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ALPHA MICRO SERVICE DIVISION
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April 1987 **AMSD Journal** Volume 9, Number 4

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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
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Reader Questionnaire Summary

In the December 1986 issue (Vol. 8, No. 11) we published a Reader Questionnaire and this article summarizes the responses we received. The information in this summary is based on questionnaires returned to us by March 5, 1987.

In all, this summary reviews 28 responses out of a potential 650*, resulting in an approximate 4% response rate. Considering we didn't have a promotional give-away to encourage you to write in, a 4% response is not bad at all. We at least can give you our thanks-- Thanks!

About the responses. Some people answered all the questions, some did not. In some cases, where we asked for preferences, we also asked people to choose more than one category. To avoid nightmarish statistics, the summaries describe responses in high-tech terms such as "vast majority," "about equal," or "very few."

The questionnaire has eight questions: one through seven asking for your opinion and number eight-- which was optional-- asking for name, company, and so on. Only responses to questions one through seven are described in this summary.

Question One

"What category best describes the people in your organization who read the AMSD Journal? Technician, Sales or Programmer?

RESULT:

The Technician category came in first with nearly half of the votes, and programmers at second with about 35%. The sales category trailed last with the remaining 15%.

DISCUSSION:

It was not surprising to see so many people choose the two technical categories, Technician and Programmer. However, we were pleasantly surprised to find sales people represented.

Although the Journal will not be a marketing or sales newsletter but continue as a forum for communicating technical information, we will consider our sales audience as we prepare topics and articles.

Question Two

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.)

RESULT:

Problem fixes were the most requested information category, with technical descriptions and operating tips tying for second. Tutorials and product overviews tied for fourth.

Most all the fill-ins for "Other" stressed the need for more technical information regarding software, hardware and product compatibility.

---

* Since only dealers responded to this questionnaire, only dealer circulation numbers are used to determine response rate. Journal circulation to dealers is roughly 650 issues.

Journal Notes (Continued)

Two people felt very strongly about Tutorials and Product Overviews as Journal topics and told us in no-uncertain-terms to exclude them from consideration.

However, some fill-in comments about Product Overviews seemed to indicate they would be well received as long as they were written from a technical point of view.

DISCUSSION:

Your responses to this question are helping us identify what the best article mix is for each issue. Problem fixes such as software patches and hardware advice will be an important part of topic selection and continue to be the mainstay of the Journal. And, to calm the fears expressed by some of you, we intend to keep the Journal technical.

Question Three

Which Alpha Micro product are you more interested in reading about: Hardware or Software?

RESULT:

Nearly 65% of the responses requested more information on Hardware.

DISCUSSION:

This question, like question two, was intended to help us develop a good article mix based on your opinions.

Question Four

What kind of hardware topics are you most interested in? Systems, peripherals or boards? Are there particular hardware products you are interested in? Please list.

RESULT:

The hardware system category was the overwhelming winner and write-ins specifically asked for information on our newer systems-- VME, AM-2000, AM-1500 and AM-1200.

The "boards" category was second and specific requests included the AM-610 board, VIDEOTRAX (AM-616 board), graphics and communications controller products.

Peripherals brought up the rear with very few votes and one or two write-ins, both for printers.

DISCUSSION:

We are now developing a specific series of topics regarding our new family of computer systems because of your enthusiastic requests.

One general request was for revision history on boards and we are researching this topic for future articles.

Question Five

Which of these software topics are you most interested in? AMOS, Languages, or Applications? What specific software products are you interested in? Please list.

RESULT:

AMOS, in all flavors, brought in the most votes with languages and applications trailing behind.

Journal Notes (Continued)

Particular software products mentioned were VIDEOTRAX, MULTI, AMOS Utilities, AlphaBASIC, Unify and AlphaRJE.

One write-in suggestion was a general request for information about AMOS so developers and programmers can plan for the future and know what requirements they must fulfill. We will investigate this idea further.

DISCUSSION:

In the past issue or two, we've begun to provide more information about new AMOS releases. Publishing these articles was due, in part, to the responses you gave to this questionnaire.

We intend to continue our focus on AMOS, but will not ignore other topics of interest to you.

Question Six

Are there specific topics you want to see discussed in the Journal?

RESULT:

The topics you suggested were:

- Upcoming Software: Planning for Future Changes.
- Building Terminal Cables: Real World Recommendations
- Memory Management on New Systems
- Communication Between Alpha Micro and IBM Computers
- Remote Computing
- Troubleshooting: Diagnostic Aids
- 68,000 Hints for Using AMOS

DISCUSSION:

This question was a shameless, but successful, attempt to get you to supply us with specific article titles. Thanks.

Question Seven

Do you want to see monthly columns in the Journal: for example, a Question and Answer column? Yes or No. If you answer yes, is there a type of column you'd like to see?

RESULT:

An overwhelming majority of responses want to see monthly columns in the Journal.

A good many people approved of the Question and Answer column and supplied some of their own ideas too:

- Tip of the Month
- SPRs (Software Problem Report) in Progress
- SPR Resolutions
- Report from SSAC (Software Standards Committee)
- Reader's Forum
- From the Technical Support Group: Common Problems and How to Solve Them

DISCUSSION:

We had the impression monthly columns would not be well received and were we wrong!

The ideas you gave for columns are being considered carefully so we can gauge how much material is available and who might be interested in being a Journal columnist from time to time.

Journal Notes (Continued)

We intend to continue the "Ask Alpha Micro: Question and Answer" column. But, we need your help-- we can't answer unless we have the questions to answer--please, just ask us! Drop a line, or give us a call with your ideas for the Q. & A. column. Although we can't guarantee to use your question in the Journal, I guarantee you'll get a response.

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Conclusion

We always welcome your advice and comments about Journal articles and topics. By giving us your preferences and opinions we can make article topics pertinent and important to your work.

Thanks to all of you who took the time to respond to our first Reader Questionnaire, thanks especially for words of encouragement and compliments about the Journal's new look.

2.5.15
Update to Hardware Volume Article 2.5.8 - "AM-415/AM-410 Configurations" - July 1985

[Editor's Note: The following procedure is a partial reprint with updated software modification procedures for the 410DVR.DVR, as originally given in the July 1985 article.]

In the July 1985 Hardware volume article 2.5.8 - "AM-415/AM-410 Configurations" two sets of procedures are given for allowing use of an AM-410 board with an AM-415 controller in the same chassis.

Of the two procedures given, only the software modification procedure has changed. Therefore, only the software steps are updated and entirely reprinted here.

Software modification steps 3 and 8 from the original 2.5.8 article have changed to accommodate a new addressing scheme--you must now identify the correct port address for your version of AMOS. The driver you create in these software procedures won't function unless the correct address is installed within the driver. (This change in the software modification procedure is because of a change in AMOS/L 1.3B to support 32-bit addresses.)

SPECIAL NOTE: These modifications are not supported by Alpha Micro and, if made, void the warranty of the hardware, if applicable. The information in this article is provided because of the many requests from our dealer base. Technical Support has, for its own purposes, modified an AM-410 board to co-exist with an AM-415 controller. The procedures in this article and in the July 1985 article 2.5.8 are instructions and general requirements for any such modification and serve as a starting point for your requirements.

PLEASE READ HARDWARE ARTICLE 2.5.8 IN YOUR JOURNAL BACK ISSUES IN CONJUNCTION WITH THIS HARDWARE ARTICLE.

The following software modification steps replace those on the second page of the original article 2.5.8.

Software Modification Procedure

IMPORTANT NOTE: These patches are for S-100 systems only. AMOS/L versions 1.3I and 1.3A are excluded from these patches as they are not released for S-100 systems.

1. LOG into the driver account (DVR:), DSK0:[1,6].

2. Type:

   COPY 411DVR=410DVR.DVR

3. Using AlphaVUE, create a file named AM411.M68 and enter the following patch, using only one port address, the one correct for your version of AMOS, then finish from the file.

2.5.15 (Continued)
Update to Hardware Volume Article 2.5.8 - "AM-415/AM-410 Configurations" - July 1985

```
; Patch to create Phoenix driver for
; Port "1C" using interrupt level
; "6"...
;
  COPY    PATCH

  PORT = ^H0FFFFFF1C    ; for AMOS/L 1.3B and Later
  PORT = ^H0FFFF1C      ; for AMOS/L 1.3 and Earlier
  INT = 6.

  .=^H18

  LWORD  PORT
  LWORD  ^H<11C-<INT*4>

  END
```

4. After the file is complete, from AMOS command level, type:

   PATCH 411DVR.DVR WITH AM411

5. After the patch is installed, copy the 411DVR.DVR to the name for the peripheral that the AM-410 device will use. For example:

   COPY SMD.DVR=411DVR.DVR

6. LOG into the system account (SYS:), DSK0:[1,4].

7. From AMOS command level, type:

   COPY CRT411=CRT410.LIT

8. Using AlphaVUE, create a file named CRTSMD.M68 and enter the following patch, **using only one CMP instruction, correct for your version of AMOS,** then finish from the file.

```
; Patch to certification program for
; Phoenix drive with
; alternate port address.
;

  COPY PATCH

  .=^H0CE

  CMP  A1,#^H0FFFFFF1C ; for AMOS/L 1.3B & later
  CMP  A1,#^H0FFFF1C   ; for AMOS/L 1.3 & earlier

  END
```

2.5.15 (Continued)
Update to Hardware Volume Article 2.5.8 - "AM-415/AM-410 Configurations" - July 1985

9. From AMOS command level, type:

   PATCH CRT411 WITH CRTSMD

10. If any logical device on this drive needs to be recertified, use only CRT411 to perform the certification.

This completes the software modification process. Use the SMD device the same in all other respects, as you would any other peripheral device.

3.4.2
AM-320 Cabling Information

By Art Silverstein
Technical Support Specialist
Alpha Micro Service Division

The AM-320 Line Printer Interface supports many different printers. The AM-320 supports short line distances to 25 feet, and long line distances to 500 feet. However, the AM-320 only communicates in Data Products parallel printer protocol.

Since we do not provide a cable to attach between your printer and the AM-320 board, you need to know the pin assignments to make the cable. Table 1 gives you the pinouts for the cable and the Data Products B-600 series printer.

The B-600 series printer can have any one of three different interface connectors installed on it: RS-232 serial, Centronics Parallel, and Data Products parallel. However, the AM-320 only supports one: the Data Products Parallel interface. This is the one we assume is installed on your printer.

In addition, the B-600 series printer may be set for either short line or long line, and may come with one of two connector types. The cable used in both cases is the same but you need to be sure the AM-320 is set to match the printer. The two connector types are **Winchester** and **Amp.** You can use either connector type as long as the pinouts are correct for that connector type at the printer cable end. Pin outs for both Winchester and Amp are given in Table 1.

PLEASE BE CAREFUL and check that your printer uses the Data Products Parallel interface before making and installing the cable. Connecting to either of the other interfaces can damage the AM-320 interface and your printer interface board.

TABLE 1
AM-320 PIN ASSIGNMENTS

		Data Products B-600 Connector Type:	
SIGNAL	**AM-320**	**WINCHESTER**	**AMP**
Data-0 +	17	B	19
Data-0 -	18	D	3
Data-1 +	15	F	20
Data-1 -	16	J	4
Data-2 +	13	L	1
Data-2 -	14	N	2
Data-3 +	11	R	41
Data-3 -	12	T	40
Data-4 +	9	V	34
Data-4 -	10	X	18
Data-5 +	7	Z	43
Data-5 -	8	b	42
Data-6 +	5	n	36
Data-6 -	6	k	35
Data-7 +	3	u	28
Data-7 -	4	w	44
Demand +	23	E	23
Demand -	24	C	7
Online +	21	Y	21
Online -	22	AA	5
Ready +	19	CC	22
Ready -	20	EE	6
Strobe +	1	j	38
Strobe -	2	m	37

The short line and long line interfaces use the same cable pinouts. The long line is a differential driver set and the short line is TTL (Transistor to Transistor Logic) level open collector driver. Therefore, the "+" signals for the TTL level is the actual signal and the "-" is logic ground.

6.1.44
AM-1000 Retrofit Kit for Power Cable Assembly

AM-1000 Power Cable Assembly

A new power cable assembly is now being used for the AM-1000 system, part number DWB-10171-00.

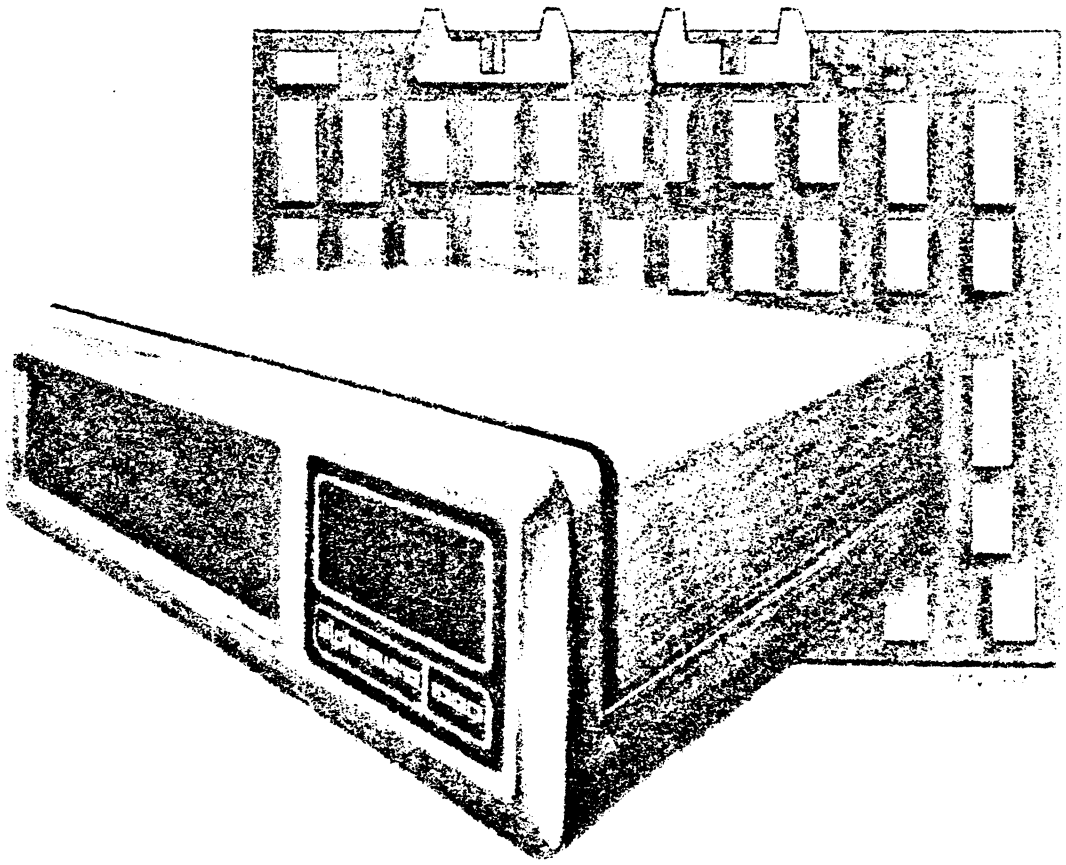
AM-1000 Connector

Once the DC power input connector on the AM-1000's main logic board, part number CNR-00025-02, has been damaged due to heat or a poor connection, you must replace it to keep from having the same power related problems again.

Retrofit Kit

Both the new cable and a replacement connector have been bundled together into a retrofit kit and can be ordered through Order Administration by this part number:

RFK-00167-03



13.1.25
Troubleshooting an Alpha Micro Computer Site

by Mike Wsol
Senior Regional Support Specialist
Alpha Micro Service Division

Alpha Micro has recently made an intensive effort to track down some of the system level problems reported by some customers in new and existing installations of Alpha Micro computers. This article discusses some of the problems found by the Field Engineering Department of the Alpha Micro Service Division. System configurations examined ranged from AM-1000s, AM-10X2s, the new AM-1200, AM-1500, and AM-2000 systems.

In the near future, we will publish further articles examining the problems discussed below in more detail, along with a Site Survey Form and Installation Checklist.

Introduction

Since the release of the AM-1500 and AM-2000 systems, the Field Engineering Department has been called out in support of our dealers to several installations that are experiencing problems. It has been our job to discover and resolve these problems to get the sites stabilized. Some of the typical problems were: system lock ups, crashes, intermittent communication problems, faulty boards needing to be replaced, low VCR Reliability Ratios, non-booting systems or difficulty in booting. Other problems reported were: sector errors on disk drives and phantom read errors. System level errors included: "EM1111" error messages, buss time out messages, phantom memory errors, and apparent memory parity errors.

After researching these problems, we have been able to determine the causes of most of them. We summarized Field Service Reports and determined "Categories of Failure," listed below in order of most frequently to least frequently encountered.

1. Improper power wiring and power line noise.
2. Incompatibility of power conditioners.
3. Cabling and communication problems.
4. Ground loops.
5. Errors in end user application programs.
6. Operating system software patch level not current.
7. Hardware revision levels not current.

The sections that follow discuss each of these categories in more detail.

Improper Power Wiring and Power Line Noise

Of all the problems investigated, improper electrical wiring and power conditioning turned out to cause the most trouble and to be the most common problem in the sites investigated.

Some of the problems found were:

- Improper or no earth grounds to the CPU and its peripheral equipment (e.g., CRTs, printers, and modems).
- Incorrectly wired power outlets (e.g., Line and Neutral swapped at the duplex outlet). Also, we found outlets with Ground floating or Ground and Neutral tied together (a violation of code and a severe safety and shock hazard).

13.1.25 (Continued)
Troubleshooting an Alpha Micro Computer Site

- Non-dedicated power lines or power lines pulled from a power distribution subpanel that has Neutral and Ground tied together (also a violation of the National Electric Code). A subpanel should have the Neutral and Ground busses broken and the Ground buss taken to the building service entrance with its own Ground conductor (all the green wires from all the outlets that provide power to the peripherals and CPU).

Some of the problems caused by these kinds of electrical problems ranged from random system lock ups or crashes, communication errors, and damage to CRTs and I/O boards severe enough to require replacement.

Most sites have no power conditioning equipment to clean up noise generated at the computer site and external noise from other sources. Often, noise was generated by pulling the power lines for the CPU from a subpanel that had other high peak current loads or cyclic voltage loads connected to that subpanel. Examples of equipment that we found generating these types of loads were: air conditioners, X- ray machines, elevators, photocopier machines, typewriters, heli-arc welders, motors for air conditioning and ventilation, pumps, drill motors, mammograph machines, etc.

To clean up noise sources, we installed proper power conditioning units with low-output impedance so they are matched with the new switching-mode power supplies used in computer and peripheral equipment. Power conditioners we have used are OneAC and Topaz units-- specifically the Topaz Peak-current Line 2 Power Conditioner or Topaz Line 1 Power Conditioner manufactured in 1985 or later, and the OneAC CM, CS, or CN Series Conditioner units. These units normally have Common Mode noise levels below .1V peak to peak and Normal Mode noise levels below 3V peak to peak (typically 1V to .5V peak to peak). These levels are well below those required by the specifications for Alpha Micro computers which are:

Normal Mode $\leq$ 10V peak to peak

Common Mode $\leq$ 0.5V peak to peak

Normal Mode noise is a noise voltage potential between Line and Neutral. Common Mode noise is a noise voltage potential between Line and Neutral as a pair and Ground.

The problems solved by using proper power conditioning equipment included: random system lockups, system hangs, incomplete booting, random memory errors, random parity errors, low VCR Reliability Ratio, sector errors on disk drives, "EM1111" messages, and phantom disk read errors.

Incompatibility of Power Conditioners

Some problems caused by using the **wrong** power conditioner are: system lock ups, incomplete booting, read errors on disk drives, and random system crashes. Such power conditioners are high-output impedance devices; typically high-isolation transformers, ferroresonant transformers, and spike suppressors. These units work to some degree with old computer systems that use linear power supplies, but are not properly matched to work with switching-mode power supplies. As for spike suppressors-- all they really do is provide proper power to the computer and clip off a voltage spike to a 200 to 300 volt level (typically). This isn't much protection for your computer system!

13.1.25 (Continued) Troubleshooting an Alpha Micro Computer Site

Cabling and Communications Problems

Most of the sites visited also had severe cabling problems. In most cases, unshielded, untwisted, stranded wire was found. Sometimes the cable used was standard, solid-conductor, untwisted, unshielded telephone wire. These cables were run next to X-ray machines, power busses, fluorescent lighting fixtures, transformers, and combinations of the above. Since these cables had no shielding and were usually long lines in excess of 150 feet, communication transmission errors occurred evidenced by dropped bits and screens that had extra or missing characters displayed. Also, the noise induced on these cables caused intermittent system crashes or I/O lock ups, and garbled printouts because noise coupled onto terminal lines is "injected" into other parts of the system.

To solve these problems, we installed shielded, twisted, stranded pair cable that is low capacitance. Also, the shield must make contact with with the chassis ground of the CRT/Printer, which is usually the metal shell of the DB-25, since all shield noise must make its way to earth ground. Once this was done, the stray transmission problems went away. In some cases, as much as 20-50% of the random system crashes disappeared.

Ground Loops

Ground loops were encountered at some of the sites. These sites exhibited low VCR Reliability Ratios, I/O board and CRT failures, and poor system performance due to random system errors and crashes.

Ground loop problems were normally fixed by using proper grounding techniques, proper power wiring, and power conditioners at the CRT or printer end. Also, where long lines occurred, either line driver modems were used or RS-422 interfacing was used. In some cases, isolation had to be provided, so we used line driver multiplexers, which broke the ground path from the system to the CRT, reducing or eliminating the ground loop.

In some cases, we could easily find the ground loop by monitoring the VCR output signal from the system and observing if it had any 60 Hertz ripple. Then we started disconnecting terminal cables until we found where most of the signal was coming from. Finally, we used a power conditioner at that terminal or checked to see if the terminal had floating ground or no ground connection, or if Line and Neutral were reversed.

End User Application Programs

A few sites evidenced problems caused by errors in end user application software. We found it is very difficult to track down software problems if the problems described in the previous paragraphs are not isolated and solved first.

Because each application is different, it is difficult to give general troubleshooting guidelines except to say it is a good idea to have a programmer on staff who knows your application software from the inside out so that potentially troublesome software can be tested. Most times problems were found to occur because of a bad subroutine, improper AlphaBASIC assembly language subroutine calls, or improper file locking.

System problems caused by incorrect application software included: "EM1111" messages, buss time out errors, access to nonexistent memory, the system monitor version being wiped out to zero or some

13.1.25 (Continued) Troubleshooting an Alpha Micro Computer Site

random number, program crashes, and files being corrupted.

Operating System Software Patch Level Not Current

The problem of operating system software not containing the current patches was evident at most of the sites in which a dealer does not install the latest operating system software patches on the end user system. Normally, this manifested itself as a problem when the end user started expanding the system or new application software began behaving incorrectly.

Hardware Revision Levels Not Current

The problem of hardware not being at the current revision was evident at most of the sites that have more than 18 devices attached to the computer. Below that number of devices, this problem did not cause as much trouble as with the larger systems. Specific problems included improper revision levels of AM-350 and AM-515 boards, and improper boot PROM revision levels. (AM-1500 boot PROMs should be at revision D00; AM-2000 boot PROMs should be at revision B01.)

Summary

I hope this introduction to system troubleshooting has given you a few ideas of what to look for when tracking down system problems.

If you have any questions regarding your system status, call your dealer (or Technical Support or Field Engineering, if you are a dealer) for help identifying and solving installation problems.

3.2.19
New Patches from AMSD

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

Patches in the following list include SPNs 254 through 266, released as of 17 March 1985 beginning where the list appearing in the March Journal article left off (see Journal Vol. 9, #3 - Software Article 3.2.16).

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

SPN#	MODULE	PURPOSE
254	AM1213.TDV	In test.
255	SMCBAS	This corrects a problem with file locking when the same file is opened under two different channel numbers (SMC BASIC Version 1.0A(144)).
256 thru 265		In test.
266	LSYS.MON	This resolves two problems with the -6 patch as implemented on AMOS/L 1.3B. It corrects a problem that prevented slow drives (such as Priams) from booting and resolves a problem with TDV FLGs of some terminal drivers being handled properly. (AMOS/L 1.3B(151)-6).

3.2.20
AMOS/L 1.3B Monitor Patch - SPN-266-00

The SPN-266-00 Patch to AMOS/L 1.3B Monitor resolves two problems:

1. Fixes timing problem preventing slow disk drives (Priams) from booting under -6 patch.
2. Resolves problem with TDV FLAGS not being handled properly.

Previous Patches

There are three previous patches to LSYS.MON (SPN# 188, SPN# 229, and SPN# 252-02) that must be made prior to this one.

Installation Instructions

If you use the AlphaNET Video Network software, before you proceed with installation of this patch, make sure the system on which you are installing this patch, and all systems it is connected to, have NODECHECK set to ON.

Before installing this patch, use the MONHSH program to verify that you have the correct monitor hash total of LSYS.MON.

Old version and MONHSH:
040-156-636-147 1.3B(151)-6

To install this patch, create a copy of LSYS19.M68, by typing it in (using AlphaVUE) from the attached listing. A copy of LSYS.MON should be copied from DSK0:[1,4] to the account where you have created LSYS19.M68.

Now enter the command:

```
PATCH LSYS.MON WITH LSYS19
```

You will see the patch file being assembled and installed. You should see no error messages. If you do, check to make sure that you have entered the patch file correctly and are trying to patch the correct version of LSYS.MON. Further information on installing patches is contained in AMOS/L System Operator's Guide.

After installing the patch, use the MONHSH program to verify that the monitor hash total of the patched file is correct. Enter the command:

```
MONHSH LSYS.MON
```

New version and MONHSH:
445-405-160-214 1.3B(151)-7

If the hash total does not match, then check the patch file for errors and enter the patch again or contact Technical Support. If the hash total is correct, then you must use the MONGEN program to install the correct disk driver for your system disk. Once you have completed the MONGEN procedure, use MONTST to make sure that the system will boot properly. After the system has booted correctly, rename LSYS.MON to AMOSL.MON. For example,

```
RENAME AMOSL.MON=LSYS.MON/D
```

After the patch has been installed correctly, and you have successfully booted the system via MONTST, the patched version of LSYS.MON should be copied on to DSK0:[1,4].

3.2.20 (Continued)
AMOS/L 1.3B Monitor Patch - SPN-266-00

```
;Patch #7 to SYS:AMOSL.MON Version 1.3B(151)-6 (For AMOS/L 1.3B)
;
;Copyright (C) 1987 - Alpha Microsystems
;
    COPY PATCH

    OVER 1,3,2,151.,6
    NVER 1,3,2,151.,7

    .=2204
    BYTE -1

    .=22304
    WORD 177436

    END
```

3.4.1
Programming Cautions: AM-350 Phase II

At the time the original AM-350 Phase I software was released, neither the software nor the AM-350 hardware supported use of eight megabytes or more of system memory.

The AM-350 Phase II software (which will be availabe soon) removes this general restriction. It also corrects a printer lockup problem and incorporates several corrections for problems found on some high-end VME systems.

> **NOTE:** In order to use the AM-350 Phase II software, your AM-350 board MUST be at revision A04 or later.

AM-350 Phase II Restrictions

Even though the AM-350 Phase II software removes the limit of a maximum of eight megabytes of system memory, certain situations still require that a memory limit be observed. Also, some programming restrictions apply.

During the course of developing the AM-350 Phase II software, we discovered that some terminal drivers in the field make use of a large number of monitor calls not supported by the AM-350 Phase I software. Therefore, the Phase II software includes additional monitor call support for terminal drivers.

For terminal driver **input, output,** and **echo** routines only, a restriction applies concerning which monitor calls may be used in those routines. In addition, the terminal driver developer must make sure the monitor calls used by those routines do not access any memory location above 8Mb.

At the end of this article we list the monitor calls that are supported by the AM-350 Phase II software for use with terminal driver input, output, and echo routines.

Memory Limitations

The AM-350 8Mb restrictions established to date are listed below. (NOTE: Items #1 and #2 are normal situations that will be enforced by the system in AMOS 2.0).

1. All system queue blocks must be allocated below 8Mb.
2. All TCBs and their related terminal buffers must be allocated below 8Mb.
3. Any subroutines queued up into the terminal output chain to be executed by TRMSER for an AM-350 port must reside below 8Mb and must not reference any data structures above 8Mb.
4. In systems using the AM-350, the Task Manager job's entire memory partition must reside below 8Mb. (This restriction will be removed as of AMOS 2.0.)
5. Use of monitor calls by terminal driver input, output and echo routines must be restricted to the ones shown in the list at the end of this article. Use of these routines is further restricted by the fact that all data structures accessed by the monitor calls be located below 8Mb.
6. TDV input, output and echo routines cannot explicitly or otherwise access data structures above 8Mb.

3.4.1 (Continued)
Programming Cautions: AM-350 Phase II

Supported Monitor Calls

A comprehensive list of AMOS monitor calls approved for use in TDV output, input and echo routines servicing AM-350 ports is given below. This list is qualified by the fact that all data structures accessed by the monitor calls must reside below 8Mb.

ALF
BYP
DCVT (to memory only)
ERRMSG (to memory only)
FSPEC
GTDEC
GTOCT
GTPPN
JLOCK (is a NOP)
JRUN
JUNLOK (is a NOP)
LCS
LIN
NUM
OCVT (to memory only)
OUT (to memory only)
OUTCR (to memory only)
OUTI (to memory only)
OUTL (to memory only)
OUTS (to memory only)
OUTSP (to memory only)
PACK
QADD
QGET
QINS
QRET
TIMER
TRM
TRMBFQ
TRMRST
TRMWST
TTYIN
UCS
UNPAK
VCVT (to memory only)

The SVLOK monitor call is not needed because interrupts are always locked when TDV output, input and echo routines are called. And, the SVUNLK monitor call should not be used in any case.

6.4.2
New Features for the VIDEOTRAX 3.1 Release

By Ken Ellson
Manager Software Development
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VIDEOTRAX® 3.1 will soon begin shipping. There are several changes from the current VIDEOTRAX 3.0 software making the new VIDEOTRAX 3.1 release a better product.

Restore 32Mb Logical Disk

The most significant change in VIDEOTRAX 3.1 is a fix allowing backup and restore of a full 32Mb logical disk in image mode. Previous versions were limited to approximately 31.5Mb of data. For example, under previous versions of VIDEOTRAX, if you had a system with a large disk partitioned into one maximum partition of 32Mb and another partition containing the rest of the disk, the 32Mb logical disk could not be saved in image mode.

Delayed Backup Feature Removed

Another change is the removal of the "Delayed Backup" feature because its function was better implemented by the memory resident backup scheduler in VIDEOTRAX 3.0.

The "Delayed backup" caused serious problems when file sizes were changed between the time the files were selected and the time they were actually saved. The tape would certify as error free, but an attempt to restore files past the one whose size changed would result in a "Cannot read tape" message, which means a hard tape error occurred.

The problem can still occur, especially on a network where one user can be backing up while another is working. However, VIDEOTRAX 3.1 can detect this problem at the time it saves the file and reports the error immediately.

If any of these incorrect tapes exist from previous versions, they can be restored via a special program available from AMSD. However, the procedure is somewhat laborious and it is better to prevent this situation altogether, which is what VIDEOTRAX 3.1 does.

New Wording on Screens

Another change in VIDEOTRAX 3.1 is the wording on the Tape Certification screen. Previous versions referred to "CRC Errors" and "Hard Errors," terms which were unclear to people unfamiliar with VIDEOTRAX technology. Since these terms were misleading-- you do not get "error free" backups-- VIDEOTRAX 3.1 uses the terms "CRC Dropouts" and "Tape Errors" to better indicate the process of writing to video tape.

"CRC Dropouts" means the number of times **any** copy of a data block cannot be read successfully. "Tape Errors" means the number of times **all** of the copies of a data block cannot be read and indicates actual data loss.

Disk Congruency

Additionally, the disk congruency calculation made during an image mode restore has been changed. When restoring an image mode tape to a disk, VIDEOTRAX checks three factors to make sure the disks are "congruent:"

6.4.2 (Continued)
New Features for the VIDEOTRAX 3.1 Release

- The cluster size on the disk and tape must be identical. The cluster size is the number of 512-byte disk blocks allocated as a unit.

- The maximum number of entries in the root directory on the tape and disk must match.

- The size of the FAT (File Allocation Table), the number of clusters, must be the same on the disk and tape.

Under VIDEOTRAX 3.1, the cluster size criteria still holds rigorously, although the maximum number of entries and number of clusters criteria have been relaxed slightly. If the size of the root or FAT on tape is less than that on disk, VIDEOTRAX 3.1 allows the restore to proceed. Thus, assuming the cluster size is the same, VIDEOTRAX 3.1 may allow a smaller disk to be saved and restored later to a slightly larger one.

Error Troubleshooting

VIDEOTRAX 3.1 can identify and report the particular file being processed when an error occurs during a file mode backup or restore. This reporting makes it easier to locate and deal with whatever problem has arisen, from a corrupted disk to a bad spot on the tape.

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]

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SECTION 2 - DISK CONTROLLERS & DISK DRIVES (continued)

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