PEEK (65)

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INSIDE:

Column One

As most readers know, the PEEK(65) CBBS is available for your use if you have a 300 baud modem. Only recently, the past few days, it hasn't been. It has, in fact, been down again. This is a matter of some concern to me, since: 1) I wrote the program & 2) I messed it up last Thursday.

Today, I went into the office and listed out the program which operates the CBBS to see why it was simply going away into never-never land whenever you tried to POST a message. The answer was simple and embarrassing. In "improving" the program, I had added 7 lines of simple BASIC code. Six of them had stupid errors in them. I set up a string array, B$(X), then in the next few lines referred to it as TY$(X), CM$(X) and A$(X), but never again as B$(X), its correct name. Also, to be sure that B$(3) did not start off with a leading space, I typed: If you program in BASIC, you recognize that "" is not the same at all as " ", that I was testing to see if the leftmost character of the wrong string was nothing at all and if so, erasing it. This kind of code will never fly.

As usual in this space, there is a point. What looks fine on paper at the time is NOT fine until it has been tested. And not just tested a little, tested a LOT. If I had made that same mistake in the part of the program which tests to see if the message being posted is to PEEK(65), then tested it to see if it would post notices, sale items, wanted items and messages to me, it would have passed the test with flying colors, then locked up tighter than a drum the first time any of us tried to post a message to PEEK(65).

The other day, Dale King from Texas called to ask if I knew of a good operating system which takes care of record contention. Let me explain a little. You have a small business, say one which sends out mail-order catalogs. You use your computer, with maybe MP/M or OS-65U, and three terminals on it, to input the orders which your catalog customers call in to your 800 toll-free number. Operator #1 gets a call ordering 5 basketballs. She types in the part number, and the computer reads the record for part # 23456, basketballs, orange, and displays the information on your screen that you have 15 more in stock. Operator #1 then types in the order (for 3 basketballs) and hits the carriage return, and your clever program subtracts 3 from the "number in stock" field and records the record back on disk. But wait a minute. Computers don't just read one record off a disk. They read maybe a whole track into a "buffer" in computer memory, then let you mess with it. This track will contain all of the record for part #23456, plus maybe parts #23457 and #23458. While operator #1 is changing the information about how many basketballs are in stock, suppose operator #2 gets an order for 9 baseballs, part #23458. Being a faster typist than operator #1, she finishes her transaction first, and writes the information about how many baseballs are left back onto the disk. Then operator #1 finishes HER transaction, and writes not just record #23456, basketballs, back on the disk, but her entire buffer, effectively covering up the baseball information with outdated numbers.

That, folks, is record contention. I have done considerable research, including several lengthy phone calls to software vendors, to see what can be done about it. OS-65U, to its credit, is one of the very few 1st or 2nd generation operating systems which pays any attention at all to record contention. It does provide the ability for the programmer writing the inventory and sales program to assign a "resource number" to each file, or indeed each record within the file, and "lock" the file or the record for the duration of the transaction entry. Much program rewriting required, and downright impossible if you have lots and lots of records.

Unix also allows for record locking, but runs (I am told) so slowly on 8-bit micros when record locking is implemented that you wouldn't want to wait around for it. So does MP/M-86, and just as soon as there is any software available for that system, and providing it is somewhat faster than MP/M II (molasses in January), it might be okay. Oasis, running on 16-bit machines, may be an answer, but we will have to wait to see.

ADD A SIEMENS 8" DISK DRIVE TO YOUR OSI CHALLENGER (C2, C4 OR C8P)

by Len Magerman and James Loan

Directors of OSI/Boston (a sub-group of the Boston Computer Society)

Part 2

ENCLOSURE ASSEMBLY

There are several enclosures for single-drive systems available from the supply houses. Most can be purchased with a power supply, fan, AC filter, switch and power cables for about $175. You can install the drives with the access door vertical: opening left or right; horizontal, opening upwards; or upright, opening to the front or rear.

We decided to install the drive with the door positioned vertically. Furthermore, anticipating the addition of a second drive and already having a power supply, we purchased a 10.5 by 19 by 17 inch enclosure and panels from Premier Metal Products. We also bought a chassis shelf to support the drive and power supply and a set of slides and support angles to hold the shelf and allow easy access to the equipment. All components are stock and require no modification except for the shelf which had to be narrowed to make room for the slides. The parts necessary to complete the assembly are: Enclosure-TIC 101917, Support Angles-TIA 17, Shelf-TIS 17, Rear Panel (Perf'd)-PFP 1019, Front Panel-ARP 1019, Slides-TFE 50-16, Fuse Holder (Panel Mount), AC Filter (3A), Switch, SPSTS (Lighted), Fan, 120 VAC, 120 CFM and a 6 ft. AC Line Cord.

While the following procedure is specifically for installing the disk drive(s) and the above components in the Premier enclosure, it can be applied generally to any enclosure. Positioning of power supplies will vary, depending on their size and whether you use one or two of them. In either case, place them so as to get good air flow from the cooling fan.

1) Trim the TIS 17 Shelf, spot and drill the holes for the disk drive as shown in Figure 4.

2) Position the power supply, AC filter and barrier strip and drill the appropriate mounting holes to secure each component on the shelf. Be sure to leave clearance at the rear of the shelf for the fan, which will be mounted to the rear panel.

3) Using the slide mounting brackets, secure the slides to the enclosure walls and then the support angles to the slides (you will have to drill holes in the support brackets to attach them to the slides). Bolt the shelf to the support brackets and adjust the slide mounting brackets so that the slides are level and the top surface of the shelf is 1 inch from the lower lip of the enclosure opening.

4) Remove the shelf/slide assembly from the enclosure and bolt the power supply, AC filter, and barrier strip to the shelf and then the drive(s) so that they extend 5/16 inch past the front of the shelf and then reinsert the assembly into the enclosure.

5) Cut out the rear panel for the AC power cable, data cable and fan, locating the fan hole directly behind and above the power supply.

6) Attach the fan to the inside wall of the rear panel with the flow direction outwards. Put a grommet or grommet stripping in the AC cable hole and the data cable holes for protection against fraying.

7) Cut out the front panel as shown in Figure 5 for the switch, fuse holder and one or two disk drives as required. The drive cut-outs are oversize to provide clearance for a 5-1/4 by 10 inch dress bezel to be attached to the face of the drive (Siemens Pt.# C22256-A108-C145 for tan or C240 for white).

8) Mount the switch and fuse holder to the front panel and secure the panel loosely to the extended chassis shelf.

9) Slide the shelf assembly into the enclosure, fitting the front panel into the opening as you do so and then tighten the screws holding the front panel to the chassis shelf.

10) When you are satisfied that all the components clear the enclosure opening and the slides are working smoothly, slide the front panel/chassis assembly out of the enclosure. Be sure to support the assembly while doing this so it doesn't tip over and land on the floor. Now proceed with the wiring using twisted pair 18 gauge stranded hook-up wire. The twisting can easily be done by inserting the ends of the two wires into a drill chuck and holding the other ends securely while operating the drill at slow speed until you get a tight twist. If the wire starts to double up on itself, you're over-doing it. Two 18 gauge wires, three feet long, will yield 2.5 feet of twisted pair.

11) Wire the fan first and leave the ends free. The wire should be long so that the shelf can be extended freely. Snake the AC and data cables through their respective holes in the rear panel and secure the rear panel to the enclosure. Then wire everything to the proper contacts on the barrier strip (see last month's PEEK), finishing up with the switch and fuse holder on the front panel.

12) Check your wiring as you proceed and then check all voltages at the connector ends BEFORE making any final connections.

13) Attach the data cable to the drive(s) and insert a 2A (slow-blow) fuse into the fuse holder. Then slide the entire assembly into the enclosure and secure the front panel to the enclosure opening.

14) Snap the dress bezels to the face of the drives and you're finished.

MEMORY TESTING

There are several good memory test programs (see References) which perform static and dynamic tests on RAM. The program in listing 1 is a simple BASIC program that does a static test of specific locations to see if they will hold the data entered into them. To determine if the

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data will change over a given time interval, one may add the optional LINE 45 in the listing. This line will halt the program with the data resident in RAM until you choose to continue.

Test values of 0 and 255 enter all zeros or all ones respectively into each bit of each location to be tested. This is helpful in determining which RAM of a specific one K set is defective. Entering a 170 or 55 loads the bits of each location with alternating zeros and ones and provides a check on the sensitivity of adjacent bits to the input data. The articles listed in the Reference explain this in more detail.

The RAM in the MEM-CM9 board is set up as shown on pages 7, 11 and 14 of the D&N manual. Each 1K of RAM is made up of two 2114's with the low order bits, D0 to D3 located in the top (even numbered) chips and the high order bits, D4 to D7, located in the lower (odd numbered) chips of each pair.

Let's do a sample run and explain the output when a defective chip is found. Switch the computer to the C/W/M mode, type the program in and RUN it. Assuming you're checking the additional 24K of RAM above the 8K you already have, the starting memory location will be 8192 (i.e., 1024x8) and the final location will be 32767 (remember that the first location is 0, so that the last location is 1024x32-1=32767).

If a defective RAM chip is found a message might appear on the screen such as: DATA AT LOCATION 15748 IS 2 ---SHOULD BE 0

This indicates that the 16th Kilobyte of RAM is faulty (15748/1024=15+). Furthermore, it is the lower (odd numbered) chip since the returned value of 2 (0000 0010 in binary) shows that bit 1 did not hold the test value of 0 (0000 0000 in binary). If the message stated that the data value at the above location was 65 instead of 0, then both chips of the 16K set would be defective. Since 65=0100 0001 you can see that bit 0 (in the even numbered chip) and bit 6 (in the odd numbered chip) did not hold the test value of 0.

CONCLUSIONS

Having completed the project, you now have a reliable drive in a convenient, enclosure with 32K bytes of memory at a cost of less than $850. Your next move is to buy OSI's OS65D operating system and you're ready to run.

Since the operation of OS65D can fill an article all by itself, we won't go into that now, but you can get some pertinent information by referring to Reference #6.

Be aware that there is a proper operating procedure that you should follow so that you don't crash the disk. First, power up the computer and hit BREAK. Next, power up the drive and THEN insert the disk. Close the access door, hit D and OS65D will boot. To shut down, FIRST remove the disk, then shut off the drive and then the computer.

Your first task after you familiarize yourself with the operating instructions of OS65D should be to copy the disk and use the copy for your work, keeping the original disk as a back-up.

COMPONENT SOURCES

Disk Drive:

1) Floppy Disk Services, NJ, Tel: (609) 771-0374. Siemens Model FDD-100-8 Disk Drive & Manuals, ($373).

Power Supplies:

1) US Micro Sales, 11 Edison

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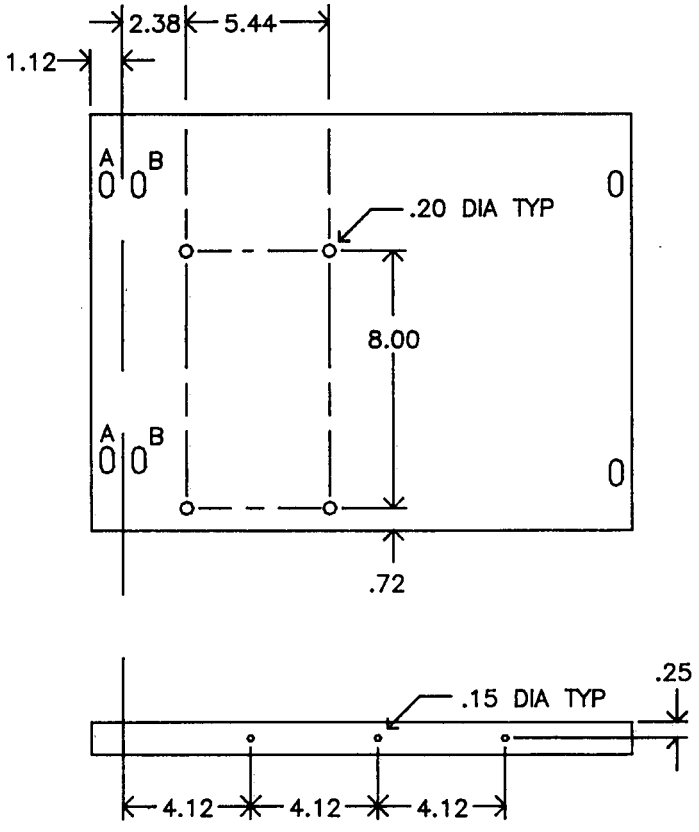
LISTING #1

```
10 INPUT "ENTER STARTING MEMORY LOCATION TO BE TESTED (>1095)";S
20 INPUT "ENTER FINAL MEMORY LOCATION TO BE TESTED (<=32767)";F
30 INPUT "ENTER TEST VALUE (0 TO 255)";T
40 FOR L=S TO F:POKE L,T:NEXT L
45 INPUT "ENTER ANY CHAR. & C.R. TO CONTINUE";Z: REM-WAIT AWHILE LINE
50 FOR L=S TO F:D=PEEK(L)
60 IF D<>T THEN GOSUB 100
70 NEXT L
80 PRINT "LOCATIONS";S;"TO";F;"OK WITH INPUT DATA =";T
90 GO TO 30
100 PRINT "DATA AT LOCATION";L;"IS";D;"---SHOULD BE";T
110 RETURN
```

FIGURE 4

Figure 4 - Shelf Layout

Trim 1-1/8" from the side of the shelf as shown and re-drill the support angle holes (A) at the corresponding positions (B). The disk drive mounting holes can be drilled larger if desired to allow for better positioning of the drives.



DR., New Lenox, IL 60451. US 206: 5VDC @ 2A, 24VDC @ 3A ($69)
2) Sunny Internatinal, PO Box 4296, Terrance, CA 90510. R3: 5VDC @ 5A, 24VDC @ 5A ($67.95)

Enclosures:

1) Premier Metal Products, 381 Canal St., Bronx, NY 01451. Case TIC 101917: 10.5 by 19 by 17 inch enclosure for 2 drives, ($110.28)
2) Jade Computer Products, 4901 W. Rosecrans, Hawthorne, CA 90250. Cab. Kit END 00421: incl. p.s., fan, sw. & p. cable for 2 drives ($225)
3) Bison Products, PO Box Q, Sherman Oaks, CA 91423. Cab. DDS+8: incl. p.s., fan, AC filter, p&d cables for 1 drive ($175)

Chips:

1) Hanley Engineering, 13400 Northup Way #22, Bellevue, WA 98005. RAM 2114L200 ($2.60 each, 31 or more pcs.)
2) Chips & Dale, PO Box 31607, Seattle, WA 98103. RAM 2114L300 (8 for $19.75)
3) Solid State Sales, PO Box 74B, Somerville, MA 02143. Most support chips.

Disk Controller Memory Board ($50 Bare), Data Cable & Paddle Board ($65): 1) D&N Microproducts Inc., 3684 N. Wells St., Ft. Wayne, IN 46808.

Connectors:

1) Cronin Electronics Inc., 77 4th Ave., Needham, MA 02194. AMP Conn. No. 88480-8 ($9.84) & Recept. No. 88478-8 or 88393-8 ($8.14)

ACKNOWLEDGEMENTS

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Alan Barrett, Senior Sales Engineer, Siemens Corporation.

J. Barrie Clark, Product Manager, Siemens Corporation.

John Goodman, Principal Engineer, Polaroid Corporation.

Dale Krauskopf, President, D & N Microproducts Corporation.

REFERENCES

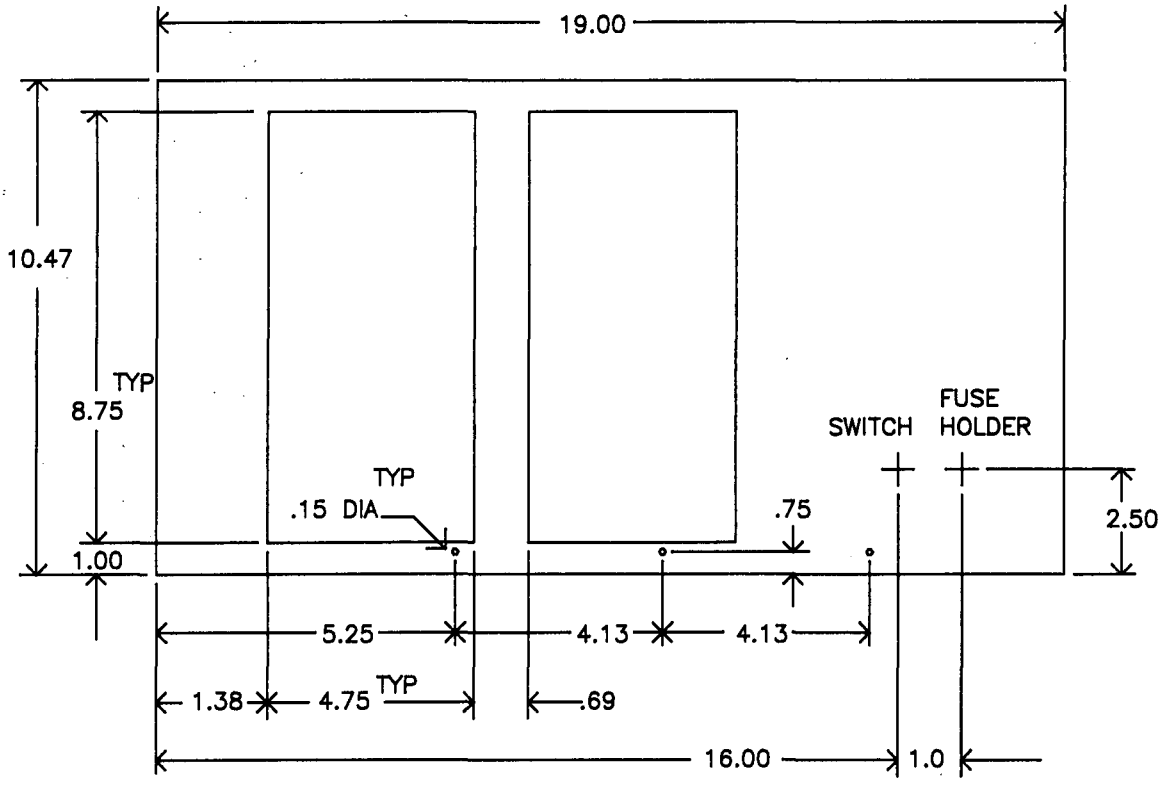
1) MEM-CM9 Disk Controller Memory Board Manual, D & N Microproducts.

2) Technical Manuals 1 & 2-Model 100-8D, Siemens Corp-

FIGURE 5

Figure 5 - Front Panel Layout

The layout pertains to the front panel used with Premier's 10.5 by 19 by 17 inch case for a dual-drive system. Fuse holder and switch locations are not critical.



oration.

3) Sams OSI Servicing Manual for computer boards 502, 505, 527, 540 & 542.

4) OSI Small Systems Journal, September 1977, page 15 (Memory Test).

5) MICRO, January 1981 -(OSI Small Systems Journal-Memory Tests).

6) A Small Operating System: OS65D The Kernal, Compute, January-March 1981.

★

BUSI-CALC - NOW AN ELECTRONIC SPREADSHEET FOR OSI (65U)

By: Liz Ellington
Dominion Business Systems
6048A Virginia Beach Blvd.
Norfolk VA 23502

Tired of spending your valuable time on tedious manual spreadsheets? Now you can produce sales analyses, business trend forecasts, statistical models - almost anything you can do on paper - without lifting a pencil! Yes, it's another "visi-clone" but this one is different - it runs on OSI. All you business people who stuck by OSI while others were trying to manage with personal computers can have the last laugh. Now there is BUSI-CALC!

A product of Microsoftware International, Busi-Calc is aimed at the business user. For example, our monthly sales journal is kept on a Busi-Calc file. Each sales category has its own column. Following this is a column for sales tax. A subtotal column provides a summary of all taxable sales, followed by three columns for non-taxable sales and a total column for all sales. Each sales tax entry is actually a function - the sum of all the row entries prior to it, multiplied by .04 (Virginia's state sales tax). Each entry in the subtotal column is likewise a function, the sum of all the prior row entries (except sales tax). As each day's invoices are entered, the proper amount of sales tax for that invoice is shown and the total sales tax liability to date is displayed. At the same time, the total for taxable sales and the total monthly sales figures are automatically recalculated and displayed. Thus we know, on a daily basis if desired, how much of our current income is tied up in state sales tax.

A local construction company uses Busi-Calc for job costing. Estimates for each phase of a job go in the first column. The actual costs are entered, as they are incurred, in a separate column for each unit. The final column shows the difference between the estimate and the actual cost for each phase. As each new entry is made, the

difference column is automatically recalculated.

Another firm in our area plans to use Busi-Calc for financial planning, modeling projected income and costs for various combinations of business development. The resulting figures will show them where their advertising and development budget should be used to give the best return for the money.

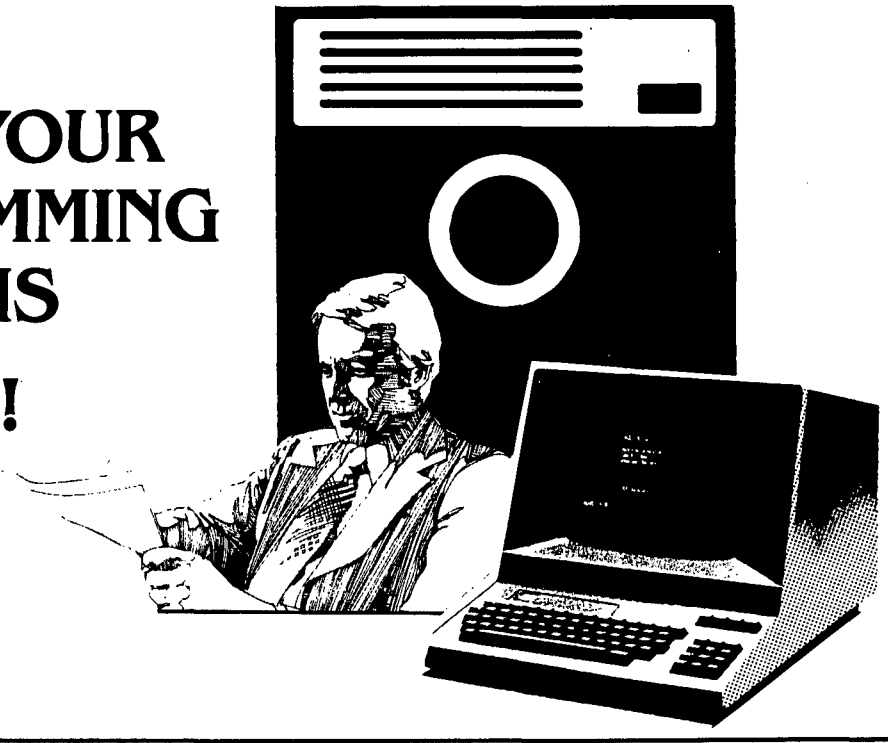
These are some very simple examples of how Busi-Calc can be used to reduce manual labor and to provide reports which are not always available from standard accounting packages. Busi-Calc is extremely easy to use - the screen displays a "grid" format of rows and columns with a line of slashes showing the current active location. This position can be changed with simple horizontal or vertical scrolling or, if one is shifting across a larger portion of the worksheet, a one-key command allows the user to specify the row and column location to which he wishes to move. On terminals with special video capabilities (such as reverse video or high intensity fields), the active location is emphasized as a highlighted field. This is a handy feature, although not absolutely necessary, if your terminal is not capable of it. Other considerate provisions include automatic centering for column headings, automatic money-mode formatting for numeric entry, and a "graph" mode in which numeric entries are shown as a corresponding number of asterisks (we turned out some neat bar graphs with that!). Formatting options may be applied to the worksheet as a whole or to any desired portion of it.

When you are ready to print your masterpiece, you may specify that row and column identifiers be included or not, and you may print any portion of the worksheet, from one row/column location to the entire spread. Both serial and parallel printers are supported (as Device #8 and Device #5 respectively) and the documentation includes instructions for connecting one's printer to other than the standard ports.

The only real problem we had turned out to be with the terminal we were using, a Micro-Term Act 5. The terminal set-up routine supplied with Busi-Calc is super comprehensive and self-explanatory, but repeated attempts to make our Act 5 respond correctly were fruitless. Steve Vandyke at Microsoftware reported similar symptoms with a terminal he had tried and mentioned that he was getting what appeared to be framing errors. That rang a bell with me, and going back to the Act 5 book, we discovered something called the "8th bit transmit select" switch. In the on position, the eighth bit of each word is transmitted as a logical 1 (mark); when the switch is off, the eighth bit is sent as logical 0 (sense, or space). Micro-Term terminals (at least the Act 5 and 5A) come with this switch set to off, and in all the years we have used their terminals we had never before encountered any software that looked at that eighth bit. Microsoftware's does, and moving that switch to the On position completely cured the problem. The terminal still works fine with everything else. The other frustrating problem we had stems from the Act 5's habit of automatically spitting out a carriage return and line feed when it hits the 80th column. On many terminals this can be disabled, but not on the Act 5 or 5A. We got around that by defining the terminal width as 79 columns rather than 80 (one of the questions asked during terminal setup).

A few other tips may save you Micro-Term users some headaches: when the terminal set-

TACKLE YOUR PROGRAMMING PROBLEMS HEAD ON!



If operating bugs and "unsolvable" coding problems have got you dodging a big project, here's help . . . Quality software products that'll let you tackle those problems and move on to something easier.

At Software Consultants, we know the kinds of problems you often face with OSI gear, so we designed our software accordingly. Most of our products are modifications and/or extensions of OSI packages, but some are complete replacements. All are easily extensible for your own custom applications. We feel they're the finest OSI software products around – and the most reasonably priced.

PRODUCT ROUNDUP

OS-65D V3.2 DISASSEMBLY MANUAL

A super-complete manual that has it all. 50 pages of disassembly listings, complete and clear comments on all lines, 10 pages of computer generated cross reference listings, and more! Praised by many OSIers who couldn't believe it til they bought one. A deal at $25.95.

REF COMMAND UNDER BASIC

A complete, cross reference utility that'll find and list any BASIC line number, variable, or numeric constant. It's available under 65D or 65U and comes on 8" floppies. This one will save your sanity, and cut out hours of wasted time. Yours for $31.95.

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A useful utility that feeds backed-up data to your printer for normal output, and leaves your screen free for other work by intercepting data bound for the printer and temporarily storing it on hard disk. Written in super fast machine language. Interfaces with serial and parallel printers. Only $69.95.

FIG FORTH UNDER OS-65U

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Unlike the majority of other software vendors, we offer our customers copies of source code (on floppies) for any of our products they've purchased. For a nominal fee of $12, covering postage & handling, we'll send you the source code you choose.

Foreign orders please add $10 postage fee for air mail. Dealer inquiries welcome. Tennessee residents add 6% sales tax. COD orders will incur a $1.50 handling charge. We ship via UPS, so please include street address with your order.

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up routine asks for the code for "Clear screen," use the sequence for "home and clear," not the one for "clear foreground." The set-up will also ask whether row and column addresses are sent in decimal. They are, but answer "No" anyway. I don't know why - that's just what works! By the way, we spent a few minutes trying to run the setup on someone else's Intertube (before finding out about the switch setting on the Microterm) and had the same symptoms as with the Act 5, so Intertube users might suspect a similar fix.

If you have guessed by now that we are delighted with Busi-Calc (and with the support from Microsoftware) you are so right. I have called Microsoftware so often over the last few months that they recognize my voice even if I don't immediately identify myself, and they have been unfailingly courteous, helpful and professional. They do prefer to work through local OSI dealers rather than directly with the end user (and that's the way it should be), but when a dealer is unavailable (or - shudder - unhelpful) they have been known to take care of the end user themselves. Now that's real service from a software vendor!

★

THE CONFIGURABLE BUSINESS SYSTEM

Frederick S. Schaeffer
84-55 Daniels St. #4f
Jamaica, NY 11435

Release 1.3 e. 1979, 80, 81, 82 by Dynamic Microprocessor Assoc.,545 Fifth Ave., Suite 1400, New York, NY 10017. Distr. by The Lifeboat.

Around the beginning of the year, I was looking for a fast and versatile Data Base Manager which runs under CP/M, with an eye on future expansion into the statistical field, but not being very adept at ASSEMBLY language, I needed a package that was "User friendly". My entry into the software marketplace was with the OS-DMS (9/79) and you all know that the number of bugs in that software was horrendous (depending on which version of version 9/79), so I felt forewarned not to get too deeply into CP/M software which I would be unable to customize or reprogram. One evening, I happened to be talking about subscription renewals with the folks at "Lifelines" (a magazine similar in scope to PEEK (65) but wholly devoted to CP/M followers), and the young lady (whose name I unfortunately forgot) started a chit-chat conversation about computers and software and somewhere along the lines "Configurable Business System" (hereafter referred to as CBS) was mentioned. She hadn't actually used it, she said, but on the other hand, she had not heard adverse complaints either and she did know that no support language was needed to run it and all the operator had to do was read the documentation and answer simple questions. Well, I ordered it; admittedly, with some trepidation (after all it was around $400), but my fears were totally unfounded and in fact I rather like it.

Basically, CBS is a designer's package. For example, an OEM Manufacturer or software house can use it to bring customized business software into the market place (e.g. accounting type software or mailing list software). The fact that it IS flexible, is what makes it interesting to me. The documentation is excellent. Granted, the use of the similarity in the sample file names in the manual at first confused me somewhat, but the way to learn anything is by doing it, and the confusion soon turned into expertise. Two disks come with this package, one, the designer disk is used solely to set up the data base, and two, the application disk runs the software.

To set up a file, one uses the designer disk in drive A and either the application disk OR an initialized all data disk in drive B (the system can be used with many drives; since logical drive data goes in the menus you must keep notes which drives you're planning to use for what until the menus are all set up). The program will ask you for the number of fields, the file name (and password which you select as an option in a SETUP program; in the same SETUP program you also select protocol for the CRT you're using...CBS supports 18 predefined CRT's and codes can be set manually for most others. This SETUP program must appear on all, including the data disks), two header lines (optional), for each field the lower bound and upper bound (you can thereby limit the input) and the type of input (e.g. Alphanumerical, Integer, Precision, Double Precision, Date, or Spare field- this last one is wonderful: it allows you to add one or more fields to AN EXISTING file after the fact, so always put one or two spare fields in!). You also define here whether to show decimals or not in the output (that means you can put them in but you can suppress them from showing); and if duplicates are permitted (e.g. records with identical key-fields). Field ONE is always the Key Field in the Master (ISAM) File, but a key-file create function can place KEYING (and subsequent sorting) on any field you designate. The contents in the KEY field can't be changed however; the only way to change it is to delete the record and start another one... why mention this here? - because you've got to plan for it! When all this is completed (takes anywhere from 3-10 minutes depending on length of record) you have the option (which I advise you to use) to print out a PROFILE of the just created File. In the headers of these profiles upon data entry, you'll automatically find the record length and the number of the last record entered PLUS the date the file was created and last accessed. That's very handy.

Once this is done, you should

cont. on page 13

CLUTTER FOR OSI

by Kerry Lourash
1220 North Dennis
Decateur, IL 62522

After doing some immediate mode calculations and making a few mistakes, I was faced with an all-too-familiar problem: the screen was cluttered with OK's, error messages, and blank lines. I had a one-key screen clear available, but there was valuable information on the screen that I didn't want erased.

The clutter program solves this dilemma. It erases blank lines, error messages, etc. and transfers the remaining lines to the bottom of the screen. It can be set up as a USR routine with a POKE 11,34:POKE12,2. Call Clutter by typing X=USR(X) or put X=USR(X) in line 0 and type RUN. Higher line numbers will not be executed because Clutter exits to the immediate mode.

Clutter has two pointers, ST (start) and PP (poke point). The start pointer is moved up the screen, line by line. The start of each line is examined to see if the line should be erased or not. If the line contains character strings identical to those stored in Clutter's data table (TBL), the line is erased. If the line is to be saved, it is stored in the location pointed to by PP. When Clutter is finished, it prints a $A4 graphics character (a white block) and exits to the immediate mode.

By adding to the table at the end of Clutter, you can expand the repertoire of lines to be erased. There must be a null (0) after every entry and a double null at the end of the table. By changing BNE DECST (near the start of the program) to NOP NOP and LDA #$62 (in the DONE routine) to RTS, it's possible to selectively erase and/or pack screen lines in a running BASIC program.

For users with non-standard screen formats, LEN should be set to the numbers of characters/line that your screen displays. One last word: before trying out this program, make sure you have it copied correctly! I had many a system crash when experimental versions of Clutter ran amok in RAM.


```
PAGE 001                CLUTTER FOR OSI

002  00                         ZPG
003  00            LEN     EQU  $17        $3F IF C2/4
004  00            LINE    EQU  $20        $40 IF C2/4
005  00            ST      EQU  $45
006  00            PP      EQU  $47
007 0000                     EZP
008 0222                     ORG  $222
009 0222
010 0222 A940                LDA  #$65-40    #$40 IF C2/4
011 0224 8545                STA  ST         SET START, POKE POINT
012 0226 8547                STA  PP
013 0228 A9D7                LDA  #$D3       #$D7 IF C2/4
014 022A 8546                STA  ST+1
015 022C 8548                STA  PP+1
016 022E D034                BNE  DECST      BRANCH ALWAYS
017 0230
018 0230 A2FF        CKLIN   LDX  #$FF
019 0232 A0FF        C0      LDY  #$FF
020 0234 E8          C1      INX
021 0235 C8                  INY
022 0236 BD8502              LDA  TBL,X
023 0239 F03F                BEQ  ERASE      IF NULL, ERASE LINE
024 023B D145                CMP  (ST),Y     COMPARE CHAR. TO SCREEN
025 023D F0F5                BEQ  C1         LOOP IF A MATCH
026 023F E8          C2      INX
027 0240 BD8502              LDA  TBL,X      GET NEXT TBL CHAR.
028 0243 D0FA                BNE  C2         LOOP IF <> 0
029 0245 BD8602              LDA  TBL+1,X    DOUBLE NULL?
030 0248 D0E8                BNE  C0         NO, NEXT TBL ENTRY
031 024A
032 024A A017        PKLIN   LDY  #LEN       LINE LENGTH OF SCREEN
033 024C B145                LDA  (ST),Y     GET CHAR TO BE MOVED
034 024E AA                  TAX             SAVE CHARACTER
035 024F A920                LDA  #$20       ERASE OLD CHARACTER
036 0251 9145                STA  (ST),Y
037 0253 8A                  TXA             RESTORE CHARACTER
038 0254 9147                STA  (PP),Y     PRINT AT NEW LOCATION
039 0256 88                  DEY
040 0257 10F3                BPL  PKLIN+2
041 0259
042 0259 38          DECPP   SEC             POKE POINT UP 1 LINE
043 025A A547                LDA  PP
044 025C E920                SBC  #LINE
045 025E 8547                STA  PP
046 0260 B002                BCS  DECST
047 0262 C648                DEC  PP+1
048 0264
049 0264 38          DECST   SEC             START UP 1 LINE
050 0265 A545                LDA  ST
051 0267 E920                SBC  #LINE
052 0269 8545                STA  ST
053 026B B002                BCS  DONE
054 026D C646                DEC  ST+1
055 026F
056 026F A546        DONE    LDA  ST+1       ST < $D000 IF DONE
057 0271 C9D0                CMP  #$D0
058 0273 B0BB                BCS  CKLIN
059 0275 A962                LDA  #$62       POINT MESS. AT $A162
060 0277 4C78A2              JMP  $A278      TO WARM START
061 027A
062 027A A017        ERASE   LDY  #LEN       ERASE A LINE
063 027C A920                LDA  #$20
064 027E 9145                STA  (ST),Y
065 0280 88                  DEY
066 0281 10FB                BPL  ERASE+4    LOOP IF NOT DONE
067 0283 30DF                BMI  DECST      GO TO DECST IF DONE
068 0285
069 0285 2020202000  TBL     DATA $20,$20,$20,$20,0
070 028A 3F                  DATA $3F        "?"
071 028B 00                  DATA 0
072 028C 4F4B                DATA $4F,$4B    "OK"
073 028E 00                  DATA 0
074 028F 4C495354            DATA $4C,$49,$53,$54 "LIST"
075 0293 0000                DATA 0,0
076 0295                     END

*****************************
* S Y M B O L   T A B L E *
*****************************
C0    =0232  C1    =0234  C2    =023F  CKLIN =0230  DECPP =0259
DECST =0264  DONE  =026F  ERASE =027A  LEN   =0017  LINE  =0020
PKLIN =024A  PP    =0047  ST    =0045  TBL   =0285
```

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TREK ADVENTURE by Bob Retelle — This one takes place aboard a familiar starship and is a must for trekkies. The problem is a familiar one — The ship is in a "decaying orbit" (the Captain never could learn to park!) and the engines are out (You would think that in all those years, they would have learned to build some that didn't die once a week). Your options are to start the engine, save the ship, get off the ship, or die. Good Luck.

Authors note to players — I wrote this one with a concordance in hand. It is very accurate — and a lot of fun. It was nice to wander around the ship instead of watching it on T.V.

CIRCLE WORLD by Bob Anderson — The Alien culture has built a huge world in the shape of a ring circling their sun. They left behind some strange creatures and a lot of advanced technology. Unfortunately, the world is headed for destruction and it is your job to save it before it plunges into the sun!

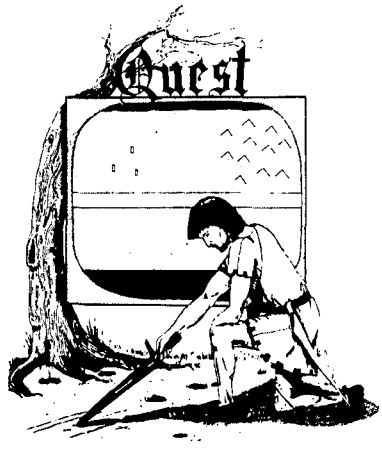
Editors note to players — In keeping with the large scale of Circle World, the author wrote a very large adventure. It has a lot of rooms and a lot of objects in them. It is a very convoluted, very complex adventure. One of our largest. Not available on OSI.

HAUNTED HOUSE by Bob Anderson — This one is for the kids. The house has ghosts, goblins, vampires and treasures — and problems designed for the 8 to 13 year old. This is a real adventure and does require some thinking and problem solving — but only for kids.

Authors note to players—This one was fun to write. The vocabulary and characters were designed for younger players and lots of things happen when they give the computer commands. This one teaches logical thought, mapping skills, and creativity while keeping their interest.

DERELICT by Rodger Olsen and Bob Anderson — For Wealth and Glory, you have to ransack a thousand year old space ship. You'll have to learn to speak their language and operate the machinery they left behind. The hardest problem of all is to live through it.

Authors note to players — This adventure is the new winner in the "Toughest Adventure at Aardvark Sweepstakes". Our most difficult problem in writing the adventure was to keep it logical and realistic. There are no irrational traps and sudden senseless deaths in Derelict. This ship was designed to be perfectly safe for its' builders. It just happens to be deadly to alien invaders like you.



NUCLEAR SUB by Bob Retelle — You start at the bottom of the ocean in a wrecked Nuclear Sub. There is literally no way to go but up. Save the ship, raise her, or get out of her before she blows or start WWIII.

Editors note to players—This was actually plotted by Rodger Olsen, Bob Retelle, and someone you don't know — Three of the nastiest minds in adventure writing. It is devious, wicked, and kills you often. The TRS-80 Color version has nice sound and special effects.

EARTHQUAKE by Bob Anderson and Rodger Olsen — A second kids adventure. You are trapped in a shopping center during an earthquake. There is a way out, but you need help. To save yourself, you have to be a hero and save others first.

Authors note to players — This one feels good. Not only is it designed for the younger set (see note on Haunted House), but it also plays nicely. Instead of killing, you have to save lives to win this one. The player must help others first if he/she is to survive — I like that.

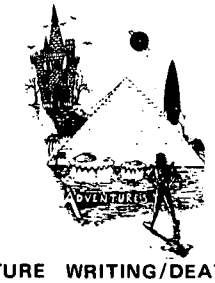
PYRAMID by Rodger Olsen — This is one of our toughest Adventures. Average time through the Pyramid is 50 to 70 hours. The old boys who built this Pyramid did not mean for it to be ransacked by people like you.

Authors note to players — This is a very entertaining and very tough adventure. I left clues everywhere but came up with some ingenous problems. This one has captivated people so much that I get calls daily from as far away as New Zealand and France from bleary eyed people who are stuck in the Pyramid and desperate for more clues.

QUEST by Bob Retelle and Rodger Olsen — THIS IS DIFFERENT FROM ALL THE OTHER GAMES OF ADVENTURE!!!! It is played on a computer generated map of Alesia. You lead a small band of adventurers on a mission to conquer the Citadel of Moorlock. You have to build an army and then arm and feed them by combat, bargaining, exploration of ruins and temples, and outright banditry. The game takes 2 to 5 hours to play and is different each time. The TRS-80 Color version has nice visual effects and sound. Not available on OSI. This is the most popular game we have ever published.

MARS by Rodger Olsen — Your ship crashed on the Red Planet and you have to get home. You will have to explore a Martian city, repair your ship and deal with possibly hostile aliens to get home again.

Authors note to players — This is highly recommended as a first adventure. It is in no way simple—playing time normally runs from 30 to 50 hours — but it is constructed in a more "open" manner to let you try out adventuring and get used to the game before you hit the really tough problems.



ADVENTURE WRITING/DEATHSHIP by Rodger Olsen — This is a data sheet showing how we do it. It is about 14 pages of detailed instructions how to write your own adventures. It contains the entire text of Deathship. Data sheet - $3.95. NOTE: Owners of OSI, TRS-80, TRS-80 Color, and Vic 20 computers can also get Deathship on tape for an additional $5.00.

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All adventures are $14.95 on tape except Earthquake and Haunted House which are $9.95. Disk versions are available on OSI and TRS-80 Color for $2.00 additional.

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cont. from page 9
set up your REPORT specification (you can add other report specs later on). This is where CBS and OS-DMS go their separate ways: CBS's report formatter is so vastly superior because you can set report formats into menu functions and you can ADD, MULTIPLY, DIVIDE or SUBTRACT the contents of one column from/to/by the contents of another column or field. You can subtotal (with different break levels) and run a total count or summation, etc. You can set criteria for printouts based on conditional output which can be ANDed or ORed. You can put in calculation or work columns (those are mandatory when working with multi-step calculations where the answer to one part of the calculation must be stored in a non-printing work column, so it can be accessed for the next operation- it's a bit complicated to describe in a review).

As to the physical appearance of the report, you've got some niceties not found in some of the other DMS type software (I don't have dBaseII or MDBS so I can't make an objective judgement about other software). Using CBS, you will be able to define the number of spaces ahead and following a column and you can also suppress output of content (so instead of 0 the line remains blank under the column designation). You can have a total of FOUR header lines, PLUS date and page number, and the column heads and you can set this up selectively for 80 or 132 col. paper (report appears centered). You have option to change the number of lines per page, use form feeds (or not, in case your printer doesn't support FF), you can set the specs for printout to Console, to Line Printer or "Request" (you get a prompt on screen asking where to output to). Column headings may be optionally omitted. Using CP/M, there is a problem that we can't just define a DV# (Printer) such as 3, 5, or 8 as in OS65U, for that reason, I keep one set of CBS disks where the Default IOBYTE is set to 40H (at location 03H) for CA10X First serial port, and one set of CBS disks set to 80H (CA9-parallel port), but 9 out of 10 times I find myself using the serial ports since my word processing printer is RS232C and that printer really outputs CBS reports so much more professionally than the Dot-matrix printer I have connected to a CA9 board. I haven't found a way to change that IOBYTE when IN CBS since leaving CBS (to warm start CP/M) just isn't practical when you're in the middle of a CBS operation.

The third thing to do is to set up your special sorting modules, e.g. to create special index files. Again, that's a matter of answering a series of questions, such as the file name of the master file, the file of which to create the index, the type of file (Master or Transactional) the drive on which it's normally logged, the index to read the master by, the field number of the new key and so forth. You can chain these instructions, and that's the fourth thing to do, i.e. you must now set up the application disk menus - those menus coordinate all operations; on the one hand they refer to the program name and on the other hand to the various operations to be performed as a single or a chain of operations. So when you want to run a report, for instance on a mailing list, and you want that list sorted by ZIP, you'll have to create a special index file and then in the application menu you first refer to the index creating program and the parameter name to which it applies and then to the report program with the parameter name that you've setup in the report specs and when you want to run that report, all you have to do is ask for item 2 (or 3 or whatever) from the menu selections and your index file will be created (each time, prior to listing report), and the report will be printed out. And all this goes pretty fast.

I could write samples and give printouts of the parameters and specifications (all this can be printed out easily) but it would make this review much too long. Let me now summarize what else I omitted from the above description that CBS is capable of:

It can be set up to allow sales updates (or updates of non-sale data) and it can do true transactional batch updating of the master file. A transaction file can update more than one master file. Programs can be accessed from command level (to by-pass the menus). The CLP (Command Level Processor) also contains many system level commands. A separate password utility allows for modification of user access and access rights to different parts of the ap-

plication menu. Files can be initialized for re-use, cleaned up, and repacked. Keying on key fields (for sorting) can be done on the amount of characters you specify instead of the length of the whole field. File headers (lines of title) can be changed at any time in the report specs. A Master file profile can be changed AS LONG AS NO data has been placed in the file, but you can prevent problems by adding one, two or more spare fields from the beginning. Conditional retrieval set or report specs can be changed prior to running the report (a prompt will appear) without having to redo the report specs. Range addition is possible (but to be quite honest I'm not sure how that applies and just what it is). External ASCII files can be used to update a master file (certain conditions must be adhered to, however). In transaction processing you have the option to reject, add, request (disposition) append or delete an item, if this option is so defined in the update specs. You can run a user (non-CBS) program from the command level processor and return to CBS after completion. Date and batch numbers appear on all processing.

There are optional packages, which I don't have, one is called "FORMULA" and the other is a CBS LABEL OPTION PAK. The former is actually not an option, it's another (probably expensive) program which can be used compatibly with CBS for more expanded functions. It seems to have "Free formats" "Simulated" reports, and a bunch of other things, but the description is by inference only in the documentation.

Would I recommend CBS to CP/M users of OSI C3's?- YES, I sure do!

Is it better than OS-DMS? - Well, that's a hard question to answer. OS-DMS (sans bugs, of course) is good in its own way, and CBS is also good in its own way, but the two are hard to compare. I like OS-DMS since it's in many cases simpler to operate, but on the other hand, you have to answer the same stupid questions over and over again. However, the report generator of CBS is vastly SUPERIOR not only for design flexibility but for the math functions it is capable of and the transactional and update functions are highly desirable features in the business world for such functions as inventory control, pricing, etc.

So far, CBS has worked exactly as advertised and I have encountered NO BUGS! That's after about 40-50 hours of use.

P.S. CBS is really intended for use with CP/M v.2.2x upward. Personally, I find CP/M 2.25 (which I have) a blessed relief after toying with CP/M v1.4 (and getting nowhere in many instances!). Also, CP/M v2.2x does NOT come with COBOL, FORTRAN, OR BASIC. The BASIC (v4.51) on my 1.4 disks seem generally able to work with CP/M 2.25 but I don't know if same holds true for COBOL and FORTRAN, since I have no cause or expertise to use them. In any case, it should be mentioned to hang on to v1.4 utilities and programs after one buys v2.2x!

★

The BASIC Input Routine

Steven P. Hendrix
Route 8, Box 81E
New Braunfels, TX 78130

This month's column will discuss the portion of BASIC which accepts lines of ASCII text for processing either by BASIC's immediate mode (commands, program lines) or by the INPUT statement. I will point out some of the problems caused by OSI's routine and some possible fixes.

BASIC's input buffer resides in page zero (what a dumb use of such prime memory!) at $0013 thru $005A. The exact end of this buffer is hard to specify, because BASIC only uses 71 bytes for the actual text, but needs an additional 3 bytes for marking the end of the line. $5B and $5C get some double use for the last two bytes of the buffer and flags for other routines.

The routine which accepts input from the keyboard has its normal entry point at $A357. The routine has various pieces scattered throughout the ROMs, but the main part is at $A34B thru $A3A5. This routine uses all the registers but does not assume any specific contents for them when it is called. It loads straight ASCII text to the buffer, terminates it with a NUL ($00), and places the address of the buffer (minus 1) in X and Y, with the high part in Y and the low part in X. Thus, since the buffer is fixed in memory, X contains $12 and Y contains $00 upon return. The A register is undefined. If you press <RETURN> without typing anything this routine will place a NULL at $0013, which indicates the end of line as always. This routine itself does not cause an abort for a null input. It handles backspaces, buffer overflow, illegal characters, and echo to the screen.

During execution of the input routine, the X register contains the number of bytes currently in the input buffer. It can be (and is) used as an offset from the beginning of the buffer to the location where the next character should be placed. At $A357, X is preset to 0. (See listing #1) Next, the JSR $A386 gets a single character in the A register without altering any other registers.

Taking a little side tour through the character routine, we see at $A386 a JSR $FFEB. This jumps to a jump through the vector in page 2 at $0218. Basically, we are saying that the address of the routine which will return a character is at $0218. Since the address of the routine is thus kept in RAM, you can change it and have BASIC take input from somewhere besides the keyboard. HEXDOS, for example, takes advantage of this to receive input from disk files. Following this JSR is a string

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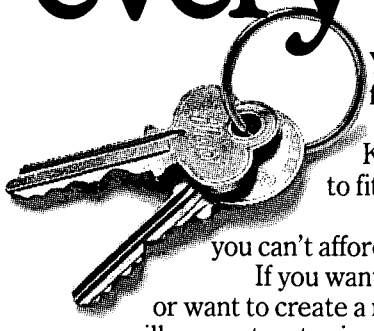

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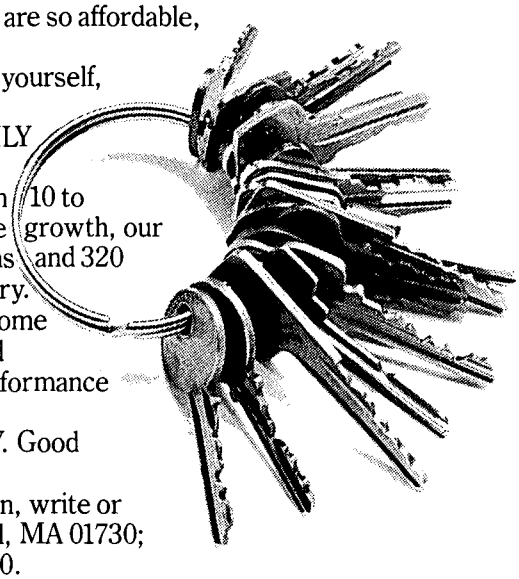

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of NOPs. These apparently replace some code which was used on another OSI system. (These ROMs are apparently hand-me-downs which OSI just adapted to the C1P). Starting at $A397, we mask off bit 7 (which might be a parity bit, depending on the source of the input character), and then compare the character to a $0F (ctrl-O). If it matches, the routine complements the flag at $0064 which determines whether or not output is allowed. If bit 7 of this location is a 1, all output is simply discarded; otherwise it is output normally through the vector at $021A. So ends the character-input routine.

Returning (so to speak) to $A35C, we start through a string of tests to handle special cases in the input. The routine will ignore all control characters (less than $20), but allows the BEL character and the RETURN character (respectively, $07 and $0D) as exceptions to the rule. $A35C - $A35E test for a BEL and jump to place it in the input buffer. $A360 - $A363 check for a RETURN and jump to the routine which wraps up the buffer and gets things up for the return. More on this later.

The next couple of tests limit input characters to the valid printable ASCII characters, ignoring any characters outside the range $20 - $7C. Then, at $A36C, we begin to run into some complications. Here we test for the commercial "at" sign (@), which OSI chose to use for a line-cancel character. If the test finds a match, we jump back to $A351, which prints the @ sign, does a carriage-return and line-feed, and then "falls through" into the beginning of the line input routine, starting all over again.

Next comes the portion of the routine which has been the main cause of the many replacement monitor ROMs - OSI's pseudo-backspace. At $A370, the routine tests for an underscore ($5F or shift-O) and if the character matches, jumps back to $A34B. Back there, we print the underscore (hence the series of cursor characters for backspaces), decrement the X register (effectively backing up one character in the input buffer), and jump to get the next character. If we have fallen off the beginning of the line buffer, we also issue another underscore and a carriage-return and line-feed. While this is a simpler routine to implement than a true backspace, (due to the screen wrap-around problems), it makes for a very messy screen, as any OSI user can attest to.

LISTING #1

```
$A34B JSR $A8E5 ; Print a character
$A34E DEX       ; Backspace in the input buffer
$A34F BPL $A359
$A351 JSR $A8E5 ; Print a character
$A354 JSR $A86C ; Carriage-return line-feed
$A357 LDX #$00  ; Normal entry point
$A359 JSR $A386 ; Get a character
$A35C CMP #$07  ; BEL character
$A35E BEQ $A374
$A360 CMP #$0D  ; RETURN
$A362 BEQ $A383
$A364 CMP #$20  ; Ignore all other control characters
$A366 BCC $A359
$A368 CMP #$7D  ; Ignore characters > $7C
$A36A BCS $A359
$A36C CMP #$40  ; Commercial "at" sign (@)
$A36E BEQ $A351
$A370 CMP #$5F  ; Shift-O (backspace)
$A372 BEQ $A34B
$A374 CPX #$47  ; Test for line overflow
$A376 BCS $A37C ; Jump to the imbedded LDA #$07
$A378 STA $13,X ; Place character in buffer
$A37A INX       ; Move buffer pointer
$A37B BIT $07A9 ; Ignore this imbedded LDA #$07
$A37E JSR $A8E5 ; Echo character to the screen
$A381 BNE $A359 ; Effectively a "branch always"
$A383 JMP $A866 ; Jump to the wrapup
$A386 JSR $FFEB ; Get a character through the vector in RAM
$A389 NOP
        .
        .
        .
$A396 NOP
$A397 AND #$7F  ; Mask off the parity bit, if any
$A399 CMP #$0F  ; Control-O
$A39B BNE $A3A5
$A39D PHA       ; Preserve the input character
$A39E LDA $64   ; Complement the output flag
$A3A0 EOR #$FF
$A3A2 STA $64
$A3A4 PLA       ; Restore the input character
$A3A5 RTS
```

Next we come to what appears to be a comparison against an ASCII "G". Hmmm... strange! Aha!! In this comparison (at $A374) notice that we are comparing the X register rather than the A register. Actually, this is a test for the 72nd character, and only by coincidence does it happen to look like a "G". If the X register is less than 71, the sequence starting at $A378 stores the character in the buffer, increments the pointer, echoes the character to the screen, and jumps to get the next character. But what's this funny business at $A37B?? The instruction says BIT $07A9, which makes no sense at all here. This is actually a clever dodge to allow the routine to fall through here with no effect. If you jump into the routine one byte later, however (at $A27C), notice that the "address" $07A9 is actually the instruction LDA #$07. The test for "buffer full" at $A374 jumps to this instruction without inserting any characters in the buffer. This causes the machine to load a $07 to the A register (the ASCII BEL character, which prints as a graphic character on a stock C1P), followed by the echo routine. This is the source of the graphic characters which print when you type past the end of the buffer.

The JSR $A8E5 at $A37E does the actual character echo to the screen. The BNE following it is actually a "branch always", since the Z flag will never be set upon return from this routine in this setting. The "branch always" is used to go back and get the next character. The JMP $A866 is the finale for this routine, executed when you type a RETURN from the keyboard. The routine at $A866 marks the end of the input with a null

($00), sets up the X and Y registers as noted above, and issues a carriage- return and line-feed with the number of nulls specified by the last NULL statement.

Some possibilities for changes in this routine include changing the keyboard characters specified for certain operations, especially the commercial "at" sign and the backspace. Making the backspace a "true" backspace would get complicated due to the previously mentioned wrap-around problems, but not impossible. Also, the character echoed for line-overflow could be changed to a null (resulting in no response to typing characters, also requiring a change to the BNE at $A381), and control characters could be allowed in the buffer, giving the capability to type some limited graphics into BASIC statements.

Next month - BASIC's immediate mode processor.

★

COMPUTERCUBE CHANGES
FOR C2E CEGMON

By: Maurice L. Johnson
Rt. 4, Box 120
Covington, VA 24426

```
1 PRINTCHR$(26):POKE56900,0

380 POKE54549+I,ASC(T$):NEXT

700 REM SET WINDOWS
705 DATA31,128,212,203,214
710 DATA31,128,214,203,214
715 DATA9,23,210,144,214
720 DATA31,128,208,192,208

800 DATA521,524,527,719,911
805 DATA908,905,713,716
810 DATA147,273,399,396,393
815 DATA267,141,144,270
820 DATA913,721,529,403,277
825 DATA469,661,787,595
830 DATA1231,1228,1225,1161,
    1097,
835 DATA1100,1103,1167,1164
840 DATA903,902,901,709,517
845 DATA518,519,711,710
850 DATA153,345,537,536,535
855 DATA343,151,152,344

915 P(T,I)=A+53499:NEXTI,T
935 FORI=1TO9:P=P(1,I)
940 POKEP+1,143:POKEP-1,136
945 POKEP-63,207:POKEP-64,135
950 POKEP-65,210:POKEP+63,209
955 POKEP+64,128:POKEP+65,208
960 P=P(2,I):POKEP-1,189
965 POKEP+2,189:POKEP-64,189
970 POKEP-62,135:POKEP-63,135
975 POKEP-61,189:POKEP-125,128
980 P=P(3,I):POKEP+64,189
985 POKEP+1,189:POKEP-127,143
990 POKEP-63,143:POKEP-190,136
```

I hope there are some C2-4P Cegmon (cassette based) users that will enjoy this if they haven't already converted it. I think it is a very nice program and the kids with the real cubes might get some pleasure in playing with it. I had to make a couple other changes to get it to work by having Cegmon located in RAM at $7800-7FFF. I had to read the keyboard at $7D00 but this was no problem.

★

A TRAVEL GUIDE TO THE
SELECTRIC KINGDOM

by: Bruce Showalter
857 Cedar [illegible]m. H11
Abilene, TX 79601

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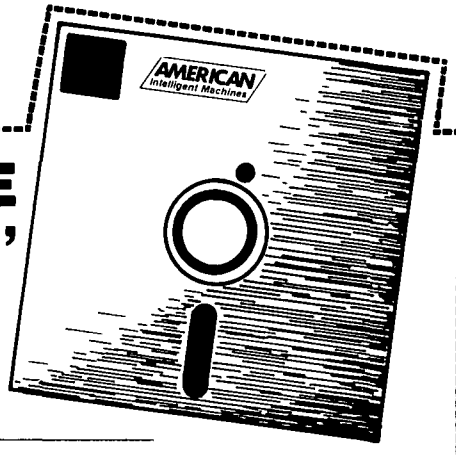

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Since video displays are typically 64 characters per line, it seems logical that hard copies should at least equal this. And since most paper comes 8 to 8-1/2 inches wide, the printer should accommodate it. If we stop here, we can accept a surplus teletype for a printer. Models before #33 can be had for very reasonable prices (sometimes free).

Such machines have built-in future costs, or prices not expressed in dollars. One such cost is, no small or lower-case letters. Another is, availability of replacement parts. Related to this is accessibility of repair service. One last non-dollar cost is its requirement of Baudot code, not ASCII like computers use. This cost turns into dollars when a conversion circuit is purchased. The cost of conversion is circumvented by getting a model 33 or later TTY. Such machines work on ASCII. However, one is still stuck with only upper-case letters. We now encounter increased demand, which raised the price of such machines. $200 is the bare minimum in most cases.

Enter the Selectric typewriter. Here we have a printer that is convertible to use as a computer slave or as a two-way terminal. It includes lower-case letters, prints 64 or more characters per line, and handles paper up to 15 inches wide, depending on the model. However, it has a non-ASCII code which must be converted. Surplus machines in good working order start at about $350. Lower-price units will be in lower-grade condition.

I bought two incomplete machines. The first one (model 745 I/O printer) had about everything except the print mechanism and the paper feed rollers. The second one (model 1062 Bank Terminal) had everything except lower-case, and would only accept two 6 inch wide forms; side-by-side, but one inch apart. To merely obtain these two units, without housings, I paid $102.

The print mechanism from the 1062 was installed on the 745. But I still did not have the necessary paper feed rollers. I tried to order these parts from a local typewriter sales/service company. There I learned two very important lessons. First, IBM sold the Selectric mechanism in an untold number of variations. Second, those variations which are used in I/O terminal applications are unknown to office typewriter service personnel. The model numbers, part numbers and terminology are often different from one to the other.

It was only by visiting my public library that I finally got in touch with someone who could help me: IBM. The library's telephone books provided me with addresses of IBM offices in major cities. The only problem in dealing with IBM is finding the right department or product division. By writing to New York, I got the address of the regional product literature office, which is in Midland TX (not a major city). They sent me an illustrated catalog of parts with numbers for my machine. Now, where should I send my parts order?

Some years ago, I worked in the data processing department of an independent oil company. I learned there that IBM's data processing division office for my region is in Houston TX. I got that address from the Houston phone book at the library. They promptly returned my parts order with instructions to contact the regional parts center in Dallas TX. Dallas filled my order promptly, completely and accurately. At last, my Selectric was mechanically complete... almost. I still did not have a typehead (the 'golfball' element).

Once more I tried the local typewriter supply companies. Once more, all they had were parts for office machines. The whole ASCII character set is not used in office typewriters. Instead, they use some characters which my C1 doesn't. Until I was sure of my character set, I could not complete the last phase of the hookup: electronic interface.

While hunting for a parts source for my Selectric, I had designed and built an interface to my C1's serial port. I had hastily ordered a custom PROM to translate ASCII to Selectric. Now, I realized, that PROM was not correct. The code depended on the location of the characters on the typehead. My PROM had been based on an office typewriter's character set. The set I wanted uses a very different arrangement, so, I had to have the PROM reprogrammed.

The typehead is divided into hemispheres, front and back. The front half is lower-case, and the back half is upper-case. In each half, there are four rows of 11 characters each. By selecting certain mechanical latches, the typehead is simultaneously tilted and rotated to a given character position. Hence, the latch codes determine which character is printed.

Here are the character positions and their latch codes, looking at the surface of the typehead:

```
 1  2  3  4  5  6  7  8  9 10 11
12 13 14 15 16 17 18 19 20 21 22(T1)
23 24 25 26 27 28 29 30 31 32 33(T2)
34 35 36 37 38 39 40 41 42 43 44
                                (T1+T2)
R1 R2 R1 R2 R1    R5 R5 R5 R5 R5
R2 2A R2          R2 R1 R2 R1
2A                2A R2
```

For example position 1 requires that latches R1, R2 and 2A be engaged. If the shift mechanism is engaged, the #1 position on the back half of the typehead would print. Notice that positions 1-11 use neither tilt latch, and positions 6, 17, 28 and 39 use no rotate latches. If you manually pushed the typehead up against the paper, the character in position 6, lower-case, would be printed.

The selector latches are controlled by solenoids, simply called magnets. When a selector magnet is ON, its latch is pulled OFF. Hence, you must apply inverted logic to the magnets. If you wish a certain latch to be ON, you must turn its magnet OFF. The R5 selector magnet, however, uses true logic. The magnet must be ON for the R5 latch to be ON. The same applies to the PRint magnet, and all other operational magnets.

For my purposes, I chose to use only the Carriage Return and SPace operations. Line Feed is accomplished by executing a CR. Since I would only be printing edited copy, Back Space was unnecessary. The Tab operation I chose to omit, since tabs must be set and cleared manually. There are two special codes I chose to activate, the SP and CR magnets. They are the only codes without a PR bit. Two 8-input NAND gates with appropriate inverters decode the SP and CR magnet signals.

Some Selectrics have two Shift magnets: one for upper-case and one for lower-case. My machine has only one Shift

magnet. The printer goes into upper-case when the Shift magnet is ON, and lower-case when it is OFF.

So now I have the format for my Selectric code word: six Selector latch bits, a PRint bit, and a SHift bit. I chose to arrange them as follows:

```
Bit Name   PR R5 T1 T2 SH 2A R2 R1
Bit No.     7  6  5  4  3  2  1  0
```

At last, my typehead order was filled. The character set is called Extended BCD and the IBM part number is 1167952. This part had to be ordered from IBM's plant in Lexington KY.

Here are the chararacter locations on that typehead:

```
= " ; ^ + 1 ' * ) < (     upper-case
: Z W U S ? Y X V T -     T1
! R O M K > Q P N L J     T2
¢ I F D B % H G E C A     T1+T2

# 9 6 4 2 0 8 7 5 3 1     lower-case
, z w u s - y x v t /     T1
$ r o m k & q p n l j     T2
. i f d b @ h g e c a     T1+T2

1 2 1 2 1   5 5 5 5 5     R
2 2A2       2 1 2 1       R
2A        2A 2            R
```

Based on this information, a translation must be made to convert ASCII into suitable magnet signals on my Selectric:

With the translation, only 83 printable character codes and two control codes are programmed.

Now let's start at the C1 and trace the signal path to the printer. We begin at the UART or ACIA, U14 (6850). The jumper W5 is changed as follows: U14-4 to TxClk, from U63-9, is cut. The signal from U63-9 is relabeled Cassette Clock. It remains connected to U14-3, RxClk. U14-4 is jumpered to the line called RxClk which comes from U67-4. Since U67 is not installed, I jumpered U67-4 to U67-1 and renamed it Clock In. This now completes the circuit of Clock In to molex connector J2-2.

U68 is also not installed. Hence, I jumpered U68-9 to U68-8. This completes the TxData circuit to J2-4. Cassette Clock is connected to J2-5 by jumpering U68-11 to U68-10. To provide a Ground connection, I jumpered the holes which would normally be occupied by R39. This changes CTS to Ground (J2-3). With these changes, the cassette port will operate normally so long as J2-5 and J2-2 are connected.

Now begins the interface to the printer. The three renamed signals are brought to the interface via a three-conductor shielded cable.

The cable leads are Cassette Clock, TxData, and Clock In. Ground is connected through the cable shield. A DPDT switch connects Clock In to either Cassette Clock or Printer Clock, which comes from pin 3 of 555. The components specified give a range of about 1806 to 2546 hz, or about 113 to 159 baud. If you encounter problems going from upper-case to lower-case (or vice-versa), I suggest you increase these timing resistors. As far as operating life is concerned, slower is better.

When switched to the Printer position, TxData is connected to pin 20 of a model AY3-1014 UART. This chip is hard-wired in Receive mode, with the Printer Clock applied to its pin 17. The 1014, requiring only a single positive voltage, converts the serial TxData to parallel bytes. When the UART's DA signal goes high, it is inverted and triggers a 556 dual one-shot. This times the arrival of the Selectric magnet signals, then resets the DA signal.

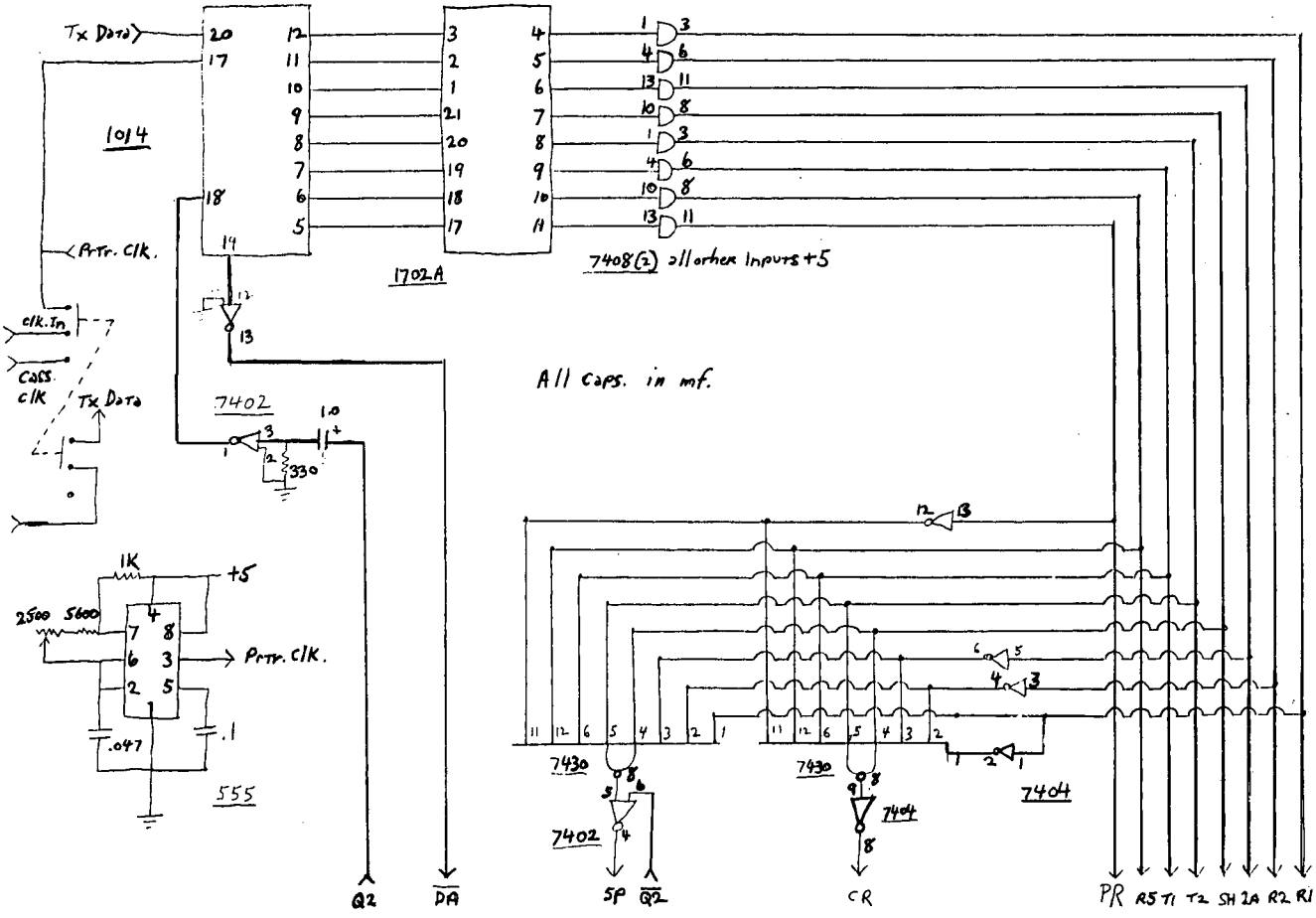
The parallel output of the 1014 then addresses the custom 1702A PROM to generate the desired Selectric magnet codes. Refer to your device data sheets for complete wiring.

Coming from the PROM, the Selectric codes are buffered by two 7408 AND gate ICs. Next they go to the CR and SP magnet decoder circuits, in the form of two 7430 NAND gates and appropriate inverters.

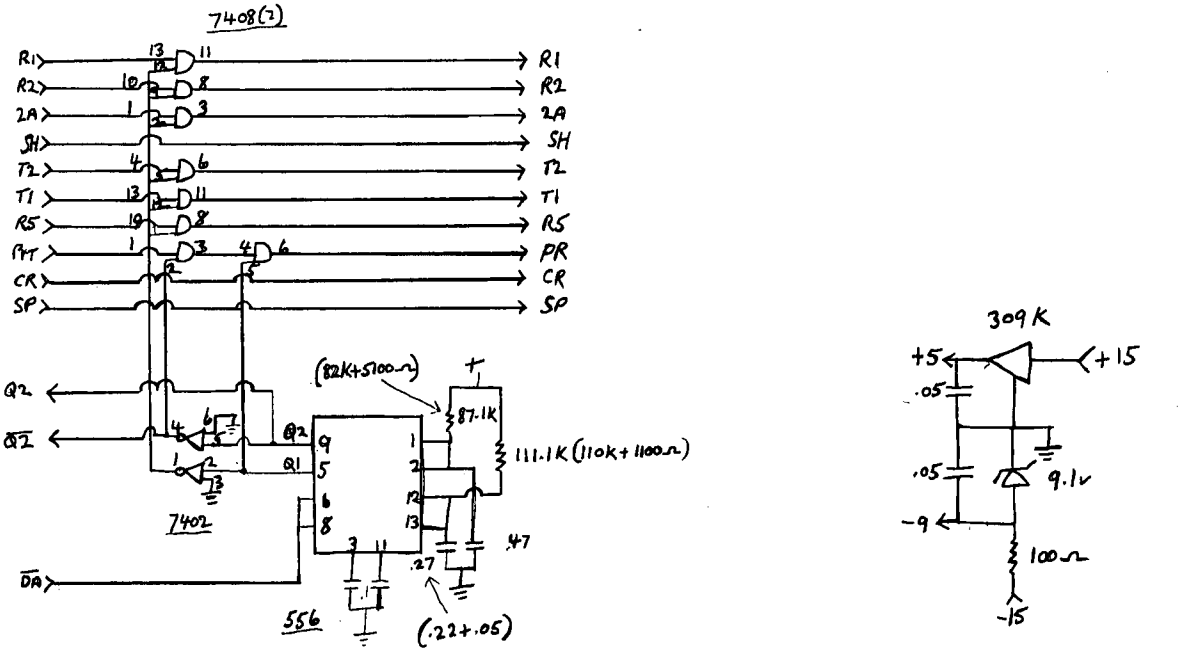
To provide the correct signal timing to the latch magnets, two more 7408s are wired in conjunction with a 556 dual timer. Also note the +5 volts used by all chips, and the -9 volts used by the 1702A.

My 745 Selctric came complete with a set of magnet driver transistors and passive components. However, they required negative true logic (active low). To operate the magnets with my active high outputs.

SELECTRIC INTERFACE PAGE 1



SELECTRIC INTERFACE PAGE 2



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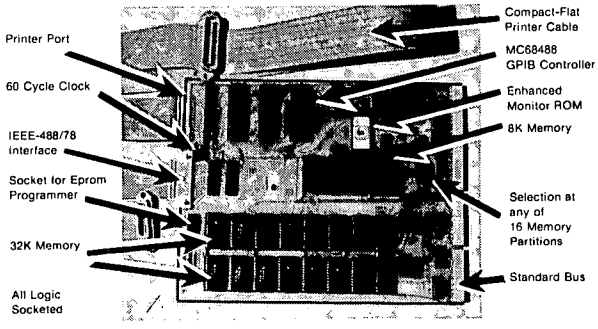

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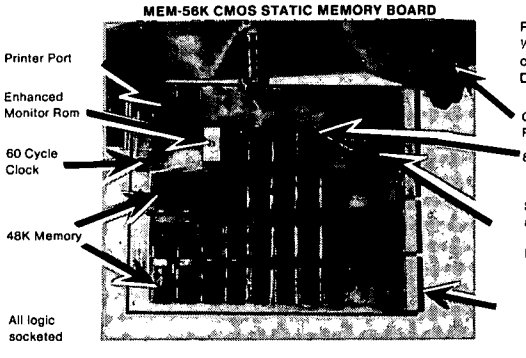

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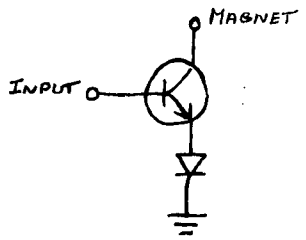


Since TTL gates can only source about .8 ma in the high state, Darlington transistors are required. I used GE type D40C4 rated at 6 watts, 0.5 amps, 40 volts, with a gain of 10,000. The diode is a 1 amp 50 piv rectifier. It serves to protect the transistor from the counter emf generated by the magnet coil. Note - for 48 volt magnets, use a D42D3 transistor with a 1 amp 100 piv diode.

Our editor is now interested in articles describing how we use our computers in business. Well, besides printing articles like this one, I'll be using my system to print invoices and statements in my appliance repair business. And I'll maintain a customer name/address list for reference. It's even possible I'll start a fan club for the 'Man from U.N.C.L.E.' TV show of 16 years ago.

★

LETTERS

ED:

In your June's issue Column One, I noticed the call for articles on successful business installations of M/A COM OSI equipment. We purchased our C8P DF system a year ago, just shortly after we formed our little production company. As far as success goes, we have survived the year in good shape, and a lot of credit has to be given to our computer. We are engaged in a number of diverse projects which require the coordination of graphics, word-processing, mailing lists, and database files, and without the assistance of M/A COM OSI's reliable equipment our infant organization would not have produced anything.

We have received excellent dealer support and are slowly collecting and writing the software we require. Currently, we are using OS-65U V1.2, OS-65D V3.2, WP-3-2, OS-DMS, AND DTI BUSINESS II. Our complaints are few, and generally in the areas of user-friendliness and documentation.

We would like to see more articles on machine code subroutines for 65U, particularly in the areas of screen formatting, cursor control, and user interaction. We are hungry for information about graphics software and hardware, and would like to hear from any of your readers who are using or developing graphics systems and software. And finally, we would like to hear more about installing and using the universal telephone interface.

Keep up the good work!

Brian P. Francisco
Whittier, CA

* * * * *

ED:

I am a new subscriber, beginning with the August '82 issue. In it I see some favorable comment about OSI 65D3.3 and also WP6502 version 1.3.

In recent months I have purchased both of these items of software, and my experience with them has been less than satisfactory, for the following reasons:

The 65D3.3, a new operating system replacing 65D3.2, has a built-in line editor. I appreciate an editor, believe me, and this one utilizes the RUB-OUT key to selectively erase unwanted characters. This would be just fine, except that I expect the RUB-OUT to function consistently as a backspace, but with 65D3.3 this is not the case when you are editing anywhere except at the right hand end of a line. This is a deviation from standard keyboard practice, and I find it annoying and inconvenient.

My primary reason for purchasing 65D3.3 was because I was given to understand that it decodes the keyboard in a typewriter like fashion, so that one can include lower case strings conveniently in BASIC programs. Well, it does this alright, but at the expense of additional disk space and additional RAM space. I have found another solution to my keyboard problem, so I have reverted to using 65D3.2, and I use the AARDVARK machine code EDITOR, all of which suits my purposes much better.

I have installed an EPROM which provides the corrected keyboard which I had been seeking. It is available from Micro-Interface, which is one of the advertisers in your magazine.

With regard to WP6502 version 1.3, I found it to be inconvenient because it requires the use of the ESC key in lieu of the CR (carriage return) for returning to the MENU. This is contrary to all my previous experience, and, in trying to accustom myself to this new habit, I found that it was confounding my normal habits when running other BASIC programs. It caused me to balk and hesitate whenever the occasion arose to the CR key. This is the sort of inconvenience that I can do without.

As a consequence I am now using WP6502 V1.2 with DQ Justify and DQ Secretary enhancements. This combination provides the features that I prize, and it is more economical of computer memory.

Another reason I resent the enforced use of the ESC key is that I have another use for it. WP6502 V1.2 gives you the option of changing the embedded command codes, and I like to use the ESC as the embedded command marker in lieu of the # character. I like this because I consider the # to be a useful character, which I like to be able to type from the keyboard. Also by making suitable code selections, I am able to type @ with a single key stroke.

For the reasons which I have explained, I am well pleased to continue to use 65D3.2 and WP6502 V1.2. In passing I should mention that I purchased my SYNKEY EPROM from Mr. Jeff Mann, 6207 Sycamore Drive, New Port Richey, FL 33552. He was most helpful to me in interpreting the installation instructions.

Carl M. King
Sarasota, FL 33579

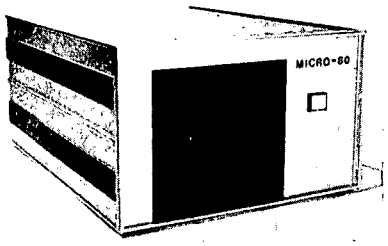
* * * * *

ED:

Another quirk of OSI 65U-V1.2.

The system changes (patches) of Tech Newsletter 28 allowing destructive backspace and lower case will cause 'Multi' to "Lock-Up" the host. At least on a C8P-DF host with C1P series 2 with option 11 as satellites.

NEW FROM D & N MICRO PRODUCTS, INC.



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Serial printer port, dip switch baud rate settings

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Basic Compiler	$329	Mac	$ 85	Mail-Merge	$109
Fortran-80	$410	Sid	$ 78	Spellstar	$175
Cobol-80	$574	Z-Sid	$ 95	SuperSort I	$195
Macro-80	$175	C Basic-2	$110	**Pascal**	
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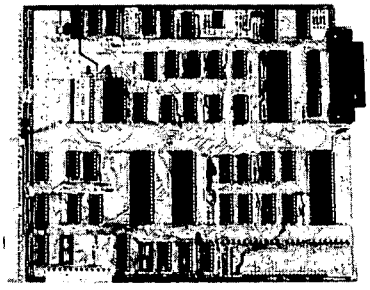
D & N-80 serial w/Wordstar $795
D & N-80 video $695
Option 001 $ 80
parallel printer and real time calendar clock



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ML 84 Same as 82A except 200 CPS, **$1152**
16" paper width, 132/232 columns, 2K buffer, dot addressable graphics, with tractor feed

The manuals and schematics furnished with the CA-10-L8 port board for 'Multi' are vague. Also, the 'Multi' print function is apparently limited to a parallel printer, and that function is slow because the lines also appear on the satellite.

Two of our C1P units came in wired wrong, all of which took months to correct. We now have the system running, and have some program enhancements available.

P.S. Just "found" Tech Newsletter 29, which explains how to enable serial printer under "Multi". It is a hardware mod.

Charles Muhleman
Marion, IL

* * * * *

ED:

I have the following system:

Ohio Scientific C1P with RS232, 2Mhz, sound, 250ns rams, 300 & 600 baud.

Have you heard of programs and/or hardware for a sound/ music mod that supports more than one voice for the C1P or SBII?

I am also interested in adapting my C1P into an eight slot mother board. Have you heard of anyone who has implemented this board on their C1P or SBII?

Arnetha Haynes
Greenville, N.H.

Arnetha:

Sound/music? Not on your machine. Hardware must be similar to the C4P so that a program called DAC may work.

Eight slot? Yes, there are some minor addressing problems, but it appears to work well. The board you need is a 620 to convert to OSI's 48 pin bus.

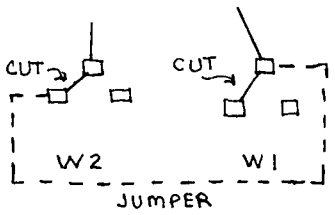
Brian Hartson
Asst. Tech. Ed.

* * * * *

ED:

For those readers who have installed or plan to install Progressive Computing's Monitor and BASIC 4 EPROMS on their C1/Superboard II, the following circuit modification should be added to the instructions.

Change W1 and W2 as shown:



This converts Pin 21 on the 2716 EPROM from 02 clock to +5 volts. I suspect a similar change is required on BASIC 3 as well. Until I made these changes, my C1 required a "warm-up" period of 5 to 10 minutes. Now, it "boots up" at once.

Bruce Showalter
Abilene, TX.

* * * * *

ED:

Two years ago I bought a super board II which has become a C1PMF not without great difficulty and some great support from Brian.

However, I do need some additional help on three areas: 1. I have purchased a 48 pin back plane and a CA-9 board, yet when I plug in the 40 pin cable my disk won't boot up. 2. Since my 600 board is pre series II, I have wrap around on my system on OS-65D. I would like to run with 32 characters. 3. How can I convert my tapes to disk?

I would greatly appreciate the help if someone has information on these questions.

John E. Bowman
Laurel, MD 20708

* * * * *

ED:

In answering a question of Neil Dennis. I have disassembled Cegmon and it vectors through page (2) just like the superboard. At this time I have Cegmon located in RAM at $7800-$7FFF. I am interested in an article in vol. 3, no. 5, the ROM EMULATOR. I am planning to put Cegmon back in and was wondering if by any chance I might get the emulator to work in my C4P. By the ACIA being at $FC00 in wiring in Cegmon (EPROM) page 5 which would have been $FC00 the code in that page is written for $F700 and I guess you could say it's doing something similar to the emulator for $FC00.

Now if I put Cegmon back in and wire up the emulator I was

wondering if it would change page 5 like Cegmon did. Without Cegmon wired in I don't think it would work... so I would like to see some comments on this in a future issue.

By the way my synmon is modified with vectors so I can use Cegmon in RAM.

Maurice L. Johnson
Covington, VA 24426

* * * * *

ED:

In the letters column of the August issue of PEEK Lars Pedersen wrote and said that the modem program from OSI didn't work. I doubt that the program is at fault because my copy works fine.

Outlined below are several steps to check before assuming the program is at fault.

1) RS 232 connections. You must use the J9 connector on the back of your C4P MF for the modem because the RS 232 in is not routed to J8 because that connector is for a printer and only requires RS 232 out.

The correct wiring for a C4P MF to a LEX - 11 modem is as follows: J9 pin 2 of C4P MF to pin 2 of LEX - 11, J9 pin 3 of C4P MF to pin 3 of LEX - 11, J9 pin 7 of C4P MF to pin 7 of LEX -11.

The Clear To Send, Data Set Ready and carrier detect pins of the LEX-11 are not needed by the C4P MF and can be left unconnected. NOTE: The C4P MF CTS input is already tied to ground enabling the ACIA. NOTE: If you have a C4P (not a MF), J8 and J9 are not connected to anything inside the computer anyway. See back issues of PEEK on converting your cassette interface into a RS 232 interface.

2) -9 volts. Most RS 232 devices don't require a negative voltage for a mark so OSI decided to tie the collectors of Q1 and Q2, the output transistors, to ground (505 rev B board). Unfortunately the LEX-11 requires at least -3v for a mark. This is easily fixed by cutting the foil from W42 to ground and installing a jumper between W42 and W43 (see page 75 of the SAMS manual) then connect a 9v battery clip to the power supply bus on the backplane; the plus or red lead to the ground bus and the negative or black lead to the -9v bus. The battery should last quite awhile if you unclip it when you're not using the modem.

3) OSI's modem program. It's unlikely that anything is wrong here but compare line 30 and 4080 with the following:

```
30 Y=PEEK(2):Z=PEEK(64774)
4080 IFY=4THENPOKE63235,52:
     POKE64512,2
```

After line 30, Y should equal 4 for a C4P MF. Line 4080 selects the modem and selects the divide by 64 mode of the ACIA clock (translates into 300 baud), respectively.

The modem program pokes a machine language program into memory starting at $5222 for the C4P MF.

If you want to use this program with another ACIA somewhere else in your system (assuming the ACIA has been properly reset and initialized) change the values poked in line 4070 from 252 (=$FC) to any page address where you have an ACIA.

I hope the above helps Mr. Pedersen and anybody else having trouble getting their modem up and running.

One final note; if you tire of seeing the $2000 computer acting like a $500 dumb terminal I suggest you get a copy of Phil Lindquist's Smart Terminal Operating System or STOS (see letter in June '82 PEEK). We purchased a copy and it works great! You can save all incoming and outgoing data in a buffer for future printing on your line printer, send 8 different messages (logons, etc.) and transfer indirect files, assembler or WP2 files and much more. It's well worth the twenty-five dollars.

Jeff Easton
Brookfield, IL 60513

* * * * *

ED:

We have been working with and selling OSI computers for over 3-1/2 years. One area (among others) that has never really been defined is disk error codes. Some are self explanatory, while others take a more educated mind. We are in the process of trying to document all disk errors, i.e.; what may have caused it, can it be fixed, should it be fixed and how.

Any readers who have answers to the above questions, for

any disk errors, please send them to us at the address below. Once the information has been compiled, we will print a complete listing which will be made available to all PEEK(65) subscribers free of charge.

Rick Guido, c/o Computer Business Service, 6455 Almaden Expwy #212, San Jose, CA 95120

* * * * *

ED:

In reference to Stephen P. Rydgig's letter in Volume 3, No. 8, I show two sketches done on a C-ITOH printer which should assist him with running COMPUTERCUBE on his C4.

One sketch shows the approximate display on screen and the other is slightly expanded to show the individual graphic units. The cube appears at the left of the screen on Superboard 32x32 and the brief instructions appear on the right.

I trust this is of assistance to Mr. Rydgig.

Colin Law
New Zealand

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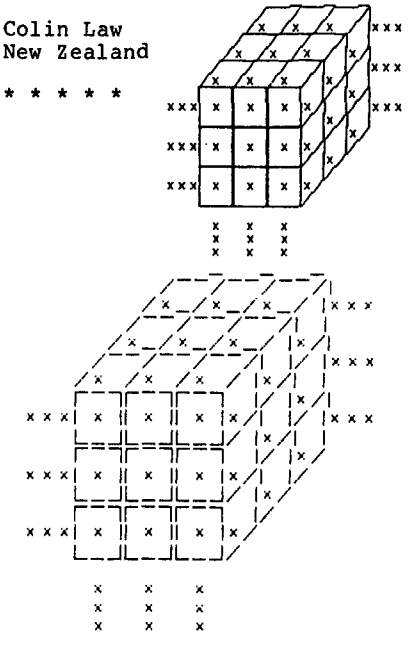

ED:

I have a C2-8P Video-based system using a keyboard and TV monitor. I can't find a Terminal Program I can use to bring in stocks from Micro-Net to save in the computer or on my 8" floppies. Can anyone help me with a Terminal Program to do this in 65 U? (Can't use Sanders', as it's for serial units).

Pete Whigham
Grand Rapids, MI.

* * * * *

ED:

I wonder if anyone knows how to get the Version 3.3 screen print routine to send a line feed. When I use it right now with my Epson MX100, no line feed is generated. However, if I change the dip switch on the Epson to get a line feed for the screen print, I get a double line feed any other time I print. Any suggestions would certainly be a great help!

David P. Redlawsk
Nashville, TN 37204

* * * * *

NEW PRODUCT ANNOUNCEMENT

INDEX 10 MICROPROCESSOR LITERATURE (Survey of Microprocessor and Personal Computer Literature)

Personal computer and microprocessor users know well that is is impossible to keep up with the mass of literature. Survey of Microprocessor and Personal Computer Literature is a new publication that overviews this literature. It surveys magazines large and small. Its purpose is to help the reader locate the article he needs; and make it easier for him to keep informed and up-to-date.

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( ) SEP #9			

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