

Domain System Software Release Notes

Software Release 9.7
Order No. 005809-A00

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Preface

This document describes standard Domain System software for Software Release (SR) 9.7. It includes an overview of new and changed functionality, a summary of changes to documentation, a summary of bugs fixed since the last software release, and a list of known errors and limitations.

The normal software installation process places a version of these release notes in each node's /doc directory. Release notes for optional Domain software are installed in a similar manner. If you are upgrading from SR9.2-based systems to SR9.7, be sure to read *Making the Transition to SR9.5* (Order No. 009492) before installing new software.

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```
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```

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Chapter 1: An Overview of Software Release 9.7

Software Release 9.7 is a release of Domain system software that provides new features, provides support for new hardware, and fixes bugs in previous releases.

This chapter first provides compatibility information about SR9.7, and then briefly describes the major changes made to standard Domain system software since SR9.6, including:

- Support for New Hardware
- New or Changed Commands
- New Utilities and Diagnostics

This document does NOT describe changes made for previous software releases. If you are upgrading from SR9.2-based systems to SR9.7, be sure to read *Making the Transition to SR9.5* (Order No. 009492) before installing new software. Also note that SR9.6 release notes are online in the /doc directory.

1.1 Forward Compatibility with SR9.7

SR9.7 is required for compatibility with all future system software releases. You *must* install SR9.7 to ensure a smooth transition to the next generation of Apollo® system software. We fully expect it to be very easy for you to transition to SR9.7 from SR9.5 or SR9.6.

By installing SR9.7, you can make a gradual transition to future software releases, and SR9.7 nodes will be able to access files on the future software file system. Without updating to SR9.7, your SR9-based systems will not be able to access files on the systems that install the next major release.

Of course, if it's not critical that SR9 nodes access files on nodes running a future software release, or if your network is small enough that you can update all of your nodes relatively quickly, updating to SR9.7 is unnecessary.

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Note that if you are running pre-SR9.5 software and you are doing any software development, you must update to SR9.7 before installing future releases. This is because future software releases assume that you have made the transition to the new compiler technology that was introduced in SR9.5, and is supported in SR9.6 and SR9.7.

If you have further questions, please contact Customer Services.

1.2 Layered Product Versions that Run on SR9.7

In the table that follows, the layered product version numbers reflect the latest versions that work with the corresponding operating system, NOT the version that was shipped with that release. Note that products that will be available after SR9.7 are shown in parentheses. Later versions of optional products are also compatible, unless otherwise stated in those products' release notes.

The table is NOT intended to help you determine which layered products are available for purchase. For specific information about purchasing layered products, see your local Sales Representative.

Software Release 9.7

<i>Product</i>	<i>SR9.2</i>	<i>SR9.5</i>	<i>SR9.6</i>	<i>SR9.7</i>
ACCESS	1.2	2.0	2.0	2.0
A_ADD_ETH EtherController-AT	1.0	2.0	2.0	obsolete
Ada	N/A	1.0	1.0	1.0
ALIS	1.10L	1.10L	1.10L	1.10L
CC (C Compiler)	4.1605	4.88	4.88	4.88
CORE	9.2	9.5	9.5	9.5
CommonLisp	2.0	2.0	2.10	2.10
D3M	5.2	5.3	5.4	5.4
Domain/Dialogue	1.0	2.0	2.0	2.0
DPAK	1.0	2.1	2.1	2.1
DPCC	2.1 (3.0)	2.1 (3.0)	2.1 (3.0)	2.1 (3.0)
DPCC_Remote	1.1	1.1 (3.0)	1.1 (3.0)	1.1 (3.0)
DPCE	N/A	1.0	1.0	1.0
DPCI1	2.0 (3.0)	2.0 (3.0)	2.0 (3.0)	2.0 (3.0)
DPCI8	2.0	2.0	2.0	2.0
DPCI_RING	N/A	1.0	1.0	1.0
DSEE	2.2	3.0	3.0	3.0
DPSS/Mail	1.1	1.1	1.1	1.1
Domain/IX	9.2	9.5	9.5	9.5
Domain 4014	2.0	2.0	2.0	2.0
Domain_5080	2.0	2.0	2.0	2.0 (3.0)

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<i>Product</i>	<i>SR9.2</i>	<i>SR9.5</i>	<i>SR9.6</i>	<i>SR9.7</i>
ECMB	1.0	2.0	2.0	2.0
EtherBridge	1.3	1.4	1.4	1.4
FTN (Fortran)	8.76	9.66	9.66	9.66
3DGMR		2.5	2.5	2.5
GPIO	9.2	9.5	9.6	9.6.1
GSR	1.0	1.0	1.1	(2.0)
Interleaf	2.5.13	2.5.13	2.5.13	2.5.13
Laser 26	2.2	2.2	2.2	2.2
Domain_LU6.2	N/A	(1.0)	(1.0)	(1.0)
NCK (Network Computing Kernel)	N/A	1.0	1.0	1.0
NFS (Network File System)	N/A	1.0	1.0	1.0
NIDL (N.I. Definition Language)	N/A	1.0	1.0	1.0
Pascal	6.335	7.3808	7.3808	7.3808
PostScript	1.0	1.0	1.0	1.0
RJE	2.1	2.1	2.1	2.1
SNA 3270	1.1	2.0 1.0	2.0 1.0	2.0 2.0
SNA 3770	1.0	1.1	1.1	1.1
SPE Board driver	1.2	1.2	1.2	1.2
TCP/BSD4.2	2.2	3.0	3.0	3.0
TCP/IP	2.2	3.0	3.0	3.0
TEK 4692	1.01	1.01	1.01	1.01
Versatec	2.1	2.1	2.1	2.1
X.25	2.1	2.3	2.3	2.3

1.2.1 Disked DN5xx-T with Floating Point Accelerator Compatibility

With SR9.7, we provide a floating point compiler option (the `-cpu fpx` switch) that makes use of a memory mapped interface to the Floating Point Accelerator (FPX). Running in this manner on a DN5xx-T with ST506 86-megabyte or 190-megabyte disks has uncovered a latent hardware bug which can result in user data corruption.

Specifically, the CPU-FPX communications via the memory mapped interface coinciding with disk DMA activity which needs to invalidate specific entries in the cache, can hold the VMEbus in an incomplete bus acquisition cycle for up to 64 microseconds. The bus arbiter on the CPU will timeout in less than 64 microseconds, causing a re-arbitration to occur. If the disk had been granted the bus prior to the re-arbitration, and the ring comes along with a bus request, the re-arbitration will grant the bus to the ring. Thus, when the bus is finally released from the cache invalidation, both the ring and disk can clash on the bus, causing data corruption.

To avoid data corruption, we have created a trap in the Aegis software that prevents the possibility of bringing up systems with the corrupting problem. If you install SR9.7 software in the damaged configuration, you will be unable to boot the system. The Aegis operating system will give you a crash status of 1b0005 and issue the following message:

Unable to boot this software release with the current CPU board revision level. Running with an FPX without the required CPU board ECO can result in data corruption.

Please place a service call through the normal channels and request ECO # 14078 for your CPU PCB.

If you encounter this crash on your node, you can temporarily work around the problem, until Apollo Customer Service installs the ECO, by booting diskless from another node running SR9.7 or another release. There will be no danger of data corruption while booted diskless. DO NOT subsequently mount the local volume once you have booted the node diskless.

Once the ECO is installed, its installation can be checked by inspecting the hardware revision returned by `netstat -config`, which should have a value of "1.06". In this case, the number "1" to the left of the decimal point indicates that the ECO is installed.

1.2.2 FPX Microcode Compatibility

To run the new FPX microcode, you must either manually install the code using the Mnemonic Debugger (MD), or power the node off to get the code loaded into the FPX.

You can ensure that the FPX microcode is loaded automatically by powering down your node BEFORE booting (just running the install and shutting down the node will not load the new code). It is also possible to load the microcode manually by typing the following sequence of commands at the

Mnemonic Debugger (MD) prompt:

EXAMPLE 1: BOOTING OFF YOUR LOCAL NODE:

- 1) RE - reset
- 2) UA - microcode load
- 3) RE - reset, again
- 4) EX Aegis

EXAMPLE 2: BOOTING OFF A REMOTE NODE:

- 1) RE - reset
- 2) DI N NODE_ID
- 3) UA - microcode load
- 4) RE - reset, again
- 5) DI N NODE_ID
- 6) EX Aegis

1.3 Compilers

Other than the new floating point compiler option described in Subsection 1.2.1 (-cpu fpx switch), no new functionality has been added to the C, FORTRAN, or PASCAL compilers since SR9.6.

For information about the bugs that have been fixed, see the appropriate release notes for the compiler in which you're interested.

1.4 Support for New Hardware Features

SR9.7 provides support for several new hardware features, including:

- Support for the DN4000 Workstation
- Support for the DN590-T Workstations
- Support for 256-MB Virtual Address Space (DN3000)
- Support for IEEE/802.3 Network Controller-VME
- Support for VMEbus Devices in DN5xx-T Systems
- Support for the DN3000 15-Inch Monochrome Monitor
- Support for the Domain Dial Box

The following subsections describe these changes.

1.4.1 Support for the DN4000 and DN590-T Workstations

SR9.7 contains support for certain hardware that we previously supported in incremental releases. Specifically, SR9.6.1 provided support for the DN4000, and SFW-DN590 provided support for the DN590-T. By running SR9.7 in your network, you can support both of these new workstations (as well as all other workstations) with one general software release.

1.4.2 Support for 256-MB Virtual Address Space (DN3000)

The DN3000 product line will now support a 256-MB virtual address space, when used in combination with new PMMU hardware. Note, however, that a DN3000 with DMMU hardware will continue to support 64-MB virtual address space. Refer to the *Domain Series 3000/Series 4000 Hardware Architecture Handbook* (Order No. 007861, Rev 02) for more information.

1.4.3 Support for IEEE/802.3 Network Controller-VME (DN5xx-T ETHERNET Features)

At SR9.7, new functionality is added to the DN5xx-T family of workstations with the addition of an ETHERNET/IEEE 802.3 Network Controller. The Network Controller allows native access to this type of network. Chapter 3 indicates changes to the DN5xx-T documentation that describes this product.

NOTE: DN5xx-T workstations require ECO 14202 to the CPU if the ring board is removed from an existing configuration with an upgrade to Ethernet, or if it is an Ethernet only node. If either of these configurations attempts to boot SR9.7, a message indicates: "***Please request ECO #14202 for your CPU PCB***" followed by a halt. This will not impact existing DN5xx-T's with rings, or with Ethernets added to an existing ring.

1.4.4 Support for VMEbus Devices in DN5xx-T Systems

SR9.7 provides operating system support for VME controllers in the DN5xx-T series VMEbus. Users who have the optional GPIO software package now have the following address space available to write device drivers:

<i>Physical Addresses</i>	<i>Resource</i>	<i>Address/Data Lines</i>
3000000-300FFFF	VME I/O (CSRs)	32-Bit Addressing 32-Bit Data Path
3200000-3FFFFFFF	User VME	32-Bit Addressing 32-Bit Data Path

1.4.5 Support for the DN3000 15-Inch Monochrome Monitor

SR9.7 provides support for the DN3000 15-inch monochrome monitor. This new 15-inch monitor will be available shortly after SR9.7 ships, so we have included the information in these release notes.

The new 15-inch monitor is a low cost, 1024 x 800, 76-Hz monochrome display. The new monitor uses the following startup files:

```
/sys/node_data/startup.19l  
/sys/dm/startup_login.19l  
~user_data/startup_dm.19l
```

See Subsections 1.7.1 and 3.2.5 for information about new diagnostics and documentation changes.

1.4.6 Support for the Domain Dial Box

The dial box is an interactive graphics input device that allows the user to dynamically manipulate various display parameters with GPR and 2DGMR applications. GTCO Nomad and Apollo dial boxes are both supported. The dial box enhances the capabilities provided by a mouse or digitizing tablet. When used with customer applications and Apollo dial device utilities, the dial box provides precise zoom, pan, 3D-rotation, and other user-selectable graphics capabilities.

Dial Server

The dial server allows for dial device data to be integrated into the GPR input environment. This data is then available for GPR, 2DGMR, and Domain/Dialogue applications. For Domain/Dialogue dial box information see the "New Domain/Dialog Features" section in these release notes. For 2DGMR information see the 2DGMR online release notes in the `/doc/gmr2d.release_notes`.

The dial box server is a process that waits for data from dial boxes connected to SIO ports. It also waits for command requests from a mailbox.

The server passes dial box data to processes that have enabled input for dial boxes via GPR, GMR, or Dialogue functions.

Dial requests (commands) are used for initializing a dial box on an SIO port and closing/releasing an SIO port. These requests are passed to the server through the mailbox.

You may connect up to three dial boxes to a node. When multiple boxes are connected, they may be distinguished by the dial numbers that are assigned when the box is initialized.

Starting the Dial Server and Sending Requests

To start the dial server, execute the following Display Manager command:

```
cps /sys/dial_server -n dial_server
```


After the dial box process is started, you must initialize each dial box. Use the following shell command to initialize a dial box:

```
/com/dial_server_request [-Init port<p> ] [-First_dial <n> (optional)]
```

Possible port numbers are 1, 2, and 3 depending on the number of SIO ports on the node. First_dial is the number assigned to the first dial. The default first dial number is 1.

The dials on the GTCO box are numbered sequentially as follows.

```
first_dial      first_dial + 1    first_dial + 2
first_dial + 3  first_dial + 4    first_dial + 5
first_dial + 6  first_dial + 7    first_dial + 8
```

The dials on the Apollo Dial Box are numbered sequentially as follows:

```
first_dial      first_dial + 4
first_dial + 1  first_dial + 5
first_dial + 2  first_dial + 6
first_dial + 3  first_dial + 7
```

Dial numbers may range from 1 to 99, and you can assign the first dial of any dial box to any number in that range. When you initialize a dial box, include the first dial argument, or the first dial will be dial 1. This occurs with every box that you initialize. If you initialize three boxes without explicitly setting the first dial number, all the boxes will have the first dial as dial 1. In this case, you will not be able to distinguish input among the boxes.

If you use two dial boxes, the following shell commands initialize the first box on Port 1, with the knobs numbered from 1 to 9, and the second box initialized on Port 3 with the knobs numbered from 20 to 29. In this case, you can distinguish what box produced the input by the dial numbers:

```
/com/dial_server_request -init port1 -first_dial 1
/com/dial_server_request -init port3 -first_dial 20
```

Provided that your request is accepted, the following messages are displayed:

```
>>Server Response: ....Request Accepted: Initialize Port 1, First dial = 1..
>>Server Response: ....Request Accepted: Initialize Port 3, First dial = 20..
```

If the server is not running, the following error message is displayed:

```
***Could not open up mailbox channel***
```

Other errors, such as port contention/inaccessibility problems with the dial box, the cables, or the request itself, are indicated by one of the following error messages:

>>Server Response:Request Failed: Box not connected or dead box....

>>Server Response:Request Error: Port not available....

>>Server Response:Request Error: Could not open port....

Closing an SIO Port

To close an SIO port, use the following request:

```
/com/dial_server_request [-close port <p>]
```

For example, to close SIO Port 1, enter the following command:

```
/com/dial_server_request -close port1
```

Provided that your request is accepted, the following message is displayed:

>>Server Response:Request Accepted: Close Port 1....

Using Dial Boxes with GPR

To enable GPR to recognize dial events, use `gpr_$enable_input`. A new event type, `gpr_$dial`, has been added to the `gpr_$event_t` datatype for this purpose.

Use `gpr_$event_wait` or `gpr_$cond_event_wait` to wait for dial events. If the event was a dial event, `gpr_$inq_event_data`, a new GPR call, returns the dial number and the dial value. The dial number identifies the dial, and the dial value indicates the amount that the knob was turned.

Testing the Dial Box

The dial box verification procedures are included in the `/systest` directory. The tests include `dial_driver_test` and `dial_server_test`.

`Dial_driver_test` allows you to check dial box functionality without initializing the dial server. `Dial_server_test` allows you to test the box with the server initialized (use the initialization command described above). The tests return positive integers when a dial is turned to the right and negative integers when a dial is turned to the left. The tests also specify the dial being used. To run the tests, enter the `/systest` directory and type:

```
dial_server_test <RETURN>  
dial_driver_test <RETURN>
```

Dial Box Startup Scripts

All the SR9.7 startup scripts include a commented command to start up the dial server. Instructions in the file direct you to uncomment this command if you want the server to start automatically:

```
# To start up the dial server, uncomment the
# following command used in conjunction with
# the dial_server_request command.
#
# cps /sys/dial_server -n dial_server
```

In addition, you may want to add the following line or one similar to it, to initialize a dial box at login:

```
/com/dial_server_request -init port1 -first_dial 1
```

1.5 New Features for Domain/Dialogue

At SR9.7, Domain/Dialogue supports input from a dial (in addition to the mouse and keyboard). There is a new dialoglib routine called `dp_$gpr_get_event` that returns the last graphics event reported to a GPR task. The routine can be used to distinguish between dial and locator input. The routine is as follows:

```
PROCEDURE dp_$gpr_get_event (
  IN task_id: dp_$task_id ;           task that received input
  OUT event_type: gpr_$event_t;      type of input event that occurred
  OUT event_data: char;               type of data received
  OUT pos: gpr_$position_t;          x and y locator coordinates
  OUT status: status_$t ) ;EXTERN;    call status
```

You can always call `dp_$gpr_get_event` instead of `dp_$gpr_get_locator`, `dp_$gpr_get_button`, and `dp_$gpr_get_keystroke`. There are some new features to support input from dials.

`Dp_$gpr_enable_input` and `dp_$gpr_disable_input` have a new event type, called: `gpr_$dial`. Note that these are Graphics Primitive Routine (GPR) events. If input from a dial is enabled and input from a dial occurs, `dp_$event_wait` or `dp_$cond_event_wait` detects an event of type `dp_$gpr_locator`. Your application should then call `dp_$gpr_get_event` to determine if the event was a locator or dial event. To get data using `gpr_$inq_event_data`, refer to the "New Graphics Calls" section of these release notes.

Input from a dial is reported the same way as locator input. This means, for example, that if your GPR task includes the statement `LOCATOR => <CALL application_routine>`, then input from a dial will also cause the application routine to be called. It is not necessary (or possible) to have a statement of the type `DIAL => <CALL application_routine>`.

Please note the following limitations about using the new routine:

You can't enable dial input from the description file.

The value returned by `dp_$gpr_get_event` in the `event_data` parameter is only meaningful with `gpr_$keystroke` and `gpr_$buttons` events.

1.6 New PRF Command for Multinational Keyboards

PRF -- The print command includes a new option (**-FONT**) for Multinational keyboards. The **-FONT** option for PRF only works for PostScript printers (i.e., the Apple Laserwriter, the LP26, and other PostScript printers.) Note that this version of prf only works for the new version of prsvr. See the PRF HELP file for more information.

PRF (PRINT_FILE) -- Queue a file for printing.

usage:

PRF pathname...

- [-INTER] [-SEA {ON|OFF}]
- [-COP n]
- [-PR name]

New Option:

-FONT [A|B|C|D|E|G|H|I]

Supports one of the character sets specified in *Using the Domain Multinational Keyboard* (Order No. 010416). The value x can be a,b,c,d,e,g as outlined in the above manual. In addition, specify h to switch back to the standard character set (this is useful if you run prf in interactive mode). You can also add "font x" to your prf.db startup file. The default is h, the standard character set.

1.7 New or Changed Utilities and Diagnostics

This section references new diagnostics for various products. You can locate the information in the manuals indicated in the following paragraphs.

1.7.1 15-Inch Monochrome Diagnostic

The 15-Inch monochrome display for the DN3000 has a new diagnostic (DISP8D.DEX). This diagnostic tests the display controller (see *Update*

Package 1 to Servicing the Domain Series 3000/Series 4000 (Order No. 010429). The update package contains the new diagnostic information that will be included (at next revision) in *Servicing the Domain Series 3000/Series 4000* (Order No. 007859).

1.7.2 New DN4000 Diagnostics

Diagnostic test descriptions and SAU7 information are located on page D-11 (Appendix D of *Servicing the Domain Series 3000/Series 4000* (Order No. 007859, Rev 03).

1.7.3 New ETHERNET/IEEE 802.3 Network Controller Diagnostic

The DN5xx-T Workstation and DSP500-T Server now supports the ETHERNET/IEEE 802.3 Controller. A new diagnostic (ETHER.DEX) is available at SR9.7, and is located in the /SAU6 directory. As with all Apollo partner tests, ETHER.DEX may be used with any type of partner.

The ETHERNET diagnostic for SAU7 and SAU8 is no longer restricted on a "live" network. In addition, two new switches have been implemented. The switches make it possible to select a different byte pattern for filling a field in the packet if the standard one is in conflict with the user's packets (i.e. the user has special diagnostic packets to partner test with either controller). See the online help file for ETHER.DEX for more information.

1.7.4 CPU.DEX/MEM.DEX Enhancements

The CPU.DEX diagnostic was revised (Version 3.1) for SR9.7. It now check-sums the node ID when installed on the CPU.

The SAU7 and SAU8 DEX memory diagnostics, MEM.DEX (Version 3) have been enhanced to find memory errors more quickly and reliably. Particular emphasis was placed on detecting and reporting memory parity errors by adding several new tests.

Following is a list of the tests, and their function:

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Test#	Test Name	Function
99	Data RAM Stuck-At Faults Test (new)	Tests for data RAM bits stuck at 'One' or stuck at 'Zero' using the MATS+ algorithm.
100	Data RAM Data Pattern Test	Tests for bad data RAM bits using a series of test patterns (5555, AAAA, 0000 etc.).
109	Data RAM Coupling Faults Test (new)	Tests for data RAM coupling between adjacent bits, and stuck at 'one' or stuck at 'zero' bits, (Suk and Reddy Test B algorithm).
110	Data RAM Address as Data Test	Tests data RAM address logic by storing the address of each location in that location.
120	Data RAM Marching Ones and Zeros Test	Tests data RAM for errors by marching 'ones' through a field of 'zeroes', and 'zeroes' through a field of 'ones'.
130	Data RAM Intensive Memory Test	Tests data RAM for data errors by checking every 2nd/4th/8th/16th etc. location.
140	Parity Checker Test	Tests the parity generation/checking logic
141	Parity RAM Stuck-At Faults Test (new)	Tests for parity RAM bits stuck at 'one' or stuck at 'zero' using the MATS+ algorithm.
142	Parity RAM Coupling Faults Test (new)	Tests for parity RAM coupling betw adj bits.
150	Refresh Test	Tests the memory refresh logic.

A known shortcoming occurs when you abort (via escape) tests 140, 141, 142 (parity may still be enabled). Reset the system to assure proper operation of DEX and any diagnostics. As in all diagnostics, when you get an error, a reset is suggested. However, if the tests pass, no reset is needed.

Note:

MEM.DEX does not automatically relocate to high memory in order to test low memory. Therefore, in order to fully test the memory board in Slot 0, use the following procedure:

- Run MEM.DEX with DEX in low memory (the default).
- Relocate DEX to high memory via the command "reloc -hi", and rerun MEM.DEX, restricting the test range to the first board.
- Relocate DEX to low memory via the command "reloc -lo".

This relocation process is also explained in the help file for MEM.DEX.

1.7.5 New PREPVOL Utility

SR9.7 includes a new utility called PREPVOL. We recommend running this

utility BEFORE you install SR9.7. For a description of the purpose of PREPVOL, see Section 4.4 of these release notes. For instructions on running PREPVOL, see Section 2.1.

1.8 New Graphics Calls

The following eight new GPR calls are available with SR9.7:

- `gpr_$inq_background`
- `gpr_$inq_blank_timeout`
- `gpr_$inq_event_data`
- `gpr_$inq_foreground`
- `gpr_$inq_plane_mask_32`
- `gpr_$set_blank_timeout`
- `gpr_$set_raster_op_mask`
- `gpr_$make_bitmap_from_array`

The datatypes used with these calls are existing datatypes described in *Domain Graphics Primitives Resource Call Reference* (Order No. 007194) or *Programming with General System Calls* (Order No. 005506). Any new datatypes are simple extensions of existing datatypes. For example, the `gpr_$mask_32_t` datatype is a set with 32 elements. C and FORTRAN programmers should use 4-byte integers rather than 2-byte integers to store the elements of this set:

- **Gpr_\$inq_background** is a function that returns the background color of the window open to the current process. The background color is returned in `gpr_$pixel_value_t` format. This is a 4-byte integer. This function can be used in only direct and frame modes. It returns the following error if it is used in borrow mode: **no such rectangle property key (graphics/rectangle manager)**.
- **Gpr_\$inq_blank_timeout** returns the time period that the display manager waits before it shuts off the screen following the last input event. This routine is similar to the shell command SCRTO. The time period is returned in the timeout parameter. The data type for this parameter is listed in `/sys/ins/base.ins.pas`. This data type is described in detail in *Programming with General System Calls* (Order No. 005506).
- **Gpr_\$inq_foreground** is a function that returns the foreground color of the window open to the current process. The foreground color is returned in `gpr_$pixel_value_t` format. This is a 4-byte integer. This function can be used in only direct and frame modes. It returns the following error if it is used borrow mode: **no such rectangle property key (graphics/rectangle manager)**.
- **Gpr_\$inq_plane_mask_32** returns the plane mask for the current bitmap. Mask, in `gpr_$mask_32_t` format, is the current mask. This is a set with

up to 32 elements. Use `gsr_$set_plane_mask_32` to set a plane mask.

- **Gpr_\$set_blank_timeout** establishes the time period that the system waits before it shuts off the screen. The time period is measured from the last input event. This routine is similar to the shell command `SCRTO [n]`. Set the time period with the `timeout` parameter. The data type for this parameter is `time_$clock_t`, which is listed in `/sys/ins/base.ins.pas`. This data type is described in detail in *Programming with General System Calls*.
- **Gpr_\$set_raster_op_mask** provides a way to set raster operations on several planes with just one call. `Pl_mask`, in `gpr_$mask_32_t` format, establishes the plane mask. This is a set with up to 32 elements. `Op`, in `gpr_$raster_op_t` format, establishes the raster operation. This is a 2-byte integer. The raster operations established with this call affect only the primitives currently specified with `gpr_$raster_op_prim_set`.
- **Gpr_\$inq_event_data** returns the time that an event occurred, and, if the event is a dial event, the dial number and the dial value. The dial number and dial value are returned in `gpr_$event_data_t` format. The two input parameters are `event_type` and `length`. `Event_type` is the type of event in `gpr_$event_t` format.

`Length` is the size in bytes of `event_data` parameter. The output parameters are `event_data`, `length_ret`, `time_stamp` and `sts`. `Event_data` is the data structure (variant record) used to return the event data. FORTRAN programmers may implement this datatype by declaring a two element array of 4-byte integers. The first element is the dial number, and the second element is the dial value.

`Length_ret` is the number of bytes returned by the call. `Time_stamp` is the time that the event occurred in `time_$clock_t` format. This data type is described in detail in *Programming with General System Calls (Order No. 005506)*. `Sts` is the status parameter.

- **Gpr_\$make_bitmap_from_array** provides a way to generate a bitmap from an array. The bitmap is stored in main memory in external bitmap file format. This feature enables BLT operations to be performed with the new bitmap, which is advantageous if read/write pixel operations done with arrays is limiting.

To deallocate this type of bitmap, use `GPR_$DEALLOCATE_BITMAP`. Since this type of bitmap resides in main memory, it would also be deallocated upon calling `gpr_$terminate`.

```
{ GPR_$MAKE_BITMAP_FROM_ARRAY is used to create a bitmap
descriptor pointing
to a given memory address (containing the image data). }
```



```

PROCEDURE gpr_$make_bitmap_from_array (
    IN   size      : gpr_$offset_t;      { X,Y size of bitmap }
    IN   attribs   : gpr_$attribute_desc_t; { Attributes bitmap is to have }
    IN   groups    : integer;           { Number of groups }
    IN OUT g_headers : gpr_$bmf_group_header_array_t;
                                           { Group headers }
    OUT  bitmap     : gpr_$bitmap_desc_t; { Returned bitmap descriptor }
    OUT  status     : status_$t          { Returned status }
); EXTERN;

```

1.9 2D Graphics Metafile Resource Changes

Changes to the 2DGMR product appear in a separate release document in */doc/gmr2d.release_notes*. This document is available online (we do not ship a hard-copy version of the document).

1.10 New Network Computing Support

New operating system functionality supported at SR9.7 includes the Network Computing Kernel (NCK) and Concurrent Programming Support (CPS). These products are now part of standard software.

The Network Computing Kernel is a component of the Network Computing System (NCS), a set of tools for heterogeneous distributed computing. Applications can use NCS to distribute both data and program execution among different types of processors and across one or more heterogeneous networks. NCS tools run on Domain workstations and are designed to be portable to other processors.

NCK provides the runtime support for distributed computing. In addition to NCK, the Network Computing System includes the Network Interface Definition Language (NIDL) and compiler, used to develop distributed applications. Unlike NCK, NIDL is an optional product and is therefore not included with SR9.7. Concurrent Programming Support (CPS) is support for multi-tasking in a single process.

For more information regarding these products, refer to the *Network Computing System Reference* manual, (Order No. 010200-A00) and the *Concurrent Programming Support Reference* manual, (Order No. 010233-A00).

Chapter 2: Installing Software Release 9.7

Installing Domain Software (Order No. 008860) provides detailed instructions for installing standard system software on Domain workstations and servers. This chapter describes changes to the installation process since Revision 02 of *Installing Domain Software*. It also contains a list of media on which this release is distributed.

2.1 Changes to the Installation Procedure

There have been four major changes to the installation procedure since SR9.6. They are

- New PREPVOL utility
- Change to the description of machine types
- Change to the description of supplemental software
- New floppy disk names

2.1.1 The PREPVOL Utility

SR9.7 includes a utility called PREPVOL. For a description of the purpose of this utility, see Section 4.4. If you run a standard installation without changing any ACLs, and reboot your system, the SR9.7 Aegis will correct the problem addressed by PREPVOL. Running the SR9.7 INVOL program will also correct the problem. However, we recommend running this utility as a precaution BEFORE you install SR9.7.

2.1.2 Running PREPVOL on Targets With Tape or Floppy Drives

If the target node to which you are installing SR9.7 is attached to a cartridge tape or floppy disk drive, you should run the PREPVOL utility before beginning the installation. To do so, shut down the target node.

Command: **shut**

You should be at the Mnemonic Debugger level on the target node, as PREPVOL must be run in that mode.

If you are installing from cartridge tape, insert `crtg_std_sfw_vol1` into your tape drive and type:

```
>RE  
> <RETURN>  
MD MM/DD/YY  
> DI C  
> EX PREPVOL
```

If you are installing from floppy disks, insert the floppy `fp_sauN_1` into your disk drive, where `sauN` refers to the `/sauN` directory on which the target node runs. Then type:

```
>RE  
> <RETURN>  
MD MM/DD/YY  
> DI F  
> EX PREPVOL
```

The PREPVOL program prompts you for the same kind of information as the INVOL program. For an explanation of the prompts, see the description of the INVOL program in Appendix B of *Installing Domain Software*.

After you have run PREPVOL, reboot the target. Type:

```
> EX AEGIS
```

Now run the installation procedure according to *Installing Domain Software*.

2.1.3 Running PREPVOL on Targets Without Tape or Floppy Drives

If the target node has neither a cartridge tape nor a floppy disk drive, you can choose from two possible courses of action. You may want to run the installation procedure before running PREPVOL, as long as you **DO NOT RUN THE ACL OPTION TO THE INSTALL**. On the other hand, you have the option of loading the PREPVOL utility to a node which does have such a drive, booting the target node diskless from the other node, and then running PREPVOL on the target. The second method will be more efficient if you want to run an ACL installation without having to invoke the install procedure twice. Otherwise, we recommend the first method.

For the first method, where you choose not to boot diskless off another node, simply run the installation **WITHOUT SELECTING THE ACL OPTION** to the install procedure. When the installation prompts you for the ACL template you wish to use, choose **DEFAULT**.

After SR9.7 software has been installed, shut down the target node, then reset and reboot the system from its own disk. After you have rebooted the target node using SR9.7 software, you may then run the install again with the ACL option.

For the second method, you need a node with a tape or floppy drive. It must be running the servers `spm`, `netman`, and `mbx_helper`, and in addition, it must contain a `/sauN` directory that matches the `/sauN` directory required to run the target node.

If you're using a floppy disk drive, insert the floppy flp_sauN_1 in the nontarget node's drive, where /sauN is the right /sau directory for the target type, and where the nontarget node has a /sauN directory. From the nontarget node, type:

```
$ mtvol f 1 /flp
$ cpf /flp/sauN/prepvol //non-target/node/sauN/prepvol -l -f
```

If you're using a cartridge tape drive or magnetic tape drive, insert crtg_std_sfw_vol2 or mt_std_sfw_vol2 respectively into the nontarget's node's drive for target nodes running on a /sau7 or /sau8 directory. Otherwise, (for target nodes running on /sau1 through /sau6), insert crtg_std_sfw_vol1 or mt_std_sfw_vol1 respectively. Select from the following table the file number associated with the target node's /sau directory.

Sau	Tape	File #
sau1	1	9
sau2	1	10
sau3	1	11
sau4	1	12
sau5	1	13
sau6	1	14
sau7	2	15
sau8	2	16

If the non-target node you're using has a cartridge tape drive, type:

```
$ wd /
$ rbak -dev ct -f File# sauN/prepvol -as sauN/prepvol -l -ms -force -du
```

If the non-target node you're using has a magnetic tape drive, type:

```
$ wd /
$ rbak -dev mt -f File# sauN/prepvol -as sauN/prepvol -l -ms -force -du
```

Now, shut down the target node and boot diskless from the server node. Then run PREPVOL, answering the prompts as described in Section 2.1.2. After running PREPVOL, reset the target node and reboot it from its own disk. In the following command, <node_id> is the hexadecimal ID number of the node from which the target node boots diskless.

Command: **shut**

(shutdown messages)

```
>RE
> <RETURN>
MD MM/DD/YY
> DI N <node_id>
> EX PREPVOL
> RE
> <RETURN>
MD MM/DD/YY
> EX AEGIS
```

When the DM login message appears, log in and run the installation procedure as described in *Installing Domain Software*.

If you don't load and run PREPVOL before running the installation, you may not be able to complete the install procedure. If the procedure determines that installing SR9.7 before running PREPVOL might be dangerous to the data on the target node, it will send a warning message and return control to the shell level. If that happens, you must shut down the target and follow the appropriate set of instructions above to load and run PREPVOL. Then, reboot your node, log in at the DM prompt, and rerun the installation.

The warning message reads:

```
The ACL installation cannot continue until the PREPVOL utility has
been run on the target node. Please load and run PREPVOL according
to the instructions in Chapter 2 of the SR9.7 Release Notes. The
release notes can be read online in /doc/sr9.7.release_notes under
the SR9.7 source area.
```

2.1.4 Machine Types

The SR9.7 installation procedure specifies machine types in a different form from the one used at SR9.6. As before, the install script asks you to choose the machine types for which you wish to install machine software. However, previously the choices were defined using the name of one of the machine types associated with a given /sau directory. We have clarified the intent of this step by asking you to choose directly the names of the /sau directories you wish to install.

At the same time, the prompt defines the model numbers of the machines associated with each /sau directory. A /sau7 directory has been added for the new DN4000 and DSP4000 workstations. The script will indicate the /sauN directories currently present on the target with an asterisk; a /sauN directory that is required in order to run the target node will be indicated by two asterisks. For example, if you are installing software to a DN300 node that

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currently contains both /sau2 and /sau5 directories, the new prompt would be:

Enter the software choice(s) corresponding to the machine type(s) for which you wish to install machine software.

```
SAU1 -- DN100, DN400, DN420, DN600 nodes
** SAU2 -- DN300, DN320, DN330 nodes
SAU3 -- DSP80, DSP80A, DSP90 nodes
SAU4 -- DSP160, DN460, DN660 nodes
* SAU5 -- DN550, DN560, DN570, DN580, nodes
SAU6 -- DN570-T, DN580-T, DN590-T, DSP500-T nodes
SAU7 -- DN4000, DSP4000 nodes
SAU8 -- DN3000, DSP3000 nodes
ALL -- All of the above.
NONE -- None of the above.
QUIT -- Exit from the installation.
```

2.1.5 Supplemental Software

We have changed the list of supplemental software in the installation to better reflect the differing needs of our customers and to provide a method for more efficient use of disk space. The new list includes diagnostic software for the new DN4000 workstation. As with the list of machine types, an asterisk indicates supplemental software currently present on the target. On a machine whose disk currently contains HELP, EXAMPLES, and INCLUDE files, the new prompt would be as follows:

The supplementary software available is

```
SAU4_DIAG -DSP160/DN460/DN660 diags          2,200 blocks
SAU6_DIAG -DN570-T/DN580-T/DN590-T diags     1,845 blocks
SAU7_DIAG -DN4000 diags                       1,000 blocks
SAU8_DIAG -DN3000 diags                       1,071 blocks
* EX      -Domain Examples                    700 blocks
* HELP    -System Help Directory              1,600 blocks
* INCLUDE -System Include Files               1,000 blocks
SYSTEST   -Systest Directory                  3,700 blocks
FONTS     -Supplemental Fonts                 613 blocks
INSTALL   -Local copy of install directory   1,000 blocks
ALL       -All of the above
NONE     -None of the above
QUIT     -Exit from the installation
```

2.2 Media Types

We distribute SR9.7 on magtapes, 1/4-inch streaming cartridge tapes, 5-1/4-inch floppy disks, or 8-inch floppy disks as indicated in the following subsections.

2.2.1 Magtapes

Magtape distributions of SR9.7 consist of the following two tapes:

MT_STD_SFW_VOL1 SR9.7
 MT_STD_SFW_VOL2 SR9.7

2.2.2 Streaming Cartridge Tapes

Streaming cartridge tape distributions of SR9.7 consist of the following tapes:

CRTG_STD_SFW_VOL1 SR9.7
 CRTG_STD_SFW_VOL2 SR9.7

2.2.3 Floppy Disks

Floppy disk names have changed since SR9.6. The table that follows indicates the new names for the SR9.7 distribution of floppy disks. Please note that these changes affect the information about initializing a disk in Chapter 4 of *Installing Domain Software*, (008860).

<i>Old Name</i>	<i>New Name</i>
load_a.300	load_sau2
load_a.3000	load_sau8
load_a.400	load_sau1
load_a.4000	load_sau7
load_a.460	load_sau4
load_a.550	load_sau5
load_a.570	load_sau6
load_a.80	load_sau3
load_b	load_base
load_c	load_install
load_d	load_doc_bs
load_sau.460	load_sau4_1
flp_b	flp_base
flp_c	flp_install
flp_d	flp_doc_bs
flp_a_dn400	flpa_sau1
flp_a_dn300	flpa_sau2
flp_a_dn3000	flpa_sau8
flp_a_dn4000	flpa_sau7
flp_a_dn460/dsp160	flpa_sau4

2.3 802.3 Network Controller-AT Installation

DN3000 workstations that contain the 802.3 Network Controller-AT REQUIRE SR9.6 or later software, which contains the controller driver. In addition, DN3000 workstations WITHOUT the Apollo Token Ring Network Controller-AT will NOT boot from disk if SR9.2.6 or an earlier release is installed on the disk.

802.3 Network Controller-AT customers must check the software release on the disk and update to at least SR9.6.

To install a DN3000 that does NOT contain an Apollo Token Ring Network Controller-AT and to ensure that it has the correct software release, use the instructions that follow:

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1. Select a DN3000 that contains a disk. Install the 802.3 Network Controller-AT and other hardware, then connect the node to the IEEE 802.3 network according to the instructions in *Unpacking and Installing Your DN3000/DN4000 Personal Workstation and the DSP3000/4000 Server* (Order No. 007857).
2. Switch the node to SERVICE mode and power it on. When you receive the MD prompt, type:

> EX AEGIS

Examine the operating system banner that appears on the display and note the SR number. If the disk contains SR9.7, type GO, switch back to NORMAL mode, and continue with the installation instructions in the manual.

If the disk contains an earlier release, type SHUT, then go on to Step 3 to load SR9.7 on the disk.

3. Initialize the disk from SR9.7 cartridge tape as described in Chapter 4 of *Installing DOMAIN Software* (Order Number 008860).
4. Return to the instructions in *Unpacking and Installing manual to boot the node, run diagnostics, and complete the installation.*

You may now use the node as the partner node in the next step.

5. *To install software on other DN3000s without ring controllers, you can use one of the following methods:*

A. Initialize the disks using floppies or cartridge tapes, as described in Steps 2 through 4.

*B. Initialize the disks from the network using the partner node you created in Steps 1 through 4, as described in Chapter 4 of *Installing Domain Software.**

NOTE: If you have a DN3000 workstation with a disk that will contain both an 802.3 Network Controller-AT and an Apollo Token Ring Network Controller-AT (to serve as a routing node), you can install SR9.7 software as indicated in this chapter.

Chapter 3: Documentation

This chapter lists the documents that have changed at SR9.7. It also includes additions and corrections to documentation.

We provide an on-line list of our user manuals and their part numbers and revision numbers. We update this list at each operating system release. To use this list, request help for manuals. Type:

help manuals

Consult this list if you want to determine whether you have the most up-to-date revision of a manual, or if you want to see other manuals that are available.

3.1 List of Revised Documentation

This section lists changes and additions to documentation for standard system software, and for the new hardware products available for the first time at this release. For a complete list of all technical publications relating to Domain System products, refer to the *Technical Publications Overview* (002685).

The following manuals have been revised or updated for SR9.7:

Domain Series 3000/Series 4000 Hardware Architecture Handbook
(Order No. 007861)

Domain Graphics Instruction Set
(Order No. 009791)

Programming with Domain Graphics Service Routines
(Order No. 009797)

Domain Graphics Service Routines Release Document
(Order No. 010316)

*Unpacking and Installing the DN5xx-T Workstations
and the DSP500-T Server*
(Order No. 009493)

*Update Package 1 to Servicing the DN5xx-T Workstations
and the DSP500-T Server*
(Order No. 011261)

Installing the Graphics Controllers in the AT-Compatible Bus
(Order No. 010409)

Update 1 to Servicing the Domain Series 3000/Series 4000
(Order No. 010429)

The parent manual is *Servicing the Domain Series 3000/Series 4000* Order No. 007859, Revision 03). This update adds the new monitor and controller FRU part numbers. New illustrations are included showing operational controls and switches. The display controller and the stand-alone diagnostics sections are expanded to include the new controller and its parameters.

Update 1 to Servicing Domain Monitors
Order No. 011259)

The parent manual is *Servicing Domain Monitors* (Order 009349, Revision 01). This update provides a new monitor/node configuration chart in Chapter 1. Chapter 7 is an addition to fully describe the 15-inch monochrome monitor. Information on switches, controls, fuse location, and fault determination are provided.

Update 1 to Domain Hardware Site Planning Specifications
Order No. 011189)

The parent manual is *Domain Hardware Site Planning Specifications* Order No. 009859). This update includes a new specification sheet for the 15-inch monochrome monitor and a monitor/workstation configuration table.

3.2 Changes to Documentation

The following subsections contain additions and/or corrections to documentation that we are not reissuing at this release.

3.2.1 Changes and Additions to DN5xx-T Documentation

Please note that the DN5xx-T documentation now describes the ETHERNET/IEEE 802.3 Network Controller-VME as indicated in the following paragraphs.

Additions to Operating the DN5xx-T Workstations and the DSP500-T Server (009494) (These additions contain new information for the ETHERNET/IEEE 802.3 Controller).

Page 1-1

Your Domain system is a high-performance node designed for both the IEEE/802.3 network and the Domain local area network, and used for many scientific and engineering applications, including MCAD/CAE, molecular modeling, and simulation.

Page 2-12

LED Error Codes - Hex Code 08 failing device should read Network Controller.

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When booting over the network, the Mnemonic Debugger command **DI** is used in the following ways:

DI N to use the system's default network and the node's network partner

DI N <nnnn> to use the system's default network and the specified nonpartner

DI E <nnnn> to use an IEEE 802.3 network

DI R <nnnn> to use an Apollo Token Ring network

The default network priority is as follows:

- o The Apollo Token Ring network
- o The 802.3 network unit 0
- o The 802.3 network unit 1

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When dumping memory over the network, the Mnemonic Debugger command **DI** is used in the following ways:

DI N <nnnn> to use the system's default network

DI E <nnnn> to use an IEEE 802.3 network

DI R <nnnn > to use an Apollo Token Ring network

Additions to the DN5xx-T Workstation and DSP500-T Server Technical Reference (009491) (These additions contain new information for the ETHERNET/IEEE 802.3 Controller):

Add to Chapter 1:

Section 1.2.6 802.3 Network Controller-VME

The 802.3 network controller manages the system's interface to the IEEE standard 802.3 network. This VME-based, intelligent IEEE 802.3 compatible communications controller:

- o Supports connection of a DN5xx-T or DSP500-T to an IEEE 802.3 network
- o Supports industry standard transport media and transmission protocols
- o Communicates with ETHERNET Version 1, Version 2, and IEEE 802.3 compatible controllers
- o Provides connection to standard ETHERNET/IEEE 802.3 cabling through a transceiver/transceiver cable via a 15-pin connector at the rear panel.
- o Provides thin ETHERNET cable support by using transceiver model number ETH-XCVR-03DIAG, available through the *Domain Systems User Catalogue*.

Additions to the DN5xx-T Workstation and DSP500-T Server Hardware Architecture (009490-00) (These additions contain new information for the ETHERNET/IEEE 802.3 Controller):

Add to Chapter 7:

Add to 7.1 Introduction

Our network-independent architecture allows the DN5xx-T/DSP500-T systems to communicate over more than one type of Local Area Network (LAN). Currently, we support two LANs: the Apollo Token Ring, and the ETHERNET/IEEE 802.3 network.

In an Apollo Token Ring network, communications cable connects workstations or servers (nodes) in a circle (the ring). A special bit pattern (the token) circulates around the ring, passing through each node.

In an ETHERNET/IEEE 802.3 network, communications cable connects nodes in a linear bus-type topology. No token exists to control access to the ETHERNET/IEEE 802.3 network. Instead, nodes on the ETHERNET/IEEE 802.3 network use a contention-based scheme (called CSMA/CD, for Carrier Sense Multiple Access with Collision Detection) to communicate with one another.

Add Section 7.6 ETHERNET/IEEE 802.3 Network Protocols

ETHERNET/IEEE 802.3 network hardware "listens" to detect the presence (or absence) of a message (packet) in the network. To transmit, a node must

establish that the network is available; i.e., that no other node has already begun transmitting a packet. If another node has begun transmitting, the "listener" node must wait until the network traffic clears.

Two nodes can listen, determine that the network is available, and begin transmitting at exactly the same time. Such contention creates collisions. During collisions, each node stops transmitting, and pauses for a random amount of time before retrying. When successive collisions occur, the wait between transmit retries grows progressively longer.

ETHERNET/IEEE 802.3 network packets always begin with a 14-byte header that contains a 6-byte destination address field, a 6-byte source address field, and a 2-byte, type/length field. To identify our network, the destination and source addresses include an Apollo-specific prefix followed by a node ID (08001E <node id> hex). The Apollo Domain network also uses a multicast address with the value 09 001E 000000 hex. Likewise, the type/length fields contain an Apollo-specific value (8019 hex). Packets from other networks will contain other values within these fields. When communicating to foreign systems using other protocols (non-Domain), such as TCP/IP, the destination address field contains any legal address, and the type/length fields will contain protocol specific values.

For more detailed information about ETHERNET/IEEE 802.3 network protocols, refer to the "IEEE Standards for Local Area Networks - Carrier Sense Multiple Access with Collision Detection (CSMA/CD) - Access Method and Physical Layer Specification."

3.2.2 Changes and Additions to Planning Domain Networks and Internets (009916)

Please note the the following changes and/or additions to *Planning Domain Networks and Internets*. This information documents the impact of the Domain Series 4000 and the 802.3 Network Controller-VME on the information in the current manual.

General Changes and Information:

In illustrations throughout the manual, the systems available on the IEEE 802.3 network now include the DN4000, DSP4000, DSP500-T, DN570-T, DN580-T, and DN590-T, as well as the DN3000 and DSP3000.

The 802.3 Network Controller-VME supports the standard IEEE 802.3 network cable (thick cable), and also supports the IEEE 802.3 Thin cable (Thinnet) using the ETH-XCVR-03DIAG transceiver, available through the Domain Systems User Catalog.

The 802.3 Network Controller-VME can support simultaneous TCP/IP and Domain routing as does the 802.3 Network Controller-AT (for the Domain Series 3000 and Series 4000).

Specific Changes:

Chapter 1, page 11 -

We now offer the IEEE 802.3 networking option for Domain Series 3000, Domain Series 4000, and DN5xx-T (with VME chassis) systems. These systems connect to the IEEE 802.3 network through a network controller and network attachment devices that meet the IEEE 802.3 specifications for physical signaling.

Chapter 6, page 10, bulleted list -

The second bulleted item should read "A DSP3000 equipped with an Apollo Token Ring Controller and an EtherController-AT (Routing Node B)". In Figure 6-5, Routing Node B should appear as a DSP3000, not a DSP90.

Chapter 6, page 10, last paragraph-

A single Domain Series 3000 or Domain Series 4000 routing node can contain up to four network controllers (two Apollo Token Ring Network Controllers-AT and two 802.3 Network Controllers-AT). A single DN5xx-T routing node, when equipped with a VME chassis, can contain up to two 802.3 Network Controllers-VME and one Apollo Token Ring network controller.

3.2.3 Changes and Additions to Managing the Domain Environment in an Internet (005694)

Please note that the following information supports the IEEE/802.3 Network Controller-VME.

A DN5xx-T/DSP500-T can use the IEEE/802.3 Network Controller-VME to boot directly on the IEEE/802.3 network. If you run Domain internet routing service on the DN5xx-T/DSP500-T, the IEEE/802.3 Network Controller-VME can be the principal or alternate network device. The following table shows the possible network configurations for the DN5xx-T/DSP500-T.

<i>When the node contains:</i>	<i>The network is:</i>
Ring only	Principal
IEEE/802.3 only	Principal
Ring and IEEE/802.3 (1 or 2)	Principal Alternate
IEEE/802.3 (2)	Principal Alternate

When you issue the /com/rtsvc and /com/rtstat commands, use the name eth802.3_vme to indicate the IEEE/802.3 Network Controller-VME.

If both TCP/IP and Domain internet routing service share the same eth802.3_vme device, then /com/rtsvc -off and /com/netsvc -none have no effect on TCP/IP service. That is, you can use these commands to turn off

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Domain internet routing service while allowing TCP/IP service to continue.

The `/com/rtstat` command reports the following statistics for the device `eth802.3_vme`:

Adapter err	Adapter error: This controller behaved in a way that was not expected by its software driver. Rising adapter error counts can indicate a problem with controller firmware.
Bad interrupt	Bad interrupt: This controller behaved in a way that was not expected by the operating system. Rising counts can indicate a fault in the controller.
CRC errors	Cyclic Redundancy Check (CRC) errors: A CRC error occurs when the controller receives a frame with corrupted bits. CRC errors indicate problems in network hardware anywhere in the network.
Excess coll	Frames aborted due to excess collisions: Shows the number of transmit frames that were aborted because a maximum of 16 collisions were encountered.
Frames xmit	Frames transmitted without error: Shows the number of frames transmitted without error (with or without retries) by this controller. The count includes Domain and non-Domain traffic such as TCP/IP. The value of frames xmit differs from counters that show only Domain traffic.
Frames rcv	Frames received without error: Shows the number of frames received without error by this controller. The count includes Domain and non-Domain traffic such as TCP/IP. The value of frame rcvs differs from counters that show only Domain traffic.
Frames lost	Frames lost: Shows the number of frames that would normally have been received, but were lost because no controller receive buffers were available.
Full socket	Full socket: The operating system could not accept an arriving packet. Full-socket errors usually indicate that the node is heavily used.
Misalignments	Misalignments: Indicates bits were added to or dropped from the bit stream rec'd by this controller. Most likely the sender added or dropped bits.
SQE test err	SQE TEST errors: Shows the number of those transmitted frames that encountered heartbeat absence errors in the transceiver.
Xmit errors	Transmit error: The controller detected that a transmit operation failed. Errors usually result from excessive network collisions.

The following information is about Domain internet configurations that use EtherBridge software.

Appendix C, page C-1. The paragraph which begins, "Typically, nodes with MULTIBUS...." is incorrect. At SR9.6 and later, Domain internet routers that use MULTIBUS and EtherBridge software (SFW-EBR) cannot communicate

with, or route packets to Domain nodes that reside natively on IEEE/802.3 networks.

Appendix C, Section C.2, page C-2 Step 1. does not work.

3.2.4 Changes to TCP/IP Documentation

Please note the following changes and/or additions to TCP/IP product definitions.

Planning for TCP/IP (010483)

Support for TCP/IP gateway hardware is no longer supplied with the TCP/IP software. Since TCP/IP Version 3.0, controller driver software is shipped as follows:

EtherController-AT driver is shipped with controller. See the Release Document (009742) for information about installing the software. See also, the 802.3 Network Controller information that follows.

EtherController-MB driver is shipped with the controller. See the Release Document (009743) for information about installing the software.

- 802.3 Network Controller-AT driver is included in SR9.6.
- 802.3 Network Controller-VME driver is included in SR9.7.
- Drivers for all Apollo Token Ring Network controllers are part of standard software.

Configuring and Managing TCP/IP (008543)

The following information supports new definitions of physical interfaces for network devices.

Configuring and Managing TCP/IP contains descriptions of network physical interfaces in the `/sys/node_data[.node_id]/networks` file. These descriptions, on page 3-6, have changed with SR9.6 and later and TCP/IP 3.0. Please note the changes on page 3-6 as follows:

- A `dr0`, `dr1` interface can be any Apollo Token Ring controller, or an IIC in a Domain/Bridge -A or -B configuration.
- `eth0`, `eth1` Specify IEEE/802.3 Network (ETHERNET) interfaces. The `ethn` interface can be any supported IEEE/802.3 controller.

The following table summarizes the network controller and software configurations for TCP/IP products and EtherBridge.

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<i>Node Bus</i>	<i>Controller</i>	<i>SFW-TCP</i>	<i>SFW-EBR</i>	<i>SR Level</i>
AT-Comp Bus	EtherCtrl-AT	eth0	eth1	SR9.2 to SR9.5
AT-Comp Bus	802.3 Network Controller-AT	eth0, eth1	N/A	SR9.6+
AT-Comp Bus	Token Ring Net Ctrl-AT	dr0, dr1	N/A	SR9.6+
MBUS	EtherCtrl-MB	eth0	eth1	SR9.2 to SR9.5
MBUS	Token Ring Network Ctrl	dr0	N/A	SR9.5+
MBUS	IIC Dom/Br -A -B	dr1	N/A	SR9.5+
VMEbus	802.3 Net Ctrl-VME	eth0, eth1	N/A	SR9.7+

DN3000/DN4000 nodes can contain a maximum of four network controllers, but only two of the same network type. Thus, you can have a gateway that contains two Apollo Token Ring Network Controllers and two 802.3 Network Controllers (dr0, dr1, eth0, and eth1). For example, here is a possible configuration:

- 129.9.3.023 on dr0 ; Apollo Token Ring
- 130.1.2.028 on dr1 ; Apollo Token Ring
- 149.8.5.044 on eth0 ; ETHERNET
- 150.2.3.052 on eth1 ; ETHERNET

A DSP90 gateway connected to an Apollo Token Ring Network and an ETHERNET network through the EtherBridge product would appear in the networks file /sys/node_data[.node_id]/networks as follows:

```
197.9.8.11 on dr0           ; Apollo Token Ring
149.8.5.023 on dr1         ; EtherBridge
```

Note that the dr1 interface can also apply to a Domain/Bridge-A or -B link or a second Token Ring network.

3.2.5 Changes and Additions to DN3000/DN4000 Documentation

Please note the the DN3000/4000 hardware documentation now includes the 15-inch monochrome monitor option.

Changes and Additions to Unpacking and Installing Your DN3000/DN4000 Personal Workstation and the DSP3000/4000 Server (007857, Rev 05)

General Changes and Information:

This manual explains how to unpack and install a workstation and server as a standalone system or within an Apollo Token Ring network or ETHERNET/IEEE 802.3 network (referred to as the 802.3 network). It is used to install the system and as a reference manual.

Apollo-supplied system component boards are shipped in separate shipping containers and must be installed as part of the system installation process. This manual will direct you to the appropriate manual for system component board installation. Instructions are also provided for connecting the major system units (monitor and keyboard), connecting to the network (if necessary), booting the operating system, and verifying the operation of the system. A flowchart is provided to guide you through the installation, and a "Solving Problems" table appears at the end of most sections.

Chapter 2 of these release notes contains the software installation procedures.

Specific Changes:

In the "Unpacking the System Unit and Monitor" chapter, all illustrations that show the rear view of the monochrome monitor refer to the 19-inch monochrome monitor. For the 15-inch monochrome monitor, the Signal Cable is 8 ft long and permanently attached to the rear of the monitor. The 3-pin male connector for the ac power cord is located to the left of the Signal Cable, and the Voltage Select switch is located directly above the 3-pin male connector.

In the "Connecting the System Unit and Monitor" chapter, all illustrations that show the monochrome monitor refer to the 19-inch monochrome monitor. For the 15-inch monochrome monitor, the Power switch (which should be OFF during the installation) is located at the lower right side facing the front of the monitor. The Voltage Select switch (located at the rear of the monitor directly above the 3-pin male connector for the ac power cord) can be switched up or down by using a 1/4-inch, flat-blade screwdriver. The voltage setting is clearly marked; the switch is pushed up for 115 V and down for 230 V.

CAUTION: System damage will occur if the Voltage Select switch is set incorrectly.

Changes and Additions to Operating the DN3000/DN4000 Personal Workstation and the DSP3000/DSP4000 Server (007858, Rev 03)

General Changes and Information:

This manual explains how to operate the DN3000/DN4000 personal workstation and the DSP3000/DSP4000 server. Before using your system, you should read and understand this manual, and then keep it handy for reference.

Specific Changes:

(All changes are in the *Using the Domain System Personal Workstation* chapter).

All illustrations of the monochrome monitor refer to the 19-inch monochrome monitor. For the 15-inch monochrome monitor, the Signal Cable is 8 feet long and permanently attached to the rear of the monitor.

In the "Using the Monitor Controls" section, the Power switch is located at the lower right side facing the front of the 15-inch monochrome monitor. The Brightness knob is located at the lower left side, facing the front of the monitor. The 3-pin male connector for the ac power cord is located to the left of the Signal Cable, and the Voltage Select switch is located directly above the 3-pin male connector.

In the "Starting Up in NORMAL Mode" section, the Voltage Select switch (located at the rear of the monitor directly above the 3-pin male connector for the ac power cord) can be switched up or down by using a 1/4-inch, flat-blade screwdriver. The voltage setting is clearly marked; the switch is pushed up for 115 V and down for 230 V.

CAUTION: System damage will occur if the Voltage Select switch is set incorrectly.

Changes and Additions to the Domain Series 3000/Series 4000 Technical Reference (008778, Rev 03)

General Changes and Information:

This manual contains interface connection and performance specification information for the Domain workstation (DN3000/DN4000). All references to the monochrome monitor in this manual refer to the 19-inch monochrome monitor. The following additions must be made to the *Domain Series 3000/Series 4000 Technical Reference*.

Specific Changes:

In the section on "Display Controllers", add the following sentence. The DN3000/DN4000 high-resolution 15-inch monochrome monitor has the following features: high resolution 1024 x 800 display; flicker-free, 76-Hz, noninterlaced screen refresh; low power requirements; 128-KB image memory using high-density, dynamic Dual-Ported Video RAMs; and high-speed image and main memory BLTs facilitated by a specialized gate array.

In the section on "Physical Address Space", add the following information. The physical address range for the 15-inch monochrome graphics memory space is FA0000 to FBFFFF.

In the section on "DN3000/DN4000 Power Supply Distribution", add the following information. The 15-inch mono display controller's power consumption in Amps is 1.5 at +5 V and 0.1 at -5 V.

The chapter on "Graphics Controllers" contains illustrations of the color and monochrome controller PCBs. For an illustration that show the 15-inch monochrome controller PCB, refer to *Installing Graphics Controllers in the AT-Compatible Bus* (010409).

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The chapter on "The Monitors" contains illustrations of the color monitors and the 19-inch monochrome monitor. For illustrations that show the front and rear views of the 15-inch monochrome monitor, see *Update Package 1 to Servicing Domain Monitors* (011259).

In the section on "Connecting a Monitor to the DN3000/DN4000", add the following information. The display cable is permanently attached to the 15-inch monochrome monitor.

In the section on "Monochrome Monitor Specifications", add the following information:

15-Inch Monochrome Monitor Signal Specifications

<i>Item</i>	<i>Video Signal</i>	<i>Vertical Signal</i>	<i>Horizontal Signal</i>
Input Level	ECL Balanced	TTL	TTL
Polarity	Positive	Positive	Positive
Impedance	50 ohms +/- 5%	220 ohms +/- 5%	220 ohms +/- 5%

Interconnection - Twisted Pair, 50 ohms Impedance, Shielded

15-Inch Monochrome Monitor CRT Specifications

<i>Item</i>	<i>Specification</i>
Size	15-Inches
Electron Gun	Low-Voltage Focus
Neck Diameter	29 mm
Deflection Angle	110 Degrees
Faceplate Transmission	27%
Phosphor	PC-104 or Equivalent
Surface Treatment	Antiglare Specular Glass 60 Degree Large Aperture = 50 to 70

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15-Inch Monochrome Monitor Performance Specifications

<i>Item</i>	<i>Specification</i>
Resolution	1024 x 800 (noninterlaced)
Scanning Frequencies	Horizontal - 63.96 KHz (+/- 250 Hz) Vertical - 75.96 Hz (+/- 2 Hz)
Maximum Light Output	30 FL (+10/-5 FL) with background raster equal to 0
Minimum Light Output	Less than 5 FLB with Brightness Control Set Full CCW
Return Ratio	Greater than 1.75 Footcandles with 250 Lux incident at 6500 Kelvin
Resolution at 15 FL Full Width Half Mod.	12 mils @ center, maximum 16 mils @ edge, maximum
Audible Noise Level	As specified in para. 8.0 of the Mech. Environmental Spec. 008405

Display Performance

This section lists the various display performance specifications.

Video Image Size

The Horizontal Raster size is 250 mm (+/- 1%). The Vertical Raster size is 195 mm (+/- 1%).

Raster Size Regulation

The Raster Size Regulation is less than a 1% change between 5 FLB and 30 FLB.

Video Image Centering

The video image shall be centered in the bezel opening within a 4-mm band at the on axis vertical position and within a 6-mm band at the on axis horizontal position.

Drift

The monitor operates over the specified temperature range without loss of sync. No manual adjustments are necessary over the specified temperature range. All specifications will be maintained over the specified temperature range after a 30-minute warm-up period.

Emission Warm-Up Time

The emission warm-up time is 20 seconds.

Brightness Uniformity

Brightness uniformity should not exceed a 30% change anywhere within the active video area.

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15-Inch Monochrome Monitor Power Specifications

<i>Item</i>	<i>Specification</i>
Input Voltage	90 to 132 Vac or 180 to 264 Vac (Switch-Selectable)
Frequency	50 to 60 (+/- 3) Hz @ 120 vac 50 (+/- 3) Hz @ 240 Vac
Power Consumption	Less than 60 Watts
Power Surge Current	Power-On - Less than +50 A Peak @ 120 or 240 Vac (Worst Condition)
Input Current	0.5 A @ 115 Vac RMS

15-Inch Monochrome Monitor Environmental Specifications

<i>Item</i>	<i>Specification</i>
Temperature	Operating = 0 to 32 degrees C Nonoperating = -20 to 60 degrees C
Humidity	5% to 90% Noncondensing
Altitude	Operating = 3000 meters (10,000 Feet) Nonoperating = 12,000 meters (40,000 Feet)

3.3 Help File for Manuals

For SR9.7, the help file for user documentation has been revised to include all books produced or revised since SR9.5. To access this information, press HELP and type "manuals".

Chapter 4: Fixed Bugs, Limitations, and Known Bugs

This chapter documents bugs that we have fixed since SR9.6 as well as User Change Requests (UCRs) we have addressed. The chapter also documents all known limitations and bugs in SR9.7 standard software.

We also ship, in hardcopy only, a final bugs list. This list includes any bugs discovered, or fixed, after this document went to press. Consult that document, also shipped with the media kit, to ensure that you know of the final disposition of all bugs that are known to exist or that are fixed in this release.

4.1 Bugs Fixed Since SR9.6

The following subsections document bugs fixed since SR9.6 in the Aegis operating system (kernel and libraries), the Display Manager, and various commands and utilities.

4.1.1 Bug Fixed in Pmlib

Certain (rare) programs, when debugged, would cause an access violation in `pm_load` (the system program loader). This has been fixed.

4.1.2 Bugs Fixed in Dialoglib

Domain/Dialogue V2.0 was originally released at SR9.5. It was rereleased at SR9.6. Since SR9.6, the following bugs have been fixed:

With the SR9.6 dialoglib, changing the display mode of a DN590-T (using the "`cdm -p`" Display Manager command) while a Domain/Dialogue application was running, could cause subsequent Domain/Dialogue applications to have incorrect color choices (including, for example, black on black). This problem has been fixed in the dialoglibs released with the DN590-T and SR9.7.

In SR9.5 and SR9.6 dialoglibs, the routine `dp_gmr_disable_input` was not marked as a global, requiring you to mark it manually if your applications used it. The routine is marked as a global in SR9.7 (fixes UCR 0d886147).

4.1.3 Bug Fixed in Syslib (Floating Point)

Certain vector library routines, i.e. `vec_$...`, when executing on a DN570/580/590 with an FPX installed, would leave the Floating Point Control register (FPC) in a corrupted state (if the process faulted inside the vector routine). This bug has been fixed by causing these routines to establish cleanup handlers. Now, when a fault occurs, the cleanup handlers restore the FPC to its original value at the time the routine was called.

Also note that `VEC_$DOT` and `VEC_$DDOT` have been made much faster for 881 and FPX systems.

4.1.4 Bug Fixed in GPR

For wide lines, GPR now correctly draws the width regardless of the orientation of the line. In SR9.6, non-horizontal or non-vertical lines had a wider width than what was specified. The worst case was a 45 degree line whose width was 1.4 times as wide as it should have been.

4.1.5 Bugs Fixed in NCK

On lookups and registrations, the Location Broker now uses the full network addresses to make comparisons against database entries. It formerly used only host ids and therefore did not distinguish between hosts sharing the same id and residing on different nets.

Formerly, `lb_$unregister` was unable to delete an entry with an invalid socket address from the Global Location Broker database. Now, such entries can be unregistered. However, if replicas of the Global Location Broker exist at several nodes on your network or internet, this software release should be running at all of these nodes before you unregister any entries with bad addresses.

If a server received a quit fault (e.g., if the server node was shut down) while executing a call on behalf of a remote client, that fault was reflected back to the client. Quit faults on a server are now made to look like communications failures to the client.

4.1.6 Limitations Fixed in NCK

The total size of input and output parameters to a remote procedure call was limited to 64 KB. That limit has been fixed.

An `rpc_$shutdown` call has been added, to allow a server to shut itself down; this call takes one parameter, a completion status of type `status_$t`. When `rpc_$shutdown` is called, the server stops processing incoming calls, and `rpc_$listen` returns. In a tasking environment, all "listen tasks" are killed. If `rpc_$shutdown` is called from within a remoted procedure, the call completes and the server shuts down after replying to the caller.

A `monitor` command has been added to `drm_admin`. The syntax is `monitor [-r m]`. This command causes `drm_admin` to read the clock of each replica of the default object every `m` minutes and to report any clock skews or non-answering replicas. The default value for `m` is 15.

4.1.7 Binder Limitation Fixed

Global symbols that were defined in libraries to be installed at execution time (e.g., libraries specified by the `-inlib` option) were still being reported as

undefined globals. Bind now checks libraries that will be installed at execution time and does not report globals defined in those libraries.

4.1.8 Bug Fixed in Mouse Documentation

The help file and command reference description of TPM specified the wrong maximum -s scaling factor values for mice. With a mouse, the values did not appear to be in raster units, but rather seemed to be a relative multiplier. Values up to 32767 are valid.

4.1.9 Bug Fixed in DN460

Heavy network activity on diskless DN460 class machines could result in a system bus error crash, i.e., crash status 110013.

4.1.10 Bug Fixed in ETHERNET Network

Lcnode -from (remote lcnode) fails on certain node configurations running on an ETHERNET network using a VMEbus ETHERNET controller. The failure occurred when the VMEbus node contained both a ring board and an ETHERNET board. The problem applies to both Ring and ETHERNET boards, and can cause failures in the lcnode -from option when the "from" network has a private and secondary configuration. The failure appeared in the SAX system exerciser, resulting in SAX failures.

4.1.11 Bug Fixed in DN3000/DN4000

Hangs occurred occasionally when either a DN3000 or DN4000 was booted via an EMT process. The node was losing communications with its Serial I/O line.

4.1.12 Bug Fixed in FTNLIB

A problem had occurred in the Fortran run-time library (/lib/ftnlib). The problem affected direct access I/O in certain unusual circumstances, causing a program to abort with a run-time failure and no data corruption.

4.1.13 Bug Fixed in Domain/Dialogue Applications

A problem in the graphics library routine affected DN590-Ts running Domain/Dialogue applications. The problem occurred when a program performed a gpr_\$pixel_blt to a screen from any pixel oriented bitmap (POB) having more than 8 bits.

4.1.14 Bug Fixed in Cpboot

The command line for cpboot is supposedly:

cpboot src_dir [target_dir]

but it actually required you to specify the target_dir instead of defaulting to '/'.

4.1.15 Bug Fixed in DPAT Help File

DPAT minimum interval reduction from 10 msec to 1 msec had not made the dpat.hlp file

4.1.16 Bug Fixed in /LIB/PMLIB & /SYS/ENV

NOTE: SR9.7 and more recent versions of the Aegis and Domain/IX operating systems already include this patch.

Patch 50 fixes a bug in SR9.6 and SR9.6.1 that causes process pages that have never been validated to be nonzero upon first validation, if the process has a fork'd child that uses the pages first. The problem is most common in programs that:

spawn a child process using 'fork', and

invoke the 'malloc' function with a large size argument.

The files in the patch ensure that pages will be properly set to zero. Before installing Patch 50, you must already be running the SR9.6 or SR9.6.1 version of the Aegis or Domain/IX operating system (use the BLDT Shell command to determine which version is running on your workstation). Do not update your system software to one of the above versions AFTER installing this patch; if you do, you will reverse the effects of the patch.

Patch 50 changes the following system file:

/lib/pmlib
/sys/env

4.1.17 Bugs Fixed in /com/help

Prior to SR9.7, /com/help required users to have 'w' rights for files residing in /sys/help in order to use the command in processes running the CRP command, terminal emulators like VT100, and other cases where help output was written into the transcript pad rather than being displayed in a new DM window. That restriction is now removed.

Also, /com/help did not handle shell pipelines correctly. It is now possible to direct help output into a pipeline rather than into the transcript pad or new DM window. For example, the following command line now works correctly (output is piped to the FLEN (FILE_LENGTH) command, which returns line, word, and character counts):

```
$ help cpf | flen
      102    473   4226
$
```

4.2 UCR Fix Summary

This is a summary of the standard software UCRs fixed in this release, listed by UCR number. For complete information about the fixes or new features, see the sections that describe bugs fixed or new features.

- 0d883299 - unfriendly behavior if wrong univ # for swap entered.
- 0d883711 - wbak intolerant of mis-selection of tape unit number.
- 0d884575 - add new plane mask call for raster op configurations.
- 0d884724 - confusion when using uctob and ctob on directories.
- 0d884994 - auto refresh windows refresh only one plane.
- 0d885056 - request archive date stamping.
- 0d885180 - crddf truncating cmd lines at 81 chars.
- 0d885247 - pbu_\$wait never gets control back on quit.
- 0d885298 - problem w/debug and gpio.
- 0d885315 - wbak occasionally rejecting new tape.
- 0d885327 - cpt deletes files under some circumstances to gms.
- 0d885328 - gpr_\$inquire_bitmap_pointer not returning valid address.
- 0d885332 - request how to add a badspot on an SMD.
- 0d885427 - lsyserr not reporting location of parity errors.
- 0d885441 - occasional "disk not ready" from a file server.
- 0d885498 - request for utility to recover from lost acl objects.
- 0d885559 - system call returns bad status after GMR file.
- 0d885602 - request to make tb work the way it used to (prior to 9.5.1).
- 0d885603 - request bindable libs minus overflowing globals.
- 0d885661 - tb changed with 9.5.
- 0d885667 - alarm needed when tape swap required.
- 0d885676 - rbak -as option working incorrectly.
- 0d885685 - sio dropping characters; irregular problem with xon/xoff.
- 0d885687 - loss of events when a gpr program is run several times in background mode.
- 0d885712 - multiple slinks in a pathname in SR9.5.

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- 0d885717 - complaint about edacl.
- 0d885727 - wbak -nwla option complains when new tape used.
- 0d885755 - C initialization with forward referencing of statistics.
- 0d885757 - first boot after power on fails with peb board installed.
- 0d885788 - acl & edacl change the time.
- 0d885788 - request for /com/acl to offer -pdt option.
- 0d885794 - acl command // / -all.
- 0d885799 - dlt -pr doesn't handle wildcards properly.
- 0d885802 - problem with -f end option in wbak/rbak.
- 0d885806 - request for better handling of bad tape media.
- 0d885820 - request for name_\$get_path to obey search rules to find full pathname.
- 0d885824 - nodes crashing back to phase II boot shell.
- 0d885834 - auto refresh windows in direct mode are not being refreshed properly.
- 0d885839 - cursor ghosts when it crosses between two windows.
- 0d885841 - complaint about text cursor positioning.
- 0d885842 - program crashes if window 1 obscures window 2 and the cursor is moved rapidly between them.
- 0d885851 - text cursor positioning is jumpy in SR9.5.
- 0d885860 - blanks as input for a logical format.
- 0d885864 - acl problem with /com/help.
- 0d885875 - question on use of 'node_data for temporary files.
- 0d885888 - tb omits line number in faulting routine.
- 0d885891 - problems concerning tb in SR9.5.
- 0d885914 - C compiler faults during optimization phase.
- 0d885926 - controller timeout on files larger than 1.6 megs.
- 0d885929 - request shell script to determine availability of sio lines.
- 0d885948 - compiler optimizations giving incorrect results.
- 0d885953 - rwmt attempt to change volume id crashes node with 1e0021.
- 0d885958 - tb problem in SR9.5.
- 0d885964 - fscanf strips leading blanks on %22c.
- 0d885989 - writing second backup gets error.

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- 0d885993 - question about requirement for chuvol.
- 0d885998 - floating point library fault.
- 0d886059 - problems deleting objects with long names.
- 0d886066 - gmr in gm_\$within_gpr mode problem.
- 0d886067 - Aegis C compiler can't convert unsigned int:
- 0d886073 - C compiler not returning "true" on some boolean evaluations.
- 0d886074 - compiler test failure.
- 0d886078 - gpr_\$spline_cubic_x causes program crash.
- 0d886083 - controller timeout using wbat with -f end option.
- 0d886085 - refresh on a resized window doesn't always work right.
- 0d886089 - incorrect program when compiled -opt 3 or better.
- 0d886092 - incorrect program when compiled with -opt 3 or better.
- 0d886094 - vt100 window seems to get confused.
- 0d886110 - request documentation fix for pm_\$get_home_txt call.
- 0d886116 - cursor positioning problem.
- 0d886127 - cv file;(X,Y)DR;WC -Q;GM causes DM to fault with odd address error.
- 0d886131 - mouse not working properly.
- 0d886134 - acl problem with /com/help using terminal emulation.
- 0d886145 - request pst to return false if it fails.
- 0d886147 - command dp_\$gmr_input_disable not marked as global.
- 0d886153 - unbalanced parenthesis in /sys/ins/proc1.ins.ftn.
- 0d886153 - unbalanced parenthesis in proc1.ins.ftn.
- 0d886174 - jumping cursor.
- 0d886204 - optimizer problem.
- 0d886213 - in borrow mode and borrow-nc mode, button events being missed.
- 0d886225 - graphic primitives routines not working properly.
- 0d886229 - cursor not appearing in GMR area.
- 0d886298 - moving cursor between 2 windows causes program to crash.
- 0d886305 - printf problem with floating point numbers near 1.0.
- 0d886316 - invalid memory access was fixed in SR9.5.

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- 0d886317 - INQUIRE(name=...) changed from sr9.2.3.
- 0d886368 - problem with shared gpio on DSP90.
- 0d886373 - polyline with > 365 points produces access errors.
- 0d886374 - tone_\$time call does not work properly on DN580-T.
- 0d886379 - xref listing lines too long.
- 0d886390 - request to repair acl / problem.
- 0d886402 - jumping cursor.
- 0d886425 - request use of prf to print pixel oriented bitmaps.
- 0d886438 - fatal error (double negative).
- 0d886444 - /com/help in pipelines.
- 0d886457 - complaints regarding mounting subsequent volumes on multi-reel backups.
- 0d886479 - problems with timeout value in select(2).
- 0d886484 - problem printing to Imagen CX printer.
- 0d886497 - change the "you must be from prime" msg in boot shell.
- 0d886516 - INTEGER parameter constants passed as the wrong size.
- 0d886566 - gpr_\$ing_disp_characteristics with pgr_\$frame option fails.
- 0d886578 - using gpr_\$polyline after line pattern is set can result in a crash
- 0d886671 - ttyname system call on SPE problem.

4.3 Known Bugs and Limitations at SR9.7

The following subsections describe limitations and known bugs at SR9.7.

4.3.1 EtherBridge Configuration Limitation

At SR9.6 and later, Domain internet routers that use MULTIBUS and Ether-Bridge software (SFW-EBR) cannot communicate with, or route packets to Domain nodes that reside natively on IEEE/802.3 networks. This limitation will not be removed since at SR9.6 and later, Domain internet capability to the IEEE/802.3 network is available through other configurations.

4.3.2 SAX Limitations

A SAX limitation appears in the manual *Using Domain Diagnostics*; we repeat it here. If you are running SAX test processes on the SAX host node, you may only run SAX on one diskless partner. However if you are not running SAX test processes on the host node, and are just using it as a server, you can run SAX on up to three diskless partners.

When trying to run SAX on a SAU1 node (DN100, DN400, DN420) and the configuration is 1 MB of memory (and has a Winchester disk), the two disp test processes hang after the title line "DISP_D.SH REV 1" in SR9.5 SAX 1.1.

4.3.3 DN3000/DN4000 15-Inch Monochrome Monitor Limitation

If you are using 3DGMR V2.5 on the 15-inch monochrome DN3000/DN4000, you must set the color ID binding. After calling "gmr_\$init", please insert the following code:

```
(C)
for (index = 2; index < 15; index++)
    gmr_$color_set_range (index, short(1), short(1), status );
```

```
(Fortran)
      DO 25 index = 2, 15
        CALL gmr_$color_set_range (index, INT2(1), INT2(1), status )
25     CONTINUE
```

```
(Pascal)
for index := 2 to 15 do gmr_$color_set_range (index, 1, 1, status );
```

4.3.4 NCK Limitations

The following limitations and restrictions apply to Location Broker components. The lb_admin set command does not allow you to specify the Global Location Broker to which you want to send commands. It does, however, allow you to specify a Local Location Broker to which you want to send commands.

If you start `glbd` while you are `crp`'d onto a node, `crp` will not be able to exit because it cannot close the streams that `glbd` has open in the process. The solution is to start `glbd` from another node:

```
$ crp -on //node_name -cps /sys/ncs/glbd
```

If you start `llbd` while you are `crp`'d onto a node, `crp` will not be able to exit because it cannot close the streams that `llbd` has open in the process. The solution is to start `llbd` from another node:

```
$ crp -on //node_name -cps /sys/ncs/llbd
```

4.3.5 Bug in DN590-T

The following occurs when running `ctape.dex` on a DN590-T.

```
Test 17: Write Entire Tape / Read Single Block
736 blocks write second timeout waiting for char after CR.
emt> EMT remote mode... F1 to exit.
15744 blo2 second timeout waiting for char after CR.
```

4.3.6 Bugs in GPR

If you are initializing GPR in frame mode and use less than the number of planes in the system, you have to explicitly set the plane mask to the number of planes you requested. This bug occurs most frequently with applications written to use one plane for a monochrome node, but are run on a color node.

After you acquire the display, you can not set the current bitmap to a bitmap initialized in direct mode if the previous bitmap was initialized in frame mode. The direct mode bitmap will not initialize correctly. You must release the display, set the current bitmap to the direct mode bitmap, then reacquire the display.

4.3.7 Bug in GPR (DN3000)

When using `GPR_$TEXT` on a DN3000 high resolution monochrome workstation with a large number of font files (more than approximately 40) there is a small probability that a spurious "bad font file" (symbol `gpr_$bad_font_file`) status will be returned, and the text will not be drawn.

This problem is most likely to occur when GPR is being used either in borrow mode, or in direct mode with little or no other activity on the screen.

4.3.8 Bug in FSTEST

FSTEST cannot be run on a SAU1 node (that is, a DN100, DN400, DN420, or DN600) containing n.5 megabytes (that is, 1.5, 2.5 or 3.5-megabytes) of memory. If the 0.5-megabyte board is removed, FSTEST can be run on the file server.

4.3.9 Bug in VMTEST

Running VMTEST on a Storage Module Disk (SMD) with a paging file size greater than 342 blocks causes the system to fail (Crash Status 80022).

4.3.10 Bug in the Magtape Diagnostic

For a node configured with two magtape drives, the magtape diagnostic, in the SAU1, SAU3, SAU4, and SAU5 directories, cannot test two tape drives concurrently. You must test one drive at a time.

4.3.11 Bug in /Systest

In systest/ssr_util/all_stcode the output goes to error out rather than stdout like the help file says.

4.3.12 Bugs in the Diagnostic Executive (DEX)

Because of a problem in handling of the sysboot file, using the ld command while running DEX can cause an error. To work around this problem, exit from DEX, then reenter DEX. The next time you use ld, it will operate properly.

4.3.13 Bugs in SAX

SAX creates temporary stack files that reduce the amount of free disk space. To delete these temporary files, shut down and reboot the node after running SAX.

When you quit from SAX, you may receive one or more seemingly irrelevant messages, such as "Object not found." These messages are the result of cleanup errors. They are not indicative of problems associated with running SAX.

4.3.14 Paging Boot Error

Paging boot error message refers to the SR9.5 release document (If your paging file is too small, you get an error message while trying to boot referring you to the SR9.5 release document). Please refer to the 9.7 release documentation to fix this problem.

4.3.15 Change to /com/login

/com/login changed to invoke the shell specified by the user's SHELL environment variable (or the /com/sh by default) and passes "-<shellname>" in the zeroth element of the argument vector to conform with Unix convention.

4.3.16 Bug in Domain/IX Permissions

A problem with the C library affects Domain/IX permissions. The problem causes **mkdir** to ignore unmask settings from the parent, and not set all permissions properly in a new directory. If you experience the problem, use **chmod** to set the missing permissions manually.

4.3.17 Bug in FPX Microcode (Turbos)

There is a low probability problem with the floating point microcode in Turbo systems with an FPX. Certain commands will terminate with the following error: "floating point branch/set on unordered condition (OS/fault handler)." The problem is usually seen during an install. The install may continue with the error or terminate. In any case, you will have to restart the install.

4.3.18 CLIB Limitation

The new C Library does work properly with SPE (and TTY) when the SPE software is loaded as a global driver. When it is loaded as a private driver, TTY fails the second time it is run.

4.3.19 Bug in Unix Signal Handling

Fault statuses will not be reported for non-C commands run out-of-process from C-shells.

4.3.20 Bug in Domain/PCC

Domain/PCC 2.1 and Domain/PCC-Remote 1.1 cannot properly read or write floppy diskettes on a DN3000 (with Rev 04 CPU) or a DN4000 running SR9.7. In order to avoid this problem, use DPCC or DPCC-Remote with the **-NDMA** option. For example:

```
$ dpcc -ndma <option> ...
```

```
$ dpcc_remote -ndma <option> ...
```

This problem will also occur when running DPCC with an MS-DOS formatted floppy under SAX. To avoid this problem, either run SAX without an MS-DOS formatted floppy, or add the **-NDMA** option to the indicated lines of the following SAX scripts:

```
/systest/pcc/ms_dos.sh  
dpcc -m -bf -start /systest/pcc/pcc_flop_startup  
dpcc -m -nf -start /systest/pcc/pcc_hd_startup
```

```
/systest/init_pcc.sh  
xdmc (800,600)cp /com/dpcc -bf -start /systest/pcc/pcc_init_flop_startup
```

4.3.21 Bug in Interleaf Print Server

Files that contain a first line with a length greater than 2048 characters will cause the print server to abort with an access violation. This may be particularly apparent with Interleaf documents printed on an IMAGEN printer. If you encounter this problem, the file must be modified. In addition you will have to delete the problem file from the queue and spooler before restarting the print server. If the problem is unacceptable, you can revert back to the SR9.5 printer server.

4.3.22 Bug Using Mixed Case Names

The mvf command does not handle mixed case names correctly, and therefore should not be used in operations involving names with mixed case. The workaround is to either replace the command with a sequence of cpf and dlf commands, or do the equivalent under a UNIX shell, which handles mixed case names correctly.

4.3.23 Bug in DN460/DN660

DN460/DN660 nodes with 1-MB of memory overload when running SAX in -cit mode.

4.4 Explanation for New PREPVOL UTILITY

PREPVOL corrects a problem that can occur on workstations running SR9.5.1 or SR9.6. It is possible, but highly unlikely, that it might occur on workstations running an earlier version of the operating system. The problem could cause corruption of the directory structure and loss of user data. It may arise if a user formats the disk of a node using the INVOL utility, and then attempts to create or change the default ACLs on one or more of the following directories:

```
/
//
/sys
/sys/node_data
```

The default ACLs are changed by running the 'acl' or 'edacl' command with either the -i, -id, -if, -is, or -all options, OR by using the ACL option to the standard system installation procedure, which runs those commands.

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While the problem discussed above occurs very rarely, it can be quite serious if it does occur. In the worst case, changing the ACLs of the entry level directory by executing the command:

```
acl / /path -all (where '/path' represents any other directory)
```

can result in corruption of the entry level directory, making it impossible to access the disk even to mount or to back up user data. The only reliable solution once this has occurred is to INVOL the disk and reload software.

PREPVOL is a standalone utility that should be run on any node that is running SR9.5, regardless of whether the installation of SR9.5 included an INVOL or was just an update. PREPVOL should be run BEFORE any attempt is made to change the default ACLs (via the 'acl' or 'edacl' command) of the above directories. It should also be run before installing system software on such a node, if the user wants to invoke the ACL option of the installation procedure in order to change default system ACLs.

NOTE: The INVOL utility distributed with SR9.7 has been changed to eliminate this problem; therefore, once you have installed SR9.7, you will no longer need PREPVOL. However, if you're installing SR9.7 and plan to use the installation option mentioned above, run PREPVOL between the time you run INVOL on the disk (if that's part of your installation) and the time you invoke the installation procedure. After you've run PREPVOL, shut down the node and reboot the system.

You should run PREPVOL on ALL Apollo workstations running SR9.5 or SR9.6 (use the BLDT Shell command to determine which version is running on your workstation). If you use a pre-SR9.7 INVOL to reformat the disk AFTER running PREPVOL, run it again.