alpha micro
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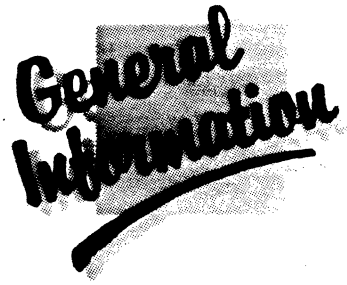
ALPHA MICRO SERVICE DIVISION
December 1986
Volume 8, No. 11

In this issue...



December 1986 **AMSD Journal** Volume 8, Number 11

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Article Filing Instructions

We hope you find the *AMSD Journal* to be a valuable reference tool, and that you will want to refer to its articles frequently in the future. To make it easy and quick to find information, current articles are designed to be filed with articles from past issues. The entire set of *Journal* back issues forms three volumes: "General Information," "Software Information," and "Hardware Information." (The set of back issues is available for purchase. See "Subscription Information," above.)

The title of each feature article in this issue includes a reference number. Use the reference number to file the article in the back issue volume indicated at the top of each page of the article. For example, if the top of the first page of the article "6.5.5 One Hundred New Uses for MULTI," contains the words "Software Information," you know that article is to be filed in Section 6 of the "Software Information" back issue volume after article number 6.5.4.

The last pages of the *Journal* are new Tables of Contents for the back issue volumes, updated with entries for articles included in this month's issue.

Journal Notes

by Sandi Tomlin
Assistant Editor
Technical Publications Department
Advanced Products Division

As you know from last month's issue, the Journal is now being produced by Alpha Micro's Technical Publications Department for AMSD.

In this issue, to help us get to know your preferences and expectations for the Journal, you'll find a brief questionnaire. By taking just a few moments to respond and return it to us, you can let us know what you want to read about in the Journal.

Along with the technical articles, this issue also contains the January through June 1987 Training Class schedule offered by Customer Education. Following the schedule you'll find enrollment instructions and a synopsis of each class. If you want more information about these classes, call Nancy Steen at 714/641-6330.

We hope you like the Journal's new look and we welcome your ideas and feedback. You can get in touch with us to offer suggestions for technical articles or questions you'd like answered in the Question/Answer column, by writing or calling:

AMSD Journal
C/O Technical Publications
Alpha Microsystems
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Santa Ana, California 92799
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AMSD

Alpha Micro Holiday Schedule

Alpha Micro wishes all our dealers and customers a Happy Holiday. All Alpha Micro departments will be closed:

Dec. 22, 1986 through Jan. 2, 1987

with the exception of Sales Order Administration, AMSD Technical Support, Field Engineering and Central Dispatch whose holiday schedules are shown below.

AMSD Technical Support

AMSD will provide phone coverage for the Technical Support Group during our holiday closure except on Christmas Day (12/25/86) and New Year's Day (1/1/87).

Please direct your technical questions to **714/641-7608.**

Field Engineering & Central Dispatch

Field Engineering and Central Dispatch will have phone coverage during our holiday closure except on Christmas Day (12/25/86) and New Year's Day (1/1/87).

Their toll free number is **800/548-4848.**

Sales Order Administration

Sales Order Administration will be open during our holiday closure except on Christmas Day (12/25/86) and New Year's Day (1/1/87).

AMSD Journal
Reader Questionnaire

1. What category best describes the people in your organization who read the AMSD Journal?

   ☐ Technician ☐ Sales ☐ Programmer

2. Circle the types of information you think should appear more often in the Journal (circle any that apply):

   Technical Descriptions | Operating Tips | Tutorials | Product Overviews | Problem Fixes

   Other (please list): _____

3. Which Alpha Micro product are you more interested in reading about?

   ☐ Hardware ☐ Software

4. What kind of hardware topics are you most interested in?

   ☐ Systems ☐ Peripherals ☐ Boards

   Are there particular hardware products you are interested in? Please list:

   _____ _____

5. Which of these software topics are you most interested in?

   ☐ AMOS ☐ Languages ☐ Applications

   What specific software products are you interested in?

   _____ _____

6. Are there specific topics you want to see discussed in the Journal? If so, please list below.

   _____ _____

7. Do you want to see monthly columns in the Journal; for example, a Question and Answer column?

   ☐ YES ☐ NO

   If you answered YES, is there a type of column you'd like to see?

   _____.

8. Optional:

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   Address: _____
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Q&A Ask Alpha Micro: Questions and Answers

Q. How can I get the master terminal on my system to begin running a program automatically every time I boot?

A. As of AMOS/L 1.3 and AMOS/32 1.0, you can force the master terminal to begin running a program automatically via a FORCE command in your system initialization command file.

As you probably know, every system initialization command file must end with the command MEMORY 0. This command is required to reset the system memory allocation map so remaining memory can be allocated. Because this command resets the master job's memory partition, it also terminates the system initialization command file, preventing you from placing any additional commands after the MEMORY 0 command.

However, by using the FORCE command immediately before the final MEMORY 0 line of your system initialization file, you can have a program start running on the master terminal as soon as booting is complete. The format for this command is:

FORCE [Master Jobname] [Program]

For example, if your master terminal is attached to a job named JOB1 and you want it to begin running the program named SHOWME after booting, you'd enter the command line:

FORCE JOB1 SHOWME

on the line immediately before the MEMORY 0 line of your system initialization file. As soon as the MEMORY 0 command is complete, your master terminal will run the SHOWME program.

Why doesn't the FORCE command interrupt the system boot? Whenever a job looks for the next thing to do, it first checks to see if it is running a command file (and the system initialization command file is, after all, just another command file). If a command file is running, the job gets its input from the command file before looking elsewhere for input. After the command file finishes, the job then looks in the keyboard input buffer for commands. Using the FORCE command in this case is the same as typing ahead; after the MEMORY 0 command executes, the job then looks in its keyboard input buffer and sees the command placed there by the FORCE command and executes it.

Here is another example of using this technique: You want to allocate the master terminal job (JOB1) a specific amount of memory, but the MEMORY 0 command automatically allocates JOB1 whatever memory is left over after the system has finished booting. To allocate JOB1 exactly 200K (for example), enter the following command before the MEMORY 0 command:

FORCE JOB1 MEMORY 200K

For more information on your system initialization command file and the FORCE command see the System Operator's Guide for your system.

Ask Alpha Micro: Questions and Answers (Continued)

Q. My screen clears and then the keyboard locks whenever I try to call up my application package under MULTI. I have to reboot to get my system back. What gives?

A. MULTI version 1.0(140) contains a bug exhibiting the symptoms you describe whenever it attempts to interpret the status line TCRT call (TCRT -1,128). Patch number SPN-193L-00, available from AMSD, corrects this problem in the WINDOW.TDV file. **AMSD**

13.1.23
Notes on VME Bus Compatibility

Introduction

Alpha Micro's family of new generation systems is based upon the "industry standard VME 32-bit bus structure" using Motorola 68010 and 68020 microprocessor technology. These new products establish the architecture for all new Alpha Micro high end systems.

The VME bus implementation is the heart of these new systems, and is perhaps the most significant hardware enhancement contained in this family. It was chosen as the basis for these systems for four primary reasons.

32-Bit Data Transfers

The VME bus supports full 32-bit data transfers, as well as eight and sixteen bit transfers, allowing hardware compatibility between our AM-1500 systems and AM-2000 systems.

Protocol

The VME bus protocol is compatible with the 68000 family of microprocessors; hence there is little hardware overhead associated with the implementation.

Increased Bus Bandwidth

The VME bus is capable of increased bus bandwidth over our previous system bus. Alpha Micro products have been designed to take advantage of this increased bandwidth to provide significant performance enhancements that are applicable across the product family.

World-Wide Acceptance

The VME bus has achieved world-wide acceptance, which allows for a great number of compatible cards for possible inclusion in the Alpha Micro system.

This last point has generated significant interest, and a corresponding number of questions concerning the details of the Alpha Micro implementation of the VME bus. Since Alpha Micro's implementation of this bus differs somewhat from the standard and uses the "user defined bus pins," this report has been produced to document the uniqueness in the Alpha Micro implementation and illustrate how to incorporate standard VME bus compatible cards into the Alpha Micro systems.

Printed Circuit Card Size Considerations

Alpha Micro has chosen a standard Eurocard size which is slightly "taller" than the Eurocard size selected in the VME standard. The Alpha Micro standard card size is 8.661" by 9.188", while the standard VME board size is 6.3000" by 9.188".

This size difference is similar to the difference in Alpha Micro's implementation of the S-100 bus in terms of card size. Studies of optimum card size generally indicate a square card facilitates layout and therefore potentially increases circuit density. Therefore, Alpha Micro chose the closest Eurocard standard size to a square card, giving us layout benefits and at the same time providing a card size that can provide increased functionality over standard VME cards due to increased component real estate availability.

Configuring a standard size VME card for insertion into the Alpha Micro card cage is a relatively simple matter using the Alpha Micro AM-123 VME Extender Board.

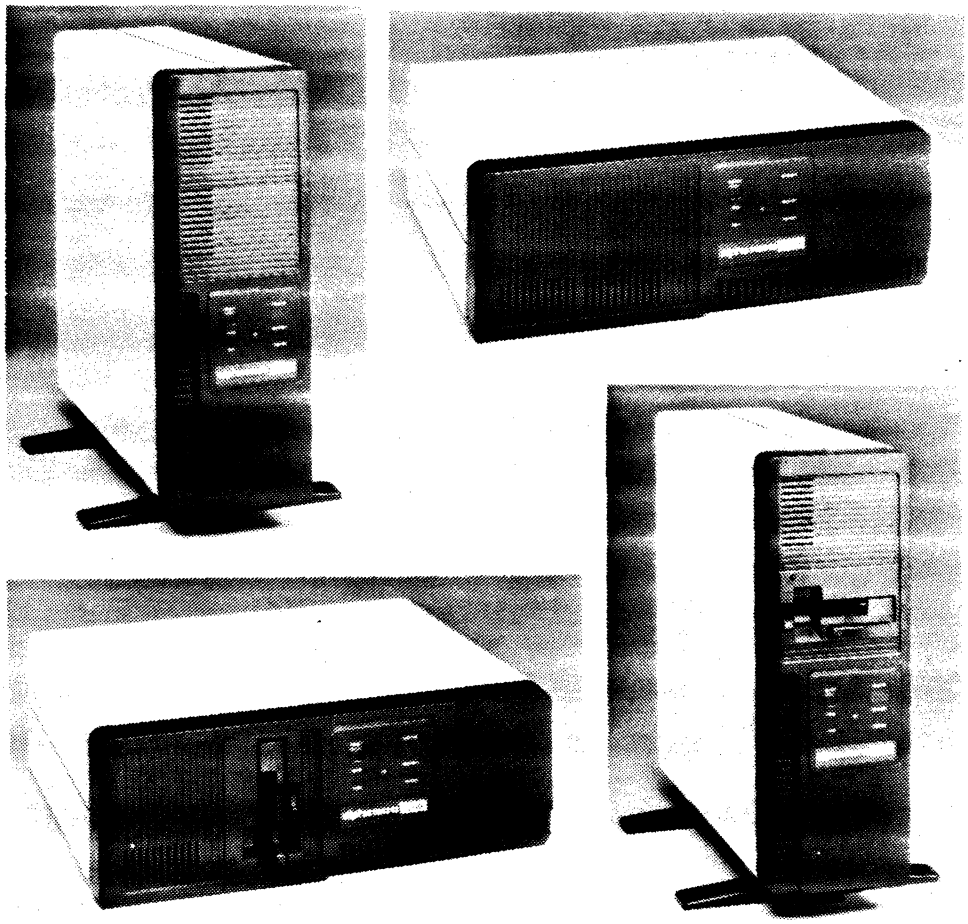
13.1.23 (Continued)
Notes on VME Bus Compatibility

External Cabling Considerations

External cabling from standard VME cards vary, depending on the manufacturer. Some manufacturers use the user defined bus pins on the P2 connector to provide access to I/O signals, while others provide separate I/O connectors on the board itself. Either method is acceptable for use in the Alpha Micro systems, however the AM-123 VME Extender Board must be used to isolate the P2 connector user defined bus pins.

Front Panels

Although optional in the VME bus standard, most manufacturers provide front panels attached to the top of their VME boards. When used in the Alpha Micro systems, these front panels must be removed to allow proper installation of these cards in the Alpha Micro card cage. Alpha Micro recommends the use of card ejectors (supplied in the AM-123 VME Extender Board kit) on the top corners of each board, and provides these on all standard Alpha Micro manufactured boards.



13.1.23 (Continued) Notes on VME Bus Compatibility

Alpha Micro User Defined Pins

Alpha Micro elected to use the user defined pins on the P2 connector to support unique requirements within the system. These requirements include:

- Support for future MMU hardware.
- Support for special memory error handling.
- Support for Alpha Micro non-DMA eight or sixteen bit I/O half card configurations such as: AM-630 VCR Interface card or AM-212 Floppy Controller card.

Any standard VME cards using the P2 user defined pins must use the AM-123 VME Extender Board to isolate these user defined pins from the bus.

Special Characteristics of Alpha Micro's VME Bus Implementation

The following items are characteristics of Alpha Micro AM-1500 and AM-2000 systems which may be of help to you when incorporating "industry standard" VME controller boards into these systems.

Priority Interrupt Characteristics

Relative to the VME Bus specification for interrupts, the Alpha Micro system architecture can be considered to be a distributed system, with capability for two or more interrupt handlers that receive and service bus interrupts. The standard system configuration contains only one of these interrupt handlers (on the CPU board), but this may be increased in the future.

In the present system configurations, only IRQ4 is monitored and processed by the Alpha Micro central processor board interrupt handler. Therefore, any boards which generate interrupt requests to the CPU must be set up to use IRQ4. In VME terminology, the CPU is a D08(O) type interrupt handler.

Data Transfer Bus Arbitration Characteristics

The central processor board in the system contains the bus arbiter for the system. Relative to the VME Bus specification for data transfer bus arbitration, the type of arbiter contained in the Alpha Micro system is a single level arbiter (SGL). This means only one bus request line (level 3) is supported. Therefore, any DMA controllers must be set up to generate bus requests on BR3.

Memory Read DTACK Timing (Early DTACK)

During a read data bus cycle, DTACK defines when the data is valid on the VME bus and can be acquired by the bus master. Alpha Micro has chosen to implement an "Early DTACK" feature on its Memory boards to enhance system performance. Early DTACK is issued by each Memory board 80 nanoseconds before the valid data is placed on the bus during a memory read cycle, predicting that the bus master requires some time to recognize DTACK and actually acquire the data.

All Alpha Micro bus masters support this feature, thereby maximizing system performance. If a potential DMA controller cannot support an Early DTACK, then this feature must be disabled, resulting in decreased system performance. Non-DMA controllers are not affected by this timing.

I/O Address Assignments

64 kilobytes of I/O address space is available in the Alpha Micro AM-1500 and AM-2000 systems. The upper half of this

13.1.23 (Continued)
Notes on VME Bus Compatibility

address space is typically used by Alpha Micro developed controllers. You are strongly encouraged to request I/O address assignments for the standard VME cards you want to use from the Alpha Micro Vendor Software Interface Group in APD (Advanced Product Development). This group will coordinate these I/O address assignments to minimize conflicts in this area.

4.5.1
VCR Remote Cable Orientation

The VIDEOTRAX products used on PCs, AM-1500 Series, and AM-2000 Series computers use a special remote control cable to relay signals from the computer to the VIDEOTRAX VCR. This remote cable has a flat connector at each end, and it's possible to get it in the slot upside down.

The cable's metal shield acts as a keying mechanism. One of its two metal halves overlaps the other, and from this feature you can determine which way to insert the connector into the appropriate slot. Note the Pin 1 marking in Figure A. As you look at the end of the cable with the overlapping half of the metal shield on top, pin 1 is in the lower left corner.

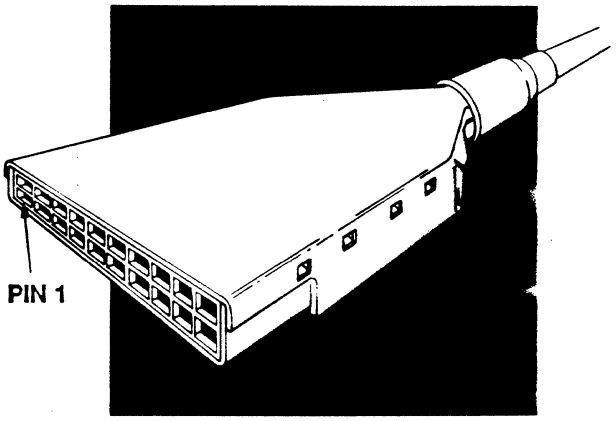


FIGURE A. Remote Connector

Figure B illustrates the back panel of the VIDEOTRAX VCR. Note that the overlapping half of the metal shield is on the bottom.

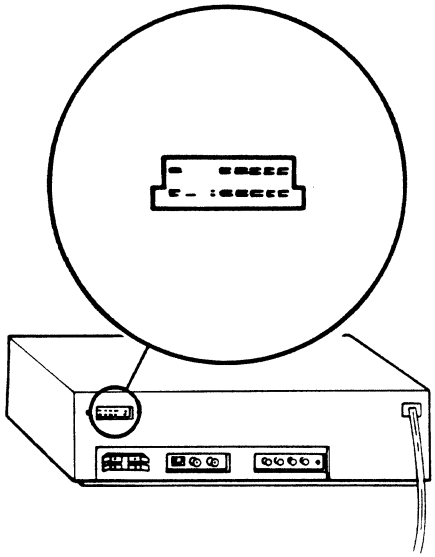


FIGURE B. VCR Back Panel

Figure C illustrates the back panel of an AM-1500/AM-2000 Series computer. On the computer end of the remote control cable, the overlapping half of the metal shield is ON TOP.

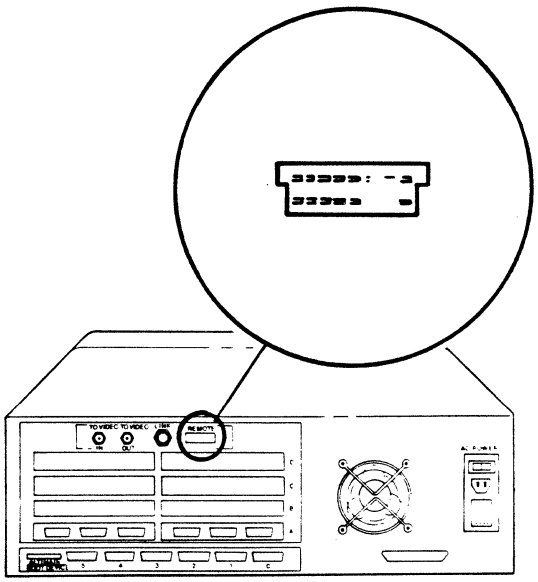


FIGURE C. AM-1500/AM-2000 Back Panel

4.5.1 (Continued)
VCR Remote Cable Orientation

And finally, Figure D illustrates the back panel of a PC. The overlapping half of the metal shield is to the right.

If the remote control cable is forced into any of the slots the wrong way, you might damage the connector itself as well as cause electrical damage to the computer.

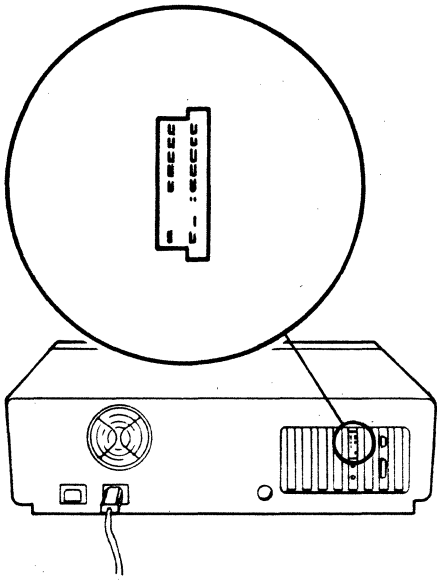


FIGURE D. PC Back Panel

1.1.20
1/4" Streamers on VME Systems

By Randy Bird
Product Manager
Computer Systems Division

In last month's article, I described four new software updates for AMOS that have been released since AMOS/L 1.3B and AMOS/32 1.0. [Editor's Note: "1.1.19 The Inside Scoop: AM-350, AM-515, and AM-640 Software Upgrades," November, 1986.]

As you will remember, these were: the **AM-640 Magnetic Tape Controller Update,** providing high-performance magnetic tape support; the **AM-350 Intelligent I/O Controller Update,** which resolved some problems in the AM-350 software; and the **AM-515 Intelligent Disk Controller and AM-350 Phase II Updates,** which principally provided the capability of accessing more than 8 megabytes of system memory to computers using those boards.

Just when you thought you had the whole story straight, here comes another Update to confuse things again. This software update is required to support backup on AM-622 quarter-inch streaming tape drives.

Streaming Tape Drives?

"Streaming tapes?" you say. "I thought everyone with an Alpha Micro used reliable and economical VCR backup." Well, most folks do, but there remain certain specialized situations that require a 5 1/4" streamer on the system. Previously, streaming tape drives (QIC 24 format) were supported on VME bus systems only on AM-1500 systems without an AM-515 board. This was because changes to the AM-515 microcode were required in order to use streamer backup on systems containing that board.

No Warm Boot

Those changes were made as part of the AM-515 Phase II Update, and all that remained was to modify certain files and verify operation of the streaming tape drive in a system containing an AM-515. This has now been done, and an official Streamer Support Update tape has been released. Note that this software supports backup only, not warm boot capability.

Installing the Update

The Streamer Support Update tape contains the same files that were released as part of the AM-515 Phase II Update along with updated STRSAV.LIT, XEBDVR.RTD, and 415DVR.RTD files. Instructions on what you should do to install the programs are included; basically, you have to install the AM-515 Phase II Update first, if you have not already done so, then bring over the updated files on the tape.

Be aware that installing the AM-515 Phase II Update (described in the instructions) is not quite the same as you might be used to; it is very important that you read the instructions first, rather than using them as a tool to diagnose what went wrong. In any event, make sure the AM-515 board has the hardware Phase II update installed (that is, the board is revision A06 or later), as mentioned in last month's article, before trying to install the AM-515 Phase II software.

1.1.20 (Continued)
1/4" Streamers on VME Systems

Availability

The Streamer Support Update tape will be bundled with streaming tape drives until it is incorporated in the next AMOS release; it is also available as a separately orderable item, PSB-00171-00, beginning in December. Note that if you need both the AM-515 Phase II Update and streaming tape drive support, you need only get the Streamer Support Update since it contains the AM-515 Phase II Updates files as well as the streaming tape drive support files.

3.2.13
New Software Patches Available from AMSD

The following list gives a description of the new software patches now available from AMSD. The products affected by these patches are: AMOS/L, AMOS/32, AlphaWRITE and AlphaCALC.

Patches in the following list include SPNs 223 through 231, released as of 17 November 1986; beginning where the list appearing in the November Journal article left off (see Journal Vol. 8, #10 - Software Article 3.2.11).

The SPN description in the purpose column ends with the software version(s) this patch is intended for.

SPN #	Module	Purpose
223	COMPIL	Corrects another problem compiling programs with a large number of MAP statements. AMOS/L version 1.3B and AMOS/32 version 1.0.
224	420DVR.DVR	Upgraded to support 32 bit addressing so the streamer software works correctly. AMOS/L version 1.3B.
225	420RTD.DVR	Upgraded to support 32 bit addressing so the streamer software works correctly. AMOS/L version 1.3B.
226	WRT170.OVR	Corrects problem with Cut Sheet Feeder loading and ejecting paper on an AM-302. AlphaWRITE version 1.2.
227	ALC070.OVR	Corrects a problem where AlphaCALC would not "shut-down" the printer after printing a file. AlphaCALC version 1.2.
228	ALC120.OVR	Corrects a problem where AlphaCALC would not "shut-down" the printer after printing a directory file. AlphaCALC version 1.2.
229	LSYS.MON	Removes a problem created when using MULTI before assigning memory to the first job. AMOS/L version 1.3B.
230	32SYS.MON	Removes a problem created when using MULTI or MTUSAV before assigning memory to the first job. AMOS/32 version 1.0.
231	MSGINI	Corrects a problem where MSGINI would not create buffer sizes larger than 128K. AMOS/L version 1.3B and AMOS/32 version 1.0.

4.3.2
New Release of XCERT 2.0(105)

Alpha Micro's Technical Services Department has released XCERT 2.0(105), an enhanced version of the original XCERT 1.1(115).

XCERT is a disk formatting and certification program for Alpha Micro computers that contain 5 1/4 inch Winchester disk drives. XCERT requires that you enter the manufacturer's defect information, and then it will format the disk, initialize ALL logical surfaces, and create a BADBLK.SYS file. The newly created BADBLK.SYS file is created from the defect information you entered plus all other defects XCERT may locate in the remaining and adjacent tracks of the disk.

The enhancements to XCERT enable it to support currently used disk drives. Due to its limitations and complexity, however, XCERT should be used only by trained field technicians.

For further technical information, please phone the Technical Services Department at:

(714) 641-7608

To order a copy of XCERT, phone:

(714) 641-6330

3.2.1
Availability of New Manuals

Several new user manuals are available for sale in December. (See the December Alpha Micro Dealer Price List for prices.) The new documents are:

AlphaCALC Tutorial, DSO-00008-00
This document uses two colors and special artwork to present a comprehensive, step-by-step learning guide to the basic functions of AlphaCALC.

VIDEOTRAX Release 3.0 Addendum, DSO-00007-00

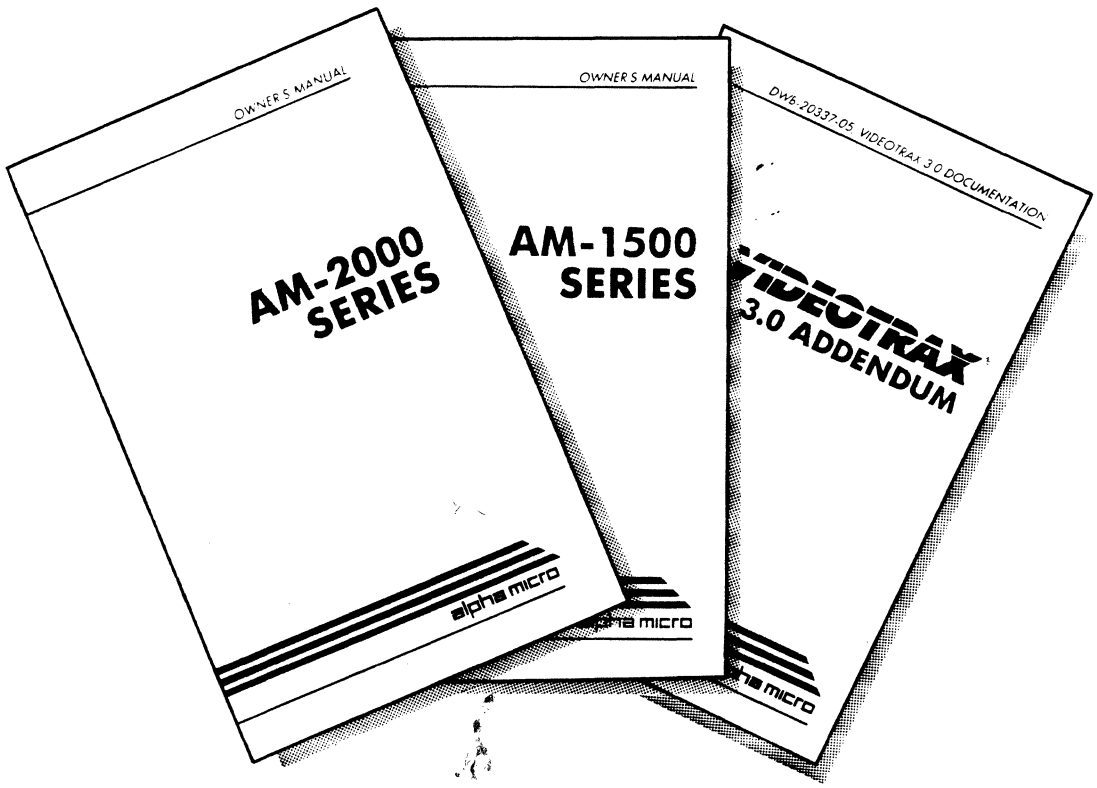
New Owner's Manuals for the modular configuration AM-1500 and AM-200 series computers:

AM-1500 Series (Desktop) Owner's Manual, PDB-00018-07

AM-1500 Series (Rack Mount) Owner's Manual, PDB-00018-08

AM-2000 Series (Desktop) Owner's Manual, PDB-00020-07

AM-2000 Series (Rack Mount) Owner's Manual, PDB-00020-08



4.1.15
AMSD Training Information

The Alpha Micro Customer Education Department, part of the Alpha Micro Service Division (AMSD), offers a variety of training programs for Alpha Micro users:

- o Hardware/Maintenance Courses
- o Software Operating Courses
- o Language Courses
- o Word Processing Courses
- o Video Training Tapes
- o Customized Classes
- o Courses at Your Location
- o Courses at Our Facilities
- o Training Manuals for Classes
- o AMSD Journal - technical newsletter

Our classes offer hands-on experience and lab time in which students put into practice the theory and information presented in the class.

Enrollment Procedures

To enroll in any one of our classes please use the enrollment form below and mail to:

Customer Education Training Classes
Alpha Micro
P.O. Box 25059
Santa Ana, California 92799

Receipt of class tuition with your enrollment form lets us reserve your seat in the class. If we do not receive payment at least ten working days prior to the first day of class, we must offer the seat to the next person on our waiting list.

If you have enrolled in a particular class and for some reason cannot attend or must change the date, please notify us at least ten working days before the class start date. This lets you avoid the ten percent service charge necessary for class cancellation. If we do not receive notification that you wish to cancel a class at least five working days before the start date of that class, it will not be possible to refund your tuition fee.

For more information contact Nancy Steen in the Customer Education Department at (714) 641-6330.

= = = = = = = = = = = = = = = Enrollment Form = = = = = = = = = = = = =

Class (Title & Date) _____

Student Name(s)_____

Company Name_____DI#_____

Address_____

City_____State_____Zip_____

Phone# ( )_____ Tuition $_____

4.1.15 (Continued)
AMSD Training Information

CUSTOMER EDUCATION CLASS SCHEDULE
1987

Class/Date	Jan	Feb	Mar	Apr	May	Jun
AlphaBASE			2-6			22-26
AlphaBASIC		16-27				
Assembly		2-6				
Introduction to AMOS	12-16		9-13		4-8	
Advanced AMOS	19-23		16-20		11-15	
System Maintenance, Week 1		2-6	30- 3			8-12
System Maintenance, Week 2		9-13		6-10		15-19
AM-1500/2000	19-20		9-10		4-5	

REGIONAL CLASSES

Class/Place	Dallas	Atlanta	Chicago
AMOS/L - AMOS/32	Feb. 16-20	Apr. 6-10	Jun. 15-19

Alpha Micro Customer Education

Class Descriptions

The classes described below are being offered by Alpha Micro Customer Education during January through June 1987 at Alpha Micro in Santa Ana, California.

Customized classes are also available. (60 day notice, please). Special, on-site, and custom classes vary in cost. Travel and living expenses are in addition to course prices. All tuition prices are subject to change without notice. For more information please call Nancy Steen at (714) 641-6330.

Introduction to AMOS (Alpha Micro Operating System)

Provides an overview of the Alpha Micro Operating System (AMOSL and AMOS/32). Emphasis placed on system commands, their functions and use; the System Initialization Command File. An introduction to AlphaVUE and command files is also given. Alpha Micro users develop and improve the skills and procedures necessary to implement system commands, add jobs, peripherals and/or backup devices to an existing system.

5 Day Class - Tuition $625/week Offered: January 12-16, 1987, or March 9-13, 1987, or May 4-8, 1987.

4.1.15 (Continued)
AMSD Training Information

Advanced AMOS (Alpha Micro Operating System)

Provides a more advanced study of the Alpha Micro Operating Systems - AMOSL and AMOS/32. Emphasis on troubleshooting the system from a software perspective and a more detailed study of system commands: how they may be used to solve or prevent system problems. Also described: extended command and DO file features, disk allocation, system housekeeping methods, recovery of lost data files and memory configurations available to Alpha Micro users.

5 Day Class - Tuition $625/week (if taken consecutively with "Introduction to AMOS," total tuition is $1000 for both classes.) Offered: January 19-23, 1987, or March 16-20, 1987, or May 11-15, 1987.

AlphaBASE

New Class. Two segment class: first 3 days for beginners, last 2 days for advanced students. Provides overview of program operation, shows basic steps necessary to create a data base, menu and report. Subsystems described include MESSAGE, SELECT/SORT and PASS. ZIP CODE and TABLE file maintenance also discussed. Additional programming techniques and installation procedures are also given.

5 Day Class - Tuition $725/week Offered: March 2-6, 1987, or June 22-26, 1987.

AlphaBASIC

This class is offered as two one-week sessions.

Week One: is especially for beginning AlphaBASIC programmers. Topics include purpose and implementation of structured programming, writing and debugging AlphaBASIC programs, using both interpreter and compiler modes. Unique AlphaBASIC features, lower-level file I/O and file manipulation are also described.

Week Two: of the course reviews statements and extended statement techniques. Advanced file handling, dealing with sequential, random access ISAM files, XCALLS, and program chaining are also covered. All concepts will be applied to actual programming applications.

Week One - 5 Day Class - Tuition $600/wk. Offered: February 16-20, 1987

Week Two - 5 Day Class - Tuition $600/wk. Offered: February 23-27, 1987

Week One & Two - 10 Day Class - Tuition $1000. Offered: February 16-27, 1987.

Assembly Language

Gives an introduction to assembly language programming. Topics include basic principles of writing assembly language programs, macros, and AlphaBASIC XCALL subroutines. Describes how to use the Alpha Micro 68000 instruction set along with Alpha Micro monitor calls. How to debug assembly language programs using AlphaFIX is also covered.

5 Day Class - Tuition $725/week. Offered: February 2-6, 1987.

Systems Maintenance

This class is offered as two one-week sessions and is especially for maintenance technicians and system engineers.

4.1.15 (Continued)
AMSD Training Information

Week One concentrates on maintenance and troubleshooting of the AM-100/L S-100 bus based systems.

Week Two covers operation and troubleshooting of the AM-1000, AM-1500 and AM-2000 Series Systems. A cursory coverage of the Workstation, Terminal and Printers is also included.

Week One - 5 Day Class - $625 tuition. Offered February 2-6, 1987, or March 30-April 3, 1987, or June 8-12, 1987.

Week Two - 5 Day Class - $625 tuition. Offered February 9-13, 1987, or April 6-10, 1987, or June 15-19, 1987.

Week One and Week Two - 10 Day Class - $1000 tuition. Offered February 2-13, 1987, or March 30-April 10, 1987, or June 8-19, 1987.

1500/2000 Series Systems Seminar

Covers description and operation of the AM-1500/2000 Series Systems and the new VME Bus. Includes instruction on installation and setup of the VME Bus based boards. Boards discussed are AM-175 CPU, AM-180 CPU, AM-182 Cache Memory board, AM-117 S-100 Bus adapter, AM-212 Floppy controller, AM-350 Intelligent I/O controller, AM-355 I/O, AM-515 Intelligent Disk Accelerator, AM-630 VCR controller, and AM-706, AM-730 Memory boards, AM-433 and AM-435 Disk Subsystems, AM-905 SIO Subsystem, AM640 Magnetic Tape Subsystem. Selftest and software requirements will also be discussed.

2 Day Seminar - Tuition $600 (includes training manual.) Offered: January 19-20, 1987, or March 9-10, 1987, or May 4-5, 1987.

Regional Classes

The following Regional schedule is subject to cancellation depending on enrollment.

The classes shown are also available as on-site classes.

Tuition: Scheduled Regional System Maintenance and AMOS classes are $800.00 per week per student, and will be scheduled with a minimum of eight students.

Class: AMOS/L - AMOS/32

Dallas: February 16-20, 1987

Atlanta: April 6-10, 1987

Chicago: June 15-19, 1987

AMSD JOURNAL TABLE OF CONTENTS UPDATE PAGES

The next pages of the Journal are updated Table of Contents pages for your back issue volumes. The updated pages are:

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- A footer line at the bottom of each table of contents page shows you revision information. This line shows month, year, volume and issue number of the Journal this table of contents page arrived with.

- All table of contents pages have a title line showing which volume they belong in: Hardware, Software or General Information.

- Entries for articles published since 1983 show the month and year of publication.

- Cross reference article entries use this format:

  "Article Name" - Cross reference: See Volume Name Article #.#.# - [Month Year]

  Where Volume Name is Hardware, Software or General Information. Where #.#.# is the article number designating section, category and article number. (For example, article 6.4.3 is filed in section 6, under category 4 and is the 3rd article in category 4.) [Month Year] is the Journal publication date for the article.

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