

apollo®



D O M A I N

Order No. 005448
Revision 00

Operating the DN3xx



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Order No. 005448

Revision 00

This manual summarizes the standard and optional
DN3xx hardware, and describes operational
procedures for DN3xx nodes.

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WARNING: For continued protection against risk of fire, replace only with the same type and rating of fuse.

ATTENTION: Pour assurer une protection continue contre les risques d'incendie, ne remplacer les fusibles qu'en conservant les mêmes modèles et voltage.

PRECAUCION: Para la protección constante contra incendio, use sólo un tipo de fusible con las mismas características nominales.

WARNUNG: Um ständigen Schutz vor Feuergefahr zu gewährleisten, ausschliesslich mit Sicherung derselben Art und Stärke ersetzen.

WAARSCHUWING: Voor onafgebroken bescherming tegen brandrisico, vervang enkel met zekeringen van het zelfde type en dezelfde belasting.

VARNING: För fortsatt skydd mot brandfara, måste fäkringens bytas mot en av samma typ och tal.

注意: ヒューズの変換は同じタイプが同品質のものだけですから、焦熱の危険から常に守って下さい

WARNING: Disconnect power before installing or removing device.

ATTENTION: Débrancher l'alimentation avant l'installation ou la dépose de l'appareil.

PRECAUCION: Desconectar el aparato antes de instalarlo o quitarlo.

WARNUNG: Strom abschalten, bevor das Gerät installiert oder entfernt wird.

WAARSCHUWING: Schakel de stroom uit vóór het installeren of verwijderen van het apparaat.

VARNING: Koppla ur sladden innan anordningen installeras eller tas bort.

注意: 装置を設置した場所を移したりする前にパワーを切って下さい

- WARNING:** No operator-serviceable parts inside the unit.
- ATTENTION:** La machine ne comporte aucune pièce dont l'opérateur puisse lui-même assurer l'entretien.
- PRECAUCION:** No contiene partes que puedan ser reparadas por el técnico de servicio.
- WARNUNG:** Die Teile innerhalb des Gerätes können nicht vom Operator gewartet werden.
- WAARSCHUWING:** Binnenin het apparaat zijn geen onderdelen die door de bediener kunnen onderhouden worden.
- VARNING:** Inuti apparaten finns inga delar som kan repareras av användaren.
- 注意: 操作するオペレーターはユニット内部の部品には触れないで下さい
-
- NOTE:** Red light-emitting diodes (LEDs) on DOMAIN workstations indicate system status. When lit, these red diodes do not indicate hazardous or warning conditions.
- REMARQUE:** Les diodes électroluminescentes rouges (DEL) sur les postes de travail DOMAIN indiquent l'état du système. L'allumage de ces diodes rouges ne signale aucune condition d'alarme ou de danger.
- NOTA:** Los diodos emisores de luz roja (DEL) en las terminales DOMAIN indican la condición del sistema. Cuando los diodos rojos se iluminan, no indican situaciones peligrosas o alarmantes.
- WARNUNG:** Rotlichtemittierende Dioden (LEDs) auf DOMAIN-Arbeitsstationen zeigen den Systemstatus an. Wenn sie aufleuchten, zeigen diese roten Dioden keine gefährlichen oder warnauslösenden Zustände an.
- NOOT:** Red-light emitting diodes (LED's) op DOMAIN werkposten tonen de stand van het systeem aan. Indien ze aan zijn, duiden deze rode diodes noch gevaarlijke, noch waarschuwingstoestanden aan.
- OBS.:** Röda lysdioder (LED) på DOMAIN-stationer anger systemstatus. När dessa röda dioder lyser betyder det inte fara eller varning.
- 注: DOMAINワークステーションの赤色ライトを点灯しているダイオードはシステムの状態を示しているだけです。ライトが点灯しているときは危険な、あるいは注意を要する状態を示しているわけではありません。

PREFACE

This manual contains introductory and operational information for the DN3xx family of DOMAIN® nodes and associated peripherals.

Audience

This guide is intended for those persons who operate DOMAIN nodes and peripherals. This group includes end users, system builders and their designated service representatives, and our service representatives.

Structure of This Document

This manual contains two chapters and associated appendices.

Chapter 1 describes the DN3xx standard and optional hardware.

Chapter 2 describes several operating tasks you may have to perform on a DN3xx node.

Appendix A describes preventive maintenance procedures for DN3xx nodes.

Appendix B describes how to get help if you have a problem with your node.

Related Documents

For information about planning and cabling the network, refer to the DOMAIN System Site Planning and Preparation Guide, order number 004171.

For information about using the DOMAIN system, refer to Getting Started With Your DOMAIN System, order number 002348, and the DOMAIN System Command Reference manual, order number 002547.

For information about installing network software, creating and maintaining the DOMAIN Network Registry, and troubleshooting network problems, see Administering Your DOMAIN System, order number 001746.

For further information about installing peripherals supported by DOMAIN software, refer to the Peripheral Installation Package, order number 004172.

For further information about installing a DN3xx node, refer to Unpacking and Installing the DN3xx, order number 005447.

Documentation Conventions

Unless otherwise noted in the text, this manual uses the following symbolic conventions.

UPPERCASE	Uppercase words or characters in formats and command descriptions represent commands or keywords that you must use literally.
lowercase	Lowercase words or characters in formats and command descriptions represent values that you must supply.
[]	Square brackets enclose optional items in formats and command descriptions. In sample Pascal statements, square brackets assume their Pascal meanings.
{ }	Braces enclose a list from which you must choose an item in formats and command descriptions. In sample Pascal statements, braces assume their Pascal meanings.
	A vertical bar separates items in a list of choices.
< >	Angle brackets enclose the name of a key on the keyboard.
CTRL/Z	The notation CTRL/ followed by the name of a key indicates a control character sequence. You should hold down the <CTRL> key while typing the character.
...	Horizontal ellipsis points indicate that the preceding item can be repeated one or more times.
.	Vertical ellipsis points mean that irrelevant parts of a figure or example have been omitted.

Problems, Questions, and Suggestions

We appreciate comments from the people who use our system. In order to make it easy for you to communicate with us, we provide the User Change Request (UCR) system for software-related comments, and the Reader's Response form for documentation comments. By using these formal channels you make it easy for us to respond to your comments.

You can get more information about how to submit a UCR by consulting the DOMAIN System Command Reference manual. Refer to the CRUCR (Create User Change Request) Shell command description. You can view the same information on-line by typing:

```
$ HELP CRUCR <RETURN>
```

For documentation comments, a Reader's Response form is located at the back of each manual.

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CHAPTER 1

DN3xx PRODUCT FAMILY OVERVIEW

The DN3xx family of DOMAIN workstations (also referred to as nodes) incorporate the following features:

- 32-bit VLSI processor
- 16 Mbyte virtual address space
- 17-inch high-resolution bit-mapped graphics display
- access to the DOMAIN local area network
- optional support for floating-point calculations

Figure 1-1 shows the cabinet which houses the DN3xx nodes. The design of the cabinet allows you to tilt the monitor to a comfortable viewing angle, and the detached keyboard connects to the front of the node with a coiled cable. You can adjust the display's brightness with the knob on the right side of the cabinet.

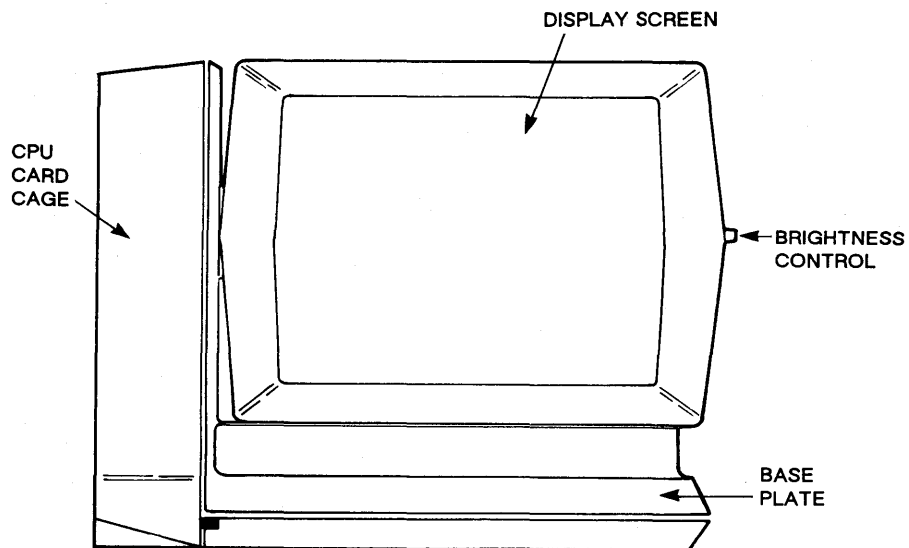
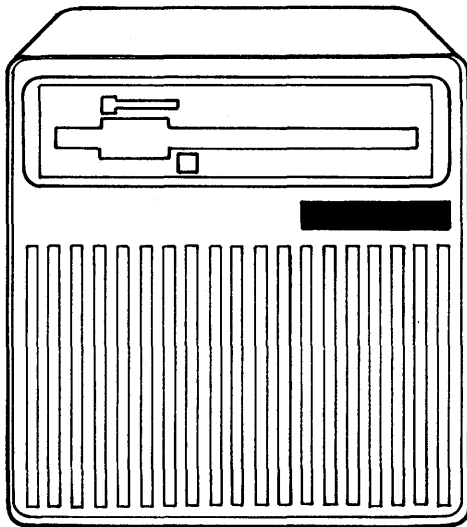


Figure 1-1. Front View of a DN3xx Node

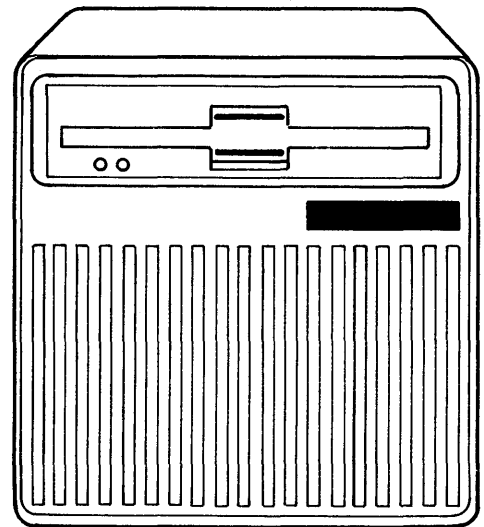
Optional hardware for DN3xx nodes includes:

- keyboard with touchpad
- mouse (attaches to the back of the keyboard)
- 34 Mb (megabyte) or 70 Mb Winchester disk (housed in a separate cabinet)
- 1.2 Mb floppy disk (housed with the Winchester disk)

Figure 1-2 shows the front of the disk storage option cabinet (the Winchester disk is in this cabinet); the optional floppy disk drive is also in place.



LEVER-TYPE DRIVE



LATCH-TYPE DRIVE

Figure 1-2. Disk Storage Option Cabinet with Floppy Disk Drive

CHAPTER 2

OPERATING DN3xx NODES

This chapter describes several operating tasks you may have to perform on a DN3xx node. These tasks include:

- Starting up and shutting down
- Using the floppy disk drive
- Recovering from a node hang or a node crash (including how to perform a memory dump)

Each task description gives a brief introduction to the task, the procedure you use to perform the task, and any notes that may apply to the task.

Figure 2-1 shows the locations of the NORMAL/SERVICE, RESET, and POWER switches on the back of the DN3xx cabinet. You must know the locations of these switches before you can use the information in this chapter.

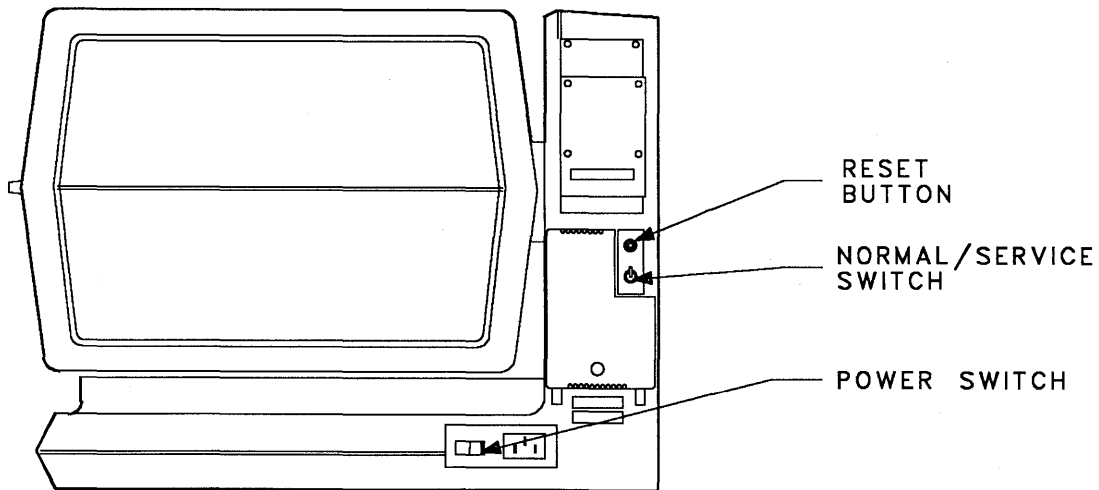


Figure 2-1. Back View of a DN3xx Node with Operational Controls

For more general information about using DN3xx nodes, refer to Getting Started With Your DOMAIN System.

2.1 STARTING UP

After you switch on the power, the node starts up under control of a program called the Mnemonic Debugger (MD). If you start up with the NORMAL/SERVICE switch set to N, for NORMAL mode, the MD program automatically runs node integrity tests and then boots (loads and starts) the AEGIS operating system. If you start up with the NORMAL/SERVICE switch set to S, for SERVICE mode, the node remains under the control of MD, which displays its right-arrow prompt, >. You should always start up the node in NORMAL mode unless a service representative directs you to do otherwise.

WARNING: Use this start-up procedure only if a service representative has previously installed and tested the node according to the instructions in Unpacking and Installing the DN3xx.

If you are starting up a diskless node, be sure that its partner node is running the NETMAN program, and that the partner node contains the SAU2 subdirectory of the node entry (/) directory. Also check that the diskless node's ID number is in the file /SYS/NET/DISKLESS_LIST on the partner node. For more information, consult your system administrator or refer to Administering Your DOMAIN System.

Procedure for Starting Up in NORMAL Mode

(Refer to Figure 2-1 for all switch locations.)

1. Set the NORMAL/SERVICE switch to N (NORMAL).
2. Make sure that all AC line cord connections are secure. Then switch on the AC power to the disk option (if you have one) and the node. Always switch the disk option on first.
3. The MD program now runs a series of eight tests. You will see the number of each test (1..8) appear on the screen. Following the eighth test, MD boots the AEGIS operating system which displays the "Please log in:" prompt when the node is ready for use.

Procedure for Starting Up in SERVICE Mode

(Refer to Figure 2-1 for all switch locations.)

1. Set the NORMAL/SERVICE switch to S (SERVICE).
2. Make sure that all AC line cord connections are secure. Then switch on the AC power to the disk option (if you have one) and the node. Always switch the disk option on first.
3. The MD program now displays its right arrow prompt, >. Press the <RETURN> key to make MD respond to keyboard input:

```
> <RETURN>
MD yy/mm/dd
```

The <RETURN> causes MD to display a message showing the date. You can now issue MD commands as necessary.

4. When you are ready to load the AEGIS operating system, reset the debugger with the RE command, then press <RETURN> a second time:

```
> RE <RETURN>
> <RETURN>
MD yy/mm/dd
```

5. If your node is diskless, use the DI N command to request use of the programs on a partner node's disk (refer to Section 2.1 for information on how to set up a diskless node):

```
> DI N <RETURN>
```

6. Use the EX AEGIS command to boot the operating system:

```
> EX AEGIS <RETURN>
```

(If the node is diskless, you will see several messages appear on the screen as the partner node loads the operating system onto your node.)

7. When you see a right parenthesis prompt, ")", load the Display Manager with the GO command:

```
) GO <RETURN>
```

Your node is ready when the "Please log in:" prompt appears.

2.2 SHUTTING DOWN

The shut-down procedure is a two-step operation which is nearly the reverse of the start-up procedure described in Section 2.1. In the first part of the procedure you leave the AEGIS operating system and return to the MD program; in the second part, you switch off the power to the node. Once you return to the MD program you can enter MD commands and then boot the AEGIS operating system again, or continue and completely switch off the node.

WARNING: If you intend to shut off the node's power, it is important that you use the following procedure to insure that you do not damage the node's Winchester disk (if it has one).

Procedure

1. Use the Shell command LO (Log_Out) to log out of the node.
2. Use the Display Manager SHUT command to leave the operating system:

Command: SHUT <RETURN>

The following message appears at the top of the screen:

```
BEGINNING SHUTDOWN SEQUENCE...  
SHUTDOWN SUCCESSFUL
```

Finally, the MD program displays its right-arrow prompt, >, at the bottom of the display. You can now enter commands to MD, or continue this procedure to finish the shut-down operation.

3. DO NOT switch off the node's power yet. You must "spin-down" the Winchester disk (if the node has one) before you can switch off the power. Enter the following MD command sequence to reset and completely shut down the node:

```
> RE <RETURN>  
> <RETURN>  
MD yy/mm/dd  
> SHUT <RETURN>
```

4. If you have a disk, wait about 20 seconds for the disk to stop rotating.
5. Check to be sure that the floppy disk drive is empty, then shut off the power. (DO NOT leave a floppy disk in the drive with the power shut off, you may damage the drive.)

2.3 USING A FLOPPY DISK DRIVE

If your node has a floppy disk drive, you can use it to read files from floppy disks or write files to floppy disks. Floppy disks are useful for transferring files between nodes that are not in the same network, for making backup copies of files, and for storing little-used files. Figure 2-2 illustrates the top of a typical floppy disk.

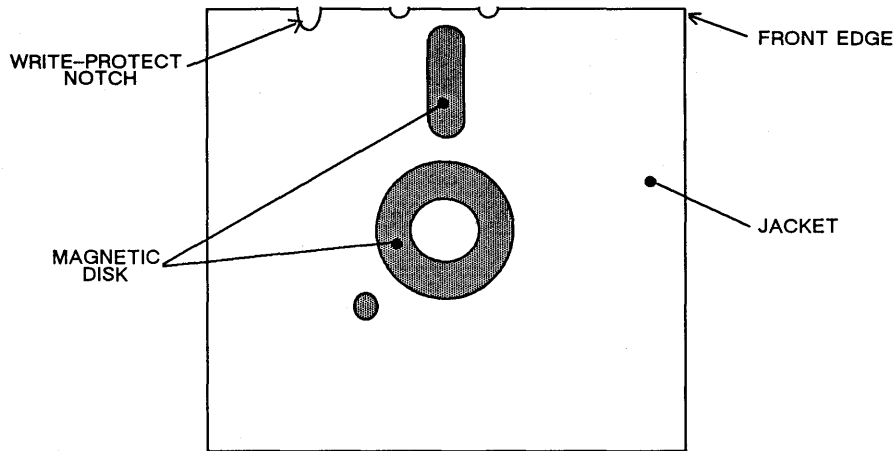


Figure 2-2. A Typical Floppy Disk

Figure 2-3 shows the location of the floppy disk drive in the upper portion of the disk storage option cabinet. Notice that your node may have one of two different types of floppy drives: one has a "lever" and the other has a "latch." The drives are essentially the same, except that you will use either the lever or the latch to lock the floppy disk in the drive.

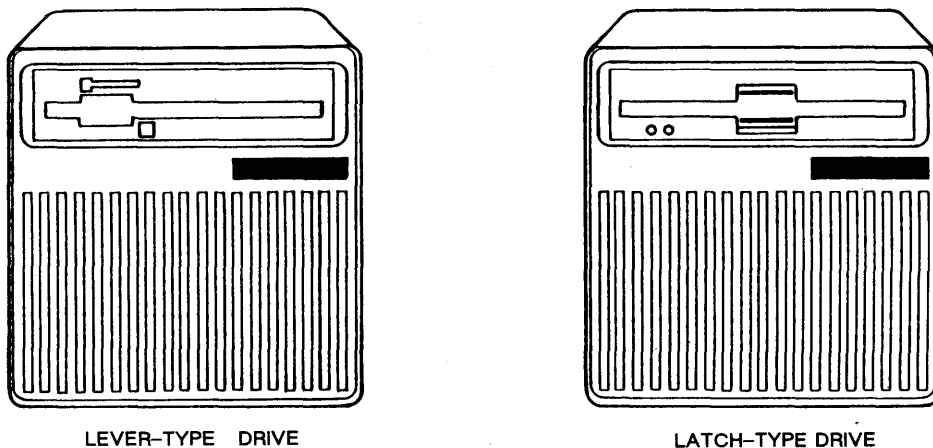


Figure 2-3. Floppy Disk Drives in the Disk Storage Option

Procedure

1. Take the floppy disk out of its paper envelope. You can see the actual disk through the cutouts in the protective plastic jacket. Do not touch the surface of the disk or try to remove the plastic jacket. The disk operates from inside the jacket, and in general, we refer to the actual disk with jacket as a "floppy."
2. Look for a notch about 1/4-inch (0.5 cm) deep in the front edge of the jacket. When this write-protect notch is exposed, you cannot write new information to the floppy. If you want to write to the floppy you must cover the notch with a "write-enable tab." This is a small sticker that you fold over the edge of the jacket to cover the notch. The tab must completely cover the notch on both sides of the jacket. (Each box of floppies usually contains a sheet of write-enable tabs.)
3. Insert the front edge of the floppy into the drive as shown in Figure 2-4. Make sure that you insert it rightside up.

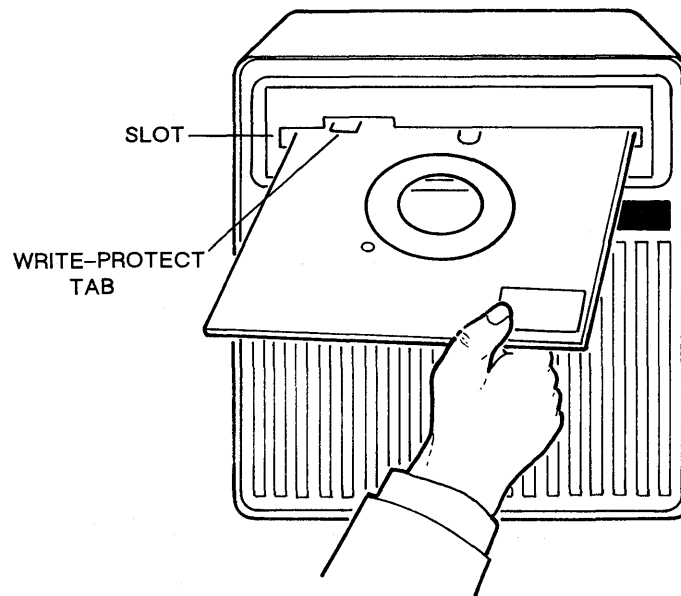


Figure 2-4. Loading a Floppy Disk into the Disk Drive

If the floppy drive is the lever type, gently push the floppy in until it stops and then turn the lever down. If the floppy drive is the latch type, gently push the floppy in until it stops and you hear a click. When you hear the click, lift up on the bottom half of the latch until it nearly touches the top half. You will hear another click when you have properly closed the latch.

4. If you are using a new floppy disk you must initialize it before you can write files to it. (If you are not sure if the floppy has been initialized, try to mount the floppy as described in Step 5. If you are unable to mount the floppy disk, continue with this step.)

Log in to the node and type the INVOL (Initialize_Volume) command at the Shell prompt:

```
$ INVOL <RETURN>
```

The INVOL command runs a program that prompts you for some information. The following is an example of the INVOL program's output. The term "physical volume" refers to the floppy disk itself; the term "logical volume" refers to the actual information storage space available on the floppy. Respond to INVOL as shown:

```
invol (initialize_volume), revision xx mm/dd/yy
```

Options are:

- 1 - initialize virgin physical volume.
- 2 - initialize partial physical volume, preserving existing logical volumes.
- 3 - re-initialize an existing logical volume.
- 4 - delete a logical volume.
- 5 - list logical volumes.
- 6 - list badspots on volume.
- 7 - input and record badspot information.
- 8 - create or modify an os paging file on an existing logical volume.
- 9 - add to existing badspot list.

Option: 1 <RETURN>

Controller type

(W=Winchester, S=Storage module, F=Floppy): F <RETURN>

Verification options are:

- 1 - no verification
- 2 - write all blocks on the volume
- 3 - write and re-read all blocks on the volume

Enter verification option: 3 <RETURN>

Expected average file size,
in blocks, (CR for default, 5 blocks): <RETURN>

For each logical volume to be formatted, enter the logical volume size, followed by the name, in the form "size, name". Up to 10 volumes may be specified. Terminate input with a blank line.

There are 1231 blocks available.

volume 1: 1231 <RETURN>

Enter badspots between physical disk addresses 1 and 4CF, one per line. Badspots must be input in (hex) physical disk address form. Terminate badspot entry with a blank line. -q will abort the run.

: <RETURN>

Is the badspot information you entered correct? Y <RETURN>

Enter physical volume name: ANYNAME

Initialization complete.

Anything more to do? N <RETURN>

5. Mount the floppy disk. Mounting the floppy disk makes the storage areas in the logical volume available to the AEGIS operating system. (The floppy must be correctly loaded and initialized as described in Steps 1 through 4.) Use the Shell command `MTVOL (Mount_Volume)` to mount the floppy:

```
$ MTVOL F FLOPPYNAME <RETURN>
```

F (floppy) specifies the disk type; FLOPPYNAME is the "volume entry directory" name. This name becomes the top-level directory name for the files on the floppy. Make a note of the name you choose; you'll need to use it when you dismount the floppy.

If the floppy you are using has not been initialized, you will receive the following message when you try to mount it:

```
Unable to mount volume, bad disk format
```

(Refer to Steps 1 through 4 for instructions on how to initialize a floppy.)

6. Set your working directory to the volume entry directory. You can now create directories and files on the floppy, list directories, copy to and from the floppy, and perform any other operations that you normally do with directories and files.

7. Dismount the floppy when you have finished using it. You must dismount the floppy before you remove it from the disk drive, or you may lose the information it contains. Dismounting makes the storage areas in the logical volume inaccessible to the AEGIS operating system, so be sure you have completely finished with the floppy before you dismount it.

To dismount the floppy, first set your working directory to a directory that is not on the floppy. Then use the Shell command DMTVOL (Dismount_Volume) to dismount the floppy:

```
$ DMTVOL F FLOPPYNAME <RETURN>
```

Again, F (floppy) specifies the disk type, and FLOPPYNAME is the volume entry directory name that you specified when you first mounted the floppy.

8. Remove the floppy from the disk drive. If you have a lever-type drive, turn the bar back up and the floppy will pop out. If you have a latch-type drive, lift up on the bottom half of the latch until you hear a click, then release the latch, and the floppy will pop out. Put the floppy back into its envelope, front edge first (see Figure 2-2). Make sure you label the floppy with at least its volume entry directory name. LEAVE THE LEVER OR LATCH OPEN WHEN THE FLOPPY DRIVE IS NOT IN USE.

2.4 RECOVERING FROM A NODE HANG

If your node seems to suddenly stop in the middle of whatever you were doing, the cause may be a node hang. Usually the cursor stops flashing or disappears, and the node may not respond to keyboard input. A node can hang due to hardware or software problems in the node itself, a program failure, or a network failure. This procedure describes several steps you can take to correct node hangs.

Use this procedure only if the node was running the AEGIS operating system when the hang occurred. Contact your service representative if you have a problem while you are starting up or running the Mnemonic Debugger.

Procedure

1. If the cursor disappears and does not return while you are executing a program, it is possible that the program itself has hung. Try to quit the program by typing <CTRL>/Q. If the cursor does not reappear, or if it is not flashing or the keyboard is not responding, proceed with Step 2.
2. Disconnect the keyboard plug from the display cabinet then connect it again. This operation resets the microprocessor that controls the keyboard.
3. If the problem continues, go to another node and use the Shell command NETSTAT (Network_Statistics) to check the status of the network:

```
$ NETSTAT -L
```

The node then prints statistics about that node's communications across the network. At the end of the message, however, NETSTAT displays several lines of information about the last recorded failure on the entire network. An example appears below:

```
Last ring hardware failure detected by node xxx
on 1984/11/16 at 11:20
Node was receiving clock signals but no data.
System configured with 1.0 mb of memory.
A total of 0 parity errors were detected.
```

4. If the last ring hardware failure occurred recently, there may be problems with the network. If the problem is in the network, the cursor should return after you solve the problem. If it does not, go on to Step 5. If the message reports no recent ring hardware failures, and the node remains hung, proceed with the Step 5.

5. Put the NORMAL/SERVICE switch (shown in Figure 2-1) in the S (service) position and type:

```
<CTRL>/<RETURN>
```

Then check to see if the following display appears:

```
CRASH_STATUS 000B0008 ECB nnnnnnnn PID nnnnnnnn
S          E2F320          2700
E2F320:  4E4F
>
```

6. If the "CRASH_STAUS" message appears, go to Step 7A. If the message does not appear, go to Step 7B.

- 7A. This CRASH_STATUS message indicates that you have stopped the AEGIS operating system and given control to a lower-level program called the Mnemonic Debugger. Make a note in the node's log book describing what you were doing when the node hung, and that you were able to give control to the Mnemonic Debugger by typing <CTRL>/<RETURN>.

You can restart the AEGIS operating system using the following commands:

```
> G <RETURN>
> G *+2 <RETURN>
<CTRL>/F
```

Wait for 10 or 20 seconds. If the display resets, and the flashing cursor reappears, continue normal operation. If the flashing cursor does not reappear, you should perform a "memory dump" as described in Section 2.6. When you have completed the memory dump, go on to Step 8.

- 7B. Because you were not able to enter the Mnemonic Debugger (MD) with <CTRL>/<RETURN>, you must enter MD and reset your node manually. Press the RESET button (shown in Figure 2-1), then enter the RE (Reset) command at the MD's right-arrow prompt, followed by another <RETURN>:

```
> RE <RETURN>
> <RETURN>
```

Make a note in the node's log book describing what you were doing when the node hung, and that you had to use the RESET button to give control to the Mnemonic Debugger. You should now perform one of the memory dump procedures described in Section 2.6. When you have completed the memory dump, go on to Step 8.

8. To start the AEGIS operating system again, put the NORMAL/SERVICE switch in the N (Normal) position, and press the RESET button. The node then runs a set of diagnostics. If the boot volume (the Winchester disk or other storage device which your node boots from) needs salvaging, the node automatically executes the SALVOL (Salvage_Volume) program and displays the message "SALVAGING BOOT VOLUME". Once the salvage is complete, the node boots the AEGIS operating system. When the log-in prompt returns, you can resume normal operation.

9. Contact your service representative for directions on what to do with the data you collected in the memory dump procedure.

2.5 RECOVERING FROM A NODE CRASH

A crash is an unexpected exit from the AEGIS operating system to the Mnemonic Debugger (MD) program. When a node crashes, all processes stop and a crash message appears at the bottom of the display screen. In most cases, the first line of the message contains the words "CRASH_STATUS" along with some information about the crash:

```
CRASH_STATUS nnnnnnnn ECB nnnnnnnn PID nnnnnnnn
```

The two lines that follow the CRASH_STATUS line give information about the contents of various registers at the time of the crash. These lines are followed by the MD program's right-angle prompt, >, which indicates that the MD program is now in control of the node:

```
S          E2F320          2700
E2F320:  4E4F
>
```

In some cases, the CRASH_STATUS line may contain more information than shown in the previous example.

Because many different types of problems can cause crashes, it is impossible for this guide to list all the possibilities. This procedure tells you what to do if your node does crash, describes some common crashes, and tells you how to recover from a crash.

Procedure

1. Copy the entire crash message into the node's log book. Look back through the log book to see if the node has crashed before with the same crash status code (the number that directly follows CRASH_STATUS in the message). If there is no crash status code, go to Step 4.
2. If the node has crashed with this status code before, it may indicate a hardware problem. Contact your service representative about the problem, then go to Step 4. If the node has not recently crashed with this status code, go to Step 3.
3. Refer to Table 2-1 to see if it lists the crash status code. If the code appears in the table, follow the directions provided there. Otherwise, go to Step 4.

NOTE: You can use the Shell command STCODE (Status_Code) to display the meaning of each crash status code, as well as other error codes. To display the meaning of the status code on your node, go to a node running the AEGIS operating system and enter STCODE nnnnnnnn (where nnnnnnn is the status code) in the Shell input window. For information about Shell commands, refer to the DOMAIN System Command Reference manual. Enter the status code starting with the leftmost non-zero character.

4. Put the NORMAL/SERVICE switch (shown in Figure 2-1) in the S (service) position. Then perform one of the memory dump procedures described in Section 2.6.
5. To start the AEGIS operating system, put the NORMAL/SERVICE switch in the N (normal) position, and press the RESET button (shown in Figure 2-1). The node then runs a set of diagnostics. If the boot volume (the Winchester disk or other storage device which your node boots from) needs salvaging, the node automatically executes the SALVOL (Salvage_Volume) program and displays the message "SALVAGING BOOT VOLUME". Once SALVOL completes the salvage, the node boots the AEGIS operating system. When the log-in prompt returns, you can resume normal operation.
6. Contact your service representative for directions on what to do with the data you collected in the memory dump procedure.

Table 2-1. Some Common Crash Status Codes

If the status code is:	It may indicate the following:	Take the following steps:
000B0008	The node was in SERVICE mode, and you typed <CTRL>/<RETURN>, or one of the SIO ports received a "1B" (hex) character.	<ol style="list-style-type: none"> 1. Enter the following MD commands: <ul style="list-style-type: none"> > G <RETURN> > G **2 <RETURN> 2. Enter <CTRL>/F to reset the display. 3. Make sure that the NORMAL/SERVICE switch is now in the N (normal) position. 4. Resume normal operation.
0008001B	Door of floppy disk drive opened or a storage module stopped.	If you are using a floppy disk, close the drive door and skip to Step 5. (The second half of this message does not apply to DN3xx nodes.)
0008....	The node may have a disk problem.	Contact your service representative and report the problem. Your representative will tell you what to do next.
0012000F	There may be a problem with the node's memory hardware.	Contact your service representative and report the problem. Your representative will tell you what to do next.

2.6 MEMORY DUMPS

A "memory dump" is a procedure you use to make a copy of the state of the operating system at a particular time. Memory dumps are especially useful for analyzing the cause of a node hang or crash, so it is usually important to take a memory dump as part of the hang or crash recovery procedure.

In the following memory dump procedures, you save the contents of the memory and the /SAU2/AEGIS.MAP file on floppy disks, and then you send the floppy disks to your service representative for further analysis.

This section provides two procedures for taking memory dumps:

- Dumping to a floppy - Use this procedure if the node that hung or crashed contains a floppy disk drive and contains no more than 1 megabyte of memory. If your node has more than 1 megabyte of memory, you cannot dump directly to a floppy, you must dump across the network.
- Dumping across the network - Use this procedure if the node that hung or crashed does not contain a floppy disk drive or has more than 1 megabyte of memory. In this procedure, you dump the contents of the memory to a file on a node with a floppy drive and then copy the contents of the file onto floppy disks.

2.6.1 Dumping Directly to a Floppy

Before you begin, your node should be in SERVICE mode and under the control of the Mnemonic Debugger as a result of the node hang or crash recovery procedures (Sections 2.4 and 2.5). You will need two initialized floppy disks to hold the memory and the /SAU2/AEGIS.MAP file. (Section 2.3 describes how to initialize a floppy).

NOTE: If the node has more than one megabyte (1Mb) of main memory you must use the procedure for dumping across the network, as the floppy disks used with DOMAIN nodes can hold only slightly more than 1Mb of data.

Procedure

1. Use the RE command to RESET the Mnemonic Debugger (MD):

```
> RE <RETURN>
> <RETURN>
```

The node displays this message:

```
MD yy/mm/dd
```

2. Insert the initialized floppy disk into the disk drive. (Section 2.3 describes how to initialize a floppy disk.)
3. Now, type this MD command to direct the dump memory to a floppy:

```
> DI F <RETURN>
```

4. Enter the following command to start the dump procedure, being careful to enter it exactly as shown:

```
> G 100C00 <RETURN>
```

5. You will hear the floppy drive clicking. The node displays a count of pages dumped as follows:

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

Each "!" indicates that the node has dumped 32 pages from memory. The dump is complete when this message appears:

```
DONE
```

6. If the node hangs during the dump, press the RESET switch to reset the node and start again with Step 1.
7. To restart the operating system, put the NORMAL/SERVICE switch in the NORMAL position and press the RESET switch. The node runs a set of diagnostics. If the boot volume needs salvaging, the node automatically executes the SALVOL program, and displays the message, "SALVAGING BOOT VOLUME". The node then boots the operating system.
8. When the log-in prompt returns, log in and set your working directory to /SAU2.
9. Insert an initialized floppy disk into the floppy disk drive. Type the following to copy the /SAU2/AEGIS.MAP file onto a floppy disk using the WBAK Shell command:

```
$ WBAK AEGIS.MAP -F 1 -DEV F -L <RETURN>
```

10. As WBAK proceeds, the screen displays several messages. The following is a sample transcript:

Label:

```
Volume ID:      (no ID specified)
Owner ID:       (no owner specified)
File number:   1
File section:  1
File ID:       (no ID specified)
File written:  1985/01/31 11:25:47 EST
```

Starting write:

```
(file) "/SAU2/AEGIS.MAP" written.
```

Write complete.

11. When WBAK completes, remove the floppy disk from the floppy drive and label it "/SAU2/AEGIS.MAP, node_ID, date".
12. Contact your service organization for directions on where to send the floppies containing the memory dump and the AEGIS.MAP file.
13. Return to Step 8 of the node hang recovery procedure, or Step 5 of the crash recovery procedure.

2.6.2 Dumping Across the Network

In this procedure you send a memory dump across the network, and store the dump in a file on another node. You can then copy the dump file onto a floppy disk or magnetic tape. Use this procedure when you need to perform a memory dump for a node without a floppy drive, or when your node has more memory than can be dumped directly onto a single floppy disk (more than one megabyte (1Mb)). Before you begin, your node should be in SERVICE mode and under control of the Mnemonic Debugger as a result of the node hang or crash recovery procedures (Sections 2.4 and 2.5).

NOTE: You can perform this procedure only on nodes which have a CPU board boot PROM (the part of the CPU which stores the startup program) with a revision date marking of MD 83/02/26 or later. To find the revision date of your PROM, start this procedure and check the revision date that you display in Step 3. If your PROM does not meet the revision date you cannot perform a memory dump unless your node has a floppy drive. If this is the case, return to the procedure for hang or crash recovery.

You must also know the node ID of the node that will receive the dump file (the "dump storage" node). To display the node ID of the dump storage node, go to the node and enter this Shell command:

```
$ LCNODE -ME <RETURN>
```

The dump storage node must be running the NETMAN process, and must have enough "free space" on its Winchester disk to accept the dump file. Refer to Administering Your DOMAIN System or ask your system administrator for information about how to run NETMAN. You can use the Shell command LVOLES (List_Volume_Free_Space) to check the free space on the dump storage node.

Table 2-2 shows how much free space the dump storage node must have in order to accept a dump from nodes with various amounts of memory.

Table 2-2. Space Required for Network Memory Dumps

Problem Node Memory Size	Space Required on Dump Storage Node
1.0 Mb	1041 blocks
1.5 Mb	1553 blocks
2.0 Mb	2065 blocks
3.0 Mb	3089 blocks

If the hung or crashed node does not have a Winchester disk, you can use its partner node as the dump storage node as long as the partner has a floppy drive and adequate free space to accept the dump file.

Procedure

1. Enter the RE command to RESET the Mnemonic Debugger (MD):

```
> RE <RETURN>
> <RETURN>
```

The node displays the revision date of the CPU board's boot PROM. For example:

```
MD 83/02/06
```

2. Enter the node ID of the dump storage node as shown here:

```
> DI N nnnnnn <RETURN>
```

substituting the dump storage node ID for nnnnnn. If the hexadecimal node ID begins with a letter, you must add a zero (0) to the beginning of the node ID. For example, enter node ID "A01" as "0A01".

3. Enter this command to dump memory across the network:

```
> G 100C004 <RETURN>
```

4. The screen displays the name of the dump file in the following format:

```
DUMP FILE IS: pathname.date
```

The screen then displays a count of pages dumped:

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

where each "!" indicates that the node has dumped 32 pages from memory.

5. The memory dump is complete when the node displays this message:

```
DONE
```

6. Go to the node containing the dump file and write (copy) the file to a floppy disk, using the WBAK Shell command. (WBAK prompts you if the size of the dump file requires more than one disk.) Type the following to copy the dump file onto the floppy:

```
$ WBAK dump_file_pathname -F 1 -DEV F -L <RETURN>
```

7. As WBAK proceeds, the screen displays several messages. The following is a sample transcript:

```
Label:
  Volume ID:      300_1
  Owner ID:      (no owner specified)
  File number:   1
  File section:  1
  File ID:      (no ID specified)
  File written:  1985/01/31 11:25:47 EST
```

Starting write:

```
** Floppy swap: unit 0, volume "300_1"
   Please mount the next volume for writing.
   Press <return> to continue.
```

:

```
** The new volume id is "300_2".
```

```
(file) "dump.27fe.01.31" written.
```

Write complete.

8. When WBAK completes, remove the floppy disk from the floppy disk drive and set it aside for your service representative. You now need to copy another file from the problem node, the AEGIS.MAP file, onto a floppy for your service representative to review. Before you can copy the AEGIS.MAP file, reset the operating system on the problem node.
9. To restart the operating system, go to the problem node, put the NORMAL/SERVICE switch in the NORMAL position and press the RESET switch. The node runs a set of diagnostics. If the boot volume needs salvaging, the node automatically executes the SALVOL program, and displays this message "SALVAGING BOOT VOLUME". The node then boots the operating system.
10. Now, go to a node that contains a floppy disk drive and insert an initialized floppy disk into the floppy disk drive. You may use the same node that you used in Step 6, or you any other node in the network).

11. Set your working directory to //Problem_node/SAU2. If problem node is diskless, set your working directory to //Partner_node/SAU2. Type this command to copy the AEGIS.MAP file onto a floppy:

```
$ WBAK AEGIS.MAP -F 1 -DEV F -L <RETURN>
```

When WBAK completes, remove the floppy disk from the drive and label it "/SAU2/AEGIS.MAP, node_ID, date".

12. Contact your service representative for directions on where to send the floppies containing the memory dump and the AEGIS.MAP file. Refer to the DOMAIN System Command Reference manual for more information on the MTVOL, CPF, and DMTVOL commands.
13. Return to Step 8 of the node hang recovery procedure, or Step 5 of the crash recovery procedure.

APPENDIX A

PREVENTIVE MAINTENANCE

This appendix describes the preventive maintenance that you can perform to help keep your DN3xx node and disk option running smoothly. Ideally, you should perform this maintenance on a weekly basis.

DN3xx Nodes

Clean the dust from the display screen and the air intake at the bottom of the CPU card cage (Figure A-1) with a soft, lint-free cloth.

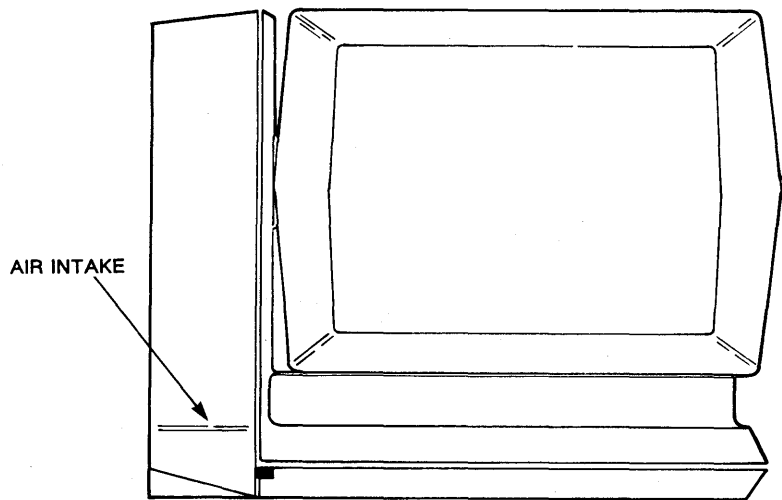


Figure A-1. Air Intake on DN3xx Nodes

Disk Storage Option

If you have a disk storage option with a floppy disk drive, you should clean the floppy drive read/write heads. To clean the floppy drive, you must obtain a commercial head-cleaning diskette such as the Scotch (TM) model 7400. Follow the manufacturer's instructions. Note that you must mount the head-cleaning diskette (using the MTVOL command) in order for it to clean effectively. Refer to Section 2.3 of this manual for more information on the MTVOL command.

APPENDIX B

IF YOU NEED HELP

APOLLO Computer has established the Customer Service Response Center to help you with problems and questions about your DOMAIN node. This center is staffed with persons trained to help correct your problem. To contact the Customer Service Response Center, use one of the following toll-free phone numbers:

800-2AP-OLLO (from the continental United States)

617-256-6600 ext. 4226, 4227, 4228, or 4229 (from international sites)

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Document Title: Operating The DN3xx
Part Number 005448, Revision 00

What is the best feature of this manual? _____

Please list any errors, omissions, or problem areas in the manual. (Identify errors by page, section, figure, or table number wherever possible.)

What type of user are you?

- Systems programmer; language _____
- Applications programmer; language _____
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How often do you use the DOMAIN system? _____

Nature of your work on the DOMAIN system: _____

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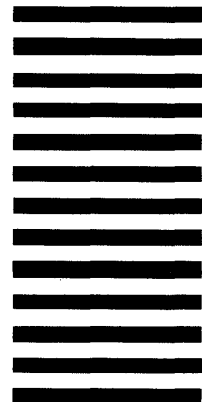


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