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Supporting the Sinclair and Timex Personal Computers

EDITORIAL

Well, it's time for another newsletter, and boy do I have some neat stuff to write about. First of all, thanks to all of you who have written to me and offered support. Thanks especially to Narti Kitiyakara who has submitted a review of HDT Z 2068, and also to good old John Bloxham (a.k.a. J.B.) from across the water. He sent me a lot of things, including a nice letter in which he has offered to continue sending us British updates and other "JB gems". Thanks John and Narti. Without the support from you folks, I'd have a tough time filling this newsletter.

Speaking of member mail, I have only received 6 questionnaires from last issue. Although the information which I got from these responses cannot reflect the needs and desires of the entire group, I have gotten some ideas for future issues. Most of the people who bothered to respond wanted to see hardware and machine code applications, as well as Sinclair rumors, new product information, reviews and other general news items. I will try to include what I can, but I need your help, also. If anybody has any special interests (and I saw some good ones in the questionnaires) which you would like to share, I would be more than happy to publish them. Also, if you have any questions or problems, just drop me a line and I will get you an answer (hopefully!).

By the way, if any of you still think that the Sinclair/Timex computers are dead, take a good look at this issue. You'll find news of Spectrum emulators, word processors, printer interfaces, and floppy disks for the 2068. There's even news of a PASCAL and a C compiler to be available in about 10 weeks.

And what of the ZX80/B1 and TS1000? When I went down to New Jersey to visit Bill and Maria at 21st Century Electronics, they showed me their ZX80. They had it hooked into a KRADLE keyboard with 64K and an AERCO dual disk drive. They were running ZX PRO/FILE. They also told me about a software package which allows for high res graphics of 256x192 pixels. After seeing all this done on a ZX80, I was forced to agree with Bill when he said that he "...could see the ZX80/B1 computers never dying.

And finally, what about rumors of the resurrection of the 2068? Although there's nothing to back up these rumors, you can't ignore the fact that Timex hasn't sold the rights to the 2068 yet, and that Sinclair Research is still going strong in England producing 200,000 Spectrums each month, according to John Bloxham.

There is certainly life left in our computers. @

SUPPORT !

The following companies are still supporting the Sinclair and Timex/Sinclair computers:

21st CENTURY ELECTRONICS
6813 Polk St.
Guttenberg, N.J. 07093

E. ARTHUR BROWN CO.
3404 Pawnee Dr.
Alexandria, NM. 56308

ZEBRA SYSTEMS, INC.
78-06 Jamaica Ave.
Woodhaven, N.Y. 11421

SOFTSYNC, INC.
14 East 34th Street
New York, N.Y. 10016

SYNTAX
RD 2 Box 457
Harvard, MA 01451

SYNCWARE CO.
P.O. Box 5177
El Monte, CA 91734

GAMES TO LEARN BY, INC.
P.O. Box 575
2 South Street
Williamsburg, MA 01096

AERCO
Box 18093
Austin, TX 78760

BYTE-BACK CO.
Rt. 3 Box 147
Brodie Rd.
Leesville, S.C. 29070

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P.O. Box 64
Jefferson, NH 03563

SIRIUSWARE
6 Turning Mill Rd.
Lexington, MA 02173

G. RUSSELL ELECTRONICS
RD 1 Box 539
Centre Hall, PA 16828

HUNTER
1630 Forest Hills Dr.
Okemos, MI 48864

MEMOTECH
7550 West Yale Ave.
Denver, CO 80227

PHEONIX ENTERPRISES
1780 N. DuPere Hwy - #17
Dover, DE 19901

SIMULUSION
Box 2382
La Jolla, CA 92038

KNIGHTED COMPUTERS
707 Highland St.
Fulton, N.Y. 13069

A.F.R. SOFTWARE
1605 Pennsylvania Ave.
No. 204
Miami Beach, FL 33139

In addition to the companies above (see issues 3:4 and 3:5 for more details on these companies), the following companies are also providing support for our computer:

A & J MICRODRIVE: This company offers microdrives for the Sinclair/Timex computers. Starter kit costs \$169.50 and includes one drive, manual, operating system, power supply and cable. A second drive costs \$99.50, and a five foot micro wafer costs \$3.50 (50 feet for \$4.50). Write for more information:
1050 E. Duane Ave., Suite I, Sunnyvale, CA 94086 (408) 732-9292

HEATH COMPUTER SERVICES: They offer business programs for all the Sinclair/Timex computers. Some titles include Sales File, Inventory, Invoice Control, Gradebook, and Appointment Calendar. Write to:
950 East - 52 South, Greentown, IN 46936 (317) 628-3130

ROMPAK, INC.: Software on ROM for the ZX80/81 and TS1000 computers. They offer ZX Pro/file on cartridge, Textwriter (word processor), and others. Write to:
1525 Aviation Blvd., Suite a-111, Redondo Beach, CA 90278

SUNSET ELECTRONICS: Software and hardware for all Sinclair/TimeX computers. They also offer a Spectrum Emulator and some British titles. Write to:
2254 Taraval St., San Francisco, CA 94118 (415) 685-8330

RAMEX: Supporting the 2068. They offer software (educational, games, utilities, business), and also hardware including the Tasman line and a disk drive system. Write to:
48945 Vandyke Rd., Utica, MI 48087 (313) 463-1795 ☐

INPUT/OUTPUT

John Bloxham has a copy of the 2068 manual (thanks to Ralph Coletti), and says that the two computers are not very different, although the ROM appears to have been rewritten and the expansion slot is quite different.

John also said that there are a few bugs in the Spectrum ROM. Well, the 2068 has more than its share of bugs. The tech. manual includes a 10 page section outlining all the known bugs and corrections/workarounds for them. Although most of the bugs show up during bank switching and advanced video modes, there are a few BASIC bugs. For example, pressing ENTER many times with an invalid tape command on the edit line causes the system to reset. If you use ON ERR GOTO to jump to a non-existent line number, the system will crash. This is because the ROM enters an endless loop trying to report the absence of a valid error handler to the non-existent error handler (sounds like the Liar's paradox - everything I say is a lie...)

Also, according to the tech. manual, the INT function for (-65536) gives an incorrect result of -1, and for other cases where the result should be -65536, it gives -1E-38. If you respond to the SCROLL? prompt using multiple keys (i.e.: Cap Shift/2 or Cap Shift/Symbol Shift), strange things can happen. All of these bugs occur in ROM, so they cannot be corrected. However, Sinware (makers of HOT-Z) is offering corrected EXROMs, so that may be the route to go (see review of HOT-Z 2068, page 5, as well as new product news, page 4.)

John also wrote that there are over 200,000 Spectrums being produced every month in England. He further said that a new enhanced version of the Spectrum is out, and the QL is now out on the shelves. (See JB's Corner, page 6)

Van Vangor says that he's using his TS1000 for business inventory control, and plans to use them for data acquisition and control during testing of prototype electric motors. Could you keep us informed as to how you make out, Van? I'm sure we'd all be interested in your application.

Van also writes that he has 2 A & J microdrives. Let us know what you think of them, O.K. Van?

Narti Kitiyakara says that he has the Tasword word processor - look for a review in a future issue. Also look for Narti's review of HOT-Z 2068 on page 5.

Kirt Olson, owner of Syntax magazine, called to inform me that the price of subscription quoted on page 18 of issue 3:5 was wrong. The price is \$48/12 issues, and \$27/6 months.

He also told me that the Sinclair/Samsung deal is domestic only - Samsung cannot sell Sinclair products outside of Korea. Thanks for that bit of news, Kirt. ☐

NEW PRODUCT NEWS

IN THE IMAGE OF SINCLAIR

Spectrum emulators have finally hit our shores. They allow the 2068 to be software compatible with the Sinclair Spectrum, thus opening a seemingly vast library of software.

These emulators come in many forms. At their worst, they are bare Spectrum ROMs which you replace your 2068 ROM with. At their best, they allow you to switch between the 2068 and Spectrum so that you can have easy access to both ROMs. All types require you to open your 2068 (gasp!), although some companies will install it for a fee (you have to send your computer to them).

How compatible are they? I cannot speak from experience, but G. Russell Electronics claims that their ROMSWITCH 2068 has loaded all of the programs tried so far.

Now for the bad news. According to Scott Duncan of the RAMEX company, the emulator disables all of your 2068 peripherals (except tape & video). So, the emulators probably won't allow printer operations, etc. (Remember, the 2068 and Spectrum edge connectors are different.)

Emulators are available from the U.K. (Spectrum ROMs), Phoenix Enterprises (one chip for \$29.95 - no ROM switching available), Sunset Electronics (\$60.00 - no further info on this one), G. Russell Electronics (ROMSWITCH - \$54.95) and 21st Century Electronics (ROMSWITCH). Refer to SUPPORT! on page 2 for the addresses of these companies.

SPINNING DISKS WITH YOUR 2068

As you all know, disk drives for the ZX80/81, and TS1000 computers have been available for some time. But, what about the 2068? At long last, they're here.

At the time of this writing, I know of two systems either on the market now, or coming soon (like by the end of this year). The first system is the AERCO drive system. Actually, this is a cooperative effort between AERCO and 21st Century Electronics. According to 21st Century, they will offer two packages. One will have one drive and interface. The other package will include one drive, with room for a second, as well as an expansion bus with room for a dual RS-232 interface and a Centronics parallel interface. Although there are no firm prices available yet, I would guess that the single package will sell for \$300 - \$450, while the larger package will probably sell for \$500 - \$600.

The good thing about this system is that it uses a standard IBM format. This may not seem very important, but it is, considering that AERCO is also promising a 2068 version of CP/M 2.2, perhaps on a cartridge. The combination of IBM format drives plus CP/M 2.2 should open up a huge library of software for the 2068. Look for the AERCO system by the end of the year with CP/M soon to follow. If you have any questions concerning this product, feel free to call me or either Bill or Maria at 21st Century.

The second system available is put out by the RAMEX company. They offer a \$200 disk drive interface, as well as a package including the interface and one SA 460 drive. The drive is double sided, quadruple density with an 800K format. According to Scott Duncan at RAMEX, it can load 32K/sec. And, in about 8 - 10 weeks, they will have full PASCAL and C compilers available.

However, this drive does not have a standard format like the AERCO system. Rather, it uses a hybrid between the IBM and TRS-80. This could cut down its versatility.

And there you have it. Two seemingly excellent disk systems, both with their own pros and cons. On the one hand you can get full CP/M compatibility, while the other one promises high speed and full PASCAL. If anybody knows of any other drives available, or has any further info concerning the drives mentioned here, please let me know.

MODEM NEWS

As you all probably know by now, the modem which Timex was promising to come out with is still widely available under the Westridge label. The modem sells for about \$119, and connects directly to the 2068, as well as to the 1000. By now the advanced software is available, which allows the modem to auto answer, upload and download programs, etc. The software sells for about \$30. (Note - the modem comes with software, but not with the advanced software.)

There are at least two bulletin board services (BBS's) dedicated to the Sinclair/TimeX computers that I know of. One is run by ZEBRA SYSTEMS. Their number is (718) 296-2229. Another one is the RIVER CITIES SMART BBS in Sisterville, West Virginia, according to TS Horizons #8. Their number is (304) 652-1416.

Also according to TS Horizons (#7), a Sinclair Information Network has been designed. This can be used through the SOURCE, COMPUSERVE, and many local BBS's. Finally, if any of you out there are currently using a modem, let us know of your experiences. O.K.?

HOT Z NEWS

Ray Kingsly, author of HOT Z-2068 writes to say that a cartridge version of HOT Z-2068 is now available. This version allows you access to bank switching. The new version is called HOT Z-AROS, and "...gives you an interesting link to hardware that hasn't been developed yet." (This undeveloped hardware, by the way, is a bus expansion unit. Rumor has it that there is one under development, although I don't who is working on it. I'll keep you informed.) Furthermore, HOT Z-AROS corrects many of the 2068 bugs, and a corrected EXROM is also available, so you can correct the errors without having HOT Z an memory. All this is available from SINWARE, Box 8032, Santa Fe, NM 87504. ☺

REVIEWS

HOT Z-2068

Reviewer: Narti Kitiyakara
2917 Ursulines Ave.
New Orleans, La. 70119

Available from: Sinware
Box 323
Dixon, NM 87527

Price: \$24.95 + \$2.00 s/h

HOT Z-2068 is a disassembler, limited assembler, and a single-step editor. The disassembler is very full, it gives the hex address, the contents of the address in hex, a four character label for the address, if any, and, of course, the mnemonics. It also interprets any floating-point instructions (those after RST 28). It can also give you the decimal equivalent of the address and hex code, along with the character represented by the code for looking at tables of data.

The assembler would not serve for entering long machine code programs because of the large size of HOT Z, and because you cannot use a label before you have defined it. What is a label you ask, a label is a four character name for an address. It can't have any spaces or semicolons

(semicolons are a command to ignore what you've just typed, and not change the contents of the address). HOT Z comes with a built in set of labels for the ROM (well parts of it any way) and for HOT Z itself, and then you define your own for your programs. When in the assembler mode you can save, load, and verify TS-2068 tapes, and load ZX81 tapes, although I haven't been able to test this, I imagine it works.

The single-step editor allows you to go through a program one step at a time, or a block of code at a time. It shows all the register pairs, in hex, decimal (or the label if it points to one), and the contents of that address. It keeps a stack for your use, and uses the real one itself, which will prevent crashes due to having an imbalance of POPs and PUSHes in your program. The last four values placed on the stack. It also shows the state of the flags, and position of the stack pointer, and the exchange flags (HL', etc.). Lastly you can set up another screen (if you have enough memory) so that output from your program does not interfere with the HOT Z screen.

Quibbles. My first quibble is the cursor. The only way to tell if you're in CAPS LOCK or not is if the first character is BRIGHT, this may be fine for those who use it with a dark INK color on a light PAPER, but I like white ink on black paper, and this makes it very hard to see one bright square.

My next quibble is the instructions. They describe the program well enough, but I don't think the beginner will be able to understand them easily. Also there is no index, which means if you need to look something up, you could spend a good bit of time just looking for it, when you want to be learning about it.

My last quibble is still to do with the instructions. There are no beginners instructions, a small set of insrtuctions telling just how to use the program for entering code and watching it run.

Other than than those few things I think HOT Z is an excellent program, for both editing large programs, and entering smaller ones. But until it has some beginners instructions, I wouldn't recomend it to anyone just learning machine code.

MSCRIPT

Reviewer: Joseph Dell'Orfano
122 Weaver St.
Greenwich, Ct. 06830

In looking for a printer, I made sure that it had all the features I wanted. Namely, dot matrix with a wide variety of print styles, good graphics capability, and flexibility. The Gemini 10 by Star Micronics supplied that nicely. Once I had my printer, all I needed was a word processor which was just as flexible. MSCRIPT is that program.

First of all, MSCRIPT is a full fledged word processor which can rival even WORDSTAR. It has all the capabilities which you would expect to find in a word processor, including full screen editing (with 64 column display), global search/replace/delete commands, justification, block commands, etc. In addition, MSCRIPT has automatic headers (even odd page and even page headers - look at the headers in the N/L and you'll see what I mean), hanging indents (the SUPPORT! column at the bottom of page 2 illustrates this), and tape merge facilities. But the most versatile feature of this word processor is its ability to support all the features of any printer.

MSCRIPT has a feature called 'imbedded printer control codes'. This allows you to define your own special escape codes which allows you direct control over your printer. So, character font changes are easily handled by the word processor. International character sets, special non-ASCII characters, etc. are at your disposal. It is this ability which makes MSCRIPT an extremely versatile word processor.

There are limitations. MSCRIPT can only handle about 9 pages of text. This is overcome, however by 'daisy chaining' files on tape and using the MERGE command. Also, you cannot save tab stops on tape. Despite these downfalls, however, MSCRIPT is an excellent program.

MSCRIPT is available from 21st Century Electronics for \$69.95. ©

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JB CORNER JB CORNER JB CORNER JB CORNER JB

Spectrum Update by John Bloxham.

Yes! JB Corner really is alive and kicking. Following the sad story of the demise of Timex and the Plummet of the new born 2068 I was thinking that there wasn't going to be much of a following in the U.S. for SPECTRUM/2068 material. However, Joe has convinced me that there are a considerable number of users all hungry for info - so, here goes!! Remember, as always, you can send me queries via Joe and I will do my best to get you an answer.....fast.

NEWS.

The latest Sinclair news is that a new SPECTRUM has been launched in the U.K. (!). In fact the machine is a standard 48K SPECTRUM inside a cut down "QL style" keyboard. The feel of the keys is a little better than the normal SPECTRUM keyboard, but not much. There are 18 extra keys giving single key delete, edit, extended mode etc. The price is 180 Pounds which puts it against the Commodore 64 and the British Electron computers - my verdict, I don't think it will sell. Interestingly, the new computer (called the SPECTRUM Plus) was actually in the shops before Sinclair announced it was available, Uncle Clive had his knuckles severely rapped over the QL fence - the machine was offered for sale when it simply did not exist. Also this week, the QL has also gone on sale in the shops.

COMPATABILITY.

You may be wondering just how compatible the U.K. Sinclair SPECTRUM and the Timex 2068 really are, and whether you will be able to run any of the Programs I shall be sending over. THE GOOD NEWS: The BASIC seems to be identical, with the 2068 having a few extra commands - FREE, STICK, SOUND etc. The memory map is virtually identical, and, more importantly, all the system variables are the same except that the 2068 has a few more for the extra commands, see Page 265 of the 2068 manual. So PEEKing and POKEing around the system variables should do the same for you as it does for me. Try POKE 23658,8 - that should switch the caps lock on (it doesn't tell you that in the book!) and POKE 23658,0 should switch it off again, a useful command that may be included in a Program line. HOWEVER (there is always a however) the fact that the 2068 has a few extra system variables means that the BASIC Program area starts a little further UP the memory. Examine the system variable PROG - do PRINT PEEK 23635+256*PEEK 23636. I get 23755, what do you get? This will not normally cause any Problem with a BASIC Program unless you have a machine code routine in the first Program line behind a REM, in which case the start address will be different on a 2068 to that on a SPECTRUM. Otherwise I don't think we shall have too much difficulty. I hope to be able to swap a SPECTRUM tape with Joe to see if we can actually cross load Programs. I'll let you know how we get on.

THE BAD NEWS: The only real bad news is that Timex appear to have rewritten the Spectrum ROM operating system for the 2068. This causes two Problems, firstly the various routines are at different addresses so any Program that calls ROM routines will not work with the "wrong" ROM. Secondly, I have discovered a number of interesting bugs in the Spectrum ROM which may, or may not, have been corrected by Timex. Here is a quick one that demonstrates a surprising bug in the line drawing routine - at least it does on a Spectrum.....

```
10 PLOT 128,0: DRAW @.175,59*3#PI any good????
```

Note that on my Printer the "up arrow" symbol comes out as "@". The upshot of this is that many lengthy machine code Programs that use the ROM routines will not transfer from UK to US without a good deal of alteration.

Please remember that I have never laid hands on a 2068 and I don't know yet just how the machine will react to complex Spectrum Programs. I think that as long as we stick to BASIC we will have few Problems. Of course, we have the best BASIC in the world, and we can pull off some super Programs that other machines can only do with machine code. To demonstrate, and to help you machine code freaks to peer into your computers, I have enclosed a BASIC disassembler, which can look at any address in the machine, ROM or RAM, and churn out what it finds as assembly language. Make sure that you copy the Program in exactly as it is listed, in particular don't change any line numbers and make sure that all the characters - including spaces - between quotes are correct. Note:

```
Line 99 POKE 23658,8 to switch on the caps lock.
Line 730 POKE 23692,255 inhibits the "scroll?" Prompt.
Line 4500 and 4900 suggest you put in the initial letter of
"Address", "Bytes" etc. in inverse video, to give the idea that
the A key, B key etc. are to be pressed.
Remember that the "@" is the "up arrow" (H key).
```

When the Program is entered save a copy onto tape with SAVE "DIS" LINE 1, then you are ready to try it out. The Program will first ask if you wish to see byte values (the characters represented by the stored numbers) and then the start address. Enter the desired address in decimal, NOT HEX. Then away she runs, disassembling at about 3 lines per second. Press any key to stop and you will get another Prompt.

If you have a Printer connected break into the Program and enter this direct command:
OPEN #2,"P" (OPEN is on the 4 key, note the comma).
Restart the Program with GO TO 99 and now all output will appear on the Printer instead of the screen. Revert to normal with CLOSE #2

Well, I hope this Program runs okay, I am sure that Joe will advise me of any Problems. All being well I will be sending more goodies over the water for my Spectrum/2068 Pals.

```

1 REM SPECTRUM BASIC DISASSEMBLER
99 CLS : PRINT AT 5,5;"Spectrum Disassembler": POKE 23658,8: GO SUB 4900
100 INPUT "Start address ? ";P
110 LET P1=P: LET q=PEEK P: LET P=P+1: LET k=1: LET i$="HL"
120 IF q=118 THEN LET a$="HALT": LET b$="": LET c$="": GO TO 700
130 IF q=203 OR q=237 THEN LET k=2+(q=237): LET q=PEEK P: LET P=P+1: GO TO 200
150 IF q=221 THEN LET i$="IX"
160 IF q=253 THEN LET i$="IY"
170 IF i$<>"HL" AND PEEK P=118 THEN GO TO 850
180 IF i$<>"HL" THEN LET q=PEEK P: LET P=P+1: IF q=203 THEN LET k=2: LET f=PE
EK P: LET P=P+1: LET q=PEEK P: LET P=P+1
200 LET a=INT (q/64): LET b=INT (q/8-a*8): LET c=q-b*8-a*64: LET d=INT (b/2)+1:
LET e=b-2*d+3: LET a=a+1: LET b=b+1: LET c=c+1: RESTORE k*1000+a*100+c*10+e-111
: READ a$
230 IF a$=">" THEN READ l,m: RESTORE l+m: READ a$
240 IF a$(1)=" " OR a$(LEN a$)=" " THEN GO TO 850
250 READ b$,c$,q
260 LET i=0: IF CODE b$>90 THEN LET d#=b$(1): LET m=1: GO SUB 900: LET b#=d#
270 IF CODE c$>90 THEN LET d#=c$(1): LET m=2: GO SUB 900: LET c#=d#
280 IF i#<>"HL" AND NOT i THEN GO TO 850
300 IF q=1 THEN LET b#="( "+b#+")"
310 IF q=2 THEN LET c#="( "+c#+")"
700 PRINT P1;TAB 6;a$;TAB 11;b$; IF c#<>" " THEN PRINT ", ";c$; " ";
720 IF e THEN FOR z=P1 TO P-1: LET q=PEEK z: PRINT TAB 21;q;TAB 25;CHR$(PEEK
z AND (q<16 OR q>23)): NEXT z
730 PRINT : POKE 23692,255
740 IF INKEY#<>" " THEN GO TO 4500
800 GO TO 110
850 LET a#=a$: LET b#="": LET c#="": BEEP .1,0: LET e=1: GO TO 700
920 IF d#="u" THEN LET q=PEEK P: LET P=P+1: LET d#=STR$(P+q-256+(q>127)): RET
URN
930 IF d#="v" THEN LET q=PEEK P: LET P=P+1: LET d#=STR$(q): RETURN
940 IF d#="w" THEN LET q=PEEK P: LET d#=STR$(q+256+PEEK (P+1)): LET P=P+2: RE
TURN
945 IF d#="" THEN LET d#=a$: BEEP .1,10: LET e=1: RETURN
950 IF i#<>"HL" THEN LET i=1
955 IF d#="g" THEN LET d#=i$: RETURN
960 LET q=m: IF i#="HL" THEN LET d#="HL": RETURN
970 IF k=1 THEN LET f=PEEK P: LET P=P+1
990 LET f=f-256+(f>127): LET z#="+" AND f)=0: LET d#=i#+z#+STR$(f): RETURN
1001 DATA ">",4000,b
1010 DATA "LD",a$(d),"w",0
1011 DATA "ADD",a$(d),a$(d),0
1021 DATA ">",4010,b
1030 DATA "INC",a$(d),"",0
1031 DATA "DEC",a$(d),"",0
1041 DATA "INC",r$(b),"",0
1051 DATA "DEC",r$(b),"",0
1061 DATA "LD",r$(b),"v",0
1071 DATA v$(b),"","",0
1171 DATA "LD",r$(b),r$(c),0
1271 DATA x$(b),r$(c),"",0
1301 DATA "RET",q$(b),"",0
1310 DATA "POP",t$(d),"",0
1311 DATA ">",4020,d
1321 DATA "JP",q$(b),"w",0
1331 DATA ">",4030,b
1341 DATA "CALL",q$(b),"w",0
1350 DATA "PUSH",t$(d),"",0
1351 DATA "CALL", "w", "w", 0
1361 DATA x$(b),"v","",0
1371 DATA "RST",STR$(b*8-8),"",0

```

```

2171 DATA "BIT",STR$(b-1),r$(c),0
2271 DATA "RES",STR$(b-1),r$(c),0
2371 DATA "SET",STR$(b-1),r$(c),0
3071 DATA "^"
3101 DATA "IN",r$(b),"C",2
3111 DATA "OUT", "C",r$(b),1
3120 DATA "SBC", "HL",s$(d),0
3121 DATA "ADC", "HL",s$(d),0
3130 DATA "LD", "w",s$(d),1
3131 DATA "LD",s$(d),"w",2
3140 DATA "NEG",o$(d),"",0
3141 DATA "^"
3150 DATA "RETN",o$(d),"",0
3151 DATA "RETI",o$(d),"",0
3161 DATA "IM",p$(b),"",0
3171 DATA ">",4040,b
3231 DATA u$(c)+y$(b),"",",",0
3371 DATA "^"
4001 DATA "NOP",",",",",0
4002 DATA "EX", "AF", "AF",0
4003 DATA "DJNZ", "u", "",0
4004 DATA "JR", "u", "",0
4008 DATA "JR", r$(b-4), "u",0
4011 DATA "LD", "BC", "A",1
4012 DATA "LD", "A", "BC",2
4013 DATA "LD", "DE", "A",1
4014 DATA "LD", "A", "DE",2
4015 DATA "LD", "w", "y",1
4016 DATA "LD", "y", "w",2
4017 DATA "LD", "w", "A",1
4018 DATA "LD", "A", "w",2
4021 DATA "RET", "", "",0
4022 DATA "EXX", "", "",0
4023 DATA "JP", "y", "",1
4024 DATA "LD", "SP", "y",0
4028 DATA "^"
4031 DATA "JP", "w", "",0
4032 DATA "^"
4033 DATA "OUT", "v", "A",1
4034 DATA "IN", "A", "v",2
4035 DATA "EX", "SP", "y",1
4036 DATA "EX", "DE", "HL",0
4037 DATA "DI", "", "",0
4038 DATA "EI", "", "",0
4041 DATA "LD", "I", "A",0
4042 DATA "LD", "R", "A",0
4043 DATA "LD", "A", "I",0
4044 DATA "LD", "A", "R",0
4045 DATA "RRD", "", "",0
4046 DATA "RLD", "", "",0
4048 DATA "^"
4500 PRINT "Address Bytes Nobytes Continue"
4510 IF INKEY$("<>") THEN GO TO 4510
4520 IF INKEY$="A" THEN PAUSE 0: GO TO 100
4530 IF INKEY$="B" THEN LET s=1: GO TO 110
4540 IF INKEY$="N" THEN LET s=0: GO TO 110
4550 IF INKEY$="C" THEN GO TO 110
4560 GO TO 4520
4900 PRINT AT 21,5;"Bytes or Nobytes ?"
4910 IF INKEY$="B" THEN LET s=1: GO TO 4940
4920 IF INKEY$="N" THEN LET s=0: GO TO 4940
4930 GO TO 4910
4940 CLS
4990 LET n$=CHR$ 18+CHR$ 1+"?"
4995 LET o$=" ^^^"
5000 LET r$="BCDEHLX&A"
5002 LET p$="0^12^"
5005 DIM s$(4,2): DIM t$(4,2)
5010 FOR z=1 TO 4
5015 LET s$(z)="BCDEy SP"(2#z-1 TO 2#z)
5020 LET t$(z)="BCDEy AF"(2#z-1 TO 2#z)
5040 NEXT z
5050 DIM q$(8,2): DIM x$(8,3): DIM v$(8,4): DIM w$(8,3): DIM y$(8,2): DIM u$(8,2)
5055 FOR z=1 TO 8
5060 LET q$(z)="HZZ NCC PPEP M "(2#z-1 TO 2#z)
5065 LET x$(z)="ADDADC SUBSBCANDXOROR CP "(3#z-2 TO 3#z)
5070 LET w$(z)="RLCRRRCL RR SLASRA^^^SRL"(3#z-2 TO 3#z)
5075 LET v$(z)="RLCARRCARLA RRA DAA CPL SCF CCF "(4#z-3 TO 4#z)
5076 LET y$(z)="^^^I D IRDR"(2#z-1 TO 2#z)
5077 LET u$(z)="LDCPINOT^^^"(2#z-1 TO 2#z)
5080 NEXT z
5090 RETURN

```

21st CENTURY ELECTRONICS

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This is the program that will bring out the power of your TIMEX/2068. MSCRIPT is a word processor, which has the capabilities only found in the best word processing programs costing many times the price of MSCRIPT. A seventy page manual is included to lead you thru the world of wordprocessing, even if you have had no previous experience in the use of this type of program. A screen command and function menu, is at your finger tips at all times. **Delete, insert, string search, block move, printer formatting,** are just a few of the functions available to you. There are even ten user definable functions. The manual also gives you an intro on how to use this program as a DATA BASE. MSCRIPT is the type of program whereby the more you use it, the more uses you will find for it. MSCRIPT was developed to operate with the centronics interface being marketed by 21st CENTURY ELECTRONICS and AERCO.

SUPER VALUE

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SINCLAIRWATCH SPECIAL

THE SHAPE OF THINGS TO COME?

More than just a rumour ... Your Spectrum's Roger Munford gives you a sneak preview of the latest addition to the Sinclair Research range of computers — the soon-to-be-released ZX Spectrum+.

This time last year, the spicier rumours around town concerned the identity of the new machine Sinclair Research was keeping very close to its chest. Speculations ranged from a complete re-design for the business market (which it turned out to be) to an upmarket Spectrum re-package, complete with Interfaces 1 and 2 and Microdrives (which also played their part in the QL's design). However, once the QL was launched, all thoughts of any other machine were lost in the press attention that followed ... until now.

ON THE PLUS SIDE

Your Spectrum has good reason to believe that Sinclair Research will be launching a new machine to hit the market just before Christmas. Called the Spectrum+ (Plus), the computer will look a little like a QL, only not quite so big, incorporating a QL-like keyboard — complete with Space bar, separate cursor keys, left- and right-hand Shift keys, additional command keys, and a membrane beneath the keyboard.

The first signs of any future development was the announcement that Sinclair Research would be "doubling production of the Spectrum ... allowing production to ramp up to over 200,000 units per month by the end of the year" (as reported in *YS Frontlines* issue 7). OK, so we know Sinclair Research has cracked the foreign computer markets of late ... but 200,000 per month?

At a recent 'selected' press meet, Managing Director Nigel Searle was up against a barrage of questions as to what announcements Sinclair Research would be making — just what was its next computer going to look like? Sensing no real

One of the most confusing aspects of selecting commands on the Spectrum is the way that you have to access different modes before pressing a command key. On the Spectrum+, you'll be able to jump straight into extended and graphic mode at the touch of a single key.

meat to the question, Searle threw it back at the audience, "What would you do?". To the rather astute suggestion that it could be "a re-packaged Spectrum with a new keyboard, but maintaining software compatibility", Searle deflected the remark skillfully with another question, "Why would we want to do that? The Spectrum's already a successful product — this new machine would cost around £149/159 ... does that seem to make commercial sense to you?". After much wise shaking of heads from those assembled, the idea was dismissed as ridiculous.

But it's not that ridiculous when you really think about it. OK, the Spectrum's an old product — in terms of computing, it's positively ancient! But that's not to say that it's out of date — the Spectrum is still extremely good value for money and the support it has from software and

The video functions have been pulled out on to separate keys to make these controls more accessible.

Another annoying consequence of squeezing so many functions on so few keys of the Spectrum is that editing and deleting program lines can be quite tricky. With separate keys to carry out these functions, the whole process becomes much easier.



On each side of the keyboard, you'll see there's a Caps Shift and Symbol Shift key. No longer do you have to have hands spanning two octaves to access some of those hard-to-get-at commands.

hardware companies is unbelievable — and that's over two years after its launch.

Think back to the press release announcing the production figures for the Spectrum — 200,000 per month by the end of the year. Now cast your eyes over the illustration we've constructed of the Spectrum+; the casing for it is very similar to that of the QL, so presumably the equipment to manufacture it would only have to be slightly tailored to suit the new machine's dimensions. Is it all beginning to make a bit more sense? Yes, it seems that Sinclair Research could be

The Break key will assume the role previously sited on the Space Bar. Sensible positioning of this key will not allow the user to press it accidentally.

The Spectrum+'s keyboard will be a full-size QWERTY layout, complete with a membrane beneath the keyboard itself to protect the circuit board. It's quite possible that, like the QL's keys, an audible click will signify a key-making contact.

The Enter key has been enlarged à la QL. Those used to a conventional typewriter-key layout should be dancing in the aisles.

The Space Bar has been made into a reasonable size for those amongst you wanting to use the machine for serious applications like wordprocessing.

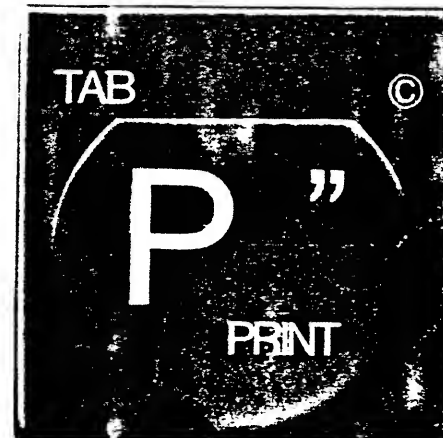
Separate cursor control keys, for use in games and the like.

Here's where a touch of mystery comes in — we at YS can't think what these keys could be for. However, logic dictates that they could be duplicates of the most popular keys, such as separate Load, Save and List keys.

in the position to not only announce the Spectrum+ over the next few weeks, but also to have some of the devices available for sale *immediately!*

NOT ON SHOW

The rumours of the new machine were strongest at the PCW Show, where an announcement was supposed to have been made. But the show passed without comment and it is left for Nigel Searle to make the final contribution, "I can't comment on the possibility of a new machine — but I can promise you the



Spectrum, in whatever form, will be with us for many years to come." Searle also mentioned the possibility of TV advertising, supposedly over the pre-Christmas period, which will be used to promote Sinclair Research products. Could this be a hint that it's for the Spectrum+? Watch this space for further developments... **YS**

SPECTRUM+ SPECIFICATIONS

DIMENSIONS

Width 320mm
Depth 150mm
Height 50mm (at back)
40mm (at front)

CPU

MEMORY CAPACITY AND SPEED

16K ROM (containing Basic interpreter and operating system)
48K RAM
3.5 MHz

SCREEN CHARACTERISTICS

The screen comprises 24 lines of 32 characters. Bit-mapped graphics with resolution of 256 x 192. 16 pre-programmed block graphics. 21 user-definable graphics characters. Eight colours (plus FLASH, two brightness levels and an independent Border colour.)

INTERFACES AND PORTS

System bus connector. (From the information available to YS it would seem that the Interface 1 unit will need substantial re-design to connect to the Spectrum+.)
Sockets for cassette storage and TV.

LANGUAGES

ZX Basic and Z80 assembly language

KEYBOARD

58 moving-type membrane QWERTY layout (à la QL). All keys have auto-repeat. Although the majority of the Spectrum+'s keys can each access up to eight separate functions (using a similar Shift system to that used by the Spectrum), the Spectrum+ has a number of command-specific keys to ease accessibility, these include separate cursor keys, left- and right-hand Shift keys, Edit, Delete, Inverse Video, True Video, Break, Extended Mode, Graphics Mode, as well as a much larger Space Bar. There's also the possibility of separate List, Save and Load keys.

DOCUMENTATION

The Spectrum+ will come complete with a new manual, containing a guide to the computer's operation and an introduction to ZX Basic. There will also be a 'Horizons+' tape for first-time users to get the hang of manipulating cassette-based programs.

Brains to come

HAVING beaten both the Japanese and the Americans in the home computer war, Sir Clive Sinclair is now investing most of his personal fortune in a bid to beat them to the Fifth Generation computer — the machine which will be as intelligent as a human.

'We're the only British company working to build a complete Fifth Generation computer,' he claimed in an exclusive Computer Mail interview. Other British companies are working on various parts of it, but we're alone in trying to build the whole thing.'

So far, Sinclair has had no government money and the funding for his 45-strong development team in Cambridge comes out of his own pocket and from sales of his massively successful home computers.

Sinclair has head-hunted some of the most progressive and radical scientific minds in the world, bringing several outstanding researchers back from the lucrative and glamorous world of San Francisco's Silicon Valley.

He's been able to do this by offering them two things: Creative freedom and money—LOTS of money, mostly his own.

If Clive Sinclair has gained the edge in world research into artificial intelligence, it will have been done from shaky beginnings. Despite his high-flying aims, his day-to-day business is still bogged down by customer complaints about his new business computer, the QL, and the lack of service offered to the public by his companies.

Sinclair himself tends to dismiss criticism: Very little went wrong with the QL launch, by comparison. The time between launch and delivery was less than IBM take, and the six week delay we suffered was unfortunate, but not when you consider what an enormous leap forward the QL is.'

Computer Mail readers who have QLs might not be impressed with this attitude. Problems with the machine's operating system still exist — there are no problems there,' insists Sir Clive; Microdrive storage cassettes are unavailable — we're increasing manufacturing capacity now; the word-processing program Quill is considered so slow as to be almost unusable — ah, well a new version will be available soon; And the QL has failed to provide the back-up and information promised — I haven't heard about that but I'll look into it.'

Sir Clive Sinclair is an optimist, and while

that is probably his greatest strength, it is also a weakness when looking objectively at his own operation.

'I don't see customer complaints any more,' he admits. 'My work is on the longer-term technology.'

D

ESPIITE the rarefied atmosphere in which he moves, the Office of Fair Trading did manage to pin him and his company down to a written promise on conduct over future product launches. Under the ultimate penalty of a jail sentence—for persistent offenders under the Fair Trading Act—a written assurance was delivered by Sinclair.

'We take our lesson very much to heart,' said Sir Clive earnestly. 'I promise you won't be seeing it happen again.'

This promise is interesting in the light of his revelation about the much-vaunted Sinclair electric car: 'We plan to launch our first electric vehicle early next year and by that I mean full volume production.'

'We've had prototypes on test for quite a while and we've solved the theoretical problems. The car is very radical indeed.'

However, there's much speculation over the Sinclair car. Most of the major vehicle manufacturers have had electric car projects running for years and are sceptical about the chances of a private computer company solving the problems.

Other observers are more optimistic: Sinclair's reputation for technical innovation is startling and informed sources suggest that his vehicle will be a three wheeled two-seater, will use battery cells distributed within the body shell of the car and will have a range of over 100 miles per charge with a top speed of around 60 mph.

The key to the new vehicle is likely to lie in computer control of the battery, using a program which will precisely match the output to the vehicle's ever-changing requirements, switching the battery on and off thousands of times a second.

Industry sources suggest that the car is made largely of nylon and fibreglass, and the most stunning suggestion of all is that the car will be priced firmly in the Sinclair tradition—at £999!

Sir Clive smiles and leans back in his chintz office sofa at these suggestions. He colours a little as his natural good manners collide with the need for business reticence.

'I won't say what the vehicle's made from, I can neither confirm or deny the performance figures and I can't comment on the price. We have a very strict policy about not releasing any unnecessary information.'

Clive Sinclair gives the impression he's delighted with the car but that it is a project which

is already in the past as far as he's concerned. The businessman in him will relish its launch but his mind is more concerned with the ultimate goal, the machine with human capability.

'I think the computer will become a new form,' he asserted, repeating his recent pronouncements which have rocked the establishment. 'That is very easy to say but it is hard for people to grasp the implications. I think that people realise what the computer is, there will be a reaction against it, probably on religious considerations. People might start to get frightened.'

But there are many problems which stand between Sir Clive and his goal to become a self-appointed God. It is the solution to them that his Cambridge team are now working on, and the first problem is to achieve a massive increase in computer processing speed.

'We've opted for bipolar silicon technology against the gallium arsenide and C-MOS semiconductors that the Japanese and Americans are using. I am sure we can get the speed. Originally we were looking for a circuit that could carry out 100,000,000 instructions per second. Now we think that's a bit conservative.'

But perhaps Sir Clive and his team's most difficult problem to overcome is speech recognition. Try saying 'I saw' and 'eyesore' to a computer which claims to understand the spoken word and you'll get a glimpse of the problem.

W

WHILE the heavyweight research plunges ahead, Mrs Thatcher's favourite businessman waits to find out whether the government is going back to what is essentially an attempt to force a small British company to outmanoeuvre the rest of the world.

Sinclair is now preparing a case to put before the Government's Alvey Directorate, the body responsible for putting public money into hi-tech projects. He's pleading for support in the face of a massive Japanese drive to beat the West in what is, perhaps, the most crucial industrial race of all.

'We are putting up a complete package to Alvey,' confirmed Sir Clive. 'It will be a very, very big one requiring a lot of money. Our approach to the Fifth Generation computer is quite different to the Japanese and we're ahead at Sinclair Research. They're going to be very surprised.'

Meanwhile, Sir Clive may have a little gadget up his sleeve to keep us all happy. A recent patent filing shows a design for a wrist radio transmitter/receiver built around a watch. The watch transceiver has a tiny aerial built into the strap laying parallel with the arm, turning the wearing into a large radio aerial.

'Where did you find out about that?' asked a surprised Sir Clive. 'We are working on communications products but we can't talk about them yet.'

Sir Clive may not be talking, but there's a twinkle in his eye which suggests that we may all be playing Dan Dare by Christmas.

FORUM

Throughout this issue, I've stressed the fact that there is, in fact, life left in the Sinclair/Time computers. In the reprint of "Brains to Come" (reprinted from the British newsletter *COMPUTER MAIL* thanks to John Bloxham), Sir Clive Sinclair made this statement literally. "I think the computer will become a new life form" Sinclair said. As a student of biology and mathematics, this seems too far gone to me.

The computer is a data storage device with the ability to manipulate its data according to specific rules according to a program. Artificial intelligence allows us to use this high speed capability to simulate human thought processes, but it can never simulate life. There is one basic reason why a computer cannot simulate life, let alone become a life form, and that is because to simulate something presupposes an understanding of that process. In other words, to create life from scratch, we must first understand what life is. We are far from understanding this. In fact, biologists cannot even define life. Doctors often cannot tell the difference between life and death. Life is far from being quantitized in the form of a computer.

Perhaps Sir Clive was thinking of a type of evolution somewhat akin to the type found in *Star Trek*, where Voyager probes are brought to life, or an episode of the *Twilight Zone*, where a computer falls in love with Wally Cox. But whatever he was thinking, I don't think that there is any cause for fear as he suggests. Sir Clive says, "I think that as people realise what the computer is, there will be a reaction against it, probably on religious considerations." I think that any religious reactions against computers will come out of ignorance of the machine, not from an understanding of it.

So keep working on your living computer, Sir Clive. In the meantime, we'll enjoy your wrist radios and electric cars and super computers. Let us know how you make out! Keep on ZX'in!



SIR CLIVE: 'The computer will become a new life form.'

If anybody wishes to comment on the issues presented in the FORUM, or on any other issue, please write. I'd be interested in hearing your opinions. @