SORCERER'S APPRENTICE

(C)

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NEWS FROM EXIDY - By Fred Langhorst

In discussions with Exidy Marketing personnel a number of news items have been identified, the most significant of which is that the move to a small business emphasis is well underway. As of January 15, 1981, the Data Products Division of Exidy, Inc. is being spun off as a separate company in a new facility:

Exidy Systems, Inc.
1234 Elko Dr.
Sunnyvale, California 94086

The thrust of this new company will be small business ($150K to $5M per year sales) office automation equipment. A number of press releases are planned for the next month and advertising should begin appearing by March. Their product line will begin with the Sorcerer II; however, a Sorcerer III is under development and is targeted for an October, 1981 introduction. The III model will consist of a new injection molded cabinet that houses keyboard, computer, CRT and disk drives. The CPU is said to be a Z80; however, new peripherals are planned such as a 5" hard disk.

We also understand that a Dutch company, CompuData (sp ?), has been granted a European license to manufacture and distribute the Sorcerer hardware line. Exidy Systems, Inc. will therefore be concentrating on the North American markets. Best of luck Exidy Systems, Inc. and CompuData!!!

Our current understanding of new software products for the Sorcerer include the following:

Monitor ROM Version 1.1- $49.00

Extended BASIC on cassette- $49.95

Printer Driver Routines for Diablo, Qume, NEC & C, Itoh on cassette or disk.- $99.95

Video Full-Screen Editor for Exidy CP/M, 30 commands- $99.95

ODDS AND ENDS- by Ralph LaFlamme, Secretary, Sorcerer's Apprentice

You have overwhelmingly requested more software reviews. This is your Newsletter and we want to give you what you want. However, we need your help to make this forum work. If you have programs in which other members may (or should not) be interested, please forward a review for publication. Don't worry about lack of experience as a computerist or lack of writing experience. The process of sharing your experiences has more value to all than any self-perceived lack of prose.

Our policy, regarding software submitted by authors or vendors for review, is as follows: We will respect your wishes as to how the software is handled with regard to duplication. If the particular piece of software would aid us in the operation of the Group and publication of this Newsletter, then we would ask that we be allowed to retain a copy for this use. (We are serious. We're more interested in our integrity and long term credibility than in any short term gains through pirated software.) It would be considered a courtesy to allow the reviewer(s) to retain a copy.

The next issue will contain a review of the Arrington Software Service program, GALAXIANS.

Since we have a sizeable membership at the beginner computerist level, we would like to offer more for this audience. We are looking for someone to write and/or edit a column primarily directed to the new Sorcerer owner and/or novice computerist. If you qualify and would be interested in contributing to or editing such a column please let us know.

We also need authors/editors in the following areas:

* Interfacing the various printers
* Interfacing the various Disk systems
* Implementing CP/M on the Sorcerer
* Comparison of Lifeboat and Exidy CP/M
* Implementing MDOS on the Sorcerer
* Implementing other DOS's on the Sorcerer

We are presently preparing a data base containing the information included in your membership application forms. As soon as all the necessary software is ready to access this file, we'll publish the results. We expect to announce the availability of member information exchanges in the next issue. Those of you who are already subscribers but do not wish to have your name exchanged, have until the next issue to advise us that you do not wish to be available for this service.

We have received the report of an Exatron Stringy Floppy successfully interfaced to a 32K Sorcerer. This is being reviewed by our member responsible for this project. More on this in a future issue.

ERRATA - My attention was brought to an error in my article in the last issue on the Exatron Stringy Floppy. While it is true that there is loading compatibility of programs recorded by different types of computers using the S-100 Stringy Floppy, this compatibility does not extend to dedicated Stringy Floppies i.e. TRS80, Apple, etc.

(continued on next page)

(ODDS AND ENDS continued)

Some members have complained about the slowness of delivery and the condition of their Newsletter after delivery by third class postage. To overcome this problem we're offering delivery of the Newsletter in an envelope by first class postage. The rate for this is $20 a year or $1 more per issue to cover the additional handling and expenses. If you've already subscribed, and want this service, forward an additional $1 per issue remaining in this volume.

If any of you are aware of Sorcerer Newsletters other than the English, Australian, and Oregon publications, please let us know.

If you are aware of other Sorcerer users who are not members, please send us their names and addresses. We would like to send them a complimentary copy of the Newsletter.

Here are the names and addresses of three groups in which some of you may be interested:

Z-Users Group	Micropolis Users Group	CP/M Users Group
Charlie Foster, Dir.	Buzz Rudow, Editor	1651 3rd Ave.
7962 Center Parkway	604 Springwood Circle	New York, NY 10028
Sacramento, CA 95823	Huntsville, AL 35803	

If you are aware of any other similar groups please let us know so we can pass it on.

Here are answers to some member questions:

Volume I of the Sorcerer's Apprentice was published by Dave Bristor. We carried on from Volume II.

Volume I contained 7 issues and Volume II 5 issues. Volume III will contain 8 issues.

Exidy did not produce computers with more than 48K. However, up to 56K can be configured using an expansion unit by adding S-100 RAM boards.

We will have an upcoming article on how to build an EPROM programmer on an S-100 board. We are considering offering EPROM programming as a service. Look for an announcement in a future issue.

The Source and MicroNET numbers, referred to on the Membership application form, are issued to members of the computer time-sharing systems provided by Source Telecomputing Corp. and CompuServe Inc., respectively.

For those who wrote expressing an interest in a CHESS program, look for an announcement in the next issue.

The following are requests for information that hopefully someone out there can answer:

Has someone come up with a neat, compact and, hopefully, portable arrangement for housing your Sorcerer system? Please let us know. There are many of us in need of such a set up to rescue back a room and allow for greater mobility.

RELOCATED WORD PROCESSOR WITH AUTOMATIC JUMP TO BASIC- by Larry Stempnik

The Sorcerer Computer Users of Australia have had several articles in their newsletter on relocating the Word Processor PAC and using this version to transfer BASIC programs. The relocated version can also be customized to suit the user; such as a personal signon logo, personal Y table at startup, custom printer driver, and special video routine. A feature I incorporated is a new "J" command which automatically transfers a WP file to BASIC just as if you keyed it in while in BASIC. This enables you to use your Word Processor as an editor when you key in a BASIC program and then automatically transfer it to BASIC, ready to RUN or LIST.

The following instructions show you how to: 1. Relocate the Word Processor PAC. 2. Add the 'Jump to BASIC' routine. 3. Add a RAM reader routine to be used by the J command.

1. To relocate the Word Processor Pac:

   a. With the WP PAC in place, use the command X to get to the monitor. Move WP to start at 5000 (MOVE C000 DFFF 5000). Save moved WP on tape (SAVE WP 5000 6FFF).
   b. With the BASIC PAC in place, enter the BASIC program called MOVIT for changing all absolute addresses C000-DFFF to 5000-6FFF.

```
100 REM MOVIT BY L. STEMPNIK FOR SORCERER
200 CLEAR 2000: DIM B(37), H$(20)
210 FOR X=0 TO 17: READ H$(X): NEXT X
215 FOR Z=1 TO 37: READ B(Z): NEXT Z
220 DATA 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,F,"    "
221 REM  BE SURE TO KEY IN TWO F'S IN THE ABOVE DATA STATEMENT
222 REM  AND 4 SPACES BETWEEN THE QUOTES.
230 DATA 194,195,202,210,218,226,234,242,250
240 DATA 196,204,205,212,220,228,236,244,252
250 DATA   1, 17, 33, 34, 42, 49, 50, 58, 58
260 DATA 0,0,0,0,192,223,-112,20480,28672,20480
270 PRINT: PRINT "MOVIT BY L. STEMPNIK  REV 11-19-80": PRINT
300 REM     START OF A NEW READ CYCLE
320 H$(19)=H$(17):B(28)=B(29):B(29)=B(30):B(30)=PEEK(B(35))
340 IF (B(30)<B(32) OR B(30)>B(33)) THEN 660
400 FOR Z=1 TO 9
420 IF B(28)=B(   Z) THEN H$(19)="JP    "
440 IF B(28)=B( 9+Z) THEN H$(19)="CALL  "
460 IF B(28)=B(18+Z) THEN H$(19)="LD    "
480 NEXT Z: IF H$(19)=H$(17) GOTO 660
500 M3=B(30)+B(34): POKE B(37),M3: D=B(37): GOSUB 800
520 P$=H$(18)+H$(17): D=256*B(28)+B(29): GOSUB 800
540 P$=P$+H$(18): D=256*M3+B(29): GOSUB 800
560 B(31)=B(31)+1: P$=P$+H$(H4)+H$(H3)+H$(17)+H$(19)+H$(18)
620 PRINT B(31);TAB(10);P$: B(28)=0: B(29)=0: B(30)=0
660 B(35)=B(35)+1: B(37)=B(37)+1: IF B(35)<B(36) GOTO 300
760 PRINT: PRINT "END": PRINT: PRINT: GOTO 999
800 D=D+32767*(1-SGN(D)): REM   DECIMAL TO HEX ROUTINE
820 H4=INT(D/4095.99): H3=INT((D-4096*H4)/255.999)
840 H2=INT((D-4096*H4-256*H3)/15.999)
860 H1=INT(D-4096*H4-256*H3-16*H2)
880 H$(18)=H$(H4)+H$(H3)+H$(H2)+H$(H1): RETURN
999 END
```

(continued on next page)

(RELOCATED WP PAC WITH 'J' COMMAND continued)

c. Go to the monitor (BYE) and load the WP file from step a (LO). Go back to BASIC (PP) and RUN. MOVIT itemizes the addresses changed and displays this and the new code on the screen. For the WP it makes 1083 changes and takes about 40 minutes to run. When the program is done save the new file on tape (SA WP 5000 6FFF).

d. The MOVIT program corrected all LD, JP, and CALL addresses, however some corrections need to be made and addresses in two byte jump tables have to be changed manually as follows:

```
EN 518B (CR)    C2 92 51 / (CR)
EN 5B08 (CR)    CD 0E 5B / (CR)
EN 5E9B (CR)    CD 31 51 / (CR)
EN 5F14 (CR)    C2 18 5F / (CR)
EN 5F52 (CR)    B1 64 0E 60 4B 6B 55 60 75 62 3A 60 EF 07 (CR)
                22 61 82 62 60 70 54 62 BC 60 33 62 EF 07 EF 07 (CR)
                45 66 70 6A 99 6B 8F 63 6A 62 B6 61 3F 66 43 6C (CR)
                34 69 54 65 90 62 / (CR)
EN 6601 (CR)    CD 9B 67 / (CR)
EN 6634 (CR)    D0 / (CR)
EN 663F (CR)    CD 8B 67 / (CR)
EN 6782 (CR)    32 DF 07 / (CR)
EN 67D7 (CR)    CA E6 07 / (CR)
EN 6A83 (CR)    C3 1B 5F / (CR)
EN 6A90 (CR)    C3 1B 5F / (CR)
EN 6AD3 (CR)    CD EB 6A / (CR)
EN 6B28 (CR)    C3 F9 6B / (CR)
EN 6D47 (CR)    CD FD 6D / (CR)
EN 6EA7 (CR)    C9 / (CR)
```

A special thanks to Craig Petku for debugging the program and providing the corrections. With these corrections made, you should have a working version of the relocated Word Processor. Save it on tape SE X=5000 (CR), SA WP 5000 6FFF). Now, try it! GO 5000 for cold start (new text). GO 5003 for warm start (does not destroy text in RAM)

2. To add the 'J' command to the relocated WP add the following code: (Jump address, 7060, in the jump table was added in step d.)

```
EN 7060 (CR)    C0 21 70 70 22 D2 7F 21 0F 08 22 5E 70 C3 FA DF / (CR)
```

3. Add the following RAM Reader by David Woodbury which is used by the 'J' command :

```
EN 7070 (CR)    E5 2A 5E 70 7E 23 22 5E 70 B7 E1 FE 03 C0 21 1C (CR)
                EB 22 D2 7F 3E 0D C9 / (CR)
```

Save your WP with J Command on tape.

4. With the BASIC PAC in place , this is how you use the 'J' command:

a. Key in your BASIC program in the edit mode. Add a dummy program line at the beginning of your program (0 REM) because occasionally the first line is dropped.
b. Enter the command mode and enter J (CR). Watch the program transfer to BASIC. When the program is fully transferred the machine will be in the BASIC mode.
c. LIST or RUN your program. If it works, CSAVE it on tape.

DUSTINGS FROM THE LIBRARY- by Robert Hageman

1. To bring you up to date on our S.B.B.S. (Sorcerer's Bulletin Board Service) project. We are now beyond the planning stage and have the majority of the hardware assembled and software purchased. Those of you with an interest in this project are invited to send in any comments, suggestions, or ideas. I'll explain the access procedure in the next issue as well as provide more details on objectives for this "on-line" system.

2. For users of MDOS (Micropolis Disk Operating System), a good source of information on subroutines and reentry points are two files "SYSQ1" and "SYSQ2" mentioned in "MDOS Shared Subroutines". Together these document 117 addresses and what is to be found at each. An example;

a. 04E7 Warm Start - initializes console and list devices and signs on
b. 2000 MDOS RETURN - does not reinitialize but does sign on
c. 200C MDOS Executive - does not reinitialize or sign on but issues prompt

Here is a serial printer driver for MDOS written for Ralph LaFlamme's system, he has reported no trouble with it:

```
06CB 78        PLIST   LD    A,B        ;MDOS gives in B
06CC F5                PUSH  AF         ;Save character
06CD 3E 80     PRDY    LD    A,80H      ;Get speed 80H=300 baud
06CF D3 FE             OUT   (FE),A     ;Send speed to port
06D1 DB FD             IN    A,(FD)     ;Get port status
06D3 CB 47             BIT   0,A        ;Is it ready?
06D5 CA CD 06          JP    Z,PRDY     ;No.  Do again
06D8 FL                POP   AF         ;Yes.  Get character
06D9 D3 FC             OUT   (FC),A     ;Send to port
06DB C9                RET              ;Return to caller
```

And here is an initialization routine you will need for the serial port:

```
06FE E5        PINIT   PUSH  HL         ;Save these registers
06FF FD E5             PUSH  IY
0701 CD A2 EL          CALL  GETIY      ;Use monitor routine
0704 3E 80             LD    A,80H      ;Get speed 80H-300 baud
0706 FD 77 45          LD    (IY+45),A  ;Set speed in MWA
0709 AF                XOR   A          ;Clear flags
070A FD EL             POP   IY         ;Get registers back
070C EL                POP   HL
070D C9                RET              ;Return to caller
```

REPORT ON THE DECEMBER SA USER GROUP MEETING- by Ed Heussner

An all day, Saturday, open house was the format of the December meeting. Wives, kids, and friends were invited. The action started at 11 am and wound down about 8 pm. Some came for an hour, some stayed the whole time. Our host, Bob Rogers deserves a hearty thanks!! He supplied room for about 20 systems and about 10 spaces were occupied at mid-day. Equipment available to look at, feel, and see in action included a Beta-Drive; a dual, quad density Micropolis 5 1/4" disk system; a dual, 8" Discus disk system; an Anadex 9500 printer; and an Epson MX80 printer. Software demonstrated included Arrington's Music Package playing through our host's stereo system, the TRS-80 Level II BASIC working in a Sorcerer (one of the SA technical projects), System Software's Machine Code Tutorial Package, and plenty of games to keep the kids occupied.

SORCERER'S MAGIC- A NEW COLUMN TO ANSWER YOUR TECHNICAL QUESTIONS

by Bob Freeman, P.O.Box 70310, Sunnyvale, CA 70310

I have just received the last issues of the Sorcerer Users Newsletter and thought that I could help answer some of the questions readers had about the Sorcerer and the peripherals.

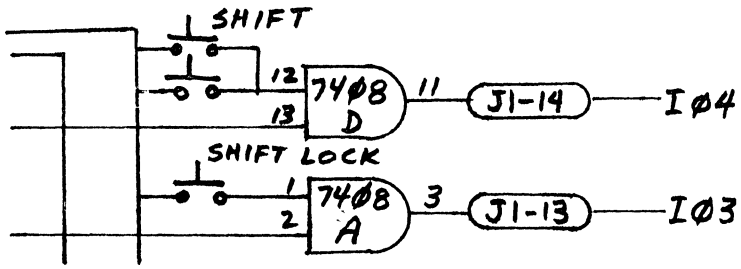
I have a Sorcerer I and a Sorcerer II with both the S100 Micropolis Quad Density drives and the Exidy Floppy Disk Subsystem. I program mostly in assembly language, both Z-80 and 8080. BASIC programs as well as COBOL and FORTRAN are part of my background.

I have, before getting the Sorcerers, built my own S100, multi Z-80 system and have been on a sucessful design team that built a medical, microprocessor, heart analyzer. Enough of me!

In the June issue of S.U.N., Terry Calvert suggested using diodes and a capacitor to help the cassette interface. Though this is a good approach, it will not solve all the problems with the Sorcerer II.

Exidy's Customer Service has a Technical Bulletin (the latest one, No.9, supercedes all others) for fixing the interface. The modification to the receiver section improves the signal/noise ratio and speed variance tolerance of the circuit. The volume setting is about 1/2 setting for best results, but will work from 1/4 to full volume. Also the makes of recorders you can use is more varied after the fix; I have used Radio Shack and Panasonic recorders with no problems.

The other problem Terry mentioned is related to the blocking diodes on the keyboard. The diodes are germanium and sometimes become flaky. There are two fixes I have found to work. One is to simply replace the two 1N270's. The other fix is to take out the 1N270's and the 7414 and put in a 7408 as shown:



If anyone has any technical questions about the Sorcerer or peripherals write to me directly, preferably on cassette using the Word Processor PAC, and I will respond through this column in the newsletter.

*** STALEY'S SORCERER SOFTWARE BRINGS YOU ***

SORCERER ASTEROIDS

This is a machine language program which simulates the action of the arcade game which is now number one in popularity. Just like the pay-to-play game, you can rotate your ship either clockwise or counter-clockwise and move it in any direction by pressing keys. A press on the SPACE BAR sends your lazer beam out. If you strike an asteroid, it blows up into smaller rocks which are not easy to dodge. And look out for the saucer. It has good aim and can hit you if you don't pay attention. A Sorcerer with a capacity of 16K or greater is required. If you have "The Sorcerer's Voice", your fun is doubled by the sound effects. The price of $19.95 includes postage by 1st class mail in the USA. Add $0.50 for airmail overseas. Send for free catalog of 25 other programs.

Staley's Sorcerer Software, 3497 School Road, Murrysville, PA 15668.

THE WORD PROCESSING CORNER #10

Steven Guralnick
15 Southgate Ave., Suite 246
Daly City, CA 94015

Back again. I got my first two week vacation in about ten years and it's hard to come to Earth again.

I having been thinking a lot about where this column is going. I have just about run out of brilliant things to say about the WP Pak. At the rate I am going, I will be describing how to use it to re-invent the wheel. On the other hand, SPELL BINDER is here and it has a lot to offer.

So, what I am going to do for a while is to start up a series of comparisons between the Pak and SB. It wll be helpful to those of you who are going to be using SB and to those of you who have the Pak and are thinking about getting the new program.

Let's start with the search routines. In SPELL BINDER, there are several, some of which may look familiar. If you wish to do a discretionary search, you type "Sn" where "n" is the number of times you want to search. The program then asks "SEARCH FOR:". You enter the old string. The program then asks "RELPACE WITH:" and you enter the new string. The program then searches for the old string and then asks "REPLACE?(Y/N)". If you press "Y", the old string is replaced. If you press "N", the program skips to the next old string.

The program will also do automatic searches. The format is somewhat similar to the Pak. The convention is "nS /OLDSTRING/NEWSTRING" where "n" is the number of times you wish to search.

If you just want to search without replacing anything, the convention is "S/STRING". The program searches for the desired string, drops the cursor on it and then exits to the COMMAND mode.

Where it gets interesting is when you want to search or search and replace in a file that is bigger than the computer's memory. Here, there are a series of global routines. After opening up a read file (and a write file if you are writing the searched file to disk), you then insert "g" in the chain. For example, "Sg/OLDSTRING/NEWSTRING". The program then fetches enough text into work space to work with and then searches and, in this case, replaces automatically. When it has done so, it writes the changed text to disk and fetches more, and continues until the entire file has been searched and written to disk. It is not necessary to add the "n" to the convention; the "g" does it all. In fact, you can use the "sg" approach with a file that is in workspace and it saves you from having to figure out how many times to search. "Sg" also works on discretionary searches and on straight searches. For example, suppose you have a large file and you want to find a piece of it to use somewhere else. You open a read file and then "sg/STRING". The program will the search through the entire read file until it locates the string you want. You can then close the read file, pick up what you need and use it elsewhere.

As you can see, we are talking about some leaps forward in processing.

See you soon!

JOYSTICKS FOR THE SORCERER-

We have had several requests for information about joysticks for the Sorcerer. The December 1980 issue of Byte had an article by Steve Ciarcia on page 320 about joysticks for the Sorcerer. The following article by Howard Arrington indicates how the do-it-yourselfer can make some. See his FLASH BULLETIN for ready-to-go joysticks.

*** FLASH BULLETIN FROM ARRINGTON SOFTWARE ***

Atari joysticks configured for the Sorcerer parallel port are available for $39.95 per pair. They have control for four directions plus diagonals, plus "fire" button and come with a demostration cassette containing BASIC and machine language utility routines for the joysticks. See ads on pg. 12-13 for more software.
Arrington Software Service, 9522 Linstock, Boise, Idaho 83704

JOYSTICK/KEYBOARD STANDARD FOR THE SORCERER

This article describes the standards as adopted by ARRINGTON SOFTWARE SERVICE and its representatives in AUSTRALIA. Future software offered by Arrington Software Service employing joystick/keyboard control will conform to this standard. It is suggested that all SORCERER owners use these standards for international compatibility of software and hardware.

Two joysticks may be attached to the INPUT of the parallel port. UNIT #1 uses the LOW-order 4 bits, and UNIT #2 uses the HIGH-order 4 bits. Each unit may steer in the four basic directions, LEFT, RIGHT, UP, DOWN, as well as in the four diagonal directions. Both units operate independently, and simultaneous operation is permitted.

FIRE BUTTON control may be included, and has priority over directional control of the joystick unit it is attached to. FIRE BUTTON is activated by grounding both BIT 0 and BIT 1 for unit #1, and BIT 4 and BIT 5 for unit #2 .

KEYBOARD has priority over JOYSTICK, and overrides both joystick units if used. KEYBOARD INPUT RESULT is returned as the RESULT CODE of joystick unit #1, with joystick unit #2 disabled.

Keyboard directional control is via the "arrow" (normally cursor control) keys in the NUMERIC KEYPAD only. The SHIFT key need not be depressed when using these keys. FIRE BUTTON on the keyboard is the NUMERIC-PAD "5" key (HOME). Optional FIRE BUTTONS may be SKIP/TAB or SPACE BAR. FIRE BUTTON overrides directional keys on the keyboard.

In the event that both the LEFT and the RIGHT keys are pressed together, it is treated as NO INPUT. The same rule applies to depressing both the UP and the DOWN keys together. The UP/LEFT ("7"), UP/RIGHT ("9"), DOWN/LEFT ("1") and DOWN/RIGHT ("3") keys on the numeric-pad are optional.

For programming in Z80 machine code, the 8-bit INPUT RESULT CODE is returned in the A-register. No other registers are affected. If there is no input, the A-register must contain 00, and the Z-flag must be set .

INTERFACE STANDARD — The PARALLEL PORT bit assignment is the same as the INPUT RESULT CODE except it is ACTIVE LOW.

BIT	PIN	FUNCTION	BIT	PIN	FUNCTION
0	10	UNIT #1 LEFT	4	12	UNIT #2 LEFT
1	22	UNIT #1 RIGHT	5	24	UNIT #2 RIGHT
2	11	UNIT #1 UP	6	13	UNIT #2 UP
3	23	UNIT #1 DOWN	7	25	UNIT #2 DOWN
0 AND 1	10/22	UNIT #1 FIRE	4 AND 5	12/24	UNIT #2 FIRE
	8	GROUND		20	+5 VOLT SUPPLY

CIRCUIT DIAGRAM -- Designed by B.T.F. TAN. Circuit diagram of one joystick unit only. Duplicate for the second unit.

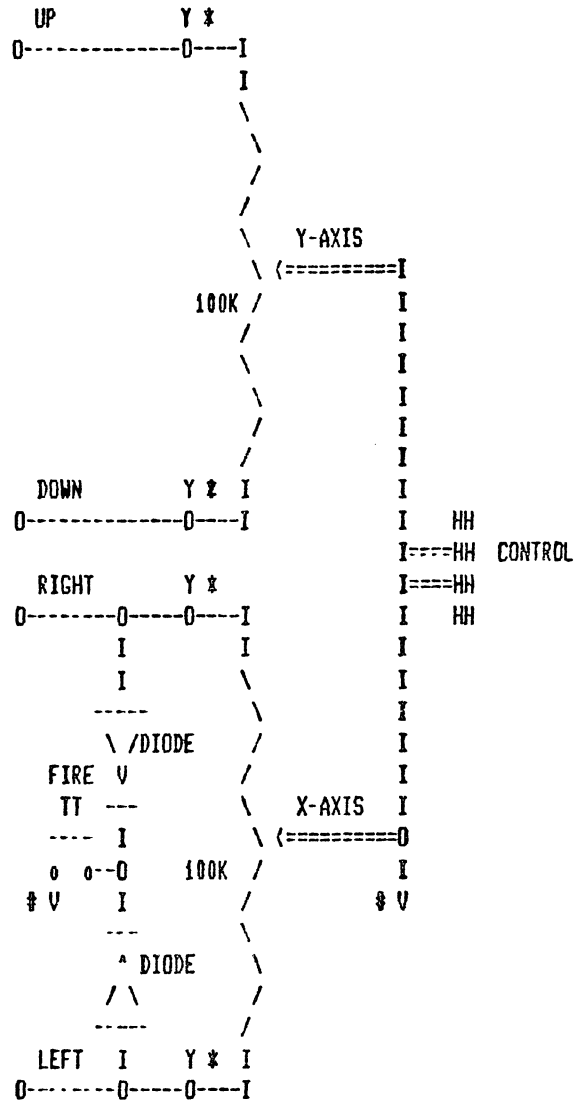
```
100 A = 255 - INP(255) : REM  READ PARALLEL PORT

110 IF (A AND  3)= 3 THEN "FIRE BUTTON UNIT #1"
120 IF (A AND 48)=48 THEN "FIRE BUTTON UNIT #2"

130 IF A AND 1 THEN "UNIT #1 LEFT"
140 IF A AND 2 THEN "UNIT #1 RIGHT"
150 IF A AND 4 THEN "UNIT #1 UP"
160 IF A AND 8 THEN "UNIT #1 DOWN"

170 IF A AND  16 THEN "UNIT #2 LEFT"
180 IF A AND  32 THEN "UNIT #2 RIGHT"
190 IF A AND  64 THEN "UNIT #2 UP"
200 IF A AND 128 THEN "UNIT #2 DOWN"

210 GOTO 100 : REM  SCAN AGAIN
```



‡ note : tied to +5V via a 50K ohm resistor
# note : tied to GROUND

Also, it is relatively easy to utilize ATARI or BALLY arcade joystick units. Use a 4.7K 1/4 watt resistor to pull-up each direction input to +5 volts. The FIRE BUTTON would employ the two diodes as above to connect between the LEFT and the RIGHT direction inputs to the parallel port. The GROUND line connects to the common line on each joystick. When the joystick selects a direction, or the fire button is pressed, a switch closes which changes the input bit from +5 volts to ground.

From Basic, the state of the joysticks is observed as listed above. The text strings tell what to do after determining the condition of the joysticks. If you branch to a routine to service Unit #1, be sure to return to a scan of Unit #2 so that it can operate simultaneous with Unit #1.

ARRINGTON SOFTWARE SERVICE

CASSETTE FILES -- This utility enables your Basic programs to reliably write string records to cassette tape, and subsequently read the data back. It is also easy to store and retrieve numbers by converting them to and from strings using the STR$() and VAL() functions. The number of strings written or read is unlimited, and the length of each string may vary up to 254 characters. Just look at these powerful, yet straight forward features:

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.

```
100 REM ---------------  SAMPLE PROGRAM  ----------------
110 TP$="":POKE 260,80:POKE 261,123:REM Establish entry address.
120 INPUT "READ/WRITE";A$:IF A$="READ" THEN 200
130 PRINT "SET RECORDER IN RECORD MODE"
140 INPUT "FILE NAME";TP$:Z=USR(0):REM Open named file.
150 INPUT "DATA";TP$:Z=USR(W):IF TP$()"END" THEN 150
160 Z=USR(C):END:REM Close file. We are finished writing it.
200 PRINT "SET RECORDER IN PLAY MODE":Z=USR(F):REM Printer on.
210 INPUT "FILE NAME";TP$:Z=USR(0):REM Open named file.
220 Z=USR(R):IF TP$="END" THEN Z=USR(D):END:REM Don't close file.
230 PRINT TP$:GOTO 220:REM Print record, go read another one.
```

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SORCERER SIZE: 16K 32K 48K
RETURN ADDRESS:

KEY: B-Basic M-Machine language U-Utility G-Game S-Sound J-Joystick or keyboard

This advertisement was printed on my Hewlett-Packard 2631A serial printer, using the Exidy Word Processor Pac and my VISTA 5 1/4 inch double density disk drive. The software offered is excellent, and I GUARANTEE continued support.

FORTH- A NEW COLUMN

by Daniel Conde, 1145 Pine St. #15, San Francisco, CA 94109

I am really glad to see FIG-FORTH being made available for the Sorcerer by Quality Software. Unfortunately, I do not use their version, thus not knowing their exact implementation peculiarities, I will try to write a general introduction to FORTH as it may apply to the Sorcerer. Although FORTH is supposed to be a super portable language, owners have been prolific in making their programs use their own custom words that others don't have. I will not try to teach FORTH in this column since there are other sources that do a good job. I will be happy to answer questions or discuss any topics you might suggest.

GETTING USED TO FORTH

One of the common complaints I hear about FORTH is that the stack is hard to get used to. I suppose practice is the only way to learn, but having a couple of tools to help you along can't hurt. So here, I will present a WORD called PEEK which will allow you to peek at the contents of the stack without destroying it. I also hope that we can learn a bit of FORTH programming while doing so.

First, before defining PEEK, let us create another word to form a basis. It is called PICK, to pick a number from the stack.

```
: PICK  2 *  (multiply the argument by two, since there
              are two bytes for a number)
        SP@  (get the address of the stack)
         +   (add it to your number, thus point deeper
              down into the stack)
         @   (use the address created by adding, find out
              what is there)
         ;   (semi-colon finishes the colon-definition)
```

This could have been typed on one line, without the comments, but FORTH allows you to write it out in a freeform structured manner as long as spaces are placed between the words.

Now we are ready to create the word PEEK. It is a good practice to create building blocks rather than to write huge definitions since it is easier to debug smaller units, and the blocks may be used elsewhere. Now for PEEK...

```
: PEEK          (lets you peek at a stack of a given depth)
  CR            (go to a new line)
  1 +           (add one to your number for the loop index)
  1             (the bottom of the index)
  DO            (a DO LOOP)
  I .           (print out the current loop index, which is
                 also the current depth level)
  ." --------- "
                (print out a line to show the stack-like nature)
  CR            (another new line)
  I PICK        (pick up the Ith number down)
  5 .R          (print it out, right justified by 5 spaces)
  CR            ( new line )
  ?TERMINAL IF LEAVE ENDIF
                (terminal asks if user wants to stop)
  LOOP ;        ( loop back )
```

(FORTH continued)

Here is how FORTH works when PEEK is defined:

1. Type 1 2 3 to load these numbers on the stack. In your mind you know that 3 is the topmost, 2 the second and 1 at the bottom.

2. Verify it by typing . . . You should see 3 2 1 and now these numbers are no longer on the stack.

3. Type 1 2 3 again to reload them.

4. Type 3 PEEK to mean "Let me peek at the top three numbers on the stack". You should see:

```
1---------
     3
2---------
     2
3---------
     1
```

5. To verify that the stack was not disturbed, type . . . You should see 3 2 1

This version of PEEK does not check the address, so you could PEEK beyond the real depth of the stack.

IN THE NEXT ISSUE....

Articles for the next issue include:

How to upgrade your Sorcerer I 32K to 48K without S-100 expansion
How to run TRS-80 software in your Sorcerer
A Hexpad Keyboard for loading into RAM
More technical tips from Bob Freeman

COPIER- COPIES ANY TAPE- by Paul Miller, reprinted from the European Sorcerer Club newsletter (formerly S.P.E.C.)

This program accepts data from a tape and loads it into memory in exactly the same sequence that exists on the tape. This routine may be used to copy any program, BASIC or machine code no matter what has been done to prevent you from doing so. If the program you are copying is in several parts you should rerecord each part individually. The resultant tape produced by this exercise is an exact copy of the original and if the original had been "copyproofed" then the copy will be copyproof also.

To use this routine after you have keyed it in, GO 200 (SAVE it with the auto-execution SE X=200 to be able to LOG it). It will instruct you to PLAY the tape you want to copy. You must be able to listen to your program going in (or watch the LED through the vent screen) because you must switch off the tape when all the program has gone into RAM. The program tells you how many bytes long the program you are copying has been found to be. The request that you set up your recorder ready to SAVE your program next appears with a request to hit any key when ready. Pressing any key will start the recorder and SAVE your program.

EDITORS NOTE: I used this routine to make a back-up copy of my SYSTEM 2 Editor which was difficult to copy otherwise. I wanted a back-up copy because the original tape was only marginally compatible with my recorder. The routine worked fine. I haven't tried it yet on tapes that I can't load because of CRC errors but I wonder if it could be used to rescue otherwise unloadable tapes.

The Sorcerer's Apprentice does not approve of copying copyrighted programs for the purpose of exchange or providing free programs for friends; however copies for back-up or personal use of the program owner is necessary and it is for this need that the COPIER program is provided.

```
.DU 200 2CE

ADDR   0  1  2  3   4  5  6  7   8  9  A  B   C  D  E  F

0200:  21 79 02 CD  BA E1 21 88  02 CD 54 02  CD 0F E0 28
0210:  04 77 23 18  F7 CD 27 E0  E5 3E 00 23  77 23 77 E1
0220:  01 00 10 A7  ED 42 E5 E5  D1 CD E8 E1  21 B2 02 CD
0230:  BA E1 21 79  02 CD BA E1  21 8E 02 CD  54 02 C1 7E
0240:  CD 12 E0 ED  A1 EA 3F 02  CD 27 E0 21  BC 02 CD BA
0250:  E1 C3 03 E0  CD BA E1 21  95 02 CD BA  E1 CD 18 E0
0260:  28 FB FE 03  28 F7 FE 1B  28 F3 CD 05  E2 CD 05 E2
0270:  06 01 CD 24  E0 21 00 10  C9 52 65 61  64 79 20 74
0280:  61 70 65 20  74 6F 20 00  49 6E 70 75  74 00 4F 75
0290:  74 70 75 74  00 20 70 72  6F 67 72 61  6D 20 54 68
02A0:  65 6E 20 70  72 65 73 73  20 61 6E 79  20 6B 65 79
02B0:  2E 00 20 42  59 54 45 53  2E 0D 0D 00  0D 0D 44 4F
02C0:  4E 45 21 00  00 00 00 00  00 00 00 00  00 00 00
```

A REVIEW OF EXIDY'S EXTENDED BASIC-
by Ralph Porter, 6157 South 700 West, Murray, Utah 84107

After a long wait Exidy has finally released it's Extended BASIC on cassette. I would like to discuss my initial thoughts after using this for a few hours.

Basically this software is Microsoft's Disk Extended BASIC without the disk commands. It is superior to the ROM PAC BASIC and has several features that are not included in Radio Shack's Level II BASIC. Extended BASIC is 18K long and therefore requires at least a 32K machine.

Here is a list of some of the extensions:

CALL- to directly call a machine language routine.
AUTO- automatic line numbering
RENUM- renumbering
ELSE- for use after IF-THEN statements
INKEY$- for keyboard input during program execution
CURSOR- to move cursor to a desired screen location
LPRINT and LLIST- for printer output (an option permits either a Centronics or serial printer)
RANDOMIZE- randomize the random number generator
WHILE-WEND loops- a conditional FOR-NEXT loop
SWAP- exchange variables or array elements
WIDTH- reset video or printer line length
PRINT USING- formats numeric or string variables
ON ERROR GOTO- error trapping routine which allows the program to continue without interruption. Automatically does REDO FROM START if you enter a string character when it expects a number.
CSAVE* and CLOAD* are new routines that work properly
EDIT- line editor eliminates line retyping
LIST xx-yy- lists sections of program specified
Mathematical functions can be Integer, Single Precision or Double Precision (16 digit).
Numbers can be entered as decimal, hexidecimal, or octal.

One feature that is available with the Disk version that is not included in Exidy's Extended BASIC is the ability to merge and chain cassette files.

Program tapes for ROM PAC BASIC are not compatible with the Extended BASIC. A program is included with Extended BASIC which converts ROM PAC BASIC programs to Extended BASIC. It worked well except for programs with USR(X) routines which required some manual corrections.

Overall I feel that this is a welcome addition for Sorcerer owners who cannot afford the luxury of a disk system. I find the extra features make my programs shorter as well as easier to write. For $50 it is well worth the price.

BASEX Compiler:A Review
By Mark Northrup;9212 North 70th St;Milwaukee,WI 53223

I first became aware of BASEX from an article in the October 1980 issue of Creative Computing. I later found an article by the author of the compiler, Paul Warme, in volume III, number 30, of Dr. Dobb's Journal.... Based on the information in these two articles I decided to purchase the compiler and the manual. The manual is available from Byte Books for $8. You may purchase the compiler and the manual from Interactive Microware,Inc. P.O. Box 771, State College,PA 16801 for $33.

Upon receiving the compiler and loading it, I attempted to write a simple number guessing program that would guess, or allow the user to guess, a number from 1 to 100. In BASIC such a program would require about 15-20 steps, in BASEX it requires 100 to 120 steps. BASEX requires the author of the program to provide a random number generator. The following is the one I wrote. It will produce a number from 1 to 255 with a fairly good distribution.

```
*** RND
MLT R*16383
MLT R*13
SET R=A
ABS A
DIV A/129
INC A
```

The reason this works is BASEX does not check for overflow; it just "wraps around" to the next value.

While devloping the random number generator I discovered that Innovative Info. Systems, who had prepared BASEX for the Sorcerer, had left the "print record length" at 80 characters. Whenever I printed something 16 characters were lost, and not put on the next line as in BASIC. In order to fix this bug, enter the monitor, after loading the run time library, and type EN 429 CR at 0429: type 41 / CR, this will set the "print record length" to 64 characters.

In the benchmark tests that I ran BASEX was as fast if not faster than machine code and about two to three times faster than Exidy BASIC but not the seven to 20 times faster as advertised. BASEX is very good in printing and in its equivalent of PEEK and POKE, it is very fast.Too fast for me to get a reliable speed estimate!

The major problem with BASEX is that it "is somewhat weak on error checking" as Dr. Warme had warned in Dr. Dobbs.... It is very weak; altho none of the programs I have written went "wild", there are far too many ways to get into frustrating trouble. Inserting and deleting lines is at best a dangerous proposition. There are two kinds of deletes: those after inserts and just a delete. If you should use the wrong one, you may have to reload your program, providing you had saved it on tape previously. The rub-out character is ctrl-h, but use it carefully. If you go back too far, your results are unpredictable, and you may have to reload the program again! If you enter a number greater than plus or minus 65540 on an input statement, you get a "dump". An overflow flag would have been useful here. When characters are entered in a numeric field, the field is set to zeros with no error condition flag set.

(continued on next page)

(BASEX review continued)

Strings are handled very much as they are in HP-BASIC, that is, you must predefine the length of the string and you can address each character in the string as tho it were a one- dimensional array. When the defined string is too short for the string entered, you will get a "dump", not an overflow. In several places I have mentioned "dumps";these are produced by the run time library and are not easily recognizable as such. Printing a message as well as a "dump" would have been a better approach.

So far all the bugs I have mentioned have dealt with the compiler and the run time library. The third component is the loader. There is a facility called "FIX" that will relocate and compress (by as much as 25%) the BASEX program. I have tried to use this facility several times and I cannot get it to work despite the fact that the command is syntactically correct. In addition, there are no error messages, so I cannot determine what was done wrong.

The manual was not well-documented and was not sufficiently explicit. It did not warn the user that the LST (LIST) command would not list exactly what was entered when the user typed it in, nor that the A-register is somehow involved in array manipulation. When the program did not produce the expected results, I would in desperation wade through the compiler or the loader listings, in the back of the manual, to determine what I was doing wrong.

In general, the faults far out-weigh the benefits for this compiler. It is faster than BASIC, but you pay for this speed with longer debugging time and much more coding. It is very good for animated graphic games, but not for most other applications.

ARRINGTON'S MUSIC SYSTEM- a review by L. Kobylarz

I was so impressed with the quality of the sound when I first heard a demo of Arrington's MUSIC SYSTEM, that I ordered mine the same day. I received it a few days later and hooked it up to my stereo. The D/A converter, that is part of the system, plugs into the parallel port. A patch cord from a RCA type receptacle on the D/A board to my stereo completed the hook-up. I loaded the machine language program, MUSIC, which includes the music making routine, an editor for writing music files and using the program, and the animated "PIANO PLAYER". I then loaded a demo music file included in the package, prompted by the editor part of the program and out of my stereo came beautiful music with the "piano player" accompanying it on the monitor screen.

Next I tried to write my own music file and it got a little tougher. The computerist who isn't a musician, or the musician who isn't a computerist might have trouble. Arrington provides five pages of documentation to help and his latest improvements to the editor give a non-musician like me a chance. This program is not a game or demo that you just load and let run; it will take some time to become familiar with the operation.

I have noticed the difference in arcade games; i.e. Space Invaders; when the sound effects are present. The sound adds another dimension to the excitement. Arrington has started offering some of his software with sound when used with the MUSIC SYSTEM. I will probably use my MUSIC SYSTEM in conjunction with purchased software at first. I hope to be able to add sound to my own programs. I don't think I'll be using the system to write serious music files; if someone is using it for that purpose, send me your comments.

This package is a good addition to your computer system. See Arrington's ad on page 13. The MUSIC SYSTEM is $40; the PIANO PLAYER is $15 extra.

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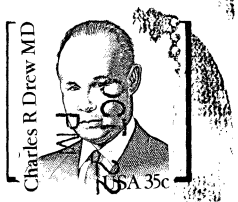

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