PEEK (65)

The Unofficial OSI Users Journal

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INSIDE:

Column One

We just got the phone bill, and it was over a thousand dollars. For one month. Something has got to be changed.

Problem is, PEEK(65) has become the default OSI technical problem center.

Problem is, we really love it.

When one of our readers calls up and says, "I have this C4P and I was wondering how I can..." we are hooked. If we didn't love to talk computers, we wouldn't be here. So Bryan stops fixing hardware, Dick stops writing programs, and we gather around the telephone and try to help the guy.

Problem is, we can't afford it.

So how can PEEKers get the help they need, while we still manage to get some work done around here? Here is the new procedure. If you have a problem, try this sequence, advancing to the next step only if the previous one didn't work:

1) Call your dealer, the guy who got your money. He has an investment in keeping you happy.

2) Call your distributor, the guy who sold the computer to your dealer. If you don't know the distributor's name, the dealer does.

3) Call OSI. If your problem is interesting (applies to lots of guys) they will call you back with an answer. At least, they can give you the name and number of your distributor.

4) Write a letter to PEEK(65). I know, you wanted the answer today; but if you write us, we can a) give you a better answer; b) share it with everyone; and c) stay in business.

5) Leave the question in a user message to me, user 9999, on the PEEK(65) national CBBS. You have to have a modem, and you have to call (301) 363-4867, but you will get an answer quickly.

6) As a last resort, call PEEK(65) and leave your question, your name and number, and when you will be home. We will try our best to figure out the answer, then we'll call you back...collect.

I hate to be this way, but we just got the phone bill, and it was over a thousand bucks!

At the recent National Distributors' Meeting in Florida, somebody asked the powers that be if OSI is going to abandon the personal computer market. The answer, in a direct quote from Bill Chalmers, the Pres.: "No. OSI is in the personal computer market to stay."

The question is, why was the question ever asked in the first place? OSI made their first million on Superboards. OSI has more money than I ever saw in one place tied up in personal computer inventory, and they sure aren't going to just bury all that stuff in some big hole out in Ohio. OSI just came out with OS-65D V3.3, obviously designed for personal computers (see review on page 13).

Look through this issue of PEEK(65). You will see game reviews, C1P questions and answers, and very little about 65U, CP/M or hard disks.

Still, it's a fair question. The reason some folks are afraid OSI will abandon the peronal computer market is that the company has now changed its name to MA/COM OSI, with the OSI standing for Office Systems, Inc., and has started paying lots of attention in its ads to big, hard disk computers.

And the answer is, they aren't abandoning the small computers. They are simply, at last, beginning to pay some real attention to the big computers.

A few months ago, we issued a new "call for articles." Karin tells me I should say just what sort of articles we want. Here goes:

Reviews of anything you bought for your computer, hardware or software;

Descriptions of anything you made for your computer, hardware or software;

Notes about anything you learned about/for your computer, including hardware tricks, PEEKs and POKEs, undocumented or poorly documented features, or anything else you spent hours figuring out, and now you're glad you know.

OS65D3 #5 IN A SERIES

D.R. "Stretch" Manley
5664 E. Evans Creek Road
Rogue River, OR 97537

VARIABLE LENGTH RECORDS, AND A LOT OF OTHER STUFF

This time, we'll fill in the blanks left in the code I showed you last time. This project will add a basic command, "DISK RECORDS, D, L", where D is 6 or 7, and L is the length of the random access records in bytes. Thus, if you want to specify a record length of 100 bytes, instead of the normal 128, the "DISK GET, D, R" command will figure where the record is on disk, based on a length of 100, not the default length of 128. Plus, you only have to enter the record length once, after you open the file. It will be stored as a parameter of the device and used from then on. (Until another open occurs for that device, or you change it again). The routine also figures the correct number of whole records that will fit on a track, and saves that as a parameter of the device, too. That isn't the best part, though. The best part is this: when you do a 'DISK! "SELECT B"' and open file #7, then do a 'DISK!"SELECT A"' and open #6, you will find that you don't have to keep "SELECT"ing back and forth. The drive is saved as a parameter of the file. When the code finds that it's time to access the disk, it checks to see which drive is "SELECT"ed. If it's not the right one, it does the correct "SELECT" automatically. No more trying to out think the system when using more than one drive.

The "RUN" change has a little "Catch 22" situation built in. If you change the basic vector table on disk, and the additional code isn't already in

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```
                     ;     SYSTEM LOCATIONS
228A=                        DEVICE=$228A ;00=6,08=7
23AC=                        POINTL=$23AC ;POINTER FOR #6 INPUT, LO BYTE
23AD=                        POINTH=$23AD ;  "       "   "    "   HI  "
265C=                        SYSDRV=$265C ;DRIVE CURRENTLY SELECTED
                     ;
                     ;  DEVICE #6 PARAMETER LOCATIONS. ADD #$08 FOR #7
2328=                        ENDLO =$2328
2329=                        ENDHI =$2329
                     ;
                     ; TEMPORARY VARIABLE STORAGE (IN OP. SYS. BUFFER)
                     ;
2E1E=                        TEMP1 =$2E1E
2E1F=                        TEMP2 =$2E1F
                     ;
                     ;  SUBROUTINE ADDRESSES IN BASIC AND THE OP. SYS.
10D0=                        ERR4  =$10D0 ;BASIC ERROR 4, FC ERROR
2163=                        GETDEV=$2163 ;RETURNS DEVICE
0E13=                        ISCOMA=$0E13 ;IF CHAR NOT COMMA, SN ERROR
2286=                        DOWRIT=$2286 ;JSR SWAP01
                                          ;JSR WRITEB,
                                          ;JSR UPHEAD,
                                          ;JSR SWAP01,
                                          ;RTS
                     ;
                     ; YOU'LL NOTICE THAT THERE ARE SOME CHANGES TO CODE
                     ; IN BASIC, THE PUT/GET OVERLAY, AND THE OPERATING
                     ; SYSTEM.
                     ;
                     ; THE FIRST THREE ARE IN BASIC
                     ;
0212                         *=$0212 ;CHANGE THE VECTOR TABLE FOR "RUN"
                     ;
0212 DBBF                    .WORD ENDISG
                     ;
2283                         *=$2283 ;CHANGE THE CLOSE TO NEW CODE
                     ;
2283 4CB3BF                  JMP CLS:PT
                     ;
2299                         *=$2299 ;CHANGE OPEN TO NEW CODE
                     ;
2299 203FBF                  JSR RESETP
                     ;
                     ; THIS IS IN THE OPERATING SYSTEM , I/O SECTION.
                     ;
2468                         *=$2468
                     ;
2468 BDF4BF                  LDA OPNFL6,X ;CHECK IF OPEN BEFORE ALL ELSE
246B F003                    BEQ BYEBYE ;0=NOT OPEN (NO DRIVE ASSIGNED)
246D 4C00BF                  JMP TSTBUF ;CHECK OTHER PARAMETERS
2470 A910             BYEBYE LDA #$10 ;NEW ERROR, "DEVICE NOT OPEN"
2472 4C4B2A                  JMP $2A4B ;OP. SYS. ERROR VECTOR
2475 EA                      NOP
                     ;
                     ; THIS ALLOWS 2 DIGIT ERROR CODES.
                     ;
2AD8                         *=$2AD8
                     ;
2AD8 20922D                  JSR $2D92
                     ;
                     ; THESE NEXT 4 ARE IN THE PUT/GET OVERLAY.
                     ;
2E79                         *=$2E79 ;CHECK FOR NEW COMMAND
                     ;
2E79 4C5EBF                  JMP COMP:R
                     ;
2EB5                         *=$2EB5 ;CHECK IF OPEN FIRST
                     ;
2EB5 20D0BF                  JSR ISG
                     ;
2EC1                         *=$2EC1 ;SET PARMS IN MATH ROUTINES
                     ;
2EC1 2023BF                  JSR SETPAR
                     ;
2EF4                         *=$2EF4 ;CHECK FOR CURRENT DISK
                     ;
2EF4 2010BF                  JSR CHKDSK
                     ;
                     ; THIS CODE IS IN THE LAST PAGE OF A 48K SYSTEM.
                     ; FOR A SYSTEM WITH LESS THAN 48K, CHANGE THE
                     ; $BF00 TO THE SUITABLE ADDRESS AND RE-ASSEMBLE.
```

memory when basic is booted in, the whole thing will hang. Here's why: when the basic interpreter sees the "RUN BEXEC*" in the operating system buffer, it tries to ~~jump to the~~ place where our new code is. But it's not there yet. Oops!

I solved this by changing the boot routine to put the extra code up at $BF00 before it loads basic. Thus I'm o.k. If you don't want to do that, don't put the change into the basic vector table on disk. Instead, have a line in "BEXEC*" poke the new vector in after doing a "CALL" to the OP.SYS. to load the new code. A "POKE 530, 219:POKE 531, 191" will change the "RUN" vector to point to the new code. Adjust the 191 to the page where the code sits in your system. Any subsequent "RUN"s will then reset the open flags for both #6 and #7. I save the extra code at track 04, sector 2. That will work on an 8" disk, but you guys with 5-1/4" systems will have to find a place for it. How about the directory track?

Next time, I'll have the corrections to the basic manual for "USR(X)". If you've ever tried to use it, and couldn't get it to work right (if at all), then tune in. I'll also show you a few facts concerning two's complement numbers, and we'll stalk the missing -32768.

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```
                  ;
BF00                     *=$BF00
                  ;
BF00 B9AC23   TSTBUF LDA POINTL,Y ;SEE IF PAST END OF BUFFER
BF03 DD2823          CMP ENDLO,X
BF06 D01A            BNE NOTYET
BF08 B9AD23          LDA POINTH,Y
BF0B DD2923          CMP ENDHI,X
BF0E D012            BNE NOTYET
BF10 BDF4BF   CHKDSK LDA OPNFL6,X
BF13 CD5C26          CMP SYSDRV
BF16 F00A            BEQ NOTYET
BF18 8E1FBF          STX RELOAD+1
BF1B 20502C          JSR $2C50 ;SELECT CORRECT DRIVE.
BF1E A200     RELOAD LDX #00
BF20 A900            LDA #00 ;SET Z FLAG, DISK ACCESS NEEDED.
BF22 60       NOTYET RTS
                  ;
                  ; THIS CODE SETS THE RECORD PARAMETERS
                  ; AUTOMATICALLY ON A "GET".
                  ;
BF23 AE8A22   SETPAR LDX DEVICE
BF26 BDF0BF          LDA RL6LO,X
BF29 8D6E18          STA $186E ;MULTLO+1
BF2C BDF1BF          LDA RL6HI,X
BF2F 8D7618          STA $1876 ;MULTHI+1
BF32 BDF2BF          LDA RT6LO,X
BF35 8D6119          STA $1961 ;DIVLO+1
BF38 BDF3BF          LDA RT6HI,X
BF3B 8D6619          STA $1966 ;DIVHI+1
BF3E 60       ENDSET RTS
                  ;
                  ; THIS CODE RESETS THE RECORD PARAMETERS ON AN
                  ; "OPEN" AND SETS THE OPEN FLAG = CURRENT DRIVE.
                  ;
BF3F 206321   RESETP JSR GETDEV
BF42 AE8A22          LDX DEVICE
BF45 A900            LDA #00
BF47 9DF1BF          STA RL6HI,X
BF4A 9DF3BF          STA RT6HI,X
BF4D A980            LDA #128
BF4F 9DF0BF          STA RL6LO,X
BF52 A91A            LDA #26 ;OR 24 OR 16, DEPENDING ON SYSTEM.
BF54 9DF2BF          STA RT6LO,X
BF57 AD5C26          LDA SYSDRV ;1=A, 2=B, ETC.
BF5A 9DF4BF          STA OPNFL6,X ;ANY NON-ZERO VALUE = OPEN.
BF5D 60       ENDRST RTS
                  ;
                  ; THIS CODE IS FOR THE NEW COMMAND, "DISK RECORDS,
                  ; D, L" WHERE D IS 6 OR 7, AND
                  ; 1<=L<=3328 (OR 3072 OR 2048, DEPENDING ON
                  ; TRACK SIZE OF YOUR SYSTEM).
                  ;
BF5E C952     COMP:R CMP #'R
```

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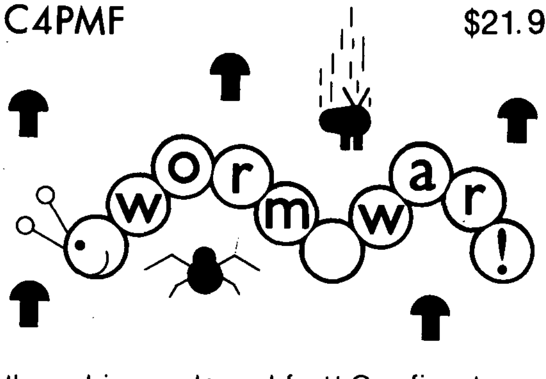

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PROGRAM NAME = "TWO.RAN.FILES"

This is the code for two random files.

The only BASIC commands that are altered are "DISKGET,N", and "DISKPUT".

"DISKGET,N" is now "DISKGET, D,N", where D is either 6 or 7. "DISKPUT" is now "DISKPUT, D", where D is 6 or 7.

The "GET" is also changed in that it now checks to see if the track is already in buffer before it does a call to the operating system for disk access. If the track is already in buffer, it skips the call and sets the pointers to the correct record.

If the desired track isn't in the buffer, then the dirty flag is checked, to see if the buffer has been written to since the last disk access. If it was written to, then the code performs a "DISKPUT,D" automatically before it reads in the new track.

This feature means that the "DISKPUT,D" command normally doesn't need to be used. Just remember to do a "DISKCLOSE,D" or a "DISKPUT,D" at the end of the program, to force a write of the last buffer back to disk.

The code is set up so that the record length can be POKED into the code at any time after the "OPEN", but before the first "GET". Unlike the O.S.I. version, it will accept any value from 0 to 65535. Only the values from 1 to the number of bytes per track are useful, however. Any other values will cause the math to be done wrong, and the code may hang up.

The records per track must be changed at the same time, to a value that is explained by the formula: INT((BYTES PER TRACK) / (RECORD LENGTH))

If both files are open, and they have different parameters, be sure to set the parameters to the correct values before doing any "GET"s on the file.

Since this code may have a record length of 1 byte POKED to it, byte addressing of the file is available.

When using byte addressing, be sure to set the records/track

```
BF60 F003            BEQ ISREC
BF62 4CA72E          JMP $2EA7
BF65 20D0BF  ISREC   JSR ISG ;MAKE SURE OPEN
BF68 20130E          JSR ISCOMA
BF6B 20B90C          JSR $0CB9
BF6E 207216          JSR $1672
BF71 A419            LDY $19
BF73 A61A            LDX $1A
BF75 E00D            CPX #13 ;OR 12 OR 8 (PAGES PER TRACK).
BF77 3008            BMI BIGOK
BF79 F003            BEQ CHKLOW
BF7B 4CD010  SIZENO  JMP ERR4 ;FC ERROR
BF7E 98      CHKLOW  TYA
BF7F D0FA            BNE SIZENO
BF81 98      BIGOK   TYA
BF82 D003            BNE SIZEOK
BF84 8A              TXA
BF85 F0F4            BEQ SIZENO
BF87 8A      SIZEOK  TXA
BF88 AE8A22          LDX DEVICE
BF8B 9DF1BF          STA RL6HI,X
BF8E 8D6619          STA $1966 ;DIVHI+1
BF91 98              TYA
BF92 9DF0BF          STA RL6LO,X
BF95 8D6119          STA $1961 ;DIVLO+1
BF98 A900            LDA #00
BF9A 8519            STA $19
BF9C A90D            LDA #13 ;OR 12 OR 8, DEPENDING ON SYSTEM
BF9E 851A            STA $1A
BFA0 205519          JSR $1955 ;DIVIDE
BFA3 AE8A22          LDX DEVICE
BFA6 AD1E2E          LDA TEMP1
BFA9 9DF2BF          STA RT6LO,X
BFAC AD1F2E          LDA TEMP2
BFAF 9DF3BF          STA RT6HI,X
BFB2 60      ENDCMP  RTS
             ;
             ; THIS CODE IS FOR "PUT" AND "CLOSE". "CLOSE"
             ; RESETS THE OPEN FLAG, THEN DOES A "PUT".
             ;
BFB3 C950    CLS:PT  CMP #'P
BFB5 F00D            BEQ ISAPUT
BFB7 20D0BF          JSR ISG
BFBA 2010BF          JSR CHKDSK
BFBD A900            LDA #00
BFBF 9DF4BF          STA OPNFL6,X
BFC2 F006            BEQ DOPUT
BFC4 20D0BF  ISAPUT  JSR ISG
BFC7 2010BF  PUTIT   JSR CHKDSK
BFCA 4C8622  DOPUT   JMP DOWRIT
             ;
BFCD 4CD010  ERROR4  JMP ERR4
             ;
BFD0 206321  ISG     JSR GETDEV
BFD3 AE8A22          LDX DEVICE
BFD6 BDF4BF  OPENED  LDA OPNFL6,X
BFD9 F0F2            BEQ ERROR4
BFDB 60      ENDISG  RTS
             ;
             ; THIS RESETS THE OPEN FLAGS ON A "RUN"
             ;
BFDC A900            LDA #00
BFDE 8DF4BF          STA OPNFL6
BFE1 8DFCBF          STA OPNFL6+8
BFE4 20C600          JSR $00C6 ;RELOAD THIS CHAR AND RESET FLAGS
BFE7 4C7E08          JMP $087E ;DO REST OF NORMAL "RUN"
             ;
             ; THESE ARE THE PERMANENT STORAGE LOC'S FOR THE
             ; FILE PARAMETERS FOR DEVICES #6 AND #7.
             ;
BFF0                 *=TSTBUF+$F0
             ;
             ; DEVICE #6 LOCATIONS
             ;
BFF0 00      RL6LO   .BYTE 0
BFF1 00      RL6HI   .BYTE 0
BFF2 00      RT6LO   .BYTE 0
BFF3 00      RT6HI   .BYTE 0
BFF4 00      OPNFL6  .BYTE 0
BFF5 00              .BYTE 0
BFF6 00              .BYTE 0
```

continued

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EXAMPLE USES:

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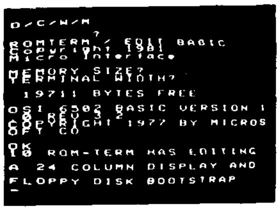

```
D/C/W/M
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A 24 COLUMN DISPLAY AND
FLOPPY DISK BOOTSTRAP
_
```
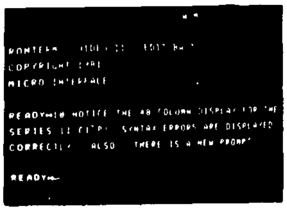

ROM-TERM



```
ROMTERM [illegible]
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MICRO INTERFACE

READY←10 NOTICE THE 48 COLUMN DISPLAY FOR THE
SERIES II C1P. SYNTAX ERRORS ARE DISPLAYED
CORRECTLY. ALSO THERE IS A NEW PROMPT

READY←
```

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:

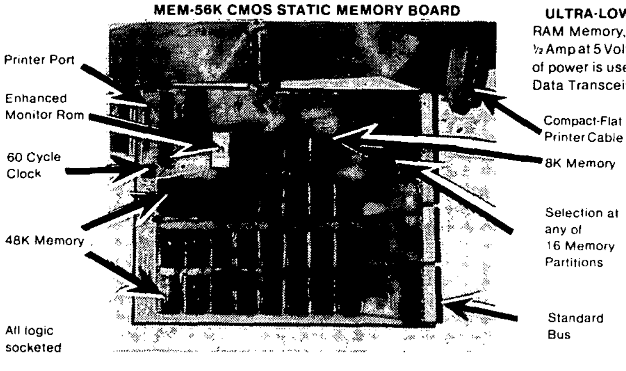
- Disk bootstrap — In disk operation you can **alternate between ROM Basic and Disk Basic with a keystroke.** Can **Warm** Start **Disk Basic.**
- Easy transfer of programs between disk and ROM Basic. (Use the ROM Basic for editing disk basic programs.)
- **Memory files can be** stored or recalled in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

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to the number of bytes/track for your system:

3328 FOR 13 PAGES / TRACK
3072 FOR 12 PAGES / TRACK
2048 FOR 8 PAGES / TRACK.

Since this code uses 2 byte math, only 65535 records are available. If you try to go past record 65535 with a "GET", you will get an FC ERROR, and be kicked out of the program.

```
BFF7 00              .BYTE 0
              ;
              ; DEVICE #7 LOCATIONS, 8 BYTES HIGHER THAN #6.
              ;
BFF8 00              .BYTE 0,0,0,0,0,0,0,0
BFF9 00
BFFA 00
BFFB 00
BFFC 00
BFFD 00
BFFE 00
BFFF 00
              ;
                     .END
```

THE "ULTIMATE" BREAK SWITCH MOD OR HOW TO WARM-START DISK BASIC!

by: Martin Ybarra
Interesting Software
15856 Ocean Avenue
Whittier CA 90604

There has been a great deal of talk on how you cannot warm start 65D Disk BASIC. Because of this, there have been many articles written on how to override the Break switch on polled keyboard machines, by moving it to another location, building little boxes around it and even some sophisticated hardware mods to add a three-second delay. In fact, this little problem has irritated people so much that even OSI has added the delayed Break switch on all new computers.

This is really fine, but I feel that it does not solve the problem, only the symptoms. I decided to see what I could do about it. After searching around a bit, I discovered that when the Break key is pressed, certain pointers are reset and the computer is back to square one again. What I decided to do was to install a patch to the DOS so that no pointers would be reset upon pressing the Break key.

Below is a short BASIC program to install the patch. After running the program, you can save the machine code routine on a little used sector on track 12 with: DISK!"SA 12,5=3178/1". This code does not take up any user memory. Now, all that is required after the Break key is pressed, is to just type 'M' and then 'G'. You will see an 'out of memory error' which you should just ignore. That is where I vectored back into BASIC. You can now list, run or save your program back to disk. I would suggest that you save the program back to disk and then re-boot to be on the safe side.

As a side note I would also like to mention that within the code I have also enabled the use of the RUB OUT key for deleting characters. Also, for those of you who still like to use Shift 0, that will still work.

```
100 X=12820
110 Y=12894
120 FOR T=X TO Y
130 READ A:POKE T,A
140 NEXT T
150 DATA 160,32,76,167,253,
    169,0,76,183,253,173,99,
    35,201,127
160 DATA 208,5,169,95,141,99,
    35,76,68,38,162,3,189,
    91,50
170 DATA 157,19,2,202,16,247,
    160,0,140,1,192,140,0,
    192,162,4
180 DATA 142,1,192,140,3,192,
    136,140,2,192,142,3,192,
    140,2,192
190 DATA 32,43,39,32,99,38,76,
    76,4,8,40,9,9
200 POKE 9530,30:POKE 9531,50
    :POKE 1,45:POKE 2,50
210 SAVE 12,5=3178/1
```

★

HOW TO GET LINE NUMBERS GREATER THAN 63999

by: James Lin
Interesting Software
15856 Ocean Avenue
Whittier, CA 90604

To protect copyright messages or valuable code, it's sometimes nice to be able to use 'illegal' line numbers which people cannot normally delete. By looking at how BASIC-in-ROM encodes programs, you can poke different values to obtain those 'illegal' line numbers. The line numbers are encoded in low-byte, high-byte form as shown below. The '0' at the end of the line determines the next line number (which is also the end of the first line).

In ROM machines, the BASIC program starts at 12929 and moves up incrementally. If you POKE a 255 into locations 12929 and 12930, you will have just created a line number of 65535. However, being that I am basically a lazy person, I am always looking for easier ways of doing things. In this case, I have come up with a single POKE that will allow you to type in those numbers from the keyboard. That POKE is: POKE 2429,26 (the normal value is 25). The lines typed will be listed in sequential order at the end of the program... neat huh?

★

MISCELLANEOUS C1P INFORMATION

by: Ken Holt
217 E. Main Street
Charlottesville, VA 22901

Single-Character Input

It's easy to input a single character in BASIC once you know how to do it.

For ROM BASIC or PICO-DOS:

```
10 POKE 11,0: POKE 12,253: REM
   SET UP USR FUNCTION
20 AC=531: REM ADDRESS OF
   INCOMING CHARACTER

1000 REM EXECUTE THE CODE ON
     LINE 1020 EVERY TIME YOU
     NEED A
1010 REM CHARACTER.  LINES 10
     & 20 NEED BE DONE ONLY
     ONCE.
1020 CH=USR(CH): CH=PEEK(AC):
     REM GET THE CHARACTER (IN
     CH)
```

For minifloppy DOS, 65D V3.0 thru V3.3:

```
10 POKE 8955,43: POKE 8956,37:
   REM SET UP USR FUNCTION
20 AC=9534: IF PEEK(9516)=68
   THEN AC=9059: REM ADDR OF
   CHARACTER

1000 REM EXECUTE THE CODE ON
     LINE 1020 EVERY TIME YOU
     NEED A
1010 REM CHARACTER.  LINES 10
     & 20 NEED BE DONE ONLY
     ONCE.
1020 CH=USR(CH): CH=PEEK(AC):
     REM GET THE CHARACTER
     (IN CH)
```

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

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List Price $395

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An alternate for minifloppy DOS:

```
20 AC=9534: IF PEEK(9516)=68
   THEN AC=9059: REM ADDR OF
   CHARACTER

1000 REM EXECUTE THE CODE ON
     LINE 1020 EVERY TIME YOU
     NEED A
1010 REM CHARACTER.  LINE 20
     NEED BE DONE ONLY ONCE.
1020 DISK!"GO 252B": CH=PEEK
     (AC): REM GET THE
     CHARACTER (IN CH)
```

Raising/Lowering Disk Drive Head

For some reason, the OS-65D operating systems based on the 5" disk drive do not provide for raising the read/write head during times when the disk drive is not being accessed. The following "trick" helps to make up for this deficiency.

```
1000 REM RAISE READ/WRITE HEAD
1010 X=PEEK(49154)
1020 POKE 49154,X AND (255-32)
1030 RETURN

1050 REM LOWER READ/WRITE HEAD
1060 X=PEEK(49154)
1070 POKE 49154,X OR 32
1080 RETURN
```

A Word of Caution:

Never do anything that could cause a disk access while the head is up. This includes opening, closing, reading, writing, and searching a data file. Don't RUN a program by file name. Also, don't give any of these DOS commands: LOAD, PUT, XQT, CALL, SAVE, EXAM, ASM, or EM. Doing any of these with the head up means instant death. You must first lower the head for all of the above activities.

★

COMPUTERCUBE

see correction p 25 May 82

by: Colin Law
c/o Box 3819
Auckland
New Zealand

No, this program doesn't solve the cube for you, but it can probably save you some time by combining two of the current time-wasting occupations: home computing and solving the cube!

The program is written for a Superboard II with CEGMON and a PSG but you can doubtless modify it for other Superboards, UK101 and other monitors. The sound is not essential but adds to the fun.

Specific CEGMON functions:

Windows - subroutine at 700 sets the parameters for four windows

Windows - subroutine at 750 resets the window when required

CHR$(13) - carriage return, sends the cursor back to the beginning of the line

CHR$(30) - clears the current window

CHR$(26) - clears the screen

GET KEY - subroutine at 1200 sets up this CEGMON function so that K=USR(X) will return the ASCII value of key pushed in variable K.

Sound:

The PSG is an AY-3-8910 with Register detail POKEd to 63235 and Data POKEd to 63233.

When the program is run, there are a few arrays to fill so the first print to screen is the message "COMPUTERCUBE----PLEASE WAIT". This changes to simply, "COMPUTERCUBE" when loading is almost complete and a 3 dimensional representation of the cube is drawn on the screen with faces labeled as follows: F=front, B=back, U=up, D=down, L=left, R=right. By changing the ASCII data in line 865, you can have whatever face labels you wish - but remember that they must match an appropriate key on the keyboard. (To use graphics for labels, you would need a double array and would need to remember which key represented which graphic - could get confusing). The screen also shows what is on the other 3 faces which are normally obscured in a 3 dimensional 3 face view.

Brief instructions are printed alongside the cube and the bottom of the screen is a window for printing moves and asking for your next instruction. When ready, the program asks "MOVE ?" and will accept from the keyboard either:

(a) one of the letters F, B, U, D, L, R or

(b) < for counterclockwise, > for clockwise rotation (actually - and . you don't use the shift key).

If you enter a letter then that face is brought to the front of the displayed cube and the sound generator gives a single note. If you select < or >, you are asked "WHICH FACE ?" and you can again input F,B,U,D,L,R and with an upscale or downscale boink from the sound generator you are told "FACE X ROTATED COUNTERCLOCKWISE" (or CLOCKWISE) and the display changes accordingly.

If you press LF key then the cube is jumbled for you. Twelve times through a loop which does one random counterclockwise and one random clockwise move each time. The RETURN key will offer you option to drop out of the program or start again with the cube all neatly in place.

The arrays ensure that the program remembers which faces are adjacent to each other and where the individual cubes belong. Remember that the center square of each face never moves, that is how the faces are designated, by the center square.

Brief Notes on Subroutines:

Lines 0 to 115 are the setting up procedure.

120-295 Get key and act on it, for rotate instructions go to subs at 500 or 600, for new face to the front go to 300.

300-390 Fill in the labels of the faces on screen and go back for next instruction.

500-599 Rotate counterclockwise.

600-699 Rotate clockwise.

700 Set-up window array.

750 Reset current window.

800 Screen locations for 3 dimensional display.

865 Face label ASCII values.

870 Adjacent faces information.

900 Loads array with screen locations for squares.

930 Draws cube framework.

1000 PSG setting up.

1030 Saves face label characters.

1050 Loads 'adjacent sides' data.

1100 Prints instructions.

1200 Sets up CEGMON get key.

1400 Routine to jumble.

1500 Escape routine.

I'm thinking about mods to actually solve the cube, but hearing that the world record is down below 30 seconds, I think I may have to go into machine code if my program is to be in the running! Mind you, the champions don't waste time going boink every move they make.

```
1 REM
10 CLEAR:RESTORE:CR$=CHR$(13)
20 DIMF(6,9),P(6,9),Y(6,6)
25 DIMWW(4,5),A(6)
30 GOSUB700:W=4:GOSUB750
40 C$="COMPUTERCUBE":PRINTC$;
50 PRINT"----PLEASE WAIT"
60 GOSUB900:REM SET LOCATIONS
70 GOSUB1000:REM PSG & LABELS
80 GOSUB1200:REM USR GETKEY
100 GOSUB1100:REM INSTRUCTIONS
110 W=2:GOSUB750:FF=1:GOTO300
115 :  REM GET KEY
120 PRINT"MOVE ?";
125 K=USR(X):FORI=1TO6
130 IFK≠A(I)GOTO270
135 NEXT:KK=K:IFK=13GOTO1500
140 IFK=10GOTO1400
145 IFABS(K-45)=1GOTO160
150 GOTO125
160 PRINTCR$;CHR$(KK+16);
165 PRINT"WHICH FACE ?";
200 K=USR(X):FORI=1TO6
205 IFK=A(I)THENX=I:GOTO220
210 NEXT:GOTO200
220 IFKK=44GOTO500
230 IFKK=46GOTO600
240 GOTO125
270 POKER,0:POKED,100
275 POKER,12:POKED,18
280 FF=1:PRINTCR$;
290 PRINT"FACING YOU: ";
295 PRINTCHR$(A(FF)):PRINT
300 FORA=1TO6
320 FORB=1TO9
330 POKEP(A,B),F(Y(FF,A),B)
340 NEXTB,A
350 POKER,12:POKED,6
360 RT$=STR$(RT):L=LEN(RT$)
370 FORI=2TOL:T$=MID$(RT$,I,1)
380 POKE53814+I,ASC(T$):NEXT
390 GOTO120
500 REM ROTATE <
505 FORI=40TO90:POKER,0
510 POKED,I:POKER,13:POKED,0
515 NEXT:FORI=1TO8:T(I)=F(X,I)
520 NEXT:FORI=1TO8
530 II=I-2:IFII<1THENII=II+8
535 F(X,II)=T(I):NEXT
545 FORI=1TO3:T(I)=F(Y(X,3),I)
550 F(Y(X,3),I)=F(Y(X,4),I+4)
555 II=I+6:IFI=3THENII=1
560 F(Y(X,4),I+4)=F(Y(X,5),II)
565 F(Y(X,5),II)=F(Y(X,2),I+2)
570 F(Y(X,2),I+2)=T(I):NEXT
575 IFJ>0THENRETURN
585 PRINTCR$;"FACE ";
590 RT=RT+1:PRINTCHR$(A(X));
595 PRINT"COUNTERCLOCKWISE"
599 PRINT:GOTO300
600 REM ROTATE >
605 FORI=90TO40STEP-1:POKER,0
610 POKED,I:POKER,13:POKED,0
615 NEXT:FORI=1TO8:T(I)=F(X,I)
620 NEXT:FORI=1TO8:II=I+2
630 IFII>8THENII=II-8
635 F(X,II)=T(I):NEXT
645 FORI=1TO3:T(I)=F(Y(X,3),I)
650 F(Y(X,3),I)=F(Y(X,2),I+2)
655 II=I+6:IFI=3THENII=1
660 F(Y(X,2),I+2)=F(Y(X,5),II)
665 F(Y(X,5),II)=F(Y(X,4),I+4)
```

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```
670 F(Y(X,4),I+4)=T(I):NEXT
675 IFJ>0THENRETURN
680 RT=RT+1:PRINT"ROTATED"
685 PRINTCR$;"FACE ";
690 RT=RT+1:PRINTCHR$(A(X));
695 PRINT"CLOCKWISE"
699 PRINT:GOTO300
700 REM SET WINDOWS
705 DATA31,0,208,224,211
710 DATA31,0,211,224,211
715 DATA9,119,208,215,210
720 DATA31,0,208,64,208
730 FORI=1TO4:FORT=1TO5
735 READA:WW(I,T)=A:NEXTT,I
740 PRINTCHR$(26):RETURN
750 REM CHANGE WINDOW
755 FORI=1TO5
760 POKE545+I,WW(W,I):NEXT
765 PRINTCHR$(30);
790 RETURN
800 DATA604,607,610,706,802
805 DATA799,796,700,703
810 DATA422,484,546,543,540
815 DATA478,416,419,481
820 DATA804,708,612,550,488
825 DATA584,680,742,646
830 DATA962,959,956,924,892
835 DATA895,898,930,927
840 DATA794,793,792,696,600
845 DATA601,602,698,697
850 DATA428,524,620,619,618
855 DATA522,426,427,523
865 DATA70,85,82,68,76,66
870 DATA1,2,3,4,5,6,2,3,1
875 DATA5,6,4,3,1,2,6,4,5
880 DATA4,6,5,1,3,2,5,4,6
885 DATA2,1,3,6,5,4,3,2,1
900 REM VIDEO ARRAY
905 FORT=1TO6:FORI=1TO9
```

```
910 READA
915 P(T,I)=A+53000:NEXTI,T
930 REM FRAME
935 FORI=1TO9:P=P(1,I)
940 POKEP+1,143:POKEP-1,136
945 POKEP-31,207:POKEP-32,135
950 POKEP-33,210:POKEP+31,209
955 POKEP+32,128:POKEP+33,208
960 P=P(2,I):POKEP-1,189
965 POKEP+2,189:POKEP-32,189
970 POKEP-31,135:POKEP-30,135
975 POKEP-29,189:POKEP-61,128
980 P=P(3,I):POKEP+32,189
985 POKEP+1,189:POKEP-31,143
990 POKEP-63,143:POKEP-94,136
995 NEXT:RETURN
1000 REM PSG
1010 R=63235:D=63233
1015 POKER,7:POKED,62
1020 POKER,8:POKED,16
1030 FORI=1TO6:REM LABEL FACES
1035 READA(I):FORII=1TO9
1040 F(I,II)=A(I):NEXTII,I
1050 REM ADJACENTS
1055 FORI=1TO6:FORII=1TO6
1060 READA:Y(I,II)=A
1065 NEXTII,I
1070 RETURN
1100 REM INSTRUCTIONS
1110 W=3:GOSUB750
1120 PRINT"Rotate"
1130 PRINT"using"
1135 PRINT"< and >":PRINT
1140 PRINT"RETURN to restart"
1145 PRINT:PRINT:PRINT"LF to"
1150 PRINT"jumble":PRINT
1155 PRINT:PRINT" MOVES:"
1160 FORI=1TO8:PRINTCHR$(183);
1165 NEXT:PRINT:PRINT
```

```
1170 FORI=1TO8:PRINTCHR$(183);
1175 NEXT:W=4:GOSUB750:PRINTC$
1180 W=2:GOSUB750:RETURN
1200 REM USR GET KEY
1205 FORX=1TO80
1210 M=PEEK(64767+X)
1215 POKE(575+X),M:NEXT
1220 FORX=1TO3:READM
1225 POKE(633+X),M:NEXT
1230 DATA76,208,253
1240 FORX=1TO15:READM
1245 POKE(655+X),M:NEXT
1250 DATA141,19,2,76,110
1255 DATA253,32,64,2,168
1260 DATA169,0,76,193,175
1265 POKE11,150:POKE12,2
1270 RETURN
1400 REM JUMBLE
1405 FORJ=1TO12:X=RND(6)*6
1410 PRINTCR$;"JUMBLE";
1415 X=INT(X)+1:PRINTCHR$(16);
1420 GOSUB500:X=RND(6)*6
1425 X=INT(X)+1:PRINTCR$;
1430 PRINT"JUMBLE";CHR$(20);
1435 GOSUB600:NEXT
1440 PRINTCR$;"*********";
1490 J=0:GOTO300:PRINTCR$;
1500 REM EXIT
1510 PRINT:PRINT"SHALL WE ";
1515 PRINT"RESTART ";
1520 FORI=1TO500:NEXT
1530 K=USR(X):IFK=89GOTO1
1535 IFK=47GOTO1560
1540 IFK=0GOTO1520
1545 PRINT
1550 PRINT"NEXT MOVE THEN..."
1555 GOTO120
1560 W=1:GOSUB750
1570 STOP
```

INVISIBLE PASSWORD PROGRAM

by: Fred W. Atchley
Ocean Springs, MS 39564

You don't need a special routine to compromise OS-65U passwords. All you have to do is use them, whereupon they glow steadfastly on the your screen for everyone to see. The problem is that the input firmware echos each input character back to the console. I tried working around the INPUT line by PEEKing the display terminal (an ACT-5A), but found that this method was too slow to keep up with typing speeds. This problem drove me to write a machine language program (MLP) which reads and tests characters from the console terminal without echoing them back. The following BASIC program POKEs the MLP into memory and then calls it.

PROGRAM NOTES

1. The target system is a C2-OEM w/48K and OS-65U.

2. The BASIC program writes the MLP into high memory at location $BC00 (48128 decimal). This location was selected because it can be protected from the OS-65U operating system. Note program

```
 10 REM   PART 1
 20 REM     INVISIBLE PASSWORD      by Fred Atchley
 30 REM
 40 POKE132,0:POKE133,188:CLEAR    :REM    limit OS-65U
    upper boundary
 50 S=48128: F=S+34          :REM   start of machine level
    program (MPL)
 60 FOR X= S TO F: READ A: POKE X,A: NEXT  :REM    write
    MLP to memory
 70 GOTO 460
 80 :
 90 :   START of MLP: $BC00 (48128 decimal)
100 :  +-------------+-----------+--------+-----+----------
    ----------+
110 :  !   decimal   !    hex    ! hex    ! mnemonic
    !
120 :  !   machine   !   memory  ! machine! assembler
    !
130 :  !    code     !  location ! code   ! code
    comment    !
140 :  +-------------+-----------+--------+-----+-----------
    ---------+
150 DATA 174,27,188   :REM    BC00    AE1BBC    LDX   load read
    index
160 DATA 232          :REM    BC03    E8        INX     add a one
    to it
170 DATA 142,27,188   :REM    BC04    8E1BBC    SDX     save it
180 :
190 DATA 173,0,252    :REM    BC07    AD00FC    LDA   get ACIA
    status
200 DATA 74           :REM    BC0A    4A        LSRA    is read
    ready?
210 DATA 144,250      :REM    BC0B    90FA      BCC       no.. get
    again
220 DATA 173,1,252    :REM    BC0D    AD01FC    LDA       yes..
    read char
230 :
240 DATA 41,127       :REM    BC10    297F      AND   7F=turn
    parity off
250 DATA 221,28,188   :REM    BC12    DD1CBC    CMP   compare
```

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line 40, which sets the upper memory boundary used by OS-65U to $BC00 (page 188). Once the BASIC program is run, the MLP remains undisturbed in high memory as other programs are swapped in and out. Hence, as long as the operating system stays up, the MLP can be exercised by any program at any time.

3. The BASIC program, as listed, consists of 2 parts: part 1, lines 10 - 440, need only be run once (i.e. each time you boot the system). Thereafter, any program which needs password protection can use a calling sequence like the one contained in part 2, lines 460 - 680. (there is no need to run both parts each time).

4. The password is tested, one character at a time, against a string of characters starting at location $BC1D (line 370). In the example listing, the password is PEEK65. The FOR/NEXT loop in lines 520-540 is therefore set for a password length of 6. Each character is read and tested, in order, by a USR(X) statement.

5. Finally, this program is sneaky. If a would-be browser triesto break the code, the calling program leads them on ... well beyond the first incorrect character... then it sounds the alarm!

```
    char to pw
260 DATA 208,3        :REM   BC15   D003     BNE     if not=
    goto RTN
270 DATA 238,28,188   :REM   BC17   EE1CBC   INC     if= bump
    good cnt
280 DATA 96           :REM   BC1A   60       RTN   return to
    BASIC pgm
290 :
300 :                Counters
310 :
320 DATA 0            :REM   BC1B   00             read
    index
330 DATA 0            :REM   BC1C   00             good
    match counter
340 :
350 :                Password is     PEEK65
360 :
370 DATA 80           :REM   BC1D   50           ="P"
380 DATA 69           :REM   BC1E   45           ="E"
390 DATA 69           :REM   BC1F   45           ="E"
400 DATA 75           :REM   BC20   4B           ="K"
410 DATA 54           :REM   BC21   36           ="6"
420 DATA 53           :REM   BC22   35           ="5"
430 :
440 :============ END of MLP: $BC22 (48162 decimal)
    =================
450 :   PART 2
460 PRINTCHR$(27);CHR$(61)          :REM       turn ACT-5A
    keyclick off
470 PD$="DUMMY, ENTER THE CORRECT PASSWORD"
480 PW$="ENTER PASSWORD"
490 POKE8778,0:POKE8779,188         :REM       point USR to
    jump to MLP
500 POKE48156,0:POKE48155,0         :REM       reset counters
510 PRINTPW$          :REM    ask for password from keyboard
520 FOR X=1 TO 6      :REM    set for a 6 character password
530 A=USR(X)          :REM    jump to MLP to read & test
    next character
540 NEXT X
550 REM
560 REM ... if # of matched password characters = # of
    character reads
570 REM then the user has entered the correct password and
    is allowed
580 REM to proceed (GOTO user program)
590 REM
600 IF PEEK(48156)=PEEK(48155) GOTO680 :REM   (match) &
    (read) count
610 REM
620 FOR X=1 TO 8      :REM    ... if not, lead the sucker on,
    and on, ..
630 A=USR(X):NEXTX
```

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```
640 REM            :REM         ... then trigger the alarm ...
650 FOR X=1 TO 25
660 FOR    Y=1     TO    190:NEXTY:PRINTCHR$(7);"INTRUDER
    ALARM":NEXTX
670 PRINT:PW$=PD$: GOTO500
680 PRINTCHR$(27);CHR$(60):PRINT:PRINT:
    PRINT"CONGRATULATIONS":END
```

★ ★ ★

OS-65D VERSION 3.3

by: Willis H. Cook
1298 Renee Drive
Lilburn, GA   30247

When OSI announced that it had been bought by MA/COM, a rumor spread that the company would concentrate its future efforts on the commercial market to the exclusion of hobbyist computers. If nothing else, the release of OS-65D version 3.3 should reconfirm OSI's commitment to the personal computer market. Not only does it contain many features that appeal to hobbyists, several features will work only on home-type computers, such as the C4 and C8 machines, that have internal video display boards.

There are some excellent utilities included in version 3.3, such as a machine-language program resequencer, a modem driver a sort routine and a very good disk copier that will work for either one or two drives. The machine-language assembler is also included as an integral part of the package, rather than as an extra-cost option.

The new version supports numerous PRINT commands, such as PRINT USING which allows formatted numeric outputs. PRINT USING "###.##" will align a column of figures and print them with two decimal positions, truncating or padding with zero as necessary. For screen display, there is a PRINT and command (OSI's version of PRINT AT: the commercial at symbol "@" is still not a directly printable character.) PRINT and (20,15) prints at column 20, and 15 lines down from the top of the screen.

If you use an Epson printer, there is a skip-over-perf forms control that keeps up with the number of lines printed and causes the printer to skip six lines between each page to provide a top and bottom margin. Altogether, there are twenty-four new PRINT commands supported, controlling color selection, cursor movement (yes, the cursor can now be moved anywhere on the screen!) and printer control.

Also included is a line-editor that allows changes to program listings to be made by moving the cursor to the location in the line and retyping material to be replaced. It is not a full-screen editor, but it is very useful once you become familiar with it.

The keyboard now acts like a regular typewriter keyboard. Either shift key allows upper-case characters and the operating system recognizes lower-case characters as their upper-case equivalents. In fact, if you type your program in lower-case, it will be converted to all capitals internally, except, of course, for string variables in quotes.

Ten escape codes are recognized that allow instantaneous screen clearing, cursor movement, changes between 32x32 and 32x64 formats and color control. A cutout guide to the escape codes provided which can be attached to the keyboard for handy reference.

Disk file handling has been improved too. There is a FIND command that will search through a disk file for a given string. Random file I/O has been simplified slightly by making the PUT command optional. The GET command now accesses the desired record and automatically writes the previously-accessed record back to the disk. PUT is still recognized, however, to maintain compatibility with programs developed under version 3.2. Random-access file record lengths are now variable and may be as small as eight bytes or as large as 256 bytes. This is a feature I wish our $40,000 office IBM had.

In addition to the utilities mentioned earlier, there is a packer program that removes spaces and comment lines to decrease program size, and a BASIC dissassembler.

Do you give up anything for these new features? Yes, you do; space, speed and a few commands.

Version 3.3 requires 14.6 k bytes compared to 3.2's 12.6 k bytes. You will probably find that a minimum of 32 k bytes of RAM is required to use this operating system effectively. The extra required space was obtained from two locations: an additional 2300 bytes were added at the end of the existing operating system area, which moves the starting address of the normal workspace from $317E to $3A7E, and five pages (1280 bytes) are used at the high-end of user RAM. At first thought, you might expect that the changed starting address would mean incompatibility with version 3.2 programs, but OSI did it right: the same BASIC program that starts at $317E under 3.2 now runs just fine starting at $3A7E under 3.3, the change being transparent to the user. Unfortunately, machine-code programs aren't relocated automatically; the user will have to re-assemble them nine pages higher in memory.

The second penalty you pay for the extras in the new operating system is speed. Four short BASIC benchmark programs including loops, divisions, subroutine jumps and sub-string extractions gave an average speed reduction of 16.6 per-cent compared to version 3.2, which is itself some 14 per-cent slower than ROM BASIC. The slower program execution speed is not normally noticable but program listing is decidedly sluggish.

The third thing you give up is a few BASIC commands. Null, WAIT and ATN (arctangent) are not supported under version 3.3. The last command is not irretrieveably lost, however. If you MUST find an arctangent, a utility program is included that will provide that function, at the expense of the expanded PRINT commands.

There is one other peculiarity involved with the operating system. Several of the utility programs included with version 3.3 will not run under that release: they will only run under version 3.2. The reason is that these utilities reside at the top end of RAM which is also used by 3.3. OSI provides the utilities on a separate disk with OS-65D version 3.2 on it. So, to run the resequencer, for example, involves booting the 3.2 disk, running the program RESEQ, which loads the BASIC command word RESEQ into high memory, loading the program to be resequenced, which is probably on another disk, and finally re-booting version 3.3. It's a little awkward, but not impossible.

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When you purchase version 3.3 you get six diskettes: five tutorial disks progressively leading the user through all the features of the operating system, and a blank disk for back-up.

The full-blown operating system is on disk #5. Numbers 1, 3 and 4 have demo programs illustrating file handling, etc., and disk #2 is the 3.2 version with the utilities. A 247 page reference manual is also included. It is an excellent guide to the operating system, includes source listings of the utilities and numerous example programs.

The price of the OS is $79, which seems reasonable for the amount of material you get. It really gives your computer a new personality and you quickly realize how much of your machine is software. Despite the speed loss and the extra space required by 3.3, once you have used it, you won't want to go back to 3.2 again.

★

CASSETTE CORNER

by: David A. Jones
38902 SW 17th Terr.
Miami, FL 33165

We seldom see reviews of software for the cassette based OSI machine. Maybe the thought is, if it costs less that $20 why bother to review it? Just go out and buy it! Well, it doesn't take long for a 10 here and a 20 there to add up to a couple of reviews.

My first purchased software was marginally useful at best. The ads were enticing but the product left much to be desired. I spent more time rewriting these than if I had started from scratch and wrote them myself. Needless to say, I was quite hesitant to rush out and buy more after that, even though I believed better programs were indeed available. Once burnt, twice shy.

Pull out some of your old magazines and see what used to be offered. I'm glad to say more well put together games and utilities for OSI are now available, but you must be careful. Still, I'm envious of the TRS80 and Apple users. I wish the OSI systems would have caught on with more of a professional game designers.

It's not that I'm such a game player, but that most of my application programs and device drivers are unique to me or my system, so I had to write those myself rather than buy them. The following are impressions of some of the games I've bought.

Breakout - Dee Products - BASIC. Although this program has been around a long time, I had never seen or played it until I got the tape. Not very impressive. Has all of the limitations of BASIC graphics. Equivalent to give-away listings in the hobby magazines. For only $5.00 though, you're relieved of the task of typing in the code and you might get some ideas on how to program graphics.

Galaxian 4K - Aardvark - machine language. Alien invader type game. Difficult to master but not extremely frustrating for the first time player. My kids consistantly beat me with their non-scientific style of play. The first game I had that I didn't immediately want to fix this and this and maybe this... etc. I think it is worth the money.

Monster Maze - Aardvark - Machine language. Another one that I like very much. I thought the playing instructions were a bit sketchy though. My daughter had to show me how to make the monsters vulnerable. (Run over

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the diamonds) I'm still not quite sure how to get an extra man, but I do get one from time to time. I've managed to remain the champ in my house on this one so far. Our most popular game.

Ground Control Approach - Aurora - BASIC. This one is listed in the game section of the brochure but is actually supposed to be a computer simulation. The instructions were vague and the graphics no better. Not much of a simulation and not much of a game either. I lost all interest after about 10 plays or so.

Wild Weasel III - Aurora - BASIC. Another simulation by the author of Ground Control Approach. I couldn't get this one to play on my machine at first. It's listed as an 8K program and that's exactly what it requires. I have a 12K RAM in my machine and kept getting overflow errors each time I tried to run it. Out of desperation I answered 8192 once at boot up and viola!, it worked. There are some machine language routines in this one. Once running though, I was disappointed again. Another simulation and not very interesting. The game ends when all the weasels are expended and does not reward the player with extra time for skillful play.

Failsafe +2 - Aurora - BASIC. The third game of the package by the same author. By now I know I don't like simulations. You're on a bombing run and you either make it or you don't. One flight per game, win or lose.

I was very disappointed in all three games and so I wrote to Aurora and told them so. Owen West of Aurora called me personally to find out why I was unhappy and what he could do to rectify the situation. We decided to exchange the programs for 3 others by a different author and I received the new tapes within 4 days. Much to my regret, I didn't think too much of the replacements either.

UFO Attack - Aurora - BASIC. The controls are arranged for one handed operation but with 9 keys the tendency is to try to play with both. Awkward. Because it is written in BASIC, movement is rather slow. Graphics get blanked when 2 objects pass. The game leaves you hanging when it suddenly ends and rewrites the screen with the introduction for the next game.

Meteor Fallout - Aurora - BASIC. The controls are erratic and unpredictable. Motion stops or slows during base movement or firing. The display didn't line up correctly on my C1P. Targets go outside of the border.

Crazy Bomber - Aurora - BASIC. I know a lot of effort went into programming this game but I feel it was all for naught. The 2 speed movement of the firing mechanism is spelled out in the instructions but really seemed to be out of the player's control most of the time. Again the graphics didn't seem to match my machine. This was the best of the 3 games in the replacement package, but I was pretty disappointed with them all.

Ganymede - Dwo Quong Fok Lok Sow - Machine language. A very professional package comes with this game including a registration card for software updates. The playing instructions were very complete but do require study in order to play. The game requires some brainwork in addition to agile fingers. It will take some time to get proficient enough to get bored with this one because it's not easy to beat. However, there really isn't much excitement in being a shuttle pilot. Dwo Quong uses a different load routine than everybody else. It worked quite well with their tape but not exactly as the instructions described. I prefer the more standard MOS Technology (OSI checksum) format. You get to see what's happening during loading.

I realize everybody's taste is not the same as mine, but I think we all would like an opinion other than that of the seller. I know I would have bought sooner if I would have had more confidence in what I was getting. Also, I think we should supply more feedback to the seller, good or bad, in order to improve the quality of what's being offered. No comment generally will be taken as customer satisfaction.

If anyone out there has bought something they really like or dislike, I wish they would let us know. It could save us all a few bucks but more importantly, a few hours of frustration.

★

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LETTERS

ED:

In reply to Mr. Steve Stratton's letter (Nov. 1981), concerning keyboard inputs appearing on the screen in other than the normal location, the following technique may be helpful. This method will work on a C2/C4/C8 video system using OS-65D version 3.2, but not with version 3.3

Memory location 9666 (decimal) determines the position of the left margin of the screen display. Normally zero, this location can be POKEd with any value between 0 - 63, moving the left margin to the right that number of spaces. The displaced location will remain until you change it back.

The vertical position of the input location is controlled by location 9667 but it is not as simple as the horizontal control. The normal content of this memory location is 215. Decreasing this value by one raises the input location by four lines. The positions available are:

	N	Lines Above Normal Input Location
POKE 9667,N	209	24
	210	20
	211	16
	212	12
	213	8
	214	4
	215	0

There is one little complication: when you do this, the cursor still appears at its regular location. Furthermore, it doesn't erase itself as it moves across the screen. You overcome this problem by changing the cursor symbol to a blank: POKE 9680,32. As an example, the following little program will accept a keyboard input and display it in the center of the screen.

```
10 POKE 9680,32 : REM Blank
   cursor.
20 POKE 9667,212 : REM Move
   input up 12 lines
30 POKE 9666,30 : REM And to
   the right 30 columns.
40 INPUT "ENTER SOMETHING"
   ;A$
50 POKE 9666,0 : POKE 9667,
   215 : POKE 9680,95
60 REM Put everything back
   to normal.
70 PRINT "THIS APPEARS WHERE
   IT SHOULD."
80 END
```

This works well with math education programs where you display the problem and have the answer appear in its proper position. I hope it helps.

Willis H. Cook
Lilburn, GA 30247

* * * * *

ED:

RE: Jack Eddington's letter, PEEK (65), December 1981.

I'm not sure I can explain what I've done to fix the random file handling since I tend to customize everything to suit my sense of aesthetics and my fervent desire to realize the maximum in utility from my C4P MF (48K with two mini-floppies). Now ~~that~~ I've started, here's my best shot.

Fixing the DISK G. (The "ET" of GET, "UT" of PUT, "LOSE" of CLOSE, and "PEN" of OPEN aren't needed -- it saves space on a BASIC line and helps me to cram a program onto one track when space is tight. I'm frugal that way. Note: I didn't discover the preceding, I read it in either PEEK (65) or the AARDVARK Journal.) In the June 1981 AARDVARK Journal, Dave Pompea presented a BASIC program which could be used each time a file handling program was written. Since the bulk of my work deals with random files, I have stored the routine which Dave Pompea wrote on my DIRectory track, track 39, in sector 6 along with other useful subroutines like a screen clear, file zeroer, and screen editor (again, none of them are originally mine). Here is a disassembly of the subroutine.

```
BFE9 AD2C23 LDA $232C
BFEC 8DD780 STA $80D7
BFEF 20CA2E JSR $2ECA
BFF2 ADD780 LDA $80D7
BFF5 CD2C23 CMP $232C
BFF8 F003   BEQ $BFFD
BFFA 206729 JSR $2967
BFFD 4C8E22 JMP $228E
```

I changed the PUT/GET overlay on track 12,4 (now on 39,5). Here's how. Do the following:

```
EXIT
EM
!CA 2E79=12,4
@2EBE           (The @ is the
                 shift P)
2EBE/20  4C     (Type only the
                 last two hex
                 digits
2EBF/CA  E9     (here and for
                 the next two
                 locations
2EC0/2E  BF     (followed by a
                 LINE FEED.)
!SA 12,4=2E79/1
```

The preceding will cause a jump to be installed in the PUT/GET overlay to the fix routine in high memory. If you have a 24 K system change the BF above to 5F.

Use the Assembler or Extended Monitor to type in the actual fix and call it into memory whenever you use a random file. Here are some example BASIC lines I use.

```
1 POKE132,0: POKE133,182:
  RUN2
2 POKE132,0:POKE133,182:
  DISK!"CA BE00=39,6"
3 REM SETS BUFFER AT $B600 AND
  CALLS FILE FIXER ETC.
```

You will note the first two lines of the program segment. This is something I have discovered by myself. Without the RUN2 in line 1 the upper limit of memory isn't set. You can imagine what happens when you use high memory buffers! They are overwritten by string concantenations and really foul up file manipulations. I learned the need for the seeming double setting of upper limits the hard way. (If anyone has seen documentation on this or knows why I need to do it, please enlighten me.)

Here are some other interesting tidbits about the fix described above. It works on DISK P(UT), too!! But not without some effort. Here are some example lines from a BASIC program which writes to a random file after sorting.

```
100 DISK 0,6,"FILE01":REM
    OPENS DEVICE #6
110 FORX=0TO351:REM NUMBER OF
    RECORDS (352) IN FILE
120 FORH=0TO-*-15-*- :REM
    NUMBER OF RECORDS (16)
    PER TRACK
130 FORT=0TO6:REM NUMBER OF
    ENTRIES (7) PER RECORD
140 PRINT#6,A$(T,H):REM PRINTS
    TO BUFFER #6
150 NEXTT,H
160 X=X+-*-15-*-:REM NUMBER OF
    RECORDS (16) PER TRACK
170 DISK P:REM PUTS THE BUFFER
    ON THE DISK
180 NEXTX
190 DISK C,6:REM CLOSES DEVICE
    #6
```

First of all, I have to change the numbers set off by the -*- with regard to the size of record I want to employ. Here it's a 128 byte record. (The -*- is not part of the BASIC syntax and MUST BE REMOVED to make these lines work.)

What happens with the Dave Pompea fix isn't important unless you're curious. What IS important is the drastic reduction in time needed in random file accessing. A 350 record ZIP CODE sort used to take up to 20 minutes. Now it is accomplished in less than 8 using a BASIC sort. The bulk of the time is in the GETing and PUTing. The result of the fix is a reduction from about 18 minutes to 6!

The second big help was from PEEK (65), September 1981. My letter which appeared in that issue asked some question about random file "doubling back." Guess what, folks?? D.R. "Stretch" Manley's article on OS65D in the very same issue solved my problem. It's #3 on page 8. Now I can have the 38 track (on a mini-floppy diskette) file I always wanted! Thanks "Stretch"! Thanks PEEK (65)!!

Well, did I make sense? Or did I confuse you more? I hope not. "Stretch", Dave, PEEK, and AARDVARK helped me to solve my most pressing difficulties. I hope I have helped you with yours, Jack.

Does anyone have an annotated disassembly of the C4P MF Monitor ROM? I'm wondering if there are any wasted memory locations in there in which I could store these neat fixes I've been talking about. I'd also like to replace the key-polling routine with the one in RAM at $3180 on the mini-floppy version of 65D. It works much faster when you repeat a key.

Another query, is anyone working on a disk motor control mod to save the disk drive motor (I've already replaced one myself) and the wear and tear on the disks and read/write head?

Another, is anyone out there using the DAC (digital to analog converter)? The OSI programs are infantile and sound no better than a kazoo. Can the DAC be programmed to have wave forms other than square ones? The OSI program indicates that sine, ramp, and triangle waves are possible, but it doesn't deliver what it hints at.

Ross C. Votaw
Springfield, OH 45503

P.S. In line 100 there is no need to POKE 12042 or POKE 12076 because the record size is 128 bytes. These locations normally have 16 and 7, respectively.

* * * * *

ED:

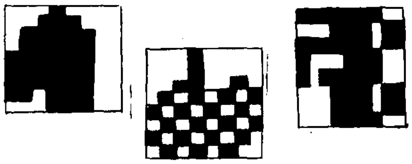
The great thing about the Challenger line is the graphics which are ready-to-go with a simple POKE statement. However, as Mittendorf and Grafix prove, they could be better! And the 'better' I wanted could be satisfied by the simple replacement of the OSI Character ROM with a custom-programmed EPROM. Now, thanks to the extra effort of the one and only Earl Morris, I have graphics perfectly suited to my programming interests. I think some of my special graphics may be of general interest (pictured below).

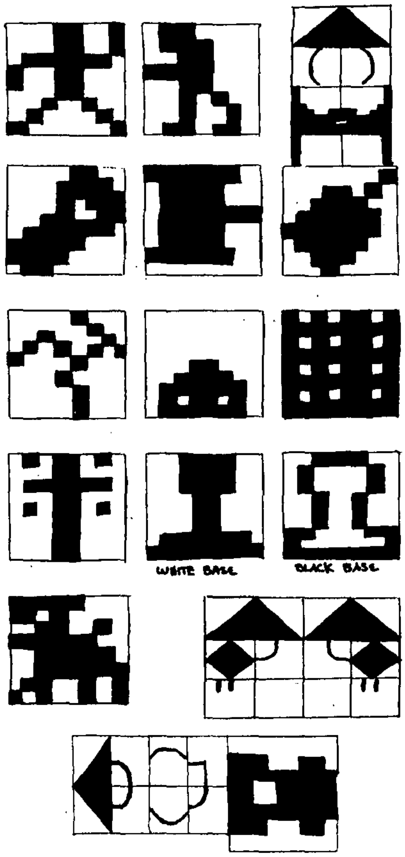
Having a Superboard, I have never seen a 64 character screen. I imagine elaborate scenes may be composed using little else than the corner combinations (chars 161, 165-174). But without the 3-cornered character graphics, a crucial building block is missing. I think this was OSI's most serious omission, which I put into 123-126, where the graphics seem unnecessary. The second problem arises when you try to build a checker or chess board, there are no corners to add to the otherwise fine graphics of 215 to 219. Placing these may involve some sacrifice of some other graphics, and while chars 25-28 are plainly bad, you may want these spots for improved chess pieces. Anyway, I finally decided to give up the lower case letters and go all the way with my ideas.

The man(240) was enlarged and gunfighters were added. Now there are 8 direction race cars to play cops and robbers, with the tanks, also enlarged. The tree(13) was given the half-tone look, in sync, with 187! CHR$(14) may double as a head and 15 may now be stacked in any direction. A sample of the chess pieces are there, and a fork lift and a monster finish the exhibition. By the way, someone in an earlier PEEK article mentioned Chinese characters for the computer. Well, these fellas were formed with the ordinary Character ROM!

David Whipp
Salt Lake City, UT 84102

* * * * *





ED:

This is to warn readers of a problem with the INP$ utility. When INP$ is enabled, the well-known formula: X=INT(X*100+.5)/100, no longer works to adjust to the nearest cent in about 10% of the cases, including most amounts of less than a dollar. For example, if X is 10 cents, the above formula followed by PRINT $L,X gives " .09 ". The remedy is to kill line 2490 of INP$, which kills the rounding routine.

Although I'm generaly pleased with version 1.3 of OS-65U, I'm disappointed that it does not fix the problem of printing amounts correct to the nearest cent. This is such a widespread need that an operating system designed specifically for small business applications ought to have solved it.

The $R and $L functions have three faults which make them quite unsatisfactory:

1) They just lop off figures past the second decimal place, and so often print a figure one cent too low. To fix this, one can use either the formula above or PRINT $R, X+.005*SGN(X). The latter has the minor disadvantage that

amounts close to, but not exactly, zero are not adjusted to zero.

2) The column width of $R is 14, which is often too large.

3) $R and $L have a leading blank, which prevents printing a $ sign immediately preceding.

The best I have been able to come up with is the following routine, which accepts X and returns X$ with two decimal places.

```
1000 X$=STR$(INT(X*100+.5))
1010 IF LEN(X$)=2 THEN X$=LEFT
     $(X$,1)+"00"+RIGHT$(X$,1)
1030 X$=LEFT$(X$,LEN(X$)-2)+
     "."+RIGHT$(X$,2): RETURN
```

To strip the leading blank needs an extra line:

```
1020 IF ASC(X$)=32 THEN X$=
     MID$(X$,2)
```

If you pass the required column width to the subroutine as a parameter W, an extra line may simplify the printing:

```
1020 IF LEN(X$)<W-1 THEN FOR
     I=LEN(X$) TO W-2: X$=" "
     +X$: NEXT
```

Although this routine solves the problem (for amounts up to $10 million), I can't say I'm satisfied. Does anyone have something better?

Roger Clegg
El Monte, CA   91731

* * * * *

ED:

Some Comments for PEEK (65), reference volume 3, No. 1.

The characters shown on the cover are a mix of Japanese Katakana characters, Japanese-Chinese characters (Kanji) and music note symbols.

In answer to Mr. Stephen Rydgig, yes, the CEGMON has very fast screen clear subroutines in it. And also you can access it by "PRINT CHR$(26)" in the BASIC program. The reasons why I stuck with my screen clear routine are, 1.) I wanted to share the idea with those people who do not have a CEGMON and 2.) I wanted to show primitive USR(X) extention example.

With a CEGMON you may do as follows to change color:

```
POKE 548,224: POKE 550,231
:REM $0224-(#$EO),$0226-(#$E7)
```

This will set the screen window at color memory. You may find out how to color this window by yourself. Anyway, my original intention was to enjoy the screen clear routine without CEGMON.

Although I have complained about the CEGMON vendor, I really like the CEGMON, especially with its screen editing capability and machine code SAVE routine. It also gives you I/O vectors that you can find in C1P and Superboard II.

The CEGMON editor is very convenient and it is designed to allow maximum compatibility with OSI BASIC-in-ROM and ASSEMBLER. If you retype edited lines often, I bet you will love the CEGMON.

Yasuo Morishita
Elk Grove, IL   40007

* * * * *

ED:

I have to start out saying that I do enjoy your unofficial users journal very much. Here in this part of Alaska the winters make it a little rough to get into Anchorage unless there is a good reason, like making a living and in the summers everyone has much more important things to do than sit around indoors and 'play computer'. I do not do a thing of value to anyone but me that couldn't be done on an HP65

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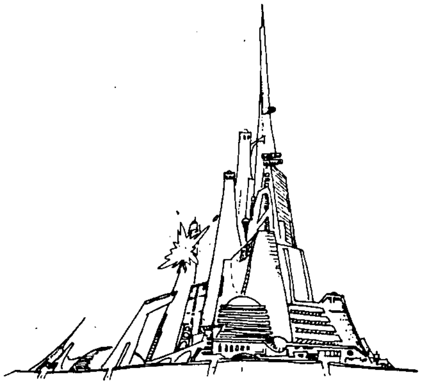

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except print out biorythums for the little lady that has kept me for the last 35 years. (If numerology turns her on I'll feed her all she wants) but, I do have fun with it and have written a few programs that are of interest to me.

I started out with a OSI C2-4P DMF and when a C-II, 8MF came by cheap, I did that too.

Here of late I've been working with some file manipulation and hiding passwords in the files rather than in the program. In OSI's 65U users guide they sketch out a sample label file routine but the protection is so easy to get around that it seems logical to do something else with the passwords to hide them. This isn't a good solution either but it's a start. Do you know of any tricks to imbed stops in an OSI 65U system that may slow an unauthorized user??

Another question that is more pressing to me just now is the ability to tie a C2-4P MF to this Challenger II. I'd like to be able to go either way, which may be impossible with the difference in the two disk drive clock speeds, but if I could move something from either work space to the other I'd be happy for now. The C2-4P has 24K and the C-II has 48 and for what it's worth, it also has a 510 board and uses a Hazeltine 1421 terminal. If one were to connect the I/O of one to the other using the serial port would this work? (both to both) Another thought that comes to mind is to put a cassette I/O board in the C-II and hook the two cassette I/O's together. (What would a 430 board cost?)

I don't know if you heard, but our OSI dealer/distributor (Jim Augut) just packed up and left town. He didn't even bother to offer the business to anyone, he just left. I'm sure that he can make more money in the computer business in Las Vegas with much less travel and worry, but it was a 'low blow' to those of us who were looking to him for support. As it worked out, it hasn't been too bad for me, but as I had not sold the C2-4P, his leaving just about ended the possibility of selling it here. So, how would one go about selling a C2-4P in fine working condition with dual 5"MF and a LEEDEX 12" CRT to someone in the lower 48 and be assured of getting paid?

Please print an article on "FIG FORTH" for the 65U, something that outlines the advantages and the pitfalls if any.

Gene Morris
Eagle River, AK 99577

Gene:

Here's a try on your questions. Readers, please help, too!

1.) What's a "stop"? The basic instruction STOP? A way to make the system stop working (mine does that all by itself sometimes!).

2.) With serial systems, file transfer is easy - write a basic program to read a disk file as a series of strings and PRINT the file out a serial port, then LOAD the program. Write a basic program to INPUT strings and print them to disk on the other computer. Run a DB-25 plug from output to input, reversing lines 2 and 3. RUN the receiver program, which will get only as far as waiting for input. Now RUN the sending program, which should have enough built-in delay between sending strings to allow the receiver time to put them away on disk. Readers - how would you do it in a video system?

3.) Sell your C2-4P by advertising in PEEK (65), Computer Shopper, etc. Send UPS C.O.D. or find a buyer you trust. Offer a 10 day money back guarantee and see if buyers trust you!

4.) Who has used FIG-FORTH? Write us a complete review and we'll pay you for it!

Al

* * * * *

ED:

I've got a couple of questions, the answers to which I've always wondered about. I own a C1P-MF and am currently running OS65D V 3.1. I know I can list my BASIC program to disk by simply opening the desired file in the immediate mode and then typing LIST#6 followed, by closing the file. Now thats fine and dandy for BASIC programs because BASIC commands make it easy. My question is, how can I accomplish the same task while running under assembler? How can I LIST my assembler text to a specific disk file?

Now for my second question. I own an Epson MX80 printer and like other curious OSI users, have dumped the monitor ROM. There seem to be several monitor programs in the ROM, each for use by different OSI systems, C2, C1, etc., depending on which, that ROM finds itself placed in. My question is, which locations are vital to the C1P? What I would like to do is replace all the non-C1P code with some of my own using an Eprom. I'm not sure if you can answer that, but any light you can shine on it would be of great help.

Frank Aguilar
Laredo, TX 78041

Readers:

Who can help?

Al

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ED:

Several months ago I succumbed to the advertisements of Pegasus Software of Honolulu, Hawaii and bought their FBASIC, a BASIC compiler for OS-65D. Since I do not believe that their ads are as explicit as they should be concerning the limitations of their product, I would like to point out several areas of possible concern to potential buyers. Since almost all of my computer work is geared to string analysis of texts, I was more than a little distraught to learn on receiving the disk and documentation that Pegasus had not implemented any of the string functions of Microsoft BASIC except CHR$. There are no string variables. It is true that their ads state that "FBASIC is an integer subset of BASIC," and it is true that a subset is by definition not a full implementation. But the fact that they say "integer subset" might lead others, as it did me, to assume that the streamlining only involved the elimination of real numbers in favor of integers. Actually, the failure to implement reals and strings is only part of their stripping down of BASIC. By my count (p. 18 of FBASIC USERS MANUAL) there are 39 ~~statements,~~ commands and functions not supported by FBASIC at the time of that writing. Actually, 4 of these had been supported by the time I got my disk which reduces the number to 35. The functions, etc., actually implemented are fewer than these 35 unimplemented ones as gaged by the number of reserved words (p. 17): these total only 22 including WHILE and WEND, a useful extension to OSI Microsoft BASIC. Add to these the 4 words corresponding to recent implementations and the total reaches 26.

I was very pleased to find John Fuller's article on FBASIC in your October 1981 issue. Without it, I would have spent a great deal of time trying to learn much. Furthermore, in response to a letter to him, he gave me some good advice on several problems I was having. Let's have another article from him. Anyone buying FBASIC should append a copy of his article to the manual for quick reference. On John's advice, I wrote to Richard Foulk at Pegasus about some of my problems, and I must say that he was prompt and thorough in his response. Some of his suggestions were helpful, some were not. But at least he supports his work.

Now that I have worked with FBASIC for several months I am less unhappy with it than at the outset. It is definitely fast. I had written a BASIC program to do underlining on my serial EPSON MX-80 (which has no backspace) and it was incredibly slow. I rewrote it to conform to the limitations of FBASIC, compiled it, ran it and could hardly believe the speed-up in execution time. It is almost certain that most all of your existing programs will have to be rewritten before they can be compiled in FBASIC, and perhaps Pegasus' ads should say as much. If you can live with its limitations, than I suggest you buy it for its tremendous speed. But the better part of prudence would be to check out its definite limitations before spending your $155.

M. Roy Harris
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ED:

I am using the "garbage collector" fix by Earl Morris that you published in your June 1981 issue, and as far as I can tell, it works perfectly. If other users would like a copy, I can make copies for them. I assume since Mr. Morris published this patch in this way, he intended for it to be a public domain item. My thanks to him!

If other users want copies, I can make them for $8 plus $1 postage. (I'll supply the EPROM.) Readers must be aware, though, that this isn't quite a plug-in change. You must invert BS2 (pin 20 of the ROM). The inverter on pins 1 and 2 of U18 can be used for this - disconnect pin 1 of U18 from BS, and then disconnect BS2 from pin 20 of the ROM socket and connect it to pin 1 of U18; then connect pin 2 of U18 to pin 20 of the ROM socket (BASIC 3, or U11). Also, disconnect pin 18 of the ROM from +5 and tie it to ground (note that the land between the BASIC 2 and BASIC 4 ROMs' pins 18 must be reconnected when you do this).

Since I've added an EPROM programmer to my system, maybe other users have other things they'd like me to program for them. If anyone has something they want to put in an EPROM, just send me the contents on one track of either an OS65D, Pico-DOS, or HEXDOS disk (don't forget to say which track it is on!) and I'll do it the same way. I'm not very enthusiastic about trying to do it with a tape, however, aside from the obvious time involved, there is a greater chance of errors.

My thanks again to Mr. Morris for this fix. It's a great relief to be able to use BASIC to manipulate strings like it is intended.

Steven P. Hendrix
415 S. Pierce
Enid, OK 73701

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ED:

Like Willis Cook, I couldn't abide the single-column directory display. My version prints four columns, useful for keeping the directory on screen while you proceed. The modification is trivial (I didn't bother with repeating the column header):

```
11092 T1=FNA(PEEK(I+6)):T2=FNA
      (PEEK(I+7)) : REM track
      numbers
11100 PRINT #DV,TAB(K);N$;
      " ";T1;"-";T2;
11110 K=K+21 : IF K>80 THEN
      K=0 : PRINT
```

More interesting is a modification to list the unused tracks:

```
00020 DIM T(76)
00030 NF=0 : K=0 : TS=0

00060 FOR I=1 TO 76 : T(I)=-1
      :NEXT I : REM fill with
      "true"

10130 PRINT TS;"tracks used,
      ";77-TS;"available:";
10131 FOR I=10 TO 76 : IF T(I)
      THEN PRINT I;
10132 NEXT I : PRINT

11104 TS=TS+T2-T1+1 : REM
      track sum (see 11092)
11120 FOR J=T1 TO T2 : T(J)=0
      :NEXT J:REM "false" the
      used tracks
```

I've already expressed my outrage over OSI's absurd system of leaving customer support solely to the retailer. The guy who sold us our C-3, and who never was much help, has now gone out of business. Other OSI dealers are not enthusiastic about giving time to an OSI user who has bought nothing from them. Now what are we supposed to do?

Jack McKay
Washington, DC 20010

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AD$

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