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THE SINC TIMES  
NATIONAL SINCLAIR TIMEX NEWSLETTER

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Supporting the Sinclair and Timex Personal Computers

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EDITORIAL

**The best of times, the worst of times...**

Well, the worst is over and it can only get better. At least that's how I feel now as I tap out my first newsletter on my 2068. I wish to thank all of you who have decided to stick with the newsletter (and, of course, the ZX computers) for your continued support - I can assure you that it will be worth your while. There are many companies out there supporting the ZX computers, and it is only through communications made possible by a group such as ours that allows these companies to continue their support. In this issue you will find a list of all the companies which I know of who are supporting our machine. If anybody out there knows of other companies not on this list, then please let me know.

Enough of that; let me tell you about my setup here. As you've probably figured out already, I have a T/S 2068 with a Gemini-10 printer. I am using the AERCO parallel interface available from 21st CENTURY ELECTRONICS in New Jersey. I am doing word processing with the MSCRIPT program from 21st Century. Other software titles which I own are VU-3D, VU-FILE, ANDROIDS, CHESS, FLIGHT SIMULATOR (all TIMEX labels), HOT Z-2068, TS COUNT, ZEUS ASSEMBLER, and UPLOAD 2000 (which I have not had the chance to use yet). I also have the ZEBRA light pen system for the 2068.

In addition to my 2068, I have a ZX80 with 8K ROM/64K RAM and a video upgrade unit, along with assorted software titles. So, I intend to continue to supply information concerning *all* Sinclair and Timex/Sinclair computers here in the U.S., as well as those which are not available here (namely, the Spectrum and QL).

In order to achieve my goals with this newsletter, however, I need to know some information about you. Please fill out the form at the back of this issue and send it in to me so that I'll have some idea of what you all want me to print.

We've had the best of times, and we've gotten through the worst of times. From here, it can only get better, so keep on ZX'ing !@

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That's it. We lost a lot of people when the newsletter changed hands (at least half), but that's the way it goes. I'm pushing for more members now; does anyone out there have a friend who owns a ZX and isn't a member? Maybe somebody who just took advantage of the \$100.00 206B's but doesn't know what to do with it? Our group can only benefit from higher memberships - the more people, the more communication, and that's what this is all about. ☺

**SUPPORT!**

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

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

THOMAS B. WOODS  
P.O. Box 64  
Jefferson, NH 03563

SIRIUSWARE  
6 Turning Mill Rd.  
Lexington, MA 02173

G. RUSSELL ELECTRONICS  
RD 41 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. DuFere Hwy - #17  
Dover, DE 19901

SIMULUSION  
Box 2382  
La Jolla, CA 92038

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

21st CENTURY ELECTRONICS: See their add in this issue. I have done a lot of business with this company and have only good things to say about them. They offer a complete line of peripherals and software, including the AERCO products. They also handle the Memotech computer, and will handle the QL when it becomes available here. Their address is:  
6813 Polk St., Guttenberg, N.J. 07093 (201) 869-2616

E. ARTHUR BROWN CO.: Here's another company which offers the latest hardware and software available for the 2068, as well as peripherals for the ZX80/81. They publish a newsletter/catalogue called *New Product Reports*. Their address is:  
Department EB5, 3404 Pawnee Dr., Alexandria, MN 56308 (612) 762-8847

ZEBRA SYSTEMS, INC.: This company also offers hardware/software for the 2068, plus an extensive line for the ZX80/81. Their address is:  
78-06 Jamaica Ave., Woodhaven, N.Y. 11421 (212) 296-2385

KNIGHTED COMPUTERS: Hardware and software for the 2068. They offer software from Softsync and Quicksilva. Their address is:  
707 Highland St., Fulton, N.Y. 13069 (Continued on page 18)

## ARTICLES

## KEYBOARD CONTROL OF GRAPHICS

BRIAN BAUER  
245 Belford  
Grand Junction, CO 81501

8K ROM; 4K RAM  
SLOW required

Fast graphics in SLOW mode is not a contradiction in terms. Machine code allows instantaneous control of a moving graphic symbol in this example program. To load the program get into FAST mode and type 1REM followed by 154 zeros. Type in the rest of Listing 1. If a printer is not attached replace LPRINT in line 150 with PRINT. Type GOTO 40 and begin entering the hex code from Listing 2. After each byte hit ENTER. Type "S" to return to the command mode. The REM statement now contains the machine code program and at the end six zeros should remain. SAVE the program now in case of a crash later. Type GOTO 110 and compare the code from the printer (or on screen) with that shown in Listing 2. Type CONT when the screen gets full if needed. Correct any errors with POKES. Get into the SLOW mode and type RUN. Lines should appear at the top and bottom of the screen and a small square should be in the center of the screen. Push any of the arrow keys (5 through 8) and the square will move rapidly in the direction of the arrow until it reaches the edge of the screen and bounces there. Push "S" to return to Basic.

This program illustrates the basic ideas of how to control graphics via the keyboard well. The instruction, LD (HL),A simply loads the moving symbol into the display file. The HL register pair is loaded with the initial print position in lines 16514 to 16521. Blanking out the character and

printing it next to its original location produces movement. Adjusting the HL register pair appropriately and using LD(HL),A again accomplishes this. Register A must contain the character code for the moving symbol before the instruction is used. Saving the screen characters about to be printed over and restoring them when the moving symbol moves on greatly increases the usefulness of this routine. The background can thereby be preserved. The preserved character is loaded into location 16570 (40BAh), and removed when another background character needs to be preserved. Add line 15 PRINT AT 10,3,"IT PASSES RIGHT THROUGH." In SLOW mode hit RUN. Now press the 5 key. The moving square does indeed pass right through but notice that the "G" was eaten. Location 16570 always contains the character code to be printed under the moving graphic. Return to Basic and POKE 16570,44 and RUN. Move the square away and behold a "G".

A timing loop begins at address 16528. By increasing the values at 16529 and 16531 the movement can be made slower. If both locations are POKEd to 255 the square moves about once every 2 seconds. Note that response to the "S" key is also slowed.

A problem about using LD(HL),A to load graphics on screen is how to keep the symbol on screen. When moving to the left or right a code 76h will be found at the edges of the screen and this is checked for in lines 16578 and 16598. Vertical

movement presents no such convenience. The lines at the top and bottom of the screen confine movement vertically. Type

```
15 PRINT AT 10,0;"fifteen inverse spaces."
```

The moving square bounces off the new obstacle when moving vertically. Checks for inverse spaces lie at 16621 and 16649.

Reading the keyboard is rather easily done with the 8K ROM. A call to 02BBh returns a specific value in the HL register pair depending on what key has been pushed. This is done at 16525 in the example program. PUSH any registers one wishes to save before calling this ROM subroutine however, since it seems to use many of them. In the example program the HL pair, containing the print position, is PUSHed at address 16524. To use the ROM routine for other purposes the program in Listing three displays what goes into the HL pair when various keys are pressed. The input section from Listing 1 can be used to load the machine code. Then add Listing 4. Type RUN 70 and when a key is pushed the resultant in the HL pair is shown in hex. Each key elicits a unique pair and shifted keys are different from the unshifted ones. Type "S" to stop.

Getting back to the main program, observe that the H and L registers are checked for the values produced by pressing the arrow keys or the "S" key. The checking occurs at 16541, 16546, 16551, 16556, and 16561. When a keypress is found a JR NZ instruction calls the appropriate routine. The routine restores the background character at the current

print position and adjusts the HL pair to the appropriate new position. Address 16571 is the beginning of this part of the program used when the "5" key is pushed. This section also checks for the forbidden characters, i.e., 76h and the code for a reverse space, 80h. For the case of the "5" key this is at 16578. Control then jumps back to line 16522, printing the character in its new position.

To use this program as a part of other programs remember that location 16570 (40BAh) contains the character code for what the moving spot is centered on. The spot could be used as "sights" in target type games. When a target is in the sights its code will appear in location 16570.

POKE 16631,28 will cause the moving square to lay eggs when it hits a white square and is traveling downward. Corresponding addresses for the other directions are 16656, 16585, and 16605.

Finally try this puzzle. Delete line 15 and type in:

```
12 FOR F=4 TO 17
14 PRINT AT F,0;"32 reverse spaces"
16 NEXT F
```

Now RUN the program. The object is to get the moving square to one of the open areas at the top or the bottom of the screen. The moving graphic is invisible most of the time except it bounces "holes" into its surroundings.

Listing 1. Hex Loader

```

1 REM 00000000000000000000000000000000
00000000000000000000000000000000000000
00000000000000000000000000000000000000
00000000000000000000000000000000000000
00000000000000000000000000000000000000
000
10 PRINT AT 0,0;"32 inverse
spaces
20 PRINT AT 21,0;"32 inverse
spaces
30 GOTO 180
40 LET L=16514
50 INPUT A$
60 IF A$="S" THEN STOP
70 POKE L,16*CODE A$+CODE A$(2
)-476
80 PRINT AT 4,3;L;"#";A$
90 LET L=L+1
100 GOTO 50
110 FOR F=1 TO 150
120 LET A=PEEK(F+16513)
130 LET L=INT (A/16)
140 LET H=A-L*16
150 LPRINT F+16513;"#";A;TAB 10
;"#";CHR$ (L+28);CHR$(H+28)
160 NEXT F
170 STOP
180 RAND USR 16514
    
```

Notes

```

80: "#"=space
150: Change LPRINT to PRINT if a
printer is not attached.
    
```

Listing 2. Move Dot

Address	Dec.	Hex	Comments
16514	33	21	LD HL, 015A
	90	5A	set first
	1	01	print pos.
16517	237	ED	LD BC, (400C)
	75	4B	get display
	12	0C	file address
	64	40	
16521	9	09	ADD HL,BC
16522	54	36	LD (HL),80h
	128	80	prints
16524	229	E5	PUSH HL
16525	205	CD	Call Keybd.
	187	BB	scan in ROM
	2	02	
16528	22	16	LD D,01 time
	1	01	delay loop
16530	30	1E	LD E, 01
	1	01	
16532	29	1D	DEC E
16533	32	20	JR NZ,FD
	253	FD	
16535	21	15	DEC D
16536	32	20	JR NZ,F8
	248	F8	
16538	167	A7	AND A
16539	62	3E	LD A,F7
	247	F7	
16541	149	95	SUB L
16542	40	28	JR Z, 1B jmp
	27	1B	if 5 pushed
16544	62	3E	LD A,DF
	223	DF	
16546	148	94	SUB H
16547	40	28	JR Z,3E jmp
	62	3E	if 6 pushed
16549	62	3E	LD A,EF
	239	EF	
16551	148	94	SUB H
16552	40	28	JR Z,53h jmp
	83	53	if 7 pushed
16554	62	3E	LD A,F7
	247	F7	
16556	148	94	SUB H
16557	40	28	JR Z, 20h jmp
	32	20	if 8 pushed
16559	62	3E	LD A,FB
	251	FB	
16561	148	94	SUB H



Listing 3. Assembly Code for the  
Keyboard Scan program.

Address	Dec.	Hex	Comments
16514	205	CD	Call ROM
	187	BB	Keyscan
	2	02	
16517	68	44	LD B,H
16518	77	4D	LD C,L
16519	201	C9	RET

Listing 4. Keyboard Scan

```

1REM 0000000
70 PRINT "INPUT A KEY"
80 PRINT " H L"
90 PAUSE 9000
100 LET B$=INKEY$
110 LET A=USR 16514
120 LET H=INT (A/256)
130 LET L=A-H*256
140 LET H1=INT (H/16)
150 LET H2=H-H1*16
160 LET L1=INT (L/16)
170 LET L2=L-L1*16
180 PRINT B$;"#";CHR$ (H1+28);C
HR$ (H2+28);"###";CHR$ (L1+28);C
HR$ (L2+28)
190 IF B$="S" THEN STOP .
200 GOTO 90

```

Printout of Listing 4. Keyboard Scan

```

1 REM LN 0???TAN
70 PRINT "INPUT A KEY"
80 PRINT " H L"
90 PAUSE 9000
100 LET B$=INKEY$
110 LET A=USR 16514
120 LET H=INT (A/256)
130 LET L=A-H*256
140 LET H1=INT (H/16)
150 LET H2=H-H1*16
160 LET L1=INT (L/16)
170 LET L2=L-L1*16
180 PRINT B$;"#";CHR$ (H1+28);C
HR$ (H2+28);"###";CHR$ (L1+28);C
HR$ (L2+28)
190 IF B$="S" THEN STOP
200 GOTO 90

```



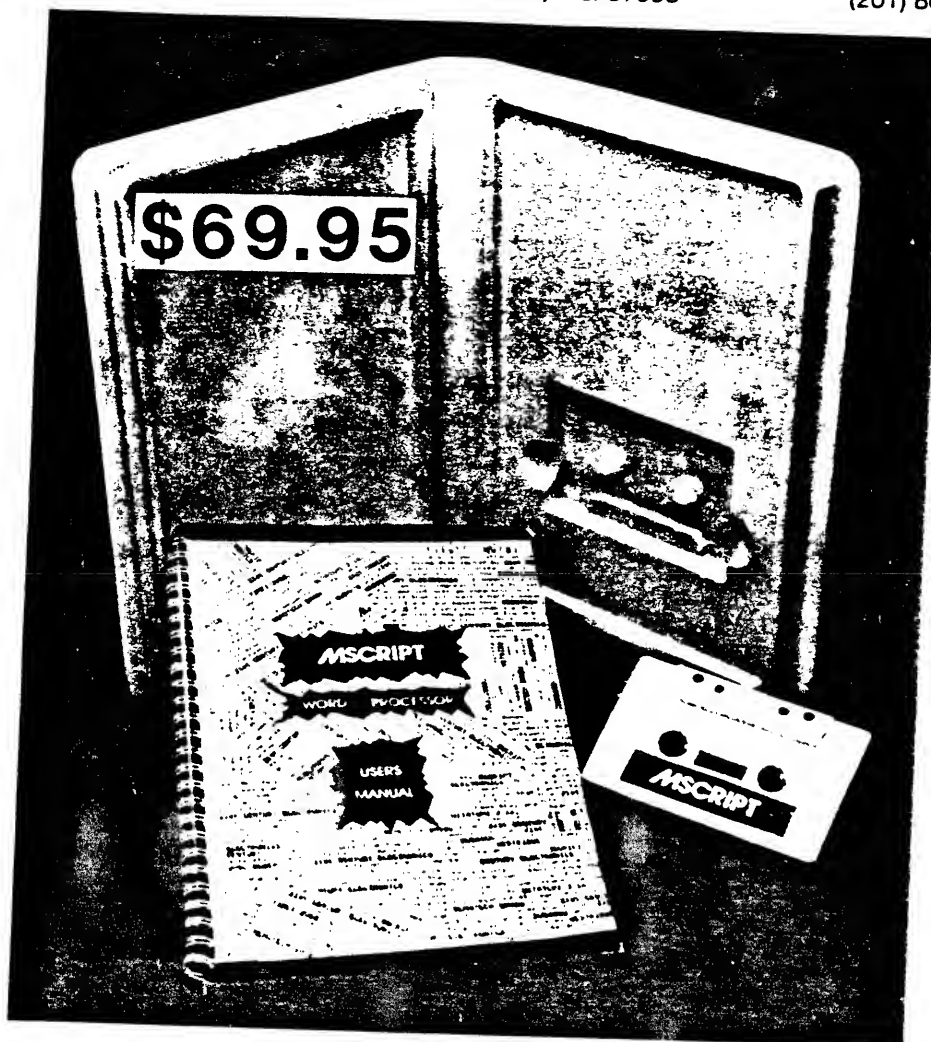
# 21st CENTURY ELECTRONICS

6813 POLK STREET

GUTTENBERG, N.J. 07093

(201) 869-2616

**M  
S  
C  
R  
I  
P  
T**



**A  
V  
A  
I  
L  
A  
B  
L  
E**

**J  
U  
N  
E  
22**

## 21st CENTURY ELECTRONICS presents MSCRIPT

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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## PROGRAM CONVERSION

## DEEPSPACE

Source: *More BASIC Computer Games*  
David Ahl

NARTI KITIYAKARA  
2917 Ursulines Ave.  
New Orleans, LA 70119

This is Deepspace a tactical simulation of ship to ship combat in deep space. You are one of a group of captains assigned to patrol a section of your star empire's borders against hostile aliens. All your encounters here will be against hostile vessels. You will first be required to select a vessel from one of three types, each with its own characteristics:

TYPE	SPEED	CARGO SPACE	PROTECTION
1 SCOUT	1ØX	16	1
2 CRUISER	4X	24	2
3 BATTLESHIP	2X	3Ø	5

Speed is given relative to other ships.

Cargo space is in units of space aboard ship which can be filled with weapons.

Protection is the relative strength of the ship's armor and force fields.

Once a ship has been selected, you will be intructed to arm it with weaponry from the following list:

TYPE	CARGO SPACE	REL. STRNGTH
1 PHASER BANKS	12	4
2 ANTI-MATTER MISSILE	4	2Ø
3 HYPERSPACE LANCE	4	16
4 PHOTON TORPEDO	2	1Ø
5 HYPERON NEUTRALIZATION FIELD	2Ø	6

Weapons #1 & #5 can be fired 1ØØ times each; all others can be fired once for each on board.

A typical load for a cruiser might be:

1-#1 phaser banks	=12
2-#3 hyperspace lances	=8
2-#4 photon torpedoes	=4

-----  
24 units of cargo

A word of caution: firing high yeild weapons at close( $\leq 100$ ) range can be dangerous to your ship and minimal damage can occur as far out as  $200$  in some circumstances.

Range is given in thousands of kilometers.

\*\*\*\*\*

#### MANUEVER CHART

- 1 fire phasers
- 2 fire anti-matter missiles
- 3 fire hyperspace lance
- 4 fire photon torpedo
- 5 activate hyperon neutralization field
- 6 self-destruct
- 7 change velocity
- 8 disengage
- 9 proceed

Suggestion: Change the time between reports- this will shorten the game by allowing you to get closer faster.

```

1 Let N5 = 0
2 Let D = 0
                                Deepspace
10 PRINT "YOU HAVE A CHOICE OF THREE SYSTEMS TO PATROL"
20 PRINT "1-ORION", "2-DENEK", "3-ARCTURUS"
30 PRINT "SELECT A SYSTEM"
40 INPUT S9
50 IF S9=1 THEN GOTO 1420
60 IF S9=2 THEN GOTO 1470
70 GOTO 1520
80 LET D0=0
90 LET D1=0
100 LET N1=0
110 LET N2=0
120 LET N3=0
130 LET N4=0
140 LET D=0
150 PRINT "WHICH SPACECRAFT WOULD YOU LIKE?"
160 INPUT S
170 GOTO 150*(S<1 OR S>3)+840*(S=1)+880*(S=2)+920*(S=3)
180 LET C=C0
190 PRINT "YOU HAVE#";C;"#UNITS OF CARGO SPACE TO FILL."
200 PRINT "CHOSE A WEAPON AND THE AMOUNT YOU WISH."
210 INPUT W
220 INPUT N
230 GOTO 190 *(W<1 OR W>5)+960*(W=1)+1050*(W=2)+1140 *(W=3)+1240*(W=4)+
    1300*(W=5)

```

```

240 IF N*C1>C THEN GOTO 1570
250 LET C=C-N*C1
260 GOTO 1030*(W=1)+1120*(W=2)+1210*(W=3)+1300*(W=4)+1400*(W>4)
270 IF C>1 THEN GOTO 190
280 LET S1=S0*RND
290 LET R=(3*RND+5)*100
300 PRINT "RANGE TO TARGET:";R
310 PRINT "RELATIVE VELOCITY:";S1
320 PRINT "ACTION?"
330 INPUT M
340 CLS
350 GOTO 460*(M=7)+700*(M=6)+980*(M=1)+1070*(M=2)+1160*(M=3)+1250*(M=4)+
    1350*(M=5)+1790*(M=8)+360*(M=9)
360 IF R<500 THEN GOTO 570
370 IF S1>0 THEN GOTO 400
380 LET R=R+(S1*8.3)**1.25
390 GOTO 410
400 LET R=R-(S1*8.3)**1.25
410 IF R>1500 THEN GOTO 1630
420 IF R>0 THEN GOTO 440
430 LET R=-R
440 PRINT
450 GOTO 300
460 PRINT "CHANGE TO BE EFFECTED?"
470 INPUT S2
480 IF (S1+S2)>S0 THEN GOTO 1590
490 LET S1=S1+S2
500 GOTO 300
510 LET F0=P1*(Z/R)**1.5
520 LET D0=(2*F0+3*F0*RND)/5
530 LET D=D+D0
540 PRINT "SCANNERS REPORT ENEMY DAMAGE NOW#";D
550 IF D>99 THEN GOTO 1760
560 GOTO 580
570 LET D0=0
580 LET K=E1+E2*RND
590 LET E=E3+E4*RND+5/P0*RND
600 LET F3=E*(K/R)**1.85
610 LET D2=(3*F3+3*F3*RND)/5.5
620 LET D1=D1+D2
630 IF (Z*D0)/(R*500)>2.2 THEN GOTO 660
640 LET D3=D0*2/(R**2*P0)
650 LET D1=D1+D3
660 PRINT "DAMAGE CONTROL REPORTS YOUR VESSEL DAMAGE AT#";D1
670 IF D1>99 THEN GOTO 1780
680 IF D>99 THEN GOTO 1790
690 GOTO 370
700 PRINT "SELF DESTRUCT FAILSAFE ACTIVATED"
710 PRINT "INPUT 1 TO RELEASE FAILSAFE"
720 INPUT U
730 IF U=1 THEN GOTO 750
740 GOTO 360
750 PRINT "SELF DESTRUCT ACCOMPLISHED."
760 IF R>60 THEN GOTO 790
770 PRINT "ENEMY VESSEL ALSO DESTROYED."
780 GOTO 1790
790 LET D4=3200/R
800 LET D=D+D4
810 IF D>09 THEN GOTO 770
820 PRINT "ENEMY VESSEL SURIVES WITH#";D;"#DAMAGE"
830 GOTO 1790

```

```
850 LET C0=16
860 LET P0=1
870 GOTO 180
880 LET S0=4
890 LET C0=24
900 LET P0=2
910 GOTO 180
920 LET S0=2
930 LET C0=30
940 LET P0=5
950 GOTO 180
960 LET C1=12
970 GOTO 240
980 LET P1=4
990 IF N1=0 THEN GOTO 1200
1000 LET N1=N1-1
1010 LET Z=200
1020 GOTO 510
1030 LET N1=N1+n
1040 GOTO 270
1050 LET C1=4
1060 GOTO 240
1070 LET P1=20
1080 IF N2=0 THEN GOTO 1680
1090 LET N2=N2-1
1100 LET Z=500
1110 GOTO 510
1120 LET N2=N2+n
1130 GOTO 270
1140 LET C1=4
1150 GOTO 240
1160 LET P1=160
1170 IF N3=0 THEN GOTO 1700
1180 LET N3=N3+N
1190 LET Z=550
1200 GOTO 510
1210 LET N3=N3+N
1220 GOTO 270
1230 LET C1=2
1240 GOTO 240
1250 LET P1=10
1260 IF N4=0 THEN GOTO 1720
1270 LET N4=N4-1
1280 LET Z=400
1290 GOTO 510
1300 LET N4=N4+N
1310 GOTO 270
1320 LET C1=0.2
1330 LET N=100
1340 GOTO 240
1350 LET P1=6
1360 IF N5=0 THEN GOTO 1740
1370 LET N5=N5-1
1380 LET Z=250
```

139ø GOTO 51ø  
 140ø LET N5=N5+N  
 141ø GOTO 27ø  
 142ø LET E1=15ø  
 143ø LET E2=5øø  
 144ø LET E3=3  
 145ø LET E4=4  
 146ø GOTO 8ø  
 147ø LET E1=2øø  
 148ø LET E2=35ø  
 149ø LET E3=4  
 150ø LET E4=3  
 151ø GOTO 8ø  
 152ø LET E1=15ø  
 153ø LET E2=4øø  
 154ø LET E3=5  
 155ø LET E4=2  
 156ø GOTO 8ø

157ø PRINT "NOT ENOUGH SPACE, RESELECT."  
 158ø GOTO 19ø  
 159ø PRINT "CHANGE BEYOND MAXIMUM POSSIBLE."  
 160ø PRINT "INCREASING TO MAXIMUM."  
 161ø LET S1=Sø  
 162ø GOTO 37ø  
 163ø PRINT "OUT OF SENSOR RANGE. AUTOMATIC DISENGAGE."  
 164ø GOTO 179ø  
 165ø PRINT "PHASER BANKS DRAINED."  
 166ø PRINT "SELECT AGAIN."  
 167ø GOTO 32ø  
 168ø PRINT "ALL ANTI-MATTER MISSILES EXPENDED."  
 169ø GOTO 166ø  
 170ø PRINT "ALL HYPERSPACE LANCES EXPENDED."  
 171ø GOTO 166ø  
 172ø PRINT "ALL PHOTON TORPEDO TUBES EMPTY."  
 173ø GOTO 166ø  
 174ø PRINT "HYPERM NEUTRALIZATION FIELD DRAINED"  
 175ø GOTO 166ø  
 176ø PRINT "ENEMY VESSEL DESTROYED."  
 177ø GOTO 58ø  
 178ø PRINT "YOUR VESSEL HAS BEEN DESTROYED."  
 179ø PRINT "ANOTHER BATTLE?"  
 180ø INPUT R\$  
 181ø IF R\$(1)="Y" THEN GOTO 1ø  
 182ø PRINT "TRY AGAIN LATER."

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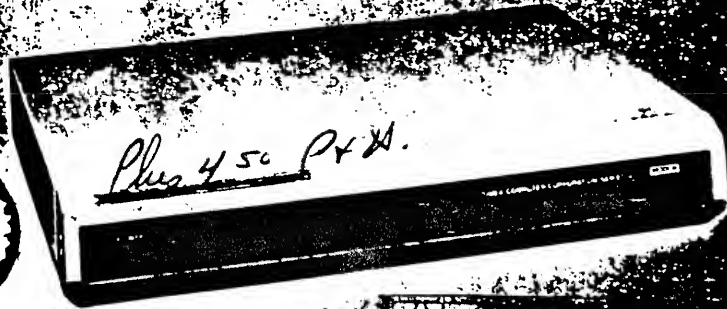
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## INPUT/OUTPUT

NARTI KITIYAKARA says that you may print characters to the screen from a machine code routine by loading register A with the character code (or a color or position control for that matter) and executing a RST 16 command. However, this does not scroll the screen, so you must use CALL 0939H (2361<sub>16</sub>) when it comes time to scroll. Note: the CALL alters the registers.

JACK DEUBER writes that he is planning to distribute a list of companies who are still supporting the TS computers. Let us know about any other companies which I may not know about so that I may publish them here. OK?

JOHN BLOXHAM says that the ZX81 is obsolete in England and that there is very little new support coming out. According to COMPUTERS & ELECTRONICS magazine (July 1984), Sinclair has signed an agreement with Samsung Electronics, South Korea, to manufacture both the ZX81 and Spectrum computers. Any word on this where you are John?

By the way, according to 21st Century Electronics, Sinclair says that the price of the QL is not \$499.00 as stated in all the magazines, but, rather, \$499.00. It should retail in the U.S. for about \$700.00 to \$800.00. See the QL report on page.

Here's some more news from the Boston Computer Society on the Sinclair/Samsung agreement. First of all, the South Korean electronics industry is geared towards export. Secondly, Samsung is a very large exporter to U.S. department stores. Finally, the TS2068 computers were being assembled in South Korea. Anybody out there have any more information to add to this?

### SUPPORT! (continued from page 3)

A.F.R. SOFTWARE: Business software for the ZX81, TS 1000, and TS 1500 computers. They offer ZX-TEXT word processor, ZX-CALC spreadsheet, and ZX-CALENDAR appointment book. Their address is:

1605 Pennsylvania Ave., No. 204, Miami Beach, FL 33139

TIMEX: The TS2068 Advanced Technical Manual is available for \$25.00 (inc. postage). I have a copy and recommend it highly for any serious 2068 user. Their address is:

Timex Material Sales Division, P.O. Box 1378, Little Rock, AK 72203 8

## JIB'S CORNER

# SPRITE MAKER

Equipping the Sinclair ZX-81 with Sprite Basic means you can have fast moving graphics without soiling your hands with machine code. Malachy Devlin explains further.

ALL BEGINNERS at computers learn to program using Basic; this is fine since it is easy to learn and easy to use. However, its real disadvantage is that it is usually slow in comparison to machine code. This means that if any fast moving graphics are required in the program then they will have to scrap the idea, or use my program which equips the ZX-81 16K with sprite Basic.

The sprite Basic can handle up to 256 sprites which can be at three levels:

- Underneath the characters
- Same level as the characters
- Over the characters.

Also when the sprite hits the edge of the screen it can either stop, bounce or wrap-round. If this sounds like what you want then roll up your sleeves and begin the hard work. First, type in

1 REM (118 characters)  
followed by lines 2 to 9 which have a Rem statement containing 128 characters. Now enter:

```
POKE 16509,0
POKE 16510,0
POKE 16511,168
POKE 16512,4
POKE 16514,118
POKE 16515,118
```

You have now produced a Rem statement with 1190 characters, and when listed should appear as 0 Rem. If not then begin again. Type in the hex loader — listing 3 — and enter all the machine code in listing 1.

Now delete the loader and add the lines in listing 2. The complete sprite Basic has been entered. It should now be saved under an appropriate name.

In order to test the program I must explain what the sprite commands are, how to use them and their syntax. The first and longest is Sprite: it takes the form:

```
LET Z =USR SPRITE
PRINT number; on or off; velocity; flag$;
xcoord; ycoord; xmove; char$
Number: this is the sprite number. Range: 0
```

On or Off: this is either 1 for on or 0 for off.

Velocity: this is not really the true velocity but it is the number of times the Move command is called before the sprite moves.

N.B. if velocity is zero the sprite will move with a velocity of 256. Range of velocity is 0 to 255

Flag\$: this is a string which is seven characters long and consists of 0s or 1s eg., "0010110" "0010110"

This tells the computer what level the sprite is at and what it does at the edge of the screen.

If the seventh character is 1 then the sprite wraps around.

If the sixth character is 1 then the sprite bounces.

If the sixth and seventh character is a 0 then it stops at the edge of the screen; if they are both 1s then it will wrap-round.

Now let us consider the fourth and fifth characters.

If the fifth is 1 it goes under the characters. If the fourth is 1 it goes over the characters, but if they are both 0s then it travels at the same level as the characters on screen.

The third character is not used by the sprite Basic.

The second character is only used if the sprite is at the same level as the characters on the screen. If this is 1 when a sprite collides with some character on screen then it continues but if it is 0 the sprite will stop.

Finally if the first character is 1 it will remain stationary or if 0 it allows the sprite to move normally.

Xcoord: this is the initial x co-ordinate.

Ycoord: this is the initial y co-ordinate also 24 lines of screen are used.

Xmove: this is the distance the sprite will move horizontally.

Y move: same as xmove except vertically.

Char\$: this is a string four characters long which contains the characters that go to make up the sprite as follows:

1 2

(continued from previous page)

The number represents where that character is in the string, this also means that all sprites are 2 x 2.

Note this command can be abbreviated to LET Z = USR SPRITE

PRINT number; on or off in order to switch sprites on or off only. This is the only possible abbreviation. The second command is Move and takes the form:

LET Z = USR MOVE

This calls the sprite moving routine which moves sprite 0 to whatever number specified by NUM command (see next command) Num takes the form:

POKE NUM, number of sprites + 1

Therefore to have no sprites POKE NUM, 1 Flag takes the form:

LET Z = USR FLAG

PRINT number of sprite

This puts either 0, 1, 2 or 3 into Z, depending on the condition of the sprite.

If Z = 0 then the sprite has hit nothing and is allowed to move

Z = 1 sprite has stopped i.e. if it is at the same level as characters then it has hit a character over and under sprites won't affect this flag simply because they will either go over or under the characters and can't hit them.

Z = 2 sprite has collided; if it is a same level sprite and it collides with a character on the screen then Z = 2, or if the sprite has stopped at the edge then Z = 2 but the 'stopped' flag is not set.

Z = 3 sprite has stopped and collided; see Z = 1 and Z = 2

Coord takes the form:

LET Z = USR COORD

PRINT number of sprite

This returns with Z equal to ycoordinate + 256 \* xcoordinate and

PEEK 16507 = ycoordinate

PEEK 16508 = xcoordinate

of the sprite defined in the Print statement.

Motion takes the form:

LET Z = USR MOTION

PRINT number of sprite

This is the same as Coord except that the x and y movements are found.

Init takes the form:

LET Z = USR INIT

This allows the Move routine to be interrupt driven. So you could run a program and when it has finished sprites can still be moving around. However the drawback is that only two sprites can be used, any more causes the screen to jump.

This command is turned off by the following commands:

FAST, SLOW, LPRINT, LLIST, COPY, LOAD, SAVE, DATA (new command) or when entering a program line.

Data takes the form:

RAND USR DATA

PRINT number of sprites

The data for the sprites is stored in a Rem statement after the machine code and 16 bytes is required for each sprite and two 'Newline' characters at the start to blank out the data. So to do this you use this command which produces enough bytes for the number of sprites in the Print statement.

REPORT CODES

T: no line after command which requires PRINT statement

W: flag\$ not correct length

U: char\$ not correct length

C: data missing in PRINT statement

One other thing is that if an 'over' sprite passes over another sprite it may leave part or all of that sprite behind but usually when it runs over anything it will not do this, but some very good 3-D effects can now be easily created.

Listing 3.

```
1000 REM HEX LOADER
1010 PRINT "START ADDRESS"
1020 PRINT "FINISH ADDRESS"
1030 PRINT "NUMBER OF STEPS"
1040 LET T = 0
1050 LET W = 0
1060 LET U = 0
1070 LET C = 0
1080 LET Z = 0
1090 LET X = 0
1100 LET Y = 0
1110 LET S = 0
1120 LET R = 0
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1190 LET K = 0
1200 LET J = 0
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Listing 2.

```

2 REM (C) M. DEVL IN 1984
300 BASIC
4 LET N=USR INIT
5 LET N=USR SPRITE
6 LET N=USR DATA
7 LET N=USR MOVE
8 LET N=USR MOVE
9 LET N=USR MOVE
10 LET N=USR MOVE
10000 FOR F=0 TO 3
10010 LET N=USR SPRITE
10020 PRINT F,1;F+1;F#;RND#32;RND
#34;RND#3;RND#3;R#(F+1)
10030 NEXT F
10040 RETURN

Demonstration program
100 LET N=USR DATA
110 PRINT "DATA"
120 DIM D#(4)
130 LET D#(1)="M"
140 LET D#(2)="M"
150 LET D#(3)="M"
160 LET D#(4)="0000"
170 LET T#="0000110"
180 GOSUB 10000
190 POKE NUM,0
200 LET N=USR MOVE
210 IF INKEY#="" THEN GOTO 200
220 LET T#="00000101"
230 GOSUB 10000
240 LET N=USR MOVE
250 IF INKEY#="" THEN GOTO 240
260 LET C=0
270 DIM T#(2,7)
280 LET T#(1)="0000101"
290 LET T#(2)="000010"
300 LET N=USR SPRITE
310 PRINT C,1;4;T#(INT (RND#2)+
#4)+1)
320 LET C=C+1
330 IF C=245 THEN GOTO 390
340 POKE NUM,C+1
350 PRINT AT 0,0;C
360 LET N=USR MOVE
370 IF INKEY#="" THEN GOTO 390
380 GOTO 390
390 GOTO 390
400 PRINT AT 10,0;"NOW FOR SOME
REAL SPEED"
410 FOR F=1 TO 100
420 NEXT F
430 POKE NUM,3
440 LET N=USR INIT
450 STOP
10000 FOR F=0 TO 3
10010 LET N=USR SPRITE
10020 PRINT F,1;F+1;F#;RND#32;RND
#34;RND#3;RND#3;R#(F+1)
10030 NEXT F
10040 RETURN

```



**Timex Computerists:**

# Outlook Bright for New Products and Services

by Eben Brews

Immediately after TIMEX quit the computer business, it was kind of hard to tell where TIMEX-Sinclair computing was going in the United States. For computer owners, it was a matter of worrying about where you'd get support for the computers you had bought. For businesses like E. Arthur Brown Company, it was a matter of whether we could make enough money selling that support to pay for expenses and make a profit.

Things looked pretty bleak there for a while. With all of the screw-ups and poor management from TIMEX, most dealers and distributors hadn't been making any money for quite some time before the big announcement. The TS2068 looked like it was going to pull us all back on track. But TIMEX started messing up the market for that one, too. Then, when TIMEX quit, many dealers just decided they'd had enough and gave it up. You get to a point where you're tired of fighting after a while.

Now that the dust has settled, I can see a bright star on the horizon for TIMEX computerists and Sinclair computers in the U.S. Unlike other companies that quit computers (i.e. Texas Instruments), TIMEX wasn't the brains behind their machines. Sinclair Research of England designed them. Now, they're quite healthy and happy with the computer business. Their ZX Spectrum, essentially the same computer as the TIMEX 2068, has sold over a million units world wide. They've even made a deal with an oriental company to manufacture the popular ZX-81 computers again. These are essentially the same as the TIMEX 2000. Finally, Sinclair plans to re-enter the U.S. market this Fall with the Spectrum and ZX-81 as well as their new business computer, the Quantum Leap. We'll probably begin distributing them sometime in the first part of 1985.

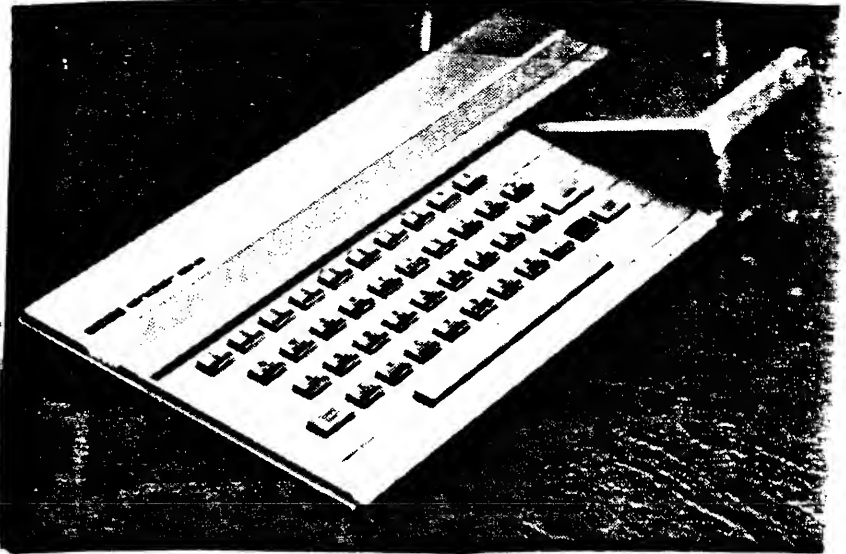
Most of the software and peripherals that work on Spectrums and ZX-81s will work on TS2068s and TS1000s with little or no modification. This means that TIMEX computer owners will again have the support of a major manufacturer. It also means a continuing market for companies like ours, who sell to TIMEX and Sinclair owners. And, it's a message of stability to software and peripheral developers who need to know there's a future before investing in new products.

Many of you are probably wondering when the microdrives will be available. They've been available for some time now in England. I expect them in the U.S. this Fall or early '85 when Sinclair will be selling them. In the mean time, we're working on importing a commercial mini-disk drive from that country. It's supposed to handle a megabyte of data and cost around \$500. You'll spend about as much or more for less memory on 8 microdrives, but the mini-disk unit won't create such clutter on your desk. I suspect Sinclair is thinking along the same lines. Rumor has it he struck a deal with Hitachi for a mini-disk drive.

On the home front, there are some rugged individualists that have answered the call to keep the public informed. The major magazines may have folded, but you can get some pretty top notch information from TS Horizons, Syncware News, and Syntax. Those of you who own modems might be interested in a bulletin board service offered by Mountaineer Software. Call or write us for more information on these publications. At the same time we'll be sure to put you on our mailing list.

Already the flood of converted Spectrum software and peripherals has begun. In this issue, you see the new Tasman line of RS232 and Centronics interfaces, word processing, and utility software. A new line of English games is in here, too. And, we have the RGB conversion kit for those of you who want the perfect picture afforded by RGB monitors. All of these are brand new products for your TS2068 computer. Even more are coming! And, so you can start boning up on the next wave of Sinclair computers, we've imported a new line of books on the Spectrum and Quantum Leap.

Yes, the outlook is bright for owners of TIMEX and Sinclair computers. We'll try to keep you informed as we search out and find the latest new products. *But, make sure you're on our mailing list!* If this is the first time you've received New Product Reports, chances are we rented your name for a one time mailing. To put you on our permanent mailing list, you have to either buy something or specifically request to be put on our list. Call or write today.



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QL REPORT

# Steering To Success:

*The sordid practice of pre-announcement has again gripped our hearts, and Sinclair are once more laughing all the way to Fort Knox. But to keep the interest ticking over during The Big Wait our ever-smiling micro Guru stuffed a company Mercedes full of eager journalists and whisked them over the Cambridge for a day's play with a QL. Quentin Lowe tells the tale.*

## The QL Roadtest



If nothing else, the Cambridge soiree succeeded in wiping a few cynical smiles off a few disbelieving faces. Yes, there are mistakes and disappointments; yes, there are delays and problems that a two-year old could have predicted; but it's one hell of a machine all the same and Sinclair Research knows that, in the end, it will delight everyone who's had the good grace to put their money up front.

Before charging into the review, I must first make all the usual disclaimers. The report is based on a one-day play on an early machine. Details may be different when the machines finally appear (in fact the QL has already changed a bit since the last time I saw one) and nothing that you read can be taken down and used as evidence...

Surprisingly, the man from Sinclair said how disgusted they all were that anyone could have written and be selling a book about the QL. But books about mythical computers are only about a fiver, whereas this particular mythical computer is going to cost some four-hundred pounds. Still, Sinclair Research did at least prove that the QL was slightly more than mythical; here's what it's like to ride a Unicorn...

### THE BODYWORK

The machine is delightful to behold and use. Its small size makes it a comfortable desktop companion and the only possible moan is that the three plastic feet (which tip the machine to a suitable tuning point)

have a habit of falling off.

Early QLs will have an additional 16K of EPROM hanging out the back — an unforeseen extra that's affectionately been nicknamed the 'Kludge'. The Kludge is really a 32K EPROM or ROM cartridge and its current nasty looks should have changed somewhat by the time it reaches the customers. It contains the bits of Basic and QDOS that either weren't ready in time or couldn't be made to fit in the original 32K ROM space. Being an indispensable cartridge, it must have a postponing effect on the QL cartridge software market.

In a way, Sinclair's approach is commendable; with the Kludge, you do get a working QL as opposed to yet another apologetic letter. The final QL ROMs will probably be around some four months after Sinclair has frozen the code in them — and the company also has to figure away of getting 48K of ROM inside the machine in a relatively short space of time. Strange then that it seems to be moving so slowly to finish the code in the ROMs. You also hear rumours of this or that keyword being added/deleted/changed and, despite missed delivery dates, Sinclair Research reckons its got the time for its programmers to do some new and fun things with the extra space available. Oh well, so you get turtle graphics commands too.

The keyboard is a bit strange at first. There's a copious layout (rumoured to be close to a DEC-like standard — if that were at all important) and every key you could possibly want is provided, including obscure characters such as `()`, `[]`, `!` and `\` that come in useful in languages such as C. What's more, the keys feel good and with a bit of practice you can type reasonably

drops a keypress. It's got a proper type head system like the BBC micro, especially useful when you're waiting for the Microdrives.

However, you will notice that there is no delete or backspace key, a curious omission considering its importance. Sinclair has a complete editing key suite between the arrow, Control and Alt keys which will be available in most applications. This includes Control/Left-arrow for backspace. I hate to say it but after five hours, I was quite happy with it. Any Shifted Zs you see in this story are purely coincidental!

## DRIVEABILITY

As soon as you've switched on (and are still cursing the lack of an on/off switch) the QL asks if you're using a TV or Monitor. Pressing F1 or F2 sets the appropriate display mode and the QL then tries to boot the Microdrive cartridge in drive 1 (or as we QLers call it MDV1). The QL searches MDV1 for a Basic program called BOOT and then runs it. This can then load whatever other programs you like, allowing you to create turnkey systems or have the QL boot up just how you like it. If it can't find boot, the system drops neatly into Basic.

The choice of TV or monitor is only for aesthetics. Some TVs won't be able to handle the QL's 80 column mode and will have to be operated in 40 columns. Sinclair, a company which has no televisions in its office, assures us that the television display is as good as you'll get. Certainly on a monitor it's bright, sharp and rock-steady—even if one of the QLs we've seen lost the left-hand 50 pixels of the display off the edge of the screen.

Amid the growing pile of QL blurb, you tend to lose sight of the display's performance. It's a pure bit-mapped display with its own 32K of memory, operating in four colours at 512x200 or eight colours (which, with a bit of software hocus-pocus, provide 256 stipples) in 256x200 mode. Sinclair has built some pretty clever screen handling software into QDOS and no doubt there'll be lots more to come.

Needless to say, the QL's windowing facility is a joke. The windows are not proper windows in the Apple, Digital Research or Microsoft sense, but more a clever screen handling gimmick. A window is effectively a set of four margins: a top-left PAPER and INK

It's associated with a particular I/O stream so that screen handling commands can be directed specifically to it.

So although it may look like it's a window, it has no contents as such — it can't be opened and closed with stuff inside. There are no window priorities — print to a window behind another one and the new text shows through, destroying whatever was in that place on the top window. Clear a window on top of another one and you destroy its contents and so on. There are PAN and SCROLL commands but these just smooth scroll the area inside the window in any of four directions, losing any data that's scrolled out of bounds.

So, with a great deal of care and attention, it is possible to produce some stunning effects. But the windows are just a trick piece of screen handling software. Similar things could easily be achieved on any other microcomputer, including the Spectrum. You may have guessed by now that QL screen handling is very software based. Character generation certainly is, and the eight different sizes avail-

able with CSIZE are just the same character definitions trotted out on to the screen in different ways.

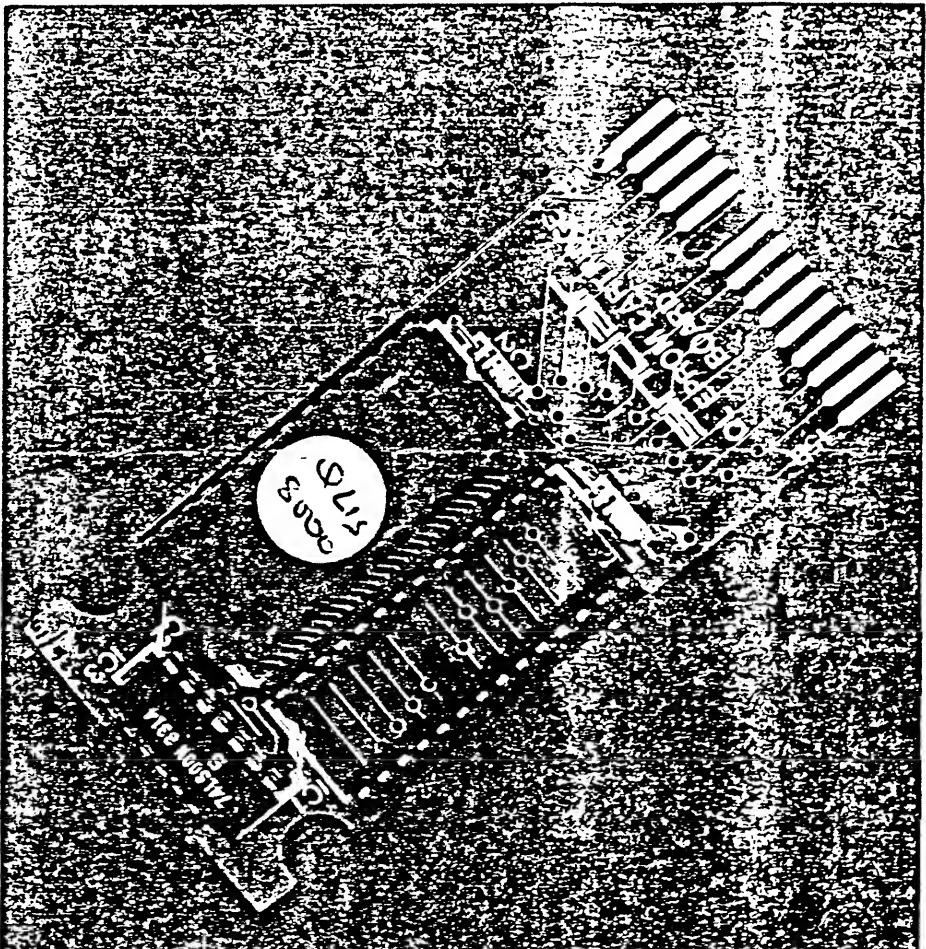
Following the shock of the impressive display, the next surprise is the two Microdrives. Despite the now wearisome round of moans about Microdrives, they are a souped-up version in the QL are a major asset. Having any kind of viable mass storage device in a home computer transforms the system. No-one is going to suggest that Microdrives are fast but they are not as slow as people might think.

The QL uses a slave processor to control the drives (it even verifies tape-writes in the background while you get on with something else) and a proper RAM-based directory — unlike with the Spectrum Microdrives. Occasionally you find yourself in exactly the right place and the drives load ten lines of Basic before you've looked up at the screen. Occasionally, they get fussy and you sit there for hours and hours.

## THE KLUDGE

Early QLs will have a 16K EPROM kludge containing the remainder of QDOS and SuperBasic that didn't fit in the original 32K ROM space. Unfortunately this rather monopolises the cartridge port. On the bright side, however, the extra space did give Sinclair Research room to add some turtle graphics commands.

Rumours that the kludge is merely aesthetic and designed to make the QL look and feel like a true Sinclair Research device are, of course, nonsense!



The media itself is nothing short of fun. The little cartridges can be carried round in pockets, put in Jiffy bags and so on. Despite stern warnings, you can do nasty things like pulling them out while running without wrecking them. This unfortunately became a necessity on a number of occasions while using the Psion packages, but that's a software problem that should be curable.

QDOS, incidentally, is very good for friends who swap cartridges around ad-hoc. When you format a tape, it gets named plus it gets a random number written to it. Even if you switch one cartridge for an identically named one, QDOS can detect it and object, thus protecting you from the consequences of the RAM-based directory getting out of sync with the actual tape in use. This process, while quite neat, does unfortunately slow down access.

All in all, it's hard to knock anything that's such good value for money. The drive system is probably the QL's best feature — it could be a Z80 with 32K and the drives would put it above its rivals. The only real way to complain about the Microdrives is the sobering thought that when you can finally buy the QLs in Smiths, there'll probably be twin 5¼ inch floppy machines for around the same price.

The more disappointing aspects of QL hardware are to be found lurking round the back. The omission of a Centronics port ranks in order of stupidity only second to the lack of a delete key. Instead we face a strange obsession with poorly implemented serial ports. First point — daft sockets. The QL uses telephone jacks which, although very trendy, aesthetic and (let's face it) secure, aren't easy to come by and are more than difficult to wire up yourself. Sinclair's wonderful free-gift for its 'sponsors' who've already ordered is, of course, one of these rare RS232 leads, valued at £14.95. If you're going to use such daft connections, the leads ought to come in the box, value £0!

But worse, the two serial ports have to be set at the same baud rate and that rate applies to both transmitted and received data. Think nothing of it until you try to access Micronet (1200 receive with 75 transmit) or drive both a Modem and a Printer. Who knows, maybe some flash device driver can squeeze other rates out of the system.

The network is quite openly not much more sophisticated than the

admits to, as yet, having problems with Spectrums on a net to QLs (who wouldn't?) but is able to demonstrate two QLs talking to each other. For the most part, it's still a question of two people stopping what they are doing and negotiating every step of the data transfer (using the NET command and the NETI (net input) and NETO (net output) drivers in QDOS). For the inexperienced, this can take more time than passing a Microdrive cartridge across by hand. However, with QDOS and the 68008, a sensible network should be possible. It remains to be seen whether the built-in system is up to it.

## STEERING IT

Onto the software and, like all things Sinclair, SuperBasic plods along as if all it had to do in life was waste away a warm summer evening by the river. It's a glamour Basic that does have some really juicy features, but what people ought to realise is that it's speed that counts. Basics are habitually used for stuff like games and it's their ability to crunch code quickly that makes



*“SuperBasic plods along as if all it had to do in life was waste away a warm summer evening by the river.”*



them good, rather than oversized ranges for floating point variables and so on.

SuperBasic also has a lot of the Cambridge academic in it. Long, cumbersome commands and short, terse error messages. The latter seems to come from using a pre-defined set of rather vague messages provided by QDOS. Quite why this is going on seems too odd to be worth investigating.

SuperBasic has all the makings of a grown-up language. Multi-line functions, procedures with local variables, long variable names and formatted listings with words like REM expanded to REMark for you. SuperBasic does away with the humble NEXT command

THE SINC TIME  
NEXT allows you to jump out of FOR...NEXT loops whenever you feel that Sinclair's claim of Superbasic making GOTO and GOSUB redundant is a little crass. To be fair, however, if you use FOR followed by a series of statements on a single line, you don't need the NEXT (or END FOR) at the end. Most elegant.

The other major nicety is that procedures can be executed outside of programs simply by typing their names. Given that these procedures can have parameters, you can easily add your own commands to SuperBasic to make program development that much more simple. For the most part SuperBasic appears to be a very sensible implementation, although missing some of the essentials — a line number trace being one of the more sore points.

It's a mature language, but one which appears to assume a certain familiarity and skill with Basic. Normally that's not the objective at all. To my mind it's for beginners and should therefore provide a fast and friendly environment that makes it easy to learn and use.

## BACKSEAT DRIVING

The four bundled applications were looking a bit sorry for themselves on the day, probably because Sinclair Research gave the impression that there were more releases and versions of the packages than working QLs — and because they are still some way from being presentable. However, running versions 0.99C, did give a fair impression as to what they are about.

The packages are real business programs and have no rival on any other similarly-priced machine. But they are not as slick as they first sound. The overall feeling was one of slowness, particularly with the word processor, QL Quill, which relies heavily on using MDV2 as a scratchpad. QL Abacus, the spreadsheet, also seemed more lethargic than you'd expect.

The packages now run under QDOS and are loaded from Basic BOOT programs. One thing that's been going on is that they've been steadily adapted to use more and more of the ever-growing QDOS. In places this may speed the system up (for example, fast area fills in graphics) or it may improve performance (QDOS supports 256 stipples based on the eight available colours). Hopefully, having to go through QDOS will not have a slowing effect.

There's no facility for linking the

export format. Going from the database to the wordprocessor produced a document with the database information plonked inside in an ordinary looking 'comma and quote' format. So it should be possible to access and create import/export files from Basic. However, the time taken to export a file, load another application and import the file is a considerable deterrent.

What's more worrying is the user-image of the programs. They look quite fabulous and exciting in the screen shots and over someone else's shoulder. But try sitting down and doing a job and you find a shockingly large amount of typing needs to be done and there are some fairly curious and fiddly key sequences.

You can get used to curious user-interfaces, but you can't cope with insecurity. Almost any filing operation causes the QL to hang, the ESCape key being ignored. If something is wrong with the cartridges in use the system hangs indefinitely, all the while re-trying the same operation. There are also a number of dangerous operations which should be checked before any move is made. Tell Archive to Quit and it resets the machine, wiping your current data, programs and screen formats, all without asking any questions.

No doubt much of this could (and probably will) be sorted out before machines start being shipped in any quantity. But the overall suspicion is that the packages perhaps try to do more than is necessary and may be too have suffered in the rush. It's hard to believe they put a strain on the machine but it is easy to wonder whether someone has been a bit over-ambitious.

Many people have ordered QLs solely for the four packages and it's certainly not unreasonable because you get the Perfect suite. However, it's nowhere near as good as gritting your teeth and buying one of those ageing Osborne things on the grounds that you get Super-Calc and WordStar.

### TRANSMISSION

QDOS, the QL's ROM-based operating system, does exist and by all accounts is an impressive piece of work. It wasn't really possible to tell how good it is because you can't use it directly and there's as yet no access to some of its more powerful features — a touch of the 'honest the really powerful features are there; you just can't use them' department! Neither is there any documentation: so much of QDOS

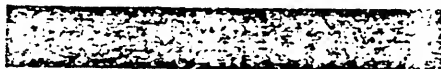
are performed more sketchy than they should be.

QDOS is a proper operating system, despite being stuck in ROM rather than loaded from Microdrive on power up. Elsewhere the practice of putting serious operating systems in ROM has almost died out, since it makes it quite hard to cure bugs and update users with new versions. That forgiven, Sinclair appears to have produced a very mature system.

QDOS has been likened to Unix simply because it's 68000-based and uses lots of Unix style syntax. In reality it's nearer to something like MS DOS 2 with the promised bonus of multi-tasking. QDOS provides total hardware support (graphics, Microdrives, network and so on), multiple Input/Output streams with installable device drivers, multiple programs in memory with pipes and simple multi-tasking —



*"Despite one or two harsh words, it's hard to deny that using the QL has made me want to own one."*



although these latter features can't be demonstrated.

At first glance, everything is beautifully implemented. All I/O devices have names (see table) and you OPEN and CLOSE streams to them, PRINT and INPUT to and from them. Some support other appropriate commands such as CLS and INK or LOAD and SAVE.

#### QDOS DEVICES

MDV1 MDV2	The Microdrives
CON	A window opened as a console (that's both input and output from the window)
SCR	A window opened as a screen (for output only)
NET	The Network port
SER1 SER2	The two serial ports

When you open a channel, you can pass an arbitrary string of characters excluding commas, to the particular device driver software. This can be used as parameters for the driver so, for example, you specify a filename when you use MDV1 or

CONsole in a screen window includes a rather unhelpful spec for where the window goes and so on. Sinclair has already set the syntax for such parameters gets out of control and inconsistent.

The beauty of this system is that any new device can become part of the machine at will. A Centronics interface add-on will probably become a CEN device. To print to it, you would OPEN CEN with a parameter list that perhaps tells it what sort of printer it's using and whether a screen dump is required or not. There's room for 16K of code for each device, allowing for some pretty sophisticated conditions to the system. Obviously, it makes it easy to bring in floppy and hard disk add-ons. QDOS recognises that devices are either character based (such as printers, keyboards, networks and so on) or directory based (such as Microdrives and hard disks).

Once the calls to QDOS are available, there's plenty of room for improving the system: a RAM-disk driver, perhaps, for half-megabyte QLs? Or a fancy font generator for the screen. With all this so nice, it's surprising that the company has made some really bad decisions with the rest of the operating system.

Files are kept absolutely simple — all are effectively just collections of ASCII bytes and QDOS will happily dump any file on the screen or down the network using the Basic COPY command. This is not such a bad idea — as a consequence, you can do little things like create programs for the Archive database with a Basic program or import from the spreadsheet into Basic and so on. SuperBasic programs are saved as straight ASCII so a straight file editor (not Quill) would provide a global editing facility.

QDOS is fine on the standard 128K twin Microdrive home computer, but the moment anyone puts a hard disk on the system, Sinclair Research will feel really stupid about the way it's done the DOS. There are almost no file types, no partitioning system and so on. This is fine if you have two drives with about ten files on each, but it makes a hard disk system unmanageable.

None of QDOS's great facilities — such as pipes and multi-tasking — are available from the keyboard through Basic. It's nothing short of lunacy to have the gear all nicely debugged and sitting there in the ROM, but to allow no access to it short of coding up your own machine code once the documentation is available.

so why does it have to hide behind Basic? In reality it needs a command line system like CP/M or MS DOS before it can be used properly. And for that matter, a cartridge of utilities — a text editor, for instance — would be very helpful. There's a chance that all this may happen, but not for some considerable time.

Even so, despite one or two harsh

words, it's hard to deny that using the QL has made me want to own one. The machine, when it happens, is likely to have the same sort of impact and long-lasting appeal as the Apple II, IBM PC and Sinclair Spectrum. The system feels grown-up and organised and the hardware feels professional enough for serious work both in development and actual gainful employment.

For hackers, it's a dream come true — a serious computer that's got great graphics (don't mention the sound), a meaty Basic, fast loading and saving and a trendy processor. The bog-standard new user who bought it just as a desk-top tool will, for the money, see it in the same light. Shame that — as dreams go, this one is such a long time coming about.

### SUPERBASICALLY . . .

SuperBasic boots with three windows open — the black one is for SuperBasic commands and error messages, the white one is for SuperBasic LISTINGS and the red area is for 'input to' and 'output from' the running SuperBasic program. This is automatically set up by two console channels (#0 and #1 — the red and black windows) and one screen channel (#2).

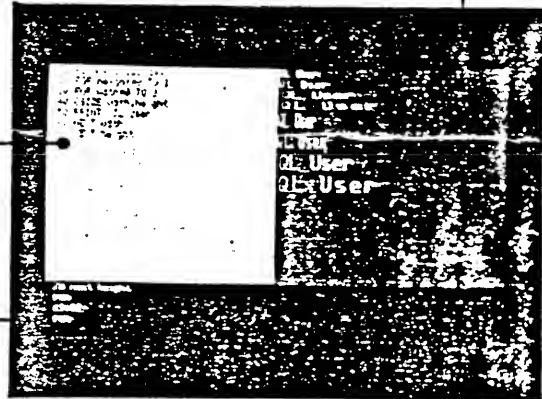
The three window system is designed to provide an easy environment for developing programs. However, the novelty quickly wears off as you discover some rather awkward problems. If you LIST a program twice, it appears in the white window with no line space between the two copies of the program.

More importantly, there is no command to change the defaults for these windows. To make the QL look like a normal Basic computer, you have to turn off Windows #1 and #2 and use explicit commands such as LIST#0 and PRINT#0. The problem of the default channels also manifests itself in other areas. All error messages generated by QDOS (and hence SuperBasic) are sent to channel #0. Close it (as the Psion packages do while loading) and you can't get any error messages!

To conclude — although SuperBasic may have some immediate visual appeal it is obvious that further research is required before it will be comfortable to use.

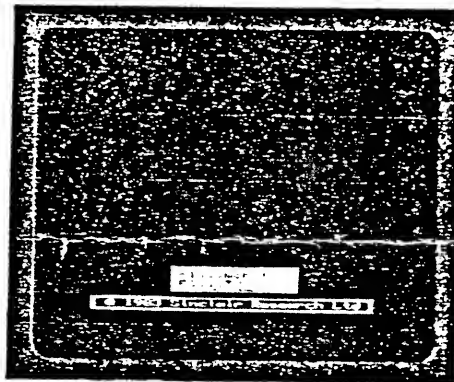
The CSIZE command produces two character heights and four character widths in software.

The SuperBasic listing builds in Window #2 as you enter it.

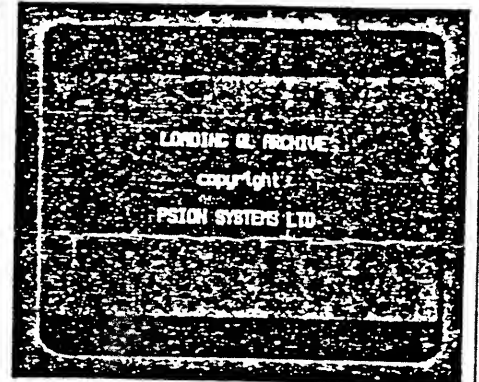


Window #0 is for commands and error messages.

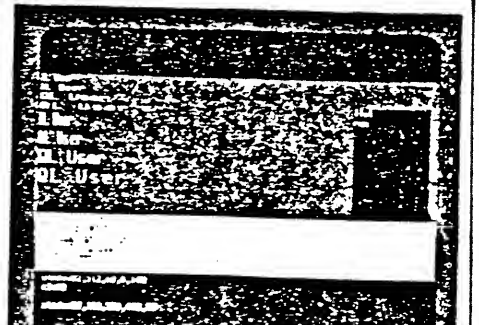
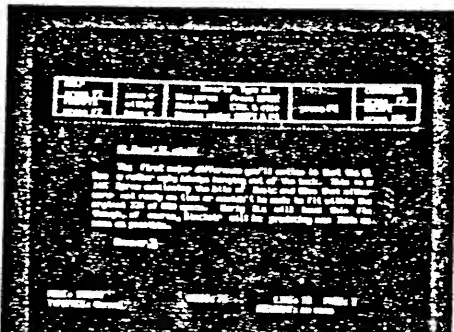
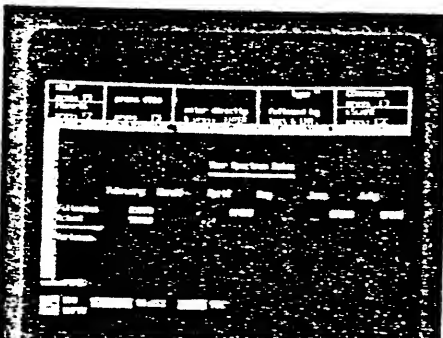
Output from the SuperBasic program appears in Window #1.

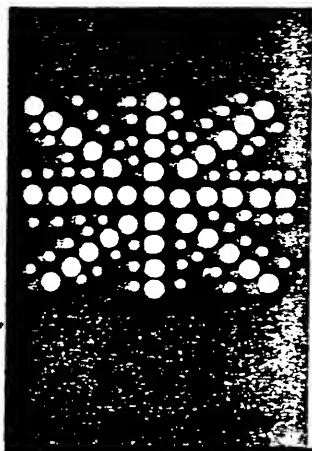


On power-up or reset, the QL needs to be told whether it's using a monitor or TV.



A Psion loading screen . . . get used to it, you're going to see a lot of it!





B·Y·T·E U.K.

# The Sinclair QL

A first look  
at this  
68008-based  
premature  
baby

BY DICK POUNTAIN

**F**or centuries, commentators in other lands have been trying to identify an "English disease" (or sometimes "vice"). The diagnosis has moved, during the latter half of this century, away from flagellation and toward excessive industrial striking and unrest. However, I would like to propose a new candidate, the premature announcement of personal computers.

The U.S. personal computer industry does not have an altogether unblemished record; for instance, the Coleco Adam had a difficult birth, as documented in *BYTE* (April, page 206). But compared to the U.K. scene, that is nothing.

In 1981, Britain had Acorn's BBC Computer; some mail-order customers waited a year for the goods to arrive. Shortly afterward, Sinclair's Spectrum took a good six months to reach full production and went through traumas that resulted in smoking power supplies, recalled machines, and redesigned main boards.

Last year the U.K. witnessed the announcement of the Elan Enterprise, an ambitious design with 256-color graphics, ANSI (American National Standards Institute) BASIC, and a Z80 with a paged 128K bytes of RAM (random-access read/write memory). Delivery was to be May '83, then September '83, now September '84. But Elan did have the grace not to release it half-finished.

British home-computer manufacturers have stumbled upon a whole new manufacturing algorithm that I've summed up in the pseudocode shown in listing 1. (For any U.K. lawyers reading this listing: It's a joke, a funny, okay?)

All of this is by way of preamble to a run-down on Sinclair Research's new QL (Quantum Leap), which I've just managed to get my hands on (see photo 1).

Sinclair Research announced the QL in January of this year, just a week before Apple unveiled the Macintosh. Most observers here agree that the launch was timed to take some of the wind out of Apple's sails, for the QL features a 68008 processor, built-in mass storage, 128K bytes of RAM, and a suite of application programs for £400, whereas Mac is going to sell at nearer £2000 here.

Delivery was quoted as 28 days from the announcement. To no one's surprise (we do learn, if slowly) the machine was not delivered in 28 days; the first models finally emerged in April. By the end of May, rumor had it that some 300 or so machines had been delivered to mail-order customers, and it's one of these that I've tested. The waiting list, according to spokespeople at Sinclair, stands at around 13,000.

## QL OVERVIEW

So what's the QL like? The question actually should be phrased "what will it be like?" because the machines currently being delivered are far from complete. Significant parts of the operating system are missing, and what operating system there is Sinclair has partly housed in a plug-in EPROM (erasable programmable read-only memory) because it won't all fit into the onboard ROM sockets. By the time you read this, though, Sinclair says that QDOS will be complete and that early customers will have a free upgrade to the onboard ROM version (and a free RS-232C cable by way of compensation).

The QL is packaged as a console unit that contains the processor and all electronics, the keyboard, and two Sinclair Microdrives in a box about the size of an IBM PC keyboard. The power supply is in a separate box, and you must add either a domestic PAL (phase alternate line) TV or an RGB (red-green-blue) monitor for display.

The keyboard looks very smart, with futuristic round, dished keys (like the NCR). Previous Sinclair computers had either membrane keyboards or the horrid rubber keys of the Spectrum, so this is a step forward. However, under those smart keytops lurks—a rubber membrane keyboard. I find the feel dead and unresponsive, while the space bar and carriage return keys have a tendency to stick if not hit squarely.

Microdrives are Sinclair's version of the

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"stringy-floppy" theme and were first introduced a year ago for the Spectrum. They differ from previous stringy-floppy designs mainly in their physical size; the tape cartridges are slightly smaller than those microcassettes used in pocket dictating machines and are filled with a 200-inch continuous loop of 2-millimeter wide video-quality tape. That's how two drives can fit into a space that would not accommodate one 3-inch floppy-disk drive.

The media hold around 100K bytes each, formatted in 512-byte sectors. The operating system performs error-checking whenever a cartridge is formatted and locks out any bad sectors, so the capacity gradually decreases with age. As for speed, the loop takes about seven seconds for a round trip, so this is the maximum seek time to find a sector—much slower than a floppy-disk drive, but very much faster than

audiocassette (most U.K. home-computer buffs still use cassettes). When the Spectrum Microdrives were first shipped, tape friction led to an excessive wear rate and a short media life. Sinclair claims that better tape stock and improved lubricants have cured the problem, but I had 2 out of 11 tapes go bad on me during the test period.

The QL architecture is based on the Motorola 68008, the 8-bit data bus version of the 68000. It runs at a respectable 7.5 MHz. Supplementing the microprocessor is an Intel 8049 that handles the keyboard and sound generation, while four custom ULAs (gate arrays in U.S. parlance) look after memory management, display logic, Microdrives, and serial ports. Two of these ULAs, designed by Ferranti, are hybrid digital/analog devices (trade-name Digilin) that perform motor-speed and signal-level control for the

**Microdrives.**

The standard memory complement is 128K bytes (in 64K-bit chips), but there is provision for a future 512K-byte expansion module.

The QL is well equipped with I/O (input/output), though it has no parallel printer socket. There are two RS-232C connectors, one wired as DCE (data communications equipment) and the other as DTE (data terminal equipment), and two jack sockets for Sinclair's twisted-pair network, which is not yet implemented. A bus extension socket lets you plug in ROM-cartridge software, but it's permanently occupied by the overspill operating system ROM on the early machines. An edge connector at the Microdrive end of the case lets you connect up to six more Microdrives (and possibly a Winchester drive later).

Color graphics are memory-mapped, with a maximum resolution of 512 by 256 pixels or 80 text columns; in this mode only four colors (red, green, white, and black) are available. In the half-resolution mode, 40 columns and eight colors are available (adding cyan, magenta, yellow, and blue). Also, an intermediate text mode has 64 columns.

Text size is variable through software switching, providing character widths of 6, 8, 12, or 16 pixels and heights of 10 or 20 pixels, which allows big letters and a variety of condensed letters. The single typeface is provided by a character generator rather than the Macintosh/Lisa soft raster graphics approach.

The eight colors are supplemented by a large number of "stipples," which consist of a plain background color with horizontal or vertical stripes or checks in a second color. The stipples are too coarse to give the appearance of true tints, but they're quite attractive in their own right. In short, the color choice on the QL is fairly restricted compared to many of the more recent home machines—for example, the Commodore 64 or MSX machines—though the resolution available is better than most.

The graphics commands available through SuperBASIC are quite rudimentary; the QL has no sprites or other hardware assistance, and only the simplest point-, line-, and circle-drawing routines.

The QL operating system, QDOS,

**Listing 1: The new British manufacturing algorithm.**

```

PROC New Home Computer IS
  Announce Product
  Announce Delivery Date
  Collect Customers' Money
  IF sufficient interest THEN /* pun intended */
    Design Product
    Manufacture Prototypes
    REPEAT
      Ship to customers
      Record complaints
      Fix bugs
    UNTIL it works
  Sell it to W.H. Smiths /* U.S. readers substitute any large retailer */
  ELSE file for bankruptcy
ENDIF
END PROC
    
```

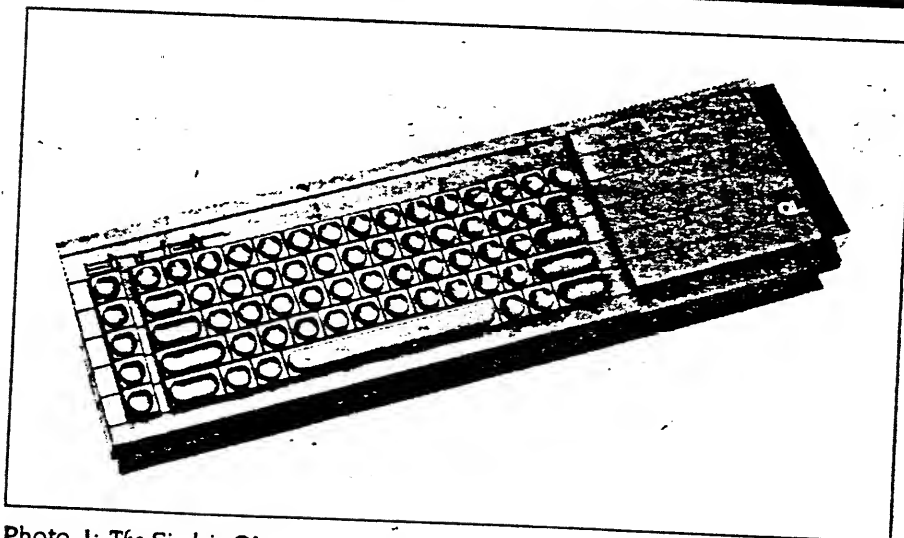


Photo 1: The Sinclair QL.

does provide direct support for screen windows, though. The operating system is channel oriented—all the physical devices are treated as files to which you assign one of 16 channels for communication. When you open a channel to the console or screen device, part of the file specification is the size window required, along with the amount of type-ahead buffer to allocate. This makes it very easy to open several different channels to different screen windows and redirect output to them using the standard I/O commands (PRINT #n sends its output via channel n). Windows can overlap each other but QDOS doesn't do anything about restoring the contents of overlapped windows; they're lost for good unless the application does something about saving them. Built-in PAN and SCROLL commands let you manipulate windows, with the same proviso that their contents are not buffered and will be lost if they leave the window.

The hot promise of QDOS is multitasking, but unfortunately this feature is not ready yet and wasn't working on the machine I used. It will work on a process model, creating a separate process for each of a number of programs to be run in parallel. Combined with the windowing, this could permit some serious integration of applications. QDOS will directly handle communication between processes using pipelines.

## SUPERBASIC

SuperBASIC is a great improvement over previous Sinclair BASICs, which were highly nonstandard. Most important, it has an excellent set of structured control constructs that make it a much better educational aid than its predecessors.

SuperBASIC procedures support full parameter passing, as well as multiline function definitions (with RETURN used to assign the result rather than assignment to the function name). IF...THEN...ELSE...ENDIF also is multiline and is complemented by SELECT ON, a variant of the Case construct, with a proper default clause called REMAINDER.

Two nicely symmetrical constructs do looping: FOR...END FOR and REPEAT...END REPEAT. Both of these use a loop identifier to clarify nested

*SuperBASIC is very, very slow. With a 7.5-MHz 68008, you'd think it would take some effort to run that slowly.*

loops, allow premature exits with EXIT, and use NEXT to force an immediate repetition (FOR is a counted loop and REPEAT is unbounded). They both have a single-line short form that requires no END statement, and these short forms allow neat coding of common operations such as filling an array or waiting for a keypress. The icing on the cake is that identifiers can be of any length (up to 255 characters) and all characters are significant.

Proper use of all these constructs gives programs a very clean, almost Pascal-like appearance; line numbers still are required but should be irrelevant except as references for editing.

SuperBASIC supports string, integer, and single-precision floating-point data types, along with the novel (for BASIC) idea of automatic "coercion." This means that, if possible, SuperBASIC will force data types into expressions of a different type, letting you, for example, add a string to an integer:

```
123 + "456"
```

This will give the answer 579, because you've coerced the string into an integer. Serious devotees of structured programming will be appalled by this liberty, which is the antithesis of strong typing. Other schools of thought, though (like the Logo community), will sympathize with the quest for an untyped language. Coercion doesn't go all the way—you can't assign a string to a numeric variable unless the string is the representation of a number, so LET A = "WOW!" fails.

A big problem with SuperBASIC is that it's very, very slow. Part of the problem is that, at present, the index of a FOR loop is coerced to floating point, when using integer would be much faster. This might change in later ver-

sions. I ran the Sieve of Eratosthenes benchmark in SuperBASIC using both FOR and REPEAT loops with an integer count. The timings came out at 4480 and 5300 seconds, respectively, which puts SuperBASIC right down at the bottom of the BYTE hit parade. With a 7.5-MHz 68008, you'd think it would take some effort to get a language to run that slowly. Sinclair will be working on the problem and later versions should be better.

Another drawback for business users is that the single-precision arithmetic only has seven-digit accuracy, which is not enough for serious cash programs. Oddly, it supports an enormous dynamic range of  $10^{\pm 613}$  so you can represent numbers far larger than the number of quarks in the universe, but not the pennies on your balance sheet if your turnover exceeds £99,000.

## SUPPLIED SOFTWARE

The QL comes with four bundled application software packages. Supplied on Microdrive cartridges, these were written by Psion, the U.K. software house that was previously better known for its Spectrum games. The four programs are the Quill word processor, Abacus spreadsheet, Archive database manager (dbm), and Easel business graphics. All four share a common user interface format that makes them collectively easier to learn. You select commands from pull-down menus by typing the first character of the name. As much as possible, the function keys have similar uses in all the programs. For instance, function key F1 always retrieves on-line, context-sensitive help, while F3 pulls down the command menu.

The applications are not integrated; the multitasking operating system was not ready when Psion was developing them. You have a limited ability to transport data files among them—the database can import from the spreadsheet or graphics packages and export to all the others, for example.

Quill is a neat little editor in the what-you-see-is-what-you-get mold. It includes all the basics and few frills. You can see superscripts and subscripts in place on the screen, with boldface type shown in a different color. The screen automatically is reformatted when

(continued)

reverse word-wrap, so you can indent a paragraph or alter the margins by merely "pushing around" the text with the cursor. Quill works in 40-, 64-, or 80-character modes so you can use it on a domestic TV in an emergency. The main limitation of Quill is that it doesn't use virtual memory, so the largest document you can edit is what will fit into RAM. Surprisingly, it doesn't support split-screen windows.

Archive is a powerful dbm program that certainly is no toy. It incorporates an interpreted programming language with the same structured features as SuperBASIC but with ultrahigh-level verbs to do searching, sorting, inserting records, etc. The program is menu driven from a series of menus that are cleverly graded so a first-time user only needs to use the first one that appears after boot-up. To such a user, Archive appears to be a non-programmable menu-driven package. As you gain experience, you can move

on to the later menus that contain the programming-language commands. You can use a built-in structure editor to write procedures that you can add to the menus to extend the range of commands.

The vital statistics of Archive are quite grown-up too; you can open up to 255 files simultaneously (on a 100K-byte Microdrive!), each with up to 64,000 records (variable length) of up to 255 fields of up to 255 characters. You can use a second built-in editor to design input and output forms based on an interactive "paint-a-screen" approach. Again, a first-time user doesn't have to take advantage of this sophistication but can use the defaults provided to produce simple card-index applications.

Abacus is a quite orthodox spreadsheet that lacks the more advanced features of Lotus 1-2-3 and Multiplan, though it does have some niceties of its own. For instance, you can use a built-in function to set up columns with month headings, give names to columns and rows, and reference cells by a pair of names in expressions (for example, sales.region2, which is more meaningful than A12 or R2:C9).

Easel is the sexiest of the programs by a long chalk. It's a fully interactive graph-plotting system that accepts data straight from the keyboard or loaded from a file. The user interface is superb: You use a pair of cross hairs, like those in expensive CAD/CAM (computer-aided design/computer-aided manufacturing) systems, to position objects and text. Easel is auto-scaling, so data always fits on the screen. The program has a large variety of different graph formats and colorings, and you choose them from a "shop window" of samples rather than from some dry menu. It's too limited for scientific use (no logarithmic scales, the x-axis always must be in even time periods, etc.), but it produces very professional business charts and is easier to use than just

about anything I've seen.

Taken all together, these applications cover most simple business needs, and they're very well designed. Indeed, Psion has plans to launch the whole bundle, fully integrated under a custom-written multitasking executive, for the IBM PC and MS-DOS systems.

## LOOK BEFORE YOU LEAP

What's the overall verdict on the OL? Sinclair created a furor over here when it announced the OL; business folks who had resisted purchasing anything so far thought that they were going to get a first-class business system for a song, while the truly serious hackers were drawn to a 68000 as if by a magnet.

At £400, with usable software and mass storage thrown in, the OL certainly looks like a good buy for impoverished business users. How satisfied those users will be depends upon the long-term reliability of the Microdrive media (the signs are not encouraging); the keyboard is not going to win any friends either, when businessmen have to use it for eight hours a day. Sinclair has hinted that it plans to skip over the floppy-disk drive altogether and go straight to a mini-Winchester as the OL's upgrade path. Whether this would put a tiger in its tank or not depends on whether the extremely disappointing performance figures achieved so far are a real reflection of the chip's capabilities.

For the serious hobbyist, it's another matter. The OL costs the same as the (in my opinion, wildly overpriced) BBC Model B with its 6502 and 32K bytes of user RAM; and Microdrives beat the heck out of cassettes.

I have to confess to a certain technical disappointment though, both with the emasculated version of the 68000 and with the relatively uninspired systems software. A rival to Macintosh this is not, but then, you get what you pay for. Also, who's to know how the OL will perform once Sinclair finishes it and once the third-party software mob gets hold of it? A game that is popular over here at the moment, called 3-D Ant Attack, features full-color, animated, 3-D perspective graphics and runs fast as heck on a 48K-byte Spectrum. And what about Pinball Construction Set on the creaky old Apple...? ■