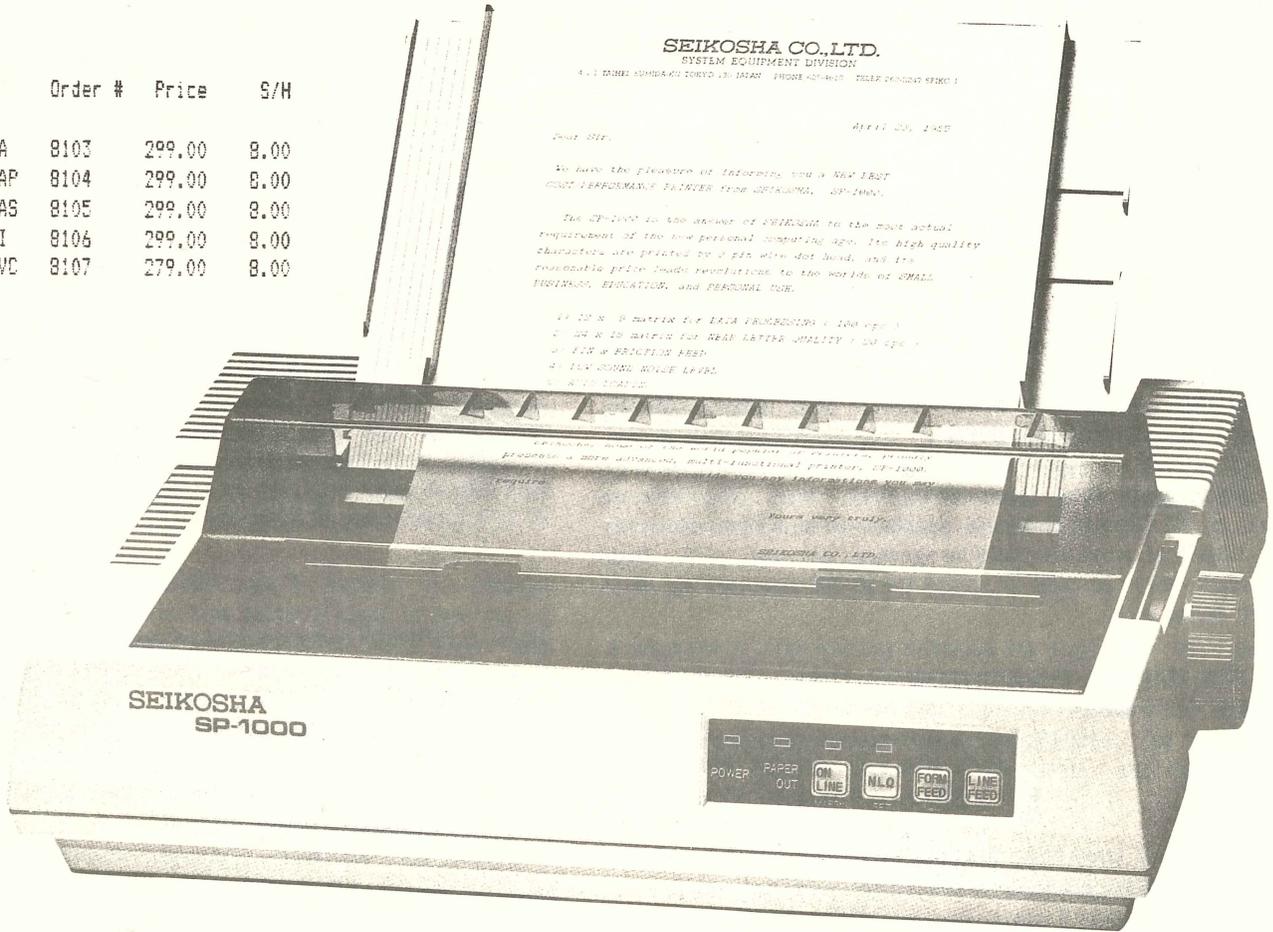
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# SEIKOSHA

Model	Order #	Price	S/H
SP-1000A	8103	299.00	8.00
SP-1000AP	8104	299.00	8.00
SP-1000AS	8105	299.00	8.00
SP-1000I	8106	299.00	8.00
SP-1000VC	8107	279.00	8.00



## Specification of SP-1000A

Printing method	Impact dot matrix
Print head	9-pins
Printing direction	Bi-directional logic seeking in text. Uni-directional in graphic.
Character kinds	96 ASCII characters and 8 country character sets
Graphics	6 kinds of horizontal graphic density (480/576/640/720/960/1,920 dots/line)
Multiple copies	Original plus 2 copies.
Line spacing	1/6, 1/8, 7/72, n/144, n/216 (n=0-255) inches
Line feed speed	6.7 lines/sec (6 lines/inch). 10 lines/sec (9 lines/inch).
Paper feed	Pin or friction feed.
Paper width	Pin and friction (4" to 10")
Ribbon	Special cassette type ribbon.
Operating temperature	5°C-35°C
Operating humidity	20%-80% (no condensation).
Power supply	Either 117, 220/240 VAC ±10% 50/60Hz
Power consumption	30W printing at self test 15W idling
Dimensions	390W×119H×278D(mm) with tractor (15.4W×4.7H×10.9D inches)
Weight	4.9kg (10, 9 lbs)

- **SP-1000A** Centronics parallel.
- **SP-1000AS** RS-232C serial version.
- **SP-1000 I** IBM®PC compatible.
- **SP-1000VC** Commodore®C-64/C-128™ compatible
- **SP-1000AP** Apple® IIC/Macintosh™ compatible

## Features of SP-1000A

- Impact dot matrix method, bi-directional in logic seeking, uni-directional in graphic printing.
- 100 (Draft mode), 20 cps (Near Letter Quality) print speed, with reduced noise level.
- Pin-feed or friction-feed available.
- Automatic paper loading function.
- Paper empty detection.
- Internal RAM error detection.
- Input data dump in hexadecimal.
- Right, left margin set function.
- Self test printing.
- A variety of functions including Under line, Bold print, Double striking.
- A variety of print character sets including, Pica, Elite, Proportional, Elongated, Condensed, Italics, Super/Subscripts, and Italic Super/Subscripts.
- Automatic printing.
- Optional intelligent serial interface (# SP-80010)
- Downloadable Characters.
- Standard 1.5K buffer.

## Printout Sample

```

789 ; ; <=> ? @ ABCDEF
<=> ? @ ABCDEFGH IJKLM
789 ; ; <=> ? @ ABCDEFGHI
/0123456789 ; ; <=> ? @ ABCDEFGHI
789 ; ; <=> ? @ ABCDEF
<=> ? @ ABCDEFGH IJKLM
789 ; ; <=> ? @ ABCDEFGHI
EFGHI JKL
789 ; ; <=> ? @ ABCDEFGHIJKLNOPQ
    
```

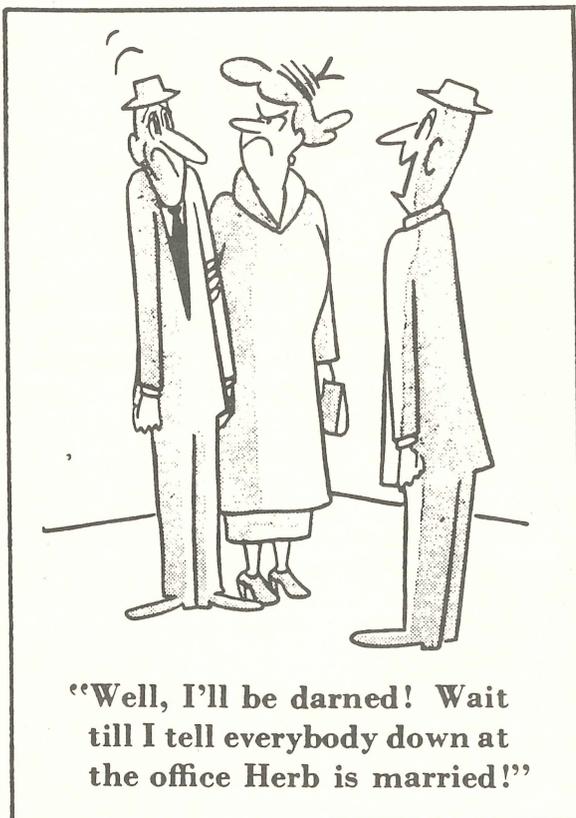
TELECOMP is a peripheral device that allows you to combine television and computer video signals. With TELECOMP, you can integrate computer graphics and animation with your video productions. A great tool for the creation of training tapes, presentations, etc. without spending an arm and a leg for professional producers. Prices start at under \$400.00. For more information contact AVAS at 196 Holt Street, P.O. Box 1070, Hackensack, NJ 07602. (201) 487-6291.

\* \* \*

The original Apple /// came with a RS232 modem eliminator cable for connection to a serial printer. The later models did not, but the need for modem eliminator cables has remained. The original cable had the following pin configuration was:

Apple ///	Printer
1 >-----<	1
2 >-----<	3
3 >-----<	2
4 & 5 >-----<	8
6 >-----<	20
7 >-----<	7
8 >-----<	4 & 5
20 >-----<	6

This was NOT an answer for all serial hookups, but should work with a majority of printers.



CAUZIN SYSTEMS has a SOFTSTRIP system with software (those funny new bar code strips you have been seeing in the computer publications) that will work on the Apple II+ and, apparently, the Apple /// in its emulation mode. SOFTSTRIPs are quickly becoming a very popular way to read and save data from a common media format. The text files created in emulation can ported to the /// via SOSTRAN (Sun Systems Remarketing) or by the Applewriter Utilities diskette. For more information, contact CAUZIN SYSTEMS at 835 South Main Street, Waterbury, CT 06706. (203) 573-0150.

\* \* \*

The new OPEN MAC will probably not be released before the summer of 1987, but should be a vast improvement over the present MacIntosh. A base system will have about 6 slots along with the standard Mac ports. The OPEN MAC will be based on the 25 Mhz Motorola 68020 processor, and it is rumored with use the Motorola 68881 floating point coprocessor for number crunching operations. 1 megabyte of RAM standard, maybe more. High resolution black and white for sure and possibly medium and low resolution color. Look for a plain vanilla OPEN MAC to cost about \$3,000.00, super systems (20 megabyte hard disk, etc.) for \$8000.00+ (shades of LISA!).

\* \* \*

Space saver tip for CATALYST users. The .UNUSED1-.UNUSED6 driver file, while vital for dynamic SDS.DRIVER loading, is a bit of a memory hog. The first 4 .UNUSED drivers are for character devices like .PRINTERS, .RS232 drivers, etc., while drivers 5 and 6 are for block devices like disk drives. The latter two are also the largest drivers of the set.

If you are not dynamically loading any block devices, use System Utilities to inactivate .UNUSED5 and .UNUSED6- you don't need them. DON'T attempt to delete the drivers- you can't without deleting all of them.

\* \* \*

We have received many questions on the differences of hardware and software handshaking between computers, modems and printers. The purpose of handshaking is to control the flow of data from computer to peripheral. Since electronic signals move far faster than they can be processed, and computers and printers have limited memory available for storage, some means of controlling the flow is needed. Which system is 'best' depends on your application.

HARDWARE handshaking involves an electrical connection between a computer and printer, usually along three cable lines- data send (line 2), data received (line 3) and handshake (lines 6/20). With the HARDWARE handshake, whenever the printer character buffer is full the printer sends voltage to the computer's line 6, which tells the computer to stop sending. When the buffer is almost empty, the line 6 voltage is turned off and the computer starts sending again. This is the operation performed by the standard serial .PRINTER driver, and it the fastest and most accurate form of handshaking.

# FORTH ///

Version 1.00

\* FORTH LANGUAGE ON YOUR APPLE /// !!!

\* All SOS system calls available

\* Built in screen editor

\* FIG-1979 Standard FORTH,  
can be extended to the  
FIG-1983 standard

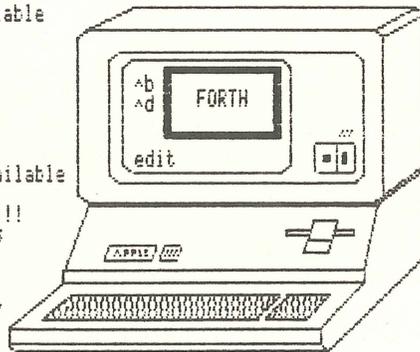
\* All Apple /// Hardware available

\* CREATES SOS.INTERP FILES !!!  
Your code runs almost as  
fast as assembler!!

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Catalyst or Selector ///

\* Special extensions for  
easier programming

\* Apple //e ProDOS version soon available



Now you can learn the exciting FORTH language on your Apple  
///// FORTH /// is a full operational version of FORTH,  
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FIG-1983 standard. Your high level language programs are  
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Obviously, such a system has limitations on cable length (about 75 feet). For longer installations, modems can be used, but since modems are designed to work over two connector telephone wire, and have no way of transmitting the on/off voltage handshaking signals. To control data over great distances, SOFTWARE handshaking is used, generally by the sending of the XON and XOFF control characters. These characters are transmitted like alphanumeric characters- XON instructs the transmitting device to send data when the receiving device's data buffer is empty, XOFF to stop sending when it is full. This is the kind of operation performed automatically by the .RS232 driver. However, the XON/XOFF system is more prone to data errors due to line transmission noise.

The devices you intend to use are important, too. Some printers have provisions only for HARDWARE handshake, some for both and others for SOFTWARE handshake only.

\* \* \*

Hardware troubles with your ///'s serial port, can be generally traced to one of several motherboard chips. The 6551 ACIA, located at position B2 on the motherboard, and the 6522 VIA chip, located at position B4 on the motherboard are the chips most often associated with serial port problems. Sometimes the 1488 (driver) and 1489 (receiver) port drivers, located at positions J2 and K1, respectively, can cause problems related to the 6522 chip.

Since these chips are not expensive, the simplest thing to do when your serial port fails is just to replace the lot of them. All are available, from JAMECO ELECTRONICS for a total cost of less

than \$15.00. The 6522 and 6551 chips are listed under their own names. The 1488 is listed as part #LM1488N, and the 1489 is listed as part #LM1489N. Be sure that the pins are clean and properly inserted into their sockets. JAMECO is at (415) 592-8097. They also carry the 6502B microprocessor chip in stock.

\* \* \*

A reader wrote to us recently on the wisdom of using a vacuum cleaner to clean the dust out of his /// in an unusually dirty environment. He taped a plastic straw on the the crevice device to increase the vacuum, then moved it around the board and peripheral slots. The system worked fine until one day a static charge built up on the plastic hose and nozzle and zapped his serial port chips (he made the recommendations above)! He still uses this system, but now periodically grounds the hose on his workroom sink's piping. The lesson: keep static electricity away and your /// well grounded.

\* \* \*

One indication that your diskette drive analog card is going to that great circuit board in the sky is when the drive's lamp begins to glow continuously. Generally the end comes slowly. The lamp will begin to stay on for long periods of time after a disk operation, then stay on continuously. This will be followed by READ/WRITE errors occurring, then, finally, cease of function. Don't waste your time. If the lamp begins to glow continuous, replace the analog card. By the same token, if the lamp burns out, replace it. It is very easy to accidentally remove media from a drive still saving data if the lamp isn't there as a warning.

\* \* \*

The original Apple /// had a 38 watt power supply, barely adequate for it's needs. Then newer Apple ///+ came with a 50 watt power supply. In the event of a power supply failure (NOTHING WORKS!), check out some these things before replacing the supply. First, some of the older Apple ///'s had bad power cables (the 10 conductor cable from the power supply to the motherboard). Heat build up can play havoc on such cables, even reducing the power supply voltage as much as 1 full volt, making a marginal power supply inadequate to the task. Inspections of the supply cable shows that +5 volts uses two of the cable leads, and ground uses 4 of the leads, indicating that the standard cable is carrying a very big load for it's size.

In such cases you should replace the cable with a new one, or, for heavy demand systems, use your own beefed up wiring. This is particularly true for the peripheral card slots- the further down the line the slots are (1-4), the less voltage is available via the motherboard circuitry, losing as much as .5 volts on the trip. Logic chips take ill to reduced voltages- they love it to be right on 5 volts.

One solution that really works well is to add a jumper between the 5 volt source and the 5 volt input on slot 4. It especially helps over-heated Titan ///+//e cards and the lessening of circuit resistance actually REDUCES the burden on your power supply. However, power supplies that fail after a period of warm-up are probably already shot. Replace them as soon as possible.

THE /// MAGAZINE

# USING /// COBOL - II

by Weber Baker

Last time we reviewed the Apple /// CoBOL environment. Now it is time to begin looking at the language itself and start the road to programming. One note before we begin about the term 'reserved word' which I could not find in either the BASIC or Pascal manuals and felt might be unfamiliar to some. A reserved word is a word that is part of the CoBOL language (or Pascal or BASIC if you are using those) which has special meaning to the compiler. Such words cannot be used as data names unless they are embedded among other characters. For example the word 'WRITE' is a reserved word in BASIC, Pascal and CoBOL. Trying to use this word as a data name will not work:

```
10 WRITE = 10; Rem An unacceptable BASIC statement but->
20 Writeplace = 10; Rem An acceptable BASIC statement
```

```
WRITE := 10; { An unacceptable Pascal statement but ->}
Writeplace := 10; {An Acceptable Pascal statement}
```

Move 10 to Write.

\* An Unacceptable CoBOL statement but ->

Move 10 to Writeplace.

\* An Acceptable CoBOL statement.

CoBOL was developed in the days of punched cards. For those who were fortunate enough to miss out on this dark age of computing, punched cards were 80 column stiff paper cards (ever wonder why the standard CRT is 80 columns?). Programs, data and whatnot were literally punched onto these cards. A heinous device called a card reader was then used to read the information on those cards. The standard format for CoBOL programs on cards was as follows:

Columns 1-6 sequence numbers. These columns were set aside so that if someone should drop a deck of cards they could easily be resequenced through a card sorter. For most CoBOL compilers, including Apple /// CoBOL these columns are still reserved. They can be left blank, or if you have a love of typing, you can use them for sequence numbers.

Column 7 is used for two purposes. If an asterisk (\*) is placed in column 7 that line becomes a comment entry. These are to CoBOL what REM statements are to BASIC and entries between {} or {\* \*} are to PASCAL. The Apple /// CoBOL also allows a slash (/) in this column which will force a form feed in the printed output listing from the compiler, but this slash will not transport to other compilers.

The second use for Column 7 is as a continuation of a line that exceeds 72 characters; which comes up later. Anything else in column 7 will generate an error.

Columns 8-11 are called Area A. Columns 12-72 are called Area B.

Columns 73-80 are used for added comments or identification. Frequently the program name or programmers name are placed here, but most often they are blank.

As we go along the uses of these areas will be presented. For the time being it is important to realize that you must start in

column 8, for most lines of the program, and column 7 for comments. Since you can use either the Pascal editor or a word processor there are several options. The Pascal editor will allow you to set up margins that it will follow as you go. Apple Writer, for example will let you either use the tab key, or alternately you can print the program to a disk file with an appropriate margin. However, keep in mind that both these editors start from column 0 not column 1, so subtract one from all the column requirements listed above.

Another point is that CoBOL, like Pascal will allow for multiple entries on a line. Since entries are terminated by periods, the compiler can determine where one starts and the next begins. All CoBOL sentences MUST end with a period. However, for readability most entries should be on only one line, and in the case where more than one line is needed indentation should be used. Look at the examples in the Apple /// CoBOL manuals.

All CoBOL is divided into four parts, called Divisions. The four Divisions are the Identification Division, the Environment Division, the Data Division and the Procedure Division. These names are descriptive of the purpose of the division the Identification Division gives information about the program; the Environment Division provides a connection to the external environment of the program, the Data Division describes the data elements of the program and the Procedure Division is where the actual work is done. These division headers must appear in the program with the division title and the word Division followed by a period. In this article we will discuss the first two.

CoBOL programs are structured to follow, more or less, the set up of a written document with levels of entries. In a book there are Sections, Chapters, paragraphs, sentences and words. In CoBOL programs, Divisions are the highest level, followed by sections, paragraphs, sentences and then statements or clauses. The four divisions must appear in the order listed above. In each case the word Division is a required part of the Division identifier. Sections and paragraphs are identified by unique programmer supplied names. When Sections are used, (and sometimes they are mandatory) the word Section is required. If it is left off, the compiler assumes that a paragraph is intended.

The Apple /// CoBOL manuals use a specific notation when showing the format of statements. This includes a bracketing format, capital and lower case letterings to indicate what is required or optional and what is programmer determined or mandatory. Rather than attempt to use such a system, I will simply explain each item in turn. But if you are going to use the manuals as supplements to this series, (which I heartily recommend) you will want to familiarize yourself with that notation.

The first division is the Identification Division it is used to provide internal information about the program. This division is optional in Apple /// CoBOL, but must appear in ANSI programs. There are not any sections or paragraphs allowed in this division, but there are a series of clauses with it. One of the proposals for CoBOL 80 is making the entire division optional since an asterisk in column 7 allows for much of the same information to be included without special clauses. Here is a sample Identification

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Input Signals	RGB TTL/RGB ANALOG Horizontal/Vertical Sync.: Positive or Negative
Input Levels	TTL/ANALOG
Display Format	2000 Characters (80 char x 25 lines, 5 x 7 dots)
Colors	RGB TTL: 16 Colors RGB ANALOG: 4096 Colors (all color)
Display Size	RGB TTL/RGB ANALOG 9.8 (H) x 7.1 (V) inches
Resolution	RGB: 640 x 240 Pixel
Video Bandwidth	16MHz
Scanning Frequency	Horizontal: 15.75KHz Vertical: 54 — 60Hz
Misconvergence	Center: 0.6mm Max. Edge: 0.8mm Max.
Linearity	Horizontal: 7% Max. Vertical: 5% Max.
Geometric Distortion	Top/Bottom: 2.5% Max. Left/Right: 2.0% Max.
Cabinet	Beige
Dimensions	12.9 (H) x 14.2 (W) x 15.2 (D) inches
Weight	26.4 lbs. (12kg)
Power Input	AC 120V, 60Hz
Power Consumption	70W
Power Cord	3-Blades
Front Controls	Power SW, H. Position, Bright, Contrast

Division with explanations following.

Identification Division.  
 Program-Id. Sample-id.  
 Author. Weber L Baker Jr.  
 Installation. The /// Magazine.  
 Date-Written. 6/8/86.  
 Date-Compiled.  
 Security. a 300 pound gorilla sitting behind your ///.

As with all of the Divisions, the division header must be the first thing to appear. The division header consists of the reserved word for the division name and the reserved word 'Division' followed by a period. (I cannot emphasize the need for these periods enough. the lack of them, will cause the program to fail, and is a source of frustration, as on the Apple /// the full word 'Identification', follows the IBM extension to the ANSI standard. Immediately following the Identification division header is the Program-ID clause. In the ANSI standard this is the only clause that is required. If your Apple /// program does use this division, then the program-id is required. The program name should not exceed 8 characters if you intend to port to a mainframe. In the mainframe environment, this is the name that is used to link a subprogram to a main program. Apple // CoBOL uses the file name as it appears on disk and so the length of the name is not as important for Apple /// CoBOL programs.

All of the other clauses are optional and serve as documentation. If used they must include the clause identifier (which are reserved words) followed by a period, (i.e 'Author.'). What follows is called a comment entry of any characters except a

period and unlike my example should contain meaningful information. The period terminates the comment and the compiler looks for the next recognizable item. Thus the following will cause a compile time error:

Author. Weber L. Baker Jr.

because the period after the 'L' terminates the comment and 'Baker Jr' is not a valid CoBOL verb or clause. This holds true for all of these clauses. Should your comments extend past one line, just begin on the next line, after column 7. The comment always terminates at a period. If you intend to use them, it is best to set up a skeleton of this data and load it into your editor each time, changing the few things that will vary.

Note that the Date-compiled clause will put the clock date into the source code listing from the compiler regardless of what you put in there. That is why I leave it blank. If you have a clock in your ///, this will be the current date.

Be aware of the fact that all of these clauses, including the division header begin in Area A. Starting them before column 8 or after column 11 will cause the compile to fail.

The Environment Division connects your program to the outside world of disks, printers and modems. ANSI standards require this division, but the Apple /// makes it optional if you are not using any external devices, an unlikely occurrence. Because this division connects the program to the machine dependent environment, it is here that the greatest number of changes will occur when transporting to another CoBOL compiler. The division

starts, as always with the division header: Environment Division. Again here is a sample with following explanations.

```
Environment Division.
Configuration Section.
Source-computer. Apple-III.
Object-computer. Apple-III.
Special-names.
    Formfeed is To-Page-Top,
    Console is CRT.
Input-Output Section.
File-Control.
    Select Customer-file
        Assign to ".d1/customers",
            ".d2/sellees",
            Reserve 2 areas,
            Organization is Sequential
            Access Mode is Sequential.
    Select Report-file
        Assign to ".printer".
```

Immediately following the division header is the Configuration Section. This is the first Section one encounters in a CoBOL program. The words Configuration and Section are both reserved words and are required if the Environment Division is used. In fact, when the word Section appears in any Division but the Procedure Division it is required. (In the Procedure Division the programmer is defining the Sections and paragraphs and thus uses them at their discretion. More later.) In the other Divisions Sections are set as part of the language. As the name suggests here we find the configuration of the computer being used. The Source-Computer paragraph (Source-Computer, with the hyphen is a reserved word) defines the computer that the program will be compiled on. The Object-Computer paragraph (again a reserved word) defines the computer is to be executed on. In most instances the actual computer name used is not overly important, although in the mainframe environment the name supplied can influence what options are available to the compiler.

The Special-Names paragraph has a variety of options which allow the programmer to relate certain special implementation functions to meaningful mnemonic names. In the above example I have chosen two of the most likely used examples, both of which are Apple /// specific and will not transport to a mainframe. There are options available for other compilers; some of which are available on the ///, some of which are not. In the above examples the special function Formfeed is given the name To-Page-Top. Formfeed is the Apple /// reserved word, and To-Page-Top is a programmer supplied name. There are rules for these names, which are the same as the rules for data variable names, which we will go over in the Data Division discussion. In this case, To-Page-top, when used, will force a formfeed on the device the program uses for output by sending an ASCII OC to the device. The Console clause renames the console device for use in CoBOL Accept and Display clauses in the Procedure Division. (These verbs are specially set for use with console I/O in Cobol. More later. )

The Input-Output Section (again note the necessary hyphen in the reserved word Input-Output and the required Section identifier.), is where the actual connection of the program and the outside world of peripheral devices. There are two paragraphs associated with the Input-Output Section, one of which I have demonstrated.

The File-Control paragraph (File-Control being a reserved word), gives each file and allows for the specification of other file information. Apple /// CoBOL allows 16 files to be open at any one time. There are two verbs for this paragraph: the Select and Assign.

Select takes the name of the file as it is identified to your program. The name here is a programmer supplied name and is used throughout the program when access to the file is desired. Thus, to prepare the file ".d1/customers" for processing you would say (in the Procedure Division):

```
Open Input Customer-file.
```

Customer-file is the name by which the program recognizes the file. Next month, when we get to the Data Division we will see how the file is specifically defined in the program through the File Description entry.

Assign takes the file as it is identified to the external environment. Only the first assignment is recognized, all other are for documentation. In the given example ".d2/sellees" is for documentation and will not allow access to any file on .d2. The optional Reserve clause reserves the number of buffers used when reading from, or writing to the file. This is an Apple /// extension (also available on some IBM compilers) to the ANSI standard. As you can see, any valid SOS device can be used, with all of the standard restrictions (you cannot read from your printer for example).

Another Apple /// CoBOL feature is the ability to dynamically assign files. In the above example the ".d2/customers" could be replaced with a data variable name and the actual file used could be specified in the Data Division or even read from the console. In most mainframe CoBOL implementations such dynamic assignment is made from without the program through a special Job Control Language. Because the Apple /// is a dedicated machine, such a language is not necessary allowing the dynamic allocation of files from within.

The Organization and Access mode clauses (the reserved word is being optional in both cases; with the word Mode as optional in the Access clause), specify the method of storage and access that are used with the file. If not specified, Sequential is the default. Sequential (a reserved word) is the most common, but Apple /// CoBOL allows for relative and indexed organization and random or dynamic access. There is also an Apple /// extension called Line Sequential. For the time being all of the examples in this series will be based on sequential file access and organization. Later on, one article will deal with the other methods.

The other paragraph in the Input-Output Section is the I-O Control paragraph. In the Apple /// environment almost all of the clauses associated with this paragraph are treated as comments, (such as those dealing with tape processing) so I have left it out of the discussion.

That fairly well covers the first two divisions of a CoBOL program. Next month we will look at some of the Data Division and some of the Procedure Division. Enough at least to write a simple program.



# THE /// HELP PAGE

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## BBS

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<p>Three's Company (804) 747-8752 Access Times: After 6 pm EST Protocols: 7 bits Duplex: Full Parity: Odd Transmission Speeds: 300-1200 Cost: Free (Largest /// private BBS in the world)</p> <p>The Lost Caverns of Tsojcanth (Third Dimension) Phone: (201) 891-5699 Access Time: After 6 pm EST Protocols: 7 or 8 bits Duplex: Full Parity: Odd or Even Transmission Speeds: 300-1200 Cost: Free (Technical/Game Board)</p> <p>Washington Apple Pi (301) 986-8085 Access Times: After 6 pm EST Protocols: 7 or 8 bits Duplex: Full Parity: Odd or Even Transmission Speeds: 300 Cost: Free</p>	<p>Compuserve (MAUG: 60 APPLE3) Phone: Various (See manual) Access Times: 24 hour Protocols: 7 or 8 bits Duplex: Half or Full Parity: Odd or Even Transmission Speeds: 300-2400 Cost: \$6.00+/Hour depends on time/area (World's largest Apple BBS)</p> <p><b>WEST COAST</b></p> <p>Doug Thom's BBS (CP/M) Phone: (408) 253-1309 Access Times: Varies Protocols: 7 bits Duplex: Full Parity: None Transmission Speeds: 300-1200 Cost: Free</p> <p>A.T.U.N.C. Phone: (415) 673-9571 Access Times: After 6 pm PST Protocols: 7 or 8 bits Duplex: Full Parity: None, odd or even Transmission Speeds: 300 Cost: Free</p>



# NEW / / / PRODUCTS FROM PAIR SOFTWARE

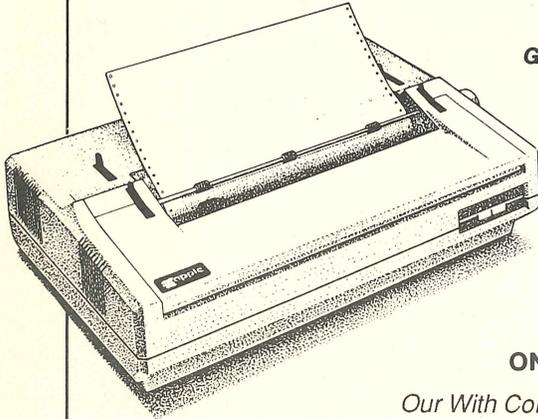
ITEM	ORDER#	.COST	.S/H	ITEM	ORDER#	.COST	.S/H
<b>ASSEMBLY LANGUAGE</b>				<b>PASCAL PROGRAMS</b>			
Jeppson Disassembler (with manual)	5000	15.00	1.00	Font Maker /// (Generate new FONT files)	5900	15.00	1.00
<b>BASIC PROGRAMS</b>				FreeForm (form based data base w/source code)	5901	20.00	1.00
Appleseed (basic program modules to build your own)	5100	10.00	1.00	GrafDraw (graphic drawing program)	5902	15.00	1.00
Basic Input Module (full text input control)	5101	10.00	1.00	Label Maker /// (creates mail list labels)	5903	15.00	1.00
Basic Tools (various utilities written in basic)	5102	10.00	1.00	p-Code Disassembler (Op-Code creator only)	5904	15.00	1.00
Basic Text Processors (word processor program frame)	5103	15.00	1.00	*Pascal Debugger System (Upgrade)	5914	29.95	3.00
Chartmaker (for Apple plotters)	5104	10.00	1.00	Pascal Menu Program (one menu runs many PASCAL prgs.)	5905	15.00	1.00
<b>CP/M</b>				Pascal Modules #1 (various programmer modules)	5906	10.00	1.00
CP/M Public Domain Pk. #1 (various programs)	5200	10.00	1.00	Pascal Modules #2 (various programmer modules)	5907	15.00	1.00
FORTH and XLISP Languages	5201	10.00	1.00	Pascal Modules #3 (various programmer modules)	5908	15.00	1.00
Small-C Language	5202	10.00	1.00	Pascal Modules #4 (various programmer modules)	5909	15.00	1.00
<b>COMMUNICATIONS</b>				Pascal X Reference (find variables in source text)	5910	15.00	1.00
Access /// Interpreter (upgrade w/command language)	5300	15.00	1.00	*Pascal Toolkit (Upgrade)	5915	39.95	3.00
Access /// 1.1 Program (upgrade, with 1.1 notes)	5301	15.00	1.00	Pascal Utilities #1 (volume directory sorter)	5911	15.00	1.00
Access /// 1.1 Program (with manual and 1.1 notes)	5302	35.00	2.00	Pascal Utilities #2 (includes Font Capture)	5912	15.00	1.00
Codefile Transmitter (for transmission of any file)	5303	10.00	1.00	Sign Maker (makes banner signs)	5913	15.00	1.00
Kermit /// (Kermit Protocol Telecommunications)	5304	15.00	1.00	<b>PERIPHERALS</b>			
<b>DATA SPEC RS232 AND CENTRONICS SWITCH BOXES</b>				*SEIKOSHA 1000A Dot Matrix Printer	8103	299.00	8.00
AB-25 RS232 Two Way Switch Box	8000	59.95	4.00	*SEIKOSHA 1000AS Dot Matrix Printer	8104	299.00	8.00
ABC-25 RS232 Three Way Switch Box	8001	104.95	5.00	STAR SG-15 NLQ Dot Matrix printer	8102	465.00	9.00
ABX-25 Cross-Matrix Switch Box	8002	89.95	5.00	Apple /// Printer Connector (all modules)	8100	20.00	2.00
ABX-36 Cross-Matrix Switch Box	8003	145.95	6.00	TEKNIKA MJ22 RGB/COMPOSITE Monitor	8201	349.00	12.00
AB-36 Centronics Two Way Switch Box	8004	99.95	5.00	*TEKNIKA MJ305 RGB/COMPOSITE HI-RES MONITOR	8202	499.00	12.00
ABC-36 Centronics Three Way Switch Box	8005	149.95	6.00	Apple /// Monitor Cable (all models)	8200	35.00	2.00
ABL-25LE RS232 Two Switch Box (w/LED readouts)	8006	129.95	6.00	<b>PUBLIC DOMAIN PACKAGES (Various Programs)</b>			
<b>DISK UTILITIES</b>				Public Domain Pk. #1 (with Elisa AI program)	6000	10.00	1.00
Backup /// (for all hard disk users)	5400	10.00	1.00	Public Domain Pk. #2 (with Star Trek program)	6001	10.00	1.00
Blocread (block read/save utility)	5401	15.00	1.00	Public Domain Pk. #3 (w/Hec-Dec Converter)	6002	10.00	1.00
Confidence Program (checks /// system)	5402	10.00	1.00	Public Domain Pk. #4 (with Mortgage rate program)	6003	10.00	1.00
Disk Maker Utility (volume copier for diskettes)	5403	15.00	1.00	Public Domain Pk. #5 (with file type Changer program)	6004	10.00	1.00
Dealer Diagnostics (96K/128K /// only)	5404	10.00	1.00	Public Domain Pk. #6 (with Mac-Unit program module)	6005	15.00	1.00
Dealer Diagnostics (256K /// & ///+ only)	5405	10.00	1.00	Public Domain Pk. #7 (w/Basic Modem program)	6006	15.00	1.00
DIF Print (print DIF files in format)	5407	15.00	1.00	Public Domain Pk. #8 (w/ Various Graphics programs)	6007	15.00	1.00
Disk Check (Repair Damaged volume directories)	5408	15.00	1.00	<b>SYSTEM DRIVERS</b>			
File Backup Utility (individual file copier)	5409	15.00	1.00	RAT //e .Mouse driver (any /// language or system)	6100	15.00	1.00
Fixer (repairs Catalyzed disks for individual use)	5406	10.00	1.00	SOS Drivers Upgrade (latest known)	6101	15.00	1.00
Grabit (Converts ASCII text files to Quick File)	5410	10.00	1.00	<b>WORD PROCESSING</b>			
List It (list PASCAL text files formatted)	5411	15.00	1.00	Applewriter WPL Pk. #1 (WPL shorts)	6200	10.00	1.00
Pascal File Converter (PASCAL text to ASCII text)	5413	10.00	1.00	Factwriter /// (Super System Editor)	6203	15.00	1.00
Reformatter /// (Interchange DIF/ASCII/Qk. File files)	5414	20.00	2.00	Ink Well Upgrade (upgrade, added features)	6201	15.00	1.00
System Utilities 1.1 (w/device sub-type changer)	5415	10.00	1.00	Super Applewriter (upgrade v4.1)	6202	15.00	1.00
System Utilities 1.2 (latest version)	5416	10.00	1.00	<b>PAIR SOFTWARE COPYRIGHTED ITEMS</b>			
Textgraphics (ASCII text to FOTO file converter)	5417	15.00	1.00	<b>(Not Public Domain)</b>			
<b>FINANCE</b>				CHECKBOOK /// (checkbook ledger program)	6300	49.95	2.00
VisiCalc Templates Disk #1 (various templates)	5500	15.00	1.00	Data Base /// (super data base manager)	6301	100.00	4.00
<b>LISTS</b>				Electronic Mailman (E-Mail formatter)	6302	100.00	4.00
Apple /// Cust. List (on 140K Disk /// diskettes)	5600	150.00	5.00	Electronic Mailman Demo Program	6305	5.00	--
Apple /// Cust. List (on 572K Micro-Sci diskettes)	5601	150.00	2.00	Post Master (super mail list manager)	6304	200.00	3.00
<b>MANUALS AND OTHER PUBLICATIONS</b>				* = New Items			
"How to use your Apple /// in Ten Easy Video Lessons" (VHS or BETA)	5702	69.95	2.00	<b>Pair Software Catalog - \$3.00 (Refundable on first order).</b>			
NEW USER PACKAGE - Includes OWNERS and STANDARD DEVICE DRIVERS Manuals, SYSTEM UTILITIES 1.2 and CONFIDENCE	5703	40.00	3.00	ALL ITEMS MARKED UPGRADE MUST HAVE YOUR ORIGINAL DISKETTE SUBMITTED WITH YOUR ORDER. ALL SALES FINAL. SOME PROGRAMS MAY NEED WORK TO BE USED IN YOUR APPLICATION. CP/M ITEMS REQUIRE CP/M CARD. BUSINESS BASIC PROGRAMS REQUIRE VERSION 1.23. PASCAL PROGRAMS REQUIRE VERSION 1.2. CALIFORNIA RESIDENTS MUST INCLUDE 6% SALES TAX. PLEASE BE SURE TO INCLUDE SHIPPING/HANDLING COSTS. OVERSEAS BUYERS PAY 3 TIMES LISTED AMOUNT. CHECK OR MONEY ORDER ONLY! A \$10.00 PER PACKAGE SURCHARGE REQUIRED IF YOU ARE NOT A SUBSCRIBER TO THE /// MAGAZINE. ALLOW TWO WEEKS FOR DELIVERY.			
Pascal 1.1 Manual (Upgrade)	5705	10.00	1.00	SEND YOUR ORDER TO PAIR SOFTWARE, 3201 MURCHISON WAY, CARMICHAEL, CA 95608 DIRECT LINE (916) 485-6525			
SANE/ELEM Pascal Manual (Upgrade)	5704	10.00	1.00	 			
Service Manual w/256K Diagnostic Disk	5700	70.00	5.00	<b>VISA / MASTERCARD ORDER LINES ONLY</b>			
Starting Forth by Leo Brodie	5706	18.95	2.00	National: 1-800-541-0900			
/// MAGAZINE 1985 (Issues Maagazine/Newsletter 1985)	5701	50.00	1.00	California Only: 1-800-334-3030			
/// MAGAZINE 1986 (Issues Magazine 1986)	5707	50.00	1.00	REV. 9/85			
/// MAGAZINE Current year:							
2nd Class Mail:	9000	40.00	-				
1st Class Mail/Mexico/Canada	9001	50.00	-				
Foreign:	9002	60.00	-				
<b>OPERATING SYSTEM AND LANGUAGES</b>							
Bus. Basic 1.23 (upgrade, no 64K program limit)	5800	10.00	1.00				
Catalyst Runtime Disk (For Catalyst Owners. Copyable)	5806	15.00	1.00				
CONSOLE and BOOT Source Text (disassembled info)	5801	10.00	1.00				
FORTH /// (Forth Language system for the ///)	5807	49.95	2.00				
FORTTRAN-77 (Pascal upgrade, 1977 standard)	5802	35.00	3.00				
PASCAL 1.2 (upgrade)	5803	20.00	2.00				
PASCAL 1.2 Dir. Patch (put PASCAL 1.2 on sub-direct.)	5804	10.00	1.00				
PAS. 2.0 Compiler (upgrade w/manual, for PASCAL 1.2)	5805	20.00	2.00				

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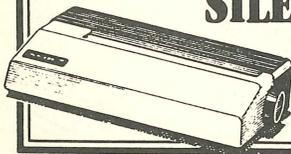
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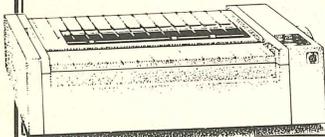
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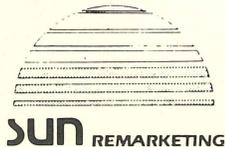
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