

SORCERER'S APPRENTICETM

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GALAXIANS ATTACK!

It is the year 1981, and Earth radar has detected the presence of Aliens swiftly approaching a defenseless planet. Their origin is unknown, and their behavior patterns a mystery, but Earth must defend itself at all costs.

Unknown to the general population, the governments of this planet swiftly distributed computer defense systems to all Sorcerers. Their distributor, Howard Arrington, hopes to save us from these mysterious GALAXIANS.

As the GALAXIANS set up their formations above the Earth, Sorcerers prepare their laser turrets in anticipation of this moment of glory. Alas, several of these despicable aliens commence their descent into the waiting fire of Sorcerer lasers. As they disintegrate from the onslaught of Sorcerer vengeance, more GALAXIANS swoop down like hawks preparing to kill their prey.

The Sorcerers swiftly realize, as more GALAXIANS break formation to devour their guns, that these are not mere INVADERS attacking in monotonous synchrony, but highly intelligent creatures from a distant galaxy. Although some of them resemble Earth creatures, such as the butterfly and bat, their behavior is more cunning, and highly planned. After all, what but such a creature would sacrifice its own life for the benefit of its species. After the passage of the initial formation, the Sorcerers regretfully realize that the GALAXIANS dive directly into the Earth laser guns so that their comrades may continue the onslaught.

In 1981 the GALAXIANS continue to invade Earth, and the Sorcerers fight on to save our dear planet. To date, one Sorcerer, Emiliano, has obtained a score of 15,140 in his fight against the GALAXIANS. Have other Sorcerers killed more?

ODDS & ENDS - by Ralph LaFlamme, Editor

Here we are in September already! It certainly has been a fast year. There are only two more issues to go before the end of this volume.

With the end of the year fast approaching, there will again be a membership form included beginning with the next issue. This will cover membership for the 1982 calendar year.

It happened again! It required 24 pages to handle all the columns and ads, and some still had to be left out! The Newsletter just keeps growin' along.

I've enjoyed 'toying' with the format of each issue. Beginning with the next issue, there will be quite a change of format. Graphic arts equipment and supplies have been purchased to improve the layout. It means more work for yours truly, but I think the results will be worth it.

In conjunction with this change of format, I must announce that all articles and advertisements **MUST be received two weeks earlier than announced in issue 3.2.** This means that it is already too late for issue 3.7 submissions. The deadline for issue 3.8 is now **October 15th.** Please get them in **early.**

The planning of content and format for the next volume is now underway. You have now had a chance to assess six issues from the present volume. **Please** let me know what changes or additions you would like to see made. In order to be responsive to your needs and interests, I need your input.

With the next issue, Jonathan Burnett will start a new Development Pac column. Welcome aboard Jonathan!

On page 69 of issue 3.4, Bryan Lewis stated that you would need to use PIP *.* to copy a disk since DISKCOPY would not work with the Micropolis modification which shuts down the drives when they are not being accessed. I have found the following procedure allows this program to be used:

Call up the DISKCOPY program then put the disk to be copied (source disk) in drive A and the destination disk in drive B. Now when you get the prompt, "Are you ready?", type Y <CR> quickly before the drive shuts down, otherwise the system will respond with a "Drive not up error on source diskette". If you miss it the first time, enter Y <CR> again when you get the "More?" prompt.
NOTE: The SHIFT LOCK key **must** be down for this to work.

As you read through this issue, you will note that we have some new advertisers (and more coming in the next issue). We have had many requests to carry more advertisements. Besides keeping you abreast of products currently available for the Sorcerer, advertising also helps us defray the very sizeable expenses incurred in getting this Newsletter to you. If you are aware of any vendors of Sorcerer products who don't presently advertise in this Newsletter, please send me their names. We would ask that you support our advertisers and mention that you saw their ad in this Newsletter. If you have an unreasonable amount of difficulty with an advertiser, please let us know that also.

=====
NOTE: The Sorcerer's Apprentice reserves the right to edit or reject any 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 each author is their own and is not necessarily that of the Sorcerer's Apprentice.

HARDWARE NOTES - by Russell Frew, Hardware Editor

On 11 Oct 1980 the FCC adopted new regulations to restrict or reduce the interference produced by certain electrical devices to include all "new" home computers. If your Sorcerer is in the same room as your TV, interference is probably not news to you. The continual hashing of your TV, particularly between the VHF channels 2-5, is due to RF interference (RFI) created by the high speed switching of the logic and the Electromagnetic interference (EMI) that is coupled with it.

Compared to most computers on which I've seen test data, the Sorcerer is a very quiet computer. Exidy was careful in their design to install a single network EMI/RFI filter on the power line to reduce interference coming into the computer which might cause transient malfunctions. At that time no one was worried about what went out of the computer. Fortunately, the single network filter does provide some protection back down the power line but that is not really the direction it was designed to work in. The FCC Level B standard for home computer emissions holds interference levels below 250 microvolts. That may not sound like much but when compared to the energy of a typical TV signal at your antenna, microvolts can get pretty significant.

Identifying the problem was fairly easy. The fix, if you are plagued by interference, may not be quite as easy. The first thing to do is separate your Sorcerer and your TV. Keep antenna lead-in wires away from your computer. Interference is a function of distance just like any other RF signal. Next, if possible, keep your TV and computer on different house circuits. Don't let your house wiring carry EMI directly to your TV. If isolation, both physical and electrical, don't do the job, you have only two real options left, shielding or additional filtering.

If the problem seems to be power line oriented and you can't isolate the TV power line from the computer, consider a dual network EMI filter. These are designed to stop EMI in both directions on the power line. On the other hand, if your problem looks like an RF problem, shielding is the only answer.

Try getting as much grounded metal around the computer as possible. The shielding of the antenna lead-in wire should be carefully reviewed. There is even a new cloth on the market called Thorstrand that is made especially for EMI attenuation. You may be able to artistically drape this around your computer, for up to 60 dB of attenuation, while pleasing your wife at the same time.

For a free catalog of EMI filters contact Stanford Applied Engineering at (408) 988-0700. For further information on Thorstrand, call Hexcel at (415) 828-4200.

(This topic is covered in more detail in Steve Ciarcia's article **Electromagnetic Interference** on page 48 of the January 1981 issue of **BYTE**. - RL)

THE WORD PROCESSOR SORT

At last a speedy Z-80 sort routine that integrates with the Exidy Word Processor Pac as a new command. Menu driven, extremely flexible, allowing multiline records in many formats. Sorts on any word in the record. Turns the Word Processor into the easiest-to-use mailing list and data base system available to Exidy users. Specify memory size, cassette or disk. Supplied on cassette for both. If ordering for disk use, specify where you locate you DOS and cold boot programs so that we may supply a version which does not conflict. \$47.50 with instructions.

ROGER HAGAN ASSOCIATES
THE DECISION EDIT
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56K MODIFICATION FOR THE SORCERER I AND II - by Ed Mentzer

PURPOSE: To allow the user to have 56K of RAM memory and the Micropolis disk controller at FC00 hex (user graphics RAM area).

The Sorcerer has a signal called UP8K to keep the user out of the top 8K of address space (E000-FFFF hex). This modification allows the Micropolis disk controller to be placed at FC00 hex. One chip was added to further decode the UP8K signal from FC00-FFFF hex. A switch was added to allow normal graphics or disk operation. A debounce circuit, the 470 ohm resistor and 1 uF cap, was added so that the switch could be operated without affecting program operation.

In the Sorcerer I (32K), the chip was put into a socket and stuck up-side-down to the board with double sided foam tape and wired to the points as shown in the schematic. The ROM Pac holder must be removed to get at the pins of IC 3E. The inverter at 1A was a spare prior to this modification. Do not forget to connect VCC and GND to the 74LS11.

In the Sorcerer II (48K), the chip was added to the spare IC at location 12A. I put pin 1 of the 74LS11 to pin 1 of the spare space and then jumped pin 7 of the 74LS11 to pin 8 of the spare space. This will put VCC and GND on the proper pins of the 74LS11

To check the modification, put the switch in the NORM position and make sure the Sorcerer works the same as before doing the mod. Be sure to check the user graphics.

To check the disk, you will have to change the boot address of the Micropolis controller to FC00. If your old boot address was BC00, remove all address straps at W-1 thru W-4 and reconnect pins 2 and 4 on 8D of the controller. The boot address will now be FC00 hex. Put the switch into the disk position and type a GO FC00. The disk should now boot.

You can still use the ROM PACs with this modification, but then you will only have 48K of RAM for user programs. If you have RAM in the S-100 expansion unit from C000 to DFFF hex (the Pac area), it will be disabled when you plug a Pac into the Sorcerer. When using any of the PACs, you must use a 47K or smaller CP/M system to allow for the PAC stack area. If you have Mentzer Electronics CP/M 2.2, you can generate a 48K or 56K system without the PAC in. If you have Exidy or Lifeboat 1.4 CP/M, you must stay at least 1K below maximum memory.

Some programs, such as Spellbinder and the WP Pac, use the user graphics area only when booting. To load these programs, boot the system, set the switch to normal, hit the reset keys, set the switch back to disk, and use the Exidy Monitor to: GO 100.

Exidy BASIC programs such as games can be saved on the CP/M disks using the following routine:

Exidy and Micropolis CP/M to Exidy BASIC Pac

TO SAVE AN EXIDY BASIC PROGRAM ON DISK:

1. Place BASIC Pac in Sorcerer.
2. Power up Computer.
3. Type BYE <CR>. This will put you into the Exidy Monitor.
4. Type GO to the CP/M boot address. - e.g. GO BC00.
5. Press both RESET buttons on the Exidy. This will return you to the BASIC Pac.
6. Type CLOAD to load your BASIC program from tape. Do NOT run the program.
7. Type BYE <CR>. Again this will return you to the Monitor.
8. Type GO 0. This is the warm boot address for CP/M. You will get the CP/M prompt >A.
9. Type SAVE XX PROGRAM.COM where XX is the number of 256 BYTE blocks that the program occupies and PROGRAM.COM is the Program Name plus the CP/M .COM. You can get the number of 256 Byte blocks from the Exidy Tape File Header. This will save your program on the disk.

(continued on next page)

(56K MOD continued)

TO LOAD A PROGRAM FROM DISK:

1. Put the BASIC Pac in the computer.
2. Turn on the computer.
3. Type BYE <CR> to enter the Monitor.
4. Type GO to the CP/M Boot address.
5. In response to the CP/M prompt >A, type the PROGRAM name without the .COM. This will load your BASIC Program into the Computer. The Computer will respond with "READY". Now type RUN. This should LOAD and RUN your program.

In Figures 1 and 2 below, X=74LS11 IC, VCC+5V goes to PIN 14, and GND goes to PIN 7.

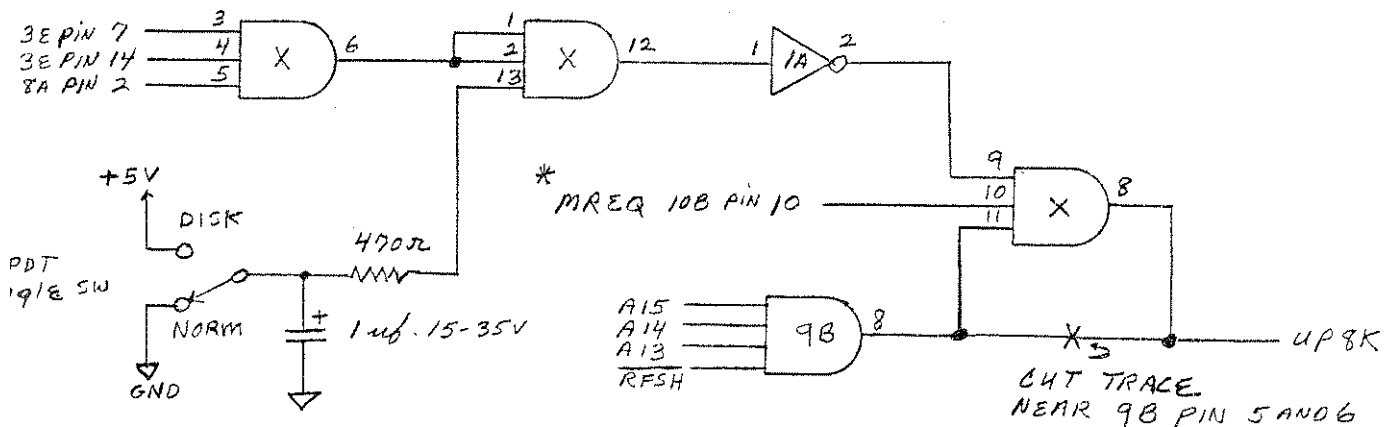


Figure 1. Sorcerer I (32K) modification.

In the Sorcerer I modification, Figure 1, *MREQ should be **anded** with UP8K to eliminate S-100 problems. See Exidy Technical Note #2 for further details. Cut the trace as shown by the X above. This is the same trace cut as shown in Tech Note #2. **NOTE:** Do NOT do the Tech Note #2 modification if you are going to do this 56K modification. Use a dipped Tantalum cap for the debounce circuit.

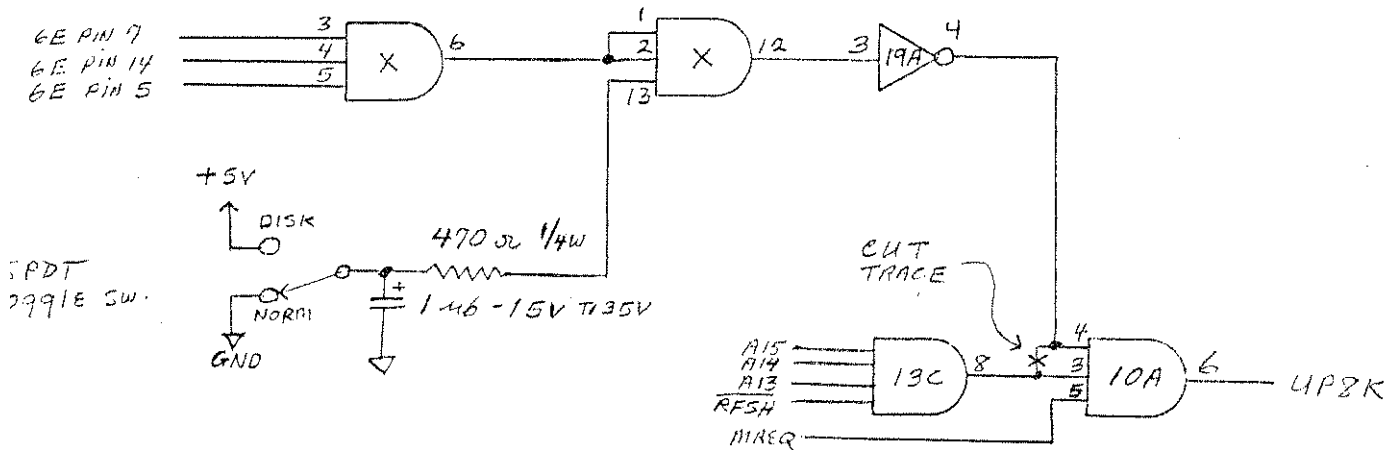


Figure 2. Sorcerer II (48K) modification.

For the Sorcerer II modification, Figure 2, cut the trace between IC 10A pins 3 and 4 on the backside of the PC board. All jumpers can also be placed on the backside. You will find PIN 3 of 10A goes to PIN 8 of 13C. Connect the modification to PIN 4 of 10A. The inverter at 19A PINS 3 and 4 are spare prior to this mod.

APPRENTICE PORT - by Don Gottwald, President

The last Apprentice Port column served more as a reference than as a beginner's corner. It brought together all the approved cassette interface modifications. In this issue, I will cover some of the basics of the Sorcerer's power-on-Monitor, hex numbers and some simple machine language basics.

When you first power up the machine (without a RomPac), a message appears in the upper left corner of the screen. This message identifies the current version of the Monitor program, the top of RAM, and the beginning of the stack.

The top of RAM tells you how much memory you have available in your Sorcerer. For a 16K machine this is 3FFF hex, 7FFF for a 32k unit, and BFFF for 48k. The stack is a small 256 byte scratchpad memory reserved for temporary data storage, subroutine calls, and interrupts. The stack is accessed via the PUSH and POP instructions of the Z-80 code. More about that another time.

The symbol '>', also called a prompt, is printed on the screen whenever you are in the power-on-Monitor mode. This means the computer is ready to accept your instructions. Only capital letters are accepted by the Monitor program.

Each memory location in your computer has a specific address. Any one of these addresses can be accessed and the contents examined with the "DU" command. This is short for "dump memory". Of course you have to tell the computer which memory location you want to dump. For example, if you type "DU 0", the contents of memory location zero is displayed. If you want to examine more than one location, then you have to give the starting location and the ending location. For example, "DU 0 100", will display all memory locations between zero and one-hundred hex (0 to 255 decimal). Each line of a dump has up to sixteen memory locations displayed. The first address is printed directly below the "ADDR" heading. For example, if you enter "DU 0 F" the following will be displayed:

```

ADDR  0  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F
0000: C3 03 B6 01 00 C3 06 A9 FF 00 FF 00 FF 00 FF 00

```

This is location 0, this location 1, and this location F (15 decimal, the sixteenth location, since zero is the first address). The next line would start with location 0010 (16 decimal).

To enter a machine language program, the ENTER command "EN" is used. (The Monitor program recognizes only the first two characters of any command). Each memory location can store up to two hexadecimal digits from 0 to FF (0 to 255 decimal). A hex to binary interpreter is built into the Monitor program to make it easier to enter programs and/or data. Hexadecimal digits were chosen because you only need two of them, versus three for decimal and eight for binary. You can enter at any location, by specifying the entry address. For example, if you wanted to change the current contents of memory location 0 from C3 to C9, you would enter: EN 0. The computer responds with: 0000:. You can then enter "C9/". (The slash "/" terminates the enter mode.) If you now "DU 0", you should see a C9 instead of a C3 in memory location 0. Try it!

You can enter a whole block of data as long as you separate each entry by a space (delimiter). When you hit a carriage return while entering a block of data, the Sorcerer will print the next address on the next line and you can continue to enter data until you are finished. Be sure to terminate the ENter mode with a slash.

There are some excellent texts available to learn machine language programming. A very good aid for the beginning programmer is the Machine Code Tutorial program offered by Arrington Software Service. This program is specifically designed for the Sorcerer owner.

In the next issue I will present some examples of machine language programming techniques.

THE WORD PROCESSING CORNER #15 - by Steven Guralnick

First off, I want to mention that I will depart from the usual material in the next few columns after this one. We have come onto some excellent application software which we run regularly with SPELLBINDER and I will share it with you.

For the moment, back to printing. Last article, I listed the Y-table entries. This is what you do with them.

PRINT DEVICE This setting is determined by what kind of print device you are using. If it is a list device, then set this entry for 1. If it is a precision printer, such as a Diablo, then set at 0. This will enable the system to do such neat things as shadow printing, subscripts, etc.

PRINT ROUTINE You have a choice here: line oriented printing or character oriented. The tutorial manual which comes with SPELLBINDER sets out a good exposition on what each routine means. For this discussion, I would say to set this at 1 for character oriented and leave it there.

LINES/PAGE This setting will determine how many lines will be printed on a page, including the line feeds between the lines. So, if you set it at 44 and you have double spacing, then you will get 22 printed lines.

CRs PAGE END If you are running continuous print and want to insert spaces between the bottom of the text and top of the next page, you insert the number of feeds here. If you want the paper to form feed, then set this entry to 255.

CONTINUOUS PRINT A setting here of 1 will cause the print to be continuous, which you want with continuous feed paper. Otherwise, a setting of 0 will cause the program to stop the printing at the end of the page (and at the end of any page bottom feeds you instructed as per the previous setting).

INDENT-10ths Here, you should set the amount of space to the left of the text you wish. It is done in tenths of an inch so a setting of 10 would be 10/10ths of an inch = one inch, and so forth.

CRs PER LINE Set this to the number of feeds you wish between the lines; 1 for single space, 2 for double spacing, and so forth. This setting does not determine the size of the feed which is set separately by the entry **LF SIZE-48/IN**.

RIGHT JUSTIFY If you wish right justification, set this entry to 1. Otherwise, leave it at 0. Justification will not be with precision spacing, however, unless you are using the precision routines.

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

ASTRONOMY PROGRAMS

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BOOK of listings of 20 astronomical programs with photos of screen displays \$25 plus \$3.50 postage and handling (\$7 overseas).

(Available for Astrologers too. A self-addressed envelope for details)

Eric Burgess FRAS, 13361 Frati Lane, Sebastopol, CA 94572 (707) 874-2352

4TH TIP - by Timothy Huang

Prior to 1980, I knew only two languages, FORTRAN and BASIC, with a little Z-80 Assembly thrown in. I couldn't justify the cost of FORTRAN, quickly outgrew the RomPac BASIC, and ran out of fingers to keep track of what was in which register for Z-80 assembly. In addition, my attempts to decipher the Development Pac manual proved futile. I never could get that darn thing to work! Dissatisfied with these alternatives, I began looking for a language that would serve my needs (and not vice versa).

At about this time, Pascal began emerging as a very promising language. Unfortunately, the P-code compiler required 48K of RAM, forcing me to choose between my 32K Sorcerer or the Pascal. I chose to keep my Sorcerer! Then in the Feb. 1980 issue of the **American Laboratory**, I spotted an article which attracted my curiosity. This article by R.E. Dessy and M.K. Starling was entitled **The Fourth Generation Language** and spoke of a new type of language. However, it was not until the August 1980 issue of BYTE that my interest in this new language was really aroused.

The issue, primarily devoted to articles on FORTH, convinced me of the superiority of this language. I read and re-read each article. Never before had I been so absorbed by a language issue of this magazine! This interest prompted me to purchase a Quality Software tape of their so called Z-80 version of FORTH. What a disappointment!

This proved a bad experience, not so much because of the language but because of the way it was implemented. At the time, I had one drive running with CP/M so the tape version proved intolerably slow. At that time, no real manual was supplied with this program so, conversion to disk was impossible (there is a manual now, but...). I was told by Quality Software that their version was converted from fig-FORTH 1.1 which is a CP/M 8080 FORTH (not a Z-80 FORTH). If you want to run it under CP/M they expect you to convert it back again!

Undaunted, I got hold of the fig **Installation Manual** and **8080 Listing** and keyed in the whole thing myself, all 60K of Assembly listings! I then compared the fig and Quality Software versions. They are about 99% identical. The only difference was the Sorcerer's I/O and Screen Editor.

Some annoying realities soon became evident about this set up. The primary problem revolved around an incompatibility between CP/M files and the FORTH screens. Unfortunately, this implementation of FORTH generates screens which cannot be recognized by CP/M. More specifically:

- 1) Screens 0-5 have the tendency to wipe out CP/M's system tracks. Since I had only one drive, I had to boot up FORTH with one disk and change disks immediately to save or recall screens. To go back to the CP/M operating system required still another disk change.
- 2) The screen disk can have many screens on it yet the CP/M directory won't recognize nor report them in a DIR command! All it shows is a blank disk.

Despite minor irritations with the fig-8080-FORTH, I am by no means putting it down. It is a bargain at \$10 and the FORTH Interest Group is to be applauded for their efforts.

Eventually, I learned of an implementation of a true Z-80 FORTH for CP/M 2.x or MP/M 1.x. It is by Ray Duncan of Laboratory Microsystems and sells for only \$50, a nickel more than the QS tape version! This version not only solves the previously mentioned problems, but it also utilizes the expanded registers in the Z-80 CPU (i.e. IX and IY which are not in the 8080). Mr. Duncan also provided more than 100 screens of examples including games (Life, Breakforth, Tower of Hanoi, etc.), utilities (trig look-up table, string, Case, Screen Editor, console controls, etc.), 79-standard, and Z-80 Assembler. I highly recommend this version to anyone with a serious interest in FORTH.

(continued on next page)

(4TH TIP continued)

As mentioned in the last issue, FORTH users do not find many tutorial books to guide them in this gem of a language. I consider this to be a blessing rather than a inconvenience, however. This forces one to learn all the basics from scratch. It also requires you to do a lot of practicing to learn to apply the relevant principles. I don't consider myself more intelligent than others, and English is not my mother tongue, but I have still managed to wrestle an understanding from the literature. If I can do it, so can you!

In the next issue I'll cover the **editor** and even attempt to show you how to extend the **editor** into a **word-processor**! Until then, may FORTH be with you.

PASCAL PORT - by Daniel Conde

This time, I would like to discuss the usage of Pascal sets. Sets, as you might expect, are quite similar to the sets you might have learned in school days with braces {} used for notation. Pascal sets are quite similar in concept. They are **bags** used to contain only one **type** of item. Although you may stuff more than one of each item into the bag, you could only tell whether that item is in or not, that is, you have no idea of quantity. SETS go hand in hand with Pascal's declared TYPES. Here's an example:

```
TYPE
  SUPPORT = ( SOFTWARE, PERIPHERALS, TELEPHONE, ADS, DEALERS ),
  COMPANY = SET OF SUPPORT;
```

```
VAR
  EXIDY, IBM : COMPANY;
```

Here I defined a TYPE SUPPORT as a scalar type defined by the contents I specified, and also the TYPE COMPANY being defined by the SET SUPPORT. I will know of the EXISTENCE of various kinds of support given by each company variable, but not of its quantity. Finally, I just dreamt up two company names. Call them say, EXIDY and IBM.

Let's say that you are a consultant and want to keep tabs on whether or not a certain type of support is given by each company. Now, in the beginning of your program, let us initialize each company to an empty set, even though we know that they are empty. [Initialized to **empty** by the compiler, that is...] Now, you could add support to the companies as news comes in.

```
IBM := IBM + [ DEALERS ]; (* AHH..IBM now has DEALERS...*)
```

There, the bracket notation is used to create a set constant. You could perform logical comparisons too, such as:

```
IF EXIDY = [ ] then USUAL :=TRUE;
```

Intersections are checked for, using '*' as the '∩' usually used.

```
IF (EXIDY * IBM)= [ ] THEN EXPECTED := TRUE;
```

Existence of certain items are possible by the keyword, "IN":

```
IF SOFTWARE IN EXIDY THEN FAINT := TRUE ;
```

Other operators are "+" for UNION (U), ">=" for CONTAINS (⊇), "<=" for IS CONTAINED BY (⊆).

NEW FOR ALL:

The famous **Software Tools** book, written by Kernighan and Plaugher, a book full of source code for many tools similar to those found on a UNIX system and helpful to all software hackers, has now been re-written in Pascal. The code may **not** be **directly** transferable to most systems, but the algorithms and designs are rock solid. A must.

Disk Notes - by Bryan Lewis, CP/M Editor

This month I'll discuss version 2.2 of CP/M. The differences between it and version 1.4 are not obvious, and I've frequently heard questions about whether it's worth the money to upgrade from 1.4. The answer is: probably not, at least for us Sorcerer users who don't get into things like hard disks or mixed brands of floppy drives on the same system. On the other hand, if you don't yet have CP/M, do try to get version 2.2; it does all 1.4 does plus some more luxury features, for little extra money. Or, if and when you do buy a hard disk (like the modified Morrow drive that Exidy is supposed to come out with), you'll get CP/M 2.2 anyway.

As I just hinted, the big difference in 2.2 is the handling of nonstandard disk drives. The disk operations are table-driven: the BIOS section of code contains tables which specify the number of bytes per sector, number of sectors, and maximum disk capacity. Multiple tables are allowed, so you can specify drive A: to be an 8-inch single-density floppy, and drive B: to be a hard disk. Another example: the Micropolis version offered by Mentzer Electronics can handle Mod I and Mod II drives together. I can't get myself too excited about this feature, though. I don't think it's possible to mix Micropolis drives with 8-inch drives (which would be useful to Sorcerer owners) because the incompatibilities between those drive types are more fundamental than just sector size.

Another big difference in the new version is in file handling. Version 1.4 could not handle a single file larger than 256 kilobytes. That restriction arose from the allowance for 16 file extents, times 16K per extent. The new version allows 512 extents, resulting in a maximum file size of 8 megabytes. Again, not a significant advantage if the physical capacity of your floppy is only 200 to 300K. File handling is improved also by the provision of random access: any record in an 8 MB file can be individually retrieved. Application programs, especially data base managers, will probably start to use that in the future, but so far there aren't many programs that require version 2.x. (Z80 Forth by Laboratory Microsystems does require it; it uses random access files for storage of Forth screens.)

For the typical floppy-based system, there are several minor improvements:

(1) Character deletion is fixed: keying in CTRL-H will delete the previous character from your input and erase it from the screen. No more echoing of the deletion, which was version 1.4's hold-over from the days of the hard-copy terminal. If you don't like the idea of pressing CTRL-H, it's relatively easy to convert some other key (like RUB) by modifying the CONIN section of the BIOS. (Although it was possible to modify version 1.4 to erase deleted characters, the fix didn't handle multi-space characters well, like tabs and controls.)

(2) Another nicety on the video screen is the way input lines are cancelled. CTRL-X now erases the entire line, leaving you back at the A> prompt to start over. Or you can use CTRL-U, which leaves the old line on the screen (as did version 1.4), but places the new cursor directly under the old starting point (i.e., two spaces from the left margin).

(3) The DIR command is improved. Four columns across, rather than a single column too long for the screen.

(4) A new built-in command is USER. When you boot CP/M, you are considered to be user 0. But if you enter USER 1 (or any number up to 15), you get a logically distinct directory. Your files can not be easily read or changed by other users. This feature was added, I suspect, for compatibility with the multi-user system MP/M. But even a single-user system might use this, as a way to separate different groups of files or non-simultaneous users.

Caution: each time a file is saved under a new user number, it occupies the same amount of disk space all over again. To get around this, you can use the load-without-running and run-without-loading tricks I described in issue 3.4. Let's say you're user 1 and you want to run MBASIC.COM (stored under user 0's directory) without having to recopy the whole thing:

(continued on next page)

(DISK NOTES continued)

```
A>USER 0      Get the file from user 0's directory.
A>MBASIC ^A   Load it without running it (or let it run and then exit
              if you prefer).
A>USER 1      Return to your own world. MBASIC.COM
              is still in RAM, remember.
A>AGAIN      Execute, with the null file AGAIN.COM.
```

(5) Two new file "attributes" are provided. A file can be designated as read-only to protect it from accidental modification or erasure. That's done by the command:

```
A>STAT FILENAME.TYP §R/O
```

Or a file can be designated as a system file, which simply means it won't show up in a directory listing. This reduces the clutter from common utilities like PIP, STAT, and ED. The STAT command takes care of that, too, with §SYS.

These attributes are coded into the file's directory entry by setting the high bit (bit 7) in the file type. A R/O file has the high bit set on the first character of the file type. A SYS file has the a high bit on the second letter of TYP. Knowing this, you may be able to change file attributes from your application programs.

(6) STAT.COM and PIP.COM have been enhanced in order to handle the new file attributes. As just discussed, STAT sets the attributes. It will also give a directory listing which shows file sizes and attributes. (Although both STAT and DIR will now give improved directory listings, I still prefer the XD.COM program from the CP/M user's group volumes, because it alphabetizes. Maybe someone will revise XD to ignore SYS files and to indicate R/O files.)

The new PIP has options for over-writing R/O files, for copying SYS files, and for transferring files between user numbers.

(7) When a "Delete File" command is sent to CP/M (via BDOS function 19), an error code is now returned if the file doesn't exist. The new ERA command takes advantage of this by reporting "NO FILE" if you ask to erase a nonexistent one. This is helpful; in version 1.4, you got no message. Unfortunately, most application programs (Spellbinder, MBASIC) still do not use this feature.

The remaining four items in my list apply only to the Micropolis version as sold by Mentzer Electronics, as far as I know. (Other versions I've heard of for the Sorcerer are Tarbell and Discus.)

(8) The new CP/M handles non-ready drives well. If you forgot to depress the loading lever on the drive, the operating system will wait forever. When you finally correct the problem, the operation will resume normally. Micropolis drives that stop the disk rotation during non-use periods are also handled correctly.

Bad sector errors are more forgiving now. I saw one during a write operation in Spellbinder, that returned control to the program; a warm boot didn't automatically occur as it used to.

(9) The memory used by the new Micropolis CP/M is the same as that used by Exidy's version 1.4. The Monitor Work Area is preserved as it should be.

(10) If you have a file named INITIAL.COM on the disk when you cold boot, it will be executed automatically, even before the sign-on message appears. In addition you can still perform the old trick of having a command executed after the boot is complete, by poking it into the sysgen image.

(11) A final frill in the Micropolis version is auto-searching for COM files. If you're logged into a drive other than A: and attempt to execute a COM file that's not there, the system will try to find it on A:. Thus you can easily keep all your utilities on A: only, and operate from B:.

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=====

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

=====

MILITARY ENCOUNTER is the popular board game of Stratego. The excellent graphic representations of the bombs, spy, flag, colonel, sergeants, etc. will create envy in your Apple friends. You and the Sorcerer advance your pieces until an encounter occurs, wherein the stronger piece removes the weaker. To win, you must capture the opponent's flag. The game requires strategy and bluff as the strength of your opponent's piece is not known until the encounter.

=====

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LOW COST INTERFACE FOR DAISY WHEEL PRINTERS - by Don Ellis

THE SOFTWARE

This is the second of a two part article covering an inexpensive Sorcerer to daisy wheel printer interface I developed. The first part, found in the last issue, covered the hardware requirements. With this issue, I conclude by providing the software necessary to complete the package. Figure 1, the hardware diagram, can be found in the last issue. Figure 2, below, presents an example of the type of graphics output possible with this interface.

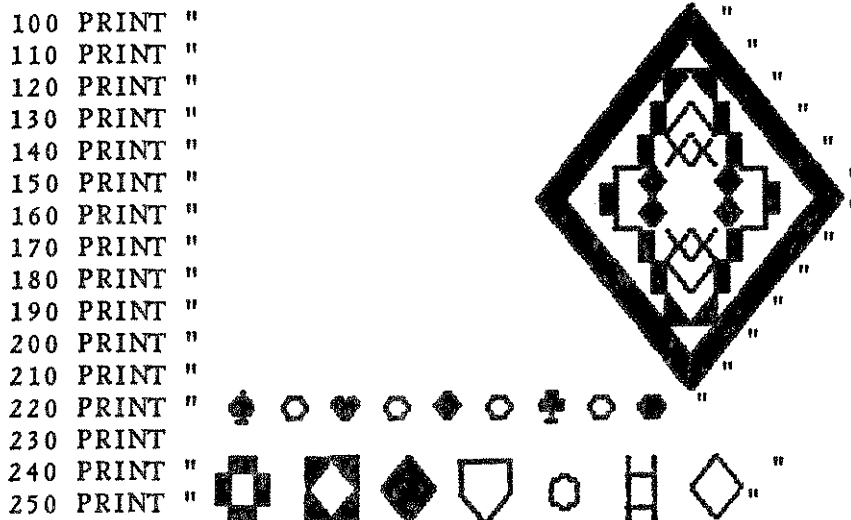


Figure 2: Example of graphics output.

Equate Table

CTRLA	EQU	01H	;CONTROL A
CTRLC	EQU	03H	;CONTROL C
CTRLD	EQU	04H	;CONTROL D
CTRL E	EQU	05H	;CONTROL E
CTRLH	EQU	08H	;CONTROL H
PWSTRB	EQU	08H	;PRINT WHEEL STROBE
CGSTRB	EQU	10H	;CARRIAGE STROBE (RIGHT)
NCGSTRB	EQU	14H	;CARRIAGE STROBE (LEFT)
PFSTRB	EQU	20H	;PAPER FEED STROBE (UP)
NPFSTRB	EQU	24H	;PAPER FEED STROBE (DOWN)
SCHRSTP	EQU	0008H	;SINGLE CHARACTER STEP
GRADDR	EQU	0FBF8H	;BASE OF STANDARD GRAPHICS MEMORY

Output Subroutine

00F1: F5	PRNT:	PUSH AF	;PRINT CHAR FROM L & STROBE FROM H
00F2: DBF0	PRDY:	IN A,(F0)	;IS PRINTER READY ?
00F4: 2F		CPL	
00F5: E60F		AND 0F	
00F7: 20F9		JR NZ,PRDY	;NO, LOOP TILL IT IS
00F9: 0EF0		LD C,F0	;SET PORT ADDRESS IN C
00FB: 44		LD B,H	;SET STROBE VALUE IN B
00FC: ED69		OUT (C),L	;SEND ALL; ADDR C, STROBE B, CHAR L
00FE: F1		POP AF	
00FF: C9		RET	

(continued on next page)

(DAISY WHEEL GRAPHICS continued)

Printer Driver Routine, Main Section

```

0000: F5      PRNTR:  PUSH AF          ;GOT HERE BY CALL FOR PRINTER
0001: C5      PUSH BC          ;SAVE ALL REGISTERS
0002: D5      PUSH DE
0003: E5      PUSH HL
0004: 57      LD D,A          ;GET CHARACTER IN D
0005: 0600    LD B,00
0007: 3E00    LOC1:  LD A,00        ;LOC1+1=MARGIN IN 1/60" UNITS
0009: 80      ADD A,B          ; LOC1+1 USED ONLY ONCE
000A: 280B    JR Z,SPCHK
000C: 6F      LD L,A          ;IF BYTE 0008H WAS NOT 0,
000D: 2610    LD H,CGSTRB     ; SEND IT WITH PAPER ADVANCE
000F: CDF100  CALL PRNT       ;DO IT
0012: 3E00    LD A,00        ;NOW GO BACK AND
0014: 320800 LD (LOC1+1),A  ; ZERO THIS BYTE
0017: 3E20    SPCHK:  LD A,20        ;IS IT A SPACE ?
0019: 92      SUB D
001A: 2005    JR NZ,CRCHK    ;NO, SKIP
001C: CDDF00  CALL ASCII     ;YES, GO MOVE PRINTHEAD
001F: 1834    JR EXIT       ;AND RETURN
0021: 3E0D    CRCHK:  LD A,0D        ;IS IT A CARRIAGE RETURN ?
0023: 92      SUB D
0024: 2005    JR NZ,BSCHK    ;NO, SKIP
0026: CDC100  CALL CR        ;YES, GO DO IT
0029: 182A    JR EXIT       ;AND RETURN
002B: 3E08    BSCHK:  LD A,08        ;IS IT A BACK SPACE ?
002D: 92      SUB D
002E: 2005    JR NZ,LFCHK    ;NO, SKIP
0030: CDC600  CALL BSPACE    ;YES, GO DO IT
0033: 1820    JR EXIT       ;AND RETURN
0035: 3E0A    LFCHK:  LD A,0A        ;IS IT A LINEFEED ?
0037: 92      SUB D
0038: 2008    JR NZ,GRCHK    ;NO,SKIP
003A: 210820 LD HL,2008     ;SET PFSTRB AND LFSIZE
                                ;SIZE IS IN BYTE 003BH IN 1/48"
003D: CDF100  CALL PRNT       ;GO DO IT
0040: 5813    JR EXIT       ;AND RETURN
0042: CB7A    GRCHK:  BIT 7,D      ;IS IT A GRAPHIC ?
0044: 2014    JR NZ,GRAPHIC ;YES, GO DO IT
0046: 3E20    PTCHK:  LD A,20        ;IS IT PRINTABLE ?
0048: 92      SUB D
0049: F25500  JP P,EXIT      ;NO, GET OUT
004C: CDDF00  CALL ASCII     ;YES
004F: 6A      LD L,D          ;GET CHARACTER
0050: 2608    LD H,PWSTRB   ;SET STROBE FOR PRINT WHEEL
0052: CDF100  CALL PRNT       ;GO DO IT
0055: E1      EXIT:  POP HL        ;LEAVE, RESTORE ALL REGISTERS
0056: D1      POP DE
0057: C1      POP BC
0058: F1      POP AF
0059: C9      RET           ;RETURN TO CALLER

```

(continued on next page)

(DAISY WHEEL GRAPHICS continued)

Graphic Character Routine

```

005A: DDE5      GRAPHIC: PUSH IX
005C: CDDA00    CALL GCHAR      ;GET SIZE TO USE
005F: DD21F8FB LD IX,GRADDR   ;POINT TO GRAPHIC CHARACTER SET
0063: 7A        LD A,D
0064: D67F      SUB 7F
0066: 010800    LD BC,SCHRSTP ;NUMBER OF ADDRESSES PER CHAR
0069: DD09      FNDCHAR:ADD IX,BC ;CALCULATE START OF CHAR ADDR
006B: 3D        DEC A
006C: 20FB      JR NZ,FNDCHAR ;LOOP TILL CHAR FOUND
006E: 210410    LD HL,1004    ;CGSTRB AND CTRLD
0071: CDF100    CALL PRNT
0074: 210524    LD HL,2405    ;NPFSTRB AND CTRLD
0077: CDF100    CALL PRNT
007A: 1608      LD D,08
007C: 1E08      L007C: LD E,08
007E: DD7E00    LD A,(IX+00) ;PICKUP BYTE OF CHARACTER
0081: CB3F      L0081: SRL A ;CHECK BIT ON/OFF
0083: 3006      JR NC,L008B  ;BIT OFF, DON'T PRINT
0085: 212E08    LD HL,082E   ;PWSTRB AND CTRLD
0088: CDF100    CALL PRNT    ;BIT WAS ON, SO PRINT
008B: 210114    L008B: LD HL,1401 ;NCGSTRB AND CTRLA
008E: CDF100    CALL PRNT
0091: 1D        DEC E ;COUNT DOWN BITS PER BYTE
0092: 20ED      JR NZ,L0081 ;LOOP TIL BYTE USED UP
0094: 210810    LD HL,1008   ;CGSTRB AND CTRLH
0097: CDF100    CALL PRNT    ;BACKUP FOR NEXT ROW OF DOTS
009A: 210120    LD HL,2001   ;PFSTRB AND CTRLA
009D: CDF100    CALL PRNT    ;ADVANCE PAPER FOR NEXT ROW
00A0: DD23      INC IX ;POINT TO NEXT BYTE OF CHAR
00A2: 15        DEC D ;COUNT DOWN BYTES PER CHAR
00A3: 20D7      JR NZ,L007C  ;LOOP FOR 8 BYTES
00A5: 210324    LD HL,2403   ;NPFSTRB AND CTRLC
00A8: CDF100    CALL PRNT
00AB: 210414    LD HL,1404   ;NCGSTRB AND CTRLD
00AE: CDF100    CALL PRNT
00B1: DDE1      POP IX
00B3: C35500    JP EXIT
00B6: 00000000 DEFS 0BH
00BA: 00000000
00BE: 000000

```

Carriage Movement Subroutines

```

00C1: 010000    CR: LD BC,0000 ;GOT A CARRIAGE RETURN TO SEND
00C4: 1803      JR L00C6
00C6: 010600    BSPACE: LD BC,0006 ;GOT A BACK SPACE TO SEND
;SIZE IS IN BYTE 00C7H IN 1/60"
00C9: 2AC200    L00C6: LD HL,(CR+1)
00CC: ED42      SBC HL,BC
00CE: FA5500    JP M,EXIT
00D1: 22C200    LD (CR+1),HL
00D4: 3E14      LD A,14
00D6: B0        OR B
00D7: 67        LD H,A
00D8: 1811      JR L00EB
00DA: 010800    GCHAR: LD BC,0008 ;GOT A GRAPHIC CHARACTER TO SEND
;SIZE IS IN BYTE 00DBH IN 1/60"
00DD: 1803      JR L00E2
00DF: 010600    ASCII: LD BC,0006 ;GOT AN ASCII CHARACTER TO SEND
;SIZE IS IN BYTE 00E0H IN 1/60"
00E2: 2AC200    L00E2: LD HL,(CR+1)
00E5: 09        ADD HL,BC
00E6: 22C200    LD (CR+1),HL
00E9: 2610      LD H,10
00EB: 69        L00EB: LD L,C
00EC: CDF100    CALL PRNT
00EF: C9        RET
00F0: 00        NOP

```

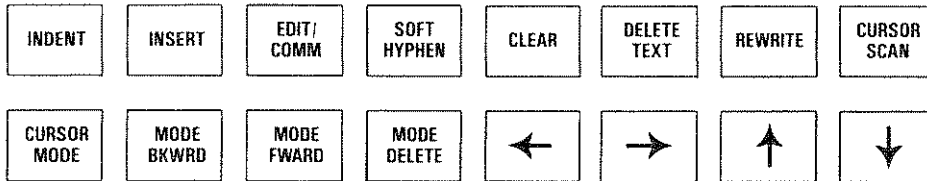
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EXIDY SORCERER USERS

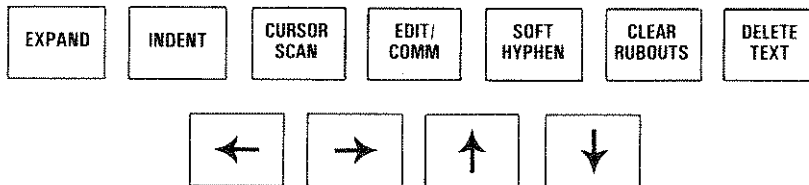
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CRYONICS SOCIETY ORGANIZER - BASIC GAME

```

1 MY=22:POKE255,MY
5 FOR G=-512TO-441:READG1:POKEG,G1:NEXT
9 DATA 0, 0, 0, 24, 24, 0, 0, 0, 0, 0, 24, 60, 60, 24
13 DATA 0, 0, 0, 24, 60, 126, 126, 60, 24, 0, 0, 56, 124
17 DATA 254, 254, 124, 56, 0, 24, 60, 126, 255, 255, 126
21 DATA 60, 24, 24, 60, 126, 231, 231, 126, 60, 24, 24, 60
25 DATA 66,195,195,66,60,24,24,36,66,129,129,66,36,24
29 DATA 231,165,126,126,126,126,126,126
33 REM GS 1 TO 5 GROWING, 6 TO 8 DYING.
37 DATA 14, 254, 22, 13, 221, 33, 49, 0, 205, 35, 0, 48, 8
41 DATA 20, 203, 98, 40, 246, 62, 255, 201, 22, 0, 221
45 DATA 102, 0, 205, 35, 0, 120, 50, 64, 0, 124, 201, 237
49 DATA 81, 237, 88, 6, 5, 203, 59, 208, 221, 35, 16, 249
53 DATA 201, 0, 1, 4, 8, 7, 10, 2, 5, 6, 9, 0, 0, 0, 11,3,0
57 FOR N=0TO 64 : READ N1:POKEN,N1:NEXT:POKE318,195:POKE320,0
61 PRINT CHR$(12);"Cryonics Society Organiser"
65 FOR N=0 TO 25:PRINTCHR$(137);:NEXT:PRINT
69 PRINT:PRINT"(C) REEVES TELECOMMUNICATIONS LABORATORIES LTD 1980"
73 REM Presented free with Sorcerer's Apprentice in order to publ-
77 REM icise RTL's software services. We sell a number of useful
81 REM utilities, such as were advertised in the April SA. We also
85 REM publish software at 50% royalty on low prices. We have some
89 REM ordinary games, such as Backgammon (4 pounds), and several
93 REM extraordinary games, such as this one which costs one pound
97 REM on cassette. Our list is free to UK customers, and is sent
101 REM free surface mail overseas.Orders are sent airmail overseas
105 REM at terms printed in April's SA.
106 :
107 REM RTL,West Towan House,Porthtowan,Truro,Cornwall TR4 8AX, UK
109 PRINT
113 PRINT"      You are the organiser of a cryonics society. If your"
117 PRINT"membership rises above";
121 PRINTMY;"members,you can offer suspension"
125 PRINT"services, and your members don't die.":PRINT
129 PRINT"      People are represented by the following characters:"
133 PRINT:FOR N=192 TO 199:PRINTCHR$(N);"      ";:NEXT:PRINT:PRINT
137 PRINT"The youngest is on the left, and the one on the right is"
141 PRINT"dead. Each person has a hidden characteristic. If you hold"
145 PRINT"down a number key on the pad, you attract people with that"
149 PRINT"characteristic whilst the key is held down.":PRINT
153 PRINT"      Someone under suspension is a ";CHR$(200);"." :PRINT
154 PRINT"      When you die, it could be said that the universe is
155 PRINT"obliterated as you can no longer perceive it. Therefore
156 PRINT"in this game, it ends when all the people are dead or sus-
157 PRINT"pended. Play for the highest membership.":PRINT
158 PRINT"      Press any number on the pad to start."
161 IF INP(0)=255 THEN A=RND(1):GOTO 161
165 PRINT CHR$(12):CLEAR:MY=PEEK(255):DIM POPULATION(100,2)
169 FOR J=0TO63:PRINTCHR$(177);:NEXT:PRINT:PRINT CHR$(17);
173 LL=64:NL=28:ST=-60*LL:SB=-(62-NL)*LL-1
177 C=ST-1
181 FOR N=0 TO 100
185 PO(N,1)=1+INT((ST-SB)*RND(1))+SB:REM 1=position
189 PO(N,0)=192+INT(7*RND(1))      :REM 0=age graphic
193 PO(N,2)=INT(10*RND(1))      :REM 2=personality number
197 POKEPO(N,1),PO(N,0):NEXT

```

(continued on next page)

(BASIC GAME continued)

```

01 FOR N=0 TO 100
05 IF PO(N,0)>=199 THEN 253
09 ALLDEAD=0
13 IF PO(N,1)<ST THEN 237
17 MX=999:MOVE=INT(MX/2-RND(1)*MX) : POKEPO(N,1),32
21 IF INP(0)=PO(N,2) THEN PO(N,1)=PO(N,1)-ABS(MOVE):GOTO 229
25 PO(N,1)=PO(N,1)-MOVE
29 IF PO(N,1)>SB THEN PO(N,1)=SB
33 IF PO(N,1)<ST THEN PO(N,1)=C:C=C-1:CF=1
37 PO(N,0)=PO(N,0)+RND(1)
41 IF PO(N,0)>=199ANDPO(N,1)<STANDFA=1THENPO(N,0)=200:GOTO 249
45 IFPO(N,0)>=199ANDPO(N,1)<STTHENM=M-1:MD=MD+1:GOSUB 273
49 POKE PO(N,1),PO(N,0):IFCF=1THENCNCF=0:GOSUB 269
53 NEXT N
57 IF ALLDEAD=1 THEN 277
61 ALLDEAD=1
65 GOTO 201
69 M=M+1:IF M>MY THEN FACILITY=1
73 PRINT"Membership:";M;"Members lost";MD:PRINTCHR$(17);:POKEST-LL*2,
:RETURN
77 REM MEMBERSHIP SURVEY
81 PRINT CHR$(12);"Membership Survey"
85 PRINT"Characteristic No vs normalised quantity"
89 FOR G=0 TO 100
93 IF PO(G,1)<ST THEN TEST(PO(G,2))=TEST(PO(G,2))+1
97 NEXT
101 IF M+MD=0 THEN M=1
105 FOR G=0 TO 9:PRINTG;
109 FOR G1=0 TO TEST(G)*60/(M+MD)
113 IF G1>0 THEN PRINT CHR$(177);
117 NEXTG1:PRINT:NEXT G:PRINT:PRINT
121 REM POPULATION SURVEY
125 PRINT"Population Survey"
129 FOR G=0 TO 100
133 TEST(PO(G,2))=TEST(PO(G,2))+1
137 NEXT
141 FORG=0TO9:PRINTG;
145 FOR G1=0 TO TEST(G)*60/101
149 IF G1>0 THEN PRINT CHR$(177);
153 NEXTG1:PRINT:NEXT G
157 GOTO 158

```

USING THE MX-80 WITH THE SORCERER - ADDENDUM - by Frank Voss

In my article in the last issue (Vol. 3, No. 5, p.84-85), I omitted to mention that the instructions for activating and de-activating the MX-80 printer from a BASIC program are for a Sorcerer with 32K RAM installed. The following table gives the values to POKE in memory locations for Sorcerers having other amounts of RAM installed.

RAM	BASIC statement to ACTIVATE the printer	
8 K	Line#	POKE 8144,33: POKE 8145,224: PRINT CHR\$(17)
16 K	Line#	POKE 16336,33: POKE 16337,224: PRINT CHR\$(17)
32 K	Line#	POKE 32720,33: POKE 32721,224: PRINT CHR\$(17)
48 K	Line#	POKE -16432,33: POKE -16431,224: PRINT CHR\$(17)
RAM	BASIC statement to DE-ACTIVATE the printer	
8 K	Line#	PRINT CHR\$(19): POKE 8144,27: POKE 8145,224
16 K	Line#	PRINT CHR\$(19): POKE 16336,27: POKE 16337,224
32 K	Line#	PRINT CHR\$(19): POKE 32720,27: POKE 32721,224
48 K	Line#	PRINT CHR\$(19): POKE -16432,27: POKE -16431,224

SORCERER'S APPRENTICE MICRONET MEETING (SAMM)
by Avram R. Vener (MicroNET # 70300,252)

Is anyone out there interested in attending a nationwide meeting of the Sorcerer's Apprentice without having to leave your home?

Thanks to a remarkable program on the MicroNET system, it is now possible for MicroNET users to get together via terminal. These electronic meetings can be held with other members, even though they are scattered throughout the country.

The program is the CB Simulator and the name is pretty much self descriptive. It is modeled after the 11 meter citizens band radio and allows dozens of users to communicate on a real-time basis throughout a 40 channel network. Each line that is sent to your screen is preceded by the **channel number** and **handle** of the sender. You can monitor as many channels as you want.

You can pick your handle after entering the CB, as well as the initial channel you wish to go to. To run the CB from MicroNET:

```
OK (MicroNET's prompt)
R CB (instruction to Run CB)
```

First the system asks for your handle, then for your channel selection. For informal chitchat, I use the handle RAVEN (Ralph LaFlamme is Inkpot). For a formal meeting your real name would be less confusing.

A typical line would be:

```
(28,Inkpot)Raven===>Lets switch to the
/talk mode
```

```
My response:
Inkpot===>OK I'm /EXiting to the MPHOST
now
```

The system will insert (28,RAVEN) when it sends the line out.

I have seen as many as 47 people on one channel, all talking at once, and in general, ignoring the messages that were not directed at them. It was, to say the least, confusing. When that many people talk at once the system 'drops' some messages for lack of handling capacity.

A good way to handle large groups on the CB would be to have members type in a '?' and then waiting to be recognized. Three or four can be sending simultaneously on this medium with little difficulty.

The SAMM should be held on a weekend or business holiday to allow coast to coast access at a reasonable hour for all. A channel can be selected ahead of time and privacy, if desired, can be had by agreeing on a /SCRamble code (e.g. /SCR SORCERER). This will prevent other users from observing the meeting.

Tips, programs, and other information and data can be stored in terminal files for later dissemination during the course of the meeting. A chairman or co-ordinator can control the general protocol and allow time out for setting up STORE commands as needed.

My greatest regret is that by the time this sees print, I will have plunged into the heady thrills of college life and probably be unable to take an active hand in setting up the first SAMM (that doesn't mean I won't try!!).

If you want the SAMMs, then leave a message for Ralph LaFlamme on MicroNET at #70150,365 or the Sorcerer's Apprentice MiniCBBS at (313) 535-9186 (ring back: let it ring once, hang up and dial again). Let's have some ideas and feedback on this. If anyone is interested in acting as the co-ordinator for these meetings, please let him know. It's not going to happen unless you make it happen.

RAMBLINGS - by Jack MacGrath

I'm going to ramble on about a few things that have been of concern to me and many other Sorcerer users. We all know about the CRC problems which have driven many users to either disk drives or other systems. The Exidy modification helps somewhat, but does not really solve the problem. I have performed this modification on 3 machines, and it did not improve them much, if any. The real problem lies with the different tape recorders being used. Each requires a different input level. I have found that installing a 10k potentiometer in place of R23 (a 10k resistor), completely cures all CRC problems.

Adjusting the control and observing the header tone with a scope, I watch for the highest level without distortion. I then mark the setting and leave it there for the user's particular recorder. If you decide to perform this modification, I recommend leaving R5 alone as this balances the OP-Amp. Also, R6 is 130K, not 270K, as stated.

If you are planning to upgrade your model I to 48K using the piggyback technique, be sure to connect PIN 14 of the 7400 IC to +5 volts and PIN 7 to ground. These connections are seldom shown in logic diagrams. I recommend that you solder the 4116's together directly, piggyback style with PIN 4 bent up so that you can run a buss to all PIN 4's. Be sure to align the chips properly, and triple-check all wiring before turning on the power!

I exchange many ideas and information with users from around the world and am technically qualified to answer Sorcerer hardware problems. I welcome all correspondence from users.

Jack MacGrath, P.O. Box 5, Billerica, MA 01821

C FOR YOUR SORCERER

Based on Ron Cain's small-C, C/80 was written by Walt Bilofsky of the Software Toolworks. Triangle Systems distributes C/80 for the Sorcerer with an enhanced tutorial introduction to C/80. C/80 needs at least 40K of RAM and either Exidy or Micropolis C/PM.

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EVALUATIONS - by Emiliano C. De Laurentiis

The cry of "improve that software" easily emanates from the lips of most computer users, but does anyone know how? Let us evaluate some software, and perhaps, obtain some gleam of what should be looked for in software and other computer products.

Entertainment programs may cause users to suffer from "hand-cramp syndrome" and "boredom entertainus" as much as other software can. Following is a review of a software package which happily only slightly causes these ailments.

SORCERER ASTEROIDS from Staley's Sorcerer Software, 3497 School Road, Murrysville, PA 15668 - \$19.95.

Here is a fast, machine language program that is visually interesting and which does reasonable justice to the Sorcerer's graphic capabilities. The purpose of the game is to accumulate as many points as possible by destroying asteroids, or the fragments of exploding asteroids, before being destroyed yourself. One hundred points are allotted for every asteroid destroyed and 500 points for disintegrating a fragment of the asteroid. Every so often, a flying saucer will fly across the screen spraying laser shots. These may be avoided by maneuvering out of the way, or stopped by shooting the saucer. No points are given for surviving. The game is over when you lose 3 space ships.

The Basic ROM PAC is required to run the program, since it uses Basic to display various messages. The motion of objects on the screen is very smooth, of a quality comparable to arcade games. The explosions of ships and asteroids are only adequate, though, and could have been made much more interesting. Check out GALAXIANS for an example of what I mean. There is sufficient randomness in the game to keep it interesting, but many of the visuals are repetitive.

Overall, I rate this game as very good, giving many hours of fun (I still enjoy it after six months and a high score of 23,500). Its major fault, which should be emphasized, is the keyboard-user interface. The "<" and ">" keys rotate the craft left or right, the "?" key moves the craft and the space bar fires the laser shots. I discovered that this strongly contributes to "hand-cramp syndrome" and is one of the major reasons why I play the game less now. This item is NOT insignificant as it also occurs in other programs such as word processors! My experiences, and the comments of other users, indicate that the best keys to use for left/right movement, and other functions, are a combination of the arrow keys on the numeric keypad (which is beautifully designed) and the space bar. The results are less fatigue and a happier user.

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DUSTINGS FROM THE LIBRARY - by Robert Hageman, Librarian and Sysop

For those of you using Lifeboat CP/M 1.42 or Exidy CP/M 1.42/3 on Micropolis drives, I would like to document what is known as your Mode Byte. The mode byte is a location holding "flags" for the optional functions.

These options include:

1. READ BEFORE WRITE Checks the area of disk to which CP/M is to write a file.
2. READ AFTER WRITE Checks to be sure file was properly copied to disk.
3. WRITE PROTECT DETECTION Checks for a write protected disk.
4. ENABLE INTERRUPTS AFTER DISK ACCESS Allows interrupt driven routines AFTER disk access is done.
5. RUN AUTO AFTER WARM BOOT If there is a program named AUTO.COM, it loads and runs automatically after a restart.
6. RUN AUTO AFTER COLD BOOT Does the same as when the CP/M system is first loaded. NOTE: The program does not have to be AUTO.COM. For example, by placing the word BASIC into the SYSGEN image of CP/Mxx.COM, BASIC will be auto loaded. For more information on changing this area of the CP/M image, see Jon Lindsay's article, "For CP/M: Automatic Program Execution on Start-up", in the January 1981 issue of Kilobaud Microcomputing.
7. DIAGNOSTIC ERROR MESSAGES Error messages for nonfatal conditions (soft errors). Reports ANY problem encountered by CP/M.

LOCATION	LIFEBOAT		EXIDY	
	USER - 1		BIOS + 2	
OPERATION	Bit pos.	Std.	Bit pos.	Std.
Read before write	7	on (1)	-	N/A
Read after write	6	on	0	on
Write protect detection	5	off(0)	-	N/A
Enable interrupts after disk access	4	on	-	N/A
Run AUTO after warm boot:	1	off	-	N/A
Run AUTO after cold boot:	0	off	-	N/A
Diagnostic error messages	-	N/A	2	off

The features marked N/A are either nonexistent on the particular CP/M or not optional (they are standard and so not easily removed). Disk access may be speeded up at the expense of reliability by turning off the read before and/or after write functions. If you have doubts about the performance of your system, you can gain more information about it by turning on the diagnostic error messages.

Lifeboat's mode byte, at USER minus one, is at 24FFH in the SYSGEN image. Exidy's mode byte, at BIOS plus two, is at 1F02H in the SYSGEN image. DDT is used to change these locations according to the features you desire to have active.

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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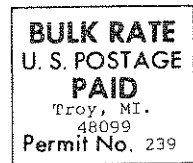
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