

MODULE 1

AVIION PRODUCT OVERVIEW

OBJECTIVES:

1. IDENTIFY THE VARIOUS PRODUCTS THAT MAKE UP THE AVIION LINE OF HARDWARE.
2. DESCRIBE THE SIMILARITIES AND DIFFERENCES BETWEEN THE AVIION PRODUCTS.
3. IDENTIFY THE OPTIONS THE CAN BE USED WITH THE AVIION PRODUCTS.

REFERENCES:

MAINTAINING AVIION 300 SERIES STATION (014-1859) CHAPTER 1

EXPANDING AND MAINTAINING AVIION 400 SERIES STATION
(014-1859) CHAPTER 1

SETTING UP AND STARTING AVIION 3000/4000 SERIES COMPUTER
SYSTEMS (014-1872) CHAPTER 1

SETTING UP AND STARTING AVIION 5000 SERIES COMPUTER SYSTEMS
(014-18060 APPENDIX A

STARTING AVIION 6000 SERIES (014-1819) CHAPTER 1

MAVERICK

AVIION 300 SERIES STATION AND OPTIONS = monochrome

300c = color

STANDARD COMPONENTS

THE BASIC AVIION 300 SERIES CONSISTS OF A DESKTOP COMPUTER UNIT, A GRAPHICS MONITOR, AND A IBM-COMPATIBLE KEYBOARD. THE AVIION 300 SYSTEM BOARD CONSIST OF THE FOLLOWING:

- o 4 MBYTES OF MINIMUM MEMORY, EXPANDABLE IN 4 MB INCREMENTS TO A MAXIMUM OF 28 MB.
- INEN o AN ETHERNET LAN PORT.
- o A PARALLEL PRINTER PORT, CENTRONICS/DATA PRODUCTS COMPATABLE.
- o AN RS-232-C/RS 422 ASYNC. PORT FOR A DATA TERMINAL DEVICE, SUCH AS A MODEM, DISPLAY TERMINAL, SERIAL PRINTER, OR PLOTTER.
- o A SCSI PORT FOR ADD-ON MASS STORAGE DEVICES.

OPTIONAL COMPONENTS

BASED UPON THE AVIION 300 SERIES MODEL NUMBER YOUR SYSTEM MAY INCLUDE THE FOLLOWING OPTIONAL COMPONENTS:

- o MOUSE AND MOUSE PORT
- o MASS-STORAGE SUB-SYSTEM. EACH ONE CONTAINING ONE OR MORE OF THE FOLLOWING:

150 MB CARTRIDGE TAPE DRIVE

179 MB OR 322 MB WINCHESTER DISK DRIVE, 662 MB DISK

DISKLESS CLIENT

SCM > b, INEN() to boot diskless client

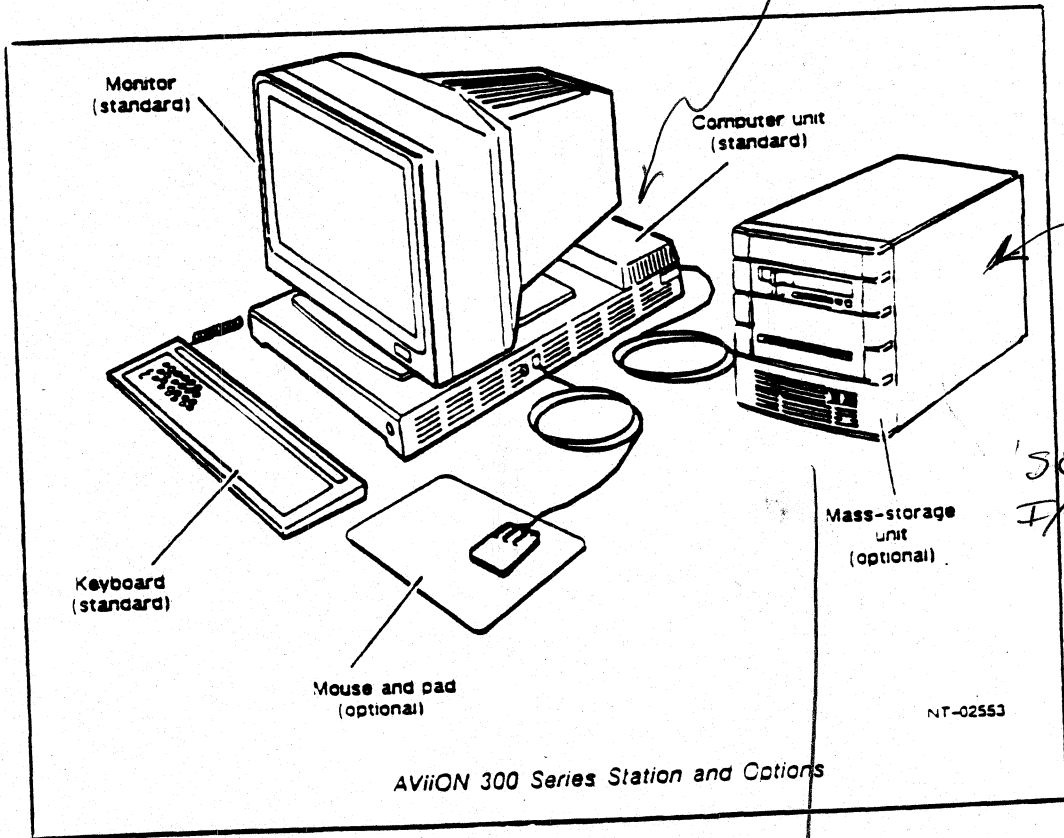
only SCSI

100, 200 have no DG/UT

scm>b, sd(INSC(1)) root:/ dgnx
 ↑
 integrated surji controller
 on system board

sd(INSC(0),0) root: dgnx
 CTLR device

SCSI
 CTLR

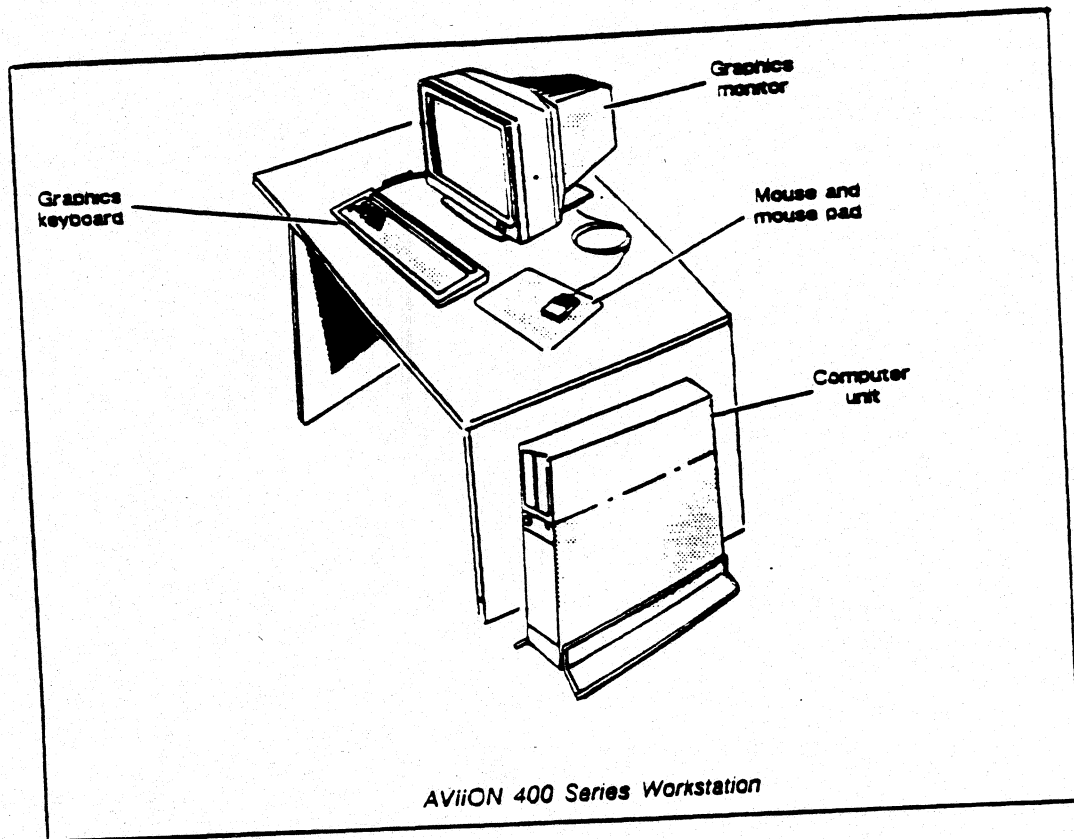


MAVERICK
 only SCSI devices allowed

1 full height
 1 half height (tape drive)

SCSI supports 7 devices
 0-3 for disks
 4-6 for mag tape

scm>b, st(INSC(1),4)
 1-2
 default to 0 if no value specified



SPU, P/S & FANS

AVIION 400 SERIES STATION AND OPTIONS

THE DESKSIDE COMPUTER INCLUDES THE SYSTEM BOARD, POWER SUPPLY AND FANS, AND INTERNAL STORAGE DEVICES. SOME MODELS MAY INCLUDE ADDITIONAL MEMORY, ENHANCED GRAPHICS, AND A SECOND CPU

BASE UNIT

- o SYSTEM PROCESSOR BOARD, *w internal low*
- o POWER SUPPLY, THREE FANS, TIME OF BOOT CLOCK WITH BBU.
- o VME CARD CAGE WITH SLOTS FOR TWO 6U CARDS.

SYSTEM BOARD

- o 16 OR 20 MHZ MOTOROLA CHIP SET
- o TWO TO EIGHT 4 MB PLUG-IN MEMORY BOARDS. 32 MB MAXIMUM
- o KEYBOARD CONTROLLER
- o LAN CONTROLLER
- o SCSI CONTROLLER
- o DUART (TWO RS232-C PORTS WITH MODEM CONTROL).
- o PARALLEL PRINTER PORT (CENTRONICS/DATA PRODUCTS COMPATABLE).
- MAIX BUS → o VME BUS INTERFACES
- o 8 OR 24 BIT GRAPHICS CONTROLLER
- o 24 BIT Z-BUFFER FOR HIGH SPEED GRAPHICS
- o A SECOND PROCESSOR - *daughter board*

MASS STORAGE (INTERNAL DEVICES)

max 2 half height

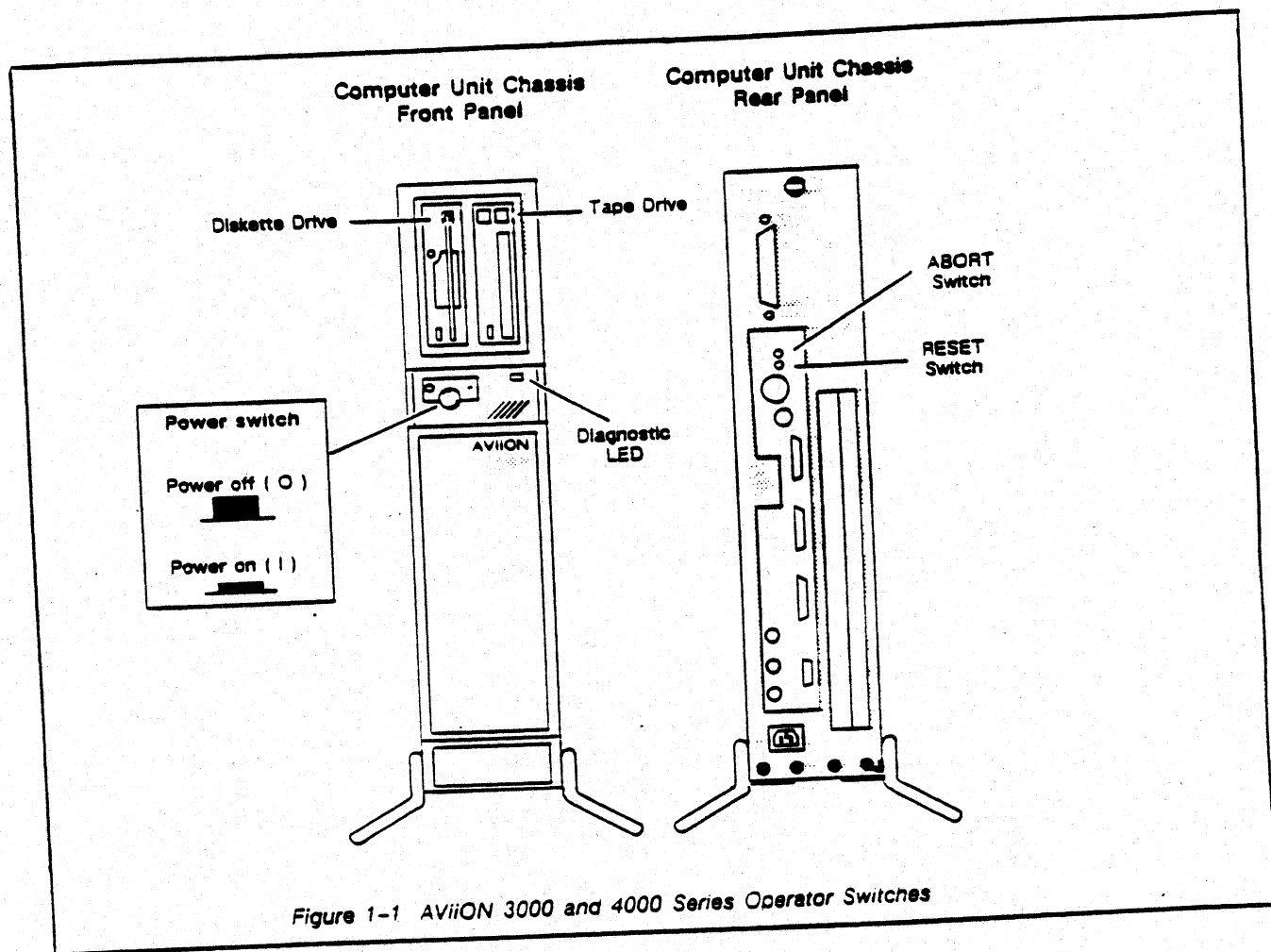
- o FULL HEIGHT 662 MB WINCHESTER DISK
- o FULL HEIGHT 322 MB WINCHESTER DISK
- o 2 GB 8MM CARTRIDGE TAPE DRIVE
- o HALF HEIGHT 150 MB CARTRIDGE TAPE
- o 179 MB WINCHESTER DISK
- o 1.44 MB 3.5 DISKETTE
- o 1.2 MB 5.25 DISKETTE

MASS STORAGE (EXTERNAL DEVICES)

- o ONE OR TWO PERIPHERL HOUSING UNITS (PHUS)
- o FULL HEIGHT 662 MB WINCHESTER DISK
- o FULL HEIGHT 322 MB WINCHESTER DISK
- o FULL HEIGHT 2 GB 8MM CARTRIDGE TAPE
- o HALF HEIGHT 150 MB CARTRIDGE TAPE
- o 179 MB WINCHESTER DISK
- o 1.44 MB 3.5 DISKETTE
- o 1.32 MB 5.25 DISKETTE

graphics board included for AU4000

6 U boards have 2 connectors ← VME option boards
Cannot use 9 U boards on AV400



AVIION 3000 SERIES COMPUTER

THE AVIION 3000 SERIES COMPUTER CAN FUNCTION AS A ENTRY LEVEL SERVER IN A CLIENT/SERVER ENVIROMENT. IT CAN ALSO SUPPORT MULTIUSERS IN A TIMESHARE/SERVER ENVIROMENT. THE AVIION 3000 SERIES CURRENTLY CONSISTS OF ONE MODEL THE AVIION 3200.

STANDARD COMPUTER COMPONENTS

- o ONE 16 MHZ MOTOROLA PROCESSOR
- o 8 MB OF BYTE PARITY MEMORY (TWO 4 MB PLUG-IN MEMORY MODULES)
- o ONE ASYNCHRONOUS RS 232-C PORT FOR SYSTEM CONSOLE
- o ONE ASYNCHRONOUS RS 232-C PORT FOR A MODEM OR DATA TERMINAL DEVICE
- o ETHERNET LAN INTERFACE
- o SCSI CONTROLLER FOR INTERNAL SCSI DEVICES. MAXIMUM OF FOUR.
- o VME BUS INTERFACE - *option card, SCSI ~~etc~~ plugs into, I/O ONLY*

ON SOME MODELS, BOTH OF THE FOLLOWING MASS STORAGE DEVICES

- o ONE 150 MB CARTRIDGE TAPE HALF HEIGHT
- o ONE SCSI WINCHESTER DISK, EITHER A 322 MB HALF HEIGHT OR A FULL HEIGHT 662 MB DRIVE.

o A ONE SLOT, VME CARD CAGE TO SUPPORT ONE OPTIONAL VME COMMUNICATIONS CONTROLLER.

ON SOME MODELS, ONE OF THE FOLLOWING VME BASED COMMUNICATIONS CONTOLLERS:

- o VSC/3,3 LINE SYNCHRONOUS ^{VME} CONTROLLER
- o VAC/16, A 16 LINE ASYNCHRONOUS COMMUNICATIONS CONTROLLER.

OPTIONAL COMPUTER COMPONENTS

- o ADDITIONAL 4 MB MEMORY MODULES UP TO 16 MB MAXIMUM
- o 179 MB HALF HEIGHT WINCHESTER DISK
- o 322 MB HALF HEIGHT WINCHESTER DISK

REMOVABLE MEDIA

- o A SECOND 150 MB CARTRIDGE TAPE
- o 1,2 MB 5.25 DISKETTE DRIVE OR A 1.44 MB 3.5 DISKETTE DRIVE
- o 600 MB HALF HEIGHT CD ROM DRIVE

ON MODELS WITHOUT A VSC/3 OR A VAC/16 CONTROLLER ONE OF THE FOLLOWING VME BASED COMMUNICATIONS CONTROLLERS:

- o VSC/3
- o VAC/16
- o VLC LAN CONTROLLER

*Lead contacts for memory boards good only
for 15 or 16 installs/removals
**

** No VDA card supported
↑ VME distributed 1-6
adapters
to run cluster
boxes*

KEYSTONE

AVIION 4000 SERIES COMPUTER

THE AVIION 4000 SERIES COMPUTER CURRENTLY CONSISTS OF THE FOLLOWING MODELS: 4020, 4100, AND THE 4120.

STANDARD COMPUTER COMPONENTS:

- o ONE (AV 4000) OR TWO (AV 4020) 16 MHZ OR ONE (AV 4100) OR TWO (AV 4120) 20 MHZ MOTOROLA PROCESSING UNITS.
- o IN THE AV 4000 OR 4100 COMPUTER, 8 MB OF MEMORY USING TWO 4 MB PLUG-IN MEMORY CARDS. IN THE AV 4020 OR 4120 COMPUTERS 16 MB OF MEMORY USING FOUR PLUG-IN 4 MB MEMORY MODULES
- o ONE ASYNCHRONOUS RS 232-C PORT FOR THE SYSTEM CONSOLE
- o ONE RS 232-C PORT FOR MODEM OR DATA TERMINAL DEVICE
- o ONE PARALLEL PRINTER PORT CENTONICS COPATABLE
- o ETHERNET LAN INTERFACE
- o ONE SCSI INTERFACE CONTROLLER WITH A EXPANSION PORT FOR EXTERNILY CONNECTED SCSI DEVICES.
- o A VME BUS INTERFACE
- o ONE 150 MB HALF HEIGHT CARTRIDGE TAPE
- o ONE SCSI BASED WINCHESTER DISK, EITHER A 322 MB HALF HEIGHT OR A 662 MB FULL HEIGHT.
- o A TWO SLOT VME CARD CAGE FOR TWO OPTIONAL VME BASED COMMUNICATIONS CONTROLLERS.

OPTIONAL COMPUTER COMPONENTS

o ONE OR MORE FOLLOWING COMPONENTS CAN BE ADDED TO THE AV 4000 SERIES COMPUTER.

- o A SECOND CPU (16 OR 20 MHZ)
- o ADDITIONAL 4 MB MEMORY MODULES UP TO 32MB MAXIMUM.
- o 179 MB HALF HEIGHT WINCHESTER DISK
- o 332 MB HALF HEIGHT WINCHESTER DISK
- o 150 MB HALF HEIGHT CARTRIDGE TAPE
- o 1.2 MB 5.25 DISKETTE OR ONE 1.44 MB HALF HEIGHT 3.5 DISKETTE
- o 600 MB HALF HEIGHT CD ROM DRIVE

A MAXIMUM OF TWO OF THE FOLLOWING VME BASED COMMUNICATIONS CONTROLLERS:

- o ONE VSC/3
- o ONE OR TWO VAC/16
- o ONE OR TWO VDA/128 ASYNCHRONOUS HOST ADAPTERS
- o ONE VLC ETHERNET LAN CONTROLLER

SPEED OF MACHINE — # of 88K CPU chips

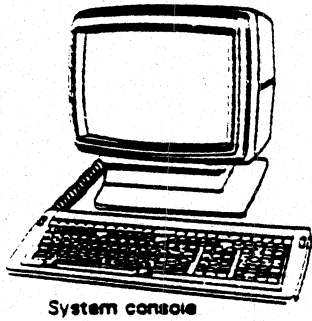
4000 — 16 MHz

4020 — 2 cpu chips

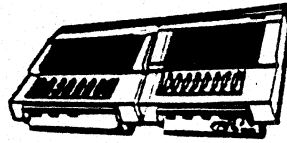
4120 — 20 MHz

* NO GRAPHICS BOARD, USED AS A SERVER

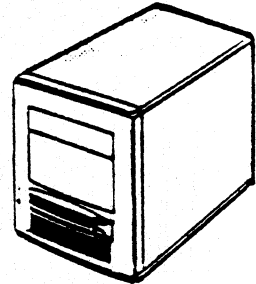
* USUALLY COMES W/ MOTTACHROM MONITOR GR 0216



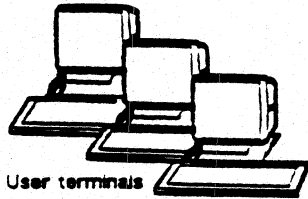
System console



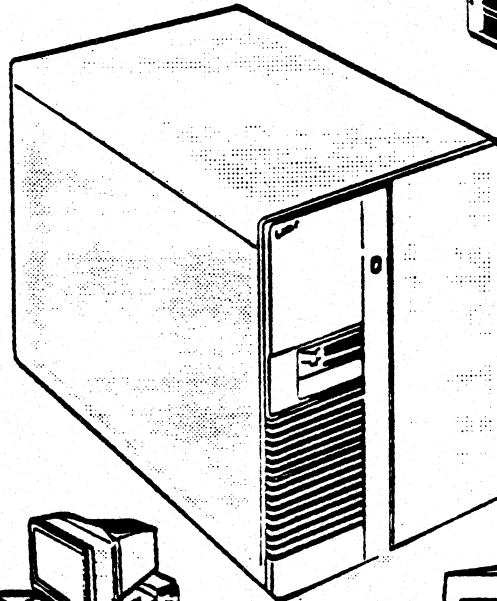
Cluster controllers



Mass storage units



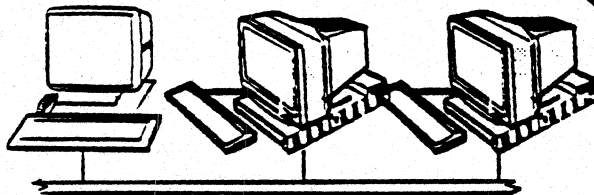
User terminals



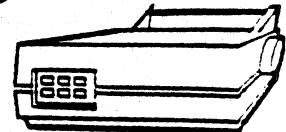
AViON 5000 Series deskside computer unit



Modems



LAN-based devices



Printers

AViON 5000 Series System Components

TOP GUN

AVIION 5000 SERIES COMPUTER

THE AVIION 5000 SERIES COMPUTER IS A MULTIUSER OR SERVER SYSTEM SUPPORTING A VARIETY OF CONFIGURATIONS. THE BASIC DESKSIDE COMPUTER INCLUDES THE SYSTEM BOARD, POWER SUPPLY, VME BUS, ONE SCSI CONTROLLER WITH A EXTERNAL SCSI BUS CONNECTION, A SCSI SCSI CARTRIDGE TAPE, ONE ESDI CONTROLLER, AND ONE ESDI HARD DISK.

STANDARD COMPONENTS

WITH mem ON BOARD

- o SYSTEM PROCESSOR BOARD, SINGLE OR DUAL, 16 OR 8 MB MEMORY (DUAL 16 ONLY).
- o ONE LINE FOR SYSTEM CONSOLE
- o ONE PARALLEL PRINTER PORT
- o ONE ASYNCHRONOUS OPTON PORT (MODEM)
- o ONE SCSI BUS CONTROLLER WITH EXTERNAL BUS PORT
- o ONE 150 MB CARTRIDGE TAPE
- o ONE ESDI CONTROLLER
- o ONE 332 OR 648 MB ESDI WINCHESTER DISK DRIVE
- o 720 W POWER SUPPLY
- o 10 SLOT VME BACKPANEL

INTERNAL OPTIONS (MAXIMUM)

- o SECOND INTERNAL 150 MB CARTRIDGE TAPE
- o SECOND OR THIRD ESDI WINCHESTER DISKS
- o FOUR 16, 32, OR 48 MB MEMORY EXPANSION BOARDS, 208 MB MAXIMUM
- o FOUR VSC/4 CONTROLLERS
- o TWO VAC/16 CONTROLLERS *for 32 local terminals*
- o FOUR VDA/128 HOST ADAPTERS
- o TWO VLC ETHERNET LAN CONTROLLERS

EXTERNAL OPTIONS (MAXIMUM)

- o MODEL 10565 PERIPHERAL HOUSING UNIT MASS STORAGE SUBSYSTEMS
- THREE HALF HEIGHT SCSI DEVICES PER PHU:
 - 150 MB CARTRIDGE TAPE
 - ONE FULL HEIGHT SCSI DEVICE PER PHU:
 - 662 MB SCSI WINCHESTER DISK
 - 322 MB SCSI WINCHESTER DISK
 - 2 GB ARCHIVE CARTRIDGE TAPE
- COMBINATION OF ONE FULL HEIGHT AND ONE HALF HEIGHT DEVICE PER PHU.
 - o FOUR 6586/6587 REEL TO REEL TAPE PER SCSI CONTROLLER
 - o FOUR SYNCHRONOUS DEVICES PER VSC/4
 - o 16 ASYNCHRONOUS DEVICES PER VAC/16
 - o 128 ASYNCHRONOUS DEVICES PER VDA/128

FOR Cluster boxes USES SPECIAL COAX, E null modem cables

CYPHER GALAXY

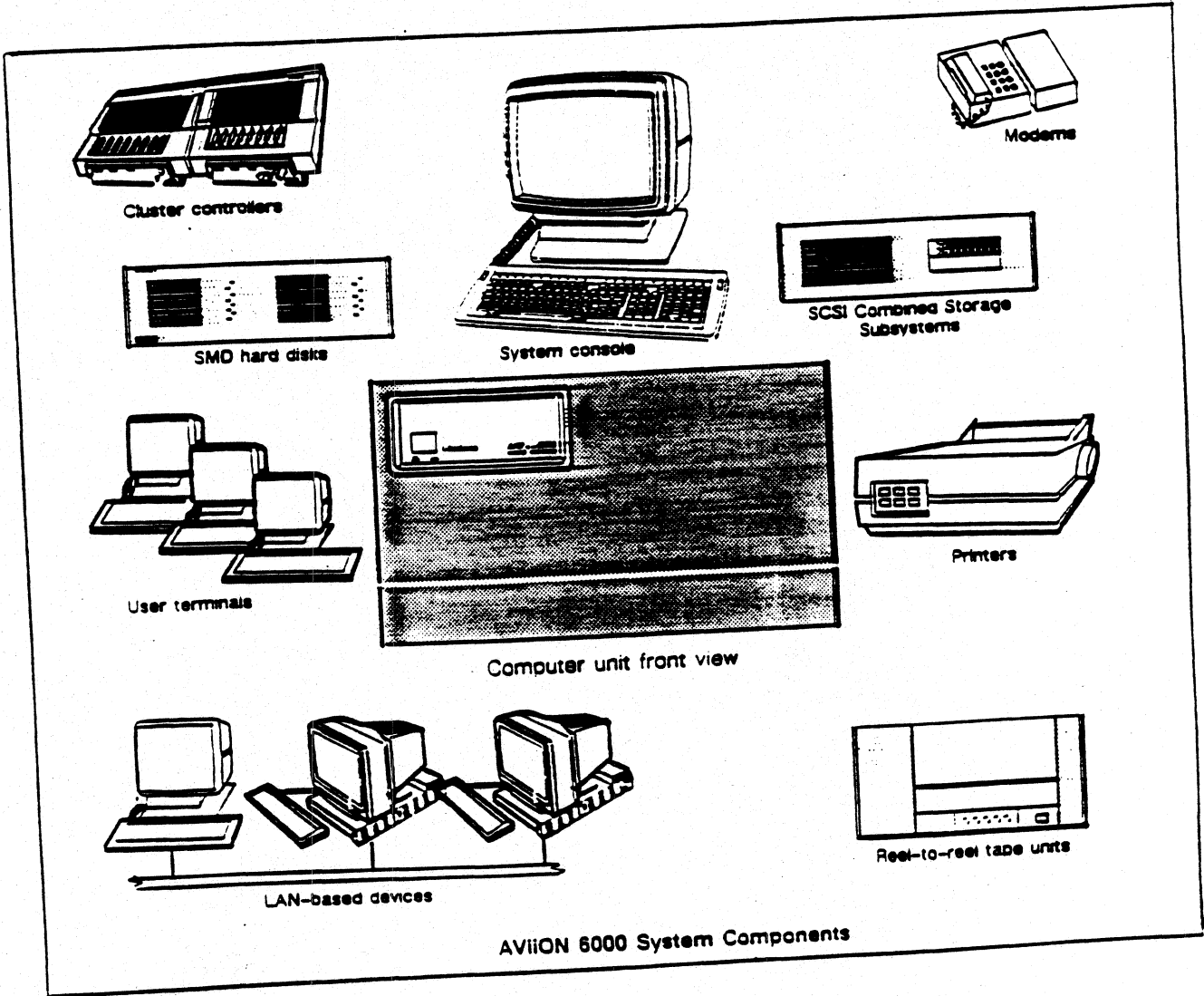
MODEL
5100 - 6 slots
5000 - 10 slots
FOR ESDI DISK

scm> b₁ cied(0,0) root: /dgux
↓
cipico ESDI CTRL
↓
VENDOR

FOR SCSI TAPE
scm> b₁ st(cisc 0,4)

scm> b₁ cimd(0,0) root: /dgux

1-9



RACK MOUNTED

AVIION 6000 SERIES COMPUTERS

THE AVIION 6000 SERIES COMPUTER IS A MULTIUSER OR SERVER SYSTEM THAT SUPPORTS A WIDE VARIETY OF CONFIGURATIONS. THE BASIC UNIT INCLUDES A 14 INCH HIGH CHASSIS THAT HOUSES THE SYSTEM BOARD, POWER SUPPLY, AND VME BUS.

STANDARD COMPONENTS

- SYSTEM PROCESSOR BOARD, SINGLE OR DUAL, 16 MB OR 8 MB OF MEMORY 208MB MAXIMUM.
- ONE RS 232-C ASYNCHRONOUS PORT FOR THE SYSTEM CONSOLE
- ONE PARALLEL PRINTER PORT (CENTRONICS OR DATA PRODUCTS).
- ONE RS 232-C ASYNCHRONOUS OPTION PORT (MODEM).

OPTIONAL COMPONENTS (MAXIMUM)

- FOUR SCSI BUS CONTROLLERS.
ONE REQUIRED TO SUPPORT 150 MB TAPE
EACH SUPPORTS UP TO SEVEN EXTERNAL SCSI DISK AND TAPE DEVICES.
- FOUR SMD CONTROLLERS (THREE IF SYSTEM SUPPORTS A VAC/16).
- FOUR VSC/4 CONTROLLERS
- ONE VAC/16 CONTROLLER
- FIVE VDA/128 HOST ADAPTERS (ONE IF SYSTEM INCLUDES A VAC/16).
- TWO VLC ETHERNET LAN CONTROLLERS.

EXTERNAL OPTIONS (MAXIMUM)

- FOUR 1.2 GB SMD WINCHESTER DISKS PER SMD CONTROLLER
16 MAX PER SYSTEM
- ONE COMBINED STORAGE SUBSYSTEM (CSS) PER SCSI CONTROLLER;
MAX OF FOUR SCSI DEVICES PER CSS:
662 MB WINCHESTER DISK
322 MB WINCHESTER DISK
TWO 150 MB CARTRIDGE TAPE PER CSS
TWO 2 GB CARTRIDGE TAPE PER CSS
- THREE 6586/6587 REEL TO REEL TAPE DRIVES PWER SCSI CONTROLLER.
- FOUR ASYNCHRONOUS DEVICES PER VSC/4 CONTROLLER
EIGHT MAX PER SYSTEM (6 MAX IF SYSTEM INCLUDES A VAC/16)
- 16 ASYNCHRONOUS DEVICES PER VAC/16 CONTROLLER
- 128 ASYNCHRONOUS DEVICES PER VDA/128 HOST ADAPTER:
640 MAX PER SYSTEM

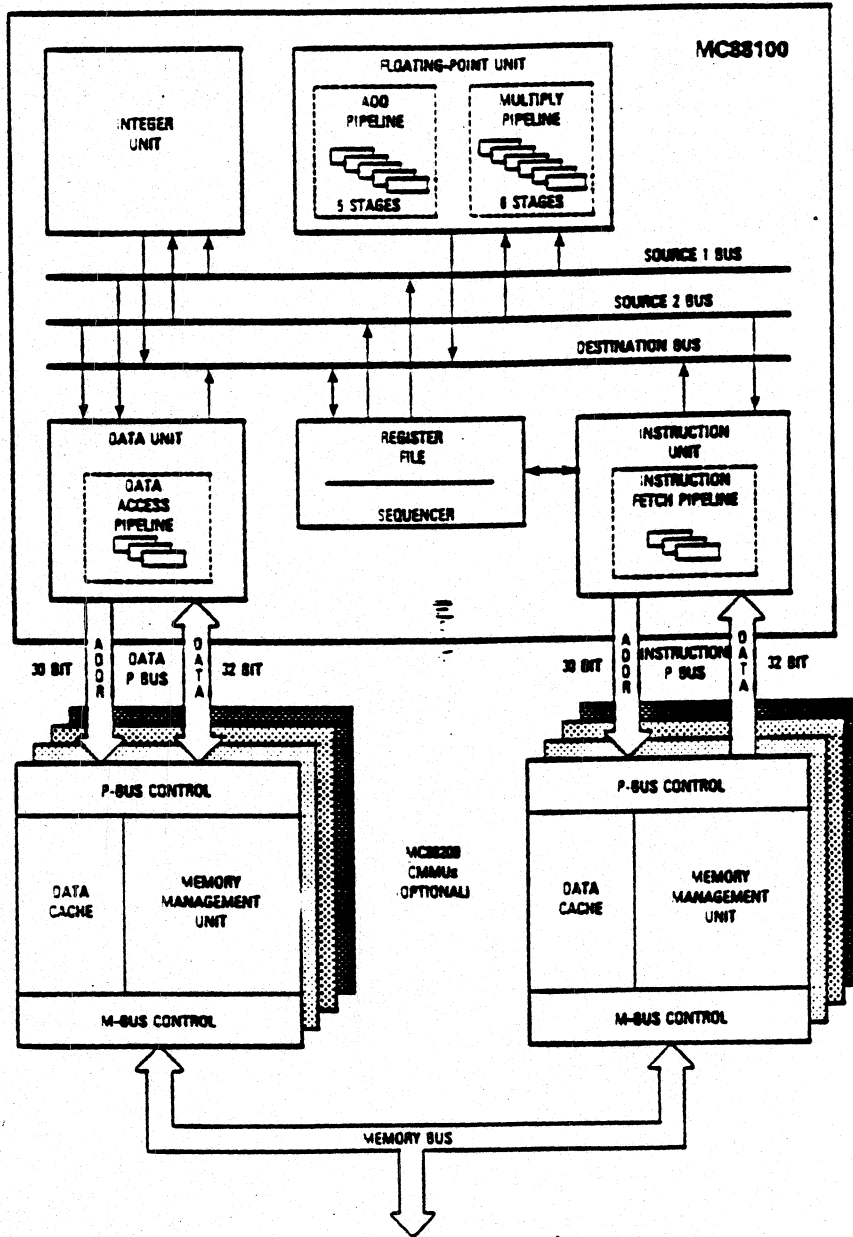
MODULE 2
SYSTEM CONFIGURATION

OBJECTIVES:

1. LIST THE FEATURES OF THE 88K ARCHITECTURE.
2. IDENTIFY THE BUS STRUCTURE USED ON THE AVION PRODUCTS.
3. CORRECTLY JUMPER AND INSTALL A MEMORY OPTION CARD ON A AVION SYSTEM.
4. DESCRIBE THE VME BUS GRANT AND REQUEST PRIORITY JUMPERS USED ON THE AVION PRODUCTS.
5. CORRECTLY JUMPER AND INSTALL A VME OPTION CARD ON A AVION SYSTEM.
6. CORRECTLY CONFIGURE A SCSI BUS DEVICE OR PHU.

MOTOROLA 88K ARCHITECTURE

- THE AVIION COMPUTER SYSTEMS ARE BASED UPON MOTOROLA'S 88100 CPU AND SUPPORTING 88200 CMMU'S.
- EACH AVIION SYSTEM RUNS A SET OF REDUCED INSTRUCTIONS CONSISTING OF A TOTAL OF 51 INSTRUCTIONS. THESE INSTRUCTIONS EXECUTE ENTIRELY OUT OF HARDWARE ELIMINATING THE NEED FOR COMPLEX MICROCODE.
- THE CPU IS MADE UP OF FIVE UNITS. THESE ARE THE INTERGER UNIT, FLOATING POINT UNIT, DATA UNIT, INSTRUCTION UNIT, AND FINALLY A REGISTER UNIT.
- ALL INTERGER, BIT FIELD, AND CONTROL REGISTER INSTRUCTIONS ARE EXECUTED BY THE INTERGER UNIT IN ONE MACHINE CYCLE. THIS UNIT CONTAINS 11 GENERAL CONTROL REGISTERS.
- FLOATING POINT INSTRUCTIONS ARE EXECUTED BY THE FLOATING POINT UNIT. THE FPU IS IMPLEMENTED AS TWO PIPELINES AND IS COMPRISED OF 11 CONTROL REGISTERS.
- INSTRUCTIONS THAT ACCESS DATA MEMORY AND CONTROL THE DATA MEMORY INTERFACE PORTION OF THE DATA PBUS ARE EXECUTED BY THE DATA UNIT.
- THE INSTRUCTION UNIT PREFETCHES INSTRUCTIONS FROM MEMORY, PERFORMS THE FIRST STEPS OF INSTRUCTION DECODE, AND PROVIDES INSTRUCTIONS TO THE APPROPRIATE EXECUTION UNIT VIA ENCODED INTERNAL CONTROL SIGNALS.
- THE REGISTER FILE AND SEQUENCER CONTAINS THE GENERAL PURPOSE REGISTERS AND PERFORMS OVERALL INTERNAL CONTROL FUNCTIONS.
- 88K ARCHITECTURE USES A HARVARD BUS STRUCTURE
- CMMU'S INCORPORATES 16K BYTES OF CACHE MEMORY PLUS CONTROL, MEMORY MANAGEMENT, AND BUS CONTROL LOGIC INTO SINGLE COMPONENT.



AVIION SYSTEM BUSES

o AVIION SYSTEMS ARE COMPRISED OF THE FOLLOWING BUSES:

- VME (VERSA MODULE EUROPA)
- PEXBUS (PROCESSOR EXTENDED BUS)
- MBUS (MEMORY BUS COMMON)
- SBUS (SUBSET BUS)
- BBUS (BADBUS)

o VME BUS

ENABLES DATA TRANSFERS BETWEEN THE SYSTEM PCB AND THE VME CONTROLLERS.

40 MB PER SECOND

CARDS ARE FOLLOWED WITH A "U" 9U IS A 15X15 CARD, 6U IS A SMALLER CARD WHICH REQUIRES A ADAPTER

9U CARDS HAVE THREE "J" CONNECTORS COMPARED TO TWO FOR THE 6U CARDS.

CONNECTORS J1 AND THE "B" ROWS OF J2 ARE USED FOR THE VME BUS SIGNALS.

o PEXBUS

9U CARDS USE THE PEXBUS TO TRANSFER DATA BETWEEN THE SYSTEM BOARD AND EXPANSION MEMORY. CONNECTOR "J3" AND THE "A AND C" ROWS OF "J2" ARE USED BY THE PEXBUS.

o MBUS

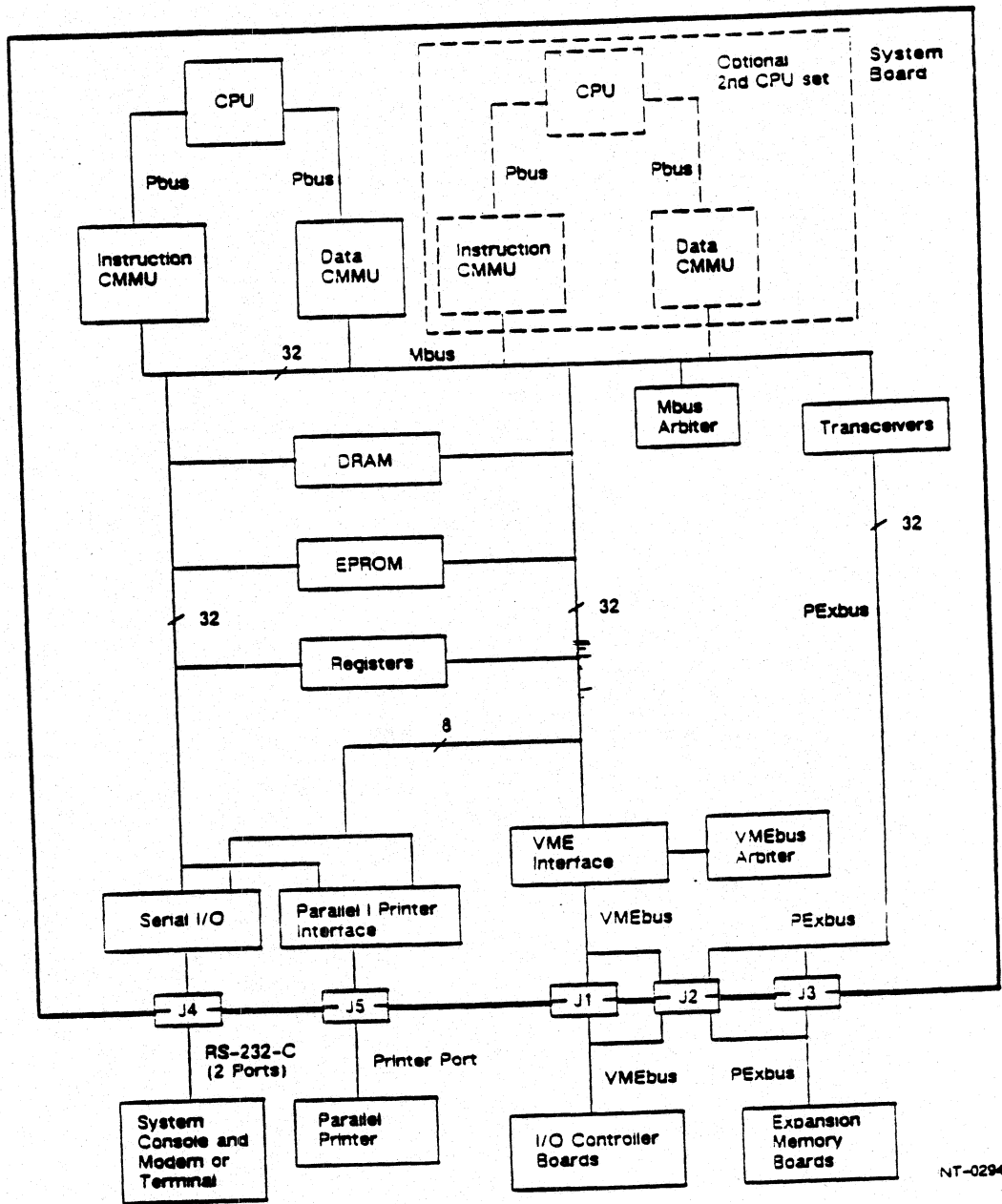
COMMON TO AVIION SYSTEMS THIS BUS IS USED FOR COMMUNICATIONS BETWEEN THE CPU KERNAL AND AND THE ON-BOARD MEMORY SUBSYSTEM. THE GRAPHICS CONTROLLER ALSO USES THE MBUS.

o SBUS

USED BY AVIION SYSTEMS TO ACCOMMODATE SLOWER PERIPHERALS. THE 32 BIT MBUS GETS CONVERTED TO THE 16 BIT SBUS. SOME OF THE DEVICES THAT ACCESS THE SBUS ARE POWER-UP EPROM, PARALLEL/SERIEL I/O INTERFACE, KEYBOARD, MOUSE, SCSI CONTROLLER, AND ETHERNET LAN CONTROLLER.

o BBUS

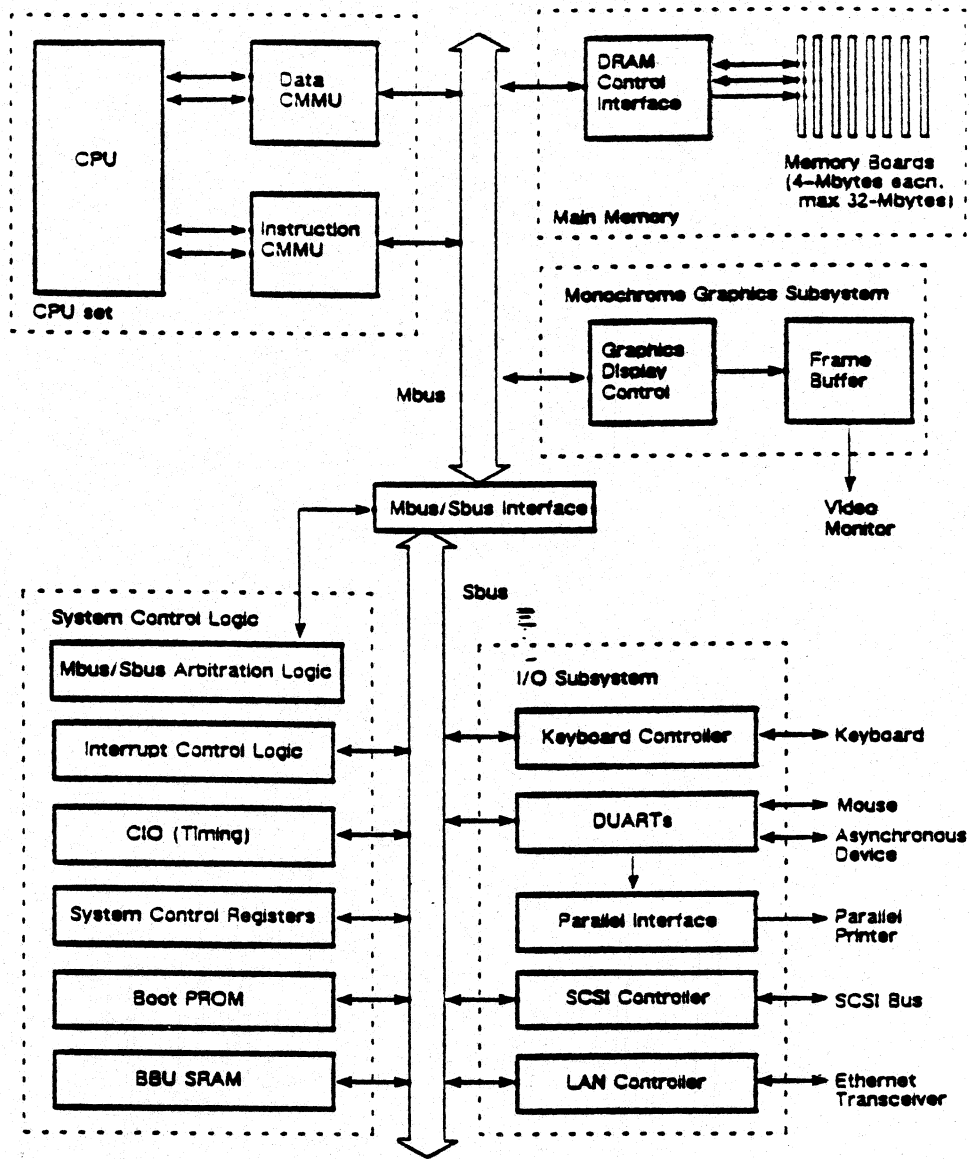
PROVIDES A INTERFACE WITH THE 88100 AND THE VME INTERFACE. ALSO FURNISHES ON-BOARD COMMUNICATIONS BETWEEN THE MBUS AND THE GLOBAL RESOURCES ON THE SYSTEM BOARD.



NT-02941

System Board Architecture

2-4



System Board Architecture - 300 Series

MEMORY JUMPERING

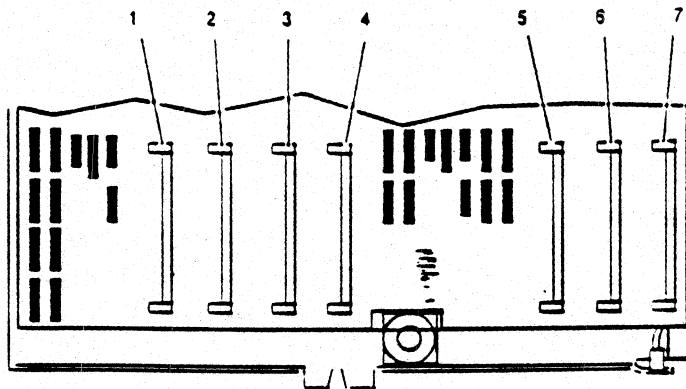
AVIion 300/400 SERIES
AVIion 3000/4000 SERIES

MEMORY BOARDS ARE IN 4 MB INCREMENTS STARTING IN SLOT ONE AND
INSTALLED IN CONSECUTIVE SLOTS THERAFTER.

* NEVER LEAVE A MEMORY SLOT OPEN BETWEEN TWO MODULES.

MEMORY IS SIZED ON POWER UP AND SHOULD MATCH YOUR MEMORY THAT WAS
TORED IN NOVDRAM AT THE TIME OF THE LAST SUCCESSFUL POWERUP.

AVIion 300 SLOT ASSIGNMENTS

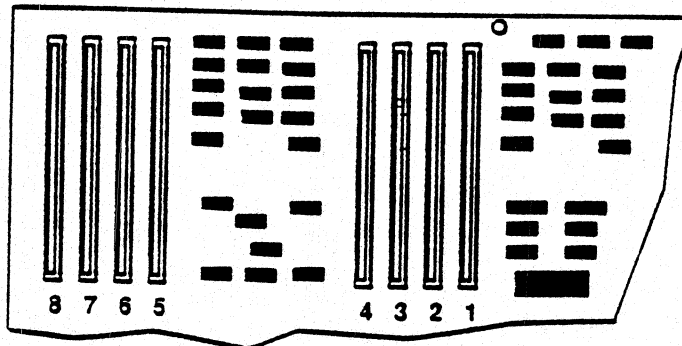


Front of tray assembly

NT-02582

AVIion 3000/4000 SLOT ASSIGNMENTS

System board



* will only see memory in front of any bad board
2-6

AVIION 5000/6000 SERIES

○ MEMORY BOARDS ARE 15 X 15 INCH AND COME IN 16, 32, OR 48 MB INCREMENTS.

○ MEMORY BOARDS ARE SLOT SPECIFIC (USE PEXBUS IN SLOTS 2-6).

○ MUST KNOW HOW MUCH MEMORY RESIDES ON THE SYSTEM BOARD BEFORE YOU INSTALL ANY ADDITIONAL BOARDS.

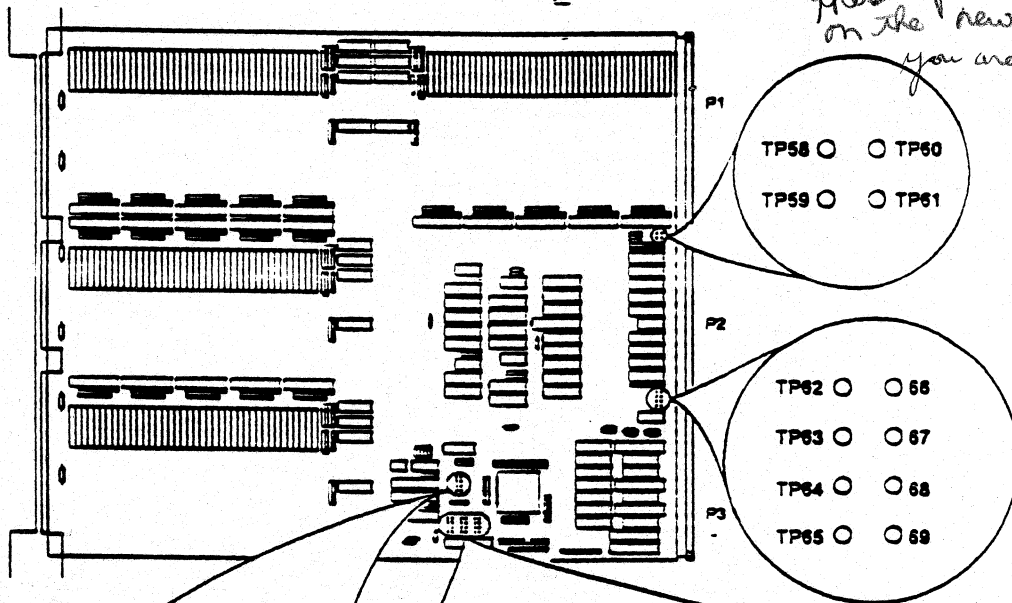
○ IF A MEMORY BOARD IS TO BE INSTALLED IN THE FIRST MEMORY SLOT THE JUMPERS SHOULD BE ARRANGED AS FOLLOWS:

○ INSTALLING STARTING ADDRESS JUMPERS ON THE FIRST MEMORY EXPANSION BOARD. FIRST DETERMINE THE AMOUNT OF MEMORY ON THE SYSTEM PCB. (THE SIZE OF THE EXPANSION MEMORY DOESN'T MATTER)

IF THE SYSTEM BOARD HAS 8 MB OF MEMORY, INSTALL A JUMPER OVER PINS TP7/15, TP4/12, TP20/24, AND TP28/32. *on New board*

IF THE SYSTEM BOARD HAS 16 MB OF MEMORY, INSTALL A JUMPER OVER PINS TP/6/14, TP3/11, TP19/23 AND TP27/31.

EXPANSION MEMORY PCB JUMPER PIN LOCATIONS



- TP5 ○ ○ 13
- TP6 ○ ○ 14
- TP7 ○ ○ 15
- TP8 ○ ○ 15

- TP1 ○ 9 ○ TP17 ○ 21 ○ TP25 ○ 29 ○
- TP2 ○ 10 ○ TP18 ○ 22 ○ TP26 ○ 30 ○
- TP3 ○ 11 ○ TP19 ○ 23 ○ TP27 ○ 31 ○
- TP4 ○ 12 ○ TP20 ○ 24 ○ TP28 ○ 32 ○

1st procedure - 1st ADD ON
2nd procedure - any additional memory add-on
 CB-00860-00-01

INSTALLING STARTING ADDRESS JUMPERS ON THE FIRST MEMORY EXPANSION PCB.

TP5 ○ ○ 13 TP1 ○ ○ 9 TP17 ○ ○ 21 TP25 ○ ○ 29
 TP6 ○ ○ 14 TP2 ○ ○ 10 TP18 ○ ○ 22 TP26 ○ ○ 30
 TP7 15 TP3 ○ ○ 11 TP19 ○ ○ 23 TP27 ○ ○ 31
 TP8 ○ ○ 16 TP4 12 TP20 24 TP28 32

8 MB OF MEMORY ON SYSTEM PCB

TP5 ○ ○ 13 TP1 ○ ○ 9 TP17 ○ ○ 21 TP25 ○ ○ 29
 TP6 14 TP2 ○ ○ 10 TP18 ○ ○ 22 TP26 ○ ○ 30
 TP7 ○ ○ 15 TP3 11 TP19 23 TP27 31
 TP8 ○ ○ 16 TP4 ○ ○ 12 TP20 ○ ○ 24 TP28 ○ ○ 32

16 MB OF MEMORY ON SYSTEM PCB

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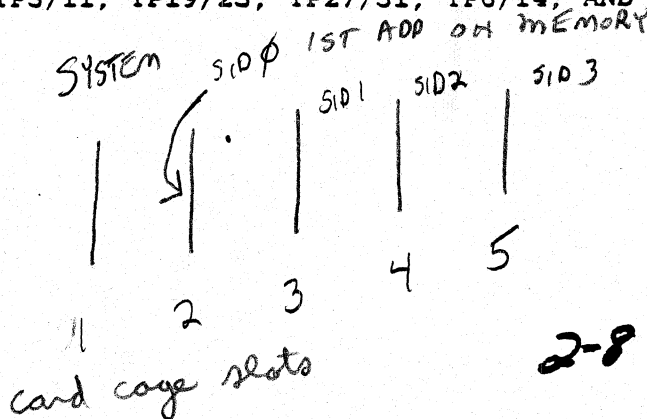
slot I.D.

○ INSTALLING SID JUMPERS ON THE FIRST MEMORY EXPANSION BOARD. INSTALL A JUMPER OVER PINS TP62/66.

○ IF THE MEMORY EXPANSION PCB BEING INSTALLED IS THE SECOND, THIRD, OR FOURTH TO BE INSTALLED, THE JUMPERS SHOULD BE ARRANGED AS FOLLOWS:

DETERMINE THE AMOUNT OF MEMORY PRESENTLY IN THE SYSTEM; (THE MEMORY ON THE SYSTEM BOARD AND ANY OTHER EXPANSION PCB), THE MEMORY SIZE OF THE EXPANSION PCB BEING JUMPED DOES NOT MATTER.

FIND THE AMOUNT OF MEMORY PRESENTLY IN THE SYSTEM ^{before adding new memory} IN THE "MEMORY SIZE" COLUMN AND INSTALL JUMPERS OVER THE PINS IN THE "JUMPER PINS" COLUMN. FOR EXAMPLE: IF A THIRD MEMORY EXPANSION PCB IS BEING INSTALLED, AND THE TOTAL MEMORY ON THE SYSTEM PCB, FIRST EXPANSION PCB, AND SECOND EXPANSION PCB IS 88 MB, INSTALL A JUMPER ON PINS TP3/11, TP19/23, TP27/31, TP6/14, AND TP7/15.



*** YOU CAN SKIP A BAD MEMORY SLOT ON AV5000**

STARTING ADDRESS JUMPER LOCATION FOR THE SECOND, THIRD, AND FOURTH MEMORY EXPANSION PCBS (1)

PLACE THESE JUMPERS ON NEW MEMORY BOARD TO BE INSTALLED

Memory Size (MB)	Jumper Pins
8. 64. 72. 128. 136. 192	TP4/12. TP20/24. TP28/32
16. 24. 80. 88 . 144. 152	TP3/11. TP19/23. TP27/31
32. 40. 96. 104. 160. 168	TP2/10. TP18/22. TP26/30
48. 56. 112. 120. 176. 184	TP1/9. TP17/21. TP25/29

STARTING ADDRESS JUMPER LOCATION FOR THE SECOND, THIRD AND FOURTH MEMORY EXPANSION PCBS (2)

Memory Size (MB)	Jumper Pins
72. 136	TP7/15
80. 144	TP6/14
24. 88 . 152	TP6/14. TP7/15
32. 96. 160	TP5/13
40. 104. 168	TP5/13. TP7/15
48. 112. 176	TP5/13. TP6/14
56. 120. 184	TP5/13. TP6/14. TP7/15
64. 128. 192	

o INSTALLING SID JUMPERS ON THE SECOND, THIRD, OR FOURTH MEMORY EXPANSION PCB. SID NUMBERS 0-3 ALLOW SOFTWARE TO IDENTIFY THE MEMORY EXPANSION PCBS. RELATE THE SID TO THE SLOT LOCATION IN THE CARD CAGE. THAT IS:

SID 0 SHOULD BE ASSIGNED TO THE PCB THAT IS INSTALLED IN CARD CAGE SLOT 2.

SID 1 SHOULD BE ASSIGNED TO THE PCB THAT IS INSTALLED IN SLOT 3.

SID 2 SHOULD BE ASSIGNED TO THE PCB THAT IS INSTALLED IN SLOT 4

SID 3 SHOULD BE ASSIGNED TO THE PCB THAT IS INSTALLED IN SLOT 5

USE THE TABLE BELOW FOR THE SID JUMPERS

SID Number	Jumper Pins
0	TP62/66
1	TP61/59. TP63/67
2	TP60/58. TP64/68
3	TP60/58. TP61/59. TP65/69

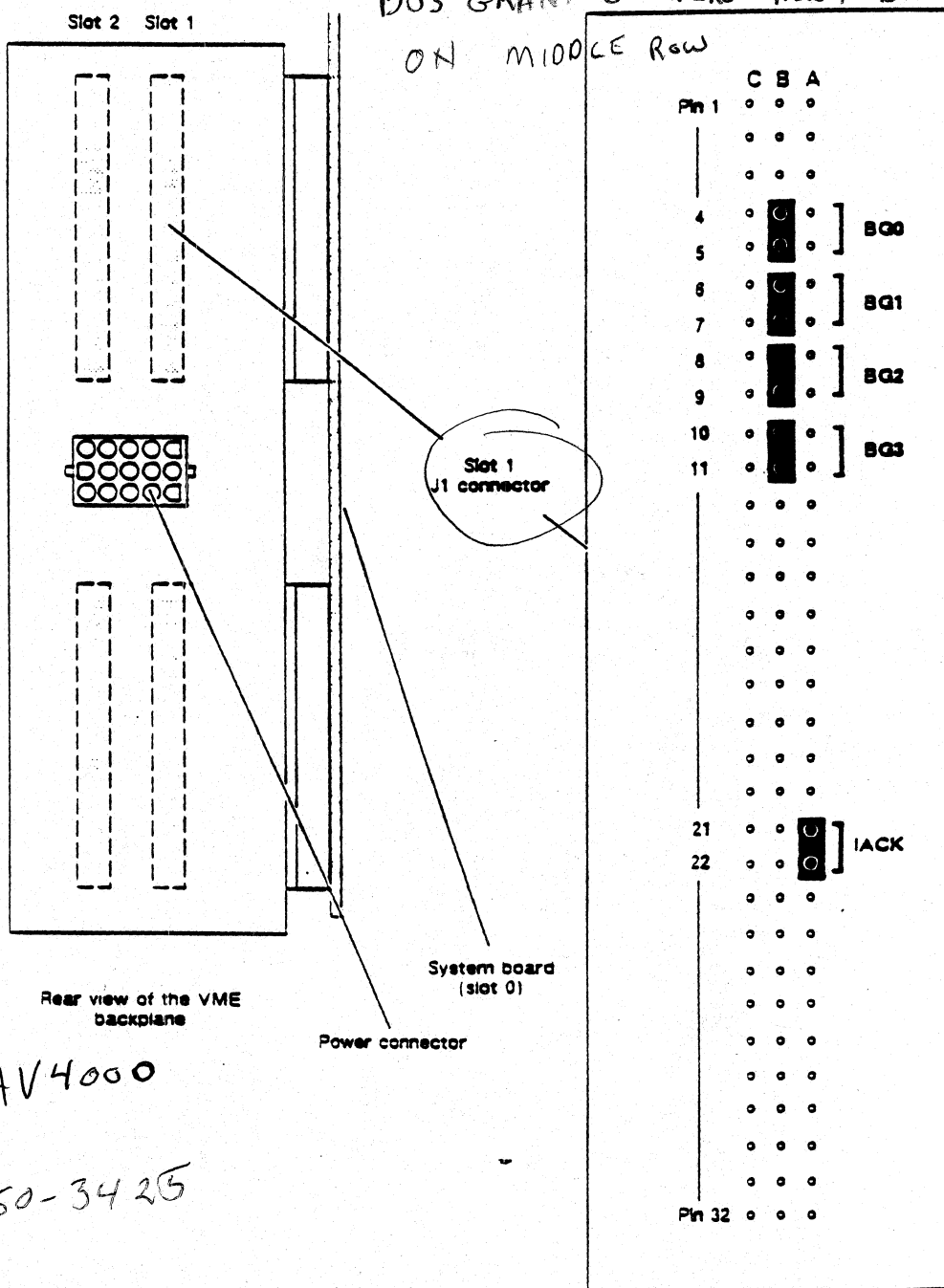
VME BUS GRANT AND REQUEST LEVELS

▷ BUS GRANT AND REQUEST LEVELS MUST BE CONFIGURED ON THE SCSI, ESDI OR SMD CONTROLLER BOARD.

▷ THE AVIION SYSTEMS USE THIS BUS FOR TRANSFERING DATA BETWEEN THE SYSTEM BOARD AND THE OTHER CONTROLLERS IN THE SYSTEM.

▷ A BUS GRANT AND REQUEST SCHEME IS USED TO DETERMINE THE BUS ACCESS THAT IS GRANTED TO THE VARIOUS CONTROLLERS.

TO JUMPER OVER AN OPEN SCOT BUS GRANT JUMPERS MUST BE USED ON MIDDLE Row



AV4000

919-850-3425

Installing Backplane Terminators

2-16

VIEWED FROM BACKPLANE

VME PRIORITY MODES

○ THERE ARE THREE PRIORITY MODES THAT THE VME BUS USES IN CONJUNCTION WITH THE BUS GRANT AND REQUEST SIGNALS;

SINGLE
PRIORITY
ROUND ROBIN

○ TWO OF THESE ARE JUMPER SELECTABLE, SINGLE AND PRIORITY, THE ROUND ROBIN MODE IS SOFTWARE PROGRAMMABLE. *- equal time to all*

○ THE BACKPLANE OF THE AVIION 5000/6000 CARRIES THESE SIGNALS TO ALL CONTROLLER SLOTS

○ THERE ARE FOUR BG/REQ LEVEL SIGNALS; BGO, BG1, BG2, BG3. BG3 IS THE HIGHEST, BGO THE LOWEST.

○ JUMPERS MUST BE INSTALLED ON ANY OPEN SLOTS IN ORDER TO PROBAGATE THE SIGNALS.

↓ ALL BOARDS HAVE SAME BG LEVEL
○ SINGLE MODE IS A DAISY CHAIN SCHEME WHERE JUMPERS HAVE BEEN INSTALLED ON ALL CONTROLLERS IN THE SYSTEM WHICH USES THE VME BUS. THE CONTROLLER WITH THE HIGHEST PRIORITY CLOSEST TO THE SYSTEM BOARD THAT IS REQUESTING THE BUS IS GRANTED ACCESS FIRST.

Different BG levels but, ↓ CAN USE SAME PRIORITY ON 2 BOARDS, BUT USUALLY ALL BG LEVELS ARE DIFFERENT
○ PRIORITY MODE IS ALSO A DAISY CHAIN SCHEME EXCEPT THAT INSTEAD OF THE CONTROLLERS HAVING THE SAME BG/REQ LEVEL, THE CONTROLLERS CAN HAVE ANY LEVEL JUMPERED (BGO-BG3). PRIORITY IS GRANTED TO THE CONTROLLER HAVING THE HIGHEST BG/REQ LEVEL AND ITS PROXIMITY TO THE SYSTEM BOARD.

○ ROUND ROBIN MODE IS SOFTWARE PROGRAMMABLE, THIS MODE ADJUSTS THE BUS TO CYCLE THROUGH ALL THE LEVELS. IF THE SYSTEM BOARD JUST ACKNOWLEDGED A REQUEST OF BG3 IT WOULD THEN HONOR A REQUEST OF BG2 AND SO ON UNTIL IN CYCLES BACK TO BG3.

○ THE BACKPLANE ALSO HAS IACK PRIORITY JUMPERS 1-7. THESE LINES MUST ALSO BE JUMPERD IF A SLOT IS OPEN TO PASS THE SIGNALS ALONG.

* ○ THE TABLE "BOARD SLOT PRIORITY" LISTS THE VME OPTION BOARDS WE SUPPORT IN ORDER OF SUGGESTED SLOT PRIORITIES.

○ ALWAYS JUMPER OVER ANY OPEN SLOT, ALWAYS REMOVE ANY JUMPERS WHEN ADDING A OPTION CARD FOR A PARTICULAR SLOT.

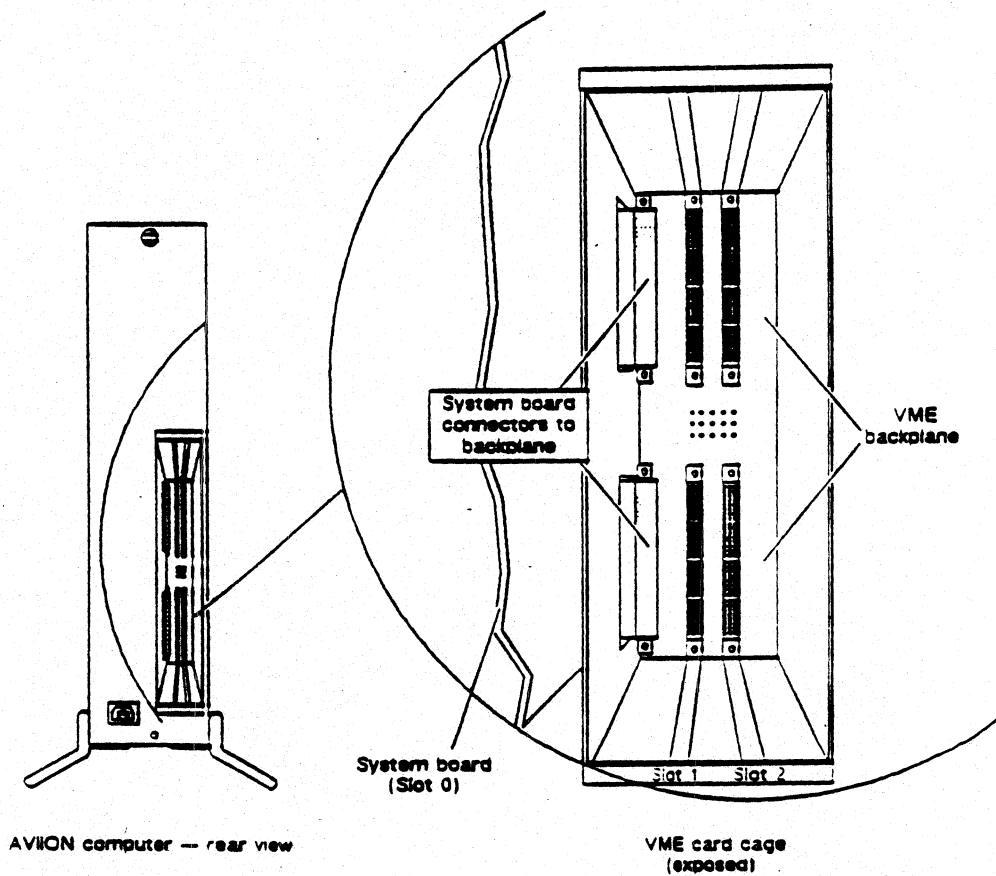
SEE 3-2 expanding the AV5000

SLOT ASSIGNMENTS

SLOT ASSIGNMENTS ARE AS FOLLOWS: THE SYSTEM BOARD ALWAYS OCCUPIES THE FIRST SLOT ON THE VME BUS (SLOT 0), THE SLOT CLOSEST TO THE SYSTEM BOARD WILL BE SLOT ONE, SLOT 2 IS NEXT ETC.

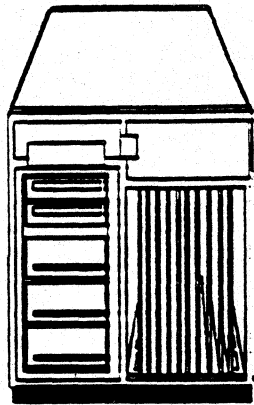
AV1000 400/400/3000 WILL HAVE SLOTS AS SHOWN BELOW.

AV1000 5000/6000 HAVE EITHER 6 OR 10 SLOTS FOR THE VME OPTION CARDS.

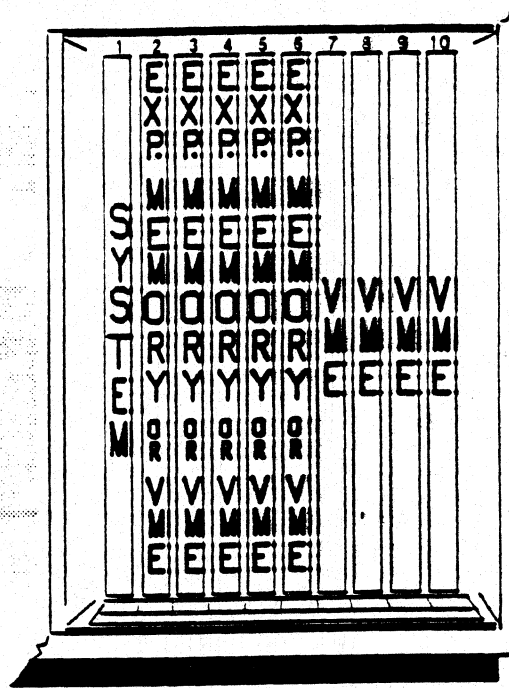


Board Slots in the VME Card Cage

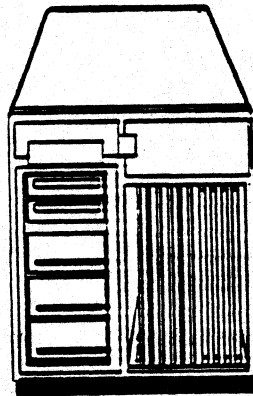
AViion 5000/5010 BOARD ARRANGEMENT



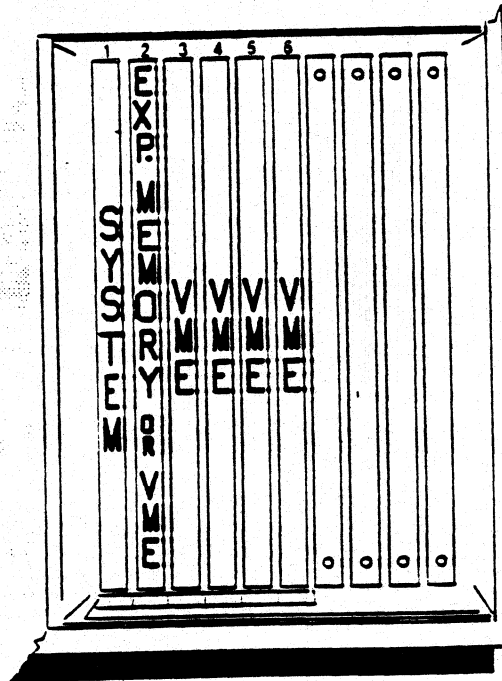
Front view
(front panel removed)



AViION 5000 Board Arrangement

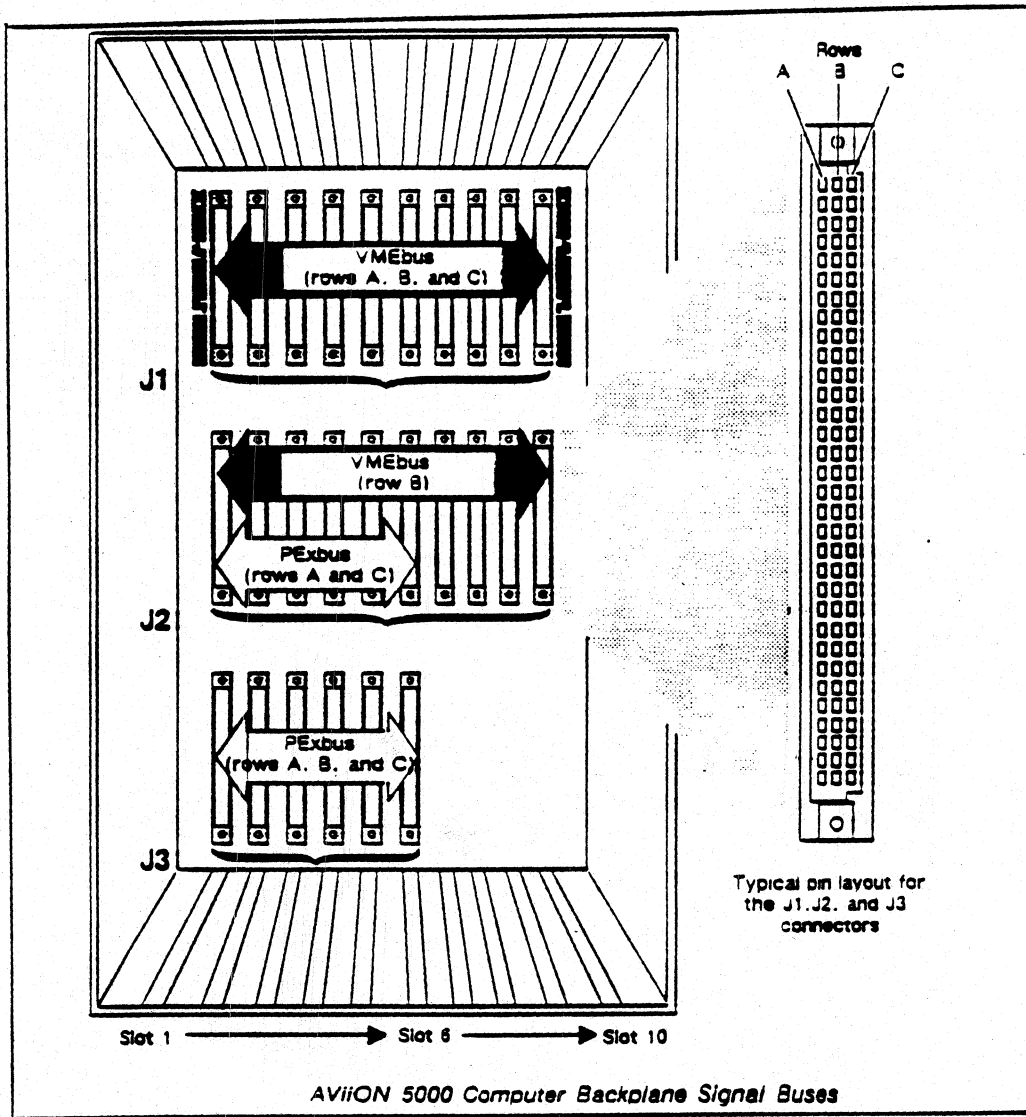


Front view
(front panel removed)

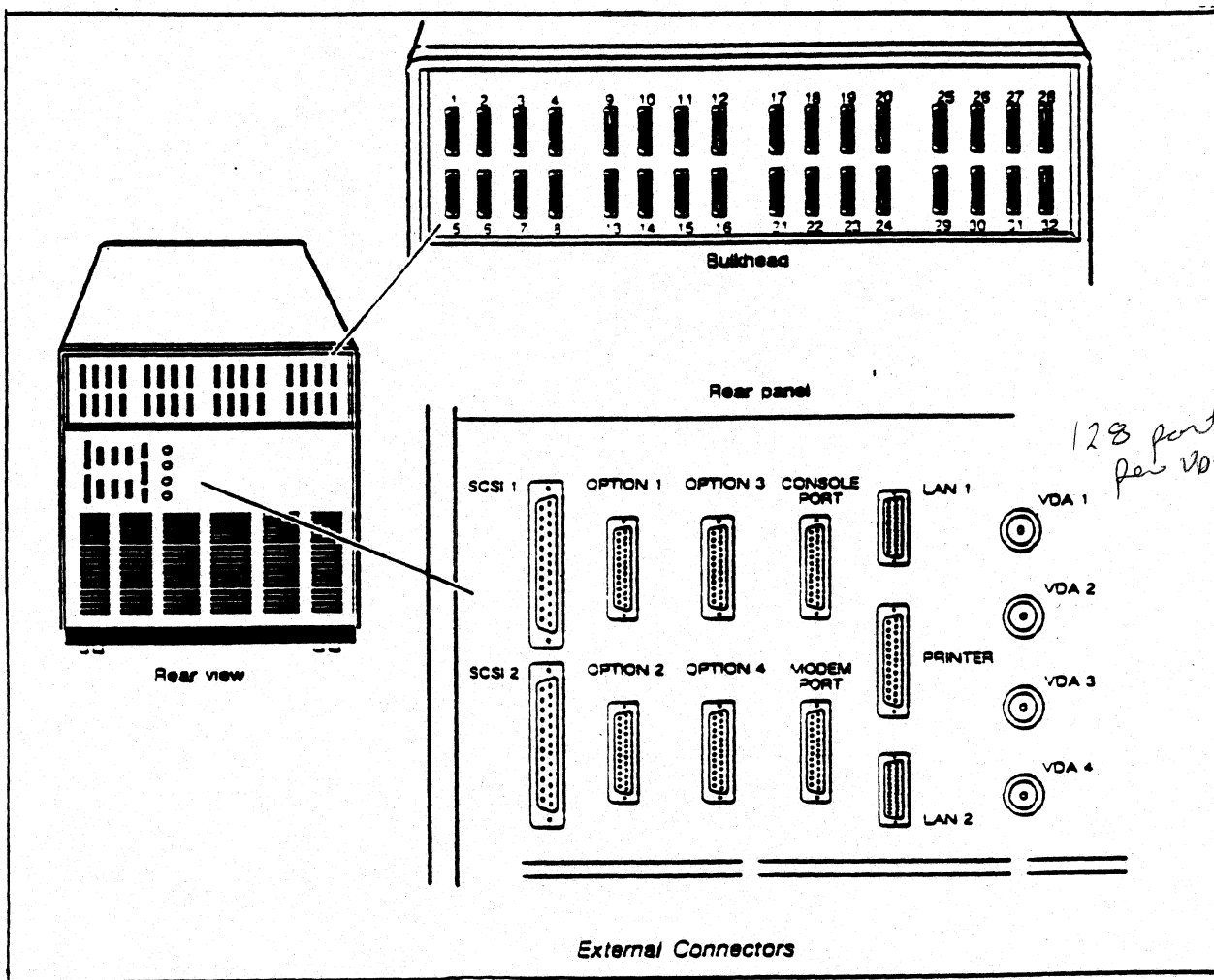


AViION 5010 Board Arrangement

AViON 5000 SERIES BACKPLANE SIGNAL BUSES

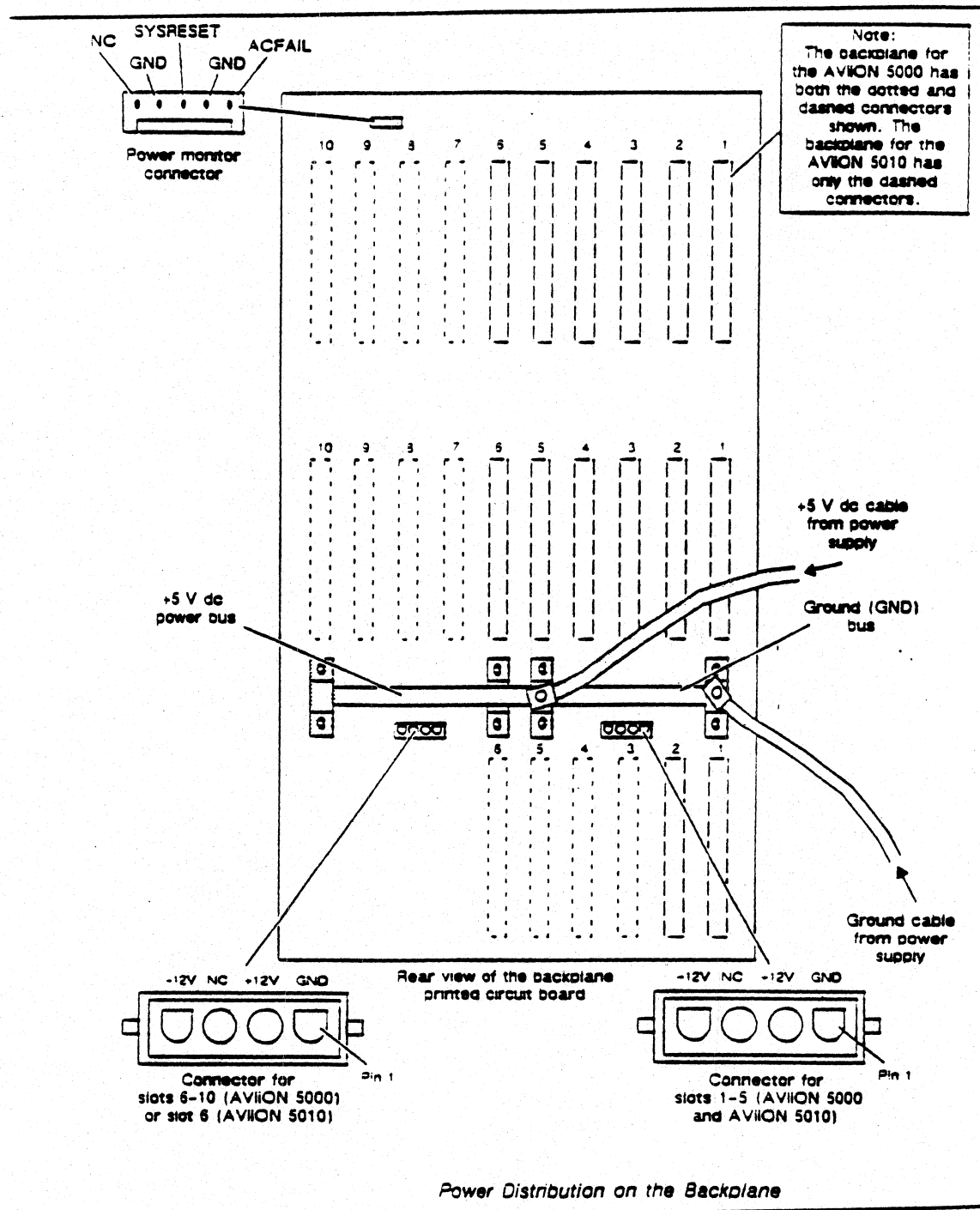


AVIIon 5000 EXTERNAL CONNECTORS



7 devices per SCSI
 FFFF 300 default SCSI address
 FFFF 500 additional SCSI address

AVIION 5000/6000 POWER DISTRIBUTION



AViiON 5000/6000 CURRENT DRAW REQUIREMENTS

Current Requirements for Boards and Drives

Board/Drive Name (Model Number)	Current (Amperes)		
	-5 V dc	+12 V dc	-12 V dc
System Boards			
Single CPU/8 Mbytes 25 MHz ¹ 20 MHz ²	22.00	.00	.01
or			
Single CPU/16 Mbytes 25 MHz ¹ 20 MHz ²	23.00	.00	.01
or			
Dual CPU/16 Mbytes 25 MHz ¹ 20 MHz ²	24.00	.00	.01
Expansion Memory Boards			
16 Mbytes (7001)	7.70	NA	NA
or			
32 Mbytes (7002)	9.00	NA	NA
or			
48 Mbytes (7003)	10.50	NA	NA
I/O Boards			
SCSI Adapter (7407)	2.60	NA	NA
ESDI Controller (NA) ¹	4.30	NA	.50
VDA/128 (7401)	3.40	NA	.17
VSC/4 (7404)	3.40	.07	.07
VAC/16 (7400)	4.50	.25	.25
VLC (7405)	2.80	.45	NA
Internal Mass-Storage Drives			
SCSI cartridge tape drive (6577-1)	0.66	1.50	NA
ESDI 322 Mbyte disk drive (6442-1) ¹	2.00	2.50 ³	NA
ESDI 648 Mbyte disk drive (6555-1) ¹	2.00	2.50 ³	NA
SCSI 322 Mbyte disk drive (6491-1) ²	2.00	2.50 ³	NA
SCSI 648 Mbyte disk drive (6554-1) ²	2.00	2.50 ³	NA

¹ Available for the AViiON 5000 computer only.

² Available for the AViiON 5010 computer only.

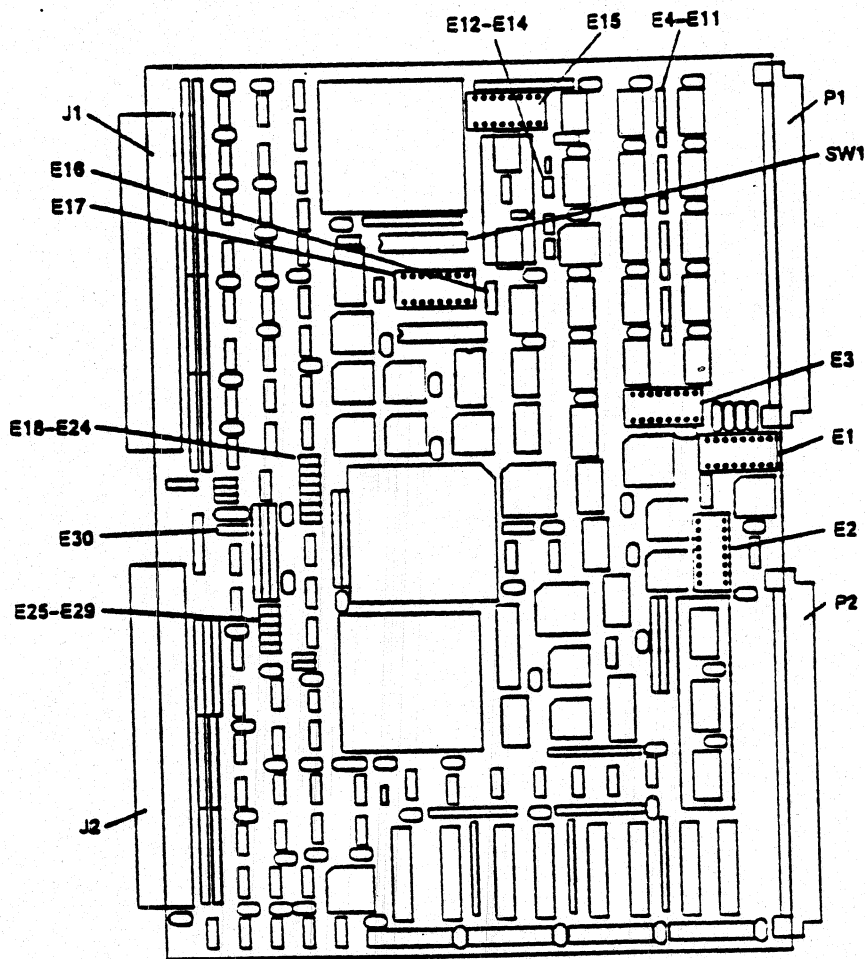
³ Typical current draw shown. Peak current draw during spin up is 4.00 amperes.
NA = not applicable

JUMPERING A VAC/16 OPTION CARD

WHEN YOU RECIEVE A VAC/16 CARD FROM US, VERIFY THAT THE DEFUALT JUMPERS ARE CORRECT FOR BOARD 0. TO RECONFIGURE THE VAC/16 TO NOTHER NUMBER, LOCATE THE BOARD NUMBER IN THE FOLLOWING TABLE AND REMOVE OR INSTALL THE JUMPERS INDICATED IN THE RECTANGLES.

DGUX ONLY RECOGNIZES ASYNCHRONOUS DEVICES AS THE SAME DEVICE NAMES, (VDA/128/VAC/16), NEVER JUMPER BOTH BOARDS THE SAME, GIVE THEM NIQUE BOARD NUMBERS.

SEE NEXT PAGE



CD-00864-00-01

VAC/16 Jumper, SW1, and Connector Locations

SEE setting up an installing VME BUS OPTIONS
 2-5
 4/2 depending the AVS000

Jumper Settings for VAC/16 Boards 0-1

Jumper Pins	Board Number		Function	
	0	1		
E1	1-2	In	In	Address bit A23
	3-4	In	In	Address bit A22
	5-6	In	In	Address bit A21
	7-8	In	In	Address bit A20
	9-10	In	In	Address bit A19
	11-12	In	In	Address bit A18
	13-14	In	<u>Out</u>	Address bit A17
	15-16	In	In	Address bit A16
E2	1-2	In	In	Address bit A31
	3-4	Out	Out	Address bit A30
	5-6	Out	Out	Address bit A29
	7-8	In	In	Address bit A28
	9-10	In	In	Address bit A27
	11-12	In	In	Address bit A26
	13-14	In	In	Address bit A25
	15-16	In	In	Address bit A24
E3	1-2	Out	Out	Interrupt request
	3-4	Out	Out	See Note 1
	5-6	Out	Out	See Note 1
	7-8	In	In	See Note 1
	9-10	Out	Out	See Note 1
	11-12	Out	Out	See Note 1
	13-14	Out	Out	See Note 1
E4	2-3	In	In	BG 0 primary jumper
E5	2-3	In	In	BG 1 primary jumper
E6	2-3	In	In	BG 2 primary jumper
E7	1-2	In	In	BG 3 (selected level)
	3-4	In	In	BG 3 (selected level)
E8	1-2	Out	Out	Bus Request 0
E9	1-2	Out	Out	Bus Request 1
E10	1-2	Out	Out	Bus Request 2
E11	1-2	In	In	Bus Request 3 (selected level)
E12	1-2	Out	Out	Extended addressing
E13	1-2	Out	Out	Extended addressing
E14	1-2	In	In	DPRAM super space

Notation

In
 Out

In or Out

Indicates

Jumper installed.
 Jumper removed.

Jumpers that you must install (in) or remove (out) in the field—
 all other jumpers are factory configured as indicated.

(continued)

Note 1: These interrupt jumpers operate with E21, E22, and E23.

Jumper Settings for VAC/16 Boards 0-1

Jumper Pins	Board Number		Function	
	0	1		
E15	1-2	Out	<input type="checkbox"/> In	Interrupt vector D0
	3-4	Out	Out	Interrupt vector D1
	5-6	Out	Out	Interrupt vector D2
	7-8	Out	Out	Interrupt vector D3
	9-10	Out	Out	Interrupt vector D4
	11-12	In	In	Interrupt vector D5
	13-14	In	In	Interrupt vector D6
	15-16	Out	Out	Interrupt vector D7
E16	2-3	In	In	27256 EPROMS
E17	1-2	In	In	Address bit A13; see Note 2
	3-4	In	In	Address bit A12; see Note 2
	5-6	In	In	Address bit A11; see Note 2
	7-8	In	In	Address bit A10; see Note 2
	9-10	In	In	Address bit A9; see Note 2
	11-12	In	In	Address bit A8; see Note 2
	13-14	Out	Out	Unused
	15-16	Out	Out	Unused
E18		In	In	Address bit A15
E19		In	In	DPRAM program space
E20		In	In	DPRAM data space
E21		Out	Out	See Note 3
E22		In	In	See Note 3
E23		In	In	See Note 3
E24		In	In	Address bit A14
E25		Out	Out	12.5 ms RTC
E26		Out	Out	25.0 ms RTC
E27		In	In	50.0 ms RTC
E28		Out	Out	100.0 ms RTC
E29		Out	Out	SYSFAIL
E30	2-3	In	In	DCD termination

Notation

In
Out

In or Out

Indicates

Jumper installed.
Jumper removed.

Jumpers that you must install (*in*) or remove (*out*) in the field—
all other jumpers are factory configured as indicated.

(concluded)

Note 2: These jumpers installed for convenience. They have no meaning unless E12 is in.

Note 3: These interrupt jumpers operate with E3.

Table 2-5 SW1 Switch-Pack Settings for VAC/16 Boards

Switch No.	Description	Switch Position
1	Reserved	Off
2	Self Test	On
3	Self Test	Off
4	Self Test	Off
5	Self Test	Off
6	Reserved	Off
7	Long word transfer	Off
8	Reserved	Off

Avion SCSI BUS CONFIGURATION RULES

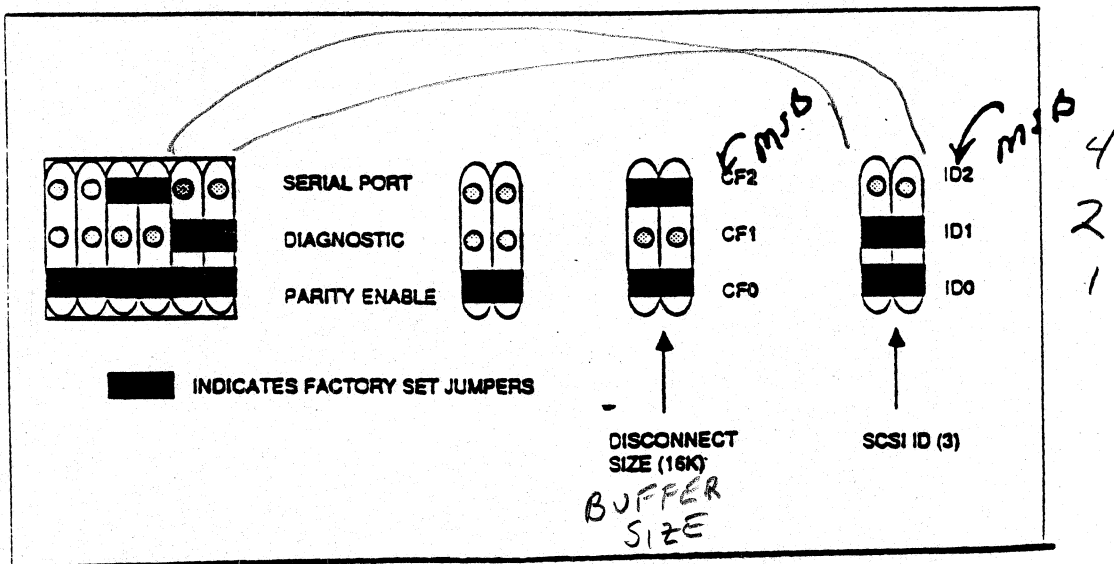
Avion SYSTEMS CAN SUPPORT A NUMBER OF SMALL COMPUTER SYSTEMS INTERFACES (SCSI). THE FOLLOWING RULES APPLY TO ALL Avion PRODUCTS WITH THE EXCEPTION OF THE AV 3000 SERIES WHICH DOES NOT SUPPORT EXTERNAL SCSI DEVICES.

- ▷ THE SCSI BUS CAN SUPPORT UP TO SEVEN SCSI DEVICES PER ADAPTER, THIS WOULD INCLUDE BOTH INTERNAL AS WELL AS EXTERNAL DRIVES.
- ▷ THE MAXIMUM LENGTH OF THE BUS MUST NOT EXCEED 6 METERS. *~ 19'*
- ▷ THE SCSI BUS MUST BE TERMINATED ON THE LAST SCSI DEVICE ON THE BUS. IF THERE ARE NO EXTERNAL DEVICES, TERMINATE THE BUS AT THE REAR OF THE COMPUTER LABELED "SCSI" OR "SCSI 1".
- ▷ DEVICE IDENTIFICATION IS PROVIDED THROUGH JUMPERS ON THE SPECIFIC DEVICE, EACH DEVICE ON THE BUS MUST HAVE A UNIQUE ID. FROM 0-6, USE THE TABLE BELOW AS A RECOMMENDED METHOD OF ASSIGNING SCSI IDS..

Device	SCSI Device ID
First disk	0
Second disk	1
Third disk	2
Fourth disk	3
First tape (internal)	4 (preset)
Second tape	5
Third tape	6

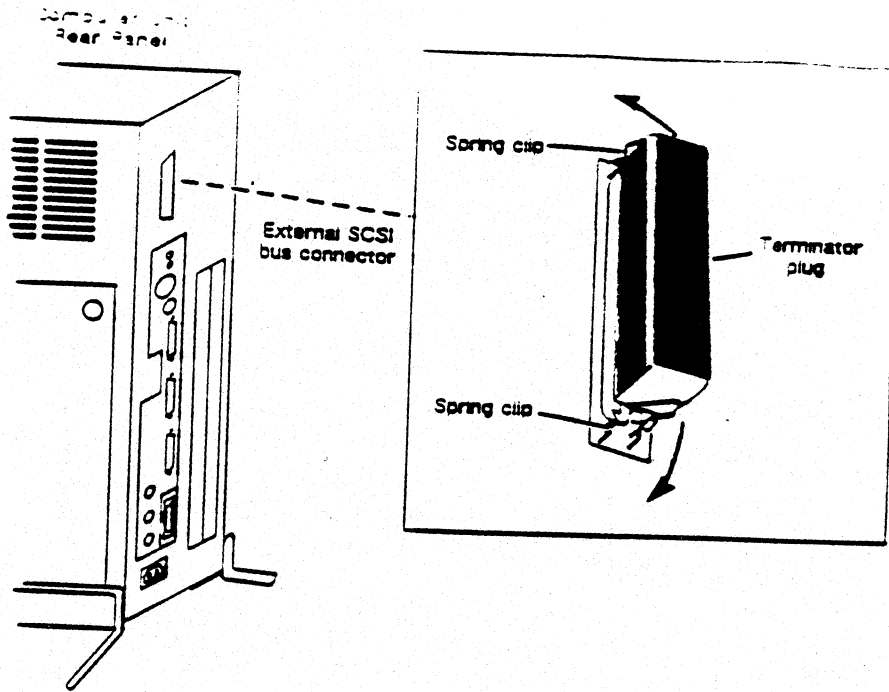
ASSIGNING SCSI ID THREE TO A QIC 150 MB TAPE

OK TAPE DRIVE

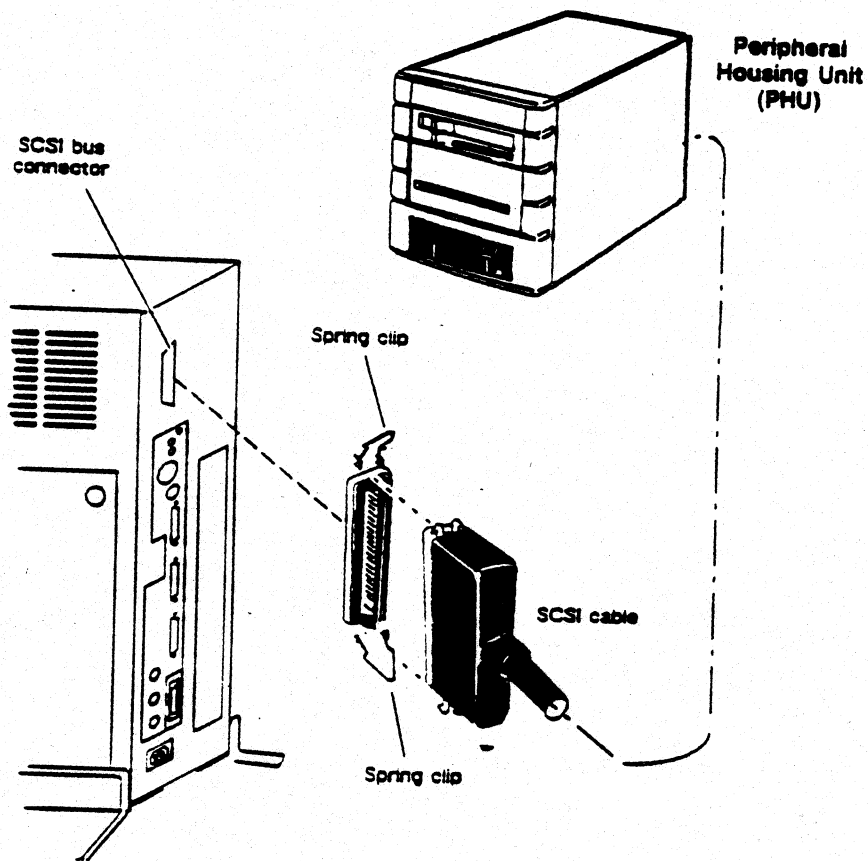


SO AS NOT TO HOG BUS

2-22

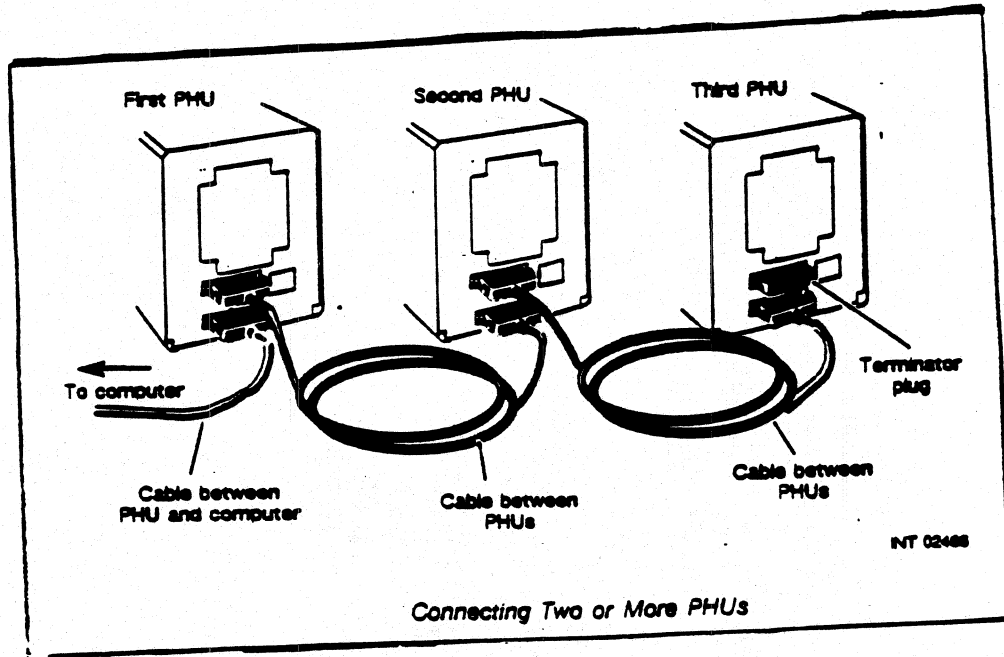


Removing the AVIIION 4000 Series SCSI Bus Terminator



Connecting the External SCSI Bus Cable to the Computer Unit Connector

DAISY CHAIN



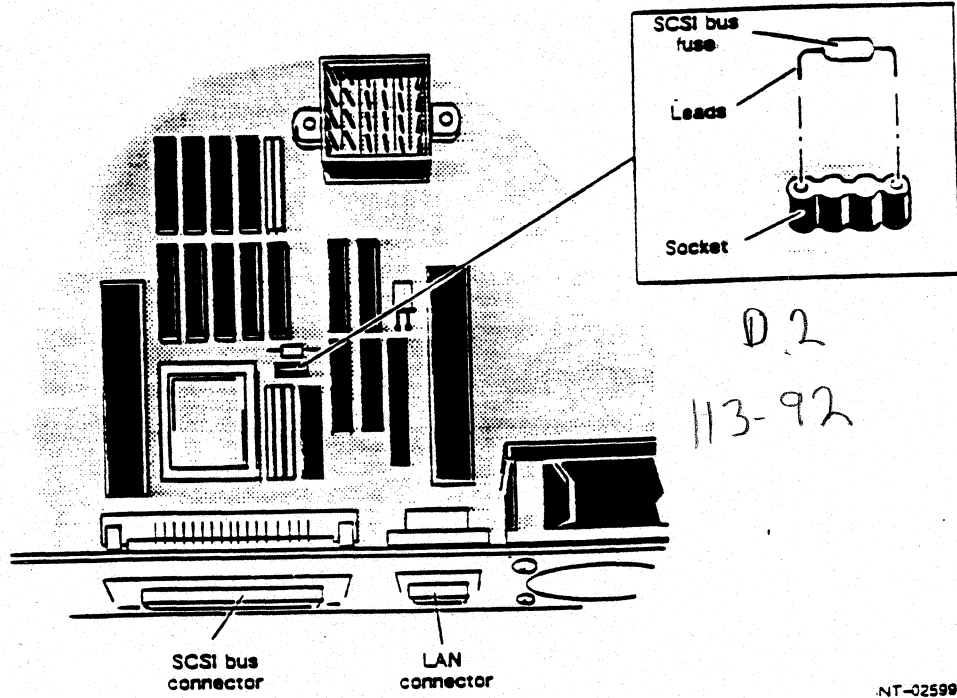
SYSTEM BOARD FUSE AND PROM LOCATIONS

REMEMBER TO ALWAYS USE A ESD STATION WHEN WORKING WITH THE SYSTEM BOARD.

AVIion 300 STATIONS

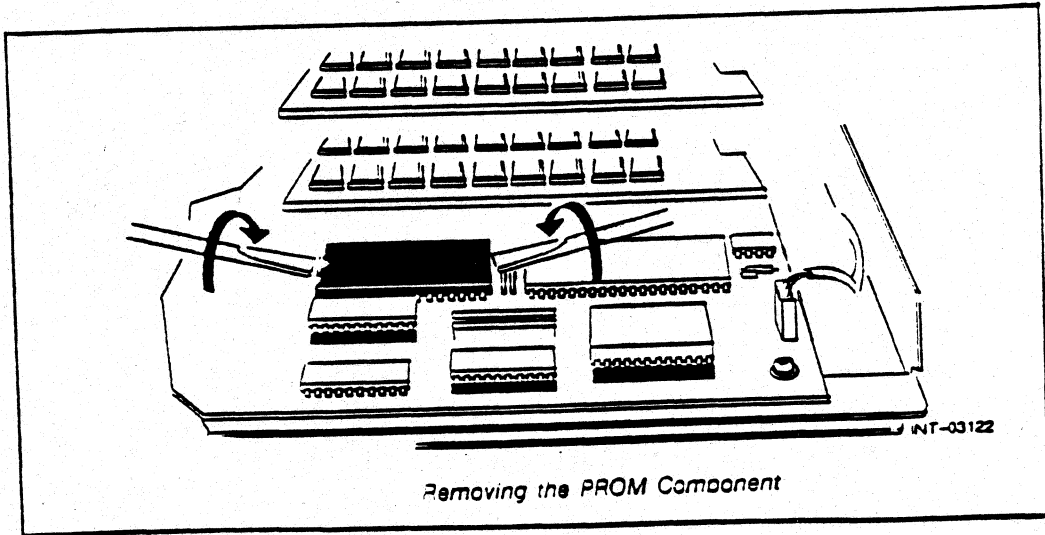
Replacing the SCSI Bus Fuse

1. With the power supply removed, locate the SCSI bus fuse on the printed circuit board as shown in Figure 5-7.



NT-02599

Removing or Installing the SCSI Bus Fuse

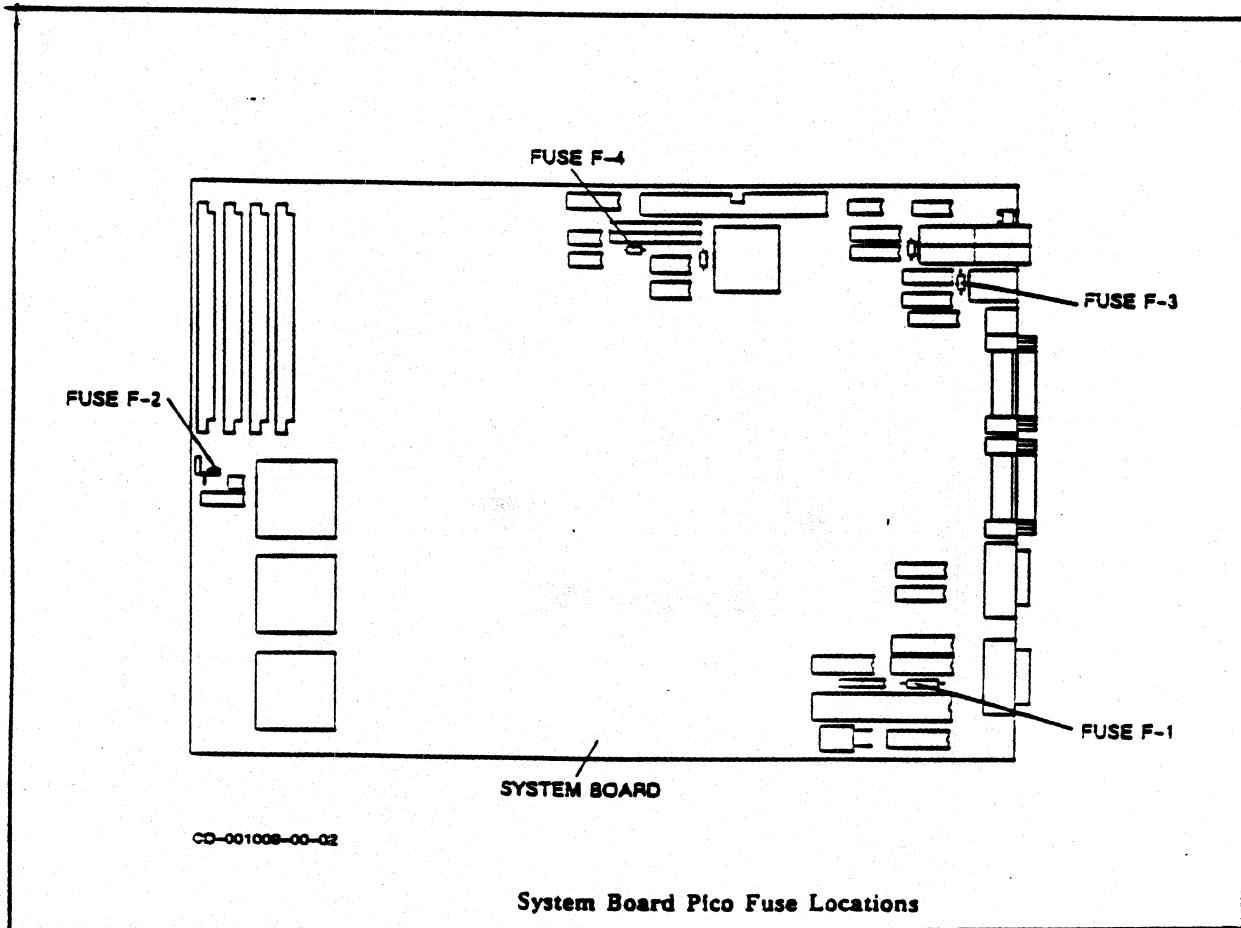


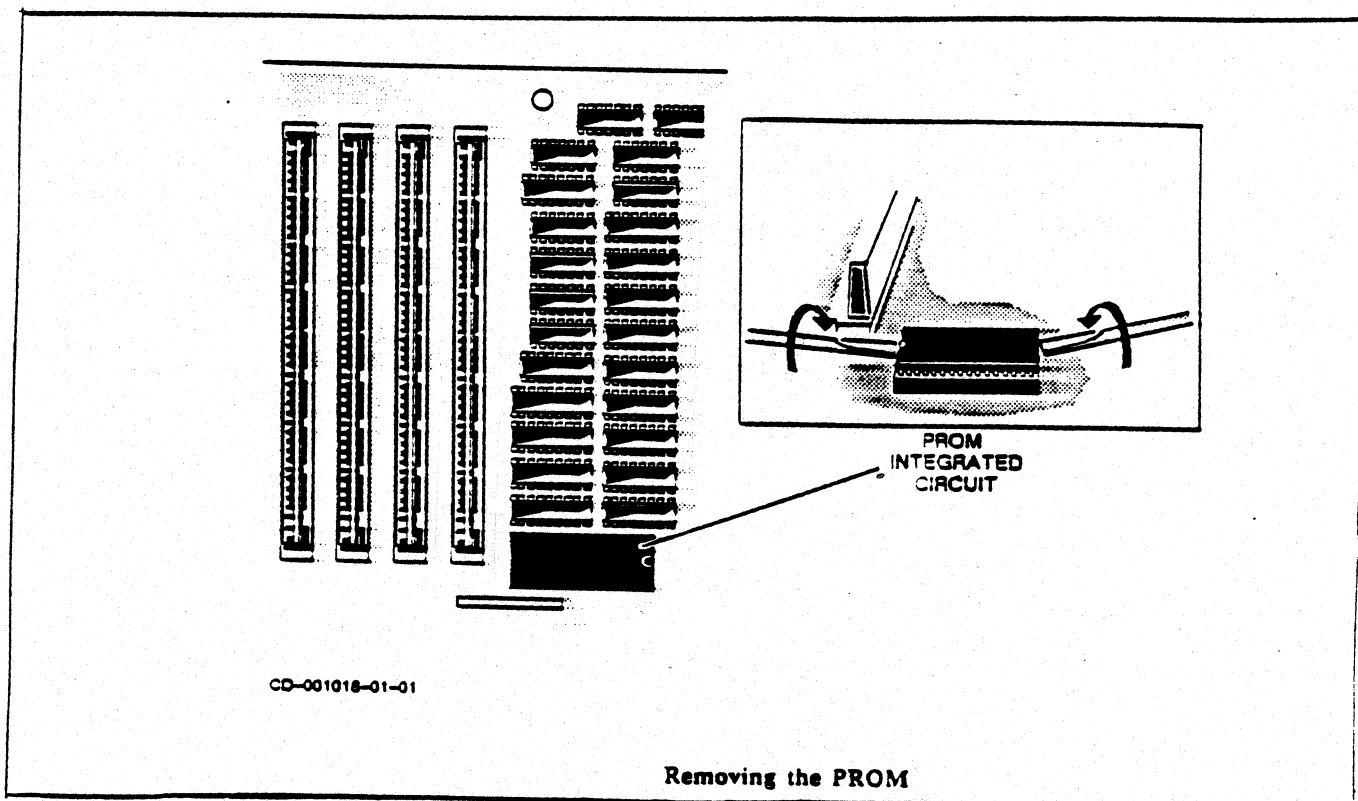
Removing the PROM Component

2-25

AViion 400/3000/4000 SERIES

- ▷ F-1 ETHERNET LAN BOARD
- ▷ F-2 SPEAKER (AV 400 ONLY)
- ▷ F-3 KEYBOARD (AV 400 ONLY)
- ▷ F-4 SCSI DRIVE UNITS





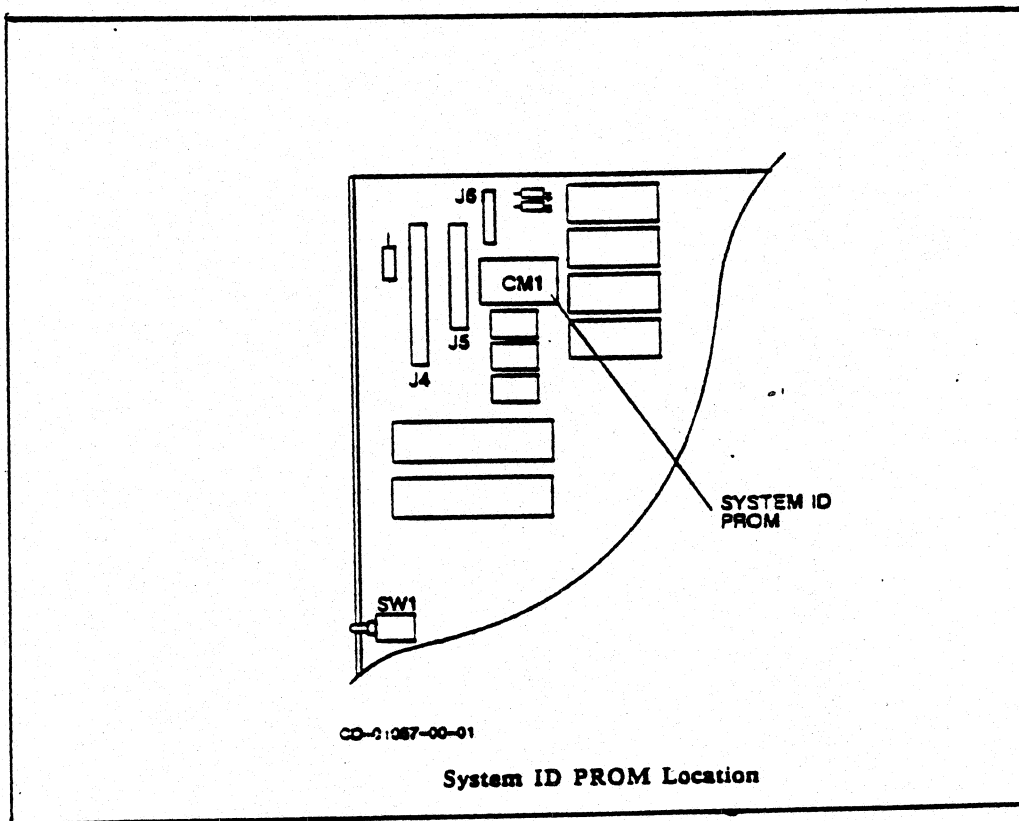
AVIION 5000/6000 SERIES LEDS/JUMPERS/SWITCHES

THE AVIION 5000/6000 SERIES SYSTEM BOARDS HAVE THREE LEDS ON THEM, THE RED LED WHEN LIGHTED INDICATES A SYSTEM FAILURE. THE YELLOW LED INDICATES A RESET CONDITION, AND THE GREEN LED INDICATES ACTIVITY ON THE M-BUS.

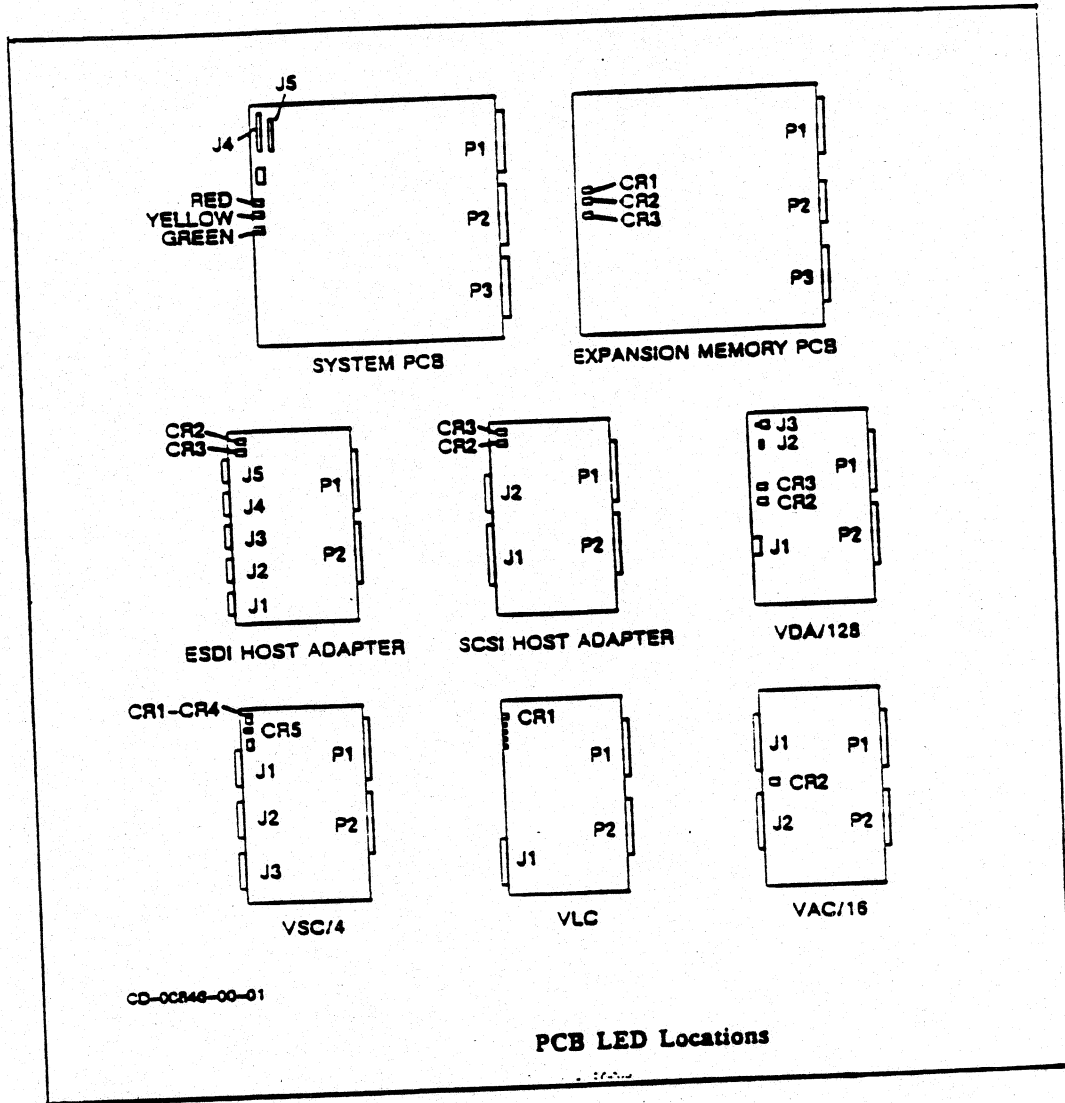
THERE ARE TWO SWITCHES ON THE SYSTEM BOARD. A EIGHT POSITION SWITCH IS RESERVED FOR FUTURE USE WHEN OPERATING MULTIPLE SYSTEM BOARDS ON THE SAME VME BUS. THE FIVE POSITION SWITCH (BIT 5) MUST BE ACTIVATED ON THE BOARD THAT HAS BEEN DESIGNATED THE MASTER.

THE SINGLE JUMPER MUST BE INSTALLED TO RUN DG/UX OPERATING SYSTEM.

OUT FOR MAGIC

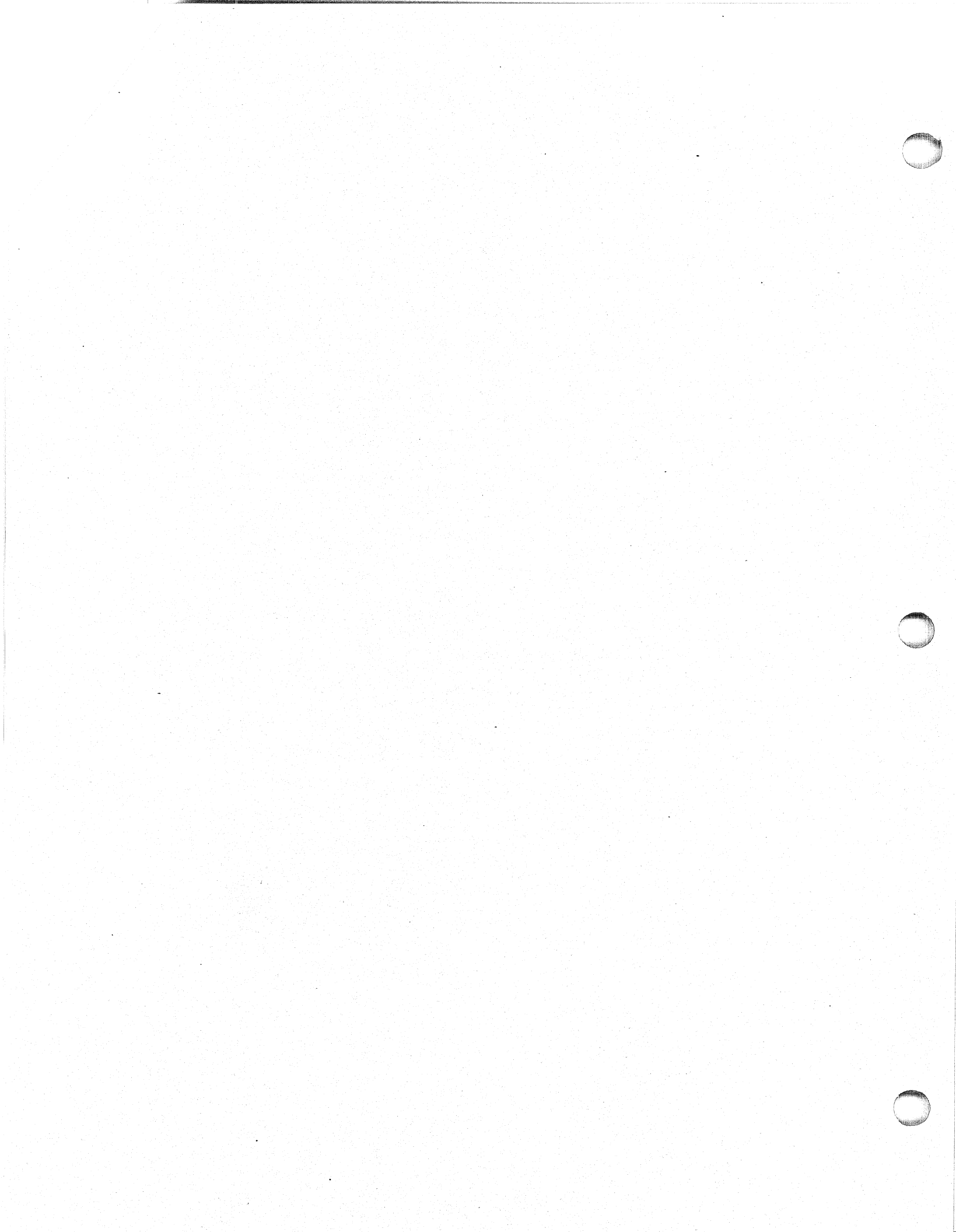


PCB LED LOCATION AND INTERPRETATIONS



PCB LED Interpretation

PCB	LED	Meaning When Lit
System	Red Yellow Green	System failure. Indicates a reset condition. Flashes to indicate activity on the CPU M-bus.
Memory Expansion	CR1 CR2 CR3	Lights steady red for hard error. Flashes yellow to indicate read/write access. Flashes green to indicate refresh cycles.
VDA/128 Asynchronous Communications Controller	CR2 CR3	Tri-color LED blinks red if controller power-up tests fail. Red when VME SYSFAIL signal asserted.
ESDI Host Adapter	CR2 CR3	Green for VME bus activity. Yellow for PCB failure.
SCSI Host Adapter	CR2 CR3	Green for VME bus activity. Yellow for PCB failure.
VAC/16 16-line Asynchronous Communication Multiplexer	CR2	Tri-color LED blinks amber until self-test passes. Green when self-test passes. Red for PCB failure.
VSC/4 Synchronous Communication Controller	CR1 thru } CR4 CR5	Blinking red if power-up tests fail. Red when VME SYSFAIL signal asserted.
VLC IEEE802.3 LAN Controller	CR1	Red for PCB failure. (Four small LEDs indicate VME bus activity and Ethernet network activity).



MODULE 3
FRU REMOVAL AND REPLACEMENT

OBJECTIVES:

1. IDENTIFY, REMOVE, AND REPLACE THE SYSTEM BOARD, OPTION CARDS, EXPANSION MEMORY BOARDS, POWER SUPPLY, BLOWER UNIT, AND BACKPANEL (OPTIONAL) ON THE AVIION 5000/6000 SERIES COMPUTER.
2. IDENTIFY, REMOVE, AND REPLACE THE INTERNAL PERIPHERAL DEVICES IN THE AVIION 5000/6000 SERIES COMPUTER.
3. IDENTIFY THE CORRECT PROCEDURES FOR REMOVING AND REPLACING THE SYSTEM BOARD, POWER SUPPLY, FAN, AND SPEAKER ON THE AVIION 300/400/4000/3000 SERIES COMPUTER.

REMOVAL AND REPLACEMENT
AVIION 5000 REMOVAL PROCEDURES

NOTE

ALWAYS TURN THE POWER OFF AND DISCONNECT THE AC LINE BEFORE REMOVING THE COVERS AND FRUS.

TO GAIN ACCESS TO THE SYSTEM FRUS THE FRONT COVER MUST BE REMOVED.

RELEASE THE CAPTIVE SCREW AT THE BOTTOM OF THE COVER

INSERT THE BLADE OF A SCREWDRIVER IN THE SLOT ON EACH SIDE OF THE TOP COVER AND POP IT OFF.

NEXT, REMOVE THE TOP COVER BY PUSHING DOWN ON IT WHILE SLIDING IT FORWARD ABOUT TWO INCHES... NOW LIFT THE COVER OFF...

THE REAR COVER SHOULD NOT HAVE TO BE REMOVED TOTALLY TO GAIN ACCESS TO THE SYSTEM FRUS BECAUSE IT IS HINGED. BUT IF IT MUST BE REMOVED, FIRST DISCONNECT THE CABLES WHICH ARE CONNECTED TO THE PORTS ON THE REAR...

THEN, REMOVE THE SCREWS ON THE RIGHT SIDE OF THE COVER.

SWING THE DOOR OPEN.

NEXT, DISCONNECT THE INTERNAL CABLES...

TO REMOVE THE ASYNCHRONOUS CONNECTOR PANAL YOU MAY HAVE TO DISCONNECT CABLES FROM THE CONNECTORS ON THE REAR OF THE CONNECTOR PANEL BEFORE REMOVING THE PANEL.

NEXT, REMOVE THE SCREWS ON BOTH SIDES OF THE PANEL...

LIFT THE PANEL OFF SLOWLY... DISCONNECT THE 64 PIN CONNECTOR ATTACHED TO THE SPREADER PANEL.

NOW REMOVE THE THE 9U AND 6U PCBS.

FIRST, REMOVE THE TWO SRCEWS HOLDING THE 9U PCB FRAME TO THE CARD CAGE...

NOW, SQUEEZE THE TWO HANDLES SIMULTANEOUSLY TOWARDS THE CENTER OF THE FRAME AND SLIDE THE PCB FRAME FAR ENOUGH OUT OF THE CARD CAGE SO THAT THE CLAMP HOLDING THE CABLES AGAINST THE PCB CAN BE REMOVED....

REMOVE THE CLAMP BY LIFTING THE BOTTOM OF IT OUT AND UP.

SLIDE THE PCB OUT SO THAT THE CABLE CONNECTORS CAN BE DISCONNECTED FROM THE PCB...THEN SLIDE THE PCB FRAME COMPLETELY OUT OF THE CARD CAGE...

TO REMOVE A PERIPHERAL DEVICE THE PERIPHERAL CHAMBER MUST BE OPENED BY FIRST REMOVING THE FOUR SCREWS...

PULL THE CHAMBER FORWARD BY THE HANDLE UNTIL IT STOPS IN THE EXTENDED POSITION...

GRASP THE TOP OF THE CHAMBER AND SWING THE TOP OUT AND DOWN UNTIL THE RETAINING ARMS ARE FULLY EXTENDED.

FOR THIS LAB WE WILL REMOVE A DISK DRIVE. THE PROCEDURES FOR REMOVING A TAPE DRIVE ARE SIMILAR. FIRST, DISCONNECT THE CABLE CONNECTORS FROM THE REAR OF THE DRIVE...

AFTER THESE CABLES ARE REMOVED SWING THE CHAMBER BACK UPRIGHT...

NEXT, REMOVE THE SCREWS ON THE FRONT OF THE DRIVE AND SLIDE THE DRIVE OUT OF THE CHAMBER.

POWER SUPPLY

OPEN THE REAR COVER ...DISCONNECT THE THE POWER SWITCH CABLE AND THE BLOWER ASSEMBLY CABLE FROM CONNECTORS J2 NAD J3 OF THE POWER SUPPLY...

DISCONNECT THE CABLES FROM CONNECTORS J1, P3, AND P4 OF THE POWER SUPPLY...

REMOVE THE TWO PLASTIC SHIELDS; THE VERTICAL SHIELD IS SECURED BY A SINGLE HEX NUT, WHILE THE HORIZONTAL SHIELD IS SECURED BY TWO HEX NUTS...

REMOVE THE HEX NUT AND WASHER SECURING THE BRACKET ON THE LEFT SIDE OF THE MODULE, DISCONNECT THE RED (+5VDC) AND BLACK (+5VDC GROUND) BUSS WIRES CONNECTED TO THE POWER SUPPLY ...

REMOVE SCREWS, LOCKWASHERS, AND WASHERS AT THE TOP AND BOTTOM OF THE SUPPLY AND SLIDE THE UNIT OUT OF THE CHASSIS.

BLOWER ASSEMBLY

REMOVE THE TOP COVER, DISCONNECT THE CABLE ON THE TOP LEFT OF THE BLOWER ASSEMBLY, REMOVE THE THREE SCREWS ON THE FRONT AND THE TWO SCREWS ON THE RIGHT SIDE AND LIFT THE BLOWER OUT.

BACKPLANE

THE BACKPLANE WILL BE EASIER TO REMOVE WITH ALL BOARDS AND POWER SUPPLY REMOVED FROM THE SYSTEM.

REMOVE THE 16 SCREWS THAT SECURE THE BACKPLANE TO THE CHASSIS MAKING SURE YOU DON'T LOSE THE WHITE WASHERS THAT ACCOMPANY EACH SCREW, AND REMOVE THE BACKPLANE.

AVIION 5000 REPLACEMENT

ALIGN THE BACKPLANE AND REPLACE THE SCREWS

ALIGN THE POWER SUPPLY AND SECURE IT TO THE CHASSIS.

CONNECT THE RED AND BLACK CABLES.

MAKE SURE ANY SWITCHES AND JUMPERS ARE CONFIGURED CORRECTLY BEFORE INSTALLING ANY PERIPHERALS. SLIDE THE DEVICE IN THE CHAMBER AND SECURE IT WITH THE SCREWS....

SWING THE CHAMBER OUT AND ATTATCH THE CABLE CONNECTORS ON THE REAR OF THE DEVICE. SWING THE CHAMBER UP AND SECURE WITH THE SCREWS.

SLIDE IN ANY PCBS THAT HAVE BEEN REMOVED MAKING SURE THEY ARE CORRECTLY JUMPERED. SECURE TO THE CARD CAGE WITH THE SCREWS.

TO REPLACE THE SPREADER PANEL, SET THE PANEL IN POSITION ON THE CONNECTOR PANEL...

NEXT, CONNECT THE 64 PIN CABLE CONNECTOR FROM THE ASYNCHRONOUS CONTROLLER TO THE CONNECTOR.

THE ASYNCHRONOUS CONNECTOR PANEL IS REPLACED BY SETTING THE PANEL IN PLACE AND SECURING THE SCREWS ON EACH SIDE OF THE PANEL.

TO REPLACE THE REAR COVER, POSITION THE COVER AND THEN RECONNECT THE CABLES...

CLOSE THE COVER MAKING SURE NONE OF THE CABLES CONNECTED TO IT ARE BINDING, AND SECURE WITH THE SCREWS.

SLIDE THE TOP COVER ON UNTIL IT IS FLUSH WITH THE FRONT OF THE SIDE COVERS.

REPLACE THE FRONT COVER SO IT OVERLAPS THE THE BASE AND SIDE COVERS, AND PARTIALLY OVERLAPS THE TOP COVER.

AVIION 300 REMOVAL PROCEDURES

START BY REMOVING THE TOP COVER...FIRST, SET THE POWER SWITCHES OF THE COMPUTER AND MONITOR OFF...DISCONNECT THE POWER CORD FROM THE AC SOURCE AND FROM THE REAR OF THE UNIT.

NEXT, DISCONNECT THE MONITORS AC POWER CORD FROM THE REAR PANEL OF THE UNIT...DISCONNECT THE VIDEO CABLE OR CABLES...REMOVE THE MONITOR FROM THE TOP OF THE UNIT.

DISCONNECT ANY OTHER CABLES THAT MAY BE CONNECTED ON THE REAR OF THE COMPUTER.

LOOSEN THE TWO CAPTIVE SCREWS ON THE REAR...SLIDE THE TOP COVER FORWARD AND OFF.

USE CAUTION WHEN REMOVING THE MEMORY MODULES...SPREAD THE TWO PLASTIC TABS OF THE MODULE CONNECTOR...THE MODULE SHOULD GO TO A MORE UPRIGHT POSITION...CAREFULLY LIFT THE MODULE OUT.

NEXT, REMOVE THE POWER SUPPLY...FIRST, PULL UP THE PLASTIC BUTTON ON THE FRONT EDGE OF THE POWER SUPPLY AND UNLOCK IT...

NEXT, UNPLUG THE POWER SUPPLY FROM THE SYSTEM BOARD BY PULLING THE SUPPLY STRAIGHT UP OR DISENGAGE THE CONNECTOR ON THE BOTTOM OF THE SUPPLY...AND THE POWER CONNECTOR ON THE BOTTOM OF THE PCB...LIFT IT OFF THE BACKPANEL HOOKS.

REMOVE THE SYSTEM BOARD BY REMOVING THE SEVEN SCREWS AND LIFTING THE BOARD OUT.

AVIION 300 REPLACEMENT PROCEDURES

INSTALL THE SYSTEM PCB CAREFULLY INSERTING THE CONNECTORS ON THE BACK OF THE PCB INTO THE OPENINGS ON THE BACKPANEL.

ALIGN THE PCB ON THE MOUNTING POSTS ON THE BOTTOM OF THE TRAY...INSERT THE HEX SCREWS INTO THE THREE I/O CONNECTORS, BUT LEAVE THEM LOOSE...

INSERT THE SCREWS THAT SECURE THE SYSTEM BOARD TO THE STANDOFF POSTS, AND LEAVE LOOSE...

TIGHTEN THE I/O CONNECTOR SCREWS ON THE BACK...TIGHTEN THE SYSTEM BOARD TO THE STANDOFF POSTS ON THE TRAY.

TO REPLACE THE POWER SUPPLY, HOOK THE TWO SLOTS ON THE BACK OF THE SUPPLY INTO THE TWO TABS ON THE REAR OF THE PANEL...

GENTLY PRESS THE FRONT EDGE OF THE SUPPLY DOWN SO THAT THE POWER CONNECTOR IN THE BOTTOM OF THE POWER SUPPLY CONNECTS TO THE CONNECTOR ON THE SYSTEM PCB...

FINALLY, PRESS DOWN ON THE PLASTIC BUTTON ON THE EDGE OF THE POWER SUPPLY SO THAT IT LOCKS THE SUPPLY TO THE METAL TRAY.

TO INSTALL A MEMORY MODULE, SET THE MODULE IN THE MEMORY SLOT NEARLY VERTICAL...THE COMPONENT SIDE OF THE MODULE MUST FACE THE RIGHT SIDE OF THE UNIT...

WHEN THE MODULE IS ALIGNED, PRESS DOWN GENTLY ON THE MODULE...KEANING IT TOWARD THE LEFT SIDE OF THE UNIT UNTIL IT SNAPS INTO THE PLASTIC TABS.



MODULE 4

OBJECTIVES:

1. USE THE SYSTEM CONTROL MONITOR TO CHANGE SYSTEM CONFIGURATION PARAMETERS
2. PERFORM THE STEPS NECESSARY TO BOOT THE AVIION SYSTEM DIAGNOSTICS FROM TAPE.
3. IDENTIFY THE SYMPTOMS OF A SUCCESSFUL POWERUP SEQUENCE
4. VERIFY PROPER SYSTEMS FUNCTIONALITY AND POWERUP THROUGH THE USE OF AVAILABLE DIAGNOSTICS.
5. IDENTIFY, ISOLATE, AND REPAIR TO THE FRU LEVEL A FAULTY AVIION SYSTEM THROUGH THE USE OF DIAGNOSTICS.

DG REMOTE FE FOR RBOS PASSWORD

DG FE FOR XDIAG

SYSTEM CONTROL MONITOR

THE SYSTEM CONTROL PROGRAM (SCM) IS YOUR INTERFACE TO THE RISC BASED HARDWARE. IT IS A FIRMWARE MONITOR PROGRAM THAT TEST AND MANAGES THE SYSTEM POWERUP AND MAINTAIN CONTROL UNTIL THE UNIX KERNEL OR SOME OTHER SOFTWARE TAKES OVER. THE SCM RESUMES CONTROL WHEN YOUR SOFTWARE HALTS.

THE SCM USER INTERFACE CONSIST OF A COMMAND INTERPRETER AND SEVERAL INTERACTIVE MENUS. YOU CAN USE THESE INTERACTIVE MENUES TO CONTROL PROGRAM FLOW, VIEW OR CHANGE SYSTEM PARAMETERS, DEBUG PROGRAMS, OR BOOT SOFTWARE.

ENTERING SCM

THE SCM CONTROLS POWERUP TESTING AND THEN BRINGS UP YOUR SYSTEM SOFTWARE THROUGH A AUTOMATIC BOOT SEQUENCE. YOU ENTER THE SCM AT POWERUP IF A POWERUP TEST FAILS OR THE AUTO BOOT SEQUENCE FAILS.

THE SCM RUNS WHEN ALL OTHER PROCESSORS ARE HALTED. YOU CAN USE THE SCM TO LOAD, START, MODIFY, CONTROL, OR HALT PROGRAMS BUT YOU CANNOT RUN SOFTWARE IN CONJUNCTION WITH THE SCM.

YOU ENTER THE SCM WHENEVER YOU SYSTEM SOFTWARE ENCOUNTERS ONE OF THE FOLLOWING:

- OPERATING SYSTEM HALT COMMAND
- UNSUPPORTED BREAK POINT OR INTERRUPT
- COMMAND BREAK KEYBOARD SEQUENCE
- HARDWARE RESET

THE SCM PROMPT

YOU SEE THE SCM PROMPT WHENEVER ALL PROCESSORS IN YOUR SYSTEM ARE HALTED. THE SCM COMMAND LINE INTERPRETER EXECUTES COMMANDS YOU ENTER AT THE PROMPT. IN A SINGLE PROCESSOR SYSTEM THE DEFAULT PROMPT APPEARS AS FOLLOWS:

SCM>

IN MULTI PROCESSOR SYSTEMS THE DEFAULT PROMPT DISPLAYS THE NUMBER OF THE ATTACHED PROCESSOR

JP#N/SCM

WHEN N IS THE NUMBER OF THE ATTACHED PROCESSOR.

*X DIAG WILL NOT RUN THE 2ND CPU
 scm> a 1 to get to test 2ND PROCESSOR
 1]^[]^[]^[to get to scm> if user is up
 4-0*

DGUX 4.30 flushes every 30 records to DISK to avoid corrupt
UP MARCO update/flush to disk
/usr/sbin/init.d /rc.update
WHEN DO YOU USE THE SCM

YOUR SYSTEM USES THE SCM DEFAULT BOOT PATHS TO BOOT YOUR OPERATING SYSTEM AT EVERY POWERUP AND, OPTIONALLY TO RUN A STAND-ALONE PROGRAM ON A ROUTINE BASIS BEFORE BRINGING UP THE OPERATING SYSTEM. WHENEVER THERE IS A SYSTEM FAULT THAT THE OPERATING SYSTEM CANNOT HANDLE, YOU ENTER THE SCM AUTOMATICALLY. WHEN THIS HAPPENS YOU NEED THE SCM TO RETURN CONTROL TO YOUR OPERATING SYSTEM BY RESUMING OR REBOOTING SYSTEM SOFTWARE. YOU MAY ALSO CHOOSE TO ENTER THE SCM TO CHANGE SYSTEM CONFIGURATION PARAMETERS, SUCH AS BAUD RATE FOR YOUR SYSTEM CONSOLE OR A DEFAULT BOOT PATH.

YOU WILL NEED TO USE THE SCM COMMANDS OR MENUS FOR THE FOLLOWING:

- TO RESPOND TO SYSTEM ERRORS
- TO BOOT A OPERATING SYSTEM OR STAND-ALONE PROGRAM
- TO CHANGE SYSTEM CONFIGURATION PARAMETERS
- TO CONTROL PROGRAM FLOW
- TO DEBUG PROGRAMS

SCM MENU SUMMARY

YOU CHOOSE WHICH CONFIGURATION PARAMETERS TO VIEW OR CHANGE FROM THE VIEW OR CHANGE SYSTEM CONFIGURATION MENU. TO DISPLAY THE MENU ENTER THE FOLLOWING COMMAND AT THE SCM PROMPT:

SCM> F (NEWLINE)

THE SYSTEM DISPLAYS THE MENU

VIEW OR CHANGE SYSTEM CONFIGURATION

1. CHANGE BOOT PARAMETERS
2. CHANGE CONSOLE PARAMETERS
3. CHANGE SERIAL PORT PARAMETERS
4. CHANGE PRINTER PARAMETERS
5. VIEW MEMORY CONFIGURATION
6. CHANGE TESTING PARAMETERS
7. RETURN TO PREVIOUS MENU

ANY CHANGE YOU MAKE AT THE SCM MENU BECOMES THE NEW DEFAULT IMMEDIATELY. HOWEVER CHANGES ARE NOT IN EFFECT UNTIL YOU RESET OR POWER DOWN THE COMPUTER. ONCE YOU RESET OR POWER UP THE COMPUTER THE CHANGES YOU MAKE BECOME THE CURRENT SYSTEM PARAMETERS.

SCM> h for more options

STARTING THE POWER UP SELF TEST

TURN ON ALL THE STORAGE DEVICES AND YOUR MONITOR BEFORE POWERING ON THE AVIION COMPUTER.

AFTER APPROXIMATLY 5 SECONDS THE SCREEN WILL DISPLAY THE POWER UP INITIALIZATION MESSAGE IN THE WINDOW.

(C) DATA GENERAL CORPORATION 1989,1990
MODEL 400/4000 SERIES
DUAL PROCESSOR
COLOR GRAFICS [N BIT], Z-BUFFER OPTION
FIRMWARE REVISION XX.XX
KEYBOARD LANGUAGE IN U.S. ENGLISH
LOCAL ETHERNET ADDRESS IS 08:00:1B:7F:7F:07
INITIALIZING [16 MEGABYTES]

VERIFY THE INITIALIZATION INFORMATION IN THE POWERUP DISPLAY IS CORRECT, IF ANY OF THE MESSAGE DISPLAY INACCURATE INFORMATION, OR IF YOUR SYSTEM DOES NOT FIND COMPONENTS THAT YOU HAVE ORDERED, CALL DATA GENERAL IMMEDIATLY.

AFTER THE HARDWARE IS INITIALIZED, POWERUP TESTS VERIFY COMPONENTS ARE FUNTIONING SUFFICIENTLY TO BRING UP YOUR OPERATING SYSTEM. AS POWERUP TESTING PROGRESSES, EACH CHARACTER IN THE SEQUENCE 0123...ABCDE..Z APPEARS ON THE SRCEEN INDICATING THE SUBTEST HAVE PASSED. ON A WORKSTATION'S DIAGNOSTIC LED AND SPEAKER BEEP TONES SIGNAL THE PROGRESS OF THE TESTS, ONCE THE TESTING IS COMPLETE THE SYSTEM DISPLAYS A "PASSED" MESSAGE ON THE SCREEN. THE MONITOR SCREEN SHOULD APPEAR AS FOLLOWS:

TESTING...
0123456789ABCDEFGHIJKLMNQPQRSTUVWXYZ

PASSED

IF THE POWERUP TESTING SEQUENCE HANGS OR DISPLAYS A ERROR MESSAGE REFER TO CHAPTER 4 "SOLVING POWERUP PROBLEMS' IN THE SETTING UP AND STARTING AVIION XXXX MANUAL. WHERE XXXX IS THE MODEL OF YOUR SYSTEM.

AVIION SYSTEMS POWER UP GOALS

FIND ANY FAULTS IN THE BASE SYSTEM, THE KERNEL SYSTEM AND LOAD PATH MUST BE INITIALIZED AND VERIFIED FROM FROM TO THE POINT OF ALLOWING DIAGNOSTIC MEDIA TO LOAD.

REPLACABLE UNIT (RU) CALL-OUTS.

IN CONFIDENCE WITH CUSTOMER, FIELD SERVICE, AND MANUFACTURING REQUIREMENTS, ALL FAILURE REPORTS WILL ATTEMPT TO ISOLATE TO THE FRU LEVEL.

PERFORM SELF-TEST ON ALL SYSTEM UNITS

ALL UNITS INSTALLED IN THE SYSTEM, STANDARD AND OPTIONAL, MUST BE SIZED AND TESTED. THE LEVEL OF SELF-TEST IS A CHECK FOR HARD FAULTS. THIS DOES NOT INCLUDE I/O DEVICES.

SUPPORT A VIRTUAL CONSOLE

VIRTUAL CONSOLE SUPPORT IS REQUIRED TO ALLOW ACCESS TO ALL REGISTERS AND MEMORY LOCATIONS AND SUPPORT OF PROGRAM LOADING.

INITIALIZE AND VERIFY THE LOAD PATH

ALL FAULTS IN THE BASE SYSTEM WHICH WOULD PREVENT THE BOOTING AND EXECUTION OF DIAGNOSTIC SOFTWARE MUST BE FOUND. FAULTS THAT WOULD CAUSE MALFUNCTION OF THE DIAGNOSTICS COULD CAUSE ERRONEOUS ERROR INDICATIONS.

EASE OF ERROR REPORTING

TO SUPPORT CUSTOMER MODE OPERATION AND OTHER NEEDS OF FIELD SERVICE, EASE OF ERROR REPORTING DURING POWERUP IS REQUIRED

SYSTEM INITIALIZATION

PERFORM THE REQUIRED SYSTEM CONFIGURATION AND INITIALIZATION TO ALLOW THE OPERATING SYSTEM TO BE BOOTED AND RUN.

PROM AND NOVRAM

VIRTUAL CONSOLE PROGRAM (VCP) WHICH INCLUDES: USER INTERFACE MENUS, MINIMAL COMMAND LINE INTERPRETER AND MNEMONIC DEBUGGER.

AUTOMATIC PROGRAM LOAD UTILITIES

BOOT ROUTINES, WHICH ARE REQUIRED DRIVERS FOR LOADING FROM LAN OR SCSI DEVICES.

POWERUP TESTS, ENOUGH TO VERIFY THAT THE DIAGNOSTIC OPERATING SYSTEM CAN BE LOADED

SYSTEM SIZING AND CONFIGURATION

SCM BOOT COMMAND

THE BOOT COMMAND FIRST RESETS THE SYSTEM BOARD HARDWARE, THEN IT LOADS A BOOTSTRAP PROGRAM FROM A VALID DEVICE YOU SPECIFY IN A OPTIONAL ARGUMENT.

WHEN YOU USE THE BOOT COMMAND WITHOUT A ARGUMENT , THE SCM ATTEMPTS TO BOOT FROM A DEFAULT BOOT PATH. IF THE DEFAULT BOOT PATH IS NOT INITIALIZED, THE SCM TRIES TO FIND A VALID BOOTSTRAP FILE ACCORDING TO A PROBE SEQUENCE SPECIFIC TO YOUR MODEL SYSTEM. ON MOST WORKSTATIONS THE SCM FIRST PROBES FOR A BOOTSTRAP FILE ON THE FIRST SCSI DISK; IF IT CAN'T BOOT FROM THE DISK, IT PROBES FOR A DEVICE ON THE INTERGRATED LAN. FINIALLY, IF THE SCM CANNOT BOOT AUTOMATICALLY, IT DISPLAY A MESSAGE AND RETURNS TO THE SCM PROMPT.

SCM BOOT EXAMPLES

BOOT [DEV([CONTR],[UNIT],[FILE#])][FILEPATH]

SCM> B st(isc(0),4,0)

SCM> B sd(isc())

SCM> B cisc(0,0)

System Diagnostics
Revision: xx.xx

Data General Corporation
Proprietary Use Only

Main Menu

1. Run Acceptance test
2. View Tools menu
3. Display help screen
4. Exit to SCM

Enter choice (1):

Multuser System

Tools menu

1. Format diskettes
2. Run tape adjustment utility
3. Test network connection (TDR)
4. View Terminal Test menu
5. Display help screen
6. Return to Main Menu

Enter choice (6):

Graphics Workstation

Tools menu

1. Format diskettes
2. Run tape adjustment utility
3. View Graphics Tools menu
4. Test network connection (TDR)
5. Run keyboard test
6. Run mouse test
7. Display help screen
8. Return to Main Menu

Enter choice (8):

Item 2

Item 3

Explanation of Menu Selections

Item 4

SCM

Item 1
(example only)

The Acceptance Test verifies that the following system components are functioning:

Memory
CPU
Integrated DUART Channel A
Integrated DUART Mouse Interface
Clock
Integrated LAN
Parallel Printer
Integrated SCSI Microp 1578-15 Disk (unit: 0)
Integrated SCSI TEAC 5.25 floppy (LUN 2) (unit: 3)
Integrated SCSI ARCHIVE Viper 150 Tape (unit: 4)

This test runs for 15 minutes.

Press New Line to Start Acceptance Test. Press Q to Quit.

NT-03366

Multuser System

Tools Menu

1. Format diskettes
2. Run tape adjustment utility
3. Test network connection (TDR)
4. View Terminal Test menu
5. Display help screen
6. Return to Main Menu

Enter choice (6):

Item 4

Terminal Test Menu

1. Start scrolling characters test
2. Start lines of characters test
3. Start keyboard echo test
4. Start port ID message test
5. Auto port identification
6. Terminate a test
7. Show executing tests
8. Display help screen
9. Return to Tools Menu

Enter option: (9)

Graphics Workstation

Tools Menu

1. Format diskettes
2. Run tape adjustment utility
3. View Graphics Tools menu
4. Test network connection (TDR)
5. Run keyboard test
6. Run mouse test
7. Display help screen
8. Return to Main Menu

Enter choice (3):

Item 3

Graphics Tools Menu

1. Graphic subsystem diagnostic test
2. Video adjustment BRIGHT pattern
3. Video adjustment CONTRAST pattern
4. Video adjustment PARALLEL pattern
5. Video adjustment REGULATE pattern
6. Fill screen with CIRCLES pattern
7. Fill screen/clear screen function
8. Display help screen
9. Exit to Tools Menu

Enter option: (9)

NT-03356

AVIION SYSTEM DIAGNOSTICS

AVIION SYSTEM DIAGNOSTICS PROVIDE MENU DRIVEN UTILITIES TO TEST ANY MODEL OF DATA GENERAL'S RISC BASED COMPUTER SYSTEMS.

SYSTEM DIAGNOSTICS TESTS ARE SEPARATE FROM POWERUP TESTS THAT RUN AUTOMATICALLY WHEN YOU POWER YOUR SYSTEM ON.

SYSTEM DIAGNOSTICS FULLY TEST YOUR SYSTEM AND ALL IT'S HARDWARE COMPONENTS.

SYSTEM DIAGNOSTICS CAN ISOLATE HARDWARE FAULTS SO YOU CAN PROVIDE DATA GENERAL WITH THE INFORMATION NECESSARY TO REPLACE DEFECTIVE PARTS.

WHEN TO USE SYSTEM DIAGNOSTICS

USE SYSTEM DIAGNOSTICS TO ENSURE THAT YOUR HARDWARE IS INSTALLED AND FUNCTIONING PROPERLY AT FIRST INSTALLATION AND WHENEVER YOU ADD OR REPLACE A PART.

AFTER INITIAL INSTALLS YOU CAN RUN DIAGNOSTICS IF YOU SUSPECT A PROBLEM WITH YOUR COMPUTER HARDWARE.

BOOTING SYSTEM DIAGNOSTICS FROM TAPE

MAKE SURE THE WRITE PROTECTION INDICATOR ON THE CARTRIDGE TAPE POINTS TO "SAFE", INSERT THE CARTRIDGE TAPE INTO THE DRIVE.

PUSH THE TAPE ENTIRELY INTO THE DRIVE AND SLIDE THE LATCH TO THE RIGHT.

IF YOU ARE RUNNING DG/UX, HALT THE SYSTEM AND RESET AS FOLLOWS:

```
# cd /  
# shutdown (nl)  
# halt -q (nl)
```

```
SCM> R (NL)
```

BOOT THE SYSTEM DIAGNOSTICS BY SPECIFYING THE DEVICE PATH FOR YOUR TAPE DRIVE AS A ARGUMENT TO THE SCM BOOT COMMAND.

WHAT COMMAND YOU TYPE DEPENDS ON THE TYPE OF CONTROLLER FOR YOUR TAPE. THE FOLLOWING EXAMPLE WOULD BOOT TAPE FROM A WORKSTATION:

```
SCM> b st(incr(),4)
```

TO BOOT TAPE FROM A SCSI DEVICE MANAGED BY A VME CONTROLLER TYPE
THE FOLLOWING:

SCM> b st(cisc(),4)

YOUR SYSTEM SHOULD DISPLAY THE FOLLOWING SCREEN

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Press New Line to proceed.

2. When you are ready to clear the screen, press New Line. The system diagnosis begins initializing each system component found. The following screen shows an AViON 300 series station during initialization. Refer to Appendix A for example screens of VME-based models.

System Diagnostics
Revision xx.xx mm/dd/yy hh:mm:ss

Initializing Operating System for System Diagnostics

8192 Kbytes system memory
7258 Kbytes memory available for test
Single CPU System (Motorola 88100 CPU Rev x)
1 Instruction Cache (Motorola 88200 CMMU Rev x)
1 Data Cache (Motorola 88200 CMMU Rev x)
Initializing Virtual Console
Initializing Real Time Clock
Initializing Integrated SCSI
Initializing Parallel Printer
Initializing Monochrome Graphics Controller
Initializing Keyboard
Initializing Quartz
Initializing Integrated LAN

ONCE THE SYSTEM COMPLETES INITIALIZATION, ACCEPT THE DEFAULT RESPONSES TO THE FOLLOWING QUESTIONS BY PRESSING NEWLINE AT THE PROMPTS:

RUN WITH INSTRUCTION CACHES ON (Y,N) [Y]?

RUN WITH DATA CACHES ON (Y,N) [Y]?

ENABLE PARITY CHECKING FOR DATA (Y,N) [Y]?

VERIFY THE CORRECT TIME AT THE NEXT PROMPT:

CURRENT TIME IS 16:15 THURSDAY, AUGUST 24, 1990.
IS THIS TIME CORRECT? (Y,N) [Y]?

THE SYSTEM WILL NOW LIST THE CONNECTED PERIPHERAL DEVICES, YOUR SCREEN SHOULD LOOK SIMILAR TO THE EXAMPLE BELOW FOR A AVIION 300 WORKSTATION.

```
Run with instruction caches on (Y/N) [Y]?
Enable parity checking for instructions (Y/N) [Y]?
Run with data caches on (Y/N) [Y]?
Enable parity checking for data (Y/N) [N]?
Current time is 16:15 Thursday, April 24, 1990.
Is this correct (Y/N) [Y]?

Sizing Peripherals...

Integrated SCSI:
Unit 0: Microp 1578-15 UPDC02 Disk Drive found
Unit 3: TEAC 5.25 Floppy (LUN 0) Disk Drive found
Unit 4: Archive Viper 150 2147-005 Tape Drive found

Press New Line to proceed.
```

IF A CONFIGURED PERIPHERAL IS MISSING FROM THE SIZING LIST, VERIFY THE FOLLOWING AND TRY AGAIN:

CHECK ALL CABLING IS CONNECTED PROPERLY.

MAKE SURE THE DRIVE ITSELF IS INSTALLED AND JUMPERED CORRECTLY.

MAKE SURE THE DRIVE IS ON-LINE AND READY.

PRESS NEWLINE TO CONTINUE WHEN YOU HAVE MATCHED THE CORRECT SYSTEM CONFIGURATION. THE SCREEN DISPLAYS THE FOLLOWING:

System Diagnostics
Revision: xx.xx

Data General Corporation
Proprietary Use Only

Main Menu

1. Run Acceptance test
2. View Tools menu
3. Display help screen
4. Exit to SCM

Enter choice

VERIFYING YOUR AVIION HARDWARE

THE SYSEYEM DIAGNOSTICS INCLUDE A 15 MIN. ACCEPTANCE TEST WHICH SIZES, TESTS, AND VERIFIES YOUR COMPUTER HARDWAR COMPONENTS.

RUN THE ACCEPTANCE TEST ANY TIME YOU ADD A NEW COMPONENT OR IF YOU SUSPECT PROBLEMS WITH ANY COMPONENT.

SYSTEM DIAGNOSTICS ARE SELECTED FROM THE MAIN MENU BY PRESSING A "1", "RUN ACCEPTANCE TEST". THE FOLLOWING WILL BE DISPLAYED ON YOUR SCREEN:

SYSTEM DIAGNOSTICS
REVISION XX.XX

DATA GENERAL CORPORATION
PROPRIETARY USE ONLY

MAIN MENU

1. RUN ACCEPTANCE TEST
2. VIEW TOOLS MENU
3. DISPLAY HELP SCREEN
4. EXIT TO SCM

ENTER CHOICE [1]

SYSTEM DIAGNOSTICS WILL DISPLAY A LIST OF DEVICES IT FOUND DURING INITIALIZATION, THE ACCEPTANCE TEST VERIFIES THESE DEVICES.

The Acceptance Test verifies that the following system components are functioning:

Memory
CPU
Integrated DUART Channel A
Integrated DUART Mouse Interface
Clock
Integrated LAN
Parallel Printer
Integrated SCSI Microp 1578-15 Disk (unit: 0)
Integrated SCSI TEAC 5.25 floppy (LUN 2) (unit: 3)
Integrated SCSI ARCHIVE Viper 150 Tape (unit: 4)

This test runs for 15 minutes.

Press New Line to Start Acceptance Test. Press Q to Quit

NEXT, THE DIAGNOSTICS WILL DISPLAY THE FOLLOWING MESSAGE:

CAUTION: TAPE TEST DESTROYS ALL DATA ON TAPE. PLEASE INSERT WRITE-ENABLED SCRATCH TAPES FOR ALL UNITS TO BE TESTED. PRESS NEWLINE WHEN READY TO PROCEED

INSERT A WRITE-ENABLED TAPE INTO THE DRIVE MAKING SURE THE "SAFE" ARROW IS POINTED AWAY FROM THE WORD "SAFE". IF THE TAPE IN YOUR DRIVE IS NOT WRITE-ENABLED THE SYSTEM DIAGNOSTICS WILL DISPLAY THE FOLLOWING MESSAGE:

MEDIA IN UNIT X IS WRITE PROTECTED.
PLEASE PRESS NEWLINE TO CANCEL THE TAPE TEST OR INSERT A WRITE-ENABLED SCRATCH TAPE AND PRESS NEWLINE TO PROCEED.

WHEN THE ACCEPTANCE TEST BEGINS, THE SYSTEM DIAGNOSTICS DISPLAYS A GENERAL STATUS REPORT SCREEN AS FOLLOWS:

General Status Report						
Revision: xx.xx			Total Hard Errors: 0000			
Elapsed Time: 00:00:00			Current time: 09:58:13			
TEST ID	SUBSYSTEM DESCRIPTION	PASS COUNT	SOFT ERRORS	HARD ERRORS	KEYTES READ	KEYTES WRITTEN
48	Memory	0	0	0	0	0
47	Single CPU	0	0	0	0	0
48	Integrated Quart	0	0	0	0	0
48	Clock	0	0	0	0	0
45	Integrated LAN	0	0	0	0	0
44	Integrated SCSI	0	0	0	0	0

S - Update General Status Report Ctrl-D to Stop all Tests

AT THE END OF THE TESTING YOU WILL SEE A FINAL STATUS REPORT SCREEN AS FOLLOWS:

PRESS NEWLINE TO RETURN TO THE MAIN MENU NAD CHOICE "4" FROM THE MAIN MENU TO RETURN TO THE SCM PROMPT.

Final Status Report						
Revision: xx.xx			Total Hard Errors: 0000			
Elapsed Time: 00:15:00			Current Time: 10:11:13			
TEST ID	SUBSYSTEM DESCRIPTION	PASS COUNT	SOFT ERRORS	HARD ERRORS	KEYTES READ	KEYTES WRITTEN
*	Memory	805	0	0	1948	1948
*	Single CPU	1732	0	0	0	0
*	Integrated Quart	932	0	0	30	30
*	Clock	1	0	0	0	0
*	Integrated LAN	815	0	0	11	11
*	Integrated SCSI	107	0	0	23131	0

Press New Line to Return to Main Menu

EXITING FROM SYSTEM DIAGNOSTICS

FROM THE MAIN MENU SELECT ITEM 4, EXIT TO SCM>.

TYPE R TO RESET YOUR SYSTEM FROM THE SCM PROMPT

SCM> R

THE SYSTEM DISPLAYS THE FOLLOWING HARDWARE STATUS VALUES ON YOUR SCREEN

PSR	XPC	NPC	FPC	DCSH	DMMU	ICSH	IMMU
XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	N	N	N	N

IF YOUR SYSTEM DISPLAYS A "Y" IN ANY OF THE LAST FOUR COLUMNS REPEAT THE RESET COMMAND.



AViiON Foundations and Operations H615

Module 5 - TCP/IP Overview and Installation

Introduction:

This module of introduce the student to the TCP/IP family of Communications products, introduce the Internet scheme of addressing and give them sufficient information to successfully install an Aviion system in a networked environment.

Objectives:

Upon completion of this module of instruction, the student will:

- be able to list the products in the "TCP/IP family" of communications products.
- be able to install an Aviion system in a networked environment and verify it's ability to communicate to to other hosts on the network.
- Be able to list the various server processes that must be present on networked machines to provide communications ability.

References:

093-701051-03

Setting Up and Managing TCP/IP on the
DG/UX System



What is TCP/IP?

General:

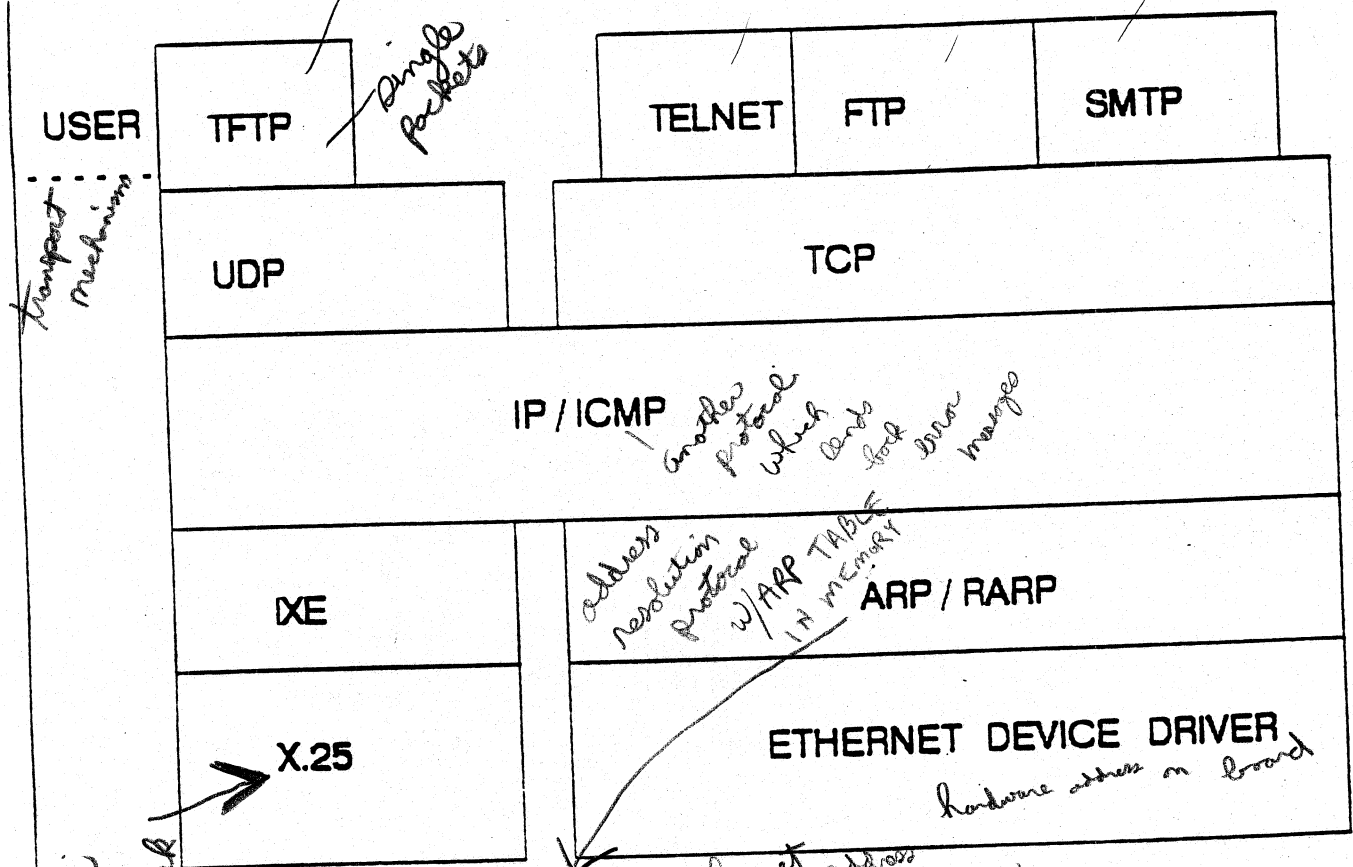
Transmission control protocol
Internet protocol

- TCP and IP are two protocols designed by the U.S. Department of Defense for DARPA (Defense Advanced Research Projects Agency) in 1969. The Project was designated ARPANET.
- The two protocols are designed to work together and to provide a host to host network.
- They are Generally used over Ethernet connections
- Data Generals implementation is based on Berkeley 4.2 with many 4.3 features and changes to make it Mil-Spec compliant.
- The protocols are the industry networking de facto standard

X.25 = long distance

TCP/IP NETWORK ARCHITECTURE

USER PROCESSES



Transport Mechanisms

Public data network

Internet address
128.222.X.X

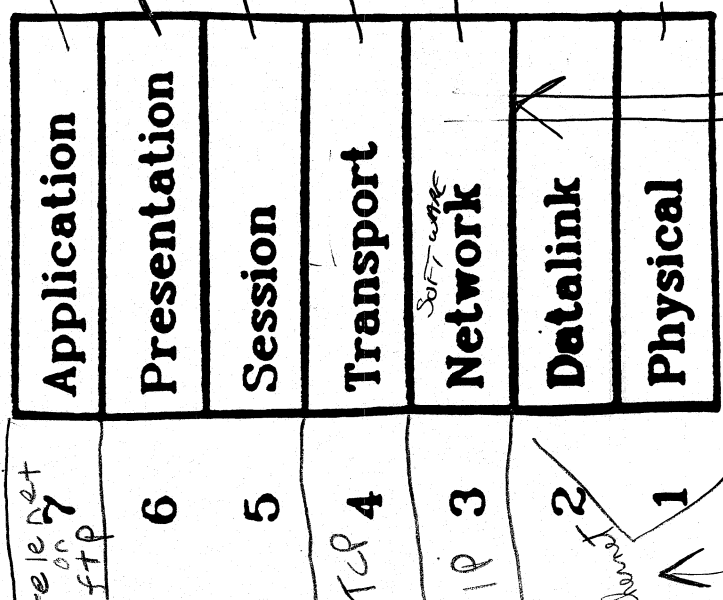
ethernet address
08:00:1a:1b:cf:09

TCP/IP

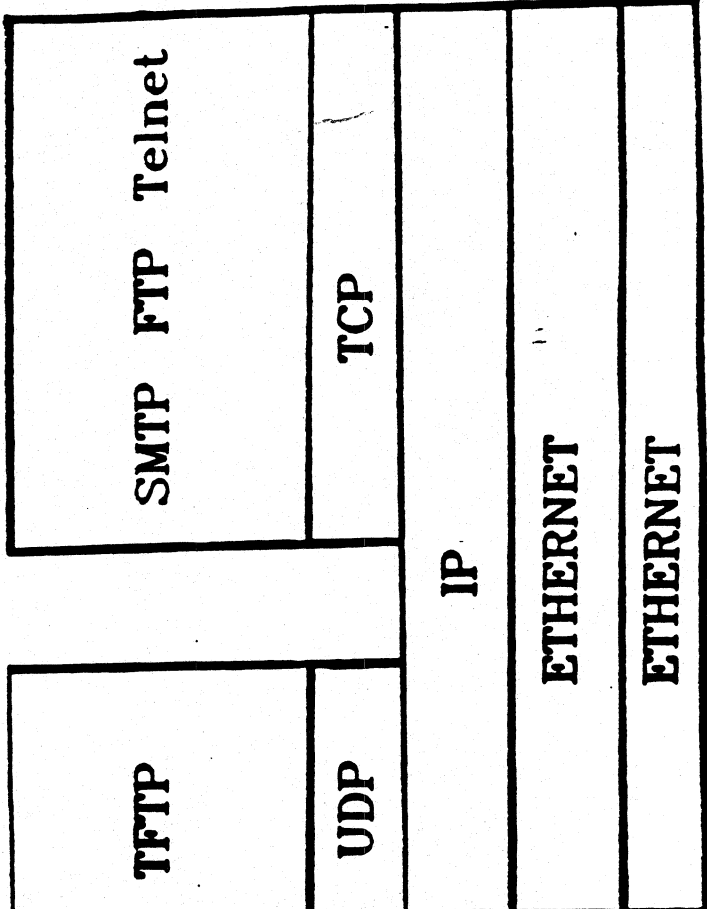
OSI - Open System Interconnect Model

if not working then try #login hostname

Layer ISO Model



TCP/IP Implementation



LAN TEST will GET you THIS FAR

also: used x.25



Kernel-Level Protocols

TCP/IP for AViON Systems contains the following kernel-level protocols:

ARP - Address Resolution Protocol

Used to associate an Internet address with a physical hardware address (Ethernet address). ARP runs only across a single physical network, and runs only over networks that support hardware broadcast, such as Ethernet. For more information about this protocol, see *RFC 826 (An Ethernet Address Resolution Protocol)*.

RARP - Reverse Address Resolution Protocol

Used by a diskless system at startup to find its Internet address. A diskless client broadcasts a request that contains its Ethernet address, and the server responds by sending the client's Internet address to that Ethernet address. For more information about the protocol, see *RFC 903 (A Reverse Address Resolution Protocol)*.

etc/ethers on host or server contains matching internet address

IP - Internet Protocol

A protocol that provides connectionless delivery of datagrams between hosts. Connectionless service means that the protocol treats each datagram as a separate entity. Each IP datagram contains the addresses of its source and destination, some control information, and the data transmitted. The protocol can deliver packets out of sequence, may drop packets, or may duplicate packets, but IP makes an earnest attempt to deliver packets. IP defines the exact format of data as it travels through a network, but delivery of data is not guaranteed.

ICMP - Internet Control Message Protocol

A partner to IP that handles error and control messages. Gateways and hosts use ICMP to tell the other hosts about problems in delivering the datagrams. ICMP also allows a host to test whether a destination can be reached and whether it is responding.

TCP - Transmission Control Protocol

A protocol that defines reliable, stream-oriented, process-to-process communication. TCP is a connection-based protocol; it requires a connection between communicating hosts before it transmits data. After a connection is established, TCP provides a two-way byte stream between communicating processes. Its messages include a protocol port number that allows the sender to distinguish between multiple programs on the remote host. TCP provides a checksum mechanism to guarantee that data has arrived intact. TCP uses IP to transmit information across a network.

*telnetd
||
responds to
telnet request*

Ports -

UDP - User Datagram Protocol

A protocol that defines datagram-based communication between a process on one host and a process on another host. UDP is a connectionless transport protocol. Its messages include a protocol port number that allows the sender to distinguish between multiple programs on the remote host. Data General's UDP provides a checksum mechanism to guarantee that data has arrived intact. UDP uses IP to transmit information across a network.

- for smaller packets w/no checks

User Commands and User-Level Protocols

TCP/IP contains the following user commands and user-level protocols:

ftp The **ftp** command implements the File Transfer Protocol (FTP). FTP allows you to transfer files from one host to another. FTP uses TCP as the transport level protocol. TCP was discussed earlier in the chapter.

R commands The R commands allow you to obtain information from, to log in to, and to execute commands on a remote host. TCP/IP for AViON Systems includes the following R commands:

rcp Allows you to copy files between systems on the network.

rlogin Allows you to login to another system over the network.

rsh (remsh) Connects to a specified host and executes a specified command. If you choose SVID compatibility during setup of TCP/IP, the command is **remsh**. If you choose not to be compatible with the SVID during setup, the command is **rsh**.

rwho Produces a list of all users logged in to all systems on the local network, as long as the systems are running **rwhod**.

ruptime Shows the status of each machine that is on the local network and running **rwhod**.

Some of the R commands use TCP as the transport level protocol, and some use UDP.

sendmail The **sendmail** command implements the Simple Mail Transfer Protocol (SMTP), which allows the transmission of mail messages. The **sendmail** program uses TCP as the transport level protocol. Chapter 4 discusses how to configure and use **sendmail**.

telnet The **telnet** command implements the TELNET protocol. TELNET allows a user on one host to interact with a remote host as if the terminal is directly connected to the remote host. TELNET uses TCP as the transport level protocol.

Virtual
terminal
package

*tftp
for short
messages*

The **tftp** command implements the Trivial File Transfer Protocol (TFTP). TFTP allows file transfer with minimal capability and overhead. The **tftp** command depends on the UDP protocol, which was discussed earlier in this chapter.

TFTP is also used during a first stage boot with Data General's AViiON stations. The boot program, once it determines its Internet address, uses TFTP to transfer a file that contains the executable image of a second stage boot program. These topics are covered at length in later chapters of this book.

bftp

The **bftp** command provides the user interface to the Background File Transfer Program, which allows you to transfer files in the background. For more information about BFTP, see *Using TCP/IP on the DG/UX™ System*.

The next chapter provides an overview of network administration. If you have experience with networks, you may skip the next chapter. However, the rest of the manual assumes that you are familiar with the terms introduced in the next chapter, and it uses examples first presented there.

Internet Addressing

89.0.0.1

network portion host or local portion

NETWORK NUMBERS 001 - 044 are reserved

NETWORK NUMBERS 045 - 126 are available

NIC - network information center
DO NOT USE

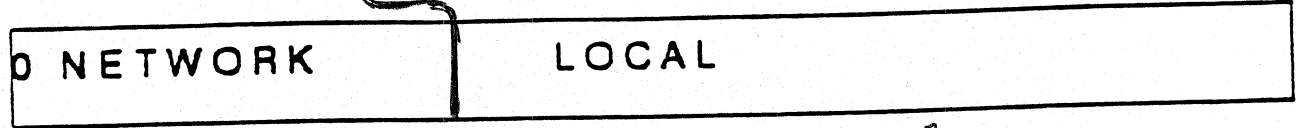
127.0.0.1 local host - loopback
127.0.0.0
127.255.255.255 - reserved for broadcasting

telnet local host
to check your
7 level software

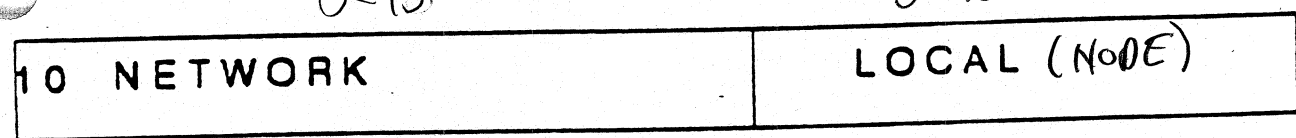
8 bits

hosts
24 bits

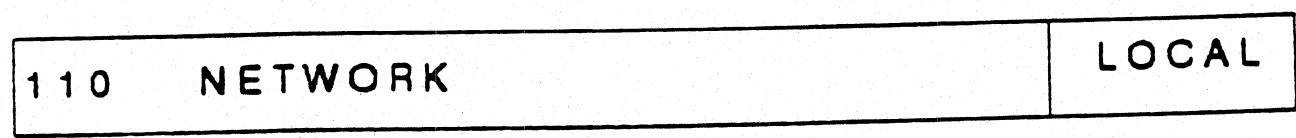
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1



0-15 CLASS A 1-127



CLASS B 128-191



CLASS C 191 →
small companies

128.22.13.X
32 bits total / each field is 8 bits

CLASS A HAS 7 BIT NETWORK NUMBER

000 - 044 ARE ASSIGNED

045 - 126 ARE UNASSIGNED

127 IS RESERVED

CLASS B HAS 14BIT NETWORK NUMBER

128.001 - 191.254 ARE UNASSIGNED

CLASS C HAS 21 BIT NETWORK NUMBER

192.000.001 - 223.254.254 ARE UNASSIGNED

* can only have 1 open connection between 2 machines @ 1 time

ARP - a to look at ARP table and override ethernet/internet address

telnet

\$ telnet

telnet>

-local (command)

-remote mode

local mode

telnet> command (address) (port)

telnet> open uwood3
OR 122.222.13.8

~d

~]

telnet> help (?)

to log on to another system
CLOSE will stop the session

\$ telnet uwood3

telnetd creates a process for the connection and assigns it to a pseudo-terminal.

^D or EXIT to get out of telnet

Once logged in the other system @ # EXIT to get to or ^]

telnet >! copy file a, file b
telnet >! sh to get to subshell

bye

terminates TELNET local mode and returns you to the shell.
any outstanding connections are terminated. (quit)

close

terminates an existing remote connection but keeps you in
TELNET local mode.

quit

same as bye

shell

used to create a shell on the local machine, a son of telnet.
If a connection exists use the escape character to return to
local mode before executing shell.

```
telnet> shell
```

```
telnet> shell [command]
```

if you have a network connection, and execute a command you
will be returned to network connection otherwise to local
mode.

![command]

returns you to the shell without terminating telnet. Use
the escape character to return to local mode before executing
!. if you give it ![command] it will return to any outstand-
ing connection otherwise to local mode. SAME AS SHELL cmd.

hostname(1C)

hostname(1C)

 NAME

hostname - set or print name of current host system

SYNOPSIS

hostname [nameofhost]

DESCRIPTION

The `hostname` command (without an argument) prints the name of the current host. The superuser can set the `nameofhost` by specifying an argument. The parameter used at boot time is defined in


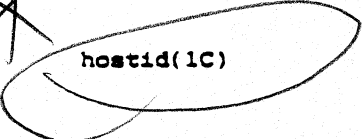
`/etc/tcpip.params`

and is used in

`/usr/sbin/init.d/rc.tcpipport`

SEE ALSO

`gethostname(2)`
`sethostname(2)`

  `hostid(1C)`

hostid(1C)

NAME

hostid - set or print identifier of current host system

SYNOPSIS

hostid [identifier]

DESCRIPTION

The `hostid` command (without an argument) prints the identifier of the current host in hexadecimal. This numeric value is expected to be unique across all hosts and is normally set to the host's Internet address. The superuser can set `hostid` by giving a hexadecimal identifier; this is usually done in the parameter file `/etc/tcpip.params`.

SEE ALSO

`gethostid(2)`
`sethostid(2)`
`hostname(1c)`

file xfer protocol

this uses TCP/IP

FTP Commands

sftp

ftp>

*# SFTP
takes you to
SFTP>*

sftp hostname

help ?

obtain info on a command, alone lists all with a command name gives info on specified command. Format:

ftp> help [command]

open

No response after command connects you to remote system

use this command to establish a connection. If auto logon is disabled you will have to use the user command. Format:

ftp> open uwood3

close

use this command to close an FTP connection. Format:

ftp> close <nl>

quit

this command closes any connection and returns the user to the shell. If a transfer is in progress it allows it to complete. Format:

ftp> quit <nl>

get(receive)

from remote mach.

this command retrieves a file and gives it the name specified. Format:

ftp> get remote-filename local-filename

put(send)

this command stores a local file in a remote directory. Format:

Quits file in present directory unless a pathname is given

only V A Z I D after an open connection
has been made!

dir = ls -la

`ftp> put local-filename remote-filename`

`dir` this command lists the contents of a remote directory. Specifying a local filename places a copy of the listing in a local file. Format:
`ftp> dir remote-dir [local-filename]`

`ls` this command will list only the filenames in a remote. If you don't specify a name the present remote directory is used. If a local filename is specified the listing is placed in there. Format:
`ls [remote-dir] [local-file]`

`pwd` this command displays the current remote working directory. Format:
`ftp> pwd`

`cd` this command will change your remote working directory. Format:
`ftp> cd dir1`

`lcd` this command will change your working directory on the local host. Format:
`ftp> lcd dir3`

`verbose` this command turns verbose mode on/off .The default is off. Format:
`ftp> verbose`

*Enhanced
Mail
System*

Sendmail

Mailx has two modes:

Input Mode	creating, editing, sending and tilde escape commands are executed in input mode.
command	reading, moving, deleting and responding to mail.

To enter input mode use the format:

```
mailx user@system
```

```
mailx chris@uwood1  
subject:
```

to leave input mode:

```
~d  
~. <nl>
```

Aliases

```
edit .mailrc
```

```
alias boaters kevin barry howard jeff
```

then:

```
$ mailx boaters
```

? as second ? will give all mail commands

To enter command mode type:

S mailx

to print messages:

? <NL> print the current message
? p <NL> print the current message
? p 2 <NL> print message number 2
? p username <NL> print all messages from user

deleting messages:

? d * delete all messages
? d :r delete all messages that have been read
? dp delete the current message and print
the next one
? d username delete all messages from user

Saving messages:

mbox
/usr/mail/username

s [msglist] filename messages saved in filename

msglist values:

n	the message number n
.	the current message
-	the first undeleted message in mailbox
S	the last message in mailbox
*	all messages
m-n	an inclusive range
username	all messages from user

replying to mail:

R <NL>	to originator
r <NL>	to originator and all recipients

leaving mailx:

? q <NL>

*Similar to Telnet
will allow a virtual logon of remote system*

R Commands

can be used for security

rlogin (hostname)

login:

passwd

Developed by Berkeley. You must have a local command running the r user program and a remote host running the r server program. You must also have an account on both machines.

users from a different system can be given access to your account by providing a .rhosts file in your home directory which lists users and their systems allowed access:

uwood3	kevin
vwood1	mike
uwood2	tom

/etc/hosts

lists recognized systems

/etc/hosts.equiv

allows users with accounts on two different machines with the same name to share accounts. i.e.:

uwood3
uwood1

rcp

this command copies files between the local and remote host in either direction. Format:

rcp source-file dest-file

remote files must be specified "rhost:path"

*.rhosts
(file)*

*can allow other machines
access to your files*

using -r allows you to copy multiple files and subdirectories to a directory

```
rcp -r source-files directory
```

to employ metacharacters on the remote system, you must quote them. i.e.:

```
rcp "rhost:/dir/file2*" cumulative
```

if your remote username is different than your local name, use:

```
rhost.rname:path
```

rsh

this command will execute a command on a remote system without having the user log on to the remote system. The command executes and terminates after execution. You can not execute interactive programs with this command. Format:

```
rsh host [-l username] command
```

if your remote username is different than your local username you must use the "-l username" option.

if you wish to use shell redirection symbols at the remote side they must be quoted. i.e.:

```
rsh sys4 cat test1 >> test2 <n1>
```

appends the remote test1 file to the local test2 file.

```
rsh sys4 cat test1 ">>" test2 <n1>
```

appends the remote file test1 to the remote file test2

the alternate format:

```
host [-l username] command
```

may be used if /etc/hosts file has been added to your PATH.

ruptime

this command gives status about each machine on the local network that is running rwhod. This status is from packets broadcast once a minute by each host.

rwhod is the server program for rwho. Format:

```
ruptime [-a][-l][-t][-u]
```

Switches

machines for which no status has been reported for 5 minutes are shown as down.

users that are idle for an hour or more are not counted unless the -a option is used.

the listing is sorted by hostname unless the -l, -t or -u options are used. These options specify sorting by load average, uptime or number of users.

must be running rwhod - demon

@ level 3 to be seen

demon answers incoming network queries

rlogin → rlogind
telnet → telnetd
ftp → ftp
ps, et, pg

process status

the last three columns in a listing represent load averages for 1, 5, & 15 minutes. The load average is the average number of jobs in the run queue.

rwho

this command displays the names of users logged on to systems on the local network that are running the rwho server. Format:

`rwho [-a]`

if no report has been received from a machine for 5 minutes it assumes the machine is down.

rwho reports idle time for users who have not typed into the system for a minute or more and it omits users who have not typed to the system for 1 hour or more unless the -a option is used.

Server processes which must be running

Servers

TCP/IP contains the following server programs. Many of them initiate daemons, which are background processes that perform a system-wide public function. Each of these daemons operates at a specified port and provides service for a user protocol. You specify the port and services in `/etc/services`. User protocols are described later in the chapter.

- inetd** The `inetd` server invokes network servers on demand. It also provides simple TCP-based services of its own. The following daemons are started by `inetd`. For more information, see `inetd(1M)`.
- ftpd** The `ftpd` program, which is the File Transfer Protocol (FTP) server (daemon), is invoked by `inetd` when an incoming connection is detected on the specified port. FTP is described later in this chapter. For more information, see `ftpd(1M)`.
- telnetd** The `telnetd` program, which is the TELNET server (daemon), is invoked by `inetd` when an incoming connection is detected on the specified port. TELNET is described later in this chapter. For more information, see `telnetd(1M)`.
- tftpd** The `tftpd` program, which is the Trivial File Transfer Protocol (TFTP) server (daemon), is invoked by `inetd` when an incoming connection is detected on the specified port. TFTP is described later in this chapter. For more information, see the `tftpd(1M)` manual page.
- rshd, rexecd, rlogind** These are servers (daemons) for `rsh` (which is `remsh` if you choose compliance with the *System V Interface Definition* [SVID], see Chapter 6), `rexec`, and `rlogin`. They are invoked by `inetd` when an incoming connection is detected on the specified port. For more information, see the following manual pages: `rshd(1M)`, `rexecd(1M)`, `rlogind(1M)`.
- named** The domain name server runs as a daemon called `named`. The `named` process listens on a specified port for queries from a domain name resolver or from another name server. It maintains a database that contains information about specified objects. For details, see Chapter 5 of this manual.
- pmttd** This is the server (daemon) for the magnetic tape pseudo device. This server handles local requests to do tape I/O operations on a tape device on a remote host. For more information, see `pmttd(1M)`.
- routed** The `routed` server manages network routing tables using the Routing Information Protocol (RIP). For more information, see the `routed(1M)` manual page.
- rwhod** This is the server (daemon) for `rwho` and `ruptime`. For more information, see `rwhod(1M)`.

— run on sending server

```

#
# Internet server configuration database
#
ftp      stream  tcp      nowait  root    /usr/bin/ftpd      ftpd
telnet   stream  tcp      nowait  root    /usr/bin/telnetd   telnetd
shell    stream  tcp      nowait  root    /usr/bin/rshd      rshd
login    stream  tcp      nowait  root    /usr/bin/rlogind   rlogind
exec     stream  tcp      nowait  root    /usr/bin/ressd     ressd
tftp     dgram   udp      wait    root    /usr/bin/tftpd     tftpd
echo     stream  tcp      nowait  root    internal
discard stream  tcp      nowait  root    internal
chargen stream  tcp      nowait  root    internal
daytime  stream  tcp      nowait  root    internal
time     stream  tcp      nowait  root    internal
echo     dgram   udp      wait    root    internal
discard  dgram   udp      wait    root    internal
chargen  dgram   udp      wait    root    internal
daytime  dgram   udp      wait    root    internal
time     dgram   udp      wait    root    internal

```

The inetd.conf.proto File

service-name socket-type protocol wait-status uid server-program server-arguments

Each entry specifies the following information:

- The name of the service, as specified in */etc/services*
- The socket type used (stream, datagram, or raw)
- The protocol used, as specified in */etc/protocols*.
- The wait-status, which is either *nowait* or *wait*
- The user ID that the server should use when it runs
- The pathname of a server process to be invoked by *inetd* to perform the requested service, or the value *internal* when *inetd* itself provides the service
- Server-arguments if a process must be invoked with command-line arguments

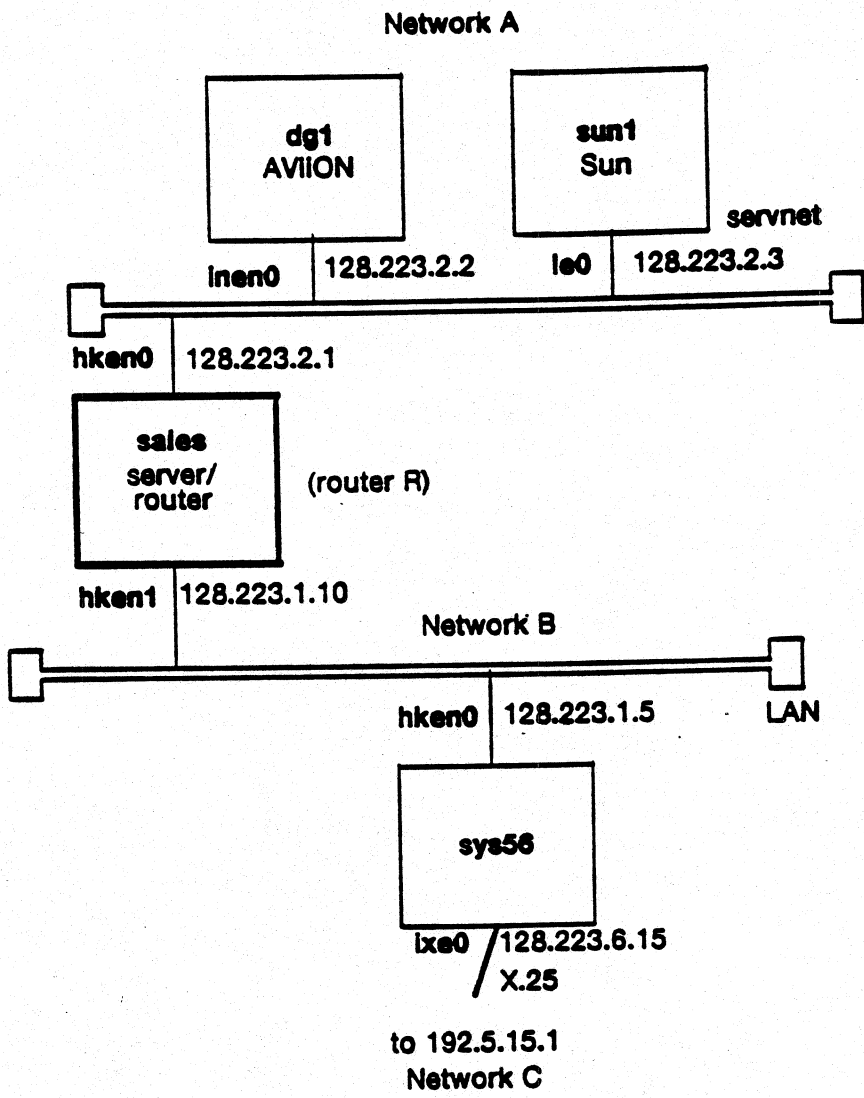
In the configuration file, you can separate fields with spaces or tab characters. A # (pound-sign) indicates the beginning of a comment; characters up to the end of the line are not interpreted by routines that search this file.

Compiling TCP/IP Information

Before setting up the TCP/IP package, you need to gather a variety of information about your system and local network. See your network administrator or *Setting Up and Managing TCP/IP on the DG/UX™ System*. You need to know:

Internet address	During network installation, you need to know the Internet address of your own system as well those of other systems on your network. An example Internet address is 128.223.2.1.
host name STUDENT 1-10	This name could be whatever you intend to call your system within your network. Step 1, "Planning Resources and Using DG/UX Conventions" discusses host names.
network name CLASS-NET	This is the name of your local network. An example is sales-net.
subnet status NO	You need to know if your local network is subnetted.
network mask	The network mask you use depends on how your local network is subnetted. An example mask is 0xffff00.
controller device type	On a workstation and some servers, your controller device type is <i>lnen</i> . For servers and workstations that have a Hawk LAN controller, it is <i>hken</i> .
controller device name	Your controller device name is the same as the type but with a 0 or 1 appended: <i>hken0</i> or <i>lnen0</i> . AViiON 400- and 4000-series systems may have an extra Hawk LAN controller (<i>hken0</i>) in addition to the integrated controller (<i>lnen0</i>). AViiON 5000- and 6000-series systems may have as many as two Hawk LAN controllers (<i>hken0</i> and <i>hken1</i>).
broadcast address type	The broadcast address may be either all zeroes (BSD 4.2 compatible) or all ones (BSD 4.3 compatible).

PONG
to see if subnet
if config *lnen0*
UP, STARTED, BROADCAST, RUNNING
is what you want



route

/usr/bin/route command dest gateway metric

commands - add, delete

Dynamic routing

icmp redirects

routed manages routing tables

/etc/gateways

proxy arp

does away with explicit routing tables

designed originally for use on one physical network.

notion that routers can act as a proxy for a system on another network.

arp

Usage: arp [-i interface_name] hostname
arp [-i interface_name] -a
arp [-i interface_name] -d hostname
arp [-i interface_name] -s hostname ether_addr [temp] [pub]
arp [-i interface_name] -f filename

arp -i inen0 uwood11

ARP entry for uwood11 found in /dev/inen0:

Hostname	Internet Address	Ethernet address	Status
uwood11	89.0.1.1	00:00:77:00:88:8f	temporary
#			
#			

gateways(4)

gateways(4)

NAME

gateways - database for routed

DESCRIPTION

When you start routed, it reads the /etc/gateways file to specify routing gateways. The file consists of a series of lines, each in the following format:

```
[net | host] n1 gateway n2 metric val [ passive | active | external ]
```

The net or host keyword indicates if the route is to a network or specific host.

n1 is the name of the destination network or host. This may be a symbolic name located in /etc/networks or /etc/hosts, or an Internet address specified in "dot" notation; see inet(3n).

n2 is the name or address of the gateway to which messages should be forwarded.

val is a metric indicating the hop count to the destination host or network.

One of the keywords *passive*, *active* or *external* indicates if the gateway should be treated as passive or active or whether the gateway is external to the scope of the routed protocol.

Gateways specified in /etc/gateways should be marked *passive* if they are not expected to exchange routing information, while gateways marked *active* should be willing to exchange routing information (that is, they should have a routed process running on the machine). *Passive* gateways are maintained in the routing tables forever and information regarding their existence is included in any routing information transmitted. *Active* gateways are treated equally to network interfaces. Routing information is distributed to the gateway and if no routing information is received for a period of the time, the associated route is deleted. *External* gateways are also *passive*, but are not placed in the kernel routing table nor are they included in routing updates. The function of *external* entries is to inform routed that another routing process will install such a route, and that alternate routes to that destination should not be installed. Such entries are only required when both routers may learn of routes to the same destination.

FILES

/etc/gateways

SEE ALSO

routed(1M)

Software Release Management

- | | | |
|---|--------------|---|
| 1 | addrelease | Add a software release area |
| 2 | delrelease | Delete a software release area |
| 3 | lsrelease | List information about software releases |
| 4 | loadpackage | Load software packages into a software release area |
| 5 | setuppackage | Set up packages in a software release area |
| 6 | makesrv | Create the initial /srv directory tree |
| 7 | lstoc | List the table of contents from a release tape |

Enter a number, a name, the initial part of a name,
? or <number>? for HELP, ~ to GO BACK, q to QUIT:

Network Management

- | | | |
|----|--------------|---|
| 1 | addhost | Add an entry to the hosts file |
| 2 | delhost | Delete an entry from the hosts file |
| 3 | modhost | Modify an entry in the hosts file |
| 4 | lshost | List entries in the hosts file |
| 5 | addnetwork | Add an entry to the networks file |
| 6 | delnetwork | Delete an entry from the networks file |
| 7 | modnetwork | Modify an entry in the networks file |
| 8 | lsnetwork | List entries in the networks file |
| 9 | addether | Add an entry to the ethers file |
| 10 | delether | Delete an entry from the ethers file |
| 11 | modether | Modify an entry in the ethers file |
| 12 | lsether | List entries in the ethers file |
| 13 | nfsparams | Set boot time parameters for NFS and YP |
| 14 | tcppipparams | Set boot time parameters for TCP/IP |

Enter a number, a name, the initial part of a name,
? or <number>? for HELP, ~ to GO BACK, q to QUIT:

class_net

Setting Up Software Packages with sysadm

Next, we execute setuppackage:

```
# sysadm setuppackage >
```

Running subcommand 'setuppackage' from menu 'releasemgmt',
Software Release Management

Release Name? [PRIMARY] >

The following packages have setup scripts that have not been run:

```
X11      nfs      tcpip    yp
X11.lg
```

Setting Up TCP/IP

Package Name? [all] tcpip >

Processing setup scripts for package tcpip.
Set up package tcpip in usr? [yes] >

Setting up package: tcpip

In revisions of the DG/UX operating system before 4.00,
the restricted shell command was named rcsah
and the remote shell command was named rsh.
To be compatible with the System V Interface Definition (SVID),
the restricted shell command must be named rsh and
the remote shell command must have a different name.
To be SVID-compliant, Data General names the remote shell rcsah.

You are prompted to choose whether or not the names of
the remote and restricted shells comply with the SVID.

If You Choose The Result Is

y The restricted shell is named /bin/rsh
 The remote shell is named /usr/bin/rcsah

n (default) The restricted shell is named /bin/rcsah
 The remote shell is named /usr/bin/rsh.

Do you want names to comply with the System V Interface Definition? [n] y >

Restricted Shell is named /bin/rsh
Remote Shell is named /usr/bin/rcsah

Remote Commands Installation Complete

Press NEWLINE when ready to continue... >
Setup package tcpip in MY_HOST root? [yes] >

Setting up package: tcpip

Creating links for initialization scripts...Please Wait

File: /srv/release/PRIMARY/root/MY_HOST/etc/hosts has been created from prototype file.
File: /srv/release/PRIMARY/root/MY_HOST/etc/hostswrds has been created from prototype file.
File: /srv/release/PRIMARY/root/MY_HOST/etc/services has been created from prototype file.
File: /srv/release/PRIMARY/root/MY_HOST/etc/protocols has been created from prototype file.
File: /srv/release/PRIMARY/root/MY_HOST/etc/ethers has been created from prototype file.
File: /srv/release/PRIMARY/root/MY_HOST/etc/tcpip.params has been created from prototype file.

Press NEWLINE when ready to continue... >

*Must supply
names of all hosts
all reside in
/etc/hosts*

y

Do you want support for loop interfaces? [y]]

Updating /srv/release/PRIMRY/root/MY_HOST/etc/hosts and /srv/release/PRIMRY/root/MY_HOST/etc/networks files...Please wait.

NOTE: Any entries encountered containing conflicting information will be deleted from the offending file.

The following lines have been removed from file "/srv/release/PRIMRY/root/MY_HOST/etc/hosts"
- Begin Remove List -
127.0.0.1 localhost
- End of Remove List -

The entry "127.0.0.1 localhost" has been added to file "/srv/release/PRIMRY/root/MY_HOST/etc/hosts"

host

Updating "/srv/release/PRIMRY/root/MY_HOST/etc/tcpip.params"
...Please wait...

IMPORTANT NOTE: You MUST have a "loop" entry specified in your system configuration file. Consult the help menu or the system(4) man page for more information.

Local Loopback Environment Installation Complete

Press NEWLINE when ready to continue...]

The following queries refer to the host being installed

Enter host Internet address: 128.223.75.10]
[128.223.75.10] Correct ? [y]]

Enter host name: avilocal]
[avilocal] Correct ? [y]]

STUDENT 2

Enter network name: sales_net]
[sales_net] Correct ? [y]]

CLASS-NET

Is "sales_net" a subnetwork? [n] y]

Enter the network mask: 0xffffffff]
[0xffffffff] Correct ? [y]]

Calculating network address...please wait...

Updating /srv/release/PRIMRY/root/MY_HOST/etc/hosts and /srv/release/PRIMRY/root/MY_HOST/etc/networks files...please wait

NOTE: Any entries encountered containing conflicting information will be deleted from the offending file.

The entry "128.223.75.10 avilocal" has been added to "/srv/release/PRIMRY/root/MY_HOST/etc/hosts"
The entry "128.223.75 sales_net" has been added to "/srv/release/PRIMRY/root/MY_HOST/etc/networks"

Enter controller device name: inen0]
[inen0] Correct ? [y]]

inen0

There are two variations of Broadcast addresses. A BSD 4.2 compatible broadcast address has a host portion of all zeros. A BSD 4.3 compatible broadcast address has a host portion of all ones.

Calculating network portion of broadcast address...please wait...

*hken always on AV5000
inen always on masenke/AV400/AV3000*

```
#
127.0.0.1      localhost
#
128.10.0.2    csnet-purdue purdue-rvax rvax
128.11.0.2    bbn-cvax cvax
128.16.9.2    ucl-tg
.
.
128.4.0.5     dcn5 dcn-11c
128.5.32.5    ford-wd15
```

The /etc/hosts.proto File

```
#
# Internet networks
#
loopback-net  127          software-loopback-net
#
bbn-pr-temp   1
sf-pr-1-temp  2
bbn-rcc       3
satnet        4
demo-pr-1-temp 5
sf-pr-2-temp  6
bbn-net       8
bragg-pr-temp 9
arpanet       10
.
.
.
rutgers       128.6
.
.
nyu-net       192.5.15
```

The /etc/networks.proto File

```

# /*****
# * Copyright (C) Data General Corporation, 1985 - 1988 *
# * All Rights Reserved. *
# * Licensed Material-Property of Data General Corporation. *
# *****/
#
# /*****
# * This software is made available solely pursuant *
# * to the terms of a DGC license *
# * agreement which governs its use. *
# *****/
#
# Data General SCCS ID @(#)protocols 3.1
#
# Internet (IP) protocols
#
ip      0      IP      # internet protocol, pseudo protocol number
icmp    1      ICMP    # internet control message protocol
ggp     3      GGP     # gateway-gateway protocol
tcp     6      TCP     # transmission control protocol
pup     12     PUP     # PARC universal packet protocol
udp     17     UDP     # user datagram protocol

```

```

# /*****
# * Copyright (C) Data General Corporation, 1985 - 1988 *
# * All Rights Reserved. *
# * Licensed Material-Property of Data General Corporation. *
# *****/

```

```

# /*****
# * This software is made available solely pursuant *
# * to the terms of a DGC license *
# * agreement which governs its use. *
# *****/

```

Data General SCCS ID @(#)services

3.1
 PORT # 5

Network services, Internet style

```

#
echo          7/udp
echo          7/tcp
discard      9/udp      # sink null
discard      9/tcp      # sink null
systat       11/tcp
daytime      13/udp
daytime      13/tcp
netstat      15/tcp
generator    19/tcp      # character generator
chargen      19/udp      # character generator
chargen      19/tcp      # character generator
ftp          21/tcp
telnet       23/tcp
smtp         25/tcp
time         37/udp      mail
time         37/tcp      timserver
time         37/tcp      timserver
time         37/tcp      timserver
name         42/tcp      nameserver
whois        43/tcp      nickname
mtp          57/tcp
hostnames    101/tcp     hostname      # deprecated
# usually from sri-nic

```

Host specific functions

```

#
tftp         69/udp
rje          77/tcp
finger       79/tcp
link         87/tcp      ttylink
supdup       95/tcp
ingreslock   1524/tcp

```

UNIX specific services

```

#
exec         512/tcp
login        513/tcp
shell        514/tcp      cmd           # no passwords used
printer      515/tcp      spooler       # experimental
efs          520/tcp      # for LucasFilm
courier      530/tcp      rpc           # experimental
connect      540/tcp      rcon          # local-echo remote login
biff         512/udp      comsat
who          513/udp      whod
syslog       514/udp
talk         517/udp
route        520/udp      router routed # 521 also
new-rwho     550/udp      new-who       # experimental
rmonitor     560/udp      rmonitord     # experimental
monitor      561/udp      # experimental

```

Sun NFS Services

```

#
sunrpc       111/udp
sunrpc       111/tcp

```


cd /usr/releases

* PANIC CODES

ls -l

anything that ends in .rn is a release file
.sl = files loaded

To load TCP/IP
INIT 1

SYSADM LOAD PACKAGE

SYSADM SETUP PACKAGE

load only
TCP/IP

class-net

Do you want the host portion of the broadcast address to be all ones? (y))

Calculating broadcast address...please wait...

Updating /srv/release/PRIMARY/root/MY_HOST/etc/tcpip.params...
please wait...

IMPORTANT NOTE: You MUST have a "lsm" entry specified in
your system configuration file. Consult the help menu or the
system(4) man page for more information.

Local Environment Installation Complete.

Press NEWLINE when ready to continue.)

The following queries refer to DE configuration.

Would you like to configure any DE interfaces? (n))

DE Configuration Complete

Press NEWLINE when ready to continue.)

Would you like to add a remote host entry? (y))

The following refers to other hosts on this network

Enter host Internet address: 128.223.33.1)

Enter host name: goeber)

The entry "128.223.33.1 goeber" has been added to the file
/srv/release/PRIMARY/root/MY_HOST/etc/hosts.

Do you want to add another remote host entry? (n))

Do you want to edit the
/srv/release/PRIMARY/root/MY_HOST/etc/protocols file? (n))

Press NEWLINE when ready to continue.)

Do you want to edit the

/srv/release/PRIMARY/root/MY_HOST/etc/services file? (n))

Network Environment Installation Complete

Press NEWLINE when ready to continue.)

Enter FTP login directory (/var/ftp):)
[/var/ftp] Correct ? (y))

Modifying ftp password entry in
/srv/release/PRIMARY/root/MY_HOST/etc/passwd

Directory: /var/ftp exists

Directory: /var/ftp/bin exists

Directory: /var/ftp/etc exists

File "/usr/bin/ls" has been copied to "/var/ftp/bin/ls"

File "/usr/bin/pwd" has been copied to "/var/ftp/bin/pwd"

File "/srv/release/PRIMARY/root/MY_HOST/etc/group" has been
copied to "/var/ftp/etc/group"

FTP Installation Complete

Press NEWLINE when ready to continue.)

File: /srv/release/PRIMARY/root/MY_HOST/etc/hosts.equiv has been created from prototype file

Warning: The following query may produce a security breach in your system. An entry in the /srv/release/PRIMARY/root/MY_HOST/etc/hosts.equiv file allows a user from the specified remote host having the same user name to remotely login to your host WITHOUT having to enter a password. Caution should be exercised when adding entries to this file.

Do you wish to add a host to the /srv/release/PRIMARY/root/MY_HOST/etc/hosts.equiv file? [n])
File "/srv/release/PRIMARY/root/MY_HOST/etc/passwdtab" created from prototype.
File "/srv/release/PRIMARY/root/MY_HOST/etc/passwdbtab" created from prototype.

Remote Commands Installation Complete

Press NEWLINE when ready to continue.)

"/srv/release/PRIMARY/root/MY_HOST/etc/sendmail.cf" created from
"/srv/release/PRIMARY/root/MY_HOST/etc/arpaproto.cf"

Do you need to customize ruleset 0? [n])

Modifying mail passwd entry in
/srv/release/PRIMARY/root/MY_HOST/etc/passwd.

Do you want to use sendmail as the mailx router? [y])

File "/srv/release/PRIMARY/root/MY_HOST/var/mailx/mailx.rc" has been created.

The entry "set sendmail=/usr/lib/sendmail" has been added to file
"/srv/release/PRIMARY/root/MY_HOST/var/mailx/mailx.rc"

File "/srv/release/PRIMARY/root/MY_HOST/etc/aliases" created from prototype file.

Do you want to edit the /srv/release/PRIMARY/root/MY_HOST/etc/aliases file? [n])

Executing /usr/bin/newaliases...please wait

3 aliases, longest 11 bytes, 53 bytes total

Sendmail Installation Complete

Press **NEWLINE** when ready to continue...)

The Domain Name System provides a means to distribute management of host information. It can be used in place of or in conjunction with Yellow Pages and/or the `/etc/hosts` file.

To install and run the domain name server on your machine you must have data bases set up for the name server. Chapter 5 of *Setting Up and Managing DG/UX TCP/IP* explains in detail the domain name system and the requirements to run this service. Please read this chapter before attempting to set up the domain name service on your system.

The answers to the following questions will be used to partially configure your system for domain name service access. The only files that will be edited are `/etc/resolv.conf`, `/etc/named.boot`, and `/etc/svcsorder`. If you do not want to edit these files at this time, answer no to the first question.

Do you want to partially configure for domain name service? (n))

Partial Domain Name Server Installation Complete

Press **NEWLINE** when ready to continue...)

Deleting obsolete files...Please wait...

setuppackage is finished
#

Setting Up ONC/NFS

sysadm setuppackage)

Running subcommand 'setuppackage' from menu 'releasemgmt',
Software Release Management

Release Name? (PRIMARY))

The following packages have setup scripts that have not been run:

 x11 x11.lg nfs yp

Package Name? (all) nfs)

Processing setup scripts for package nfs.

Set up package nfs in usr? (yes))

 Setting up package: nfs

Set up package nfs in MY_HOST root? (yes))

 Setting up package: nfs

Setting up the `rcf.d` directory links.

Remove links in `/srv/release/PRIMARY/root/MY_HOST/etc/rcf.d`

+.....
Link from `/usr/sbin/init.d` to `/srv/release/PRIMARY/root/MY_HOST/etc`
+.....

That completes the automated portion of the NFS configuration

setuppackage is finished.
#

Building a Custom Kernel

```
# sysadm newdgux >
```

```
Running subcommand 'newdgux' from menu 'sysadm',  
SYSTEM CONFIGURATION MANAGEMENT
```

```
System Name? (avlion) >
```

```
System File /usr/src/uts/avlion/Build/system.avlion does not exist.
```

```
Create the system file? (yes) >
```

```
Editor? (vi) >
```

```
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```

/usr/src/uts/avlion/Build/system.iwayne

```
# serial = "(c) 88K 1990 system.dgux.proto 94.5"
```

```
-----  
#  
# Prototype fragment of system configuration for:  
#  
# (Product Name):      DG/UX  
# (Release):           4.30  
#  
# This prototype is provided to assist you in creating your  
# customized system configuration file.  
# This file consists of system file entries pertaining to this  
# product. Include this fragment in your customized system file  
# and edit it to reflect your system's configuration.  
# See this product's master file (in /usr/etc/master.d) for more details.  
#  
-----
```

```
-----  
# Devices:  
#  
# List all devices and pseudo-devices in this section, one entry per  
# line. Typical configurations for several typical configurations  
# have been provided below; delete entries that do not apply to your  
# system and add to the list any devices your system has that are not  
# already listed.  
#  
#
```

```
#### Typical AVLION 300 series workstation configuration:
```

```
# Note that your system can have a second durt() or an lp() controller,  
# but not both!
```

```
kbd()          # - keyboard  
grfx()         # - graphics display  
sd(iscs(),*)   # - all SCSI disks on integrated SCSI adapter  
st(iscs(),*)   # - all SCSI tapes on integrated SCSI adapter  
iscs()         # - integrated Ethernet controller  
durt()         # - integrated Durt terminal line controller  
# durt(1)      # - second Durt (if present on system)  
lp()           # - integrated printer controller (if present)
```

```

ptc()      # -- pseudo-terminal controller device
ptsl()     # -- pseudo-terminal slave device
pmt()      # -- pseudo-magtape device
log()      # -- Streams logger pseudo-device
prf()      # -- profiler pseudo-device

```

Typical AVLION 400 series workstation configuration:

```

# kbd()      # -- keyboard
# gfx()      # -- graphics display
# sd(insc),* # -- all SCSI disk drives on integrated SCSI adapter
# st(insc),* # -- all SCSI tape drives on integrated SCSI adapter
# insc()     # -- integrated Ethernet controller
# durt()     # -- integrated Durt terminal line controller
# durt(1)    # -- second Durt
# lp()       # -- integrated line printer controller
#
# ptc()      # -- pseudo-terminal controller device
# ptsl()     # -- pseudo-terminal slave device
# pmt()      # -- pseudo-magtape device
# log()      # -- Streams logger pseudo-device
# prf()      # -- profiler pseudo-device

```

Typical AVLION 4000 series server configuration:

```

# sd(cisc),* # -- all SCSI disk drives on integrated SCSI adapter
# st(cisc),* # -- all SCSI tape drives on integrated SCSI adapter
# sd(cisc),* # -- all SCSI disk drives on Ciprico SCSI adapter
# st(cisc),* # -- all SCSI tape drives on Ciprico SCSI adapter
# cird()     # -- Ciprico Rinfire or SMD disk controller
#
# insc()     # -- integrated Ethernet controller
# hnam()     # -- Interphase WE Ethernet controller
# sync()     # -- Systech terminal line controller
# durt()     # -- integrated Durt terminal line controller
# durt(1)    # -- second Durt
# lp()       # -- integrated line printer controller
#
# ptc()      # -- pseudo-terminal controller device
# ptsl()     # -- pseudo-terminal slave device
# pmt()      # -- pseudo-magtape device
# log()      # -- Streams logger pseudo-device
# prf()      # -- profiler pseudo-device

```

Typical AVLION 5000 or 6000 series server configuration:

```

# cird()     # -- Ciprico Rinfire or SMD disk controller
# sd(cisc),* # -- all SCSI disk drives on Ciprico SCSI adapter
# st(cisc),* # -- all SCSI tape drives on Ciprico SCSI adapter
# sync()     # -- Systech terminal line controller
# durt()     # -- integrated Durt terminal line controller
# hnam(0)    # -- 1st Interphase WE Ethernet controller
# hnam(1)    # -- 2nd Interphase WE Ethernet controller
# lp()       # -- integrated line printer controller
#
# ptc()      # -- pseudo-terminal controller device
# ptsl()     # -- pseudo-terminal slave device
# pmt()      # -- pseudo-magtape device
# log()      # -- Streams logger pseudo-device
# prf()      # -- profiler pseudo-device
#
#
#

```

Protocols:

List all protocols in this section, one entry per line.
Each entry consists of the name of a protocol you want to
configure into your system.

You should not have to specify any additional protocols in order to
use this product.

Protocol Name

STREAMS Modules:

List all explicit STREAMS modules in this section, one entry per line.
Each entry consists of the name of a streams module you want to
configure into your system and that has not already been implicitly
configured because of protocols you have specified.

It is recommended that you specify the Transport Provider Interface
STREAMS modules, `timod` and `tirder`.

STREAMS Module Name

`timod`
`tirder`

Tunable Configuration Parameters:

List all configuration parameters you wish to override in this
section, one entry per line.
The default values from the master file will be used unless
explicitly overridden in this file.

Each entry consists of the name of a parameter you want to
override, followed by the value you wish to assign to it.
If you list just the name of the parameter but not a value for it,
its implied value from the master file will be used.

You should set the TZ variable to accurately reflect your timezone
(300 minutes west of GMT is USA Eastern time).

You should set the MAXUP variable to the maximum number of processes
that each user will be allowed to run simultaneously. This number
should be at least 64 for workstations.

You should set the NODE variable to control your nodename for `uname(1)`
and `uucp(1)`, but not more than 255 characters.

You should set the DUMP variable to the name of the tape device (in
DG/UX Common Device Specification Format) that will be the default
device to take dumps in case of system emergencies. For diskless
workstations, the DUMP variable should be set to the network device
used to boot the machine.

```

#
# If your system is a diskless workstation, you should set the
# PERCENTNFS variable to 100 in order to get the best possible NFS
# performance.
#
# If either your system's root file system or its swap file will be
# mounted over NFS (a diskless workstation will NFS-mount both, a
# dataless workstation will NFS-mount only the root), you must set
# the NETBCODEV variable to the name of the network device (in DG/UX
# Common Device Specification Format) that will be used in booting
# over the network.
#
# If your system's root file system will be mounted over NFS (as will
# be done on both diskless and dataless workstations), you must set the
# ROOTSTYPE variable to NETWORK_ROOT.
#
# If your system's swap file will be mounted over NFS (as will be done
# on diskless workstations), you must set the SWAPDEVTYPE variable to
# NETWORK_SWAP.

```

```

#
# Parameter Name      Value
# -----
#
# TZ                  300
# MAXDP              64
# NOCE               "avticol"
#
# DUMP               "st(incr(),4)"
## DUMP              "incr()"

```

```

## PERCENTNFS        100
## NETBCODEV         "incr()"
## ROOTSTYPE         NETWORK_ROOT
## SWAPDEVTYPE       NETWORK_SWAP

```

```

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```

```

# accid = "@(#) 88K 1990 system.nfs.proto 94.2"

```

```

#
# Prototype fragment of system configuration for:
#
# (Product Name):      NFS
# (Release):           4.30
#
#
# This prototype is provided to assist you in creating your
# customized system configuration file.
# This file consists of system file entries pertaining to this
# product. Include this fragment in your customized system file
# and edit it to reflect your system's configuration.
# See this product's master file (in /usr/etc/master.d) for more details.
#

```

```
# Devices:
#
# List all devices in this section, one entry per line.
# The string is the name of the device.
# Note that some pseudo-devices have no device code at
# all, so none should be listed.
# Any other text on a line will be ignored.
#
#
# Device Name
# _____
#
#
# plm()          # -- network lock manager pseudo-device
#
#
```

```
# Protocols:
#
# List all protocols in this section, one entry per line.
# Each entry consists of the name of a protocol you want to
# configure into your system.
#
# You will not need to specify any additional protocols to use this
# product.
#
#
# Protocol Name
# _____
#
#
#
```

```
# STREAMS Modules:
#
# List all explicit STREAMS modules in this section, one entry per line.
# Each entry consists of the name of a streams module you want to
# configure into your system and that has not already been implicitly
# configured because of protocols you have specified.
#
# You will not need to specify any additional STREAMS modules
# to use this product.
#
#
# STREAMS Module Name
# _____
#
#
#
```

Tunable Configuration Parameters:

List all configuration parameters you wish to override in this
section, one entry per line.
Each entry consists of the name of a parameter you want to
override, followed by the value you wish to assign to it.
If you list just the name of the parameter but not a value for it,
its Implied Value from the master file will be used.

To use NFS, you must specify the NFS variable so that its implied
value will be used.

# Parameter Name	Value
------------------	-------

NFS

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terms of a DGC license agreement which governs its use.

socsrd = "(*) 88K tcpip 90.1"

Prototype fragment of system configuration for:

(Product Name): TCP/IP
(Release): 4.30

This prototype is provided to assist you in creating your
customized system configuration file.
This file consists of system file entries pertaining to this
product. Include this fragment in your customized system file
and edit it to reflect your system's configuration.
See this product's master file (in /usr/etc/master.d) for more details.

Devices:

List all devices and pseudo-devices in this section, one entry per

line. Verify typical configurations for both workstations and
server systems. You will need at least one LAN controller
(lans or hlan). (see the DG/UX system.proto file for these)

The protocol engines are Streams multiplexing drivers

ip()
tcp()
udp()

It is also recommended that you include the loopback pseudo-device.

loop()

Protocols:

- # List all protocols in this section, one entry per line.
- # Each entry consists of the name of a protocol you want to configure into your system.
- # You will need the tcp, ip, udp and icmp protocols.

Protocol Name

ipproto_ip
ipproto_tcp
ipproto_udp
ipproto_icmp

STREAMS Modules:

- # List all explicit STREAMS modules in this section, one entry per line.
- # Each entry consists of the name of a streams module you want to configure into your system and that has not already been implicitly configured because of protocols you have specified.

STREAMS Module Name

ether
arp
socksys
netlog

Tunable Configuration Parameters:

- # List all configuration parameters you wish to override in this section, one entry per line.
- # Each entry consists of the name of a parameter you want to

```

$ override, followed by the value you wish to assign to it.
$ If you list just the name of the parameter but not a value for it,
$ its implied Value from the master file will be used.
$
swq )

```

Installing the New Kernel

```

Ready to Configure a Kernel? [yes] )
sysadm will now run config on /usr/src/uts/avlicn/Build/system.avlicn

```

Config succeeded.

```

sysadm will now attempt to build a kernel.
Building...
The build succeeded.

```

```

Install the New Kernel? [no] y )
For a Diskless Client of this Host? [no] )
Kernel Pathname? (/dgnk.avlicn) ) WAYNE

```

```

The new kernel has been copied to /dgnk.avlicn.
Link /dgnk to the New Kernel? [yes] )

```

The new kernel will not take effect until you shutdown and reboot.
To do this, quit sysadm, and say:

```

cd /
/etc/shutdown
/etc/halt -q

```

Until you do this, a few commands which depend on the symbol table
in /dgnk (such as the kernel profiler and netstat) may not work correctly.
This should not cause any serious difficulties.

\$

Bringing Down the System

```

$ cd / )
$ /etc/shutdown -g0 -y )
...
$ halt -q )

```



AViiON Foundations and Operations H615

Module 6 - NFS Overview and Installation

Introduction:

This module of introduce the student to the Network File System product available on the Aviiion platform. This module will give the student sufficient information to successfully install NFS on Aviiion system and to obtain remote resources from another machine on the network.

Objectives:

Upon completion of this module of instruction, the student will:

- be able to state what steps are necessary to perform for an NFS "server" to make resources available.
- be able to state what steps are necessary to perform for an NFS "client" to access resources across the network.
- install NFS on an Aviiion system and and verify it's ability to make resources available to other machines and also for it to access remote resources across the network.
- Be able to list the various server processes that must be present on networked machines to provide communications ability.

References:

093-701049-

Managing NFS and it's Facilities on the
DG/UX System



Network File System

- an Industry Standard interface that Provides transparent remote access to shared filesystems

- allows heterogeneous systems to share files. Designed to be: machine
operating system
network architecture
and transport protocol
 - independent

- Developed by Sun Microsystems.
part of Sun's ONC (Open Network Computing)
(based on Sun 2.00)

- DG/UX NFS supported over Local Area Networks
(ethernet and 802.3)

ADVANTAGES

- hardware savings

- performance benefits

- less downtime

NFS

SERVERS

- machines that export filesystems that remote machines may mount

CLIENTS

- machines that obtain resources from server machines
- a machine may be a server and a client at the same time

RPC

XDR

mount
(umount)

- /etc/mount -ato

-a Mount all filesystems described in /etc/fstab.

-t The next argument is the filesystem type

-o The next argument is a string that specifies mount options. Valid options are:

ro	- read only
rw	- read write (default)
hard	- hard mount
soft	- soft mount

mount uwood:/udd /udd1

mount -at nfs

mount -o soft uwood3://fortran /project

/etc/fstab

- mount table referenced during system initialization

```
#
# Copyright (C) Data General Corporation, 1984 - 1989
# All Rights Reserved.
# Licensed Material-Property of Data General Corporation.
# This software is made available solely pursuant to the
# terms of a DGC license agreement which governs its use.
#
# This is a prototype for the file /etc/fstab. Use sysadm to maintain this
# file to conform to the configuration of your system.
# Comment lines are allowed, but blank lines are not.
#
# Local filesystems:
#
/dev/dsk/root          /                dg/ux rw d 0
/dev/dsk/swap         swap_area       swap sw x 0
#
/dev/dsk/usr /usr dg/ux rw d 1
/dev/dsk/tmp /tmp dg/ux rw w 1
uwood11:/dev/dsk/usr /usr1 nfs,soft rw d 1
```

EXPORTS(5)

EXPORTS(5)

NAME

exports, xtab - directories to export to NFS clients

SYNOPSIS

/etc/exports

/etc/xtab

DESCRIPTION

The /etc/exports file contains entries for directories that can be exported to NFS clients. This file is read automatically by the exportfs(8) command. If you change this file, you must run exportfs(8) for the changes to affect the daemon's operation.

Only when this file is present at boot time does the rc.local script execute exportfs(8) and start the NFS file-system daemon, nfsd(8).

The /etc/xtab file contains entries for directories that are currently exported. This file should only be accessed by programs using getexportent (see exportent(3)). (Use the -u option of exportfs to remove entries from this file).

An entry for a directory consists of a line of the following form:

directory -option[,option]...

directory is the pathname of a directory (or file).

option is one of

ro Export the directory read-only. If not specified, the directory is exported read-write.

rw=hostnames[:hostname]...

Export the directory read-mostly. Read-mostly means read-only to most machines, but read-write to those specified. If not specified, the directory is exported read-write to all.

anon=uid

If a request comes from an unknown user, use uid as the effective user ID. Note: root users (uid 0) are always considered unknown by the NFS server, unless they are included in the root option below. The default

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EXPORTS(5)

EXPORTS(5)

value for this option is -2. Setting anon to -1 disables anonymous access. Note: by default secure NFS will accept insecure requests as anonymous, and those wishing for extra security can disable this feature by setting anon to -1.

root=hostnames[:hostname]...

Give root access only to the root users from a specified host|Aoe. The default is for no hosts to be granted root access.

accessxD(=client[:client])...

Give mount access to each client listed. A client can either be a hostname, or a netgroup (see netgroup(5)). Each client in the list is first checked for in the netgroup database, and then the hosts database. The default value allows any machine to mount the given directory.

secure

Require clients to use a more secure protocol when accessing the directory.

A '#' (pound-sign) anywhere in the file indicates a comment that extends to the end of the line.

EXAMPLE

```
/usr      -access=clients      # export to my clients
/usr/local  # export to the world
/usr2     -access=hermes:zip:tutorial # export to only these machines
/usr/dgux  -root=hermes:zip        # give root access only to these
/usr/new   -anon=0              # give all machines root access
/usr/bin   -ro
/usr/stuff -access=zip,anon=-3,ro # several options on one line
```

FILES

```
/etc/exports
/etc/xtab
/etc/hosts
/etc/netgroup
```

SEE ALSO

exportent(3), hosts(5), netgroup(5), exportfs(8), nfsd(8)

WARNINGS

You cannot export either a parent directory or a subdirectory

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EXPORTS(5)

EXPORTS(5)

of an exported directory that is within the same filesystem. It would be illegal, for instance, to export both /usr and /usr/local if both directories resided on the same disk partition.

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mountd

- /usr/etc/mountd

server that answers NFS filesystem mount requests

portmap

- /usr/etc/portmap

server that converts RPC program numbers into DARPA protocol port numbers.

nfsd

- /usr/etc/nfsd [nservers]

starts the server daemons that handle client filesystem requests on the server.

/usr/etc/biod

- starts asynchronous block I/O daemons on an NFS client

Yellow Pages (YP)

- a replicated data lookup facility.
- part of Sun's ONC (Open Network Computing)
- provides clients with a read only access to a set of maps
- ensures consistency

Master server

Slave server

Client

domain

passwd.byname	obtain passwd entries indexed by username
passwd.byuid	obtain passwd entries indexed by user ID
group.byname	obtain group entries by name
group.bygid	obtain group entries by group id
hosts.byname	translate hostname to internet address
hosts.byaddr	Translate Internet address to hostname
networks.byaddr	translate network internet number to name
networks.byname	translate network name to internet number
protocols.byname	translate protocol name to internet protocol number
protocols.bynumber	translate internet protocol number to protocol name
services.byname	translate internet service names to port numbers
netgroup.byhost	obtain netgroup entries by hostname
netgroup.byuser	obtain netgroup entries by username
ethers.byhost	translate ethernet address to internet address
ethers.byaddr	translate hostname to ethernet address
ypmaps	list of YP maps in the domain and hostnames of their master servers indexed by map name
ypservers	List of YP servers in the domain
bootparams	lists root and swap files for diskless client
mail.aliases	translate alias entries to mail addresses for users and groups
rpc.bynumber	lists rpc programs by rpc program number

ypcat

- ypcat keyword -keyword is a map name
- d to specify a domain other than the default.
 "domainname"

returns passwords for the default domain name.

ypcat passwd

passwd	passwd.byname
group	group.byname
hosts	hosts.byaddr
networks	networks.byaddr
services	services.byname
protocols	protocols.bynumber
netgroup	netgroup

ypserv

- the YP server, must be running on each server.
- looks up database information in it's local maps
- keeps the maps consistent

ypbind

the YP binder daemon, must be running on all machines, servers and clients. It binds a client to a server in a particular domain. Originates from the client.

it keeps a record of:

- domain name
- the internet address of the YP server
- the port number where server is listening

binding done:

- at initialization
- if a server fails
- if an unbound domain is called

ypoll

`/usr/etc/yp/ypoll [-h hostname] [-d domainname] mapname`

asks a ypserv server process for information about one map.

`-h` specifies the hostname on which the ypserv process is running. (default is local)

`-d` specifies an alternate domainname for the YP

ypwhich

tells you which YP server a client is currently using

Local and Global YP Database files

before setting up the first time make sure that the following files are complete and up to date on the Master:

/etc/passwd

/etc/hosts

/etc/group

/etc/networks

/etc/protocols

/etc/services

/etc/netgroup

/etc/ethers

/etc/bootparams

/etc/netmasks

/.rhosts

/etc/hosts.equiv

/etc/aliases

/etc/rpc

YP Files

Local Files:

/etc/passwd

+ca: : : :Chris Anderson:/usr/chris:/bin/csh

/etc/passwd entry.

+ca:

+ca::100:101:Chris Anderson:/usr/chris:/bin/csh:

ca::100:101:Chris Anderson:/usr/chris:/bin/csh:

/etc/group

format:

groupname:encryptedpasswd:gid:user1,user2

Global Files:

/etc/services

It contains a list translating Internet service names, host specific function names and Unix specific function names to port numbers. i.e.:

ftp	21/tcp
netstat	15/tcp

/etc/protocols

contains a listing of Internet Protocol numbers

ip	0	IP	internet protocol
icmp	1	ICMP	internet control message protocol
ggp	3	GGP	gateway to gateway protocol
tcp	6	TCP	transmission control protocol
pup	12	PUP	PARC universal packet protocol
udp	17	UDP	user datagram protocol

/etc/networks

format:

woodstock

89

/etc/netgroup

The netgroup map defines network wide groups, which are used for permission checking for remote mounts, logins and remote shells. format:

```
groupname member1, member2, member3
```

```
shiftn ( , , )
```

/etc/hosts

format:

```
89.0.0.3      uwood3
```

Special Files

/etc/hosts.equiv

format:

```
hostname  
uwood3
```

```
+      ( anyone
```

```
 +@netgroup or -
```

```
 +@shiftn
```

each of the names to the right of the @ sign are treated as a group name defined in the global netgroup map.

.rhosts

If there are + or - entries whose arguments are netgroups, the YP netgroup map is consulted; otherwise YP is unused. Controls superuser access via rlogin or rsh. It's format is identical hosts.equiv.

dbm format -

```
/usr/etc/yp/hostname/hosts.byname.dir  
/usr/etc/yp/hostname/hosts,byname.pag
```

makedbm -

```
makedbm [-i yp_input_file] [-o yp_output_name] [-d yp_domain_  
name] [-m yp_master_name] infile outfile
```

```
makedbm [ -u dbmfilename ]
```

- i create a special entry with the key YP-INPUT-FILE
- o create a special entry with the key YP_OUTPUT_NAME
- d create a special entry with the key YP_DOMAIN_NAME
- m create a special entry with the key YP_MASTER_NAME
- u undo a dbm file. That is print out a dbm file one entry per line, with a single space separating keys from values.

```
cd /usr/etc/yp  
makedbm mymap.asc uwood3/mymap
```

```
cd /usr/etc/yp/domainname
makedbm -u map.name > map.tmp
vi map.tmp
makedbm map.tmp map.name
```

ypmake

```
make -f Makefile
rebuilds the YP database for everything out of date and then
executes a yppush
```

```
make passwd
```

```
makefile
DIR = /usr/etc/yp/src
NOPUSH = ""
DOM = `domainname`
```

```
make -e          - must be used for these variables to take
                  effect.
```

yppush

```
/usr/etc/yp/yppush [ -h hostname] [-d domainname] mapname
```

```
-h                specifies the hostname on which the ypserv
                  process is running. (default is local)
```

```
-d                specifies an alternate domainname for the YP
```


YPPASSWD(1)

YPPASSWD(1)

NAME

yppasswd - change your network password in the Yellow Pages

SYNOPSIS

yppasswd [name]

DESCRIPTION

yppasswd changes (or installs) a network password associated with the user name (your own name by default) in the Yellow Pages. The Yellow Pages password may be different from the one on your own machine.

yppasswd prompts for the old Yellow Pages password, and then for the new one. You must type in the old password correctly for the change to take effect. The new password must be typed twice, to forestall mistakes.

New passwords must be at least four characters long, if they use a sufficiently rich alphabet, and at least six characters long if monospace. These rules are relaxed if you are insistent enough. Only the owner of the name or the super-user may change a password; in either case you must prove you know the old password.

The Yellow Pages password daemon, yppasswdd(8C) must be running on your YP server in order for the new password to take effect.

SEE ALSO

passwd(1), ypfiles(5), yppasswdd(8C)

BUGS

The update protocol passes all the information to the server in one RPC call, without ever looking at it. Thus if you type in your old password incorrectly, you will not be notified until after you have entered your new password.

ypinit

```
/usr/etc/yp/ypinit -m [-s master_name]
```

automatically constructs required YP maps for a server, some from text files in /etc. Sets up master YP servers and slave YP servers for the first time.

-m indicates a that the local host is to be the YP master

-s set up a slave database

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Module 7 - TCP/IP Troubleshooting

Introduction:

This module of instruction will discuss techniques to troubleshoot TCP/IP network problems and introduce tools available to an administrator.

Objectives:

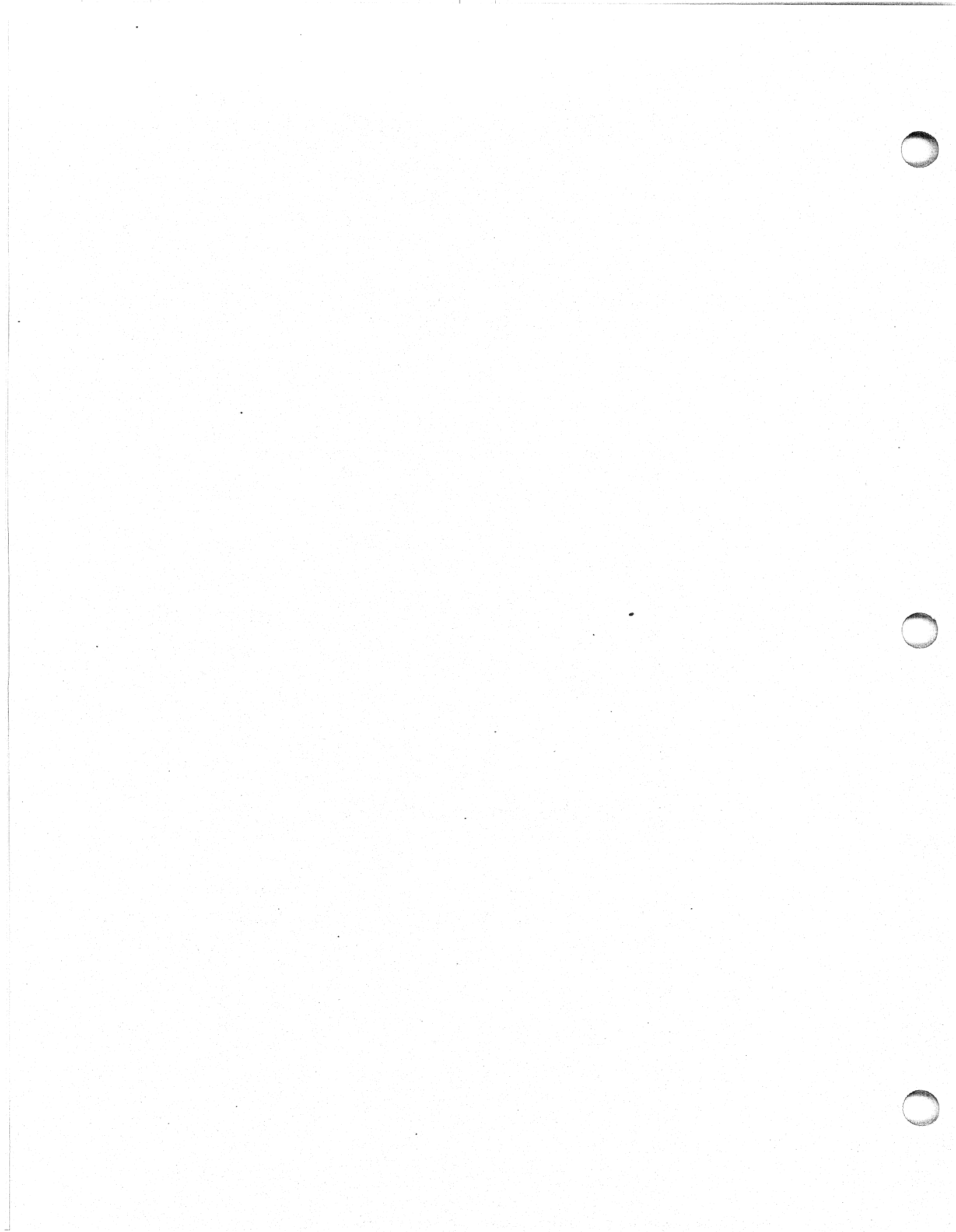
Upon completion of this module of instruction, the student will:

- Be able to list the various files used during network initialization to bring the network up.
- be able to use a troubleshooting methodology to isolate problems.
- be familiar with various commands and utilities available to assist in problem determination.

References:

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Setting Up and Managing TCP/IP on the
DG/UX System



Problem Determination:

- ISOLATE

When

Where

What Function

Problem Determination:

- On installation

1. Record any error messages.
2. Read release notice and retry installation
3. Had Diagnostics been run on the System before loading Operating System.
4. Rev level of hardware.
5. What Software Release

usr/release

```

-lia
1094
5 drwxr-xr-x 2 bin bin 512 Nov 13 16:42 .
: drwxr-xr-x 19 bin bin 512 Nov 13 16:49 ..
83 -r--r--r-- 1 root other 6270 Jul 17 09:03 DTK_2.10.fl
84 -rw-r--r-- 1 bin bin 52886 Jul 27 12:47 DTK_2.10.rn
14 -r--r--r-- 1 bin bin 13517 Jul 12 15:11 STR_form
79 -rw-r--r-- 1 root daemon 25526 Jul 13 11:52 X11_4.10.fl
78 -rw-r--r-- 1 bin bin 31169 Jul 26 14:58 X11_4.10.rn
80 -rw-r--r-- 1 437 200 13268 Jul 20 16:26 avx30_1.6.rn
75 -rw-r--r-- 1 bin bin 13423 Jul 27 14:38 cs_usr_pkg_4.10.avx
15 -r--r--r-- 1 bin bin 84691 Jul 14 15:57 dgux.fl
73 -rw-r--r-- 1 bin bin 43808 Jul 27 16:29 dgux.rn
74 -rw-r--r-- 1 bin bin 132314 Jul 28 10:23 dgux_4.10.panic
76 -rw-rw-r-- 1 bin bin 584 Jul 19 15:47 gcc_1.35.12.fl
77 -rw-rw-r-- 1 bin bin 28285 Jul 26 17:41 gcc_1.35.12.rn
93 -rw-r--r-- 1 bin bin 9656 Jul 26 23:25 nc_usr_pkg_4.10
94 -rw-r--r-- 1 bin bin 37609 Jul 27 16:04 nfs.rn
86 -rw-r--r-- 1 bin bin 38718 Jul 27 16:47 tcpip_4.10.rn
87 -rw-r--r-- 1 root other 3311 Jul 21 09:39 tcpip_4.10.tl
88 -rw-r--r-- 1 root other 13636 Jul 11 16:44 tcpip_str_form

```

Module TCP/IP Troubleshooting

6. What run level is the system at?
7. Are the necessary filesystems mounted?

- Errors on a running system

1. Was there an error message?
2. Is the system at the proper run level?
3. Try `#telnet localhost`, *ok*
`#telnet internet#`
4. Is the LAN intact.
5. was the controller started properly

Module TCP/IP Troubleshooting

ping(1C)

ping(1C)

NAME

ping - Network debugging

SYNOPSIS

/usr/bin/ping host [timeout]

DESCRIPTION

The ping command tests whether a node on an Internet network is up and working, though the upper layers of TCP/IP need not be up. This program sends an ICMP echo packet to host using a RAW socket interface, expecting the required ICMP response. If the ICMP packet is sent and received correctly, then a message is printed saying that host is alive. If there are errors locating host, creating the socket, sending the message, or receiving the message, an error message is printed.

The ping continues testing the network until timeout seconds have elapsed or until an answer is received. The default timeout is 20 seconds. The host argument can be a name or an Internet address.

EXAMPLE

ping bucky
bucky is alive (This line is returned.)

SEE ALSO

ruptime(1c)

*Cable/connection/remote host is OK
⊗ IP level is OK, but software
levels above may not be OK
- next try rlogin*

you can ping yourself


```
# ls -lia
```

```
total 234
```

65516	drwxr-xr-x	2	bin	bin	512	Jul 20 14:37	.
16	drwxr-xr-x	4	bin	bin	2048	Jul 20 16:48	..
69896	-rwxr--r--	1	root	sys	1748	Jul 14 11:03	chk.date
69888	-rwxr--r--	1	root	sys	10172	Jul 14 11:03	chk.devlink
69889	-rwxr--r--	1	root	sys	3524	Jul 20 13:01	chk.system
69890	-rwxr--r--	1	root	sys	6242	Jul 14 11:03	functions.h
69891	-rwxr--r--	1	root	sys	1870	Jul 14 11:03	messages.h
69892	-rwxr--r--	1	root	sys	1693	Jul 14 11:03	rc.account
69893	-rwxr--r--	1	root	sys	1666	Jul 14 11:03	rc.cron
69898	-rwxr--r--	1	root	sys	3255	Jul 14 11:03	rc.links
69899	-rwxr--r--	1	root	sys	1812	Jul 14 11:03	rc.localfs
69900	-rwxr--r--	1	root	sys	2460	Jul 20 13:02	rc.lpsched
69909	-rwxr--r--	1	root	sys	2291	Jul 14 09:18	rc.nfsfs
69910	-rwxr--r--	1	root	sys	2298	Jul 20 13:08	rc.nfsserv
69901	-rwxr--r--	1	root	sys	1860	Jul 14 11:03	rc.preserve
69902	-rwxr--r--	1	root	sys	1022	Jul 20 13:02	rc.setup
69895	-rwxr--r--	1	root	sys	1455	Jul 14 11:03	rc.syacs
69894	-rwxr--r--	1	root	sys	1413	Jul 14 11:03	rc.syslogd
69907	-rwxr-xr-x	1	bin	bin	4144	Jun 15 13:45	rc.tcpipport
69908	-rwxr-xr-x	1	bin	bin	2384	Jun 15 13:45	rc.tcpiplib
69903	-rwxr--r--	1	root	sys	1519	Jul 14 11:03	rc.update
69904	-rwxr--r--	1	root	sys	1032	Jul 14 11:03	rc.usrproc
69911	-rwxr--r--	1	root	sys	3958	Jul 14 09:18	rc.ypserv
69897	-rwxr-xr-x	1	bin	bin	47522	Jul 14 11:03	set_boot_time

Scripts to start TCP/IP

su

```
# su >
```

```
Password: (enter the superuser password)
```

```
# /usr/sbin/init.d/rc.nfsserv stop > (only if running NFS)
```

```
# /usr/sbin/init.d/rc.ypserv stop > (only if running YP)
```

```
# /usr/sbin/init.d/rc.tcpiplib stop >
```

```
# /usr/sbin/init.d/rc.tcpipport stop >
```

```
# /usr/sbin/init.d/rc.tcpipport start >
```

```
# /usr/sbin/init.d/rc.tcpiplib start >
```

```
# /usr/sbin/init.d/rc.ypserv start > (only if running YP)
```

```
# /usr/sbin/init.d/rc.nfsserv start > (only if running NFS)
```

PATH = \$PATH : . :

*M includes
PWP into executable
commands
in ENV*

*- retinet
- protocol stack was built*

*# if config "your host name" (in loopback OK)
if config ineth0 -*

NAME

netinit - Build a network protocol stack

SYNOPSIS

`/usr/bin/netinit input_directives_file`

or

`/usr/bin/netinit`

where:

input_directives_file contains a sequence of directives

DESCRIPTION

Use the netinit command to build the TCP/IP protocol stack. The netinit replaces the ifinit command.

Building the protocol stack involves opening new Streams to the drivers that TCP/IP uses, pushing appropriate protocol modules, and linking together the appropriate drivers. When you use netinit, you start a non-active controller. You must build the TCP/IP protocol stack before you use an interface to transmit and receive packets. Run netinit as a daemon that builds and configures an arbitrary Streams stack. The daemon is driven by an *input_directives_file* composed of many individual netinit directives. The file may be delivered to netinit in a file through the command line or it may be read from standard input. All netinit output is directed to standard error. The netinit command uses standard Streams linkages throughout.

netinit Directives

A netinit directive is a sequence of ASCII words delimited by spaces, the first of which is the keyword. You separate directives with newlines. Directives emulate function calls. Each directive is interpreted and executed as soon as it is read from the standard input. The result of executing a directive is returned as an ASCII status string through standard error. The string "OK" is returned when no errors occur during execution of the directive. Appropriate negative acknowledgements are returned under error conditions.

The Directive Vocabulary

The directive primitives are closely involved with Streams operations such as the LINK ioctl. This section focuses on the nature of the *input_directives_file*. It is beyond the scope of this manual page to explain Streams functionality.

The netinit command recognizes the following keywords: AS, OPEN, CLOSE, PUSH, POP, LINK, UNLINK and RUN. When using these keywords, case is not important.

Use the OPEN keyword as follows

`OPEN device`

or

`OPEN device AS name`

This opens the Streams driver with pathname *device*. The netinit program retains the file descriptor for use in processing subsequent directives that refer to the given device. If the optional AS clause is supplied, subsequent

netinit directives may refer to the opened device using the supplied *name* rather than the device pathname.

Use the CLOSE keyword as follows:

CLOSE *device*

If the program has an open Stream to the named *device*, it is closed.

Use the PUSH keyword as follows:

PUSH *device module*

This pushes the specified Streams *module* onto the open Stream to the named *device*. An error occurs if the *module* or the *device* does not exist, or if there is not an open Stream to the device.

Use the POP keyword as follows:

POP *device*

This pops the *module* associated with the named *device* that is nearest the Stream head from the Stream. An error occurs if there is no open Stream to the named *device*, or if no modules are in the Stream.

Use the LINK keyword as follows:

LINK *mux_device lower_device*

The open Stream to *lower_device* is linked beneath the *mux_device*. An error occurs if there are not open Streams to both the *mux_device* and the *lower_device*, or if the *mux_device* is not a Streams multiplexing driver.

Use the UNLINK keyword as follows:

UNLINK *mux_device lower_device*

Unlink the *lower_device* from under the *mux_device*. An error occurs if *lower_device* does not specify a device linked under a Streams multiplexing driver specified by *mux_device*.

Use the RUN keyword as follows:

RUN *program_name* [*arglist*] [< *input_device*] [> *output_device*]

You must specify a pathname to an executable file as the *program_name*. The optional *arglist* is passed to the *program_name*; the input and output device specifications, if specified, must refer to open Streams.

Use the RENAME keyword as follows:

RENAME *mux_device lower_device AS label*

This verifies that the *lower_device* has been linked under a *mux_device*, and that the multiplexor device has not been linked. It then causes the *mux_device* to assign the string *label* to the lower stream identified by *lower_device*.

EXAMPLES

The following example shows a typical *input_directives_file* that builds a TCP/IP stack containing a loopback and an inen network device.

```
open /dev/ip as ip
open /dev/loop0 as loop0
link ip loop0
rename ip loop0 as loop0
run ifconfig loop0 localhost broadcast 127.255.255.255 netmask 0xffffffff
open /dev/inen0 as inen0
push inen0 ether arp
link ip inen0
rename ip inen0 as inen0
run ifconfig inen0 mav33 broadcast 128.222.8.255 netmask 0xffffffff
```

SEE ALSO

ifconfig(1m), inen(7), hken(7), STREAMS Programmer's Guide for the DGIUX™ System.

NAME

ifconfig - configure DG/UX System network interface

SYNOPSIS

ifconfig dev [host [netmask val] [broadcast addr]] | [start|stop]

DESCRIPTION

The `/usr/bin/ifconfig` command controls a network interface for the TCP/IP protocol stack. It assigns an address to a network interface, configures the network interface parameters, and

stops and restarts message passing for that interface. You must use `ifconfig` when you bring an interface up to define its network address; you can also use it later to redefine an interface address.

The `dev` option is a string that specifies the name and the unit number of the network interface, such as `in0`. The `host` argument to the option is either a hostname found in the host database (`/etc/hosts`) or an Internet address expressed in the Internet standard dot notation.

Use the `netmask` option with address assignment to specify a network mask to use for subnetting. The `netmask val` is a 32-bit number that identifies which bits of the host's Internet address indicate the subnet number. The `broadcast` option, which you also can use with address assignment, changes the IP broadcast `addr` for the given interface to the specified value.

You can change the `dev` address, the `broadcast addr`, and the `netmask val` only if the interface is stopped.

The key words `start|stop` represent the following:

start: Enables sending and receiving messages.

stop: Disables sending and receiving messages.

If you omit the optional arguments, `ifconfig` displays the current configuration for the specified network interface.

If the interface is capable of broadcasting, and the `broadcast` command line option is not supplied, `ifconfig` uses the default broadcast address for the interface. If the `netmask` command line option is not supplied, the default network mask for the address is used. The default will disable subnetting at the interface.

Only the superuser can change the configuration of a network interface.

EXAMPLES

```
ifconfig inen0 128.0.0.31
ifconfig inen0 hostB broadcast 128.0.0.0
ifconfig inen0 128.5.1.31 broadcast 128.5.1.0 netmask
0xfffff00
```

The first example assigns Internet address 128.0.0.31 to interface inen0 with the default broadcast address. The second example maps hostname hostB to an Internet address given in /etc/hosts and associates that address with interface inen0. It also sets the IP broadcast address to be 128.0.0.0. The third example assigns the Internet address 128.5.1.31 to the interface inen0, sets the network mask to 0xfffff00 so that the high-order 24 bits of the address will be used as the Internet network number (network 128.5, subnet 1), and sets the broadcast address so that its host number part is all zeroes.

DIAGNOSTICS

The system displays messages when the specified interface does not exist, when the requested address is unknown, when the user invoking ifconfig is not the superuser, and when the broadcast value is not satisfactory. For example, the only acceptable broadcast values for unsubnetted class B addresses are:

```
255.255.255.255
net-number.255.255
0.0.0.0
net-number.0.0
```

FLAGS

All of the following flags should be present for a working interface:

RUNNING

LAN controller is working. It was activated either by the ifinit(1M) command or by another protocol stack using the same LAN controller.

ATTACHED

The TCP/IP protocol stack was successfully built by the ifinit command.

STARTED

Interface enabled for sending and receiving data. It is adjusted with ifconfig start|stop

UP

Interface is STARTED, ATTACHED, and RUNNING

BROADCAST

Interface has capability to broadcast

```

#
#
# /*****
# * Copyright (C) Data General Corporation, 1985 - 1988 *
# * All Rights Reserved. *
# * Licensed Material-Property of Data General Corporation. *
# * *****/
#
# /*****
# * This software is made available solely pursuant to the *
# * terms of a DGC license agreement which governs its use. *
# * *****/

```

```

#ident "@(#)tcpip.params      8.1"
#
#-----
#

```

```

# Example:      The following arbitrary information will be used
#               in examples through out this file in an attempt
#               to further clarify the use of specific parameters.
#

```

```

#               For our purpose let's suppose we have a hosts
#               named "nav-31" whose internet address is
#               "128.222.8.31" and is to be configured on device
#               "inen0".
#

```

```

#               Thus, our consolidated information is as follows:
#

```

```

#               hostname:          nav-31
#               internet address:   128.222.8.31
#               interface device:   inen0
#
#-----
#

```

```

#-----
#
#               rc.netport Parameters
#
#-----
#

```

```

# Command:      hostname
# Parameters:    hostname_ARG
# Definition:    This is simply a symbolic name you assign to your host.
# Example:      hostname_ARG="nav-31"
#
#-----
#

```

```

hostname_ARG="uwood12" STUDENT 2
#-----
#

```

```

# Command:      hostid
# Parameters:    hostid_ARG
# Definition:    This is the id of the local host specified in the hostname_ARG
#               parameter. The host id is a hex number formed by the
#               concatenation of the hexadecimal representation of the local
#               host's internet address.
# Example:      Assuming our internet address is 128.222.8.31 . By converting ea
ch
#               field to hex we get 80.DE.08.1f. The hex number we get from
#               concatenating these four fields is 0x80DE081f.
#               hostid_ARG="0x80DE081f"
#
#-----
#

```

```

hostid_ARG="59000102"
#-----
#

```

Command: security
Parameters: security_ARG
Definition: Parameters for the security command.
Example: See the security(1M) man page for more information.

security_ARG="-i -n"

: rc.netboards Parameters
:#####

Command: ifconfig
Parameters: HOSTNAMES
DEVICES

BROADCAST_ADDRESSES
NETMASKS
Definition: Each of these parameters are ordered lists or "arrays".
The parameter values MUST be separated by white space.
HOSTNAMES: The name of the hosts associated
with a device to be configured. This name
MUST be defined in the /etc/hosts file
for ifconfig to function properly.
DEVICES: The name of the device to be configured.
The device name MUST be an entry in
the /dev directory.
BROADCAST_ADDRESSES: This is the broadcast address to be
assigned to the configured interface.
NETMASKS: This is the subnetwork mask to be assigned
to the configured interface.
Example: Assumptions:
Our host is named "mav-31".
We are assigning this name to device "ineno".
We have already defined the local loopback interface.

HOSTNAMES="localhost mav-31"
DEVICES="loop0 ineno"
BROADCAST_ADDRESSES="127.255.255.255 128.222.8.255"
NETMASKS="0xffff0000 0xfffff00"

NOTE: IMPORTANT!!!
Although we don't care what the broadcast address and the
netmask are we MUST explicitly fill in the parameters
with the defaults because the lists ARE ORDERED. In
this example we explicitly set the broadcast address and
network mask. Actually, the any parameter value for
HOSTNAMES, BROADCAST_ADDRESSES, or NETMASK may be expressed
in internet dot notation, hex format, or symbolic name.
Any symbolic name used MUST be defined in the /etc/hosts
file for the name to be resolved correctly. The use of
symbolic name reference is recommended.

It should be noted that the local loop back device does not
have broadcast or subnet capabilities. However, we must
create "dummy" entries as fillers to maintain array order.
#

VARIABLES

/etc/host file

HOSTNAMES="localhost uwood12"
DEVICES="loop0 inen0"
BROADCAST_ADDRESSES="127.255.255.255 89.255.255.255"
NETMASKS="0xff000000 0xff000000"

```

-----
#
# Command:      route
#
# Parameters:   ROUTE_TYPES
#               ROUTE_DESTINATIONS
#               ROUTE_GATEWAYS
#               ROUTE_METRICS
#
# Definition:   Each of these parameters are ordered lists or "arrays".
#               The parameter values MUST be separated by white space.
#
#               ROUTE_TYPES:      This indicates whether the destination address
#                                   is a host or network.
#
#               ROUTE_DESTINATIONS: The host or network name specifying the
#                                   destination of the route.
#
#               ROUTE_GATEWAYS:    Specifies the name of the interface or
#                                   gateway through which traffic is routed.
#
#               ROUTE_METRICS:    This parameter takes on either a zero or
#                                   non-zero value. A zero value implies an
#                                   interface route. A non-zero value implies a
#                                   gateway route.
#
# Example:      Assumptions:
#               We wish to route all traffic for 128.222.3.0 network to
#               our gateway machine whose address is 128.222.8.50
#               on our network. The 128.222.3.0 network is on a
#               different physical network.
#
#               ROUTE_TYPES="net"
#               ROUTE_DESTINATIONS="128.222.3.0"
#               ROUTE_GATEWAYS="128.222.8.50"
#               ROUTE_METRICS="1"
#
# NOTE: IMPORTANT!!! Any parameter value for
# ROUTE_DESTINATIONS or ROUTE_GATEWAYS may be expressed
# in internet dot notation, hex format, or symbolic name.
# Any symbolic name used MUST be defined in the /etc/hosts
# or /etc/networks files for the name to be resolved correctly.
# The use of symbolic name reference is recommended.
-----

```

ROUTE_TYPES=""
ROUTE_DESTINATIONS=""
ROUTE_GATEWAYS=""
ROUTE_METRICS=""

```

*****
#
#               rc.netserv Parameters
#
*****

```

/etc/tcpip.params

Command: <any-network-daemon>

Parameters: <any-network_daemon>_ARG

Definition: Provides parameters for any specified network daemon.

Example: Assume we are providing parameters for the simple mail transfer protocol daemon named "smtp". We simply create the entry by appending _ARG to the name and fill in the parameters.

smtp_ARG="-q30m"

ntp_ARG="-q30m"

Daemons to be started/stopped by rc.tcpiperv:

TCPIPSEV_DAEMONS="smtp inetd rwhod" *

```
# cat /etc/nfs.params
#
#
# /*****
# * Copyright (C) Data General Corporation, 1985 - 1988 *
# * All Rights Reserved. *
# * Licensed Material-Property of Data General Corporation. *
# *****/
#
# /*****
# * This software is made available solely pursuant to the *
# * terms of a DGC license agreement which governs its use. *
# *****/
#
# SWhat: <@(#) nfs.params.proto,v 1.7> $
#
```

```
# /etc/nfs.params
#
```

```
#
# The parameters for nfs/yp must be setup for your particular
# system. Two kinds of variables in the /etc/nfs.params file
# control the way NFS and YP will be invoked and initialized
# each time you change to an appropriate run level with init.
#
# These variables are either _START arguments which determine
# the services made available automatically, or _ARG variables
# which set the parameters used by the services/demons when
# they're started.
#
# Each variable has a description of its purpose and a
# recommended default value. See the Network File System Guide
# for information specific to each service/demon.
```

```
#####
# REQUIRED YP VALUES
```

```
# IF you are using YP, THEN you MUST set the domainname_ARG
# There is NO default for this argument
# Running YP with no domainname is an ERROR causing YP to FAIL.
```

```
domainname_ARG="topgun"
```

```
# You must indicate whether this is a YP master, server or client.
# Masters maintain yp map sources and supply yp map info to others.
# Servers supply yp map info to other yp hosts on demand.
# A client consumes yp services without supplying any.

# Set the ypserv_START to reflect the status of your host.
# the default value is: ypserv START="CLIENT"
# any value other than "MASTER" "SERVER" "CLIENT"
# is equivalent to the default, which turns YP OFF!
# IF you are a MASTER, set to: ypserv_START="MASTER"
# IF you are a SERVER, set to: ypserv_START="SERVER"
# IF you are a CLIENT, set to: ypserv_START="CLIENT"
# a good default value is: ypserv_START="CLIENT"
ypserv_START="CLIENT"
```

```
# indicate whether this host is passwd master so yppasswdd demon
# will start. See the nfs/yp manual for information on yppasswdd

# if this host is master for the yp passwd map, set yppasswdd_ARG
# to "/etc/yp/src/passwd -m passwd" (or appropriate value).
# IF THIS IS NOT THE yppasswd MASTER, set yppasswdd_ARG to ""

yppasswdd_ARG=""
```

```
#####
# OPTIONAL NFS VALUES
```

```
# nfserv starts the demons associated with NFS services
# (portmap, rwalld ruserd, mountd, nfsd, biod).
# nfsfs mounts remote nfs file systems listed in /etc/fstab

# IF you intend to mount remote nfs file systems THEN
# nfserv_START and nfsfs_START must both be true

# the default value is: nfserv_START="true"
# any value other than "false" equals the default
nfserv_START="true"

# the default value is: nfsfs START="true"
# any value other than "false" equals the default
nfsfs_START="true"
```

number of biod demons to be started is based on the amount
of network (nfs) traffic. See the manual for details.

biod_ARG="4" # default value is: biod_ARG="4"

nfsd_ARG="4" # default value is: nfsd_ARG="4"

remote locking demons

lockd_ARG="" # default value is: lockd_ARG=""

statd_ARG="" # default value is: statd_ARG=""

lockd_sleep_ARG="45" # default value is: lockd_sleep_ARG="45"

SHOWMOUNT(8)

SHOWMOUNT(8)

NAME

showmount - show all remote mounts

SYNOPSIS

/usr/etc/showmount [-ade] [host]

DESCRIPTION

showmount lists all the clients that have remotely mounted a filesystem from host. This information is maintained by the mountd(8C) server on host, and is saved across crashes in the file /etc/rmtab. The default value for host is the value returned by hostname(1).

OPTIONS

-a Print all remote mounts in the format

hostname:directory

where hostname is the name of the client, and directory is the root of the file system that has been mounted.

-d List directories that have been remotely mounted by clients.

-e Print the list of exported file systems.

FILES

/etc/rmtab

SEE ALSO

hostname(1), exports(5), exports(5), mountd(8C)

BUGS

If a client crashes, its entry will not be removed from the list until it reboots and executes 'umount -a'.

nfsstat

- /usr/etc/nfsstat -csnr

displays statistical information about the NFS and remote procedure call (RPC) interfaces to the kernel

- c display client information
- s display server information
- n display NFS information for both client and server
- r display RPC information for both client and server

default with no options is: nfsstat -csnr

i.e.

Server rpc:

calls	badcalls	nullrec	badlen	xdr call
4	0	0	0	0

server nfs

calls	badcalls
0	0

null	getattr	setattr	root	lookup	readlink	read
0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%

wr cache	write	create	remove	rename	link	symlink
0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%

mkdir	rmdir	readdir	fsstat
0 0%	0 0%	0 0%	0 0%

Client rpc:

calls	badcalls	retrans	badix	timeout	wait	newcred
225	0	0	0	0	0	0

Client nfs:

calls	badcalls	nciget	ncisleep
225	0	225	0

null	getattr	setattr	root	lookup	readlink	read
0 0%	51 22%	3 1%	0 0%	150 66%	0 0%	6 2%

wr cache	write	create	remove	rename	link	symlink
0 0%	6 2%	0 0%	0 0%	0 0%	0 0%	0 0%

mkdir	rmdir	readdir	fsstat
0 0%	0 0%	8 3%	1 0%

Version 2 mnemonics

null	do nothing
getattr	get get file attributes
setattr	set file attributes
root	obsolete function

lookup	lookup filename
readlink	read from symbolic link
read	read from file
writetocache	obsolete function
write	write to file
create	create file
remove	remove file
rename	rename
link	create link to file
symlink	create symbolic link
mkdir	create a directory
rmdir	remove a directory
readdir	remove read from a file
statfs	get filesystem attributes

rpcinfo

```
- /usr/etc/rpcinfo -p [host]
  /usr/etc/rpcinfo -u host program-number version-number
  /usr/etc/rpcinfo -t host program-number version-number
```

rpcinfo makes an RPC call to an RPC server and reports what it finds

rpcinfo -p gives the program numbers to use with rpcinfo -u and -t.

program number are:

100002	rusersd
100004	ypserv
100005	mountd
100007	ypbind
100008	rwalld
100009	yppasswd

-p probe the portmapper on [host] and print a list of all registered RPC programs. Default hostname(1) if no argument supplied.

-u Make an RPC call to procedure 0 version # of program #, using UDP and report whether a response was received.

-t make an RPC call to procedure 0 of version # of program #, using TCP and report if a response was received.

SPRAY(8C)

SPRAY(8C)

NAME

spray - spray packets

SYNOPSIS

```
/usr/etc/spray host [ -c count ] [ -d delay ] [ -i ] [ -l  
length ] host
```

DESCRIPTION

spray sends a one-way stream of packets to host using RPC, and reports how many were received, as well as the the transfer rate. The host argument can be either a name or an internet address.

OPTIONS

-c count

Specify how many packets to send. The default value of count is the numbers of packets required to make the total stream size 100000 bytes.

-d delay

Specify how may microseconds to pause between sending each packet. The default is 0.

-i Use ICMP echo packets rather than RPC. Since ICMP automatically echos, this creates a two way stream.

-l length

The length parameter is the numbers of bytes in the ethernet packet that holds the RPC call message. Since the data is encoded using XDR, and XDR only deals with 32 bit quantities, not all values of length are possible, and spray rounds up to the nearest possible value. When length is greater than 1514, then the RPC call can no longer be encapsulated in one Ethernet packet, so the length field no longer has a simple correspondence to Ethernet packet size. The default value of length is 86 bytes (the size of the RPC and UDP headers)

SEE ALSO

icmp(4P), ping(8C), sprayd(8C)

netstat(1C)

netstat(1C)

NAME

netstat - Show status for DG/UX network parameters

SYNOPSIS

netstat [-Aainsrt] [interval] [system [core]]

DESCRIPTION

The netstat command symbolically displays the contents of various network-related data structures. The options are as follows:

- A The address of any associated protocol control blocks (used for debugging).
- a The state of all sockets; normally, sockets used by server processes are not shown.
- i The state of interfaces that have been auto-configured (interfaces statically configured into a system but not located at boot time are not shown).
- n Network addresses as numbers (normally, netstat interprets addresses and tries to display them symbolically).
- s Per-protocol statistics.
- r The routing tables.
- t Shows the local and remote addresses, send and receive queue sizes (in bytes), protocol, and (optionally) the internal state of the protocol for active sockets. This is the default display.

The arguments system and core allow substitutes for the defaults /dgux and /dev/kmem.

If an interval is specified, netstat continuously displays information related to packet traffic on the configured network interfaces. The netstat command pauses the number of seconds indicated by interval before refreshing the screen.

The arguments system and core allow substitutes for the defaults /dgux and /dev/kmem.

If an interval is specified, netstat continuously displays information related to packet traffic on the configured network interfaces. The netstat command pauses the number of seconds indicated by interval before refreshing the screen.

If a socket's address specifies a network but no specific host address, address formats are displayed in the form host-port or

netstat(1C)

netstat(1C)

network-port. When the host and network addresses are specified, they are displayed symbolically according to the databases /etc/hosts and /etc/networks, respectively. If a symbolic name for an address is unknown, or if the -n option is specified, the address is printed in the Internet dot format. Unspecified or wildcard addresses and ports appear as *-.

The interface display provides a table of cumulative statistics on packets transferred, errors, and collisions. The network address (currently Internet-specific) of the interface and the maximum transmission unit (mtu) are also displayed.

The routing table display indicates the available routes and their status. Each route consists of a destination host or network and a gateway to use in forwarding packets. The flags field shows the state of the route (U if up), and whether the route is to a gateway (G). Direct routes are created for each interface attached to the local host. The refcnt field gives the current number of active uses of the route. Connection-oriented protocols normally hold on to a single route during a connection; protocols without connections obtain a route, then discard it. The use field provides a count of the number of packets sent using that route. The interface entry indicates the network interface used for the route.

When invoked with an interval argument, netstat displays a running count of statistics related to network interfaces. This display shows two columns: one for all interfaces, and one for the interface with the most traffic since the system was last rebooted. The first line of each screen of information contains a summary of activity since the system was last rebooted. Subsequent lines of output show values accumulated over the preceding interval.

SEE ALSO

hosts(4), networks(4), protocols(4), services(4)

```
% netstat -r -n )
```

*Need routing tables in memory
of 2 networks are in 1 machine*

Routing tables

Destination	Gateway	Flags	Interface
127.0.0	127.0.0.1	U	loop0
128.223.1	128.223.2.1	UG	inen0
128.223.2	128.223.2.2	U	inen0
128.223.3.5	128.223.2.1	UGH	inen0

netstat -s

```
udp:
    8 bad header checksums
    0 incomplete headers
    0 bad data length fields
tcp:
    4 bad header checksums
    0 bad header offset fields
    0 incomplete headers
icmp:
    205 calls to icmp_error
    0 errors not generated 'our old message too short'
    0 errors not generated 'our old message was icmp'
Output histogram:
    echo reply: 6
    destination unreachable: 205
    time stamp reply: 1327
    address mask reply: 1
    0 messages with bad code fields
    0 messages < minimum length
    0 bad checksums
    6 messages with bad length
    1334 message responses generated
Input histogram:
    echo reply: 4
    destination unreachable: 75103
    source quench: 5
    routing redirect: 416
    echo: 6
    time exceeded: 13
    time stamp: 1327
    address mask request: 1
ip:
    0 bad header checksums
    13 with size smaller than minimum
    0 with data size < data length
    0 with header length < data size
    0 with data length < header length
```

netstat -i

*Some collisions
are OK
but NEVER
or
CTLR*

Name	Mtu	Network	Address	Ipkts	Ierrs	Opkts	Oerrs	Collis
hlan1	1500	128.223.1.0	sales	1037544	3	910644	0	46406
hlan0	1500	128.223.2.0	sales-alt	311546	0	134806	0	3809
loco0	1500	127.0.0.0	localhost	398	0	398	0	0

local loopback

netstat 10

*Updated
every
10 seconds*

input (hlan1)		output			input (Total)		output		
packets	errs	packets	errs	colls	packets	errs	packets	errs	colls
312165	0	134962	0	3811	1353318	3	1049158	0	50606
19	0	1	0	0	49	0	31	0	0
16	0	16	0	0	93	0	88	0	0
11	0	11	0	0	132	0	134	0	12
18	0	19	0	9	108	0	74	0	17
4	0	94	0	24	182	0	171	0	24
12	0	81	0	9	159	0	146	0	9
22	0	2	0	0	63	0	41	0	0
5	0	15	0	0	54	0	55	0	10
14	0	10	0	0	116	0	98	0	2
27	0	11	0	8	125	0	99	0	9
12	0	0	0	0	68	0	59	0	0
25	0	1	0	0	48	0	16	0	8
21	0	3	0	8	71	0	50	0	8
5	0	4	0	0	61	0	93	0	0

netstat -a

Active connections (including servers)

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	(state)
tcp	0	0	sales-alt-53	*	
tcp	0	0	sales-53	*	
tcp	0	0	localhost-53	*	
tcp	0	0	*-53	*	
tcp	0	0	*-echo	*	
tcp	0	0	*-rftp	*	
tcp	0	0	*-715	*	
tcp	0	0	*-route	*	
tcp	0	0	*-syslog	*	
tcp	0	0	*-993	*	
tcp	0	0	*-sunrpc	*	
tcp	0	0	sales-alt-login	dpl-1021	ESTABLISHED
tcp	0	0	sales-alt-login	sun1-1022	ESTABLISHED
tcp	0	0	sales-telnet	sys02-2977	ESTABLISHED
tcp	0	0	sales-alt-1048	dpl-XV11	ESTABLISHED
tcp	0	0	sales-1043	sys56-txtp	ESTABLISHED
tcp	0	0	*-1034	*	LISTEN
tcp	0	0	*-53	*	LISTEN
tcp	0	0	*-time	*	LISTEN
tcp	0	0	*-daytime	*	LISTEN
tcp	0	0	*-chargen	*	LISTEN
tcp	0	0	*-discard	*	LISTEN
tcp	0	0	*-echo	*	LISTEN
tcp	0	0	*-exec	*	LISTEN
tcp	0	0	*-login	*	LISTEN
tcp	0	0	*-shell	*	LISTEN
tcp	0	0	*-telnet	*	LISTEN
tcp	0	0	*-ftp	*	LISTEN
tcp	0	0	*-http	*	LISTEN
tcp	0	0	*-656	*	LISTEN
tcp	0	0	*-649	*	LISTEN
tcp	0	0	*-629	*	LISTEN
tcp	0	0	*-1024	*	LISTEN
tcp	0	0	*-994	*	LISTEN
tcp	0	0	*-sunrpc	*	LISTEN

rp(1M)

arp(1M)

AME

arp - address resolution display and control

SYNOPSIS

```
/usr/bin/arp [ -i dev ] -a  
/usr/bin/arp [ -i dev ] host  
/usr/bin/arp [ -i dev ] -d host  
/usr/bin/arp [ -i dev ] -s host ether_addr [ temp ] [ pub ]  
/usr/bin/arp [ -i dev ] -f file
```

DESCRIPTION

The arp program displays and modifies the Internet-to-Ethernet address translation tables used by the Address Resolution Protocol arp(6P) and the Reverse Address Resolution Protocol rarp(6P). *- Options*

When you use the -a option, the program displays all of the current ARP entries by reading the internal kernel tables (using the appropriate ioctl calls). When you use this option, you do not have to specify the name of a host or of a file. *- hardware*

With host as the argument, the program displays the current ARP entry for that host. You may specify the host by name or by number, using Internet standard dot notation.

With the -d option, a superuser may delete an entry for the host named host.

Use the -s option to create an ARP entry for the host named host with the Ethernet address ether_addr. The Ethernet address is specified as six hexadecimal bytes separated by colons. The resulting ARP entry is permanent unless the word temp is specified on the command line. If the word pub is specified, the entry will be "published"; that is, this system will act as an ARP server, responding to requests for host even though the host address is not its own. Only a superuser may set a new entry in the table.

The -f option causes the file named file to be read and multiple entries to be set in the ARP tables. Only the superuser may use this option. Entries in the file should be of the following form:

```
host ether_addr [ temp ] [ pub ]
```

with argument meanings as described above. *# arp - a*
arp - s *ethernet address*

If you specify the -i option, only the ARP table for the interface named dev will be searched.

FTP

ftp> debug

Allows the user to see

ftp protocols commands listed as they execute

FTP user (version 4.0 6/28/88) ready.

ftp>

ftp> Verbose mode off.

ftp> Verbose mode on.

ftp> Debugging on (debug=1).

ftp> Connected to uwood3.

220 uwood3 FTP server (version 4.0 6/28/88) ready.

Name (uwood3:root): --> USER root

331 Password required for root.

Password (uwood3: root): --> PASS root1

230 User root logged in. No account needed.

ftp> --> XPWD

251 '/' is current directory.

ftp> --> PORT 89,0,0,5,4,21

200 PORT command okay.

--> MLST -ll

150 Opening data connection for /bin/lis (89.0.0.5,1045) (0 bytes).

before ftp_recv_data

filedes in = 6, out = 1

total 7820

2	drwxr-xr-x	11	root	sys	1024	Jun	9	16:50	.
2	drwxr-xr-x	11	root	sys	1024	Jun	9	16:50	..
266	-rw-rw-rw-	1	root	other	70	Dec	29	15:24	.editreadrc
492	-rwxr-xr--	1	root	root	100	May	12	13:44	.profile
275	-rwxr-xr-x	1	root	other	0	Mar	2	15:08	a.out
102	drwxr-xr-x	2	bin	bin	1024	Dec	29	07:24	bin
160	drwxr-xr-x	8	root	sys	3072	Dec	31	1969	dev
204	-rwxr-xr-x	1	root	other	770096	May	12	11:08	dgux
3	-rwxr-xr-x	1	root	other	767322	Jan	27	14:14	dgux.old
269	-rwxr-xr-x	1	root	other	767322	Dec	31	1969	dguxav7800
274	-rwxr-xr-x	1	root	other	770096	May	12	11:08	dguxav8000
4	drwxrwxr-x	13	root	root	2560	Jun	12	09:15	etc
270	-rwxr--r--	1	root	other	23	Jan	25	13:45	go
273	-rw-rw-rw-	1	root	other	139	Feb	10	15:28	gai2fromwd5
281	-rw-rw-rw-	1	root	other	0	Jun	9	15:57	hostupda
146	drwxr-xr-x	2	bin	bin	512	Dec	29	07:24	lib
32	-r-----r--	1	root	root	442416	Jan	6	10:52	av7800.acf
268	-r-----r--	1	root	other	442416	Jan	6	10:53	av7800.acf1
267	drwxrwxrwx	2	root	other	0	Dec	29	15:35	nfstst
277	-rw-rw-rw-	1	root	other	0	May	17	16:07	serb
494	-rwxr--r--	1	root	sys	3455	Dec	29	09:42	shutdown
222	-rwxr-xr-x	1	root	other	54	Jan	6	10:48	space
100	drwxr-xr-x	2	bin	bin	512	Dec	28	13:45	stand
279	-rwx-----	1	root	other	0	May	18	11:21	test
205	drwxrwxrwx	5	root	root	2048	Jun	12	13:40	tap
282	-rw-rw-rw-	1	root	other	1031	Jun	9	16:20	tapaddr
283	-rw-rw-rw-	1	root	other	1247	Jun	9	16:33	tapbyname
271	-r-----r--	1	root	other	11	Feb	2	13:30	tapusrspoollockst
278	-rwx-----	1	root	other	70	May	18	11:29	u
264	drwxrwxrwx	26	root	root	2048	May	24	10:39	udd
161	drwxr-xr-x	22	bin	bin	512	Mar	23	13:13	usr
272	-rw-rw-rw-	1	root	other	75	Feb	10	13:27	washere

after ftp_recv_data

226 Transfer complete.

2232 bytes received in 13.799 seconds (0.16 Kbytes/s)

The FTP user program interprets the three-digit number to determine how it should respond. The text message is displayed for the user. Because the message is server-dependent, it may be different for different servers. The numbers, however, should have consistent meaning for all servers.

Each digit in the number provides special information. The first digit indicates whether the response is an error message, a positive acknowledgement, or a request for more information. If the first digit indicates an error message, the second and third digits describe the type of error that occurred.

The DG/UX TCP/IP FTP user program displays the number and text sent from the server program. It recognizes and responds to the first digit only. The first digit can be one of the following:

- 206
- 1yz Indicates a positive preliminary reply. The requested command is being initiated and you should wait for another reply before issuing a new command.
 - 2yz Indicates a positive completion. The requested command has been successfully completed. You can issue a new command.
 - 3yz Indicates a positive intermediate reply. The command has been accepted but is waiting for more information. You should send another command providing the information needed.
 - 4yz Indicates a transient negative completion reply. The command was not accepted, but the error is temporary and you can re-issue the command in exactly the same form.

 - 5yz Indicates a permanent negative completion reply. The command was not accepted and the requested action did not take place. You should not re-issue the command until you correct the problem (for example, correct the spelling of an invalid command).

If the first digit indicates an error, you can check the second and third digits for more specific information. These digits can be helpful if you are not using the DG/UX TCP/IP server. The second digit indicates one of the following categories:

- x0z Indicates an error in syntax, a command that does not fit any functional category, an unimplemented command, or an unnecessary command.
- x1z Indicates a reply to a request for information, such as help or status.
- x2z Indicates a reply to the command and data connections.
- x3z Indicates a reply to the login process and accounting procedures.
- x4z Indicates an unspecified reply.
- x5z Indicates the status of the server file system as it relates to the requested transfer or other file system action.

The third digit fine tunes the meaning of the category indicated by the second digit. It distinguishes replies grouped in the same category.

Table A-1 lists and describes the error messages that the DG/UX TCP/IP server can return.

Table A-1 FTP Server Error Messages

Error	What It Means
421 Timeout (<i>number seconds</i>): closing control connection	The timeout parameter (<i>-t</i> option for ftp server) value is too small. Increase the parameter or set it to 0 - no timeout.
425 Can't create data socket (<i>dest-address, dest-port</i>): relevant-message	FTP is unable to open data connection for file transfer. Any of the socket related calls could have failed.
451 Error in server: Out of memory	The malloc function call failed.
451 Error in server: Unknown state in scanner	The yylex function has detected an unknown token. This indicates bad data on the command connection.
500 Command not understood	The wrong argument type or wrong number of arguments has been passed to the server.
502 <i>command-name</i> command not implemented	The specified command is not implemented on the remote server.
502 Invalid TYPE	Only ASCII, EBCDIC, Image and Local Byte are allowed.
502 Invalid STRU	Only File, Record, and Page structures are allowed.
502 Invalid MODE	Only Stream, Block, and Compressed modes are allowed.
503 Bad sequence of commands; RNFR ignored	The RNFR (rename from) server command was not followed by an RNTO (rename to) server command.
503 RNFR failed -- RNTO not accepted	The RNTO (rename to) command is not accepted because the RNFR (rename from) command failed.
503 Login with USER first	You tried to invoke the PASS command before invoking the USER command.

Table A-1 FTP Server Error Messages

Error	What It Means
504 STAT command does not accept parameters	Foreign server implementation does not allow any parameters to be sent to STAT (status) command.
530 Login incorrect	You didn't give a password or you gave an incorrect password.
530 User <i>username</i> unknown	The <i>username</i> provided as an argument to user command was not found in /etc/passwd file.
530 Please login with USER and PASS	You tried to access the remote system without executing the login sequence first.
540 Command <i>cmd-name</i> not accepted during transfer	The FTP server received a command that cannot be executed in the middle of an interrupted data transfer.

(concluded)

Table A-2 FTP Server Error Messages

Error	What It Means
541 Invalid combination of transfer parameters	The transfer parameters are set in one of the following combinations: type ascii structure page type ebcdic structure page type binary structure page mode block structure page mode compress structure page
542 Cannot position file for recovery	The file position from which the transfer should continue was specified incorrectly.
543 Error on write	FTP server detected an error while writing to a file or socket.

Table A-2 FTP Server Error Messages

Error	What it Means
543 Unexpected EOF	Server found a premature End of File delimiter while reading from the socket.
543 Wrong escape sequence	Server found an incorrect escape sequence while receiving a file in Record structure and Stream mode.
543 Page is not multiple of logical byte	The page size defined for Page structure is not a multiple of the logical byte size.
544 EOR not changed, string too long	The string chosen as the End of Record delimiter for file storage exceeds 10 characters.
544 Byte size must be multiple of 8	Logical byte size does not accept values that are not multiples of 8.
550 <i>filename</i> : not a plain file	You tried to transfer a character or block device file.
550 <i>filename</i>	Either the file cannot be opened or cannot be accessed.
550 Can't set guest privileges	The root directory cannot be changed to your home directory on the remote system.

If you receive an error message or error number you can search the file

`/usr/include/sys/errno.h`

for a text string that matches or for the error number and it's corresponding text. If the error begins with a leading 0 change it to decimal since error's are listed in decimal in the file



ruptime(1C)

ruptime(1C)

NAME

ruptime - show host status of local machines

SYNOPSIS

```
ruptime [ -a ] [ -r ] [ -t | -u | -l ]
```

DESCRIPTION

Use the ruptime(1C) command to display a status line for each machine that is on the local network and running rwhod(1C). These lines are formed from packets broadcast once every three minutes by each host running rwhod on the network.

Machines for which no status report has been received for eleven minutes are shown as being down.

Users who are idle an hour or more are not counted unless the -a flag is given.

Normally, the listing is sorted alphabetically by hostname. The -l, -r, -t, and -u flags specify sorting by load average, reverse sort, uptime, and number of users, respectively.

EXAMPLES

In the following example, the last three columns represent load averages for the intervals 1, 5, and 15 minutes. The load average is the average number of jobs in the run queue. It is a relative indication of how busy the systems are.

```
$ ruptime <NL>
sys14   up    10:46,  4 users, load  0.04,  0.03,  0.04
sys16   down   1:14
sys10   up 1+02:11,  1 user,  load  2.40,  2.52,  2.43
$
```

Shows the host status of the machines on the local area network.

rwho(1C)

rwho(1C)

NAME

rwho - who's logged in on local machines

SYNOPSIS

rwho [-a]

DESCRIPTION

The rwho command produces output similar to who(1), but for all machines that are on the local network and running rwhod(1M). If no report has been received from a machine for eleven minutes, rwho assumes the machine is down and provides no information on its users.

If users haven't typed to the system for a minute or more, then rwho reports this idle time. However, if users haven't typed to the system for an hour or more, rwho doesn't display their status unless you use the -a flag.

Command line flags other than -a are ignored.

EXAMPLES

```
$ rwho -a <NL>
```

```
jones    sys10:tty00   Dec 17 08:07
wilson   sys04:tty03   Dec 17 08:02   2:15
smith    sys08:tty25   Dec 17 07:01
brown    sys02:tty15   Dec 17 08:03   :14
```

Displays users who are logged in on machines that are on the local area network and running rwhod, including those who have not typed to the system in an hour or more.

FILES

/var/spool/rwho/whod.*

SEE ALSO

ruptime(1C), rwhod(1M)

BUGS

The rwho command becomes unwieldy when the number of machines on the local net is large.

APPENDIX A

AViion 300/400 MEMORY BOARD ADDRESS RANGES

	Hex	Dec	Oct	range
Board 0 Lower	0	0	0	0-4MB
Upper	3FFFFFF	4194303	17777777	
Board 1 Lower	400000	4194304	20000000	4-8MB
Upper	7FFFFFF 7FFFFC	8388607	37777777	
Board 2 Lower	800000	8388608	40000000	8-12MB
Upper	BFFFFFF	12582911	57777777	
Board 3 Lower	C00000	12582912	60000000	12-16MB
Upper	FFFFFF	16777215	77777777	
Board 4 Lower	1000000	16777216	100000000	16-20MB
Upper	13FFFFFF	20971519	117777777	
Board 5 Lower	1400000	20971520	120000000	20-24MB
Upper	17FFFFFF	25165823	137777777	
Board 6 Lower	1800000	25165824	140000000	24-28MB
Upper	1BFFFFFF	29360127	157777777	

Lower=Lowest mem adress on board
Upper=Highest adress on board

MISC.

COLOR SYSTEMS MUST BE RUNNING DG/UX 4.11 OR BETTER

MONO SYSTEMS RUN DG/UX REV 4.10, CAN RUN 4.11 IF IT FINDS "hardware_type" IN THE ROOT DIRECTORY. - READ RELEASE NOTICE FOR UD1 TAPE.

PARALLEL PRINTER IS NOT SUPPORTED UNTILL DG/UX 4.20

THE FCO 900681 CUT IN DATE WAS FOR BEFORE FISCAL WEEK 4989 THIS DATE CODE CAN BE FOUND ON THE SYSBD NEAR THE PT# AROUND THE EDGE OF THE P/S

CNTL C TAKES YOU TO THE SCM (VIRTUAL CONSOLE) OR YOU CAN HIT THE RESET BOTTON ON RIGHT SIDE NEAR MOUSE

ASYNC TEST PLUG PT# IS 5-22188 USED FOR ASYNC PORT. REV 2 OF RBOS WILL NOT TEST THE MODEM CONTROLL SIGNALS.

TO FIND OUT WHAT PATCH LEVEL THE DGUX SYSTEM IS DO THE FOLLOWING COMMAND "cd /usr/src/uts/aviion/lb" "sum sc.a" if value is 55009 150 sc.a then its 4.20.00.20, if its 19504 136 sc.a then its rev 4.20 unpatched.

APPENDIX B

AVilion 5000 SERIES COMPUTER SYSTEMS
 MODELS G70034-G70036, G70040-G70042, G70078-G70080,
 G700104-G700106

Model Numbers

AV SYSTEM	MODEL NUMBER	CPU SPEED/ SINGLE OR DUAL CPU	NO. OF CARD CAGE SLOTS	SYSTEM PCB MEMORY	STORAGE DEVICES STANDARD
AV5010	G70104	20MHz/Single	6	8 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 322 MB SCSI Disk Drive
AV5010	G70105	20MHz/Single	6	16 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 322 MB SCSI Disk Drive
AV5010	G70106	20MHz/Single	6	16 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 662 MB SCSI Disk Drive
AV5100	G70034	20MHz/Single	10	8 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 322 MB ESDI Disk Drive
AV5100	G70040	20MHz/Single	10	8 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 648 MB ESDI Disk Drive
AV5100	G70035	20MHz/Single	10	16 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 322 MB ESDI Disk Drive
AV5100	G70041	20MHz/Single	10	16 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 648 MB ESDI Disk Drive
AV5120	G70036	20MHz/Dual	10	16 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 322 MB ESDI Disk Drive
AV5120	G70042	20MHz/Dual	10	16 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 648 MB ESDI Disk Drive
AV5200	G70078	25MHz/Single	10	16 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 322 MB ESDI Disk Drive
AV5200	G70079	25MHz/Single	10	16 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 648 MB ESDI Disk Drive
AV5220	G70080	25MHz/Dual	10	16 MB	1 150 MB SCSI QIC Cartridge Tape Drive, 1 648 MB ESDI Disk Drive

Performance Specifications

Item	Specification
CPU clock rate: CMMU cache memory:	20 MHz (AV5010, AV5100, AV5120) 25 MHz (AV5200, AV5220) 32 KB (AV5010, AV5100, AV5200) 64 KB (AV5120, AV5220)
Available I/O ports:	2 SCSI, 2 LAN, printer, console, modem, 32 asynchronous, 4 terminal server, 4 synchronous
Maximum Internal Storage:	2 half-height 5 1/4-inch SCSI devices and 3 full-height 5 1/4-inch ESDI devices (AV5010 uses only SCSI devices)
PCB capacity AV5100, AV5120, AV5200, AV5220: AV5010:	10 (System PCB, up to 4 memory expansion PCBs, up to 9 VME I/O controllers) 6 (System PCB, 1 memory expansion PCB, up to 5 VME I/O controllers)
Power supply rating:	750 watts.

AV5000 Series Computer Systems FRUs (Continued)

DG PART NUMBER	DESCRIPTION
005-034968	322 MB ESDI Disk Drive
005-030147	648 MB ESDI Disk Drive
005-030105	322 MB SCSI Disk Drive
005-030138	662 MB SCSI Disk Drive
005-030140	150 MB QIC SCSI Tape Drive
005-034990	Cable, Asynchronous Terminal, 4.6 m (15.0 ft)
005-034991	Cable, Asynchronous Terminal, 7.6 m (25.0 ft)
005-034992	Cable, System Console, 4.6 m (15.0 ft)
005-034993	Cable, System Console, 7.6 m (25.0 ft)
005-034994	VDC/8P Distributed Asynchronous Communication Cluster Controller with Printer Port
005-035573	Cable, Centronics Printer, 4.6 m (15.0 ft)
005-035574	Cable, Centronics Printer, 7.6 m (25.0 ft)
005-035575	Cable, Data Products Printer, 4.6 m (15.0 ft)
005-035576	Cable, Data Products Printer, 7.6 m (25.0 ft)
005-036263	PEXbus Terminator (P2)
005-036264	PEXbus Terminator (P3)
005-036290	Dual 25 MHz CPU with 16 MB (AV5200)
005-036291	Single 25 MHz CPU with 16 MB (AV5220)
109-000809	Power Cord, 240V Australia
109-000810	Power Cord, 220V Switzerland
109-000811	Power Cord, 220V Italy
109-000812	Power Cord, 220V Austria
109-000813	Power Cord, 240V United Kingdom
109-000815	Power Cord, 220V Denmark
109-000821	Power Cord, 100/120V United States
115-000587	Blower
111-001316	"T" connector
111-003081	93 Ohm Coaxial Terminator
113-000019	Fuse: 15A, 250V, 3AB
113-000122	Fuse: 6A, 250V, 3AG
118-004336	Cartridge Tape

AV5000 Series Computer Systems FRUs

DG PART NUMBER	DESCRIPTION
005-034213	120V Chassis (AV5100, AV5120, AV5200, AV5220)
005-036798	120V Chassis (AV5010)
005-032885	Dual 20MHz CPU with 16 MB (AV5120)
005-033334	SCSI Terminator
005-033384	ESDI Host Adapter
005-033386	SCSI Host Adapter
005-033490	48 MB Expansion Memory
005-034105	Single 20MHz CPU with 8 MB (AV5010, AV5100)
005-034114	Power Supply, 100V, 750W
005-034115	Power Supply, 120V, 750W
005-034116	Power Supply, 220V, 750W
005-034190	ESDI Internal Cable
005-034192	SCSI Internal Cable (AV5100, AV5120, AV5200, AV5220)
005-036779	SCSI Internal Cable (AV5010)
005-034193	Internal Cable, VAC/16
005-034194	Internal Cable, VSC/4 (1st, 2nd, and 3rd line)
005-023094	Internal Cable, VSC/4 (4th line)
005-034195	Internal Cable, VLC
005-034196	Serial Printer Internal Cable
005-034198	Disk/Tape Power Cable
005-034200	+12Vdc to Backpanel Cable
005-034201	+5Vdc to Backpanel Cable
005-034202	Blower Cable, 100/120V
005-034203	Blower Cable, 220/240V
005-034204	VAC/16 16-line Asynchronous Communication Multiplexer
005-034205	Spreader Panel (2 per VAC/16)
005-034206	VSC/4 Synchronous Communication Controller
005-034207	VDA/128 Asynchronous Communication Controller
005-034209	VLC IEEE 802.3 LAN Controller
005-034211	VDC/16 Distributed Asynchronous Communication Cluster Controller
005-034212	Single 20MHz CPU with 16 MB (AV5010, AV5100)
005-034246	Coaxial Cable, Cluster Controller, 7.6 m (25.0 ft)
005-034247	Coaxial Cable, Cluster Controller, 15.2 m (50.0 ft)
005-034248	Coaxial Cable, Cluster Controller, 30.5 m (100.0 ft)
005-034255	Cable, System Console, 3.0 m (10.0 ft)
005-034256	Cable, Asynchronous Terminal, 3.0 m (10.0 ft)
005-034395	Backplane (AV5100, AV5120, AV5200, AV5220)
005-036778	Backplane (AV5010)
005-034396	240V Chassis (AV5100, AV5120, AV5200, AV5220)
005-036799	240V Chassis (AV5010)
005-034397	32 MB Expansion Memory
005-034398	16 MB Expansion Memory
005-034949	SCSI External Cable

MODEL NUMBERS

MODEL NUMBER	DESCRIPTION
G70034	AV5100 CPU/8MB Mem; Model 6442-I, 322MB 5.25" ESDI Disk Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70035	CPU/16MB Mem; Model 6442-I, 322MB 5.25" ESDI Disk Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70041	CPU/16MB Mem; Model 6555-I, 648MB 5.25" ESDI Disk Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70036	AV5120 Dual CPU/16MB Mem; Model 6442-I, 322MB 5.25" ESDI Disk Add-on, Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70042	Dual CPU/16MB Mem; Model 6555-I, 648MB 5.25" ESDI Disk Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
E70043	AV6100 CPU/16MB Mem; Model 6542-A, 2-1GB SMD Disk Drive w/Rack Mount; Model 6577-A, CSS Support Chassis w/150MB QIC Cart Tape
0045	CPU/16MB Mem; Model 6443-A, CSS Add-on Support Chassis w/322MB Disk; 2 Model 6491-M, 322MB 5.25" Disk Add-on Kit for CSS; Model 6577-M, 150MB 5.25" QIC Cartridge Tape -CSS
E70047	CPU/16MB Mem; Model 6554-M, 648MB 5.25" SCSI Disk Add-on Kit; Model 6577-A, CSS Support Chassis w/150MB QIC Cart Tape
E70044	AV6120 Dual CPU/16MB Mem; Model 6542-A, 2-1GB SMD Disk Drive w/Rack Mount; Model 6577-A, CSS Support Chassis w/150MB QIC Cart Tape
E70046	Dual CPU/16MB Mem; Model 6443-A CSS Add-on Support Chassis w/322MB Disk; 2 Model 6491-M, 322MB 5.25" Disk Add-in Kit for CSS; Model 6577-M, 150MB 5.25" QIC Cartridge Tape -CSS
E70048	Dual CPU/16MB Mem; Model 6554-M, 648MB 5.25" SCSI Disk Add-on Kit; Model 6577-A, CSS Support Chassis w/150MB QIC Cart Tape
G70104	AV5010 CPU/8MB Mem; Model 6491-I, 322MB FH 5.25" SCSI Disk, Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70105	CPU/16MB MEM; Model 6491-I, 322MB FH 5.25" SCSI Disk, Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70106	CPU/16MB Mem; Model 6554-I, 662MB FH 5.25" SCSI Disk, Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape

AV5200

078 CPU/25MHz, 16MB, Model 6442-I, 322MB 5.25" ESDI Disk Add-on;
Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape

079 CPU/25MHz, 16MB, Model 6555-I, 648MB 5.25" ESDI Disk Add-on;
Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape

AV5220

080 Dual CPU/25MHz, 16MB, Model 6555-I, 648MB 5.25" ESDI Disk
Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape

AV6200

081 CPU/25MHz, 8MB, Chassis

082 CPU/25MHz, 16MB, Chassis

084 CPU/25MHz, 16MB, Model 6541-A, 2GB SMD Disk Drive w/Rack
Mount; Model 6577-M, CSS Support Chassis w/150MB QIC Cart
Tape

086 CPU/25MHz, 16MB, Model 6541-A, 2GB SMD Disk Drive w/Rack
Mount; Model 6577-M, CSS Support Chassis w/150MB QIC Cart
Tape

088 CPU/25MHz, 16MB, Model 6554-M, 648MB 5.25" SCSI Disk
Add-on Kit; Model 6577-M, CSS Support Chassis w/150MB QIC
Cart Tape

AV6220

083 Dual CPU/25MHz, 16MB, Chassis

085 Dual CPU/25MHz, 16MB; Model 6541-A, 2GB SMD Disk Drive
w/Rack Mount; Model 6577-M, CSS Support Chassis w/150MB QIC
Cart Tape

70087 Dual CPU/25MHz, 16MB; Model 6541-A, 2GB SMD Disk Drive
w/Rack Mount; Model 6577-M, CSS Support Chassis w/150MB QIC
Cart Tape

70089 Dual CPU/25MHz, 16MB, Model 6554-M, 648MB 5.25" SCSI Disk
Add-on Kit; Model 6577-M, CSS Support Chassis w/150MB QIC
Cart Tape

001 16MB Expansion Memory

002 32MB Expansion Memory

003 48MB Expansion Memory

400 VAC/16 for integrated systems

7401 VDA/128

7402	VDC/8P
7403	VDC/16
7404	VSC/4
7404-V	VSC/4 (Rackmount only)
7405	VLC
7406	VAC/16 (Rackmount only)
7407	VME SCSI Controller (add-on)
7407-V	VME SCSI Controller (Rackmount only)
7408	SMD Controller (Rackmount only)
7409	Adapter Card Kit (6U to 9U)
6443-A	CSS Add-on support chassis w/322mb Disk (Rackmount only)
41	1.2GB Disk w/Smd Controller (Rackmount only)
6541-A	1.2GB Disk w/tray and rack kit (Rackmount only)
6541-K	1.2GB Smd Disk -Add-on (Rackmount only)
6542	Dual 1.2GB Smd Drives w/controller (Rackmount only)
6542-A	Dual 1.2GB Smd Drive w/rack mount (Rackmount only)
6544	SCSI Controller (Office only)
6555-I	648MB 5.25" ESDI Disk (add-on) (Office only)
6577-I	Add-on 150MB Cartridge (int) (Office only)
6577-A	CSS Support Chassis w/150mb QIC Cart Tape (Rackmount only)
6554-M	648MB 5.25" SCSI Disk Add-on
6442-I	Add-on 322MB ESDI disk (int) (Office only)
6587-A	1600bpi Reel-to-Reel (table)
6586	1600bpi Reel-to-Reel (rack)

1-I	662MB FH 5.25" SCSI Disk (Entry Office only)
1-I	322MB FH 5.25" SCSI Disk (Entry Office only)
565	Peripheral Housing Unit
77-E	150MB Cartridge for PHU
01	PHU w/ 322MB disk
02	PHU w/ 150MB cartridge
04	PHU w/ 322MB disk, 150MB cart

Related Documents

Manual Number	Title
014-000793	Ethernet/Thin-Ethernet Local Area Networks Installation Guide
014-001806	Setting Up and Starting AViiON Series Systems
015-000355	Expanding the AViiON Series Systems
015-000915	Product Specification Guide
015-000918	Site Planning Guide
043-000102	Product Service Guide
043-000075	AViiON System Diagnostics Field Guide
043-003203	Installation, Repair, and Maintenance Manual, Peripheral Enclosure, Model 10565
043-002018	Product Information Package, 150 MB Cartridge Tape Drive, Models 6536 and 6577-A
043-002015	Product Information Package, 1800 BPI SCSI Reel-to-Reel Tape Drive, Models E6586, E6586-A, E6587, and E6587-A
043-003715	Product Information Package, Winchester 5 1/4-inch Disk Family
014-001802	Using the System Control Monitor
015-001863	Using AViiON System Diagnostics

APPENDIX C

AViion 5100/5120 AViion 5200/5220 AViion 5010
 AViion 6100/6120 AViion 6200/6220

MODELS G70043, G70044, G70045, G70046, G70047, G70048
 G700104, G700105, G700106, G70078, G70079, G70080
 E70081, E70082, E70083, E70084, E70085, E70086
 E70087, E70088, E70089, E70034, E70035
 E70036, E70041, E70042

PART NUMBER	DESCRIPTION
	OFFICE PACKAGE UNIQUE + RACK MOUNT COMMON
005.034105	SINGLE PROC.W/8MB 20MHZ
005.034212	SINGLE PROC.W/16MB 20MHZ
005.032885	DUAL PROC. W/16MB 20MHZ
005.036292	SINGLE PROC.W/8MB 25MHZ
005.036291	SINGLE PROC.W/16MB 25MHZ
005.036290	DUAL PROC. W/16MB 25MHZ
005.034398	16MB EXPANSION MEMORY
005.034397	32MB EXPANSION MEMORY
005.033490	48MB EXPANSION MEMORY
005.033386	SCSI CONTROLLER
005.033384	ESDI CONTROLLER
005.034192	SCSI INTERNAL CABLE
005.033334	SCSI TERMINATOR
005.034190	ESDI INTERNAL CABLE
005.034196	SER/PRINTER INT CABLE
005.034198	DISK POWER CABLE
005.034199	TAPE POWER CABLE
005.034201	+12V TO BCKPNL CABLE
005.034200	+5V TO BCKPNL CABLE
005.034114	POWER SUPPLY 100V 750W
005.034115	POWER SUPPLY 120V 750W
005.034116	POWER SUPPLY 220V 750W
005.034395	BACKPANEL 10 SLOT
005.034204	ASYNC CONTROLLER /16
005.034193	16 ASYNC INTERNAL CABLE
005.034205	8-CONNECT PANEL ASYNC
005.034206	SYNC CONTROLLER
005.034194	SYNC INTERNAL CABLE
005.034207	TERM SERVER HOST ADAPTER
005.034209	LAN (NON INTELLIGENT)
005.034195	LAN INTERNAL CABLE
118.5943	8-PORT CLUSTER CONT BOX
118.4850	16-PORT CLUSTR CONT BOX
005.034202	BLOWER CABLE 100/120V
005.034203	BLOWER CABLE 220/240V
115.587	BLOWER
109-821	POWER CORD 100/120V U.S.
109-813	PWR CD 240V U.K.
109-809	PWR CD 240V AUSTRALIA
109-812	PWR CD 220V AUSTRIA
109-811	PWR CD 220V ITALY
109-815	PWR CD 220V DENMARK
109-810	PWR CD 220V SWITZERLAND

PART NUMBER	DESCRIPTION
	OFFICE PACKAGE UNIQUE + RACK MOUNT COMMON
109-681	PWR CD 220/240V
109-996	PWR CD 120/60
005.034948	AC HARNESS
005.034246	BLKHD TO CLUSTER 25 FT
005.034247	BLKHD TO CLUSTER 50FT
005.034248	BLKHD TO CLUSTER 100FT
005.034255	ASYNC CONSOLE CABLE 10FT
005.034992	ASYNC CONSOLE CABLE 15FT
005.034993	ASYNC CONSOLE CABLE 25FT
005.034256	ASYNC FROM CLUSTER 10FT
005.034990	ASYNC FROM CLUSTER 15FT
005.034991	ASYNC FROM CLUSTER 25FT
005.035573	PRT (CENT) EXT CABLE 15F
005.035574	PRT (CENT) EXT CBL 25FT
005.035575	PRT (DP) EXT CABLE 15FT
005.035576	PRT (DP) EXT CBL 25FT
005.036778	BACKPANEL 6 SLOT
005.036779	SCSI INTERNAL CABLE
111-1316	T-CONNECTOR
111-3081	COAX TERMINATOR

PART NUMBER	DESCRIPTION
	AV 6100/6120
005.034438	SMD CONTROLLER
005.035548	SCSI INTERNAL CABLE
005.034446	SMD INTERNAL CABLE
005.035541	SYS CONSOLE INT CABLE
005.035545	B/P TO P/S HARNESS
005.035537	AC/LOGIC HARNESS
005.035552	MOUNTING KIT
005.034493	POWER SUPPLY
005.036263	PEX BUS TERMINATOR (P2)
005.036264	PEX BUS TERMINATOR (P3)
005.035553	FAN MODULE ASSY 120/240
005.035536	AC HARNESS (SWITCH)
005.035549	16 ASYNC INTERNAL CABLE
005.035550	SYNC INTERNAL CABLE
005.036279	SYNC INT CBL (4TH LINE)

MODEL NUMBERS

MODEL NUMBER	DESCRIPTION
G70034	AV5100 CPU/8MB Mem; Model 6442-I, 322MB 5.25" ESDI Disk Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70035	CPU/16MB Mem; Model 6442-I, 322MB 5.25" ESDI Disk Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70041	CPU/16MB Mem; Model 6555-I, 648MB 5.25" ESDI Disk Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70036	AV5120 Dual CPU/16MB Mem; Model 6442-I, 322MB 5.25" ESDI Disk Add-on, Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70042	Dual CPU/16MB Mem; Model 6555-I, 648MB 5.25" ESDI Disk Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
E70043	AV6100 CPU/16MB Mem; Model 6542-A, 2-1GB SMD Disk Drive w/Rack Mount; Model 6577-A, CSS Support Chassis w/150MB QIC Cart Tape
J45	CPU/16MB Mem; Model 6443-A, CSS Add-on Support Chassis w/322MB Disk; 2 Model 6491-M, 322MB 5.25" Disk Add-on Kit for CSS; Model 6577-M, 150MB 5.25" QIC Cartridge Tape -CSS
E70047	CPU/16MB Mem; Model 6554-M, 648MB 5.25" SCSI Disk Add-on Kit; Model 6577-A, CSS Support Chassis w/150MB QIC Cart Tape
E70044	AV6120 Dual CPU/16MB Mem; Model 6542-A, 2-1GB SMD Disk Drive w/Rack Mount; Model 6577-A, CSS Support Chassis w/150MB QIC Cart Tape
E70046	Dual CPU/16MB Mem; Model 6443-A CSS Add-on Support Chassis w/322MB Disk; 2 Model 6491-M, 322MB 5.25" Disk Add-in Kit for CSS; Model 6577-M, 150MB 5.25" QIC Cartridge Tape -CSS
E70048	Dual CPU/16MB Mem; Model 6554-M, 648MB 5.25" SCSI Disk Add-on Kit; Model 6577-A, CSS Support Chassis w/150MB QIC Cart Tape
G70104	AV5010 CPU/8MB Mem; Model 6491-I, 322MB FH 5.25" SCSI Disk, Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70105	CPU/16MB MEM; Model 6491-I, 322MB FH 5.25" SCSI Disk, Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape
G70106	CPU/16MB Mem; Model 6554-I, 662MB FH 5.25" SCSI Disk, Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape

AV5200

78 CPU/25MHz, 16MB, Model 6442-I, 322MB 5.25" ESDI Disk Add-on;
Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape

79 CPU/25MHz, 16MB, Model 6555-I, 648MB 5.25" ESDI Disk Add-on;
Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape

AV5220

80 Dual CPU/25MHz, 16MB, Model 6555-I, 648MB 5.25" ESDI Disk
Add-on; Model 6577-I, 150MB 5.25" 1/4" Cartridge Tape

AV6200

81 CPU/25MHz, 8MB, Chassis

82 CPU/25MHz, 16MB, Chassis

84 CPU/25MHz, 16MB, Model 6541-A, 2GB SMD Disk Drive w/Rack
Mount; Model 6577-M, CSS Support Chassis w/150MB QIC Cart
Tape

86 CPU/25MHz, 16MB, Model 6541-A, 2GB SMD Disk Drive w/Rack
Mount; Model 6577-M, CSS Support Chassis w/150MB QIC Cart
Tape

88 CPU/25MHz, 16MB, Model 6554-M, 648MB 5.25" SCSI Disk
Add-on Kit; Model 6577-M, CSS Support Chassis w/150MB QIC
Cart Tape

AV6220

83 Dual CPU/25MHz, 16MB, Chassis

85 Dual CPU/25MHz, 16MB; Model 6541-A, 2GB SMD Disk Drive
w/Rack Mount; Model 6577-M, CSS Support Chassis w/150MB QIC
Cart Tape

87 Dual CPU/25MHz, 16MB; Model 6541-A, 2GB SMD Disk Drive
w/Rack Mount; Model 6577-M, CSS Support Chassis w/150MB QIC
Cart Tape

89 Dual CPU/25MHz, 16MB, Model 6554-M, 648MB 5.25" SCSI Disk
Add-on Kit; Model 6577-M, CSS Support Chassis w/150MB QIC
Cart Tape

01 16MB Expansion Memory

02 32MB Expansion Memory

03 48MB Expansion Memory

40 VAC/16 for integrated systems

41 VDA/128

7402	VDC/8P
7403	VDC/16
7404	VSC/4
7404-V	VSC/4 (Rackmount only)
7405	VLC
7406	VAC/16 (Rackmount only)
7407	VME SCSI Controller (add-on)
7407-V	VME SCSI Controller (Rackmount only)
7408	SMD Controller (Rackmount only)
7409	Adapter Card Kit (6U to 9U)
6443-A	CSS Add-on support chassis w/322mb Disk (Rackmount only)
6541	1.2GB Disk w/Smd Controller (Rackmount only)
6541-A	1.2GB Disk w/tray and rack kit (Rackmount only)
6541-K	1.2GB Smd Disk -Add-on (Rackmount only)
6542	Dual 1.2GB Smd Drives w/controller (Rackmount only)
6542-A	Dual 1.2GB Smd Drive w/rack mount (Rackmount only)
6544	SCSI Controller (Office only)
6555-I	648MB 5.25" ESDI Disk (add-on) (Office only)
6577-I	Add-on 150MB Cartridge (int) (Office only)
6577-A	CSS Support Chassis w/150mb QIC Cart Tape (Rackmount only)
6554-M	648MB 5.25" SCSI Disk Add-on
6442-I	Add-on 322MB ESDI disk (int) (Office only)
6587-A	1600bpi Reel-to-Reel (table)
6586	1600bpi Reel-to-Reel (rack)

4-I	662MB FH 5.25" SCSI Disk (Entry Office only)
1-I	322MB FH 5.25" SCSI Disk (Entry Office only)
565	Peripheral Housing Unit
577-E	150MB Cartridge for PHU
601	PHU w/ 322MB disk
602	PHU w/ 150MB cartridge
604	PHU w/ 322MB disk, 150MB cart

Related Documents

Manual Number	Title
014-000793	Ethernet/Thin-Ethernet Local Area Networks Installation Guide
014-001806	Setting Up and Starting AVIIION Series Systems
015-000355	Expanding the AVIIION Series Systems
015-000915	Product Specification Guide
015-000916	Site Planning Guide
043-000102	Product Service Guide
043-000075	AVIIION System Diagnostics Field Guide
043-003203	Installation, Repair, and Maintenance Manual, Peripheral Enclosure, Model 10585
043-002016	Product Information Package, 150 MB Cartridge Tape Drive, Models 6536 and 6577-A
043-002015	Product Information Package, 1600 BPI SCSI Reel-to-Reel Tape Drive, Models E6586, E6586-A, E6587, and E6587-A
043-003715	Product Information Package, Winchester 5 1/4-inch Disk Family
014-001802	Using the System Control Monitor
015-001863	Using AVIIION System Diagnostics

APPENDIX D

AVIION 400 SERIES STATIONS
 AVIION 3000 AND 4000 SERIES SERVERS

MODELS 70063-70073, 7206, 7208, 70133-70138
 70142-3, 70145-6, 70132, 70136, 70138, 701XX

PART NUMBER	DESCRIPTION
005-030105	ASSY 322MB 5.25" FH DISK
005-030138	ASSY 663MB 5.25" FH DISK
005-030139	ASSY 180MB 5.25" HH DISK
005-033334	ASSY SINGLE PORT TERMINAT
005-033889	ASSY 4MB 100NS MODULE
005-034266	ASSY 16MHZ SYSTEM PCB
005-034267	ASSY 16MHZ 2ND CPU PCB
005-034268	ASSY GRAPHICS 24 BIT
005-034269	ASSY GRAPHICS 8 BIT
005-034270	ASSY Z BUFFER PCB
005-034272	ASSY BACKPANEL PCB
005-035145	ASSY EXTENDER CA - MOUSE
005-035146	ASSY EXTENDER CA - KEYBD
005-035712	ASSY 20MHZ SYSTEM PCB
005-035713	ASSY 20MHZ 2ND CPU PCB
005-035750	ASSY CHASSIS
005-035751	ASSY FAN MODULE
005-035752	ASSY MTG KIT 1/2 HEIGHT
005-035753	ASSY MTG KIT FULL HEIGHT
005-035755	ASSY MTG KIT SCSI PCB CA
005-035757	ASSY HARNESS A/C
005-035758	ASSY HARNESS FAN MODULE
005-035759	ASSY HARNESS D/C P/S BKP
005-035761	ASSY HARNESS D/C PERIP/CH
005-035762	ASSY CABLE I/O
005-035763	ASSY HARNESS SPKR & LED
005-035855	ASSY BNC CABLE
005-036553	ASSY POWER SUPPLY
005-037014	16 PORT VME ASYNC CTLR
005-037015	VME DISTRIBUTION ADPTR
005-037016	3 PORT VME ASYNC CTLR
005-037017	VME IEEE 802.3 LAN CTLR
005-037019	JUNCTION ASSY
005-037108	ASSY 332MB 5.25" HH DISK
100-010142	ASSY PROM FOR AV400 AND AV4000 16 MHZ
100-010971	ASSY PROM/AV3000 16 MHZ
109-000809	PWR CRD 240V 50HTZ (AUST)
109-000810	PWR CRD 220V 50HTZ (SWIT)

PART NUMBER	DESCRIPTION
109-000811	PWR CRD 220V 50HTZ (ITAL)
109-000812	PWR CRD 220V 50HTZ (AUST)
109-000813	PWR CRD 240V 50HTZ (UK)
109-000815	PWR CRD 220V 50HTZ (DENM)
109-000996	PWR CRD 100/120V 50/60HTZ
110-000787	AC POWER SWITCH
111-002256	AC POWER CONNECTOR
113-000092	PICO FUSE
113-000200	12A FUSE (FOR 5V POWER)
115-000354	ASSY FAN
118-003796	101-KEY KEYBD U.S. FONT
118-004337	ASSY 150MB CTG TAPE DR
118-004640	ASSY 8MM 5.25" TAPE DRIVE
118-004658	19" COLOR MONITOR 230V
118-004659	19" COLOR MONITOR 120V
118-004673	102-KEY KEYBOARD (GERMAN)
118-004674	102-KEY KEYBOARD (FRENCH)
118-004675	102-KEY KEYBOARD (U.K.)
118-004676	102-KEY KEYBOARD (SWEDISH)
118-004752	102-KEY KEYBOARD (KANJI)
118-004754	ASSY 3.5" 1.44MB FLOPPY
118-004883	ASSY MOUSE
118-004898	ASSY CD-ROM DISK DRIVE
118-004969	102-KEY KEYBOARD (SPANISH)
118-004971	102-KEY KEYBOARD (ITALIAN)
118-004972	102-KEY KEYBOARD (SWISS)
118-005427	ASSY 5.25" 1.2MB FLOPPY

Table 1-1. Packaged System Computer Models

MODEL	CLOCK RATE	DISK DRIVE	MEMORY
70135 AV 4000	16 MHz	322 MB	8 MB
70137 AV 4000	16 MHz	662 MB	8 MB
70139* AV 4020	32 MHz	662 MB	16 MB

*This model has dual 16 MHz CPUs.

DGC PART NO.	DESCRIPTION
014-001802	Using the AVIION System Control Monitor
014-001809	MC88100 Users Guide
014-001808	MC88200 Users Guide
014-001815	HPS VMEbus Host Adapters Technical Manual
014-001816	VMEbus Data Communications Processor (DCP) Tech. Manual
014-001817	HPS VMEbus Sixteen-Channel Multiplexer Tech. Manual
014-001818	V/Ethernet 3207 Hawk High Performance VME Ethernet Communications Controller
014-001858	Setting Up and Starting AVIION 400 Series Systems
014-001859	Expanding and Maintaining AVIION 400 Series Systems
014-001865	Technical Notices AVIION 4000 Series Systems
014-001867/	Setting Up and Installing VMEbus Option Boards in AV Systems
043-003732	
015-000915	Product Specification Guide
015-000916	Site Planning Guide
043-000075	AVIION System Diagnostics Field Guide
093-701052	Installing and Managing the DG/UX™ System

Table 1-2. Optional Equipment

MODEL	DESCRIPTION
7000-K	4.0 MB, Expansion Memory Module
7012-K	8.0 MB Memory (Available with Initial Purchase, Only)
7006-K	Second 16 MHz CPU
6539-F	179 MB, Half-Height, Disk Drive
6491-F	322 MB, Full-Height, Disk Drive
6554-F	640 MB, Full-Height, Disk Drive
G6577-F	150 MB, Half-Height, Cartridge Tape Drive
G6563-J	1.2 MB, 5.25-inch, Half-Height Diskette Drive with SCSI Adapter for for PHU
G6562-J	1.44 MB, 3.5-inch, Half-Height Diskette Drive with SCSI Adapter for for PHU
G6563-JX	1.2 MB, 5.25-inch, Half-Height Diskette Drive without SCSI Adapter
G6562-JX	1.44 MB, 3.5-inch, Half-Height Diskette Drive without SCSI Adapter
G6491-J	322 MB, 5.25-inch, Full-Height Disk Drive for PHU
G6539-J	179 MB, 5.25-inch, Half-Height Disk Drive for PHU
G6554-J	662 MB, 5.25-inch, Full-Height Disk Drive for PHU
G6577-J	150 MB, Half-Height, QIC Cartridge Tape Drive for PHU
G6591-J	2 GB, 8 mm, Full-Height Tape Drive
6586	Stand-Alone, Reel-to-Reel Tape Drive (9 track, 1600 bps)
6587	Stand-Alone, Reel-to-Reel Tape Drive (9 track, 1600 bps)
7600	VME Backpanel with Two 6U VME Slots
7601	Chassis, including Power Supply, Cables, without VME Backpanel
70072	16 MHz System Board with 8 MB Memory
7411-K	VAC/16 16-Line Asynchronous Multiplexer PCB with Two Junction Boxes
7401-K	VDA/128 Asynchronous Communication Controller PCB
7413-K	VSC/3 Synchronous Communications Controller PCB
7405-K	VLC IEEE 802.3 LAN Controller PCB
7402-K	8 Port VME Cluster
7403-K	16 Port VME Cluster

Table 1-4. Field Replaceable Units (FRUs)

DG PART NO.	DESCRIPTION
005-034268	16 MHz System Board
005-035750	Complete Chassis
005-036553	Power Supply Assembly
005-034967	Power Supply PCB
005-033889	4 MB Memory Module
113-000092	Pico Fuse (System Board)
113-000200	12A Fuse (for 5V DC Power)
110-000787	AC Power Switch
110-002258	AC Power Connector
005-035763	Speaker and LED Harness Assembly
005-035757	A/C Harness Assembly
005-035759	D/C Harness Assembly
005-035751	Fan Module
005-035758	Fan Harness Assembly
115-000354	DC Fan (3 Required)
005-035762	Peripheral I/O Cable Assembly
005-035761	Peripheral DC Harness
005-033334	SCSI Terminator
005-030139	179 MB Disk Drive with Mounting Kit
005-030105	322 MB Disk Drive with Mounting Kit
005-030138	662 MB Disk Drive with Mounting Kit
005-035753	Mounting Kit for Full-Height Drives
005-035752	Mounting Kit for Half-Height Drives
005-035755	SCSI Adapter PCB Kit with Cables and Mounting Hardware
118-005427	1.2 MB 5.25-inch Diskette Drive
118-004754	1.44 MB 3.50-inch Diskette Drive
005-030140	150 MB Half-Height Cart. Tape Drive with Mounting Kit
005-030156	2 GB Backup-Tape Drive with Mounting Kit
005-034267	16 MHz Second CPU
005-034272	VME Backpanel
005-037014	VAC/16 16-Line Asynchronous Communication Multiplexer PCB with two Junction Boxes
005-007819	VDA/128 Asynchronous Communication Controller PCB
005-037016	VSC/3 Synchronous Communications Controller PCB
005-037017	VLC IEEE 802.3 LAN Controller PCB
118-005943	8 Port VME Cluster
118-004850	16 Port VME Cluster
Power Cords	
109-000996	100V/120V 50/60 Hz (No Power Suffix - U.S., Japan)
109-000813	240V 50 Hz (Power Suffix 5 - U.K., Hong Kong)
109-000809	240V 50 Hz (Power Suffix 6 - Australia, New Zealand)
109-000812	220V 50 Hz (Power Suffix 7 - France, Germany)
109-000811	220V 50 Hz (Power Suffix 8 - Italy)
109-000815	220V 50 Hz (Power Suffix 9 - Denmark, Greenland)
109-000810	220V 50 Hz (Power Suffix 0 - Switzerland, Italy)

Table 1-4. Field Replaceable Units (FRUs) (Continued)

DG PART NO.	DESCRIPTION
Communication Cables	
005-033791	Ethernet Cable 5.0 m (16.4 ft) Teflon
005-033787	Ethernet Cable 20.0 m (66.2 ft) Teflon
005-033766	Ethernet Cable 5.0 m (16.4 ft) PVC
005-037742	Ethernet Cable 20.0 m (66.2 ft) PVC
005-033776	RS-232 Cable 15.2 m (50.0 ft)
005-013325	RS-232 Cable 1.5 m (5.0 ft) (Serial)
005-033703	RS-232 Cable 4.5 m (15.0 ft)
005-033788	RS-232 Cable 7.6 m (25.0 ft) (Serial)
005-033783	RS-422 Cable 7.6 m (25.0 ft)
005-033743	RS-422 Cable 15.2 m (50.0 ft)
005-033745	RS-422 Cable 30.5 m (100.0 ft)
005-020907	RS-422 Cable 91.4 m (300.0 ft)
005-020908	RS-422 Cable 152.4 m (500.0 ft)
005-033775	Modem Cable
005-011433	Modem Cable
005-033000	SCSI Cable 1.5 m (5.0 ft) (CPU to PHU)
005-033001	SCSI Cable 3.0 m (10.0 ft) (CPU to PHU)
005-033345	SCSI Cable 4.57 m (15.0 ft) (CPU to PHU)
005-033003	SCSI Cable 0.4 m (1.3 Ft) (PHU to PHU)
005-033004	SCSI Cable 1.5 m (5.0 ft) (PHU to PHU)
005-033005	SCSI Cable 3.0 m (10.0 ft) (PHU to PHU)

APPENDIX E
AVilion 300 SERIES STATIONS

Table 1-1 Customer Replaceable Units and Part Numbers

CRU	Part Number	CRU	Part Number
Power cord (computer unit)		System board assembly	
100/120 V ac	109-000249	Color	
240 V ac (Australia)	109-000812	16 MHz	005-035581
240 V ac (Austria)	109-000809	20 MHz	005-035585
240 V ac (Denmark)	109-000815		
240 V ac (Italy)	109-000811	Terminal or serial printer cable	
240 V ac (Switzerland)	109-000810	EIA RS-232-C (5 ft)	005-013325
240 V ac (U.K)	109-000813	EIA RS-232-C (15 ft)	005-033703
Power cord (monitor)	109-001253	EIA RS-232-C (25 ft)	005-033788
Power supply	005-034141	EIA RS-232-C (50 ft)	005-033776
SCSI bus fuse	113-000092	Terminal or serial printer cable	
SCSI bus cable		EIA RS-422 (25 ft)	005-033783
5 ft	005-033000	EIA RS-422 (50 ft)	005-033743
10 ft	005-033001	EIA RS-422 (100 ft)	005-033745
15 ft	005-033335	EIA RS-422 (300 ft)	005-020907
Speaker assembly	005-034420	EIA RS-422 (500 ft)	005-020908
System board assembly			
Monochrome			
16 MHz	005-035579		
16 MHz with Kanji character set support	005-035580		
20 MHz	005-035583		
20 MHz with Kanji character set support	005-035584		

Table 1-1 Customer Replaceable Units and Part Numbers

CRU	Part Number	CRU	Part Number
Fan assembly	005-034418	Memory module	005-033889
Housing	002-038729	Modem cable 25 ft	005-033775
Keyboards		Monitors	
102-key (French)	118-004674	Monochrome	
102-key (German)	118-004673	100/120 V ac	118-004654
102-key (Italian)	118-004971	220/240 V ac	118-004653
102-key (Katakana)	118-004752	Color	
102-key (Spanish)	118-004969	100/120 V ac	118-004659
102-key (Swedish)	118-004676	220/240 V ac	118-004658
102-key (Swiss)	118-004972	Monitor cables	
102-key (U.K.)	118-004675	Monochrome	005-034410
101-key (U.S)	118-003796	Color	005-034408
LAN cable		Mouse	118-004883
IEEE 802.3 16.4 ft Teflon ^a	005-033791	Parallel printer cable	005-023915
IEEE 802.3 16.4 ft PVC	005-033766		
IEEE 802.3 65.6 ft Teflon	005-033787		
Ethernet 65.6 ft Teflon	005-33742		

AViion 5000 CONFIGURATION LAB

OBJECTIVES;

UPON COMPLETION OF THIS LAB YOU WILL BE ABLE TO:

1. CORRECTLY CALCULATE YOUR POWER REQUIREMENTS FOR A AViion 5000 SERIES COMPUTER
2. INSTALL SYSTEM BOARD AND OPTION BOARDS ACCORDING TO THE CORRECT SLOT POSITION IN THE CHASSIS.
3. JUMPER ANY EXPANSION MEMORY OR VME OPTION BOARD FOR THE CORRECT ADDRESS AND BG/R LEVEL.
4. LOCATE THE CORRECT PART NUMBERS FOR ANY FRU IN YOUR SYSTEM.

REFERENCES:

- (014-1850) EXPANDING THE AViion 5000 SERIES SYSTEM
- (014-1867) SETTING UP AND INSTALLING VME OPTIONS IN AViion SYSTEMS

OR THE PURPOSE OF THIS LAB YOUR SYSTEM WILL CONTAIN THE FOLLOWING
COMPONENTS;

QUANTITY	TYPE
1	25MHZ SYSTEM BOARD W/16 MB OF MEMORY
2	MEMORY EXPANSION BOARDS (48MB) (16MB)
2	SCSI ADAPTER BOARDS
1	ESDI ADAPTER BOARD
2	VME VAC/16 OPTION BOARDS
1	VME VLC LAN OPTION BOARD
TOTAL 9 BOARDS	

MASS STORAGE DEVICES

INTERNAL DEVICES

1	SCSI 150 MB TAPE DRIVE
1	ESDI 322 MB WINI DISK DRIVE

EXTERNAL DEVICES

1	SCSI 150 MB TAPE DRIVE
1	SCSI 648 MB WINI DISK DRIVE

USE THE TABLE BELOW TO CALCULATE YOUR SYSTEMS POWER CONSUMPTION.

1) WHAT IS THE TOTAL AMOUNT OF POWER (WATTS) CONSUMED IN THIS CONFIGURATION?

2) WHAT IS THE TOTAL AMPERAGE ON EACH OF THE FOLLOWING LINES?

+5V

+12V

-12V

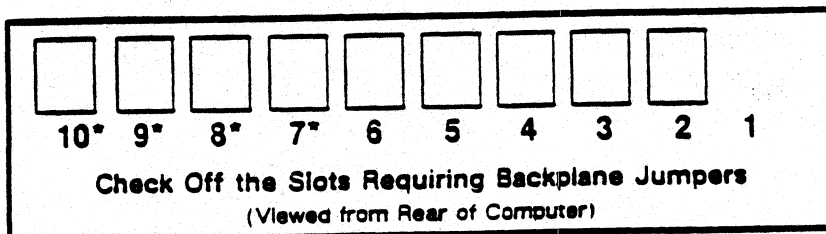
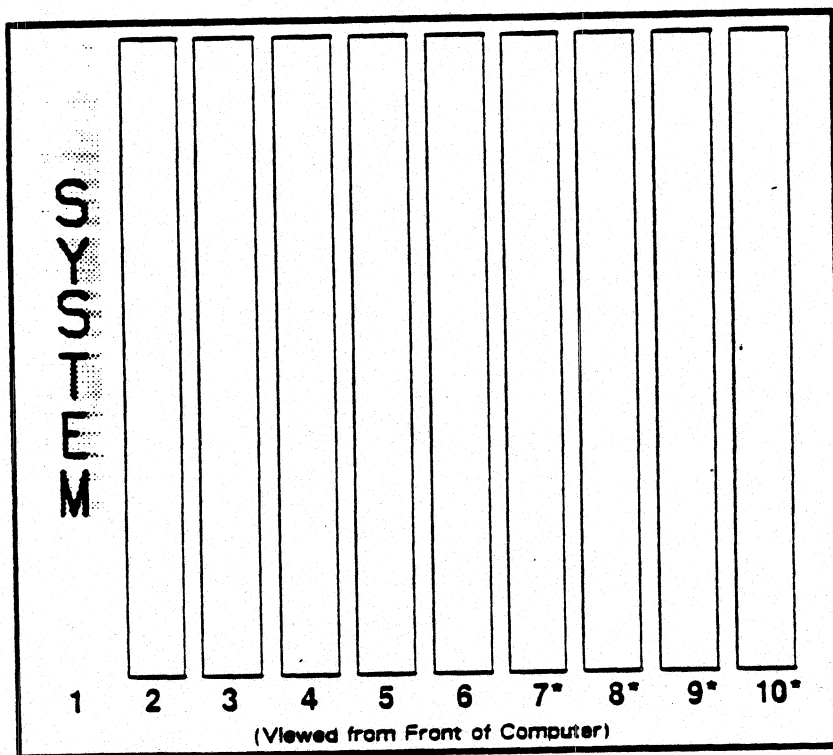
Slot No.	Board Name/Drive Name	Current (Amperes)		
		+5 V dc	+12 V dc	-12 V dc
1	_____	_____	_____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____
4	_____	_____	_____	_____
5	_____	_____	_____	_____
6	_____	_____	_____	_____
7	_____	_____	_____	_____
8	_____	_____	_____	_____
9	_____	_____	_____	_____
10	_____	_____	_____	_____
	SCSI cartridge tape drive 1	_____	_____	_____
	SCSI cartridge tape drive 2	_____	_____	_____
	ESDI ¹ or SCSI ² hard disk drive 1	_____	_____	_____
	ESDI ¹ or SCSI ² hard disk drive 2	_____	_____	_____
	ESDI ¹ or SCSI ² hard disk drive 3	_____	_____	_____
Power Supply Limits				
Amperage:				
+ 5 V Total (do not exceed 105.0 amps max.) =		_____		
+12 V Total (do not exceed 17.0 amps max.) =			_____	
-12 V Total (do not exceed 4.0 amps max.) =				_____
Wattage:				
+ 5 V wattage total =		_____ ← = 5 V X _____ A		
+12 V wattage total =		_____ ← = 12 V X _____ A		
-12 V wattage total =		_____ ← = 12 V X _____ A		
Total power (750 watts max.) = _____				
(670 watts total for the 100 V ac power supply)				

¹ Available on the AVIIION 5000 computer only.
² Available on the AVIIION 5010 computer only.

SLOT ASSIGNMENTS AND PRIORITIES

ASSUME THAT ALL VME OPTION CARDS WILL HAVE A BG/R LEVEL OF THREE FOR THIS EXERCISE, USE THE CHART BELOW TO CONFIGURE YOUR SYSTEM. WRITE THE BOARDS NAME IN THE APPROPRIATE SLOT ALONG WITH IT'S PART NUMBER. ALSO, ANSWER THE FOLLOWING QUESTIONS.

- 1) WHAT VME OPTION CARD HAS THE HIGHEST PRIORITY ON THE VME BUS?
- 2) WHAT IS THE PART NUMBER FOR A 16 MB EXPANSION MEMORY BOARD
- 3) WHAT BACKPANEL SLOTS, IF ANY, WILL HAVE BG/R AND IACK JUMPERS ON THEM?



*The AVION 5010 computer does not support these board slots.

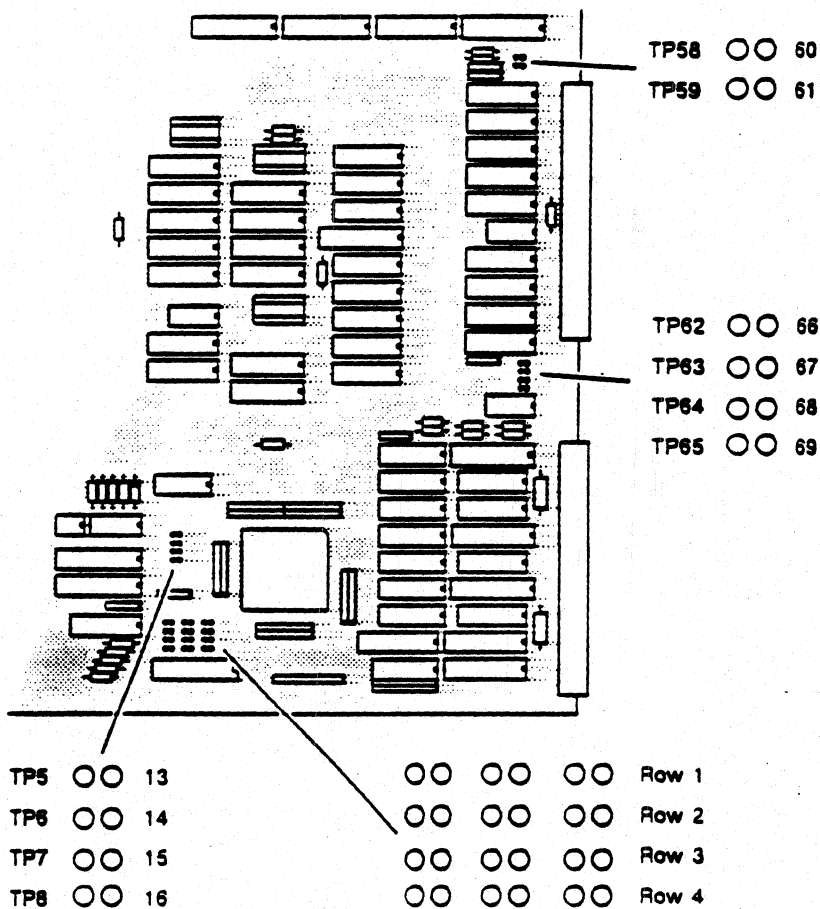
EXPANSION MEMORY JUMPERING

THE SYSTEM BOARD HAS A TOTAL OF 16 MB OF MEMORY ON IT, YOU HAVE A ADDITIONAL TWO EXPANSION BOARDS TO ADD. ANSWER THE QUESTION BELOW FOR ADDING EXPANSION MEMORY BOARDS.

WHAT JUMPERS WILL YOU INSERT FOR THE FIRST EXPANSION BOARD AND WHAT WILL THE TOTAL AMOUNT OF MEMORY BE AFTER THE INSTALL? DON'T FORGET TO GIVE THE BOARD A ID.

USE THE CHART BELOW TO RECORD YOUR ANSWERS BY DRAWING A JUMPER FOR THE CORRECT PINS.

EXPANSION BOARD 1

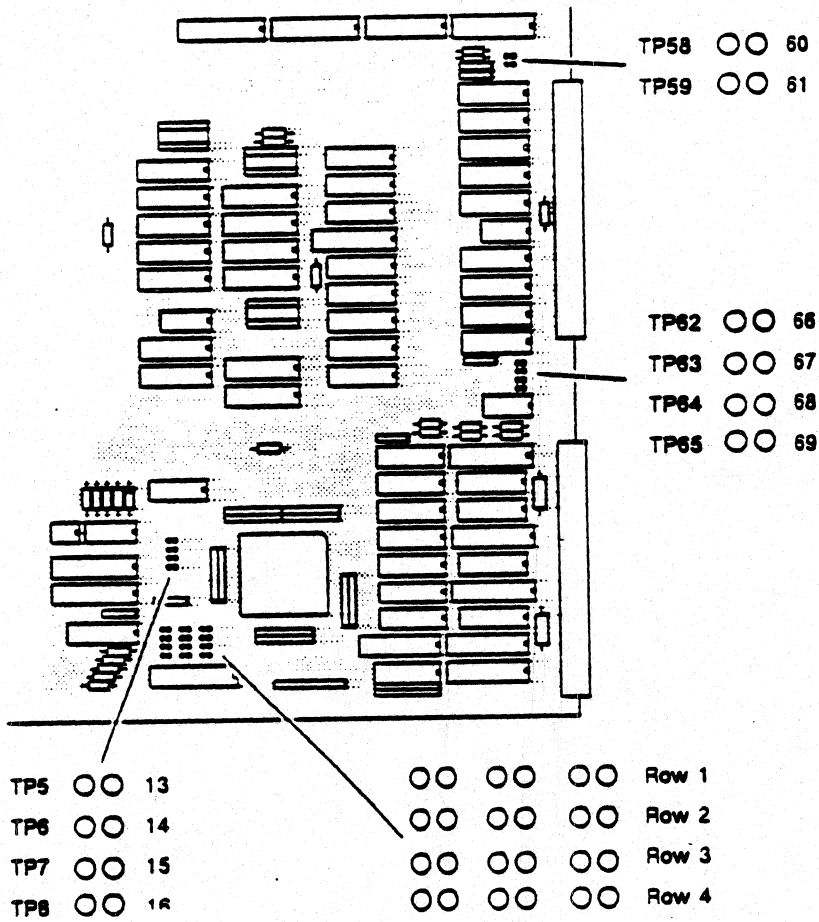


Jumpers on the Expansion Memory Board

EXPANSION MEMORY BOARD 2

WHAT JUMPERS WILL BE INSERTED ON BOARD 2? WHAT WILL THE TOTAL SYSTEM MEMORY BE?

WHAT BACKPANEL SLOT SHOULD CONTAIN MEMORY TERMINATORS?



Jumpers on the Expansion Memory Board

VME OPTION BOARD JUMPERS

YOU HAVE IN YOUR SYSTEM TWO VAC/16 OPTION CARDS. LIST THE CORRECT JUMPER SETTINGS FOR THE FIRST VAC/16 THAT REFLECT ITS ADDRESS AND ALSO BG/R LEVELS.

WHAT WOULD THE CORRECT ADDRESS SETTING BE FOR THE SECOND VAC/16 TO BE SIZED BY DIAGNOSTICS?

LIST THE CORRECT SWITCH SETTINGS FOR A VLC BOARD 0. WHAT ADDRESS WOULD THE DIAGNOSTICS EXPECT TO FIND IT AT?

LIST ONLY THE SWITCHES THAT ARE "OFF"

SW 1

SW 2

SW 3

MASS STORAGE DEVICES

OUR FIRST SCSI ADAPTER BOARD HAS COME CONFIGURED FOR A ADDRESS OF
"FFFFFF300", INSTALL THE SECOND SCSI ADAPTER BY JUMPERING THE
CORRECT ADDRESS LINES USING A "OUT" TO INDICATE A "1" AND A "IN" TO
INDICATE A "0" FOR THE APPROPRIATE LINE BELOW;

A15 A14 A13 A12 A11 A10 A9 A8

WHAT PORT ON THE BACK WOULD YOU USE TO CONNECT A PHU TO THE SECOND
SCSI ADAPTER?

WHERE SHOULD THE SCSI BUS TERMINATOR BE PLACED?

CIRCLE THE CORRECT ADDRESS FOR THE ESDI ADAPTER TO BE FOUND IN YOUR
SYSTEM

fffff100 fffffb00 fffffd00 fffffef00

WHAT IS THE CORRECT SYNTAX TO BOOT FROM YOUR SECOND 150 MB TAPE
HOUSED IN THE PHU?

SCM LAB

THE FOLLOWING LAB WILL FAMILIARIZE YOU WITH THE COMMANDS AND MENUS USED WITH THE SCM PROMPT.

1> POWER ON YOUR PERIPHERALS FIRST, THEN POWER ON YOUR AVIION PROCESSOR.

2> MAKE SURE YOUR SYSTEM POWERS UP CORRECTLY, IF YOU DETECT A FAILURE NOTIFY THE INSTRUCTOR.

3> FROM THE SCM PROMPT TYPE IN "HELP" TO DISPLAY A LIST OF COMMANDS USED FOR THE SCM. MOST OF THESE COMMANDS ARE USED TO DEBUG PROGRAMS, HOWEVER, THE FOLLOWING ONES YOU SHOULD BE FAMILIAR WITH;

BOOT
START/CONTINUE
FORMAT

"BOOT" WILL BE USED TO LOAD DIAGNOSTICS OR YOUR OPERATING SYSTEM FROM THE SCM PROMPT.

"START" CAN USED TO START A PROGRAM THAT RESIDES IN MEMORY. CONTINUE ALSO CONTINUES PROGRAM EXECUTION AT THE CURRENT PC VALUE.

"FORMAT" IS USED TO CHANGE SYSTEM CONFIGURATION PARAMETERS.

4> ENTER A "FORMAT" COMMAND TO "VIEW OR CHANGE SYSTEM CONFIGURATION PARAMETERS".

5> TYPE "1" "CHANGE BOOT PARAMETERS" AND ANOTHER "1" TO "CHANGE SYSTEM BOOT DEVICE".

THE SYSTEM DISPLAYS THE DEFAULT SYSTEM BOOT PATH IN BRACKETS, FOLLOWED BY A PROMPT TO CHANGE THE CURRENT BOOT PATH.

```
SYSTEM BOOT PATH = [ ]  
DO YOU WANT TO CHANGE MODIFY THE SYSTEM BOOT PATH? [N]
```

NOTE: THE SYSTEM BOOT PATH IS NOT INITIALIZED WHEN THE BRACKETS ARE EMPTY.

6> A NEWLINE KEEPS THE CURRENT DEFAULT, ANSWER [Y] TO DISPLAY THE FOLLOWING

```
ENTER NEW SYSTEM BOOT PATH ->
```

7> TYPE IN THE NAME; sd(inc(),0)root:/dgux

THE SCM WILL BOOT THE FILE DGUX AT EVERY POWERUP.

> AFTER YOU SPECIFY THE DEFAULT BOOT PATH THE SCM WILL DISPLAY THE
NEW DEFAULT IN BRACKETS, FOLLOWED BY A PROMPT TO CHANGE THE CURRENT
SYSTEM BOOT PATH AGAIN. TAKE THE DEFAULT [N].

THE SYSTEM PROMPTS YOU TO BOOT FROM THE CURRENT SYSTEM BOOT PATH

DO YOU WANT TO BOOT? [N]

> PRESS NEWLINE TO RETURN TO THE "CHANGE BOOT PARAMETERS" MENU
WITHOUT BOOTING THE DEVICE.

NOTE: TYPING A [Y] WOULD BOOT THE DEVICE.

CHANGING THE DIAGNOSTIC BOOT PATH

THE DIAGNOSTIC BOOT PATH YOU SPECIFY IS THE PATH THE SYSTEM WILL
USE AT POWERUP TO BOOT A FILE OR DIAGNOSTIC PROGRAM BEFORE YOUR
SYSTEM BOOT PATH IS PROBED.

10> TYPE A "2" FROM THE MENU TO SELECT "CHANGE DIAGNOSTIC BOOT
PATH" THE SYSTEM DISPLAYS THE CURRENT DEFAULT IN BRACKETS, FOLLOWED
BY A PROMPT TO CHANGE THE CURRENT BOOT PATH AS FOLLOWS;

DIAGNOSTIC BOOT PATH= []
DO YOU WANT TO MODIFY THE DIAGNOSTIC BOOT PATH? [N]

11> PRESS NEWLINE TO KEEP THE CURRENT BOOT PATH AND RETURN TO THE
"CHANGE BOOT PARAMETERS" MENU, OR A [Y] TO CHOOSE A NEW PATH

MODIFY YOUR DIAGNOSTIC BOOT PATH TO REFLECT THE FOLLOWING;

12> ENTER NEW DIAGNOSTIC BOOT PATH -> st(inc(),4)

IF YOU CHOOSE TO BOOT A DIAGNOSTIC FILE FROM DISK ENTER THE
FOLLOWING;

ciéd()usr:/stand/diags [AV5000/6000
sd(inc())usr:/stand/diags [av300/400]

THE SCM WILL BOOT THE FILE DIAGS FROM THE DISK AT POWERUP UNTIL YOU
CHANGE THE BOOT PATH AGAIN.

13> INSERT A DIAGNOSTIC TAPE IN THE DRIVE, POWER OFF THE PROCESSOR
AND THEN POWER IT BACK ON NOTING THE BOOT PATH THAT IS USED AFTER
POWERUP.

USE THE FOLLOWING SUMMARY MENU SUMMARY TO GO THROUGH THE REMAINING OPTIONS AVAILABLE FOR THE SCM MENU. WHEN YOU FEEL COMFORTABLE USING : MENU YOU HAVE CONCLUDED THE SCM LAB.

REFER TO THE FOLLOWING PAGES IN THE "USING THE SYSTEM CONTROL PROGRAM" MANUAL FOR THE REMAINING PORTIONS OF THE LAB. PGS.2-8 TO PGS. 2-18.

SUMMARY OF SCM MENUS

THE SCM DISPLAYS THE "VIEW OR CHANGE SYSTEM CONFIGURATION MENU WHEN YOU ENTER THE "FORMAT" COMMAND AT THE SCM PROMPT.

SCM> F

VIEW OR CHANGE SYSTEM CONFIGURATION

1. CHANGE BOOT PARAMETERS
2. CHANGE CONSOLE PARAMETERS
3. CHANGE SERIEL PORT PARAMETERS
4. CHANGE PRINTER PARAMETERS
5. VIEW MEMORY CONFIGURATION
6. CHANGE TESTING PARAMETERS
7. RETURN TO PREVIOUS SCREEN

CHANGE BOOT PARAMETERS (1)

1. CHANGE SYSTEM BOOT PATH
2. CHANGE DIAGNOSTIC BOOT PATH
3. CHANGE DATA TRANSFER MODE [BLOCK]
4. RETURN TO PREVIOUS SCREEN

CHANGE CONSOLE PARAMETERS (2)

1. CHANGE BAUD RATE [9600]
2. CHANGE CHARACTER LENGTH [8 BIT, NO PARITY]
3. CHANGE CHARATER CODE SET [ANSI]
4. CHANGE FLOW CONTROL [ENABLED]
5. CHANGE CONSOLE LANGUAGE [US ENGLISH]
6. RETURN TO PREVIOUS SCREEN

CHANGE BAUD RATE

1. 300
2. 600
3. 1200
4. 2400
5. 4800
6. 9600
7. 19200
8. RETURN TO PREVIOUS SCREEN
CURRENT DEFAULT IS [9600]

ENTER CHOICE(S) ->

CHANGE SERIEL PORT PARAMETERS (3)

1. CHANGE BAUD RATE
2. CHANGE CHARACTER LENGTH [8 BIT, NO PARITY]
3. RETURN TO PREVIOUS SCREEN

CHANGE PRINTER PARAMETERS (4)

1. CHANGE PRINTER TYPE [CENTRONICS]
2. RETURN TO PREVIOUS SCREEN

VIEW MEMORY CONFIGURATION (5)

MEMORY SIZE IS A 8 MBYTES
TOP OF MEMORY = XXXXXX HEX.
MEMORY MODULE 0 CONTAINS 4 MBYTES
MEMORY MODULE 1 CONTAINS 4 MBYTES
MEMORY MODULE 2 NOT PRESENT
MEMORY MODULE 3 NOT PRESENT
MEMORY MODULE 4 NOT PRESENT
MEMORY MODULE 5 NOT PRESENT
MEMORY MODULE 6 NOT PRESENT

PRESS ANY KEY TO CONTINUE

CHANGE TESTING PARAMETERS (6)

ECW BIT	FUNCTION	STATE
0	RESERVED	DISABLED
1	LOOP ON ERROR	DISABLED
2	OUTPUT OT CONSOLE	ENABLED
3	PERCENT FAILURE	DISABLED
4	PRINT PASS MESSAGE	ENABLED
5	OUTPUT TO PRINTER	DISABLED
6	DISASSEMBLER	ENABLED
7	PRINT SUBTEST MESSAGE	ENABLED
8	REPORTALL	DISABLED
9	HALT ON ERROR	DISABLED
10	ENABLE ERROR LOGGING	DISABLED
11	CONTINUE ON EXCEPTION	DISABLED
12	RESERVED	DISABLED
13	PAGE MODE	DISABLED
14	RESERVED	DISABLED
15	RESERVED	DISABLED
16	RESERVED	DISABLED
17	RESERVED	DISABLED
18	RESERVED	DISABLED
19	RESERVED	DISABLED
20-31	RESERVED	DISABLED

SELECT BIT(S) TO TOGGLE ->

AVIION PRODUCT INFORMATION PACKAGES

43-3723 - AVIION 300 SERIES STATIONS

43-3722 - AVIION 5000 SERIES COMPUTERS

43-3724 - AVIION 6000 SERIES COMPUTERS

43-3727 - AVIION 400 SERIES STATIONS

43-3729 - AVIION 3000/4000 SERIES COMPUTERS

AVIION SYSTEMS POWER UP GOALS

AND ANY FAULTS IN THE BASE SYSTEM, THE KERNAL SYSTEM AND LOAD PATH MUST BE INITIALIZED AND VERIFIED FROM PROM TO THE POINT OF ALLOWING DIAGNOSTIC MEDIA TO LOAD.

REPLACABLE UNIT (RU) CALL-OUTS.

IN CONFIDENCE WITH CUSTOMER, FIELD SERVICE, AND MANUFACTURING REQUIREMENTS, ALL FAILURE REPORTS WILL ATTEMPT TO ISOLATE TO THE FRU LEVEL.

PERFORM SELF-TEST ON ALL SYSTEM UNITS

ALL UNITS INSTALLED IN THE SYSTEM, STANDARD AND OPTIONAL, MUST BE SIZED AND TESTED. THE LEVEL OF SELF-TEST IS A CHECK FOR HARD FAULTS. THIS DOES NOT INCLUDE I/O DEVICES.

SUPPORT A VIRTUAL CONSOLE

VIRTUAL CONSOLE SUPPORT IS REQUIRED TO ALLOW ACCESS TO ALL REGISTERS AND MEMORY LOCATIONS AND SUPPORT OF PROGRAM LOADING.

INITIALIZE AND VERIFY THE LOAD PATH

ALL FAULTS IN THE BASE SYSTEM WHICH WOULD PREVENT THE BOOTING AND EXECUTION OF DIAGNOSTIC SOFTWARE MUST BE FOUND. FAULTS THAT WOULD CAUSE MALFUNCTION OF THE DIAGNOSTICS COULD CAUSE ERRONEOUS ERROR INDICATIONS.

EASE OF ERROR REPORTING

TO SUPPORT CUSTOMER MODE OPERATION AND OTHER NEEDS OF FIELD SERVICE, EASE OF ERROR REPORTING DURING POWERUP IS REQUIRED

SYSTEM INITIALIZATION

PERFORM THE REQUIRED SYSTEM CONFIGURATION AND INITIALIZATION TO ALLOW THE OPERATING SYSTEM TO BE BOOTED AND RUN.

PROM AND NOVDRAM

VIRTUAL CONSOLE PROGRAM (VCP) WHICH INCLUDES; USER INTERFACE MENUS, MINIMAL COMMAND LINE INTERPRETER AND MNEMONIC DEBUGGER.

AUTOMATIC PROGRAM LOAD UTILITIES

BOOT ROUTINES, WHICH ARE REQUIRED DRIVERS FOR LOADING FROM LAN OR SCSI DEVICES.

POWERUP TESTS, ENOUGH TO VERIFY THAT THE DIAGNOSTIC OPERATING SYSTEM CAN BE LOADED

SYSTEM SIZING AND CONFIGURATION

Table 3-3 Integrated Devices

Mnemonic	Device Type	Parameters		
		cntrl	unit	file#
inen	Integrated Ethernet controller	N/A	N/A	N/A
insec	Integrated SCSI controller	N/A	N/A	N/A
sd	SCSI disk	insec ()	SCSI ID ¹	0
st	SCSI tape	insec ()	SCSI ID ¹	Tape file number

¹ An integer 0 through 6, determined by configuration jumpers.

NOTE: If you have a computer with an integrated SCSI bus, arguments in Table 3-3 apply. If your computer has a primary VME bus, arguments in Table 3-4 apply.

Table 3-4 VME Devices

Mnemonic	Device Type	Parameters		
		cntrl	unit	file#
sd	SCSI disk	SCSI adapter cisc ()	SCSI ID ¹	0
st	SCSI tape	SCSI adapter cisc ()	SCSI ID ¹	Tape file number
cisc	Ciprico SCSI adapter	Adapter number or VME address	0	0
ciend	Ciprico ESDI disk	Controller number or VME address	Unit number ²	0
cimd	Ciprico SMD disk	Controller number or VME address	Unit number ²	0
hken	Interphase Hawk Ethernet	0	0	0

¹ An integer 0 through 6, determined by configuration jumpers.

² An integer 0 through 3, assigned to differentiate devices on the same disk controller.

booting on esdi drive on AV5000

scm > b cied(0,0) root : / dg ux

This section contains some examples of valid boot device specifications for standard devices.

First disk on first integrated SCSI controller	sd(insc(0),0)
Second disk on first integrated SCSI controller	sd(insc(0),1)
Third disk on first integrated SCSI controller	sd(insc(0),2)
Fourth disk on first integrated SCSI controller	sd(insc(0),3)

First tape drive on first integrated SCSI controller	st(insc(0),4)
Second tape drive on first integrated SCSI controller	st(insc(0),5)
Third tape drive on first integrated SCSI controller	st(insc(0),6)

First server responding on integrated Ethernet LAN	inen()
--	---------

First disk on first Ciprico ESDI or SMD controller	cied(0,0) or cimd(0,0)
Second disk on first Ciprico ESDI or SMD controller	cied(0,1) or cimd(0,1)
Third disk on first ESDI or SMD Ciprico controller	cied(0,2) or cimd(0,2)
Fourth disk on first ESDI or SMD Ciprico controller	cied(0,3) or cimd(0,3)

First disk on third Ciprico ESDI or SMD controller	cied(3,0) or cimd(3,0)
Second disk on third Ciprico ESDI or SMD controller	cied(3,1) or cimd(3,1)
Third disk on third Ciprico ESDI or SMD controller	cied(3,2) or cimd(3,2)
Fourth disk on third Ciprico ESDI or SMD controller	cied(3,3) or cimd(3,3)

First SCSI disk on second Ciprico SCSI adapter	sd(cisc(1),0)
Second SCSI disk on second Ciprico SCSI adapter	sd(cisc(1),1)
Third SCSI disk on second Ciprico SCSI adapter	sd(cisc(1),2)
Fourth SCSI disk on second Ciprico SCSI adapter	sd(cisc(1),3)

First SCSI tape drive on first Ciprico SCSI adapter	st(cisc(),4)
Second SCSI tape drive on first Ciprico SCSI adapter	st(cisc(),5)
Third SCSI tape drive on first Ciprico SCSI adapter	st(cisc(),6)

First server responding on first VME Ethernet LAN	hken(0)
First server responding on second VME Ethernet LAN	hken(1)

LAB - 18

TCP/IP LAB

This lab will get you started by having you install TCP/IP. You will then determine whether you have successfully installed the network by trying to communicate to another system and you will finish this lab by using several troubleshooting commands.

Pair up with another student and obtain a TCP/IP tape from your instructor. You have been given a Unix starter system, bring it up to run level 1. before installing the TCP/IP product

- make necessary entries for every student in the class in your /etc/passwd file,
- make each a home directory and
- make any filesystems you wish on your local pack.

Choose an internet network addressing scheme for your network and hosts, i.e. internet address of 89.0.0.X, where 89 is the network address and X is the number of the your system in lab. (System numbers should be on the top of the machine. If not ask the instructor for your machine number). For a system name use classX (again, X being the number of your machine and class in lower case. We will use "ClassX" for the node name of your system in the System file). Use "Aviion" for the network name.

3. Be sure the DG/UX tape is loaded and run "sysadm loadpackage".
4. Run "sysadm settuppackage" for TCP/IP, and answer the questions from the setup script as they appear, when in doubt take the default answer.
5. Select a host portion of all one's for the broadcast address and select "remsh", the new SVID compatible name, for the remote shell command and rsh for restricted shell). Ask your instructor if in doubt.option
6. Answer the questions for each of the TCP/IP install steps dealing with network setup, ftp, the r commands and sendmail. Do not add any hosts.equiv entries at this time or customize ruleset 0. Use "mailx" as the frontend to sendmail.

TCP/IP Lab (continued)

Run "sysadm newdgux" which can be found from the main menu under "sysmgmt". Select the "system.aviion" system file and "vi" as the the editor.

After the first "Tuneable Configuration Parameters" portion a new portion that begins :

"Prototype fragment of system configuration for:

(Product Name): TCP/IP

(Release): 4.xx "

should be present. If not contact your instructor

be sure that your system file contains loop() and either hken() for a AV5100, AV6100 or inen() for an AV300, AV400. Also check to be sure that entries for "ptc" and "pts" exist in the file. There should be a Devices section that contains ip(), tcp() and udp(). Under the protocols section the following lines should appear:

```
iproto_ip
iproto_tcp
iproto_udp
iproto_icmp
```

the streams section should contain:

```
ether
arp
socsys
netlog
```

exit the file with shifted zz and Rebuild the kernel, install and link it to /dgux. When done shut the system down (shutdown -g0 -y) and then reboot under the new kernel. Bring the system up to run level 3.

From the command line type in "ifconfig interface name" (hken0). What does this show you? Are these values what you set them up to be?

TCP/IP Lab (continued)

3. From the prompt enter "rwho". What does the -a option do?
4. While on the remote host type in "netstat -i" from the command line. Notice the various columns including "Ierrs", "Opkts", "Oerrs" and Collis".
5. Enter "netstat 10"
6. enter "ps -e", find the pid number of netstat and do "kill (pid#)" from the command line. Next enter "netstat -s" and examine the output this generates.
7. Use "netstat -a" to show connections are presently established.
8. Log off the remote system and close the outstanding rlogin session.
9. From the command line type in "arp -a" . What information does this provide?
10. Remove one of the entries from the arp table by entering "arp -d (host)" .
11. Renter this line manually in the arp table by becoming root and entering "arp -i (hken0 or inen0) -s systemname ethernet-address"

TCP/IP Lab (continued)

Try changing several of these values by manually running the "ifconfig" command from the command line.

After you've changed several of them return them to what you had originally set them up to be. Type in "ps -e|pg" what communication processes are running.

From the command line type "ping hostname". What does it do?

On the command line type "pong hostname", what does this produce?

Type "telnet" on the command line. You should now find yourself in Telnet local mode. Type Help and view the help facility available.

Connecting to a Remote Host:

Open a connection to the host "localhost" by typing "open localhost" at the ">telnet" prompt. When the logon banner appears, log on with the same username/password pair that you initially used. Type who and see what terminal you are on. Type "hostid", when the prompt returns type "hostname". What hostid is returned? Type bye and return to the local shell.

Execute the Telnet program again. Open the Internet address 127.0.0.1 but this time type "telnet 127.0.0.1" from the command line. Log on with your same username/password. What hostid and hostname are returned from this internet number?

try to open a connection using the name of another system. Type "hostid" and "hostname" again.

Close the connection by logging off and quit out of telnet. From the command line type in "rlogin (hostname)" to the same host and log in.

At the prompt enter "ruptime", what does this show you? How many users are there on the system?

Run the command again with the -a option, what does this option do? Run the command with the -l option. Run it again with the -t option and finally with the -u option.

NFS LAB

This lab will have you install the NFS package and then verify its installation by mounting resources from another system. You will finish this lab by executing several troubleshooting commands.

Pair up with another student and obtain a DG/UX tape from your instructor. You have been given a Unix starter system, bring it up to run level 1.

Be sure the DG/UX tape is loaded and run "sysadm loadpackage". (or if the NFS package has already been loaded precede to the next step)

Run "sysadm settuppackage" for NFS, and answer the questions from the setup script as they appear, when in doubt take the default answer.

Run "sysadm newdgux" which can be found from the main menu under "sysmgmt". Select the "system.aviion" system file and "vi" as the editor.

After the "Tuneable Configuration Parameters" portion for TCP/IP there should be a new portion that begins :

"Prototype fragment of system configuration for:

(Product Name): NFS
(Release): 4.xx "

If not contact your instructor

be sure that your system file contains plm() and NFS

5. Exit the "vi" session by entering shifted zz. Rebuild the kernel, install and link it to /dgux.

run "sysadm diskmgmt" from the command line. Examine the amount of space on your disk by choosing "physical disk management" and then selecting item 3. "Display a Physical Disk's Layout".

If sufficient space exists, create another logical disk 10,000 blocks in size name after your system. Use the "sysadm Logical Disk Management Menu" and select option 1 "Create a Logical Disk".

After creating this logical disk make a file system on it by entering the "sysadm File Management Menu" and selecting option 1. "Make a File System". Do not specify any flags or options.

Return to the main "sysadm" menu and select "File System management", select 1. "addfsys". In response to the questions, make it writeable, dump cycle [d], Export "yes".

You will be asked for the directory mount point, make it the name of your system in the root directory. i.e. /systemname. You will be told it doesn't exist and be asked if you want to create it. Answer yes.

Use "sysadm addfsys" to add the name of the other teams filesystem mount it on a directory called "remote". Follow the prompts but this time instead of answering yes to "Is this a local file system?" , answer no.

Give it the name of the remote system and the name of the remote mount directory. Remember, it should be /systemname. Answer "no" to the question "hard mount?".

The system will advise you if the directory "/remote" does not exist, answer "yes" to have it created.

The system will next try to contact the remote system but will fail since we are not at run level 3.

When done shut the system down (shutdown -g0 -y) and then reboot under the new kernel. Bring the system up to run level 3. and verify that the remote filesystem is mounted by typing in "mount". There should be a line indicating that the remote system is mounted. Which line is it?

Cat the /etc/fstab file and find the line that indicates that a remote mount should be performed.

"cd" into the "/remote" directory and cat a file. Create one of your own.

3. At the shell prompt, enter "ps -e|pg" check that nfsd, biod and the portmap daemon are present.
4. Enter "showmount -d "yourhostname". What does it show?
5. Execute "showmount -e yourhostname" and notice the different info this produces. What does it show?
6. Finally try "showmount -a"
7. "cat" /etc/exports. What is in this file?
8. "cat" /etc/xtab. what is in this file? What is the difference between the two.
9. Enter "exportfs" at the prompt. What does this show you? What command is it similar to?
10. Edit the /etc/xtab and remove all entries. Then run the exportfs command with the -va option. What did this do?
11. Enter "rpcinfo -p (name of your nfs server system)" at the shell prompt. Notice the print out it gives. What are these items?
12. Ask the root user on the NFS remote server system to kill all nfsd processes on his machine. Then enter "rpcinfo -u (server name) (program number for nfsd). What is the response?

