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The Unofficial OSI Users Journal

★★ $1.75 ★★

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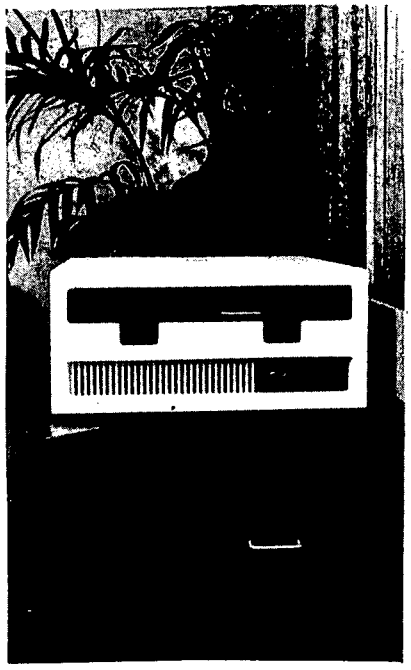
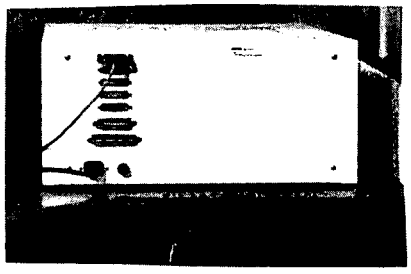
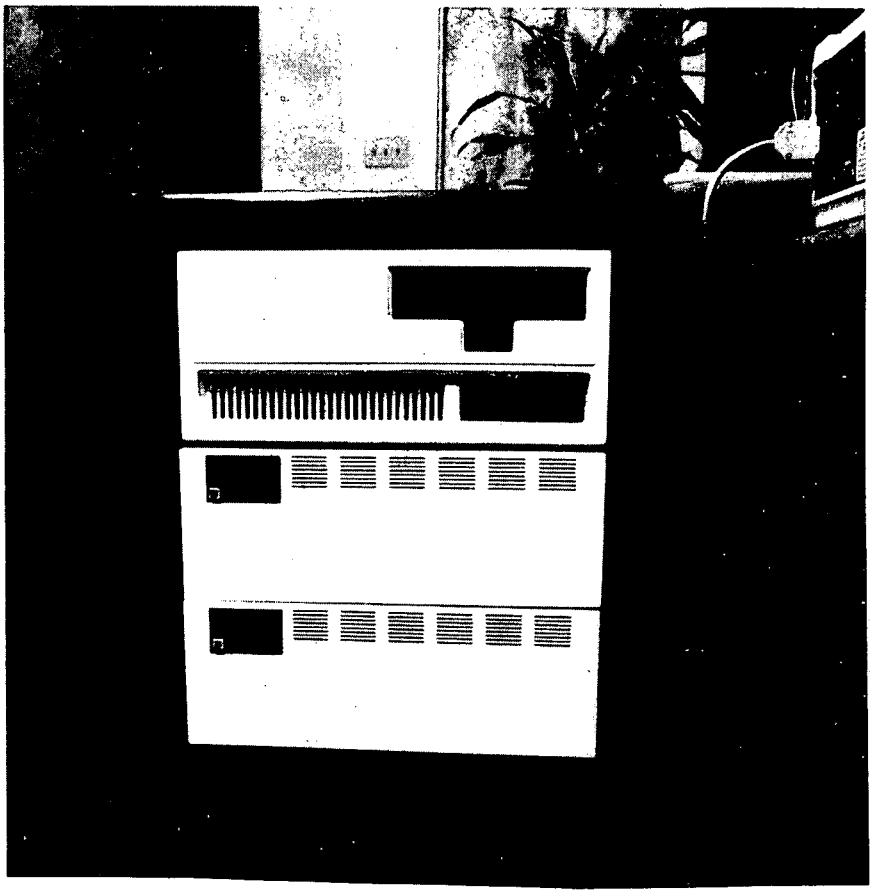




MASCOM/OSI .....has finally joined the ranks of the real computer manufacturers with an entire line of business oriented microcomputers which are professionally styled, engineered and documented to replace the older OSI business computers which looked like erector sets. The C-200 (table top) and C-300 (rack mounted) computers have been designed to have the greatest number of common parts as possible. There is only one chassis and only one power supply thereby eliminating the past problems when a customer wants to upgrade. All computers with the three chip (now two) CPU card will be configured and powered for multiuser--just add another memory board and terminal. Multiuser software will be standard. The little brackets at the bottom of the board have been replaced with card guides, and all the holes in the back of the cabinet have been closed up with the intention of receiving UL approval.

A new 48K RAM board with readily available chips will be included in all 2 or 3 MHz machines. This board has art work for 64K; one can hope that a full 64K will be available soon! There is a new single board controller for the 8" hard disk and all machines will be equipped with the 8 bit and the 12 bit parallel interfaces as standard.

The new products do not stop with the hardware. There is a new release of OS 65U. This version is much better documented than any in the past, and it contains many enhancements such as terminal independence, common variables, print spooler (for hard disk machines only), extended input and lower to upper case translation.



THINGS I DID TO MY OSI C4P-MF

by: Cyrus N. Wells
1405 Lucilee Street
Las Vegas, NV 89101

The power supply problem seems to be inadequate heat dissipation by the rectifier diodes. I removed the diodes from the regulator boards, which needed quite a bit of clean-up. Dull-appearing (burned) solder was removed and the cleaned joints resoldered. The rectifier diodes were replaced by 12 Amp rectifiers mounted on an isolated heat sink and wired to the original regulator pads.

I was forced to repair the power supplies by the appearance of alternating light and dark bands slowly moving up the video screen. I finally recognized these as "hum bars" from the old T.V. days. In the T.V., they were usually caused by leaky rectifier filter capacitors. Replacing the rectifier diodes as in paragraph 1 cured that problem. I believe that the bars were caused by the poor solder connections on the regulator boards. It would appear that one power supply was still rectifying full-wave while one of the rectifiers in the other supply developed an open connection. I found, and corrected, the burned solder problem before I had reasoned out the "hum bar" cause, so I couldn't verify my theory with a 'scope! I do know that it permanently cured the problem.

When I purchased my C4P-MF (April 80) the prices were about to go up so I also bought another 527 memory board with 8K memory installed. When I worked on the power supplies I rewired them so one supply was connected to the backplane 5-volt bus and served the CPU and video boards. The original 24K memory board was powered by a 3-pin connector on the side of the board and was isolated from the backplane bus. I paralleled a connector to the added memory board thinking it also was isolated. I later found a jumper on the added memory board tying it to the backplane bus. No harm done, but, to maintain the isolation, an added memory board should be checked for this jumper.

After reading the review of the D & N Micro Products 'Disk Switch' in MICRO #40, I ordered the kit. It went together easily and operates exactly as advertised. I am using double-sided disks which, by running the disks in reversed directions, is causing wear not planned for in the disk design. By turning off the drive motor when the disk is not being accessed, I am sure the wear is minimized. Incidentally, I have about 25 disks I have double-sided and I have had no problems caused by the doubling. The only disk failures in almost 2 years were a single-sided disk that picked up an abrasive somewhere and one disk I double-sided that would not initialize on the second side.

It is not difficult to relocate the 'reset' button from the <BREAK> key to the upper left corner of the keyboard panel since it is wired to a seperate connector on the CPU board. Simply locate the two wires and extend them to a normally-open pushbutton switch. I also removed the SYNC, VIDEO, COLOR and BIAS pots from the video board and epoxied them to a flat metal bar, screw-slot up. I mounted the bar under a line of four appropriately-spaced holes near the 'reset' switch and extended the connections with a piece of ribbon cable. Particularly when changing T.V. monitors (I spent several months using T.V.s in motel rooms), it makes a sometimes unreadable screen usable without taking the computer apart.

By running two additional wires I was able to install a small transistorized audio amplifier and speaker in the disk drive case. The necessary 12 volts comes from the disk power supply and a volume control/switch mounted on the rear panel with the speaker, controls the audio. A single pole-double throw switch on the computer rear panel selects the DAC or audio output.

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INTERFACING THE OKIDATA 82A PRINTER TO THE OHIO SCIENTIFIC C1P

by: Steve Hendrix
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Since Ohio Scientific doesn't provide a printer for the C1P, I have tried several ways to give my system some way to make hard copies of my programs and data. Most recently, I added the Okidata 82A printer. This article gives a very simple way to connect the printer with no active components, and is usable on other systems. The only requirement is a serial port at TTL levels, like the one provided by the M6850 in the cassette interface. I will close with some comments on the printer itself.

The 82A printer includes both a parallel and a serial port. Since I added a parallel port to my C1P some time back, I planned to use that for the printer. However, I could not find a connector to mate with the one on the printer. So much for plan A! But the serial port should be a snap - I've used the cassette port as a serial port before. Just before I put the power on it, I took one last look at the printer manual, which probably saved some burned integrated circuits. The serial port on the printer is at RS-232 levels (-12 volts to +12 volts), but the computer's serial interface is at TTL levels (0 volts to +5 volts). So much for plan B!

Guessing that the serial signal had to get to TTL levels sooner or later, I started browsing around the circuit board in the printer. Lo and behold, an 8251. This is functionally almost identical to the M6850 in the cassette port on the C1P. All that is needed is a line from the Transmit-Data line on the M6850 to the Receive-Data line on the 8251. On the C1P, tie the line to pin 10 of U18. On other systems, use pin 6 of an M6850, or pin 19 of an 8251. On the plug for the serial port of the printer, tie this line to pin 3. Figure 1 shows the patch on the printer circuit board to convert this data line to TTL levels. It involves cutting the line from the plug to a buffer and the line from that buffer to the 8251, and replacing the connection with a jumper directly from the plug to the 8251.

With this line and a ground connected (pin 7 on the printer to the minus side of the C1P's five volt power supply), the C1P can send data to the printer. However, it has no way to detect a "printer busy" condition, which can be caused by running out of paper or sending data faster than the printer can print it. The Supervisory Send Data (SSD) line on the printer (pin 11 on the serial port) is pulled low to indicate that the printer cannot accept data. The Clear To Send line on the M6850 on the C1P is designed to sense this condition, so the solution looks simple - but again, the printer works with RS-232 levels and the C1P uses TTL levels. Figure 2 shows two alternate ways of clamping the voltage to the allowable range at the C1P.

With this interface, you can send data to the printer by typing SAVE (or POKE 517,255). Anything which appears on the screen will also go to the printer. To stop output to the printer, type LOAD (or POKE 517,0). If you are using a disk operating system such as OS65D or HEXDOS, simply PRINT or LIST to the device number designated for the cassette port. To use the control functions, PRINT CHR$(X);, where X is the decimal value for the desired function from the table on page 68 of the printer manual.

The first time you try to list a long program, you will probably become very impatient with the 300 bits-per-second data rate of this interface. I have installed a set of switches to let me select data rates of 300, 600, 1200 and 2400 bits-per-second for the cassette interface (but for cassette tapes, 600 bps is the limit). The clock for the cassette interface is derived from the video divider chain. Pin 2 of U57 is the clock input to the cassette interface. It is normally tied to pin 14 of U59 - setting the 300 bps rate. By tying it to pin 11 of U30, the rate increases to 600 bps (be sure to disconnect it from pin 14 of U59; if you tie the outputs of the video divider chain together, you will lose the video). Similarly, moving it to pin 12 of U30 gives 1200 bps, and pin 13 of U30 gives 2400 bps. I use the printer at its maximum rate of 1200 bps, with pin 2 of U57 tied to pin 12 of U30. I have not had any problem with errors even though this is the printer's highest rate.

Finally, some comments on the 82A printer itself. It seems to be solidly built, and the feed mechanism is strong enough to provide a good pull with friction feed or tear out the sprocket holes with tractor feed paper. The print quality is crisp and clear. I was disappointed in two things, however. Though Okidata advertises "fully addressable dot graphics", the only graphics are TRS-80 style block graphics. The advertisement apparently refers to the ability to change the character generator (a 2716) to a user-defined character set, but no instructions for this are provided. The TRS-80 graphics provide medium resolution, using the compressed-print and 8-lines-per-inch modes (31 dots per inch horizontal by 24 dots per inch vertical). The other disappointment is that the tractors are not adjustable in width. They are fixed at a standard 9" center, for 9-1/2" wide paper.

In summary, this interface provides a cheap and simple way to provide your C1P or other computer with a printer. The most expensive item in the interface is the DB-25P plug.

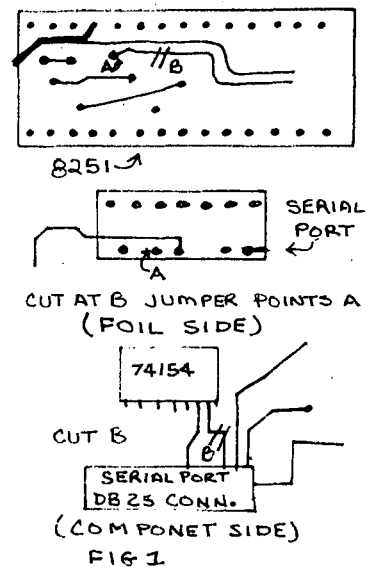


FIG 1

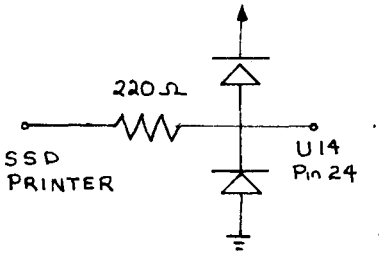
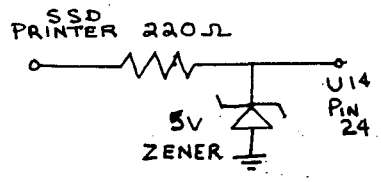


FIG 2

FIG 2 CONT.



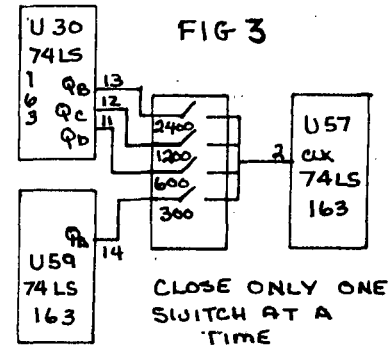


FIG 3

★

REAL ERROR MESSAGES
for the OSI Cassette
Assembler

by: Kerry Lourash
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Decatur, IL 62522

Here's a patch to the OSI cassette assembler that prints error messages instead of numbers. I call it REM (Real Error Messages). It's a little over one page long and could be placed immediately after the assembler at $1391.

There is a short block of code at $0590-05D2 that prints line numbers and error numbers. By patching into this area, it's possible to anticipate when an error number is about to be printed and substitute a more informative message.

To patch REM into the assembler, change $0590-0592 to a jump to REM. If REM is located at $1391, the contents of the start-of--assembler-workspace pointer (at $12C9, CA) must be changed to $14BE, so that REM isn't overwritten by assembler lines.

The messages may seem a bit abbreviated, but I wanted to keep the length of the message table down to one page. Hope this addition will make your sessions with the assembler more pleasant. I'm currently working on an editor and other improvements for the assembler.

I think REM will also work

with the disk assembler, although I wasn't able to try it. I'm not sure where the disk assembler workspace is located, but I know REM can't be placed at $1391.

```
 1; ASSEM ERROR MESSAGES
 2; BY KERRY LOURASH
 3; CHANGE $0590-0592
 4; TO JMP XXXX
 5; XXXX=START OF ROUTINE
 6;
 7 *=$6000
 8 OUTPUT=$0343
 9        LDA ($24),Y
10        CMP #$20
11        BEQ ERR
12        TAX
13        JMP $0593
14;
15 ERR    LDY #0
16        LDX $20
17 E0     DEX
18        BEQ PRINT
19 E1     LDA TBL,Y
20        INY
21        ASL A
22        BCC E1
23        BCS E0
24 PRINT  LDA TBL,Y
25        BMI P1
26        JSR OUTPUT
27        INY
28        BNE PRINT
29 P1     AND #$7F
30        JSR OUTPUT
31        JMP $11CF
32;
33 TBL
34.BYTE'1 RESERVD HAM',$C5
35.BYTE $80
36.BYTE'3 ADRESS )6553',$B5
37.BYTE'4 FORWD RE',$C6
38.BYTE'5 ILLEGL OPERAN',$C4
39.BYTE'6 ILLEGL OPCOD',$C5
40.BYTE'7 INVAL EXPRES',$CE
41.BYTE'8 INVAL INDE',$D8
42.BYTE'9 NON-ALPH LAB',$CC
43.BYTE'10 LONG LAB',$CC
44.BYTE $80
45.BYTE'12 PREDEFIND LAB',$CC
46.BYTE'13 ADRESS )25',$B5
47.BYTE $80
48.BYTE'15 NO OPERAN',$C4
49.BYTE'16 LONG BRANC',$C8
50.BYTE $80
51.BYTE'18 UNDEFIND LAB',$CC
52.BYTE'19   PAGE  0    FORWD
RE',$C6
53.BYTE'20 OPERAND )25',$B5
54.BYTE $80,$80,$80,$80
55.BYTE'25 TBL OVERFL',$CF
```

★

SORTED DIRECTORY FOR OS65D 3.0

by: Jeff Easton
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Have you ever wished that when you booted a disk and displayed the directory it would be already sorted so that at a glance you could tell what tracks were available? You could use the standard OSI program, 'DIRSRT', to do it but this program only displays your sorted directory on the screen.

On most of my disks I use the Aardvark BEXEC* that runs a directory on bootup so I thought, why not have the directory come in all ready sorted? I had two choices, either rewrite BEXEC* so that it sorts the directory before displaying it or write a program to sort the directory and store it on disk in sorted form. I chose the latter because with the other method I would have had to wait 25 seconds for the directory to sort every time I wanted to see it. The listing below is the program I wrote to do the job.

Before we get to the program let's take a look at how OSI utilizes a directory. Track 8 sectors 1 and 2 contains the directory file (track 12 for minifloppies). When you run the program 'DIR' it calls sectors 1 and 2 into the directory buffer at $2E79. Unfortunately the buffer is only one page long so your programs have to call in the directory file one sector at a time.

Once the desired sector is in the buffer the program reads out its contents by using peeks. To add an entry into the directory file the program must first load the directory file into its buffer then find an open space to place the name by PEEKing the buffer until a string of nulls is found. Once a place has been located, the program can POKE the name and track range in the buffer and save the buffer contents back on disk. The track range is encoded into a 2 byte hexadecimal number that follows the name in the file. To see exactly what the file looks like if you have a video system type DISK!"CA D200=08,1" (for mini floppies type DISK!"CA D200=12,1"). This will bring in the first sector of the directory file to the screen memory. Notice that the two characters following are not track numbers but encoded versions of the track ranges. Therefore to decode the hex numbers (displayed as graphics characters in the above demonstration) into usable track ranges we will use the FNA function. Once the file is sorted we can use the FNB function to re-encode the track ranges for storage back on disk. See lines 30 and 40 in the listing to see the definitions for the FNA and FNB functions.

Now let's take a look at the program below. Lines 30 and 40 define the BASIC functions FNA and FNB. The variable N will be used as the array counter. P equals the decimal value of $2E79, the beginning of the directory buffer.

Lines 1000 to 1070 read the directory sectors into the buffer one at a time, where the contents are read out to the arrays. The names are converted from ASCII by the use of the CHR$ function and stored in the array A$(N). The track ranges are decoded and stored in the arrays A%(N) and B%(N) where A%(N) = the beginning track of the file and B%(N) = the ending track of the file.

Lines 2000 to 2140 take the arrays and sort them by track. The sort routine here and in lines 3000 to 3110 parallel the sort routines found in OSI's utility DIRSRT.

Lines 3000 to 3110 take the arrays and sort them by name.

Lines 4000 to 4120 take the sorted arrays and POKE them back into the directory buffer and then save the buffer back on the disk. The rest of the directory is filled with nulls (#).

There are actually three versions of this program below. The main listing is for 8 inch disk systems. For those of you with a minifloppy system, add the lines shown. And for those of you that have implemented 'Stretch' Manley's 14 character file names mod, described in the June '81 PEEK, I have included the additional lines needed. CAUTION! Do not use the 14 char. version of this program on any disk set up for 6 char. file names. To do so will crash the disk. The reason is that part of the mod includes moving the BASIC overlays from sectors 3 and 4 to sectors 5 and 6 so that this space can be used for additional directory filenames. If you use the 14 char. version on a 6 char. disk the program could load the BASIC overlays, try to sort them, and save them back on disk in the form of garbage. I have all three versions running in OS65D 3.1 thru 3.3 with no problems.

You might want to add a subroutine to print out the sorted directory before storing it back on disk. I chose not to include this to keep the speed of the program fast.

cont. page 6

OSI

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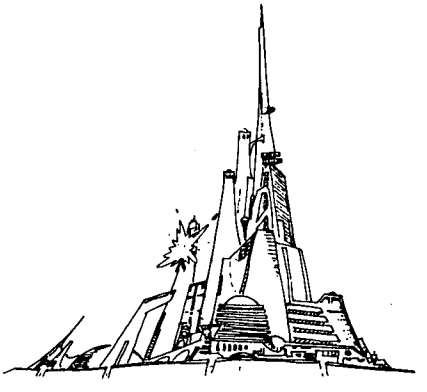

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NEW — NEW — NEW

LABYRINTH - 8K - This has a display background similar to MINOS as the action takes place in a realistic maze seen from ground level. This is, however, a real time monster hunt as you track down and shoot mobile monsters on foot. Checking out and testing this one was the most fun I've had in years! — $13.95.

NIGHT RIDER - You've seen similar games in the arcades. You see a winding twisting road ahead as you try to make time and stay on the road. NIGHT RIDER uses machine code to generate excellent high speed graphics - by the same author as MINOS.
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OSI

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OSI

DIRECTORY SORT UTILITY
8 INCH DISK VERSION

```
10 REM --- DISK SORT UTILITY
12 REM --- JEFF EASTON / DEC 31, 81
14 REM --- 9416 WASHINGTON
16 REM --- BROOKFIELD IL, 60513
18 REM --- (312)-485-2224
20 DIMA$(64),A%(64),B%(64)
30 DEF FNA(X)=10*INT(X/16)+X-16*INT(X/16):REM--INPUT DECODE
40 DEF FNB(X)=16*INT(X/10)+X-10*INT(X/10):REM--OUTPUT ENCODE
50 N=0:P=11897:REM--DECIMAL LOCATION OF DIRECTORY BUFFER
60 FORX=1TO30:PRINT:NEXT
70 PRINT" DIRECTORY SORT UTILITY"
80 PRINT:PRINT" THIS UTILITY WILL CALL IN THE DIRECTORY AND SORT IT."
90 PRINT"THIS SORTED DIRECTORY WILL THEN BE SAVED BACK ON DISK.":PRINT
100 INPUT" SORTED BY NAME OR TRACK (N/T)";Z$
110 PRINT:PRINT
120 PRINT" Working...."
999 REM --- CALL DIRECTORY INTO ARRAYS
1000 DISK!"CA 2E79=08,1":GOSUB1020
1010 DISK!"CA 2E79=08,2":GOSUB1020:GOTO1070
1020 FORI=PTOP+248STEP8:IFPEEK(I)=35THEN1060
1030 FORX=ITOI+5:A$(N)=A$(N)+CHR$(PEEK(X)):NEXTX
1040 A%(N)=FNA(PEEK(I+6)):B%(N)=FNA(PEEK(I+7))
1050 N=N+1
1060 NEXTI:RETURN
1070 IFZ$="N"THEN3000:REM--JUMP TO SORT BY NAME ROUTINE
2000 REM --- SORT BY TRACK
2010 M=N-1
2020 M=INT(M/2):IFM=0THEN4000:REM--IF FINISHED THEN SAVE
2030 J=0:K=N-1-M
2040 I=J
2050 L=I+M
2060 IFA%(I)<A%(L)THEN2120
2070 T$=A$(I):A$(I)=A$(L):A$(L)=T$:REM--SWITCH NAMES
2080 T=A%(I):A%(I)=A%(L):A%(L)=T:REM--SWITCH BEGINNING TRACK
2090 T=B%(I):B%(I)=B%(L):B%(L)=T:REM--SWITCH ENDING TRACK
2100 I=I-M
2110 IFI>=0THEN2050
2120 J=J+1
2130 IFJ>KTHEN2020
2140 GOTO2040
3000 REM --- SORT BY NAME
3010 M=N-1
3015 M=INT(M/2):IFM=0THEN4000:REM--IF FINISHED THEN SAVE
3020 J=0:K=N-1-M
3023 I=J
3026 L=I+M
3030 IFA$(I)<A$(L)THEN3090
3040 T$=A$(I):A$(I)=A$(L):A$(L)=T$:REM--SWITCH NAMES
3050 T=A%(I):A%(I)=A%(L):A%(L)=T:REM--SWITCH BEGINNING TRACK
3060 T=B%(I):B%(I)=B%(L):B%(L)=T:REM--SWITCH ENDING TRACK
3070 I=I-M
3080 IFI>=0THEN3026
3090 J=J+1
3100 IFJ>KTHEN3015
3110 GOTO3023
4000 REM --- RETURN A FRESH SORTED DIRECTORY TO DISK
4010 N1=N-1:N=0:REM--RESET ARRAY POINTER TO BEGINNING
4020 GOSUB4050:DISK!"SA 08,1=2E79/1"
4030 GOSUB4050:DISK!"SA 08,2=2E79/1"
4040 PRINT:PRINT" Done, ":END
4050 FORI=PTOP+248STEP8
4060 IFN>N1ANDN<=64THENFORX=0TO7:POKEI+X,35:NEXT:GOTO4090
4070 FORX=0TO5:POKEI+X,ASC(MID$(A$(N),X+1,1)):NEXTX
4080 POKEI+6,FNB(A%(N)):POKEI+7,FNB(B%(N))
4090 N=N+1
4100 NEXT I
4120 RETURN
```

For 5-1/4" disks, change the following lines to:

```
1000 DISK!"CA 2E79=12,1":GOSUB1020
1010 DISK!"CA 2E79=12,2":GOSUB1020:GOTO1070
4020 GOSUB4050:DISK!"SA 12,1=2E79/1"
4030 GOSUB4050:DISK!"SA 12,2=2E79/1"
```

For 14 character file names (8 inch) change and or add:

```
1010 DISK!"CA 2E79=08,2":GOSUB1020
1015 DISK!"CA 2E79-08,3":GOSUB1020
1018 DISK!"CA 2E79=08,4":GOSUB1020:GOTO1070

1020 FORI=PTOP+248STEP16:IFPEEK(I)=35THEN1060
1030 FORX=ITOI+13:A$(N)=A$(N)+CHR$(PEEK(X)):NEXTX
1040 A%(N)=FNA(PEEK(I+14)):B%(N)=FNA(PEEK(I+15))
4032 GOSUB4050:DISK!"SA 08,3=2E79/1"
4036 GOSUB4050:DISK!"SA 08,4=2E79/1"
4050 FORI=PTOP+248STEP16
4060 IFN>N1ANDN<=64THENFORX=0TO15:POKEI+X,35:NEXT:GOTO4090
4070 FORX=0TO13:POKEI+X,ASC(MID$(A$(N),X+1,1)):NEXT
4080 POKEI+14,FNB(A%(N)):POKEI+15,FNB(B%(N))
```

Happy computing!!

★

CASSETTE CORNER

by: David A. Jones
8902 SW 17th Terrace
Miami, FL 33165

This month I wish to publicly express my appreciation to E. Morris and his string bug fix for ROM based systems which was published in the June PEEK (65). My homebrew word processor is written in BASIC and so I had to use extreme caution when editing large files until now. I replaced the BASIC 3 ROM with an EPROM and his code and it's truly a pleasure to be free of the bug. If you want to install an EPROM (2716) in U11 with the fix, you must remove the inverter between U17 and U11 and rewire U11 pins 18 and 21. To remove the inverter, find the trace between U16 pin 10 and U11 pin 20 and make a small cut with a razor blade. Then add a jumper wire from U17 pin 5 to U11 pin 20. Isolate U11 pin 18 from +5v and tie it to 0v. Isolate U11 pin 21 from clock 02 and tie it to +5v. I accomplished the last 2 steps by soldering a small wire between pins 12 and 18 directly on the chip for 0v and between pins 21 and 24 for +5v and then put the PROM in the socket with pins 18 and 21 sticking out to the side. These steps are necessary as the 2716 uses logic low levels for output enable and chip select rather than the high levels the original ROM used. See Peter Hitt's letter in the August issue for more background on EPROMS and ROMS.

If you have a modem that you want to interface to the C1P/SII the most common recommendation to obtain a negative voltage for the RS232 driver is to use a 9v battery since the C1P only has a +5v supply. This isn't always necessary as pins 9 and 10 of the 25 pin modem connector quite often have positive and negative test voltages. Although this is optional, my Livermore Star (now Prentice?) does provide these voltages and the current is sufficient to be used as the negative voltage for the interface. Possibly Novation and Lexicon modems provide these voltages also. Wire the modem pin 10 to SII J3 pin 7 (goes to R64) and cut W10 and you're in business without the battery.

Continuing last month's column on game reviews, here are my thoughts on a couple more.

AAARRRGGG - Pretzelland - BASIC - $7.95 - We like this

one even though you sometimes do get the feeling the title suggests. The controls do exactly what they're supposed to do and the display matched my system nicely. The object of the game is to chase targets around the screen. Each target has a different point value. You want to accumulate the most points by catching them before they disappear. Simple, but we enjoy it. Pretzelland uses what they call a 'Standard Keyboard Layout'. Their standard is:

ESC	UP
CTRL	DOWN
L/SHIFT	LEFT
R/SHIFT	RIGHT
REPEAT	SHOOT

You don't have to relearn which keys do which function. I laud their efforts, however, it really seems the choice of keys was made to facilitate the programmer. By using all row zero keys it is not necessary to disable the control C routine and everything can be checked with just a PEEK. Everyone in my family prefers using the / for left movement instead of the left shift key. This way up and down movement is controlled with one hand and left and right movement is done with the other. I made this small change to my copy and I feel the game is much more playable this way.

Video Games III - Orion - Machine Language - $14.95 - Three games for the price of one seemed like too good a bargain to be true but I took the bait anyway. As is the usual case it wasn't quite true. Really 3 variations of the same game. Still, if the game is good I don't mind paying the price. These are 'Asteroid' type games and as the instructions state 'is there such a person who hasn't heard of Asteroids'? Well I'll admit that I had never played the real thing but I don't think it would be as popular as it is if this were it. Once you fire your thrusters you're at the mercy of the keyboard scan routine and you might as well forget about scoring until you get under control which is not easy to do. The only way to slow down or stop is to turn around so you are flying backwards and then use your thrusters again. This usually results in not enough or too much thrust whereupon you must again turn around and use your thrusters, etc, etc. Meanwhile your opponent is racking up points and laughing at your foolishness. Consequently, there isn't much incentive to use the thrusters except that when the games starts the opponents are out of range of each other so someone has to do it. Can't say that I enjoy this one very much but with a little rework it could be acceptable. The other 2 variations have the same fault. Orion is very slow to process orders. It took 4 weeks to get my order and either 3 or 8 weeks to get their catalog. I sent 2 requests 5 weeks apart.

In my evaluations, I try to be objective and really do try to make the games work. After all I buy them with the expectation of enjoyment, not to review. If a particular game doesn't click the first time I try it, I set it aside and try again in a few days.

★

FDSAP - SOFTWARE REVIEW

by: Brian Hartson
Asst. Tech. Editor

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Sometime ago we received a machine language program called FDSAP - Floppy Drive Service Aid Program, from Ken Holt of H/B Computers. I must say that this program has to be one of the best service aids for the servicing of floppy disk drives that I have seen for MA-COM/OSI computers.

A list of some of the functions are;

- Select drive A,B,C,D
- Home the selected drive
- In step the head one track
- Out step the head one track
- Track step to track
- Set stepping rate
- Write test pattern
- Verify test pattern
- Alternating seek
- Exercise the disk

The above is but a partial list of the functions available to test and exercise the drive. While this a great program and I don't know how I did without it for so long, it does have a few minor things that could be corrected.

The first item is that this program does not format the disk in an OS65U compatible format. While this may sound trite, it is still a worthwhile utility.

The second item is something dear to all of us, ERROR 17. It has been my experience with this package that it will not find fault with a drive that gives this system error.

I have been sounding off about FDSAP's shortcomings which are few, I strongly feel that this program is one that every tech. should have. It is well written and the documentation while short is concise and appears to be written with the novice in mind. I recommend FDSAP to every technician and to anyone who feels the need to keep a check on the performance of their system.

For availability and cost contact Ken Holt at H/B Computers, 217 E. Main St., Charlottesville, VA 22901

★

TMAKER-II
Our CP/M **VISI**ble **CAL**Culator

by Al Peabody

We were very excited when Lifeboat Associates recently announced the availability of TMAKER/II, an "electronic spreadsheet" program which will run on OSI computers with CP/M. Through the cooperation of Lifeboat, we were able to obtain a copy to review for you.

Now we have tried it, and we are even more excited. Turns out, T/MAKER II does much more than make tables.

Here's how it works. First you must configure the program to your system (more about that later), then use a very powerful editor to type in a table or **any other** text file. The file may include equations which will cause certain lines or columns to be calculated from other lines or columns, but it doesn't have to.

Next, you type in "compute" and the equations are applied to the values in the table, producing the desired new figures, which are nicely formatted, with commas and decimal places where you want them, and all lined up.

Finally, you "clean up" your table, removing the equations, and print it out. What started out as, perhaps, your budget for the month or your profit/loss statement, with just the raw data entered, now is nicely formatted, with totals drawn, expenses subtracted from income, percentages calculated, changes, percent of change, maximum, minimum, etc., etc. all neatly indicated.

So much for the "normal" use of TMAKER. Don't get me wrong. If the program did no more than that, it would be well worth the price. But like I said, it does **much** more.

First of all, the full-screen editor included in the package to let you type in tables is fantastic, just short of WordStar. It accepts text, moves lines or blocks, finds and replaces, inserts, deletes and does all that fancy stuff the other word processors do, including justification of text.

Secondly, there is a sort program which will sort all the lines in your table (file) in either numeric or alphabetic order, based on any location on the line (maximum line length 300 characters). So for example, you could use T/MAKER II to type in your list of names and addresses, always putting the names first, then addresses starting at the same position on the line, then zip code, again always starting at the same position.

Now type "sort 1 30" and in a flash your name file is sorted by the first 30 characters on each line (the names). Make a copy of the file, load it and type "sort n 70 75" (assuming the zip codes start at position 70 on each line) and quick as a wink you have a zip sorted name list. Super. And we haven't even gotten into the mathematical abilities of TMAKER!

Wait, there's more. Who says math is only useful for tables of numbers? One of the things T/MAKER II can do is count. Add just one marginal notation, and while it is generating your alphabetical name list, T/MAKER II will count the names on the list. With just a little more effort, you could count names with positive balances due, or names west of the Mississippi, or ...whatever your imagination can dream up.

But where T/MAKER II really

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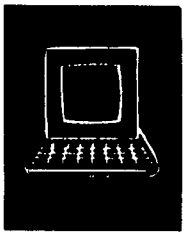

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shines is in what it is designed for -- making numerical tables. I have been working with it for weeks, and haven't come close to the limits of what it can do.

There is room for 7 equations down the left margin, with the results of any calculations being usable as the inputs to new equations (like the total expenses become a minus in the equation for net profit).

Equations adding (or subtracting or dividing or multiplying or averaging or counting or whatever) across the page can be applied to every line, to every line which was not produced as the result of another equation, to every line which **was** produced as the result of another equation, to just the next line, or to all the lines until you tell it to stop.

You can even use T/MAKER II to make tables too wide for your screen and printer. As you move the cursor over to the right edge of the screen, it all shifts left, so what you see on the screen is a "window" into a part of your table.

Then, when you print the table out, just let T/MAKER II know where you would like to break the table (preferably between two columns), and it will print out the left half, then the right half on the next page, ready for you to paste together!

Then there is the macro capability, in two flavors. If you find you are entering the same sequence of keystrokes over and over, you can quickly define them as a "macro" and re-enter them by striking a single key.

The second flavor of macro works like this: enter your monthly financial statement or projection, then on the very top line, type something like:

"save compute clean print"

Now return to the command mode by typing Ctrl-Q (for quit), and respond to the standard prompt ("What next?") by just typing DO. T/MAKER II will first save your file, then do the computations, then remove the formulas and line up the numbers, then print it out. If you had typed "save compute clean print get filename edit," T/MAKER II would even print out one version, then present it to you for editing, so you could see what would happen if sales went up 10% or inflation were 3% higher or whatever.

In short, T/MAKER II will do whatever you want it to do.

With a program (really a whole programming system) this complex, the manual had better be good. Good news. It is. It could be better, but it is good. It is divided into sections: initializing the system, a tutorial, and a reference section. There is even a little cardboard quick reference section you can keep with the disk to help you remember all those commands.

Problems? Sure, every system has problems. The main problem with T/MAKER II is that it is so powerful, so comprehensive, that it is somewhat frightening to start using.

First of all, there is that initialization process. You have to go through a whole menu, each selection in which leads to another menu or long list of questions, just setting up the system for your particular terminal type, which keys you want to use for cursor movement, character delete, insert line, etc., etc.

The first 19 times I tried it, I wound up specifying the same character combination for at least two functions (keep notes, dummy), and that produced some interesting but nonproductive results.

Then, again because there are so many commands and features, it isn't easy to remember how to do things. That's where the little cardboard reference guide comes in. There are even blanks to fill in what you have changed the "standard" controls to, so by faithful use of the guide, sooner or later you become proficient. And once you are, look out! You can do most anything!

★

UNSTALL YOUR PRINTER

By: David Broadt
Broadt Computers
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Lewisburg, PA 17837

Those of us who sit behind a computer keyboard for what seems like 25 hours a day, 8 days a week, learn many little tricks and interesting things about the operating systems. Most of them do not seem worthy of writing about; but then after telling one of these facts to someone, I find it mentioned in one of his articles in PEEK (65). I only mention this because it made me aware of the value these things can be to other OSI programmers.

So much for small talk, let's start in. I would like to explain in a little more detail the inadequate printer stalled routine in 65U. In machine code it is necessary to have timing loops within timing loops to count off several seconds. The #5 driver routine in 65U tests for printer busy in the outer loop instead of the inner loop where it should be doing the test. If busy goes low a few microseconds after the test, the system will still be tied up in the inner loop. This can deteriorate the data transfer rate to the printer; the degree is dependent on the printer's firmware.

Although POKEing 15886 with numbers larger than 12 will increase the stall delay it also reduces the data transfer rate by increasing the time of the inner loop. To illustrate this: POKE 15886,100 then output a program with LIST #5. An MX80, ML80, etc. will print very slowly. POKEing 15896,0 prevents the stall notice, but does not improve the data transfer rate.

Since I feel the stall notice is more bother than it's worth, the simple solution is to replace the timing loop with a 4C jump that locks the system in a high speed busy test as in 65D. Just POKE 15885,76: POKE 15886,7: POKE 15887,62 and most parallel printers will run significantly faster than before. Here is another simple little trick: terminate all PRINTS to the #5 port with a CHR$(13); (don't forget the semicolon). This will allow BASIC to continue to crunch data while the printer is printing. Now, if you are wondering about the line feeds, all you have to do is preceed each PRINT statement with another PRINT: which resets BASIC'S TAB pointer and produces a line feed. Also, put one additional PRINT at the end of the report to force the printer to line feed the last printed line.

If the editor is willing, I'll be back again with a few more tricks. Until then, happy bug hunting.

continued

Tech. Editor's note:

It works great, 25% faster on program listing with level 3 and Okidata SL125 and yes! please send us more tricks!

Dick

★

TERMINAL INDEPENDENCE AND OS-65U VERSION 1.3

By: David A. Weigle
108 N. Missouri Ave.
Morton, IL 61550

One of the concepts announced with version 1.3 of OS-65U is that of terminal independence. In the reference manual discussion about the Line Editor the statement "The EDITOR is terminal independent..." is made. This is not entirely true as those of us who do not use a Hazeltine 1420 terminal (mine is an ADDS-25) have already discovered or soon will. (There is a lot of similarity between the line editing commands of OS-65U V1.3 and the WP-3 word processing package in format and orientation to the Hazeltine 1420 terminal.)

For example, Control-F is used to signal that a non-destructive cursor move to the front of the line (left-most byte) is desired. (For Extended Input Mode this signals a non-destructive cursor move to the left-most byte of the input field on the screen.) For the ADDS-25 terminal, Control-F is the forward space character. This means that it is impossible when editing a line with EDITOR or inputting data to do forward cursor movement. Entering Control-F or depressing the "->" (forward arrow) key results in the cursor being positioned at the beginning of the data field on the screen.

The following information is provided to assist in customizing the Line Editor and/or Extended Input Mode function of OS-65U version 1.3 to work with terminals other than Hazeltine and to recover the use of the commercial "at" sign ("@") and the underscore character ("_"); the "@" and the "_" are used to request line and character deletion, respectively, in the system as supplied by OSI.

Modifications to the system may be made in the programs initializing the functions (EDITOR and INP$), through the terminal when in immediate mode or in an application program. If modifications are made in either EDITOR or INP$, they should be made at the point these programs exit and return to the system menu. When the term "initial value(s)" is used it means the decimal number content(s) of memory location(s) following activation of the Line Editor or Extended Input Mode. The memory locations are the same for both facilities.

Memory locations 23699 and 23700 are both used to identify the delete character code (destructive backspace). The initial value of location 23699 is 127, the DELete character. The initial value of location 23700 is, 95 the underscore "_". Location 23700 may be changed (why not to 127?) to enable the underscore to be used.

Location 23701 is used to identify the line delete code. The initial value is 64, the commercial "at" sign ("@"). Changing this memory location (e.g., to 5, the value for Control-E to mean "erase line") permits use of the "@" character.

Locations 23702 and 23703 contain the codes to be recognized as incoming forward space and incoming backspace commands respectively. Locations 23734-23740 contain the code(s) to be echoed to cause a forward space. Locations 23741-23747 contain the code(s) to be echoed to cause a backspace. For most terminals these echo codes would be one character. The structure appears to provide for an echo command of up to six (6) characters. A zero (0) in a memory location denotes that the previous location was the last character in the command sequence. All of these values are contained in the terminal parameter file "CRT 0", and are placed in memory during initialization of the Line Editor or Extended Input Mode.

Location 23704 contains the code to be recognized for "toggling" between character insert/overstrike modes. The initial value is 20, Control-T. Location 23721 is used to indicate which mode is currently in effect. (See the reference manual for more information).

Location 23705 contains the code entered from the terminal to request a non-destructive cursor move to the front of the line. The initial value in 6, Control-F.

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Location 23706 contains the code entered from the terminal to request tabbing eight (8) character positions to the right". The initial value is 9, Control-I.

Location 23707 contains the code entered from the terminal to request a non-destructive cursor move to the rear of the line. The initial value is 18, Control-R.

The above changes address only one of the problems associated with achieving terminal independence using V1.3. Program "BEXEC2" which is for terminal setup does not provide a facility to add a terminal definition to the set of terminals currently included. (From the comments in this program one gets the impression that this is the program which someday will support the addition of terminal specifications to the terminal parameter file "CRT 0".) If your terminal is not one of those included in the current parameter file, how do you go about adding it?

For the discussion which follows it is recommended that the reader refer to the "CRT Control Codes Subroutine" article in the Programmer's Reference Guide portion of the V1.3 reference manual (or a listing of program GETCRT) and a dump of the "CRT 0" file. This material will show you how terminal data is stored in the parameter file and how it can be retrieved from computer memory for use in an application program.

Each record in the CRT file contains 11 fields each 71 bytes in length. The data in all fields but the first one has the format of a series of three (3) decimal digits followed by a space (blank). Three (3) zeros (000) denote the end of the data string for the field.

The first field contains the name of the terminal. It is used by the terminal setup program (BEXEC2) in preparing a menu from which a particular terminal can be selected for setup.

The next four (4) fields specify the codes to be used to define incoming forward and backward space commands and the codes to be echoed to the terminal to cause forward and backward spacing of the cursor. So far it seems fairly simple. Now comes the complicated part.

The next field (field #6) is named "ADDRESS CURSOR". This is a deceptively simple name. This field is used to define the control sequence to tell the terminal that the cursor is being addressed; if screen coordinates are to be x,y or y,x format; if there is a delimiter character to follow the x or y coordinates in the PRINT statement; what offset is to be added to the logical x and y coordinates to calculate the physical screen coordinate values; and, if the x and y coordinates are to be presented to the terminal as alphanumberic or numeric characters. When writing a program to add your terminal to the parameter file, once you get past determining the data for this field the rest is easy!

The first three digits specify the first character in the cursor addressing sequence and whether x, y (column,row) or y,x (row,column) addressing is used for the terminal. If your terminal uses x,y addressing, then the value you would specify is the actual code of the first command character. If the terminal coordinates are addressed as y,x then this value is to be specified as 128 greater than the actual value.

The next three digits are interpreted as follows: If they are zero (000), then there are no more characters in the cursor control sequence (preceeding the x and y coordinate specifications) AND there are no delimiter characters required by the terminal in the cursor positioning PRINT statement. If there is a value and it is less than 128, then this value is part of this cursor positioning control sequence (you may need to code several sets of values to specify all the characters making up the lead-in sequence for the cursor positioning command). If the value is 128 or greater then it is the first character of the first delimiter value.

If there is to be more than one character making up the first delimiter, the additional characters are specified in a series of three-digit numbers until all have been given at which point three zeroes (000) are coded. If there is a second delimiter to be used its values are coded next; "000" is coded when all characters comprising this delimiter have been specified.

The next two three-digit numbers specify the displacement to be added to the x and y logical coordinates to calculate the actual physical screen coordinates. The x-coordinate value specification is also used to identify whether the terminal expects screen coordinates to be specified as alphanumeric or numeric characters. If the screen coordinates for your terminal are given as alphanumeric characters, then code the actual displacement values for your terminal. If the screen coordinates for your terminal are given as numeric characters code the x-coordinate displacement as being 128 greater than the actual displacement and the value of the y-coordinate displacement as it actually is.

The remaining fields to be coded are for the commands to be sent to the terminal to clear the screen, clear to the end of the screen (page), clear to the end of line, set foreground and set background.

Now for an example of adding a terminal to the system. The following program was used to include my ADDS-25 as one of the terminals supported (note: Extended Input must be activated in order for this program to run):

```
10  OPEN "CRT 0","PASS",1:
    REM OPEN PARAMETER FILE
20  INDEX<1> = 9 : REM SET FOR
    READING END-OF-DATA
    POINTER
30  INPUT%1, EOD : REM READ
    END-OF-DATA POINTER
40  INDEX<1> = EOD : REM SET
    INDEX FOR ADDING DATA TO
    FILE
50  FOR K = 1 TO 11 : REM SET
    LOOP COUNT FOR 11 FIELDS
60  READ A$ : REM PICK UP
    FIELD DATA ITEM
70  PRINT%1, [71,"L"] A$ : REM
    WRITE FIELD DATA ITEM
80  NEXT K : REM LOOP CONTROL
90  EOD = INDEX(1) : REM GET
    NEW END OF DATA POINTER
100 INDEX<1> =9 : REM SET TO
    UPDATE FILE HDR WITH NEW
    EOD PTR
110 PRINT%1, EOD : REM UPDATE
    EOD POINTER IN FILE HEADER
120 CLOSE : REM CLOSE THE FILE
200 DATA "ADDS 25" : REM
    TERMINAL NAME
210 DATA "006 000" : REM
    INCOMING FORWARD SPACE
220 DATA "021 000" : REM
    INCOMING BACKWARD SPACE
230 DATA "006 000" : REM
    FORWARD SPACE ECHO
240 DATA "021 000" : REM
    BACKWARD SPACE ECHO
250 DATA "155 089 000 032
    032" : REM ADDRESS CURSOR
260 DATA "012 000" : REM CLEAR
    SCEEEN
```

continued

```
270 DATA "027 107 000" : REM
    CLEAR TO END OF SCREEN
280 DATA "027 075 000" : REM
    CLEAR TO END OF LINE
290 DATA "000" : REM SET
    FOREGROUND (N/A FOR THIS
    TERMINAL)
300 DATA "000" : REM SET
    BACKGROUND (N/A FOR THIS
    TERMINAL)
```

Program line 250 is interpreted as meaning this terminal uses y,x (row,column) addressing (the first value is greater than 127); the first character of the cursor addressing command sequence is 27 (155 minus 128), and the second character is 89; there are no delimiter characters (the third set of digits is "000"); both x and y coordinates will need to have a displacement of 32 added to them for actual physical screen coordinates; and the coordinates for this terminal are alphanumeric (the x-coordinate displacement -- fourth set of digits--is less than 128).

After this program is run the terminal setup function can then be executed to make the new terminal the default terminal for the system.

LETTERS

ED:

After reading PEEK (65) a few weeks ago, I was amazed to see that someone actually liked WP-3. Since he or she liked it so much I thought I'd mention that WP-3.1 (the video version) works considerably better on the Hazeltine 1420 than the WP-3.2 that it is supposed to use. The commands are all highlighted and the screen actually scrolls both forward and backwards. We found this out entirely by accident and if you want to stick to WP-3, you might get a copy of 3.1 and try it out.

David Robertson
Fort Collins, CO 80525

* * * * *

ED:

A lot of people seem to be confused about how easy it is to change the name of "BEXEC*" under OS65D. Here's a short program that will handle all of the work for 8" disks. Hope this helps!

```
10 PRINT"PROGRAM TO CHANGE
   BOOT FILE NAME"
15 PRINT"OS65D VER3.2  8IN.
   DISK"
20 PRINT"..................
   ........"
30 PRINT"FIRST LOAD PART OF
   BASIC TO $4A00
35 PRINT"DISK!";CHR$(34);"CA
   4A00=01,1";CHR$(34)
40 DISK!"CA 4A00=01,1"
50 INPUT"NEW BOOT FILE";N$
55 IFLEN(N$)>6THENPRINT"TOO
   LONG" :GOTO50
60 IFLEN(N$)<6 THENN$=N$+" "
   :GOTO60
70 N$="RUN"+CHR$(34)+N$+
   CHR$(13)
80 FORI=1TO11:POKEI+20004,ASC
   (MID$(N$,I,1)):NEXTI
90 INPUT"CORRECT (Y/N)";A$
100 IFLEFT$(A$,1)<>"Y"THEN130
110 DISK!"SA 01,1=4A00/5"
120 PRINT"NEW BOOT COMMAND IS
    ";N$
130 END
```

Gary Kaufman
Philadelphia, PA 19107

* * * * *

ED:

To continue our CP/M Lifeboat dialogue:

My experience with Lifeboat continues to be less than satisfactory. After writing to them and telling them I'd like my money back because of the CP/M problems, I did get a call from them saying they would send a user note detailing a number of changes that could be made to make it work more reliably - such as changing the step rate, changing the head "lift" timing, etc. Not only do all these possible changes suggest an unreliable system - but I never got the user note from Lifeboat even after their call!

WFBIOS.COM doesn't help! (I'm disappointed in you thinking that I am so much of a novice that I didn't try that!) I have now tried running Lifeboat CP/M on three C-3's - the last using Shugart drives - all with similar results. I did get one of Siemen's drive to run at 2 MHz some of the time.

Good idea on the pokes for using different serial printers on the CA10X board! (Lifeboat told me you couldn't change the port without using DDT.)

The problem you described in your paragraph (4) sounds like you didn't use the HEX representation for the length of your .COM file.

Tom Stover
Gering,NE 69341

* * * * *

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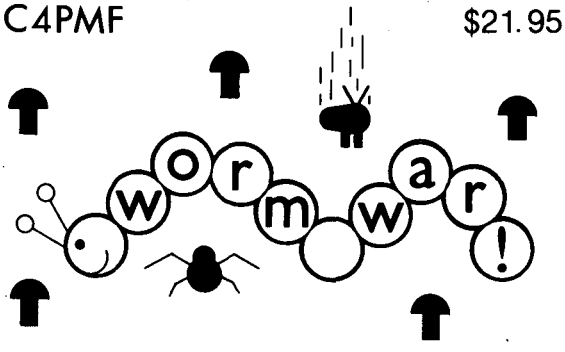

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. A general report writer for "User" specified reports

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The Accounts Payable System may be used as an extension of the General Ledger. It provides the user with the following features:

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. Detailed age analysis by invoice number
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. General report writer allows "User"specified report production

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The Payroll System includes the following features:

. Horizontal screen display for payroll entries
. Computes payroll with several extra deductions
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  Payroll checks
  Payroll Journal
  Payroll Register
  Employee listing
  Earnings list
  W-2's
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Planner extra is a time saving program you can't afford to do without. It is a program writer and report generator all in one. Don't confuse this package with other planers or report generators currently on the market. This one goes much further in that it actually generates program code and then executes it. Planner Extra goes far beyond the hobbiest's needs. It is designed for the professional business programmer or the serious "end user."

It can save a programmer many weeks of programming time in writing "print report" type programs which perform statistical functions or math operations across fields, with vertical or horizontal format. This package produces professionally laid out results which you will be very proud to add to your program.

The reports may be set up on the computer system and then remove the generating programs until you need them again. In some situations you may wish to leave all of the programs in tack for the "end user" to produce his own special reports. Once generated the reports are stored in their own 2k disk file and recalled, for change or addition of new reports.

This program will run on any OSI 8" or hard disk based computer under Level I or III. The Planner Extra is currently installed in a four year college with a five user C3-C performing all of the schools accounting, student files, payroll, accounts payable, accounts receivable and much more. The school produces reports such as budget analysis, period comparisons, conditional journals, department and budget reports for audit information, student record conditional reports and a variety of other reports from the files on the system.

Your imagination is the primary limitation to this package. There are virtually thousands of uses for the Planner Extra package. A few such uses are: journals, budgets, cost accounting, comparison charts, probability tables, stock trends, grade averages, statistical analysis, audit reports, payment schedules, interest schedules, and most any report that involves conditions, statistics, math formulas, constants, or percentages with vertical or horizontal format.

The possibilities are too numerous to list. No other program can even begin to compare to the features of Planner Extra.

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* Produce complicated math operations across fields
* Produce results in non-existant fields which you specify and name.
* Math operands : +,-,/,*,(,),constants.example: 6=(5+2)-3*4)/1+(100) where the numbers 1-5 are existant field numbers, 6 is a non-existant field and the (100) is a constant.
* Up to ten lines of formulas can be entered to perform operations across fields.
* Conditions can be tested on any part of a field, entire field or even '&' sign for don't care. (condition on 3rd. and 4th character of a field.
* Condition specifier's: <, >, <=, >=, <>, =, between two limits.
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* Specify field types:
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* Alphanumeric left justified.
* Money right justified (00.00).
* Integer & floating point.
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* Floppy or hard disk based, level I or III.

OS-65U UTILITIES

VARIABLE TABLE MAKER: $25.00

Searches the basic program and produces a list of all variables and the line number in which they are located.

SEARCH VARIABLE TABLE: $25.00

A handy programmer's tool for finding any part of a program. It lists the line number of every occurrence of a specific command, variable, string, remark, print statement or any other part desired.

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Never key in another disk handling routine. The following routines can save the programmer hours of time producing and modifying code. They contain all of the necessary code for opening files, inputting from disk, printing to disk, or searching for a string with the "find" command.

All routines are DMS compatible and are stored in a disk file for quick merging into your basic program as needed If you are just learning the OS-65U operating system, writing your first multi-user programs, or just need a good standard format for the DMS file handling, then these routines are just what you need.

The routines all share common variables and set flags for different optional file handling needs such as time-sharing file locking or when to close. Each routine can handle opening and closing, input and output, string searches, or time-share locks of each and all of your files. The user only sets the variables and flags, and then, GOSUB to the routine.

The flags will determine whether a file will be left open or locked. All file header information is contained in memory and there are separate variables for each open file. The channel number variable determines which file is being accessed after the initial opening.

These routines will serve as a learning tool or as a quick method of programming disk handling routines.

DISASSEMBLER: $25.00

The Disassembler program lists out the machine code from the operating system or any other part of memory. It prints headings, dates and remarks on the top of each page of the listing. It contains fields for decimal address, hex address, contents mnemonic, and a remark column.

It is a useful tool for finding out about the operating system or a machine code program. You can specify the start and end address that you want to list. Two other programs on the disk convert hex to decimal or decimal to hex.

DMS COMPATIBLE ENTRY PROGRAMS: $99.00

These programs are set up for easy entry of data from a serial terminal using verticle or horizontal format. All that is required is that you specify the file name or disk device. These can be input on each run or set in program lines.

The horizontal format can be used on any file with a record length of less than 80 bytes. It provides for character backspace and field backspace for easy editing. Items may be duplicated from the field above by pressing the return key. The verticle format entry is similar to the DMS entry and edit in its format, except, it is much cleaner in format.

It lists each line, one under another, and the entry is made to the same line. If you back up a field the cursor moves up the screen without destroying the display. It also has character and field backspace abilities and duplication abilities.

Editing may be performed by field label search, string search, record number search, and key file search. Any record may be sent to the screen or printer or you may dump the file header labels to the screen or printer.

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Prices subject to change without notice.

ED:

Below, you will find a somewhat belated response to Tom Westhoff's letter (June 1981, p. 11) in which he asks for help with 14 points of improvement of the MONITOR ROM of the C4P.

The Math-extension (No. 14) seems to be difficult, and I don't think it has anything to do with the MONITOR ROM. But the rest is o.k. with me.

No's. 6 and 7 have already been dealt with, 2 and 3 are quite simple, and I will try at No's. 1 and 4 (see assembler-listing below).

I would also like to add a No. 15: CONTROL-S for stopping the output and CONTROL-Q for resuming it. This can easily be implemented in the output routine and I think I have already seen it somewhere in PEEK.

I'll make a try at No. 10 (Os after CR) next time, there have been some nice suggestions PEEK.

Axel Unterschuetz
W. Germany

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```
ØØØØ                        ;Keyboard Routine for C1P
ØØØØ                        ;by Axel Unterschuetz
ØØØØ                        ;Manrade 41
ØØØØ                        ;D-23ØØ Kiel
                ;-------------------------------------------------------
Ø214    TIMER   EQU     $214    ;counter for number of loops
Ø216    TIMECOU EQU     $216    ;mem. to save timer
Ø217    CHARCOU EQU     $217    ;counter for number of char's output
Ø212    CTRLBYT EQU     $212    ;this Byte is used to  switch  off
ØØØØ                            ;the real rubout (if it contains $77
ØØØØ                            ;it is  supressed)
Ø215    CODENOW EQU     $215    ;key -code currently being worked on
Ø213    CACHE   EQU     $213    ;used for  various storages

D7ØØ    SCR     EQU     $D7ØØ   ;last page of video
ØØ8Ø    LEFMAR  EQU     $8Ø     ;left margin of visible line
ØØBF    RIGMAR  EQU     $8Ø+63  ;right margin of visible line
Ø04Ø    LINELEN EQU     64      ;actual line length (32 or 64)

DFØØ    KEYBO   EQU     $DFØØ   ;polled keyboard
AØ84    TAB3    EQU     $AØ84   ;Table of BASIC commands

Ø2ØØ    SCRNPOI EQU     $2ØØ    ;screen  pointer used by BASIC
ØØØE    TCC     EQU     $ØE     ;Terminal Char. Count (BASIC)

ØØ8C    FIRTIME EQU     14Ø     ;delay time for first repeat
ØØØF    REPTIME EQU     15      ;delay time for next repeats

                ;-------------------------------------------------------
1ØØØ            ORG     $1ØØØ
                ;-------------------------------------------------------
1ØØØ                            ;This part of the Keyboard Routine gets
1ØØØ                            ;the ASCII-Code of the key pressed at the
1ØØØ                            ;moment it is called.
1ØØØ                            ;if no key is pressed the result will be Ø
1ØØØ                            ;there is no more SHIFT-confusion, but
1ØØØ                            ;the tradeoff for that is the loss of a
1ØØØ                            ;few signs: the rectangular brackets
1ØØØ                            ;and the up-arrow. This last one is neces-
1ØØØ                            ;sary, so it was assigned to (SHIFT Ø).
1ØØØ                            ;(SHIFT O) is taken over by rubout
1ØØØ                            ;(SHIFT P) by LINE FEED
1ØØØ                            ;the information how SHIFT and CONTROL
1ØØØ                            ;affect each key is stored in the two
1ØØØ                            ;highest bits of the code in TAB

1ØØØ 8A     TAST    TXA                     ;save X and Y
1ØØ1 48             PHA
1ØØ2 98             TYA
1ØØ3 48             PHA
1ØØ4 A9Ø2           LDA     #2
1ØØ6 2Ø7A11 L1      JSR     ATOKEBO
1ØØ9 48             PHA
1ØØA 2Ø8211         JSR     KEBOTOA
1ØØD AA             TAX
1ØØE 68             PLA
1ØØF CA             DEX
1Ø1Ø E8             INX
1Ø11 DØØA           BNE     PRESSED         ;Key Pressed
1Ø13 ØA     L2      ASL     A
1Ø14 DØFØ           BNE     L1              ;test next row
1Ø16 A9ØØ   ERROR   LDA     #Ø              ;result Ø if error
1Ø18 8D15Ø2         STA     CODENOW         ;save it
1Ø1B FØ5E           BEQ     AUS

1Ø1D 4A     PRESSED LSR     A
1Ø1E BØF3           BCS     L2              ; it is a special key
1Ø2Ø 2Ø8811         JSR     LOG
1Ø23 98             TYA                     ;get row number
1Ø24 8D13Ø2         STA     CACHE
1Ø27 ØA             ASL     A
1Ø28 ØA             ASL     A
1Ø29 ØA             ASL     A
1Ø2A 38             SEC
1Ø2B ED13Ø2         SBC     CACHE
1Ø2E 8D13Ø2         STA     CACHE
1Ø31 8A             TXA                     ;get column number
1Ø32 4A             LSR     A
1Ø33 2Ø8811         JSR     LOG
1Ø36 DØDE           BNE     ERROR           ;more than 1 key pressed
```

7B, C, D

Key values must be changed

cont.

```
1Ø38 18              CLC
1Ø39 98              TYA
1Ø3A 6D13Ø2          ADC CACHE
1Ø3D A8              TAY
1Ø3E B9E111          LDA TAB,Y          ;get code from lookup table
1Ø41 CD15Ø2          CMP CODENOW
1Ø44 FØØ7            BEQ KOR            ;same key as last time
1Ø46 8D15Ø2          STA CODENOW        ;save it
1Ø49 A9ØØ            LDA #Ø             ;but give Ø as result
1Ø4B FØ2E            BEQ AUS
1Ø4D C9FF    KOR     CMP #$FF           ;now check if special key pressed
1Ø4F DØØ4            BNE SPECIAL        ;it was not CR
1Ø51 A9ØD            LDA #$ØD           ;else
1Ø53 DØ26            BNE AUS            ;output code for CR
1Ø55 A9Ø1    SPECIAL LDA #1             ;search for special key
1Ø57 2Ø7A11          JSR ATOKEBO
1Ø5A 2Ø8211          JSR KEBOTOA
1Ø5D AA              TAX
1Ø5E 294Ø            AND #%Ø1ØØØØØØ
1Ø6Ø DØ42            BNE CTRL           ;Control key pressed
1Ø62 8A              TXA
1Ø63 29Ø6            AND #%ØØØØØ11Ø
1Ø65 DØ1F            BNE SHIF           ;SHIFT key pressed
1Ø67 8A              TXA
1Ø68 4A              LSR A
1Ø69 9Ø39            BCC CTRL
1Ø6B AØØØ    OK      LDY #Ø             ;all ready
1Ø6D 8C13Ø2  RE      STY CACHE          ;store offset to ASCII-code
1Ø7Ø AD15Ø2          LDA CODENOW        ;get raw code
1Ø73 293F            AND #%ØØ111111     ;mask info-bits
1Ø75 18              CLC
1Ø76 692Ø            ADC #$2Ø           ;convert to capitals
1Ø78 6D13Ø2          ADC CACHE          ;add offset
1Ø7B 8D13Ø2  AUS     STA CACHE          ;save complete code temp.
1Ø7E 68              PLA
1Ø7F A8              TAY                ;restore Y and X
1Ø8Ø 68              PLA
1Ø81 AA              TAX
1Ø82 AD13Ø2          LDA CACHE          ;get code back
1Ø85 6Ø              RTS
1Ø86 AD15Ø2  SHIF    LDA CODENOW
1Ø89 C99Ø            CMP #$9Ø           ;are SHIFT and Ø pressed?
1Ø8B DØØ4            BNE NOR            ;no
1Ø8D A95E            LDA #$5E           ;else get code for ---
1Ø8F DØEA            BNE AUS
1Ø91 29CØ    NOR     AND #%11ØØØØØØ    ;if no info-bit set
1Ø93 FØD6            BEQ OK             ;SHIFT has no influence
1Ø95 C9CØ            CMP #%11ØØØØØØ    ;if all info-bits set
1Ø97 FØD2            BEQ OK             ;also no influence
1Ø99 ØA              ASL A
1Ø9A BØØ4            BCS SH1            ;if info-bit 7 set
1Ø9C AØ1Ø            LDY #$1Ø           ;info-bit 7 clear, so code must
1Ø9E DØCD            BNE RE             ;be incremented by $1Ø
```

continued

ED:

I have just recently discovered your fantastic magazine. It really has been helpful. I have a few questions about my C-4P MF system.

First of all, the music software mentioned in the January '82 issue for the C-100 systems (page 1), is it the same, better, or what, when compared with the old DAC routines? Is there someone who has some really excellent routines for music for an OSI C-4P MF?

Secondly, where can one find inexpensive M.P.I. drives and not from OSI themselves? I have seen the ad for Midwest Computer Peripherals in Kilobaud, but don't know if they are OSI compatible.

Please respond.

Bill Fast
Clearbrook, B.C.

Bill:

DAC I & II from OSI play 4 part music. It also allows you to write your own music. Why doesn't someone out there write a review on it?

Any 5-1/4" soft sectored single density drive should work. If you are going to use it as the B drive, OSI doesn't use the standard floppy drive buss. They change select and ready for the second drive. Refer to the Sams manual for the C4P. It would also be a good idea to purchase the technical manuals for the disk drives too. In reference to the M.P.I. drives, contact, Micro Peripherals, Inc., 9754

cont.

NEW
FULLY DOCUMENTED
COMPREHENSIVE

A PAYROLL PACKAGE

DMS COMPATIBLE

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Germantown, Maryland
20874

A Payroll Package designed with the following features:

- DMS compatible employee files
- Hard or soft disks
- Multi-company usage
- Support of serial or parallel printer
- Configurable for various CRTs

Program includes:

- Up to 52 taxing authorities
- Check printing routine
- Comprehensive list of deductions
- Generation of forms 941 & W2
- Provision for multiple department code charges
- Crediting for vacation and sick hours earned

A detailed Manual of Instructions is available for review. The Manual's price of $10.00 is deductible from the cost of the Payroll Package.
Price includes 1 year's free update on program improvements !
Alternative individualized check printing routines optional.
Total Payroll Package $390.00
check or money order.

Dealer Inquiries Invited Allow 2 weeks for delivery

digital technology

BUS-II LEVEL I BOOKKEEPING & ACCOUNTING SYSTEM

The BUS-II turn-key multi-client accounting package is the leading OSI business software package. BUS-II Version 32 includes five principle modules:

	Inst. Price	List Price
GENERAL LEDGER	$1200	$599
ACCOUNTS RECEIVABLE (a)	1000	599
ACCOUNTS PAYABLE (a)	1000	599
ORDER ENTRY W/ INVENTORY (a) (b)	1000	599
PAYROLL (no extra charge for optional versions)	1200	799

01 - STANDARD MULTI-STATE OPERATION
02 - CPA FIRMS & SERVICE BUREAUS
03 - RESTAURANTS
04 - COMMISSION SALES
05 - CONTRACTOR'S JOB-COST ACCOUNTING

The Accounts Receivable, Accounts Payable, and Order Entry W/ Inventory are completely interactive with the BUS-II General Ledger. Two optional specialized packages (completely interactive) are also available.

CPA EXTENSIONS (see below)
POINT-OF-SALE TERMINAL W/ INVENTORY (see below)

The BUS-II CPA EXTENSIONS Package provides special features for accountants and bookkeepers. The POS-1 Point-of-Sale Terminal package enables the operator to use the computer system's video terminal as an on-line "electronic cash register."

Note: BUS-II operates on floppy-disk or hard disk-based systems running the OS-65U operating system (single-or multi-user). Multi-client use can accommodate any number of client companies on floppy disk systems or hard disk system with H/D/E (required for hard disk use). BUS-II LEVEL I files are limited in size for floppy disk back-up; floppy disk operation continues in case of hard disk failure.

BUS-II "SOFTWARE EXCHANGE" SPECIAL

Users of other business software packages who wish to upgrade to Digital Technology's full-function BUS-II BOOKKEEPING & ACCOUNTING SYSTEM can, in many cases, "trade in" their old, unuseable, or unsupported software for full rebate of the original purchase price (up to $750.00). This "SOFTWARE EXCHANGE" offer includes virtually all of the previously-available OSI business software packages. Contact Digital Technology or your dealer for more information.

BUS-II LEVEL II (EXPANSION TO BUS-II LEVEL I)

BUS-II LEVEL II is designed for much larger businesses. Expanded file size and special operations allow virtually unlimited numbers of accounts and transactions. BUS-II LEVEL II requires BUS-II LEVEL I. Minimal back-up is data cassette (tape) or floppies--although multiple Winchester disk operation is recommended (provides ability to continue computerized bookkeeping functions in case of hard disk failure.) H/D/E Hard Disk Executive is required.

	Inst. Price	List Price
GENERAL LEDGER (c) (d)	$	$399
ACCOUNTS RECEIVABLE (c) (d)	600	399
ACCOUNTS PAYABLE (c) (d)	600	399
ORDER ENTRY W/ INVENTORY (c) (d)	600	399

CPA EXTENSIONS PACKAGE

CPA EXTENSIONS is designed for public accounting firms. A number of special operations are provided: "bankers" Balance Sheet and Profit and Loss statement with summarization and consolidation options, Statement of Changes in Financial Position, Statement of Changes in Components of Working Capital, Cash Flow Analysis, Departmentalized Sales Analysis, Asset Depreciation Schedule (compatible with TAXMAN-1040), and Loan Amortization Schedule. In addition, a pre-processed or "after-the fact" payroll system is provided.

CPA EXTENSIONS is interactive with BUS-II 32 BOOKKEEPING & ACCOUNTING SYSTEM

CPA EXTENSIONS (a) Inst. Price $2400 List Price $1500

POINT-OF-SALE TERMINAL

POS-1 is an on-line multi-store point-of-sale terminal program with integrated inventory designed for cash register emulation. POS-1 controls cash drawer and ticket printer (or system printer). Automates taxable or nontaxable sales, cash transactions, and credit sales (with verification operations). POS-1 also allows the use of industry-standard bar code readers with the point-of-sale terminal system through a "Siamese port-- on the C2 or C3 CPU card. (Extra serial port NOT needed except in multi-user operation.) Configured for industry-standard RS232 bar code "wand" (INTERMEC) or "window" (SPECTRA-PHYSICS).

POS-1 is interactive with the BUS-II V 3.1 BOOKKEEPING & ACCOUNTING SYSTEM.

POS-1 POINT-OF-SALE TERMINAL (a)(b)
Inst. Price $1600 List Price $1199

TAXMAN-1040 PERSONAL INCOME TAX PREPARATION

TAXMAN-1040 is designed for tax practitioners and public accountants. TAXMAN-1040 is the leading tax package for OSI micorcomputers--the package has been installed on OSI, Hewlett-Packard, DEC and IBM systems. Designed and supported by CPA tax experts. This package automatically prepares FORM 1040 and 32 schedules. Support includes annual forms, tax tables, and computational revisions in accordance with Federal Tax Law changes.

TAXMAN-1040 Inst. Price $3600 List Price $2399

H/D/E HARD DISK EXECUTIVE

Digital Technology's implementation of H/D/E is the answer to AMCAP's HDM. Digital Technology's H/D/E provides user functions not found on HDM of similar products: ability to copy from any user "system" to another; automatic recovery in case of "back-up to floppy" or "restore from floppy" utility failures, allowing the user 3 options: (1) ignore error, (2) abort to menu, (3) try again; use of both "A" and "B" floppy drives to back-up hard disck files; and automatic back-up diskette initialization. H/D/E operates on any OSI Winchester disk system from 7 - 80 megabytes. Re-use of hard disk space is provided. Superior to AMCAP's hard disk manager in every respect (and Digital Technology software does not self-destruct).

NOTE: H/D/E is required when installing any Digital Technology business applications packages on OSI hard disk systems.

H/D/E HARD DISK EXECUTIVE List Price $399

OS-DMX DATABASE MANAGEMENT SYSTEM

Command-oriented OS-DMS compatible database management system. OS-DMX operates under the OS-65U V1.2 operating system (single- or multi-user). Features such as control files, extensive operating commands and the innovative HELP function, make this one of the most usable--as well as powerful--systems available for microcomputers. OS-DMX may be used instead of, or in addition to, OS-DMS Nucleus, Query, Sort; OS-DMX will replace virtually all of the specialized OS-DMS modules-- and in most applications will provide greatly improved performance.

OS-DMX Database Management System buyers will receive (no extra charge) a number of "extras" previously sold separately:

DMX-MAIL	Mailing List Management (FEB 82)
DMX-STAT	Comprehensive Statistical Analysis package (JULY 82)
DMX-COPY	Edit Database Structure after the fact (FEB 82)
DMX-MERGE	File Merge Operation (FEB 82)
DMX-TUTOR	450-Pg Tutorial w/ Demo Data Diskette (AVAILABLE)

In addition, DMX-SORT operations will be upgraded to machine-code sorting for faster operation. There will be no need to purchase high-speed sort programs separately.

OS-DMX DATABASE MANAGEMENT SYSTEM
Inst. Price $1600 List Price $1199

BISYNC-80/HASP

BISYNC-80/HASP is a full-function Multileaving Workstation package which allows communication with any remote CPU that supports a HASP Multileaving Workstation, and, as such, is ideally suited to Remote Job Entry applications.

OS-BISYNC-80/HASP (e)(f) List Price $1195

BISYNC-80/3270

BISYNC-80/3270 is a full-function IBM 3270 terminal emulator which allows the microcomputer to communicate over point-to-point telephone lines with any IBM S/360, S/370, or S30xx CPU that provides standard IBM support for one of the following:

IBM 3275 Model 2
IBM 3271 Model 2 or control unit w/ attached 3277 Model 2
IBM 3284 or 3286 printer

OS-BISYNC-80/3270 (e)(f) List Price $895

BISYNC-80/3780

BISYN-80/3780 is a full-function IBM 2780/3780 emulator allowing the microcomputer to communicate over point-to-point telephone lines with any CPU or device that provides standard IBM support for:

IBM 2780 Models 1, 2, 3 or 4
IBM 3780 w/ or w/o 3781 card punch
IBM CPU to CPU BSC communications

OS-BISYNC-80/3780 (e)(f) List Price $895

BISYNC-80/ASYNC

BISYNC-80/ASYNC is a full-function asynchronous communications package which allows microcomputers to communicate asynchronously with a mainframe or other microcomputers. This package is an ASYNC adaptation of BISYNC-80/3780 terminal emulation program, providing asynchronous communications at 75 to 9600 baud, using full IBM BISYNC protocol.

OS-BISYNC-80/ASYNC (e)(f) List Price $195

OS-BISYNC-80 SYNCHRONOUS INTERFACE ASSY List Price $395

NOTE: The prices shown in this catalog are estimates only; contact your OSI dealer for quotations. The "suggested installed price" reflects a typical business installation and includes reasonable allowance for software installation, minor program adaptation or customization, operator training, dealer support, back-up, etc. The "reference" or "list" price reflects a base price for the software for comparison purposes, exclusive of dealer installation and support.

Digital Technology, Inc., is the largest independent supplier of OSI software with hundreds of business packages in use around the world. Digital Technology software is sold by a growing number of conscientious OSI dealers and OEMs. Every package is backed by the finest support program in the microcomputer industry. All "bugs" are fixed free of charge. Updates (fixes to bugs, minor enhancements, new product announcements) are provided to all dealers and licensed users free of charge. And upgrades to new versions are encouraged (at nominal charge).

Digital Technology's software is user-obtained. In fact, no one else provides such expansive features as on-line documentation, idiot-proof prompting, and operator's manuals that are comprehensive, detailed, and accurate.

All Digital Technology software systems allow the operator to "set" the programs to the type of video terminal and printer used. The operator selects the terminal and printer types from the list provided in the "TERMINAL & PRINTER OPTIONS" program. Screen formatting and printer control are provided automatically yet may be redefined through user subroutines.

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inc.
P.O. BOX 178590
SAN DIEGO, CA 92117
(714) 270-2000

REQUIREMENTS

(a) BUS-II LEVEL I or LEVEL II G/L req'd
(b) BUS-II LEVEL I or LEVEL II A/R req'd
(c) Corresponding BUS-II Level I module(s) req'd
(d) H/D/E req'd
(e) C3 CPU W/ 56K RAM & OS-CP/M or Lifeboat Associates CP/M req'd
(f) SYNCHRONOUS INTERFACE ASSY req'd

```
10A0 A0F0    SH1     LDY   #$F0          ;else it must be decremented
10A2 D0C9            BNE   RE            ;by $10 (numbers)

10A4 AD1502  CTRL    LDA   CODENOW
10A7 29C0            AND   #%11000000
10A9 C9C0            CMP   #%11000000    ;if any info-bit not set
10AB D0BE            BNE   OK            ;ctrl has no influence
10AD 8A              TXA
10AE 4A              LSR   A             ;was CONTROL or SHIFT lock pressed
10AF D004            BNE   CTR2          ;if yes
10B1 A020            LDY   #$20          ;else add $20 to code
10B3 D0B8            BNE   RE            ;(for small letters)
10B5 A0C0    CTR2    LDY   #($100-$40)   ;subtract $40
10B7 D0B4            BNE   RE            ;(for real CONTROL char's)
             ;-------------------------------------------------------
10B9                                     ;higher keyboard routine
10B9                                     ;it uses the lower one as subr.
10B9                                     ;and performes some special tasks
10B9 8A      OTAS    TXA
10BA 48              PHA                 ;save X and Y
10BB 98              TYA
10BC 48              PHA
10BD 2000010 WAITLOP JSR   TAST          ;get code of key pressed
10C0 C900            CMP   #0
10C2 D00D            BNE   TA            ;valid key pressed
10C4 8D1602          STA   TIMECOU       ;else prepare for
10C7 8D1702          STA   CHARCOU       ;new key
10CA A902            LDA   #2
10CC 8D1402          STA   TIMER         ;set timer for 2 loops
10CF D0EC            BNE   WAITLOP
10D1 CE1402  TA      DEC   TIMER
10D4 F007            BEQ   WEIT          ;same key 3 times
10D6 A004            LDY   #4            ;debounce time
10D8 20D811          JSR   DELAY
10DB F0E0            BEQ   WAITLOP
10DD A28C    WEIT    LDX   #FIRTIME
10DF CD1602          CMP   TIMECOU
10E2 D002            BNE   FIRST
10E4 A20F            LDX   #REPTIME
10E6 8E1402  FIRST   STX   TIMER
10E9 8D1602          STA   TIMECOU
10EC C95F            CMP   #$5F          ;RUB OUT
10EE F04F            BEQ   RBT
10F0 AD1702          LDA   CHARCOU
10F3 C910            CMP   #$10          ;check if shorthand was last
10F5 F0C6            BEQ   WAITLOP
10F7 A901            LDA   #1            ;was ESCape key also pressed?
10F9 207A11          JSR   ATOKEBO
10FC 208211          JSR   KEBOTOA
10FF 2920            AND   #%00100000
1101 D018            BNE   ESC           ;if yes
1103 AD1602          LDA   TIMECOU
1106 8D1602  BACK    STA   TIMECOU
1109 68              PLA
110A A8              TAY                 ;restore Y and X
110B 68              PLA
110C AA              TAX
110D AD1602          LDA   TIMECOU       ;now some more special features
1110                                     ;can be implemented like
1110 C90C            CMP   #$0C          ;Ctrl L
1112 D003            BNE   NOSPEC
1114 4CAE11          JMP   CLSN          ;clear screen
1117                                     ;here you may want to make some
1117                                     ;more checks for any CONTROL-char's
1117                                     ;you want to use for your system
1117 AD1602  NOSPEC  LDA   TIMECOU
111A 60              RTS
             ;-------------------------------------------------------
111B                                     ;this routine will give
111B                                     ;BASIC-Shorthand-commands
111B AD1502  ESC     LDA   CODENOW       ;press ESC and other key
111E A202            LDX   #2            ;(see table)
1120 8E1402          STX   TIMER
1123 293F            AND   #%00111111
1125 A8              TAY
1126 B91212          LDA   TAB2,Y        ;get position in BASIC ROM
1129 18              CLC
112A 6D1702          ADC   CHARCOU       ;add number of char's already done
112D A8              TAY
112E B984A0          LDA   TAB3,Y        ;get 1 char of command
1131 1007            BPL   OUT           ;if still in middle of command ➡
```

Deering Ave., Chatsworth, CA 91311, 213/709-4202. Model 51 OSI.

Brian
Asst. Tech. Editor

* * * * *

ED:

After reading last month's issue, I decided to write. (All references are about a C3-B with a 36MB using OS65U, V1.2.)

First, for those like me that get tired of checking for lower and upper case, here is a two liner I sometimes use to solve this problem.

```
1000 B$="" : FOR ZZ=1 TO LEN
     (A$) : Z=ASC(MID$(A$,ZZ,
     1))
1010 B$=B$+CHR$(Z+32*(Z>96AND
     Z<123))) : NEXT ZZ
```

This routine takes a string in A$ and puts the upper case equivalent in B$.

For those who like a structured look in their programs try this, POKE 204 to 0 then enter your program putting leading spaces in as wished. Then when done, POKE 204 back to 243. When the program is listed the spaces will remain and will not affect the program.

```
POKE 204,0

10 REM THIS IS A TEST FOR
   SPACE SUPPRESSION
20 FOR X=1 TO 100
30 FOR Y=1 TO 10
40 V=V+1
50 NEXT Y
60 NEXT X
70 END  <<<< END TEST >>>>

POKE 204,243
```

If the peek of 204 is not equal to 243 to start with, your version of OS-65U may not have the WAIT fix (Tech. letter #26) installed, so you need to POKE 207 to 36 and back to 240 when done.

Listed below is a simple program to make and run indirect command files.

HELP!! I am working at a Pain Clinic where we use and score Minnesota Multiphasic Personality Inventory (MMPI) questionnaires and biofeedback equipment, among other things, and I still have trouble because of stray writes, does anyone have any new fixes to try? I have started writing a program to interface a SCANTRON mark-sensor, has anyone

```
1133 297F          AND   #%Ø1111111      ;else mask end-marker
1135 A2ØF          LDX   #$ØF            ;and mark that shorthand ended
1137 8E17Ø2        STX   CHARCOU
113A EE17Ø2   )UT  INC   CHARCOU
113D DØC7          BNE   BACK            ;always
                   ;-------------------------------------------------
113F AD12Ø2   RBT  LDA   CTRLBYT
1142 C977          CMP   #$77
1144 FØ2D          BEQ   ULIN            ;only underline wanted
1146 68            PLA
1147 A8            TAY                   ;restore Y and X
1148 68            PLA                   ;to look at X which acts
1149 AA            TAX                   ;as input buffer pointer
114A FØ26          BEQ   END             ;input buffer empty
114C 48            PHA                   ;else save X and Y again
114D 98            TYA
114E 48            PHA
114F AEØØØ2        LDX   SCRNPOI
1152 A92Ø          LDA   #$2Ø            ;BLANK
1154 9DØØD7        STA   SCR,X           ;erase on screen
1157 CA            DEX                   ;erase in input buffer
1158 EØ7F          CPX   #LEFMAR-1             ;now check if left marg
115A DØØ5          BNE   R1              ;of screen  is reached
115C 2Ø8F1]        JSR   LFET            ;if yes, do line fetch
115F A2BF          LDX   #RIGMAR         ;and store pos. of right margin
1161 8EØØØ2   R1   STX   SCRNPOI         ;in  screen  pointer
1164 A95F          LDA   #$5F            ;and put cursor in that pos
1166 9DØØD7        STA   SCR,X
1169 C6ØE          DEC   TCC             ;decrement Terminal char count
116B 68            PLA
116C A8            TAY                   ;restore Y and X
116D 68            PLA
116E AA            TAX
116F CA            DEX
117Ø A9ØØ          LDA   #Ø              ;and give 0 back
1172 6Ø       END  RTS

1173 68       ULIN PLA                   ;this routine  is intended for
1174 A8            TAY                   ;other programs than  BASIC
1175 68            PLA                   ;which need a RUBOUT char
1176 AA            TAX
1177 A95F          LDA   #$5F            ;Underline
1179 6Ø            RTS

                   ;-------------------------------------------
117A 49FF     ATOKEBO EOR   #$FF
117C 8DØØDF         STA   KEYBO
117F 49FF           EOR   #$FF
1181 6Ø             RTS
                   ;-------------------------------------------
1182 ADØØDF   KEBOTOA LDA   KEYBO
1185 49FF           EOR   #$FF
1187 6Ø             RTS
                   ;-------------------------------------------
1188 AØØ8     LOG   LDY   #8
118A 88       LOG1  DEY
118B ØA             ASL   A
118C 9ØFC           BCC   LOG1
118E 6Ø             RTS
                   ;-------------------------------------------
118F AØØ9     LFET  LDY   #9
1191 B94D12   LF1   LDA   TAB4,Y
1194 99Ø7Ø2         STA   $2Ø7,Y          ;SHIFT part of the program
1197 88             DEY                   ;to  page 2 for execution
1198 1ØF7           BPL   LF1
119A A2CF           LDX   #$CF
119C 2Ø7Ø2    LP2   JSR   $2Ø7
119F DØFB           BNE   LP2
11A1 CEØ9Ø2         DEC   $2Ø9            ;since it is  modifying  code
11A4 CEØC Ø2        DEC   $2ØC            ;hardly suitable for  a PROM
11A7 88             DEY
11A8 EC Ø9Ø2        CPX   $2Ø9
11AB DØEF           BNE   LF2
11AD 6Ø             RTS
                   ;-------------------------------------------------
11AE 8A       CLSN  TXA                   ;this is a routine to clear
11AF 48             PHA                   ;a 2K  video
11BØ 98             TYA                   ;only  A is altered (set to Ø)
11B1 48             PHA
11B2 A92Ø           LDA   #$2Ø     ;blank
11B4 AØØØ           LDY   #Ø                              continued
```

done this? Does anyone know anything about the 710 CPU expander or the software to go with it? Can anyone tell me how to get new or updated manuals. My OS-65U manual, what there is of it, says V1.1, June 1978.

After getting the 36MB hard disk I was somewhat surprised to learn that no utilities are provided to copy files from one system to another or to back up a full system on floppies, you can buy these separately but almost anyone using a hard disk will need these utilities so why not include them with the system and increase the price a little. Also, anyone who has used PIP under CP/M or FID on an APPLE will understand just how much better OSI's utilities could be. After so many problems with the utilities I was not too surprised to find that the RENAME utility does not check to see if the new name exists.

If anyone wants the Tech. letters put out by OSI, I was able to get a complete set (1-28) from Data Products Maintenance Corp., 9460 Telstar Ave., El Monte, CA 91731

```
 10 REM INDIRECT COMMAND FILE
    GENERATOR
 20 REM
 30 REM
 40 REM
 50 REM This program sets up
    BASIC command files.
 60 REM
 70 RV = 128 : CL$ = CHR$ (26)
    : MI = 11657 : MO= 11661
 80 POKE MI,0 : POKE MI + 1,RV
    : POKE MO,0 : POKE MO +
    1,RV
 90 PRINT CL$; SPC( 25);"I N D
    I R E C T I O N" : PRINT
100 POKE 2976,13 : POKE 2972,
    13 : REM GET THEM THAR
    COMMA'S AND COLONS
110 INPUT "(F)ile or
    (K)eyboard Run";TY$ : DIM
    A$(100) : PRINT
120 IF TY $ < > "K" AND TY$ <
    > "F" GOTO 110
130 IF TY$ = "K" GOTO 220
140 INPUT "File Name ";NF$ :
    OPEN NF$,1 : FOR IN = 1
    TO 100
150 INPUT %1,A$(IN) : IF
    A$(IN) < > "OK" THEN
    NEXT IN
160 CLOSE
170 PRINT : INPUT "Do you wish
    to check the file";A$ : IF
    A$ = "N" GOTO 330
180 FOR X = 1 TO IN : PRINT
    X,A$(X) : NEXT
190 PRINT : INPUT "File Ok";A$
    : IF A$ ="Y" GOTO 330
200 INPUT "Wrong Line";WL :
    PRINT "What should the
    line read";
210 INPUT A$(WL) : GOTO 180
```

```
11B6 99ØØD7    CL1     STA     $D7ØØ,Y
11B9 99ØØD6            STA     $D6ØØ,Y
11BC 99ØØD5            STA     $D5ØØ,Y
11BF 99ØØD4            STA     $D4ØØ,Y
11C2 99ØØD3            STA     $D3ØØ,Y
11C5 99ØØD2            STA     $D2ØØ,Y
11C8 99ØØD1            STA     $D1ØØ,Y
11CB 99ØØDØ            STA     $DØØØ,Y
11CE C8                INY
11CF DØE5              BNE     CL1
11D1 68                PLA
11D2 A8                TAY
11D3 68                PLA
11D4 AA                TAX
11D5 A9ØØ              LDA     #Ø
11D7 6Ø                RTS
                ;-------------------------------------
11D8 A2ØØ      DELAY   LDX     #Ø
11DA CA        ZE1     DEX
11DB DØFD              BNE     ZE1
11DD 88                DEY
11DE DØFA              BNE     ZE1
11EØ 6Ø                RTS
                ;-------------------------------------
11E1                                ;please note that Y and Z are
11E1                                ;positioned according to
11E1                                ;German standard, you will pro-
11E1                                ;bably want to re-exchange them

11E1 FØ9B4FØØ  TAB     .DBYTE  $FØ,$9B,$4F,$ØØ,$F9,$E1,$F1
11E8           ;         P   ;   / space Y   A   Q
11E8 4CEDEEE2          .DBYTE  $4C,$ED,$EE,$E2,$F6,$E3,$F8
11EF           ;         ,   M   N   B   V   C   X
11EF EBEAE8E7          .DBYTE  $EB,$EA,$E8,$E7,$E6,$E4,$F3
11F6           ;         K   J   H   G   F   D   S
11F6 E9F5FAF4          .DBYTE  $E9,$F5,$FA,$F4,$F2,$E5,$F7
11FD           ;         I   U   Z   T   R   E   W
11FD FFFFFF2Ø          .DBYTE  $FF,$FF,$FF,$2Ø,$EF,$EC,$4E
12Ø4           ;        (-) (-)  CR  LP  O   L   .
12Ø4 FF3F4D9A          .DBYTE  $FF,$3F,$4D,$9A,$9Ø,$99,$98
```

continued

```
220 PRINT CL$;"Enter your
    commands (End with OK)"
    : PRINT
230 FOR IN = 1 TO 100 : PRINT
    IN; : INPUT A$(IN)
240 IF A$(IN) < > "OK" THEN
    NEXT IN
250 PRINT : PRINT "Commands
    Ok";A$ : IF A $ = "Y"
    GOTO 290
260 FOR X = 1 TO IN : PRINT
    X,A$(X) : NEXT X : PRINT
270 INPUT "Commands Ok";A$ :
    IF A$ = "Y" GOTO 290
280 INPUT "Wrong line";WL :
    INPUT "Enter new line"
    ;A$(WL) : GOTO 260
290 PRINT : INPUT "Do you wish
    to save these commands";A$
300 IF A$ = "N" GOTO 330
310 INPUT "File Name ";NF$ :
    OPEN NF$,1
320 FOR X = 1 TO IN : PRINT
    #1,A$(X) : NEXT X : CLOSE
330 PRINT : INPUT "Do you wish
    to run these commands";A$
340 IF A$ = "N" THEN NEW
350 FOR X = 1 TO IN - 1 :
    PRINT #4,A$(X) : NEXT X
360 POKE 2976,44 : POKE 2972,
    58
370 PRINT #4,"POKE 11668,1" :
    POKE 11668,8
380 NEW
```

Mike Fowler
San Bernardino, CA 92412

* * * * *

Cont. page 23

OSI Disk Users

Double your disk storage capacity Without adding disk drives

Now you can more than double your usable floppy disk storage capacity—for a fraction of the cost of additional disk drives. Modular Systems' DiskDoubler™ is a double-density adapter that doubles the storage capacity of each disk track. The DiskDoubler plugs directly into an OSI disk interface board. No changes to hardware or software are required.

The DiskDoubler increases total disk space under OS-65U to 550K; under OS-65D to 473K for 8-inch floppies, to 163K for mini-floppies. With the DiskDoubler, each drive does the work of two. You can have more and larger programs, related files, and disk utilities on the same disk—for easier operation without constant disk changes.

Your OSI system is an investment in computing power. Get the full value from the disk hardware and software that you already own. Just write to us, and we'll send you the full story on the DiskDoubler, along with the rest of our growing family of products for OSI disk systems.

Modular Systems

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Telephone 201 262.0093

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```
12ØB                    ;       (-) RBT  -   :   Ø   9   8
12ØB 97969594            .DBYTE  $97,$96,$95,$94,$93,$92,$91
1212                     ;        7   6   5   4   3   2   1
                ;-------------------------------------------------
1212                                                ;Table for shorthand
1212 49ØØØØØØ  TAB2      .DBYTE  $49,Ø,Ø,Ø,Ø,Ø
1218 ØØØØØØØØ            .DBYTE  Ø,Ø,Ø,Ø,Ø,Ø
121E DØBFD558            .DBYTE  $DØ,$BF,$D5,$58
1222 652613              .DBYTE  $65,$26,$13
1225 6ACC                .DBYTE  $6A,$CC
1227 C989DB9D            .DBYTE  $C9,$89,$DB,$9D
122B C2C638              .DBYTE  $C2,$C6,$38
122E ØØØØØØØØ            .DBYTE  Ø,Ø,Ø,Ø
1232 54972D5D            .DBYTE  $54,$97,$2D,$5D
1236 ØAACØ31D            .DBYTE  $ØA,$AC,$Ø3,$1D
123A 6DØEB2AF            .DBYTE  $6D,$ØE,$B2,$AF
123E 61B5Ø63F            .DBYTE  $61,$B5,$Ø6,$3F
1242 BBA3324D            .DBYTE  $BB,$A3,$32,$4D
1246 799A1621            .DBYTE  $79,$9A,$16,$21
124A 8Ø3BA6              .DBYTE  $8Ø,$3B,$A6
                ;-------------------------------------------------
124D                                                ;Table for LFET
124D B9          TAB4    .DBYTE  $B9                 ;LDAY
124E ØØ                  .DBYTE  Ø                   ;ØØ
124F D7                  .DBYTE  SCR/$1ØØ
125Ø 99                  .DBYTE  $99                 ;STAY
1251 4Ø                  .DBYTE  LINELEN
1252 D7                  .DBYTE  SCR/$1ØØ
1253 88                  .DBYTE  $88                 ;DEY
1254 6Ø                  .DBYTE  $6Ø                 ;RTS
```

SYMBOL TABLE FOR KEYBOARD-ROUTINE(S)

ATOKEBO	117A	L1	1ØØ6	SCR	D7ØØ
AUS	1Ø7B	L2	1Ø13	SCRNPOI	Ø2ØØ
BACK	11Ø6	LEFMAR	ØØ8Ø	SH1	1ØAØ
CACHE	Ø213	LF1	1191	SHIF	1Ø86
CHARCOU	Ø217	LF2	119C	SPECIAL	1Ø55
CL1	11B6	LFET	118F	TA	1ØD1
CLSN	11AE	LINELEN	ØØ4Ø	TAB	11E1
CODENOW	Ø215	LOG	1188	TAB2	1212
CTR2	1ØB5	LOG1	118A	TAB3	AØ84
CTRL	1ØA4	NOR	1Ø91	TAB4	124D
CTRLBYT	Ø212	NOSPEC	1117	TAST	1ØØØ
DELAY	11D8	OK	1Ø6B	TCC	ØØØE
END	1172	OTAS	1ØB9	TIMECOU	Ø216
ERROR	1Ø16	OUT	113A	TIMER	Ø214
ESC	111B	PRESSED	1Ø1D	ULIN	1173
FIRST	1ØE6	R1	1161	WAITLOP	1ØBD
FIRTIME	ØØ8C	RBT	113F	WEIT	1ØDD
KEBOTOA	1182	RE	1Ø6D	ZE1	11DA
KEYBO	DFØØ	REPTIME	ØØØF		
KOR	1Ø4D	RIGMAR	ØØBF		

Table of Shorthand commands

ESC + prints

A	ABS	B	GOSUB
C	CONT	D	DATA
E	EXP	F	FOR
G	GOTO	H	TAB(
I	INPUT	J	SIN
K	COS	L	LIST
M	TAN	N	NEXT
O	ON	P	PEEK
Q	SQR	R	RETURN
S	SAVE	T	THEN
U	USR	V	READ
W	RUN	X	STEP
Y	STOP	Z	RND
1	RESTORE	2	DIM
3	NEW	4	CHR$
5	ASC	6	AND
7	MID$	8	FRE
9	STR$	Ø	CLEAR
:	VAL	-	LEN
@	POKE	;	REM
/	PRINT	.	RIGHT$
,	LEFT$	SPACE	LOAD

* * * * *

BASIC THAT SCREAMS

Is the sedate pace of OSI BASIC taking the fun out of your programming?

Then turn your system on to FBASIC! Now you can compile your programs with FBASIC and take full advantage of your computers potential.

FBASIC is extremely fast. Allowing you to do unheard of things in BASIC. Things that cannot be done in any other language except assembler, with no need to learn a new language.

For the example program:

```
10 FOR I=1 TO 60000
20 A=A+1
30 NEXT I
```

FBASIC produces a machine code equivalent, which, including the run-time package is less than 400 bytes, and executes in *less than 4 seconds.* (1 MHz clock).

The secret to this incredible speed is that FBASIC is an integer subset of BASIC that produces *native 6502 machine code.* With no run-time interpreter to get in the way of all-out machine performance.

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So let that pent-up performance out! Find out what your machine is really capable of. Feed it some FBASIC and stand back!

FBASIC runs under OS-65D and requires 48K.

Available on 8-inch diskette for $155 including postage. Cross-reference only $25.

Pegasus Software
P.O. Box 10014-P
Honolulu, Hawaii 96816

Mike:

Stray writes on Ohio Scientific Hard Disk Multi User Computers have been a problem for a long time. Fortunately, Joe Linden of Four State Micro Computers, P.O. Box 1446, Joplin, MO, offers a solution. Send him $50 and he will send you a pair of disks with a matched and fixed system and set of utilities which will cure your problem.

It appears that M/A-COM OSI has placed the 710 CPU on the back burner while they work on more pressing problems.

There are no updated manuals for OS65U version 1.1 and 1.2, but there is a new (much better) manual for version 1.3. See your dealer.

Projects, Inc., 20 Mountaintop Farm, Charlottesville, VA, has a set of utilities called the H/D/E which will copy a file or a system from the hard disk to the hard disk or to floppy. Will restore files or systems from floppies to the hard disk. Will create or rename subsystems and has modified CREATE, DIR and PACKER programs which self configure to the size of the hard disk subsystem. The H/D/E sells for $595 and DBMS will not sell any hard disk computer without one.

Dick
Tech. Editor

* * * * *

ED:

The DQFLS WP6502 version I am using is 1.2; I used to have 1.3 but I turned that in for a refund some time ago (and purchased 1.2 instead). Reason was, that the program interacted with my Hazeltine 1520 SO BAD, that it became a matter beyond frustration.

Meanwhile, a friend of mine, also using a Centronics 737 (but a Hazeltine 1500), has V1.3, and I've been playing with it at his place, and yes, I agree, it does right justify on the Centronics, but ONLY when you select 1. (NEC) rather than 2. (Other) from the menu following the copyright notice, and then ONLY with the Default or Condensed font. We've tried everything and cannot get it to work right with the proportional font, where I really wanted it. So back to V1.2, which I think is a darn good piece of software.

When I had my 1.3 (before I turned it in), there were two major things wrong. 1. Upon bootup, it sporadically (almost often) categorically refused to boot (I'd get Drive A not ready, Drive B not ready, and it clunked a little and that was it); I finally solved this to some degree by refreshing the system (initializing from 0 to 25087 and copying a standard OSU system onto it! I have a hunch (but only just that) that Dwo Quong was using a faster processing speed, but it didn't dawn upon me to change it at that time with the applicable poke).

[Do you mean the floppy disk drive stepping rate, PEEK (11895)? ...AL]

Whenever I used proportional font in conjunction with #N27 etc., and such decimal codes as 17, 19 or 20 for font selection, or 14 and 15 for elongated (the standard Centronics repertoire of printer control codes) my Hazeltine would go into format, and either hang or print crap on the screen, messing up what I had in memory. Sometimes the Terminal reset would get me back to the WP menu, but sometimes I just couldn't get out of the mess. This happened when the board switch for the terminal was on tilde or escape, either way, it seemed to make no difference. I don't have this problem with V1.2! Then when trying to print out the ostensibly justified proportional text on the Centronics, I'd get Dwo Quong tokenized basic (or whatever it was) on the printer.

I've had long discussions about this with Joseph Ming and talked to Fred Beyer as well, at Dwo Quong, but my final decision was to trade down to V1.2; which has been a regular work-horse around here.

Your DBMS INC's Terminal Extension Package does indeed allow me to use some of the specialized features of the Hazeltine 1520, but it's only the tip of the iceberg, I think.

Parenthetically, I think I mentioned to you that I had returned my OS-CP/M disks to OSI for upgrading (since there were disk errors on them that could not be fixed). To my very great surprise and relief (particularly since I had not gotten a Return Authorization beforehand), they did (after some phone calling) send me an updated copy of V1.4 with some fixes on it dated in 1980. I'm really not experienced enough to figure out what these

\cont. page 25

SMART TERMINAL SOFTWARE
For OSU Serial Systems ---- by Jim Sanders
"Sanders' Software Works!"

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EXAMPLE USES:

C4P & C8P: Expansion to **40K RAM** of Basic workspace.
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All of this on 1 Board, using only one of your precious slots. Software for Enhanced System Monitor capabilities is continuously being developed and improved. As new EPROM Monitors are available, you may upgrade to them for any price differential plus a nominal $10 exchange fee. Another possibility is to fill any portion of the memory with Basic Programs in EPROM for **Power-on Instant Action.** This custom EPROM programming service is available at $25 per 2716 (includes EPROM). Extra copies at $15 for each EPROM.

C4P-MF & C8P-DF: Memory expansion to **48K.**
Add 4K **Memory** at $E000 for special software requirements.
Parallel Printer Interface and/or **Displaying Calendar/Clock.**
Add 1.75K **Enhanced System Monitor ROM.**

C3: Up to **56K of Memory** Expansion — can be addressed for **Multiuser.** (Optionally, each user can have his own **Dedicated Printer Port**).
Add **Enhanced Monitor ROM** with Calendar/Clock software, warm start and Hard Disk Boot.

IEEE-488 INTERFACES AND SOFTWARE:

The General Purpose Instrumentation Bus (GPIB) Controller interface is available for all OSI Computers. Machine code GPIB Drivers are linked to Basic to provide easy control of IEEE-488 instruments which is equal to the best of Hewlett-Packard Controllers and far superior to most others. Basic Commands for Serial Poll, Parallel Poll, IFC Clear, full Local/Remote Control, Respond to SRQ Interrupts, Send Trigger, do Formatted Input/Output, Direct Memory Input/Output and MORE. Interface includes IEEE-488 Ribbon Cable/Connector.

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EPROMS: (Check with your Dealer for newest EPROM Products).

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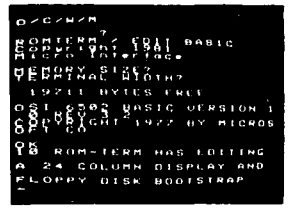
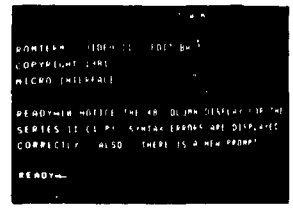
C1-P Series II Computer with ROM-TERM II Smart Terminal Monitor (Order Direct) ... **$549.00**

WHICH EDITING "SMART-TERMINAL" MONITOR ROM IS BEST FOR YOUR C1P?*



ROM-TERM



ROM-TERM II

FEATURES AVAILABLE ON BOTH ROMS **AT THE TOUCH OF A KEY:**

- Enter "Smart Terminal" mode for **communications with** a time share Dial-up computer network.
- Select **half-duplex/full-duplex operation.**
- Select **auto or manual line feed** at carriage return.
- **Transmit** a pre-prepared **memory file** from C1P to remote computer: This memory file can be a message, letter or program and is sent **at full speed — saving time and telephone expense.** Programs can be listed to memory file while in basic.
- **Receive a message** or program (or all transactions) **into a memory file for later review** on video, recording on tape and printing. The file can be downloaded to basic after you exit the "smart terminal" mode.
- **Uploading/downloading of programs** can be done in this memory file manner or directly into basic by using a new serial output distributor and a new "Control-L" load command.
- Return to basic program operation at the same point of execution from which you entered the "smart-terminal" mode.
- "Smart-Terminal" mode can be utilized with the modem/telephone disconnected in order to prepare memory files, type directly to serial printer, send memory files to printer or tape, and to view tapes without interference from basic "Syntax Error."
- The serial output distributor can be turned on and off with a "control S" keystroke or with a poke which allows easy **control of a serial printer from basic.**
- **Basic program lines can be recalled, edited** and re-entered. The **editing includes backspacing, forward spacing, deleting, typing over, inserting new text, and changing line #** (duplicating a line). During editing, the cursor position and display are wrapped around, allowing operation on and displaying of an entire line up to 72 characters long. The preparation of line numbered messages can utilize these features — extremely handy for poor spelling, typists like me!
- **Keyboard** has been **completely corrected** to provide standard typing format. By the use of the control and repeat keys as modifiers, any character in the full **USASCII 128 character set can be entered from the keyboard. This will give you all the characters you need for running Pascal and other high level languages in a remote computer.**
- Video output may be halted at any time for easy viewing.
- Screen clear at keystroke.

ALL FEATURES ARE ROM RESIDENT AND ALWAYS AVAILABLE AT POWER ON.

ADDITIONAL FEATURES PROVIDED IN THE ROM-TERM:

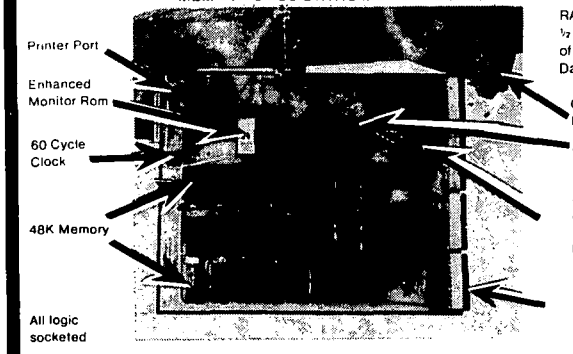
- Disk bootstrap — In disk operation you can **alternate between ROM Basic and Disk Basic** with a keystroke. Can **Warm Start Disk Basic.**
- Easy transfer of programs between disk and ROM Basic. (Use the ROM Basic for editing disk basic programs.)
- **Memory files can be** stored or recalled in **Disk Basic, ROM Basic or the "Smart Terminal"** interchangeably.

ADDITIONAL FEATURES PROVIDED BY ROM-TERM II:

- A 48 column video display on series II C1P (Revision "D" Superboard). Selection of **48 or 24 column video with a** "Control-V" keystroke. Corrected "Syntax Error" messages.

***RECOMMEND THE ROM-TERM II** FOR NON-DISK OPERATION OF **SERIES II C1P** (OR REVISION "D" SUPERBOARD) AND THE **ROM-TERM FOR ALL OTHER SYSTEMS.**

MEM-56K CMOS STATIC MEMORY BOARD



ULTRA-LOW POWER — By using CMOS Static RAM Memory, the total power consumption is about ½ Amp at 5 Volts when populated for 48K. In fact, most of power is used by the Address Line Buffers and the Data Transceivers.

MULTI-USER — Can be addressed for any of the 16 multi-user memory partitions. The low power and single memory board/partition simplify installation and provide a typical $1400 saving for a 3-user system.

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are, since for the most part they are in hex, and that's one of my weaker points. But they were MOST cooperative - and that's a step in the right direction for OSI (for any company for that matter)!

Also, let me state that Dwo Quong in the above matter, was most cooperative and it's too bad things turned out as they did; I sure would have liked V1.3 to work.

Fred S. Schaeffer
Jamaica, NY

* * * * *

ED:

Here's a handy little Ram diagnostic some of the readers may find useful in locating memory faults.

First, generate a tape with a routine something like this:

```
10 DIMA$(133)
20 FORL=1TO133
30 PRINT L; TAB(5);
40 INPUT A$(L)
50 NEXTL
60 PRINT"DATA LOADED"
70 INPUT"<SPACE-RETURN TO DUMP
   TO TAPE>";Q$
80 REM- YOUR TAPE OUTPUT
   STATEMENT GOES HERE,
   POKE517,1 OR DISK!"IO
   02,03"
90 FOR L=1TO133
100 PRINT A$(L)
110 NEXT L
120 REM- YOUR TAPE OFF
    STATEMENT, POKE517,0 OR
    DISK!"IO 02,02"
130 PRINT"ANOTHER COPY":GOTO
    60

*** DIAGNOSTIC DATA ***
A9 00 85 11 85 14 A0 82
A9 80 A2 09 8D 10 D2 99
00 00 D9 00 00 D0 0E 4A
CA D0 F1 C8 D0 EA E6 11
E6 14 4C 08 00 48 8C 12
D2 AD 11 00 8D 13 D2 A9
2A 8D 14 D2 A9 FD 8D 00
DF AD 00 DF C9 EF D0 F4
A9 20 8D 14 D2 A9 FD 8D
00 DF AD 00 DF C9 EF F0
F4 A9 FE 8D 00 DF AD 00
DF C9 DE F0 06 C9 7E F0
09 D0 EE 20 70 00 68 4C
17 00 20 70 00 4C 00 00
A9 20 8D 10 D2 8D 11 D2
8D 12 D2 8D 13 D2 8D 14
D2 60 . 0000 G
```

With the hex data loaded and the 'dump to tape' prompt on screen, roll tape in record mode, wait several seconds to <space-return>. When the dump is finished, your tape is ready to use!

Rewind, hit <BREAK> <M>, roll the tape, when you have stable input- <L>.

Interpreting the results:

When an error or end of Ram+1 is detected, the routine loops the keyboard while the screen indicates error data, bit and page with an asterisk to indicate 'halt'. The findings are displayed as the character equivalent of the hex value, thus:

@ +k* is data $40 or bit 6 (0-7), location $2B, page $6B, and halted. To locate the chip, convert the page indicated to decimal: K (CHIP)= INT(DECIMAL PAGE/4)+1. In this example, the problem is in K-27 (610 board).

Another example:

@ #$* would be in K-10, also on the 610 board. The space bar clears the halt, <ESC) continues with the next bit and <repeat> restarts the entire test. You may test the video ram by loading the routine then: <BREAK> <M> 0001 /D0 . 0007 / 00 . 0000 <G>. The video ram test controls, presents and decodes the same as ram.

Kenneth D. Koonsman
Abilene, TX 79603

* * * * *

ED:

Here is a way to simulate an IF...THEN...ELSE :

```
100 L=-(X=3):GOTO 200*L+300*
    (1-L)   is the same as
100 IF X=3 THEN GOTO200 ELSE
    GOTO 300
```

Here is another one: As everyone knows, after testing N logical conditions one may have branched to one of 2^N possible nodes in a program. For example, suppose we have the following 3 conditions: P=(X=3), Q=(Y<0)OR(X=4), and R=(Y>1)AND(X<2). Since each P,Q and R may be -1 or 0 (T or F) there are 2*2*2 or 2^3 possible ways to assign truth values to the triple (P,Q,R). The distinct states of this triple may be thought of as a binary number where the (P,Q,R) corresponds to -(4*P+2*Q+R). Here is a table of all 8 ways that this triple can be assigned truth values. Included in the table are line numbers we wish to branch to given the corresponding logic state.

N	P	Q	R	Line Num.
0	F	F	F	200
1	F	F	T	145
2	F	T	F	12351
3	F	T	T	3162
4	T	F	F	23000
5	T	F	T	8121
6	T	T	F	56421
7	T	T	T	9999

During the initialization phase of the program there should be something like the following:

```
100 DIM LN(7):FORI=0TO7:READ
    LN(I): NEXT
110 DATA 200, 145, 12351,
    3162, 23000, 8121, 56421,
    9999
```

Then later in the program:

```
200 P(3)=(X=3):REM CONDITIONAL
    P
210 P(2)=(Y<0)OR(X=4) : REM
    CONDITIONAL Q
220 P(1)=(Y>1)AND(X<2) : REM
    CONDITIONAL R
230 L=0:F=1:FORI=1TO3:L=L-F*P
    (I):F=2*F:NEXT
240 GOTO LN(L) : REM BRANCH RE
    TABLE ABOVE
```

Clearly this can be expanded to larger number of logical variables. However, code of this type can be exceedingly difficult to debug or to update later unless one is most careful to write clear documentation. Of course, you do this all the time anyway... right?

Harry Suber
Salisbury, MD 21801

* * * * *

ED:

Some notes on 65D V3.3. It's a big improvement over V3.0 that I've been using. It came in a notebook the size of their systems, with 5 tutorial disks. If you are just getting started, over 200 pages of indexed information

OSI 65D V3.3 Guide

- Contains fixes for the bugs and other data OSI didn't tell you about
- Increase compatability and runability between 65D V3.X and V3.3
- Run extended utilities under V3.3 and much more...
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BIT
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209 Richmond Avenue
Buffalo, New York 14222

(no disassembly or source code). Print at and print using, BASIC line editor, window definition on screen, a screen clear command, screen manipulating commands, a fix for GET command and all sorts of other goodies.

Alex J. Kowalski, Jr.
South Bend, IN 46619

* * * * *

ED:

Page 12 of your November, 1981 issue, has a nice item on a port 8 driver in OS-65U. The problem outlined there is similar to the one we faced when we added a NEC Spinwriter to our C3-B (which already had a line printer.)

To avoid cable-swapping, we had a regular Centronics parallel output board readdressed to $F500, so as to be at a different address from the usual $F400. The following program allows switching from line printer to daisy wheel (or thimble, to be precise) without any hardware juggling. It also sets top of form and, for the Spinwriter, will change the pitch and spacing. Believe me, the convenience is worth the $200 or so that the board costs. Alan Heinold of the Computershop, our local OSI dealer, was of great help on this.

William E. Shawcross
Cambridge, MA 02238

```
1 PRINT:INPUT"SPINWRITER OR PRINTRONIX AS DEVICE #5 (S OR P)
  ";Q$
2 IF LEFT$(Q$,1)<>"S"THENGOSUB300:GOSUB400:GOTO100
3 REM
4 REM -- UTILITY TO SET UP SPINWRITER (DEVICE 5) AT $F500
5 REM
6 POKE62720,0:POKE62721,0:POKE62723,0:POKE62722,255:POKE62721,4
7 POKE62723,4:POKE62722,255:POKE11695,0
8 REM THE PRECEDING POKES INITIALIZE THE PIA AT $F500
9 GOSUB 200
10 POKE 15881,245:POKE15904,245:POKE15149,245
20 PRINT:PRINT"THE SPINWRITER IS NOW DEVICE #5":GOSUB400:PRINT
30 INPUT"DO YOU WANT TO CHANGE FROM PICA PITCH (10 CPI), 6 LPI
  ";Q$
40 IF LEFT$(Q$,1)<>"Y" THEN PRINT#5,CHR$(27)+"]L";:GOTO 100
50 INPUT"ELITE PITCH (12 CPI) ";Q$
60 IF LEFT$(Q$,1)="Y" THEN PRINT#5,CHR$(27)+"]J";
70 INPUT"8 LPI ";Q$
80 IF LEFT$(Q$,1)="Y"THENPRINT#5,CHR$(27)+"]U";
90 PRINT#5:END
100 END
110 REM FOR PITCH P (8 TO 120) AND LPI L (3 TO 48) USE THE FOL-
    LOWING --
111 REM BY FIRST RUNNING SPIN, THEN TYPING "RUN 115"
115 INPUT"PITCH ";P:INPUT"LINES PER INCH ";L
120 PRINT#5,CHR$(27)+"]"+CHR$(64+INT(120/P))+CHR$(27)+"]";
130 PRINT#5,CHR$(79+INT(48/L)):END
200 POKE15835,245:POKE15838,245:POKE15841,245:POKE15846,245
210 POKE15851,245:POKE15854,245:RETURN
300 POKE15881,244:POKE15904,244:POKE15149,244:RETURN
400 PRINT:INPUT"RESET TO TOP OF FORM ";QQ$
410 IF LEFT$(QQ$,1)<>"Y"THEN GOTO 450
420 POKE 15908,60
450 RETURN
```

★ ★ ★

ED:

Does your system need more memory but your power supply is already straining? I would like to suggest that you replace a few of those power hungry 2114's with ultra low power CMOS RAMS. A 6514 CMOS RAM can be plugged directly into a socket intended for a 2114. A typical 2114L draws 65 ma per chip. The CMOS version draws 10 ma during a read/write cycle, but less than 1/2 ma when not selected. One source for the 6514 is B.G. Micro, Box 280298, Dallas, TX 75228. BG's price is $2.95 each for 350ns chips. One word of caution, the 6514 will NOT work as video memory. The chip latches the address line on the edge of the chip enable pulse. The OSI video circuits keep the chip enable constantly true.

Micro Interface (3111 S. Valley View Blvd., Suite I-101, Las Vegas, NV 89102) is offering a 56K CMOS memory board and parallel printer port. The board is populated with 6116 CMOS static RAM. These chips are 2K by 8 bits and pin compatible with 2716 EPROMS. The board is designed so that any 2K block in the memory map can be enabled.

The Micro Interface board can be purchased with a minimum of 4K to a maximum of 56K installed memory. Additional chips are easily added by soldering on more sockets and enabling diodes. I have run a board populated with 24K for several hours with two different memory tests with no failures. The board runs with a noticable lack of heat. Only the address and data buffers run slightly warm. The 6116 memory chips are rated at 200ns. Micro Interface guarantees the board to operate at 2 Mhz although my tests were run at only 1 Mhz.

The CMOS board also has provision for a monitor ROM at $F800 to $FFFF. Seven of eight pages are decoded rather than 3 of 8 as on OSI boards. For those of us running the OSI 500 CPU board, this is an opportunity to replace those hard to program 1702 monitor ROMs.

Earl Morris
Midland, MI 48640

Earl:

A similar board is available from OSI. There is space for 64K, but no printer port (CM20).

Brian
Asst. Tech. Editor

* * * * *

AD$

Dual ss,sd floppies, CPU with additional 8K for CPM, CA-10, C-23 hard disk completely rebuilt from factory OS65U, OS65D, Abacus G/L, CPM-Basic, Cobol, Fortran, Malibu 160 printer, Hazeltine 1500 terminal, fast floppy loader, memory test, Unisoft G/L, etc. Works beautifully. No problems. Will sell whole system for $11,000 or will sell without hard disk for $6800. R.J. Murray, 916/628-5513.

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CROSS REFERENCE UTILITY
(REF Command)

Let's face it. These days nobody has the time to plow through pages and pages of program listings looking for references to some variable, constant, or line number. But what if you can't remember where A$ is being used, or *if* it's being used, or where T% is set, or how many references there are to line 5710?

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- Can be co-resident with utilities like EDITOR and RSEQ.
- Functions under Level III in networking.
- Easy to read display includes symbols to indicate exact nature of each reference:

```
20 A = 1:A% = 1:A(1) = 1:A%(1) = 1:A$ = "X":A$(1) = "X"
40 T% = 1:A$ = "STRING CONSTANTS ARE NOT SEARCHED. I.E. X = 1
                IS NOT FOUND"
80 A = A + A + A + A + A% + A + A + A + A + A + %A + A + A + A + A + A%
     + A + A + A% + A + A + A + A + A
```

Entering "REF A" gives the following results:

```
A:  20(%1  20($1  20(1  20/%1  20/$1  20/1  40/$1
    80/%3  80/21
```

- Requires only 1K of memory. Can be loaded into high end of user memory, or under 65U, REF can be hidden in the OS area.

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