

SORCERER'S APPRENTICETM

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ODDS & ENDS

by Ralph LaFlamme, Editor

Well I finally got my computer back after being without it for about 4-5 weeks. The charge for repairs was not too bad, but I never did get a full explanation of what was wrong with it. I would hate to have to rely on Exidy Systems Inc. (ESI) for repairs on my unit if I was using it to keep track of my business. Considering that ESI is trying to cater to the small business community, it is pitifully poor service to expect a businessperson to put up with. If this is ESI's idea of support, I would suggest they cater to the 'computer game/hobbyist' market where downtime with a computer is not as critical (but I know, not liked any better).

The tardiness of the last issue put us behind schedule with this one. I spent most of my Thanksgiving holidays putting it together. (I just finished it today, Nov. 29th, and it goes to the printer tomorrow.) This issue is 24 pages long but really would have required 28 pages to include all the articles and columns that we had wanted to include. The Apprentice Port and 4th Tip return in the next issue.

Unfortunately, Rudy Vener will not be able to act as co-ordinator for SAMMs (Sorcerer's Apprentice MicroNET Meeting). He's busy with his studies at Rochester Institute of Technology, and his disk system is with Jack MacGrath for repairs. If anyone else is interested in acting as co-ordinator, please contact me.

Kim Gration of Melbourne, Australia has contacted me on the Source. He would like to join the Sorcerer's Apprentice and would like to communicate with other members. If you are interested, you may contact him at TCU703.

Once we have the renewals in for next year, I would like to publish the account numbers of members who are on the Source or CompuServe (MicroNET). Please don't forget to fill out this information on the membership form found on page 174.

I had wanted to implement a new logo for the Newsletter before the end of the year. However, we have not had enough time to come up with a satisfactory one. So, I'm announcing a BIG contest with BIG money! We'll give a whole \$25 to someone who can design an acceptable new logo for the SORCERER'S APPRENTICE. Contest closes March 15, 1982. The new logo will be chosen by the SA board of directors and should appear in issue 4.3. Their choice will be final.

Due to the tardiness of the last issue, Northamerican Software has extended the deadline on their Special Offers. See their add on page 154.

Triangle Systems has moved. Their new address and phone number is: 1690 W. Lane Ave., Columbus, OH 43221 - tel. (614) 486-3527.

Don Gottwald's phone number, as a contact person at SA, was inadvertently left out of the last issue. His number is (313) 286-9265. ●

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DISK NOTES

by Bryan Lewis, CP/M Editor

For this month's column I'll again use the answer to a reader's question. Kenneth Gray requested a recommendation on floppy disk systems for the Sorcerer. In particular he wanted to know which systems do not require the S-100 box, since he has upgraded his Sorcerer I to 48K RAM without the box. Here's a summary of the information I dug up by calling Exidy, Vista, and Morrow Designs. All of these are complete systems: drive(s), controller, cables, and operating system.

Manufacturer & Model	Capacity per Drive	LIST Price	Needs Box?
Morrow Designs Discus 2+2 (dual sided) for Exidy (with CP/M and MBASIC)	1000 K	\$1495 one, 2575 both	Yes
Vista V200 double-sided (with CP/M)	400 K	\$1495 both	No
Micropolis 1053 Mod II Dual-Sided (with MDOS, Micrps. Basic)	630 K	\$1888 both	Yes
Morrow Designs Discus 2D for Exidy (w. CP/M and MBASIC)	500 K	\$1095 for one, 1875 for two	Yes
Exidy Floppy Disk System (with CP/M)	305 K	\$ 995 for 1st, 795 for 2nd	No
Vista V200 for Exidy (with CP/M)	200 K	\$1195 both	No
Micropolis 1053 Mod II (with MDOS, Micro-polis Basic)	315 K	\$ 939 for one, 1534 for two	Yes

The list prices can be deceiving. I've found disagreement between suppliers. Anyway, you can get much better prices if you're willing to buy mail-order. Priority One Electronics (look for their ad in BYTE magazine) sells the Micropolis systems for 26 to 35% off, and the Discus systems for about 15% off. The disadvantages of mail-order buying are lack of service (you can send back a defective system, but you may wait weeks for replacement), total lack of installation help, and a tendency to rack up phone bills for those of us outside California.

I ranked the systems in the above table by the price/size ratio, which I defined as the total price (adding in CP/M or the S-100 box when necessary), divided by storage capacity of a two-drive system. It surprises me to see the Micropolis 1053 on the bottom of that ranking, since it's a very popular drive among Sorcerer owners. The killer is the cost of the S-100 box. Another reason is that the ranking system is biased in favor of the larger-capacity drives.

A more practical way to rank them for most of us is the cost by itself. (How cheaply can I get any size disk system?) Then the winner is the Vista (still assuming you don't already have the S-100 box).

There are many other differences. I'll tell you everything I know or have heard; I hope other readers will correct any misconceptions.

The Discus 8" drives are the fastest, and the controller is I/O mapped, which means it doesn't take up any memory space and won't conflict with other memory areas such as the RomPac. The storage capacity is large, and the eight-inch format is compatible with lots of other computers and suppliers. Reliability is very good. A bonus with the Discus system is Microsoft Disk BASIC version 5.2, which would be about \$300 separately (but verify this with the dealer when you order). If you can foresee a future need to buy the S-100 box, and if you can afford the extra initial cost, then get these.

[Some readers may be confused by the inclusion of the Discus double-density drives, since they didn't work with the Sorcerer at one time. They have been modified and do work now; make sure you order the Exidy version. That fact makes the older single-density Discus system not economical, since it's almost as expensive as the double-density. On similar reasoning, I haven't included the Micropolis Mod I, with 143 K capacity.

As long as I'm clearing up confusion, I'll point out that double-density refers to the capacity of a single side of a single disk on a single drive; it simply means twice the capacity of whatever the same manufacturer used to make.

Double- or dual-sided means that both sides of a disk are used for storage, which doubles the capacity; the controller treats the pair of sides as one big single resource. Finally, a dual-drive system merely means two mechanical drives hooked to the same controller. They're separate -- you can't treat them as one big single disk -- but having two is very convenient for copying files, and is occasionally necessary for business programs.

Now back to my comments.]

The CP/M supplied with Discus isn't very well tailored to the Sorcerer; I've been told by Ed Mentzer that screen listings are slow. That can be fixed by patching in my BIOS (available free on the Sorcerer Bulletin Board) if you're somewhat experienced in assembly language. I believe that the source code of the BIOS is supplied with the Discus, which makes patching much easier.

The Vista system uses the most nonstandard disk format: five-inch soft-sectored. That might cause you future inconveniences in swapping your programs with other Sorcerer owners, or buying software from any but the largest vendors. The Vista CP/M is well tailored to the Sorcerer, and the source code is provided. Vista drives appear to require more maintenance than others.

The Micropolis system is a workhorse: sturdy, reliable, but not real speedy. The disk format is slightly nonstandard in the CP/M world, but it's the most common among Sorcerer owners. A disadvantage is that CP/M is not supplied, which is something you will want if you want to buy almost any commercial software. I myself have two Micropolis drives, and have had no problems (other than those caused by my own heavy-handed soldering on the controller board).

I don't know much about the Exidy system; I've seen it once in a store. The drives are five-inch soft-sectored (made by MPI, I think) which is again a compatibility problem. The CP/M BIOS is good, but Exidy didn't supply the source code the last time I heard. There are some extra utilities supplied, for saving cassette programs on disk and linking the Word Processor Pac to the disk. The Exidy system is expensive, any way you look at it.○

POWER ON AND CASSETTE LOADING INDICATOR

by Terry Walters, San Diego Computer Society

One of the few things overlooked by Exidy was the need for a Power On indicator. This would keep people from inadvertently leaving the computer on for extended periods. It may be noted that there is a LED inside the Sorcerer that flickers when a program is being loaded from tape. This LED solves the problem of a power indicator very nicely (and incidentally saves getting up and down all the time to check cassette loading). TOOLS: Soldering iron; Jumbo LED; 24 inches wire; wirecutters; transistor socket.

1. Remove the top and disconnect the keyboard plug.
2. Locate the LED and remove it using wirecutters. (The LED is on the left rear of the tape interface board, near the power supply.)
3. Remove the excess solder and remaining wire from the holes.
4. Attach one 12 inch piece of wire to each hole.
5. Solder two of the three leads of a transistor socket to the other end of the wires.
6. Drill a 13/16 inch hole in the vertical lip of the top just above the colored band surrounding the keyboard (above the zero (0) key).
7. Insert a new LED into the hole (it should be snug, not needing glue).
8. Turn the power on. Insert the leads of the LED into the socket and check that the LED is lit (if not reverse the socket).
9. Mark the socket for future reference.
10. Reassemble the computer.

I think you will find this a very useful and attractive modification to your computer.○

Terry Walters (Source TCB692; MicroNET 70340,312)

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BITS & BYTES

by Jonathan Burnett

Hello again! In this issue as promised, I will attempt to explain the principles involved in writing an assembly language program, using a utility program called the 'ASSEMBLER', just one of the four utilities found in the DEVELOPMENT PAC.

Using the small program I gave you last month as an example, lets begin:

A program written in assembly language goes through many transitions before the final product is ready to be run. The first step is to enter the program into memory in a format that is readable and understandable to yourself. This format is called 'SOURCE CODE'. It is the 'source' of the eventual machine readable instructions that the SORCERER will execute. We enter the instructions for the Z80 to execute in the form of 'mnemonic' operators. This simply means, the instructions are (easy-to-remember) verbal abbreviations of the operations they are to accomplish.

As with any of the utilities in the PAC, we must first set up our I/O vectors, and in this instance, they are for using the EDITOR.

```
Set vector :CI (Console input) to :SK (Sorcr'r keybrd)
Set vector :CO (Console output) to :SV (Sorcr'r video)
Set vector :SI (Source input) to :BI (Inp. to B buf.)
Set vector :SO (Source output) to :SV (Sorcr'r video)
```

Now we enter the command: E :ED [CR]

Once we have entered this command, we MUST NOT ever use it again, until you have safely stored the program onto tape. Each time it is used, the source code buffer is reinitialized, destroying any program found there.

If you ever need to re-enter the EDITOR, then you MUST use the following command: E :ER [CR]

Now that we are in the EDITOR we can begin to enter our program by typing the command: I [CR]

```
START EQU *
CALL CHRIN ;Call the monitor keyboard
;input routine.
JR Z,START-$ ;Loop until a key is pressed
CP 1EH ;Compare to the ESC key.
JP Z,WARM ;If yes, go to the monitor,
;warm start entry address.
ID HL,0FE80H ;Put start of video screen,
;address into reg pair HL.
ID DE,0FE81H ;Put the next address
;into the reg pair DE.
ID BC,1920 ;Put the number of bytes on
;the video screen into
;reg pair BC.
ID (HL),A ;Put the input from keyboard
;(returned in reg A), into
;the location addressed by
;reg pair HL.
IDIR ;Block move this character,
;for the length in reg BC.
JR START-$ ;When done, loop back to
;get the next key pressed.
```

```
;***** MONITOR ENTRY ADDRESS EQUATES *****
;
CHRIN EQU 0E009H ;Keybrd inp. routine.
WARM EQU 0E003H ;Mon. warm start entry.
;
;***** END OF PROGRAM *****
```

Now that we have entered all the source code, we are ready to assemble it into OBJECT CODE. Press the ESCAPE key, and the EDITOR prompt character (*) will return. To exit the EDITOR type 'E' and press the RETURN key. This will 'End' the edit session by typing out the source file through the SO: vector (SOURCE OUT), which in our case is the SORCERER VIDEO (:SV).

And again we must reset the I/O vectors for the utility we are going to now use, called the ASSEMBLER.

```
Set vector :CI (Console inp.) to :SK (Sorcr'r keybrd)
Set vector :CO (Console outp.) to :SV (Sorcr'r video)
Set vector :OI (Object outp.) to :AI (Inp. to A buf.)
Set vector :SI (Source inp.) to :BO (Outp from B buf)
Set vector :SO (Source outp.) to :SV (Sorcr'r video)
```

Now we enter the command: E :AS [CR]

The assembler now takes over, and processes the source code file by passing through it twice. The first pass, will create a symbolic table of all labels and their relative addresses. The second pass will resolve the jumps and calls to these labels using the table. In addition, the source code is checked for syntax errors, and flagged with the appropriate error code. If a statement is error free, then it is converted into object code, where at the end of the assembly, a message will indicate the number of errors (if any), were found.

NOTE: A problem with the EXIDY assembler, particularly with programs of a length greater than 20 lines, is that the assembly listing, showing the source code along with the assembled object code and any error codes, is scrolled off the video screen, generally faster than you can catch the errors. Unless you have a printer, you'll find this causes you a serious problem. One temporary aid you might find useful, is to put a low value into the send delay byte of the MONITOR work area. It can be found by adding 3F hex to the start of the monitor stack address. It ordinarily contains 00 hex, for no delay. The larger the value, the greater the delay. Now when the assembler scrolls the listing, it can be slowed enough to copy the errors by hand.

Now it needs to be understood that the OBJECT code file just created is not executable yet. This is because this assembler is actually a 'RELOCATING ASSEMBLER', which requires the use of another utility called the 'LINKING LOADER'. The object code file contains additional information statements to aid the LOADER routines to RELOCATE the object code to any location you desire.

Again we must set the I/O vectors to use the LOADER utility.

```
Set vector :CI (Console inp.) to :SK (Sorcr'r keybrd)
Set vector :CO (Console outp.) to :SV (Sorcr'r video)
Set vector :OI (Object inp.) to :AO (Outp from A buf)
```

Now we enter the command: L 0,FF [CR]

This causes the LOADER to relocate and load the object file starting at address 0000 hex, and to build a symbol table starting at address 00FF hex. This table is used by the LOADER to correctly adjust the addresses found in CALL and JUMP statements, and to resolve any labels marked as GLOBAL. When it has done so, an asterisk (*) will appear signifying that the load is complete. In addition it will report the starting and ending addresses for the now relocated object code, which we now refer to as a 'LOAD module'. Now press the PERIOD key (.) to return control to the MONITOR so you can dump it to tape or test execute it. Provided that it does not disturb the other buffers, your original SOURCE and OBJECT code will still be available.

You might find it convenient to use the vectors I have given in the above examples as you become familiar with the PAC. As you will come to realize, the DEVELOPMENT PAC book, does not provide everything you need to know in any one place. So to assist myself I have constructed a table of all the settings necessary to use the routines in the PAC, when using the RAM-BASED development configuration, as described above.

I/O CHANNELS	EDITOR VECTOR	ASSEMBLER VECTORS	LOADER VECTOR
CI:	:SK	:SK	:SK
CO:	:SV	:SV	:SV
OI:	n/a	n/a	:AO
OO:	n/a	:AI	n/a
SI:	:BI	:BO	n/a
SO:	:SV	:SV	n/a

If you haven't already come to this conclusion, you will shortly.....IT GENERALLY IS A LOT OF TROUBLE TO GET FROM ONE ROUTINE TO ANOTHER!!! There is also the added risk, that if you don't properly set the vectors, you can destroy the source code buffer. Mildly upsetting to say the least!

Before despairing, and resolving to make due with BASIC, help is on the HORIZON!!! or more precisely in the next issue. In it we will discuss a short Z80 routine that will simplify your life (or at least the coding aspects of it) immensely!

Until then, have fun! ☺

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THE OFFICE SORCERER

by Roger Hagan, Business Editor

I have a small business in which I sell and use the Exidy line as business equipment. Because of this, Ralph LaFlamme suggested that I act as Editor of a column on the Sorcerer as a business machine. I have consented to do so and will try to restrict my contribution to solid news, reviews, actual programs and macros. Initially, I wish to give my perspective.

I am primarily a writer, secondarily a producer, and thirdly, a businessman. I first bought a Sorcerer for its Word Processor Pac, then taught myself Basic to do a business accounting program for my company, and finally taught myself assembly language to create a sort program that would work with Word Processor Pac files. I needed this a lot but nobody had one available so I had to do it myself.

I have now started another company with a new partner to deal in microcomputers for business, for writers, and for self-employed professionals. This has provided me with the opportunity to work on several systems and compare features. We sell S-100 based systems with 8" disk drives and Televideo and Adds terminals, and we are getting into the Zenith line as well. With all these other systems available, why do I still like the Sorcerer?

Familiarity may be a large factor in why I like this system, but I still work on the Sorcerer by preference. The keyboard is ideal for Word Processing, the Monitor has excellent subroutines which can be accessed both directly and from programs, and the Word Processor Pac is a bargain which outclasses software on any other home micro, especially if PPRINT is added. Spellbinder finds probably its best home on the Sorcerer, with the keypad carrying the editing commands rather than function keys arrayed across the top of the keyboard. The Arkay keytops make it very easy to master, without the help of screen messages, which I hate in all WP systems: Spellbinder, Word Star, and Magic Wand.

The Pac Basic is applicable to cassette based business programs for a small office grossing up to a million dollars a year if whole-dollar accounting suffices. It does suffice for tax purposes. The ROM graphics, along with USR subroutines which have come out in the newsletters, allow sophisticated cursor addressing and screen formatting for such software. The Exidy disk system is capacious, at 296K per side formatted, and well thought-out, allowing Rom Basic programs to be saved and run from disk. And, EXBASIC on disk, or its cassette version, are full Microsoft implementations allowing higher-precision math and the use of powerful business programs with minimal modifications.

But best of all, there's no fan. The S-100 systems with their big fans are noisy. And, the monitor can be set at any distance from the keyboard. The fatigue factor of being jammed up against the monitor is documented. For this reason, with the exception of the Zenith, we show only monitors with separable keyboards on the larger systems.

Although it seems that many readers of the Apprentice have moved

to disk, the genius of the Exidy system remains in how well it functions as a cassette based system. I can provide a writer with a fully professional capacity word processor, with more output formatting power than Magic Wand, and a Daisy Wheel printer, for less than \$4000; with a rebuilt Wang-Selectric terminal (not a typewriter conversion), or a dot matrix draft printer, for less than \$3000, if he can forego disk. I know that users with Sorcerer Ones have troublesome cassette interfaces, but the fixes are now well known, and Twos are relatively dependable. I've used one on cassette for two years of word processing.

For the cost of one standard small business micro, I can provide an office disk based system and a machine to keep at home to work with, and a method (cassette) of transporting drafts between the two systems. And, those of us with different disk systems can exchange programs nonetheless with cassettes. It remains our universal language. With cassette Extended Basic, I can also save a disk Basic program with the "A" option for an Ascii version, rename it to a Word Processor file, load it in Word Processor, and save it on cassette to take home for more work, in either Word Processor or in Cassette Basic. (For the latter, and for getting the program back into disk Basic at the office, the trick is to get the resident Basic to read the Ascii file in RAM as if it were being input from the keyboard. The program to achieve this will appear in the next issue.

So, to summarize the attitude behind this column, I believe that as much work as possible should be gotten out of the Word Processor Pac and/or Spellbinder. Because Steve Guralnick does a column on the latter, I will pay some attention to useful macros for the Word Processor Pac, and later to Spellbinder if he tires. I have created macros for the WP Pac which duplicate the functions of those on the Spellbinder demo disk. The Pac can work hard for you. (Spellbinder is being expanded by its creators into a total office system.)

Second, the most useful business programs for immediate use on the Sorcerer are those in Microsoft Basic. Exidy's EXBASIC, which is a superset of Microsoft Basic v.5, EXBASIC can handle direct cursor addressing on the Sorcerer very simply. The CP/M 2.2 now released by Exidy promises to solve cursor addressing problems for other software, so the picture may change, but for the moment the programs easiest to customize to your applications will be those compatible with the Basic you get with Exidy disk drives. [Ed Mentzer is now implementing direct cursor addressing in his CP/M 2.2. - RL]

Off-the-shelf business programs almost universally call for two drives, but I will be discussing methods of adapting them to single drive systems. Many call for 80 character screens and are not adaptable to the Sorcerer. Others provide a 64 character option, or are of a nature that the occasional wraparound is not troublesome, and does not occur in printouts. I will try to solve this problem insofar as possible.

I will also be discussing viable

cassette based equivalents wherever I can find them or create them. Incidentally, in such programs, it is often desirable to save string arrays. My cassette business programs were made possible by the solution to this problem by the founder of The Apprentice, Dave Bristol. He came up with his solution two years ago. (Our Australian friends were still struggling with the problem a year later.) But, in business applications, even for the one-person office, the presence of at least one disk drive is what makes the daily use of a business program truly practical. A cassette-based business program for income-tracking and accounts receivable takes 5 minutes to load at 1200 baud! So you tend not to load it, and soon the cash is moving around untracked.

I will review any program sent to me which has a business or professional application, and I hope some of these will be generated by readers. As a dealer, I will try to arrange sales and demos for such products, if they show promise, but will share code only on some of my own software, and pass along none as favors.

Now for a quick review of what is now available for use on the Sorcerer. All of these will be discussed in the future.

1. The Compumax business package "Microbiz", fully adapted to the Sorcerer, is the system Exidy sells. It receives fair to good reviews in professional publications, but gets high marks for adaptability and for providing source code. It consists of seven integrated modules at \$350 each. Many small businesses would not need the inventory or payroll modules, and order entry might not be needed either.

2. Exidy says Supercalc is available. A spreadsheet program for such IF=THEN exercises as cash flow projections is one of the most useful things a micro can do, which is why Visicalc is one of the most successful sellers in micro history. But none is yet on the Sorcerer. And Exidy's version does not work with less than 56K RAM, so it's intended for their new Multi-Net 80 system based on the White computer, not the Sorcerer. System Software is reported to be working on a Supercalc implementation; I hope so. Meanwhile, I needed one NOW, so I wrote one in EXBASIC. I'll publish the code in a future issue of the Apprentice, but I'll sell it on disk. I think, from the way it is going, that a Basic Rom Pac version will be possible too, using Paul Grimshaw's ingenious cursor addressing program which requires only "OUT col, row" to place the cursor. [In a future issue. - RL]

3. Guralnick and Rubin have produced a powerful set of macros for Spellbinder to make it take over a lot of work in a law office. A review on this is forthcoming. Price not settled.

4. Lexisoft has released SPELL-CHECK, their version of the SPELLGUARD dictionary. It works on any Ascii disk file, so you do not need Spellbinder to run it. It can be used with Word Processor Pac disk files. It lists for \$295, but will be discounted to Apprentice members.

5. Exidy in co-operation with Chicago Systems Inc., has released two sets of programs in the field of

banking and loan processing, called **General Banking and Installment Lending**. The programs are in Microsoft Basic and provide a useful set of calculations and quick printouts.

6. Exidy has also shown dealers a **Legal Billing demo program** in Microsoft Basic, but has not yet released details on a full, saleable program. Exidy seems to be targeting law offices in much of its advertising, so more of this type of software can be expected.

7. Lexisoft has agreed to provide sufficient source details to enable us to adapt WSORT to Spellbinder, but those details have not yet arrived at our office.

8. dBASE II, one of the best-reviewed data base management systems, has been implemented on Exidy equipment, but we have yet to see it. It is a language in itself, allowing an office to customize it to its forms and requirements. It takes some time to learn. It lists for around \$700. We can review it based on other systems in our office, but we will wait until we see it behaving on our 64 column screen and memory mapped video, which will necessitate our acquiring Exidy's new CP/M 2.2.

9. CADAS, the Cassette Database System by R.J.V. Stafford, allows a good-sized membership list, inventory or payable file to be set up, sorted, totaled, and printed out in a flexible format. It is column oriented and limited to 9 lines of 56 characters.

10. The newly advertised cassette "General Business System" by Lee Anders, issued by Quality Software, appears to be another database system, at \$99.95. We will seek a review copy and report.

11. Triangle Systems of Columbus, Ohio, has been advertising a math extension for the Word Processor Pac, and had agreed to exchange a preview copy for a copy of WSORT, but since being sent WSORT, has been incommunicado for over two months and does not return phone calls. Probably bugs. We still have high hopes for Mr. Wim Platt's promised augmentation of the Pac, and for that reason have refrained from undertaking a math and decimal tabulation program for it ourselves. [A call to Wim Platt confirmed that bugs have been a problem in integrating the WP extension with WSORT. - RL]

12. The same lack of response has been found from Staley Software, who briefly advertised a Sorcerer's Spell dictionary for a very reasonable price. We are anxious to analyze that program and report to you, but our mail to them has been unanswered for two months. [See Staley Software's Spell dictionary ad on page 158. - RL]

I hope to be able to expand this list of Sorcerer work programs every month, as well as provide useful details and reviews. ©

<<< CLASSIFIED ADS >>>

\$1/line \$1/line
=====

FOR SALE

Silent Printer: Trendcom 200, 8.5", Parallel, ASCII & graphics. Cable extra or make your own. Includes program to dump screen to printer. **\$150 + shipping and insurance.** L.M. Zatz, 959 Mears Ct., Stanford, CA 94305. (415) 493-0692, evs.

ADVERTISEMENT/ANNOUNCEMENT

MAKE THE SORCERER

DO REAL WORK WITH:

WSORT, The Word Processor Sort.

This Z-80 utility can now be loaded warm or cold from tape or disk, without destroying anything in RAM. It becomes a new WP command, sorting records of any length and shape very quickly. Specify your equipment and disk operating system. On tape, **\$47.50**. On disk with related utilities for Exidy CPM (or on cassette with the utilities ready to transfer to disk for another CPM), **\$75**.

HAGAN SPREADSHEET

Despairing of finding Visicalc adapted to a Sorcerer, and knowing that Supercalc takes 56K RAM, we wrote our own. Now it's in all three Exidy Basics. Up to: 13 columns, 40 rows, 20 in-column relational formulae, 5 steps per formula, 3 subtotals per column which may be independent sections, 10 lines excluded from addition. Formulae entered as responses to queries, before, during, or after data entry. Full or empty sheets may be saved with their labels and formulae to tape or disk, ready to re-use. A set of these can be developed for various uses.

Your screen is a four-by-twenty window on any part of the sheet. A total-of-rows column can be temporarily placed anywhere on the sheet to show intermediate or year row totals. Help menu available at all times; fully self-documented, but comes with short manual and sample file.

Never did the Sorcerer seem more justified than when we first ran a twelve month cash flow projection and showed that the lease we were about to sign would be a disaster seven months down the road. Includes a graph module, so even my partners could see where the bank balance was headed. Change some input values, run the sheet calculation, and print a new graph to show an alternative future. Up to six selectable rows of values are plotted against the compressed column grid; self-ranging.

Spreadsheet and graph values are standard Basic arrays and can be created or accessed by other Basic programs. Source is not protected and is modifiable. Instructions show how to expand the resident operator set. Commented source is available to purchasers for a small surcharge. Maximum 13X40 size is set by RAM available; therefore, the RomPac version can be modified to create a much larger sheet in 48K. Use for cash flow projection, performance summaries, test data tabulation, ecological models. Specify your Basic.

The most useful program we have tried. On cassette, **\$47.50**. Exidy Disk Basic version **\$75** with all modules chained and sharing data.

ROGER HAGAN ASSOCIATES

1019 Belmont Pl. E
Seattle, WA 98102

EVALUATIONS

by Emiliano De Laurentiis

WSORT, a program by Roger Hagan Associates, costs \$47.50, and is worth every penny. If you need a fast, no fuss, reliable and inexpensive sort, then this is the one.

It took me less than two hours to learn how to use it, and I probably would have learned it faster if I had bothered to read all eight pages of instructions. The program LOG's into memory and can be called from the WP Pac using a new command, G/S. If you have disks, then it uses your disk drive routines such as Exidy Systems' DISKDRIV, for saving and loading sorted files.

Sorting is fast because WSORT sets up an index of the file and sorts the index, rather than the actual file. This technique reduces the amount of blocks of text that the program would otherwise have to shuffle if indexing were not used.

The program sorts by words, not characters or column spaces, so that one may have words of different length ad have it sorted just as easily. Similarly, the records, or the blocks of text that are to be sorted (eg. mailing labels), may vary in length; also, the field which is used for sorting may occur anywhere in the record. A field may be the last name of customers, for example, or the Zip code.

You may also store both, a sorted version of a file, and the unsorted version in memory (assuming that each file takes up only half the memory space) so that the same file can be sorted for different fields. And, of course, if an error is made in setting up the file, it is a simple matter to return to the WP Pac to make the corrections.

When setting up records, different characters may be used to delimit the records. I discovered, in fact, that graphic characters will also be accepted as a delimiter. This may prove useful for files which may include just about any ASCII character and an unused delimiter would be hard to find.

Despite it being such a well written program, there are suggestions that could be made for its improvement. For one thing, when inputting values in the menu, the value that is entered does not show on the screen until one presses return. This can be more than a simple nuisance for a novice computer user! Similarly, in order to make a change to any value, it is necessary to restart the menu. You cannot simply backspace to erase a character. The documentation (I had a preliminary draft) is generally very complete except for one glaring omission, there were no specific instructions for how to load the program from cassette. Is it LO? or LOG? etc. Some polishing, and this will classify as some of the best documentation I have read.

WSORT is well worth the price. When Roger Hagan releases another version of WSORT with disk I/O for sorting larger than memory files, then the program will easily be worth twice the amount! ©

ARRINGTON SOFTWARE SERVICE

9522 Linstock

Boise, IDAHO 83704 U.S.A.

< < < < 1981 CHRISTMAS CATALOG > > > >

Arrington Software Service is pleased to present its 1981 Christmas catalog. This eight page colored section lists the products we have to offer to help make this an enjoyable and pleasant season of gift giving. Just fill out the order form on the reverse side and return it, as soon as possible, to receive your order in time for Christmas.

An item not listed, is the new **Votrax** speech synthesizer at \$370. Just give us a call to hear how it sounds. (See phone number on reverse side.) A program that you should pay particular attention to is our newest release called **CHOMP**.

CHOMP IS A CHAMP

by Ralph LaFlamme, Editor

Do you remember Christmas when you were little? The anticipation of opening a gift? The excitement of playing with a new toy? Well get ready to be young again! **CHOMP**, a game fashioned after the very popular Pac-Man video arcade game, is just the thing to bring out the kid in any adult! (I suspect real kids would be more than a little interested also!)

In this game, you control a little fellow who is all mouth. He goes around chomping up the dots in a maze of alleys. You get points for each dot that he eats. When he's eaten up all the dots, you get another 'plate full'. Sound exciting? No? Well it is because you are constantly being chased down by four hood-like characters with big eyes. Get in **their** way and **you** get chomped.

These 'villains', however, have their weakness. They become vulnerable to being chomped up when you eat one of the four large dots in the alleys. They become 'ghosts' of their former selves. But hold on! You only have a short time to take out your revenge. Get them quick! They will return to their villainous ways very soon. You get 200 points for your first one and multiples of this for each additional one so it's worthwhile taking the chance!

If dodging the 'hoods' and being chased away from chomping up all the dots were not enough to be concerned about, you also have a bunch of cherries that keeps appearing at random times. Chomp **these**, if you can get near them, they are worth a lot of points! Makes for quite a fast action 'juggling act'.

You get three **chomps** to play. Make the most of them. I've already gotten over 13,000 and I'm just limbering up!

This game has action. It has excitement. It has suspense. It requires strategy. And, it has superb graphics. Isn't that why you bought your Sorcerer?

Howard Arrington compares this game to Galaxians in excitement and graphics resolution. I find it a cut above. It is more challenging and exciting and better sustains my interest. I would rate this game a definite **must** to any video arcade aficionado.

This is a very well written machine language program that I'm told took over a year to write! The only negative I find is that use of the four keypad arrow keys gets somewhat awkward after a while. Use of a joystick, and the addition of sound, would improve the enjoyment still further.

I used the method outlined in this issue's article, **Saving ML Programs On Micropolis Disk**, to transfer this program to disk for a simple load/run capability.

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CHRISTMAS SHOPPING? Software makes an appreciated gift. If we could be Santa's helper we would have Santa fill the stockings with some of the great products from this catalog. Everyone enjoys our Music System and Piano Player. Be sure you have all of the following highly recommended items under the tree this year:

- [] MUSIC SYSTEM I and PIANO PLAYER, OR MUSIC SYSTEM II
- [] MOZART RONDO, THE STING, AND MAPLE LEAF RAG SONG FILES
- [] SORCERY BREWS MANUAL
- [] DATABASE SYSTEM II
- [] GALAXIANS GAME
- [] CHOMP GAME
- [] GRAPHICS PACKAGE I, OR GRAPHICS PACKAGE II

All orders are in the return mail within 3 days. Software is recorded at both 300 and 1200 baud and is guaranteed. We seek to have your approval and satisfaction. We will try to answer questions and be of service in every possible way.

We thank our patronage for a very successful two years. Next year promises to be even better as we continue to grow in staff and product offerings. Our formula for success has been: **Customer Satisfaction**. We want to bring you the very best software for the Sorcerer, and support it with the service that has made us unique. Again, thank you very much.

See the next six pages for details on all the items we are offering this Christmas Season.

KEY: B-Basic M-Machine code U-Utility G-Game S-Sound J-Joystick or keyboard
H-Hardware E-Education F-Music File

HOWARD ARRINGTON
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BOISE, IDAHO 83704

(208) 377-1938 After 6 p.m.
Mountain Standard Time.
Checks O.K. - No credit cards.

[] MUSIC SYSTEM I	\$40.00	BMUSHEF	SORCERER SIZE>>>	16K	32K	48K
[] PIANO PLAYER	\$15.00	MF	RETURN ADDRESS:			
[] MUSIC SYSTEM II	\$59.95	BMUSHEF				
[] FINLANDIA FANTASIA	\$10.00	FF				
[] BOOGIE & ELEANOR	\$10.00	FF				
[] 'JESU' & ODE TO JOY	\$10.00	FF				
[] STRAUSS WALTZES	\$ 5.00	F				
[] MOZART RONDO	\$10.00	F	[] CHOMP	\$19.95	MG	
[] WILLIAM TELL OVERT	\$ 5.00	F	[] JUKEBOX COMPLETE	\$40.00	MUEFHS	
[] MOCKINGBIRD	\$ 5.00	F	[] JUKEBOX (no board)	\$21.95	MUEFS	
[] STING & MAPLE RAG	\$10.00	FF	[] ARTILLERY	\$10.00	BMG	
[] BACH'S BOUREE IN C	\$ 5.00	F	[] CUBES	\$15.95	MG	
[] CHESS 'BRUCE'	\$17.95	MG	[] DATABASE SYS II	\$29.95	MU	
[] GRAPHICS PACK I	\$25.95	BMU	[] M.CODE TUTORIAL	\$25.95	ME	
[] GRAPHICS PACK II	\$25.95	BMU	[] SCREEN GENIE	\$14.95	BMU	
[] DISASSEMBLER	\$17.95	MU	[] CASSETTE FILES	\$14.95	MU	
[] CROSS REFERENCE	\$14.95	MU	[] SPACETREK 32K	\$14.95	BGS	
[] MUSICAL HORSERACE	\$10.00	BMGS	[] BLACKJACK	\$10.00	BG	
[] JAIL BREAKOUT	\$10.00	MGS	[] QUBIC	\$10.00	BG	
[] EDITOR FOR BASIC	\$10.00	MU	[] OTHELLO	\$10.00	MG	
[] QUICK EDIT	\$10.00	MU	[] CONCENTRATION	\$10.00	BG	
[] MITITARY ENCOUNTER	\$15.95	BMG	[] CIRCUS	\$17.95	MGS J	
[] 2716 EPROM BURNER	\$49.95	MUH	[] MISSILE DEFENSE	\$17.95	MG J	
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UPGRADES of our products occur from time to time as new features are added. Our policy is to provide you the improved version at the cost of the postage, packaging, tape and labor. We will provide upgrades at these prices only to those for whom we have a record of your previous purchase.

- [] \$ 5.00 INVADERS with sound and joystick control.
- [] \$ 5.00 GALAXIANS with sound and joystick control.
- [] \$ 6.00 DATABASE SYS II with both cassette and CP/M storage routines.
- [] \$ 8.00 MUSIC II with cassette and CP/M storage routines IF you also already own PIANO PLAYER.
- [] \$22.00 MUSIC II with cassette and CP/M storage routines IF you do not own PIANO PLAYER.
- [] \$ 5.00 CASSETTE FILES with separate read and write buffers for two recorders.

CIRCUS is another great game by Martin Sevier, the author of Invaders and Galaxians. A clown jumps off a platform onto a trampoline which you move back and forth. The clown bounces high to pop balloons that move across the top of the screen. He then falls back to the trampoline that you were supposed to move underneath him. If you misjudge the placement of the trampoline the clown splats on the ground, and another clown jumps from the platform. Each game lasts until three clowns have met with ill fortune. Scoring is according to how many balloons were popped, plus a few bonus situations. The game is complete with sound, keyboard or joystick control. Sevier's graphics are excellent. **\$17.95**

CASSETTE FILES gives your Basic programs filing capabilities using two cassette recorders. Basic programs have complete control of both tape recorders. The READ and the WRITE functions operate from separate buffers which allow you to intermix READ and WRITE operations via two recorders. This will greatly simplify your business programs by reading from one recorder, processing data, and writing a new file to the second recorder.

- USR(O) -- OPEN file. Put the file name in TP\$. Always use a 5 letter name. Files are written and read by this name.
- USR(C) -- CLOSE file. Always the last statement when finished writing a file. Empties buffer onto tape.
- USR(W) -- WRITE TP\$ string into buffer. When the buffer is full it is automatically written to tape.
- USR(R) -- READ next string from buffer and place in TP\$. A file is read from tape when the buffer is emptied.
- USR(S) -- Connects output to 300 baud serial printer.
- USR(F) -- Connects output to 1200 baud serial printer.
- USR(P) -- Connects output to centronics parallel printer.
- USR(D) -- Disconnects printer.

Passing a parameter value of 2 in the READ, WRITE, and CLOSE commands controls the motor control of unit #2. Unit #1 is controlled by a parameter of 1. Example: R=2:Z=USR(R):W=1:Z=USR(W):C=1:Z=USR(C):REM Read from #2, Write to #1 and then Close the write file on unit #1. Data strings are written to and read from the buffers using a certain string variable. **\$14.95**

CROSS REFERENCE prints a complete variable and line number cross reference for Basic programs. Reference statements such as: GOTO, GOSUB, THEN, RESTORE, ON-GOTO, ON-GOSUB, FNxx(), are also cross referenced. Having an alphabetized cross reference listing with line numbers is a great documentation and debug aid. **\$14.95**

SCREEN GENIE gives your Basic programs the following impressive capabilities:

- > It directs PRINT statements to any row and column on the screen. Just specify ROW # and COLUMN #.
- > Selectively erase any row or set of rows. Does not affect graphics, whereas CLEAR does.
- > Inverted printing can be turned on or off to highlight text. Prints black letters on white background.
- > Auto indentation to redefined left margin.
- > Selectively suppress any character on output. Suppress 'space' to print strings and numbers adjacent, etc.
- > Scroll a windowed set of rows instead of the whole screen.

Screen Genie includes a demonstration program that illustrates every feature. It shows how to imitate 'PRINT USING' for formatted numeric printing. By adding only a few poke statements, these features are added to your existing programs. **\$14.95**

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GRAPHICS PACKAGE I is a powerful set of line drawing and screen motion routines accessed from your basic programs via the `USR()` function. The screen is organized as 128 columns by 90 rows with each dot individually addressable. The demonstration program has dozens of superb figures, bar charts, circles, stars, X-Y-Z function plots, and screen motion. This software really shows off the Sorcerer's graphic capabilities. **\$25.95**

GRAPHICS PACKAGE II is a set of machine language routines that manage all 128 graphic characters to give the programmer ultimate flexibility in plotting in high resolution of 512x240. You pass to the routines the coordinates of the lines or points to plot, and the routines do the rest with graphic characters until all 128 are used. As characters are freed up, they rejoin the pool of available characters, all of which is transparent to the user. If an existing character pattern matches the one needed, it is reused rather than defining a redundant character cell. The mileage one can get out of 128 characters is amazing. Coordinates are passed in X1, Y1 variables for plotting or erasing both points and lines. Documentation is thorough. Use the routines with ROMPAC Basic or other languages. Includes excellent demonstration. How can you enjoy the Sorcerer's powerful graphics without this? **\$25.95**

2716 EPROM BURNER uses parallel port to program +5V 2716 EPROMS. This system includes assembled hardware, software and documentation. It turns your Sorcerer into a powerful 2716 EPROM burner. **\$49.95**

DATABASE SYSTEM II is a RAM-based general purpose database system for handling alphanumeric data. It is written in Z-80 machine language and is suitable for use in 32K or 48K Sorcerer microcomputers. Files may be stored on cassette or on disk under the CP/M 1.4 or later operating system. This database is useable by both cassette based systems and/or disk based systems.

Commands available in functional groupings are:

A:File Definition:	CREATE
B:File Input/Output:	LOAD, MERGE, SAVE
C:File Alteration:	ADD, DELETE, EDIT, SORT
D:File Listing:	LIST, REPORT, TOTAL
E:System Parameters:	PRINTER, SPACE, TABSET
F:Program Exit:	CPM, MONITOR@C

Allowance is made for up to 750 records which may consist of 1-9 fields. Each field is given a name by the user when creating the database and this is used as an aid in manipulating the file. The space available for record storage is approximately 9K less than the available RAM in cassette mode and 14K less than CP/M system size in disk mode. A field may contain up to 56 characters. It is best to divide the record into small fields which are useful for sorting and searching. For example, a file of names and addresses, could have the fields:

NAME, STREET, CITY, and PHONE.

The software is sent on cassette tape, but is easily transferred to your CP/M disk. Use the Monitor `>LO` command, boot your disk, and then type `A>SAVE 27 DATABASE.COM`. **\$29.95**

CUBES is a graphical RUBIK (TM) cube puzzle. The sides of the cube are unfolded on the screen, and you have control to rotate the faces of the cube both clockwise and counter-clockwise. The puzzle is solved when all of the symbols on each cube face are the same. You can begin with a solved cube and jumble it up for either yourself or a friend to resolve, or you can select any of 5 pre-programmed puzzles whose solutions the Sorcerer will show upon request. This is a very challenging mental activity, which may be the reason for the surge of popularity for this cube puzzle. RUBIK is a trademark of the IDEAL TOY Corporation which is not associated with this program. **\$15.95**

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SUPERX EDITOR is the best editing tool for Basic programs for the price anywhere. It includes such powerful features as revive a lost program, block listing, block deletion, block renumbering, merge, string search, compact program, pause listing and resume, and execute Monitor commands from Basic mode. One can edit any line shown on the screen by moving the cursor to the edit location. Edit features include insert, delete, tab, truncate, copy and auto-line number generation. As a professional programmer, this program has saved me countless hours in editing. Customers who have used both SYSTEM III and SUPERX say they prefer the ease-of-use of SUPERX. I do too!!! **\$21.95**

MACHINE CODE TUTORIAL Many have requested additional knowledge about the Sorcerer and help in learning to program in machine language. This package will help you understand video and keyboard routines, Z80 registers, instructions and flags, Monitor and Basic work areas and useful routines in ROM, and sound generation. I particularly like the interactive environment where one can immediately try the exercise ideas being presented. The eight programs that you load into the Sorcerer lead you step-by-step in your development. **\$25.95**

SORCERY BREWS is a manual of programming tricks specific to the Sorcerer. This ready reference of valuable examples simplifies programming efforts and improves both professional appearance and performance. The manual has chapters on Programming Tips, Basic's Commands and Functions, Keyboard, Video, Joysticks, Sound, the Monitor, Machine Language Interfacing and Routines, I/O Drivers, Cassette Tape, a source listing of an Editor for Basic, CP/M, Word Processor, Development PAC, Plotting, tables and forms. Best of all, we are very proud of the extensive Basic ROMPAC Map which identifies dozens of useful ROMPAC routines and how they work. Customers have been hungry to have this kind of information collected together and concisely presented in a single manual. I've gleaned my mind of every clever and useful piece of information I know about the Sorcerer. Everyone is sure to discover something they will treasure. Believe me, YOU'LL USE THIS MANUAL! It's over 100 pages long and stuffed with hundreds of 'brews'. **\$14.95** (+\$4 overseas postage)

SORCERER INVADERS is a fast action game similar to the popular arcade version. Rows of marching invaders continue their advance while you dodge back and forth avoiding the falling phasers. The bunkers under which you may hide only provide temporary protection. The only hope for you is skill in shooting down the advancing party, each and every one of them. Then to your horror another screen full of invaders appear to continue their march back and forth and downward. The superb graphics and the fast-paced action make the excitement very real. The game is addictive because it is so fun. Invaders comes with both joystick or keyboard control, and sound. **\$17.95**

SORCERER GALAXIANS has been raved about in the reviews. Don't you think it's time you joined in the excitement? Galaxian spaceships peel out of formation at the top of the screen, and fire at you as they dive and zip across the screen. You constantly dodge them and their fire while trying to shoot down the darting ships. The graphics are superb and the excitement very addictive. Galaxians uses either joystick or keyboard control, and comes with spaced-out sound! Use our music system interface board for all of our software which offers sound. **\$19.95**

DISASSEMBLER is a Z-80 machine language two-pass disassembler whose output format is directly compatible with the Development Pac. The Z-80 assembly language source (input to assembler) listing can be sent to Video, Cassette or Printer. The cassette file produced is a source file for the Editor/Assembler and can be read directly into the editor of the Development Pac. The disassembler has a displacement function which allows any program residing anywhere in memory to be decoded, whether it is at it's normal address or has been moved to be decoded. **\$17.95**

SAMPLE PRINTOUT	E993	F5	LE993	PUSH	AF
	E994	CD 1B E0		CALL	LE01B
	E997	FE 0A		CP	00AH
	E999	29 14		JR	Z,LE9AF-\$
	E99B	F5		PUSH	AF
	E99C	DB FF	LE99C	IN	A,(0FFH)

ARRINGTON SOFTWARE SERVICE

MUSIC SYSTEM I is valued by customers as being the most sensational piece of software available for the Sorcerer. The price includes the assembled hardware to interface the Sorcerer to your amplifier and speakers.

FEATURES -- Tempo control from slow to exceedingly fast.
Set the music's key signature by placing sharps or flats on the staves.
Select notes by moving cursor up and down musical staves. It's like copying what you see on music sheets.
Graphically select note durations and rests.
Full editing of inserting, deleting or overwriting chord sets in the song data file.
Hear a pitch in a chord before the note is entered into the data file.
Play the last ten chord sets to verify the accuracy of the data just entered.
Or play the entire song.
Copy refrains for rapid duplication of repeated measures.
Transpose the playing of the song into another key. Adjust to suit your vocal range for singing along.
Automatic loading and saving of data files from and to cassette.
Restoration of data file notes to the screen for rapid editing and file verification.
Single step through the file listening to each chord. Aids in file editing.
User prompts and error protections. System includes the necessary hardware interface to your amplifier.
Select individual voices to play only their part. Example: hear the Bass and Soprano parts together.

EASY TO USE -- Customers, DON'T BE HESITANT because you feel you know nothing about music. You don't need to know all about music to enjoy this software. You can experiment with the editor, dabble in song writing, and enjoy prewritten music such as PIANO PLAYER, FANFARE, BACH, FINLANDIA, BOOGIE WOOGIE, etc. Creating song data files is done graphically. **\$40.00**

PIANO PLAYER is an option for the Music System I and adds delightful graphical animation of a high resolution piano player tinkling the ivories. The man's arms move in synchronization with the beat of the music. A large keyboard is displayed upon which four cursors jump around on the keys to the four notes being played. Both Piano Player and the Music System come with a sample song file, and there are several prewritten song files to choose from. Being both graphical and musical, these programs are crowd pleasers twice over. Order yours NOW! **\$15.00**

MUSIC SYSTEM II is the same as Music System I except that it includes CP/M disk routines for the reading and writing of song data files to and from disk. MUSIC SYSTEM II includes the PIANO PLAYER feature, and a demonstration file called FANFARE. The program also has cassette capabilities to allow you to transfer all of our music song files from tape to your disk. The program is distributed on cassette tape and is easily transferred to any CP/M disk system. Although this is CP/M based, it still requires the use of the Basic ROMPAC. **\$59.95**

JUKEBOX is 100% machine language for those disk based systems who do not have access to the Basic ROMPAC. Song files can be read from tape and transferred to your disk. With JUKEBOX you can queue up several song files resident on disk to be played one after another while enjoying the delightful animation of the Piano Player. The difference between JUKEBOX and MUSIC SYSTEM II is the ability to queue song files for playing, and the absence of any editing capabilities. Although you will not be able to create your own music with JUKEBOX, there are numerous prewritten song files available. JUKEBOX may be purchased either with or without the hardware since many of you already have the needed Music Board. **\$40.00** complete; **\$21.95** no board.

SONG FILES are preprogrammed data files for use with Music System I and II and Jukebox. Several are offered at \$10 with two files per tape, recorded at both 1200 and 300 baud. We encourage single files to be paired up so that two can be sent per tape. This keeps our cost down so that the cost of these files can be kept low.

DOUBLE PORT is a printed circuit board that splits the parallel port into separate input and output ports. This allows you to use our Joysticks and our Music Board at the same time for use by games such as Galaxians, Invaders, and Circus. You may buy the board only if you wish, and solder on your own DB25 connectors (two female connectors and one male connector are required). Or, you may buy the board assembled at the higher price which pays for those 3 expensive little DB25 connectors. **\$24.95** complete; **\$7.95** board only.

ARRINGTON SOFTWARE SERVICE

9522 Linstock, Boise, IDAHO 83704

JAIL BREAKOUT is a reflex game where a ball knocks out bricks from a wall at the top of the screen. You use the left and right cursor keys to move the game paddle back and forth to keep the ball in play. This game is similar to the TV arcade game, and includes sound. \$10.00

QUBIC is our best artificial intelligence program. The Sorcerer is practically unbeatable as you compete to place four in a row on a three dimensional grid of 4 16-cell planes. This tic-tac-toe is challenging as four in a row may be vertically in corner cells. \$10.00

ARTILLERY is a graphical game that utilizes the routines from Graphics Package I. Across a randomly generated windy hill, two players fire cannon balls at each other's castle by selecting the cannon's angle and powder load. With the 128x90 resolution the cannon ball arches smoothly across the sky. You need to own Graphics Package I. \$10.00

CONCENTRATION is a mental game where you match squares. The game has excellent graphics! Up to four may play, two of which may be the computer players named Merlin and Merle. In fact, it is fun to watch Merlin and Merle play against each other. Each player selects two squares to turn over to match the graphic pictures on the reverse side. If they match, you score points and your turn continues. \$10.00

OTHELLO is written in machine language for fast execution. Each player places tiles in turn on a checker board such that each tile placed captures one or more lines of opponent tiles. Othello is a strategic game whose skill level lies between that of checkers and chess, yet provides hours of enjoyment. \$10.00

HORSERACE gambling is always fun, especially when you don't have to cover your losses with real money. The excitement of the big race is brought into your home with high resolution graphics and the melodies of the 'LONE RANGER' and 'IF I WERE A RICH MAN'. \$10.00

BRUCE CHESS is an excellent chess opponent. The chess board is displayed in high resolution graphics. The playing level is selectable. You may castle, and capture En Passant. Bruce does not allow you to preset the board position for situation playing. Customers report that Bruce may have a chess rating of 1150, which is very good for an artificial intelligence program. Bruce will provide a challenging game and hours of entertainment. \$17.95

SPACE TREK is an excellent version of the ever popular game where you venture through the galaxy's 64 quadrants in search of enemy Klingons. You are the captain of a starship with a mission of rid the galaxy of the enemy in a specified number of stardates. There will be starbases for resupply and repair of your starship. Game includes sound and makes good use of the video display for control and status reports. \$14.95

CHOMP is an absolute must for every game enthusiast. It is just like the arcade game where you are being chased through a maze of alleys by four CHOMPS who will eat you if they can catch you. As you maneuver around to keep out of the way of the CHOMPS, you score points by eating small dots found in the alleys. If you eat one of the large dots, you become mightier than the CHOMPS in that you can now chase, catch and eat them. You score big for each chomp you catch, but be careful as they soon return to their normal rolls as the aggressors. The game is a superb display of high resolution graphics. The program is 100% machine language for speed and ease of use by all of our customers, disk based systems included. This program is fantastic. WE LOVE IT!! Move over Galaxians -- you have to share some of the spot light for the elite with this new game entry. Order your copy today and enjoy it over the holiday season! \$19.95

ARRINGTON SOFTWARE SERVICE

9522 Linstock, Boise, IDAHO 83704

MISSILE DEFENSE is challenging and exciting as you try to shoot down warheads before they reach your cities and destroy them. High resolution graphics mark the paths of the falling warheads and add realism to the explosions and ruin of your cities. The game can be controlled from either the keyboard or by joystick.

Sixteen enemy missiles enter randomly through two areas at the top of the screen. They descend to a random release point where three warheads are ejected to descend towards your cities and missile sites. When they detonate they destroy everything within a 5x5 surrounding area. Your cities and missile sites are reduced to rubble after the brilliant explosion. Victory is yours when all 16 enemy missiles have been launched and you still have sites with missiles and parts of your cities remaining. You must be swift and skillful in choosing which warhead to destroy. If you don't make the correct decisions, you will fail in your Missile Defense. **\$17.95**

MILITARY ENCOUNTER is the popular board game of Stratego. The excellent graphics for the bombs, spy, colonel, sergeants, etc. will create envy in your Apple friends. You and the Sorcerer advance your men until an encounter occurs, wherein the higher ranked man removes the other. You must capture the Sorcerer's flag to win. Strategy and bluff are required as the strength of his pieces is not known until the encounter. **\$15.95**

JOYSTICKS is a pair of ATARI joysticks modified to connect to the Sorcerer's parallel port. They are for use with all of our software which includes joystick control. We include demonstration software of a few games and a general purpose joystick routine in machine language. It is easy to add joystick control to your existing programs as our standard is well documented. Each joystick unit gives you eight directions of movement and a fire button. **\$39.95 (+\$5 overseas postage)**

DYBUG TOOL is as necessary to a machine language programmer as a hammer is to a carpenter. With this tool you can set breakpoints in your code, single step through the execution of your program, examine and alter the Z80 registers. Single step includes the option to execute entire subroutines as a single step. You can examine, alter and/or move blocks of memory. Being able to enter ASCII text directly into memory is another very useful feature. DYBUG can relocate itself to any desired address so it will never conflict with your code. **\$14.95**

CHARACTER GENERATOR is a useful Basic program that makes designing characters and shapes a snap. You work with enlarged dots on a figure 5 cells wide by 3 cells high. Features include turning on or off a dot, inverting the cell right to left or upside down, and reverse video. The contents of a cell can be stored for any of the 128 definable characters. Graphic cell data can be stored on cassette tape, or decoded for inclusion as DATA statements in your Basic programs. The program is easy to use and very flexible. **\$10.00**

SCREEN SYSTEM is a menu driven network of machine language routines that facilitate working with graphics. Animation is achieved by storing up to 50 files in memory and recalling them in a programmed sequence. Files may be saved on tape either individually for future use, or as a whole for future playback like a short film. You can draw on the screen, store, recall and edit these screen files which are stored in a compacted format. The character generator is the most powerful one on the market as features allow cells and blocks of cells to be defined, duplicated, rotated, and inverted. In the program mode a sequence of up to 50 steps can be entered to perform recall and refile functions automatically. The timer function controls the duration a file remains displayed on the screen. Loops can also be programmed so that display sequences can be repeated. This system of functions is extensive, and thus is a little difficult to comprehend at first sitting. But everything is easy to use as one follows step by step the descriptive documentation. We anticipate that files may be offered in the future for the Screen System that have cartoon animation. If you put together such a cartoon, we are interested in marketing it. Screen System comes with a demonstration file. **\$25.95**

AUTHORS We seek excellent programs to market worldwide. Our royalties are generous, and our interest in having satisfied customers is keen. We invite you to join with us and our distributors to bring your product into the marketplace. Submit programs for evaluation at 300 baud along with documentation (word processor files preferred).

PASCAL POET

by Daniel Conde

Those of you who read my article, in issue 3.5, on sparse matrices and allocating space, might say that the method used is not really efficient. We reserve space (1000 array cells in that case), not knowing if we are going to use all of them. That is true, since we often have a list of items, which may be "records" in Pascal that change in number and we cannot know in advance how many are needed. Thus we will start a discussion on pointers and lists, which are useful in keeping matrices of undetermined size, and also very useful in many other applications.

To begin with, Pascal's method of memory allocation is more rigid than BASIC'S. We cannot start using an undeclared variable, as BASIC would allow us to. However, it does have provisions for requesting an almost arbitrary number of items, which are usually "records" from the system, for our use. These items must be treated very differently from normal declared variables, but as we shall see, they offer features unique to them. To understand them fully we need to know what records, pointers and the "new" function are.

Records, as you may know, are a collection of different variables accessed under the same main name, with different sub-names to distinguish between the sub-items. Examples are: address.name, address.street, address.city, etc. Pointers are variables that allow you to actually point at a variable. Assembly language programmers will immediately think of addresses of memory locations, and that is what pointers are usually made of. Therefore, having records and pointers, it is possible to have a "record" that has a "pointer" as one of its fields. That pointer within that record may point to another record, making a chain of records, linked like railroad cars as illustrated in the following diagram:

```
IIIP----IIIP----IIIP (each of these
"cars" represents a record; with 4
items of the record represented by an
'I' and a pointer represented by a 'P'.
The series of dashes are used to show
the links).
```

It is not hard to think of a chain of records set up as shown above in an array. If we have 10 records linked in that manner, it is possible to walk down the train to reach whatever cell we would like. Going down each link in the train might seem like quite a complicated task for accessing elements in an array, but we must remember that new cars may be linked together, which effectively allows us to re-dimension our array while we run the program (and not get a ?DD re-dimensioned array error message!). To acquire new elements, we need to use the "new" function mentioned earlier. Using some tricks, it is possible to "unlink" our array right in the middle, couple with another array, and relink with the rest making a new array. Our new arrays may now be of almost arbitrary length and only as long as we need them.

Next time we will discuss the exact Pascal statements required to create these items. Meanwhile, think about what could be possible, if each of these records with pointers contain more than one link. ○

DUSTINGS FROM THE LIBRARY

by Robert Hageman, Librarian and Sysop

In this issue, I will present a brief introduction to the Editor found in MiniCBBS and cover several of the CP/M modem programs available.

First, a short introduction to MiniCBBS' edit features.

The number of incorrect (sometimes garbled) messages left on our, or any other, CBBS is truly amazing. These systems all have editing capabilities included in the message entry portion. These editors, while not Spellbinder or Wordstar, are relatively easy to use.

We begin by running the CBBS enter-message function. The prompt given by CBBS and our answers;

```
FUNCTION: B,C,D,E,G,K,L,N,P,Q,R,S,W,X (or ? if not known)
?E;10/26/81;ALL;USING MCBBS LINE-EDITOR;N<CR> (note use of ';' to give
multiple answers... more on this later). CBBS responds with;
```

MSG assigned number: 123

ENTER THE LINES. 60 Chars/line max. (Bell rings at 55).

-----> When done, enter a blank line (C/R alone)

-----> To abort, enter: ABORT

01 ?[---- message may be entered at 60 characters per line ----]

.....

16 ?[----- message may contain a total of 16 lines -----]

When we have entered our sixteenth line, or when we enter a blank line, the program responds with:

ENTER A LETTER:

A=Abort, C=Cont. input, E=Edit, L=List, R=Retype line,

S=Save <--- (DO THIS WHEN YOU HAVE FINISHED)

A,C,E,L,R,S:?

This is where you may begin editing your message. The functions behave in the following ways;

A=Abort	- throw the message way, do not add to the files
C=Cont. input	- continue entering on the next blank line
E=Edit	- run the search and replace message altering routine
L=List	- display the message beginning with some line number
R=Retype line	- bring line to entry buffer and display, line may be retyped but need not be
S=Save	- write message to disk

I usually find myself beginning with the 'L' command and I always use 'L;1' to have the message listed from line 1. After finding the errors or rough spots I wish to correct or alter, the 'E' or 'R' commands are useful. If the problem is in a very short line, 'R' is quite handy for retyping the whole line. However, if the line is more than a few words long, 'E' is better suited with its search and replace function. Both commands will display the line as it is presently formatted and give you the choice of changing it or keeping it as is. With the 'R' command the only choice is either retype the entire line or leave it alone. The 'E' command allows you to specify a string to be searched for and a string to replace the search string, e.g. /sorcer/sorcerer/<CR> will replace 'sorcer' with 'Sorcerer' and then display the corrected line. You may continue the search and substitute procedure until the line is correct at which time you enter a lone carriage return to return to the menu.

When you have entered the message you want, then use the 'S' command to save it to the disk file. There is really no reason for sloppy or difficult to read messages, when the tools are there to edit out the rough spots.

As I've said before, the best way to become familiar with these commands is to call the system and use the program.

My second topic for this issue, concerns the CP/M communication programs: MBOOT3, MODEM, PLINK, SETMODEM, SETTAPE, and DIAL.

MBOOT3 is a special receive only version of MODEM. It is meant to be picked up by something like Q.S. Smart Terminal for transfer into the CP/M environment.

MODEM is the CP/M smart terminal program. It allows the user to both upload to and download from RCPM systems. It is compatible with XMODEM (the remote modem program on RCPMs).

PLINK is the ASCII capture and transmit program. It is capable of 'capturing' a TYPED file and writing the file to disk. It is also able to pick-up a copy of the remote system's directory and is capable of sending a preformatted message to MINICBBS.

SETMODEM and SETTAPE are the UART control programs for setting the serial port status to either RS232 or tape output. With these programs, there is no need to ENTER the Monitor to set this port prior to booting CP/M. They set the UART directly from CP/M's command level without

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having to exit CP/M. They are meant to be used with MODEM and PLINK as assembled for a serial port modem.

DIAL is for S-100 modem boards capable of dialing the phone under software control.

MODEMxxx.ASM is the file name which you will find on RCPMs when you are ready to get serious about CP/M communications. (xxx is a number indicating some revision of the original program which may be a version number or part of the date of that revision.) Since MODEM.ASM is between 36K and 48K in size, not many people will be able to receive that file with their smart terminal program, which is why MBOOT3.ASM was written. MBOOT3 is about 10K in size and most new CP/M users have sufficient memory to use a smart terminal program to capture a TYPED MBOOT3.ASM from a RCPM.

When you have a good copy of MBOOT3, you need to edit the assembly equates which are hardware dependent. These equates allow assembly for a number of modem devices, S-100 boards or serial modems. If you are planning on using a SERIAL modem, PLEASE NOTE: you need either MONITOR 1.1 PROMS, a HARDWIRED RS232 PORT, or a KEYBOARD DRIVER IN YOUR BIOS. Exidy's Monitor 1.0 keyboard driver will reset your computer's UART and blow you off line (end communication).

When you have either fixed the serial port or are operating an S-100 modem board, you begin by finding the following lines from Mboot ASM file or the equivalent in Modem or Plink ASM files. (That's right, they also have to be edited after you've picked them up).

```

;STDCPM EQU TRUE ;TRUE, IS STANDARD CP/M <---for Sorcerer, this is
TRUE
ALTCPM EQU FALSE ;TRUE, IS ALTERNATE CP/M FOR H8 OR TRS80
;
FASTCLK EQU FALSE ;TRUE FOR 4 MHZ CLOCK <---FALSE for Sorcerer, we
have 2 MHZ
;
PMMI EQU FALSE ;TRUE, IS PMMI MODEM <---If this is true you're very
lucky
DCH EQU FALSE ;TRUE, IS D.C. HAYES MODEM <---Likewise if this is true
;
If both the above are FALSE for your system, don't worry, you are in good
company. That will be the case for ALL serial modem users.
;
;IF YOU ARE USING AN EXTERNAL MODEM (NOT S-100 PLUG-IN)
;CHANGE THESE EQUATES FOR YOUR MODEM PORT REQUIREMENTS
;
INITREQ EQU FALSE ;TRUE, IF MODEM PORT INIT. REQ'D <---I believe this
is the case for serial modems. Please write to us if you know otherwise.
;
INITC1 EQU 0AAH ;1ST INIT CHAR TO CTL PORT FOR USART
INITC2 EQU 40H ;2ND "
INITC3 EQU 4EH ;3RD "
INITC4 EQU 37H ;4TH "
;
IF NOT PMMI AND NOT DCH:
MODCTLP EQU 0EDH ;PUT YOUR MODEM CONTROL PORT HERE <---Port ED for
Sorcerer
MODSNDB EQU 01H ;YOUR BIT TO TEST FOR SEND <---Bit 0
MODSNDR EQU 01H ;YOUR VALUE WHEN READY
MODRCVB EQU 02H ;YOUR BIT TO TEST FOR RECEIVE <---Bit 1
MODRCVR EQU 02H ;YOUR VALUE WHEN READY
;
MODDATP EQU 0FCH ;YOUR MODEM DATA PORT <---Port FC for Sorcerer
ENDIF ;END OF EXTERNAL MODEM EQUATES

```

Once you have Mboot assembled you use it once! Mboot is only used to receive the Modem assembly file (Mboot operates as receive only while Modem is both send and receive). Using Mboot is very easy, simply follow the directions in the ASM file. REMEMBER, until you have the -SET programs, you have to set up the serial port from the Monitor before entering CP/M.

(The following is excerpted from MBOOT3.ASM and shows the commands you use to activate Mboot to receive a file. What it does not show is that you must tell the RCPM to: XMODEM S FILENAME.FILETYPE, and wait for that program to tell you the file has been opened before you give Mboot the ctrl-[.])

A simple terminal routine, at the start of the program, allows the user to communicate with a remote system prior to receiving a file. This makes it possible to down-load a file without intervention on the part of the host system's operator.

```

COMMANDS: MBOOT FILENAME.FILETYPE
or MBOOT A:FILENAME.FILETYPE
or MBOOT B:FILENAME.FILETYPE

```

The program will operate as a dumb terminal until an 'ESC' key is typed (ctrl-[). It then branches to the receive routine. The user may also exit to CP/M without opening the receive file by typing ctrl-E from the terminal. The values for the escape and exit keys may be changed in accordance with the needs of the user - some keyboards do not have the 'ESC' key and/or provision for control characters.

We will cover this topic further in the next issue. ●

THE WORD PROCESSING CORNER

#17 - by Steven Guralnick

When you install a word processor such as SPELLBINDER, one of the problems you can run into, as we have, is keeping track of all the files created with that program. We presently have a little over 1000 files spread out over about 100 disks. The trick is to find the one you want when you want it.

To make that possible, we are using a program called CATALOG. I recommend it highly.

The program will keep track of all files and the disk(s) on which each file is located. In addition, on command, the program will tell you how much space is occupied by each file and by each disk. The command "DISKS", will list all disk I.D. numbers in use, tell you when the disk was last updated, and how much space is in use on each disk.

It is possible to search for a filename by use of the usual CP/M conventions and wildcards, such as *ASM or FILENAME.* or ???E-NAME.* or whatever. In addition, there is a "FIND" command which allows you to search for a string and if that string is anywhere in a filename (not an extender), it will find it. For example, a file called DOEWILL.WPF can be located by the command "FIND DOE" or "FIND WILL" or even "FIND D". Thus, it is not necessary to know the precise way the filename was originally written, just as long as you know a few sequential characters of the name.

Outputs are a pleasure. You can get a list of what is on each disk or a list of filenames. Output is to the screen or to your list device, at your option.

The really unique thing about this program is that you can annotate any given file with an alpha description of the file, up to 63 characters in length. It makes it easy to figure out what a given file is all about. The annotation shows up on screen print or hardcopy.

Ed Mentzer is selling the program in a variety of configurations, including eight inch, with manual, for \$75.

To save space in the Newsletter, I am not including any examples. If you will send me a self-addressed, stamped envelope (#10 size), I will be happy to send along copies. ●

Steve Guralnick, 375 Mayfair Ave.,
Daly City, CA 94015

<<< CLASSIFIED ADS >>>

\$1/line \$1/line
=====

FOR SALE - BEST OFFER

- 1 56K Exidy Sorcerer II, 2 years old
- 1 S-100 Box w/16K & 4K boards
- 2 Shugart 5 1/4" Drives w/controller card, lots of disks & software
- 1 Sanyo Monitor
- 1 Anadex DP-800 Printer
- 1 Novation Cat modem
- Call Henry Deutsch at: (513) 541-7770 collect during the week; (513) 489-0053 after 6:00 pm during the week and weekends

ADDING INVERSE FONT

by Burke Wilson

By adding the following subroutine to your programs, you can print using the inverse font anytime you want. The only requirements are to set "TB=TAB" and "I\$=" to the text you want printed in inverse font before branching to the "PRINT INVERSE FONT SUB". Note that a short assembly program must also be added to your program. Its purpose is to build the inverse characters and to restore them if they are reset by a CLEAR SCREEN command.

```
10000 REM ***** INVERSE FONT DEMO *****
10010 REM
10020 CLEAR 250:PRINT CHR$(12):PRINT CHR$(1);
10030 REM
10040 REM ***** POKE FONT CONV CODE *****
10050 REM
10060 FOR I=0 TO 20:READ X:POKE I,X:NEXT I
10070 DATA 1,0,4,17,0,252,33,0,248,62,255,150
10080 DATA 18,19,35,11,120,177,32,245,201
10090 POKE 260,0:POKE 261,0
10100 REM
10110 REM ***** ENTER TEXT *****
10120 REM
10130 TB=19:I$=""== INVERSE FONT DEMO ==":GOSUB 10220:PRINT:PRINT
10140 FOR I=1 TO 10:PRINT CHR$(19);:NEXT I:PRINT TAB(54):PRINT
10150 PRINT CHR$(23);:INPUT "TAB, TEXT";T$,I$:TB=VAL(T$)
10160 PRINT:PRINT TAB(64);:PRINT:PRINT TAB(64);:PRINT
10170 PRINT CHR$(23);CHR$(23);CHR$(1);:GOSUB 10220
10180 PRINT CHR$(17):FOR I=1 TO 4:PRINT:NEXT I:GOTO 10140
10190 REM
10200 REM ***** PRINT INVERSE FONT SUB *****
10210 REM
10220 IF PEEK(-1024)=0 THEN 10240
10230 A=USR(0):FOR I=-1024 TO I+6:POKE I,0:NEXT I
10240 T$="":B$="":FOR I=1 TO LEN(I$):T$=T$+CHR$(128)
10250 B$=B$+CHR$(ASC(MID$(I$,I,1))+128):NEXT I
10260 PRINT TAB(TB);T$:PRINT TAB(TB);B$:RETURN
10270 REM
10280 REM ***** END *****
```

Burke L. Wilson, 320 N. Anton Dr., Montgomery, AL 36105

HINTS AND KINKS

by Don Myklebust

Recovering your Word Processor file from a reset (just happened to me when the printer got a headache and had to be turned on and off).

The uncorrupted file begins at 080EH with a 02H and ends wherever with a 03H. Reset inserts a 03H at 080FH, and a stack (garbage to you) from 0820H to 08CEH. Because of the stack, you can't save it all, but you'll get most of it back.

1. Type 'x' to go to the Monitor.
2. Run the cursor to about 6 lines from the top with the keypad arrows.
3. Use the MO command to display 256 byte pages on the screen. For example, this point is line 44 and I would estimate its address to be somewhere around 0F00H to 1000H page. So, type MO 0F00 0FFF F080. If it's not there, try the next page and so on. When you find the last thing you typed, you'll see what looks like a backward L. That's the 03H.
4. >MO 08CF 0F08 080F
5. 'PP' gets you back to the WP Pac and maybe next time you start yanking on the PG&E pipe, you'll save your file first!

Donald Myklebust, 19710 Guthrie, Strathmore, CA 93267

SAVING MACHINE LANGUAGE PROGRAMS ON MICROPOLIS DISK

by Bryan Lewis

A way to save BASIC programs onto Micropolis Disk was described in the Sorcerer User's Newsletter of January 1980. Here is a method of saving machine language programs (such as Fastgammon or Adventures). Saving ML programs is a little more complicated since the starting address and the execution address are not always the same.

The following method moves the program up in memory to keep it from being overwritten by the disk operating system, then saves the relocated block of memory on disk. A short move routine is attached at the head of the program, so that when it is recalled from disk, the program will relocate itself to the proper execution address. Here are the steps to follow:

```
>GO xx00          Boot the disk.
>LOAD "SAVEML"    Retrieve the relocating program
                  (given below).
>EXEC E003        Return to the Monitor.
>LO              Load program from cassette.

Take note of the BLCK, ADDR, and GOADDRS.
Calculate END = ADDR + BLCK.

>EN 7B05          "ENDLL" means the low byte
7B05: BLCKLL BLCKHH/ of END, "ENDHH" the high
>EN 7B21          byte, and so forth.
7B21: ADDRLL ADDRHH/
>EN 7B34
7B34: GOADDRLL GOADDRHH/
>EN 7B02          Modify the relocation program
7B02: ENDLL ENDHH/ with proper addresses.
>GO 7B01          This moves it up.
>GO xx00          Boot the disk again.
>MATH 7B00 BLCK  Use Micropolis' hex math
xxxx START xxxx xxxx command to calculate start of
                        the moved image -- the second
                        answer equals START.

>SAVE "NAME" START 7B40 18 7B16
```

Once you've done that, you only have to type in the NAME to reload, relocate, and run the program in one easy step. ●

SAVEML

by Bryan Lewis (disassembly by Bob Hageman)

Enter and save hex code under MDOS, xx should be replaced with 00. This is for a 32K system; for other sizes, change all 7B's to 3B's or BB's.

```
7B00 00          NOP
7B01 11 xx xx    ID    DE,END      ;END = ADDR + BLCK
7B04 01 xx xx    ID    BC,BLCK
7B07 ED 43 3B 7B LD    (7B3B),BC  ;Save BLCK for move back
7B08 03          INC    BC
7B0C EB          EX    DE,HL
7B0D 11 00 7B   LD    DE,7B00
7B10 ED B8      LDDR          ;Move program to below
                          SAVEML
7B12 C9          RET          ;Go back to Monitor
7B13 00          NOP
7B14 00          NOP          ;Save the program with move
7B15 00          NOP          ;routine
7B16 21 00 7B   LD    HL,7B00
7B19 ED 4B 3B 7B LD    BC,(7B3B)  ;Get BLCK for move back
7B1D AF          XOR    A      ;Calculate low address of
                          saved
7B1E ED 42      SBC    HL,BC   ;program
7B20 11 xx xx    LD    DE,ADDR
7B23 ED B0      LDIR          ;Move prgm back to proper
                          loc'n
7B25 ED 2A 00 F0 LD    IY,(F000)  ;Do short version of GETIY
7B29 01 92 FF    LD    BC,FF92
7B2C ED 09      ADD    IY,BC
7B2E ED F9      LD    SP,IY   ;Save in stackpointer
7B30 CD B1 E9   CALL   E9B1   ;Have Monitor init. video
                          board
7B33 21 xx xx    LD    HL,GOADDR ;Set Go Address
7B36 E9          JP    (HL)   ;Go do it!
```

HARDWARE NOTES

by Russell Frew, Hardware Editor

In my last column, I discussed the makeup and use of video RAM. We looked at how the ASCII code points to PROM locations and how the 8 bytes needed for each character are shifted out of the character generator to the screen. Before any character can be written on the screen, however, it must go through one more transformation. Our digital signal of 1's and 0's must be changed into an analog signal that the monitor can use with its electron gun.

As our data arrives at the output shift register (74166), it is prepared to be clocked out of the computer along with other video information that is invisible to the user but required by the monitor. Because the picture you see on your screen is dynamic, it is constantly being redrawn by the monitor's electron gun. At a rate of 60 frames per second, you get flicker free displays. Each of these frames is made up of two scans. The first scan does pixel line 1,3,5...525. The second raster scan does 0,2,4...524. Because this happens so fast, your eye sees only the static, interlaced frame. The electron gun, however, needs to know when it has reached the end of a vertical line so that it can shut down and swing back to the left side to start the next line. Likewise, when the gun reaches the lower right corner it must again shut down and retrace to the upper left for the next scan. The two signals needed for these actions are called horizontal and vertical blanking. They are generated by the Sorcerer's video timing circuit and arrive at an OR gate near the shift register for final integration into the data stream.

Now we have the data in a serial bit stream waiting to be clocked out of the shift register and the video sync signals waiting to be integrated with our data at the right moment. The combination is done in a Digital to Analog Converter (DAC) formed out of a good old 2N2222 transistor and a handful of resistors and cap's. As the data is shifted out of the register by the video clock, the 1's and 0's turn the transistor on and off. The output is shaped by the RC network tied to the transistor's output and an analog signal results that can be used to drive the monitor. The horizontal and vertical sync pulses are also added to this information by the computer. When the counters indicate that the end of the line has been reached, the shift register is inhibited and the negative going HSYNC pulse is inverted to turn off all the transistor's output so we never see the horizontal retrace to the next line. The same happens when the counters say that the scan has finished the last line. As simple as it may sound, the timing is done at 6MHz and that leaves no margin for errors.

The Sorcerer is the only personal computer that utilizes this sophisticated system which is why we can do so many great hi-res things on our system. It also makes things like integrating light pens very easy because the computer always knows where it is on the screen. Next time one of your TRS-80 or Apple friends is giving you the party line, ask him how his video system works and judge for yourself who has the more sophisticated system!

Please note the following errors in the Sorcerer I Technical Manual:

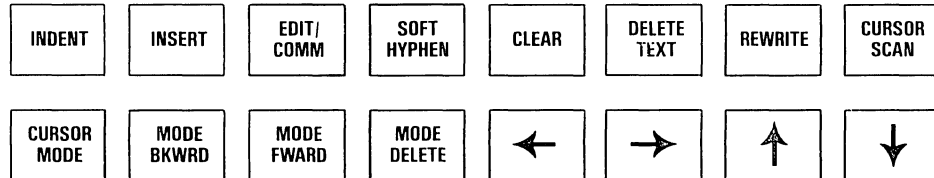
On page 39 under Horizontal Sync Generator; 7B-6 shuts off video not 7B-5 as stated; under Vertical Sync Generator note that 1B-9 not 5A-9 works similarly to 3A,4A...etc. Also note that by testing bit 5 of port FE you can tell when the computer issues a vertical sync pulse. This can be useful for many applications such as light pens and subliminal experiments and other exotic applications. ●

EXIDY SORCERER USERS

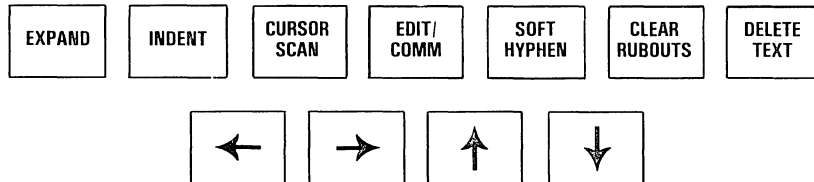
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Never has there been such a captivating and superbly written arcade game for the Sorcerer. Styled after the well known and very popular ASTEROID DELUXE arcade game, SUPER ASTEROIDS is destined to become the most popular piece of demonstration software used by dealers and users alike. Perhaps it is the outstanding use of fine line graphics or the silky smooth movement. Maybe it is the breathtaking speed, dazzling explosions, gripping sound effects or simply the challenge of avoiding those fire balls from that persistent flying saucer that insidiously follows you across the screen. Whatever it is, we warn you NOT to purchase this game for fear that you may join the ranks of hundreds of other ASTEROID Addicts who, square and bleary eyed at 3 am, just MUST have ONE more go at trying to beat that High Score.

The object is to guide a small space ship across the screen avoiding but shooting asteroids as they glide past. When an asteroid is hit, it will break up into many smaller pieces. By repeatedly hitting the pieces they will soon disintegrate and disappear. If you crash your ship into an asteroid it will break into pieces and splinter across the screen in a shower of sparks! However, if you manage to stay in one piece, chances are you'll soon be pursued by a flying saucer that shoots balls of fire! Best that you treat him with care, else you may make his friends VERY aggressive.

Apollo has used a novel but ingenious method of continually reprogramming graphics characters and has obtained stunning results! All movement is done pixel by pixel but without speed loss. Numbers of asteroids, directions, speeds and such like are all totally unpredictable. If you can show us a piece of software that has finer, smoother and faster graphics than SUPER ASTEROIDS, we guarantee to refund your money in full!

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We are running a programming competition and encourage anyone with time and enthusiasm to enter. Prizes will total over \$2,500.00! One prize of \$500.00 will be awarded to each winning entry in all 5-sections with the chance of more than one winning entry per section if the standard is particularly high.

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CONDITIONS OF ENTRY

All applications must be lodged at System Software on or before the 31st December, 1981. Entries should be submitted on cassette at both 1200 and 300 baud twice each. If the software is to be run on disk, instructions should be included on uploading.

No entry will be returned unless specifically requested and return postage forwarded.

Entries will be judged according to: (1) Programming technique. (2) Reliability. (3) Usefulness. (4) Creativity. (5) Originality. (6) Marketability and (7) Documentation.

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Only winning entries will become the property of System Software.

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ZAP80 'Secret Code Disassembler' by Ian Robinson

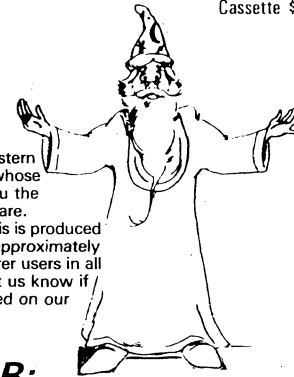
This is far from your average run-of-the-mill disassembler! Other than being a mere 4K long, able to disassemble at the speed of light and packed with options, ZAP80 will display before your very eyes all those unknown instructions ZILOG never talk about! Ian has been doing extensive research into the actions of the Z80 processor when confronted with the 700 or so undocumented (and so called 'illegal') code sequences. Over 100 of these are VERY useful! Did you know you have extra 8 bit registers and a complete set of instructions to manipulate them? Did you know about extra rotate instructions?

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