PEEK (65)

The Unofficial OSI Users Journal

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INSIDE

Column One

Although finding enough material to fill these 24 or so inches is rarely difficult, what really hurts is the thought of not doing justice to all when space becomes a constraint. That's the case this month.

Let's start with ISOTRON. The news release is titled, "ISOTRON'S CAPITALIZATION IS TRIPLED". That should say a lot about their "staying power". The investors are familiar: Beijer and Ahlsell. The purpose is to "strengthen the company so that it can develop and successfully market new product lines." The key is access to DIAB (a company owned by Ahlsell) which has been developing computers since 1970 and includes several American firms. For the record, that's where the 700 series had its grounding. Lars Karlsson, one of the 700 developers, now heads the new tech support office in Foster City, CA.

The new money has also made it possible for ISOTRON to increase their involvement in Co-Op advertising and you should begin to see more media visability.

Finally, on the ISOTRON front, Advanced Business Computers, Electronic Business Systems and Puerto Rico Computer were the winners of the "Fun in the Sun" sales contest. Congratulations! Just wish that we were going to be in the Bahamas too.

At DBI, the first order of business is, "Happy Birthday to You!" Three years behind them and more in the wind than the founders probably ever thought of. In his article, Art Hughes, the designer of the DBI multi-processor system covers most items, but here are a few additional details. Art mentioned networking and it is a reality since the first working system will be out the door long before you read this. The testing of the DBI-65E operating system is going extremely well - only very minor bugs and thus it looks as though they might even be ahead of schedule for the official release. Their ability to handle 9-Track tapes should be out about the turn of the year. More user memory? Hmmm! Sounds very interesting.

About the "boxes"! The DBM-1 has 10 slots; SCSI, Printer and 8 users. The DBM-2 has 18 slots to accommodate 16 users, but no room for the SCSI devices. They are housed in a "Tower" (if you can call 22"x16"x13"h a tower) and can house two controllers (each with up to 2 HDs and 2 other devices). Rumor has it that the latter two boxes might be housed in one floor model to be demoed at Comdex. Best of all, the rumor machine also says that the Tower will run on a standard OSI box (SCSI and all).

Charles Curley (long time PEEKer) is vending "real-FORTH" in a host of versions for 68000, PDP-11's, 6502 and 65C02s for OS65-D. It is a descendant of fig-FORTH thus upward compatible. It comes with a host of utilities and some 80 pages of text plus source listings.

BETA/65, a recently developed high-level language for the 6502, is about to make its formal debut. It is an interpretive system that uses bytecodes for high speed execution and APL-like notation. Its author, Don Johansen of Microgram Systems, has been in the air and space control arena for some 25 years and this is the outgrowth of their needs. The list of capabilities is impressive and we will have more next month.

Only enough space to say enjoy this first software issue of the year and HURRY if you want your free listing to get in next month!

BEGINNER'S CORNER

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A DIRECTORY MENU

This month two programs are discussed - "Disk Menu" and "Directory Copier." But first something about Directories.

THE DIRECTORY

A disk directory is unique to the disk on which it is found. The directory is a list of all the file names found on the disk. Following a file name are the numbers of the disk tracks on which the file resides. In non-OSI systems, files are saved in, say, 256 byte blocks to any part of the disk where there is space. The method is very economical on disk space, but it can mean that a program is located in small pieces across several non-consecutive tracks. On an OSI system, files are always saved on consecutive tracks and space is wasted when short files are saved. A file, even a one line program, will use up one track and so, on a 5" disk, waste about two thousand bytes of storage.

IDENTIFYING FILES

OSI files are not distinguished from each other by the Operating System. The OS has no way of determining whether the file is BASIC, Assembler, Machine Code, Sequential or Random. The user is left to work out an identification system of his own. This can be a little tricky since file names are limited to 6 characters only. Here is a suggestion. Make the final character of the file name a "#" for Assembler files and a "$" for machine code files. Mark sequential files with a "SEQ" and random files with a "RND". The OS, of course, is still at a loss as to which file is what!

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THE ENTRIES

On an 8" disk the directory of file names is stored on track 8, and on a 5" disk the directory is on track 12. Every time a disk is accessed by OS65D 3.3 the disk's directory is called into the buffer at $2E79. (A buffer is some RAM set aside for temporary storage of data).

Consequently, there are no problems if a disk is swapped while a program is running. Not all disk operating systems work like this, and disk swaps during program runs can be gruesomely fatal!

Have a look at a disk directory by typing the command "DISK!"CA D205=08,1" - the contents of the first half of the directory will appear on the screen. What you see should be readable; six characters for a file name, followed by two graphics characters or two ASCII characters. The hex ASCII numbers of the two characters are the decimal starting and ending track numbers for the file. Blimey!

Here is an example. The 8 characters are "MYFILEEF", and "MYFILE" is the file name. The starting track number is signified by "E" and the ending track is coded with "F". ASCII "E" in hex is "45" and for "F" it is "46". The file is on tracks 45 and 46. The two numbers are stored, written and used as base 10 numbers. The "EF" seen on screen is a BASIC translation of the "45" and "46" as stored in RAM.

If a file name entry is blank, then it is filled with 6 of "#" followed by two zeroes. An entry in the directory does not guarantee that the file actually exists on disk! It is possible to save a file by track number. It will then exist on disk but there will be no corresponding file name in the directory. This is less than satisfactory, but there is one advantage. If the directory track is corrupted, files can still be loaded by track number. Also, the directory can be restored if a record of the file names has been kept. See PEEK(65) Feb '83 for a directory restore program.

ONLY 64

Why can only 64 file names be stored in the directory? Mainly because the DOS kernel only searches two sectors on the directory track. There is plenty of room on the track for more file names to be stored. Only 32 6-character file names and their associated track numbers will fit in the RAM buffer - the contents of one sector. The first 32 names are on track 8 sector 1 (or 12,1 for 5" disk), and the second 32 are on track 8 sector 2, (or 12,2). The directory is searched in two halves, each half is called into the buffer as required. Eight bytes are used per file entry, 32*8=256. OK, for $64, what is the size of the directory buffer?

DISK MENU PROGRAM

The DISK MENU program, listing 1, copies the directory from a disk, puts the file names, numbered, on the screen in three columns, and then runs the program chosen by the user.

One way to implement "DISK MENU" is as follows. Create a file "MENU" on the disk - it could replace a redundant utility such as COMPAR or TRACE. Type in the listing and save it to "MENU". The program could be made to run automatically by adding two lines to BEXEC*. Load BEXEC* into memory and add the lines:

```
105 GOTO 60000
60030 INPUT "Disk Ready ";S$:
      RUN "MENU".
```

Now save BEXEC* back to disk. The program "MENU" will now run automatically after "BEXEC*" has finished.

In the "MENU" program the early declaration of variables in line 40 is done deliberately to speed up the subroutines. Variable "R" is set to $2E79, the start of the directory buffer, and "ER" equals 11897+ 256-8. The file names are stored in array N$. The program is set to read all file names, beginning with file one. If disks are to be read beginning with, say, file 20 then, in line 50, change "W=1" to "W=20".

Alternately, make the choice a part of the program by removing the REM on line 90.

The directory is read off disk in line 110 with the command "DISK! A$+Y$". Yes, it works! 5" disk users change, in line 30, "08" to "12".

The next step is to PEEK the file names from the buffer and

to place them into array N$. But first, a check is made for no file name, see end of line 110. If a file name exists it is PEEKed in the FOR..NEXT loop in line 120. After the first half of the directory has been read, Y$ is set to 2 in line 130 and the second half of the directory is loaded into the buffer and processed.

Printing the file names in three columns of 21 names per column is a breeze with the DOS 3.3 "print at" command. The cursor character is made a less distracting blank with "POKE U,32", line 160. If by some chance there are 64 file names on disk then that final name is taken care of in line 180.

The program cannot be stopped with a CTRL-C or by merely pressing <RETURN>; the POKEs in line 30 see to that. But if the program must be stopped, a password can be used. Insert your password in line 190. Notice the check in line 200 for menu numbers that do not exist. If everything is satisfactory the program is called off disk and run with "RUN N$(Y)", in line 220.

Disk errors are trapped in line 7000 and the program is run again. Notice the cunning way the DOS error message is linked to the message in line 7000 with the "print at" statements in lines 100 and 220.

DIRECTORY COPIER PROGRAM

The second program is very simple and, if nothing else, is another example showing how to work with the directory from BASIC. The program will copy a directory from one disk and save it to another. If you don't understand the value of this you are probably not making backup copies of your most valuable disks. The process of making a backup is very simply done from BEXEC* in OS65D 3.3.

DISK MENU PROGAM

```
10 REM Disk Menu Program. (c) LZ Jankowski 24/6/1985
20 :
30 POKE2888,0:POKE8722,0:POKE2073,96:TRAP7000:A$="CA 2E79=08,"
40 C=0:K=0:Z=0:P=35:M=0:R=11897:ER=12145:S=8:F=5:Y=0:T=21:E=42
50 D=64:DIMN$(D):W=1:L=W:U=13026:POKEU,32:PRINT!(21)!(25)&(0,4);
60 X=19:GOSUB250:PRINTTAB(X)": DISK MENU PROGRAM :":GOSUB250
70 :
80 REM-------------READ DIRECTORY FROM DISK--------------------
90 REM PRINT&(X,12);:INPUT"List from file # ";L:IFL<WORL>32THENL=W
100 M=R+(L-1)*S:PRINT&(X,12)"* Reading Directory *":PRINT&(12,22);
110 Y$="1":FORY=1TO2:DISK!A$+Y$:FORC=MTOERSTEPS:IFPEEK(C)=PTHEN130
120 Z=Z+1:FORK=0TOF:N$(Z)=N$(Z)+CHR$(PEEK(C+K)):NEXTK
130 NEXTC:Y$="2":M=R:NEXTY
140 :
150 REM----------------PRINT FILE NAMES-----------------------
160 POKEU,32:PRINT!(28);:FORC=0TOESTEPT
170 FORK=1TOT:PRINT&(C,K)C+K;N$(C+K):IFC+K=ZTHENK=T:C=E
180 NEXTK,C:POKEU,12B:IFZ=DTHENPRINT&(T*2,K)Z;N$(Z)
190 PRINT&(0,23)"Number ";:INPUTY$:Y=VAL(Y$):IFY$="pass"THEN230
200 IFY<LORY>ZTHEN160
210 :
220 PRINT!(28)&(12,22);:POKE2073,173:POKEU,171:RUNN$(Y)
230 POKE2073,173:POKEU,171:END
240 :
250 FORC=1TO21:PRINTTAB(X)"-";:NEXTC:PRINT:RETURN
260 :
6990 REM----------------TRAP ROUTINE--------------------------
7000 PRINT&(25,22)". RUNning program again.":FORC=1TO3000:NEXT:RUN
```

DIRECTORY COPIER PROGRAM

```
10 PRINT!(28):T=8:REM DIRCOP by LZJ
20 :
30 PRINTTAB(T)"*************************************************"
40 PRINTTAB(T)"*                                               *"
50 PRINTTAB(T)"*              DIRECTORY COPIER !               *"
60 PRINTTAB(T)"*                                               *"
70 PRINTTAB(T)"*************************************************"
80 PRINT:PRINT:N$="1":GOSUB120:PRINT"PAGE 2 also ? ";:GOSUB210
90 PRINT:PRINT:PRINT:IFY$="y"THENN$="2":GOSUB120
100 PRINT:PRINT"RUN BEXEC* ? ";:GOSUB210:IFY$="y"THENRUN"BEXEC*"
110 END
120 X=11895 :REM $2E77 - okay!
130 FORA=1TO256STEP8:FORB=1TO6: POKEX+A+B,ASC("*"):NEXTB
140 POKE X+A+7,0:POKEX+A+8,0:NEXTA:GOSUB190:GOSUB210
150 DISK!"CA 2E79=08,"+N$:PRINT"DIR Page --> "N$" LOADED":PRINT
160 GOSUB200
170 DISK!"SA 08,"+N$+"=2E79/1":PRINT"DIR Page --> "N$" SAVED":PRINT
180 PRINT:RETURN
190 PRINT"Insert * MASTER *      Disk, hit a key!  ";:RETURN
200 PRINT"Insert * DESTINATION * Disk, hit a key!  ";
210 DISK!"GO 2336":Y$=CHR$(PEEK(9059)OR32):RETURN
```

★ ★

THE FORTH WAY OF CONTROLLING THE CA-20 CLOCK

By: Kent Anthony Behrends
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Within the pages of PEEK(65), there have been a few articles on FORTH, but not many programs. Here is a sample program written in FORTH-83 (the 1983 "standard" of FORTH). This program will read the current time and date, set the time and date, and allow the CA-20 clock to interrupt the CPU (Central Processor Unit) at specified intervals.

A little introduction into FORTH might be needed for those who have not been exposed to one of the best control languages now available. Looking at the listing, you might first notice the format that it is printed in. These are called screens (16 lines by 64 columns), and they are numbered from zero (0) to nine (9). There are shadowed (paired) screens, examples are one (1) and six (6), two (2) and (7), etc.. The first screen in the pair is the code screen, the second in the pair is used for documentation. FORTH uses RPN (Reverse Polish Notation: 1 2 +) as opposed to algebraic notation (1 + 2). A colon (":") is used to start a definition (a program unit) and a semi-colon (";") is used to finish. To compile a definition, you LOAD the screen in which it is written.

Example: 2 LOAD (loads screen number 2)

Remember the RPN notation, the 2 comes BEFORE the operative word (verb). In the above example, a VOCABULARY (where you place definitions) CLOCK is defined to place all the clock definitions. Then a CONSTANT CLOCK-BASE is defined holding the base address for the CA-20 clock board. A VARIABLE, READ-TRUE is defined. Another VARIABLE, READ-DATA is defined and then set to 12, using the STORE ("!") operator. The clock data is then stored a byte at a time, following the READ-DATA definition. Skipping down to the first COLON definition (": init"), the definition named "init" is compiled into the CLOCK vocabulary. What this definition does is this: "init" expects an address on top of the stack. The address is the address of a data structure of: count, data pair [,data pair...]. The same as we defined for READ-DATA. The count is the first parameter

```
     0
 0 ***************************************************30may84kab
 1  \_____ ___________________________________________________/
 2   :                                                       :
 3   :  Clock driver for osi CA-20 RTC board                 :
 4   :  Forth-83                                             :
 5   :  Kent Anthony Behrends                                :
 6   :  17309 Hapes Ave. Cerritos, CA 90701                  :
 7   :  Ohio Scientific C3-serial/polled                     :
 8   :  56K CP/M 2.2                                         :
 9   :                                                       :
10   :                                                       :
11   :  Thanks go to: Henry Laxen & Michael Parry            :
12   :                for the Forth-83 implementation        :
13   !_______________________________________________________!
14  /                                                         \
15 ***************************************************************

     1
 0 \ ca-20 support load screen                        10feb85kab
 1
 2 6 VIEW# !  ' CA-20.BLK VIEW-FILES 12 + !
 3
 4 1 4 +THRU CR .( Ca-20 clock support loaded ) EXIT
 5
 6 This package allows reading and writting of the OSI ca-20
 7 battery backup clock board. Also there is a background word for
 8 keeping the time in the lefthand corner of my terminal screen.
 9
10
11
12
13
14
15

     2
 0 \ ca-20 support --- read-init write-init            30APR84KAB
 1 VOCABULARY CLOCK  CLOCK DEFINITIONS
 2 51076 CONSTANT clock-base
 3 VARIABLE read-true
 4 VARIABLE read-data 12 read-data !
 5         01 C, 058 C, 00 C, 31 C, 01 C, 42 C, 03 C, 58 C,
 6         02 C, 000 C, 03 C, 42 C,
 7 VARIABLE write-data 12 write-data !
 8         01 C, 000 C, 00 C, 31 C, 01 C, 04 C, 03 C, 34 C,
 9         02 C, 255 C, 03 C, 38 C,
10 : init   (S addr --- ) LENGTH
11         0 DO I OVER + C@ clock-base + OVER I + 1+ C@ SWAP C!
12              2 +LOOP DROP ;
13 : read-init  (S --- ) read-data  init read-true ON ;
14 : write-init (S --- ) write-data init read-true OFF ;
15

     3
 0 \ ca-20 support --- bcd- -bcd read-byte write-byte   23APR84KAB
 1 : bcd- (S bcd# --- decimal# ) 0 16 UM/MOD 10 * + ;
 2 : -bcd (S decimal# --- bcd# ) 0 10 UM/MOD 16 * OR ;
 3 : wait (S --- ) BEGIN clock-base 3 + C@ 128 AND UNTIL
 4       clock-base 1+ C@ DROP ;
 5 : read-byte (S addr --- b ) read-true C@ 0= IF read-init THEN
 6             clock-base C! 54 clock-base 1+ C!
 7             clock-base 2+ C@ 42 clock-base 1+ C! bcd- ;
 8 : write-byte (S b addr --- ) read-true C@ IF write-init THEN
 9             clock-base C! -bcd clock-base 2+ C! wait
10             1 clock-base C! 0 clock-base 2+ C! wait ;
11 : write-interrupt (S mask --- ) 17 write-byte ;
12 : enable-interrupt  43 read-data 5 + C! 43 read-data 11 + C! ;
13 : disable-interrupt 42 read-data 5 + C! 42 read-data 11 + C! ;
14
15

     5
 0 \ Clock tasks                                      10feb85kab
 1 VARIABLE second
 2 : KB-LOCK ( --- lock keyboard ) 15 EMIT ;
 3 : KB-UNLOCK ( --- unlock keyboard ) 14 EMIT ;
 4 : GET-CURSOR 27 EMIT ASCII ? EMIT KEY 32 - KEY 32 - KEY DROP ;
 5 : SET-CURSOR 27 EMIT ASCII = EMIT 32 + EMIT 32 + EMIT ;
 6 : term-display (S --- ) [ CLOCK ] second C@ 2 read-byte = 0=
 7         IF KB-LOCK 2 read-byte second C! GET-CURSOR SWAP
 8         70 0 SET-CURSOR TIME TYPE SET-CURSOR KB-UNLOCK THEN ;
 9
10 BACKGROUND: TOD BEGIN SINGLE term-display MULTI PAUSE AGAIN ;
11 TOD WAKE ( wake up the TimeOfDay process )
12
13 FORTH DEFINITIONS DECIMAL FORTH
14
15 EXIT

     6
 0 \ ca-20 support load screen
 1
 2 Set up view file support
 3
 4 Load the osi ca-20 clock support definitions
 5
 6
 7
 8
 9
10
11
12
13
14
15

     7
 0 \ ca-20 support --- read-init write-init            22apr84kab
 1
 2 Base address for ca-20 clock board
 3 READ-TRUE holds a true value (1) if clock is inited for read
 4 READ-DATA hold address offsets and date to init ca-20
 5          for reading. No interupts
 6
 7 WRITE-DATA holds address offsets and data to init ca-20
 8           for writing. No interrupts
 9
10 INIT takes a address of the first byte fo a table in the form
11      of: offset data offset data ... includes 6 sets
12
13 READ-INIT inits the ca-20 for reading
14 WRITE-INIT inits the ca-20 for writing
15

     8
 0 \ ca-20 support --- bcd- -bcd read-byte write-byte
 1 BCD- convert a BCD number to a decimal number
 2
 3 WAIT wait for clock to crunch it's data
 4
 5 READ-BYTE read a byte from clock at clock address addr
 6
 7
 8 WRITE-BYTE write a byte to clock at clock address addr
 9
10
11 WRITE-INTERRUPT giver interrupt mast write to interrupt register
12 ENABLE-INTERRUPT should change 42's to 43's in read-data
13 DISABLE-INTERRUPT should change 43's to 43's in write-data
14
15
```

continued on page 6

in the DO loop control construct and zero (Ø) is the second (so knowing RPN and FORTH, this is a DO - LOOP going from Ø to count). "init" then goes about and adds CLOCK-BASE to the first data in the data pair and then stores the second data of the data pair at that location, then skips to the next data pair (2 +LOOP -> loops with step of two) and continues to loop.

The "1 4 +THRU" does the loading of the screens 1,2,3,4, and 5. In screen number five (5) is a sample TASK (FORTH-83 is inherently multi tasking, and has some high-level support for such) that keeps the current time in the upper right hand corner of my terminal screen, while I am editing, playing a game or compiling. Look through the code

presented here. Read the book, - "STARTING FORTH" by Leo Brodie. Above all, enjoy!

FORTH-83 is in the public domain, and placed there kindly by Laxen and Parry. This program OSI-CLK.F83 I have placed in the bulletin board in Downey, CA., called "NORTHSTAR DOWNEY" (213) 861-2313. Anyone who wishes to leave a message for me, may also do it at NORTHSTAR.

```
 4                                                    9
0 \ ca-20 support --- set read                 10feb85kab \ ca-20 support --- set read                 30may84kab
1 : set  (S m d d h m s n1 n2 --- ) DO I SWAP write-byte LOOP ;   SET clock month d-o-month d-o-week hour minute second
2 : read (S n1 n2 --- m d d h m s ) DO I read-byte 0 -1 +LOOP ,  READ clock variable 7=month 2=seconds all returnd 32bit for (0)
3 VARIABLE days   ," SunMonTueWedThrFriSat" 23 days !            DAYS data table for days of week display
4 VARIABLE months ," JanFebMarAprMayJunJulAugSepOctNovDec"       MONTHS data table for months display
5 VARIABLE year   ," 1985" 4 year !   38 months !                YEAR data for year display
6                                                                SECOND place to hold current second for TERM-DISPLAY
7 : tsep ASCII : HOLD 2DROP ;                                    TSEP puts a : in format and jumps to next number
8 : dsep SWAP 3 * + DUP DUP 0 2 DO I + C@ HOLD -1 +LOOP ;        DSEP gets the day sub-string and month sub-string
9 : TIME 2 4 read (0 0 0 tsep 0 0 tsep 0 0 0) ;                  TIME gets and formats current time hh:mm:ss leaves address
10 : .TIME (S --- ) TIME TYPE ;                                  .TIME displays time on the terminal screen
11 : DATE 5 7 read 2SWAP 2ROT (0 DROP months dsep 32 HOLD        DATE builds date string ddd dd mmm yyyy
12       0 0 1DROP 32 HOLD DROP days dsep 0 0 0) ;
13 : .DATE (S --- ) DATE TYPE ;                                  .DATE displays date on terminal screen
14
15
```

★ ★ ★

WHAT IF YOUR SUPERBOARD REFUSES TO BREAK?

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Sorry, I meant, doesn't respond to the BREAK key. The most common symptom is a screen full of characters, yet no action when the break key is held down.

If you think about it, the screen full of characters tells you quite a bit. First of all, the video is working. The video counters are also responding. Most likely too, you have the phase 0 signal to the CPU, pin 37. That leaves a whole area that needs little or no checking.

At this point, it is well to go over any recent changes or soldering you have done. All too often a near invisible thread of solder is left behind. A splash across two traces can be equally frustrating. Close examination, with the help of a magnifier, should find most of these problems quickly.

Check any recently installed chips for bent pins, or proper location of pin 1. More than one of my chips have been consigned to the bin because of this. An 8T28, for instance, will survive for a while like this, but certainly won't allow the computer to operate. Some chips, particularly 24 pin sizes, have a knack for bending the pin in under the chip, making the problem difficult to see. If possible, sight along the plane of the board to detect these pins.

If you have recently installed a ROM or EPROM chip, check the enable lines, pin 18 and 20, as well as pin 21. Contrary to some OSI documentation, the 2716 you are likely installing, needs +5 on pin 21. Chip enable, pin 20, and output enable, pin 18, are both active low. You may need to invert some of these signals, by moving a jumper, or taking a signal before it is inverted. Always check OSI's documentation against another source, or with your own probe. Remember to start off the 2716's at 1 MHz. They may not work at 2 MHz on the 600 board until a few changes are made to the enable lines.

Still nothing? You can start checking signals. First and foremost is the low reset at pin 40 of the CPU. Press reset, a low pulse should then appear at pin 40. To run, this pin must return to a high. The op-amp doing this on the REV-D Superboard/C1P has been known to quit.

After this, things get more serious. Check for a clock signal on pin 37. If your probe indicates a pulsed signal, it will likely be fine. Check too for the phase 2 clock on pin 39. This is the clock output from the CPU.

Check now for action on the address lines. On a reset the processor will get $FF page, so there should be a lot of activity on the address bus. An inactive line could be shorted, or loaded by some defect in the computer.

You need a monitor ROM to boot. With OSI's SYN600 you also need BASIC 4, as the print routines there are used. Monitors like the C1E have a built in print routine, and can at least get to the ML monitor, to let you look around. As a matter of fact, long ago, my BASIC 4 ROM did pack up. It did run for a few seconds when it was cold. A plastic bag of ice (dangerous!) confirmed the problem, as it allowed the computer to run for a few minutes.

At this point, you had better start to follow the schematics, and try to isolate the problem. I have spoken to someone who bought one of the $10.00 Superboards. In desperation he used the PIA from a running computer connected to the address bus to look through the memory map. His problem turned out to be a shorted trace, so that one part of the ROM was repeated at other locations. Hopefully, you will spot your problem by eye.

Another possibility, at least as likely as a bad chip, are defective sockets. If you have removed/replaced a chip a number of times on the OSI 600 board, cast a jaundiced eye toward the socket. They are of marginal quality, and are well known for their troubles.

Remember to go over any of your recent changes or fixes.

I know you do them perfectly the first time, but it never hurts to check it out. Then start through the trouble-shooting areas I have indicated. I must say that so far, I have always finally traced the problem, sometimes after a few nights of fruitless hunting. My hat goes off to someone I know who zapped his machine with 110 volts. His repair of the Superboard qualifies as a resurrection. He replaced 2 dozen TTL chips, and the CPU. Interestingly, his 2114 RAMS, being "delicate" MOS chips, survived. Just shows how tough these Superboards are! Of course, I must tip another hat to the inventive person mentioned above who used the lines from a parallel port to check through the address decoding. It just goes to show you what OSI hackers are made of. You certainly can't say that we didn't learn anything over the last few years.

★

SIMPLIFIED 5 1/4" HEAD UNLOAD

By: Ray Osborn
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I implemented Dave Pompea's disk switch (from an old Aardvark) about a year ago on my dual-drive C4. It wasn't all that easy as I didn't have SAMS or an MPI schematic, but it worked. I have now simplified the logic.

Firstly, I don't believe in chopping up complex boards if it can be avoided so the only tracks cut are on the A13, and 1 on the 505. Secondly, my schematic only shows detail where it differs from that in the July 85 PEEK.

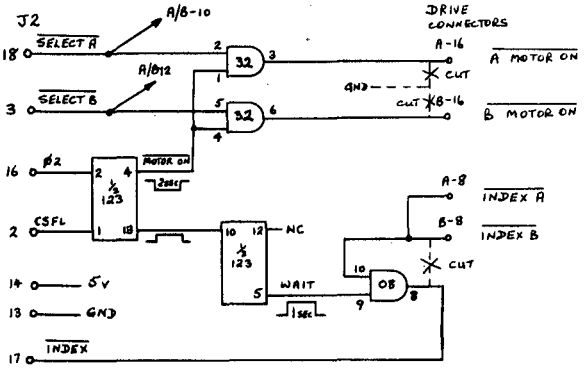
1. On the 505 find a convenient pad connected to U1A pin 22 (CSFL) and jumper to J2 pin 2 (unused). $\overline{\text{CSFL}}$ also seems to work on U1F pin 13.

2. Find another connected to U1A pin 25(Ø2) and jumper to J2 pin 16, also unused.

3. Make a track cut on the 505 from J2/2 to U4A pin 4 which appears to be unused by OSI.

4. Have a look at the A13 and cut tracks so as to:

(a) Separate A and B drive connector pins 16 from each other and from ground (J2-13). Do this so that J2-3 remains connected to A and B drive pins 10, and J2-18 remains connected to A and B connector

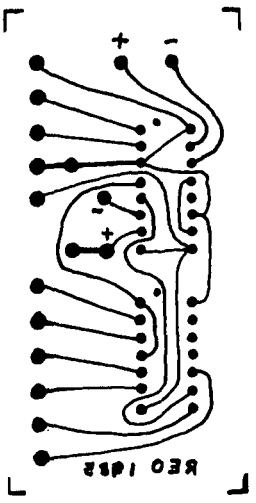


pins 12. Without schematics I'm not sure what this does except perhaps to control logic other than motor on in the drives?

(b) Isolate A and B connector pins 8 from ground but not each other.

5. Make up PCB with additional components, about 1" x 2 1/2" is enough.

6. Insulate both sides of board with acetate sheet, run 10 jumpers to the A13 and tuck the board in between the 505 and A13.



I also used smaller capacitors and larger resistors as they take up less space. 6.3 volt 68mF tantalum with 68K for 2 secs and 33K for 1 sec.

That's all there is and it works like a charm. Hope it's useful.

★ ★

V3.3 BUG REVISITED

We let you and author Paul Chidley down last month. Paul's article about the patches won't do you much good without the patches, so, belatedly, here they are!

```
                        ; SOURCE FOR 65D V3.3 PATCH 5" VERSION
                        ;
                        PAGE0  = $0000
                        MEMLO  = $00FE
                        MEMHI  = $00FF
                        SECTNM = $265E
                        TENMS  = $2678
                        SETTK  = $26BC
                        READDK = $2967
                        CALL   = $2B11
                        VIDSIZ = $DE00
                        PIA    = $F700
                        ;
                               * = $2E79      ; SCRATCH BUFFER USED BY I/O
                        ;
                        ; V3PTH5 - OS65D V3.3 PATCH 5" VERSION
                        ;
2E79 EE 5E 26  V3PTH5 INC SECTNM     ; INCREMENT SECTOR #
2E7C A9 06            LDA #$06       ;
2E7E 20 BC 26         JSR SETTK      ; MOVE HEAD TO TRACK #6
2E81 20 B8 2E         JSR V3READ     ; GOTO $2EB8
2E84                  ;
2E84 A9 34            LDA #$34       ; SET A = $34
2E86 8D 01 F7         STA PIA+1      ; STORE IN PIA AT $F701
2E89                  ;
2E89                  ; TPATCH - TIME DELAY PATCH (SEE TENMS & DELAY)
2E89                  ;          USES A READ FROM $DE00 ON THE 540 BOARD
2E89                  ;
2E89 A2 00     TPATCH LDX #$00       ; X=0
2E8B A0 00            LDY #$00       ; Y=0
2E8D E8          S1   INX            ; INCREMENT X
2E8E F0 20            BEQ SET.T      ; IF 0 THEN GOTO SET.T
2E90 C8          S2   INY            ; INCREMENT Y
2E91 F0 FA            BEQ S1         ; IF 0 THEN GOTO S1
2E93 AD 00 DE         LDA VIDSIZ     ; LOAD A FROM $DE00
2E96 30 F8            BMI S2         ; IF BIT#7 = 1 THEN GOTO S2
2E98 A0 01            LDY #$01       ; Y=1
2E9A AD 00 DE  S3     LDA VIDSIZ     ; LOAD A FROM $DE00
2E9D 10 FB            BPL S3         ; IF BIT#7 = 0 THEN GOTO S3
2E9F C8               INY            ; INCREMENT Y
2EA0 F0 0E            BEQ SET.T      ; IF OTHEN GOTO SET.T
2EA2 A2 1F            LDX #$1F       ; X=$1F
2EA4 CA          S5   DEX            ; DEX
2EA5 D0 FD            BNE S5         ; IF <> 0 THEN GOTO S5
```

```
 450 2EA7 A5 00           LDA PAGE0     ; LOAD A FROM PAGE0
 460 2EA9 AD 00 DE        LDA VIDSIZ    ; LOAD A FROM $DE00
 470 2EAC 30 F1           BMI S4        ; IF BIT@7 = 1 THEN GOTO S4
 480 2EAE 10 02           BPL S.END     ; IF BIT@7=0 THENGOTO S.END
 490 2EB0 A0 31     SET.T LDY #@31      ; Y=31
 500 2EB2 8C 7B 26  S.END STY TENMS+3   ; STORE Y IN TENMS DELAY LOOP
 510 2EB5 A0 00           LDY #@00      ; Y=0
 520 2EB7 60              RTS           ; RETURN
 530 2EB8                 ;
 540 2EB8 20 67 29  V3READ JSR READDK   ; READ TRACK INTO MEMORY
 550 2EBB EE 5E 26        INC SECTNM    ; INCREMENT SECTOR #
 560 2EBE A9 00           LDA #@00      ;
 570 2EC0 85 FE           STA MEMLO     ; SET MEM POINTER TO $0000
 580 2EC2 85 FF           STA MEMHI     ;
 590 2EC4 20 67 29        JSR READDK    ; READ TR@6,SECT@2 INTO $0000
 600 2EC7 A9 01           LDA #@01      ;
 610 2EC9 8D 5E 26        STA SECTNM    ; SET SECTOR # TO 1
 620 2ECC A9 13           LDA #@13      ; SET TRACK # TO 13
 630 2ECE 20 BC 26        JSR SETTK     ; MOVE HEAD TO TRACK #13
 640 2ED1 A9 32           LDA #@32      ;
 650 2ED3 85 FF           STA MEMHI     ;
 660 2ED5 A9 74           LDA #@74      ; SET MEMORY POINTER TO $3274
 670 2ED7 85 FE           STA MEMLO     ;
 680 2ED9 4C 1A 2B        JMP CALL+9    ; JUMP TO CALL+9
 690 2EDC                               ; (READ TR@13,1 INTO $3274)
 700 2EDC                 ;
 710 2EDC                 .END  V3PTH5
TOTAL ERRORS =      0


  10 0000                ; SOURCE FOR 65D V3.3 PATCH 8" VERSION
  20 0000                ;
  30 0000                PAGE0  = $0000
  40 0000                MEMLO  = $00FE
  50 0000                MEMHI  = $00FF
  60 0000                SECTNM = $265E
  70 0000                TENMS  = $267B
  80 0000                SETTK  = $26BC
  90 0000                READDK = $2967
 100 0000                CALL   = $2B11
 110 0000                VIDSIZ = $DE00
 120 0000                PIA    = $F700
 130 0000                ACIA   = $C010
 140 0000                ACIAIO = $C011
 150 0000                ;
 160 2E79                       * = $2E79      ; SCRATCH BUFFER USED BY I/O
 170 2E79                ;
 180 2E79                ; V3PTCH - OS65D V3.3 PATCH 8" VERSION
 190 2E79                ;
 200 2E79 8E C0 2E  V3PTCH STX TEMP      ; SAVE X IN TEMP
 210 2E7C 20 C1 2E        JSR V3READ    ; JSR TO LOAD MORE TRACKS
 220 2E7F                 ;
 230 2E7F EA              NOP           ; RETURNS HERE AFTER
 240 2E80 EA              NOP           ; THE LAST RTS OF CALL+9
 250 2E81 EA              NOP
 260 2E82 EA              NOP
 270 2E83 EA              NOP
 280 2E84 A9 34           LDA #@34      ; SET A = $34
 290 2E86 8D 01 F7        STA PIA+1     ; STORE IN PIA AT $F701
 300 2E89                 ;
 310 2E89                ; TPATCH - TIME DELAY PATCH (SEE TENMS & DELAY)
 320 2E89                 ;
 330 2E89 A0 00     TPATCH LDY #@00      ; Y=0
 340 2E8B A9 03           LDA #@03      ;
 350 2E8D 8D 10 C0        STA ACIA      ; RESET DISK ACIA
 360 2E90 A9 38           LDA #@38      ; SET TO DIVIDE BY ONE,
 370 2E92                               ; 8 BITS, EVEN PARITY,RTS=LOW
 380 2E92 8D 10 C0        STA ACIA      ; TRANSMIT INTERUPT ENABLED.
 390 2E95 8D 11 C0        STA ACIAIO    ; STORE A CHAR IN ACIA
 400 2E98 48              PHA           ;
 410 2E99 68              PLA           ; WASTE SOME TIME HERE?
 420 2E9A 48              PHA           ;
 430 2E9B 68              PLA           ;
 440 2E9C 48              PHA           ;
 450 2E9D 68              PLA           ;
 460 2E9E 8E 11 C0        STX ACIAIO    ; STORE ANOTHER CHAR IN ACIA
 470 2EA1 AD 10 C0  S2    LDA ACIA      ; GET ACIA STATUS BYTE
 480 2EA4 30 03           BMI S1        ; IF BIT7(INTERUPT)=1 GOTO S1
 490 2EA6 C8              INY           ; INCREMENT Y
 500 2EA7 D0 F8           BNE S2        ; BRANCH BACK AND TRY AGAIN
 510 2EA9 B9 B2 2E  S1    LDA TABLE,Y   ; LOAD DELAY VALUE FROM TABLE
 520 2EAC 8D 7B 26        STA TENMS+3   ; STORE IN TENMS SUBROUTINE
 530 2EAF A9 00           LDA #@00      ; SET Y=0
 540 2EB1 60              RTS           ; RETURN TO OS65D
 550 2EB2 31        TABLE .BYTE $31,$31,$31,$31,$31  ; CPU= 1MHZ
 560 2EB7 62              .BYTE $62,$62,$62,$62      ; CPU= 2MHZ
 570 2EBB A0              .BYTE $A0,$A0,$A0,$A0,$A0  ; CPU= 3MHZ?
 580 2EC0 00        TEMP  .BYTE 0       ; TEMPORARY STORAGE
 590 2EC1                 ;
 600 2EC1                 ;
 610 2EC1 A9 03     V3READ LDA #@03      ;
 620 2EC3 8D 5E 26        STA SECTNM    ; SET SECTOR # TO 3
 630 2EC6 A9 80           LDA #@80      ;
 640 2EC8 85 FE           STA MEMLO     ; SET MEMORY POINTER
 650 2ECA A9 31           LDA #@31      ; TO $3180
 660 2ECC 85 FF           STA MEMHI     ;
 670 2ECE 20 1A 2B        JSR CALL+9    ; READ TR@1,SECT@3 INTO $3180
 680 2ED1 EE 5E 26        INC SECTNM    ; INCREMENT SECTOR # TO 4
 690 2ED4 A9 00           LDA #@00      ;
 700 2ED6 85 FE           STA MEMLO     ; SET MEM POINTER TO $0000
 710 2ED8 85 FF           STA MEMHI     ;
 720 2EDA 20 1A 2B        JSR CALL+9    ; READ TR@1,SECT@4 INTO $0000
 730 2EDD EE 5E 26        INC SECTNM    ; INCREMENT SECTOR # TO 5
 740 2EE0 A9 32           LDA #@32      ;
 750 2EE2 85 FF           STA MEMHI     ; SET MEMORY POINTER
 760 2EE4 A9 74           LDA #@74      ; TO $3274
 770 2EE6 85 FE           STA MEMLO     ;
```

Continued on page 18

NEWS FROM DBI!

By: Art Hughes
DBI, Inc.
P. O. Box 21146
Denver, CO 80221

Among buzzwords, advertising hype, and computer-news coverage that chases after every new fad, it's hard for users to understand what's significant in computer systems and hard for computer engineers to assess their customers' desires and needs.

In this article, I will explain DBI's new networking system, review our concurrent processing and, whilst trying to avoid creating vaporware, indicate something about current and future development plans in the areas of telecommunications, tape backup, larger disk capacities, RAM beyond 64K, and the new operating system.

NETWORKING

The primary purpose of a LAN is to let several computers share use of peripherals such as disk drives and printers.

The more popular LANs seem to be Ethernet, Arcnet, or token ring. This popularity overlooks bus arbitration in a system such as DBI's where multiple computers (the DB-1 boards) are tied to the same bus. It also overlooks the potential of the SCSI (Small Computer System Interface) in extending the bus-arbitration network beyond the confines of a single box.

Continued on page 18

SOFTWARE LISTING 1985

EXPLANATION OF LISTING CODES

BASIC Version No./
Minimum computer/
1=SB,SBII,C1P,C2/4P
4=C4P
8=C8P
O=C2/3OEM
D=C2/3-D
2=C200,C3A/B
3=C300

Minimum Storage required/
C=Cassette
5=5 1/4" MF
8=8"FD
7=CD-7
2=CD-20/23/28/30/36/74/
digit following indicates number of devices required.

Systems Supported/
S=Single User
M=Multi-User
H=Hard Disk
R=Record Locking
record lock assumes multi-user. Two may be specified.

Software Support by/
D=Dealer
P=Phone
M=Modem
N=None
O=Other

Sold by/
A=Author
D=Dealer
M=Mail order
O=Other

Copies in Circulation/
No. multiplied by 10, i.e.
1=Less than 11
11=100-110

Price/
Dollars only, no cents, tax, shipping, etc.

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That said, we hope that this listing will prove useful to our readers, dispel the belief that "there isn't any software out there" and encourage those of you who have not already made submissions to do so immediately upon reading this.

<> <> <> <> <> <> <> <> <> <>
CP/M*BUSINESS*SERIAL
<> <> <> <> <> <> <> <> <> <>

ACCOUNTS PAYABLE
/3/21/MH/D/D/1/ $700

Author:
ELECTRONIC BUSINESS SYSTEMS
307 MICHIGAN ST., NE
GRAND RAPIDS, MN 49503

Seller:
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140 SHERMAN ST.
FAIRFIELD, CT 06430

ACC PAYABLE FEATURES ENTRY OF VENDOR INV & AUTO PAYABLES CHECK PRINTING. VENDOR PURCHASE AND PAYMENT HISTORY IS MAINTAINED WITH ON LINE VENDOR INQUIRY. REPORTS FEATURED ARE USER DEFINED AGING ANALYSIS, 1099 VENDOR REPORT, CHECK RECONCIL, OPEN INV LISTING, A/P JOURNAL & CASH FLOW ANALYSIS.

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FAIRFIELD, CT. 06430

A/R SYSTEM FEATURES: A) OPEN ITEM & BAL FORWD CUST B) SALES TRANS ETRY, EDIT & POST C) MULTIPLE CASH RECPTS ENTRY PER MO, EDIT & POSTING D) AUTO OR MANUALLY CALC & POSTS FINANCE CHGES E) CONTROLS SALES COMM DUE F) DIST OF TRANS TO G/L ACCTS G) MAY INTER WITH G/L ACCT FORMAT XXXX.XX. 11 REPTS.

CITRUS MAIL ORDER ENTRY SYSTEM
2.11/3/21/MH/D/D/1/ $9500

Author:
D.R.HENDRICKS, ASSOC INFO SYS
825 OSCEOLA DR.
ROCKLEDGE, FL 32955

Seller:
SAME

CMOES - CITRUS MAIL ORDER ENTRY SYSTEM. MULTIUSER MAIL LIST, LABELS, REPORTS, STATISTICS. SUPPORTS UP TO 100,000 ADDRESSES. CAN BE NETWORKED IF MORE THAN 8 USERS ARE REQUIRED. HAS PROCESSED OVER 2000 ORDERS PER DAY. PRODUCES WAYBILLS WITH TRUCK ROUTING, ETC.

GENERAL LEDGER
/3/21/MH/D/D// $700

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ELECTRONIC BUSINESS SYSTEMS
307 MICHIGAN, NE
GRAND RAPIDS, MI 49503

Seller:
ISOTRON, INC.
140 SHERMAN ST.
FAIRFIELD, CT 06430

G/L SYS IS A GEN PURPOSE DOUBLE ENTRY STANDARD ACCT DYS. FEATURES ARE: A) ALLOWS UP TO 13 ACCT PERIODS B) PROFIT CENTER REPORTING UP TO 10 DIV. C) 10 USERS DEF. SOURCE JOUR. ARE AVAL. D) USER DEF. CHART OF ACCTS E) REOCCURRING JOUR. ENTRY MAY BE ASSG. F) AN AUTO AUDIT TRAIL IS GENERATED.

INVENTORY
/3/21/MH/D/D/1/ $700

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ELECTRONIC BUSINESS SYSTEMS
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INV SYS FEATURES: A) ALLOWS INV COSTING BY EITHER AV COST, LIFO, OR FIFO B) ALLOWS ON LINE STOCK STATUS INQ. C) USER DEFINED NUMBER OF PRICE LEVELS (MAX OF 8) D) USER DEFINED NUMBER OF VENDORS PER PART (MAX 6) E) 40 USER DEFINABLE COMM CLASS F) 40 USER DEFINABLE COMM CLASSES 10 KEY RPTS.

PAYROLL
/3/21/MH/D/D/1/ $700

Author:
ELECTRONIC BUSINESS SYSTEMS
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GRAND RAPIDS, MI 49503

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ISOTRON, INC.
140 SHERMAN ST.
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PR FEATURES 10 USER DEFINED EARNINGS & 6 DEDUCTION CATEGORIES FOR MULTI DIVISIONS OR DEPTS. PR DATA ENTRY IS AUTOMATED WITH CHECK PRINTING. RPTS INCLUDE A CHECK REGISTER, PAYROLL JOURNAL, QTD - YTD EARNINGS & DEDUCTION RPT, FUTA/SUTA TAX RPT, WORKMAN'S COMP RPT & W-2 FORMS PRINTING.

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OS65-D*BUSINESS*SERIAL & VIDEO
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FINANCIAL ANALYSIS DISK
3.X/4/81/S/P/O/11/ $44

Author:
DR. JIM OWEN
AMERICAN UNIVERSITY
WASHINGTON, DC

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OS65-D*BUSINESS*VIDEO
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RENTAL PROPERTY ANALYSIS
3.X/4/C1/S/P/A/1/ $24

Author:
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EVALUATES BEFORE & AFTER TAX RETURN ON SINGLE OR MULTIPLE UNIT RENTAL PROPERTY. CONSIDERS INTEREST RATE, TAX RATE, FIXED OR VARIABLE COSTS, VARIABLE HOLDING PERIODS, AND APPRECIATION. PRINTS OUT SCHEDULE OF RETURNS OVER TIME 8K RAM.

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OS65-D*GAME*VIDEO
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EARTH COMMAND
3.2/4/51/S/N/A/0/ $15

Author:
MILLENNIUM SOFT., LG BUNBURY
30 CEDARHILL DR, RR 7 NEPEAN
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BRAND NEW (1985). FAST ACTION VIDEO GAME BASED ON ATARI 'MISSLE COMMAND'. SUPER GRAPHICS AND REALISTIC SOUND PLACE YOU IN CONTROL OF THE DESTINY OF EARTH. 24K C4P AND JOYSTICKS REQUIRED A MUST FOR EVERY OSI COMMANDER.

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OS65-D*OTHER*SERIAL & VIDEO
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ASM68K
ASM/8/81/S/O/A/1/ $130

Author:
D. LIVESAY
AVE DE LA RESISTANCE 6
B4920 EMBOURG, BELGIUM

Seller:
SAME

ASM 68K IS A MOTOROLA 68000 CROSS-ASSEMBLER. THIS IS A DISK TO DISK SYSTEM AND THE OBJECT CODE LENGTH IS NOT LIMITED BY YOUR COMPUTER'S MEMORY SIZE. MINIMUM SYSTEM REQUIREMENT IS ONE DISK DRIVE AND 30K OF MEMORY. COMES WITH RICK TRETHEWEY'S EDIT+. PRICE INCLUDES AIRMAIL FROM BELGIUM.

CHECKWRITER
3.3/4/51/S/P/A/1/ $39

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Seller:
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DESIGNED FOR SINGLE-KEY-STROKE INDIVIDUAL WHO WANT TO DO MIN INPUT & MAXIMIZE WHAT MACHINE DOES FOR THEM. YOU ENTER (OR RECALL) CHECK, DEPOSIT, OR TRANSFER;IT WRITES CKS & STUBS RECORDS DATA IN "CHECKBOOK",IN TAX/BUDGET & RECURRING ITEMS FILES & DISPLAYS BALANCES; YOU SIGN & DROP IN WINDOW ENV.

HAND ASSEMBLER HELPER
3.3/8/81/S/O/A/2/ $20

Author:
D. LIVESAY
AVE DE LA RESISTANCE 6
B4920 EMBOURG, BELGIUM

Seller:
SAME

THIS PROGRAM WAS USED TO HELP GENERATE HAND ASSEMBLED CODE BEFORE ANY 68000 ASSEMBLERS WERE AVAILABLE. THIS PROGRAM CAN BE USED TO LEARN 68000 ASSEMBLY CODE. IT IS MENU DRIVEN AND WILL STEP YOU THROUGH EACH INSTRUCTION. OUTPUT CAN BE DIRECTED TO A PRINTER OR STORED ON DISK.

PERSONAL FINANCE DISK
3.X/4/81/S/P/O/11/ $19

Author:
DR. JIM OWENS
AMERICAN UNIVERSITY
WASHINGTON, D.C.

Seller:
KEN THURMAN
6706 ABBEY ROAD
BARTLESVILLE, OK 74006

HANDY DANDY PROGRAMS FOR ANALYZING, FORECASTING & MANAGING YOUR FAMILY FINANCES. INC ANALYSIS OF CURRENT FINANCIAL CONDITION; BUDGET ANALYSIS & PERSONAL ECONOMETRIC MODEL. HANDLES FORECASTING, "WHAT-IF" VARYING RATES OF INFLATION & GROWTH. PRINTS OUT A "GRID" OF KEY INFO FOR UP TO 10 YRS.

real-FORTH
3.1/8/82/S/P/A/2/ $100

Author:
CHARLES CURLEY
5595 EAST 7TH ST #285
LONG BEACH, CA 90804

Seller:
SAME

real-FORTH IS A PROFESSIONAL FORTH DEVELOPMENT SYSTEM. IT RUNS ON THE PDP-11, APPLE IIe, AND 68000 (ATARI ST SOON!). FOR THE OSI, IT COMES WITH TWO 8" DISKS OF USEFUL SOURCE CODE AND A BOOT DISK. DOCUMENTATION RUNS TO SEVERAL HUNDRED PAGES. COMPATIBLE WITH FORTHCOMING TEXT "Advancing FORTH".

<> <> <> <> <> <> <> <> <> <>
OS65-D*OTHER*SERIAL
<> <> <> <> <> <> <> <> <> <>

ANOVA
3.3/O/81/S/O/A/1/ $50

Author:
ROBERT T. KINTZ
104 COUNCIL ROCK AVE.
ROCHESTER, NY 14610

Seller:
SAME

ANOVA PERFORMS ANALYSIS OF VARIANCE FEATURES; LARGE DESIGNS, UNEQUAL CELL SIZE, BOTH WITHIN & BETWEEN VARIABLES.MAX # INDEP GROUPS <=32, # SCORES/SUBJECTS <=32 & TOTAL # FACTOR <=9.

CRVFIT
3.3/O/81/S/O/A/1/ $50

Author:
ROBERT T. KINTZ
104 COUNCIL ROCK AVE
ROCHESTER, NY 14610

Seller:
SAME

CRVFIT IS A PROG TO PERFORM LEAST-SQUARES PARABOLIC CURVE FIT TO A GIVEN SET OF DATA. INPUT ROUTINE INCLUDED. UNLIMITED NUMBER OF DATA POINTS. NON-DMS FILES. TERMINAL REQUIREMENTS.

FDM
3.3/O/81/S/O/A/1/ $30

Author:
ROBERT T. KINTZ
104 COUNCIL ROCK AVE.
ROCHESTER, NY 14610

Seller:
SAME

FDM IS A DECISION SUPPORT PROG WHICH PERFORMS A SELECTION OF ALTERNATIVES BASED UPON FUZZY SET THEORY. NUMBER OF ALTERNATIVES AND CRITERIA INPUT IS UNLIMITED. NON-DMS FILES. TERMINAL REQUIREMENTS.

MULREG
3.3/O/81/S/O/A/1/ $65

Author:
ROBERT T. KINTZ
104 COUNCIL ROCK AVE.
ROCHESTER, NY 14610

Seller:
SAME

MULREG PERFORMS MULTIPLE LINEAR REGRESSION ANALYSIS. NUMBER OF INPUT VARIABLES LIMITED ONLY BY MEMORY. ALSO INCLUDED IS COMPANION PROG LOAD TO PERMIT EASY DATA ENTRY. NON-DMS FILES. TERMINAL REQUIREMENTS.

OPTCAL
3.3/O/81/S/O/A/1/ $50

Author:
ROBERT T. KINTZ
140 COUNCIL ROCK AVE.
ROCHESTER, NY 14610

Seller:
SAME

OPTCAL IS A PROG TO OPTIMIZE POLYNOMIAL EQUATION WHICH SOLVES FOR (OUTCOME) AS FUNCTIONED OF UP TO 4 INDEP. VARIABLES (X1...X4). THESE CAN BE EXPRESSED AS LINEAR SQUARED OR INTERACTION TERMS. NON-DMS FILES. TERMINAL REQUIREMENTS.

PRINCP
3.2/O/81/S/O/A/1/ $35

Author:
ROBERT T. KINTZ
104 COUNCIL ROCK AVE.
ROCHESTER, NY 14610

Seller:
SAME

PRINCP PERFORMS PRINCIPAL COMPONENT ANALYSIS (MAX # OF COMPONENTS = 5) OF MULTIVARIATE DATA. COMPANION PROG LOAD IS PROVIDED TO PERMIT DATA INPUT TO DISK FILE. NON-DMS FILES. TERMINAL REQUIREMENTS.

SIGAVG
3.2/O/81/S/O/A/1/ $75

Author:
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<> <> <> <> <> <> <> <> <> <>
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<> <> <> <> <> <> <> <> <> <>

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1.2/D/71/HR/O/A/1K/ $675

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ED COOPER
1430 MINER STREET
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Author:
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Author:
PEEK (65), INC.
P.O. BOX 347
OWINGS MILLS, MD 21117

Seller:
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A BASIC PROGRAM RESEQUENCER. GLOBAL CHANGES, TABLES OF BAD REFERENCES, GOTO'S, GOSUB'S AND VARIABLES BY LINE #. HANDLES 50,000 LINE TRAP. RESEQS ALL OR PART OF PROGRAM. MACHINE LANGUAGE MAKES IT VERY FAST.

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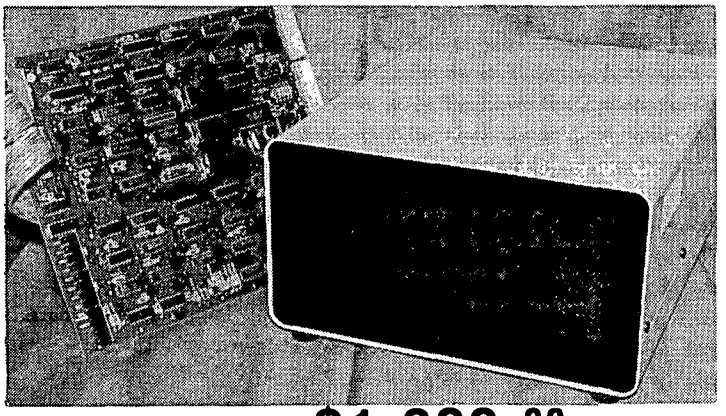

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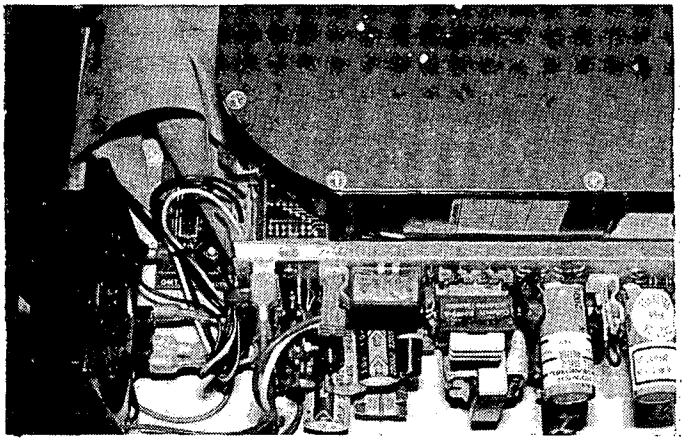
The SPACE-COM SUPER SUBSYSTEM Uses 5¼'' Industry Standard Hard Disk drives interfaced to the OSI bus by the DS-1 SCSI Host Adapter Board at the computer end and the state of the art OMTI 5000 series Intelligent Disk/Tape Controllers at the disk end. The Denver DS-1 Board not only provides the Bus Translation, but gives Real Time of Day, Day/Week, AM/PM, and Day/Mo. With on board battery, Date and Time are maintained w/o power.



The chassis is beautifully engineered with lighted on/off switch, standard a/c cord, and insulated spade terminals for easy service. A Corcom Emi Filter is incorporated in the a/c jack, and power is provided by an extremely efficient switching power supply. The case is also available in dual, side by side configuration and looks like an IBM PC box. It incorporates a larger power supply and can support 2 Winchester drives, or 1 drive and tape, or 2 5'' floppies in place of one of the above.

Drives can be accessed from any single or multi-user OSI system by running an overlay program on that partition, or can be booted directly by replacing current ROM/PROM with our SCI 500 PROM, available for $49.00 extra.

Single 20 M/B drive (15.7 formatted) single case	$1,999.00
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14661A Myford Road, Tustin, CA 92680 (714) 731-6502

```
780 2EE8 A9 08          LDA #$08      ; SET TRACK # TO 8
790 2EEA 20 BC 26       JSR SETTK     ; MOVE HEAD THERE
800 2EED 4C 1A 2B       JMP CALL+9    ; READ TR#8,SECT#5 INTO $3274
810 2EF0                              ; (CALL+9 ENDS WITH AN RTS)
820 2EF0          ;
830 2EF0                .END  V3PTH8
TOTAL ERRORS =      0
```

★ ★

USEFUL MEMORY LOCATIONS IN OS-65U

By: Roger Clegg
Data Products Maintenance Corp.
9460 Telstar, El Monte, CA 91731

21	NULL count (usually 0). Poke higher number to slow down screen display, or a printer which lacks handshaking.
22	POS(X) counter. After printer commands containing a character > 31, you often need to POKE 22,PEEK(22)-1.
27-97	71-character input buffer
120,121	Address of start of Basic program
122,123	Address of start of variable table
124,125	Address of start of array tables
126,127	Address of bottom of string space
130,131	Address of highest unused byte of string space
132,133	Memory size (First byte not available to Basic)
1390	Line delete character (usually @), if EDITOR not enabled
1394	Rubout character (usually _), if EDITOR not enabled
1398	Maximum length of input string (usually 71, maximum)
1797	Poke 44 to remove line numbers from listing, 32 to restore
2073	Poke 96 (or FLAG 25) to kill Control-C, 76 to restore.
2676	Poke 0 to kill carriage returns (usually 13)
2683	Poke 0 to kill line feeds (usually 10)
2720	Width of Basic PRINT fields using commas (usually 14)
2797	Input prompt character (usually 63 = ASC(PRINT))
2888	Poke 0 to enable null input. FLAG 27 does the same.
2972	Poke 13 to allow ":" in inputs (usually 58 = ASC(:))
2976	Poke 13 to allow "," in inputs (usually 44 = ASC(,))
3015	Poke 47 to input M/D/Y as three numbers (usually 44)
8495-6	OS-65U Version Number = PEEK(8495)+PEEK(8496)/100
8620-1	Version Date (M/Y)
8704	Start of Basic dispatch address table
8738-9	Address of NULL routine -1 (for replacement by NULL etc.)
8778-9	Address of USR(X) routine (usually points to "FC ERROR")
8960	Start of reserved word list
9025-8	"NULL". Replace by RSEQ, NULL, KILL, PNTR, etc.
9057-60	"LIST". POKE 9057,1 to prevent listing. (65U uses 9058)
9712	Field width of PRINT $R,X (usually 12)
9832	Current disk drive, set by DEV. 0=A,1=B,2=C,3=D,128=E
9889-97	Disk I/O Control Block:
9889	Disk drive. 0=A,1=B,2=C,3=D,128=E
9890-3	Disk address, low byte first
9894-5	Number of bytes to transfer
9896-7	RAM address. 0 denotes the OS-65U buffer at 19968
9906-13	Channel 1 control block:
9906	Access rights (0=NONE, 3=R/W) + file type (0=DATA, 4=BASIC, 8=OTHER). Always R/W when password is given. After CLOSE 1 changes 9906 to 255, POKE 9906,3 will reopen (as R/W DATA) without rereading DIREC*.
9907-9	High 3 bytes of disk address, as in DIREC*. Note that INDEX<1>=0 is 16 bytes further, after the file header.
9910-12	High 3 bytes of file length, as in DIREC*. Poke with length actually in use to limit the FIND command.
9913	Disk drive. 0=A,1=B,2=C,3=D,128=E
9914-21	Channel 2 control block, as above
9922-29	Channel 3 control block
9930-37	Channel 4 control block
9938-45	Channel 5 control block
9946-53	Channel 6 control block
9954-61	Channel 7 control block
9962-69	Channel 8 control block
9970	Start of 256-byte disk directory buffer
10226	Disk error number
10287	Lowest character printable to files (usually 13)
11193-5	To disable password checking: POKE with 169, 0, and 96.
11657-8	Memory input pointer (device #4, killed by EDITOR)
11661-2	Memory output pointer
11664-5	Console I/O device numbers (serial console = 1, video = 2)
11666-7	Indirect file pointer. See Basic Manual p. 32
11668	Lowest "on" bit gives default INPUT device (console = 1)
11686	Each "on" bit gives default PRINT device (console = 1, printer = 16 (bit #5), console + printer = 17, etc.)
11774-5	Line number of error = PEEK(11774)+256*PEEK(11775)
12019	51 at 1 Mhz, 102 at 2 Mhz
12098	Padding character used by INP$ (usually 32 = space)
13314-5	Base cylinder number of current hard disk system
14387	Lines per page, device #5 (usually 66)
14394	Spooling indicator. 0 = spooling off.
14457	Lines per page to be printed, device #5 (usually 60) Poke 66 (or = PEEK(14387)) to kill automatic paging.
14646	Poke 91 to move program to indirect file. (See Basic
14721	Poke 24 to get program from indirect file.| Manual p. 32)
15006	Control-C flag: 0 when control-C not entered
15908	Lines on page not yet printed, device #5
16317	OS-65U level. 1 = single user, 2 = networking, 3 = timesharing, 4 = timesharing with network, 5 = Denver boards.
18959	Transient enabled: 1=EDITOR, 2=RSEQ, 3=INP$, 4=COMKIL
19632	Number of seconds to WAIT FOR. 60 or more waits forever.
19633	Contains 0 if WAIT FOR was unsuccessful.

Cont. on page 20

Your existing mainframe (DBM-1 or 2) already serves the primary purpose of a LAN; peripheral sharing. We have now completed a system that permits networking two or more mainframes together so that as many as 75 users can share the use of disk drives. The users within one mainframe continue to have exclusive use of "their" printers.

The SCSI bus allows the SCSI Host Controller in each mainframe to talk to disk drives that are available to all users within the network. A file server -- another piece of equipment needed by other LANs to handle arbitration -- is not necessary. The networking function is totally transparent to both the user and the programmer, just as the SCSI function within a single mainframe is transparent.

We believe simple is better. Since we already used SCSI to control the disk drives for one mainframe, we decided to extend the SCSI bus to additional mainframes. To that, we added a ring network to handle semaphore passing. Among other things, this approach allowed the use of present hardware.

To handle the ring network, a DB-1 board, Rev. D or later, is installed in each mainframe as the ring command processor (RCP). The RCP interfaces with other DBI mainframe RCPs via the RCP's RS-232 port. The RCP's baud rate is set to 76.8 Kbaud. This would be slow for networking, but semaphore passing is the only thing the ring is used for. All of the data transfer is handled by SCSI at high speed.

No change in application software is required.

CONCURRENT PROCESSING

"Concurrent Processing" and "Multi-User" are used synonymously in the press. Multi-user may refer to one processor serving multiple users or one processor per user in a network configuration. Sometimes, concurrent processing refers to parallel processing.

SOME COMMENTS ON DEVELOPMENT

It is always difficult to hint at development plans because the direction they take can be changed by so many factors, such as new technology or heavy demand for a different

Continued on page 20

USEFUL MEMORY LOCATIONS IN OS-65U CONTINUED:

19798	POKE 2*(X-1) for device #8, printer #X, where X = 1 TO 16
19968	Start of 3584-byte floppy disk buffer
23552	23552-23695 is free under level 1 unless RSEQ is enabled.
23696	Start of EDITOR code if EDITOR or INP$ enabled.
23700	EDITOR's character delete character (usually 95 = ASC(_))
23701	EDITOR's line delete character (usually 64 = ASC(@))
23702	EDITOR's forward space
23703	EDITOR's backspace (usually 8)
23705	EDITOR's move-to-start-of-line character (usually 6)
23707	EDITOR's move-to-end-of-line character (usually 18)
23734-40	EDITOR's forward space echo to terminal
23741-47	EDITOR's backspace echo to terminal
24527	24527-24564 is free under level 1 unless RSEQ is enabled.
24565	WP-3 flag. If not 0, utility programs return to WP-3.
24569-71	Day, Month, Year, in level 1
24572-3	Number of bytes of machine code before Basic program
24576	Start of workspace for Basic programs (usually 24K)
48127	Top of workspace when COMKIL is enabled
49151	Usual top of workspace
55333-64	256-bit semaphore table. To read as 1=locked, 0=unlocked, DEF FNSM(X) = -((PEEK(55333+X/8) AND 2^(X AND 7))=0)
55363	POKE 55363,PEEK(55363) OR 128 to unlock printer #5
55364	POKE 55364,PEEK(55364) OR 4 to unlock printer #8
55381	User Number in Timesharing and Networking
55919-24	Second, Minute, Hour, Day, Month, Year, in level 3.
56425-30	Devices 3-8, level 3: User number if locked, 127 if unlocked. Poke with 255 to make unlockable.
56431-34	Available for devices 9-12, or other use.
57199	Network node number. 0=K, 1=L, ..., 15=Z
57272	Partition number (0-15) in networking
57368	Start of 3584-byte hard disk buffer
64513	Last key pressed, in level 1

★

PROFILE OF A "HOBBYIST"

By: Olof Swembel
Lundagardsv. 35
S-163 53 Spanga
Sweden

I've been a happy reader of PEEK(65) since 1981. OSI answered an early question of mine that they never communicated with users directly and didn't recommend any trade paper officially. They did, however, say that PEEK(65) was the unofficial organ for OSI users. Well, here we are, still alive and kicking ideas around! Wunnerfull, wunnerfull!!

First of all, I want to tell you that I'm in computing strictly as a hobby, learning how computers function along with a hardware mod. or two.

Born in Sweden, I was taken to the USA in 1926 as a 1 1/2 yr old by my parents. They have been officers in the Salvation Army, both in Sweden and USA. (Dad's alive and well!) We lived near NYC on Long Island, where I finished High School. In 1948, during a "tourist trip" over here, I decided to stay on to see what the "old country" was all about. I liked it so much that I've lived here ever since. I married a Swedish girl and we live in our house with no children.

My first job was at WTAG (CBS) in Worcester, MA as a studio sound engineer. In Sweden, I got the same job at the Swedish Radio Corp. Later on I became a cameraman and lighting technician for the budding Sweden Television Service.

★

In 1957 I went over to a motion picture company called Europa Film. They had built a new recording studio and needed someone to make musical sound recordings. They became a big entertainment facility house along with film making until 1984. The Swedish record company, Sonet Grammofon, bought the studios of the now almost bankrupt Europa Film. The rest was bought by Svensk Filmindustri, Sweden's oldest and now largest (!) film company. (A bit of trade news for followers of film history.)

Today we are known as Sonet Studios and run a complex of sound, video and film recording studios near Stockholm, capital of Sweden. I transfer films from a "scanner" to master video tapes to be copied to video-casettes, etc.

I learned about this wonderful hobby on a Compukit UK101 computer that I built from a kit in 1980. It was used for many modifications and experiments. Problems were encountered with intermittent breaks that often caused lock-ups, due to my experiments. Not wanting to re-learn "the wheel," I bought another one just like the first. This was an almost new UK101, in a case, with the RS-232 port added and included a Microline 80 printer. Offered as a used package deal, I bought it for Xmas in 1983.

The Compukit UK101 is a European spin-off of the Superboard I, made in England. It had 8K of RAM and a 48 x 16 screen instead of 24 x 24. It was a complete, uncomplicated computer that lent itself to many extensions, the way most OSI machines do.

Today ROM BASIC is available with 40K of RAM, most of it on Elector memory/Eprom boards. They include some 6116's and are coupled through an unbuffered mother board that takes 40-pin plugs. You can relocate them anywhere in memory, 8K at a time. A single 5 1/4" TEAC disk drive stands on top of the metal case that houses the extra RAM. The drive is controlled by an FDC from Premier Publications in England, an OSI supporting company that has gone out of business.

I've bought many things from them, including a special Screen Enhancement Kit that

News from DBI! continued

product. So, bear with me if the following comments seem a little vague.

Telecommunications has not been a function we've had great demand for. We intend to start development on this during 1986. If you have features that would be important to your use, please let us know.

So far as we can tell, we can satisfy anyone's needs for disk storage. Today, using SCSI, DBI can give you up to 675 megabytes of formatted disk. Within a year, we'll provide 1,500 megabytes, formatted.

In addition to cassettes, we currently deliver 60 megabyte streaming tape drives. A 9 track, IBM compatible controller is under development now.

RAM, random access memory, will be expanded significantly during 1986. This expansion, like other enhancements we have added, will allow your programs to run, in virtually all cases, in the larger memory without significant alteration.

Our new operating system, DB-65E is now in ALPHA test. It will be available for general use in 1986.

We value your business and intend to meet your needs. If you have suggestions or comments on what you want, we would appreciate you letting us know. While we are pressed for time, serious questions and/or criticisms are always welcomed.

★

gives you 11 different screen sizes, normal and reverse video, with guard bands. It can change the UK101MF screen from boot-up with 64 x 32 down through to 24 x 24. I can run both C1P and C4P programs without having to rewrite the graphics! The CEGMON/C1E Monitor is a prerequisite because of its variable screen windows. There's a Ceg Linker to use it with 65D V3.0-2.

V3.3 works great to. I have changed the screen driver at $352F to 3535 so that PRINT!(20) puts a 1 into my screen switch at $DE80 and !(20) puts a 4. That's for 65 x 32 and 32 x 32 screens. Thank you PEEK(65) for all tips on setting up V3.3 screens! I have added a simple reverse video mod. that I use normally. With an amber filter, it's easier on the eyes to look at dark red letters on yellowish "paper." You don't see "red" "flashes" as you do when you look away from a green screen.

I have EPROM extensions of ROM BASIC although all aren't used daily. Along with the revised BAS-1 and 3, there is also the new 4, 4.5, 5, 6 and X. These can add over 45 new commands and instructions to BASIC along with named, cassette file handling. Too bad more of BASIC 5, 6 and X weren't sold on a wider basis, so that exchange programs could utilize them. I am trying to contact the authors to see if their programs have been made Public Domain. There are a couple of good Tool kits with REPLace, RENUMber, single key, etc. There is a BASIC 5 + LINK65 (DUmp to disk) for V3.0-2 also.

Disk operating sytems I use include OS65D3, OSIO's V5.14 and HEXDOS V4 from Steve Hendrix. I started off with a ROM BASIC DOS from Prem. Publ. called ROMDOS that I use for programs that don't use DATA files. Most DOS commands are the same since it's a V3.0 relocated to $0300-127E. You use !" for the same Kernel commands as with 65D, but no BASIC extensions. Backups are made on cassettes.

A larger version is called VORTEX, ending at $277E. It includes 8 one page buffers for DATA files located in the DOS along with extended program file handling. You can DUmp a new program without "CREATE", show a double DIR, ZEro, set BUffers, etc., from BASIC or Kernel without losing the resident program (like "Hooks into BASIC," Dec. 84). I use it for the Video department's local Client Register for easier access and updating, making print-outs for all 7 of us when needed.

My main language is BASIC along with a bit of ASSEMBLER and FORTH. I have an APPLE IIe on loan from work, with a 5" disk drive. I use it now and then, mainly to enter a program that I'm VERY curious about. My most recent purchase was the delightful Jupiter Ace with 56K RAM and a "real" keyboard attachment. The $60 machine is sold by Boldfield Computing, Cambridge, England. They bought up the remaining stock from Jupiter Cantab and have added a host of expansions and programs.

The ACE contains a FORTH-79 in 8K of ROM run by a Z80 processor. Programs run from a good game of chess (not for me), a Spreadsheet (FORTH=speed!), a DATABASE and Adventures to high-res Turtle Graphics, to name a few! It was designed by Richard Altwasser and Steven Vickers. They also helped create the Sinclair/Timex Spectrum, so a certain similarity exists between the two machines. All new WORDS are compiled as you enter them and are linked directly to the ROM dictionary. When rewriting new words you can LIST, EDIT and REDEFINE the original word. The current DICTIONARY in RAM can be saved to cassette at 1500 BAUD. These can be "chained" to other words later on. It's a great advantage not to have BASIC available when learning FORTH!

Another "fun thing" is a system called BASICODE-2. The Dutch Radio transmits a technical hobby program called "Hobbyscoop". For this program, N.O.S. - (Dutch Radio) has published a 2 page MC translation program for each of some 24 different computers called "NOS-Basicode 2". Anyone who sends 38 Dutch Guilders to them will receive a large booklet and a C60 cassette with almost all versions of the code, and many good programs that you can experiment with using cassettes or another machine. The code is established in Europe as a standard universal transfer code.

Their address is:

N.O.S. Hobbyscoop
Basicode 2
PO Box 1200
1200 BE Hilversum
The Netherlands.

Tell 'em where you read about it!

On Fridays, at 1910 hours Greenwich Mean Time, N.O.S. transmits 10 min. of code on Medium Waves to most of Europe. Some short-wave transmissions are also done. I can only pick up the MW program during the dark months. During summer in Sweden, the sun goes down after 2000 hours GMT and goes up around 0200. DX Med. Wave reception is dead till the sun goes down! By using Basicode-2, anyone can make a recording on cassette or tape of programs that are transmitted by radio or from a computer. This can be loaded into another computer, by using the same code.

The programs are recorded as an ASCII file at 1200 BAUD. The translation program loads the code to one page above the workspace. On finishing, the program is automatically downloaded to the work space with an Indirect-file function like the one that is used under 65D. It ends up giving you a "Checksum Error" if something is missing. Merged with machine dependent subroutines in lines 10-999, the program can be run directly! Of course, the BASIC program has to be written with an agreed upon protocol, but this mainly follows Microsoft and DIF. It can become quite sophisticated, with many surprising, if slow, graphics when run at 1 MHz. At 2 MHz you can hardly see the difference!

Saving a program can also be done, but only from the BASIC workspace. I've tried it out on a couple of demo programs from the Apple. These were recorded on a cassette using the Apple version of the Basicode 2 translation program. It was loaded into the UK101 with no difficulty at all. All Basicode-2 material is non-copyright for personal use and copying, as long as it isn't sold. The program for OSI isn't included on the latest cassette, but will be published in PEEK(65) soon!

I've been "collecting" programs from magazines like PEEK, MICRO, COMPUTE!, UK101 Users Club N.L., Personal Computing World (UK) and Practical Computing (UK), adapting them for the UK 101. Now and then a few have been bought or exchanged. Most of them are on 5" disks with a back-up on the "flip" side. I have adapted most programs to run on a 64 x 32 screen with the inverted keyboard like on a

model C1E.

My EPROM programmer kit was sold by the now departed UK101 Users Group. It programs the EPROM at $C000, by the program at $E000. This picks up the code from anywhere in memory. I made a new set of graphic characters, making them wider for easier reading in the 64 x 32 mode. Both sets are available by piggybacking the 2 EPROMS. A switch is coupled to pins 20, alternating between ground or 5v. thru 10K resistors. Pins 18 are coupled to ground via pin 12 as usual.

My computer is nowadays a friendly, reliable machine and I don't intend trading it in for a SMALL new model for a good while yet! I've gotten too familiar with "Barbara," as she's called, to leave her! If I get to the point where she isn't big enough for my programs, we'll see... I still want to learn more about her. Some people think of a computer as a car, "Gotta have the latest one now!" I think of it as a good book. It has to be read several times to really be appreciated.

"Th-th-that's all, f-folks!!"

LETTERS

ED:

Here are a couple of new routines which are of rather limited value, but your readers might think worthwhile.

1. Over 3000 strings can be imperfectly sorted by storing the first seven letters in a numeric array as follows:

```
30 DIM A(N),P%(N):K=27:L=32:
   M=64
40 FOR I=1 TO N:INDEX<1>=
   128*I: INPUT%1,NAME$:Y=0
41 IF LEFT$(NAME$,9)=
   "AMERICAN " THEN NAME$=
   "AME"+MID$(NAME$,10)
50 FOR J=1 TO 7:X=ASC(MID$
   (NAME$,J))-M:IF X>L THEN
   X=L
60 IF X<0 OR X>=K THEN X=0
70 Y=Y*K+X: NEXT J
80 A(I)=Y: P%(I)=I
90 NEXT I
```

This algorithm treats "A" and "a" identically, and all non-alphabetic characters identically. Line 41 is just an example of how to overcome the 7-letter limitation.

2. The other routine concerns FLAG 30, which OSI introduced with no mention of its use. Clearly, I thought, it was mainly to catch amounts past $42,949,672.95 for programs which keep money in cents. (I always keep money in dollars so it didn't concern me.) But OSI never explained how to cope with amounts between $10 million and $42 million, which BASIC will store accurately but refuse to print accurately. What is needed is a special ouput routine:

```
300 REM ACCEPTS X IN CENTS,
    RETURNS X$ IN DOLLARS
310:
320 Y=X:Z=INT(ABS(X/1E9))*SGN
    (X):IF Z THEN Y=Y-Z*1E9
330 X$=STR$(Y/100):IF ASC
    (RIGHT$(X$,2))=46 THEN
     X$=X$+"0"
340 IF ASC(RIGHT$(X$,3))<>46
    THEN X$=X$+".00"
350 IF Z THEN X$=STR$(Z)+
    RIGHT$("0000000"+MID$
    (X$,2),10)
360 IF ASC(X$)=32 THEN X$=
    MID$(X$,2)
370 RETURN
```

Roger Clegg
El Monte, CA 91731

* * * * *

ED:

Sometime ago I wrote about some problems that I was having with Canon Double sided drives and my C1P. Well, the story has a happy ending, finally.

If you and your readers remember, when the Canon drives were hooked up some very strange things would happen, especially if I tried to copy a disk.

As it turns out, the Canon drives have a head load feature that is enabled by either a separate head load pulse, or by the drive select pulse, depending on the setting of a dip switch. The problems show up when the head is being loaded by both head load and drives select. Both drives are then selected, which would cause the source drive to erase the track that it just read. To see exactly why, refer to Figure 1.

First, assume that the following switches are closed on each drive: Sw 2 #3, Sw 2 #4, Sw 2 #6, Sw 3 #4, and then Sw 1 #1 for drive "A" and Sw 1 #2 for drive "B". Now if drive "A" is selected, the drive select pulse goes through Sw 1 #1 to Sw 2 #3, then to the other side of Sw 2 #4, through Sw 2 #4 to Sw 2 #4 of drive B, through Sw 2 #4 to Sw 2 #3, and then on to the drive select logic of drive "B". Ergo, both drives are active.

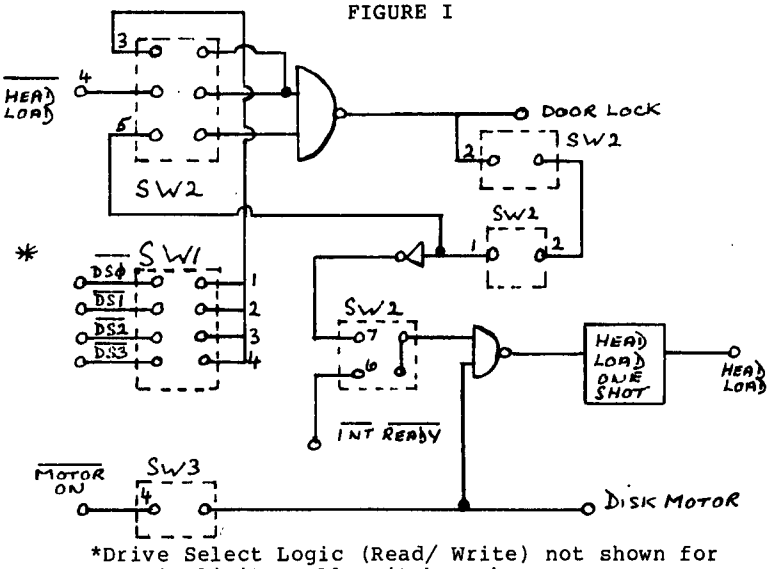
The solution is to leave Sw 2 #4 open and let the drive select load the head, especially since D&N's controller doesn't supply a head load signal.

So there it is, I now have a 32K C1P with over a quarter megabyte of on line disk space for less then the price of a used single sided drive, and I have learned the words "standard interface," and "IBM compatible" are subject to the interpretation of the reader. I also learned that these Canon drives were obviously designed for a variety of disk controllers besides the SASI type that OSI uses.

C. J. Hipsher
Virginia Beach, VA 23456

* * * * *

FIGURE I



*Drive Select Logic (Read/ Write) not shown for simplicity, all switches shown are open.

ED:

Here is an answer to Harry Pye's question, "How can I print out the two byte BASIC line numbers from a M. L. program?"

The routine at $1CDC (65D 3.2) prints to the screen the two byte value stored in the A and X registers. This routine is used for "XX ERROR IN LINE YY" to print out the line numbers. The current BASIC line number is stored in $86 and $87. You can use this routine in your M. L. program with two cautions. The string flag at $0E must be reset before returning to BASIC or a TM ERROR will result. The routine at $1CDC also requires BASIC's page zero in place. If you go to the routine by DISK!"GO 8000" page zero is swapped out and strange strings will be printed.

```
 10              ;  ROUTINE TO PRINT BASIC LINE NUMBER
 20              ;    OR TWO BYTE NUMBER IN A,X
 30              ;
 40 8000                 *=$8000
 50 8000 A587            LDA $87      GET HI BYTE TO A
 60 8002 A686            LDX $86      GET LO BYTE TO X
 70 8004 20DC1C          JSR $1CDC    JSR TO ROUTINE
 80 8007 A000            LDY #$00
 90 8009 840E            STY $0E      RESET STRING FLAG
100 800B 60              RTS          DONE
```

```
10 REM SAMPLE PROGRAM TO PRINT LINE NUMBERS
20 POKE 574,0:POKE 575,128 : REM SET UP USR TO $8000
50 Z=USR(0)
123 Z=USR(0)
9999 Z=USR(0)
12345 Z=USR(0)
```

Here is another little ditty I have learned about BASIC that I would like to pass along to you.

The following are all valid BASIC statements:

```
10 IF A THEN GOTO 100
20 IF A THEN 100
30 IF A GOTO 100
40 IF A THEN 100 : REM CHECK
   TO SEE IF A IS NON ZERO
```

The form in line 10 appears in many books on BASIC and may at one time have been required syntax. In OSI BASIC the THEN and GOTO are redundant and either may be omitted. I have been using the form in Line 20. After reading a disassembly of BASIC, I discovered the IF routine checks for "GOTO" before checking for "THEN". Thus Line 30 is faster than line 20, however, the difference is small. The REM in Line 40 causes a reduction in speed since BASIC must scan to find the end of the line even when the IF is false.

FRE (2) and FRE (A$) are also both valid. The BASIC interpreter checks for a numeric or string variable and branches to different routines accordingly. Does anyone understand the difference in these two commands? Both formats appear to force a garbage collection and report the amount of free memory remaining. In some versions of BASIC FRE (0) reports memory left but does not repack strings. This is not the case with OSI's version of BASIC.

Earl Morris
Midland, MI 48640

HUMOR!

Real Programmers don't write specs -- users should consider themselves lucky to get any programs at all, and take what they get.

Real Programmers don't write Application programs, they program right down on the bare metal. Application programming is for feebs who can't do system programming.

AD$

WANTED: A 1702A EPROM, programmed. Anyone willing and able, please contact me. Bruce Showalter, 857 Cedar, Abilene, TX 79601.

* * * * *

FOR SALE: 2 527-1MHz $40, 470 FC & Cable $30, CA9 and Cable $30, D&N Disk Switch $20, C1P/C4P Exp Board $40, Craig Borst (616)-399-3109.

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