What's new at ISOTRON? Because that is one of the most frequent questions we are asked, we will continue to give you everything that we can get our hands on. But you probably won't hear about the wondrous things promised for next January. ISOTRON is more careful than its OSI predecessors, out of justified fear of premature announcements and commitments that are not kept. So far, just about everything that ISOTRON has promised has come to be.

This month's news is not hardware-related—not that there are no new things on the drawing boards for the fall. The big splash is Comdex, advertising, and "bundled" turn-key systems.

The ISOTRON booth is a big double-plus affair, manned by some seventeen staff, showing off the Data South printers and Epson terminals (sold under OSI's name). They will be running new OSI vertical market packages (a medical system is reported to be among the first and a newly improved word processor for 6502), plus software packages by Cyma Software. A number of other packages are also under review. This is just part of the new "bundled" turn-key systems that ISOTRON has put together at reduced prices that should please both end-users as well as dealers.

President, Bob Lewis, has been busy burning the candle at both ends trying to put OSI back on the map. Now that their flashy four-color ads have been in Computer World, Computer Dealer, Retailer,
OSI ROM ROUTINES

PART 2

Part 1 published January, 1984
by: Leroy Erickson

This month's ROM routine is synchronous with page 2, the scanned keyboard driver. First though, is little description of the hardware that it is scanning.

OSI's keyboard is laid out as an 8 by 8 matrix, or 8 rows of 8 columns. When a byte is written to address SDP00, each bit corresponds to one of the 8 rows. When address SDP00 is read, each bit corresponds to one of the 8 columns for the selected row. In each case, the lowest order bit is row or column 0, and the highest order bit is row or column 7. A bit being high for a write selects that row, and a bit being high for a read indicates that the corresponding key is down. (On a CIP, an inverter is not present which is in the CP design, thus a bit being 0 selects a row or indicates a key strike.)

To do a valid keyboard scan, only one row should be selected at a time. Multiple key strokes are indicated by multiple bits set in one row, or by 1 or more bits being set in more than one row. Figure 1 shows how the keys are laid out in the matrix. Note that there are only 52 defined keys, so there are 12 open spots in the matrix.

Now for the software! The routine starts with row 0 and scans successively higher rows until a non-zero value is detected. On this first scan, row 0 is ignored except for the 'escape' key. If a key in rows 1 through 7 is detected then the row and column numbers of the key are evaluated.

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converting contents of a table into a corresponding value from the table is loaded. The shift lock, shift, and control keys are taken into account to adjust the table value, and the resulting ASCII code is returned to the calling routine.

Multiple key closures in one row are detected and ignored as an error. Multiple key closures in multiple rows, though, are not detected. In that case, the lowest numbered row with a key down is found first and that key is evaluated. The higher numbered rows are never even reached to show the error.

Another problem in this routine concerns lower case characters. When shift lock is off, lower case characters are available, but nothing else on the keyboard is correct. The numeric and special character keys decode incorrectly, the left and right shift keys respond differently, and even return doesn't work properly!

Another property of this routine is that it needs four RAM locations as temporary storage. When OSI wrote it, they decided to use locations $0213 – $0216, so these spots must be accounted for in all programs which you write. BASIC, OSI65D, and the Assembler/Editor all avoid or compensate for them.

Well, have fun looking at the code. For a challenge, see if you can see how the debounce and auto-repeat timing counters work. See you next month.

**DOUBLE SIDED DRIVES FOR OSI**

By: Robert S. Baldassano

4845 Ashbrook Circle
San Jose, CA 95124

My Shugart 800 drives that came with my 8FD had given me long and trouble free service for over three years. But during a recent OSI SIG conference, when Evan Pomerantz of OSMOSUS told me about a chance to buy new double sided Shugart 850’s for about $125 each, I couldn’t resist. Heck, I had seen numerous articles on putting new drives on an OSI, and I had the SAMS manuals to show me how to modify the boards, so it should be a piece of cake, right?

Well, I was a little slow in making up my mind, and by the time I decided to say yes these new drives were gone!

It wasn't long before Evan found a new deal for new surplus drives. They were a little more money, about $139, and had no guarantee, but I decided to take a chance.

I sent Evan the money, and he checked the drives out before sending them to me. But not on an OSI machine. He did see a set running on a C3 and copied down the jumpering for me. And sent me an 856 manual as well.
Soon my drives arrived, and they looked beautiful. These babies had Bi-Compliant heads and a track-to-track access time of 3 ms. I couldn't wait to make the swap.

Since the 850's were supposed to be plug compatible with the 800's, I decided to use my old power supply and case. The drives are the same size as 800's, but the mounting system is slightly different i.e. the 800's had smooth sides and these had stand off bosses. This required cutting about 1/2 inch away from both sides of the front opening of the case to make it 9 1/2 inches wide. A hacksaw and file did this nicely. The same bracket mount was usable, but the mounting holes in the bottom of the case had to be moved a little.

Power requirements are the same, 85-127 VAC and +24 and +5 VDC. I only required two pin 15 to an pin of connector JS, and ittle.

Also, although the modific­ tion is essentially the same, 85-127 VAC and +24 and +5 VDC. I only required two pin 15 to an pin of connector JS, and ittle.

During the process, I learned a lot about disk drives themselves. I only needed two small changes here. The AC connector had been changed to an AKP P/N 1-488701-0 and required putting AMP P/N 1-488782-0 male connectors in place of the old ones on the power supply. They were readily available in an electronic supply house. Also, my power supply and old drives had the DC return for both supplies on one pin of connector JS, and the 850's used a separate return. I guess you could jump­ er this on the drive, but I added the separate 24V return.

The mechanics done, I then turned to the drives themselves. Evan had given me a list of jumpers to connect on the printed circuit board of the drives themselves. He didn't tell me to cut any traces but I should have known better (more on that later). When the drives were jumpered, I then turned to my 585 board and modified that. It is an easy task to do, but SAMS doesn't make it really clear. Also, although the modifica­ tion is essentially the same on the 470, 585 Rev A, and 585 Rev B boards, the components are in different locations. For my board, a 585 Rev B, I made these changes:

- Cut connection from 48B pin 3 to 68B21P pin 8.
- Connect 48B pin 3 to 68B21P pin 15.
- Cut connection from 68B21P pin 15 to USA pin 12.
- Tie USA pin 12 to the 5V line through a 4.7K resistor (R62).
- Connect 68B21P pin 15 to USA pin 13.
- Cut connection from 48B pin 6 to USA pin 13.

The result of these modific­ ations is you will have changed Select Drive 1 to Drive Se­ lect, and Select Drive 2 to Side Select. It is then neces­ sary to modify the Paddle board as shown on page 18 of the OSI Tech Newsletter #27 dated April 18, 1988.

Well I did all this, and hooked everything up. turned on the system and ----------------- NOTHING!!

After much fooling around, I found if I only hooked up one drive it would work if I jumpered it as disk 1, but only A side would work. So it was back to the books and modifications looking for a clue.

I checked every solder joint I made on the 585 board, and even traced the connections using an ohmmeter. I did find a few connections that needed rework, but that was not the real problem. I then traced all 58 pins on the cable to see that they were modified according to the OSI guidance and connected to the proper pins on the drives. Here I got my first clue that some­ thing was wrong, all 24 pins on the paddle board went to the right places but now OSI pin 12 (ground) was tied to pin 26 on the 850's (Drive Select 1) and OSI pin 3 (now Drive Select) was tied to the 850's pin 32 (Drive Select 4).

The way a drive knows it is selected is for its Drive Select line to go low. If I had Drive 1 jumpered it would always be selected and the other drive would never work. I still couldn't see how this system would work with only one drive select line, an in­ verter of some kind seemed to be necessary.

I tried the drives again, this time jumpered as Drive 1. With both drives hooked up nothing worked, but with one drive up, I got sides A and C. Things were looking up! It was time for the OSISIG con­ ference again, and this time everyone was on trying to help me solve the problem. I still was convinced some inverter or flip flop was on the paddle board so that when one drive was selected the other would be off.

Well my answer was in the making. On the SIG that night, Bob Ankeney of Generic Comput­er Products told me he was getting a C20EM that had 850's in it, and if I called him that Saturday, he would tell me how it was jumpered.

Saturday night I made the call and he read me off the list of jumpers. Both drives were jumpered as DS4, and the jumpers to two IC's also had traces cut (I did not know about these cuts). So I ran to my work bench and started to make the changes.

I had jumpered IC 3C pin 7 to IC 3C pin 12, and now cut the trace to pin 12 on 3C. I was also supposed to jumper IC 4B pin 10 to IC 2E pin 9 and cut the trace to 2E. Here I found that I had jumpered to IC 2B in error! Things would surely work now!

Another try and still no luck. I called Bob again to make sure I got it all down right. As we talked, he noted other jumpers he had not seen and most important of all another IC jumper. IC 4D pin 8 was connected to IC 2B pin 13, and the trace from IC 4D pin 11 to IC 2E pin 13 was cut on the back of the board. This was only done on the B drive. Here was the inverter I ex­pected. Drive Select and Side Select are NORed in gate 4D, the output pin 8 going to pins 12 and 13 of 4D which flips the output. This modification bypassed the conversion so that when A drive is selected B drive is not and vice versa.

We quickly checked the other jumpers again. They were S,R, TA,B,DS4,850,IM,TS,E2,IR,AF,RY,S,Y,C, and DS on BOTH boards.

I made this last modification, hooked everything up, turned on the power and AT LAST IT ALL WORKED!!

I am now the proud owner of one Meg on line storage and I learned a lot about disk drives as well. I hope this little story will help the rest of you who may want to have a side drive too.

IN THE BEGINNING

By: L. Z. Jankowski
Otaio Rd 1 Timaru
New Zealand

The program to be discussed is a 'MailList'. It is easily adaptable to tape and ROM
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BASIC, to 65D 3.2 and to 65D 3.3. The accent is on ease of use and flexibility for change. In fact, with minor changes the program could be used as a simple DBMS. Those are the two ways I use it.

Writing a long program is easy, but only if it is written in short blocks. If each block 'works' as the programmer intended, then the program must work. The big advantage of a block structure is that the various routines or sections of the program are easily identified. Because this is true, program logic flow becomes obvious and testing the program is reduced to testing one small piece at a time. Editing is greatly simplified. Also, sections can be easily 'lifted' for use in other programs. All this and 8-bit OSI BASIC! Yes!

The 'Otaio Mailing List' (OML) was developed using these ideas. If you intend to type it in, use the line numbers as given. Leaving out all REM lines will save nearly 600 bytes. The spaces in the listing were inserted for clarity only. Spaces slow down long programs and reduce the number of statements that can be put on one line. The OML is useful for at least a file of 280 records and is adaptable to ROM or DISK BASIC.

Features include sorting on any field, search and ask for one buffer and 28 bytes before the BASIC workspace. Under 6D 5.3, the BASIC workspace will then start at 18874 or at 15770 under 3.2. Subtract 27 from this value to get the value for X, in line 90. What's the 28th byte for? This byte (at $469A, $3D9A) holds the first null which starts off the BASIC program. So there's a bug in CHANGE? Yup! It is necessary to ask for one more byte in addition to what is required.

When testing the program, I found that on a second RUN, the program would 'hang' when reading a sequential file of disk. CLEAR' in line 10 fixes that. The PRINT(28) is a
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FROM THE FOLKS WHO BROUGHT YOU:
All This
THERE IS MORE COMING SOON:
Program Generator for TOS
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screen-clear.

When entering data in response to the INPUT command, it is desirable that BASIC accept <RETURN> as a null and then continue to the next BASIC line. For ROM BASIC the fix is at $A944,$. Change $47 and $A6 to $54 and $A9. The changes merely bypass the null input check. For DISK BASIC the first two POKEs in line 28 do that. The next two allow ', and ';' on INPUT. The final POKE disables CTRL-C.

Lines 20 illustrates the flexibility acquired by using DISK BASIC. With ROM BASIC changes can only be made by burning new EPROMs. (There is actually another solution. Save ROM BASIC to disk, call it back into RAM and now, BD11G gives a COLD START; answer memory size with a number. Works well.)

The TRAP command is unique to 65D 3.3 and is extremely useful. Works rather like ON ERROR GOTO. All INPUT errors, DISK errors and even program syntax errors will be routed to line 2818.

Lines 90-118 contain a machine language partial screen clear. The screen is cleared from $D800$ to $DFFF$. ROM BASIC users can place this routine either at $E022$ or POKE it into high memory and then protect it with POKE 133,LO byte: POKE 134,HI byte. The variable TB is the second column tab when printing records, and V stores the device number.

★

EPROM PROGRAMMER

By: David Tasker
111 Bass Highway
Tasmania, Australia 7303

PARTS LIST:

Sockets
2 x 16 pin sockets. *
2 x 40 pin sockets.
1 x 14 pin socket.
1 x 28(24) pin socket. *
* These may be a Zero insertion force sockets, (Z.I.F.). It is recommended that the 28(24) pin socket be a ZIP type as this is used for the EPROM device. The 28(24) pin socket

SAMPLE OF "TRAP"

10 CLEAR: PRINT 1(28): REM COPYRIGHT by L. Z. JANKEWSKI APRIL '84
may be either a 28 pin or a 24 pin socket. 28 pin is preferred as this will allow 2764 EPROMS to be programmed.

**Integrated Circuits**
2 x 6821 PIA devices.
1 x 7404 TTL device.
1 x LM317 variable voltage regulator. **

**Transistors and diodes.**
4 x 2N3904 (BC107) Q1, Q3, Q4 and Q6
2 x 2N3906 (BC177) Q2 and Q5.
3 x LEDs in different colors for D6, D7, and D8.
Suggested colors are D6 Red, D7 Green, D8 Yellow.
4 x IN4001 or similar for D1 to D4. **
1 x IN914 for D5.

**Resistors and capacitors.**
R1 4.7k ohm. R2 220 ohm. **
R3 1k ohm. R4 10k ohm.
R5 1k ohm. R6 10k ohm.
R7 10k ohm. R8 10k ohm.
R9 10k ohm. R10 27k ohm.
R11 10k ohm. R12 4.7k ohm.
R13 470 ohm. R14 47 ohm.
R15 10k ohm. R16 100 ohm.
R17 470 ohm. R18 2.7k ohm.
VR1 5k ohm Tab set pot. **
C1 330uf. 47volt. **
C2 10 uf Tag.
C3 10 uf Tag.
C4 1 uf Tag. 47vol. **
C5 1 uf Tag. 47vol. **
C6 1 uf Tag. 47vol. **
C7 0.1uf.
C8 0.1uf.

Points marked as OUT 1 to 4 may have multiple 0.1" in-line header pins inserted here to facilitate access of the PIA output lines.

Items marked "***" may not be required if an external +25 volt supply is available and which can be connected at TP1 or at the point marked "0" (the center pin) of the LM317 which would not be fitted.

This programmer for I/O Bus is designed to plug into the 16 pin I/O Bus that can be found on many OSI Challenger Computer Systems. If your computer does not currently support the I/O Bus, then you should obtain the correct expansion adaptor.

There are a number of expansion boards available, but nearly all use variations of the standard 40 pin expansion socket system that OSI favors on its CI and Superboard.

This programmer can be used on any computer that has the software driver routine installed. A description of the software requirements are given in the following notes.
OVERVIEW OF HARDWARE AND SOFTWARE

The EPROM programmer requires two latched ports at $C784-C787$ and $C788-C78B$. These ports are provided by the two PIA chips on the programmer board. The address selected is in keeping with OSI Input/Output (I/O) allocation. You may choose to have the programmer somewhere else within your memory, however, this would mean a change of software. A list of memory locations is included that would require a change to implement this.

The programmer is designed to program only the single 5 volt supply EPROMS, e.g. 2708, 2716, 2732 (TMS), 2764. It is versatile enough to be able to read most ROMs such as OSI BASIC ROMs CHAR-GENERATOR and Monitor ROMs.

HOW IT WORKS

In the 16 pin socket called "Personality Header" a series of links are put in which sets up the programmer hardware for the particular device that you wish to read or program.

On Port A PA0 to PB7 (16 lines) are set as outputs and we present a binary setting which represents the address of the first location in the device. Data to the device is provided by PA0-PA7 of PORT B. The A side of port B can be inputs or outputs depending if we are reading or writing. Port B-BPB and PB1 are the two control leads that set our read/write, chip select and also programming pulses.

As each data is presented and the addresses are incremented as required, the control leads will, as required, select the device and control the 25 volt programming pulse. The timing is all controlled by the software.

As the address is incremented Port bit PB4 will eventually go high as the EOM (end of memory) signal will be provided by the particular address line that you have it connected to. The software as set up will continue to program till it reaches EOM in software, then halts and relies on EOM from PB4 to exit the software read/write routine.

Switching and control of the device, incrementing of address and data changing are all transparent to the user and is looked after by the software. The programmer is MENU driven.

MENU driven simply means that the screen display will show you a choice of functions each time that the programmer has finished a task.

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Many computer users are getting into computerized telecommunications today for both work and pleasure. Some just enjoy communicating with others, say on the OSI SIG on Compuserve. Banks are now offering bank-by-personal computer services to their customers. MCI allows you to send mailgrams from your home computer. Some people (myself included) are able to work at home, at least part time, on their home computers and have to communicate with their offices periodically. All of these applications require a modem.

The modem, which serves as a link between your computer and the phone lines, is the first item required to get into telecomputing. Ever since the introduction of the inexpensive (about $50) modem for the Commodore 64, I have wondered whether it could be adapted for use with my CIP. This modem only works at up to 399 baud and lacks fancy features like automatic dialing, but it is just fine for my uses.

**MEM PLUS**

<table>
<thead>
<tr>
<th>Memory Size</th>
<th>Price</th>
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<tbody>
<tr>
<td>32K</td>
<td>$300</td>
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<tr>
<td>64K</td>
<td>$440</td>
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<tr>
<td>128K</td>
<td>$490</td>
</tr>
<tr>
<td>256K</td>
<td>$640</td>
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denver, colorado 80207
inc. phone: (303) 428-0222
Curiosity overtook me and I finally got a Hesmodem (also for the Commodore 64) in December. I figured out that it could be adapted. I decided to make it RS-232 compatible, so that it would work with any computer, and build in a power supply. (These modems are meant to get their power from the Commodore.) The parts cost to adapt a Hesmodem is about $20, less if you have a well-stocked junk box. I have not tried it, but I think this adaptation will also work with a Vicmodem (Commodore's version). This adaptation requires no modification of the Hesmodem itself, preserving it for possible use with a Commodore or for resale if you decide to move up to 1200 baud at a later date.

The Hesmodem (and presumably the Vicmodem) is based on the Texas Instruments TM99532 single chip modem, which requires very few external parts. The Hesmodem also contains onboard supply voltage regulation and circuitry to meet FCC regulations for direct connection to the phone lines. The only connections to the Hesmodem are power and TTL-compatible data send and receive lines. Figure 1 shows the schematic of the interface. The transformer, bridge rectifier, zeners and associated resistors and capacitors provide the various required voltages. The transistor is used to convert the bipolar RS-232 line to TTL levels. The collector line is pulled up on the Hesmodem. This receiver will also work with the CIP's 0 to +5 volt output on the modem and RS-232 ports. The 1488 is used to turn the TTL level data output line from the Hesmodem into proper RS-232 levels. Construction was done on a modified 44 pin edge connector board, which was cut down as shown in Figure 2 to provide the 24 pin edge connector required by the modem.

The other ingredient required for telecommunications, once you have a modem, is the terminal software to drive it. OSI at one time supplied a simple "dumb" terminal routine on cassette with each CIP and it is probably still available. This cassette version would also work under OS-65D. There are at least two modem programs available which run under HEDOS. One is my adaptation/expansion of OSI's cassette "dumb" terminal dump time for HEDOS and the other allows spooling received data to a HEDOS disk file. Both are in the public domain and both are available from the HEDOS User's Library (c/o Vern Heidner, 1440 Co. Rd. 118 N., Mound, MN 55364). I will also supply my adaptation of OSI's program to interested HEDOS users. Send me $5 and a disk. I'll copy the program onto your disk, along with the HEXASM source code for the machine language subroutine, and return the disk to you. To protect Steve's copyright, please send the disk WITHOUT track zero! If anyone has written a smart terminal package that allows both up and down-loading and local command execution for OS-65D of HEDOS, please write in and tell us about it.

There you have it! An inexpensive way to go on-line. If you don't know who to call, there are several books listing public bulletin boards and explaining telecommunications, and Computer Shopper always has a long listing of free bulletin boards to get you started.

![Diagram of 44 pin edge connector card](image)

**Figure 2**

**Board Details**

---

**BEXEC* PROGRAM**

**REQUIRED FOR "BOOKS INTO BASIC" by RICK TRETIBWEY**

See December 1983 and January 1984 issues of *PEEK*(65) and *NEW*.

<table>
<thead>
<tr>
<th>Hex</th>
<th>Dec</th>
<th>Description</th>
</tr>
</thead>
</table>
| 10        | 16    | X=PEEK(18950)+POKE8993,X:POKE8994,X:POKE14170,16 | 2642
| 20        | 32    | POKEM(1472,8)+POKE2886,0:IFPEEK(57888)=223THENPOKE89794,37 |
| 30        | 48    | MAXMEM=PEEK(8968)+DESTD=MAXMEM+9:IFPEEK(532)=156THEN1840 |
| 40        | 64    | DELK133,DESTD=1:CLEAR:DESTD=PEEK(133)+1:GOSUB5859:95 |
| 50        | 80    | HEX$="0123456789ABCDEF";A1=INT(DESTD/16);A2=DESTD-A1+16 |
| 60        | 96    | AD$=MID$(HEX$,A1+1,1)+MID$(HEX$,A2+1,1)+"00" |
| 70        | 112   | TTT=RIGHT$(STR$(TT+100),2) |
| 80        | 128   | DISK="CA *\"ADS*+"TTT$"," |
| 90        | 144   | IFDT<>8THENDESTD=16;TT=TT+1:GOT058 |
| 100       | 160   | |
| 110       | 176   | REM INSTALL PATCH INTO LET FOR HEX KEYS |
| 120       | 192   | DESTD=PEEK(133)+1:FOR=247TO2478 @O A |
| 130       | 208   | READY:IFY=182THENPOKEK,DESTD=1EXIT |

Continued
COMPUTER

MICRO-80 COMPUTER
Z-80A CPU with 4Mhz clock and CP/M 2.2 operating system. 64K low power static memory. Centronics parallel printer port. 3 serial ports. 4" cooling fan. Two 8" single or double sided floppy disk drives. IBM single density 3740 format for 243K or storage, double density format for 604K of storage. Double sided drives allow 1.2 meg on each drive. Satin finish extruded aluminum with vinyl woodgrain decorative finish. 8 slot backplane, 48 pin buss compatible with OSI boards.

MODEL80-1200
2 8" Single sided drives
$2995

MODEL80-2400
2 8" Double sided drives
$3495

MICRO-85 COMPUTER
6502 CPU with 2Mhz clock and DOS-65 operating system. 48K of low power static memory. 2 serial ports and 1 Centronics parallel port. 2 8" single or double sided drives. Satin finish extruded aluminum with vinyl woodgrain finish. 8 slot backplane, 48 pin buss compatible with OSI. Will run OSI 65D and 65U software.

MODEL85-1
2 8" Single sided drives
$2995

MODEL85-2
2 8" Double sided drives
$3495

BP-580 8 Slot Backplane ....... $ 47
OSI 48 pin Buss compatible

MEM-CM9 MEMORY/
FLOPPY CONTROLLER
24K memory/floppy controller card uses 2114 memory chips, 1 8K and 1 16K partition. Supports OSI type disk interface

24MEM-CM9 .............. $325
16MEM-CM9 .............. $280
8MEM-CM9 .............. $180
BARE MEM-CM9 .... $ 50
Controller on assembled unit add. $ 90

BIO-1600 Bare IO card .......... $ 50
Supports 8K of memory, 2 16 bit parallel ports, 5 serial ports, with manual and Molex connectors.

PRINTERS

Okidata
ML82A, 120 cps, 10" ....... $2995
ML83A, 120 cps, 15" ....... $395
ML84 Parallel, 200 caps, 15" ....... $1150
C. loth

8510AP Prowriter, parallel ....... $419
120 cps, correspondence quality
8510APD Prowriter, serial ....... $585
F10-40PU Starwriter, parallel ....... $1319
Letter quality daisy wheel
F10-40PU Starwriter, serial ....... $1319
F10-55PU Printmaster ....... $1610
parallel, Letter quality daisy wheel
F10-55RU Printmaster, serial ....... $1610
DISK DRIVES AND CABLES
8" Shugart SA801 ......... $385
single sided
8" Shugart SA851 ......... $585
double sided
FLC-6f ft cable from D&N ....... $69
or OSI disk controller to 8" drive
5¼" MPI BS1 disk drive with ....... $450
cable, power supply and cabinet. Specify computer type.
FLC-5¼ cable for connection ....... $75
to 5¼" drive and D&N or OSI controller, with data separator
and disk switch. Specify computer type

HARDWARE

OSI COMPATIBLE

IO-CA10X Serial Printer Port ....... $125
Specify Device #3 or #8

IO-CA9 Parallel Printer Port ....... $150

CMOS-MEM

64K CMOS static memory board, uses 6116 chips, 3 16K, 1 8K and 2 4K blocks, Partitionable for multi-user, OSI type disk controller, 2 IO mapped serial ports for use with D&N-80 CPU. Ideal way to upgrade from cassette to disk.

64K CMOS-MEM .............. $490
48K CMOS-MEM .............. $390
24K CMOS-MEM .............. $250
16K CMOS-MEM .............. $200

Controller add. $ 90
2 IO mapped serial ports add. $125
on assembled memory board
Z80-IO 2 IO mapped serial ....... $160
ports for use with D&N-80 CPU card
FL470 Disk Controller ....... $155
Specify 5¼ or 8" drive

STANDARD

CP/M FOR OSI

D&N-80 CPU CARD

The D&N-80 CPU allows the owner of an OSI static memory computer to convert to Industrial Standard IBM 3740 single density disk format and CP/M operating system. Double density disk operation is also supported for 608K of storage on an 8" diskette. When used with a 5¼" disk system 200K of storage is provided. Includes parallel printer and real time clock. Also available for polled keyboard and video systems. Compatible with C2, C3, C4 and 200 series OSI computers.

D&N-80- P ................. $349

CP/M 2.2 .................. $150

64K CMOS-MEM with D&N-80
CPU card .................. $450

HARD DISK MEM

D&N-80 CPU board to control OSI 40 or 80 meg hard disk unit. Will not destroy OSI files. Will also allow for a true 56K CP/M system. Specify 40 or 80 meg drive.

BUS TRANSFER ......... $135

Allows for D&N-80 and OSI CPU to be in the computer at the same time. Toggle switch provides for alternate CPU operation.

DISK TRANSFER ......... $100

Utility program to transfer OSI CP/M format disk to IBM 3740 single density format. Will also transfer IBM to OSI format.

SYSTEM HARDWARE

REQUIREMENTS

D&N-80 CPU, D&N FL470 or OSI 470 controller, 48K memory at 0000-BFFF, 4K memory at D000-DFFF, two disk drive cables.

FORMAT TRANSFER ....... $15

You supply software on 8" diskette
D&N will transfer OSI CP/M format to IBM 3740 CP/M format. Can also transfer IBM 3740 CP/M format to OSI CP/M format. Original diskette returned.
140 POKE Y: NEXTK
150 DATA 32, 0, 182, 234, 234, 234, 234, 234
160 :
170 MAXMEM = PEEK (9648)
180 :
190 REM- ENABLE NAMED GOSUBS AND GOTOS
200 POKE 2215, 133: POKE 2216, MAXMEM-1
210 : $(56#7):$(68#7):$(70#7):$(72#7):$(74#7):$(76#7)
220 REM- ENABLE IF... THEN... ELSE
230 POKE 532, 156 : POKE 533, MAXMEM-1
240 : $(35#5):$(37#5):$(39#5):$(41#5)
250 REM- ENABLE HEX PRINT
260 DA=8643:IPEEK (1211) = 5THEND = 8379
270 POKE DA, 57 : POKE DA+1, MAXMEM
280 : $(37#5):$(39#5):$(41#5)
250 REM INSTALL PATCH TO EVAL TO ALLOW HEX EXPRESSIONS
260 GOSUB 438
270 :
280 REM- USE "CALL" TO PATCH TO EVAL
290 :
300 DEST = PEEK (133) * 256 : K= 0
310 IF A:K:K+1:IFA:A<96 THEN440
320 CALL- DEST, RETURN
330 DATA 169, 76 : REM- LDA #$4C
340 DATA 141, 195, 13 : REM- STA #DC3 3523
350 DATA 169, 27 : REM- LDA #$1B
360 DATA 141, 195, 13 : REM- STA #$DC4
370 DATA 172, 6, 35 : REM- LDY $2C00
380 DATA 136 : REM- DEY
390 DATA 140, 197, 13 : REM- STY #$DC5
400 DATA 169, 234 : REM- LDA #$2A
410 DATA 141, 196, 13 : REM- STA #$DC6
420 DATA 96 : REM- RTS
430 :
440 REM- FIND FILE CONTAINING HOOKS OBJECT CODE
450 D=11897:FS="BASIC":DT=PEEK (11716) TRAP980
460 DEF FNA (X) = 10 * INT (X/16)-X-16 * INT (X/16)
470 DT= FNA (DT):DT= Rights (STRS (DT+100), 2): S= 1
480 DISK! CA 2E794 +DT+$, "+Rights (STRS (S), 1)
490 FOR D=TOOD+255STEP8:F1S=""=
500 FOR 2=0TO=51+F1S=CHR$(PEEK (I+J)) NEXT J
510 IF 1S=FRINT= //FNEL$(PEEK (I+J) ) : RETURN
520 NEVI: IF$=2THENS=S+1: GOTO 0E10
530 :
540 REM- EXECUTIVE FOR FAILURE TO FIND "BASIC"+
550 POKE 74, 76: POKE 750, 78: POKE 2073, 173
560 PRINT " OS-65U V3.3": PRINT: CLEAR: X=FRE (X)
570 IF X=0 THENX= +65536
580 PRINTX: "BYTES FREE": END
590 :
1840 clr$=CHR$(27)+CHR$(28)
1850 PRINT clr$: R:Q: S:PRINTTAB (18); D:*:PRINT: TRAP0
1860 PRINT "(1) Create a New File"
1870 PRINT "(2) Delete a File"
1880 PRINT "(3) Rename a File"
1890 PRINT "(4) Invoke the Assembler/Editor"
1891 PRINT "(5) Invoke the Extended Monitor"
1892 PRINT "(6) Exit"
1892 INPUT "Enter Your Choice": y$K=VAL (Y$)
1892 IF y$< 0 THENEND
1910 INPUT "Enter File Name": f$
1910 INPUT "How many tracks": "int
1910 make f$: nt: GOTO 050
1910 INPUT "Enter File Name": f$
1910 INPUT "Old File Name": of$
1920 INPUT "New File Name": nf$
1930 replace nt: TO nf$: GOTO 040
1940 FOR K=0 TO 3000: NEXT; RUN
1950 ASM
1950 EM
1960 INPUT "Drive A/B": *:dr$: s:dr$: RETURN

This is a BASIC program which recognizes all the embedded commands except #Bnn. There is one extra command, #Wnn. This command changes the line width to provide a variable right margin.

If too many different #Tnn commands follow each other too closely in the text then only the 'last' #Tnn command will be recognized. A number of such commands could be replaced by one set of printer control commands.

Lines 10 to 15 of the program read the required WP6582 file into RAM from where it is processed.

SIMPLE A-B SWITCH

By: Fred S. Schaeffer
46-54 Daniels Street #4F
Jamaica, NY 11435

I don't want to take business away from those manufacturers that make fancy 'A-B' type switches, but there is a better way to solve your primitive switching problems. My problem was to have two computers input into a single peripheral (e.g. printer, terminal of modem). Of course, it is just as easy to switch cables most of the time except that mine are rather inaccessible.

The IN-cables (those into the switch box/figure 1) come from I/O serial boards in Unit 1 (a S-100 type computer which I'm in the process of populating) and Unit 2 (my existing OSI equipment). If you are using pin 1 (frame ground) that should then be strapped to the 2nd cable (or both to) to pin 1 of the Female DB25 in the switch box. It is probably not even necessary to have pin 7 (signal ground) switched. Suffice it to say that both pins 2/3 and pin 5/7 DBP switches must be thrown together and BOTH must enable unit 1 OR unit 2.

Pin 5 is CTS; it is, however, only part of the handshaking formula. There seems to be no 'standard' way of wiring here; if you have no pin 5 connected (to a board) then it shouldn't matter whether the SPST switch is off or on, but I read some-
where that you can simulate handshaking to the peripheral by looping p5 to p8. So experiment...just be sure you don’t connect the other end to a +5V pin in your equipment.

I cannot claim credit for the wiring of the null switch. Dick Brannin of E. Williston, NY thought that one out. Basically, what happens here is that pin 2 and 3 from either unit 1 or 2 feeds into a 'common' or the middle tabs of a DPST switch. By wiring as in figure 1, it effectively switches 2 and 3 on the one hand, or leaves p2=2 and p3=3 on the other hand.

Some printers need lead 20 connected; that becomes a problem because OSI’s 525 board isn’t necessarily wired for that. I use a Sooperspooler (Compulink Inc) which takes care of that and other problems.

The entire switch is in a small plastic equipment box, measuring about 4-1/2”L x 2-1/2”W x 1”H. Total cost excluding cable was $28.00 incl. 2 male DB25 with hoods that are plugged into the back panel of each computer. That is a bargain because most commercially available AB switches start at about $100. Usually, that gives you 25 switched lines, but no facility for a null modem. The switch I made can also connect two computers together with the null switch enabled.

The software projects have included the following:

1. Writing a keyboard/video driver with true upper/lower case input, full-screen cursor control, re-transmit from screen and print from screen. It replaced the standard keyboard-in and video-out calls of OS650 so it was directly usable from BASIC, Editor/Assembler, Extended Monitor and anything else that runs under OS650.

2. A Modem driver integrated into the keyboard/video handle. This meant that with 1 command I could vector modem input to OS650 and/or OS655 output to the modem, or could run in local mode to OS650, or as a dumb terminal to the modem. It provides no high level support such as phone number files, split screen (such as Rick Trethewey’s nice package), etc., but is perfect for dialing up my system at work so I can work from home, and for doing file transfers to/from any remote system.

3. Regenerating source for OSI’s Editor/Assembler and WP2. They both use a common interpreter and a lot of common code (in fact, WP2 still has a lot of unusable Assembler code buried in it). I’ve totally re-arranged WP2 and added some features.

4. Relocating OS650 from $2300 to $0300, a much more sensible location to me. I used Tom Berger’s commented source of OS650 for help in this.

5. An extensive re-write of the XPL0 package. If you’re unfamiliar with this software, it’s a very good structured programming language for 6502 systems. The language is very similar to Intel’s PL/M language. The whole system as it is sent to you works fine on any OSI system with 8-inch disks and at least 32k of memory. It is compiled with the XPL0 compiler, the I2L interpreter, a text editor, and some small utilities. What I

---

**READER PROFILE**

ED:

I started working on OSI systems in 1978 on a C2-8S with 8-inch drives and OS655 V2.0. I purchased my own C2-4P DMP in 1979 and have since accumulated a couple of systems using boards from OSI, D&N, CCS, MIS, GENERIC & ORION. I’ve done several hardware and software additions on my own.
didn't like about it is that
the editor, compiler, inter-
preter, your source code and
your executable code all had
to be resident in memory at
the same time! This re-
stricted program size tremen-
dously! I eliminated the ed-
tor, removed the compiler from
being permanently resident,
and converted the compiler to
read its input from disk and
generate the compiled output
to disk. It also accepts files
in WP2 format so that's what
I use for my editor. I
relocated the whole system
to use the moved OS65D, so now my
memory map has OS65D from
$8300 to $1200, the I2L in-
terpreter from $1200 to $2200,
and user programs from there
to the top of memory (about
39k on a 48k system). I also
developed several utilities in
XPLO including a directory
utility package (this combined
and extended the distributed
XPLO utilities), a disk COPY
program which copies whole
disks, track ranges or files on
or between drive systems, a
cross-reference program for
Assembler or XPLO files, and
numerous other programs. (The
original work on regenerating
the source of the interpreter
was split with Tom Berger and
most of the Compiler source
was regenerated by him. The
interpreter re-write and com-
piler extensions were mostly
mine).

I would like to offer this
package to anyone who wanted
it, but since the original is
still commercially available
from the 6582 Program Ex-
change, I probably can't do
that. If you have purchased
the original and would like to
have a copy of mine, send me
proof of purchase, a disk and
some postage, and it's yours.

6. The best available assem-
bler for OSI that I've found
is the A/55 Assembler. Unfor-
utunately, when I got a copy,
it didn't always work on my
files, so again I regenerated
and commented the source. I
then saved the input hand-
der and disk handler, re-
rewrote the symbol table sort
routine, extended the file
linking abilities to include
switching between drives or
volume (it waits for you to
mount alternate disks), and
added conditional assembly.
Then assembler is now effec-
tively limited in speed only
by the motion of the disk
and drives between tracks. Again,
if you've bought the original,
I can give you a copy of my
version.

Future projects that I would
like to do include moving to
an 80 column video display, a
REAL keyboard (from a Sperry
UTSS-28), and trying out DOS-65
(I bought a copy but won't
bother and I haven't had time
to find out why). I also want to
move OSI's EROM program
driver from BASIC to my XPLO
system.

Lercy Erickson
Roseville, MN 55113

********

ED:
Enclosed herein is a check to
renew my PEEK (65) subscription
from a still loyal OSI user.
I say this because it has be-
come a monthly habit of mine
to open to the back pages of
PEEK or BYTE and count the
number of people selling their
OSI's and to shake my head and
wonder. My machine, Eddie
(Electronic Digital Data In-
terface Engine), who happens
to be an OSI CA-4P 8" floppy
system will always be with me.
Mainly because I've put too
darn much work into modifying
him.

Eddie consists of:
- a 582 microprocessor board,
- a 540 video board, a D4H flop-
ppy controller/memory board, a
527 memory board, a front pan-
el display board, and a CA-20
I/O board mounted on an eight
slot backplane and enclosed in
a 12" x 12" x 16" white and black
plexiglass and metal cabinet.
- a Shugart SA-801R floppy
drive mounted in a smaller

- a detached keyboard (the 540
in a separate cabinet).
- an Epson MX-80 printer.
- various CA-20 connected per-
ipherals including a 3 octave
organ keyboard, Eprom burner,
Steve Ciarcia's Sweet Talker
voice synthesizer, A/D converter
(16 channel), stepper motor
controller, and solid state AC
switches.

Sometime in the near future, I
hope to get a Corvus 10 mega-
byte Winchester going with my
system. Since this drive
comes with an intelligent con-
troller, the physical inter-
face should be relatively
simple (such as the design
that appeared in the Oct. '83
issue of Dr. Dobb's Journal),
but the software patches to my
operating system are still
difficult (for me, anyway).
Has anyone in OSI land had any
experience with a project of
this sort?

Finally, I would like to men-
tion my first choice on my
Future wish list. Namely, an
upgrade for current OSI users
based on the new Western
Design CMOS 16 bit version of
the 6582 (one version being
pin-to-pin compatible with the
old 6502).

Douglas M. Petersen
Fresno, CA 93726

LETTERS

ED:
Maybe there are some fellow
CP4 computerists out there
like me who are enjoying Dwo
Quong Pok Lok's software.
I am using the WP6582 word
processor with great satis-
faction. There is one feature of
it that I wish I could change.

When you select the option
- a

Does anyone know how to modify
this program? Is Dwo Quong
still in business? I have had
no success in communicating
with him or them or whatever.

Carl M. King
Sarasota, FL 33579

Carl:
We also have tried communicat-
ing with Dwo Quong on your
behalf, and like you have been
unsuccessful. I fear the news
it not good. We do not have
an answer for you, but hope
one of our readers can be of
help.

Peek Staff

********

ED:
I'm responding to the letter
by J. F. McConkey III at
Rockville, MD. The Superboard
II/CI.P is extremely easy to
interface to a modem.
He can build up the RS-232 port if he likes, or do as I did, tap TTL data I/O lines of the ACIA (consult OSI schematics).

Also, I would like to respond to the two hardware expansion articles by Messrs. Cortes and Tasker in the Jan. 84 issue.

Mr. Cortes goes to the trouble of addressing each slot on the expansion board. Why? Does it ultimately save some decoding on the board in that slot?

Mr. Tasker's memory board duplicates some of the features I have on my home-brew expansion. However, he added two ICs that are really unnecessary. Those are IC8 and 9, 8728 buffers. The two found on the 680 board are more than adequate for the task. But if buffering should be necessary, my parts catalog tells me that one 74L0245 would be cheaper and more efficient. The same applies to memory chips - one TMM2016 will replace four 2114s at about half the cost.

Lastly, why does he use a 1kA resistor in series with +5 volts going to the inputs of IC-6? My TTL data sheets indicate that the chips can handle a high input up to +7 volts.

Bruce Showalter
Atlinen, TX 79501

* * * *

ED:

I recently purchased a CA-22 analog I/O board from another OSIer who never used it. I use it in conjunction with a modular analog synthesizer for audio processing and analysis. I have developed a spectrum analysis package (mucho graphics) which will analyze waveforms of any number of steps (samples) and print the computed data on a Gemini 10X, if desired. Requirements are 48K, polled keyboard with DAC, and a 5 1/4 inch disk drive. Anyone interested should send a 5 1/4 inch disk, with either return postage (5.00) or software on the diskette (I'm interested in anything and everything). There is more to the package than I have described.

My question is, do any of your readers have the adventure 'Volcano of Kanthor'? I tried to buy it from Orion before they went under but they no longer handled it. I would gladly send the $50.00 list price to Mr. Bassman for it.

Can any of your readers help?

Jack Deckard
3888 Laguna Dr.
Columbus, OH 43232

* * * *

ED:


I gave Mr. Kuhn's Utility a try on our O2 OEM and found that a change was required in four lines to make this "nifty" program work on our unit.

As follows:

220 DISK!"CA 2279 =00,1"
230 DISK!"SA 88,1=2379/1"
235 DISK!"CA 2279 =05,2"
258 DISK!"SA 88,2=2379/1"

Also, I have changed line 210 via "MEDUMP" (to find the new address) because on our disks we prefer "CREATE" and "DIR- SRT" directly behind "BEXEC**".

Dick Wilkinson
Fairview, TN 37062

* * * *

ED:

How does the "merge" command work or how do you merge a set of files in WP-6582 (The Chinese word processor)? When I go out of the processor by using "exec," it drops me into 65U and I can load or save files but there is no explanation for merge in the manual. I gather it is a 65U command function rather than WP-6582. Can anyone help? My copy does not have "file clerk" if that helps.

Neil Dennis
Bliss, NY 14024

Neil:

Your WP-6582 must be a true antique. Every version we can remember has had in its screen menu Load, & Merge, which appends the next file to be loaded to the back of the current file. The command is in WP-6582 not OS65U and simply does not reset the RAM pointer when making the next Load.

Peek Staff

* * * *

ED:

Thank you for printing my letter in the April issue of PEEK(65). What I was interested in, however, was not how to rewrite Apple programs to run on the OSI. Rather, I wanted to find out what kind of hardware changes can be performed to make the OSI "Apple-compatible," i.e., run the Apple programs as written. Taking this a step further, how about IBM-compatibility? Anyone out there working on this?

T. J. Hirase
Yonkers, NY 10703

* * * *

ED:

Re my article on a Tax Preparation program published in the Apr. 84 issue of PEEK(65), I am sorry to say a few minor bugs slipped by me, none of them major, thank God, but annoying to some I am sure.

I have corrected all these bugs, and have enclosed a new machine listing.

The corrections were made on the following lines:

Corrections on lines 185 and 415 now allows the proper filing status adjustment to be printed on Schedule A if printed directly after the file is loaded. Before it was not saved in the file and would have printed 00.

Corrections to lines 255,260, 270,585,515, and 770 correct round off errors that might occur.

Changes in lines 385,440,495, 520,600,645,1040, and the addition of line 522 serve two purposes. First in the old listing, if a person did not use Schedule B, but entered interest and dividend data directly on the 1040, he would have found that it disappeared when he printed it out. These changes correct that problem and speed up the calculations by eliminating unnecessary runs through the whole calculation set.

Finally, line 15 has been changed to reflect the revision.

Next year, I plan improvements to the program, and will keep you advised if you are interested.

Thank you for your continued support.

Robert S. Baldassano
San Jose, CA 95124

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SEE LISTING ON NEXT PAGE
**AD$**

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