PEEK (65)

The Unofficial OSI Users Journal

Editor: Al Peabody
Vol. 2, No. 2, February 1981

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INSIDE

Column One

This month's PEEK(65) is a great example of the sort of varied, valuable information we can provide for each other through our publication. I am particularly excited about the Assembly Programmer's Guide to OSI Board Interfacing which starts this month ... but then again, that is right where I am -- trying to write assembly language programs to do interfacing between my computer and other OSI computers. Others, working on other projects, may be more excited about other articles..

...Such as the article on C4P modifications by TOM, INSERT NAME. I should tell you that this excellent article has been fairly heavily edited, and therein lies a tale. When we first received the manuscript, I didn't think we would be able to use it. The author, though obviously a hardware expert, was also just as obviously not a native American. His English was somewhat convoluted and, to me at least, not always crystal clear. However, as I read through the paper, I was fascinated by what he had to say. We concluded that the information was far too valuable to pass up, and so I edited the paper. So now the situation is reversed. Whatever lack of clarity remains is more likely to be a result of the editing than the original writing. I hope you can work your way through the maze which results when a paper is passed through several hands and minds on the way to publication.

Equally exciting to me is the fact that

THE PEEK(65) NATIONAL CBBS IS ON THE AIR!!

A CBBS, or Computer Bulletin Board System, is of course simply a computer plus attendant communications and file management software which allows computer users to exchange messages and programs over the telephone. Provided you have a modem. More particularly, the PEEK(65) National CBBS is an absolutely free medium for all OSI users to exchange messages, hints, questions, problems, programs or whatever. It is on the air from 5 to 9 PM EST (at least) seven days a week. Here's how to use it. Just dial (301) 268-0356 any time. If the system is not up, the phone will not be answered. If the system is up, you will hear the carrier tone. Plug the phone into your modem, and type either a control-c or simply a carriage return, and you are on. The system is completely self-documenting from there. Brief messages will prompt you as to what you need to do. The only rule is to terminate your conversation with the board by selecting "Exit" rather than simply hanging up in the middle of something. This is so that the next person to use the CBBS will not find himself in the middle of a message or something.

The CBBS is new. As of this writing, there are just a dozen or so messages on the board, mostly put there by me. If enough of you put your FOR SALE, WANTED, NOTICE and USER messages on the board, it will soon be both fun and very valuable, and we will seriously consider expanding the hours of operation, or perhaps even installing an 800 toll-free number in exchange for a token membership fee to pay for it. So do use the system, and help us to find the programs we need to make it even more useful, like file-share programs.

A hardware tip. Raycal Vadic, well known for manufacturing communications hardware, has announced what sounds like the Mercedes of Modems. This new device works over a plain two-wire phone line, at either 0-300 baud or 1200 baud. Furthermore, you need not select which speed you want. It determines the speed of the signal being fed to it, and adjusts itself accordingly! Two drawbacks -- since it works differently from other 1200 baud modems, it cannot be used except with others of its own breed at that speed. As I understand it, it will work fine with other 300 baud modems. And of course, it is not cheap. The price is about $900. But if you need to hook two machines together, don't want to pay an arm and a leg to the phone monopoly each month for a 4-wire line, and 300 baud operation is too slow for your heavy, daily computing load, it may be the machine you have been looking for. We will let you know when we have more information, first by putting an announcement on the CBBS as soon as we know anything, then by publishing full details in PEEK(65).

al

A LETTER FROM THE NEW PRESIDENT OF OSI

I want to take this opportunity to introduce myself to you and tell you a little about M/A-COM (pronounced Maycomm) and plans for Ohio Scientific and why we believe that this exciting company and our association with it will be very beneficial to all the dealers and current and future customers of OSI.

First of all, who is M/A-COM? .....M/A-COM is a NYSE-listed company with sales last year of approximately $322 million with a history of growth and a very strong balance sheet and an equally strong commitment to become the leading telecommunications company of the 80's. M/A-COM sees Ohio Scientific as being an integral part in the plans for the business and home information systems management products of the future.

How does this affect OSI and its distribution network today?.....First, let me say that we are committed to expanding our traditional marketplaces and to producing future generations of competitive products for OSI and its markets.

Second, M/A-COM provides us with the capital needed for the growth expected and to open up new opportunities for us all. You should be seeing results of this capital commitment in the very near future.

Third, M/A-COM support will allow us to add personnel to support the dealer network and the customer in much more depth than has been possible historically. In that regard, I would appreciate hearing from you personally with your (hopefully constructive) comments which you feel would aid Ohio Scientific and your efforts in making 1981 a truly banner year. I cannot guarantee that every suggestion will be accepted, but I will guarantee you that all will be read and taken into account as we plan our programs for the future.

Finally, what does my appearance mean?.....First, both Mike and Charity are staying with Ohio Scientific, so it means that Mike Cheiky, as Vice President of Research and Development, will have more time to devote to the development of new products and new concepts for the growth of Ohio Scientific. Charity will remain as Vice President of Purchasing. I am assuming the presidency of the corporation and will be responsible for its operation, as quickly as Mike and Charity can bring me up to speed.

In summary, I believe that the financial resources and dedication of M/A-COM, combined with the outstanding products of Ohio Scientific, will result in very rapid growth in this exploding marketplace.

Harvey P. White
President

* * * * *

PEEK(65) is published monthly by:
DBMS, Inc., Owings Mills, MD 21117.
Editor: Al Peabody

Subscription rates:

US (surface mail)	$12/year
Foreign (air mail)	$20/year
Back issues	$1.50/ea

For back issues, subscriptions, change of address or other information, write to:

PEEK(65)
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C4POWER

Enclosed please find some articles for our OSIers. Since I have started to read PEEK(65), it helped me a lot to understand BASIC-in-ROM of my C4P, but I think articles for C4P is not so many. Some of Superboard II/C1P and C2-4P articles help me, but looks like board is quite or little different than my C4P. I want to have more articles for C4P, therefore I will send you some of mine to encourage other C4P-ers.

Some day I want to upgrade my C4P to mini floppy version, but I did quite a lot of modifications which may force OSI engineers to reject my upgraded C4P, or let them charge too much.

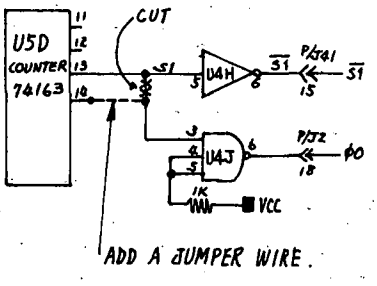
I'd like to show you some of the results of my night work here. These mods were made directly to the circuit boards; therefore, I highly recommend that you learn how to handle MOS ICs and have an oscilloscope handy before you start these projects.

1. DOUBLE THE SPEED

My C4P uses the 6502A CPU and 2114L-3 RAMs. So why not try to increase the clock rate! As you know, the C4P uses the 12MHz video clock as the CPU clock, at 1MHz. Here's how to change it to 2MHz. First, take the 540 board out and cut the foil which connects pin 3 of U4J and pin 13 of U5D. Pin 13 of U5D is also connected to pin 5 of U4H; leave this foil as it is, otherwise, you will get higher sound output. Next, using 30 gauge wrapping wire, connect pin 3 of U4J to pin 14 of U5D, which is 2.01399 MHz output in my C4P. Put the board back in the machine, and you're done! When I checked how fast my BASIC runs with this higher rate, comparing with Mr. Carlson's article in Micro-Computing (Oct), I found it runs twice as fast as Mr. Carlson's C2-4P, and I have had no errors when running my programs, LOADing or SAVEing. For example, A=1 runs at 0.7ms instead of his 2.0ms, "PRINT" at 26ms vs. 72ms, C=A+B at 1.1 ms vs 2.6ms, C=A*B at 1.3ms vs. 3.4ms, etc.

When I played Alien Invaders from Aardvark ($7.95), it was quite realistic at the 2MHz speed, even though this program was written in BASIC with lots of POKEs & PEEKs and some of my own modifications, such as Joy Stick operation, machine language screen color change when a shot hits a UFO or tank, etc.

Then I further modified my C4P to allow switch selection of the two clock rates, and ran it at the original 1MHz clock for comparison. This result convinced me not to try the 1MHz clock for this game any more.



CONTINUED

C4 cont'd

2. Aardvark's NEW MONITOR ROM
When I saw the Aardvark ad in PEEK(65) #10, I found what I was waiting for. It was the C2E Monitor ROM, CEGMON. I Thought I could just pull out the old ROM and plug in this new ROM. You can, but you have to do lots more for the C4P. I needed a 74154 decoder which Radio Shack handles, but it was out of stock. I paged through the phone book to find who else handles it. It took me almost half a day including visiting a local parts supply company. The 74154 stays on U14 of the 502 board, but as a piggy back. If you are afraid of a messy looking computer, you may not want to try this mod. If not, it is a good idea. The 74154 is glued onto the U14 by a small sticky pad that they supply. My C4P gets so hot that I cannot touch the screws that hold the power unit down to the case. Therefore, I arranged the 74154 in the same direction as the other ICs. Then I could solder pin 24 of the 74154 to the lead wire of R18. This way, I don't have to worry about the sticky pad's strength. I thought the new ROM would provide a one key screen clear, but it doesn't; but I can use PRINT CHR$(26) in my BASIC programs. This provides a very fast screen clear like my own machine language USR(C) which clears symbols and color. Overall, I am satisfied with this new ROM monitor, even though it costs too much for me ($59.95).

3. ADD 4 EXTRA I/O ports
When you examine the 540 board, you can see there is one port not used in the standard machine. It is $DE00 (56832) bit 3. When you POKE $DE00 with 8 ($08), it enables AC control OSC. I could use it, but I will keep it for future use. Then I decided to add another 74175 right on to U4G as a piggy back; this way I can get an extra 4 write only I/O ports which now I'm using for graphic mode control and RS232 port control. I used some of the molex I/O connecter pins which are not used such as P/J1 pin 3,4,10,11.* These ports are assigned as $DE00 bits 7,6,5,and 4.
* These pins are already connected to the circuit, so you have to cut off incoming foil lines.

4. ADD AN RS232 PORT
When you look at the 502 board, you see a blank portion around the edge, this space is for an RS232 port -- OSI has reserved it for you. But if you want to stay with cassette tape, you will have to find a place for another 6850. I couldn't find enough room except piggy-back style. Also my 6850 gets kind of hot on the back -- it has erased/burned off the "6850" stamp already! So I used a 74157 2-to-1 MPX. First, we need a -9~-12V power supply and a few parts. The power supply was the biggest problem for me. When I bought my CM9 RAM board with 8K memory, I had to add an extra 5V power supply, and I did it. At that time I made a ±12V which I now use for the RS232 port--or you may buy the power supply which your OSI dealer sells.

Required parts in addition to - 12V power supply:

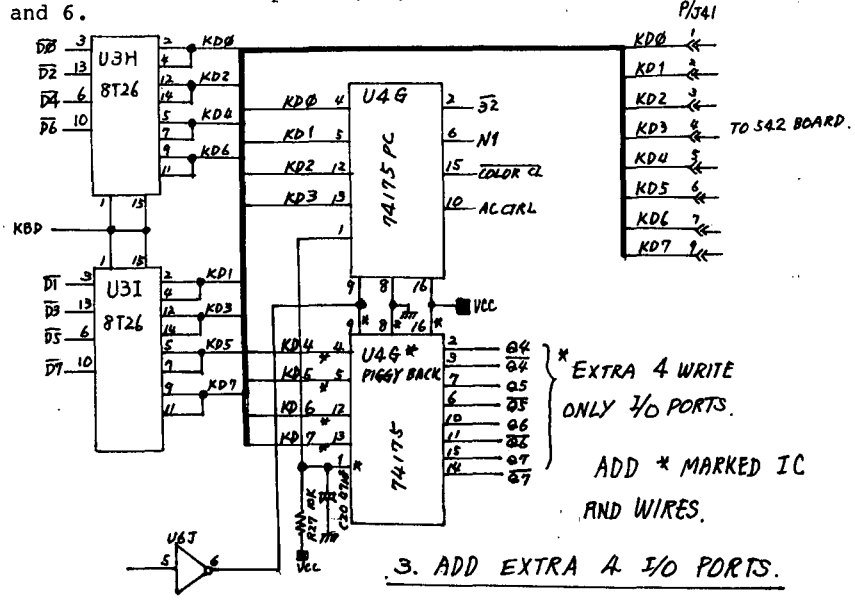
U20	7404 Hex NAND gate
U31	7404 " " "
U21	74157 2-TO-1 MPX
Q1,2,3	PNP TRANSISTORS
Q4,5,6	NPN "
D3,4,5	1N914 DIODES
9	10K RESISTORS
3	4.7K "
3	470 "

IC Sockets preferable.
12 pin molex connector set.

Place these parts on the board and solder them. You must locate the part positions from the schematics yourself by carefully following all foils to see where they go. Also, you have to cut the foils which connect the molex 12 pin connectors and U41 pins 2, 4, and 6.

You can eliminate some of the above mentioned parts, depending what kind of RS232 application you have in mind. I wanted mine as a future serial printer port since I don't have the printer yet, I have not checked it, but I did check with my oscilloscope. I used $DE00 bit 7 as the Cassette/RS232 selector. You may be able to use bit 3 if you don't do project No. 3 - 4 extra I/O ports.

NOTE:
Schematic drawings are based on Sams photo-facts.

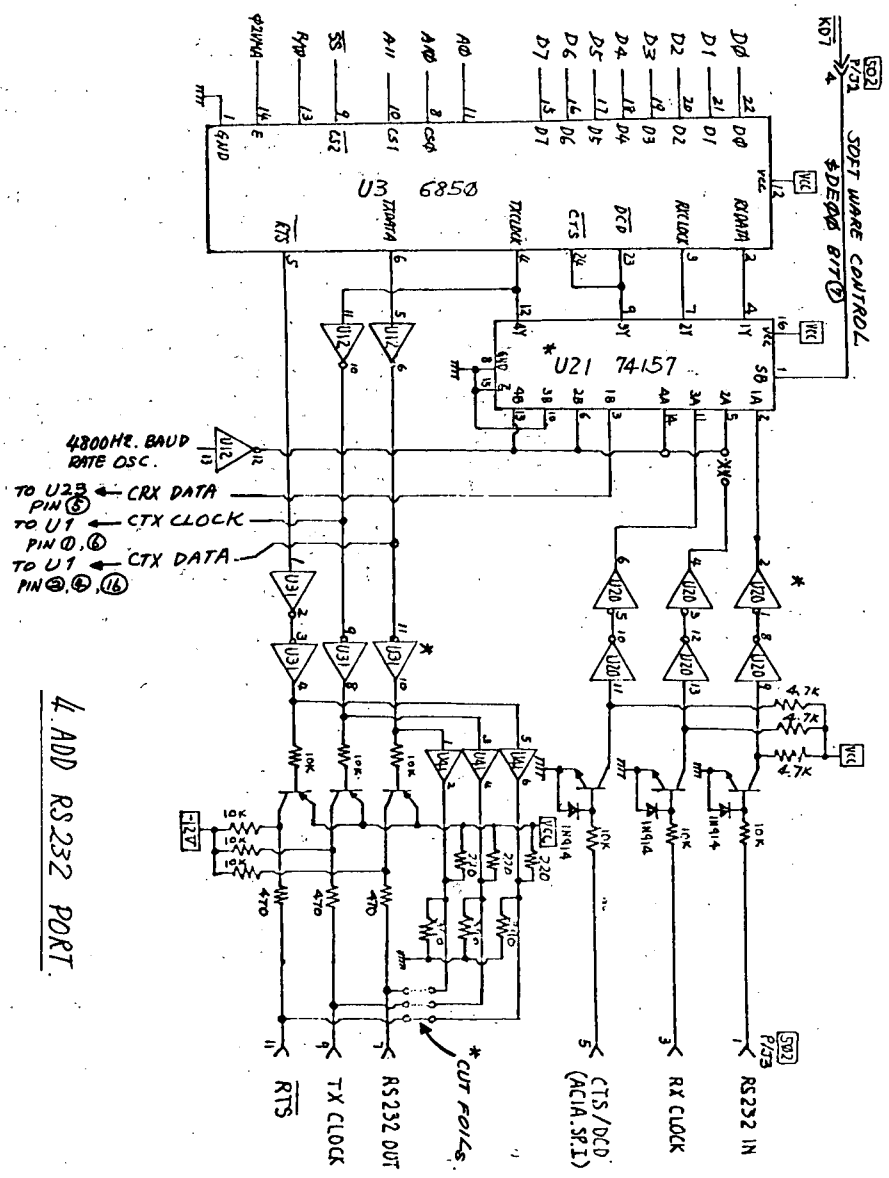


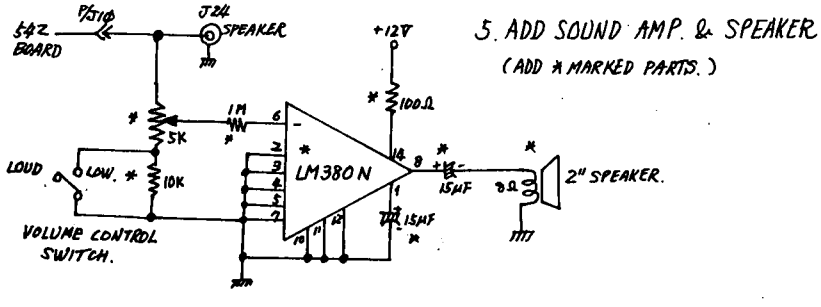
continued

5. ADD sound Amp. & speaker. I added an LM38ON power amp IC and an 80 cent 2" speaker to my computer. I had to add a small P.C. board right next to the keyboard. I also used the +12V power supply which I had built in previously.

6. ADDITIONAL COMMENTS
Since I made quite a few mods, I had 2 major problems which I would like to show you here so you can avoid them:
A. Broken 12MHz X-tal. This crystal is located right at the edge of the 540 board and its leads are very fine, easily broken. I rocked the board up and down quite often when I was working on it. This bent the X-tal and broke its lead. My C4P was down about 2 weeks to get a new X-tal.
B. Bad connector contact. Since I pulled out and plugged in the 502 board almost every night, these molex connectors became loose and some made very poor contact, so of course I had some strange screen clears after pushing the BREAK button and my C4P sometimes acts crazy. I may have to replace these loosened connectors some day. I know I can buy the molex connectors from Microcomputer world of Grand Rapids, MI.

I wanted high resolution graphics for my C4P. I spent many nights trying to get some idea. All I could think of was 128 x 128 resolution, utilizing the existing 2K display RAM. Then I came up with the idea to use the Color RAM(1K) too, and add another 1K for upper 4 bits of color RAM. In this way I can get 128V x 256H resolution. I modified my 540 board and added another prototype board to an unused slot. With the standard OSI graphic chip, this project made my C4P look like garbage. So I made a new one. With my new machine language character generator and plot routine I can display 512 8X8-dot-structured characters on my screen including Japanese characters. Of course I have to stick with B/W display since I used the color memory as graphic RAM. I'm now working on 4-color 128 x 128 graphic resolution utilizing what I already put in my C4P. For 256 x 128 graphic I process the signals prior to shift register U3D; if I skip U3D and use every bit as only color information, I may be able to get 4 color 128 x 128 graphic display. This is what I'm now working on.



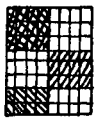


CONTINUED

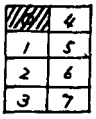
C4 CONT'D.

I enclose a part of my schematic drawing for 128x256 graphics. You can use it as an idea booster, but note that it is not the complete drawing.

If anyone can help me with an easier way of increasing the resolution without throwing away the 540 board, let me know. 256x192 resolution with color or without, is it possible? Or can anyone burn a ROM for me for my Japanese character generator and 128 x 128 graphic element?

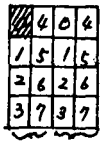


128H x 96V GRAPHIC
BUT ELEMENTS ARE UNEVEN.
CAN BE PUT IN CGN ROM
REQUIRING 64 OF ADDRESS.



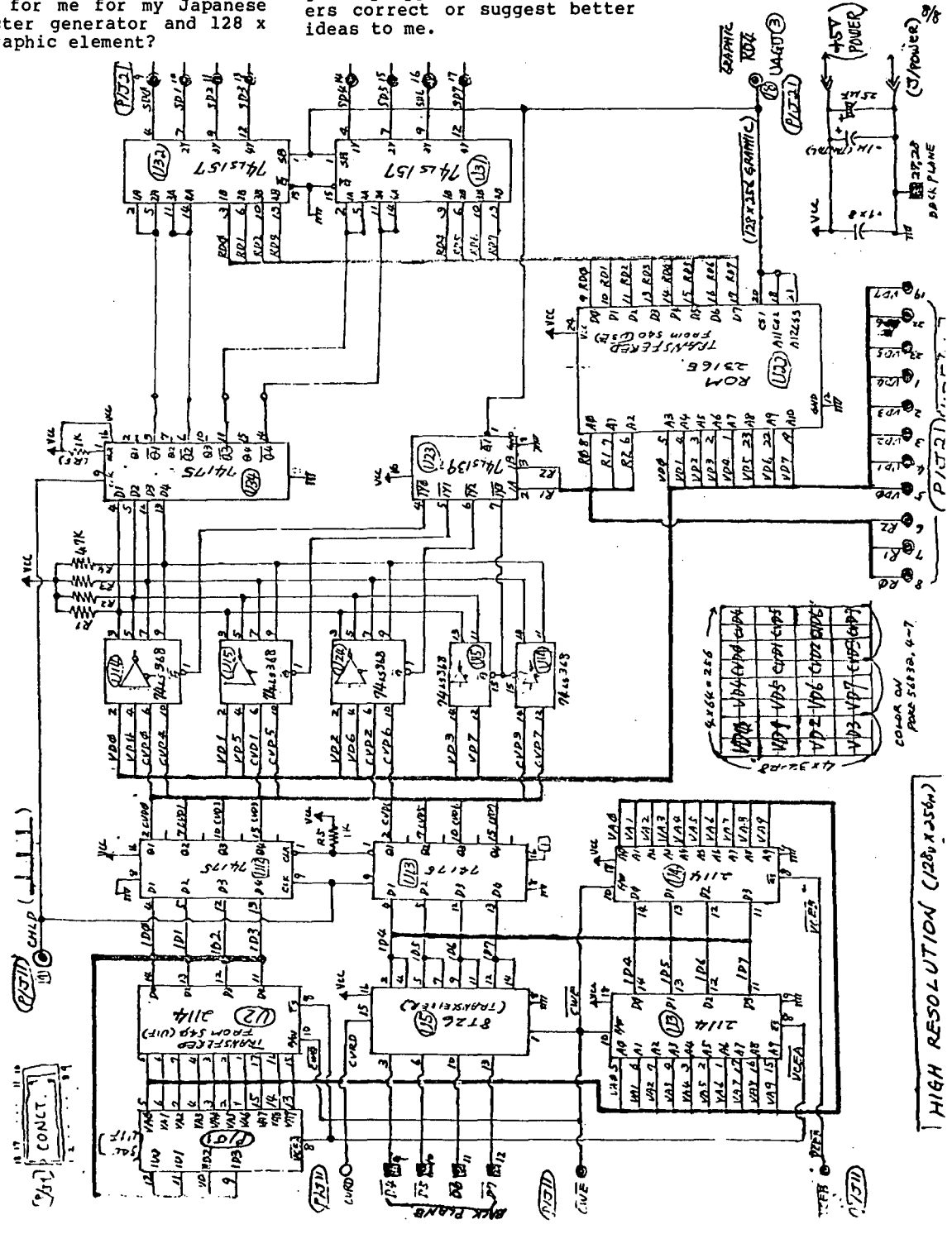
128H x 128V GRAPHIC
REPLACES ROM U22 OR.
ADDED PARALEL.
SOFTWARE SELECTABLE IF
ADDED PARALEL.

These are the ideas which came from my poor head, and I will greatly appreciate if you OSI-ers correct or suggest better ideas to me.



256H x 128V GRAPHIC.
UTILIZE 4K OF RAM AS
DISPLAY MEMORY.

by Yasuo Morishita
950 Beau Dr. #106
Des Plaines, IL 60016



SOFTWARE CONSULTANTS

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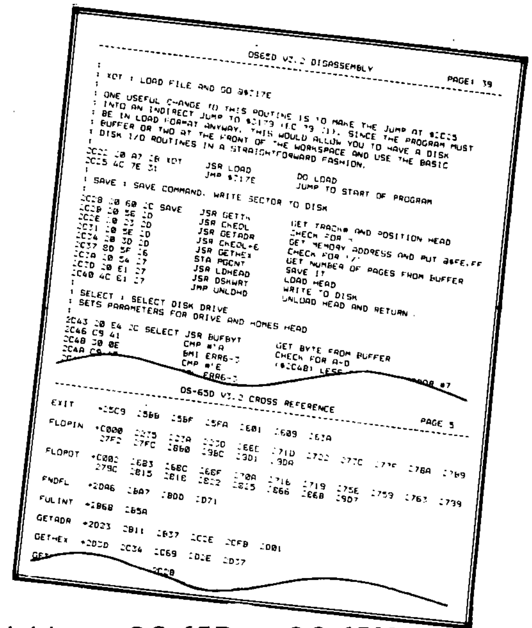

1. OS-65D V3.2 DISASSEMBLY MANUAL With CROSS REFERENCE LISTINGS. . .

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- Occupies 1¼K of memory under OS-65D.

* * * * * * * * * *

A quick note about Software Consultants for any PEEK(65) readers who may not be familiar with us. We are an independent software vendor, and are not affiliated with Ohio Scientific in any way, even though all our products are written for the OSI user.

We at Software Consultants have long been aware of the need for high-quality, well-written software for the serious OSI user. Due to the present (and continuing) lack of such materials from the manufacturer, our business is centered around providing you with the type of quality software and documentation we feel you really need and want. You'll find most of our products are either modifications of OSI code, or complete replacements of it that we've written to suit ourselves and our customers.

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- Transaction Listing
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NOTES

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BUS-II CPA requires BUS-II V 3.0 or V 3.1.

OS-DMX (OS-DMS EXTENDED)

Digital Technology's Microsystems Information Management Package superimposed on OS-DMS file structure, resulting in a command-oriented OS-DMS-compatible database management system. OS-DMX can be used in place of (or in addition to) DMS nucleus, query, sort, and many other modules.

OSI users now have the best of both worlds. OS-DMX means synergy, standardization, and support. The synergistic effect of merging the best features of the industry's two leading database management systems results in spectacular performance. And standardization will provide a continually expanding list of business application programs for OSI owners. But perhaps most important of all is support. Digital Technology supports its software 100%.

Control Files allow the operator to create a limitless number of specialized "modules" using the system's English-like command language, and store these operations for later recall as needed.

A Program Sequence Executive (a form of job control language) allows the operator to pre-define a number of BASIC programs, database operations, etc., for "pre-programmed" computer operation. These routines can be stored in executive control files which can, in turn, supervise the operation of DMX control files, BASIC or machine-code programs, etc. The operator can actually instruct the computer to "run itself".

DMX consists of three primary programs for Input, Edit, and Report generation. A number of auxiliary programs support the core operations: Database Create creates DMS-compatible files; Database Mapper displays a detailed view of the database files; two Database Sort programs allow in-memory or disk file sorts. Additional programs will be released in the near future including DMX-MAIL (mailing label generation), DMX-STAT (advanced statistical package), and DMX-COPY (allows modifying database files after-the-fact).

A number of applications packages previously available only to MIMP users will be converted to DMX format, including electronic cash register polling, sales analysis, restaurant inventory and menu explosion, and point-of-sale terminal operation. These and virtually any OS-DMS-based applications programs can be used in conjunction with the DMX package.

DATABASE INPUT OPERATING COMMANDS:

Exclude / Fields / Fixed / Help / Include / Input / Journal / Output / Quit / Reset / Run / Screen / Store / Use

DATABASE EDIT OPERATING COMMANDS:

Add / Again / Change / Count / Clean / Delete / Fields / Help / List / Output / Qlist / Quit / Reclaim / Replace / Run / Store / Sum / Use

Command modifiers: Range, Fieldname(s), Conditions

DATABASE REPORT OPERATING COMMANDS:

Average / Break / Column / Exclude / Fields / Heading / Help / Include / Output / Print / Quit / Reset / Run / Store / Total / Use

Command modifiers: Range, Fieldname(s), Conditions

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Assembler Programmer's Guide to OSI Board Interfacing

Tabulated for Digital Technology, Inc.
by:
Ken Holt of Virginia Computer Consultants

Introduction

Ohio Scientific makes several different boards which are used to interface an OSI-48 bus-based computer to some outside peripheral. If the intended application is a standard use, such as a printer interface or a multi-user terminal, little needs to be done besides plugging in the board and letting the operating system support take over. However, if your application is not one forseen by the support in 65D, 65U, or WP-2, you will end up having to program the support yourself, most likely in assembler language. This guide is primarily designed to help programmers who are working on solutions to this type of problem.

The assembler programmer needs to know two major things about the board he is working with: the addresses of the various data, control, and status ports; and the specifics: the meanings and uses of the control and status bits. In addition, projects of this type are likely to be using odd-ball cabling and connectors, so pinout information would be helpful. All three classes of information are available in existing documents from OSI and other sources, but not in one compact unit. The purpose of this guide, then, is to provide the programmer and hardware specialist with a concise complete guide containing all of the needed information.

Interface Chips

Two integrated circuit chips dominate OSI interfacing arrangements: the 6820/6821 Peripheral Interface Adaptes (PIA), and the 6850 Asynchronous Communications Interface Adapter (ACIA). With the exception of one board, all interfacing is done using one or both of these chips. The exception is the old OSI 430 board, which uses the S1883 or AY-5-1013 UART instead of the 6850 ACIA. The UART (Universal Asynchronous Reciever and Transmitter) is an asynchronous interface chip which is based on a slightly different philosophy of operation. To avoid going over interface chip information which is common to many of the boards, the three chips will be covered first.

6820/6821 PIA Interfacing

The 6820/6821 chip contains two 8-bit interfaces called A and B. Port A and Port B are addressed uniquely, but otherwise are logically identical. Each interface contains two control registers and one data register. These are accessed, however, through only two addresses. The first address provides access to either the data register or the data direction register. The second address is that of the main control register. Each of the eight bits of the control register governs some aspect of the port's mode of operation. One of these bits controls whether the first address accesses the data register or the data direction register. The remaining bits in the control register are used for some pretty fancy hardware handshaking protocol and are rarely used on OSI boards. Except for the register selection control bit, the control register bits should be set to zero unless the discussion for a board specifically advises otherwise.

The data register provides a one-to-one bit mapping to the port pins, labeled either PA0 thru PA7 or PB0 thru PB7, depending on which port it is. Each individual bit can be defined as either input or latched output by using the data direction register. Each data direction bit corresponds to the same data register bit. If the direction bit is 0, the data bit is input. If the direction bit is 1, the data bit is latched output. This provides a high degree of flexibility in interfacing to external circuitry and devices.

6820/6821 PIA Summary

Address ending in binary 00:
(Usually hex xxx0 for OSI boards)

Data Direction Register:

DDA7	DDA6	DDA5	DDA4	DDA3	DDA2	DDA1	DDA0

-or-

Data Register:

PA7	PA6	PA5	PA4	PA3	PA2	PA1	PA0

Address ending in binary 01:
(Usually hex xxx1 for OSI boards)

Control Register:

0	0	0	0	0	RZSA	0	0

Address ending in binary 10:
(Usually hex xxx2 for OSI boards)

Data Direction Register:

DDB7	DDB6	DDB5	DDB4	DDB3	DDB2	DDB1	DDB0

-or-

Data Register:

PB7	PB6	PB5	PB4	PB3	PB2	PB1	PB0

Address ending in binary 11:
(Usually hex xxx3 for OSI boards)

Control Register:

0	0	0	0	0	RZSB	0	0

DDAn - Port A direction bit n
0=Input
1=Latched output
PAn - Port A data bit n
RZSA - Register Zero Select for PORT A
0=Data direction register
1=Data register
DDBn - Port B direction bit n
0=Input
1=Latched output
PBn - Port B data bit n

6850 ACIA Interfacing

The 6850 chip contains a single asynchronous serial interface, controlled by two addresses. The first address is for control and status of the interface, while the second address is the data path to the external device.

The first address is used in two different ways, depending on whether you are reading or writing to that address. Reading the address returns the interface status register, while writing will set certain operating modes or perform control functions. The second address is the data path register, which is used by either writing (to send data to the device) or reading (to receive data from the device). However, before the data path is used for either function, the status register must be checked to see if the interface is able to accept a character for transmission, or if a character is available to read from the device.

6850 ACIA Summary

Read address ending in binary 00:
(Usually hex xxx0 for OSI boards)

Status Register:

IRQ	PE	OVRN	FE	NCTS	NDCD	TDRE	RDRF

Write address ending in binary 00:
(Usually hex xxx0 for OSI boards)

Control Register:

RIE	TC2	TC1	WS3	WS2	WS1	CDS2	CDS1

Read/Write address ending in binary 01:
(Usually hex xxx1 for OSI boards)

Data Path Register:

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0

IRQ - Interrupt request
0=Normal
1=Interrupt requested
PE - Parity error received
OVRN - Over-run condition received
(Computer didn't read incoming data fast enough)
FE - Framing error received
(Received data was garbled)
NCTS - Not clear to send (Clear to send pin not high)
NDCD - No data carrier detect (Carr. detect pin not high)
TDRE - Transmit data register empty
0=You may not write to the data path at this time
1=You may write to the data path at this time
RDRF - Receiver data register full
0=A character is ready to read from the data path
1=No character is available to read
RIE - Receive interrupt enable
TC2 - 2nd bit for transmit control
TC1 - 1st bit for transmit control
WS3 - 3rd bit for word select
WS2 - 2nd bit for word select
WS1 - 1st bit for word select
CDS2 - 2nd bit for counter divide select
CDS1 - 1st bit for counter divide select
DBn - Data bit n

TC2	TC1	/RTS output pin	Irpt on TDRE	Send break?
0	0	Low	Disabled	No
0	1	Low	Enabled	No
1	0	High	Disabled	No
1	1	Low	Disabled	Yes

WS3	WS2	WS1	Bits/Character	Stop bits	Parity
0	0	0	7	2	Even
0	0	1	7	2	Odd
0	1	0	7	1	Even
0	1	1	7	1	Odd
1	0	0	8	2	N/A
1	0	1	8	1	N/A
1	1	0	8	1	Even
1	1	1	8	1	Odd

CDS2	CDS1	Function
0	0	Divide clock by 1
0	1	Divide clock by 16
1	0	Divide clock by 64
1	1	Issue master reset

S1883/AY-5-1013 UART Interfacing

The S1883 or AY-5-1013 UART (they are identical) works much the same way as the 6850 ACIA chip. The UART is more common in 8080 and Z-80 equipment, while the ACIA seems to dominate equipment based on 6800 and 6502 processors. The ACIA and UART have more common features than differences. In the most basic terms, both devices are used to interface serial devices to paralell data buses, only the method of implementation varies.

The S1883 UART has four registers: control (write only), status (read only), data path read, and data path write. Each of these four can be given any address desired, using appropriate address decoding logic. As in the ACIA, the data path register can be written to or read from only after the appropriate status bit says it is ok to do so. Unlike the ACIA, however, a special control signal must be sent back to the UART after a character is read from the data path by the computer - this frees the UART to read the next character from the device. On OSI boards, this control signal is given a separate address to allow more complete cwrol. Another signal is the master reset which, like the acknowlege control signal discussed above, is usually assigned a separate address. The specifics of all the addressing are given in the discussion of the OSI board.

S1883/AY-5-1013 UART Summary

UART Status Register:

TBMT	1	1	1	RPE	RFE	ROR	ODA

UART Control register:

POE	NDB1	NDB2	NSB	NPB	N/U	N/U	N/U

Data Path Register:

DB8	DB7	DB6	DB5	DB4	DB3	DB2	DB1

TBMT - Transmitter buffer empty
RPE - Receiver parity error
RFE - Receiver framing error
ROR - Receiver over-run
ODA - Output data available.
0=No character is available to read from data path
1=A character is ready to read from the data path
POE - Parity odd/even
0=Odd parity
1=Even parity
NDB1 - 1st bit for specifying number of data bits
NDB2 - 2nd bit for specifying number of data bits
NSB - Number of stop bits
NPB - No parity bit
0=Parity
1=No parity
DBn - Data bit n

NDB1	NDB2	NSB	Bits/Character	Stop Bits
0	0	0	5	1
1	0	0	6	1
0	1	0	7	1
1	1	0	8	1
0	0	1	5	1.5
1	0	1	6	2
0	1	1	7	2
1	1	1	8	2

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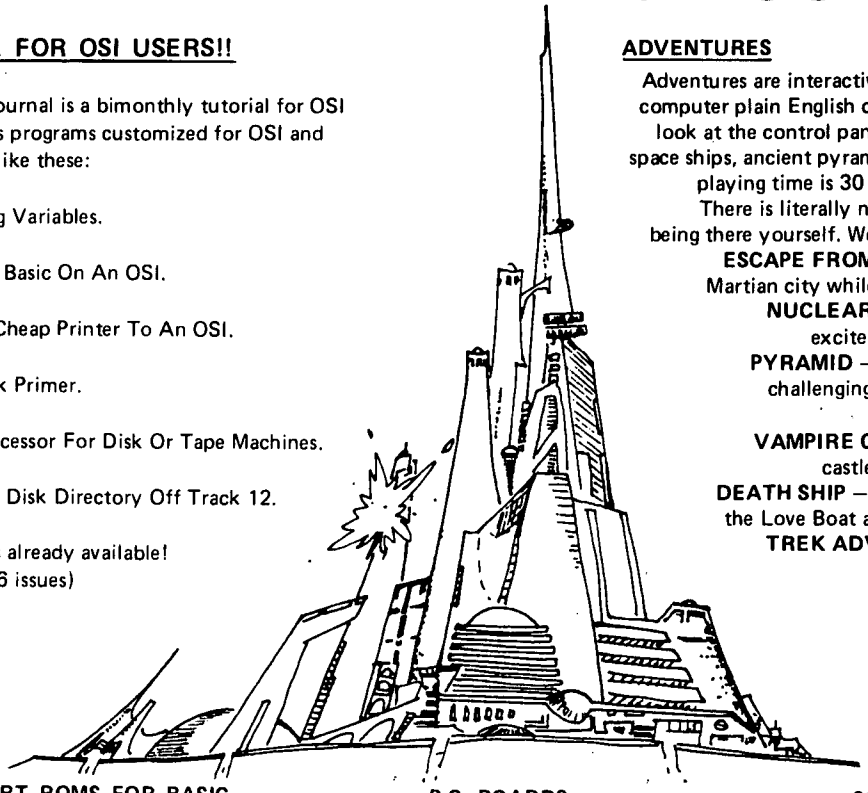

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CASSETTE CORNER
by David A. Jones
8902 SW 17 Terrace
Miami, FL.

CHECKBYTE

Although the cassette interface supplied with the SII/ClP is usually reliable, it is also slow. There have been several modifications published to increase the speed to 600, or even 1200 baud, but usually reliability is sacrificed for speed.

I increased the speed of mine to 600 baud a year or so ago and generally have been happy with the result, but occasionally a character gets dropped when loading a tape.

There is nothing like getting ahead halfway through a game or updating a weekly report and then having the program stop because of a syntax error in line 1230. Even if the error is obvious like PRNT instead of PRINT you can't correct it and pick up where you left off.

It seems that missing characters (especially spaces) are the first signs of a marginal tape. Since BASIC ignores spaces a program may run without them, but not if other characters are missing. With this thought in mind, I created the following routine which I put at the beginning of each program.

It's sort of like a checksum but rather than checking bits it checks the number of free bytes and compares with the number of free bytes available when the program was recorded. If they match, we can proceed with the assumption the load was good. If they don't match, we know right away we have a bad load.

Though not a panacea, it has proved it's worth in the past, and is particularly useful when duplicating tapes. Integrity can be checked without running the program past the first interactive point.

Lines 40 and 50 do the checking and lines 60 to 90 inform you if it's bad. Line 100 is the first line of the program being saved. G is computed by running the program and then correcting line 50 to the observed value. (printed by line 80)

The USR(X) in line 30 is "clear screen" sub-routine in EPROM which replaces the original inline routine in ROM and therefore is not useable if you still have a ROM. See last month's column.

```
 10 REM MOVING AVERAGE,3-6-80
 20 REM
 30 POKE11,14:POKE12,254:
    X=USR(X)
 40 F=FRE(X)
 50 G=5918
 60 IF F=G THEN 100
 70 PRINT"BAD TAPE LOAD, TRY
    LOADING AGAIN
 80 PRINT"F=";F,"G=";G
 90 FOR X=1 TO 2000:NEXT X
100 DIM S1(12,12),S$(12),
    S(52)
110 READ D$,N
120 FOR X=1 TO N:READ S$(X)
130 FOR Y=1 TO 10:
    READ S1(X,Y)
140 NEXT Y:NEXT X
150 X=USR(X)
(program continues)
```

VIEW

Occasionally the situation arises where you have a program loaded in your computer and want to look at the contents of another tape. Maybe it's a data file that goes along with the program now in the machine and you want to position it before loading, or you want to confirm that the portion of tape you're about to record on does not in fact contain data that you want to keep.

A simple routine to do this follows. As usual it starts at $0222 but could be located anywhere as all branches are relative. A program this short can be entered by hand through the MONITOR faster than making a tape and having BASIC POKE it in. USR(X) is the way to call it from BASIC, and with the ASSEMBLER/EDITOR just break to the MONITOR. The EXTENDED MONITOR has it's own VIEW routine so of course wouldn't use this. In my own machine I use the "Terminal" routine which I have in EPROM to do this job.

```
 10 0000                ;VIEW
 20 0000                ;THIS ROUTINE LETS YOU VIEW THE SERIAL
 30 0000                ;PORT WITHOUT LOADING THE DATA INTO
 40 0000                ;MEMORY
 50 0000                ;
 60 0222                *=$0222
 70 0222 A9FF           LDA #$FF
 80 0224 8D0302         STA $0203 SET ACIA FLAG
 90 0227 2C0302 NEXT    BIT $0203 CHECK FLAG WHEN LOOPING
100 022A 1009           BPL END
110 022C 20BAFF         JSR $FFBA GET CHARACTER
120 022F 202DBF         JSR $BF2D DISPLAY IT
130 0232 18             CLC
140 0233 90F2           BCC NEXT
150 0235 60      END    RTS     BACK TO BASIC
```

TERMINAL

The July 1980 issue of Microcomputing had an article by Frank J. Derfler Jr. concerning using the ClP/SII as a "dumb terminal". Since I was about ready to purchase a modem it was just what I needed and I quickly implemented his recommendations. The casual reader might have passed over this one if he didn't have a modem. However, the program listed in the article can be used for viewing a tape also. Especially if one has an EPROM MONITOR where the routine will be readily available at the touch of a key. I modified the program slightly so that it would fit in the 43 bytes of unused space from $FCD5 TO $FCFF. I also changed the BREAK message to T/C/W/M ? and the address to jump to when T is pressed to $FCD5. Now whenever I want to view the contents of a tape without actually loading it I just break and type T and all activity on the serial port is displayed on the screen. Flip the select switch and set the baud rate to 300 and the modem is on line. If you don't have a modem or intend to get one, it isn't necessary to build up the RS232 interface but the jumper from pin 7 of the 6850 (U14) to pin 4 of the 6502 (U8) must be installed. I recommend reading the original article if you can get hold of a back issue.

CHANGE LOCATIONS

```
$FF59  44  TO  54 "T"
$FF5D   00   TO   D5 (PART OF
ADDRESS)
$FF5F  44  TO  54 "T"
AND $FCD5 - $FCFF FROM FF'S TO
A2 02 BD F4 FC 9D C0 01 CA 10
F7 A9 03 8D 00 F0
A9 8D 8D 00 F0 58 20 ED FE 20
B1 FC 4C EB FC 4C
F7 FC 48 AD 01 F0 20 2D BF 68
40
```

* * * * *

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* * * * *

C1P/SUPERBOARD

This implementation of FORTH is a faithful adaptation of the Forth Interest Group model (release 1.1), with complier security and variable length names. It runs under the OS-65D disk operating system and includes integer arithmetic, upper and lower keyboard routine, compiler, screen editor, and assembler.

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CONTACT - Mike Alport
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RESEQ ENHANCED

RESEQ has been limited because the programmer was able only to resequence from the beginning, somewhere in the body of the program, or from the end (not resequence) to the end of a program. He was not able to resequence a part of a program such as a single subroutine easily.

Now thanks to the author much greater flexibility has been added with a new program, RESEQ6. This program, supplied on the same disk as RESEQ may be used in conjunction with the original RESEQ to resequence one or more parts of your program. You may even resequence, for instance, lines 1000 thru 2000 to 10000 thru 11000 and then resequence lines 10500 thru 10600 to 1000 to 1100, for instance.

Complete instructions are included. The combined programs will continue to be sold for the same price ($50 + $2 postage and handling). Purchasers of the original version may receive the upgrade by sending $5 + $2 postage and handling plus a disk or $10 + $2 postage and handling to:

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LETTERS

MODIFY THAT OLD B/W T.V., NOT THE COMPUTER

For those of you who are a little annoyed with the lack of guard bands, and the 'over write' when using a T.V. rather than a monitor; this quick fix may be what you need. It requires a soldering gun, 1-100 ohm, 10 watt wire wound ceramic resistor, and a T.V. set that is not important to family well-being. Remember, the voltages inside a T.V. are lethal and should be left to a qualified tinker.

All I did was to lower the voltage to the horizontal portion of the picture tube--shrinking it sideways, and move the focusing yoke forward to compensate for the change (about 1/4 inch only).

I used a G.E. B/W model M150SWH-2. There are four wires leading from the chassis to the windings on the picture tube, (not those coming from the very end). These windings look like transformer windings where the neck of the tube joins the back of the tube. After experimentation the red lead was disconnected from the terminal in the set and the resistor placed in series, lowering the voltage. It is best to bend the leads of the resistor so it doesn't touch anything, as it may tend to run hot.

Remember, this is quick and dirty, and wouldn't recommend using an expensive T.V.---but it has lasted since March '79 on mine, giving a 1/2 inch border on my screen.

Paul Savard
McAlester, OK

* * * * *

ED:

I have an OSI C1P MF with 29K RAM (One of these days, I'll get the remaining 6 chips), which I purchased in early 1979 ostensibly to learn more about computers. Early in this experience I found out that OSI is not exactly the place to start for a novice because of its sad customer service and great lack of documentation. Anyhow, through trial and error (mostly error), I've come far since then and currently using the hardware mainly for business purposes, for the Eastern Bird Banding Association. Using OSI's MDMS software, I've put the membership of this organization on a "mailing list" program and have various programs in use for other information related to all this.

The program that's giving problems is the MDMS AUX I program, specifically the KEYFILE SORTing programs. They don't sort any file information longer than about 150 records. On files with less than about 150 records, the sorting works but it takes an extraordinary amount of time (timed up to 7 minutes), but on files with more records the program doesn't seem to exit from the sorting loop. I've timed this up to 12 minutes before aborting the procedure (for fear that it would do harm by having the disk spinning for so long). I've run a tracer on it and I know just about where the problem is, except that I don't know what to do about it. In addition, two of the three disks on which I have -400 records each now seem to have repacked and this shouldn't have happened because I didn't delete anything. The order in which these files were originally filled is crucial to me. You see, the mailing' list program has no indexing line (as many magazine subscriptions, there is room for membership number etc., above the recipients name). The members of this organization all have a 3 digit (soon to become a 4 digit) membership number, so I was appending the file by using the MDMS Master disk (MAster File Edit Program), because that shows the record numbers which are otherwise intrinsic to the output. For example, if I needed to find member #625, I know this would be record #225 on the 2nd disk. This worked fine until the file decided to repack (or whatever it did, because it didn't repack in order).

It is VERY difficult for me to explore these problems because I have no printer. Actually, I have a Centronics 737 on order, but there was a delay in shipment because up to now they weren't made with a serial interface (only parallel), and since I may wish to add a modem at some later date, I chose serial from the start. I originally ordered that particular printer for word processing (and, incidentally, I have Dwo Kwong's (DQ) word processing software, which is to be recommended very highly; it works absolutely fantastic! I need it to churn out local newsletters and correspondence. I've been practicing with it on the monitor and it has great possibilities.

So all I ask, do any of you have any ideas? If so, it would be great to correspond about it and maybe I'll find the solution to these problems.

Frederick S. Schaeffer
Jamaica, NY

Frederick:

I have not used MDMS, but it is like OS-DMS, 7-12 minutes is not excessive for a sort. Before KYUTIL, I saw sorts of over 2 1/2 hours, and heard of 2-3 day sorts of large hard disk files. I hope you had a backup copy of your data disk - suspect interruption in mid-sort may be why records now seem out of order - . MDMS users, can you help?

AL

* * * * *

ED:

As a caveat - I have noticed that one may use a metal oxide varistor (MOV) as an effective (and inexpensive) transient supressor. All one need do is solder the MOV across the 110 volt supply cord on the inside of the computer.

Kenneth Shacter
Slidell, LA

* * * * *

ED:

Those of you interested in taking apart BASIC in ROM, might look carefully at the code between $BEE4 and $BEF2. This is the routine to receive tape input from the UART located on the 430 super I/O board. The routine as written cannot work. The instruction at $BEE4 is incorrect. "BF" should be "FB". OSI has made a patch by placing the first three instructions in the monitor ROM and entering the subroutine at $BEEA.

E. Morris
Midland, MI

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ED:

I just received today C1S and BASIC ROM #3 from Aardvark. This company is to be highly commended for its promptness and good packaging.

Thanks to their clear instructions and good drawings, I installed the set in 30 minutes. The C1S did not require any re-wiring on my C1P, as the latter was already correctly jumpered. The correction for BASIC does need re-wiring, but is very simple and straightforward.

Aardvark uses top quality EPROM (ceramic package with gold plated pin). For the BASIC Chip #3, I do not recommend the single sided conversion board, but instead do the jumper routine.

Now for the important part. The features of the C1S are a delight to use. The most important, for me, is to be able to backspace using Shift 0. All other features such as insert, delete, change character in a BASIC line, etc., work as advertised. No more problems with strings - that alone is worth waiting for!

All in all, I am very pleased with the C1S and String bug fix in ROM.

I really like your new format; Peek (65) is coming of age. Would like to see more hardware expansion articles.

Re sources of 8T28 and 8T95: In Canada, you can get these from RAE Industrial Electronics Ltd, 3455 Gardner Court, Burnaby BC, V5G 4J7 (Phone 604 291-8866 or Telex 04-356533).

Andre Coulombe
B.C. Canada

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ED:

In reference to Neil Dennis' question on OSI Back Plane Connectors, in volume 1, No.8, August 15, 1980. They are Molex KK156 Connectors.

They are available from two different sources: B.K.M. Micro System Corporation. 3809 Old College Rd. Bryan, Texas 77801. Tel, 713 846-8268. Also, Molex Inc. U.S.A., Eastern Regional Office, 21 Cummings Park, Suite 266, Woburn, MA 01801. Also, Molex Inc. Int. Div., 2222 Wellington Court, Lisle, IL. 60532. B.K.M. in Texas offers the lowest price for male and female connectors. They cost $1.00 for either connector.

Does anyone have information available on C2-4P BASIC in ROM to Disc Conversion for the C2-4P. I have changed the address to the Monitor ROM and can get H-D-M on the screen, after depressing the Break-Reset-Key. Does anyone know what the H in H-D-M on Reset stands for? Found this out by using Sam's Manual on C2-4P - C2-4MDF.

Andrew C. Weiss, Jr.
Derry, PA

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ED:

We have a new monitor - full editing facilities - completed, and are looking into the matter of a selectable "window". The latter would combine very nicely with the 0-80 char x 32 line video board we are developing.

The plans are to start marketing monitor and video board locally in about three months.

At the moment I am using a SWTP PR40 printer, and would appreciate some ideas on replacing the char. gen. with something equivalent to that of the Superboard. (Only capital letters available at present).

Greetings from Darkest Africa.

Johnny Enslin
Republic of South Africa

Johnny:

Try marketing your new ROM in the U.S. as well!

AL

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ED:

For those like Jerry Ryan of Fort Wayne, IN. seeking bare OSI boards, I suggest they contact D & N Micro Products Inc., 3932 Oakhurst Dr., Fort Wayne, IN. They presently offer 8K memory boards for the 48 line bus. Perhaps if they get enough letters requesting other OSI boards, they might start producing.

Computerists still need a printer that costs less than $300 new, with a line width of 64 or more characters. I urge you to write to a number of printer manufacturers, urging them to produce such a device.

Remember the law of capitalism: supply follows demand.

Bruce Showalter
Abilene, TX

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OSI-FORTH 2.0 / FIG-FORTH

OSI-FORTH 2.0 is a full implementation of the FORTH Interest Group (FIG) version of the FORTH language. It conforms to the FORTH-79 Standards Specification, and includes a resident text editor and 6502 assembler as part of the basic package. The OSI-FORTH system runs under the OS-65D3 operating system on any disk-based Ohio Scientific system, and has access to all DOS commands and resources. The package price is $79.95 for either a 8" or mini disk and manual. The manual is available separately for $9.95, deductible later from package purchase price.

Mr. Clean

Let Mr. Clean pretty up those BASIC programs! This very fast machine language program will resequence (renumber) and/or pack (remove spaces and REMarks), from any OS-65D3 BASIC program. Mini or 8" disk and instructions is $17.95.

VIDEO BANNER

Video Banner puts up to three lines of nine letters and/or punctuation marks each on the OSI 540 video screen. The letters are '3-D', built from graphics elements (resembling letters above). Mini or 8" disk contains the data files for the characters, utility programs to display them on the screen and save screens to disk, and demo program. Documentation provided will enable you to incorporate the data base and display into application programs (educational programs, games, clock programs, display 'signs'). An excellent program for dealers to catch customer eyes! Mini or 8" disk is $24.95.

ADVENTURE-65

Explore a deep and mysterious cave, but watch out for the dragon and don't spill the lamp oil! Will you find all of the treasure before the lamp burns out? Will your leap across the chasm be successful? How do you deal with the dragon? Can you find all of the rooms in the cave? This micro version of the famous 370 Adventure retains all of the excitement and frustration of the original. No two trips into the cave will be exactly alike, so keep exploring! Requires 8K of memory. Cassette is $9.95, mini or 8" disk is $14.95 .

DISK-PAK 1

A collection of very useful OS-65D3 utilities. DSKPRP prepares a new diskette for use, by initializing any track range and putting in a blank directory. DIR540 uses the full 540 video screen (or terminal) to display the complete sorted directory in one view, allowing file creation with the full directory in view. SAVE automatically creates a file of given length by finding available space for you! It will ALSO optionally figure out the space needed to save whatever program is in a scratch file ("SCR"), create the file and transfer the program from SCR to the new file! All of the convenience of an Apple with the simple sequential files of OSI! COPIER copys the OS-65D3 System onto a new disk with a minimum of disk swaps (uses 24K). ONERR is a program (subroutine) that modifies OS-65D3 to allow your BASIC program to automatically execute any given line number upon detection of an error. BACKUP maintains a backup directory on disk and will restore a directory lost due to a disk error or mistake. Mini or 8" disk is $24.95 .

MANUALS

C4P/C4P-MF Users Manual: This is a nicely typeset manual recently released by Ohio Scientific. $8.95

OSI-SAMS Service Manuals: These excellent manuals contain schematics, logic diagrams, parts lists, scope traces and other valuable service data. C4P/C4P-MF manual is $14.95 (C4 manual for C8, too). C1P/SBII is $7.49 C3/C20EM manual is $38.95 .

CONNECTORS

A set of four male and four female connectors of the type used by OSI for board connection to the backplane and other I/O. $4.95

INFO

Our Floppy Disk Information pack provides the information you need to upgrade your OSI ROM BASIC system to a disk-based system. $3.49

** Allow 30 days for delivery. Florida residents add 4% Sales Tax. Specify system model. **

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The Unofficial OSI Users Journal

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