



TO:

1976 WINTER CATALOG

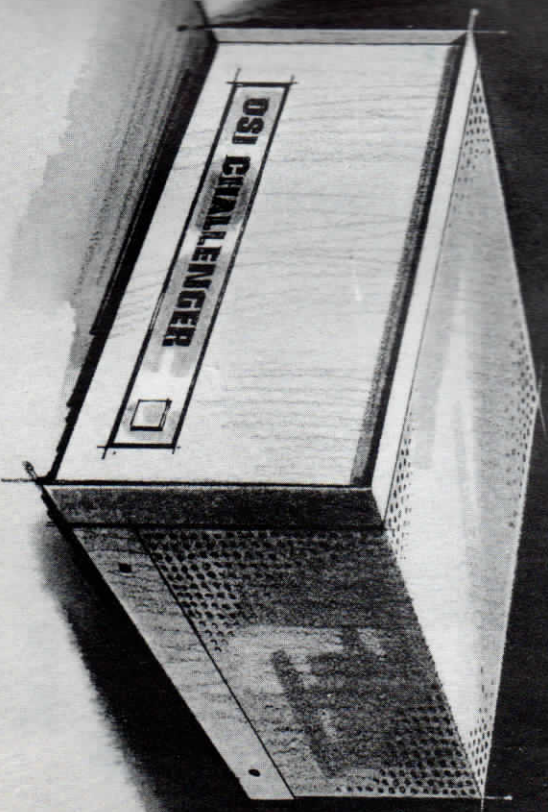
Ohio Scientific Instruments  
11679 Hayden Street  
Hiram, Ohio 44234

**OSI**

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*[Handwritten scribbles in brown ink, possibly a name or address.]*

**OSI**  
**MICROCOMPUTERS**  
for education and the hobbyist



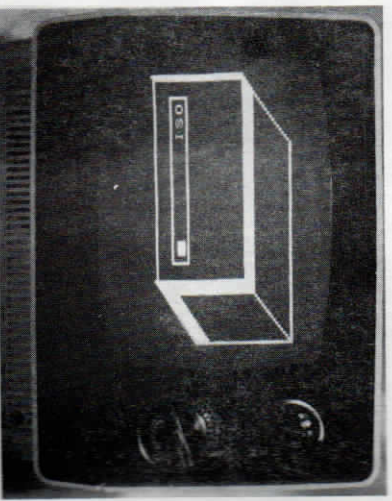
**Meet The OSI Challenger.**

It offers more. It costs less.  
And it comes fully assembled, ready to run.  
For guess how little...

See it and the full OSI line inside!

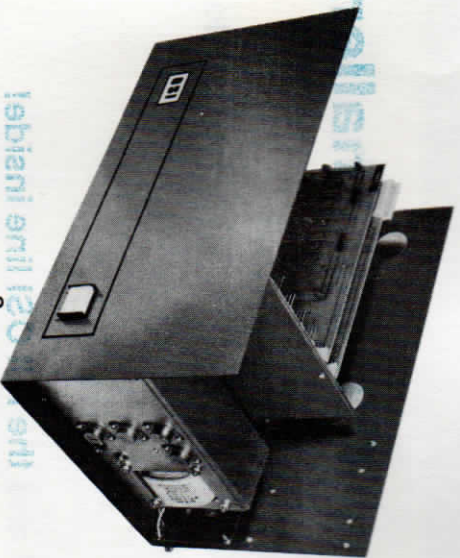


# The Challenger starts at \$439, ready to plug, and chug.



Self-portrait of the Challenger 65V-4K via OSI 440 with Graphics option.

**We took the top off to show you what's inside. Yours comes with the top on.**



The OSI Challenger isn't just one microcomputer. It's five! All fully assembled. With all the CPU, memory, interfacing and options you need to be up and running quick. Just look at these Challenger features:

## HEAVY DUTY MAINFRAME

16 gauge case with welded reinforcements, approx. 17"W x 10"H x 15"D. All six sides included. Also includes line cord, power on/off, fuse holder, front panel master reset switch and rear panel I/O-connection accessory plate. Convection cooled, no fans required.

## UL-APPROVED POWER SUPPLY

Rugged industrial-quality supply, heavy enough to power a full complement of boards with full over-voltage and over-current protection. Thermally isolated from computer boards for improved system life and reliability.

## "WIRELESS" PRINTED CIRCUIT BACKPLANE BOARD

Accepts eight OSI 400 System boards, includes backplane expander slot.

## FULL FEATURE CPU BOARD

Choose a 6800, 6502A or 6502C (special order) CPU and either of two interface options (see p. 4). Includes 256 word PROM monitor for load, dump, edit, and traditional front panel functions. Also includes 1024 words of 350 nsec RAM memory. All major ICs on all Challenger boards are socketed.

**Now meet The Challengers:**



# The Challenger comes in 5 models, complete with elbow room.

## Challenger 65-1K \$439

- 500 nsec cycle time
- 6502A CPU
- Serial interface with ACIA-based 20 ma current loop
- 1024 words of RAM memory
- ASR33 Teletype-compatible

A good, low-cost starting point. It will run some games and demonstration programs and can teach you machine language. But you'll need more memory to run even BASIC. Of course, since it's fully expandable, you can do that any time — or add any other OSI Challenger or 400 System option.

## Challenger 65-4K \$529

- 500 nsec cycle time
- 6502A CPU
- Serial interface with ACIA-based 20 ma current loop
- 4096 words of RAM memory
- ASR33 Teletype-compatible

The expanded 4K memory will let you run Tiny BASIC and more elaborate games without expansion. But check our special Challenger 65-series memory offers — you'll want to expand now!

## Challenger 65V-4K \$675

- 500 nsec cycle time
- 6502A CPU
- Includes OSI 440 Video Board
- 4096 words of RAM memory
- Base for smart terminal

Just add an ASCII keyboard and a closed circuit monitor (or a TV set with an RF converter) for an instant video terminal. Software utility to simulate a deluxe CRT terminal is included.

## Special Challenger 65 Series Offer

Order a 12K or larger memory in your Challenger 65 Series computer and receive **Extended BASIC** free! See our special prices on memory too!

## Challenger 68-1K \$459

- 1  $\mu$ sec cycle time
- 6800 CPU
- 1K memory
- Serial, ACIA, 20ma current loop, ASR33 compatible
- MIK Bug software utilities package included.

This Challenger lets you take advantage of all the MIK Bug and 6800-based software that's available and designed for small computer systems.

## Challenger 68-4K \$529

- 1  $\mu$ sec cycle time
- 6800 CPU
- 4K memory
- OSI 4K BASIC included free on paper tape
- MIK Bug software utilities package included
- ACIA, 20 ma serial interface.

Take it out of the box, plug it in the wall, hook four wires to an ASR33, put the BASIC tape in the reader, type "L" and you're up and running.

## SOFTWARE

OSI offers an ever-expanding software library for both 65-series and 68-series Challengers. The best way to keep up to date is with **The OSI Systems Journal**, just \$6 a year. See page 18 for details.



# Special Challenger Memory Offer

Additional 4096 word memory boards

**\$139** With purchase of Challenger only.  
Limit 3.

Limited time only. \$159 Ordered any other way.

This 2102-based RAM memory board features 350 nsec ultra-low-power memories. That's fast enough to support a 6502A with no wait states. And your Challenger can accept up to 209K words of memory!

## OSI Challenger Audio Cassette Interface

Uses popular Kansas City Standard Audio Cassette Interface to store data with a standard audio cassette recorder. And you can add more capabilities to the board later for high speed general purpose I/O, plus full analog I/O capabilities.

## OSI Challenger Floppy Disk

The ultimate in Challenger memory. These fully-assembled Floppy Disk systems are for use *only* on OSI computers.

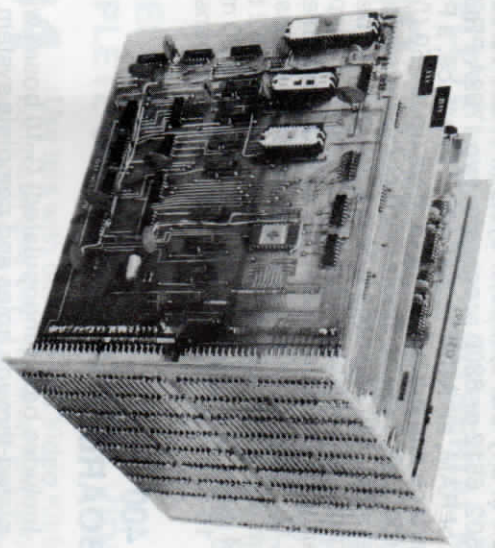
**Single Drive \$990**

**Dual Drive \$1,490**

## And you can add these OSI 400 Series options to your Challenger:

- 250 nsec cycle time 6502C CPU!
- Full multiprocessing! Z-80! 6100! (Run 8080 and PDP-8 software!) More!
- Floppy Disk Kit!
- Analog and high speed general purpose interface!
- More!

# THE INCREDIBLE OSI 400 SYSTEM.



## Now with 10 amazing boards for unsurpassed versatility!

Here's unprecedented performance at unbelievably low cost! Sophisticated, fully-assembled modular boards are surprisingly inexpensive, including comprehensive documentation. And bare boards with documentation are available for as little as \$29.

### Here are some highlights of the OSI 400 System:

#### CPU SELECTION

You can run a 6800, 6502, 6512, Z-80, or PDP-8 equivalent 6100. With full multiprocessing capability, if you want it.

#### FULLY BUFFERED DESIGN

Each board can drive 250 system boards.

#### 48-LINE BUS STRUCTURE

Simple, versatile and flexible. With OSI's "Wireless" printed circuit backplane, immense modular expansion is easily accomplished.

#### RUGGED DESIGN AND CONSTRUCTION

Plated G-10 epoxy boards with plated-through holes. System designed for thermal convection cooling.

#### FULL CHALLENGER COMPATIBILITY!

Now stand by for full data on the OSI 400 System. **READY?**



# THE OSI 400 CPU SUPERBOARDS

The heart of any OSI computer system. These versatile boards support a 6502, 6512 or 6800 processor, two 1702A PROMs, 1024 words of RAM, an ACIA-based serial interface, a PLA-based parallel interface and full buffering to drive up to 250 (!) other system boards. Use them as single-card computers or as the CPU to a larger system. Our Superboards are designed to be as general purpose as possible without resorting to a jumper jungle. You can start with just a processor, 1K of RAM and an external front panel. Or, fully populated, you can have a processor with a clock system to service different-speed memories, 512 bytes of PROM, 1024 bytes of RAM, an ACIA with RS-232 or 20 ma loop interface, a 16-line I/O PLA and full buffering for expansion.

## MODEL 400 SUPERBOARD

**\$29** Includes bare (unpopulated) G-10 board with plated-through holes and complete system documentation in an attractive OSI binder.

## MODEL 402A SUPERBOARD AND 6502A

**\$59** Includes our Model 400 Superboard and documentation, plus 500 nsec cycle time 6502A processor.

## MODEL 403 SUPERBOARD AND 6800

**\$69** Includes our Model 400 Superboard and documentation, plus 1  $\mu$ sec cycle time 6800 processor (top 6800 speed available).

## MODEL 414A COMPLETE SUPERBOARD SERIAL KIT

**\$149** Supplied with ultra-high-performance parts for 500 nsec operation. Includes Superboard, 6502A processor; OSI 65A Serial Monitor on 500 nsec 1702A PROM; eight P2102AL low-power RAMs with 350 nsec worst-case cycle time; a 6850 ACIA; all miscellaneous TTL, resistors, capacitors and buffers to complete the board; and full documentation in an attractive OSI binder.

## MODEL 414V COMPLETE SUPERBOARD-FOR-VIDEO KIT

**\$134** Use this with our OSI 446 Video Kit for both computer and CRT terminal functions. Similar to our Model 414A, but ACIA and other serial parts are omitted and 65A firmware is replaced by OSI 65V System Monitor.

## MODEL 415A COMPLETE 6800 SUPERBOARD KIT

**\$175** This version of the 414A replaces the 6502 with a 6800 processor and includes OSI 68A System Monitor programming.



# MEMORY!

The OSI 420C  
4K RAM Board

**\$29** Unpopulated, with documentation

The world's most powerful 4K RAM memory expansion board! Configure it 4K by 8 or 4K by 12. It uses popular, inexpensive 2102 RAMs; Schottky buffering and minimized logic for super speeds; switchable and programmable write protect; on-board NiCad battery backup with on-board charger and an isolated external battery input; full memory management capability with 256K-byte address limit, up to 4-page zero-and-stack on 6502 systems. It's fully compatible with all OSI systems.

**OSI USER'S GROUP SPECIAL! 2102s just \$1.75 each!**  
Minimum order 16. There are prime quality Intel P2102AL 350 nsec (worst case) memories with low power standby mode.

**Model 426 Complete 4K RAM Expansion Kit**

**\$129** Batteries not included

A 420C board and all the parts you need to populate it for 4K by 8. Uses Intel P2102AL fast (350 nsec worst case) low power memories. Typical board access time is 190 nanoseconds! Typical on-board battery data holding time is 3 hours. Power consumption 800 ma at 5 volts.

**MODEL 450 8K EPROM BOARD**

**\$29**

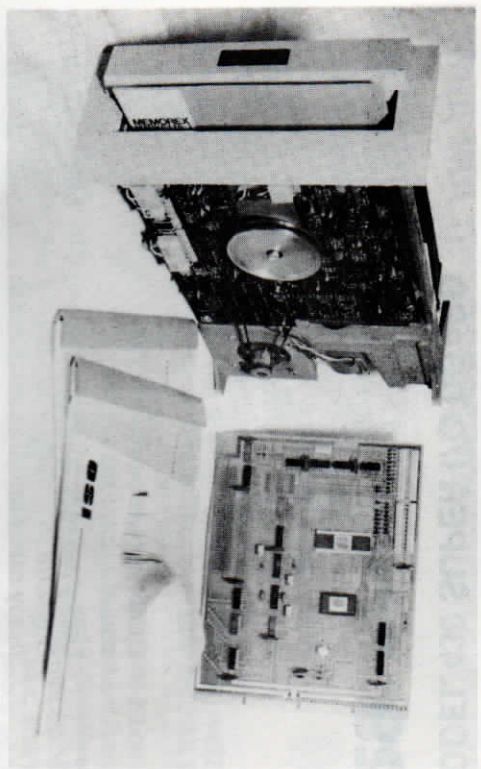
The ideal accessory for industrial prototypes and other dedicated applications. Populate with up to 8K of AMI 6834 512x8 ultraviolet-erasable PROM memory. This PROM is easy to program, and an on-board programmer is included. The board also features a PLA-based 16-line parallel I/O with handshaking.

**MODEL 455 4K PROM BOARD**

**\$29**

Accepts up to 16 1702A PROMs, and includes PLA-based 16-line I/O identical to that in the Model 450. The 1702A, however, is harder to program and no on-card programmer is included. 1702A programmers are rather expensive, but there are programming services available (not from us).

# FLOPPY DISK!



**OSI MODEL 470 FLOPPY DISK SYSTEM**

**\$599**

The ultimate mass storage device for your OSI computer! Our unique approach can now bring the price of a floppy disk system into the range of the computer hobbyist. And, frankly, partly because we make virtually no profit on it. You will have to accept two compromises: One, the OSI Model 470 Floppy Disk System is compatible only with OSI computers. Second, you will have to provide about \$100 to \$150 worth of parts, cables, power supplies and enclosure to get your floppy working. Here's what you get for \$599:

**A fully-assembled GSI Model 105 Diskette Drive.**  
Including all critical read/write circuits.

**The OSI 470 Disk Interface Board, unpopulated.**

With, of course, a full documentation manual.

**An operating system on punched paper tape and disk.**

Simple for a 6800. Or an elaborate variable-sector-length operating system for the 6502. Your choice.

See page 15 for special OSI prices on parts.



# SUPER I/O OPTIONS!

## MODEL 430 SUPER I/O BOARD

**\$29** We dare you to find a more powerful I/O subsystem! Look at what our 430 can do:

### High-speed analog I/O.

With fast 8-bit synchronous tracking A/D converter and two 8-bit D/A converters, 20 KHz bandwidth. Process or generate audio. Use in real time applications.

### General purpose high speed serial communications system.

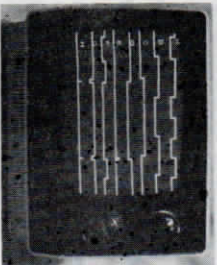
Designed to implement Kansas City Standard Audio Cassette Interface. Also extremely versatile in many other serial applications.

### Eight line parallel interface.

Eight lines of parallel input and output. Send and receive full parallel ASCII, for example. Complements other functions. Includes unpopulated board and full documentation.

## VIDEO ALPHA AND GRAPHICS!

Alphabets!  
Color graphics!  
CRT terminal!  
Animation!  
Your name !!



Turn your tv into a data analyzer.

## MODEL 440B VIDEO GRAPHICS BOARD

**\$29**

Now both alphabets and graphics in a single board! Plus on-board memory, independent control of alpha and graphics: 128x128 dot graphics display; 32 row by 32 column (1024 character) 5x7 ASCII (64-character font) display; on-board keyboard input interface (*just add a 400 for an inexpensive starter system!*); on-board area reserved for inexpensive RF converter that lets you use an *unmodified* tv set. Ultra-fast operation — the system "looks like" 1K of on-board memory for alphabets, 2K for graphics. Full documentation included.

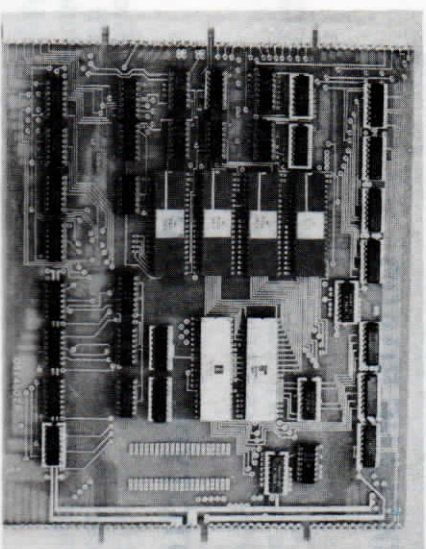
## MODEL 446 VIDEO GRAPHICS KIT

**\$129**

Includes all parts for alphabetic display and keyboard input 440 system. Most parts for GRAPHICS option also included, but you will have to add three 16-pin jumper cables, one 420B or 420C memory board and sixteen 2102 memories. Alphabets can be displayed without these additional parts. See page 15 for special parts prices.

# NEW FROM OSI!

TRUE MULTIPROCESSING!



## MODEL 460Z CPU EXPANDER BOARD

\$89 with ZILLOG Z-80 processor! Run 8080 and Z-80 software!  
\$125 with ZILLOG Z-80 and INTERSIL 6100 processor! Run PDP-8 software too!

Now your OSI 400 system can run more kinds of software than ever. Because it can run more kinds of processors than ever.

The 460Z CPU Expander comes ready to accommodate not only a Z-80 and a 6100, but any third processor you want to add — a Signetics 2650, Fairchild F8, RCA COSMAC 1802, even chips that haven't been invented yet. So any processor you want to use can run with the extremely fast 6502 as executive — *with only one operating system required!*

The 460Z's position in the OSI Systems Bus is downstream of a 6502-based 400 Series board (and its optional system boards) and upstream of the rest of the 400 system.

In addition to the three processors, the 460Z accommodates 4 PLAs for control, plus several multiplexers and demultiplexers. And the 460Z architecture allows unlimited OSI 400 expansion to any number of processors and any amount of memory.

The 6502 executive has full line-by-line control of the 460Z and can reach the bus beyond through a 4K mapped "porthole". It can run the 460Z processors at full speed or a step at a time, monitor at full speed, "trap" certain instructions, start and stop the host processor, permit "general" memory access, and in every way permit true full microprocessing operation.

More detailed discussion of system operation potentials is included in the OSI documentation manual sent with your 460Z.



# PROFESSIONAL TOUCHES FOR YOUR OSI 400

## MODEL 480 BACKPLANE BOARD

**\$39** Eight slots plus provisions for buffering and pull-up resistors; edge connectors for daisy-chaining backplane boards up to 250 board system limit; all mating connectors for eight system boards.

## MODEL 495 PROTOTYPING BOARD

**\$29** Designed for free wire and wire-wrap techniques. The board accepts four 40-pin devices and forty standard TTL packages. +5 volt and ground distribution included as well.

## MODEL 498 CARD EXTENDER

**\$29** Use with any OSI 400 or OSI Challenger backplane system. Extends any one card forward to facilitate troubleshooting and modifications.

## THE OSI CHALLENGER CASE

**\$59** Including top and reset switch.

**\$159** Including the above plus heavy-duty UL-approved power supply capable of +5V at 7 amps, -9V at 1.5 amps, and 12V at 1 amp.

# FIRMWARE!

These OSI System Monitor PROMs provide memory load, examine and run functions immediately on power-up, thus eliminating the need for any type of front panel. PROMs are 500 nsec 1702A devices.

## \$29 your choice

- OSI 65A** For 6502 systems with serial interface
- OSI 65V** For 6502 systems with 440 Video Board and ASCII keyboard, or similar parallel interface.
- OSI 68A** For 6800 systems with serial interface.

## PARTS!

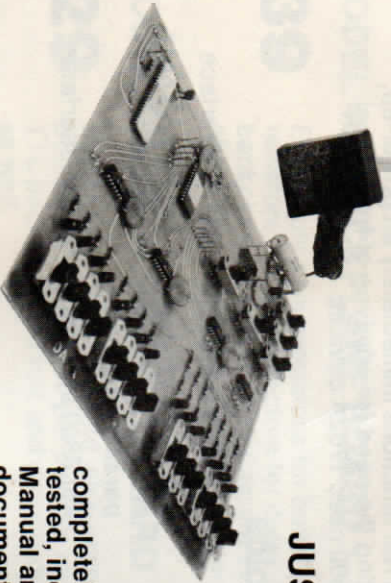
- 8T26 BUFFERS** Two used on most 400 boards (included in all kits). **\$4.00 each**
- 6850 ACIA** Serial interface used on 400 and 470. **\$15.00**
- 6820N-1 PIA** Super parallel interface used optionally on 400, 450, 455 and 470. **\$10.00**
- 1408L8 D/A** Digital-to-analog converter. Up to 3 used on 430. **\$9.00**
- S1883 UART** Universal asynchronous transceiver used on 430. **\$10.00**
- 2513 ROM** Character generator used on 440. **\$10.00**
- 6834-1 EPROM** Ultraviolet-erasable 512 by 8 PROM used on 450. **\$25.00**
- Connector Kit** Set of 8 mating connectors for one board and backplane — included with 480. **\$3.00**

### OSI Users Group Specials!

- Z-80** ZILOG advanced 8080-type processor with data sheets. **\$59.00**
- P2120AL RAM** Prime quality Intel memories. 350 nsec, low power standby mode. Minimum order 16 chips. **\$1.75**  
\$28.00 for 16 pieces.



# THE INCOMPARABLE OSI 300 COMPUTER TRAINER



**JUST \$109**

**completely assembled and tested, including Lab Manual and complete documentation.**

Everything you need to get actual hands-on experience with microcomputers is on this board. The Model 300 is completely assembled and tested, ready to use. The OSI Lab Manual is perfect for use with a computer course or can help you teach yourself. And it assumes no prior knowledge of digital electronics. It starts with loading and reading memory and goes all the way through interfacing a computer with a teletype.

The CPU is a MOS Technology 6502 microprocessor, featuring 55 basic instructions with over 145 variations. It performs binary, twos complement and binary-coded-decimal arithmetic. It also features an interrupt capability and has 13 memory addressing modes. The Lab Manual will take you through virtually all instruction types and programming procedures.

The OSI Model 300 also has sync lines for easy scope display of circuit points. Two input lines and an output latch are provided for I/O programming. The output latch can even be connected to an audio amplifier to produce tones and tunes.

Eight data switches load programs and data. Seven address switches store and recall 128 different 8-bit-wide words. A **Memory Load** switch can be momentarily activated with the computer halted to transfer the data at the data switches into the address at the address switches. A **Processor Run** switch starts and stops the computer. A **Processor Reset** switch forces the computer to reset and loads a **reset vector** into the **program counter**. A momentary **Interrupt** switch forces a **non-maskable interrupt**. And a **Memory Write Protect** switch converts the on-board **random access memory** temporarily into a **read only memory**.

Eight LEDs display the contents of the **data bus**. Seven other LEDs display the current **memory address**. A **Run** LED indicates that a **program** is being executed.

The Model 300 circuit board is 8 7/8" x 10" G-10 glass epoxy with plated-through holes and uses standard industrial components. Power requirements are 5VDC at 350 ma typical, 500 ma maximum. Four alkaline "D" cells will operate the unit for approximately 20 hours.

# THE UNBELIEVABLE OSI 315 GRADUATION PLAN

When you're done with your trainer, you send it to us. And we send you over \$100 worth of OSI 400 Systemware.

## FIRST.

Order a Model 315 for \$129 plus shipping. You will receive a Model 315 Trainer, identical to the Model 300. It may be either new or used, but it will be fully assembled and tested. You also get the OSI 20-experiment Lab Manual, specification sheets on the 6502, and Motorola's booklet **Introduction to Microprocessors**.

## SECOND.

Within sixty days after you receive your Model 315 and the documentation, return the Trainer in good working condition to us. When we get it, we will send you all of this, with shipping and insurance pre-paid:

**OSI Superboard and documentation, worth \$29.**

**OSI 430 Super I/O Board with documentation, worth \$29.**

**OSI 440 Super Video Board and documentation, worth \$29.**

**TV Typewriter and Audio Cassette Monitor software, worth \$19.**

Since you keep your 315 documentation, worth \$10, and since shipping and insurance are pre-paid (worth \$4), you get \$120-worth of your original \$129 investment back. It's like paying just \$9 for two months use of a 315!

## THIRD.

You're on your way to a complete OSI 400 System!

**This offer applies to individuals and prepaid orders only! Other OSI products cannot be converted to this plan.**



# COMING ATTRACTIONS!

As we go to press with this catalog, we're preparing to offer these exciting new products:

## **MODEL 490 DISTRIBUTED PROCESSOR BACKPLANE BOARD**

It will handle at least four 400/460Z systems and may also handle an Altair/IMSAI and/or an SWTP in the "network". A case and power supply are down the road, too, as is a network status panel.

## **ULTRA-FAST BIPOLAR CACHE MEMORY**

It will have one or two K of 80 nsec memories and additional clock circuitry for super-speed operation. It will let you make full use of the 100 nsec top speed limit of the OSI bus.

## **CONTACTLESS TELETYPE-STYLE KEYBOARD**

This modern 53-key ASCII keyboard uses an innovative switching arrangement that eliminates contact noise and wear by eliminating contacts. And it will be priced under \$85.

## **VIDEO MONITORS**

We'll be making a large group purchase of some amazingly wideband video monitors, capable of full underscanning for a complete-screen video display.

## **THE OSI SYSTEMS JOURNAL**

Originally a very limited circulation broadside strictly for OSI customers, The OSI Systems Journal has grown to become an exceedingly popular publication among all computer hobbyists. It gives you software. It discusses innovations in hardware and systems approaches. It's at the forefront of such exciting areas as multiprocessing, artificial intelligence, speech synthesis and more. It's an application forum. And a preview of the state of the hobby art to come.

As part of OSI's total commitment to the computer hobbyist, The OSI Systems Journal is now a general-circulation bimonthly publication, available by subscription at \$6.00 per year. It could be the best six dollar investment you'll ever make.

# INFORMATION

## **THE OSI LINE**

OSI's Full Line Catalog contains even more in-depth information on the OSI products you see in this short form catalog. It includes over 10 pages on The OSI Challenger alone. It's available for just \$1.00, postpaid.

## **THE OSI KITS**

We also offer a complete information package on our full line of OSI system boards. It includes the Full Line Catalog, plus schematics and parts lists on most OSI system boards. The price is \$5.00, postpaid.

## **OSI DEALERS**

More and more dealers are now stocking OSI products. Check the back of the enclosed order form for as up-to-date a list as we could put together in time for this mailing. We also invite inquiries from dealers interested in offering the OSI line.

## **DELIVERY**

OSI kits and boards are delivered in 30 to 60 days, typically. OSI fully-assembled products are typically delivered in 60 to 90 days. Orders may be cancelled without penalty if delivery is delayed beyond 120 days.

## **PAYMENT**

Add \$4 shipping and handling with each order. Ohio residents, add 4% tax. We accept BankAmericard and Master Charge. We also take personal checks, but all such payments must clear before we can make delivery. Please remit a 20% deposit on C.O.D. orders. C.O.D.s must be paid with cash (no checks) and are shipped UPS only. Purchase orders are accepted from well-rated companies and schools only. But no partial shipments will be made against purchase orders, so items ordered separately on individual purchase orders can usually reach you as-available sooner than items ordered together.

## **REACHING OSI**

If your need is *urgent*, call OSI at (216) 569-7945. But please, don't call just to shoot the breeze. Because that shoots a lot of our time, taking time away from our development efforts and costing us more in overhead. So organize your questions first, then call. If you're ordering, write **OSI Microcomputers, P.O. Box 269, Hiram, Ohio 44234.**