SECTION V

Boards

(Almost) Everything you need to know about the AM316 16 port I/O controller

Due to conflicting software addressing and which .IDV to use, we have developed a standard for using single and multiple AM316's in a system. This is for all future installations and if you already have a system down for maintenance. (In other words, don't take a running system down just to conform with this new standard).

When running a single AM316 address:
Address at Hex 90
Use **AM316.IDV** (153-750-603-747)

When running two AM316's address at:
First board FFFF90 (hex)
Second board FFFF70
Use **AM332.IDV** (750-111-122-352)

When running three AM316's address :
First board FFFF90 (hex)
Second board FFFF70
Third board FFFF50
Use **AM348.IDV** (604-367-234-206)

When running four AM316's address :
First board FFFF90 (hex)
Second board FFFF70
Third board FFFF50
Forth board FFFFF0
Use **AM364.IDV** (121-562-016-270)

With this standard, there should be no addressing conflicts with the current boards found in our systems. Note there is a unique .IDV name for each amount of boards found in the system. That and by verifying the hash totals will insure that you have a good driver. Below are jumper settings.

Board	Address	W29	W30	W31	W32	(N= Not installed, I=Installed)
1st	FFFF90	N	I	I	N	
2nd	FFFF70	N	N	N	I	
3rd	FFFF50	N	I	N	I	
4th	FFFFF0	N	N	N	N	conflict with 1st AM300
--	FFFF60	I	N	N	I	conflict with OMNLOCK I
--	FFFF80	I	I	I	N	conflict with AM330

W7 - I (Vectored Interrupt 6)
W33- I (On-board clock enable)
(all others should be removed)

April, 1986

Switch and jumper settings for AM725 memory boards

The AM725 has multiple memory sizes depending on the amount of memory chips mounted on the board. The number of memory chips on the board defines the capacity. They can be identified as follows:

(Counting from the top)
AM725-1mb has two rows of 256k chips
AM725-2mb has four rows of 256k chips
AM725-3mb has six rows of 256k chips
AM725-4mb eight two rows of 256k chips

When referencing the AM725 boards in your service reports, be sure you ALWAYS reference them this way: AM725-Xmb (rev)
{where X is the amount of memory}

Along with the old rules of mixing memory boards in the same system. The Largest memory boards are addressed lowest (or first). This is due to the address partitions of the boards.

Jumper setting: There is only one jumper location and it shouldn't ever need changing. Attached is a Page titled "7.0 System Diagnostic aid" This discribes how the jumpers can be changed to move the individual banks of memory around.

Standard setting: W1-W4 & W2-W5

See the page Titled "AM725 Starting address switch settings" for addressing information.

If total memory excedes 16mb of memory, the part going over will be automaticly disabled.

AM725 Starting Address Switch Settings

Starting Address	Switch (SW1) 1	2	3	4	5	6	Starting Address	Switch (SW1) 1	2	3	4	5	6
0 KB	1	1	1	1	1	n	8 MB	0	1	1	1	1	n
512 KB	1	1	1	1	0	n	8.5 MB	0	1	1	1	0	n
1 MB	1	1	1	0	1	n	9 MB	0	1	1	0	1	n
1.5 MB	1	1	1	0	0	n	9.5 MB	0	1	1	0	0	n
2 MB	1	1	0	1	1	n	10 MB	0	1	0	1	1	n
2.5 MB	1	1	0	1	0	n	10.5 MB	0	1	0	1	0	n
3 MB	1	1	0	0	1	n	11 MB	0	1	0	0	1	n
3.5 MB	1	1	0	0	0	n	11.5 MB	0	1	0	0	0	n
4 MB	1	0	1	1	1	n	12 MB	0	1	1	1	1	n
4.5 MB	1	0	1	1	0	n	12.5 MB	0	0	1	1	0	n
5 MB	1	0	1	0	1	n	13 MB	0	0	1	0	1	n
5.5 MB	1	0	1	0	0	n	13.5 MB	0	0	1	0	0	n
6 MB	1	0	0	1	1	n	14 MB	0	0	0	1	1	n
6.5 MB	1	0	0	1	0	n	14.5 MB	0	0	0	1	0	n
7 MB	1	0	0	0	1	n	15 MB	0	0	0	0	1	n
7.5 MB	1	0	0	0	0	n	15.5 MB	0	0	0	0	0	n

n = Not used

7.0 SYSTEM MEMORY DIAGNOSTIC AID

If it appears that a portion of your memory board is malfunctioning, but you need to continue operation with that portion of the board that is working, it is possible to reconfigure your memory board so that the malfunctioning area of memory is mapped into the upper address space that the board occupies.

There are a total of 8 banks of memory (512KB per bank) on the 4MB version of the board. As the board comes from the factory, Bank 0 resides at the memory starting address; Bank 7 resides at the memory ending address. Referring to Table 2.0, the bank sequences can be altered to position any 1MB (2 bank range) block of memory at the top of the board's memory address range by using jumper blocks W1-4 and W1-5.

This function is also very useful in diagnostic testing of the entire AM-725 Memory Board when it is the only memory board in the system.

TABLE 2.0 Memory Bank Reconfiguration Jumpers

W1/W4 Jumper	W2/W5 Jumper	Memory Bank Sequence (lowest to highest address)
In	In	0, 1, 2, 3, 4, 5, 6, 7 (factory configuration)
Out	In	2, 3, 4, 5, 6, 7, 0, 1
In	Out	4, 5, 6, 7, 0, 1, 2, 3
Out	Out	6, 7, 0, 1, 2, 3, 4, 5

NOTE: The following sized boards will not contain all possible banks; the missing banks must be eliminated from the information of Table 2 when determining memory bank sequence:

1) 3MB boards do not contain banks 6 and 7.

2) 2MB boards do not contain banks 4, 5, 6, and 7.

3) 1MB boards have bank sizes of 128KB (8 banks of memory). Therefore Table 2 may be used directly.

D4 - D5	AM-610 VCR Controller
D6 - D7	Unassigned
D8 - DF	AM-300 Alternate (third board)
E0 - E7	AM-400 Trident Formatter Interface
E8 - EF	AM-300 Alternate (second board)
F0 - F7	AM-200 Floppy Controller or AM-210 Floppy Controller
F8 - FF	AM-300 6 Port Serial I/O Board

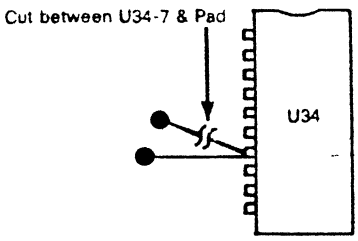
AM-420 Power Cycle Modification

This modification is designed to provide power on system reset to the AM-420 Controller circuit boards, Revisions A04 and B02. The controller boards will be deselected, thus preventing unknown conditions from being strobed into the drive during power on and power off. This modification will help insure protection of data stored on the drive when the system is reset.

Procedure

Carefully follow the steps listed below.

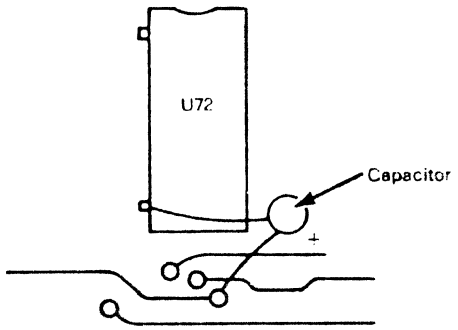
1. On the component side of the AM-420 circuit board, cut the etch between U34 pin 7 and the pad. (See below.)



AM-420 Component Side

2. Add a 2.2 microfarad capacitor (CPP-00225-01) between U72, pin 10 and the pad as shown below.

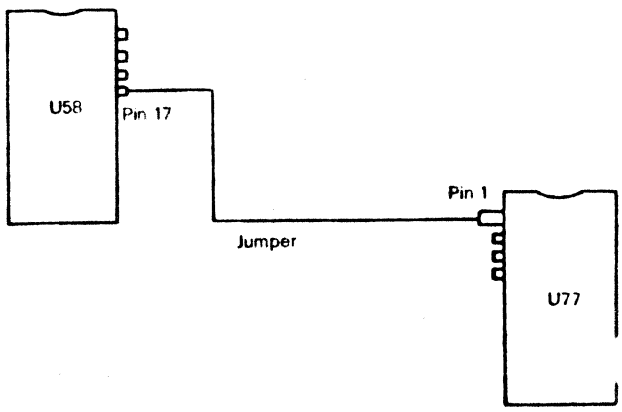
   The "+" side is in the pad. Be sure to install sleeving on both leads of the capacitor.



AM-420 Component Side

3. Remove U77 and replace it with a 74LS273 IC, part number IC1-74273-01. Before inserting this IC, bend pin 1 of U77 to isolate it from the board.

4. On the component side of the board, jumper U77 pin 1 to U58, pin 17.



AM-420 Component Side

5. On the solder side of the board, add a jumper between U14, pin 10 and U14, pin 11.

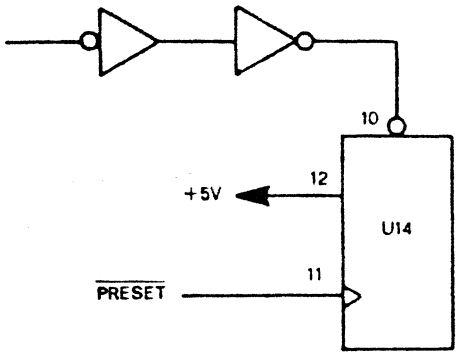
Make the following changes to the revision block.

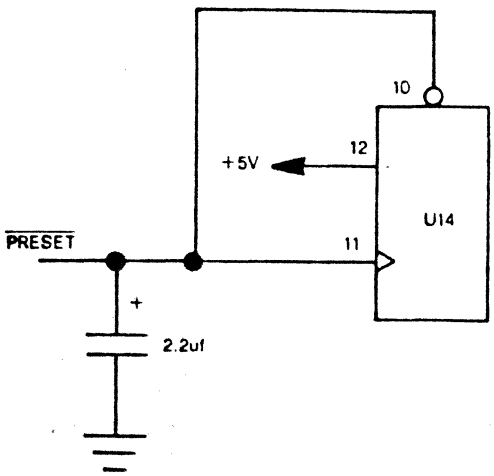
WAS	IS
B02/A04	B03/A05

Schematic Changes

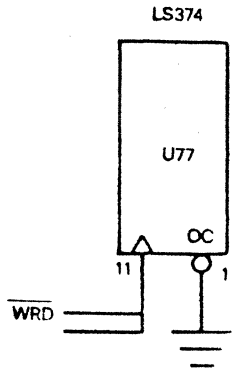
Make the following changes to DWL-00420-XX.

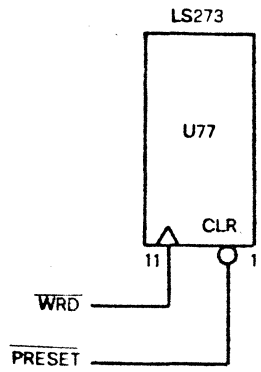
Sheet 1, A7





Sheet 4, B6





If you have any questions concerning this procedure, please call the System Support Group at (714) 957-0392.

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Editor ..... Susan Poyer
Contributors to this issue ..... Kris Ruggles, Patty Lamar

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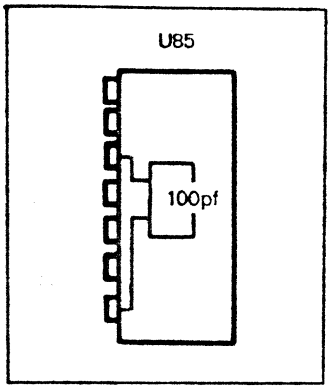
AM-420 Ground Wire Modification

The following modification is designed to increase the immunity of the AM-420 disk controller to extraneous noise that may occur during system operation. This procedure applies to AM-420 circuit boards, part numbers DWB-00420-03 and DWB-00420-00, DWB-00420-01, DWB-00420-02.

Procedure - DWB-00420-03

For the AM-420, DWB-00420-03, perform the following steps.

1. On the component side of the board, add a 100 picofarad capacitor (CPN-00101-02) between U-85 pin 3 and U-85 pin 7.
2. Add a jumper from J2-1 to ground.



Revision Level

Make the following changes to the revision block.

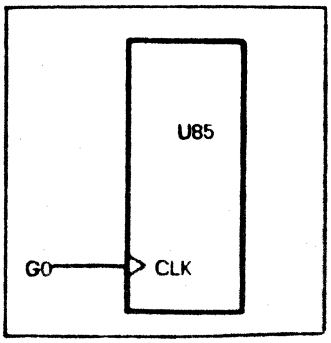
WAS	IS
D02	D03

Schematic Changes

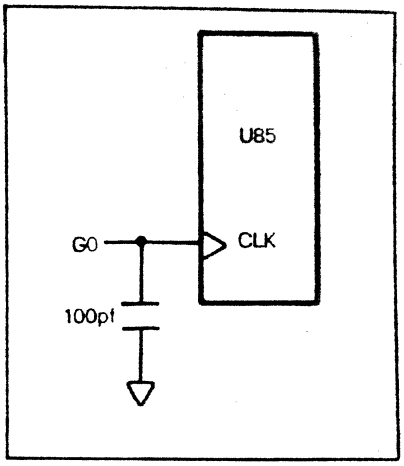
Make the following changes to DWL-00420-00.

Sheet 2D8

WAS

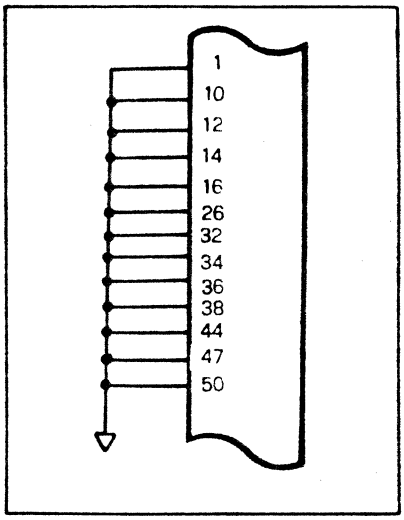


IS



Sheet 4A1

ADD



Procedure - DWB-00420-00, DWB-00420-01, DWB-00420-02

Perform the following steps.

1. On the component side of the board, add a 100 picofarad capacitor (CPN-00101-02) between U-5 pin 3 and U-5 pin 7.

Revision Level

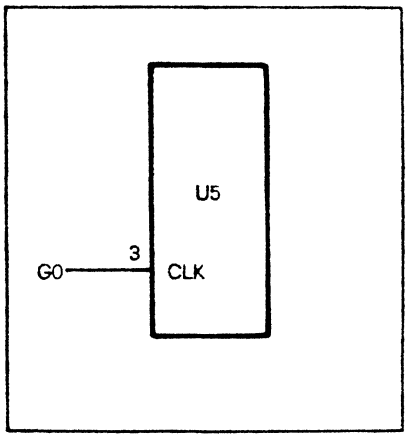
Make the following change to the revision block.

WAS	IS
C04	C05

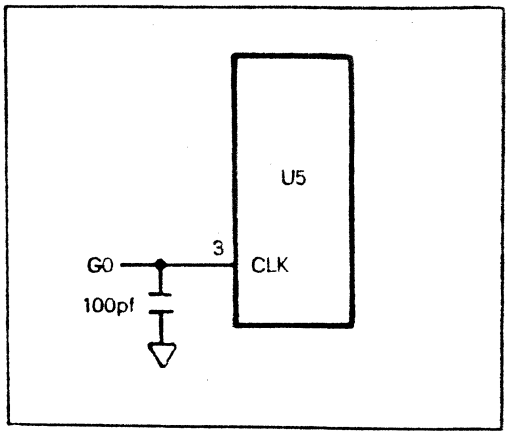
Schematic Changes

Make the following changes to DWL-00420-XX.

Sheet 2D4
WAS



IS



If you have any questions concerning this modification, please call our System Support Group at (714) 957-0392.

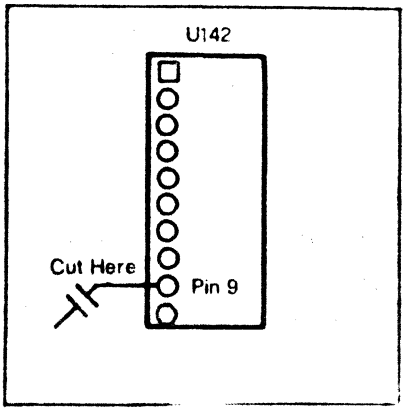
AM-1000 Modification for Use with the AM-1001

The following modification should be implemented on AM-1000s, Revision Levels A00 through A08 and Revision Levels B00 through B07. Before the AM-1001 is added, remove the AM-1000 cabinet top. (For detailed instructions on removing this top, refer to the *ISSG Newsletter*, Volume 4, Number 11, page 3.) This modification consists of a trace cut and the addition of a jumper from one integrated circuit chip pin to another.

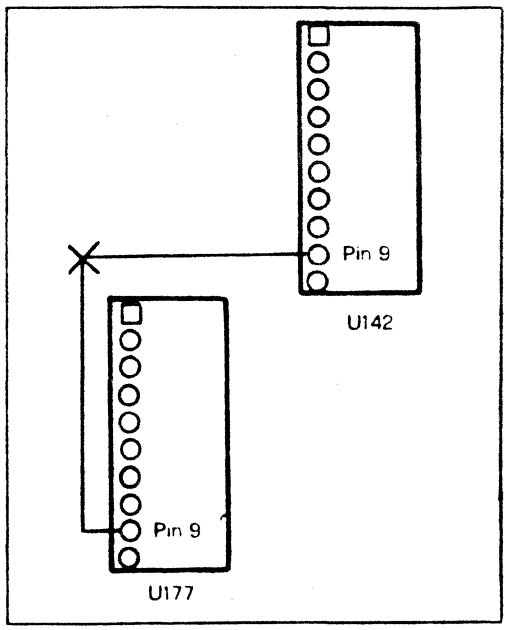
Procedure

1. Locate integrated circuit chip U142. U142 is oriented toward the front and left on the main logic board in the system.
2. Cut the trace going to pin 9 of U142. Pin 9 is on the left hand side of U142 as you face the front panel of the AM-1000.
3. Locate the trace that runs from pin 9 of U142 toward the left.

   CAUTION: Be sure to cut only the one trace and do not accidentally cut surrounding traces.



   Cut the trace perpendicular to the direction the trace runs, just to the left of pin 9, where the trace is farthest from neighboring traces.
4. Add a jumper to the circuit board, originating from U142, pin 9, to integrated circuit chip U177, pin 9.



Good soldering technique demands that you apply a minimum amount of solder to the pin, a minimum amount of heat to the chip, and yet make a good, solid connection between the pin and wire. If you have difficulty soldering the wire to the pin, it is a good idea to wait a few minutes until the chip cools before trying again.

6.1.25 AM-1000 Booting - VCR Delay Bypass

The AM-1000 Series Computers have the built-in capability of booting from an alternate device other than the system device. This provides a means of booting the system if for some reason it cannot boot from the primary device. A VCR can be such an alternate boot device.

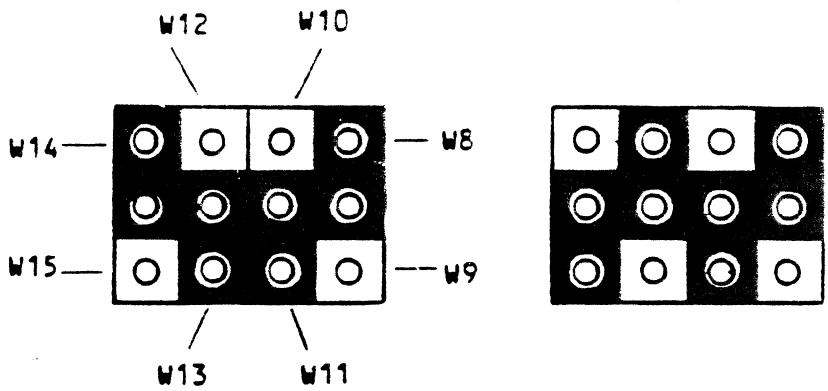
When the VCR is used as the alternate boot device, a built-in time delay allows time for valid data to be received from the VCR. If the VCR is not being used and it is desired to bypass the 25 to 30 second delay, all that is required is to change the boot jumpers.

Figure 1 shows the location of the boot jumpers on the AM-1000 CPU circuit board and the jumper configuration required for different boot devices. Notice that Boot Device ID code 9 is the only configuration identifying the VCR. Assuming that the system contains a Winchester disk as the primary booting device, all that needs to be done to bypass the VCR delay is to reconfigure the boot jumpers to Boot Device ID code A (Floppy/Winch).

Note: Beginning with COO Revision Boot PROMS an additional delay will be encountered as the system looks to determine which Winchester disk drive is installed. This allows for the same PROM to be used for either the AM-1000 or the AM-1000E.

When the system begins to boot with this configuration, it will look to see if a floppy diskette is installed in the floppy drive. If a diskette is installed and the door is closed, the system will attempt to boot from the floppy. If these conditions are not met, the system will attempt to boot from the Winchester. If a floppy drive is not installed the system will attempt to boot from the Winchester. In both cases the VCR delay will be bypassed.

Reminder: If it is desired to boot the system using a VCR tape, the jumpers will have to be returned to the position shown for Boot Device ID code 9 (VCR/Floppy/Winch).



9 A

Boot Device Jumper Selection

Boot Device ID Code	W8	W9	W10	W11	W12	W13	W14	W15	Boot Device
9	I			I		I	I		VCR/Floppy/Winch
A	I			I	I			I	Floppy/Winch

OMNILOCK II ADDRESSING

If SuperVUE does not find a device in the system, or if it finds a device with the wrong serial number, it will go into "demo mode." In this mode, you may perform most SuperVUE operations, but cannot save the document on the disk. The most common problems causing SuperVUE to go into demo mode are:

1. Wrong device in system - For instance, SuperVUE is expecting Omnilock #456 and the system actually has some other Omnilock plugged into it. The solution is to get the correct board, or a new copy of DSK0:UNIQUE.SOV[1,20]. (Note: DSK0:UNIQUE.SOV[1,20] is the only file which is actually keyed to the board. All other SuperVUE files and overlays may be used with any type or number of security device.)

2. Omnilock at wrong port address - The Omnilock is normally used at I/O port address 20-23 hex. However, these port addresses conflict with the AM-120 board in a 100/T system, so some systems may have their Omnilocks at ports 68-6B hex, or even some other address. You can change the port address SuperVUE is looking for by using the DSK0:PORT[1,20] program.

3. Device has failed - Oh my gosh! Both the MCSD and Omnilock have excellent reliability records, but nothing is impossible. The only solution to this problem is to get a new device, so give us a call.

HEX 68 = E1, E4, E6 JUMPERS INSTALLED (FACTORY SET)

HEX 70 = E2, E5 (ADDED TO ABOVE)

OMNILOCK II JUMPERS

E1 = MSB 80 (REVERSE LOGIC

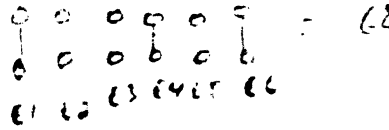
E2 = 40

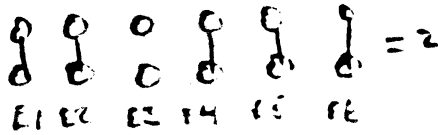
E3 = 20

E4 = 10

E5 =

E6 = LSB 4





REF MAN.

AM100L BOOT JUMPER SETTINGS

JUMPERS (Installed) BE, W2, MR = T0, MW = T3, OSC
W9- normally (Factory set - do not change)
MR = T3 for MAXI 1 meg memory boards

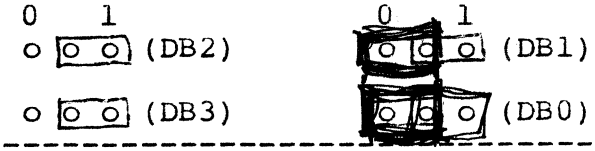
STR, else Fujitsu, else Priam
(AM620, else AM415, else AM420)

(see note below)

VCR, else Fujitsu, else Priam
(AM610, else AM415, else AM420)

Note; If there is an AM415 in a system along with an AM420 the system will not look at the AM420 if the AM415 doesn't have bootable software

Mag Tape, else Fujitsu
(AM600T,else AM415)

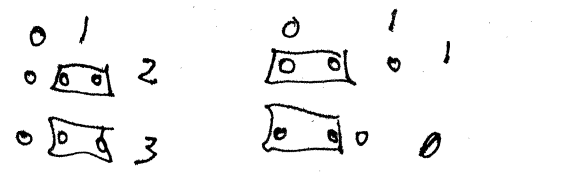


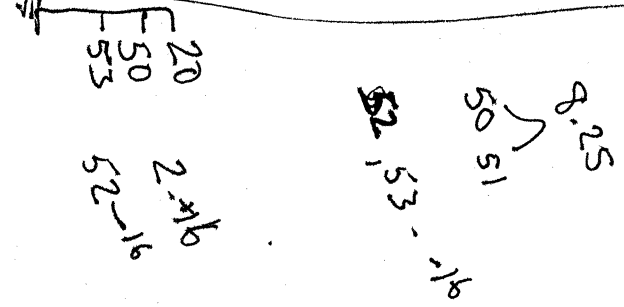
Fujitsu (alone)
,AM415)

Hawk drive
(AM500)

Phoenix drive
(AM410)

MAG TAPE, ELSE FUJI
(AM600T, ELSE AM415)





Re-Addressing AM410 (Phoenix) to Run Alongside an AM415 (Fujitsu)

This procedure will allow the use of an AM-410 board with an AM-415 in the same chassis. The AM-415 will be the primary boot device with the AM-410 as a peripheral device.

Hardware Modification Procedure

1. Locate the address jumper pads between U27 and U28 on board #1 of the AM-410 board set.

2. Cut the traces at these jumper pads: (See Figure 1)

   a. Etch at address pad 2

   b. Etch at address pad 3

3. Jumper the following address jumper pads: (See Figure 2)

   a. Address line 7

   b. Address line 6

4. Locate Pin 6 of J1 at the bottom of the board. Cut the vertical trace from Pin 6 to disable interrupt level 2. (See Figure 3)

5. Jumper from the eyelet at J1 Pin 10 to the eyelet under U33 to enable interrupt level 6. (See Figure 3)

This completes the hardware modification procedure.

Software Modification Procedure

The following patch will modify the 410DVR.DVR to allow operation of the modified AM-410 board. NOTE: This patch is verified for AMOS/L Version 1.1 or later only.

1. Log into PPN[1,6] on DSK0: (the driver account)

2. Copy 411DVR.DVR=410DVR.DVR

3. Using VUE create the following patch file:

   a. VUE AM411.M68

```
COPY PATCH

OHASH 732,333,770,131
NHASH 251,406,435,673

PORT=^H0FFFF1C          ;New board address defined
INT=6                   ;New board interrupt defined

.=^H18                  ;Relative address

LWORD PORT              ;Insert new address
LWORD ^H<11C-<INT*4>>   ;Insert new interrupt

END                     ;End of patch
```

4. After the file is complete enter:

   a. PATCH 411DVR.DVR WITH AM411

5. After the patch is installed in the 411DVR.DVR copy the 411DVR.DVR to the name for the peripheral AM-410 device such as "COPY SMD.DVR=411DVR.DVR.

This completes the modification process. Use the SMD device the same as you would any other peripheral device.

FIGURE 1

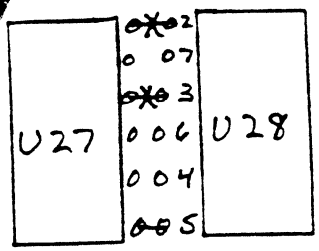


FIGURE 2

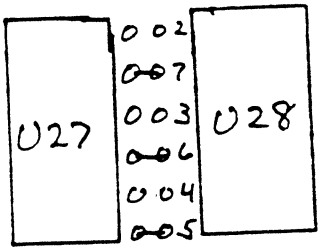
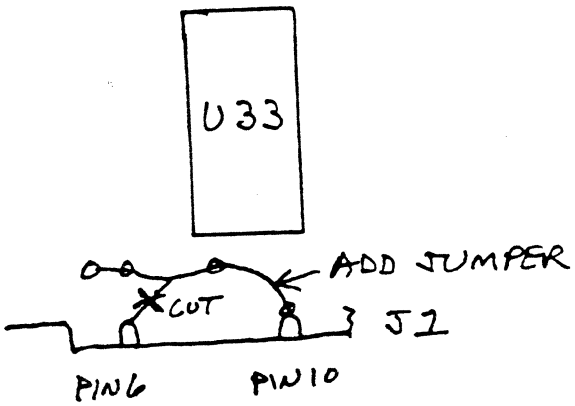


FIGURE 3



410 ~ CRT 410 TO CRT 411

411 = 410

411.M68

COPY PATCH

HPS 405, 521, 372, 156

HPSH 326, 240, 573, 433

.=↑HOCE

CMP A1, #↑HO4B1C

END

```
;"UN-OFFICIAL"  Patch for second AM420 in a system.
;
; ---------------------------------------------------------------------
; **Hardware changes**
;
;  Change VI from 5 to 4
;
;  Between U79 and U80 there are 12 solder pads.
;
;  is: 0 0          change to:  0 0
;      0 0                      0 0
;      0-0                      0-0
;      0-0                      0-0
;      0-0                      0 0
;      0 0                      0-0
;
;---------------------------------------------------------------------
;Create this file and call it AM421.M68

        COPY    PATCH
        PORT    =^HOFFFFC8
        INT     =4
                .=^H18
        LWORD   PORT
        LWORD   ^H<11C-<INT*4>>
        END
;
;Create your driver using FIX420
;Then type PATCH xyz.DVR WITH AM421
;This should hopefully redirect the software to the new board.
;Both drives attached to their separate controller should be addressed as
;drive #1. (Not #1 and #2)
```

* USES AM500 ADDRESS & VI

After you have entered the *M* followed by a carriage return, the EML> prompt appears on the screen. Enter an X. The following messages will then appear on the screen:

Please wait...
Sending mail to:
Do you want to pick up mail from the Electronic Post Office (Y or N)?

Always answer *N* to this query. The prompt EML> then appears again. Enter another X to go back to AMOS command level. Now, *AMTEC* can be entered to take you back to the main menu.

If you have any questions concerning the use of AMTEC, or the MESSAG category, please call the Technical Education Department at (714) 957-6076.

AM-410, AM-420, AM-610 Controller Board Modifications

This modification is designed to reduce noise on system input and output which may cause communication problems between the AM-410, AM-420 and AM-610 controller boards and their respective storage devices. One of the most common symptoms of this possible problem has been system lockup. This modification is designed to aid in the improving of communication lines between the controller board and drives or VCR.

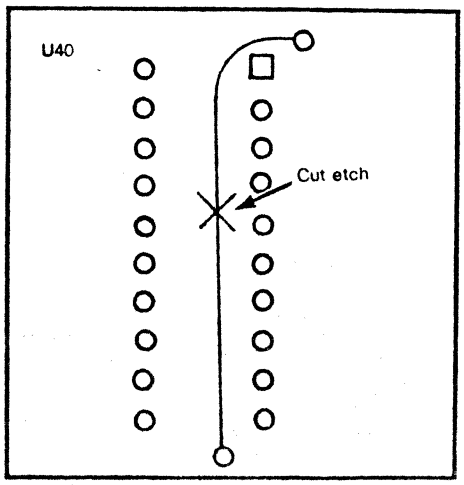
PROCEDURE

If your AM-410 and AM-420 has a Signetics 74LS138 at U26 or your AM-610 has a Signetics or Fairchild 74LS138 at U70, then you should implement the procedure described below. A Signetics IC may be identified by the letters SB below the IC identification number. A Fairchild IC may be identified by the F below the IC number.

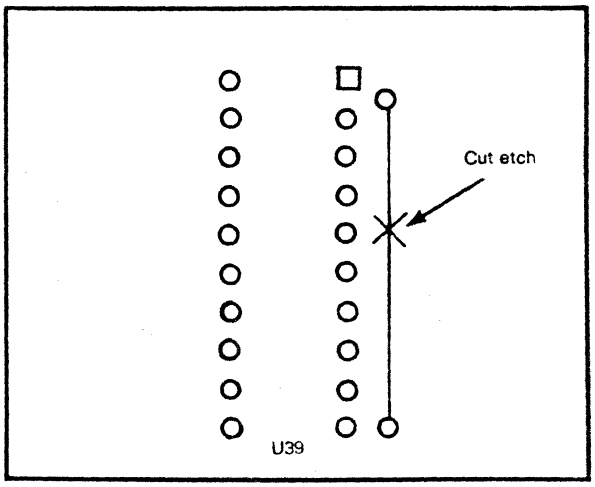
AM-410 AND AM-420 PROCEDURE:

On AM-410 Board #1:

1. *Locate U40.*
2. *Locate the trace running along the left-hand side of pins 1-10 on the solder side of the board.*
3. *Cut an etch along this trace.*
4. *Locate U39.*
5. *Locate the trace running along the right-hand side of pins 1-10.*
6. *Cut an etch along this trace.*
7. *Turn the board onto the component side.*
8. *Locate U29 and U39.*
9. *Locate U29 pin 7.*



10. *Place a 100 picofarad capacitor (CPN-00101-01) to the left between U29 and U39 with one lead connected to U29, pin 7 and the other lead to the feedthrough to the left of U39 pins 1 and 2.*
11. *Place a 220 ohm resistor (RS2-00221-00) to the left of U39 with one lead connected to the feedthrough to the left of U39 pins 1 and 2 and the other to the feedthrough to the left of U39, pin 10.*
12. *Locate U30 and U40.*



13. *Place a second 100 picofarad capacitor (CPN-00101-01) to the left of U30 below pin 8, with one lead connected to U30 pin 8 and the other to the feedthrough located in the left-hand, upper corner of U40, just above pin 1.*
14. *Place a second 220 ohm resistor (RS2-00221-00) to the left of U40 with one lead connected to the feedthrough located to the left of the upper left-hand corner of U40, above pin 1 and the other to the feedthrough above pin 46 on the edge connectors.*
15. *Stamp the board with the latest revision level.*

AM-410

	IS	*WAS*
DWB-00410-01	*F06*	*F05*

If your board is revision F04 or earlier, add DI-754A to the revision block.

AM-420

	IS	WAS
DWB-00420-XX	C01/BO5	C00/B04

If your board is revision B09/B03 or earlier, add DI-754A to the revision block.

Important Notice To AM-1000 Users

To ensure optimum performance when transferring data to the AM-1000's Winchester or floppy drives from other disk devices using the VCR subsystem, Alpha Micro recommends that additional copies be specified when running the VCRSAV program. This will ensure that the drive on your AM-1000 will have time to seek the appropriate track and write to it. The optimum number of additional copies is dependent upon the difference in the relative access times of the disk storage device from which data is being transferred.

For example, in performing a Phoenix to floppy data transfer via video tape, it is advisable to provide 10 - 20 extra copies to ensure that the floppy system has adequate time to write the new data.

Notice to AM-100/L Users

All AMOS/L conversion disks and tapes are configured for use with the Soroc I.Q. 120 terminal at a baud rate of 9600. The terminal on your system must be compatible with the SOROC 120 or 135 drivers provided for use with the VUE program, or a compatible terminal driver may be generated using the FIXTRM program.

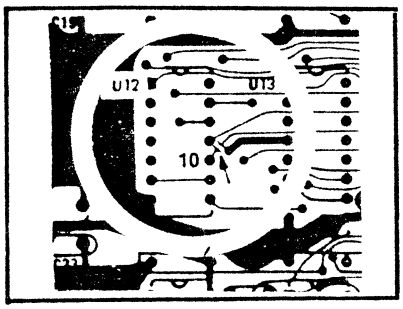
AM-420 Controller Board Reset Line Modification

This modification is *mandatory* for all Revision C AM-420 Controller Boards to help eliminate the potential for noise on the sequence counter clear line. This noise may cause blocks of data to be incorrectly written to the disk, causing scrambled user file directories, master file directories, and data files. Installation of the following modification will cause the reset line to pull high, helping to eliminate sequence counter clear line noise.

Procedure

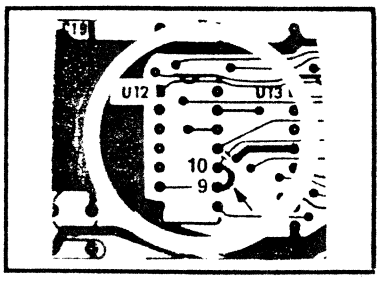
On the component side of the board:

1. Locate U-12.
2. Cut an etch at U-12, pin 10.
3. Jumper U-12, pin 9 to U-12, pin 10.



4. Mark the board with the new revision level:

	IS	WAS
DWB-00420-99	C04	C03

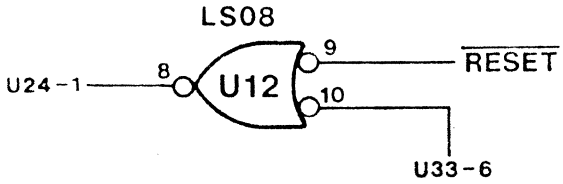


If you have any questions concerning this procedure, please call the System Support Group, (714) 957-0392.

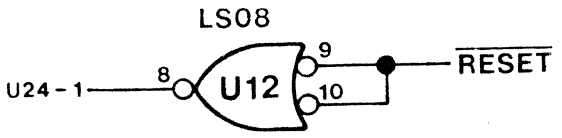
Schematic Changes

Make the following changes to DWL-00420-XX schematic, Sheet 2, Zone 5C:

Was:



Is:



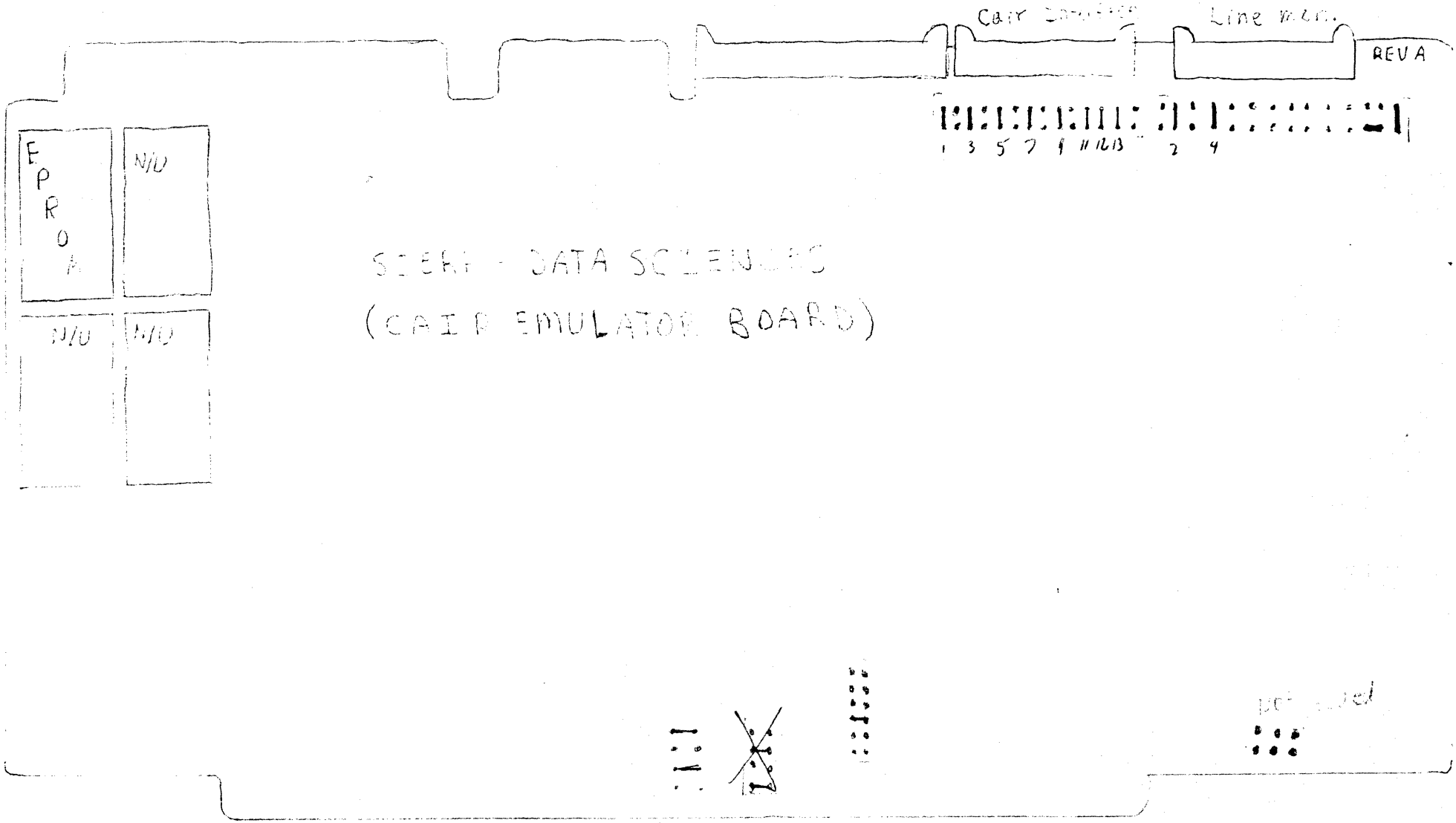
AM-210 Delay Line Modification

Some floppy drive installations utilizing the Qume floppy drive may be experiencing occasional data loss problems. These problems, indicated by CRC or Sector Not Found errors, occur primarily after the read/write heads have passed the center of the diskette. If your Qume installation has been experiencing these symptoms, replacing the 500 nano-second delay line module with a 250 nano-second delay line module on the AM-210 Controller board may help to alleviate this problem.

Procedure

The procedure for replacing the delay line module is as follows:

1. Locate U6, found on the upper row of I.C.'s in the center of the AM-210.
2. Determine the nano-second value of the delay line module presently located there; a 500 nano-second delay module's manufacturer's part number will contain the number '500", and a 250 nano-second delay module's manufacturer's part number will contain the number "250". If you have any questions concerning the nano-second level of the module, please contact the System Support Group at (714) 957-0392.
3. If the delay line module presently installed has a value of 500 nano-seconds, replace it with one that has a 250 nano-second value. This module, part number ICS-00250-00, may be obtained through the Spare



SIERRA DATA SCIENCES

(CAIP EMULATOR BOARD)

3E, W2, OSC INSTALLED

3. MR jumper setting T1 through T5

T1 = 0 wait state for memory read (standard setting)
T2 = 1 wait state for memory read — for MAXI memory B.
T3 = 2 wait states for memory read
T4 = 3 wait states for memory read
T5 = 4 wait states for memory read

W9 - NORMAL (FACTORY SET - DO NOT CHANGE)

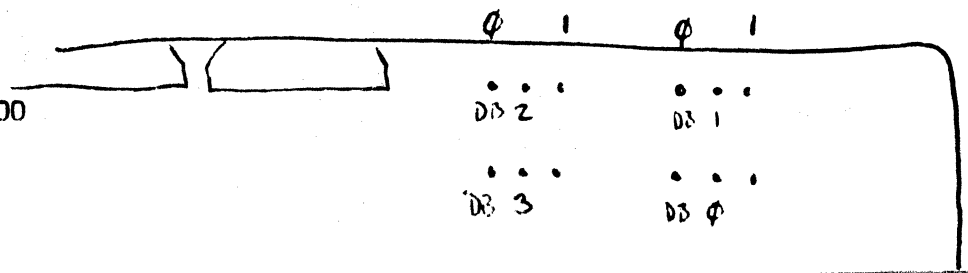
4. MW jumper setting T1 through T5

T1 = 0 wait state for memory write
T2 = 1 wait state for memory write
T3 = 2 wait states for memory write (standard setting)
T4 = 3 wait states for memory write
T5 = 4 wait states for memory write

Table II. AM-100/L Boot ID Register Summary
(Standard Boot PROMS)

BOOT DEVICE ID CODE				
BIT 3	BIT 2	BIT 1	BIT 0	Boot Device
0	0	0	0	AM-210 Floppy Drive (CDC/Persci)
0	0	0	1	AM-410 Phoenix Drive
0	0	1	0	AM-500 Hawk Drive
0	0	1	1	Reserved
0	1	0	0	Reserved
0	1	0	1	Reserved
0	1	1	0	Reserved
0	1	1	1	AM-210, else AM-415, else AM-420
1	0	0	0	AM-621, else AM-415, else AM-420
1	0	0	1	AM-610, else AM-415, else AM-420
1	0	1	0	Unassigned
1	0	1	1	AM-415 High Performance Winchester
1	1	0	0	Unassigned
1	1	0	1	Unassigned
1	1	1	0	AM-600 - AM600/T, else AM-415
1	1	1	1	Unassigned

ON 100L BOARD:



2.6.8 AM-420 Controller Board Reset Line Modification

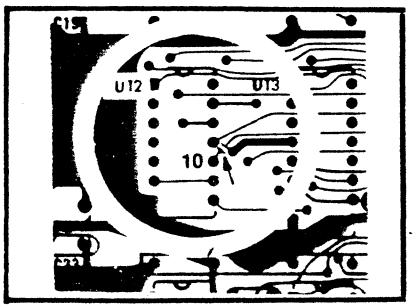
AM-420 Controller Board Reset Line Modification

This modification is *mandatory* for all Revision C AM-420 Controller Boards to help eliminate the potential for noise on the sequence counter clear line. This noise may cause blocks of data to be incorrectly written to the disk, causing scrambled user file directories, master file directories, and data files. Installation of the following modification will cause the reset line to pull high, helping to eliminate sequence counter clear line noise.

Procedure

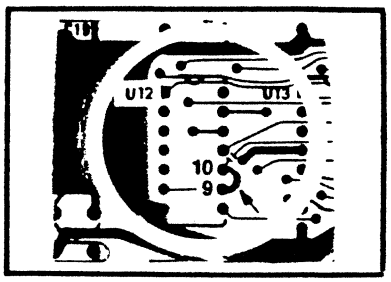
On the component side of the board:

1. Locate U-12.
2. Cut an etch at U-12, pin 10.
3. Jumper U-12, pin 9 to U-12, pin 10.



4. Mark the board with the new revision level:

	IS	WAS
DWB-00420-99	C04	C03

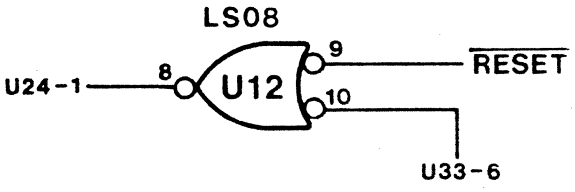


If you have any questions concerning this procedure, please call the System Support Group, (714) 957-0392.

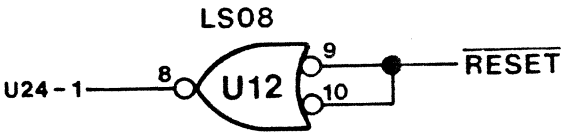
Schematic Changes

Make the following changes to DWL-00420-XX schematic, Sheet 2, Zone 5C:

Was:



Is:



2.6.9 Important Notice on Certification for Winchester Disk Users

Important Notice on Certification for Winchester Disk Users

The technology that gives Winchester disks such a high density of data also makes a small number of media flaws a common occurrence. Alpha Micro handles this situation by providing a certification program, CRT420, for use with Winchester disks that 1) run under the control of the AM-420 Winchester disk controller, and 2) are components of the AM-1000 system. The certification program searches out media flaws and builds a file called BADBLK.SYS which contains a list of all bad tracks on the disk. Whenever the monitor subsequently accesses the disk, it consults the BADBLK.SYS file to see what tracks to avoid reading from or writing to.

It has come to our attention that some dealers routinely recertify Winchester disks after they receive them from Alpha Micro. In general, dealers recertify drives for two reasons: 1) to change the number of logical devices on the drive, and 2) because they are not aware that all Winchester drives arrive from Alpha Micro fully certified.

The Spare Parts/Logistics Department has two AM-410 Phoenix Drive Retrofit Kits available that we recommend be installed on your Phoenix drive. The CDC Low Error Option Kit – Part Number 77711032 – has been designed to provide protection for drive heads and media in the event of severely restricted air flow or blower motor failure. If one of these problems occur, the drive will spin down and will not operate until the failure is corrected if this kit has been installed.

The second kit available is the Phoenix Pre-filter Filter Kit – Part Number PRA-01093-00. The installation of this filter on the front panel will ensure additional protection for the drive.

To order these kits, please contact the Spare Parts/Logistics Department at (714) 957-6112.

FILE COPY

Adding Additional AM-300 I/O Circuit Boards to an AM-100/L System

The procedure to add additional AM-300 circuit boards to the AM-100/L system differs from the procedure used on the AM-100 and AM-100/T systems. This article assumes that you are familar with the procedures used in adding additional AM-300 I/O boards to an AM-100 or AM-100/T system.

Please remember the following differences between an AM-100, AM-100/T additional AM-300 board installation, and an AM-100/L additional AM-300 board installation will apply:

1. You may use only AM-300 Revision C00 or later boards.
2. The AM-100/L systems share the same interrupt level for all AM-300 boards.
3. The software changes to the interface driver are different.

The new AMOS/L software will support a total of eleven AM-300 circuit boards per system. This is done through the use of the same interrupt level for all eleven circuit boards(vectored interrupt level 3). For this reason, all AM-300 boards in an AM-100/L system will be set to interrupt level 3

The I/O address of each board must be set to a specific address as shown below. Please see the table below for I/O addresses and the correct jumper settings:

Board	I/O Address	Address Jumpers				
		A3	A4	A5	A6	A7
1st	(FFFF)F8	1	1	1	1	1
2nd	E8	1	0	1	1	1
3rd	D8	1	1	0	1	1
4th	68	1	0	1	1	0
5th	60	0	0	1	1	0
6th	58	1	1	0	1	0
7th	50	0	1	0	1	0
8th	48	1	0	0	1	0
9th	38	1	1	1	0	0
10th	28	1	0	1	0	0
11th	18	1	1	0	0	0

The AMOS/L System Initialization Command File – AMOSL.INI – TRMDEF statements refers to the port numbers differently than does the AMOS software. The first AM-300 board is still called AM-300 with ports numbered from 1 thru 6. The second AM-300 board is also called AM-300; however, the port numbers are 11 through 16. A TRMDEF statement for a third AM-300 board and the second port would appear as:

TRMDEF TERM14,AM300=22:9600,SOROC,100,100,100

The source program for the AM-300 interface driver is located in PPN [10,2] and is named AM300.M68. If additional boards are to be added to the system, a new "IDV" must be generated by first modifying one line in the AM300.M68 source file. Then the file must be assembled by entering: *M68* followed by the file name to generate the new driver. This line is titled "NUMBRD." The line will normally read:

NUMBRD=3 ; max number of boards supported by IDV

This number must be changed to match the number of AM-300 circuit boards used in the system. You may use any number between 2 and 11.

NOTE: Be aware that increasing the "NUMBRD" equate will cause the AM300.IDV file to increase in size. Each additional board will cause the file to increase by 176 bytes.

If you have any questions about this procedure, you may contact either the System Support Group at (714) 957-0392 or the Technical Education Department at (714) 957-6076.

AM-1002 Memory Expansion Module

Boot PROM Reference Guide

Alpha Micro systems provide the user with the option of selecting either an AM-100 based or an AM-100/T based system. Each Integrated System also features a specific type of drive. For example, the AM-1010/1011 series is a floppy drive based system controlled by the AM-210 disk controller. The AM-1020/1021 series includes an 8.5 Megabyte Winchester drive controlled by the AM-420 controller board. The AM-1041 with a 32 Megabyte Winchester drive is also controlled by the AM-420 board, as is the AM-1061 Integrated System with a 60 Megabyte Winchester drive.

The specific PROM required for the AM-420, however, will depend upon the type of backup device included with the system, floppy, VCR, or Streaming Tape. If a Video Cassette Recorder is added to an existing AM-1020/1021 Integrated System with a floppy backup device, then a specific PROM will be required for the AM-420. Refer to the table below.

Those systems containing an AM-420 controller board may also have only one alternate boot device for the system. If the alternate boot device is a floppy disk drive, a Video Cassette Recorder unit may be added, but not as a third boot device.

The table presented below lists the device interface and the correct setting for the AM-100/T CPU or the AM-100. The part number with the current revision level is also given. The "Current Controller Revision Level" column refers to the revision level of the circuit board now shipping from Alpha Micro. If you have any questions about these PROMs, please call our System Support Group at (714) 957-0392.

Boot PROM Reference Guide

Device Interface	AM-100/T Boot I.D. Register 3 2 1 0	AM-100 Boot Address Header (Hex)	Controller Boot PROM Part Number	Controller Boot PROM Revision	AM-100/T Boot PROM Part Number	AM-100/T Boot PROM Revision	Current Controller Revision
AM-110 CPU Link	0 1 1 0	F400	DWB-00112-00	B00	DWB-00152-03/04 [1]	C00	C03
AM-200 Persci		FC00	DWB-00206-00	D00			B10
AM-200 Wangco		FC00	DWB-00205-00	D00			B10
AM-210	0 0 0 0	FC00	DWB-00218-00	C00	DWB-00152-01/02	C00	F07
AM-400 T-25, T-50, T-200 Trident	0 0 1 1	FC00	DWB-00402-00	C00	DWB-00152-03/04 [1]	B00	A03
AM-400 T-80, T-300 Trident	0 1 0 0	FC00	DWB-00403-00	A00	DWB-00152-03/04 [1]	B00	A03
AM-410 Phoenix	0 0 0 1	F400	DWB-00412-00 [2]	B02	DWB-00152-01/02	C00	F05
AM-420 with Floppy	0 1 1 1	F400	DWB-00422-00 [3]	B01	DWB-00152-05/06 [3]	B01	B03
AM-420 with STR	1 0 0 0	F400	DWB-00422-01	B01	DWB-00152-07/08	B02	B03
AM-420 with VCR	1 0 0 1	F400	DWB-00422-02	B01	DWB-00152-09/10	B01	B03
AM-500	0 0 1 0	F400	DWB-00501-00	D00	DWB-00152-01/02	B01	B03
AM-610 VCR	1 0 0 1	F400	DWB-00613-00 [4]	B01	DWB-00152-09/10	B01	B03
AM-620 STR	1 0 0 0	F400		B02	DWB-00152-07/08	B02	A00

1 - 03/04 PROMs, Revision C will not support the Trident drive
1 - 03/04 PROMs, Revision B will not support the AM-110

2 - Controller Boot PROM, Revision B01 supports multiple Phoenix configurations
2 - Controller Boot PROM, Revision A06 supports single Phoenix configurations

3 - 05/06 PROMs, Revision A01 (or later) supports 8.5 MB Winchester
3 - 05/06 PROMs, Revision B00 supports all Winchester drives
3 - Controller Boot PROM, Revision A03 supports 8.5 MB Winchester
3 - Controller Boot PROM, Revision B00 supports all Winchester drives

4 - Not meant for booting

When assigning terminals to the second AM-300 through the TRMDEF statement in the SYSTEM.INI file, use the AM301.IDV in the same manner as the AM300.IDV. AM301 must be specified for the interface driver rather than AM300 in order for the system to recognize the correct driver.

Test the driver by creating a TEST.INI and then MONTST the system using the TEST.INI file.

****
* USING THE AM-300 IN AN AM-100L BASED SYSTEM *
****

1. HARDWARE: ONLY Rev. C and above boards are compatible

Port addresses are selected the same as when using the AM-300 in an AM-100T based system(use the jumpers), except there are more of them.

I/O ADDRESSES	BOARD NUMBER
0FFFFF8	1
0FFFFE8	2
0FFFFD8	3
0FFFF68	4
0FFFF60	5
0FFFF58	6
0FFFF50	7
0FFFF48	8
0FFFF38	9
0FFFF28	10
0FFFF18	11

The maximum number of boards that can be used is 11.

2. SOFTWARE: Interrupt vector level - same for all cards = 3

When running more than one AM-300 board the only thing that needs to be changed in the software driver is the number of cards in the system. (NUMBRD=3) for example.

In the AMOSL.INI file the the port numbers in the TRMDEF statements will be as follows:

FIRST BOARD port numbers are 1 to 6
SECOND BOARD port numbers are 11 to 16
THIRD BOARD port numbers are 21 to 26
etc. through the eleventh board.

Table II. AM-100/T Boot I.D. Register Summary
(Standard Boot PROMS)

BOOT DEVICE I.D. CODE					
BIT					
3	2	1	0	Boot Prom Set	Boot Device
0	0	0	0	DWB-00152-01/02	AM-210 Floppy Drive (CDC/Persci)
0	0	0	1	DWB-00152-01/02	AM-410 Phoenix Drive
0	0	1	0	DWB-00152-01/02	AM-500 Hawk Drive
0	0	1	1	DWB-00152-03/04	AM-400 T-25/50 Trident Drive
0	1	0	0	DWB-00152-03/04	AM-400 T-80/300 Trident Drive
0	1	0	1	DWB-00152-01/02	AM-210 Floppy (Wangco)
0	1	1	0	DWB-00152-03/04	AM-110 CPU Link
0	1	1	1	DWB-00152-05/06	AM-420 Winchester/Floppy Combination
1	0	0	0	DWB-00152-07/08	AM-420 Winchester/Streamer Combination
1	0	0	1	DWB-00152-09/10	AM-420 Winchester/VCR Combination
1	0	1	0		Unassigned
1	0	1	1		"
1	1	0	0		"
1	1	0	1		"
1	1	1	0		"
1	1	1	1		Unassigned

RUNNING MORE THAN ONE AM-300 I/O CONTROLLER

The AM-300 Serial I/O Controller in an AM-100 system is applicable to Alpha Microsystems' AM-300 Rev.A&B and is fairly straightforward. But,it is important that each step be followed exactly in order for the procedure to work properly.

The hardware and software portions will be covered separately with examples given in each area.

HARDWARE CHANGES

Two hardware items must be changed. First the board I/O address must be changed, and second, the board interrupt level must be changed.

	Suggested I/O Address	Interrupt Level
1st AM-300 board	F8(normal)	3
2nd AM-300 board	E8	6
3rd AM-300 board	D8	7

(FOR 100T ONLY)

The suggested interrupt levels are only a guide. The interrupt level you use must not be used by any other board on the system If you have an AM-100 based system, be sure to enable the same interrupt level on the AM-100 board.

As an example, a second AM-300 board will be set up using I/O address E8 and interrupt level 6. See Figure 1 below. On the AM-300 board, find the ADDRESS HEADER and the INTERRUPT lines.

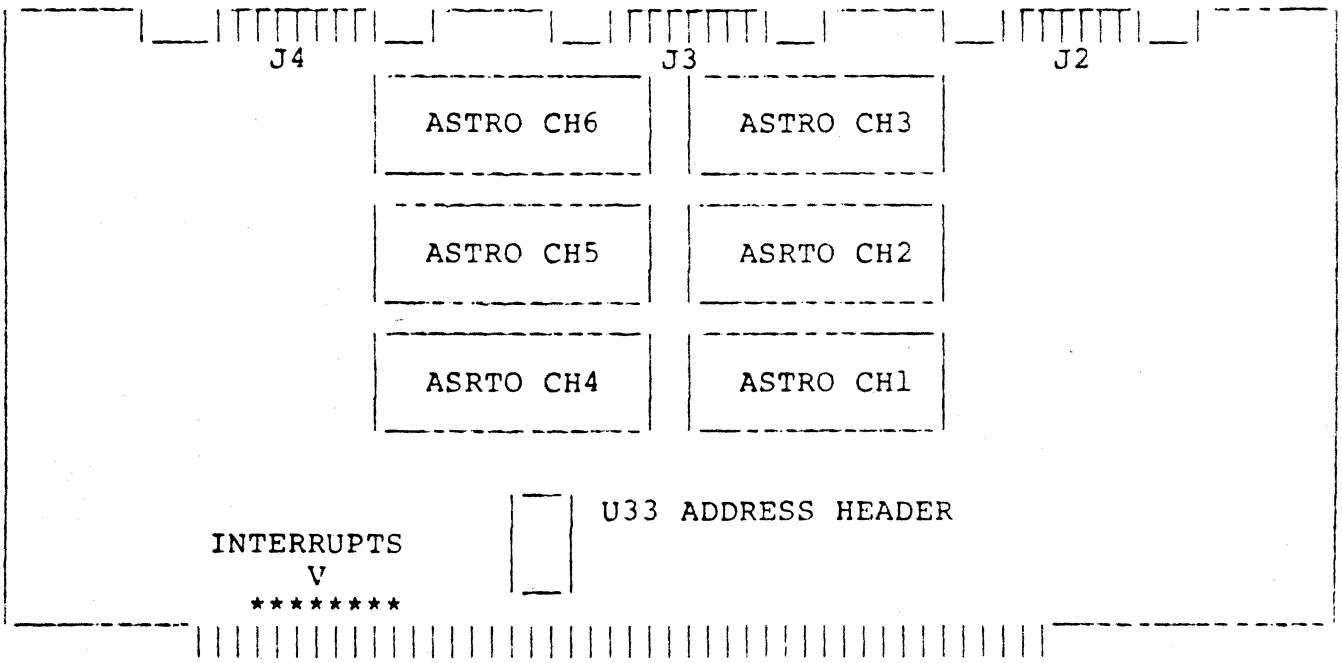
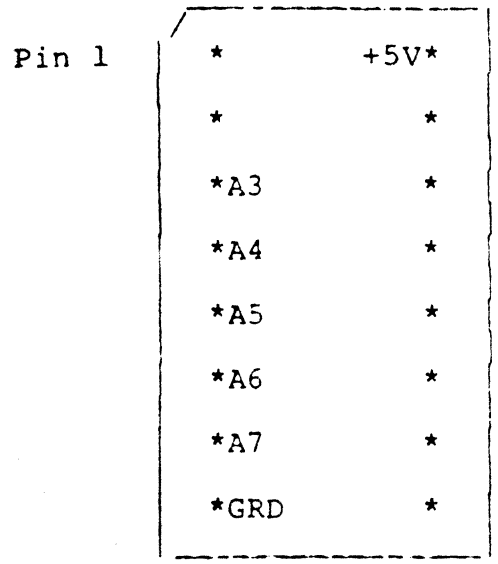


FIGURE 1 AM-300 BOARD

100T ONLY

The address header is normally set up for address F8. This header will be changed to E8. Figure 2 shows the address header and the pin identification. Pins 3 thru 7 are the address lines A3 thru A7. Pin 16 is + 5 volts and pin 8 is ground. The address lines are tied to +5 volts to make the address lines "1" level or to ground for a "0" level.



An address of F8 will have A3,A4,A5,A6 and A7 jumpered to +5 volts.

An address of E8 will have A3,A5,A6 and A7 jumpered to +5 volts and A4 jumpered to ground.

An address of D8 will have A3,A4,A6 and A7 jumpered to +5 volts and A5 jumpered to ground.

FIGURE 2
ADDRESS HEADER

After the address has been changed to E8, the interrupt level must be changed to "6" for this example. See Figure 3 for interrupt identification.

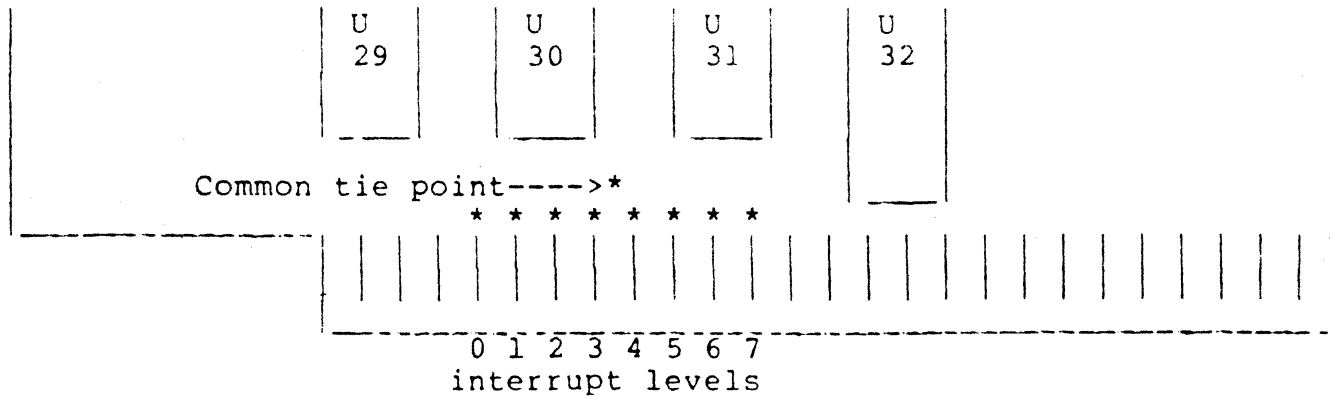


FIGURE 3 AM-300 BOARD (Lower left corner)

To change the interrupt, level the jumper (foil etch on older boards) must be installed from the common tie point to the correct interrupt pad. In this example to the pad labeled "VI 6".

Note: The interrupts are labeled on the board. The labeling may look like "V10 to V17". Should be "VI0 to VI7".

SOFTWARE CHANGES 100T ONLY

Now, a new driver must be generated for the second AM-300 board. The source for the AM-300 driver is located in PPN [10,2], file "AM300.MAC". Copy this file to "AM301.MAC". Using the "VUE" or "EDIT" program change two lines in the AM301.MAC file. In the beginning of the file are the two lines which must be changed to reflect the hardware changes.

The first; find the line that reads:

```
AMX=177770              ;BOARD ADDRESS
```

If the board address has been changed to "E8" on the header; change this line to read:

```
AMX=177750              ;BOARD ADDRESS
```

If the board address has been changed to "D8" on the header; change this line to read:

```
AMX=177730              ;BOARD ADDRESS
```

Note: The octal address is calculated by adding the address of the board to 177400 octal.

Second; find the line that reads:

```
AMV=3                   ;INTERRUPT VECTOR LEVEL
```

Change this line to reflect the same interruupt level that was set up on the board. For interrupt level "6" this line should read:

```
AMV=6                   ;INTERRUPT VECTOR LEVEL
```

After the two changes have been made, the file must now be reassembled using the MACRO program. To MACRO the program, type the following:

```
MACRO AM301.MAC [RETURN]
```

The MACRO program will generate two new files in PPN 10,2. They are:

AM301.OBJ
AM301.PRG

Erase the AM301.OBJ file, it is not needed. The AM301.PRG file must be renamed to AM301.IDV and transferred to area 1,6 on the system disk where the drivers must reside.

The Spare Parts/Logistics Department has two AM-410 Phoenix Drive Retrofit Kits available that we recommend be installed on your Phoenix drive. The CDC Low Error Option Kit – Part Number 77711032 – has been designed to provide protection for drive heads and media in the event of severely restricted air flow or blower motor failure. If one of these problems occur, the drive will spin down and will not operate until the failure is corrected if this kit has been installed.

The second kit available is the Phoenix Pre-filter Filter Kit – Part Number PRA-01093-00. The installation of this filter on the front panel will ensure additional protection for the drive.

To order these kits, please contact the Spare Parts/ Logistics Department at (714) 957-6112.

Adding Additional AM-300 I/O Circuit Boards to an AM-100/L System

The procedure to add additional AM-300 circuit boards to the AM-100/L system differs from the procedure used on the AM-100 and AM-100/T systems. This article assumes that you are familar with the procedures used in adding additional AM-300 I/O boards to an AM-100 or AM-100/T system.

Please remember the following differences between an AM-100, AM-100/T additional AM-300 board installation, and an AM-100/L additional AM-300 board installation will apply:

1. You may use only AM-300 Revision C00 or later boards.
2. The AM-100/L systems share the same interrupt level for all AM-300 boards.
3. The software changes to the interface driver are different.

The new AMOS/L software will support a total of eleven AM-300 circuit boards per system. This is done through the use of the same interrupt level for all eleven circuit boards(vectored interrupt level 3). For this reason, all AM-300 boards in an AM-100/L system will be set to interrupt level 3

The I/O address of each board must be set to a specific address as shown below. Please see the table below for I/O addresses and the correct jumper settings:

Board	I/O Address	Address Jumpers				
		A3	A4	A5	A6	A7
1st	(FFFF)F8	1	1	1	1	1
2nd	E8	1	0	1	1	1
3rd	D8	1	1	0	1	1
4th	68	1	0	1	1	0
5th	60	0	0	1	1	0
6th	58	1	1	0	1	0
7th	50	0	1	0	1	0
8th	48	1	0	0	1	0
9th	38	1	1	1	0	0
10th	28	1	0	1	0	0
11th	18	1	1	0	0	0

The AMOS/L System Initialization Command File – AMOSL.INI – TRMDEF statements refers to the port numbers differently than does the AMOS software. The first AM-300 board is still called AM-300 with ports numbered from 1 thru 6. The second AM-300 board is also called AM-300; however, the port numbers are 11 through 16. A TRMDEF statement for a third AM-300 board and the second port would appear as:

TRMDEF TERM14,AM300=22:9600,SOROC,100,100,100

The source program for the AM-300 interface driver is located in PPN [10,2] and is named AM300.M68. If additional boards are to be added to the system, a new "IDV" must be generated by first modifying one line in the AM300.M68 source file. Then the file must be assembled by entering: *M68* followed by the file name to generate the new driver. This line is titled "NUMBRD." The line will normally read:

NUMBRD=3 ; max number of boards supported by IDV

This number must be changed to match the number of AM-300 circuit boards used in the system. You may use any number between 2 and 11.

NOTE: Be aware that increasing the "NUMBRD" equate will cause the AM300.IDV file to increase in size. Each additional board will cause the file to increase by 176 bytes.

If you have any questions about this procedure, you may contact either the System Support Group at (714) 957-0392 or the Technical Education Department at (714) 957-6076.

AM-1002 Memory Expansion Module