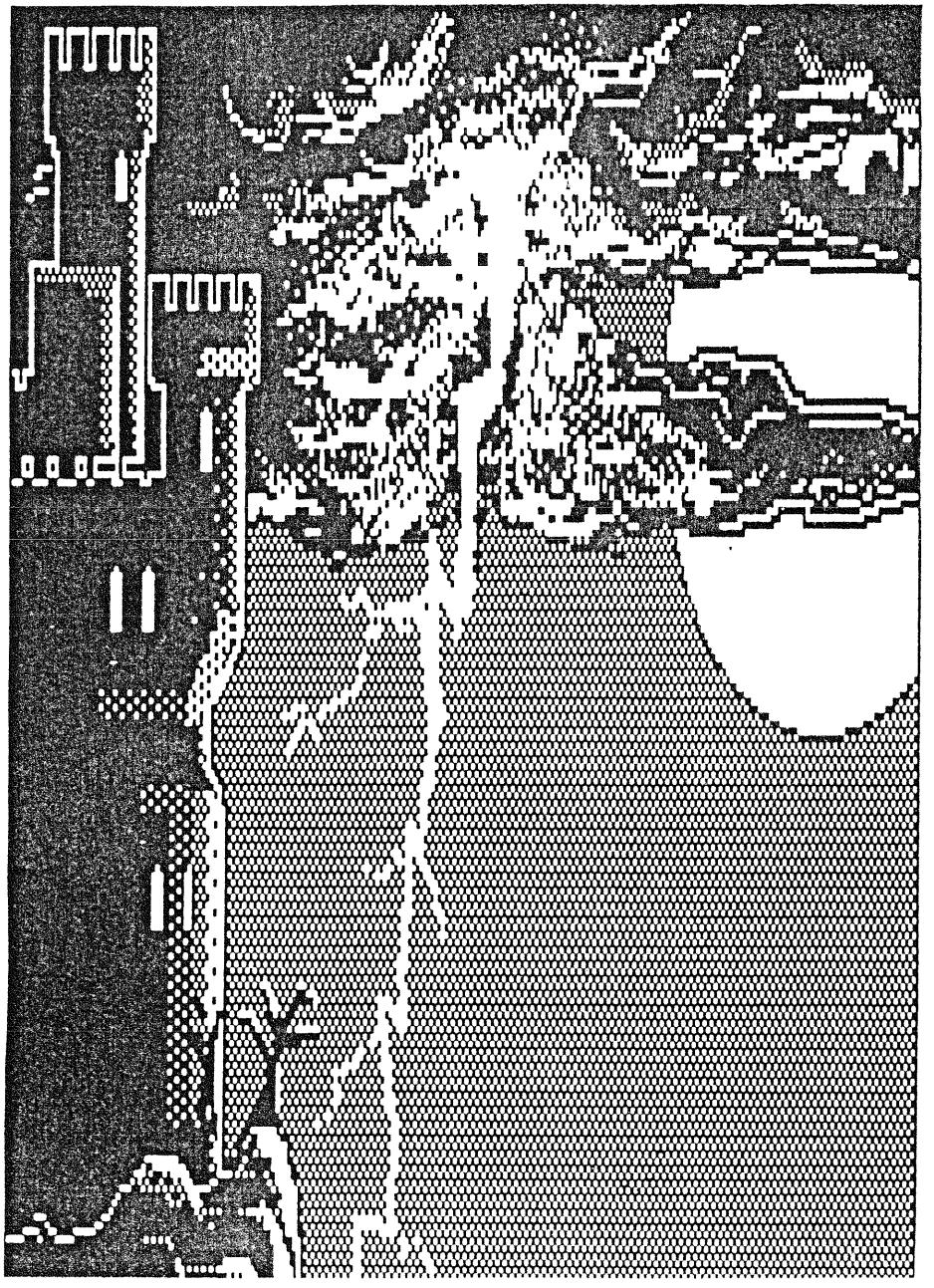
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* UPDATE COMPUTER SYSTEMS *

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Assistance in Publishing this magazine is provided by Eliad P. Wannum, poet, computer user and all round good guy. The magazine is made possible by the regular contributors such as Peter Hale, Bill Cable, Paul Holmgren, Bill Pedersen , Bob Hartung to name a few, and by the many contributions of other writers and programmers. Your contributions to this magazine are welcome. This is truly a magazine BY THE USER AND FOR THE USER OF SINCLAIR, TIMEX AND CAMBRIDGE COMPUTERS. When we cover other operating systems such as CPM or MSDOS it will be in relationship to our computers or emulators for our systems to run their software. We primarily cover disk based systems and software for the TS2068, Spectrum, QL, Z88...and will cover items on the TS1000 if disk drive based or in relationship to using it with the above mentioned computers. We do accept reviews of peripherals that are useable by our systems, such as scanners, printers, modems, etc. Submissions should be on disk or hard copy (two copies and at least NLQ, no draft mode). If there is artwork, please let us know in what order it should be used, and provide it as a saved screen or hard copy screen dump. The format is very relaxed. Just pay attention to the width of the pages and allow 3/4 inch top and bottom, and make the left and right margins wide enough to accomodate a 3 hole punch that does not cut out some of the text. We have enlarge and reduction capacity to adjust a page, but may lose some print legibility in the process. Most important is legibility. Draft quality dot matrix does not reproduce well. Print size preference is ELITE 12 characters per inch. PICA 10 characters per inch is okay also, but please no condensed print. Please do not make programs submitted on cassette tape, use disk, mdv or wafer. Z88 programs on disk may be in either IBM or QL format or hardcopy. TS2068 programs may be LLISTED in 32 chr. lines.

UPDATE COMPUTER SYSTEMS PAGE DIRECTORY, OCTOBER 1992

The computer that an article concerns is marked by using the following mark at the start of the page number-TS2068 = *,QL = # ,Z88 = % ,TS1000=^. There will be no mark if the article or ad applies to all or several different computer systems.

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OCTOBER EDITORIAL by Frank Davis

Welcome to the first issue of the 1992-93 subscription year of UPDATE Magazine. I hope that all of you will enjoy this issue. If you have failed to renew your subscription (they all came due last July, save for two of you) then please do so at this time. No other issues will be sent out to those who are not current paid up subscribers, it just cost us too much. I enjoy doing this magazine, but my philanthropy only goes so far. The vast majority of you already did so, and for you a big thanks. We welcome your constructive input, as well as your program and article contributions. And now as they say here in Peru (Circus City Capital of the World), on with the show!

This issue finds us favoring more to the Z88 and the TS2068, so next issue I promise to give more of an edge to the QL, as it is my main machine these days. Oddly enough it was my involvement with Mechanical Affinity that brought this about. It was necessary to be very familiar with what one sells. Next issue we will be touching on this as we hope to do some mini profiles of several North American Sinclair dealers. The more you know about the people who serve you, perhaps the easier it will be for dealer and customer to work together. It also makes for good trivia.

I heard from Bob Dyl, Editor of IQLR, that around the end of November we will be seeing the release of Miracle's new QL compatible machine and a QL card for the IBM compatible. Two new ways to keep on using the QDOS! My hopes at this time are that the price is reasonable for the two of them. I have quite a bit invested in QL soft and hardware and just want an upgraded machine to continue using this fine system. These are not the only ways you can upgrade on the QL system, but I will let Eliad tell you more about what is going on in that scene in one of his articles this issue.

Just what do we have this issue that is new for the TS2068? Well we get started on a new program, for those who operate a small business and use their TS2068. This will help with payroll as well as a few other things. This issue we will print the docs for it, and the listings next issue. For those who cannot wait to get it typed in, or want it sooner, it will be offered as an issue disk for $20.00 US$. At this time it is only available in the Larken format. By the way has anyone heard from Larry Kenny lately? As we get new issue disks I will be retiring some of the older ones. For now they are still available, but as in all things, when there is little or no demand ...they go away. I will also finish up on the differences for the IBM version of CAD for those who want to type it in. Early on we offered some from Bob Mitchell of the Toronto Club. I thought they were good programs, but there was not even one order, so we withdrew them.

Next issue will see the final emergence of a new issue disk for the QL. I will be filling out the disk with some short programs and utilities that have come our way in the last two years. Some might have made it into print had they come with some text or been other than CODE. Sadly, new programs for the QL have been in short supply the last few months. Those of you who are programmers, please share some of your wisdom with the rest of us. I can not offer you money if you write for us (except for issue disks, where half of the money goes to the author) but you will get some small measure of fame and gratitude. Bye for now!

DAYTON COMPUTERFEST REPORT

by FRANK DAVIS

Many thanks to all of the folks who made the trek to the Dayton DMA Computerfest at the end of August. Carol and I were pleased to see many old friends and to make some new ones. A great deal of people showed up, and many who said they would be there..were not! Human nature is so hard to figure out. At times this reminds me of asking a girl out on a date and being told she has to wash her hair that weekend!?! Still a lot of fun was had by those in attendance, and for UPDATE Magazine and Mechanical Affinity, both found it a financial success.

After the long and arduous loading up and making of the trip (first making sure that the dogs and cats were well cared for), we arrived at the Red Roof Inn in Dayton, only to be told we had had many people call looking for us. It is nice to have friends. The poor girl at the motel desk was glad we had finally arrived. In the lobby were Gene Wilson and Toby Radloff of Cleveland, Paul Holmgren and Bill Angel of Indianapolis, Don Lambert of Auburn (home of the Cord for you auto buffs), and we later ran into Jeff Taylor and Rene Bruneau of the Toronto area, Mark Stuber of Sharp's, Bill and John Pedersen of Grand Rapids, and Tim Swenson and Manuel Quintero of the D.C. area. From that point on, whenever we went to supper or breakfast...we went in mass groups. At the show of course we ran into many other friends, such as D.G. Smith and son, Bill Heberlein, Neal Schultz, Mel Laverne, Bill Bell, Doug Gillespie and Dave Bennett, to name just a few.

We went over on Friday, the night before the show, and set up our 4 tables (which really was not enough room to display all that we had for sale) and got to visit with some of the Dayton users, led by their trusty leader, Gary Ganger. Contrary to what we had been told, we were placed exactly in the same location as the year before. This made it easy for folks to find us, if they had been there last year. As for booths that were devoted to Sinclair products, there was Bill Angels flea market, SMUG of Milwaukee, T/Snug (who shared space with Chicago, but Chicago was a no show), DMA's Timex Sinclair SIG and a booth of D.G. Smiths. I hope I have not missed anyone. If so, pardon my error in advance.

I spent the next couple of days selling books, hardware, software and browsing other booths to find programs to feed to my other computer, my Amiga. Sometime I hope to find the spare time to see if I can Network my QL and Amiga. Just a side note on the Amiga! I have an improved, by the fine folks of Colorado thanks to Andy Hradesky, QL emulator for use on the 68000 series of Amigas. Soon, it should also be set to run on the other accelerated Amigas. If you are interested in getting a copy of this, get in contact with me.

We were told that about 27,000 people attended this years Computerfest, which would make the show a definite success. Last year the attendance was figured at just over 15,000. I would have liked to have seen it advertised more by the Dayton group to Sinclair users. I would also have liked to have at least seen mention of it in the Sinclair user group newsletters. I know that they all heard about it. They just failed to pass on the word to the readers of their newsletters. When there are so few of us, it ill behooves any of us to act in petty ways. When ever there is any event that concerns the use of Sinclair or Cambridge computers, anywhere in North America, that is the kind of news that belongs in all of our user group newsletters. We should all give the information to our readers and allow them to decide on an individual basis if they wish to attend. The event was still good.

TS2068 Video Bells and Whistles

The Faint-of-Heart Zone

Stay away from advanced video modes at any cost! Who needs them? Besides, what we can already do is all anyone really needs.

The screen is divided up into 24 rows of 32 characters, each of which can have 8 ink and paper colors plus bright and flash attributes. In addition, writing characters can be done using exclusive OR logic (useful for cursors), ordinary OR (useful for overprinting), AND (for selective erasing), and other modes for transparent ink, paper, negation and contrast.

In graphic mode, there are 176 rows of 256 dots (pixels) which can be plotted and drawn. Even though colors can be used, they apply only to whatever character space in which work is being done. Planning is required to avoid "bleeding". Creating a graphics cursor is challenging, but rewarding.

Color blind people become irritated when the use of color interferes with their use of a program. Politely, the answer is to use color only for decoration, but this cheats others out of the program enhancements that color makes possible. The best way is to have separate programs for monochrome and color.

The Somewhat-Daring Zone

A limit of 32 characters per line makes it difficult to do word processing. Fear not! The TS2068 has an advanced video mode which increases horizontal pixels from 256 to 512, allowing 64 normal (or more if special) characters to appear per line. The BASIC commands for writing to the screen must be supported by new routines, either rewritten as with "64", or in high memory as shown in the technical manual. Color is available, but applies only to the entire screen. Bright and flash generally produce poor viewing conditions.

Graphic mode is possible. Its primary use would be for word charts and line drawing in support of word processing.

Though better than 32 wide for word processing, there is still not enough room on screen to accomodate a graphic printer line unless more than one screen line is used per printer line.

The use of printer "windows" mapped to the screen, where they can be written to at will, forms the basis for drivers to access printer graphics. The same applies to 32 wide screens, so printer drivers should work in both modes.

Experience shows that 64 wide mode has no advantage over 32 wide when it comes to "windowing" and desk-top-publishing unless larger than screen windows are required, and tiling is not an acceptable option.

The Devil-may-Care Zone

Those who are somewhat-daring use programs written for them, or a cartridge. Both save the user the trouble of learning how their programs work. What they do is not in the general users' manual so there is a learning curve.

Going higher on the learning curve reveals new horizons to the adventurer -- high resolution color!

Because adventurers aren't that rare, it descends upon those of us with programming skill, the responsibility to develop tools for them; as happened with "64". The rest of this article will be devoted to describing that task, beginning with historical considerations.

THE ORIGINAL CHEAP MONITOR

The console is the computer's interface with you, consisting of a keyboard and monitor. Though usually a video tube, a printer was often used for logging status messages(works for the TS2068 too, hint). For home computers, the most easily obtained monitor is your TV set.

TV standards limit how good a picture you can get. Detail improves with increased bandwith (the size of channel assigned by the FCC for broadcasting). For black & white sets this came out to be about 400 pixels per scan line. This becomes less for color TV because the channel has to be divided up among colors. Assignments are unequal. Intensity gets the most, blue next, then red (oversimplified, but you get the idea). If you look closely at the TV screen. you can see that red areas smear out several pixels referred to intensity.

To make a remarkably affordable, yet powerful home computer, Sinclair designed a video driver with color TV as the monitor. With no monitor or printer to buy, what a deal! As options, RGB monitors and a special printer could be attached.

Anyone trying to display colors at too high a resolution has found out about blurring. For acceptable results, more than one adjacent pixel must be assigned to a color. A 4*4 checkerboard character gives much better results than an 8*8. An RGB monitor does not have this limitation.

There is a "bug" in the TS2068 caused by two crystals not being synchronized with each other. Rippling color bands are caused by the phase difference.

ADVANCED COLOR MODE AND TV

At first, the advanced color scheme for the TS2068 is hard to understand.

Other Computers, with expensive monitors, have screen display formats tailored for specific applications.

Those modes which are character oriented work the same as the TS2068.

Graphic modes are pixel oriented -- e.g. each screen pixel has a number associated with it. The number occupies a number of data bits called depth. One byte can hold one pixel of depth 8, two pixels of depth 4, etc. "TRUE COLOR" uses 24 bits, 8 for each of R, G & B.

As you can see, full screen color pictures have tremendous memory needs. Within the memory restrictions of the TS2068, a remarkable compromise was made, consistent with using TV as the monitor. There are two memory bytes for each byte written to the screen, making pixel depth 16/8; a value which could provide four colors on an IBM CGA adapter, but not the TS2068. It takes two bytes to display two colored dashes of four pixels. One in D_FILE1, a nibble of INK followed by a nibble of PAPER set up in advance to make two dashes, and one in D_FILE2 to define 2 colors. Using four pixels per color does away with smear, but allows only 64 dashes per line.

Colored dashes on screen can be combined in various ways to obtain more colors, but only one technique is sufficient. Two vertically alligned dashes blend their colors as viewed, so two dashes can define 36 colors instead of just 8. (64 combinations, but many are reverse order duplicates.)

From here on, a colored vertical dash pair is what we are talking about when we say "bixel", appropriate because bixels (pairs) always come in pairs.

The bytes defining them also come in pairs. We will call the first byte scan#0 and the second scan#1 because that is how they will be used. Scan0 defines the upper half colors of both bixels. The lower halves are colored by the second byte. These are written to D_FILE2. D_FILE1 was prepared in advance by filling the image frame with 00001111 to make dashes.

scan#0	scan#1	bixels on screen
00aaaccc		....aaaacccc....
	00bbbddd	....bbbbdddd....

A bixels file can be of any size. It can be panned if larger than the screen. For the moment let's consider a file (picture) that fills the top half of the screen. It will be 64 bixels wide by 48 high and consist of 3,072 bytes.

Even bytes go to even scan lines, odd to odd. 32 byte pairs are written before going on to the next scan line pair. An algorithm for computing sequential addresses (starting at 24576) is simple and easily written.

THE BIXEL COLOR CHART

H\L	0	1	2	3	4	5	6	7
0	BLK	1	2	3	4	5	6	7
1	...	BLU	10	11	12	13	14	15
2	...	...	RED	19	20	21	22	23
3	...	...	...	MAG	28	29	30	31
4	...	...	...	...	GRN	37	38	39
	(DUPLICATES)							
5	...	...	...	...	...	CYA	46	47
6	...	...	...	...	...	...	YEL	55
7	...	...	...	...	...	...	...	WHT

This table shows all possible bixel colors and labels which could be used to decribe them. The area [...] holds duplicates of colors to the upper right. There are 36 different, ignoring the possible use of Bright. (If used, both Bright and Flash must apply to both bixels of a pair. They won't be used here.)

REMAPPING MEMORY

Advanced video uses D_FILE2 in CHUNK3. On startup, BASIC overlaps (shadows) D_FILE2. BASIC is allocated 38,655 bytes. This drops to 31,743 when using advanced video modes. Running in Spectrum mode allows even larger programs to run. Little effort has been spent writing programs that use overlays and/or bank switching to let large programs make better use of memory. Oliger DOS makes overlays relatively easy, so somebody out there, get on the ball.

BASIC conflicts with the SCLD video processor when shadowing CHUNK3 (Spectrum even more so). Everything slows down. BASIC runs faster when memory is remapped even when advanced modes aren't being used. Contrary to what the tech manual implies, use shadowing only when you really must have that last piece of memory. ALWAYS use remapped memory if you can.

The routines in EXROM for remapping memory have some problems, but can be used with sufficient care. There are errors in the jump and fix tables which you don't normally bump in to. A much simplified version of the access routine in the tech manual is available. Once called, there is seldom any reason to reverse it

An interesting possibility for storing machine code exists when A_FILE1(768) and/or A_FILE2(768) are not being used for video.

The most important thing to remember about video modes is that there is absolutely no functional connection between memory mapping and video modes. You can change video modes any time you please without crashing anything. Of course, if memory has not been remapped first, there are going to be some awfully wierd looking screens. Once memory has been remapped, BASIC is all you need to run your video mode applications.

BIXEL FILE STRUCTURE

Graphic files usually have a header defining what they are to interpreters that handle many file types. Programs expecting only one file type can dispense with a self defining header in some cases but other programs cannot.

The first byte of the file tells the interpreter something. It may not be enough, but it's a start. The first byte of a bixel on screen is 00pppiii, followed by 00PPPIII.

Notice that the first two bits, which normally represent FLASH and BRIGHT respectively can be used for control purposes in a file without displacing data. Setting bit 6 high could signify the start of a row. Setting bits 6 and 7 high could signify the end-of file (EOF). Reading through a file, you can count the columns and rows for the file and store them. If the file is bigger than the frame, a common default is to display the upper left corner of the picture, and enable a panning utility.

At least two more bits are available for control because bytes always come in pairs. Odd numbered bytes could have bit 6 set for EOF instead of the even byte bit 7. Then all characters would pass a bit 7 filter, but all values from 0 through 63 represent valid data, so ASCII control characters would be present. This would pose a problem for modem transmission of files.

Borrowing a technique from RLE, we might add 32 to all data to avoid having to deal with control codes. Valid data bytes would then be from 32 to 95. It looks like we have a winner! Using a header, we encode our values instead of RLE pixel counts. Values greater than 95 cannot represent valid data, so they can be used to insert special bytes into the data stream. A file identifier of "ts" (116,115) is nice. Beyond that, ASCII command codes can serve to delimit rows and provide EOF.

VIDEO EDITORS

Making a cursor visible on a full color screen in advanced video mode is not as easy as it sounds. Blinking is the only sure way. The trick is how to make only one bixel blink instead of two. The answer is to operate the blink from the editor, not the SCLD. The blink must be three steps, true color, all white, all black and repeat.

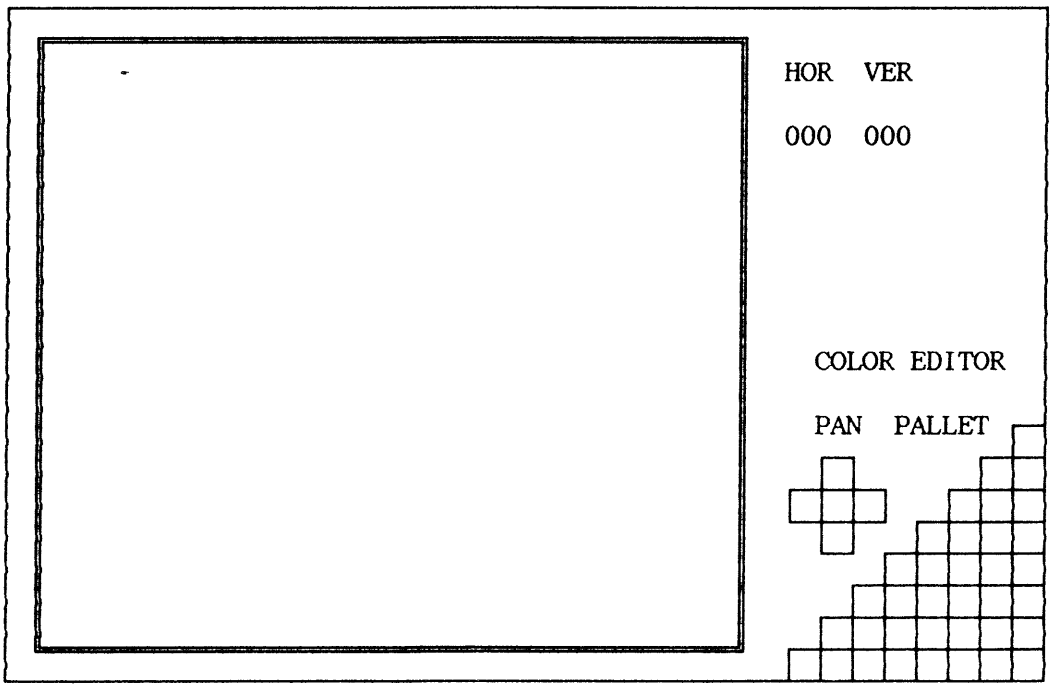
Somewhere on screen should appear a pallet of all 36 colors, so the cursor can be used to select a color for painting with the press of a button.

When not selecting, the cursor position color should show on the pallet.

Somewhere on screen should appear the file array coordinates of the upper left corner of the viewing frame.

Command buttons should be available to pan the image in the duplicate color area of the pallet display.

Other functions are best handled using the keyboard.



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A SCREEN DUMP PROGRAM

Basil Wentworth
1413 Elliston Drive
Bloomington, IN 47401

Here is a screen dump program that is fairly simple, and offers a bit of flexibility. It is configured for the Oliger 2068 interface, and the CITIZEN MSP-10 printer. I expect that other printers would work with the program, as I believe that the MSP point-graphic printing system is fairly standard.

To check whether your printer can use this program, RUN the printer compatibility test program shown. Again, line 100 is for the Oliger interface. For other interfaces, you should be able to make an adaptation. The two POKEs in line 100 tell the printer to interpret the (CHR$ 27) as an ESC command, rather than to print the corresponding character. Incidentally, if you want to LLIST the program, you'll have to undo these POKEs by repeating LET/p=o/g, or you'll get some interesting (and not very helpful) interpretations of the keywords.

If the compatibility test program gives a printout like that shown, you're in business.

The COPY program is a hybrid: part BASIC and part machine code. The CLEAR command in line 9110 ensures that the next variable defined (in this case, B$) will be at the beginning of the VARS area of memory, where you'll know how to find it. Line 9150 and the following DATA lines fill the first 65 characters of B$ with the machine code you will need.

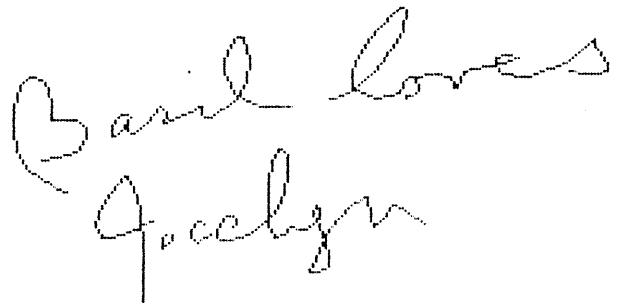
As you may remember, the memory from 16384 to 22527 holds screen display information. The machine code program converts this information into a form that the computer needs for dot-matrix printing, and plugs it into the latter bytes of B$.

The program as shown prints the top 22 lines of the screen, which comprise all of the display except the two "report" lines at the bottom. If you want to LPRINT less than the entire display, you can change line 9290. The width of the print-out can be changed by varying the control character in line 9370, with results as shown in the figure. Note that the height of the print-out (i.e. the rate at which the printer eats paper) does not change, so the shape of the picture will be different.

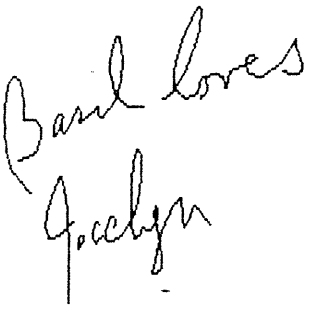
One caution: be careful that you do not erase the screen drawing when you activate the COPY command (GO TO 9200). One way to avoid this problem would be to SCREEN$ SAVE the picture you want, and then recall it after you have LOADed the COPY program, as prompted in line 20.

```
  10 PRINT '''''       "; FLASH
1;"DO NOT USE RUN!!"; FLASH 0
  20 PRINT '''"Clear the screen
, generate the  figure desired,
 and GO TO 9200"
8900 STOP
9000 REM  SAVE
9010 SAVE /"COPY" LINE 9100
9020 VERIFY /"COPY"
9030 BEEP .3,12: BEEP 1,12
9040 STOP
9100 REM  INITIALIZE
9110 CLEAR : DIM B$(325)
9120 PRINT '''''       "; FLASH
1;"DO NOT USE RUN!!"; FLASH 0
9130 PRINT '"    Be with you a
s soon as"'"     initializing i
s done"
9140 RESTORE
9150 FOR F=1 TO 65: READ N: LET
 B$(F)=CHR$ N: NEXT F
9161 DATA  17, 31,118, 14, 32,
33,  0, 64
9162 DATA   0,  6,  4, 62,  0,2
03,126, 40
9163 DATA   1, 60,  5, 40,  5,2
03, 39, 36
9164 DATA  24,243, 18, 19, 58,2
36,117,214
9165 DATA   8, 50,236,117,254,
62, 40,  9
9166 DATA 213, 17,  0,  3,237,
82,209, 24
9167 DATA 216, 13,200,213, 17,2
55,  2,237
9168 DATA  82,209, 62,126, 50,
52,109, 24
9169 DATA 200
9170 LET /p=o/g: POKE 23300,60:
 POKE 23301,3
9180 GO TO 1
9200>REM  COPY
9210 LET A=6+PEEK 23627+256*PEEK
 23628
9230 LET B=A+65: LET M=INT (B/25
6): LET L=B-256*M
9240 LET B$(2)=CHR$ L: LET B$(3)
=CHR$ M
9250 LET B=A+14: LET M=INT (B/25
6): LET L=B-256*M
9260 LET B$(30)=CHR$ L: LET B$(3
1)=CHR$ M
9270 LET B$(35 TO 36)=B$(30 TO 3
1)
9280 LET B$(62 TO 63)=B$(30 TO 3
1)
9290 FOR L=1 TO 22
9295 REM  can be varied, to prin
t less lines
9300 IF L<9 THEN LET start=16352
+L*32
9310 IF L>8 AND L<17 THEN LET st
art=18400+32*(L-8)
9320 IF L>16 THEN LET start=2044
8+32*(L-16)
9330 FOR F=1 TO 2
9340 LET B$(8)=CHR$ INT (start/2
56)
9350 LET B$(7)=CHR$ (start-256*C
ODE B$(8))
9360 RANDOMIZE USR A: LET B$(15)
=CHR$ 126
9370 LPRINT CHR$ 27;"A";CHR$ 4;C
HR$ 27;"K";CHR$ 0;CHR$ 1;B$(66 T
O )
9380 REM  "K" for single density
; "L" for double density; "Y" fo
r high-speed double density; "Z"
 for quadruple density
9390 LET start=start+1024
9400 NEXT F
9410 NEXT L
9420 LPRINT CHR$ 27;"A"
9430 BEEP .3,12: BEEP 1,12
```

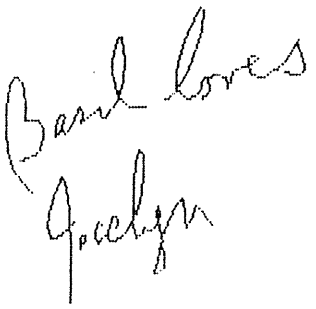
2068 screen dump program; MSP-10 printer, Oliger interface



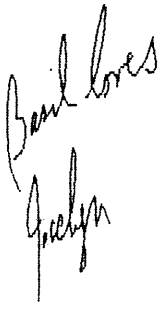
Single Density: "K" in line 9370



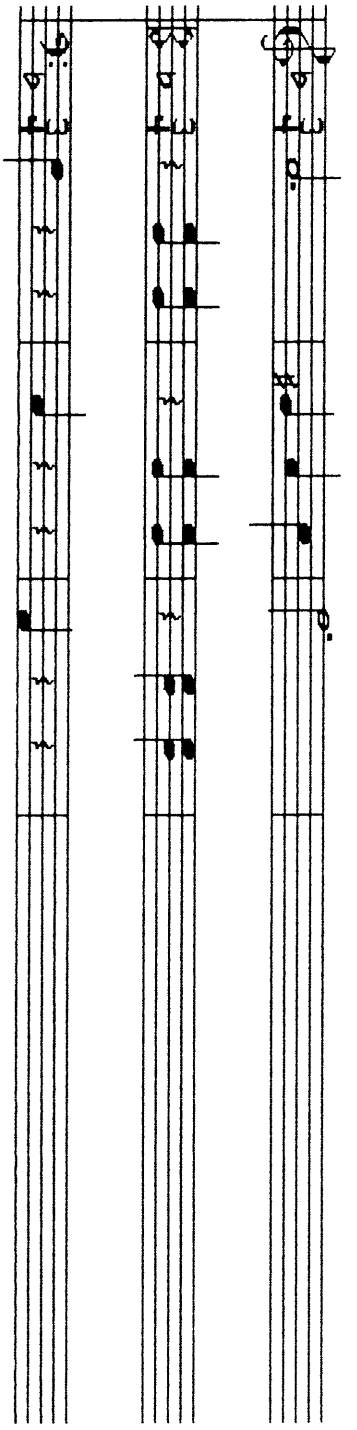
Double Density: "L" in line 9370



High-speed Double Density:
"Y" in line 9370



Quadruple Density: "Z" in line 9370



```
 100 LET /p=o/g: POKE 23300,60:
POKE 23301,3
 150 LET A$=""
 200 FOR F=1 TO 5: LET A$=A$+CHR
$ 15: NEXT F
 250 FOR F=1 TO 5: LET A$=A$+CHR
$ 240: NEXT F
 300 LET A$=A$+A$
 310 LET A$=A$+A$
 320 LET A$=A$+A$
 500 LPRINT CHR$ 27;"L";CHR$ 80;
CHR$ 0;A$
```

Test for printer compatibility
should give the following
pattern:



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ROM BYPASS CIRCUIT DESCRIPTION

This board bypasses 0-16k of the HOME bank and 0-8k of the EXROM bank. By providing all 16 bits of address for the bypass "EXROM", this bank is expanded to 64k.

"EXROM" from 0-32k can be EPROM or battery backed SRAM, from 32-64k it is volatile SRAM.

"HOME ROM" can be a single 16k EPROM or a pair of battery backed 8k SRAMS.

Both internal ROMs are part of LOCAL memory (managed by the SCLD). Even though BYPASS replaces LOCAL, it is not true expansion memory. It remains "LOCAL" because the SCLD is still managing its use, not a bank switching controller (BSC). It is important to remember that true expansion memory banks have more priority than local, including bypass.

Expansion banks from 0 through 255 can be used. There are no "missing" banks -- for example, if an expansion bank #254 was present and active, it would take the place of local EXROM.

Bank #0 shadows DOCK (Cartridge slot).

Bank #255 (shadowing HOME) is a special case, being active on power-up.

Expansion banks exert authority by driving BE low, so this signal is intercepted by the bypass board before passing it through to the TS2068 SLD. The BE signal to the TS2068 is also driven low when either bypass memory is active so it can replace LOCAL TS2068 ROMs. This is the job of U4A & U4B.

U4C turns off bypass memory when an expansion bank is active, when a refresh cycle is in process, and to initialize it at power-up.

SCLD output signals ROMCS and EXROM enable HOME ROM and EXROM respectively. ROMCS is not available at the rear connector so it must be brought out on an unassigned pin location (A5). Now the SCLD can select bypass memory banks.

Now things get interesting. When the SCLD senses BE low, it turns off local memory selection including ROMCS and EXROM. If nothing else is done, this de-selects bypass memory and BE goes high again, causing oscillation.

The function of the two flip-flop latches is to remember the memory selection during one instruction, and then reset in preparation for the next. This solves the oscillation problem. Each flip-flop is a "data"(D) type with "set"(S) and "reset"(R) inputs. Set and reset are active low. Data is latched to output (Q) on the rising edge of the clock signal.

Because data is hard wired low, this is the same as a reset. It happens after a memory cycle is completed and the signal MREQ returns high.

A flip-flop is set whenever a memory cycle begins while local ROM is enabled by the SCLD. Note that it will be immediately reset if an expansion bank is active.

For the Z80 CPU the address and M1 signal are put on the bus by the rising edge of T-STATE #1 (T1up). MREQ appears on the bus after T1dn.

In between Z80 T1up and T1dn the SCLD has three additional transitions because its clock frequency is four times that of the Z80 in order to be fast enough to run video. This allows the SCLD to put the local bank select signal ROMCS or EXROM on the bus before T1dn (and MREQ).

Many transient and special conditions like DMA operation can occur. This design is compatible with interrupt protocols, DMA, external bus masters, and memory expansion.

"DEAF" memory cannot take data off the bus. "DUMB" cannot put data on the bus. If two memory banks are enabled at the same time, all but one must be "DUMB".

ROM is "DEAF" by nature, so making RAM "DEAF" makes it look like ROM to the computer.

Making bypass memory "DUMB" allows writing to it for purposes of modification or booting. Though this design uses physical switches, I/O registers could be used so you can re-boot or edit using software in place of operator intervention.

Copying internal ROM to the bypass board while it is inactive, then turning the computer off and the bypass board to active is a good test. If everything is working properly, you will not be able to see any difference -- not very useful, but reassuring.

It is hard to describe the power the bypass board gives you. The deliberate barriers put into ROM code can be removed so the TS2068 can run as originally advertised, including DOS.

DOS, Microdrive, or any other mass-storage system can be run from EXROM (as tape already is), using up to 32k of code and 32k of buffer space. More device drivers can be accommodated. Unused entries in the function dispatcher are available for assignment. With care, IBM clone controllers for floppy and hard drives can be run on the expansion bus (EBU).

With an expansion bus adapter, and bank switching controller to remove memory size barriers, CGA and even VGA monitors can be attached to a "lowly?" TS2068.

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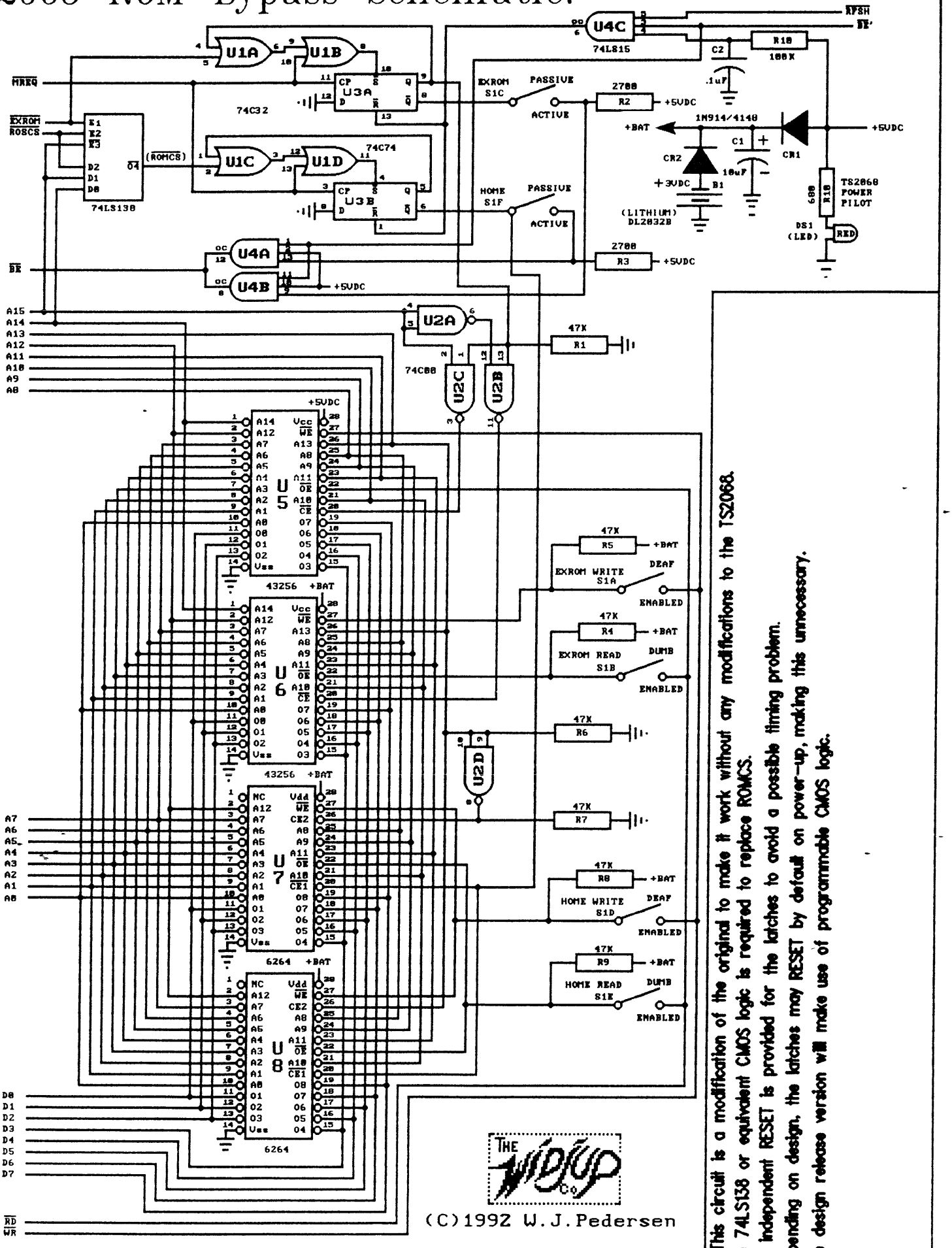


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TS2068 ROM Bypass Schematic.



This circuit is a modification of the original to make it work without any modifications to the TS2068.
The 74LS138 or equivalent CMOS logic is required to replace ROMCS.
An independent RESET is provided for the latches to avoid a possible timing problem.
Depending on design, the latches may RESET by default on power-up, making this unnecessary.
The design release version will make use of programmable CMOS logic.

```
  11 GO TO 1100
  12 PRINT AT 21,7;" PRESS ANY KEY ": RETURN
 998 RETURN
 999 DATA "p","1280","4543","p","26739","4543","1","4543","4543"
,"LLIST#5","512"," "
1000 DATA 33,83,92,94,35,86,235,43,43,1,q,r,205,187,18,201
1001 RESTORE 1000: FOR n=23706 TO 23721: READ byte: POKE n,byte:
 NEXT n
1002 RANDOMIZE USR 23706
1003 RETURN
1009 CLS : PRINT '"     CURRENT ASSIGNMENTS "'"Chan Addr  OUTPUT
 INPUT DEVICE  "
1010 LET b=PEEK 23631+256*PEEK 23632: LET a=PEEK 23635+256*PEEK
23636: LET k=1: REM CHANS, PROG
1011 PRINT " ";k;TAB 5;b;TAB 11;PEEK b+256*PEEK (b+1);TAB 18;: L
ET b=b+2
1012 PRINT PEEK b+256*PEEK (b+1);TAB 25;: LET b=b+2
1013 LET dv=PEEK b: PRINT CHR$ dv: LET b=b+1: IF dv>48 AND dv<58
 THEN  GO TO 1017
1014 IF PEEK b=128 THEN  GO TO 1016
1015 LET k=k+1: GO TO 1011
1016 PRINT "EOT  ";b;" BASIC @ ";a: LET bb=b: RETURN
1017  FOR n=b TO b+9: PRINT  INK 1;CHR$ PEEK n;: NEXT n: LET b=b
+10
1018 LET len=PEEK b+256*PEEK (b+1): LET b=b+2
1019 PRINT " Data & Buffer ";len: LET b=b+len: GO TO 1014
1100 RESTORE 999: DIM y$(12,10): FOR n=1 TO 12: READ I$: LET y$(
n)=I$: NEXT n: LET j=1
1102 GO SUB 1009
1103 IF a=26710 THEN  PRINT '"" This is the default setup for  C
HANNELS after POWER-UP or NEW.": GO SUB 12: PAUSE 0: GO TO 1108
1104 IF a=27253 THEN  PRINT '"" The correct CHANNELS setup has a
lready been installed.": GO SUB 12: PAUSE 0
1105 PRINT AT 21,3;" CREATING LLIST#5 ": GO TO 2032
1107 PRINT '"  AN INCOMPATIBLE CHANNEL SET IS PRESENT.  IN ORDER
 TO RUN THIS  PROGRAM, EITHER CYCLE POWER OR  EXECUTE ""NEW"".
THEN RELOAD.    " : STOP
1108 PRINT AT 21,3;" CREATING NEW CHANNELS "
1109 LET s=0: LET w=4543: LET file=0: LET I$=y$(j): LET j=j+1: I
F I$(1)=" " THEN  GO TO 1150
1110 LET n=CODE I$: LET n=n-(32 AND n>96): IF n>90 THEN  GO TO 1
109
1111 IF n>63 THEN  GO TO 1115: REM alphabetic
1112 IF n>48 AND n<58 THEN  GO TO 1114: REM numeric
1114 LET file=1
1115 LET J$=CHR$ n
1117 LET I$=y$(j): LET j=j+1
1118 LET nn=VAL I$
1120 LET I$=y$(j): LET j=j+1
1121 LET m=VAL I$
1123 IF NOT file THEN  GO TO 1180
1125 LET I$=y$(j): LET j=j+1: LET J$=J$(1)+I$
1127 LET I$=y$(j): LET j=j+1
1129 LET ss=256*INT ((VAL I$-1)/256)+256
1130 LET s=21+ss
1131 LET r=INT (s/256): LET q=s-256*r
1133 GO SUB 1000
```

```
1135 LET msb=INT (nn/256): LET lsb=nn-256*msb: POKE bb,lsb: POKE
 bb+1,msb: LET bb=bb+2
1136 LET msb=INT (m/256): LET lsb=m-256*msb: POKE bb,lsb: POKE b
b+1,msb: LET bb=bb+2
1137 FOR f=0 TO 10: POKE f+bb,CODE J$(f+1): NEXT f: LET bb=bb+11
1138 LET msb=INT ((ss+4)/256): LET lsb=ss+4-256*msb: POKE bb,lsb
: POKE bb+1,msb: LET bb=bb+2
1139 FOR f=bb TO bb+ss-1: POKE f,32: NEXT f
1140 GO TO 1108
1150 PRINT AT 21,3;"   CREATING LLIST#5   ": GO TO 2020
1180 LET r=0: LET q=5: GO SUB 1000: REM nonfile
1181 LET msb=INT (nn/256): LET lsb=nn-256*msb: POKE bb,lsb: POKE
 bb+1,msb: LET bb=bb+2
1182 LET msb=INT (m/256): LET lsb=m-256*msb: POKE bb,lsb: POKE b
b+1,msb: LET bb=bb+2
1183 POKE bb,CODE J$: LET bb=bb+1
1184 GO TO 1140
2000 DATA BA,AN,0,167,AN,0,NNA,117,104,AB,RNZ,0,0,CP,165,JRC,10,
SUB,165,CP,38,JRZ,114,CALL,69,7,RET
2001 DATA CP,144,JRC,4,198,49,JR,82,CP,128,JRC,4,198,97,JR,74,CP
,32,JRNC,42,CP,12,JRNZ,12,198,110,253,203,48,86,JRZ,-36,SUB,59,J
R,54
2002 REM   CODES
2003 DATA CP,13,JRZ,109,CP,6,202,63,105,CP,16,RC,CP,24,RNC,CP,22
,AN,1,JRC,1,60,NNA,117,104,201
2004 DATA CP,58,JRZ,44,CP,123,JRC,20, 203,71,JRZ,-78,253,203,48,
86,JRNZ,4,CP,123,JRNC,-88,CP,127,JRNZ,2,SUB,63
2005 REM   OUT_CHAR
2006 DATA 79,AN,10,CP,74,212,NEW,LINE,121,CALL,IOA,IOB,ANN,CUR,S
OR,60,NNA,CUR,SOR,RET
2007 REM   STYLE
2008 DATA 55,JRC,6,CP,58,JRZ,-27,JR,-123,253,203,48,86,245,204,N
EW,LINE,241,CP,38,JRZ,-15
2010 DATA PSHH,33,106,105,PSHB,BN,4,126,CALL,OUT,CHAR,35,DJNZ,-7
,POPB,POPH,RET
2011 REM   NEW_LINE
2012 DATA AN,13,CALL,IOA,IOB,AN,10,CALL,IOA,IOB,AN,10,NNA,CUR,SO
R,167,RZ,PSHB,BA,AN,32,CALL,IOA,IOB,DJNZ,-7,POPB,RET
2013 REM   PRINT_COMMA
2014 DATA CALL,84,105,230,15,47,198,17,BA,AN,32,CALL,OUT,CHAR,CA
LL,84,105,RZ,DJNZ,-11,RET,ANN,MAR,GIN,PSHB,BA,ANN,CUR,SOR,144,PO
PB,RET
2015 REM   TAB/AT
2017 DATA 229,33,104,105,229,42,79,104,233,225,201
2018 DATA 32,32,32,58
2020 LET MAR=46: LET GIN=105: LET PRT=71: LET COM=105: LET OUT=2
32: LET CHAR=104: LET CUR=234: LET SOR=104: LET IOA=95: LET IOB=
105: LET NEW=35: LET LINE=105
2021 LET DJNZ=16: LET JR=24: LET JRNZ=32: LET JRZ=40: LET JRNC=4
8: LET JRC=56
2022 LET BN=6: LET AN=62: LET NNA=50: LET ANN=58: LET AB=120: LE
T BA=71
2023 LET CP=254: LET RET=201: LET RNZ=192: LET RZ=200: LET RNC=2
08: LET RC=216: LET CALL=205: LET SUB=214
2024 LET PSHB=197: LET POPB=193: LET PSHH=229: LET POPH=225
2025 RESTORE 2000: FOR N=26739 TO 26989: READ BYTE: POKE N,BYTE:
 NEXT N
2030 POKE 23282,21: POKE 23584,26
2032 CLS : GO SUB 1009: PRINT '" This arrangement provides:"'"P
RINT #4   2040 printer,"'"LPRINT #5  Formatted printing,"'"LLIST
```

```
 #5   Formatted listings,"'"MEMORY     256 bytes @ 26995."
2033 PRINT '"See documentation for ""LLIST#5""."
2035 GO SUB 12: PAUSE 0
2036 LOAD /"INTFC_BE"
2040 STOP
9990 POKE 26876,167
9991 INPUT "Date? ";i$: LPRINT "LN";CHR$ 6;: LPRINT #5'"CAD#5BE
Listing, Oliger/EPSON ";i$'': LLIST #5: LPRINT "LO";CHR$ 12;: ST
OP
9999 SAVE //"CAD#5BE" LINE 1100
```


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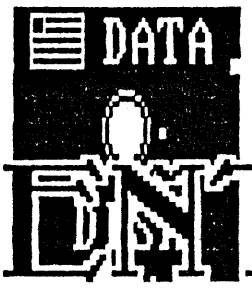
WE STILL HAVE SETS OF BACK ISSUES OF UPDATE MAGAZINE, BOTH FOR THE YEARS THAT BILL JONES AND THE DAVIS FAMILY HAVE PUBLISHED THE MAGAZINE. WHEN THESE ISSUES ARE GONE THAT WILL BE ALL, AS WE WILL NOT BE DOING REPRINTS. THERE IS TOO MUCH TIME INVOLVED IN REPRINTING SINGLE ISSUES (IT TAKES ABOUT 3 HOURS CONSERVATIVELY TO DO A SINGLE ISSUE). THIS IS NOT COST EFFECTIVE FOR US. THIS MEANS THAT WHEN THE 40 FULL SETS AND 124 ODD SINGLE ISSUES ARE GONE, THAT IS IT. ONLY NEW ISSUES AS THEY COME OUT WILL BE AVAILABLE. WE ALSO NEED THE SPACE AROUND THE HOUSE THAT THESE BACK ISSUES TAKE UP. WE ARE CONTINUING THEM ON SALE THROUGH CHRISTMAS, TILL THEY ARE GONE. IF YOU WANT THEM, PLEASE ORDER IN THE NEAR FUTURE TO INSURE THAT YOU GET ISSUES THAT YOU WANT. THEY ARE $16.00 US$ FOR 4 ISSUES IN THE US AND ADD $3.00 POSTAGE OUTSIDE THE USA. FOR A SINGLE ISSUE THE PRICE WILL BE $4.50, AND ADD ONE DLLLAR OUTSIDE THE USA. FOREIGN POSTAGE COSTS QUITE A BIT MORE THAN IN THE US. SIX YEARS OF SINCLAIR NEWS AND PROGRAMS ARE CONTAINED IN THESE PAGES, SO GET THEM WHILE THEY ARE BOTH HOT AND AVAILABLE!

TMX Disk Operating System
Disk Boot Program
Public Domain
Informed by: A. Hradesky
Original Author: Unkown

There are many different types of disk operating systems (DOS) for the *TIMEXsinclair 2068* computer. Ramex, Oliger, Aerco, and Larken all come to mind, however, there is one that stands out on its own as the official TIMEX DOS (titled *TOS* for the TIMEX Operating System) which is perhaps the finest design of an operating system offered for any 8-bit computer. Except for the use of an *NMI* (non-maskable interupt) save routine, *TOS* allows full use of direct sector read/write and other advanced features. *TOS* also allows the use of an automatic load routine on power up or reset. To achieve this, the program's name must be titled *Boot*. Below is just such a program. It will catalog the current drive in use. Use the 6 and 7 arrow (do **not** use the shift keys) keys to move a small marker (<) up and down to select your program. Once selected, hit the Enter Key to execute your preference. This Boot program also allows the downward movement through multiple sub-directories.

```
10 REM SAVE *"START" LINE 10
15 BORDER 1: PAPER 7: INK 2
20 OVER 0: CLS
30 LET CURSOR=7
40 PRINT AT 1,0;
50 CAT *
60 PRINT AT CURSOR,8;"<"
70 IF INKEY$=CHR$ 54 AND SCREEN$ (CURSOR+1,0)<>" " THEN PRINT AT     CURSOR,8;" ": LET
   CURSOR=CURSOR+1-(CURSOR=20)
80 IF INEKY$=CHR$ 55 AND SCREEN$ (CURSOR-1,8)=" " THEN PRINT AT
   CURSOR,8;" ": LET CURSOR=CURSOR-1+(CURSOR=1)
90 IF INKEY$=CHR$ 13 THEN  GO TO 110
100 GO TO 60
110 LET A$="": FOR I=0 TO 7
120 IF SCREEN$ (CURSOR,I)<>" " THEN  LET A$=A$+SCREEN$ (CURSOR,I)
130 NEXT I
140 LET B$="": FOR I=9 TO 11
150 LET B$=B$+SCREEN$ (CURSOR,I)
160 NEXT I
170 IF B$="DIR" THEN  GO TO *A$: GO TO 10
180 IF B$="MC " THEN  LET A$=A$+".MC": LOAD *A$CODE : STOP
190 IF B$="   " THEN  LOAD *A$
200 IF B$="SCR" THEN  LET A$=A$+".SCR": LOAD *A$SCREEN$ : STOP
210 LET A$=A$+"."+B$: LOAD *A$
```

Remember, this program is for the TMX operating system (this includes the FDD-3000 and the Zebra drives). Enjoy...



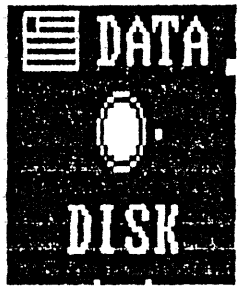
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ZX/SPECTRUM EMULATION

In the July UPDATE Peter Hale reported on three emulators for Sinclair computers and included letters from their developer, Carlo Delhez. The three described emulate the ZX81 and Spectrum on the QL and the ZX81 on a PC.

In early August one of the deputies at the sheriff department where I am chaplain was showing me a CD-ROM he had just acquired for his PC. Since the first computer he had ever owned was a ZX81, he brought up a ZX81 to PC emulator he had found on his disk. Then a couple weeks later the head of the computer science department at the school where my brother teaches gave me a copy of a Spectrum to PC emulator he had downloaded from a BBS to which he subscribes. Since neither of these programs showed any credits I have no way of knowing whether they are the work of Carlo Delhez or not.

Even on my relatively-slow 286-12 PC clone the Spectrum emulation is almost as fast as the Spectrum ROM on my TS2068. All commands except those intended for peripherals seem to function as they should. It gives excellent resolution and color on my VGA monitor and enables state (snapshot) saves/loads to/from my hard drive as well as the floppy drives. The system and ROM addresses are in the same virtual memory locations as in the Spectrum memory map so Z80 machine code and calls to ROM routines seem to work OK with it, including a copy of Manic Miner that was part of the BBS SW package.

On the down side, the package did not include any SW for emulating or translating the LPRINT, LLIST, or COPY commands so they can be recognized by the PC printer driver and IF. In his letters to Peter Hale, Carlo Delhez suggests that a serial IF card might be the best way to do this but indicated he probably would not be offering one.

QL SUBDIRECTORIES

In another area of exploration, I have been comparing notes with Kenton Garrett on ways to take best advantage of the 3.2Mb capacity of the ED drives he is using with his Gold Card. In effect each ED disk may be used as a small hard drive, especially if subdirectories are set up in it.

I first tried using the DIR_USE command provided in the Toolkit III supplement to Toolkit II. This allows a drive/directory path to be pre-set, such as DIR_USE flp2_quill_. As long as this drive/path is in effect, the titles of all files saved or loaded will automatically be given a prefix of the subdirectory name and all directories will display only those titles having that prefix. This works fine for SuperBasic files, for loading in files from the PSION programs such as QUILL, and when the "?" is keyed for a directory display. However, PSION data files are corrupted when saved under DIR_USE. PROG_USE and DATA_USE will not work here either.

Since I only have a Trump Card, I then tried using a new ROM chip called Flp-Level-2 that Kenton obtained for me through Merz Software in Germany. In it Jochen Hassler has adapted for the Trump Card many of the functions Tony Tebby wrote for the Gold Card ROM as well as those found on the Trump Card 1.32 and 1.37 ROMs. Because of Trump Card hardware limitations, neither it nor the TC 1.32/TC 1.37 ROMs enable the HD and ED densities provided by Gold Card, but they all allow the timing and stepping parameters to be set so as to take best advantage of newer and faster drives.

An ATR_DEV function allows direct data transfer between IBM (and Atari) and QL disks, but on my 5 1/4" 80-track drives I cannot format disks that my PC drives will accept, even in 40-track format (which is also the case when using double-step mode in PC Conqueror). The MAKE_DIR function makes it possible to create true subdirectories but there is no corresponding DIR_USE nor the DEV_USE set of commands as provided on the Gold Card ROM to pre-define drive/ directory paths. Because of this, subdirectories may not be used with this or the TC 1.32/ 1.37 ROMs for programs such as QUILL, ABACUS, etc. which limit file-title input to no more than eight characters.

What to do? Actually, as long as file titles on a disk do not duplicate one another, any disk may be filled with

all kinds of programs and data. By simply giving each of the respective boot routines its own distinctive title, I have all four of the PSION programs plus several other utility programs on one DD disk where one keystroke can call up the one selected from a simple menu as in the listing given below. They may all use the same printer_dat file, or else by giving each of several versions of this file its own distinctive title, then inserting a line such as COPY flp1_newname_dat TO RAM1_printer_dat ahead of the EXEC line in each boot routine, each program will have its own set of printer data to use. If RAM1 is to be accessed for printer_dat CONFIG_BAS must be used to re-direct each program to look there for system files.

The menu as given may be copied up to 26 times on a disk, with the first copy as BOOT, then succeeding copies as Bboot, Cboot . . . Zboot, which would provide for up to 936 titles to be entered in the menu string definitions. Actually, even an ED disk is unlikely to require more than two or three such menus. Put all programs with conflicting files on separate disks. Toolkit II ED or AUTO 1,1 or EDIT (line no.) may be used to define the titles of the routines which load the respective programs.

Write a one-line EXEC routine for any programs which require this command to call them up and save these to the disk also so they may be selected from the menus. By keying uppercase B through Z any of the menus may be loaded and displayed and 0-9 or a-z (lowercase) may then be keyed to select the desired program. If uppercase A is keyed from any menu it brings up the BOOT menu which is also displayed upon a powerup or a RESET with the menu disk in flp1.

BOOTmenu

```
1 mdrv$="1": FLP_USE flp: POKE_W 163976,
Ø: PAPER Ø: PAPER #Ø;7: INK #Ø;Ø: MODE 4
: DIM o$(36,18): o$(1)="QUILLboot"
2 o$(2)="ABACUSboot"
3 o$(3)="ARCHIVEboot"
4 o$(4)="EASELboot"
5 o$(5)=""
6 o$(6)=""
7 o$(7)=""
8 o$(8)=""
9 o$(9)=""
1Ø o$(1Ø)=""
11 o$(11)=""
12 o$(12)=""
13 o$(13)=""
14 o$(14)=""
15 o$(15)=""
16 o$(16)=""
17 o$(17)=""
18 o$(18)=""
19 o$(19)=""
2Ø o$(2Ø)=""
21 o$(21)=""
22 o$(22)=""
23 o$(23)=""
24 o$(24)=""
25 o$(25)=""
26 o$(26)=""
27 o$(27)=""
28 o$(28)=""
29 o$(29)=""
3Ø o$(3Ø)=""
31 o$(31)=""
32 o$(32)=""
33 o$(33)=""
34 o$(34)=""
35 o$(35)=""
36 o$(36)=""
5Ø FOR j=1 TO 36
6Ø AT j-1-18*(j>18),2Ø*(j>18):PRINT CHR$
 (j+47+39*(j>1Ø));"=";o$(j)
7Ø END FOR j
8Ø PRINT #Ø;" Key: A-Z for other menus
  Ø-9 or a-z to LOAD file"\" £ to set:"
9Ø slc=CODE (INKEY$): AT #Ø;1,12: PRINT
#Ø;DATE$;' ';DAY$: IF slc=Ø THEN GO TO 9
Ø
1ØØ IF slc > 64 AND slc < 91 THEN :
11Ø    IF slc = 65 THEN LRUN "flp" & mdr
v$ & "_" & "BOOT"
12Ø    LRUN "flp" & mdrv$ & "_" & CHR$(s
lc) & "BOOT"
13Ø    END IF
14Ø END IF
15Ø CLS #Ø
16Ø IF slc=96 THEN setdate: GO TO 8Ø
17Ø slc=slc-47-39*(slc>57)
18Ø IF slc < Ø OR slc > 36 THEN GO TO 5Ø
19Ø IF o$(slc)="" THEN GO TO 5Ø
2ØØ ld$="flp" & mdrv$ & "_" & o$(slc): L
RUN ld$
21Ø DEFine PROCedure setdate
22Ø INPUT #Ø;'Year: ';yr;' Mo: ';mo;' Da
y: ';da;' Hour: ';hr;' Min: ';mn;' Sec:
';sc
23Ø SDATE yr,mo,da,hr,mn,sc
24Ø CLS #Ø
25Ø END DEFine setdate
```

CABLE COLUMN

By Bill Cable

ARCHIVE SERIES
PART 10 : IF and ALL and MODE COMMANDS

The next two ARCHIVE commands to be introduced are the IF command and ALL command. Both have beginning and ending statements like the WHILE command discussed last time. We will also mention the MODE command to illustrate useful control of the display screen.

We are working from the ARCHIVE command prompt (>), still hoping to attract more neophytes before we tackle formal ARCHIVE programming. We are doing complex tasks by putting more than one command on a "line". The colon (:) is used to separate commands as we type them in and then <ENTER> is pressed to execute the "line". I call this Command Prompt Programming. They are simpler than real programs created with the ARCHIVE program editor that can be saved and loaded but powerful enough to be very useful

PREPARATION

In the description below I will "*italic*" what you should type in to participate in the examples. The "line" to type in may span several column lines. You must type everything as one line up to the <ENTER> and then press the ENTER key. On your screen it may or may not wrap around to span more than one screen line. Take special care to spot where spaces are. Putting in extra spaces usually will not cause problems but leaving a space out will most likely result in an error. If you do get an error after pressing <ENTER>, press the <F5> key to recall the line and look it over carefully for mistakes. Correct mistakes with the normal QL editing keys.

We will use the LOOK command on the GAZET_DBF database supplied with ARCHIVE. Make sure you use a copy and not your original. Start ARCHIVE (DATABASE) and access GAZET as shown below :

look "{}gazet"<ENTER>	{}=device,mdv1_,flp1_, etc
print count()<ENTER>	see how many countries
display<ENTER>	display current record
order pop;a<ENTER>	order by population

MODE COMMAND

The MODE command allows for setting the screen display with specific partitions or as one large shared area. Initially you see the screen with 3 areas : Control, Display, and Work. Pressing the <F2> key will toggle the Control area in and out. The Control area is that area at the top which names the commands and provides information. The Display area is in the middle and is where output is displayed. The Work area is where the ARCHIVE prompt (>) waits for your input. By using the MODE command we can join the Display and Work areas or have them separate. Try the following and note where the ARCHIVE prompt (>) is :

<F2>	*No Control area*
<F2>	*Control area*
MODE 0<enter>	*Display & Work joined*
<F2>	*No Control area*
<F2>	*Control area*
MODE 1<enter>	*Display and Work apart*
<F2>	*No Control area*

You see that there are lots of possible ways to set up the screen. We have left ourselves in MODE 1 so the Work and Display areas are separate and the Control area is removed. When running ARCHIVE programs we would use MODE 0 since the Work area is not used so we don't need to reserve space for it. For command Prompt Programs as we will be using now, it is a little less confusing if we keep the Work and Display areas separate so we use MODE 1. You can always get the Control area back by pressing the <F2> key to the ARCHIVE prompt. This is all you will every have to know about the mode command unless you use a TV for a monitor.

IF COMMAND

The IF command is a 2-part or optionally 3-part command. It has a starting statement of the form :

if {numerical expression}

Which can be followed by ARCHIVE commands. Then optionally there can be a statement of the form:

else

Which can be followed by more ARCHIVE commands. Then there must be an ending statement of the form :

endif

So it is a conditional branching statement allowing us to control the flow of statement execution based on the value of a numerical expression. Statements after the "if" and before an "else" or the "endif" will only be executed if the numerical expression directly following the "if" is true (nonzero). If there is an "else" as part of an IF command, the statements between the "else" and "endif" will only be executed if the numerical expression is false (zero).

Here is a simple command prompt program which shows how the IF command works :

```
let x=0:if x:print "True":else:print "Fals
se":endif<ENTER>
```

Note that the numerical statement after the "if" is simply the variable x. Because x was set to zero (false) the statement **print "False"** after the **else** statement is executed and we see the word **False** printed on our upper screen. Now press the <F5> key to recall the statement. Alter "x=0" to be "x=1" using the editing keys. It should now appear as follows:

```
let x=1:if x:print "True":else:print "Fals
se":endif
```

Now press <ENTER>. Since the variable x is now true (nonzero), the **print "True"** after the **if x** is executed and

we see the word **True** printed on the upper screen.

Now for a more complex example using the WHILE command introduced last time. Remember we have accessed the GAZET database. We will use the eof() function which remains true unless we try to move past the last record of the database with the NEXT command. We will print out all sparsely populated countries (few people per area) using the ratio of the pop field with the area field in our numerical expression to branch on.

```
first:while not eof():if pop/area<.01:prin
t country$;tab 20;pop;tab 30;area;tab 40;po
p/area:endif:next:endwhile<ENTER>
```

Notice that the order of the countries printed is by increasing population which makes sense because we have ordered by the pop field and started at the FIRST record and used the NEXT statement to move sequentially through them. Press <F5> to recall the line and we will alter it slightly to move from last to first. It is a little more complicated because there is no function like eof() to test if we try to move past the first record. In this example recnum() is a function which returns the record number of the current record (they go from count()-1 to 0). We use it to sense when we reach the first record (recnum()=0) and can stop our WHILE loop.

```
last:let x=recnum():while x:let x=recnum()
:if pop/area<.01:print country$;tab 20;pop
;tab 30;area;tab 40;pop/area:endif:back:end
while<ENTER>
```

Now notice the countries are printed out in reverse order of last time because we started at the last and worked our way towards the front.

You can use logical "and" and "or" and "not" within the numerical expression of the IF command. So lets look at only large sparsely populated countries. Press <F5> to recall the last command prompt program and alter to be like the previous one and add a little more in the numerical expression so it appears as:

```
first:while not eof():if pop/area<.01 and
area>1000:print country$;tab 20;pop;tab 30;
area;tab 40;po p/area:endif:next:endwhile
```

Now press <ENTER>. Notice that all the small area countries have been eliminated by the **and area>1000** added after the **pop/area>.01**. It never hurts to use parentheses in the numerical expression to add clarity so :

pop/area<.01 and area>1000

can more clearly be read as :

(pop/area<.01) and (area>1000)

You can also nest the IF statements within one another but you must always have an "endif" for each "if". Those familiar with SuperBASIC know that you can be sloppy and not match each "if" with an "endif". SuperBASIC will implicitly assume you meant to put an "endif" at the end of the line. ARCHIVE requires you to be conscientious and if you leave out "endif"s or "endwhile"s or "endall"s you will get an error. Press <F5> to recall the last command prompt program and alter it so it has the following nested if so our listing is organized by continent :

```
order continent$;a:let c$="":first:while n
ot eof():if pop/area<.01 :if c$<>continent$
:let c$=continent$:print:print c$:endif:pri
nt tab 2;country$;tab 20;pop;tab 30;area;ta
b 40;pop/area:endif:next:endwhile<ENTER>
```

ALL COMMAND

The ALL command is a 2-part looping command.
It has a starting statement of the form :

all

Later there must be an ending statement of the form :

endall

Statements between the "all" and "endall" will be executed once for all records currently selected. If an error occurs within the loop execution will be stopped. Pressing the escape key, <ESC>, will also halt the loop but if any other key is pressed before <ESC> it will block the <ESC> from halting the loop. This means that if you start an "all" loop you may not be able get control of the program again until it has finished. On databases with lots of records it can take considerable time for an "all" loop to finish.

So an ALL loop works much like the loops done above using the WHILE and NEXT commands to step through the records. The coding is even simpler:

```
order pop;a<ENTER>
all:if pop/area<.01:print country$;tab 20
;pop;tab 30;area;tab 40;pop/area:endif:end
all<ENTER>
```

Although the database is ordered by the **pop** field, notice that wasn't the order they came out in. Unlike the looping using NEXT or BACK with a WHILE command that works sequentially through a database off the currently defined order, the ALL command has no user predictable order as it works its way through all the records. Because of this, never ALTER, INSERT, DELETE, OR APPEND within an ALL loop, use the WHILE loop instead. The ALL loop is faster and easier to use than the WHILE loop. That makes it handy for quickly looking through a database:

```
all:print country$:endall<ENTER>
```

Combining the ALL command with the IF command can make fast inspections possible:

```
all:if continent$="AFRICA" or continent$=
"ASIA":print country$:endif:endall<ENTER>

all:if not (continent$="AFRICA"):print cou
ntry$:endif:endall<ENTER>
```

```
close<ENTER>
```

Always close files when done

Next time we will look at the PRINT and LPRINT commands and at useful ARCHIVE functions.

Until Next time Happy Archiving!

Adding RGB to Your 2068

Crisp, Beautiful Color Economically

RGB on the 2068 is probably one of the most gratifying additions you can get. The problem is that there is no simple way to do it and few companies (if any) have any to sell. E. Arthur Brown did have one they were selling for $19.95 which installed inside the machine, stripped the sync from the video, and provided for RGB connections. The Timex Technical Manual also shows a way to add RGB by building a three transistor circuit to strip sync from the video for RGB operation.

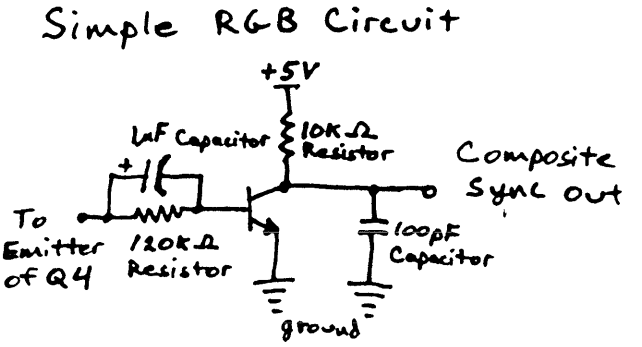
The problem with stripping the sync from the video is that you don't always get a clean sync signal. Some of the video gets into the sync and causes tearing of the video. Performance also changes if you have something plugged into the video out jack of the computer, loading down the circuit.

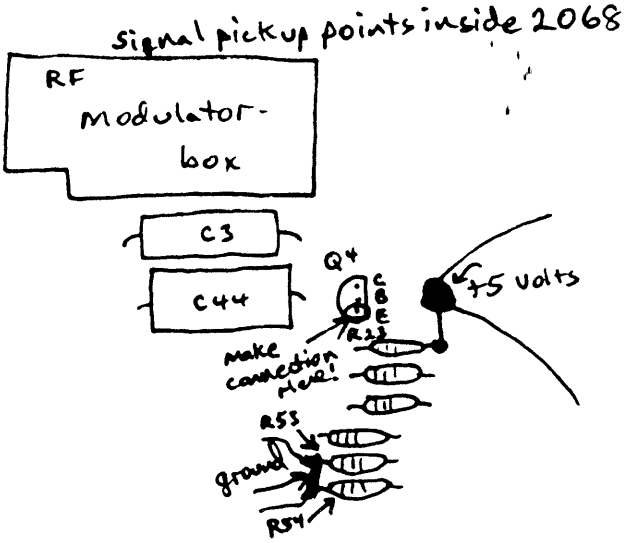
The best way is to get the sync at the source before any video is added - like the TC 2068 does (or did?). Inverted low level sync can be found on the emitter of transistor Q4 in the video circuit. All that is needed is to invert and amplify the sync to a peak to peak voltage of 5 volts which can be accomplished by a simple one transistor circuit.

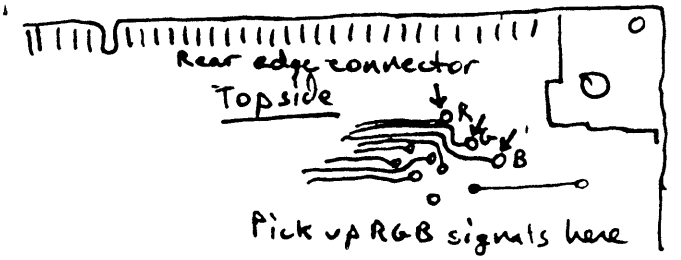
WARNING: You must be very careful while going inside your computer to do any type of work to it. Be sure and disconnect the power before going inside. This is not recommended for a first time project.

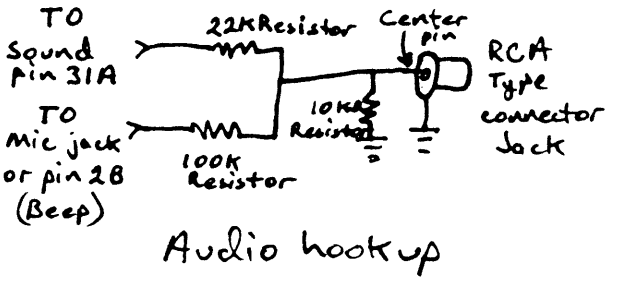
This circuit will provide the type of sync that most RGB monitors require such as the Sears 14 inch RGB monitor, the Magnavox (NAP) model 40 and model 80 RGB monitors, or any monitor that accepts negative-going composite (or horizontal) sync.

The RGB signals are available on the rear edge connector at B27, B28, & B29, and ground at B32. For internal connections, see diagrams. Because the circuit is so simple, they can be mounted freestyle on the printed circuit board. Just take care that they stay close to the board to prevent accidental shorting against the top cover or other components.





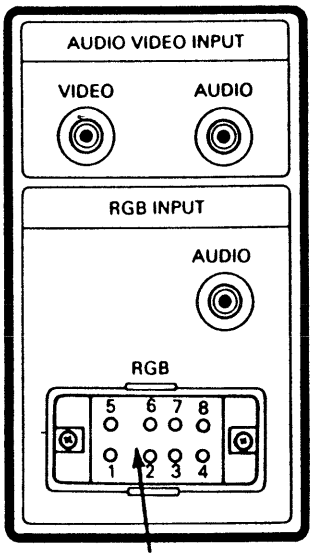




To keep this compatible with other Sinclair computers such as the QL and the Spectrum 128 which both have built-in RGB interfaces, an eight-pin "DIN" plug and socket should be used with connections as shown. The eight-pin "DIN" socket can be easily mounted on the rear plastic casing by notching the top and bottom case with wire clippers till the cases will fit back together with the connector between the two.

Shown are three cables, one for the Sears RGB/TV monitor combo, one for the Magnavox, and one for using the QL with a monochrome monitor. All the plugs and sockets should be numbered. Follow the diagram and wire the ends of the cable so that they match up to each other. On the Magnavox cable, you need to mark the ends so that they are not reversed (both ends will have an eight-pin "DIN" plug on it.

An audio jack can also be mounted and connected as shown in the diagram for SOUND and BEEP to be heard through the monitor's audio amp if available.

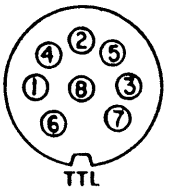


Sears RGB Cable

8pin DIN	Signal	Sears Connector
2	Ground	5+6
4	Comp. Sync	7
6	G	3
7	R	2
8	B	4

PIN ASSIGNMENTS

PIN NO.	TTL INPUT 8 PIN SIGNAL
1	IBM Open/Apple Gnd.
2	Red
3	Green
4	Blue
5	Intensity
6	Ground
7	Horiz. Sync
8	Vert. Sync



TTL INPUT

Magnavox RGB Cable

8pin DIN computer	Signal	8pin DIN Monitor
2	Ground	6
4	Comp. Sync	7
7	R	2
6	G	3
8	B	4

QL Monochrome Monitor Connection

8pin Din	Signal	RCA-Type Plug
3	video	center pin
2	ground	outside (shield)

Keep all leads as short as possible, use a shielded cable to the monitor - particularly if you make it very long. Once you have everything hooked up, turn on the computer. It should come up with a white screen and no rolling. Try BORDER with all the colors to make sure they are wired in the right order. If you got everything right, you can now enter the new world of sharp, brilliant displays, and less eye strain!

We had quite a few inquiries as to where to purchase the Magnavox (NAP) RGB Monitors as mentioned in the December issue. They can be found at Service Merchandise which is a chain of catalog showrooms throughout the US. For the

location of the one nearest you or to order a monitor over the phone, dial toll-free 1-800-726-4636. We have also learned that Best Products Co. Inc. also carries them at 1-800-221-BEST. They both have had the model 40 on sale for $199.95.

Service Merchandise also now has a higher resolution RGB monitor called the Magnavox RGB 80 for $277. The Magnavox 40 works quite well with the 2068 with OS-64 though. They also have a nice Amber monitor for $99 which also works well with OS-64.

-- Joe Williamson

pin	function	signal
1	PAL	composite PAL
2	GND	ground
3	VIDEO	composite monocrhome video
4	CSYNC	composite sync
5	VSYNC	vertical sync
6	GREEN	green
7	RED	red
8	BLUE	blue

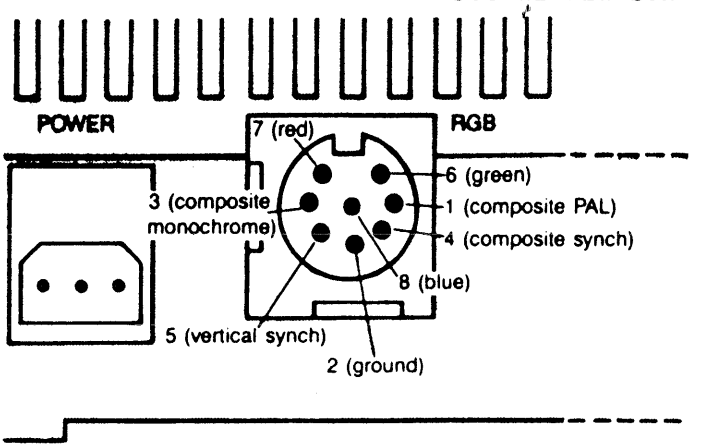


Diagram of Monitor Connector as Viewed from rear of QL Showing pin numbers and functions

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How to Convert a Surplus WC2050 Modem into an RS-232 SERIAL INTERFACE for your TS1000/1500/2068

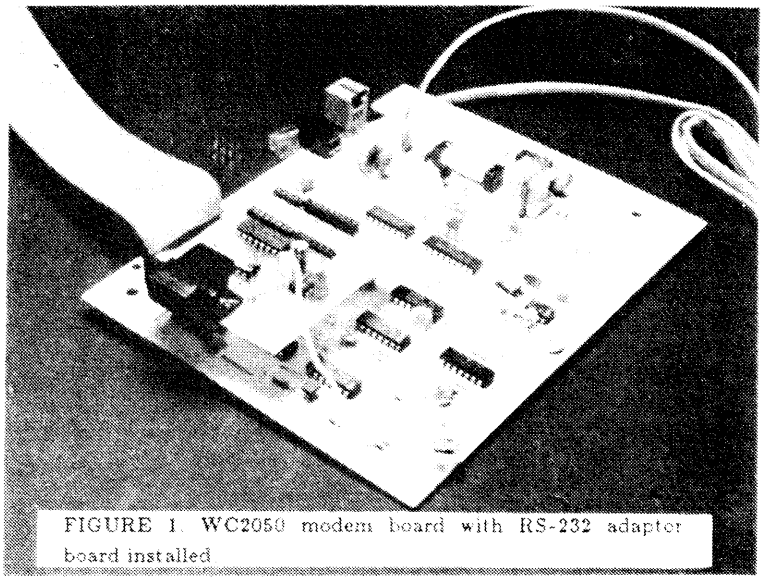


FIGURE 1. WC2050 modem board with RS-232 adaptor board installed

INTRODUCTION

The purpose of this article is to show you how, with the addition of a few inexpensive components, you can convert a WC2050 modem board into a general purpose RS232 serial interface.

In October of last year, Anchor Automation auctioned off several thousand completely assembled WC2050 Modem boards as electronic surplus. Fortunately for Timex users, these boards were discovered by Timex support companies like Zebra Systems, Clifford Associates, Sunset Electronics, and RMG, and are being resold to Timex users at bargain basement prices.

BLOCK DIAGRAM

Now take a look at Figure 2. It shows a block diagram of the modem board. The address decoding, crystal oscillator, frequency divider and 8251 serial I/O, and power supply portions provide nearly all we need for an RS232 interface. As a complete modem, the input and output serial data available at the points marked A and B, would be connected to the modem's analog circuitry and translated between tone frequencies and voltage levels. For an RS-232 interface we need to redirect these signals to DC voltage level translators.

RS-232 PARTS

Next take a look at Figure 3. It shows a schematic of the recommended RS-232 adaptor circuit. The parts list is contained in Figure 4. Notice that there are only three IC's. A MC1889 Line Receiver is used to buffer the incoming signals; a MC1888 Line Driver is used to buffer the outgoing signals; and an Intersil ICL7662 switching regulator is used to develop the required negative supply voltage from the modem's +9 Volt supply. An alternative to using the switching regulator would be to just use a second 9 VDC A/C adaptor. In our prototype we used a 9-Pin Male Atari Joystick style connector for our RS232 output, but you can directly wire in a cable or another choice of connector.

INSTALLATION PROCEDURE

Before installing the RS-232 adaptor board, be sure you have a working modem board in front of you. It is not important that the modem's analog section be working as long as the digital portion of the board is working. Of course if the entire modem does work, the digital portion will work.

Build up the circuit shown in figure 3. The parts are easy to find except for the Intersil regulator (see below). An optional etched and drilled PC board is available to simplify building the circuit, but any small protocard such as the ones available from radio shack will do fine.

CONSTRUCTION HINTS

The RS-232 adaptor board requires 9 signals from the modem board:

OUTPUT SIGNALS: RTS , TX, DTR
INPUT SIGNALS: RX, CTS, DSR
POWER SIGNALS: GROUND, +5 Volts, +9 Volts

Eight of these signals are available at the pins of the 8251 serial I/O chip. The only signal not present on the chip is the +9 volt power, which can be picked up on one side of the modem's DATA Light Emitting Diode (LED). Our prototype board (shown in Figure 1), takes advantage of this and uses a pin-and-socket arrangement to make the 8 connections at the IC. First a 28-pin IC socket is soldered right on top of the 8251. Then pins are soldered onto the RS-232 PC Board so that the board can plug in, right on top of the IC. The ninth signal required is made by attaching a single wire between the RS-232 board and the +9 Volt power were the LED is. The positive side of this LED is the lead closest to the corner of the modem board.

TRACE CUTS

You must make three trace cuts on the modem PC board. This is to disconnect the three modem input-signals that go from the modem's analog section to the 8251 chip. These signals are replaced with those coming from your RS-232 adaptor board. The traces to cut are shown in Figure 5.

SOFTWARE & TESTING

If you just want to test out your RS-232 by itself you can do a simple wrap around test by temporarily connecting CTS to RTS, and TX to RX. A sample TS2068 software driver for the modem is shown in figure 6. Under this test arangement, whatever you send out will be wrapped around and received back.

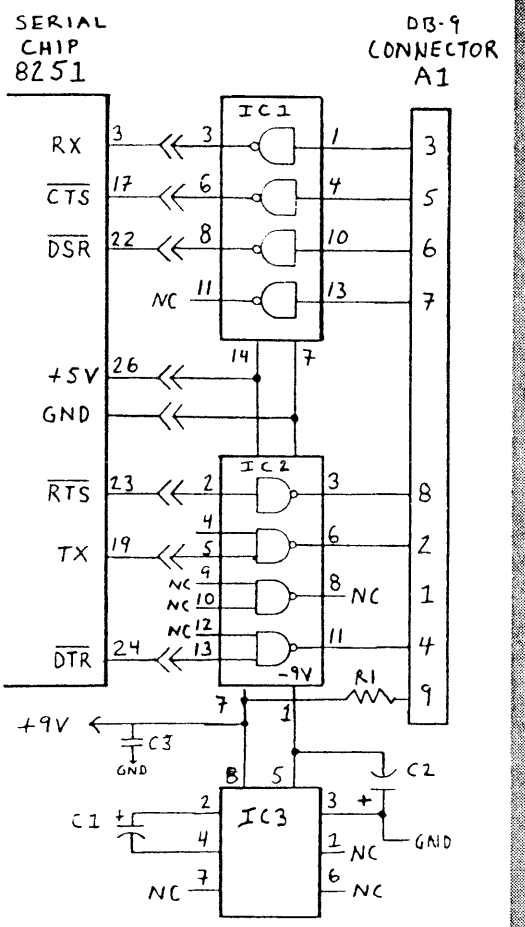


FIGURE 3. RS-232 ADAPTOR SCHEMATIC

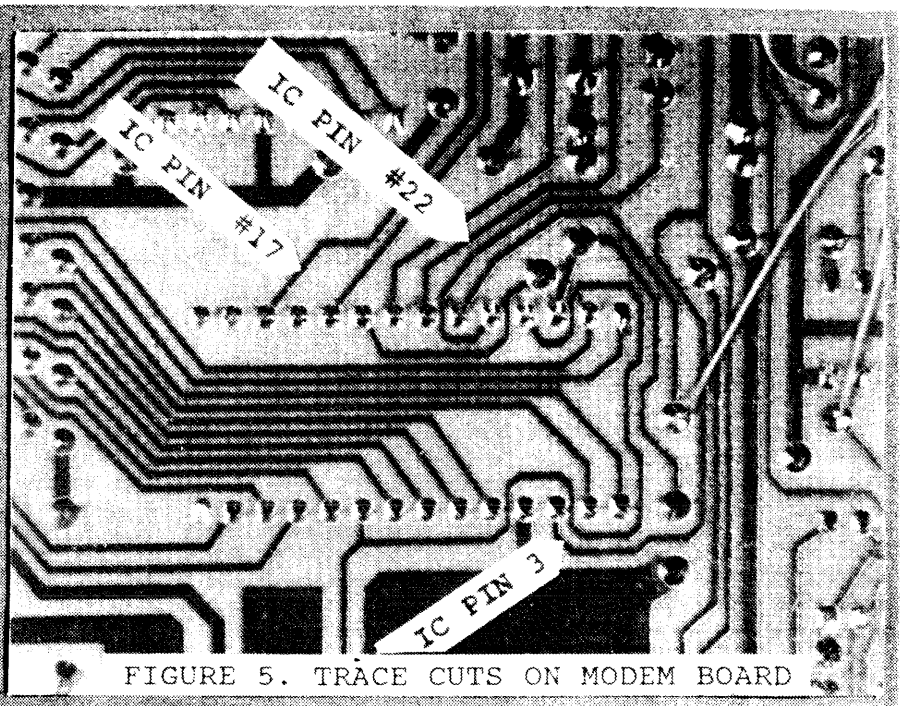


FIGURE 5. TRACE CUTS ON MODEM BOARD

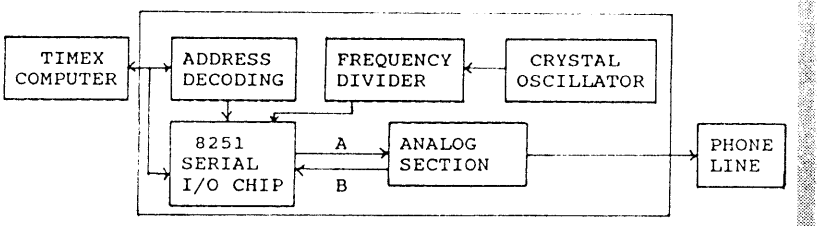


FIGURE 2. MODEM BLOCK DIAGRAM

FIGURE 4. WC2050-TO-RS232 PARTS LIST

IC1	MC1489 QUAD LINE RECEIVER
IC2	MC1488 QUAD LINE DRIVER
J1,J2	WIRE JUMPERS, 0.3 INCH
J3	WIRE JUMPER, 4.5 INCH
A1	CONNECTOR, DB-9 MALE "JOYSTICK TYPE"
A2	DUAL ROW WIRE-WRAP HEADER PINS
R1	RESISTOR, 1K 1/4W
PC89-C	PRINTED CIRCUIT BOARD
C3	0.1UF 25V CER. DISC. (SUPPLY BYPASS)
----------	POWER SECTION - VERSION ONE----------
IC3	INTERSIL ICL7662 POWER CONVERTER IC
C1	10UF 16V ALUM. ELECTROLYTIC (CHARGE PUMP)
C2	10UF 16V ALUM. ELECTROLYTIC (OUTPUT)
----------	POWER SECTION - VERSION TWO ----------
A3	2.5MM OR 3.5MM JACK (NEGATIVE POWER)
X1	AC POWER ADAPTOR

FIGURE 6. Sample TS2068 BASIC driver for wrap-around test at 1200 BAUD. Change 78 in line 14 to 79 for 300 baud.

```
  10 OUT 119,0: REM send Zero to
                   clear UART chip
  11 OUT 119,0
  12 OUT 119,0
  13 OUT 119,64: REM UART reset
  14 OUT 119,78: REM 1200b,8 bit
                   NO parity
  15 OUT 119,55: REM Enable xmit
                   and Receive
  20 REM Each byte sent OUT 115
     will arive on the Transmit
     line of the RS-232 port.
  25 REM Example:
  30 PRINT "This is a test."
  40 LPRINT "This is a test."
  50 LET a$="This is a test.": G
O SUB 1000
  60 PRINT "End of TEST."
  70 LPRINT "End of TEST."
  80 LET a$="End of TEST.": GO S
UB 1000
  90 STOP
1000 LET i=LEN a$: IF i=0 THEN G
O TO 1050
1010 FOR x=1 TO i
1020 OUT 115,CODE a$(x): PAUSE 4
1030 PRINT CHR$ IN 115;
1040 NEXT x
1050 RETURN
```

```
  1 LOAD /"J$T" DATA j$()
 110 CLS : PRINT "  THIS PROGRAM ESTABLISHES THE        EPSON CLA
SS INTERFACE      ",,"  Please select which physical   interface
 you have.","""
 111 PRINT ,,"    1  TASMAN Type A (USA Type B)"''"    2  TASMAN T
ype B (USA Type C)"''"    3  AERCO/OLIGER"''"    4  A & J"''"    5
 OTHER"
 112 INPUT "Which? ";Intf:  IF Intf>5 OR Intf<1 THEN  GO TO 111
 113 GO SUB 120+Intf
 114 PRINT AT 3,0;"        PRINTER ADDRESSES      ",,,," Data Port:
       c1 = ";c1," Data Cmd Port:  c2 = ";c2," Status Port:
 c3 = ";c3,"  BUSY bit val:   c5 = ";c5," Control Port:    c7 =
";c7,"  STROBE Bit val: c6 = ";c6,"  RESET Bit val:  c8 = ";c8,"
 Control Cmd Port c4 = ";c4''
 115 PRINT "  Cmd ports apply to Z80 PIO.","Set to 0 if not used
."''"  Input new values as required  and GO TO 114, else CONTINU
E.": STOP
 116 PRINT AT 21,2;" CREATING PRINTER INTERFACE ": GO TO 140
 120 REM  PIO#2
 121 PRINT AT 0,0,,,,AT 1,6;" TASMAN Type A ": LET c1=123: LET c
2=0: LET c3=191: LET c4=0: LET c5=1: LET c6=8: LET c7=251: LET c
8=255-c6: RETURN
 122 PRINT AT 0,0,,,,AT 1,6;" TASMAN Type B ": LET c1=123: LET c
2=0: LET c3=251: LET c4=0: LET c5=1: LET c6=8: LET c7=251: LET c
8=255-c6: RETURN
 123 PRINT AT 0,0,,,,AT 1,6;" AERCO ": LET c1=127: LET c2=0: LET
 c3=127: LET c4=0: LET c5=16: LET c6=0: LET c7=0: LET c8=0: RETU
RN
 124 PRINT AT 0,0,,,,AT 1,6;" A & J ": LET c1=66: LET c2=0: LET
c3=65: LET c4=0: LET c5=4: LET c6=4: LET c7=65: LET c8=0: RETURN

 125 PRINT AT 0,0,,,,AT 1,6;" GENERAL CASE ": LET c1=130: LET c2
=131: LET c3=128: LET c4=129: LET c5=16: LET c6=64: LET c7=128:
LET c8=0: RETURN
 130 DATA 8,219,c3,230,c5,32,16,243,8,211,c1,62,((255-c6) AND In
tf<>4)+(c6 AND Intf=4),211+(8 AND Intf=3),(c7 AND Intf<>3)+(c3 A
ND Intf=3),62,255 AND Intf<>4,211,c7,0,0,251,201,205,9,32,56,-27
,207,12: REM PIO#2
 131 DATA 245,62,255-c6-c8,211,c7,62,255,211,c1 AND intf<>3,211,
c7,241,201: REM INIT.printer
 132 DATA 207,18,0,0,24,111: REM JUMP entries
 133 DATA 245,175,61,211,c2,60,211,c2,61,211,c4,62,255-c6-c8,211
,c4,62,7,211,c2,211,c4,24,-41: REM INIT.intfc
 134 DATA 197,123,135,135,135,79,123,31,31,230,56,130,205,9,38,1
93,203,105,200,203,236,201
 135 DATA 203,97,245,33,154,92,121,230,12,71,229,205,FN b(1,72),
FN b(0,72),126,225,119,203,89,32,2,35,119,35,20,16,-17,6,8,197,3
3,154,92,6,8,126,7,119,121,143,79,35,16,-9,193,203,113,245,205,F
N b(1,0),FN b(0,0),241,196,FN b(1,0),FN b(0,0),16,-28,203,169,24
1,200,203,233,175,24,-64
 136 DATA 17,0,0,1,8,22,197,33,FN b(1,226),FN b(0,226),205,FN b(
1,217),FN b(0,217),213,62,80,167,40,8,71,62,0,205,FN b(1,0),FN b
(0,0),16,-7
 137 DATA 6,32,197,213,205,FN b(1,94),FN b(0,94),209,193,28,16,-
10,209,121,230,12,130,87,33,FN b(1,235),FN b(0,235),205,FN b(1,2
17),FN b(0,217),193,16,-48
 138 DATA 33,FN b(1,239),FN b(0,239),70,35,126,205,FN b(1,0),FN
```

```
b(0,0),16,-7,201,8,27,51,24,27,42,5,80,1,2,0,10,13,2,27,50
 139 DEF FN b(b,o)=((ld0+o-256*INT ((ld0+o)/256)) AND b=1)+(INT
((ld0+o)/256) AND b=0)
 140 GO SUB 7771
 141 RESTORE 130: FOR j=LD0 TO LD0+241: READ Byt: POKE j,Byt: NE
XT j
 142 DIM U$(242): FOR j=1 TO 242: LET U$(j)=CHR$ PEEK (LD0+j-1):
 NEXT j
 143 GO SUB 7770
 144 PRINT AT 19,0;" Interface Module completed.": PAUSE 120
 160 CLS : PRINT AT 10,6; FLASH 1;" RECORDING PmodE "
 161 SAVE //"PmodE" DATA u$()
 165 LOAD /"CAD_BE": STOP
 300 DATA 197,123,135,135,135,79,123,31,31,230,56,130,205,9,38,1
93,203,105,200,203,236,201,0,0,0,0,0,0,0,0,0,0,0
 334 DATA 122,230,7,103,122,31,31,31,230,24,180,103,122,135,135,
230,224,131,111,124,48,2,198,8,246,64,103,203,105,200,203,236,20
1
 449 FOR n=1 TO 11: POKE (Ld0+CODE o$(n)),CODE j$(Select,n): NEX
T n
 450 RANDOMIZE USR (Ld0+CODE o$(12)): RETURN
 451 LET select=1: GO TO 449: REM dump
 452 LET select=2: GO TO 449: REM zoom dump
 453 LET select=3: GO TO 449: REM 64w@20,0
 454 LET select=4: GO TO 449: REM G1
 455 LET select=5: GO TO 449: REM G2
 456 LET select=6: GO TO 449: REM G3
 457 LET select=7: GO TO 449: REM 2h2w@20,0
 476 STOP
7769 REM INIT MOD & Z80 PIO
7770 GO SUB 7772: GO SUB 7771: FOR j=1 TO 242: POKE LD0+j-1,CODE
 U$(j): NEXT j: RANDOMIZE USR (LD0+49): LET Wa=PEEK 23631+256*PE
EK 23632: LET Wc=INT (LD0/256): POKE Wa+15,LD0-256*Wc: POKE Wa+1
6,Wc: RETURN
7771 LET LD0=26995: RETURN
7772 RESTORE 7773: DIM O$(13): FOR n=1 TO 13: READ i$: LET X=VAL
 I$: LET O$(n)=CHR$ X: NEXT n: RETURN
7773 DATA "161","162","164","165","175","188","235","229","232",
"233","234","45","49"
7776 REM WINDOW GENERATION
7777 LET W64=0: LET Pot=7778: LET Ww=576: LET Wg=5: LET Wm=54: L
ET Wide=513: LET Wdh=1: LET Wdw=1: LET Row=0: LET Lines=1: LET C
ol=0: LET Wcur=3: LET Wlc=0: LET Wmod=78
7778 GO SUB 7835: PAPER 7: BORDER 7: INK 0: CLS : PRINT '"   Par
ameter    Value "'" GRAPHIC MODE.. ";Wg'" INCH MARGIN... ";INT
(8000*Wm/Ww)/1000'" INCH WIDE..... ";INT (8000*Wide/Ww)/1000;" (
";INT (Wide/8/Wdw);" CHAR)"'" CHAR HEIGHT... ";Wdh'" CHAR WIDTH.
... ";Wdw
7779 PRINT " MAP at   ROW.. ";Row'"        COLUMN.. ";Col'" LINES
..... ";Lines,'" Display Screen map"'" Line Mode..... ";CHR$
 Wmod,
7780 GO SUB 7855
7781 LET wi=CODE INKEY$: IF Wi=0 THEN  GO TO 7781
7782 IF Wi=10 THEN  LET Wcur=Wcur+(1 AND Wcur<12)
7783 IF Wi=11 THEN  LET Wcur=Wcur-(1 AND Wcur>3)
7784 IF Wi=10 OR Wi=11 THEN  GO SUB 7854: GO TO 7781
7785 GO TO 7775+4*Wcur
7786 STOP : REM Safety stop
7787 INPUT "GRAPHIC MODE ? ";x: IF x<0 OR x>7 THEN  GO SUB 7830:
 LET x=Wg
```

```
7788 LET Wg=x: GO TO Pot
7791 INPUT "Inches MARGIN/DIVIDER? ";x: LET x=x*Ww/8: IF x<0 OR
x>255 THEN  GO SUB 7830: LET x=Wm
7792 LET Wm=x: GO TO Pot
7795 INPUT "LINE LENGTH in Char(0 if inches) ? ";x: IF NOT x THE
N  INPUT "Inches wide ? ";x: LET x=x*Ww/8: GO TO 7797
7796 LET x=x*8*Wdw
7797 IF x+Wm>Ww THEN  GO SUB 7833: LET x=Ww-Wm
7798 LET Wide=x: GO TO Pot
7799 INPUT "1 for normal height","2 for double height ? ";x: IF
x<1 OR x>2 THEN  GO SUB 7832: LET x=Wdh
7800 LET Wdh=INT x: GO TO Pot
7803 INPUT "1 for normal width","2 for double width ? ";x: IF x<
1 OR x>2 THEN  GO SUB 7832: LET x=Wdw
7804 LET Wdw=x: GO TO Pot
7807 INPUT "Screen map at ROW ? ";x: IF x<0 OR x>23 THEN  GO SUB
 7830: LET x=Row
7808 LET Row=x: GO TO Pot
7811 INPUT "Screen map at COLUMN ? ";x: IF x<0 OR x>31 THEN  GO
SUB 7830: LET x=Col
7812 LET Col=INT x: GO TO Pot
7815 INPUT " LOGICAL LINES ? ";x: IF x<1 OR x>24 THEN  GO SUB 78
30: LET x=Lines
7816 LET Lines=x: GO TO Pot
7819 BORDER 0: CLS : DIM a$(INT (Wide/8/Wdw)): PRINT AT Row,0;:
FOR n=1 TO Lines: PRINT TAB Col; PAPER 6-n+3*INT (n/3);a$': NEXT
 n
7820 GO SUB 7860: PAUSE 0
7821 REM Allow for stacking segments
7822 GO TO Pot
7823 CLS : PRINT "      LINE MODE SELECTION"''" N = Normal full
line"''''"      CONCATENATED LINES"''" L = Left end (Start)"'" M
= Middle"'" R = Right end (New line)"''" Lower case letters sign
ify thathalf a logical line is to be    printed."
7824 PRINT " The upper half is printed by   default."'" To selec
t the lower half,"'"      ADD .5 TO ROW."''"      PRESS ANY KEY
": PAUSE 0
7825 CLS : PRINT '" This allows you to intermix    normal and d
ouble high copy any-where on the page, saving havingto do it on
the screen."''" If not intermixed, a logical   line is printed,
whether single or double high.  The latter doestwo passes automa
tically."
7826 PRINT '" The simplest way to include    normal printer text
 is to allow blank space for it in your gra- phic run, and repos
ition the    page before overprinting with   printer characters.
"'" See your manual for this, and  other ways to combine text an
d  graphics."
7827 INPUT "Line MODE ? ";i$;: IF NOT (i$="N" OR I$="L" OR i$="M
" OR i$="R" OR i$="n" OR i$="l" OR i$="m" OR i$="r") THEN  GO SU
B 7830: LET i$=CHR$ Wmod
7828 LET Wmod=CODE i$
7829 GO TO Pot: REM Safety stop
7830 PRINT #1;"INVALID PARAMETER": PAUSE 120: RETURN
7831 PRINT #1;"OFF BOTTOM OF SCREEN": PAUSE 120: RETURN
7832 PRINT #1;"MUST BE EITHER 1 OR 2": PAUSE 120: RETURN
7833 PRINT #1;"LINE TOO LONG. SHORTENED TO FIT",: PAUSE 120: RET
URN
7834 DATA "480","960","960*","1920*","640","576L","720"
7835 RESTORE 7834: FOR n=1 TO Wg+1: READ i$: NEXT n: LET Ww=VAL
i$( TO 3): PRINT AT 3,21;"(";i$;" DOTS)": RETURN
```

```
7854 PRINT AT Wlc,0;" ";AT Wcur,0;">": LET Wlc=Wcur: RETURN
7855 GO SUB 7854: GO SUB 7835: LET W0=8: LET W1=INT (239*Wm/Ww)+
W0: LET W2=INT (239*Wide/Ww)-1: PLOT 0,40: DRAW 0,27: DRAW 255,0
: DRAW 0,-27: FOR k=0 TO 8: PLOT k*239/8+W0,64: DRAW 0,2: NEXT k
: FOR k=Wm TO Ww STEP 80+(80 AND Wdw=2): PLOT (k-1)*239/Ww+W0,59
: DRAW 0,-2: NEXT k
7856 LET W=(W0+W1+W2)>254: FOR k=56-8*Wdh TO 55: PLOT W0,k: PLOT
  INK 4;W1,k: DRAW  INK 4-(2 AND W);(W2 AND NOT W)+(6 AND W),0:
NEXT k: RETURN
7860 REM LINE PARAMETER CALCS
7861 LET x=CHR$ Wmod>"Z": LET k=Wmod-(32 AND x): LET W2=INT (Wid
e/8)
7862 LET W1=wm+8*(W2*wdw*(w64+1)): LET msb=INT (W1/256): LET lsb
=W1-256*msb
7863 IF Wmod=78 THEN  PRINT  PAPER 8;AT 3,0;col;" ";row*8;" ";8-
(4 AND wdh=2)+(64 AND wdw)+(16 AND w64=2);" ";lines*wdh;" ";wm;"
 ";W2;" ";2;" ";24;" ";wg;" ";lsb;" ";msb
7864 IF (Wmod=76 OR Wmod=77) THEN  PRINT  PAPER 8;AT 3,0;col;" "
;row*8;" ";8-(4 AND wdh=2)+(64 AND wdw)+(16 AND w64);" ";lines*w
dh;" ";wm;" ";W2;" ";1;" ";0;" ";wg;" ";lsb;" ";msb
7865 IF Wmod=82 THEN  PRINT  PAPER 8;AT 3,0;col;" ";row*8;" ";8-
(4 AND wdh=2)+(64 AND wdw)+(16 AND w64);" ";lines*wdh;" ";wm;" "
;W2;" ";2;" ";24;" ";wg;" ";lsb;" ";msb
7866 PRINT '' PAPER 8;"       PRESS ANY KEY": RETURN
7878 STOP : GO TO POT
9990 POKE 26876,167
9991 INPUT "Date? ";i$: LPRINT "LN";CHR$ 6;: LPRINT #5'"INTFC_BE
 Listing,Oliger/EPSON. ";I$'': LLIST #5: LPRINT "LO";CHR$ 12;: S
TOP
9999 SAVE //"INTFC_BE" LINE 1
```

WITH THIS WE COMPLETE ALL WE WILL BE PRINTING CONCERNING THE CAD SERIES OF PROGRAMS BY BILL PEDERSEN. WE HAVE GIVEN YOU, SO FAR, THE VERSION FOR LARKEN WITH OLIVETTI INKJET PRINTER, AND NOW THE OLIGER WITH THE EPSON/IBM COMPATIBLES. WE ALSO HAVE THE LARKEN WITH EPSON/IBM COMPATIBLE AND THE OLIGER WITH OLIVETTI PRINTER. SHOULD YOU NEED THE PRINTOUTS FROM EITHER OF THEM PLEASE SEND A LARGE SELF ADDRESSED ENVELOPE WITH TWO STAMPS ON IT (OR INTERNATIONAL REPLY COUPONS) AND $2.00 US AND WE WILL SEND YOU THE COMPLETE PRINTOUT. YOU MAY, OF COURSE, STILL BUY THE FULL PROGRAM ON DISK WITH MANUAL THROUGH OUR ISSUE DISK PROGRAM.

NOTE

WE HAD INTENDED, IN THIS ISSUE, TO GIVE YOU JIM BRETZ PAYROLL PROGRAM. THIS HAS BEEN DELAYED TILL NEXT ISSUE. THE ERROR WAS MINE AND TWO KITTENS, WHO CARRIED OFF THE PACKAGE (AND HID IT) THAT CONTAINED THE DISK WITH THE PROGRAM. YES, I HAD A BACKUP OF THE DISK...BUT (AND HERE I GET TO TEAR OUT MY LAST REMAINING HAIR) IT WAS IN THE SAME PACKAGE. I HAVE FOUND IT , BUT TOO LATE TO PRINT THIS ISSUE.

NEWS AND NEW PRODUCTS FOR YOUR QL by Eliad P. Wannum

During a recent trip over to the home of Frank Davis, and during a recent four week vacation which took me to Oregon, Toronto, Montreal and New York, I got the chance to try out several new software and hardware items for the QL. Never be afraid to try new products; it can be fun. Or that can be put as "Never regret yesterday, life is in you today and you make your own tomorrow!" In short, you may find a few dogs when you go looking for new items for your computer, but if you never look you will also never find the gems that may be out there. In New York I ran into an old friend who pretty much still only used the four PSION programs that came with the QL when he first purchased it. He had bought only three programs in the last four years. Two he had never learned how to use, the third had a bug in it, and he had never subscribed to any Sinclair periodical (I sold him some back issues of UPDATE, of which all are now available for $16.00 for any one year or $4.50 each otherwise from the UPDATE office, so get your collection completed before some issues are sold out), nor had he ever joined a Sinclair user group, despite having the LIST group nearby! He was afraid that if he spent a lot on his computer, which he uses almost daily to do sales reports, that he might waste money on a program that he could not learn to use! Talk about allowing fear to paralyze one! As a psychologist this was to me a challenge. I spent about 2 hours getting him honed in on the two programs he never learned to use, then fixed the bug he had in the other (a patch to get it to work with the JSU ROM), sold him a subscription to UPDATE and got him to join QUANTA. He is still considering the LIST group. I also told him to contact EMSoft and Mechanical Affinity to get newer software. Not bad for an afternoon visit to an old friend; and after all, what are friends for, right?

While at Franks I got to try out a new item, which while minor, can still be of great help to those of us who do some networking. It is a small box, with LEDs for placement between two or more networked QLs that informs us of when the network is in use and working. It worked just as advertised. It had no software to load, or complicated procedure, just plug it in to one of the networks and the cable into it and otherwise proceed as usual. I could only have wished for an auditory signal to let me know when it started and stopped operation on a network line. But that is just an additional bell and whistle and not really necessary. He was evaluating as to whether to add these to the catalog of Mechanical Affinity. On my advice he ordered some more and now has them available for $12.00, which as with all items they handle does include postage. If you do even a modest amount of networking, this can be handy. While for those new to it, you will find it easier to keep track of just what is going on between the various machines.

While in Oregon I tried to see Dick Wagner, but found him not home, so I went over to Ed Rourkes. He had written me that he had just got the new ROMSWITCH from QLEA in the U.K. I could not pass up the chance to see this and try it out (Frank told me that Bob Dyl of IQLR had been giving it a modicum of praise). The version that Ed has fits inside of the QL, but I hear there is also an external version that is a small box. What it consisted of was a small printed circuit board that fitted inside the QL. It has a small toggle switch that you mount on the case, with which you choose one of two possible ROMs to work with when you power up. Ed had his JSU ROMs and the MINERVA Mark 1 on his board. With this he could avoid any program he found to be having trouble with Minerva, and switch back to his JSU. I tried putting a Bent ROM

board from Mechanical Affinity on the board so I could use it's switch to select or de-select the extra 16K area I keep Lightning in and it worked. On the QLEA board is a bi-colored LED so you can see which system you have selected. Red is for the Minerva and green is for your normal QDOS operating system. There is a new version that I have heard about, but not seen and it is external. With this you can easily change ROMS without opening up your QL, and it will work with either the Mark 1 or the Mark 2 Minerva. This board is available from QLEA, c/o Chris Howard, 13 Oak Grove, Horsford, Norwich, Norfolk, U.K. NR103DR. If you want they can also provide the Minerva ROM. I believe the price is £25 for the kit and £50 with the Minerva. Postage to the USA is £2 and £4 respectively. They will take major credit cards. I am not sure of the price on the external board so you may want to write about this. Ah, yes, one more little item on this is that it fits in the left hand ROM slot, so if you are using the QIMI mouse interface, the right hand socket is free to do so. Of course if you are using the new Serial Mouse available from Jochen Merz or Mechanical Affinity then you need not worry about this. One last note on this, QLEA stands for QL East Anglica, a QUANTA sub-group, and this system is fully compatible with the Miracle Systems Gold Card.

What else is new, or I have not mentioned, yet that I have tried? I get so use to these things I start to take them for granted and assume that all of you have all of the newest items, but this is not so. My old CST disk interface on my QL always had four drives hooked up to it, but when I went to a Trump Card I found myself limited to two drives. Even when I went to the Gold Card I could only use three drives. Miracle Systems solved this with their 4 drive adaptor. This allows you to use four drives on your Trump Card or Gold Card. If you have earlier than a 1.28 ROM on your Trump Card it will need to be updated or replaced with the FLP/RAM Level 2 Eprom from Jochen Merz or Mechanical Affinity to get this little board to work. The price is about $42 with the updated eprom, and a total of $80 if you want it with the Level 2 operating system. The Level 2 Eprom will allow you to have directories and read them off of disks done on a Gold Card, as well as give you increased disk access speed for all disk related activities. Last, but not least, you can use the new ATR DEV and read/write as well as format IBM/ ATARI disks. With the Miracle eprom upgrade 1.37 you will get the directories and sub directories as well as an updated ToolKit 2 (both have this). If you are not going for a Gold Card, then the four drive adaptor and new eprom is the best thing you can do for your QL to modernize it. Just what do you need four drives for? How about if you want to run a BBS and do not have a hard drive, or perhaps you are heavily into desktop publishing and want all of those fonts and clip art available . I am sure you can dream up your own reason. It may even be that you like knowing you have all that power available. This is the sort of area where we get into personal preferences.

I seem to be running out of the space allotted to me and I have so much more I wanted to tell you about, such as the HERMES replacement chip for the 8049. I wanted to tell you about the new Gold Card version of PERFECTION (new QL word processor), and the new Gold Card version of PC Conqueror (uses HD drives, Extended Memory, and lets you use ED drives as mini hard drives) just to name a few. These are all done by Digital Precision and are now once again available in North America from Mechanical Affinity. Peter Hale is also offering some of these DP products if you are a member of his club. The list goes on from here, folks!

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ALL DISKS £2.00 EACH INCLUSIVE OF MEDIA AND P&P
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ADVENTURE GAMES DISK 1: includes Fantasia and Ye Classical Type Adventure.

ADVENTURE GAMES SOURCE CODE DISK 1: includes Fantasia, Haunted House etc.

ADVENTURE SOLUTION DISKS 1- 3: includes The Pawn and Mortville Manor, mainly ST though!

ADVENTURE SOLUTIONS DISK 4: QL specific

ADVENTURE UTILITIES DISK 1:includes Quill to SuperBasic converter and demo adventure.

AUSTRALIAN P.D. DISKS 1+ 2: include a wide variety of games, utilities etc.

BOOT PROGRAMS DISK 1: a small selection.

COMMUNICATIONS DISK 1: includes QBOX Bulletin Board system.

COMMUNICATIONS DISK 2: includes QL Kermit.

CONNECTIONS DISK 1: includes ST - QL and Spectrum - QL screen and file converters.

DEVICE UTILITIES DISK 1:includes many, formatting and Shell programs.

DEVICE UTILITIES DISK 2 includes arciving and compacting progs

DILWYN JONES DISK 1: includes many SuperBasic progs and Wordsearch.

DISK CATALOG DISK 1: Alan Pemberton's Disktidy program.

EDITORS DISK 2: QED and MicroEmacs runtime.

EDITORS DISK 3: MicroEMACS source code.

EDUCATIONAL PROGRAMS DISK 1: includes maths, music, and chemistry programs.

EMMANUEL VERBEECK DISK 1: includes screen save and print progs, and many more utilities.

EMULATORS DISK 1: Carlos Delhez's Spectrum and ZX81 emulators. (Need 256K+)

ENGLISH DICTIONARY DISKS 1 AND 2 : text files ported from the ST, with word meanings.

ESOTERICA DISK 1: includes D-I-Y Pyramid construction prog, Biorythms and psychology progs.

FONTS DISK 1: A few text 87 fonts - more wanted.

FRACTALS DISK 1: includes large numbers of mandelbrot and other fractal progs.

FRACTALS DISK 2: Carl Cronin's Mandelbrot prog plus animation screens.

FRACTALS DISK 3: Rainer Kowallick's mandelbrot prog as amended to give "Jewel" efffect.

FRACTALS DISK 4 : disk full of sample screens from QRactal by PROGS.

FRACTALS DISK 5 : Lyapunov Space generator plus 20 sample screens by Per-Erik Forssen.

GAMES DISK 1: includes Starburst, Cavern Frenzy. (Menu on Games Disks by Rich Mellor.)

GAMES DISK 2: includes many arcade type games.

GAMES DISK 3: includes QL War.

GAMES DISK 4: includes the demo version of Oddyssey by Neil Davidson (not Minerva compat!)

GERMAN - ENGLISH DICTIONARY DISK: a multi-tasking pop-up utility to translate from German to English.

GRAPHIX DEMOS DISK 1: Too many to list!

GRAPHIX DEMO DISK 2 :" Movioloa" (as TV Movie 2 but with extra commands.

GRAPHIX DEMO DISK 3 : the Brummie 'Elite' Demos - not Minerva compat.

GRAPHIX DEMO DISK 4 : includes the brilliant Double 3-D Wave animation.

GRAPHIX DEMO DISK 5: Franz Herrmann's Wirlworld (O.K. on Minerva now.)(needs 512K+)

GRAPHIX DEMO DISK 6 : Mark J. Swift's Prize winning "Turning Head" animation. (non-Minerva)

GRAPHIX DEMO DISK 7 : Mark J. Swift's "Turning Head" done for Minerva.

GRAPHIX SCREENS (GIF FORMAT) DISKS 1,2,3: Misc screens with GIF viewer prog.

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GRAPHIX SCREENS (PCX FORMAT) DISK 1: Comes with screens and viewer prog. (Not Minerva compatible.)

GRAPHIX SCREENS (QL) DISK 1 : Misc screens

GRAPHIX SCREENS (QL) DISK 2: J.R. Haldane's clip art and other screens.

GRAPHIX SCREENS (QL) DISK 3: Roland Kaiser's disk of clip art plus 4 SuperBasic progs.

GRAPHIX SCREENS (SPECTRUM) DISK 1: Andy Dean's converter prog and sample screens.

GRAPHIX SCREENS (ST) DISKS 1,2,3,4,5,6,7,8: Misc screens ported from the ST mainly by muggins.

GRAPHICS/ SCREEN UTILITIES DISK 1: includes sprite designer, CAD and windows progs.

HAM RADIO DISK 1: includes PC conversions.

HARDWARE INFO DISK 1: includes info on Quest Disk i/face and SuperQBoards. More welcome!

INDEXES DISK 1: includes QL World and QUANTA indexes by Chris Adams.

JIMMIE ROBB DISK 1: Several useful progs, esp for printers.

MALCOLM SMITH DISK 1: 5 useful SuperBasic progs.

MATHS AND CALENDAR DISK 1: includes calculator, pi and calendar creator progs.

MONEY DISK 1: 3 useful money progs by Stan Harle - need extra memory and TK2.

OLIVER FINK DISK 1: includes progs requiring Pointer environment to work.

PRINTER UTILITIES DISK 1: includes label creators and printer tutorials.

PROGRAMMING DISK 1: includes QL PROLOG.

PROGRAMMING DISK 9: includes QLFORTH

PROGRAMMING DISK 18: C68 for QDOS - C Tutorial

PROGRAMMING DISKS 19 - 21: C68 For QDOS Runtimes and docs. (By Dave Walker)

PROGRAMMING DISKS 22- 26: C68 For QDOS, Source Code.

PROGRAMMING LANGUAGES DISK 27: C-PORT Support Library.

QITALY DISKS 5 - 11: Reviews, screens shots and progs, mostly in Italian.

QPAC UTILITIES DISK 1: Jeremy Davis' QPACer program, includes several example boot progs.

RALF BIEDERMANN DISKS 1 + 2: excellent collection of programs, games, utilities etc.

RAY DENT DISK 1: 4 utility progs.

RECREATIONAL MATHS DISK includes Life cellular automatons etc.

RICH MELLOR DISK 1: 4 utility progs.

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TEXT DISKS 1- 7: The Bible- (Old Testament)

TEXT DISKS 8 - 9: Computer Jargon Text Files.

TEXT DISKS 10 - 11: German-English Word Translator (and vice versa)

TEXT DISK 12: Olympic Winners (up to 1988!)

TEXT DISK 13: Misc files

TEXT DISK 14: 400+ Business Letters from U.S.A.

TEXT DISKS 15 - 16: The Bible (New Testament)

TEXT DISKS 17 - 21: 200,000 English words. An ST port - needs editing!

TEXT DISKS 22 - 24: CIA'S World Fact Book. Current to 1990.

THOR P.D. DISK 1: THOR info files and progs.

T.V. MOVIE DISKS 1 - 5: Digitised Italian TV animations.

TYPING TUTOR DISK 1: Roger Hamilton's Artip prog.

NEWS ON THE Z88 IN NORTH AMERICA by Eliad P. Wannum

I would like to take this time to share some of my recent observations on the Z88 and to pass along a couple of tips I hope will be of help to new users. I am but a neophyte at this machine myself. First of all, allow me to say that a notebook computer like the Z88 fits my lifestyle, as a poet, counselor and a back to nature type of person..it works and is inexpensive.

One of the oddest things I recently found out is that it takes more power to expand the Z88 with a 32K cartridge than it does to add a 128K cartridge, so that perhaps in the long run it would be less expensive to add a 128K to start with. They can be obtained in the U.S. from any of the following three: Macro Systems of Arizona, Domino Cubes of New York, or Mechanical Affinity of Indiana. Mechanical Affinity also has some 512K cartridges of RAM, and the best price of the three, but if you want the 1 meg RAM cartridges you should contact Domino Cubes or Macro Systems. Macro Systems also has the best solution to the search for the perfect battery pack for the Z88. Check back issues of UPDATE for other info on Macro Systems. Domino Cubes can get you just about anything that was ever produced for the Z88, but the prices are all strictly "suggested retail price", but may be worth it considering the level of support that Mike Fink, the owner, can give you. MacLink, cables and soft Z88 carrying cases can all be found at Mechanical Affinity. At the Fest in Dayton, Mark of Sharp's indicated that he was still offering some support for the Z88 (at least a lot more than he is giving tthe QL!)

Now for a question from me to you the readers, "Does Miracle Systems still produce anything for the Z88?" Does this surprise you? Well it did me too. Looking at a copy of Z88 USER, Spring 1988, they had a full page ad on the back cover that offered all of the following: 1)Z-88 Centronics I/F 2)Z-88 V23 Modem 3)Z-88 Serial Printer Cable 4)Z-88 Zwitch to enable you to leave both a printer and a modem plugged in 5)Z-88 Modem Cable. I have heard nothing lately as to whether they still carry such items, and not being the owner of a phone I'll not be calling soon to find out. Perhaps if one of you does, drop me a line care of UPDATE Magazine and let me know.

As for modems for the Z88, Frank Davis tells me that those interested should contact either Roy Wisti, 135 Sheldon Rd., Voluntown, CT 06384-3628, or Domino Cubes. It sounds like Roy has got the ability to give you a good deal on a modem for your Z88. He also can do repairs for you on them. If you want to get even more exotic and are looking to really go portable, then Mike Fink of Domino Cubes can set you up with a fax/modem for your Z88, and even hook it all up to a cellular phone. This way you can be on the road and still stay totally connected.

Frank has told me that Dan Elliott has recently undertaken to learn the repair of Z88s and as soon as he gets a good line set up for replacement parts he will be able to add this to the wonderful services he has already been offering us. Speaking of repaired Z88s, Frank and Paul of Mechanical Affinity recently bought up a bunch of non-working ones and are in the process of getting them fixed so that they can turn around and sell them to us. My hat off to them, only a fool would give the few dealers we have left in North America a hard time. All of

these people work regular jobs, have families and still find time to try to help us, and at small or none, on the profit margin! Thanks to all of our dealers. Why would I bring this up...?...because I have heard a few false tales about more than one of our few remaining dealers. When you hear such tales, ask yourself as to whether the person who would spread lies is really being your friend. Pardon my digression on this point, but I was in Oregon recently and heard such tales about RMG, and in Toronto I heard similar tales about EMSoft and Mechanical Affinity. As a trained counselor, I am trained to recognize such mental aberration and to try to heal such wrong doings. In both places such tales could be traced to one or two disgruntled people who were lacking in morals and ethics. All three business locations that I have mentioned are working hard to provide the best of service. End of subject, and if you are offended, then examine your motives. I am quite blunt on such points.

Now for a much lighter note. Some folks are confused by what is meant by "hard" or "soft" reset on the Z88. Hard resets are done by opening the Perplex (plastic) flap at the front of the Z88 and pressing on the reset button once, on the left hand side. After pressing on the button, then close the flap and the screen should display "Hard RESET" boldly on the screen. Wait a short while for the RAM to be cycled through and the INDEX will once again appear. You will have lost all saved files or suspended activities, etc. All will be lost except what was in EPROM. This gives the machine a clean sweep.

In order to do a "soft reset" do the following. Make sure that the Perplex flap is closed, then hit the reset button twice. They tell me that it will try to retain all of the saved files, but lose the clock setting and suspended activities and any other data, as well as the PANEL settings. I would only do either of these resets if the machine would not respond to any keyboard input (do not be rash, make sure this is the case) or it will not turn either on or off in the usual manner. Then try a soft reset first. Save the hard reset as a last resort. If the soft reset works then you will have saved your data, and lost but little else. Should the soft reset not work, or the screen says "soft reset" but goes no further, then by all means go ahead with the hard reset, as your last resort. Hard resets are also advised by some when you put in new batteries, but for my money only if I have saved all I am working on either over to my Amiga, QL, or PC3. Perhaps they mean when you "first" put in batteries for the first time or after having allowed the machine to sit with dead batteries? I will play with this concept and let you know what I find out.

I need some help on the following. I have about 6 EPROMS that are already burned with Z88 programs. What I want to do is remove the contents from these EPROMS and save it over to disk, and then reburn the EPROMS with some new programs. I do not want to lose the data, yet want to re-use the EPROMS. Will some kind soul tell me how to do this? I have also heard that there are some Z88 user groups in Europe. Does anyone have the names and addresses of the above? Let me know and I will pass it on to the readers of this column. Thanks folks. EPW

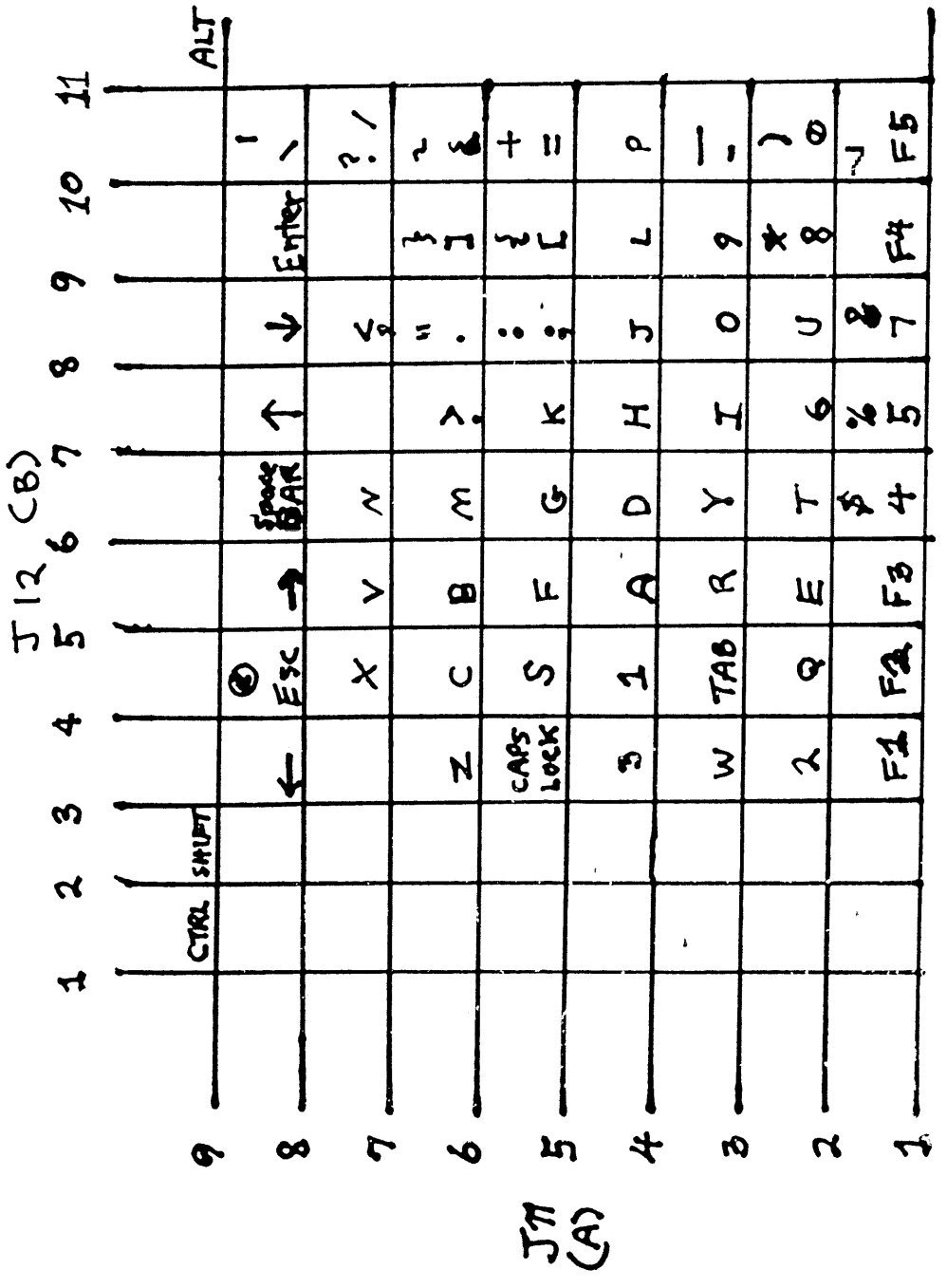


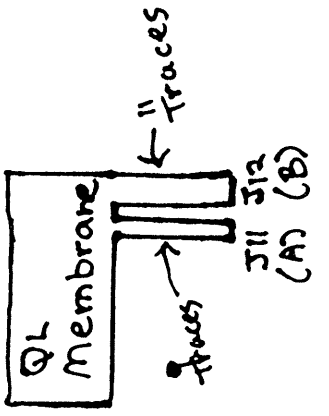
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CORRECTED QL MEMBRANE MATRIX
It has long been known that the layout for the membrane in the QL, as given in the manuals is not correct. This appears to correct most, if not all errors (should you find more or have more to add, send it to the UPDATE editor. Corrections are offered courtesy of Mike Hereid and Paul Holmgren. They worked independently of each other.





TRANSFERRING Z-88 FILES TO THE 2068

by John J. Shepard

I got my Z-88 so I could have a truly portable computer. Not a 2068 or a 1000 in a suitcase, but a real notebook, at a price that was affordable. I wanted a Sinclair product on which I could continue my efforts while on the road on my job. maybe use it as an enhancement to my job. (That has worked out). So, I appealed to the Timex community through N/L. I used my local (HA! I'm in Iowa, local is Chicago) UG - CATUG & it's N/L 'NITE TIMES NEWS' and T/SNUG's N/L 'SIR CLIVE'. I was answered with not one, but five offers, and one was within my price range and worked. This was how I met Dave Bennet (more on him, later), but he told me of the seller who was selling it for a friend and even with this kind of third party relationship she took my personal check, packaged it up with bubble wrap, PC Link, a power supply, and fresh batteries. Isn't this a great group we're in??! Now with batteries in their slot, a rechargable set from Lee at Macro Systems, Salt Lake City, Utah and the Realistic Power supply my memory is almost non-volatile.

My only problem was how to archive my files. I don't have a PC, Mac, or QL so the Link SW is out, nor did I want to support them anyway. I couldn't afford the $450 disk drive that is offered by Domino Cubes. What I wanted to do was typically something no one seemed to be doing - using what I had - a 2068. There seemed to be no easy road. There is not an Import-Export pgm avail. for the 2068 nor is there a serial hardware/software pkg readily available. Oh sure, if you've got a ZSI/O IF or a 2050 PCB - you can hack one out, - so you might have the hdw, but the SW?????

So, when Frank Davis and then Dave Bennet mentioned a null modem, they really had my interest. Especially, since this type of transfer could help me get around the need for a serial to parallel converter needed to print straight from the Z-88. They are expensive, about $100, this may not be much to you, but with 5 children and a middle income, you have an idea of my budget constraints. It also makes me mad when someone asks so much for something that is so simple. Back to the null modem, where if I understand it correctly, you cross the Recieve and Transmit wires and use a modem pgm. without a modem. Probably, not real accurate but as close as any user who's out in the sticks without a UG to go across the street and compare notes.

So, as I was searching, Dave Bennet, came to my rescue and suggested I could somehow use Z-88COM (a Z-88 modem pgm.) and a BBS on the 2068. Here I must tell you that without Dave Bennet I would be using my Z-88 for a doorstop, not my Z-81. Dave bent over backwards trying to help this ignoramus deal with his failings. Dave's first contact with me & my 88 was to send me a PC disk full of 88 pgms and utilities that could be had as soon as I discovered the diff. between a 286 and 386 based PC.

Talk about incompatibility, Timex/Sinclair machines have got nothing on IBM, right HAL? (But no matter how much you love our machines, let me tell you if you're to get along in the outside world you had better get PC smart. Sort of like, if you're in a foreign country, the ability to read, write and speak their language puts you on much firmer footing than if you're working through an interperter). I have called Dave time and time again, written many stupid questions and even borrowed equipment, me a perfect stranger, but a fellow Sinclairist in trouble. The same can be said of Bob Swoger who has listened many times to my whinnings, much to the dismay of his lovely wife, Annette, but there has been light at the end of the tunnel. Not as bright as I would like, but close.

I can transfer files. I can archive them on disk with my LKDOS 2068. But, if my Z-88 crashes it's modem program I haven't figured how to get it back from the 2068, with no readily, recognizable or operable transfer pgm., method, SW. So, until I can, I'll use an EPROM cartridge to store the modem SW. The only source, for the EPROM I found, is Domino Cubes, (212-971-0368) % Mike Fink.

The phone line connection is not a straight wire. I could not get the Hayes compatible modem for the Z-88 to call without a dial tone to start it off. Or, the same for the 2050, I could have done as John Bell suggested in TDM 5.1 (Boy, was 5.1 hard to come by, Huh?). He says, by soldering a push button Normally Open switch across pins 4 & 7 of the 74C00 IC, you can simulate an incoming call. Now, I'm not above a little hardware hacking, but my 2068 has enough loose wires connected to it, So, if I can bypass hacking, I will. Therefore, the following method:-

Take a phone line from the Hayes and one from the 2050 and plug them both into one of those phone jack modules that lets you plug two into one. Then, you have to get house hold security to break the fingers of any teenager or otherwise who dares to pick up any other phone during your transfer. Next we'll set up the Z-88. When it's on, set the parameters first, (no adjustment later, as you can with MTERM)on the Panel ([] S) to 300 BAUD - RECIEVE & TRANSMIT, Parity - NONE, XON/XOFF - No. (It then matches your 2050). That "[]", (left and right bracket) is to symbolize the square symbol on the Z-88 keyboard where [] S will get you to the Z-88 Panel. With your parameters set, LOAD Z-88COM.BAS into BASIC and RUN, after the M/C is LOADed, the menu will come up.

On the LKDOS 2068 LOAD MAXCOM and set it up to AUTO ANSWER as a BBS as pointed out in the Manual, Bob Swoger or I can help, (sorry, Bob) if you have any questions,

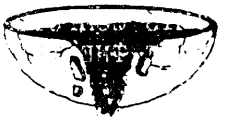
Once it'set, go to the Z88COM menu and press G, this will take you to the V-52 terminal where you can access the Hayes modem with an ATDTXXX-XXXX where the X's are your phone number, the ATD tells the modem you want to dial a number and the second T says it will be a tone rather than a pulse. Some of you may find this all rudimentary, but I had no idea that these Hayes Commands were a standard, maybe someone else won't know either.

Anyway, when you dial your own number you will, of course, get

a busy signal, (but you will have also entered the 2050's 74C00 IC), after the busy sig press ENTER on your Z-88, when the terminal resonds and waits, type ATA - ENTER. This will send a modem carrier. If you have done it quick enough, (during the time the 2050 sends it's carrier before it times out), you'll get a connect. When you do, ENTER the BBS staying with the Z-88 keyboard as the caller. When the Command Menu pauses at the prompt, choose Upload a pgm with a U. It will ask you for the file's name with an LKDOS extension, ie., X.CT where X can be the name of your Z-88 file or any name you want to call it. Then it will ask if you want Headers - say Yes with a Y and will go to Recieve. Now get out of the V-52 Terminal by keying [] B for Basic to get to the Z88COM menu where you'll press S to SEND a file, the SEND menu asks for the name of the file you have in the RAM, pre-selected by the Panel parameters, that you wish to SEND, the pgm will tell how many blocks are to be sent and you're off. (The number of blocks will, with experience, tell you how long the transfer will take - at 300 BAUD about 4.5 secs per block). Using XMODEM there can be no glitches to corrupt your transfer. A good block transfer is indicated by a "+" appearing on your monitor, while a glitch (usually caused by any extraneous noise on the line) is indicated by a "-". If a block transfer has been corrupted by some problem, XMODEM will reattempt the transfer till it's good. If you get a string of "-" then maybe you should break the connect and clean up your signal. You can hear this either with the speaker on your modem or over a phone. Usually a wiggle of a connector will clean up the signal. While I've used this method, since you have a "captive, dedicated" phone line (except for teenagers" it has gone error free. When the file is transferred, MAXCOM will SAVE it, on disk selected by it's menu, to the file you named, then say BYE at the prompt and you're home free.

Or as Bob Swoger says,
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OUR COMPUTER CAN BE USED ANYWHERE, ANYTIME, INSTANTLY, AND NEVER NEEDS CHARGING
OUR COMPUTER WEIGHS LESS THAN 2 POUNDS ▮ THE FAX/MODEM WEIGHS 7 OUNCES.
OUR COMPUTER CAN SEND FAXES ANYWHERE, ANYTIME, NO ELECTRICITY REQUIRED
OUR COMPUTER ALLOWS BEGINNERS TO START USING IT IN 2 SECONDS, MOST INSTRUCTIONS ARE IN FRONT OF YOUR EYES, UNDER THE 80 COLUMN SCREEN.
OUR COMPUTER HAS ALL THE PROGRAMS FOR INDIVIDUALS AND SMALL BUSINESSES ALREADY INSIDE, NO PROGRAMS NEEDED!!
OUR COMPUTER ALLOWS LOCAL DEALERS TO INSTANTLY CREATE CUSTOM-MADE INFORMATION FOR THE RENTER-IT CONTAINS AN EPROM BURNER!!
OUR COMPUTER ALLOWS THE USER TO CREATE THEIR OWN PROGRAMS IN SPREADSHEET OR IN BASIC. ALL NECESSARY INSTRUCTIONS FOR THE USER CAN BE PUT IN THE 32K EPROM

IT NOW OCCURS TO ME THAT IT WOULD MAKE MORE SENSE FOR THE CAR MANUFACTURER TO OFFER THIS COMPUTER AS AN OPTION WHEN THE CAR IS SOLD, RATHER THAN RENTING IT.
IT CAN BE USED AT HOME, IN THE CAR, AT THE OFFICE, OR ON A YACHT.
TO SEND FAXES OR DATA ALL YOU NEED IS A PHONE, OR A CELLULAR PHONE.
IF YOU CARRY THE 8 OUNCE PRINTER CABLE, YOU DON'T EVEN NEED TO CARRY THE 4 LB. PORTABLE PRINTER, BECAUSE PRINTERS ARE AVAILABLE ALMOST EVERYWHERE.
THE COMPUTER FITS IN A PLAIN MANILLA ENVELOPE!

MIKE FINK - PRESIDENT OF DOMINO CUBES .
ROY WISTI - VICE PRESIDENT ♣ ♠ ♥ ♦ END OF PAGE .

DOMINO CUBES - 484 W. 43rd ST.SUITE 27 Q-NEW YORK 10036 (PRESIDENT MIKE FINK) .
PH: 212 971 0368 FAX: 212 268 4122 Number OF PAGES SENT = 003 P.1 .
NEWS-1 HARLAN NEUGEBOREN FAX 563 7154

MR. NEUGEBOREN, IF YOU WANT TO BE THE FIRST NEWS MEDIA TO DISCUSS THE IMPENDING REVOLUTION IN THE COMPUTER WARS - YOU SHOULD CONSIDER THE FOLLOWING:

CHUBB INSURANCE HAD TO GO DOWN TO FLORIDA TO TAKE CARE OF HURRICANE ANDREW BUSINESS. THEY WERE UNABLE TO COMMUNICATE FROM FLORIDA BECAUSE ALL THE POWER WAS DOWN. THEY ASKED A CELLULAR COMPANY TO FABRICATE QUICKLY A LAPTOP, WITH FAX ABILITY AND A FAX CELLULAR PHONE. IT WORKED! BUT THEY WERE OUT OF BUSINESS IN 2-3 HOURS AND HAD TO LOOK FOR ELECTRICITY TO RECHARGE.
THE MOBILE OFFICE THEY USED IS TYPICAL OF ALL THE MAJOR COMPUTER MAKERS IN THE WORLD! THEY ARE EXPENSIVE, HEAVY AND RUN OUT OF STEAM IN A FEW HOURS.
THE COMPUTER WORLD THEY HAVE CREATED IS RUNNING ON THE WRONG TRACK AND THEY ARE ALL GOING TO CRASH!!! THEY WILL VERY SOON COME TO THIS REALIZATION.
THERE IS ONLY ONE COMPANY IN THE WORLD THAT OFFERS A LIGHTWEIGHT,INEXPENSIVE COMPUTER/FAX/SEND/SYSTEM THAT NEVER NEEDS NEEDS RECHARGING OR CHARGING! * !
THIS COMPANY IS ABOUT TO SET THE WORLD ON ITS HEELS, BY OFFERING THE BEST MOBILE OFFICE SYSTEM IN THE WORLD, THE EASIEST TO LEARN AND USE, AND THEY ARE PUSHING AUTO MAKERS TO OFFER THEIR INSTANT-ON GLOVE COMPARTMENT COMPUTER AS AN OPTION WHEN BUYING A CAR. AVIS IS TRYING TO RENT LAPTOPS WHEN THEY RENT THEIR CARS, BUT THEIR COMPUTERS ARE NOT USABLE UNTIL YOU CHECK INTO A MOTEL TO CHARGE THE BATTERIES. IF YOU GO TO SLEEP IN THE MOTEL THE BATTERIES LOSE MOST OF THEIR POWER BY THE TIME YOU WANT TO USE IT THE NEXT DAY. FOR NOVICES THE INSTRUCTIONS TAKE 10 HOURS TO LEARN. WITH DOMINO CUBES, A COMPLETE NOVICE CAN BEGIN USING THE COMPUTER IN 3 SECONDS, MOST OF THE INFO IS IN YOUR FACE UNDER THE 96 COLUMN SCREEN, AND IF THAT ISN'T ENOUGH, CUSTOM MADE INSTRUCTIONS OR MAP DIRECTIONS COULD BE PUT ON THE REMOVABLE EPROMS, WHICH TAKE 4 TO 40 SECONDS TO BURN. THE EPROM BURNER IS PART OF THE COMPUTER! OTHER COMPUTERS CAN'T EVEN DO THAT. THE COMPUTER ALSO ALLOWS DATA TRANSFER FROM IBM'S OR MAC'S THE FAX MODEM SENDS FAXES FROM ANYWHERE TO ANYWHERE ANYTIME, ANY PLACE, WITHOUT ELECTRICITY, AND LASTS AS LONG AS YOU WISH!!!!!!!! WHEN THE INSURANCE FIELD PEOPLE, AND THE AUTOMOBILE PEOPLE, AND AVERAGE HOME PERSON WANT AN EASY TO USE, EASY TO LEARN FULL FUNCTION COMPUTER, THAT HAS THE EQUIVALENT OF WINDOWS INSIDE, AND ALL NECESSARY PROGRAMS ALREADY INSIDE, NO SOFTWARE TO BUY, THE REST OF THE COMPUTER WORLD TRAVELLING IN THE WRONG DIRECTION AS FAR AS PORTABLE LIFE, AND WEIGHT IS CONCERNED IS GOING DOWN THE DRAIN.
FOR SCHOOL, FOR LIBRARIES, FOR SMALL BUSINESSES, FOR FIELD DATA CAPTURE, THERE IS NO OTHER COMPUTER TO COMPETE WITH DOMINO CUBES. THERE ARE MANY SOFTWARE PROGRAMS AVAILABLE, BUT THEY ARE NOT NEEDED FOR MOST PEOPLE, BUT THE DEGREE OF SOPHISTICATION IS UNLIMITED.
IF YOU ARE TALKING PRICE.....WE ARE THE BEST!
IF YOU ARE TALKING WEIGHT.....WE ARE THE BEST!
IF YOU ARE TALKING FIELD LIFE.....WE ARE THE BEST!
IF YOU ARE TALKING USER FRIENDLY.....WE ARE THE BEST!
IF YOU WANT MUSIC, GRAPHICS AND GAMES...YOU HAVE TO GO ELSEWHERE.
OUR COMBINED WORDPROCESSOR/SPREADSHEET IS POWERFUL AND EASY TO USE.
OUR FAX/MODEM ALLOWS FIELD GRAPHICS TO BE SENT WITH THE SAME CLARITY AS THE TEXT AS OPPOSED TO OPTICAL BLURRING.

IN ESSENCE, THE STORY IS THAT THE REST OF THE COMPUTER WORLD HAS TO CHANGE DIRECTION IF THEY WANT TO CATCH THE MARKET OF PORTABLE OFFICE COMMUNICATION THAT DOMINO CUBES IS ABOUT TO TAKE FROM THEM!!!!!!!!!

WE ALSO HAVE THE ONLY LIVE TELETYPE FAX PROGRAM, THAT YOU HAVE TO BUY EXTRA! you can sit in the stands in barcelona, and type what you see and as you type it is faxing at the ny times fax machine!!
MOBILE OFFICE MAGAZINE WANTS A COLOR SLIDE OF OUR COMPUTER.

Maclink and the Macintosh

The MacLink program on the Macintosh was written after the MSDOS version PCLink and the higher level of user friendliness that has resulted from this is quite striking. Once the cable has been connected between the Z88 and the "Telephone" port of the Macintosh, and the Link program has been started up on both, all operations are then performed on the Macintosh. The Link program is started by double clicking the Macintosh Application and by typing □ L on the Z88. The Z88 becomes a "disk drive" for the Macintosh and may be selected using the DRIVE button on the Macintosh screen. All file transfers are performed from left to right so the first task is to open up the various "Folders" on the Macintosh, and the Devices and directories on the Z88 so as to have the file being moved in the left column and the place it is going to on the right. Next the operator should select the file conversion to be performed. This will normally be "None" unless the document is a spreadsheet document or a normal word processing document in which case the appropriate conversion can be selected. Next select the files in the left hand box that are to be moved using the mouse click and perhaps the **command or SHIFT key** to select more than one. When all are selected click the transfer box and file transfer and conversion if required will proceed. In practice its simpler than it appears here.

The Link package is not fast (about 100 bytes per second) so have your coffee ready for larger files.

The cables required to link the Z88 to a Macintosh are provided with MacLink or may be built up using the circuit details at the end of the manual.

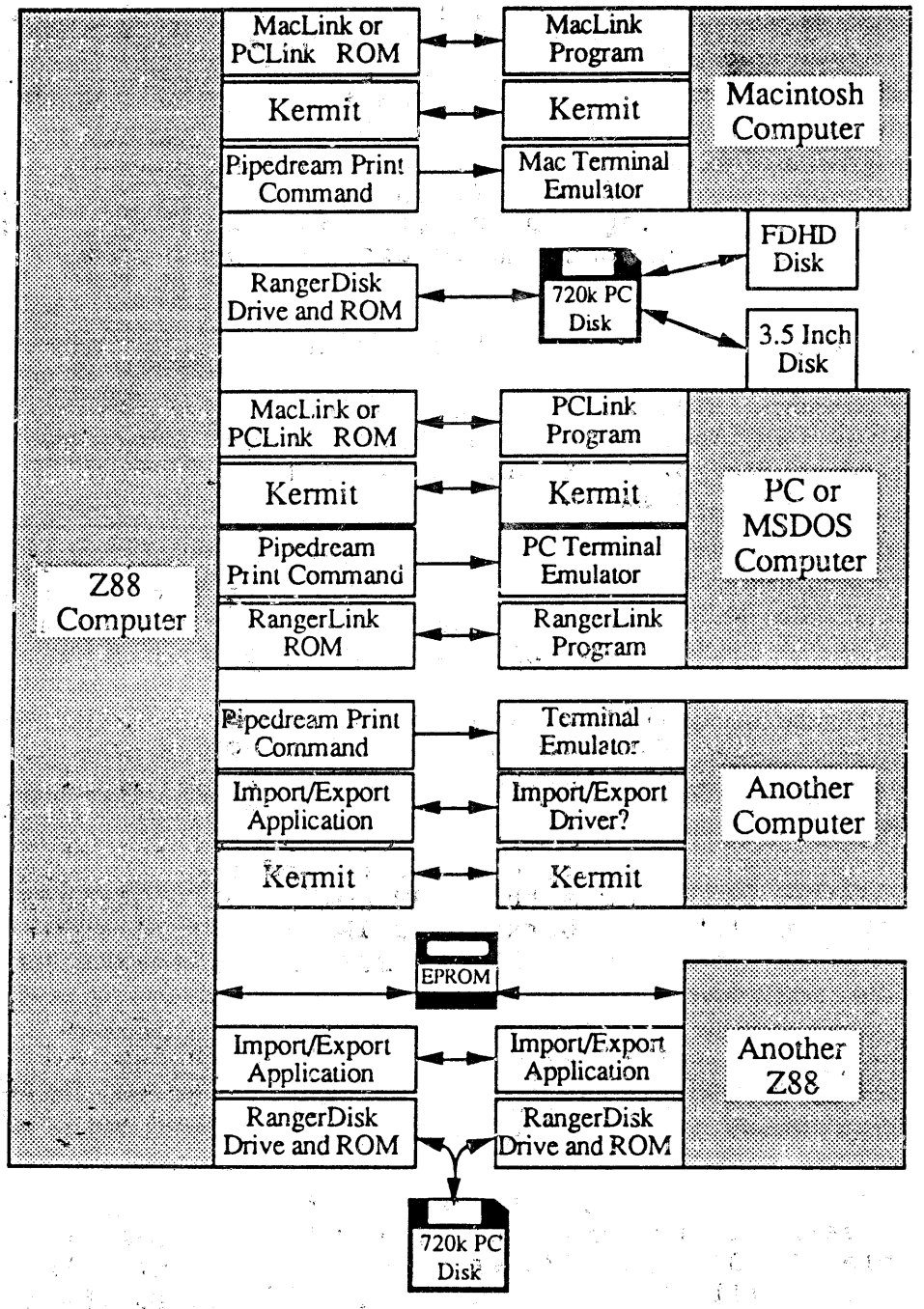
PClink and the PC

PClink is a fairly intuitive package to operate on the PC. Apart from its speed, it has a few minor difficulties. It will only handle one file at a time, conversions to other file formats must be handled as separate operations, and the conversions must be performed in the directory that contains PCLink and the conversion modules. If these points are adhered to there should be no problems.

To operate the link connect the Z88 to the PC's COM.1 serial part and run PCLink on the Z88 using □ L. All further operations are now handled on the PC. Move to the directory on the PC containing PCLink and enter the command PCLINK. Communications will be established and a display will appear on the PC showing the two computers in diagrammatic form.

To prevent conversion difficulties it is suggested that files that need to be converted be moved to the PCLINK directory before conversion takes place. It is often best to work all transfers to and from this directory. If you perform conversions in another directory the resulting converted files will not contain any data.

Some Possible Links Between the Z88 and Other Computers



TS2068 UPDATE ISSUE DISKS

These disks contain at least one major piece of software written specifically for disk drive and are guaranteed to be worth the money. The rest of the disks are filled with various utility programs taken from the issues of UPDATE and a few surprises thrown in. Half of the money goes to the author and is meant to encourage new programming for the TS2068 that makes use of the various disk drive systems. All are $20.00 per disk (add $1.00 Canada) except where noted in the listing. Postage and handling is included. Both 3 1/2 and 5 1/4, 40 and 80 track available. Please add $5.00 for mailing to other countries. We accept personal checks, company checks, money orders. No charge cards please.

1) Daisy Word Processor, now available for Aerco and Oliger.

2) Bob Hartung DOSDEX UTILITY ISSUE DISK, a complete disk management group of programs for the Oliger Interface only. This includes Multi-Manager for file handling. This collection has recently been updated and expanded.

3) MAIL MERGE ISSUE DISK, Oct 87 and Jan 88 issues of UPDATE utilities added to fill out this disk. Includes a tutor program for the Mail Merge program, List Looker, Purity, J-Utilities and Extra Memory Utilities. Larken, Oliger and Aerco versions.

4) WIDJUP'S CAD PROGRAM, this will give you professional results from your TS2068 for computer aided design. Authored by William J. Pedersen, perhaps the NO.1 authority on the inner workings of the TS2068. This program can be used to create user friendly printed circuit boards, computer art or desktop publishing files It does not need expanded memory cartridges and is available in four versions: (a) Oliger for either IBM compatible printers or for the Olivetti Ink Jet. (b) Larken for IBM compatible printers or the Olivetti Ink Jet printer. Please specify version. NEW!

5) OLIGER DISK DRIVE BBS PROGRAM, this allows users of the Oliger interface to be able to operate a disk based bulletin board from the TS2068. The disk is also filled with many other Oliger disk routines and tips on using the Oliger System. New by Paul Holmgren. Can use upto four DSQD disk drives.

6)The HYBISCUS ENSEMBLE, consisting of two separate, but complimentary sets of programs. A) Daisy.B6 Ensemble, and B) Udbm.B6 Ensemble. LKDOS only, $22 each or $36 for both. The best file and database available for Larken, by Bill Jones. The price remains the same on this one, no change. Wordprocessor included.

7) TS2068 Super Calc by Bill Jones. Available in both Larken and Oliger formats. Handles loans, amortization, savings and fixed investments, plus a calculator and all for only $15.

UPDATE COMPUTER SYSTEMS invites you to submit software programs that may become Issue Disks. Please submit program on disk, with documentation and article to accompany the program. Our goal is to get North American software available and known. We also solicit minor programs, tips and utilities for print in future issues of the magazine. Please do not submit unlistable programs or copy protected programs.

QL UPDATE ISSUE DISKS

These disks contain at least one major piece of software written specifically for disk drive and are guaranteed to be worth the money. The rest of the disks are filled with various utility programs taken from the issues of UPDATE and a few surprises thrown in. Half of the money goes to the author and is meant to encourage new programming for the QL that makes use of the disk drive systems, and microdrives on both the expanded and unexpanded QL. Where possible we will give a version for each of these configurations. Some of the programs take advantage of TK2 by Tony Tebby. All are 20.00, except QLuster, which is $15.00; includes P & H, add $1.00 CAN.Available as 3 1/2 or 5 1/4 disks. Add $5.00 for mailing to other countries. We accept personal checks, company checks, money orders as well as International Postal Money Orders, but no charge cards. If ordering on MDV, then please include one that is already formatted, so we will know it will run on your QL. Due to the expense of MDVs this is necessary. If two MDVs are required we will state so in the ad.

1) HARTUNG UTILITY ISSUE DISK- Several excellent programs such as stand alone data base, Address, and QSO files. All are in Superbasic. Lots of hints and tricks for programmers. Requires some knowledge of Superbasic or a yen to learn. Recently updated by Bob Hartung. Address file can be used as inventory program. It can print out labels. Both screen or paper printouts can be by Alpha sort, or be by last name.

2) CABLE ARCHIVE ISSUE DISK- Contains six Archive programs along with Doc files to get you going on making use of the Archive programming language. Also has Tasket, plus Doc file, to give you multi-tasking on your QL (much cheaper than QRAM or Taskmaster). Included is Arithmetic, a Superbasic program for math, along with math drills. This is for both the advanced and beginner user and greatly extends the use of Archive. To order on microdrive send two formatted microdrives, too much for one!

3) QLUSTER ISSUE DISK by Al Feng- Ql utilities to unclutter your disks and microdrives. COPY, DELETE, FORMAT, PRINT, VIEW, plus extended use of some Tool Kit 2 commands. TK2 is required. These are TURBO compiled for speed. Multitasks and uses minimal key presses. Includes Fast-Disk and Vegemat2, a super clone making program. Also Snap Shot-a directory column or condensed printout program.

4) DOS EMULATOR COMPANION ISSUE DISK by Al Feng- Just released in Oct. issue. Makes better use of Solution, PC Conqueror, DisCover, XOVER, QLuster and scr_codes. If you are going to use the emulators, then check this out, you won't regret this buy.

5) QLuMSi DOS by Al Feng- a MSDOS simulator and front end program for the QL, also includes other programs by AL Feng for file management and cloning of programs. A Great Learning Tool

UPDATE COMPUTER SYSTEMS invites you to submit software programs that may become Issue Disks. Please submit program on disk, with documentation and article to accompany the program. We are here to get North American software available and known. We solicit programs, tips, reviews and utilities for future issues.