

PORT FE

SORCERERS USERS' GROUP

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SORCERER

Newsletter



The Toronto Sorcerer Users' Group was founded in the Spring of 1979, a handful of willing and eager to learn members.

This newsletter shall at all times keep in mind the goal at its conception. To spread the seeds of knowledge.

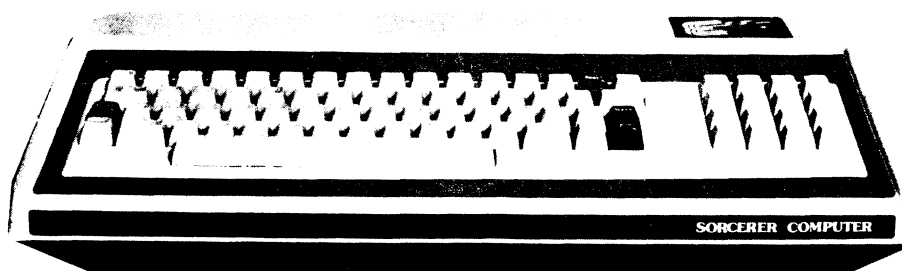
Articles printed in this newsletter shall be free for all Sorcerer Users' groups to reprint or comment on as they see fit.

Articles submitted for this newsletter must be in no later than the beginning of the 1st of every month.

April 1981 ISSUE

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This article was submitted to the SORCERER COMPUTER USERS OF AUSTRALIA - Newsletter March 1981 again by our man Devin Trussell on assignment in California.

In June 1980 I made a brief visit to the offices of Exidy. At that time efforts were being made to sell a majority interest in their Data Products Division, which manufactures Sorcerer and related products. At the time, there was very little activity in the Sorcerer side of Exidy's business because of the intended sale. It subsequently transpired that the computer division was not sold (contrary to press reports). Recently (December 1980) I made a second trip to the U.S., and once again was able to stop at Exidy. One reason for my visit was to obtain a clear idea of Exidy's policy and future plans for Sorcerer. My motivation was not idle curiosity. On the contrary, it was based on serious concern about the company generated experiences in Australia and North America; specifically Ottawa, Toronto, Calgary, Vancouver, New York, Seattle, Portland, San Francisco, San Diego, Phoenix and Houston. Exidy has earned a reputation for great reluctance to provide product support. This, plus imaginative delivery times, and an absence of quality control shown by a not uncommon failure rate of 3 out of 5, has caused many dealers to quit handling Sorcerer. I understand that the Australian distributor Dick Smith, one of Exidy's largest customers, was at one stage ready to give up Sorcerer because of Exidy's intransigence. Popular Electronics, in a recent survey article on personal computers, also observed that Exidy had a very poor record for product support.

Initially I had high hopes of obtaining information on the future of the company, since I had an appointment with the company president, Mr. Kaufman. However the appointment was not honoured. The people I did see do not formulate basic company policy (apparently only the President does this), so I was able to obtain little pertinent information on future directions.

The computer division is not up for sale at the present time. It may possibly be separated into an independent facility with some autonomy. This would be a positive development. At present Sorcerer operations are carried out concurrently with Exidy's main cash flow product; coin operated arcade games, all of which are Z80 based. The Sorcerer computer was developed as an interesting sideline to the main product. I believe that a large measure of the customer unhappiness with Exidy is due to their failure to understand that there is a fundamental difference between marketing arcade games and marketing personal computers.

During the day and a half that I was at Exidy, Ramona Fleck, a most helpful and extremely dynamic member of the Marketing Department, introduced me to representatives from most of the technical departments in the Computer Products Division.

I had a brief chat with Paul Terrel, who is in charge of Marketing. He said that in the future, Exidy will emphasize the selling of "systems" consisting of the Sorcerer, packaged with various peripherals, many of which will not be manufactured by the company but will be proprietary equipment relabeled. There is no intention to make Sorcerer more price competitive with other personal computers (e.g. Apple). Exidy will concentrate on small business and foreign sales where higher prices can be obtained. I was told that there is no Sorcerer III on the drawing boards, or even major improvements scheduled. I would have thought a 24 x 80 display format and 8 inch disk drives would have been important specifications in business applications. It also seems some color capability (at least 68047 quality) would be worthwhile. He mentioned the computer division sales were 6 to 8 million dollars per year and that overseas (Holland 4,000, Australia 2,000 and Japan 1,000) account for at least half of all sales. I noted the recent absence of any sort of magazine advertising for Sorcerer. He said that this would soon be rectified. I approached Mr. Terrel (via the ever helpful Ramona Fleck) on the question of SCUA distribution of tape versions of Basic 1.1 and Monitor 1.1. He took the view that this was not possible because it would be "an infringement of copyright". I was not surprised at this response. Mr. Terrel impressed me as a person who liked to talk but avoided action. He seemed totally disinterested in feedback from one of the most active user groups (SCUA) via yours truly. He did not want to hear any frank observations I had picked up from Sorcerer owners, dealers, and ex-dealers, and there are plenty of the latter.

I spoke with Laval Pennington who is in charge of Customer Service. He seemed aware that the company's past response to letters was not quick. He assured me that correspondence from individuals was now being promptly answered. Customer service also handles distribution of technical updates. These will now be sent routinely to all major Sorcerer user groups. The current technical bulletins were recently

received by SCUA and were reprinted in the January issue of the newsletter. I requested a set of up to date schematics for Sorcerer I, Sorcerer II, and the S100 Expansion Unit. These were received early in January so it seems Customer Service is really living upto its policy.

I spent a considerable time with Vic Tolomei, who is in charge of Software Development. He recently completed two disk software projects for Sorcerer. One is a text editor called (Exedit) for the development system. The other is the addition of conditional assembly and macro capabilities to Exidy's assembler. Both these products will be released in the first half of 1981. Vic is currently working on customizing "Spellbinder", which is a greatly improved disk version of the word processor PAK. Since it will cost little more than the ROM PAK, and is so much more powerful and flexible, I expect that very few Sorcerer owners who are going to disk and have not bought the WP PAK will choose Spellbinder. Steve Guralnick, who wrote a regular WP PAK column for SPEC (the English Sorcerer newsletter) swears by Spellbinder. Hopefully he will give a detailed review of its features in the near future.

Vic Tolomei also confirmed that the TEST function in the monitor is worthless. This, and the BATCH command (which he has never used) are the two parts of the monitor which he feels could be safely eliminated by those who wish to write custom monitors. I also asked him about 'Rosetta Smalltalk', but he had not yet had a chance to try it, so could not comment on this new language that has been implemented for the Sorcerer.

Tony Bagshaw

***** HEXPAD FOR THE SORCERER *****

An article from Paul Grimshaw in the S.P.E.C. Newsletter of Feb. 1980.

This is really a first class program! Everyone that uses it, needs it like yesterday and can't do without it. This very useful contribution that converts the numeric keypad into a hexadecimal keyboard to facilitate the entry of Hex data into memory. I have personally checked the program for correct operation for complete satisfaction first time.

1. Load program
2. GO 6E00
3. Use numerical keypad to enter data; no need to 'RETURN'
4. Use space bar to step thru memory
5. Use 'RUB' to step back thru memory
6. Use 'CLEAR' to enter '00'
7. Control 'B' allows entry of string of ASCII direct.
8. Control 'C' escapes from (7) above.
9. RUN/STOP returns you to monitor.

A 7 8 9

B 4 5 6

KEYPAD LAYOUT

C 1 2 3

D 0 E F

ADDR	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
6E00:	21	E0	6E	CD	BA	E1	0E	02	1E	04	CD	30	E0	28	FB	CD
6E10:	AE	6E	06	04	30	0F	FE	5F	20	F0	CB	3C	CB	1D	10	FA
6E20:	CD	F0	6E	18	E5	07	ED	6A	10	FB	1D	20	DD	CD	05	E2
6E30:	CD	45	E0	5D	54	CD	E8	E1	41	CD	D2	E2	7E	CD	ED	E1
6E40:	41	CD	D2	E2	50	59	CD	30	E0	28	FB	CD	AE	6E	38	11
6E50:	06	04	07	CB	12	10	FB	1D	20	EC	7A	CD	D6	6E	23	18
6E60:	CC	FE	0D	28	9B	B9	20	20	CD	30	E0	23	FB	FE	08	20
6E70:	05	2B	36	20	18	08	FE	03	28	B3	CD	D6	6E	23	CD	45
6E80:	E0	FE	0D	CC	05	E2	18	E0	FE	5F	20	0F	CD	85	E9	CB
6E90:	43	20	B1	2B	3E	0D	CD	45	E0	18	98	FE	20	28	BF	FE
6EA0:	1B	CA	05	E2	FE	0C	20	9E	AF	CD	ED	E1	18	AC	E5	21
6EB0:	E9	6E	06	06	BE	28	10	23	10	FA	FE	3A	30	15	FE	30
6EC0:	38	12	CD	45	E0	18	08	3E	40	80	CD	45	E0	D6	07	07
6ED0:	07	07	07	3F	E1	C9	77	56	BA	C8	2B	3E	3F	C3	45	E0
6EE0:	0D	0A	53	74	61	72	74	3A	00	3D	2E	2B	2A	2F	2D	00
6EF0:	1C	C3	85	E9	FF	00	FF	00	FF	00	FF	00	FF	00	FF	00

Tony Bagshaw

Contributed by Paul Grimshaw ('A' level student) Batley Grammar School, Yorks, U. K. This routine scans for keys pressed using the USR function as a true function of the variable 'A' where 'A' is the code for the key required as given below.

Routine:-

```
DATA 205,208,199,122,211,254,219,254,163,195,26,207
FOR I=0 TO 11:READ A:POKE I,A:NEXT I
POKE 260,0:POKE 261,0
```

The next line should be your test to determine if a key has been depressed by 'IF USR(A)=0 THEN whatever'. If key is not pressed then 'USR'X returns a positive integer. Note that you should use 'IF USR(2)+USR(16)+USR(520)=0 to test for SHIFT / GRAPHIC Q and not the longer 'IF USR(2)=0 AND IF USR(16)=0 AND IF USR(520)=0'

Main Keyboard:-

ESC= 272	TAB= 264	GRAPHIC= 2	CTRL= 4
1= 528	Q= 520	SHIFT LK= 8	SHIFT= 16
2= 784	W= 776	A= 516	Z= 514
3=1040	E=1028	S= 772	X= 513
4=1032	R=1026	D= 770	C= 769
5=1296	T=1288	F=1025	V=1282
6=1552	Y=1544	G=1284	B=1281
7=1808	U=1800	H=1540	N=1538
8=2064	I=1794	J=1796	M=1537
9=2056	O=2052	K=1793	,=2049
0=2320	P=2312	L=2050	=2306
=2576	[=2568	=2308	/=2305
=2832] =2564	@=2562	SHIFT= 16
^=2824	LINE FEED=2820	RUB=2817	REPEAT= 258
SPACE BAR= 260	RETURN=2818	CLEAR= 257	RUN/STOP= 1

Numeric Keyboard:-

--3080	7=3344	8=3336	9=3600
/=3076	4=3332	5=3588	6=3592
x=3074	1=3330	2=3586	3=3856
+ =3073	0=3329	=3585	=3848

Sample Program:-

```
10 DATA 205,208,199,122,211,254,219,254,163,195,26,207
20 FOR I=0 TO 11:READ A:POKE I,A:NEXT I
30 POKE 260,0:POKE 261,0
40 IF USR(1028)=0 THEN PRINT"FOUND E",
50 IF USR(514)+USR(16)=0 THEN PRINT"SHIFT Z",
60 IF USR(2)+USR(16)+USR(520)=0 THEN PRINT"FOUND GR. SH. Q",
70 GOTO 40

RUN
FOUND E          FOUND E          FOUND E          FOUND E
FOUND E          SHIFT Z          FOUND E          SHIFT Z
FOUND GR.SH.Q    FOUND E          FOUND E          SHIFT Z
ETC,ETC,ETC.
```

Tony Bagshaw

***** BACKUP ON TIDBYTES - FEB 1981 NEWSLETTERS *****

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We received this update from T. Baldwin, 78150 Le Chesnay, France. He says how about this in place of your Bit Manipulation - The man is very modest!!!

```
FOR I=-1024 TO -513:POKE I,255-PEEK(I):NEXT I
```

CAN ANYBODY BEAT THAT ROUTINE?

***** WHAT PRINTED THE SORCERER CHARACTER ON THE FRONT COVER? *****

Numerous enquiries have been received regarding the front cover graphics. Well an I.D.S.460G Paper Tiger did the job. The printer and Northamerican Software's program, Super Graphic Scratch Pad 2.2, deserve all the credit!

Tony Bagshaw.

While most of us are familiar with the Sorcerer's microprocessor speed of 2.0 Mhz (2 million processing cycles per second), few if any of us know, how this compares against the other popular Micros. When talking about speed, those working with basic, like myself, should be aware of a second level of speed, that of basic language execution, which may vary greatly between different types of computers and may have little if any correlation between it and the actual microprocessor speed.

To measure this Basic speed, one may use the following program, but this is just one of several used to achieve a reasonable assessment. This program, will calculate and print all the prime numbers from 1 through 997, out of the first 1000 numbers.

```

10 REM PRIME NUMBER SEARCHER          90 IF M > L THEN 110
20 REM                                100 IF M = L THEN 130
30 FOR N = 1 TO 1000                  110 NEXT K
40 FOR K = 2 TO 500                    120 PRINT N;
50 LET M = N/K                        130 NEXT N
60 LET L = INT(M)                     140 PRINT CHR$(7)
70 IF L = 0 THEN 120                  150 PRINT "END"
80 IF L = 1 THEN 110                  199 END

```

As the comparison chart below shows, this program takes the Sorcerer with Standard Basic just over 20 minutes to execute. It would be interesting for some of you to let us know how it would compare with MBASIC, CBASIC, 19K EXBAS, EBASIC and MICROPOLIS BASIC.

This has been tried with a compiled version of MBASIC running under CP/M, as you can see the time has been cut down a great deal.

Computer Model	Microprocessor Speed	Execution Speed
Apple II	1.0 Mhz	960 Sec.
Ohio Scientific	1.0 Mhz	1431 Sec.
Radio Shack	0.9 Mhz	1457 Sec.
TI-99/4	3.0 Mhz	2480 Sec.
Aim 65	2.0 Mhz	1001 Sec.
Sorcerer (ROM PAC BASIC)	2.0 Mhz	1230 Sec.
Sorcerer (MBASIC compiled)	2.0 Mhz	405 Sec.

As you see on the last line a basic program compiled can increase speed quite dramatically.

By: Heinz Benedikt

WORDSTAR * Part One

For those of you that do a lot of typing of essays and the like, here we shall give you a rundown of what this program can mean to the user in a CP/M environment. We shall not try to entice anyone to buy this product but to simply describe it's operation and function to you.

Wordstar is a disk oriented word processor, that can speed up your letter writing, documentation, notes etc... It has basically five levels of command functions, all levels have sub-commands i.e. two keystrokes are required to issue a command. Sounds complicated, but once this program has been used for a period of time, it becomes almost natural. Each level of commands can be called upon at any time and displayed at the top of the screen. This means simply that you don't have to keep flipping through the instruction manual to find a certain command. The way the program is set up will determine during the initial stages what HELP level you wish to use. For the beginner, all command levels and their sub-commands can be displayed (should you so wish it) in the first upper quarter of the video screen, and as one becomes more and more used to the various commands the help level can be changed so as the commands are not shown completely all the time.

This program was mainly designed for daisy wheel type printers, but does allow for some software type control. I have modified it so as to run my I.D.S. 460. This lets me change type size and enhanced characters on the fly you might say. The formatting of text lines to a printer up to 240 columns can be realized without any difficulty. Most printers are only 132 columns wide anyway.

Now the main disk features are nice, you can add files together, write parts (blocks) of text from file to file, delete, copy, move groups of text around within a file, edit on screen what you wish to change etc... Complete search and replace commands, automatic text justification and word wrap around, very versatile cursor control and on and on and on.

I won't go into it in this issue but the next I will detail the commands fully. There is one thing that I like very much indeed and that is it is capable of printing out a file while you are editing another. Yes this is a spooler built right into the program. Alas you say there must be some fault with this program, there can't be anything that is 100%, well I can only find one fault with it so far and that is #&@!! HOW DOES ONE MAKE MULTIPLE COPIES ON PRINTOUT ??? This has had me wondering for some time now, that a program this good doesn't ask you how many copies you want. Well I guess a little rain must fall on even the good things in life. So to finish off for this time, for those of you that are thinking of spending your money on word processing programs (lets say a bundle) keep posted and look for the follow up in the next issue and I'll.

Ey: H.A. Lautenbach (to be cont'd next issue)

PORTFE Confusion

A strange little bug has come to my attention by one of our members (Ted Seki) who informs me that there may be some confusion going on between the Sorcerer and the S100 Box in as much as if you try to send information via register 'A' through a port to the S100. Only information that gets sent is up to E0 Hex, from there on it hangs. The 'A' register may be in some way trapping the information. Tests have been made with two Sorcerers and identical results were attained, this leads me to believe the whole story.

Now if anybody can shed some light on the matter we can get our EPROM programers to work, otherwise they will stay in the box for a little while longer. Come on guys here is a challenge. Spread the bytes around and not only on PORT FE.

We wait to hear from you learned gentlemen.

The Editor Who Waits

Up Coming Topics

Most of you have been probably wondering when we shall get on to some of the other software reviews. The next issue, will contain the follow up and completion of WORDSTAR. Possibly also an outline on the Exidy Disk system which plugs directly into the back of the Sorcerer. This is not to bad a system, it saves you buying the Expansion Box. A review of two Sorcerers communicating via the Parallel Port at maximum data transfer rate (CP/M based).

We shall also list the Hex dump of Three Dimensional Tic Tac Toe game. (so there will be no chance for only part of the listing).

Notice to all MEMBERS

The business aspect of the Sorcerer Users' Group shall be held every second meeting. The next session will be April 15/81 at Centennial College Campus (Warden & St.Clair) @ 7:00 PM

Any members that have not paid their dues shall be stricken from the record as of June 1/81.

Dues are now payable and become due as of JANUARY 1 of each year.

A permanent meeting place has not been resolved as of this time. You may be informed as to the time and place of the MAY/81 meeting by phone or in the next newsletter.

VIDEO AND BOOT UP PROBLEMS

Recent developments have led me to bring the following to everyone's attention. There exists the possibility that some of you may be experiencing some video problems. This is not to say that the actual video driver itself is the cause, but to point to a potential trouble maker.

The following are the symptoms that you would encounter:

1. Unstable video image.
2. Unable to find top of RAM or to boot up.
Takes quite a long time before system will even attempt to boot.
3. When video contrast is increased so the background becomes very bright, there appears to be one or more horizontal darker lines on the screen.
This gap of darker area decreasing in width after initial turn on.(over say 5 Min.)

If one or more of these symptoms appear, it is most likely that this will happen on a Sorcerer that has not been used for a period of from three to six months or longer.

What has happened is a deterioration in the main ELECTROLYTIC capacitor (8000 uf 15vdc). This is the -10v line. The problem in simple terms is that the capacitor will not hold a charge sufficient enough to stabilize the -10v line. The capacitor becomes leaky.

Replace this capacitor Exidy Sorcerer I part # SC25-1001 and for Sorcerer II part # 20-4013 (6000uf). It is recommended that the 8000uf capacitor be used to allow more leeway.

It is possible that this type of problem may be a bad capacitor (leaky), originally from the manufacturer, 1 in a thousand odds. But this would be an exception and not the rule.

This is NOT a fault of Exidy in design but the fault of the Sorcerer owner for not using the computer for long periods of time. Electrolytic capacitors have a non-use time frame (without being charged or the computer not turned on) of approximately six months to one year before the capacitors - yes not just one but all will start to deteriorate. Electronic equipment owners beware - turn on all electronic equipment at least once a month so that the capacitors will maintain their tolerances. This will insure good continued service.

Usual boot up problems

Symptom: ** Occasional change of top of memory pointer on boot up **
Solution: Change defective RAM.

If none of the video symptoms appear to be present in the system and the Sorcerer completely refuses to boot up at all, then first check to see if all power supply Regulators have the correct voltage output, next in line is the RAM memory itself. For ease and time replace one row of ram chips at a time. If this still doesn't solve the problem then it is possible that the on board video ram is defective (last choice).

DO NOT ATTEMPT TO FIX THE SORCERER IF YOU ARE NOT QUALIFIED

You could cause more damage than was originally there.

Get a qualified Exidy distributor to service the Sorcerer.

This space shall be filled by YOU the members. Send in your WANTS and NOT WANTS complete with information. EACH item to be no more than two lines. Make sure that you include your Name, Add, Tele. # where you can be reached and when.

COMPUTERS ~~~ VIA ~~~ COMPUTERS (continued)

Now that you have had some time to think about this topic and maybe let some of it sink in, I'll give you some more food for thought.

Most satellites are controlled via computer signals and send back acknowledgements. This takes the form of TELEMETRY signals which can be coded (private) in most cases. The telemetry is sometimes sent in excess of 9600 baud and requires some form of decoding.

In the same way one computer owner could contact another via satellite some two to three thousand miles apart, exchange greetings or data in a matter of seconds. The exchange must be first initiated by the calling station and request only the called station to answer. This is normally handled in this way, each user in the system has what you would term I.D. (identification). With no two users having the same I.D., it would almost be like dialing a telephone number. The called station would acknowledge that it is on line and ready to receive. All this is accomplished in a matter of a second. The sender would have his message or program ready in a holding buffer and then send bursts (blocks), (packets) of data i.e. approximately 500 bytes at a time. These packets are each accompanied with the senders I.D. and the length (number) of bytes transmitted, if the receiving station byte count does not tally with what was sent in the header of the transmission then no acknowledgement is sent back to the sender and the sender assumes it was not received correctly and would keep sending until it gets the acknowledgement. This ensures that the information gets there.

Remember that there could be up to 300 users time sharing this system. A lot of errors could delay the network response time. Since each transmission is limited to a maximum number of BYTES at a time it allows for a good cycling throughout the users.

The International Regulations at this time permit only the use of ASCII characters so the problem of privacy is still to be overcome. It will be possible that the sender requests not only I.D. but also a further form of acknowledgement that would be harder to break into. Since also the information is sent in small packets certain replies could be worked into the system that no further data be transmitted unless these are received first. Well now you can imagine a good chess game at a fair arms length.

Large corporations will be using this method for large wide spread on line link-ups with their parent company/ies. This would also get rid of the possibility of telephone line breaks due to various reasons. The cost of multiple relay stations is also eliminated. The cost of land, service, towers for all the microwave gear etc.

There is one such system in existence now between HAWAII and North America. This system is called ALOHA, and is in the experimental stages with very few users at this time. It seems to be working out very well for all those involved. I can see many more such stations and systems in the near future so watch out there may be quite a few modems up for sale before this decade is out.

To finish off with, keep your ears and eyes open for future developments in this specific field, it could very well be to your advantage, as a programmer having to deal with the environment or just as a plain user of the systems.

By: H.A. Lautenbach VE3IME

PIRANHA - CORRECTION

First we would like to apologize to those of you that have encountered problems with the entering of the Piranha program. This came about because of the way a CP/M file called .PRN structures the printout of the source code. ie: only the first five hex codes are shown and listed. This leaves something to your imagination and also leaves gaps in the program.

Below is the hex dump for Piranha from 06E0 to 088F Hex. Check the listing carefully in order that you don't miss some of the information. Most of the bytes you will be missing will be from strings, longer than five characters.

Because of this error the Piranha CONTEST will be carried for an additional month. So for those of you who have made the changes already you have a distinct advantage over the late comers. But remember it is the highest score received by: NEW DEADLINE: MAY 30/81 (only members are eligible).

Here is a little more news on the Digital to Analog board from Northamerican Software. The card comes completely assembled ready to plug into the Sorcerer. On board are two 14 pin I.C. sockets for your joysticks - as you might think - yes for those new games that are in the works. There already exists a number of games which use the audio portion such as SPIDER, ECHO, CHASE and more, from different parts of the world.

DUMP OF PIRANHA - FROM 06E0 to 088F HEX

```

06E0 80 08 00 00 00 00 00 00 00 00 53 43 4F 52 45 20 20 .....SCORE
06F0 20 20 20 20 20 30 30 20 20 20 20 20 20 50 48 41      00    PHA
0700 53 45 20 20 20 20 20 20 20 FF 3E 00 64 01 14 50 28 SE    SE    )d..P(
0710 01 01 00 16 07 16 40 01 02 60 30 0A 01 32 48 01 .....@...0..ZH.
0720 26 5C 30 14 04 4B 50 01 24 58 2C 1E 07 64 58 01 &\0...KP.sX...dX.
0730 22 54 2C 28 0A 7D 60 02 20 50 28 32 0D 96 68 02 "T,(.)'. P(2..h.
0740 1E 4C 28 3C 10 AF 70 02 1C 48 24 46 13 C8 78 02 .L((.p..HsF..x.
0750 1A 44 24 50 16 E1 80 04 18 40 20 5A 19 FA 88 04 .D&P.....@ 2....
0760 16 3C 20 64 1C FF 63 06 77 0E 01 23 0D C2 6B 06 .( d..c.w...#.k.
0770 05 C2 60 06 21 7B 08 36 17 23 36 85 23 36 17 23 ...!!{.6.#6.#6.#
0780 36 00 23 01 20 F4 70 23 71 3E 07 02 16 1F 23 23 6.#. .p*q)....##
0790 36 4F CD BE 06 15 C2 8E 06 21 E7 F7 06 14 11 E9 6O.....!.....
07A0 06 1A F6 00 77 13 23 05 C2 A1 06 3E FF 32 08 07 ....w.#.....)2..
07B0 3E 00 32 0A 07 CD 3F 01 CD 86 01 C9 23 23 23 23 >.2...?.....####
07C0 23 23 C9 2B 2B 2B 2B 2B C9 01 C0 01 02 C1 02 04 ##.+++++.....
07D0 01 04 08 41 08 10 40 10 20 3F 20 40 FF 40 80 BF ...A...@. ? @.@...
07E0 80 08 00 00 00 00 00 00 00 53 43 4F 52 45 20 20 .....SCORE
07F0 20 20 20 20 20 30 30 20 20 20 20 20 20 50 48 41      00    PHA
0800 03 E0 98 03 00 01 58 03 62 03 67 03 5D 03 6C 03 .....X.b.g.J.I.
0810 71 03 7B 03 76 03 8B 03 85 01 8F 03 3B 03 FF 01 q.{.v.....
0820 1B 1B 53 0D 55 38 4A 32 48 34 4B 36 59 37 49 39 ...S.U8J2H4K6Y7I9
0830 4E 31 2C 33 20 35 50 2E 41 30 FF 20 45 4E 54 45 N1,3 5P.A0. ENTE
0840 52 20 4E 45 57 20 56 41 4C 55 45 53 20 46 4F 52 R NEW VALUES FOR
0850 3A 20 47 4F 2D 55 2D 38 44 2D 32 4C 2D 34 52 2D : GO-U-8D-2L-4R-
0860 36 55 4C 2D 37 55 52 2D 39 4C 4C 2D 31 4C 52 2D 6UL-7UR-9LL-1LR-
0870 33 48 2D 2E 50 2D 30 41 2D 2B FF 17 85 17 00 20 3H..P-0A-+.....
0880 F4 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

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TOTAL PACKAGE price which includes the two programs \$49.95 US

Sound generator board is available separately and comes completely assembled. This is a digital to analog converter and can be used not only for sound but also a variety of other things. If you're the experimenter type you'll have lots of fun trying out all sorts of applications. There is also provision to hook up joysticks for game input control, this takes the form of TWO 14 Pin DIP sockets.

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