alpha micro
AMSD
journal
ALPHA MICRO SERVICE DIVISION
Volume 9, No. 9
September 1987

In this issue...

Special Articles

Hardware

Software

General Information

Back Issue Volume Table of Contents Pages

September 1987 **AMSD Journal** Volume 9, Number 9

The *AMSD Journal* is published monthly by Alpha Micro Technical Publications for Alpha Micro Technical Services. Please address all correspondence to AMSD Journal, Alpha Microsystems, 3501 Sunflower, Santa Ana, California, 92704.

Alpha Micro has checked the information contained in this newsletter and believes it to be accurate at the time of publication. However, readers should independently determine that any information used works correctly on their system and is appropriate for their application.

Subscription Information: Subscription rates are $40 per year. Back issue sets are also available for $150 per set. Each Alpha Micro dealer receives one permanent subscription to the *AMSD Journal* free. For additional subscriptions, send your name, company name, address, customer number (if applicable) with payment of $40 for each subscription to:

AMSD Journal
Subscription Department
Alpha Microsystems
P.O. Box 25059
Santa Ana, CA 92799

AMSD Telephone Numbers

Customer Service	(714) 641-7602
Customer Education	(714) 641-6330
Technical Support	(714) 641-7608
Main Switchboard	(714) 957-8500
Spare Parts/Logistics	(714) 641-6339
AMTEC Information	(714) 641-7608

Article Filing Instructions

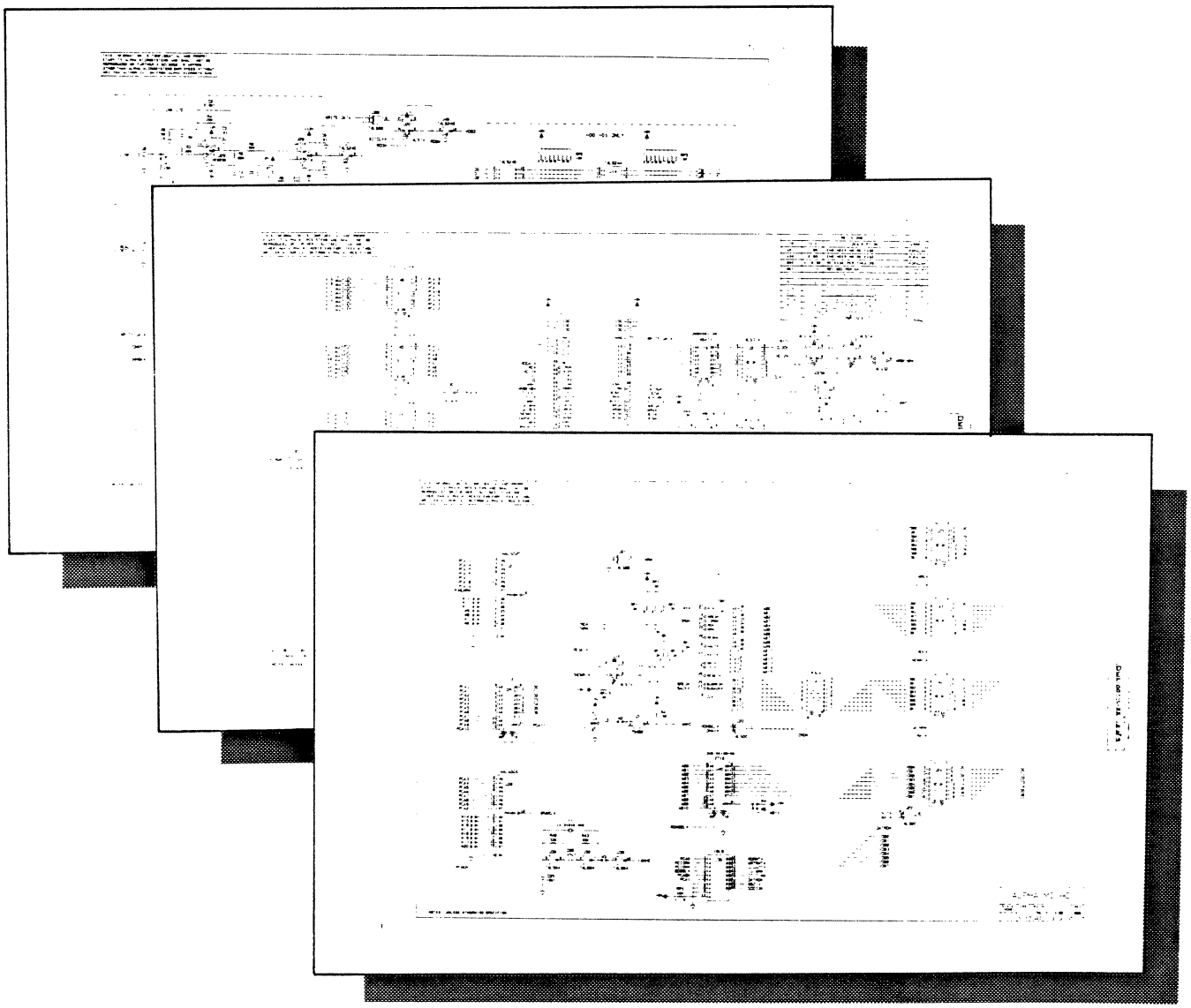
We hope you find the *AMSD Journal* to be a valuable reference tool, and that you will want to refer to its articles frequently in the future. To make it easy and quick to find information, current articles are designed to be filed with articles from past issues. The entire set of *Journal* back issues 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.

AM-1500/AM-2000 Schematics Available

Have you attended the VME System Seminar, and **NOT** received your copy of the VME systems logic diagrams? If so, please notify Customer Education in writing or call Nancy Steen at (714) 641-6330 to arrange to receive them.



AM-1000 CPU Schematics Available

If the Hardware Volume article 6.1.45 - "AM-1000 CPU Modification History," in this month's issue has piqued your appetite for more technical information on the AM-1000 CPU, you will be happy to hear that schematics for Revisions A, B, and D of the AM-167 board are now available for purchase by authorized Alpha Micro dealers.

Please send this order form and your check for $50 (per schematic set) to:

Attention: Nancy Steen
Alpha Micro Technical Support Group
3501 Sunflower
Santa Ana, California 92799

If you have any questions, please call Nancy Steen of the Alpha Micro Technical Support Group at (714) 957-8500.

ATTENTION: Nancy Steen, Technical Support

Name: _____

Dealer Number: _____ Phone Number: _____

Address: _____

_____

Ship to the attention of: _____

Which schematic set(s) do you wish to purchase?

AM-167 Revision A: _____
AM-167 Revision B: _____
AM-167 Revision D: _____

Please include a check with this order form ($50 for each schematics set). Allow two weeks for delivery after receipt of your order.

6.1.45
AM-1000 CPU Modification History

by Arthur Silverstein and
Michael Zappavigna
Senior Support Specialists
Technical Support Group

This article is designed to clarify some questions received by the Technical Support Group concerning the revisions and modifications to the AM-167 board. If you follow the instructions in this article, you will be able to update your AM-167 board to the latest revision level for its particular artwork. The limitations to each individual artwork will remain.

NOTES:

1. There was no revision C artwork released to the field-- therefore, it is not listed in this article.

2. Revision A01 is the first released version of the AM-167 board.

3. Revision A artwork is limited to 128Kb of memory and **will not** accommodate any memory expansion.

4. Revision B artwork is limited to 128Kb of onboard memory and **will** accommodate **all** Alpha Micro memory expansions.

5. 256Kb of memory located on the AM-167 PCB is only supported on revision D artwork of the AM-167.

6. 512Kb of memory located on the AM-167 PCB is only supported on revision D artwork of the AM-167.

7. Some versions of the AM-167 **will not** accommodate any I/O expansion.

8. A list of the AM-167 PCB by part number is given at the end of this article. This will help you understand the differences in the artwork and memory size restrictions and I/O restrictions.

9. Updated schematics for Revision A, B, and D of the AM-167 are available from Technical Support. [Editor's Note: See "AM-1000 CPU Schematics Available," elsewhere in this issue.]

Modification #1

Modification #1 changes the time of day circuitry on the AM-167 PCB, changing the revision level of your AM-167 from A01 to A02.

CURRENT REVISION: A02.

A. Cut etch on the solder side of the AM-167 PCB at U175 pin 5.

B. Cut the etch on component side of the AM-167 PCB that runs from U172 pin 12 to a feed through under U171, between pins 6 and 7 of U172 to between pins 10 and 11 of U171. This etch should be cut between U171 and U172.

C. Cut the etch on component side of the AM-167 PCB that runs from U172 pin 11 to a feed through under U171, between pins 7 and 8 of U172 to between pins 9 and 10 of U171. This etch should be cut between U171 and U172.

D. Cut the etch on component side of the AM-167 PCB that runs from U172 pin 10 to U171 pin 5, between pins 8 and 9 of U172 to below pin 9

6.1.45 (Continued)
AM-1000 CPU Modification History

of U171. This etch should be cut between U171 and U172.

E. Cut the etch on component side of the AM-167 PCB that runs from U172 pin 9 to U171 pin 6. This etch should be cut between U171 and U172.

F. Add a jumper from U172 pin 9 to U171 pin 3.

G. Add a jumper from U172 pin 10 to U171 pin 4.

H. Add a jumper from U172 pin 11 to U171 pin 5.

I. Add a jumper from U172 pin 12 to U171 pin 6.

J. Add a jumper from U173 pin 7 to Location TP2 (solder on the pin). This test point is located near the battery for the Day/Time clock, component location BT1.

K. Remove resistor network at location RN9, a 1K ohm resistor network, and install it with a 10K ohm resistor network. The Alpha Micro part number for the new resistor network is RSN-00020-00.

Modification #2

Modification #2, changing the revision level from A02 to A03, is a vendor rework. The change is to a construction specification for the bare PCB and does not affect the field-- therefore no rework is required for this modification.

CURRENT REVISION: A03.

Modification #3

Modification #3 changes the bus lines that are not pulled high enough during an inactive state, and also changes the time constant of the power-on circuit. The field noticeable fault is the system powering on in self-test mode. This changes the revision level of your AM-167 from A03 to A04.

CURRENT REVISION: A04.

A. Replace the resistor network at location RN12 from 4.7K ohm to 2.2K ohm. The Alpha Micro part number for the new resistor network is RSN-00025-00.

B. Replace the capacitor at location C123 from 15uf to 22uf. The Alpha Micro part number for this capacitor is CPP-000226-01.

C. Replace the resistor network at location R9 from 33K ohm to 220K ohm. The Alpha Micro part number for this resistor network is RS2-00224-00.

Modification #4

Modification #4 delays the signal **DTACK** for memory read and write operations. This change solves a high temperature problem that causes parity errors and system lockups, and changes the revision level of your AM-167 from A04 to A05.

CURRENT REVISION: A05.

A. Locate the four jumper locations marked, B, C, D, E, between IC locations U157 and U158.

B. Cut the etch on the component side of the AM-167 PCB in jumper position B.

C. Install a bare wire jumper in position C.

Modification #5

Modification #5 decreases memory access time for a read operation. It also adds

6.1.45 (Continued)
AM-1000 CPU Modification History

insulation tape under the crystals to prevent them from shorting to traces running under them, allowing the use of metal cased crystals as well as plastic cased crystals. The addition of the tape is for manufacturing purposes and does not have to be installed in existing units. This changes the revision level of your AM-167 from A05 to A06.

CURRENT REVISION: A06.

A. Replace the IC at location U46 from a 74LS373 to a 74S373. The Alpha Micro part number for the new IC is IC1-74373-02.

B. Replace the IC at location U65 from a 74LS373 to a 74S373. The Alpha Micro part number for the new IC is IC1-74373-02.

C. Replace the IC at location U167 from a 74LS32 to a 74S32. The Alpha Micro part number for the new IC is IC1-07432-02.

D. Remove the crystal at location XY2. Install Insulation tape on the area of the AM-167 PCB where the crystal sits. Reinstall the crystal. The Alpha Micro part number of the insolation tape is HDM-00037-00.

E. Remove the crystal at location XY3. Install Insulation tape on the area of the AM-167 PCB where the crystal sits. Reinstall the crystal. The Alpha Micro part number of the insolation tape is HDM-00037-00.

F. Locate the four jumper locations marked, B, C, D, E, between IC locations U157 and U158.

G. Remove the bare wire jumper from location C.

H. Install a bare wire jumper in position B.

Modification #6

Modification #6 solves memory timing problems and enables the signal **PHANTOM** at the beginning of the signal **PRESET.** This changes the revision level of your AM-167 from A06 to A07.

CURRENT REVISION: A07.

A. Cut the etch running from U148 pin 10 on the component side of the AM-167 PCB. This etch runs under U148 and exits from under this IC between pins 6 and 7. This etch should be cut after it exits from between pins 6 and 7.

B. Cut the etch running from U191 pin 4 on the component side of the AM-167 PCB. This etch runs under RN10 between pins 6 and 7 to under U190 between pins 9 and 10. This etch should be cut between U190 and RN10.

C. Cut the etch running from U153 pin 2 on both the component side and on the solder side of the AM-167 PCB.

D. Install a jumper from U187 pin 1 to the lead of R61 closest to pin 8 of U190. R1 is located next to U190.

E. Install a jumper from U132 pin 5 to U164 pin 1.

F. Install a jumper from U164 pin 1 to U164 pin 2 to U164 pin 3 to U153 pin 2.

G. Install a jumper from U152 pin 2 to the feed through beside U133 pins 6 and 7.

H. Install a jumper from U165 pin 5 to the feed through below U160 and above U181.

6.1.45 (Continued)
AM-1000 CPU Modification History

Modification #7

Modification #7 eliminates noise on the baud rate clock that causes your system to have communications problems with a terminal or other RS232 devices. This change is for A and B revisions artwork, and changes the revision level of your AM-167 A07 to A08 and B00 to B01.

This is the introduction of the B revision artwork AM-167 PCB and the first modification to it.

CURRENT REVISIONS: A08, B01.

A. Install a 100pf capacitor from U67 pin 5 to U67 pin 7. The Alpha Micro part number for the new capacitor is CPN-00101-02.

Modification #8

Modification #8 is a documentation change and there is no functional change to your AM-167 PCB. Therefore this only affects the revision level of the current, B, revision artwork. This changes the revision of your AM-167 from B01 to B02.

CURRENT REVISIONS: A08, B02.

Modification #9

Modification #9 replaces the memory address drivers to increase the address line driving current. This change is for revision B artwork only, and changes the revision level of your AM-167 from B02 to B03.

CURRENT REVISIONS: A08, B03.

A. Remove IC U133 74LS244 and install a 74S240. The Alpha Micro part number of the new IC is IC1-74240-02.

B. Remove IC U134 74LS244 and install a 74S240. The Alpha Micro part number of the new IC is IC1-74240-02.

C. Remove IC U135 74LS244 and install a 74S240. The Alpha Micro part number of the new IC is IC1-74240-02.

D. If your AM-167 PCB is populated with NEC 64K x 1 RAM chips, they should be replaced with another brand. These ICs were metal cased ICs. if your system has plastic cased ICs, they are fine to use.

Modification #10

Modification #10 reduces access time, and is for revision B artwork only. This changes the revision of your AM-167 from B03 to B04.

CURRENT REVISIONS: A08, B04.

A. Cut the etch that runs from U153 between pins 14 and 15 to U154 between pins 5 and 6 on the component side of the AM-167 PCB. This etch should be cut between U153 and U154.

B. Locate the feed through that lies between U137 and U138, and has an etch running from it to U137 between pins 11 and 12, and U138 between pins 5 and 6 on the component side of the AM-167 PCB. Cut both these etches prior to them running under their respective ICs, isolating this feed through. This feed through will be referred to later as FEED THROUGH A.

C. Locate the feed through between U155 and U156 that has an etch running from it to U156 between pins 8 and 9 on the component side of the AM-167 PCB. Cut the etch before it runs under U156, isolating the feed through. This feed through will be referred to later as FEED THROUGH B.

6.1.45 (Continued)
AM-1000 CPU Modification History

D. Install a jumper from feed through A to feed through B.

E. Install a jumper from U138 pin 9 to U152 pin 6.

F. Install a jumper from U138 pin 10 to U137 pin2 to U153 pin 6.

Modification #11

Modification #11 corrects a potential power dissipation problem with -5 volts regulator, a 79L05, for the VCR circuit on the AM-167 PCB. This change is for B revision artwork AM-167 PCBs only, and changes the revision of your AM-167 PCB from B04 to B05.

CURRENT REVISIONS: A08, B05.

A. Install a heat sink to regulator at Q1. The Alpha Micro part number for the heat sink is HDM-00071-00.

Modification #12

Modification #12 affects the memory cycle decode logic. This change is only required on systems with 5 1/4 inch floppy drives. This change is to the B revision artwork only, and changes the revision of your AM-167 from B05 to B06.

CURRENT REVISIONS: A08, B06.

A. Remove the IC at U149, a 74LS139 and replace it with 74S139. The Alpha Micro part number for this IC is IC1-74139-02.

B. Install a 10K ohm resistor between U165 pin 3 and U165 pin 14. The Alpha Micro part number of this resistor is RS2-00103-00.

C. Install a 10K ohm resistor between U149 pin 2 and U149 pin 3. The Alpha Micro part number of this resistor is RS2-00103-00.

Modification #13

Modification #13 affects the memory cycle start circuit. This change is for B revision artwork only, and changes the revision of your AM-167 from B06 to B07.

CURRENT REVISIONS: A08, B07.

A. Remove the jumper running from U132 pin 6 to U153 pin 17.

B. Install a jumper from U132 pin 6 to U164 pin 1 to U164 pin 2.

C. Install a jumper from U164 pin 3 to U153 pin 17.

Modification #14

Modification #14 enables the AM-167 to run AM-1001 disk drive subsystems. This change is for A and B revision artwork AM-167 PCBs. This is the introduction of D revision artwork. This changes the revision of your AM-167 from A08 to A09 and B07 to B08.

CURRENT REVISIONS: A09, B08, D00.

A. Cut the etch that runs from U142 pin 9, on the component side of the AM-167.

B. Install a jumper from U142 pin 9 to U177 pin 9.

Modification #15

Modification #15 allows multiple disk drive selects when running an AM-1001 subsystem. This changes the revision of your AM-167 from A09 to A10, or from B08 to B09, or from D00 to D01.

CURRENT REVISIONS: A10, B09, D01.

A. Cut the etch that runs from U175 pin 13, on the solder side of the AM-167 PCB.

6.1.45 (Continued)
AM-1000 CPU Modification History

B. Install a jumper from U175 pin 13 to U175 pin 14.

Modification #16

Modification #16 is for AM-167-00 and AM-167-01 only, revision D artwork. It removes a -5V short to -12V, adds missing grounds, and adds a filter capacitor to -5V output. This change is to the D revision artwork only, and changes the AM-167 revision level from D01 to D02.

CURRENT REVISIONS: A10, B09, D02.

A. Install a jumper from U13 pin 1 to U14 pin 1 to U15 pin 1.

B. Install a jumper from U17 pin 7 to U16 pin 7.

For AM-167-01 ONLY

C. Remove capacitor at location C2. C2 is located above the IC location U7.

D. Locate R84, which is located above and to the right of C2. Cut the etch running from the lead of R84 nearest U7 to C2. This same etch also runs to C3, and must also be cut. This isolates R84 from both capacitors.

F. Install a jumper from the negative "-" side of C3 to the lead of C2 nearest U7.

G. Install a 15uf capacitor from the lead of R84 nearest U7 to the lead of C2 nearest U7 pin 14. This capacitor is electrolytic, and the positive, "+", end should be connected to the lead of C2. The Alpha Micro part number of this capacitor is CPP00156-01.

Modification #17

Modification #17, revision level change from B09 to B10 and D02 to D03, is a manufacturing change and does not affect the field.

CURRENT REVISIONS: A10, B10, D03.

Modification #18

Modification #18 adds the SSD chip to all new systems built. The SSD is installed into U156. This changes the revision of your AM-167 from B10 to B11 or D03 to D04.

CURRENT REVISIONS: A10, B11, D04.

Modification #19

Modification #19 allows the use of the AM-1003 I/O expansion on A revision artwork. This modification is for A revision artwork only, and changes the revision of your AM-167 from A10 to A11.

CURRENT REVISIONS: A11, B11, D04.

A. Cut the etch running from U148 pin 9. This etch runs under U148 and exits from between pins 5 and 6. This etch should be cut after it exits from under U148.

B. Locate the feed through between U160 and U181. This feed through will have an etch running from it to the right. Install a jumper from this feed through to U165 pin 5.

Modification #20

Modification #20 affects the sensitivity to power supply turn-on slew rate. The field

6.1.45 (Continued)
AM-1000 CPU Modification History

noticeable problem is the system being in self-test mode on power on. This change is for ALL revisions artwork of AM-178 PCB, and changes the revision of your AM-167 from A11 to A12 or B11 to B12 or D04 to D05.

CURRENT REVISIONS: A12, B12, D05.

A. Install a 1N4001 diode with the cathode, or banded-end, toward the center of the AM-167 PCB. This diode should be parallel to R9 and resides between U193 and U189. The Alpha Micro part number for this diode is DIO-04001-00.

B. Replace the capacitor at C123 from a 22uf to a 68uf. This capacitor is an electrolytic capacitor, so be careful to insert it with the proper polarity. The Alpha Micro part number of the new capacitor is CPP-00686-00.

Modification #21

Modification #21 bypasses the sampling circuit on the AM-167 board. This change is to the D revision artwork only, and changes the revision level of your AM-167 from D05 to D06.

CURRENT REVISIONS: A12, B12, D06.

A. Locate the 4 pin jumper pad labeled BYP. This pad is located above U30.

B. The jumper is in etch running from front to back and is in the left hand position on the solder side of the AM-167. Cut this etch on the solder side of the AM-167.

C. Install a jumper in the right hand position of the BYP jumper.

Modification #22

Modification #22 increases on-board memory from 128Kb to 256Kb. This modification is for early systems that were known as AM-1000-E and had 256Kb of base memory. If you DO NOT wish to have 256Kb of base memory, this modification is not necessary. This is for revision D artwork only, and changes the revision of your AM-167 from D06 to D07.

CURRENT REVISIONS: A12, B12, D07.

A. Replace the capacitor at C99 from 100pf to 330pf. The Alpha Micro part number of the new capacitor is CPN-00331-01.

B. Replace the IC delay line at location U158 from 150ns to 100ns. The Alpha Micro part number for the new delay line is ICS-00100-00.

C. Replace the IC in location U132 from a 74LS74 to a 74S74. The Alpha Micro part number for the new IC is IC1-07474-02.

D. Install a 330pf capacitor from U150 pin 7 to U152 pin 4. The Alpha Micro part number for this capacitor is CPN-00331-01.

E. Install a 220 ohm resistor from U152 pin 4 to the feedthrough above U152 pin 1. The Alpha Micro part number for this resistor is RS2-00221-00.

F. Cut the etch on the solder side of the AM-167 running from U152 pin 4 to the feedthrough above U152 pin 1.

G. Locate the four position jumper block in etch, to the left of U156. This jumper pad is in a square pattern. Cut the etch running from under U156 to the upper left position of the four.

H. Install a jumper on the jumper pad from the previous step from the lower right corner to the lower left corner.

6.1.45 (Continued)
AM-1000 CPU Modification History

For revision D artwork only.

F. You may increase the onboard memory from 128Kb to 256Kb by removing all the memory in U84 to U92 and U102 to U110 and installing 256Kb x 1 bit memory chips. There are 18 ICs required. The Alpha Micro part number for these memory ICs are ICM-41128-00.

NOTE: The following jumper configuration is for the new memory banking PROM, DWB-00168-03, revision B00 (W20 is on B artwork only):

Base Memory	Jumpers Installed
128Kb	W20,W21,W22,W23
256Kb	W20,W21,W23

Modification #23

Modification #23 is a documentation change and there is no functional change to your AM-167 PCB. Therefore this only affects the revision level of the current, D, revision artwork. This changes the revision of your AM-167 from D07 to D08.

CURRENT REVISIONS: A12, B12, D08.

Modification #24

Modification #24 is a documentation change and there is no functional change to your AM-167 PCB. Therefore this only affects the revision level of the current, D, revision artwork. This changes the revision of your AM-167 from D08 to D09.

CURRENT REVISIONS: A12, B12, D09.

Modification #25

Modification #25 delays the start of memory cycle time. The field noticeable problem is intermittent parity errors on systems using 128Kb x 1 dual cavity memory chips, which may be installed as memory on the AM-167 or on a memory expansion, AM-1002. This change is for D revision artwork only, and changes the revision level of your AM-167 from D09 to D10.

CURRENT REVISIONS: A12, B12, D10.

A. Cut the etch running between U153 pin 3 and U153 pin 6 on solder side of the AM-167.

B. Install an IC delay line, 100ns, at U193. The Alpha Micro part number for this delay line is ICS-00100-00.

C. Install a jumper from U132 pin 5 to U193 pin 6.

D. Install a jumper from U153 pin 6 to U193 pin 12.

Modification #26

Modification #26 properly terminates two control lines on the SASI interface bus. The field noticeable symptom is intermittent type 2 code 1 errors on the disk drive. This change is for all revisions artwork AM-167s, and changes the revision level of your AM-167 from A12 to A13 or B12 to B13 or D10 to D11.

CURRENT REVISIONS: A13, B13, D11.

A. Installl a 3.3K ohm resistor from U172 pin 8 to U172 pin 14. The Alpha Micro part number for the resistor is RS2-00332-00.

B. Installl a 3.3K ohm resistor from U172 pin 11 to U172 pin 14. The Alpha Micro part number for the resistor is RS2-00332-00.

Modification #27

Modification #27 corrects intermittent boot up problems on the AM-1100 series UNIX-based systems. It does not affect AMOS-based systems. This change is for revision

6.1.45 (Continued)
AM-1000 CPU Modification History

D artwork only, and changes the revision level of your AM-167 from D11 to D12.

CURRENT REVISIONS: A13, B13, D12.

A. Install a 1K ohm from U190 pin 10 to U190 pin 14. The Alpha Micro part number of this resistor is RS2-00102-00.

Modification #28

Modification #28 is a documentation change and there is no functional change to your AM-167 PCB. Therefore this only affects the revision level of the current, D, revision artwork. This changes the revision of your AM-167 from D12 to D13.

CURRENT REVISIONS: A13, B13, D13.

Modification #29

Modification #29 corrects a problem with J2 and J7 connectors walking out of the connector during transportation. This problem resulted in intermittent drive and PCB problems. These connectors were changed to units with locking ejector tabs. This change is for revision D artwork but may be incorporated into all revisions. This changes the revision level of your AM-167 from D13 to D14.

CURRENT REVISIONS: A13, B13, D14.

A. Replace the connectors at location J2 and J7 on the AM-167 from a non-locking type to the locking type. The Alpha Micro part number of these connectors is CNF-00059-01.

Modification #30

Modification #30 changes J8 to a Gold plated connecter on the AM-167 board because of intermittent connection between power supply and PCB. This change is for revision D artwork, but should be incorporated on all revisions. This changes the AM-167 revision level from D14 to D15.

CURRENT REVISIONS: A13, B13, D15.

A. Replace the J8 connector on the AM-167 with the new unit included with the kit.

B. Replace the DC power cable running from the power supply to the AM-167 with the new unit included in the kit.

NOTE: The Retro-fit kit for this modification is RFK-00167-03 which includes a Gold plated connector and new-style power cable.

Modification #31

Modification #31 corrects the window for the clocking diagnostic flag. The field noticeable symptom is, the system starts diagnostic, self-test, mode at power on. This is for revision D artwork but may be incorporated into all revisions. This changes the revision level of your AM-167 from D15 to D16.

CURRENT REVISIONS: A13, B13, D16.

A. Replace the resistor at location R9 from a 220 ohm to a 1K ohm resistor. Only connect one side of the resistor to the anode, or non-banded end, of CR9. The Alpha Micro part number for this resistor is RS2-00102-00.

B. Replace the capacitor at location C123 from a 68uf to 2.2uf. The Alpha Micro part number of the capacitor is CPP-00225-01.

C. Install a jumper from the nonconnected end of R9 to U188 pin 11.

D. Install a jumper from U192 pin 13 to U188 pin 12.

E. Install a jumper from U188 pin 12 to U188 pin 13.

6.1.45 (Continued)
AM-1000 CPU Modification History

Modification #32

Modification #32 corrects remote reset circuit sensitivity to noise during power on conditions causing the system to intermittently power up in self test mode and changes the AM-167 revision level from D16 to D17.

CURRENT REVISIONS: A13, B13, D17.

A. Install a .1uf capacitor from U192 pin 10 to U192 pin 12. The Alpha Micro part number of this capacitor is CPN-00104-01.

Modification #33

Modification #33 allows you to run 512Kb of memory on tha AM-167 board memory and provides compatibility with an AM-706, A04 and B revisions. This change to increase memory is only supported on revision D artwork. The portion to support the large memory add-on is for revisions B and D artwork. This changes the revision level of your AM-167 from B13 to B14, or D17 to D18.

CURRENT REVISIONS: A13, B14, D18.

A. Cut etch solder side of the AM-167 between U196 pin 13 and U196 pin 14.

B. Install a jumper from U81 pin 48 to W21 nearest U196. This jumper will be to the left of U196 if you have revision B artwork and to the right of U196 if you have revision D artwork.

C. Install a jumper from U81 pin 50 to U196 pin 14.

D. Replace the memory banking PROM at location U196 from a DWB-00168-03 to a DWB-00168-04. The Alpha Micro part number for this PROM is DWB-00168-04.

For revision D artwork only.

E. You may increase the onboard memory from 128Kb or 256Kb to 512Kb by removing all the memory in U84 to U92 and U102 to U110 and install 256Kb x 1 bit memory chips. There are 18 ICs required. The Alpha Micro part number for these memory ICs are ICM-41256-00.

NOTE: The following jumper configuration is for the new memory banking PROM, DWB-00168-04 (W20 is on B artwork only):

Base memory	Jumpers Installed
128Kb	W20,W22,W23
256Kb	W20,W22
512Kb	W20,W23

Modification #34

Modification #34 incorporates AlphaNET circuitry into the AM-167 PCB. This change is for all revisions artwork, and changes the revision level of your AM-167 from A13 to A14, or B14 to B15, or D18 to D19.

The parts for this upgrade are in the AlphaNET installation kit for AM-1000s. The Alpha Micro part number for this kit is PDB-00615-02.

CURRENT REVISIONS: A13, B15, D19.

A. Replace the resistor at location R1 with a 75 ohm 5% resistor. The Alpha Micro part number for this resistor is RS2-00750-00.

B. Replace the resistor at location R36 with a 732 ohm 1% resistor. The Alpha Micro part number for this resistor is RSP-07320-00.

C. Replace the resistor at location R34 with a 68.1 ohm 1% resistor. The Alpha Micro part number for this resistor is RS-06810-00.

6.1.45 (Continued)
AM-1000 CPU Modification History

D. Replace the resistor at location R42 with a 732 ohm 1% resistor. The Alpha Micro part number for this resistor is RSP-07320-00.

E. Replace the resistor at location R44 with a 1K ohm 5% resistor. The Alpha Micro part number for this resistor is RS2-00102-00.

F. Replace the resistor at location R43 with a 287 ohm 1% resistor. The Alpha Micro part number for this resistor is RS2-00287-00.

G. Replace the resistor at location R5 with a 56 ohm 5% resistor. The Alpha Micro part number for this resistor is RS2-00560-00.

H. Replace location C14 with 10 ohm 5% resistor. This will become R87. The Alpha Micro part number for this resistor is RS2-00100-00.

I. Replace The IC PROM at location U162 with the new PROM DWB-00169-05 revision B00. The Alpha Micro part number for this PROM is DWB-00169-05.

J. Remove the diode at location CR3.

K. Install an 18pf capacitor between U6 pin 12 and U6 pin 14. This will become C135. The Alpha Micro part number for this capacitor is CPN-00180-01.

L. Install a diode, 1N4148, with the cathode, or banded-end, connected to U8 pin 8 and the anode, or non-banded end connected to U8 pin 13. This will become CR10. The Alpha Micro part number for this diode is DIO-04148-00.

Modification #35

Modification #35 is a manufacturing change to remove the 68000 socket, and flow solder the IC directly to the PCB. This was incorporated to prevent the 68000 from walking out of the socket during transportation. This change is for revision D artwork only, and changes the revision level of your AM-167 from D19 to D20.

CURRENT REVISIONS: A13, B15, D20.

Modification #36

Modification #36 is a manufacturing change to remove the memory sockets, and flow solder the ICs directly to the PCB. This was incorporated to prevent the memory ICs from walking out of the sockets during transportation. This change is for revision D artwork only, and changes the revision level of your AM-167 from D20 to D21.

CURRENT REVISIONS: A13, B15, D21.

Modification #37

Modification #37 corrects the Time/Day clock. The field symptom is, on power up the date or time is wrong. This change is for all revisions artwork. This changes the revision level of your AM-167 from A14 to A15, or B15 to B16, or D21 to D22.

The parts for this modification are available as Alpha Micro part number DWB-00016-00.

Due to the large-size AM-706 memory add-on, it will be necessary to make sure the added components reside close to the PCB.

6.1.45 (Continued)
AM-1000 CPU Modification History

CURRENT REVISIONS: A14, B16, D22.

A. Remove the resistor at location R65.

B. Lift IC pin U172 pin 8 from the IC socket.

B. Install a 22uf capacitor from the side U154 pin 8 to U172 pin 13. This is an electrolytic capacitor and the "+" end should be attached to U172 pin 8.

C. Install the 1N4001 diode across 4.7K ohm resistor provided.

D. Install the resistor/diode network from U172 pin 8 to U172 pin 1. The cathode, or banded-end, should be connected to U172 pin 1.

AM-167 Configurations

By Assembly Number

Revision A artwork:

DWB-00167-00:
128Kb memory, without VCR, no memory expansion.
DWB-00167-01:
128Kb memory, with VCR, no memory expansion.

Revision B artwork:

DWB-00167-00:
128Kb memory, without VCR.
DWB-00167-01:
128Kb memory, with VCR.

Revision D artwork:

DWB-00167-00:
128Kb memory, without VCR.
DWB-00167-01:
128Kb memory, with VCR.
DWB-00167-02:
256Kb memory, without VCR.
DWB-00167-03:
256Kb memory, with VCR.
DWB-00167-04:
512Kb memory, with VCR.
DWB-00167-05:
512Kb memory, with VCR.
DWB-00167-06:
512Kb memory, without VCR, no I/O expansion.

13.1.27
Field Diagnostics Available on AMTEC

by Dan Twaddell, Reliability Engineer
Technical Operations

Beginning the end of September, a software package will be available from Alpha Micro that provides help in diagnosing hardware problems. This package, called **Field Diagnostics,** contains many of the same test programs used by Alpha Micro to qualify products prior to shipment, and will give anyone who regularly services Alpha Micro computer equipment an invaluable tool for making accurate field repairs.

Product Description

Some of the features available in the **Field Diagnostics** package are:

- **Field Diagnostics** can be activated on site or from a remote location via modem.
- The package can detect available hardware on the system to be tested, call up the appropriate tests, and automatically set the test parameters.
- In addition to displaying test status on the terminal screen, **Field Diagnostics** creates and constantly updates a disk file containing detailed test-by-test results.
- The package is compatible with all Alpha Micro computer systems booting from 68000, 68010, or 68020 CPU chips.
- **Field Diagnostics** provides a complete system check that can test a wide variety of Alpha Micro hardware:

  AM-1000, AM-1200, AM-1500, and AM-2000 systems.

  S-100 bus systems booting from the AM-100/L CPU board.

  Priam, Fujitsu, Quantum, Vertex, CMI, Micropolis, Maxtor, and Miniscribe disk drives.

  Both 8" and 5 1/4" floppy drives.

  Archive, Cipher, and CDC streaming magnetic tape drives.

  AM-710, AM-725, AM-730, and AM-740 memory boards.

  AM-610, AM-630, AM-167, and AM-177 VCR interface circuits.

  AM-515 and AM-520 Disk Accelerators.

  AM-350 Intelligent I/O Controller.

  On-board AM-167, AM-177, AM-175, and AM-180 serial I/O.

  AM-355 serial I/O.

Restrictions

The operating system for 16-bit computers must be AMOS/L 1.3 or later. All released versions of the AMOS/32 operating system are compatible with **Field Diagnostics.**

Field Diagnostics must be run in single-user mode. The single user may either be a terminal or a modem job. Using a modem allows the versatility of being able to activate the diagnostic package from a remote location.

The system to be tested must be bootable, and some means of down loading the **Field Diagnostics** package must exist.

13.1.27 (Continued)
Field Diagnostics Available on AMTEC

The testing of Phoenix and Hawk CDC cartridge hard disk drives is not supported in the initial release of **Field Diagnostics,** but the package can be downloaded onto Hawk or Phoenix disk drives to test memory, I/O, subsystems, or other peripheral devices.

Program Distribution

The **Field Diagnostics** package will be distributed and updated on the Alpha Micro Technical Exchange Center (AMTEC), an on-line, 24-hour a day system with five rotary modem lines. A support fee of $400 includes one year's access to the **Field Diagnostics** package and access to any updates made to either the software or documentation. Availability is limited to Alpha Micro dealers and distribution will be by phone line (modem) only.

For more information, or to order **Field Diagnostics,** call Nancy Steen of Alpha Micro's Technical Support Group at (714) 957-8500.

1.1.22
New Procedures for Patch Distribution

by J. Kreider, Senior Support Specialist
Technical Support Group

With the introduction of the AMTEC system (Alpha Micro Technical Exchange Center), we now have a more efficient way to make patches available. Within 24 hours of release, patches will be available on the AMTEC system. This will not only provide each of our dealers with immediate access to any fix made available, but also provide a more convenient method of distributing module changes in lieu of traditional "patches" to existing modules.

As of June 15th, we also began making monthly patch mailings to each dealer. On or about the 15th of each month, any patches to software that have been released against any product since the previous month's mailing will be mailed as a group. This way, all the patches will arrive at the same time each month rather than trickling in throughout the period.

As more of our software products are developed with intermediate level languages (such as AlphaC and AlphaPASCAL), as are AlphaPASCAL, AlphaCOBOL, SMC Basic and others, field fixes and/or enhancements become more cumbersome to produce and distribute. Most recently, SPN-295L to the DBMS.RTI file from UNIFY was released, which required a three-page tedious, repetitious patch. Aside from being long, it is quite easy to make a mistake and, once made, hard to isolate. Now that AMTEC is available, it will make it easier for you to install such patches.

In some cases, a one- or two-line change at the source code level could change the organization of the entire assembled program. In such cases, we would provide the reassembled source fix rather than a lengthy patch. Whenever feasible, a hard copy patch will be made available and mailed with the monthly distribution. Nevertheless, at the very least, a set of instructions will be sent detailing the purpose of the module change, how to install it on the system and any other software specific characteristics about which you should be informed.

If a patch or set of patches is required, and access to AMTEC is unavailable or you have telecommunication problems, contact Customer Education at (714) 641-6330 or Technical Support (714) 641-7608 for information on alternatives and their costs.

It is our hope that these new procedures will allow you to better support your customers.

3.2.28
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, and UNIFY.

Patches in the following list include SPNs 256 through 302, and are current through 19 August 1987. As indicated on the list, some patches have already been released, some patches are still in test. See the August Journal Vol. 9, #8 - Software Article 3.2.26 for more information.

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

SPN #	Module	Purpose
256-257	—	Cancelled.
258-269	—	Released in a previous month.
270	—	Cancelled.
271-273	—	Released in a previous month.
274-277	—	Cancelled.
278-281	—	Released in a previous month.
282	AMOSL.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/L 1.3C.
283	AMOSL.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/L 1.3C.
284	AMOSL.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/L 1.3C.
285	AMOSL.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/L 1.3C.
286	AMOSL.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/L 1.3C.
287	AMOSL.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/L 1.3C.
288	AMOS32.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/32 1.0A.
289	AMOS32.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/32 1.0A.
290	AMOS32.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/32 1.0A.
291	AMOS32.MON	Corrects a problem with FILOTB monitor call working properly over the network. AMOS/32 1.0A.
292	VLP.DVR	Corrects a problem which causes a system crash upon initialization if a printer is using the older print spooler. AMOS/L 1.3C and AMOS/32 1.0A.
293-294	—	Released in a previous month.

(Continued)

3.2.28 (Continued)
New Software Patches Available from AMSD

SPN #	Module	Purpose
295	DBMS.RTI	Corrects a problem with a version mismatch between DBMS.SYS and DBMS.RTI for the "UNIFY on AMOS" product. UNIFY 3.1.
296	AM306.PDV	Corrects a problem with the initialization of a BOLD buffer pointer which causes AlphaCALC and other products to overwrite the system version number. AMOS/L 1.3C and AMOS/32 1.0A.
297	CRT610.LIT	Corrects a problem with CRT610/F, which was introduced with SPN-297L. AMOS/L 1.3C and AMOS/32 1.0A.
298	—	In test.
299	M681.OVR	Corrects problem with assembler going into debugging mode if used with AMOS/PC on an AM-113 CPU. AMOS/L 1.3C, AMOS/32 1.0A.
300-301	—	In test.
302	610DVR.DVR	Corrects problem with Control-C interrupt of VCRSAV when prompted to insert a video tape into a remote control VIDEOTRAX VCR. AMOS/L 1.3C and AMOS/32 1.0A.

3.3.20
Finding bitmap sizes on SCSI Drives

by Steve Albin, Senior Support Specialist
Technical Support Group

There are major differences between the way the new SCSI embedded controller disk drives interact with AMOS and the method used by other drives that use an external controller. The SCSI drives, currently used in the AM-1200 series systems, handle defects on the disk drive surface automatically. This results in the file BADBLK.SYS no longer being on the disk.

Also, because the SCSI drives use the new generation "self configuring" software, you do not need to specify the bitmap size of the drive in the BITMAP statement of the system initialization command file-- AMOS can read it from the drive automatically.

With these new "automated" features, plus the advantages of having an embedded controller (no boards to install or cables to hook up), installing or upgrading is virtually a "plug and play" process.

We all like the idea of not having to worry about BADBLK.SYS, or hassling with boards and cables. But, to most of us, there is something intimidating about not knowing the bitmap size. It is true, "the more automated things are, the less control you seem to have."

Using BITMAP at AMOS/L command level still tells you the memory locations assigned to the disk bitmaps and also the size of the bitmap for the devices on the system, including SCSI devices. This leads us to a final question: "How do you retrieve the bitmap size for a SCSI, self-configuring, device with a different logical split than the one currently used on your system?" FIX420 used to be the utility used for such a task, but cannot be used for SCSI controlled devices.

Here is a simple procedure to follow to accomplish this task using a system that is up and running and contains a SCSI drive. This procedure does not require you to re-configure the logical split for the drive.

Currently, Alpha Micro supports two sizes of SCSI drives: 70Mb and 145Mb. Be aware that the 70Mb drive can only be used to report proper bitmap sizes for various configurations on a 70Mb drive, and the same holds true for the 145Mb drive. In other words, don't try to find out a certain bitmap size for a 145Mb drive using a 70Mb drive, and vice versa.

Finding Out the Bitmap Size

STEP #1: To log into the System Operator's account, type: **LOG OPR:**

STEP #2: Type: **FIXLOG**

You see:

```
FIXLOG.LIT Version x.x(xxx)
1.    Change the number of logicals
2.    Create a subsystem driver
          Enter choice:
```

STEP #3: Type: **1**

You see:

```
Enter Device spec:
```

STEP #4: Type: **DSK0:**

You see:

```
Current number of logical drives defined per unit: n

Enter new number of logical drives per unit:
```

STEP #5: Type: **New logical split number**

You see:

```
If the number of logical drives is changed, your INI file must be updated
```

3.3.20 (Continued)
Finding bitmap sizes on SCSI Drives

to reflect the new bitmap size: the system must be rebooted, and the disk must be SYSACTed.

Are you sure (Y/N)?

We don't want to update the .INI file, and we definitely don't want to reboot and SYSACT. We only want to retrieve a new bitmap size. But, at this point it is OK to continue.

STEP #6: Type: **Y**

You see:

DSK has been changed to <new number> logical devices per unit. New Bitmap size is #### words.

STEP #7: Now you are back at the AMOS prompt. Write down the new bitmap size. Without doing anything else, immediately run FIXLOG again to go through the exact same steps to change the logical split information back to what the system is actually configured for. We then recommend you run DSKANA on all DSK devices to be safe.

WARNING:

If you change the number of logicals and the system is rebooted, you will have lost all of your data. Even though this procedure is quite simple, make sure you have a good, bootable backup.

For those of you who don't want to use this procedure, and yet would like to know bitmap sizes, here is a chart of possible logical split configurations and their corresponding bitmap sizes for both the 70Mb and the 145Mb SCSI drives.

SCSI Drive Bitmap Size by Number of Logical Devices

NUMBER OF LOGICALS	70Mb SCSI DRIVE	145Mb SCSI DRIVE
3	2848	---
4	2136	---
5	1709	3540
6	1424	2950
7	1221	2529
8	1068	2213
9	950	1976
10	855	1770
11	777	1610
12	712	1475
13	658	1362
14	611	1265
15	570	1180
16	---	1107
17	---	1042
18	---	984
19	---	932
20	---	885

6.7.1
UNIFY DBMS Memory Considerations

By Owen Evans, Systems Programmer
Advanced Products Development

The release notes for the UNIFY Relational Data Base Management System give some general information on memory usage and rules of thumb about memory requirements. This article provides more detailed information on how UNIFY uses memory so you, the application developer, can calculate memory usage more precisely and control what your particular application's memory requirements will be.

Below, we give specifics on UNIFY memory usage, as well as details about several areas of memory requirements. The topics covered in this article are:

- **Memory Usage of a Typical UNIFY AlphaC Program.** In order to understand how UNIFY uses memory, we need to see what the memory requirements are for a standard AlphaC program.
- **Organization of Memory When UNIFY is Executing.** When UNIFY is running, what does a user's memory partition look like? We include real-life examples.
- **Development Vs. Runtime Mode.** What are the memory considerations when you are developing an application versus the memory required when the application is being run in a production environment?
- **The Language Interface Environment-- AlphaBASIC, AlphaCOBOL, AlphaC-- and UNIFY.** What are the specific memory requirements for the various language interfaces to a UNIFY data base?
- **Table of UNIFY Program Sizes.** What are the memory requirements for specific UNIFY programs, and where do these programs get called?

Memory Usage of a Typical UNIFY AlphaC Program

Since the programs that make up UNIFY are written in AlphaC, there are three memory sizes to consider for each program. You must take into consideration the size of these three modules for any AlphaC program you write: code size, data storage area, and stack/heap area.

The Code Size: Each executable AlphaC program compiles into a .LIT file. This file contains the instructions that must be loaded into memory to be executed. For example, the UNIFY.LIT program, which displays the menus and accepts user commands, etc., contains 69048 bytes of executable code. The program is either loaded into the user memory partition to be executed, or can be loaded into system memory so the code can be shared among several users.

The Data Storage Area: This area, commonly called the program DSECT, contains the data storage, or variable space, that the program uses while executing. This area **must** be loaded into each user's memory partition-- it cannot be shared among users. The program UNIFY.LIT has a DSECT of 7172 bytes.

The Stack/Heap Area: This area of memory is used by an AlphaC program for the stack and heap spaces. The stack space is used for passing and returning information between AlphaC functions, and the heap space is where the dynamic memory allocation function, MALLOC, gets its memory. The stack starts at one end of the stack/heap area, and the heap starts at the other-- they grow towards each other as the stack grows and MALLOCs are executed. Each user, again, **must** have this area in his or her memory partition. The program UNIFY.LIT has a stack/heap size of 32000 bytes.

6.7.1 (Continued)
UNIFY DBMS Memory Considerations

The next section shows in detail what a user memory partition looks like when UNIFY is running.

Organization of Memory When UNIFY Is Executing

This section describes what the user memory partition looks like when UNIFY is running. There are **many** possibilities here, so we have chosen a few common examples for the purposes of illustration. These cases involve programs which both an applications software developer and an end user would be using (in the one case, to develop the application and, in the other, to run the application).

The next section discusses in more detail how memory requirements differ for developers and end users, and the section "Table of UNIFY Program Sizes," gives more information on the memory requirements for individual UNIFY programs and on what programs are called by other UNIFY programs.

To understand the following information, you need to know that UNIFY programs "nest" or stack during execution of various functions. For example, when you execute the UNIFY menu, and then run an ENTER screen, the UNIFY menu handler, UNIFY.LIT, stays in place and calls ENTER, which then executes. When ENTER finishes, UNIFY.LIT starts up again after the ENTER call. If ENTER calls RPT, ENTER stays in place while RPT starts up, and so forth.

For our examples, we will assume the system is set up for "runtime mode" (see the next section), and the following programs are loaded into system memory:

Program	Code Size
UNIFY.LIT	69048
ENTER.LIT	144530
RPT.LIT	86362
SQL.LIT	152254
USORT.LIT	36686
Total Bytes	488880

For the first case, let's assume ENTER is called from the UNIFY menu handler:

Module	Memory	Function
UNIFY.LIT	7172	Data
	32000	Stack/heap
	512	Buffer
UNI000.OVR	2428	SSD overlay
	512	Buffer
ENTER.LIT	11994	Data
	65536	Stack/heap
	512	Buffer
Total Bytes:	120666	

Next, let's assume you have selected a set of records from ENTER Query by Forms, and passed these records to RPT for printing-- RPT would be loaded into your memory partition as well:

Module	Memory	Function
UNIFY.LIT	7172	Data
	32000	Stack/heap
	512	Buffer
UNI000.OVR	2428	SSD overlay
	512	Buffer
ENTER.LIT	11994	Data
	65536	Stack/heap
	512	Buffer
	512	Buffer
RPT.LIT	65072	Data
	65536	Stack/heap
Total Bytes:	261786	

6.7.1 (Continued)
UNIFY DBMS Memory Considerations

Let's take another case. Assume the UNIFY menu handler calls SQL, and SQL ends up calling USORT to sort the result of a query:

Program	Memory	Function
UNIFY.LIT	7172	Data
	32000	Stack/heap
	512	Buffer
UNI000.OVR	2428	SSD overlay
	512	Buffer
SQL.LIT	51526	Data
	65536	Stack/heap
	512	Buffer
USORT.LIT	4338	Data
	65536	Stack/heap
Total Bytes:	230072	

Let's consider the case where SQL is called from AMOS command level:

Program	Memory	Function
SQL.LIT	51526	Data
	65536	Stack/heap
	512	Buffer
UNI000.OVR	2428	SSD overlay
	512	Buffer
Total Bytes:	120514	

As another example, let's consider a custom program that is called from the UNIFY menu handler: the Lead Follow Up Activity Entry/Inquiry program. The source code for this program is in the UNIFY release account [5,1] with the sample application LEADS.

Program	Memory	Function
UNIFY.LIT	7172	Data
	32000	Stack/heap
	512	Buffer
UNI000.OVR	2428	SSD overlay
	512	Buffer
LFUAEI.LIT	88738	Code
	7128	Data
	32000	Stack/heap
Total bytes:	170490	

Development Vs. Runtime Mode

When you, the applications developer, are using UNIFY to build your application, you are using UNIFY in the Development Mode. When the application is installed, being used by the end users, they are using UNIFY in the Runtime Mode. Let's consider these two modes:

Development Mode:

When you develop your application, you use programs such as the UNIFY menu handler, Schema Entry (for entering the Data Base Design), Screen Entry and PAINT (to design screen forms), Create Data Base, Reconfigure Data Base, Menu Maintenance (to build menus), and so on. You select these options from menus which are displayed by UNIFY.LIT, the menu handler program.

Application development can be a multi-user activity; that is, more than one person can be using UNIFY to develop an application on the same system (either the same application in the same disk account, or different applications in different disk accounts).

In development mode, you use some programs the end user will probably never use as well as programs the end user will definitely use. For example, the developer and the end user will both use ENTER--you will use it to test the ENTER screen you develop with PAINT, and the end user will use it to run the ENTER screen. As a developer, you will probably run the Create a Btree program, IDXMNT, but the end user will not.

One set of programs you will probably run only in development mode is the Create Data Base process; while this is a single menu selection, several different programs

6.7.1 (Continued)
UNIFY DBMS Memory Considerations

are called by this process. With **no** programs loaded into system memory, the Create Data Base process takes 640 kilobytes of memory. This is the main reason why the recommended partition size for development mode is 640Kb. Rather than performing complicated calculations to determine the exact memory requirements for UNIFY development mode, the easiest thing to do is just to set the developer's memory partition to 640Kb, if possible.

Since in development mode you probably don't have any UNIFY programs (except UNIFY.LIT) loaded into system memory, there is another case where a 640Kb memory partition is required: If you use the menu handler, UNIFY.LIT, and it calls an ENTER screen which calls RPT, which in turn calls USORT.

Both you and the end user will want to use the Reconfigure the Data Base process; this also takes 640Kb. In the development mode, you will already have a user partition of 640Kb to use to run this process (or you can temporarily modify the computer memory allocations so that one partition has 640Kb in order to run this process). On an end user system, the computer memory allocations will have to be changed to provide a 640Kb partition when the data base needs to be reconfigured.

Runtime Mode:

In runtime mode, the end user is running a finished application that makes use of the UNIFY programs. Many programs the developer uses to develop the application are never used by an end user.

When the application is installed, you will have a very good idea what programs the end user will be running. Thus, you can reduce the memory required in each user memory partition (and improve the program loading time) by loading the commonly used programs into system memory.

As stated above, if the end user ever needs to reconfigure the data base, he or she will have to have a 640Kb memory partition to do so. Since reconfiguring is done very infrequently, and will probably be done by the developer outside of normal work hours, having to temporarily change the memory allocation on the system will not usually present a problem.

The Language Interface Environment and UNIFY

This section briefly describes the memory considerations for the custom AlphaBASIC, AlphaCOBOL, and AlphaC programs you write in your UNIFY applications.

AlphaBASIC:

Writing a custom UNIFY program in AlphaBASIC makes use of the UNIFY HLI (Host Language Interface) functions. When writing such a program, you must take into consideration the memory requirements of several different programs and modules. Read the UNIFY Reference Guide Appendix B, "The UNIFY BASIC Interface," for more information on the topics covered below.

To show the various modules involved, let's look at the contents of a real user memory partition in which a sample AlphaBASIC program is running. This particular program, SEQACC.RUN, accesses the tutorial data base, and can be found in disk account [5,76] of the UNIFY release.

Module	Size
1. UNIFY.SBR	8530
2.	194
3.	65536
4. DBMS.SYS	135872
5.	10752
6. RUN.LIT	15614
7.	648
8.	294802
Total bytes used:	531950
Free bytes:	131336

6.7.1 (Continued)
UNIFY DBMS Memory Considerations

The modules involved are:

1. UNIFY.SBR

   This is the subroutine XCALLed by the AlphaBASIC program, which accesses the UNIFY DBMS HLI functions in DBMS.SYS.

   You cannot load UNIFY.SBR into system or user memory.

2. UNIFY.SBR uses this small area.

3. This is the stack/heap area used by the AlphaC functions in DBMS.SYS called by your AlphaBASIC program. The size of this module can be modified. See the discussion of UNIFY.SIZ in Appendix B of the UNIFY Reference Guide for more information.

4. DBMS.SYS

   This module contains the DBMS HLI AlphaC functions you call from your AlphaBASIC program via UNIFY.SBR. **IMPORTANT NOTE:** If enough people on a system are using UNIFY AlphaBASIC programs, this module should be loaded into system memory.

5. This area is the data storage area needed by the AlphaC functions in DBMS.SYS. This area has to be in the user memory partition.

6. RUN.LIT

   This is the AlphaBASIC runtime program. If you are familiar with AlphaBASIC, you will know when you should load this program into system memory.

7. This area is the data storage area for UNIFY.SBR; this area must be in the user memory partition.

8. This area contains the AlphaBASIC program run file SEQACC.RUN, the storage area used by RUN.LIT, and the rest of the memory in your partition that RUN can get hold of. Note that you can control how much free space RUN leaves in your partition by specifying the parameter FREESIZE in UNIFY.SIZ (see Appendix B of the UNIFY Reference Guide).

   In our example, we have a partition size of 663394 bytes. We used 531950, leaving 131336 bytes free. We had set the FREESIZE parameter to 128Kb.

   AlphaBASIC application programmers are used to the fact that when you use RUN to execute an AlphaBASIC program, no space is left over in your user partition. This is why it is difficult to write a subroutine that uses the AMOS monitor call. The method we use (DBMSBR.LIT) to execute an AlphaBASIC UNIFY program, however, ensures some free space is left over in the user partition. Some UNIFY functions in DBMS.SYS use the AMOS call to access another program-- the UNISORT function, for example, runs the sort program USORT.LIT.

AlphaCOBOL:

All of the usual memory considerations that apply to using AlphaCOBOL are in effect when you use AlphaCOBOL and the UNIFY HLI. Additionally: DBMS.SYS and DBMS.RTI must either be preloaded into system memory or the user partition. Also, a 10752 byte DSECT area and 65Kb stack/-heap area for DBMS.SYS will be present in every user's memory partition who is running an AlphaCOBOL program that is using the UNIFY HLI.

6.7.1 (Continued)
UNIFY DBMS Memory Considerations

AlphaC:

Again, all of the usual memory considerations apply when you write a custom UNIFY AlphaC program. We have talked about these in the section above "Memory Usage of a Typical UNIFY AlphaC Program." There is an additional consideration, however, you need to know about. Any AlphaC program can either use the UNIFY HLI functions in the UNIFY libraries LIBX and LIBD, or can use the HLI functions in DBMS.SYS by linking in an object module called UNIFYX.OBJ in the linkage for the program. Using the HLI functions in DBMS.SYS, rather than linking the functions right into an AlphaC program, will result in a smaller program.

Table of UNIFY Program Sizes

This section shows the amount of memory used by various UNIFY programs for code, data, and stack/heap areas. We also give a brief description of the functions of the various programs and what programs they are called by.

6.7.1 (Continued)
UNIFY DBMS Memory Considerations

Table 1
UNIFY Program Sizes

PROGRAM NAME	CODE MEMORY USED	DATA MEMORY USED	STACK/-HEAP MEMORY USED	FUNCTION AND CALLING PROGRAM
BMTOFF	50816	4452	32000	Used to set up input file for RPT. Called by SSQL, ENTER.
BUDB	47870	9922	65535	Write Data Base Backup. Called from UNIFY.
CDSF	106586	7234	65535	Create default screen form for a record. Called from UNIFY.
DBLOAD	61990	6346	65535	Data base load program. Called from AMOS command level or SQL (insert into <record type>: from <file>).
DBSTAT	43836	4544	65535	Print data base statistics. Called from UNIFY.
DSPMSC	43994	4388	65535	Redisplay menu screen. Called by various programs.
ENTER	144288	11994	48000	Data Entry, Query by Forms. Called from UNIFY.
ENTMNT	93946	5556	65535	Register executable program with ENTER. Called from UNIFY.
FNDFLD	34492	2756	65535	RPT subprocess to look up field names. Called by RPT.
HFILEC	30054	1582	65535	Generate AlphaCOBOL program include file from FILE.H. Called from AMOS command level.
HTS	40846	4446	65535	Hash table statistics program. Called from UNIFY, AMOS command level.
IDXMNT	64664	21640	65535	Create/delete Btreee index. Called from UNIFY, AMOS command level.
IFREC	34676	2756	32000	Data Base Create/Reconfigure. Called by UNIFY.
LPR	31706	1582	2048	Spool report to printer. Called by various programs.
LPRFIL	29952	1616	65535	Print report to LPR.FIL. Called by various programs.
MENUH	110184	6222	65535	Menu Handler. Called from UNIFY.
PAINT	123944	29588	65535	Screen painting utility. Called from UNIFY.
RECONF	46722	19062	32000	Part of Create/Reconfigure Data Base Process.
REDB	47842	9922	65535	Read Data Base Backup. Called from UNIFY.

(Continued)

6.7.1 (Continued)
UNIFY DBMS Memory Considerations

Table 1 (Continued)
UNIFY Program Sizes

PROGRAM NAME	CODE MEMORY USED	DATA MEMORY USED	STACK/-HEAP MEMORY USED	FUNCTION AND CALLING PROGRAM
REKEY	44250	20848	32000	Rebuild data base hash table. Called from UNIFY, AMOS command level, Reconfigure Data Base Process.
REPOIN	50002	6436	65535	Rebuild explicit relationships in data base. Called from UNIFY, AMOS command level.
RIP	43070	4358	65535	Generate RPT input section from .Q screen file. Called from AMOS command level.
RMENU	72842	5432	65535	Various data base reports. Called by UNIFY.
RPT	86362	65072	65535	Report Writer. Called from AMOS command level, SSQL.
SCH	83256	30822	65535	Data Base Create/Reconfigure. Called by UNIFY.
SCHENR	100302	10832	65535	Data Dictionary schema maintenance; runtime version. Called by UNIFY.
SCHENT	100160	10828	65535	Data Dictionary schema maintenance; development version. Called by UNIFY.
SCHGEN	79358	54722	32000	Data Base Create/Reconfigure. Called by UNIFY.
SCHLST	64052	6162	65535	Schema Listing. Called by UNIFY.
SCOM	69414	6842	32000	Data Base Create/Reconfigure. Called by UNIFY.
SFORM	106910	8884	65535	Screen form development. Called by UNIFY.
SH	29760	1616	16000	AMOS command level simulator. Called by UNIFY.
SQL	151714	51522	65535	Structured Query Language. Called from AMOS command level, SSQL, UNIFY.
SSQL	81178	10210	65535	SQL by Forms. Called by UNIFY.
SSQLMN	94090	5548	65535	Register screen with SSQL. Called by UNIFY.
SYS920	86076	7174	65535	Data Base test driver program. Called by UNIFY.
UNIFY	69754	7472	32000	Program that puts up menus, calls programs.
USORT	36686	4338	65535	Sort program. Called by RPT, SQL, etc.
UNI000 (.OVR)	2048	512	N/A	SSD overlay for UNIFY. Present in the user memory partition.

3.2.8
New Documentation Releases

Several new user manuals are available for sale in September. (See the September Alpha Micro Reseller Price List for prices and availability.) The new documents are:

Introducing Alpha Micro's PC Products, DSO-00030-00
Short booklet giving information on the different Alpha Micro products that operate on IBM PC compatible computers.

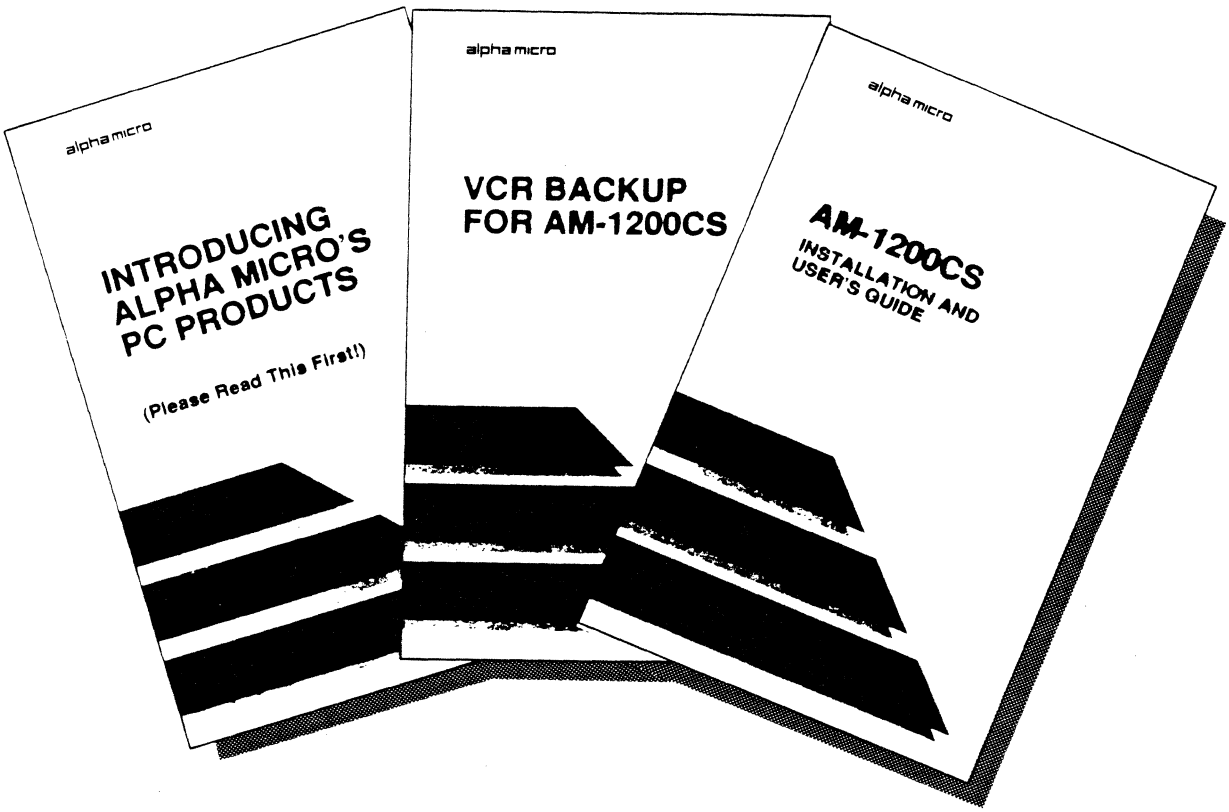
AM-1200CS Installation and User's Guide, DSO-00026-00
Installation and user's guide for operating the Alpha Micro AM-113 Co-processor and AM-PC software that allow you to run multiuser AMOS on an IBM PC compatible computer.

VCR Backup on the AM-1200CS, DSO-00025-00
Information on using VCR backup software in an AM-1200CS computer containing a VIDEOTRAX VCR Backup Controller.

AM-PC Version 1.0 Release Notes, DSO-00031-00
Short document giving last minute information on the AM-1200CS product.

AlphaMATE 2.0 Release Notes, DSS-10179-00
Information on the new AlphaMATE terminal simulation product for IBM PC compatible computers.

AlphaMATE Installation and User's Guide, DSS-10098-00, Revision B00
Installation and user's guide for the AlphaMATE 2.0 product.



5.1.2
Update on AMTEC Features

Beginning this month, we plan on adding the following major features to AMTEC (the Alpha Micro Technical Exchange Center):

- AMTEC will be moved to a VME AM-1500 system, increasing disk storage to 150Mb and, of course, increasing the speed of the system.
- Keyword searching using synonyms.
- Complete copies of each current PIC coded software release.
- VIDEOTRAX user access and information.
- Message system for sending messages to any Alpha Micro department or individual. This will included the ability to submit System Performance Reports (SPRs).
- The ability to download files containing articles from the AMSD Journal.

Downloading AMTEC User Instructions

Last month's article on AMTEC [Editor's Note: General Volume article 5.1.1 - "Announcing Alpha Micro Technical Exchange Center (AMTEC)," August 1987] discussed how to call up AMTEC. We hope you will find AMTEC simple and easy to use. However, if you want more information on using AMTEC, follow the steps given below to download a copy of the AMTEC user instructions from the AMTEC system.

1. After getting onto the AMTEC system, you see the **Main Information Menu** (Figure 1). Use the Arrow keys to move to the selection **UserIn,** and press **RETURN.** Or type the word **UserIn,** and press **RETURN.**
2. You now see the **AMTEC User Information** screen (Figure 2). Use the Arrow keys to move to selection #1, **AMTUGD.LST,** and press **RETURN.** Or, type **1** and press **RETURN.**
3. You now see the prompt:

   R)ead T)ype D)ownload L)ogoff or CR to return:

   (Figure 3). Type **D** and press **RETURN.**
4. Next, you see confirmation that the file is ready to transfer to you:

   Transfer file name is MEN:AMTUGD.LST

   And, you are asked what method you are using to communicate with AMTEC (Figure 4):

   Select utility: R)etry X)modem S)lave P)rinter port:
5. After selecting the communications utility you want to use, follow the steps required by that utility to transfer a file.

After the file transfer is complete, AMTEC returns you to the **AMTEC Main Information Menu** where you can select another menu option or disconnect from AMTEC.

5.1.2 (Continued)
Update on AMTEC Features

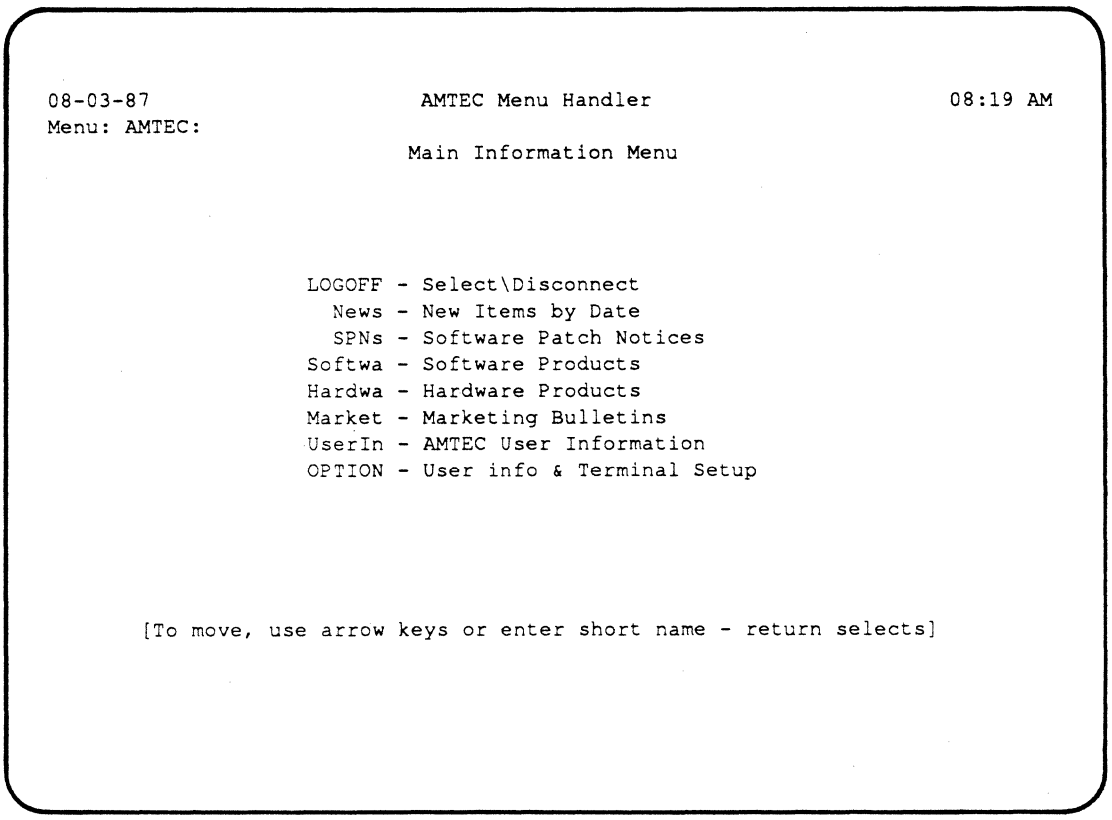


Figure 1: AMTEC Main Information Menu

5.1.2 (Continued) Update on AMTEC Features

```
 8-Aug-87                      AMTEC List Handler                      8:19 am
Menu: AMTEC/UserInfo:                                                Item: 1
                        AMTEC User Information

  1 AMTUGD.LST    AMTEC User's Guide (List File)                      24Jun87
  2 AMTUGD.WRT    AMTEC User's Guide (AlphaWRITE File)                24Jun87
  3 User_Maint    User (password) Maintenance                         13Jul87

        [Use arrow keys or enter number - return selects - ? for Help]
```

Figure 2: Selecting AMTEC User's Guide

5.1.2 (Continued)
Update on AMTEC Features

```
 8-Aug-87                      AMTEC List Handler                      8:19 am
Menu: AMTEC/UserInfo:                                                Item: 1
                        AMTEC User Information

  1 AMTUGD.LST    AMTEC User's Guide (List File)                       24Jun87
  2 AMTUGD.WRT    AMTEC User's Guide (AlphaWRITE File)                 24Jun87
  3 User_Maint    User (password) Maintenance                          13Jul87









R)ead, T)ype, D)ownload, L)ogoff or CR to return:
```

Figure 3: Selecting Download Option

5.1.2 (Continued) Update on AMTEC Features

```
 8-Aug-87                      AMTEC List Handler                        8:19 am
Menu: AMTEC/UserInfo:                                                  Item: 1
                        AMTEC User Information

  1 AMTUGD.LST    AMTEC User's Guide (List File)                        24Jun87
  2 AMTUGD.WRT    AMTEC User's Guide (AlphaWRITE File)                  24Jun87
  3 User_Maint    User (password) Maintenance                           13Jul87









Transfer file name is MEN:AMTUGD.LST.
Select utility: R)etrv X)modem S)lave P)rinter port  :
```

Figure 4: Selecting Communication Utility

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:

HARDWARE INFO. VOLUME:	- Section 6 - AM-1000 System (1 page) - Section 13 - Maintenance, Troubleshooting and Compatability (1 page)
SOFTWARE INFO. VOLUME:	- Software Volume Table of Contents (1 page) - Section 1 - General Information (1 page) - Section 3 - AMOS/L Operating System (1 page) - Section 6 - Software Packages (1 page) - Section 8 - AMOS/32 Operating System (1 page)
GENERAL INFO. VOLUME:	- Section 3 - Manuals (1 page) - Section 5 - AMTEC (1 page)

- 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.

SECTION 6 - AM-1000 SYSTEM

6.1 AM-1000

SECTION 13 - MAINTENANCE, TROUBLESHOOTING & COMPATIBILITY

13.1 Maintenance, Troubleshooting & Compatibility

13.2 Site Preparation

VOLUME II - SOFTWARE INFORMATION

Table of Contents

SECTION 1 - GENERAL INFORMATION

1.0 General Information

Alpha Micro Warranty Program

1.1 General Information

1.2 PIC Procedures

Section 3 - AMOS/L Operating System (continued)

SECTION 6 - SOFTWARE PACKAGES

SECTION 8 - AMOS/32 OPERATING SYSTEM

8.1 AMOS/32 Releases

8.2 AMOS/32 Patches

SECTION 3 - MANUALS

3.0 Manuals

3.1 Part Number Information

3.2 Documentation Releases

SECTION 5 - AMTEC

5.0 AMTEC (Alpha Micro Technical Exchange Center)

5.1 General Information