

SORCERER'S APPRENTICETM

PAGE 129

VOLUME 3

NUMBER 7

OCT. 15, 1981

INTERNATIONAL COMPUTER USERS GROUP/NEWSLETTER

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Price \$2.00

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NEWS FROM EXIDY

Exidy Systems Inc. is alive and well and undergoing some dramatic changes. It has been unable to produce enough systems to meet demand. This has necessitated an expansion of its operation. This has been accomplished by consolidating its manufacturing operation and corporate headquarters in a larger facility located at 631 River Oaks Parkway, San Jose, CA 95134.

Some of their new offerings include a legal accounting package which uses their superior Word Processor Software and a Billing and Timekeeping system.

A 20,000 word Dictionary capability was added to the Disk Word Processor Package. This software, reviewed on page 148, finds spelling mistakes and typographical errors by comparing every word in the user's document with the words in one of the dictionary files on disk. The user can maintain several dictionaries for special purposes. Words can be added or subtracted from any of them. The software package includes a program diskette and user's manual. The price is \$295.

A new Video Display/S-100 unit is now available. The Display/S-100 unit is mounted on a swivel base and includes a 12" professional green P31 phosphor CRT with 20MHZ bandwidth for high resolution. The S-100 bus is a self contained S-100 mother board with power supply and translation logic for the Sorcerer computer. The whole thing is housed in an attractive enclosure. The price is \$699.

The office of the future is here now with the Exidy Systems Inc. Multi-Net 80. This system consists of a timeshared global processor and up to 16 users which are basically single user microcomputers (Z-80 cpu and 64K RAM memory) communicating with the global processor (via high speed block transfer) over the system bus. Each user terminal is connected to a serial port on the user module and not through the system bus, reducing bus contention and operator waiting time.

The Multi-Net 80 Global Processor supports 8" Winchester hard disk drives in one to eight increments of 45 megabytes each. 8" IBM compatible floppy disk or cartridge tape can be configured for hard disk back-up. Any of the Exidy Systems Printers can be spooled off of the global processor. The user terminals (up to 16) can be Sorcerer computers used as dumb or intelligent terminals with local peripherals transferring CP/M compatible data files to the time shared hard disk and spooled printer, or communicating with other users. The Multi-Net 80 system software consists of MP/M, CP/NET and CP/NOS. Suggested retail price for a single system is \$6000, an eight user system costs \$24,500, and a sixteen user system costs \$34,100.

(continued on page 151)

ODDS & ENDS

by Ralph LaFlamme, Editor

Sorry for the lateness of this issue. Just as I was ready to start putting it together, my computer zonked out! That put me about 2 weeks behind schedule before I could get another. Assorted other problems added an additional week to that! To help keep the publishing schedule, this issue is being mailed first class to all. This will add over \$170 to our usual mailing costs for this issue!

My computer is still in ExidyLand and I don't know when I'll get it back. They had 5 computers ahead of mine to be repaired and said it would be a week to 10 days before they could get to mine! One computer repaired every 2 days or so?! Not a very impressive service department. I would like to hear from you about any dealings you may have had with Exidy Systems, Inc. Please state the reason for your contact, the type of service you received, and whether or not you were satisfied with the outcome.

Because I was behind schedule, I did not implement all the planned changes for this issue. You will find most of it, however, in the form of a 25% reduction of most of the pages (the size won't be reduced beyond this since it would become too difficult to read). This allows inclusion of more material per issue. This issue is equivalent to about 28 pages in the previous format. The extra space has allowed the inclusion of number of older unpublished submissions.

Below, I've included our 1982 publishing schedule for the next Volume. The Submissions dates are the deadlines to get your articles and ads to us for each issue, and the Publication dates are the dates the issues are scheduled to be in the mail to you. Editors and advertisers especially make note of these dates. The Newsletter is produced on a volunteer basis (me) and is requiring more time to put together since it has been growing so rapidly. Your co-operation in adhering to these deadlines would be most appreciated.

Volume	Issue	Submissions	Publication
4.1	-	Dec. 1	Jan. 15
4.2	-	Jan. 1	March 1
4.3	-	Feb. 15	April 15
4.4	-	April 1	June 1
4.5	-	May 15	July 15
4.6	-	July 1	Sept. 1
4.7	-	Aug. 15	Oct. 15
4.8	-	Oct. 1	Dec. 1

There is BIG news inside this issue for those interested in a Stringy Floppy for the Sorcerer. A unit is finally available from ASP Micro-computers. See their ad on page 137. We also have several other vendors advertising in the Apprentice for the first time. Please support them and mention that you saw their ad here.

We are shifting some responsibilities around amongst various members. This is requiring that we change our address. PLEASE NOTE OUR NEW ADDRESS: P.O. Box 33, Madison Heights, Michigan 48071.

Rudy Vener has suggested that anyone interested in the Sorcerer's Apprentice MicroNET Meeting (SAMM) get on the MicroNET system and familiarize themselves with the CB Simulator. He will prepare complete instructions on the CB Simulator and leave them on the Apprentice Mini-CBBS. Look for them there.

The latest version of Bryan Lewis' Bios for CP/M, BIOS13.ASM, is to be found on the Apprentice MiniCBBS. This file corrects the key bounce problem found in earlier versions. It's available for the taking.

Steve Guralnick is asking for contacts with people willing to rent or sell used disks. The disks MUST be Dysan, Maxell, or Scotch brand... no Verbatim! Steve is in the process of transferring from CP/M 1.4 to 2.2 and requires about 100 disks. If you can help, contact him at the address given on page 151.

Below our name on the cover, we indicate the Sorcerer's Apprentice is the name of an international computer users group and Newsletter. For those interested, I'm listing the names of the countries that make us international. We have members in the following 26 countries:

Austria, Australia, Belgium, Bermuda, Canada, Columbia, Denmark, England, France, Greece, Holland, Hong Kong, Ireland, Italy, Nepal, Netherlands, New Zealand, Norway, the Philippines, South Africa, Spain, Sweden, Switzerland, U.S.A., Venezuela, and West Germany.

Larry Stempnik, (433 Minnesota, Troy, MI 48084), has been using a Transwave K-8073 single board computer with his Sorcerer. It is based on the 8073 microprocessor with Tiny BASIC built in. It also has a real time clock, EPROM programmer, and some other nice features. It serves as a valuable supplement to the Sorcerer and is less expensive than buying a complete S-100 assembly.

Larry will provide further information if you send him a self-addressed stamped envelope with your request. Further information on the K-8073 board can be obtained from Transwaver, Cedar Valley, RD. 1, Box 489, Vanderbilt, PA 15486.

The following is a letter addressed to Don Gottwald, President of Sorcerer's Apprentice, received from Jim Frazier, 1266A Wanda, Seaside, CA. 93955. I will make comment at the end.

I was just reading your first Apprentice Post in the April 15 S.A. and thought I would try to offer a little feedback on it. I like what you are trying to do in that column. I got hooked up with the Apprentice about a year ago. I had written to the old S.U.N. using an address that I had gleaned from some Exidy literature. After several months I heard from the Apprentice that they had inherited my name on SUN's mailing list and, with a little trepidation because y'all are way over there in Michigan, I subscribed. I have not been totally satisfied with the Sorcerer's Apprentice, for reasons I will mention, but I will certainly not deprive myself of it as a source of information.

I am a beginner, a sort of person who probably represents 1/2 to 1/3 of Sorcerer owners. I am a broadcast engineer (that's what they call technicians in broadcasting) so I have a little technical knowledge that attracted me to the Sorcerer. I am out of reach of any dealer (except Radio Shack & Apple) so I am primarily a mail order consumer, and have to solve any problems myself. I have had my computer about a year and a half. It took a lot of rationalization to justify the expense of a computer, so a disk system is out of the question any time soon. I'm building a MODEM from kit to save money, bought a used WP Pac from your advertiser, Ed Mentzer, again to save money.

Sorcerer's Apprentice articles, on the average, have been too technical for me, and too disk oriented. That is why I welcome the tone of your column. Often I read a technical article and say "this doesn't make much sense now, but I might need the information some day", but just as often I find myself saying "that damn newsletter can't tell me a thing about this problem I've been trying to figure out for a month". But then I have to reflect on your remarks that the Apprentice is a volunteer activity depending on the input of participants.

It would be beneficial to the continued health of the SA if Exidy could be encouraged to make SA's address available to every Sorcerer purchaser, and perhaps vice versa. I hope every dealer would do the same.

Every Sorcerer's Apprentice mentions "services of the library", "on-line bulletin board", "technical bulletins", etc. None of this is explained. I think you had an article on the On-line bulletin board. That's about it.

You list your numbers for Source, Micronet, and something called CBBS. This is great, but it needs to be backed up with info to help people get hooked into these nets. Articles on MODEM options (kits, brand names, discount sources), how to get your Sorcerer to talk to and through a MODEM, the necessity and sources of terminal emulators, this sort of thing would be very helpful.

You see, a newsletter sort of tempts people to get back in the old pattern, like our TV's do. We sit

(continued on next page)

(continued from page 130)

back and say "OK, entertain me". What our computers are trying to tell us is "get off your a_ and run your own information system". The focus of the newsletter should be to provide the clues to help newcomers to get hooked in. Once they are started, they can seek -- and participate. You have a lot of disk articles, and columns on software like Spellbinder. Less intimate descriptions of these would be interesting. Something more oriented to people contemplating purchase, trying to compare, or just figure out if they would be of any use.

I've gotten more philosophical and less specific than I intended to. I hope I've said something you can use. I like news from Sorcerer. I would like to contact Sorcerer owners in the Monterey/Salinas area of California (about 60 miles south of Sunnyvale). Any assistance in this would be appreciated. SASE enclosed for this purpose.

P.S. After writing this, I glanced through my old issues. One thing I noticed was steady improvement. How about compiling a list of cassette recorders that people had success or failure with?

We don't usually publish letters but this one raised several points that need comment. First point: I'm sorry if the Newsletter is "too technical" for some of you. It is impossible to have every article of interest to everyone. But we try to present a mixture of articles and columns in each issue that will appeal to the novice as well as expert. Of course, an article that may be "too technical" today could be just the information you need in a month or two. So don't reject what you may not need immediately.

Second point: We can only publish what is presented for publication by our contributing editors or other articles submitted by members at large. We have made repeated requests for new editors and authors to cover various topics including articles directed to the novice. Nothing was forthcoming, therefore, Don Gottwald volunteered to do such a column. We are still interested in, and looking for, someone to write articles covering all phases of computing for the novice (as it relates to the Sorcerer computer). If you are a novice and would care to share your 'discoveries', that is quite appropriate also. The important thing is that a newcomer be given the help necessary to minimize the trauma that can be associated with being a new computer user/owner.

We are looking for Editors to cover the BASIC Pac, a column addressed to Educators, and interfacing the Sorcerer to the external world. We would also like articles on music/sound generation and voice generation/recognition. Any takers?

Beginning with the next issue, Roger Hagan, our new Business Editor, will start a new column directed to those using the Sorcerer in their business.

Third point: A very sizeable proportion of S.A. members are disk users with the largest disk system represented being the Micropolis Mod II. These members deserve to have their needs represented also. In addition, you will probably need the information if you should decide to invest in a disk system. (See the next issue for a comparison of the various disk systems that work on the Sorcerer).

Fourth point: "That damn Newsletter" won't give you an answer to a problem you are having if you keep it to yourself. We will do the best we can to help you but to do so we need your help also. Let us know it if you have a problem. If you are in a position to offer help to others, please let us know. To be fair, we haven't had the help to respond to many inquiries and have been trying to use the Newsletter to handle most of the answering. With our new format, we should be able to include more letters, queries, requests for help, etc.

Fifth point: Which brings us to a sensitive issue. We are a volunteer organization receiving no remunerations whatsoever for our efforts. We do need more help to make this organization work for all of us. We felt there was a crying need for information and help for the majority of Sorcerer users and have been doing our damndest to fill that very large void. We are too few to do it as effectively as we would like. Please help us help each other.

Sixth point: Until recently, Exidy and its dealers had been less than helpful in publicizing our existence. Exidy now publishes the Exidy System News which regularly lists our club's name and address. We have gotten some referrals by this means.

Seventh point: "The services of the library" are less than we had hoped. Bob Hageman, our Librarian, is also the club's System Operator. As such, his time has been mostly taken up by this latter function. We could use someone to be more active in the capacity of Librarian. We do have some software and publications on hand. We have not attempted to handle more up until now since we didn't have the people resources necessary. If you are interested in this position, please let us know.

The "on-line bulletin board" refers to Bob Hageman's system that is available to access by telephone through the use of a modem. We have software available for the taking by this means, as well as a message system available in the form of a program on this system called MiniCBBS. This latter program can be called up to leave messages to others and pick up messages directed your way. This is also a good means of picking up a lot of Sorcerer related information and help. There have been about 800 calls made to this message program thus far.

The "technical bulletins" are up-grades published by Exidy. They contain information on the latest revisions to the Sorcerer and usually require some type of hardware modification to a system.

Eighth point: I requested articles on the Source and MicroNET several issues ago. We still have not received any introductory articles on these systems.

We have been trying to improve each issue of the Newsletter. Glad to see you notice that we're trying.

Does anyone have a list of cassette recorders that work well with the Sorcerer? I've been using a Sankyo ST-45 with excellent results.

< < < < N O T E > > >

IT IS TIME TO RENEW!

The year is just about over and we are getting prepared for volume IV. We've got more goodies for the Sorcerer coming along in the New Year. I'm sure you won't want to miss any of it. Just turn to page 150 for the application form, fill it in, and return it to us with along with your payment as soon as possible. This will also help us by spreading out the work-load so that we don't receive everything at once. Please help us by doing it now.

While you're at it, we've made provisions for ordering back issues at the same time. If you've been meaning to complete your set of Sorcerer related newsletters, now is the time to do it. We are now sold out of Vol. I of the S.U.N. and only have limited quantities of Vol II left. We are also getting low on the Source and SA. Vol I and II. We won't have any more printed once these are sold out. So, do it now!

The following should be quite familiar to all in this age of inflation. When we started the year, we thought we had covered our costs fairly well and could get by the year without any difficulties. This has proved to be not so! Our costs have gone up quite sharply all year long. The printing and postage costs are up very significantly from a year ago when we established our prices. Other costs have been higher than anticipated also. A lot of our costs have also been unexpected. (Most of us are amateurs at this sort of thing.) The last few issues we "sweated it out", not knowing if we would have the funds to complete the volume. A few of us have had to subsidize the Newsletter by absorbing some of the costs involved. We don't want to be in the same position for 1982 so we've had to raise our membership fees accordingly. This is an unfortunate aspect of the age in which we live. We've made these increases so that we may continue to provide an informative and well presented Newsletter of which we can all be proud.

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NOTE: The Sorcerer's Apprentice reserves the right to edit or reject any advertisement, article or part thereof, submitted for publication. Although the Sorcerer's Apprentice strives for accuracy, there are not the resources available to check the accuracy of articles submitted for publication. The opinions expressed by the editors or authors are their own and not necessarily those of the Sorcerer's Apprentice.

Z-80

SORCERER I to 48K MODIFICATION

MICRO

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CP/M 2.2	with BIOS>ASM file. For use on Exidy with Micropolis hard sector only. (CP/M is a trade-mark of Digital Research)	\$190.00
Exidy 1.1 Monitor ROMS		\$ 45.00

MASTER CARD and VISA on orders of \$50.00 or more.
Shipping will be added to all orders.
California Sales Tax added for CA residents

DUSTINGS FROM THE LIBRARY

by Robert Hageman, Librarian and Sysop

In this issue I'll cover the MiniCBBS features and how to use them.

MINICBBS.COM is a name you will find listed when you request a DIRECTORY of files on the A drive. Written by Ward Christiansen, MiniCBBS is a message service program. Like it's big brother, CBBS, users call in to exchange ideas, or news, to sell or shop for things. (The program's uses are actually determined by you, the users).

You begin execution of MiniCBBS by entering it's name and a carriage return on RCPM's command line (Remote CP/M i.e. the program that answers the phone and generally acts as the system overseer). The program responds by typing the WELCOME file containing information on control characters used by MiniCBBS. Next, a BULLETIN file is displayed. This includes information about new software on the RCPM, dates of message file repacking, advisories of new DOC files, etc.

The system then asks, "What is your FIRST name?". Enter your first name followed by a carriage return. Then, "What is your LAST name?". Same format. The program then reports, "Logging name to disk...", "Next msg # will be 035 (i.e. the current number)", and "You are caller # 725 (i.e. the current number)".

MiniCBBS now prints:

FUNCTION: B,C,D,E,G,K,N,P,Q,R,S,W,X (or ? if not known)

We'll answer:

??<CR> [The system uses a '?' as a prompt and we are also entering '?' to get the list of system functions.] (See Table 1 on the next page for the list of Functions)

The following is a sample run of the MiniCBBS on another RCPM system:

(Note: Comments inside [] and <CR> are here added to the command lines for clarity but do not appear on the system.)

A>MINICBBS<CR> [do this in RCPM command level to begin the program]

(type CTL-C to skip welcome message) [you can save time if you already know the control codes]

Welcome to MINICBBS, a message service program.

--> Control Characters Accepted By This Program:

DEL/' '	Erases last char. typed (and echoes it)
CTL-H	Erases last char typed (CRT terminal)
CTL-C	Cancel current printing
CTL-K	'Kills' current function, returns to menu
CTL-R	Retypes current input line (after del)
CTL-S	Stop/start output (for CRT terminal)
CTL-U	Erase current input line

BULLETINS: [can be skipped, but may contain new information about the system or files]

]---> 8/1/81 Messages repacked #54 became #25

What is your FIRST name?BOB<CR>
What is your LAST name?HAGEMAN<CR>

Logging name to disk...
Next msg # will be 024
You are caller # 5475

FUNCTION: B,C,D,E,G,K,N,P,Q,R,S,W,X (or ? if not known)
?S;l<CR> [in vol.3 no.5 we saw the use of the ';'
to speed up input]
USE CTL-K TO ABORT, CTL-C TO SKIP, CTL-S TO PAUSE.

NO. SIZE -DATE- -----FROM----- -----TO-----

001 08 06/27/80 KEITH PETERSEN ALL
Subject:INFO/MINICBBS ON MY SYSTEM

002 16 06/27/80 KEITH PETERSEN ALL
Subject:MINICBBS FAST KEYING INPUT

-----END OF SUMMARY-----

FUNCTION: B,C,D,E,G,K,N,P,Q,R,S,W,X (or ? if not known)
?Q;l<CR>
USE CTL-K TO ABORT, CTL-C TO SKIP, CTL-S TO PAUSE.

001 INFO/MINICBBS ON MY SYSTEM
002 MINICBBS FAST KEYING INPUT
003 MINICBBS QUICK FUNCTION ABORT
004 MINICBBS SELECTIVE MSG SEARCH

-----END OF SUMMARY-----

FUNCTION: B,C,D,E,G,K,N,P,Q,R,S,W,X (or ? if not known)
?R<CR> [select retrieve function]

MSG #: to retrieve (C/R when done)?23<CR>

Msg 023 is 08 line(s) on 8/5/81 from JOHN DOE to THOMAS FOX about EXCHANGING

Tom,
I would like to arrange with you to exchange some of the Basic programs I have typed in from Basic Games for some of the Basic programs you have entered from Household Programs. John Smith said that you might be willing to do this. I'll check here later for a reply.

John Doe
123-4567

MSG #: to retrieve (C/R when done)?<CR>

FUNCTION: B,C,D,E,G,K,N,P,Q,R,S,W,X (or ? if not known)
?G;Y;08/05/81 5:35PM;;<CR> [good bye; yes I want to leave a comment; my comment is date and time; a blank line; done]

ENTER YOUR COMMENTS.

Use control-U to cancel (ignore) a line, and DEL or ctl-H to back up (and echo) a char. Each line may be up to 60 char long (Bell sounds after 55)

ENTER OK - [the comment was really entered above]
CHARACTER COUNTS: 51 typed by you, 4836 typed by system.

FROM KEITH:
Thanks for calling, BOB

RETURNING TO CP/M...

A> [this prompt tells you the program has returned to the RCPM command mode]

End of sample run.

EXPERT user mode results in prompts as follows:

FUNCTION: B,C,D,E,G,K,N,P,Q,R,S,W,X (or ? if not known)
?x<CR> [enter expert user mode]

FUNCTION:?:s;l<CR> [the new prompt line uses no headers or command list since it assumes you know what they are and when to use them]

001 08 06/27/80 KEITH PETERSEN ALL

Subject:INFO/MINICBBS ON MY SYSTEM

002 16 06/27/80 KEITH PETERSEN ALL

Subject:MINICBBS FAST KEYING INPUT

FUNCTION:?:q;l<CR>

001 INFO/MINICBBS ON MY SYSTEM [no headers or command list]

002 MINICBBS FAST KEYING INPUT

003 MINICBBS QUICK FUNCTION ABORT

004 MINICBBS SELECTIVE MSG SEARCH

FUNCTION:?:r<CR>

MSG #:?:23<CR> [the reminder to end the R function with a <CR> is dropped, and message 23 is retrieved just as in the sample run above]

Next issue I'll cover the message editor and the CP/M communications programs, XMODEM and PLINK, as well as the preparation, sending, and receiving of files to both an RCPM and MiniCBBS.

(continued on page 134)

----FUNCTIONS SUPPORTED----

- B=Reprint bulletin -- [displays the same bulletins as at sign-on]
- C=Case switch (upper/lower) -- [sets upper or upper & lower case in display]
- D=Duplex switch (echo/no echo) -- [sets duplex like the switch on your modem]
- E=Enter msg into system -- [takes you into the message editor mode]
- G=Good bye (return to CP/M) -- ['G', not BYE, is used to exit to CP/M]
- K=Kill msg from system -- [removes a message file]
- N=Nulls: Set 0 to 9 as req'd -- [slow printers need these]
- P=Prompt switch (Bell on/off) -- [turns BELL prompt off or on as desired]
- Q=Quick summary (Msg #, subject) -- [see example]
- R=Retrieve msgs by # -- [see example]
- S=Summarize msgs -- [see example]
- W=Reprint welcome -- [displays the same WELCOME as at sign-on]
- X=Expert user mode -- [shortens prompts, thereby saving time on-line]

Table 1. Summary of functions supported on MiniCBBS.

THE 'MO' MYSTERY SOLVED

by Donald Despres

In issue 1.6 of the Sorcerer's Apprentice, Dave Bristor asks for information on the ... ?MO ERROR ... I too was mystified when this came up many times. In my naive way, I thought maybe these silly computers suffered from transposition problems like some of us. I went on my way, scratching my head or just ignoring the problem, and went on to other program explorations. It was reasonable for me to accept that ?MO was a 2nd way of saying ?OM to warn, "Out of Memory, Mr. Owner."

Not so though. We know that ?MO isn't in the Exidy manual. But I found the secret in William Barden, Jr.'s book published by Radio Shack, **Programming Techniques for Level II BASIC**, page 176 and 177. (I would recommend the book for other Sorcerer novices.)

?MO ... means you have a Missing Operand in a mathematical expression and so the math operation you're trying to do cannot be done.

Barden gives the following example:

100 A = (5 + 32) / ┌
└

That's your Missing Operand

What is strange is that looking at the line number identified in the ERROR message on the screen, didn't reveal things were missing from the math expressions. Not knowing the meaning of the code sidetracked my thinking. Chalk up another fact and a lesson in my programming tool-bag.

If you have the new Exidy BASIC manual, you will find this information in Appendix E, page 69. You owners who only have the 1st BASIC manual (A Short Tour of BASIC), may want to add a note to that that edition's Appendix D, page D-2.

I do appreciate what other owners send in about troubles, facts and tricks.

Donald Despres, 6444 Deep Calm, Columbia, MD 21045

HARDWARE NOTES

by Russell Frew, Hardware Editor

What is video RAM anyway and what is it doing in my computer? This question usually comes up when someone is faced with the problem of why they can't put 64k of RAM in their computer. As they rip through their manuals they find a memory map that shows 4k of memory allocated to video. What does video use it for?

The video space in memory is mapped from F080H to FFFFH. Only the section from F080H to F7FEH is actually used in the video display, the remaining addresses are used for the ASCII PROM's, the standard graphic set and the user-defined graphics. These areas are not really video RAM but rather support video RAM in a way I'll discuss in a minute.

As most of us know, each character on the screen is made up of dots in an 8x8 array. One byte of 8 bits is necessary for each row of dots therefore 8 bytes are needed for each character on the screen. If we fill the screen with 64 characters per line by 30 lines long we have a total of 15,360 bytes of information. Some users with only 16k of memory would almost have more storage on the screen than in program memory! But if you look at the memory map again you see that somehow we've managed to stuff 15k of display information into less than 2000 bytes of RAM.

How did Exidy do it? They used the same trick with video that they used with ROM BASIC. Each character in video RAM is an ASCII token which represents the actual character. The token provides a pointer to the 8 successive memory locations in the ASCII PROMs where the pattern of the character is actually stored. Because we really don't have 1920 different characters, only 768 bytes of address space are needed to represent all the letters and symbols. In the process we have saved a vast amount of memory for program use and at the same time sped up the display rate.

A good example of how this works is with the user-defined graphic set. An 8x8 graphic is created by allowing the bits in 8 bytes to represent the dots on the screen. When you've got your 8 bytes programmed, they are assigned to a single graphic-shift key (our token). Each time that key is pressed, those same 8 bytes are transferred to the screen at the current cursor location. At the same time a special graphic token is stored in that video RAM location. Every time the screen is refreshed our token points to the portion of memory that contains our 8 bytes and they are again read out to the video monitor. Your monitor must be rewritten completely every 1/60th of a second to keep the image from fading. This process is called video refresh.

As many of you know, TV monitors don't really function on a string of 1's and 0's. They require an analog signal with a lot more information than our 8 bytes. Next time I'll tell you how the composite video signal is generated and alert you to some errors in the Technical Manual.

DISK NOTES

by Bryan Lewis, CP/M Editor

This month I'll try to restrict my longwindedness to three short topics.

(1) I've received several complaints of key bounce with my BIOS for CP/M 1.4. Yes, you're right. The root of the problem is as follows. The input routine scans the keyboard twice, one quick scan to distinguish special keys like ESC and R/S, which aren't distinguished by the Exidy Monitor, then again by calling the standard KEYBRD routine in the Monitor. Trying to read the same key twice in a row, separated by a finite time interval, causes a sensitivity to bouncy key contacts.

The solution is: don't try to separate the R/S key, don't convert it to a CTRL-S. When the R/S key is pressed during a screen display, just go into a local do-nothing loop until another key is pressed.

I've sent the new version, BIOS13, to the **Apprentice** for posting on the Bulletin Board. Or it can be ordered through the mail (on a Micropolis or 8" disk along with installation instructions) by sending \$20 to me in care of the **Apprentice**.

(continued on page 136)

SORCERER COMPETITION

SYSTEM SOFTWARE
1 KENT STREET, BICTON
WESTERN AUSTRALIA 6157
TELEPHONE: ISD (619) STD (09) 339 3842
Sunday through to Friday.
Ask for Richard Swannell for personal service.

SUPER ASTEROIDS by Apollo 'A new era in real time graphic arcade games'.

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!

Cassette \$29.95

COMPETITION

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.

SECTION 1: Games - Any type of game will be accepted although we recommend the arcade styles such as Asteroids or Adventure games.

SECTION 2: Utilities - Here a wide range of options is available including Graphics, Plotting, Assemblers, Mini Compilers, Printer Drivers and Disk Utilities.

SECTION 3: Educational - Anything from child education in Maths and Spelling to computing such as the Machine Code tutorials.

SECTION 4: Serious Applications - This may include Data Base programs, Accounting Systems (both cassette and disk based), Maths and Scientific packages, Astronomy and other special purpose applications.

SECTION 5: Miscellaneous - Anything not covered above such as Novelty Programs, Hardware/Software combinations, Sound Generation and Wordprocessor programs would come under this section.

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.

At least one (1) winning entry will be taken from each section.

The Judges' decisions will be final and no correspondence will be entered into.

A prize of \$500.00 will be awarded to each winning entry.

Only winning entries will become the property of System Software.

The names of all programmers submitting winning entries will be published in a subsequent catalogue unless otherwise requested.

ZAP80 'Secret Code Disassembler' by Ian Robinson

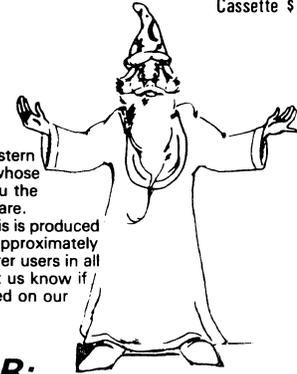
This is far from your average run-of-the-mill disassembler! Other than being a mere 4K long, able to disassemble at the speed of light and packed with options, ZAP80 will display before your very eyes all those unknown instructions ZILOG never talk about! Ian has been doing extensive research into the 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?

ZAP80 will disassemble ANY code sequence. Nothing is illegal! It will allow you to program with codes that no other disassembler can decipher! Think about that

ZAP80 comes with documentation and explanation of all new mnemonics used. Three versions are supplied that reside in low, mid and high memory. Options include ASCII output, screen pause and customised printer control.

Whether you are a serious programmer, a beginner or simply curious, ZAP80 is a piece of software you must have. Come and play a REAL adventure game!

Cassette \$24.95



We are a dynamic Western Australian enterprise whose sole aim is to bring you the best in Sorcerer software. A catalogue such as this is produced regularly and sent to approximately 2000 interested Sorcerer users in all parts of the world. Let us know if you wish to be included on our mailing list.

HOW TO ORDER:

ALL PRICES ARE IN AUSTRALIAN DOLLARS.

One Australian dollar equals 1.16 American and 1.4 Canadian.

All programs come standard on cassette but some may be requested on either Micropolis II Quad density or VISTA 5 1/4" diskettes for an additional cost of \$5.00 per diskette. Note that more than one program will fit on a diskette. Programs available on diskette include CIRCUS, GALAXIANS, GROTKNIK WARS and ZAP80.

\$2 discount if this form is used. (Photostat will suffice).

PROGRAM	PRICE
Postage within Australia is \$1 for initial item and 50c for each additional. Outside Australia is \$2 and 50c.	
Less \$2 Discount	\$2.00
TOTAL	

I enclose,

(a) Cheque or money order for the above amount, or

(b) My credit card, expiry date
(Master Charge, Visa, Bankcard, American Express, Diners Club)

No.
My name and address:

NAME:

STREET:

TOWN/CITY:

POSTCODE: COUNTRY:

(continued from page 134)

(2) The next two items are hints on using DDT.COM, the CP/M debugger utility. This first hint I found in **Lifelines**, in a note by Tom Cochran. It tells how to make the output of DDT's dump command (D) fit within a 64-character screen (instead of wrapping around as it does now because it's designed for 80-wide screens). Proceed as follows:

```
A>DDT DDT.COM          Put DDT.COM in low memory for surgery.
-S0A17                Change address 0A17 ...
0A17 05 08            ... from a 5 to an 8.
0A18 08 .
-G0                   Exit.
A>SAVE 19 DDT2.COM    Save the new version.
```

This patch removes the spaces between the hex values in the dump output.

(3) Another problem with DDT (a bug in fact) is that you can't insert a file with the I command, unless the file is on the current disk. So if you're working on the A: drive when you activate DDT, you can't use 'I' to read in a file from the B: drive. (At least not without exiting and re-executing DDT.)

You can get around that by poking the desired drive number directly into the file control block, using the 'S' command:

```
A>DDT                A: is the current drive.
-IB:FILENAME.TYP    If we try to read a file on B:, it
-R                  won't work, DDT will look on A:
?                   and won't find it.
-IFILENAME.TYP      Instead, after the I command,
-S5C                Substitute at location 5C the drive
005C 00 02          number we want: 1 = A, 2 = B, etc.
005D 46 .
-R                  Now the Read command will look in the
                    right place.
```

Using the Relocated Word Processor Pac with CP/M

by Bryan Lewis

The relocated Pac (see Larry Stempnik's January article) can be put on disk to save you the time of loading it from cassette. But its value is more than that: it can be used to transfer your old cassette files to disk, for access by Spellbinder. (They can be transferred without any special software, but this is easier.)

To put the Pac on CP/M:

```
Boot CP/M.
Exit to the Monitor (by RESETting, for one way.)
>LO                ;Load the Pac from cassette.
>MO 5000 7100 200  ;Move it down to 200H.
>EN 100            ;Enter a relocating routine:
0100: 21 00 02 11 00 50 01 FF 21 ED B0 C3 00 50 /
>EN 206            ;Change the exit from Monitor...
0206: C3 00 00    ; to CP/M.
>GO 0              ;Back to CP/M.
A>SAVE 35 PAC.COM ;And save it.
```

The remainder is necessary only if you want the file-saving feature. I use the 'O' command of the Pac. While the Pac is sitting at 200H as above, enter the following hex code:

```
2290: 0C 0D 0A 43 50 2F 4D 20 43 4F 4E 56 45 52 54 45
22A0: 52 0D 0A 45 4E 54 45 52 20 4E 41 4D 45 20 46 4F
22B0: 52 20 44 49 53 4B 20 46 49 4C 45 3A 20 20 24 00
22C0: 11 90 70 0E 09 CD 05 00 21 00 02 36 0E 23 36 00
22D0: 2B EB 0E 0A CD 05 00 21 10 02 36 00 06 0B 23 36
22E0: 20 10 FB 06 15 23 36 00 10 FB 11 11 02 21 02 02
22F0: 3A 03 02 FE 3A 3A 01 02 47 C2 09 71 3A 02 02 D6
2300: 41 CD D0 71 21 04 02 05 05 7E FE 2E C2 1F 71 23
2310: 11 19 02 05 7E 12 13 23 05 CA 26 71 C3 14 71 12
2320: 23 13 05 C2 09 71 11 10 02 0E 16 CD 05 00 21 0F
2330: 08 CD 66 71 E5 11 80 00 01 80 00 ED B0 11 10 02
2340: 0E 15 CD 05 00 CD 7F 71 E1 01 80 00 3E 03 ED A1
2350: CA 59 71 EA 4E 71 C3 34 71 0E 10 11 10 02 CD 05
2360: 00 C3 03 50 00 00 21 0F 08 3E 03 ED A1 20 FC 36
2370: 0E E5 D1 13 01 20 00 ED B0 36 1A 21 0F 08 C9 B7
2380: C8 11 90 71 0E 09 CD 05 00 C3 00 00 00 00 00 00
2390: 0D 0A 0A 0A 44 49 53 4B 20 57 52 49 54 45 20 45
23A0: 52 52 4F 52 2E 2E 2E 0D 0A 20 20 20 44 69 73
23B0: 6B 20 6F 72 20 64 69 72 65 63 74 6F 72 79 20 66
23C0: 75 6C 6C 3F 0D 0A 0A 24 00 00 00 00 00 00 00 00
23D0: C5 D5 5F 16 00 0E 0E CD 05 00 D1 C1 C9 00 00 00
```

```
>EN 116E                ;Finally, change 'O' command.
116E: C0 70 /
>GO 0                   ;Save as above.
A>SAVE 35 PAC.COM
```

To use it, just type PAC under CP/M. Load a cassette file with the Pac's R command, then give the command O. The new routine will ask you for the file name, save the text as a CP/M file, and return to the Pac.

FEEDBACK

On the membership form found on page 150, you are asked for feedback on your interests, as well as what topics or articles you like and don't like. We invite you to use an additional sheet of paper to add as many extra comments as you can. We don't get much feedback on what we are doing and would appreciate as much detail as you can provide.

SYSTEM 3 REVIEW

by Eric Burgess

I recently bought a copy of System Software's SYSTEM 3 and have used it for editing and debugging old programs and writing new ones. The program is excellent and far superior to SYSTEM 2 which I have had for some time. All the Word Processor-type commands on the keypad, can be used in the EDIT mode. SYSTEM 3 adds some 15 new commands. REN allows renumbering of lines in selected increments and between limits. TRACE displays the logical flow of a running program and can be from a selected line or for the whole program. HELP is particularly useful when you get an error message; it flags the location in the line where the computer sees the problem. FIND also is terrific. It allows you to find anything in the program, listing all the lines in which a specified variable, string, or expression occurs.

The values of numeric or string variables can be listed as they are currently defined either during a run or at the end of a program. This is a very useful debugging tool. Groups of lines can be deleted, blanks can be closed up to free memory, and there is a Centronics driver. Other printer drivers can also be accommodated. You can verify CLOAD without losing a program if there is a CRC error, and most importantly, you can MERGE two programs into one. An excellent feature lets you recover a program after CLOAD, NEW or RESET.

One word of warning. I have run into difficulties if I tried to load SYSTEM 3 after I had loaded the program I wanted to work on. SYSTEM 3 must be loaded first because it relocates itself to high memory.

I have found my programming and debugging time is very much reduced with this program, and have experienced no difficulties with it. It runs smoothly and does all that it is claimed for it by System Software. (See page 135 for their address.)

THE HIGH COST OF HIGH SPEED

Until recently, to realise the power of the Sorcerer you required an S100 Expansion Unit plus floppy disk drive and controller. Now Exidy's direct plug-in drive provides a less expensive alternative. But the investment is still significant, and who wants only ONE drive!

There had to be a cheaper method of high speed storage.

So as the Australian Distributor for the various versions of the Exatron Stringy Floppy, we decided to design a special version for the Sorcerer.

STRINGY FLOPPY

STRINGY FLOPPY is a high speed digital tape transport system for storing programs and data entirely under the control of the computer. There are no controls to adjust, just one light indicating the drive is in operation and another indicating that data is being written onto wafer. Drives are individually packaged and connected to the Controller via a narrow ribbon cable.

WAFERS - NOT CASSETTES

STRINGY FLOPPY stores data on specially designed "Wafers" about the size of a credit card and 5mm. thick. These contain an endless loop of special chromium dioxide tape ranging in length from 1.6 to 23 metres. Their low mass means they operate reliably at high speed.

Removal of a reflective label protects them against accidental overwriting of data.

The special tape and true digital recording technique (like floppy disks) means reliability. STRINGY FLOPPY does not use fluctuating audio tone like cassettes.

LOW MAINTENANCE DRIVE UNIT

The STRINGY FLOPPY Wafer has the pressure roller for the capstan built in. So the capstan and the record head are fixed in the die-cast aluminium drive.

No adjustments required.

The Wafer just slides into the Drive and "clicks" home.

No other mechanical motion is required. And because Wafers contain endless loops, the tape always travels in the same direction.

There is no need for rewind capability. Standard speed is 25 cm/second, and fast forward (25% faster) is implemented where appropriate to speed throughput.

Simplicity means reliability.

RECORDING SPEED DENSITY

STRINGY FLOPPY records at 8500 baud (850 characters per second). 28 times faster than the Sorcerer's lower tape rate, 7 times faster than its higher tape rate. On a 23 metre Wafer you can fit approximately 75K.

CONTROLLER

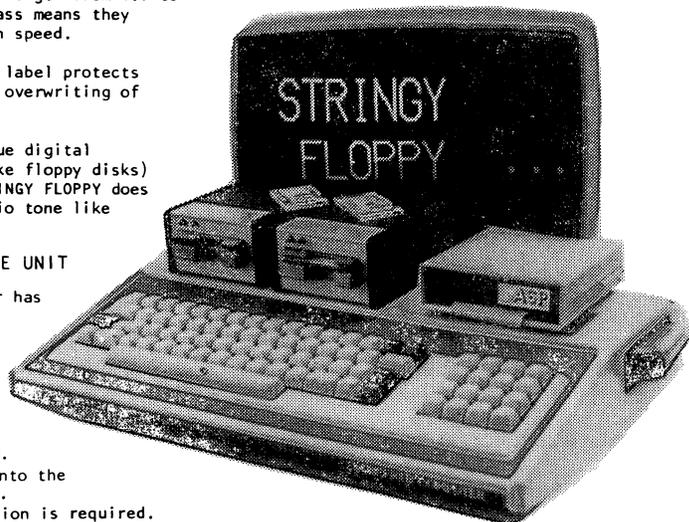
The compact STRINGY FLOPPY Controller plugs directly into the 50 way connector on the back of the Sorcerer. If you already have accessories plugged into this connector, a 2 for 1 bus extender is available for \$A35. The Controller will handle one or two STRINGY FLOPPY Drives.

STRINGY FLOPPY FOR SORCERER

Power to the Controller is provided by a plug pack. STRINGY FLOPPY Drives draw their power from the Controller. In operation the Controller turns off the Sorcerer's random access memory between 46K and 48K to accommodate a 2K read only memory (ROM) in the Controller. This ROM contains firmware routines to integrate the Sorcerer to the STRINGY FLOPPY.

MONITOR

Also included with STRINGY FLOPPY are two further ROMs to replace the Monitor program in the Sorcerer. Known bugs in the Monitor are corrected and routines included to allow computer input/output to be directed to tape or STRINGY FLOPPY using the SET Command. If STRINGY FLOPPY is plugged in at power up I/O is set initially to STRINGY FLOPPY. Others sell Monitors without the original bugs for around \$100. Ours is included in the price of STRINGY FLOPPY.



MONITOR/BASIC

STRINGY FLOPPY may be used from either the Monitor or Basic. Wafers may be certified, programs saved or loaded. Up to 127 files may be stored on a Wafer (subject to capacity).

EXTRA SOFTWARE INCLUDED

To make room for our Monitor enhancements, we had to leave out the Sorcerer's memory test. So with each STRINGY FLOPPY we include a much more comprehensive Memory Test on Wafer. In addition, to enhance Sorcerer Basic we include a Data I/O Program that allows high speed storage of String Arrays on Wafers. Full instructions and a demonstration program are included.

WORD PROCESSOR PAC

As in the case of disk systems used with the Sorcerer, a patch program must be loaded from STRINGY FLOPPY to assign Exidy's Word Processor Pac input/output to

STRINGY FLOPPY. This takes only a few seconds. The patch program is \$A50. Remember to order it if you use the Pac with your Sorcerer.

PRICE

To be honest it couldn't be done for the price of the Tandy version. After all you get a replacement Monitor correcting known bugs, implementation of the fast forward capability of the Drive, a Data I/O capability, comprehensive Memory Test, higher data density, AND a separate Controller design allowing low cost addition of a second Drive. So although the initial cost may be higher, the cost of a two Drive system is substantially lower.

Including an initial supply of 5 Wafers STRINGY FLOPPY for the Sorcerer is \$A339 (Australian Dollars). And the extra Drive is \$A157. If you order as a two Drive system at \$A496 we'll include an extra 5 Wafers on us. Add \$A10 for surface mail from Australia to the USA, or \$A39 for airmail (both including insurance). Extra Wafers are available within the USA from Exatron Inc.

If you need more detailed information, Manuals are available separately for \$A20 including air mail postage.

A 6 month limited warranty applies to Drive and Controller.

All prices are Australian Dollars, and Bank Drafts must be in Australian Dollars.

Orders may also be placed on your VISA or MASTERCARD card by forwarding signed order quoting full name, address, Card Number, and Expiry Date.

ASP MICROCOMPUTERS

ASP is an electronic distributor and design company based in a suburb of Melbourne in beautiful Australia. Having experienced the problems of inadequate attention from overseas suppliers ourselves we are particularly mindful of our obligations to our customers. We aim to establish a substantial export market for our products.

Note: Sorcerer and Word Processor Pac are products, and no doubt trademarks of, Exidy Inc. Stringy Floppy is a Trademark of Exatron Inc.

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SUPER-X EDITOR

Reviewed by Don Myklebust

Super-X, written by Billy Tan and Bob Stafford and distributed by Arrington Software Service, is, for me, the vindication for the frustration of long hours of retyping whole lines, (sometimes whole programs), wondering if, just maybe, I shouldn't have bought a TRS-80, after all. As we all know, while the Microsoft ROMPAC BASIC is a pretty good package, containing many features unavailable in some larger programs intended for S-100 systems and the like, it lacks the program handling features such as an editor, renumberer, auto line numbering and selective listing found in the other appliance machines like TRS-80 Level II and PET. Super-X, in just 2K of code, gives you those functions and more.

You can edit, renumber, auto line, selective list, search for any string (or character), recover program from RESET, NEW, or CLOAD, find the address of any line or the end-of-file, selectively delete blocks of lines, append a program from tape to the one in memory, compact the program by removing REM's and/or spaces, execute Monitor commands while in BASIC, and call Monitor commands easily from BASIC programs. Good, huh?

The editor is a screen editor like the PET's and, in my opinion, is easier to use and less error-prone than the line editor used by the TRS-80 and Exidy Extended BASIC. To use it, just move the flashing block cursor around with the shift/keypad arrows and repeat key. The functions are as follows:

CTRL D Deletes character.
CTRL ^ Inserts characters until ESCAPE or RUN/STOP or (more often since a usually unwanted space is left) CTRL D is hit.
CTRL T Truncates line from cursor position.
CTRL RUB Erases line from screen. Also replaces '@' function 'REDO FROM START RETURN'.
CTRL R Disables Super-X to BASIC.
CTRL B Disables Super-X and executes BASIC statement in cursor line.
CTRL TAB Enables Super-X after CTRL R or B.
CTRL X Exit from Super-X, requires Monitor command to restart.
TAB Tabs 8 columns. 1st tab goes just beyond line number.
SHIFT/TAB Return to column 1.

Although not mentioned in the documentation, I've also found that typing a new number over an existing one inserts the new line while leaving the old one intact. This is useful for repetitive lines. Level II won't allow this, while Exidy Extended will (using CTRL A).

Other functions are:

#L n1 n2 List lines n1 through n2. Omitting n2 lists 1 line.
#S n "... Search for string from line n. Omitting n searches from start. Substituting / for " allows search for string within quotes.
#R Recovers lost program if only the link bytes are zeroed and memory not otherwise corrupted.
@ n1 n2 Numbers screen from n1, increment n2. Omitting n2 numbers from n1, increment 10. Omitting n1 numbers from 0, increment 10.
CTRL M Pressing CTRL M after Monitor command executes that command from BASIC.
#U Request utilities as follows:
R n1 n2 n3 n4 Renumber from n1 by n2 starting from n3 and finishing with n4. R n1 n2 does whole program.
D n1 n2 Deletes lines n1 through n2. Omitting n2 deletes n1 only.
M n1 Merge program from tape unit n1.
C Compact program by removing spaces.
CR Remove REM's as well.

The documentation includes a BASIC routine for calling Monitor commands from a BASIC program through Super-X.

The only problem I've found so far isn't all that much of a problem. It's just that the editor only works on one screen line at a time. First of all, you have to remember that only the line containing the cursor gets changed when you hit RETURN. So, if you have a program line that, written out, is longer than 63 characters, you must allow for this. For example, to edit a long line that you have typed using a lot of graphic commands that, after listing, wraps around to, say, 100 characters, you must either replace the commands with the corresponding graphic character, or drop down to the 2nd half and insert a line number. Which way I go depends primarily on whether the commands will still operate properly (usually will), and how long the second half is. All that took much longer to explain than it does to accomplish, and I've found that it hasn't slowed my writing down more than a couple milliseconds.

By way of explaining how well I like this fine utility, the Super-X tape has been sitting in the number 2 recorder for about 2 weeks, now.

Don Myklebust, 19710 Guthrie, Strathmore, Ca. 93267

AUTOMATIC LOADING of SYSTEM TWO

by Bradley Perkins

I am an impatient person and as such do not like to spend the time with the loading procedure for Systems Software's SYSTEM TWO. The following procedure used with the COPIER program, by Paul Miller, listed on page 16 of Volume 3, Number 1 of the Sorcerer's Apprentice will do this for you.

Place a blank tape in the recorder and enter the monitor. Advance the tape beyond the leader. This method uses the monitor's BATCH tape system. Type:

```
>CR<cr>
*EN 0<cr>
[Note that if you do not
have motor control, start the
tape just before you type
<cr> after each '*' command
line, and stop the recorder
when a new '*' appears]
*3E E7 32 01 F0 C3 03 E0 /<cr>
*MO <n>F000 <n>FFF F700<cr>
[Note <n> depends on which
version of SYSTEM TWO
you have: 1 for 8K, 3 for
16K, 7 for 32K, and B for
48K]
*GO 0<cr>
*LO<cr>
*<cr>
```

At this point remove the tape from the recorder. Using the COPIER program load the SYSTEM TWO program into the memory. When that program tells you to prepare the tape to save the program, put the original tape back in and save the SYSTEM TWO. Then type:

```
>CR<cr>
*OV<cr>
*OV<cr>
[Note that two OV com-
mands are needed because the
system will ignore the first
one.]
*<cr>
```

To load the system start in Basic and type:

```
BYE<cr>
>BA<cr>
```

When loading is completed the system will clear the screen and print:

READY

Note that while the BATCH tape system uses motor control to load the commands, you can run this batch tape without motor control because there are no long periods when the computer is running without the recorder in this tape.

Bradley Perkins, 3299 Montgomery Way, Apt S-31, Sacramento, CA 95817

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The 16K **EXMEM** is \$129.00 plus \$5.00 postage. Easy to follow full fitting instructions are included.

* * * * *

<<<<< **CUSTOM CHARACTER SETS** >>>>>

Allows an alternative set of characters for special applications. The extra set is switch selectable. There are several sets already available. Each set consists of 96 characters.

British - This includes the pound sign
French - The Franc sign, and the three French accents
German - All the German character set
Math/Greek - All the math symbols and full Greek alphabet
Legal - This includes Copyright and Registered notices

These sets are designed to work with standard Daisy printwheels. The user is provided with the original character set and one alternative set.

Custom character sets can be made upon request at a charge of \$1.80 per character.

Fitting is easy and requires NO soldering.

The price is only \$41.49 plus \$4.00 for Airmail postage and packing. Also available for the Apple, Pet, and Tandy. Please specify which character set is required when ordering.

All prices are in U.S. dollars. (Exidy is a trademark of Exidy Systems, Inc.; Apple is a trademark of Apple, Inc.; Pet is a trademark of Commodore).

Trade Enquiries are Welcome - Telephone Dublin 803429

Send all enquiries and orders to:

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IRELAND

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. (0)

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.

CIRCUS is another great game by Martin Seviar, 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. Seviar's graphics are excellent.

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. (C)

DATABASE SYSTEM II saves and loads its data files on both cassette and any CP/M disk. The software is sent on cassette, loaded with the Monitor >LO command, and placed on disk with >SAVE 27 DATABASE.COM. This is a powerful database program and an exceptional value. We are proud to offer this CP/M product.

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=U SR(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. Owners of CASST who would like to upgrade to this new version, please send \$3.00 for the cost of the tape and postage. (C)

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.

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.

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!!!

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.

SORCERY BREWS is a book of programming tricks specific to the Sorcerer. This ready reference of valuable examples simplifies programming efforts and improves both professional appearance and performance. The book is now at the publisher and will be available for distribution by the first of November. Believe me, YOU'LL USE THIS BOOK!

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.

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.

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.

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 co-ordinates 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. Co-ordinates 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?

PIANO PLAYER is an option for the Music System 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. How many of you still do not have our Music System? Many respond that it is the most sensational piece of software they have seen for the Sorcerer. 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!

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.

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OSI SOFTWARE FOR THE SORCERER

by Larry Stempnik

Ohio Scientific BASIC tapes can be loaded into the Sorcerer without any extra hardware. There are over 100 programs available from OSI. Many cost about \$7. They may seem simple compared to some of the more complex Sorcerer programs, but if an OSI BASIC tape seems interesting to you, buy it and try it. They are another source of software for the Sorcerer and offer programs in areas of interest where no one else does.

As an experiment, I purchased three OSI tapes. They were French (339), Statistics (519), and Spelling (333). One did not require any change and the other two each required a very minor change.

There are **three techniques** I know of to load OSI tapes into the Sorcerer. Software is required because the tapes are recorded at 300 baud in ASCII without tokens. Between each line are 10 nulls, a line feed, and return.

The **first method** is to modify the tape input routine so that BASIC thinks the input is being typed in on the keyboard as the tape is played. In addition to OSI tapes, this method can be used to load Sorcerer created ASCII tapes from BASIC program run or list outputs, or WP output. Refer to the April, 1980 issue of the Sorcerer Computer Users of Australia for complete details and program.

A **second method** is to use an ASCII tape loader program to enter the input into the relocated Word Processor. I think this method is better because it permits editing of errors before BASIC modifies or rejects the line. The following input technique is from the May, 1980 issue of SCUA. Load your BASIC PAC and the relocated Word Processor. In the Edit mode, write one line of spaces. In Command mode, enter T <cr> H <cr> 100U <cr> . This will create 100 blank lines of spaces only. Enter the following program using the EN monitor command.

```
EN 0
E5 F5 21 10 08 CD 0F E0 F5 F5 CD 1B E0 F1 FE 00
28 05 F1 77 23 18 EE F1 F1 E1 C3 03 E0/
```

GO 0 and play tape. Press ESC at end of tape. GO 5003 to warm start WP at 5000-7000. The WP will change all nulls and line feeds to returns. They can be removed using the Global Search and Replace program but they won't cause any problem if you just leave them alone. After editing, go to command mode, type J, and transfer to BASIC. LIST and RUN to verify the program runs correctly.

The **third method** is to use a tape recorder to RS232 circuit which converts the 1200/2400 Hz tones of 300 baud tapes to RS232 voltage levels. This permits loading the tapes directly into a Quality Software Smart Terminal file for later downloading to either BASIC or WP. Jerry Rynkowski lent me his circuit to try this method.

To create tapes with this OSI format from BASIC, set output to the Exidy serial printer driver or equivalent. Type T=1 and return to BASIC. Type NULL 10. Turn on recorder and push record button. Type list and save the output on tape. Sending output to the serial printer will also send it to the tape recorder.

APPRENTICE PORT

by Don Gottwald, President

First I would like to correct some errors in the last column. The stack is approximately 128 bytes long and is located 128 bytes below the top of RAM. 100 hex is 256 decimal, not 255.

I'll continue the theme begun in the last issue by introducing you to some machines language and hardware terms. Don't be intimidated by these, they are not as difficult as they sound.

To start off with, let's look at page 56 & 57 of "A Guided Tour of Personal Computing" (B-1 and B-2 in older issues). There you'll find a table of Z-80 CPU assembler instructions. The listing under the OBJ CODE heading is the hexadecimal representation of the assembly language mnemonics (abbreviated instructions) found under the SOURCE STATEMENT heading.

Machine language programming is done in assembly language where the source code (assembly language program) is converted, i.e. assembled, to the Object Code, i.e. the machine executable program. We will not need an assembler for the small program segments and utilities which are covered by these articles. We will hand assemble them.

Some understanding of hardware fundamentals is essential for anyone

contemplating programming in machine code. It is beyond the scope of this article to cover all details of the Z-80 architecture, or even to act as anything more than just a cursory introduction to programming in machine code. The interested reader should consult any one of the many texts available on this subject.

The Z-80 microprocessor has several hardware registers which store address locations and/or data. The A register, also known as the accumulator, is the main register. Most of the instructions you will encounter will in some way affect the A register. In addition, there are the B, C, D, E, H and L registers. Each register can store eight bits i.e. addresses 0 to 255 or any one of 256 types of instructions are possible (0 to FF hex). But we have addresses which go as high as 65535 decimal. The Z-80 microprocessor uses the B&C, D&E, H&L registers in pairs, allowing us

to address sixteen bits. This permits extension of the range from 0 to 65535. (There are additional registers which we will cover another time.)

The architecture of this micro-computer system consist of the Z-80 MPU (MicroProcessor Unit), which implements a CPU (Central Processing Unit) on a single chip. The MPU also includes an ALU (Arithmetic Logic Unit), the internal registers mentioned above, and a CU (Control Unit) which co-ordinates the sequences of events for the whole system.

External to the MPU is the quartz crystal which serves as the timing reference for the on-board clock-oscillator. The MPU handles three buses (communication lines used in common by many parts of the processor): an 8-bit bidirectional DATA bus, a 16-bit unidirectional ADDRESS bus and a CONTROL bus.

The DATA bus carries the data being exchanged by the various elements of the system. Usually, it carries data from the CPU to the memory, or from the memory to the MPU, or from the CPU to an I/O (input/output) chip. The ADDRESS bus carries an address generated by the CPU. This address specifies the source or destination of the data being transferred along the data bus. The CONTROL bus carries the various system synchronization signals.

Some of the other elements of the system include ROM (Read-Only Memory), RAM (Random-Access Memory), PIO's (Parallel Input/Output), UART (Universal Asynchronous Receiver-Transmitter), buffers, drivers and decoders (MUX). The ROM memory chip is non-volatile. Its contents are permanent and do not disappear when power is removed from the circuit. ROM chips normally contain a startup program (bootstrap) that allows initial system operation (initialization). An example is the Monitor program in your Sorcerer.

RAM memory contents must be loaded prior to use from an external device such as the keyboard, as when entering programs, or loaded from tape or disk.

The PIO chip(s) allows for parallel input/output operation and connects to all three buses. It provides at least two 16-bit ports for communication with external devices.

A UART, is simply a parallel-to-serial and serial-to-parallel converter. It converts the parallel output of the CPU to a serial stream (or vice versa) for communicating with an external device, such as a tape recorder or modem.

Each bus is isolated from the rest of the system via buffer chips. Buffering is necessary to prevent unwanted interaction within the system and from outside of the system by isolating signals from one another. Some signals may need amplifying by drivers.

Decoders (MUX) are needed by memory chips and the CPU in order for the right information to be transferred to or from the correct system component (i.e. memory, internal registers, etc.).

PASCAL PORT

by Daniel Conde

I would like to talk about some of the common pitfalls Pascal programmers make.

Having various procedures and functions that 'hide' the work they do is a convenient, and also a 'better' way to program, but it may also isolate you from knowing how your data is behaving. As you may know, Pascal allows two different types of parameters to routines. They are the **variable** and **value** parameters, where the actual value held in the variable is allowed to be changed in a routine if it is a **variable** parameter, and is NOT if it is a **value** parameter.

Variable parameters are declared in a routine with a "VAR" preceding it, and is best thought as an **address** of a variable being passed. Variable parameters, as handy as they are for allowing a function to change their values, such as in an **initialization** routine, may also ruin a program if the routine has a bug in it. One way, to debug such a program, is to separately run each of the procedures you have with a dummy driver program that calls it with known and tested parameters. The best way, though, is to write correct procedures from the beginning. (Quite easy to say, but rare in practice.)

It is a good idea to use **FUNCTIONS** instead of **PROCEDURES** if you want to acquire a new value after a call. This practice also tends to make these functions more specialized, by doing only one function, as the name implies, rather than trying to be an all-purpose handy procedure that some **PROCEDURES** try to be. As an example, compare these segments of a program:

```
-----
scan_range := range(my_ship,enemy_ship);
if (scan_range < LIMIT) then begin
    hit := fire(scan_range);
    enemy_shield:=enemy_shield - hit;
end
else my_ship := move(my_ship);
-----
take_turn(my_ship,enemy_shield,enemy_ship);
-----
```

With individual functions, each of them could be tested easier, and the written functions may come in handy in other parts of the program as well.

In the second case, **my_ship** and **enemy_shield** needs to be a VAR parameter, if the routine is to do the same job the first example had done. It may look more compact, but **my_ship** may, in the course of all the calculations done in the procedure, acquire a **wrong** value, and we may not know it until some fluke in the running of the program.

Some extremists call for using VAR parameters as seldom as possible, but think that will make some programs look awkward. I think that testing things out in small functions, and then combining them later when you are sure of their reliability, is the best, and proven, way. It is always easier to rearrange a piece of **proven** code, rather than to look at a piece of buggy code as in the first example, and then combine it into a neat package later.

THINKER TOYS DISK JOCKEY 2D FLOPPY DISK CONTROLLER BOARD

With a TT DJ 2D Model B Rev. 2 Controller Board

The Exidy Sorcerer computer as shipped cannot be expected to work reliably with the Thinker Toys Disk Jockey 2D floppy disk controller board. The reason for this incompatibility is that the Exidy Sorcerer uses the Z-80 CPU to refresh its own internal dynamic RAM memory. This practice, which is not in adherence with the proposed IEEE standard for the S-100 bus, presents the risk of losing RAM data if the PREADY line, S-100 line 72, is brought low for any significant length of time. When the PREADY line is low, no CPU generated refresh can take place.

The Disk Jockey 2D controller uses the PREADY line to synchronize data transfer between the floppy disk and memory. The worst case specification for the time during which the RAM chips used in the Exidy are guaranteed to hold their data is exceeded during Disk Jockey 2D data transfer. Though typically the parts used by Exidy can exceed specification by an order of magnitude, it would be irresponsible on the part of Thinker Toys to guarantee reliable operation under all electrical and environmental conditions.

Therefore, Thinker Toys can only guarantee the compatibility between the Exidy Sorcerer and the Disk Jockey 2D controller if no internal RAM memory is used in the Sorcerer. All RAM must be S-100 extender box occupied by the Disk Jockey controller. This RAM may be dynamic if it utilizes on-board refresh.

The Disk Jockey 1D, the Thinker Toys single density disk controller board, asserts PREADY for a shorter period than the double density board and has been found to work with high reliability on the Exidy Sorcerer. This is partially due to the very high quality of the dynamic RAM chips used by Exidy in their machine. Thinker Toys continues to guarantee this product for use with the Exidy Sorcerer.

The following modification must be made on the Exidy CPU board in order to disable internal RAM so that external RAM only may be used. Locate IC 10A on the Exidy CPU board (the CPU board is the huge PC board inside the Exidy to which the transformer is attached). IC 10A is a 74LS32. It is located in the

first row of IC's (closest to the front of the Exidy) and is approximately in the middle of the row.

Locate pin 8 of IC 10A (called RAM DR.NOT). Looking from the front of the Exidy, pin 8 is the pin on the left (transformer side) rear corner of the IC. With a razor cutter, cut the trace on the PC board which comes from pin 8 (this trace goes left from pin 8 for about 1/4 inch, passing under a filter cap before disappearing underneath the PC board).

Locate IC 13C. This is a 74LS241 and is the left most IC on the third row. Locate pin 1 of IC 13C (also RAM DR.NOT). This is the right front pin. Jumper this pin or the trace going to this pin to +5VDC. The trace just in front of pin 1's trace and going to pin 20 of IC 13C (the front left pin) carries +5VDC.

My TT DJ 2D Model B rev. 1 works fine with my Exidy. I have 32K on the "mother" and 20K in the S-100 box.

Donald Halford, 1492 Columbine Ave.
Boulder, CO. 80302

RANDOM I/O

This is a new column for letters to the editor and communications between members. If you need help with specific problems, or you would like to comment on items of interest, please write us and we'll try to publish them.

A member living in Nepal would like information on a good single-stepping circuit for the Sorcerer. He needs it for troubleshooting purposes. Please write, c/o the Apprentice, if you can help.

Another member would like to know if anyone has used the following command: CLEAR xx,yy where xx is the amount of space to clear and yy is the pointer to inform the Basic where top of memory is located.

Attention users in Grand Rapids, MI. Dennis Scarff would like to meet you. He is interested in starting a group of interested Sorcerers in that area. We'll forward your communication if you're interested.

If you need to contact someone at Sorcerer's Apprentice by telephone, call Don Gottwald between 6:00 p.m. and 10:00 p.m. E.S.T.

Robert Lansdale, 18 Ashfield Drive, Etobicoke, ON, CANADA M9C 4T6, says he is interested in trading programs with other members. He has an assortment of 250 programs for the Sorcerer and 55 other programs. Contact him for details.

EDITORS NOTE: The Sorcerer's Apprentice will not knowingly be a party to trading of copyrighted materials in any form. We do recognize that many programs exist in the public domain. Many of these are just waiting for someone to key-in and modify to run on the Sorcerer. We sincerely hope all of our members adhere to this policy.

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Both the above games come complete with a digital-to-analog sound generator (printed circuit board assembled) that plugs directly into the Sorcerer Parallel Port. All that is required is an audio amplifier and you're away to the races. Fully compatible with other software being currently sold. There is also provision to hook TWO joysticks for game input control. NOTE: The two programs supplied do not utilize joysticks.

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This system will enhance and allow you full use of Exidy ROM PAC BASIC with disk R/W routines. Are you doing it the old way? Very cumbersome to save BASIC programs. Well, at least you now can update and do it the easy way. EDC comes on 5¼ inch disk (16-sectored Micropolis). (ML) SPECIAL OFFER **\$59.95** U.S.

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IMPROVED GLOBAL SEARCH AND REPLACE FOR WORD PROCESSOR

by Larry Stempnik, Technical Director

How would you like to search a 48k file and replace a frequently used character with another in less than 2 seconds? Or, would you like to remove carriage returns from a WP text?

In the first case, you can only change 250 characters at a time with the "S" command and it is slow when you have a large file. In the second case you can't use the "S" command.

Here is a fast, relocatable program you can use with your WP PAC to change text. It will change carriage returns as well as other non-printing hex codes.

To use the program, exit the WP with the "X" command, enter the program below, and GO 20. After making the replacement, the program will return to the WP with the text modified. Any **from/to** character codes may be used. Be careful, since the text may be modified in ways you hadn't intended. Back up your file on tape before changing it, in case of errors or a crash.

The program calculates the length of the file as the contents of 074A/B hex minus 080FH. This length is stored in BC. HL is set to start of text at 080FH. The program then compares the text to the search character and replaces it if the comparison shows them to be equal. HL is incremented and BC is decremented to 0. The program then jumps to C003, the WP PAC warm start.

To use the program as a general purpose editor, set BC=length, HL=start, and end to C3 03 E0 for Monitor warm start. The search character is stored in 0032H and is replaced by the character in 0036H. The following example changes all CR's to '!'.

```

0020: E5      PUSH HL          ;SAVE
0021: C5      PUSH BC          ;AGAIN
0022: 2A4A07  LD HL,(074A)    ;GET END OF WP TEXT
0025: 010F08  LD BC,080F      ;LOAD START OF WP TEXT
0028: A7      AND A           ;CLEAR CARRY FLAG
0029: ED42    SBC HL,BC       ;HL=(END-START)
002B: E5      PUSH HL
002C: C1      POP BC         ;BC=LENGTH OF TEXT
002D: 210F08  LD HL,080F      ;LOAD START OF TEXT
0030: 7E      LD A,(HL)       ;GET CHAR
0031: FE0D    CP 0D           ;IS IT <CR>?
0033: 2002    JR NZ,02 (0037) ;NO, DO NOT REPLACE
0035: 3621    LD (HL),21      ;YES, REPLACE WITH '!'
0037: 23      INC HL          ;NEXT ADDRESS
0038: 0B      DEC BC         ;LOWER BYTE COUNT
0039: 78      LD A,B         ;ZERO YET?
003A: B1      OR C           ;NO, LOOP
003B: 20F3    JR NZ,F3 (0030) ;YES, EXIT. RESTORING
003D: C1      POP BC
003E: E1      POP HL
003F: C303C0  JP C003         ;WARM START WP
    
```

EVALUATIONS

by Emiliano C. DeLaurentiis

So, you have been using The Word Processor Pac (WP Pac) or Spellbinder, but you (or your secretary) still have trouble remembering those editing commands. Well, Arkay Engravers Inc. (Box 916, 2073 Newbridge Road, Bellmore, NY 11710) has the solution in the form of custom keytops for the Sorcerer. These come in a variety of colors, as their ads indicate, although red is suggested. I have been using the red keytops with the WP Pac for several weeks now, and I must agree with Arkay...they do make use of the WP Pac easier.

The quality of the keytops is comparable to that of Exidy's standard keytops. The lettering is clear and, like Exidy's, engraved so that the letters will not erase on the keytops.

Arkay will also custom engrave keytops for you. So if your daily use of the Sorcerer consists of playing Galaxians, then you could have arrow keys engraved "left", "right" and the space bar engraved "fire". I would recommend, though, that keytops be engraved for the most used application, otherwise the keyboard will become cluttered and confusing, especially if it is to be used in an office by non-DP personnel. In this respect, it is ideally suited for a text editor such as Spellbinder which can be used to produce files for any application. It is also highly recommended that you purchase the keys which have the original characters engraved on the front of the key. Unless you do so, it will be difficult to remember what the original keys held.

By the way, with Exidy Systems' new extended Disk Word Processor (an extension of Spellbinder) the Arkay keys would not be required as a memory help, since this WP has a help facility which diagrams the numeric keypad on the bottom half of the video screen. In command mode, it lists the commands. The Arkay keys would then simply be a cosmetic nicety.

EDITOR'S NOTE: Don Gottwald has been using keys done in the original Exidy color while I've been using red. I find the red keys show up their markings much better than the beige. We've found them quite helpful and well worth the cost.

Northamerican Software (P.O. Box 1173, Station 'B', Downsview, Ontario, Canada, M3H 5V6) markets an Audio/Joystick interface which plugs into the parallel port and allows simultaneous use of both sound and joystick control. The assembled unit costs US\$ 24.95. Clearly, its advantage over Howard Arrington's Music board is that both joysticks and music may be used together in programs. Northamerican Software has improved the filtering technique so that the sound is clearer and has considerably less hiss than Arrington's board. Furthermore, the sound generator chip on the board is socketed so that replacement, if needed, would be a very simple matter.

Does this mean that one should purchase the unit from Northamerican Software rather than from Arrington? Do so only if you intend to write all your own software. Northamerican does not produce any documentation on how to produce Music, nor do they provide the Music generation software that Howard Arrington does. But since Howard's software operates with Northamerican's board, and since the joystick meets the standard published in the Sorcerer's Apprentice, my recommendation is to purchase Howard's software and Northamerican's hardware. This way you get the best of both.

Northamerican Software markets two game programs, ECHO and SPIDER which makes use of sound. Both are available for US\$ 49.95, including the audio/joystick interface.

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BITS AND BYTES

by Jonathan Burnett

This column's title refers to the elementary participants in Assembly Language Coding (ALC). The primary purpose of this column will be to explain and demonstrate the Development Pac operations, so you may begin to realize the full potential of your machine!

The largest quantity that Z-80 ALC can manipulate directly is only two bytes long. "So why", might you ask, "should I use this 'language'? How could one possibly do anything 'important' with such a capability???"

Well, deep down inside your SORCERER, there is an integrated microprocessor called the Z-80. This device is capable of carrying out more than 150 primary instructions (with an average execution speed of 4 microseconds each)! Assembly language provides you with a 'direct' method of controlling these functions.

Now, there are those of you who will say, "But who cares? My Basic Pac lets me do anything (almost), and I never get concerned about 'bits & bytes!'".

Very true! Basic does permit you to do very complex operations with relatively few instructions, and with only an understanding of the desired end result... But, there is a price you must pay!

Basic is an English based language. Hence, the statements are usually bulky. Basic interpreters also fragment your available RAM, so that its management chores can be minimized. And to accomplish these management tasks, it requires work areas, blocks of pointers, and even pointers to pointers!

As implied above, Basic is a piece of software that's busy just trying to keep track of your program. Each operation in Basic is actually a machine language routine made up of possibly hundreds of instructions. This length is not necessarily due to the gross complexity of these operations. These routines were coded for intentional flexibility. Practically every Basic command must be able to function in conjunction with any other verb. Hence, not many operations were coded to be as streamlined as possible. All of this has resulted in a staggering amount of overhead.

I've read quotes of speed differences in excess of 300 times faster with the use of ALC over the use of Basic. But don't just take my word for it. I'am going to give you an opportunity to prove it for yourself.

As you might have determined by my preceding comments, the purpose of this column will be to acquaint you with the wondrous capabilities of Z-80 Assembly Language. It is not my intention to dissuade you from using Basic, for it is, indeed, a useful and appropriate language for many applications. However, there is nothing you can do in Basic that cannot be done in ALC. Indeed, there are some things you can only do with ALC!

In order to use this language easily, you will require the services of an 'Assembler'. Unless you are fortunate enough to own a disk-based system, you will require the use of EXIDY's Z-80 Development Pac.

Here is a simple Basic program, written in a fairly compact style. Its length is 83 bytes, however, the total system overhead is approximately 438 bytes.

```
10 PRINTCHR$(12);      50 NEXTX:NEXTY
20 FORY=1TO30          60 PRINTCHR$(17);CHR$(1);
30 FORX=1TO64          70 GOTO70
40 PRINT"1";
```

Now type: RUN <CR>

It takes approximately 9 seconds for it to run. It accomplishes a task several game programs require before the play begins. (NOTE: Use the CNTL-C key to break out)

Key in the machine language program found in Figure 1. Its length is only 18 bytes (with a total system overhead of ...18 bytes)!

```
0 1 2 3 4 5 6 7 8 9 A B C D E F
0000: CD 09 E0 28 FB FE 1B CA 03 E0 21 80 F0 11 81 F0
0010: 01 80 07 77 ED B0 18 E8
```

Figure 1. Machine language example.

Now type: GO 0 <CR>

Nothing happens?! ...Well, just press the Graphics key and the '-' key on the numeric keypad and, at the same time, try counting to 10!

If that did nothing at all, you may safely skip the rest of this article!

If on the other hand, you are like most Basic programmers, I can only hope you've caught your breath by now!

This little sample program does a little more than its Basic counterpart. Just press any of the other keys on the keyboard as fast as you can. You will notice that it keeps up with you pretty well. Now this demonstration has some practical value as well. If you haven't done so yet, press the SPACE bar. "Oh, it 'just' clears the screen!", you say. Yes it does, but unlike the Basic CLEAR key or PRINT CHR\$(12), it leaves the user definable graphics area intact. (EXIDY

MONITOR ROMS Ver. 1.1 do this also). This could save you redundant reprogramming of the graphics, (which in a Basic program, takes a noticeable amount of time). By the way, pressing the ESC key will exit you back to the Monitor.

Next issue, I'll take you one step at a time through the generation of the above 'Object code' (don't worry, we'll define all these terms as we use them). We will also take a tour through the Development Pac, showing you how to use it and how to avoid a few dangerous pitfalls. So, until then, get a copy of Rodney Zak's book, **Programming The Z-80**, (I recommend it highly), and prepare for an exciting adventure!

THE WORD PROCESSING CORNER

#16 - by Steven Guralnick

As mentioned previously, I am going to devote the next few columns to software which supports word processing. In commercial applications especially, it is just not enough to have good word processing software, not even a program as good as SPELLBINDER. It will turn out vast quantities of printed material, but if you have input typographical errors or spelling errors, you need more than SPELLBINDER.

Now available is a superb program called SPELLCHECK. SPELLCHECK is a dictionary program which will proof a SPELLBINDER file and then report back any words which it cannot find in its dictionary. There are three possibilities for a mismatch: 1) the word is correctly spelled but is not in the dictionary; 2) the word is in the dictionary but incorrectly spelled; or 3) the word is correctly spelled, not in the dictionary, and you do not want it in the dictionary (proper names are a good example). After displaying the mismatches, SPELLCHECK gives the user the opportunity to a) add the word to the dictionary, b) have the word marked in the text because there is an error in it, and c) ignore the word altogether. Incidentally, by using the caret mark (^) to mark the typos, you can then very quickly proof the text by doing a succession of "F" commands and the cursor will jump forward to the next mark. The mark, incidentally, replaces the last character of the word. For that reason, the diskfile size will not change. This means that very large files can be proofed and restructured on disk with the proofing marks, particularly if you elect not to make a backup file.

To give you some idea of the speed with which this program operates, we have a very large file, about 25,000 words, and SPELLCHECK does the initial run-through in about two minutes. If words are to be marked, it takes another three or four minutes, using our Sorcerer and Micropolis drives.

The program is fully menu-driven. I cannot say enough for it. I do not recommend this for the occasional letter to Aunt Minnie but it sure does take a load off your mind if you

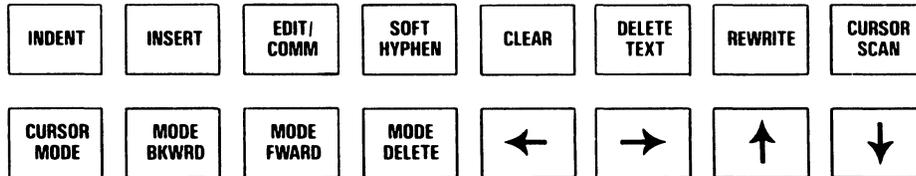
(continued on page 151)

EXIDY SORCERER USERS

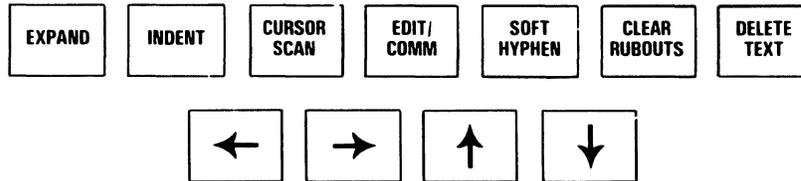
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(continued from page 148)

are regularly working with text files and don't have a lot of money to hire a whole gang of proofreaders who probably will miss several errors anyway. We have saved so many hundreds of hours of time that I know it has paid for itself several times over. This program can be obtained from Mentzer Electronics.

Banking

I don't review software very often and, frankly, I approach software reviews by others with occasional suspicion. The software never seems to work quite as well (or as badly) as they say it does.

My criterion is that I have to work with the program for some time. It has to be friendly to the user, produce the desired results, and be reasonably well error-trapped.

This group of programs, called "Banking", keeps meticulous track of all of our checks, meets my criteria and then some and I recommend it to you without qualification. We input into the program all of our drawn checks, including the date, the payee, the amount, and the code number of the account you want to be charged. There is a chart of accounts which comes with the program and you can modify that very easily. When you input the payroll account number, the program will automatically prompt for the various withholdings.

At any time, you can obtain a detailed printout of all the checks from the beginning or for a specified month or group of months. You can also do an audit run of accounts, so you can see immediately which checks you have charged to which account.

The program is also excellent for keeping your checkbook accurate. Every time you input a check (or deposit) the new bank balance is displayed on the screen and is also displayed on the printouts, associated with each check. If you make an error, you can correct the entry. If the error involves the amount, there is a routine for re-balancing.

This is a super set of programs written in Micropolis BASIC and available for either the Mod I or Mod II drives. The set is available for the trivial sum of \$75.00 and can be obtained from: G. B. Lenz, 3231 Vinyard, #42, Pleasanton, California 94566. His telephone number is (415) 846-8406. If you are looking for some good software written in Micropolis BASIC, this is it.

Steven Guralnick, 375 South Mayfair Ave., # 205, Daly City, CA 94015

4TH TIP

by Tim Huang, FORTH Editor

The Screen Editor - Part 1

Confucius once said, "If one wants his work to be done better, he must first sharpen his tools."

There is a very big difference between FORTH and other languages.

When using other languages, you are limited by the tools someone else has provided in their implementation. If everything you need is there, you are lucky, otherwise, too bad! This is not the case with FORTH.

FORTH provides the programmer with a very powerful **mothering** tool. You are now capable of creating your own individualized tools, whatever your particular needs. You can even make a new version of FORTH (e.g. meta-FORTH). FORTH programming is very much a form of 'tool building'. It's been estimated that over 80% of the time spent programming in FORTH was for this purpose. Let us therefore, examine a tool which I believe nobody can live without.

A good Editor can make your life much easier. Surprisingly, FORTH can be used to write its own Editor. What's more, it can be done rather simply. I recommend that everyone using FORTH write their own Editor. By doing so, you are not only building yourself something useful, but the process itself will teach you a lot about FORTH.

The line Editor, provided in Screens 87 to 97 in the Installation Manual, show exactly how this primitive Editor was written. The whole Editor can be put into a VOCABULARY called EDITOR and only the family name (i.e. EDITOR) will be in the FORTH VOCABULARY before you call it up. The rest of the member words will be hidden inside until you want them. You do this by typing the word : EDITOR <cr> .

Any of you who have had experience with CP/M's ED.COM, already know how terrible that Editor is. Unfortunately, fig-FORTH's line Editor is in the same class. A screen editor is much better than these line orientated ones. Any microcomputer with memory mapped video should take every advantage of it. It is so much easier to use those arrows on the numeric keypad to direct the cursor to any location on the screen.

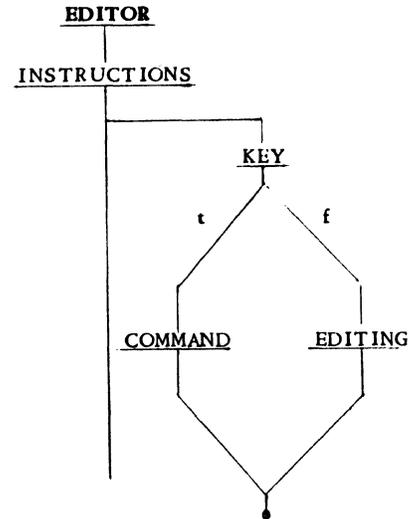
So, the first things we would like to build as part of our EDITOR are the cursor control words. CRTXY is a good name for addressing the cursor by given x and y coordinates. However, I am not going to write down every word's definition here. This would simply take too much space. I will make a copy of the EDITOR available to the Sorcerer's Apprentice to put on-line.

But before we get ourselves bogged down in too many details, let's back up one step. Let's consider what we would like included in the Editor. I think the Editor should have at least two major modes, -- Command and Editing modes, just like the Word Processor Pac or Spellbinder. With the Command mode, we can set the TAB, load a printer driver routine, do formatting, set printer parameters, do copying,...etc. You are limited only by your imagination.

In the Editing mode, we will need all kinds of tools to help us. These are: text inputting, string searching/replacing, making insertions and deletions, tabbing,... etc. It would also be nice to have automatic line

wraparound and the cursor's position constantly displayed by column and row.

Here is a simple D-chart for the above:



Then the Screen Editor can be defined as:

(Top down)

```

: EDITOR
  INSTRUCTION
  INITIALIZATION
  BEGIN
    KEY ( choice )
  IF
    COMMAND
  ELSE
    EDITING
  THEN
  AGAIN ;

```

The whole Editor uses only 10 words, WOW!!!!

Next issue, I will fill in some of the details for this Editor. Until then, may FORTH be with you.

(continued from page 129)

In addition, Exidy Systems Inc. has announced an agreement with CompuServe Inc. to offer the CompuServe Information Services with the sale of Exidy Systems Terminal Pac. The Terminal Pac contains the software to configure the Sorcerer computer as a standard ASCII terminal which will be compatible with CompuServe's national home information communications network. The purchaser will receive one free hour of connect time between the hours of 6:00 pm and 5:00 am weekdays and 24 hour service on weekends and most holidays. Instructions for gaining access to the CompuServe system, as well as a password are contained in the Terminal Pac's instruction manual provided.

Exidy Systems Inc. and Hertz Corporation have concluded an arrangement whereby their commercial leasing division will provide lease financing for Exidy System's products sold by Exidy Systems nationwide dealer network. So you no longer have a reason not to automate your small business or manufacturing operation. Just contact your local Exidy Systems dealer for all the details.

Members of the **Sorcerer's Apprentice User's Group** are entitled to 8 issues of the group's Newsletter, the **SORCERER'S APPRENTICE**; the services of the library; access to its on-line CP/M based Computer Bulletin Board Service; other services as they become available.

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