

John Re...

HP Computer Systems  
Training Course

# Moving From MPE V/E to MPE XL: System Manager

Student Workbook



FOR INTERNAL USE ONLY



INFORMATION TECHNOLOGY GROUP  
19483 Pruneridge Ave., Cupertino, CA 95014

Printed in U.S.A., August 1987  
Copyright © Hewlett-Packard Company



Page 1  
 Page 2  
 Page 3  
 Test Page 1  
 Page 4  
 Page 5  
 Page 6  
 Page 7  
 Page 8  
 Page 9  
 Page 10  
 Page 11  
 Page 12  
 Page 13  
 Page 14  
 Page 15  
 Page 16  
 Page 17  
 Page 18  
 Page 19  
 Page 20  
 Page 21  
 Page 22  
 Page 23  
 Page 24  
 Page 25  
 Page 26  
 Page 27  
 Page 28  
 Page 29  
 Page 30  
 Page 31  
 Page 32  
 Page 33  
 Page 34  
 Page 35  
 Page 36  
 Page 37  
 Page 38  
 Page 39  
 Page 40  
 Page 41  
 Page 42  
 Page 43  
 Page 44  
 Page 45  
 Page 46  
 Page 47  
 Page 48  
 Page 49  
 Page 50  
 Page 51  
 Page 52  
 Page 53  
 Page 54  
 Page 55  
 Page 56  
 Page 57  
 Page 58  
 Page 59  
 Page 60  
 Page 61  
 Page 62  
 Page 63  
 Page 64  
 Page 65  
 Page 66  
 Page 67  
 Page 68  
 Page 69  
 Page 70  
 Page 71  
 Page 72  
 Page 73  
 Page 74  
 Page 75  
 Page 76  
 Page 77  
 Page 78  
 Page 79  
 Page 80  
 Page 81  
 Page 82  
 Page 83  
 Page 84  
 Page 85  
 Page 86  
 Page 87  
 Page 88  
 Page 89  
 Page 90  
 Page 91  
 Page 92  
 Page 93  
 Page 94  
 Page 95  
 Page 96  
 Page 97  
 Page 98  
 Page 99  
 Page 100

# Table of Contents

Course Description and Objectives .....	Page 1
Curriculum Outline .....	Page 2
Reference Documentation List .....	Page 4
Preview Confidence Test .....	Confidence Test Page 1
Module 1 Introduction to the MPE XL 900 Series HP 3000 .....	Page 1-1
Module 2 Introduction to the MPE XL Command Interpreter .....	Page 2-1
Module 3 Programmig the Command Interpreter .....	Page 3-1
Module 4 Compatibility Mode .....	Page 4-1
Module 5 MPE XL Program Development .....	Page 5-1
Module 6 Managing Libraries .....	Page 6-1
Module 7 Native Compilers .....	Page 7-1
Module 8 The Optimizer .....	Page 8-1
Module 9 New and Changed Intrinsics .....	Page 9-1
Module 10 Converting Data Files .....	Page 10-1
Module 11 Switch Subsystem .....	Page 11-1
Module 12 Architecture Overview .....	Page 12-1
Module 13 .. Procedure Calling Convention .....	Page 13-1
Module 14 .. DEBUG .....	Page 14-1
Module 15 .. TurboIMAGE/V to TurboIMAGE/XL Migration .....	Page 15-1
Module 16 .. HP SQL/V to HP SQL/XL Migration .....	Page 16-1
Appendices	
Appendix A Command Interpreter Reference Tables .....	Page A-1
Appendix B Article: "MPE XL Command Interpreter" .....	Page B-1
Appendix C Document "TurboIMAGE/V vs. TurboIMAGE/XL: An Overview" .....	Page C-1
Appendix D Lab Solutions .....	Page D-1

**HP Computer Museum**  
**[www.hpmuseum.net](http://www.hpmuseum.net)**

**For research and education purposes only.**

**Curriculum**

**900 Series HP 3000 Customer Training**

MPE V/E  
Product  
Usage

HP 3000 Guide  
For the New User

Intro. to Computers  
And the HP 3000

Intro. to Computers  
For System Operators

HP 3000:  
A Guided Tour

System  
Operator

System  
Management

Programmer's  
Intro. to the HP 3000

MPE V/E  
Application  
Design and  
Development

COBOL II/3000

FORTRAN77

HP PASCAL

Other HP 3000  
Languages

Non-HP

MPE XL  
Product  
Usage

Fast Lane 3000:  
System Planning

Fast Lane 3000:  
System Planning

Moving from MPE V/E  
to MPE XL: System  
Manager

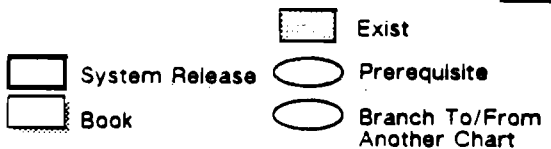
Moving from MPE V/E to  
MPE XL: Programmer

Moving from MPE V/E to  
MPE XL: System Man-  
ager

Moving from MPE V/E to  
MPE XL: Programmer

Advanced  
Pascal (XL)

To DBMS 1A  
Curriculum





## Reference Documentation

The following manuals will be useful to you for reference:

- 32650-90003 *MPE XL Commands Reference Manual*
- 32022-90001 *Asynchronous Serial Communications System Administration Reference Manual*
- 36216-90005 *HP SQL Database Administration Guide*
- 30367-90003 *System Administrator Skills Migration Guide*
- 32650-90034 *MPE XL System Startup/Shutdown Reference Guide*
- 32650-90042 *System Configuration User's Guide*
- 32650-90038 *Storing and Restoring Files Reference Manual*
- 32650-90045 *Volume Management Reference Manual*
- 30367-90007 *Migration Process Guide*
- 32650-90035 *Managing Jobs and Sessions Reference Manual*
- 32650-90018 *Getting System Information Reference Manual*
- 32022-90004 *Asynchronous Serial Communications Troubleshooting Manual*
- 09740-64001 *Precision Architecture: HP3000/930 and HP9000/840 Hardware Support Manual*
- 30190-90008 *HP3000/950 and HP9000/850S Installation and Configuration Guide*
- 09740-64006 *Online Diagnostics Subsystem Manual*
- 09740-64007 *Online Diagnostics Subsystem Utilities Manual*

900 Series HP 3000 Customer Database Training

MPE XL  
Product Usage

DBMS 1A  
From  
Operating Systems

TurboIMAGE  
Customer  
Course

TurboIMAGE/XL  
Manual

Allbase XL  
HP SQL  
Condensed  
Customer  
Course

Allbase XL  
HP SQL  
Database  
Administration  
Guide  
(Appendix "X"  
SQLGEN)

MPE XL  
Application  
Design and  
Development

Advanced  
TurboIMAGE  
Customer  
Course





## Preview Confidence Test

Degree of Confidence:

12. Use the following new CI commands:
- |            |      |     |      |      |     |
|------------|------|-----|------|------|-----|
| DELETEVAR? | [EC] | [C] | [SC] | [NS] | [U] |
| SETVAR?    | [EC] | [C] | [SC] | [NS] | [U] |
| SHOWVAR?   | [EC] | [C] | [SC] | [NS] | [U] |
| INPUT?     | [EC] | [C] | [SC] | [NS] | [U] |
| ECHO?      | [EC] | [C] | [SC] | [NS] | [U] |
| DO?        | [EC] | [C] | [SC] | [NS] | [U] |
| CHGROUP?   | [EC] | [C] | [SC] | [NS] | [U] |
| COPY?      | [EC] | [C] | [SC] | [NS] | [U] |
| LISTREDO?  | [EC] | [C] | [SC] | [NS] | [U] |
| REDO?      | [EC] | [C] | [SC] | [NS] | [U] |
13. Explain the function of the following new/enhanced CI commands:
- |             |      |     |      |      |     |
|-------------|------|-----|------|------|-----|
| CALC?       | [EC] | [C] | [SC] | [NS] | [U] |
| PRINT?      | [EC] | [C] | [SC] | [NS] | [U] |
| SETCATALOG? | [EC] | [C] | [SC] | [NS] | [U] |
| XEQ?        | [EC] | [C] | [SC] | [NS] | [U] |
- SYSTEM STARTUP, STOP, UPDATE and DUMP**
- |  |      |     |      |      |     |
|--|------|-----|------|------|-----|
| 14. Describe a system startup flow?                                  | [EC] | [C] | [SC] | [NS] | [U] |
| 15. Use the ISL Utilities?   | [EC] | [C] | [SC] | [NS] | [U] |
| 16. Start and interact with the system until it is fully brought up? | [EC] | [C] | [SC] | [NS] | [U] |
| 17. Issue ISL commands?  | [EC] | [C] | [SC] | [NS] | [U] |
| 18. List the steps involved in taking a DUMP?                        | [EC] | [C] | [SC] | [NS] | [U] |
| 19. Issue Access Port commands?                                      | [EC] | [C] | [SC] | [NS] | [U] |
| 20. Describe the Access Port and its use?                            | [EC] | [C] | [SC] | [NS] | [U] |

# Review Confidence Test

YOUR NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

Please respond to the following statements by circling the answer which best reflects your confidence level.

EC	C	SC	NS	U
Extremely Confident	Confident	Somewhat Confident	Not Sure	Unable

Are you now able to:

## HARDWARE OVERVIEW

Degree of Confidence:

1. Locate and use system switches, displays and the console in order to startup, shutdown and operate Series 930 and/or Series 950 systems? [EC] [C] [SC] [NS] [U]
2. Determine what peripheral interfaces and memory cards are installed in Series 930 and/or Series 950 systems? [EC] [C] [SC] [NS] [U]
3. Explain some of the differences between Series 930 and Series 950 systems? [EC] [C] [SC] [NS] [U]
4. Perform various tasks under the direction of a CE or SE on a Series 930 and/or Series 950 system? [EC] [C] [SC] [NS] [U]

## MPE XL COMMAND INTERPRETER

5. Explain what Command Files are? [EC] [C] [SC] [NS] [U]
6. Use "Implied :RUN"? [EC] [C] [SC] [NS] [U]
7. Explain the system default command search path? [EC] [C] [SC] [NS] [U]
8. Explain and use the command lines history stack? [EC] [C] [SC] [NS] [U]
9. Explain the syntax changes for the new MPE XL commands? [EC] [C] [SC] [NS] [U]
10. Use dereferencing and recursive dereferencing of variables? [EC] [C] [SC] [NS] [U]
11. Explain the RECURSION/NORECURSION option in UDCs? [EC] [C] [SC] [NS] [U]

## Preview Confidence Test

Degree of Confidence:

- |  |      |     |      |      |     |
|--|------|-----|------|------|-----|
| 37. Use the enhanced backup features on MPE XL?                | [EC] | [C] | [SC] | [NS] | [U] |
| 38. Perform functions of RELOAD with INSTALL and RESTORE?      | [EC] | [C] | [SC] | [NS] | [U] |
| 39. Use the new functions of STORE/RESTORE?                    | [EC] | [C] | [SC] | [NS] | [U] |
| 40. Transfer files from MPE XL to MPE V/E using STORE/RESTORE? | [EC] | [C] | [SC] | [NS] | [U] |
| 41. Recover from a file system disaster?                       | [EC] | [C] | [SC] | [NS] | [U] |

### VOLUME MANAGEMENT

- |  |      |     |      |      |     |
|--|------|-----|------|------|-----|
| 42. Use MPE V/E Private Volumes?                                       | [EC] | [C] | [SC] | [NS] | [U] |
| 43. Describe MPE XL volume management structure?                       | [EC] | [C] | [SC] | [NS] | [U] |
| 44. Create and use MPE XL volume sets?                                 | [EC] | [C] | [SC] | [NS] | [U] |
| 45. Create an accounting structure on a non-system volume set?         | [EC] | [C] | [SC] | [NS] | [U] |
| 46. Mount and dismount volume sets?                                    | [EC] | [C] | [SC] | [NS] | [U] |
| 47. Describe how to restrict a file to a volume set, class, or volume? | [EC] | [C] | [SC] | [NS] | [U] |

### TROUBLESHOOTING

- |   |      |     |      |      |     |
|---|------|-----|------|------|-----|
| 48. Invoke and use the DUI?   | [EC] | [C] | [SC] | [NS] | [U] |
| 49. Use simple DUI commands such as HELP, LIST, SUSPEND?  | [EC] | [C] | [SC] | [NS] | [U] |
| 50. Find product specific information concerning diagnostics and utilities available in the Online Diagnostics Subsystem? | [EC] | [C] | [SC] | [NS] | [U] |
| 51. Obtain a map of the CPU and I/O system using the Online Diagnostic Subsystem?   | [EC] | [C] | [SC] | [NS] | [U] |
| 52. Read the contents of system and memory log files?   | [EC] | [C] | [SC] | [NS] | [U] |

### MIGRATION OF THE MPE V/E OPERATING ENVIRONMENT

- |  |      |     |      |      |     |
|--|------|-----|------|------|-----|
| 53. Make an optimal SYSDUMP tape for DIRMIG? | [EC] | [C] | [SC] | [NS] | [U] |
|--|------|-----|------|------|-----|

## Preview Confidence Test

Degree of Confidence:

### SYSTEM CONFIGURATION

- |  |      |     |      |      |     |
|--|------|-----|------|------|-----|
| 21. Describe the major differences between SYSDUMP and SYSGEN? | [EC] | [C] | [SC] | [NS] | [U] |
| 22. Understand the MPE XL system generation process?           | [EC] | [C] | [SC] | [NS] | [U] |
| 23. Identify the major functions of SYSGEN?                    | [EC] | [C] | [SC] | [NS] | [U] |
| 24. Understand the relationship between SYSGEN and NMMGR?      | [EC] | [C] | [SC] | [NS] | [U] |
| 25. Configure a MPE XL system using SYSGEN?                    | [EC] | [C] | [SC] | [NS] | [U] |

### MPE XL DISTRIBUTED TERMINAL SUBSYSTEM (DTS)

- |   |      |     |      |      |     |
|---|------|-----|------|------|-----|
| 26. Describe the 3 NMMGR 'branches' for DTS?                        | [EC] | [C] | [SC] | [NS] | [U] |
| 27. Describe the major activities in configuring DTS with NMMGR?    | [EC] | [C] | [SC] | [NS] | [U] |
| 28. Describe the usage of the 'COMMAND' field on the NMMGR screens? | [EC] | [C] | [SC] | [NS] | [U] |
| 29. Locate the Station address for DTC?                             | [EC] | [C] | [SC] | [NS] | [U] |
| 30. Configure DTS with NMMGR?                                       | [EC] | [C] | [SC] | [NS] | [U] |
| 31. Describe the concept of a 'nailed' device?                      | [EC] | [C] | [SC] | [NS] | [U] |
| 32. Describe the purpose of a device profile?                       | [EC] | [C] | [SC] | [NS] | [U] |
| 33. Explain the environment that TERMDISM runs in?                  | [EC] | [C] | [SC] | [NS] | [U] |
| 34. Explain the purpose of each TERMDISM command?                   | [EC] | [C] | [SC] | [NS] | [U] |
| 35. Use the following TERMDISM commands:                            | [EC] | [C] | [SC] | [NS] | [U] |
| DTC?  | [EC] | [C] | [SC] | [NS] | [U] |
| DIAG?   | [EC] | [C] | [SC] | [NS] | [U] |
| RESET?  | [EC] | [C] | [SC] | [NS] | [U] |
| DUMP?   | [EC] | [C] | [SC] | [NS] | [U] |
| STATUS?   | [EC] | [C] | [SC] | [NS] | [U] |

### RECOVERY, BACKUP and DATA EXCHANGE

- |  |      |     |      |      |     |
|--|------|-----|------|------|-----|
| 36. Do partial and full backups on MPE XL? | [EC] | [C] | [SC] | [NS] | [U] |
|--|------|-----|------|------|-----|



## Preview Confidence Test

Degree of Confidence:

54. Use DIRMIG to migrate:

RINs?

[EC] [C] [SC] [NS] [U]

User logging ID's?

[EC] [C] [SC] [NS] [U]

Accounts?

[EC] [C] [SC] [NS] [U]

Private Volumes?

[EC] [C] [SC] [NS] [U]

UDC environments?

[EC] [C] [SC] [NS] [U]

### TURBOIMAGE/V TO TURBOIMAGE/XL MIGRATION

55. List the steps for transporting TurboIMAGE databases between MPE V/E and MPE XL?

[EC] [C] [SC] [NS] [U]

56. Contrast the following modes of operation between TurboIMAGE/V and TurboIMAGE/XL:

[EC] [C] [SC] [NS] [U]

Autodefer enabled?

[EC] [C] [SC] [NS] [U]

ILR enabled?

[EC] [C] [SC] [NS] [U]

User Logging enabled?

[EC] [C] [SC] [NS] [U]

"Default" mode?

[EC] [C] [SC] [NS] [U]

57. List the names of permanent files created by TurboIMAGE/XL for run-time control blocks?

[EC] [C] [SC] [NS] [U]

### HP SQL/V TO HP SQL/XL

58. List the steps in migrating from HP SQL/V to HP SQL/XL?

[EC] [C] [SC] [NS] [U]

59. Describe product differences between HP SQL/V and SQL/XL?

[EC] [C] [SC] [NS] [U]

**Series 930 Hardware**

**Series 930 Hardware**

**Specifications**

**Power:** 168–280 Volts AC, 47–67 Hz, Single Phase

**Co-Processors:** Floating Point Processor (Optional)

**Memory:** 96 Megabytes Maximum

**Channel Adapters:** 3 Channel Adapters (CA) Maximum

**Minimum MPE-XL**

**Configuration:**

32 Megabytes Memory

2 Channel Adapters

2 HP-IB Channels

Console Attachment Board (6 Port MUX Access Port)

1 LAN Channel

1 Distributed Terminal Controller (DTC)

1 Disc Drive

1 Tape Drive

Console

Support Modem

Terminals

TG200076-002

© 1987 Hewlett-Packard Company

**Notes**

Power: Nominal 230V $\pm$ 15 but has a range of 168–280 volts.

**Goal and Objectives**

**Goal:** To familiarize the students with the MPE XL hardware.

**Key Points:**

- After completing this module, you will be able to:
- Discuss the basic parts of the 930 and the 950.
- Point out the different boards of the CPU, the rest of the SPU, and compare the 930 to the 950.
- Discuss the I/O Tree Structure.
- Discuss the elementary components of a typical LAN.

**Notes**

- This module complements the following manuals:
  - Precision Architecture: HP 3000/930 and HP 9000/840 Hardware Support Manual
  - HP 3000/950 and HP 9000/850S Installation and Configuration Guide.

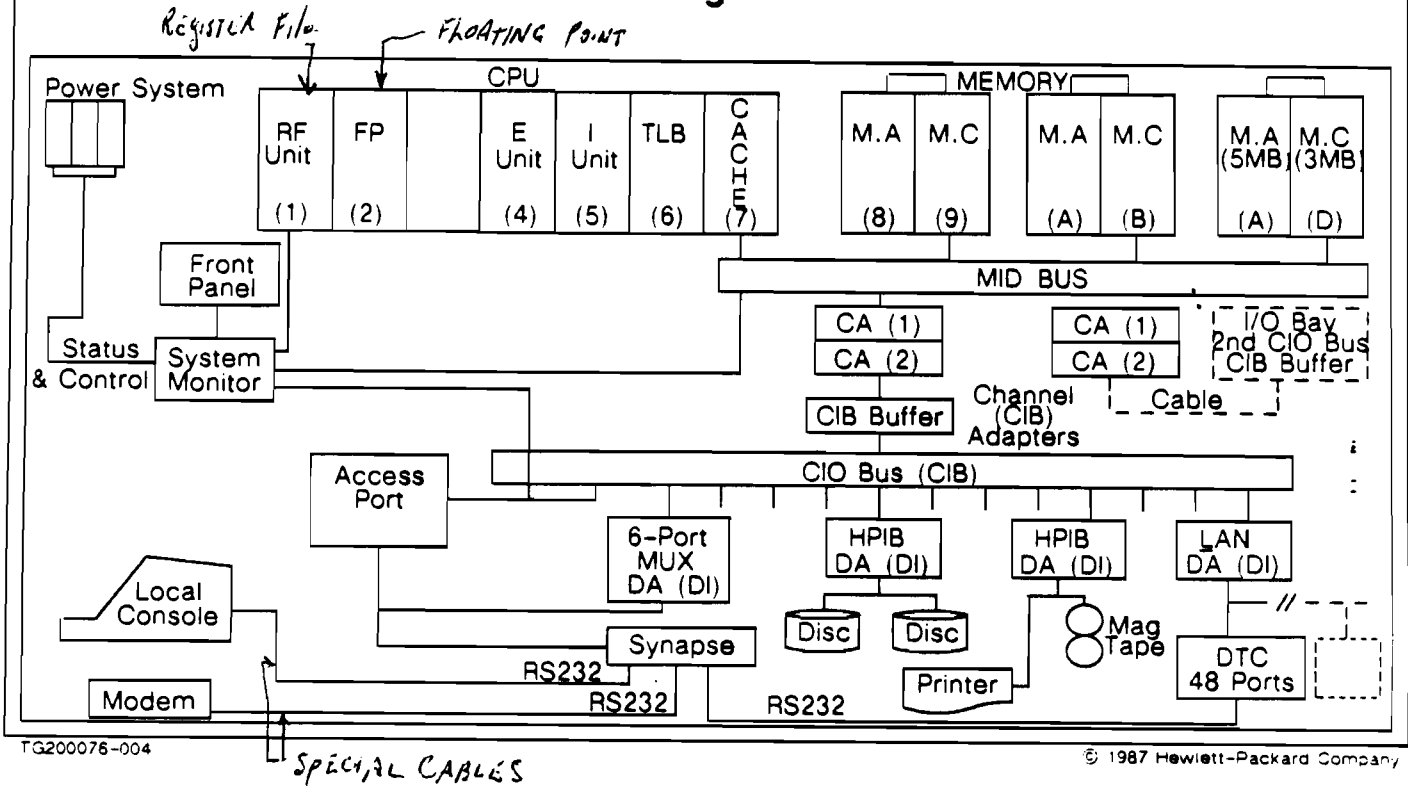


# Module 1 Hardware Overview

## Series 930 Hardware

### Architectural Overview

### Series 930 SPU Functional Block Diagram



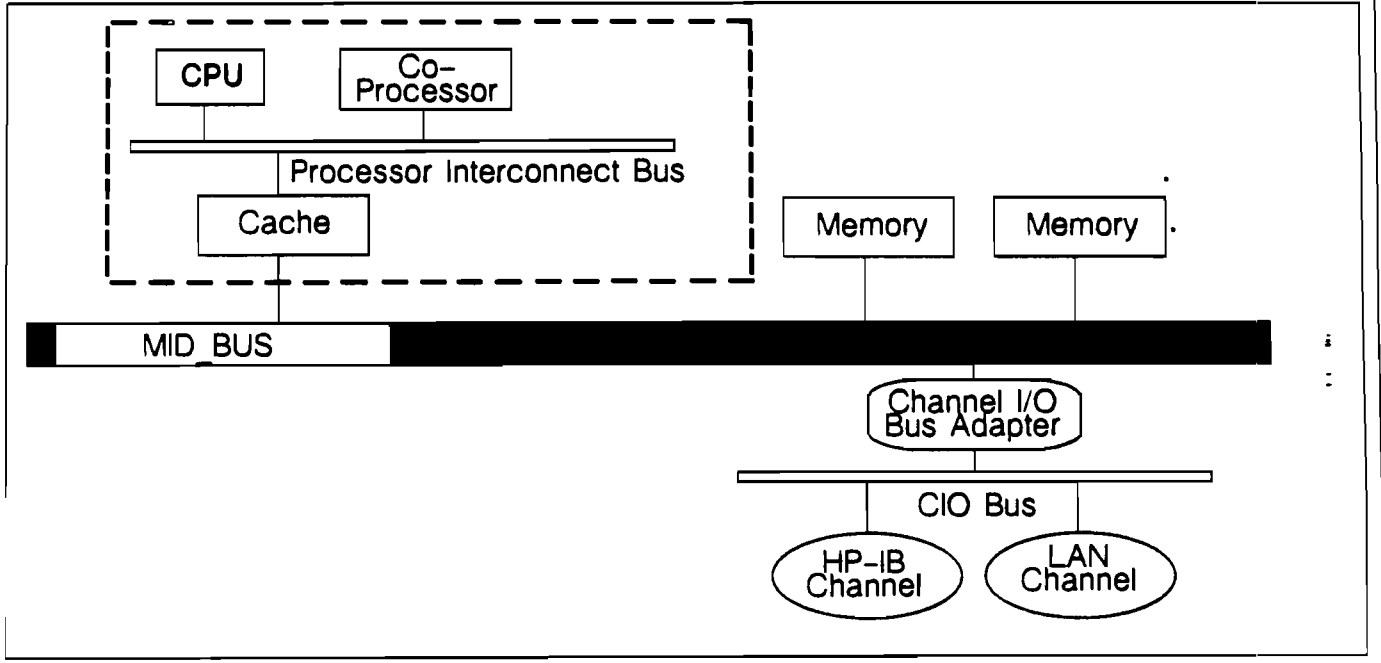
### Notes

- Memory: 3/5 or 12/20 Mbytes Boards. In Sets/PAIR 32 Mb min. 32, 40, 64 ... 96 MAX
- 3 CIO Bus MAX - 2 STANDARD
- 1 LAN for DTC ; 1 LAN for 930 to 930
- DISCS : 7937H, 7933H, 7935H ONLY NO CACHE ON DISCS - TAKE BOARD OUT
- 6-PORT MUX - NOT SUPPORTED - COMES WITH SYSTEM.

**Series 930 Hardware**

**HP 3000 Series 900 Hardware Architecture**

**Series 930 Basic Blocks**



TG200076-003

© 1987 Hewlett-Packard Company

**Notes**

**Series 930 Hardware**

**Series 930 Physical Layout**

**Front View**

Front Cabinet - CPU and Power

System Monitor	Power Supply #1	Register File (RF)	Co-Processor		Execution Unit (EU)	Instruction Unit (IU)	Translation Look-aside Buffer	Cache (CA)	Power Supply #2	Power Supply #3
		RF 1	RF 2	3	4	5	6	7		

CPU

TG200075-006

© 1987 Hewlett-Packard Company

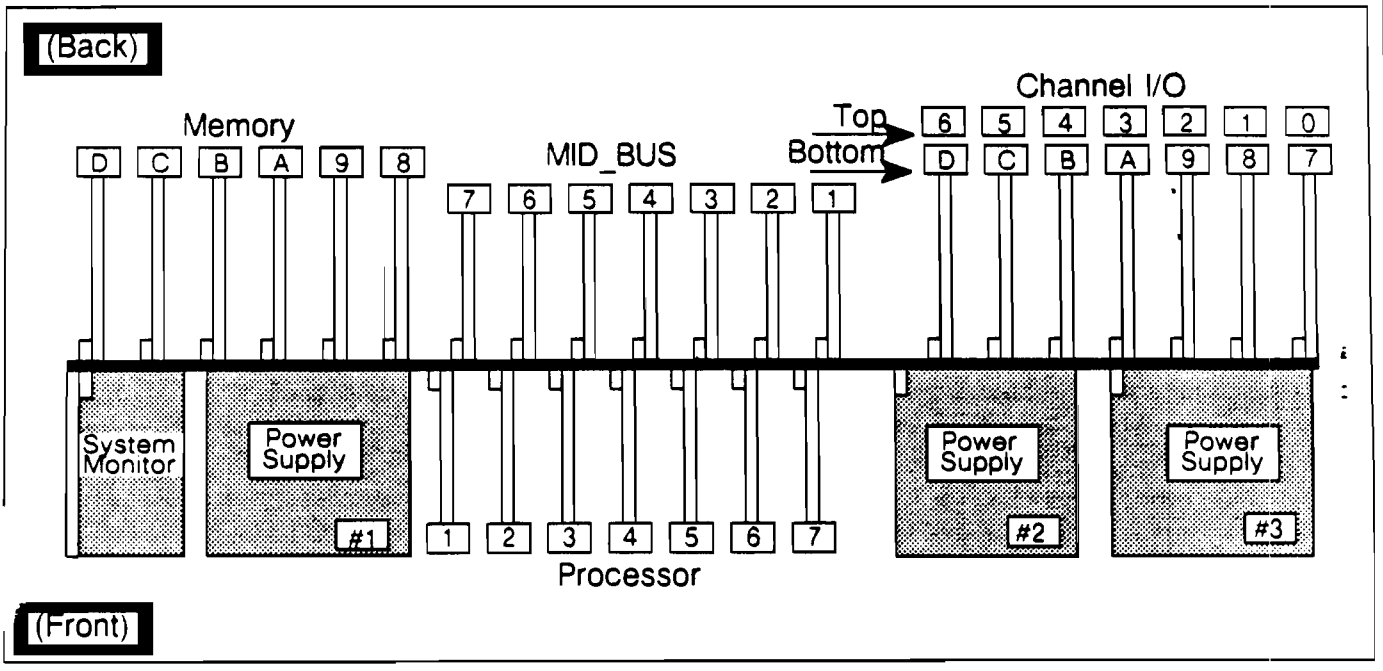
**Notes**

3. for Special Co-Processors - Remote Debugger

**Series 930 Hardware**

**Physical Layout of the Series 930 Processor**

**Top View**



TG200076-005

© 1987 Hewlett-Packard Company

**Notes**

Memory cards start at slot D and go right to left.

Memory Controllers go in slots 9, B, and D.

Memory Arrays go in slots 8, A, and C.

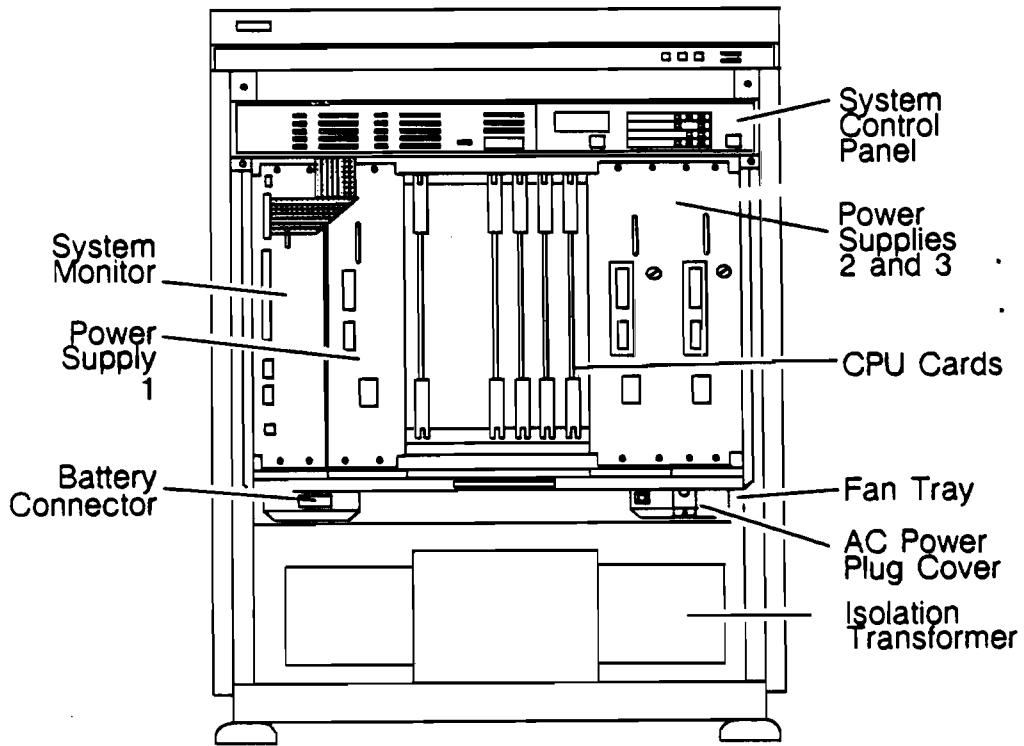
Channel Adapter 2 board sets start at slots 1 and 2 and go left to right.

*2nd Card used as CH1 CHANNEL ADAPTER # - 2nd = highest #*



**Series 930 Hardware**

**Front View of SPU Cabinet (door removed)**



TS200076-007

© 1987 Hewlett-Packard Company

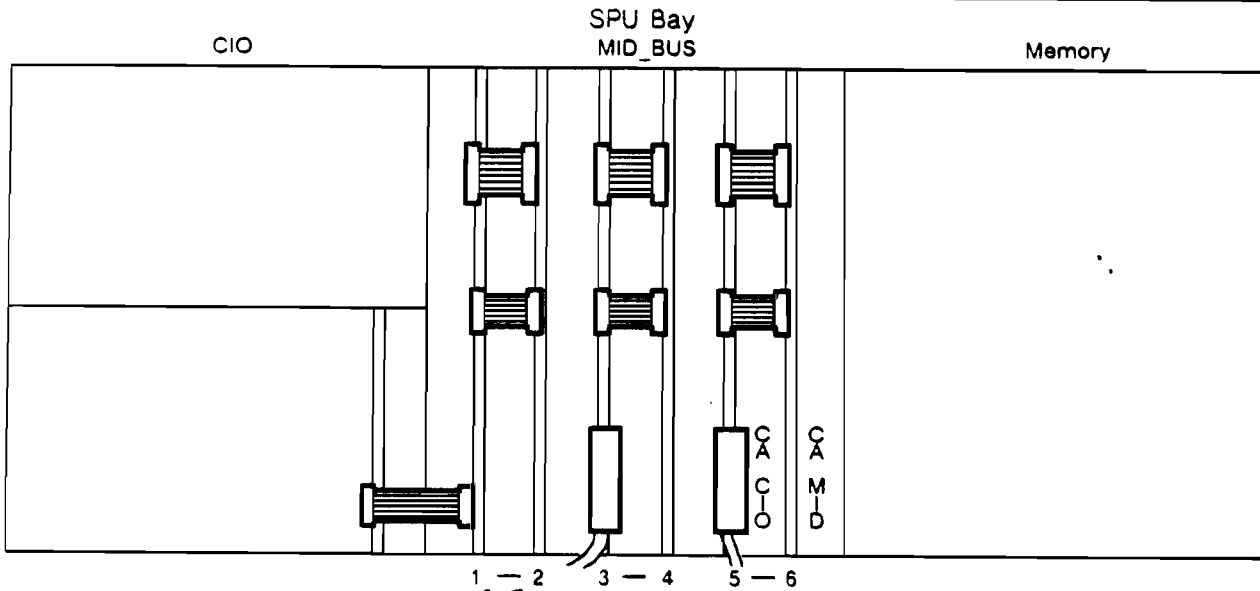
**Notes**

# Module 1 Hardware Overview

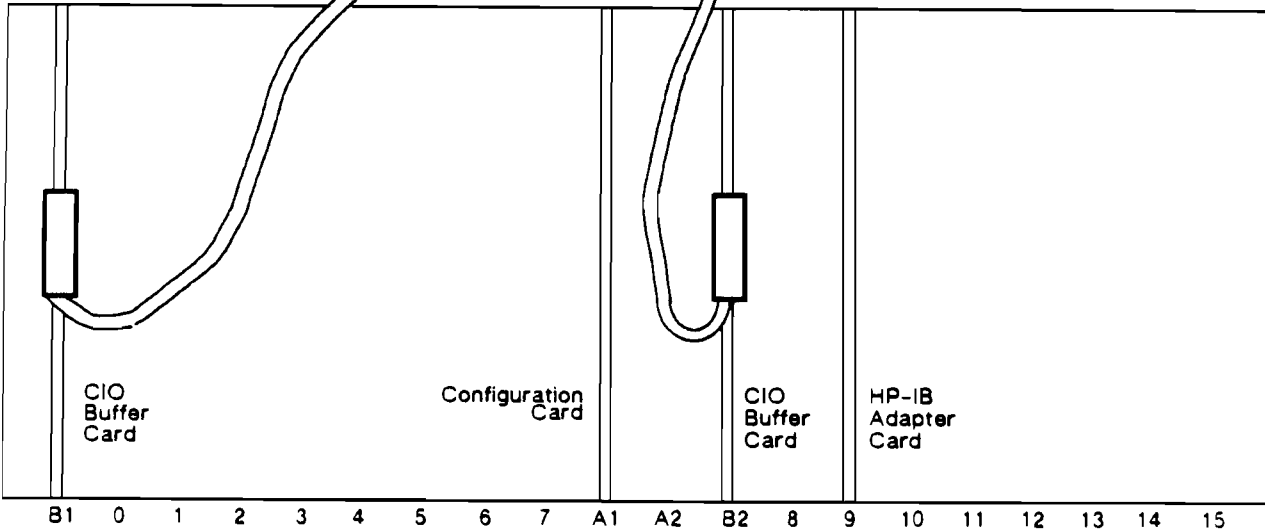
Series 930 Hardware

## SPU and Expansion Bays

*REAR VIEW*



*REAR VIEW*



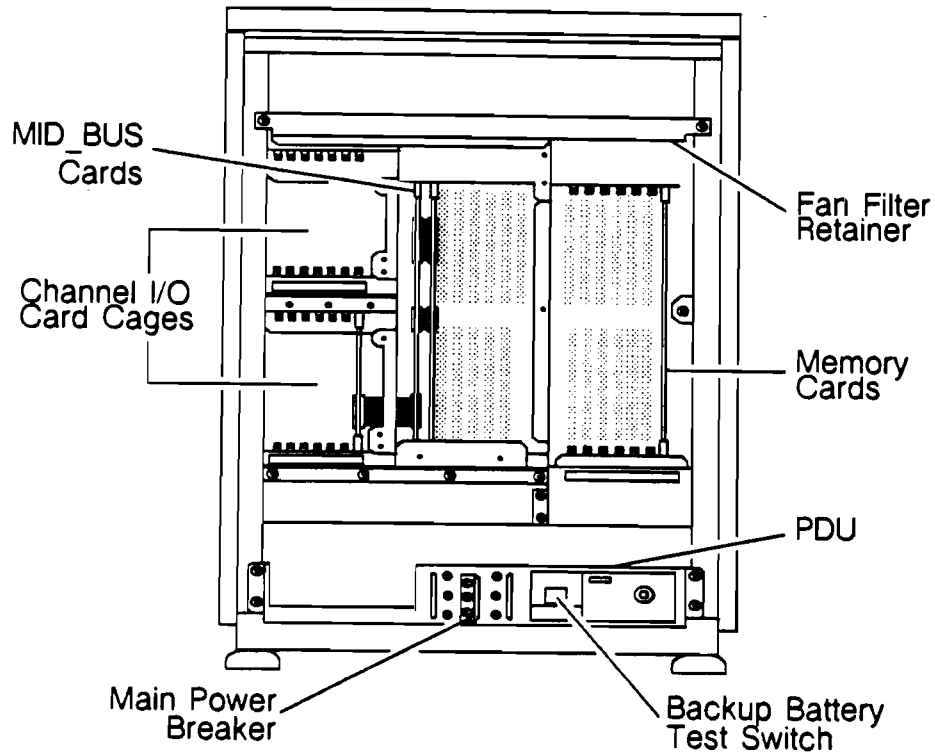
LG220011\_001

© 1987 Hewlett-Packard Company

Notes

**Series 930 Hardware**

**Rear View of SPU Cabinet (doors removed)**



TG2000:1=009

© 1987 Hewlett-Packard Company

**Notes**

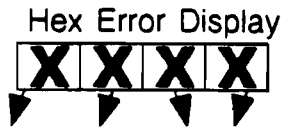
- PDU = Power Distribution Unit.
- Fan filter should be replaced at least once a year.



**Series 930 Hardware**

**Series 930 Hardware**

**Front Panel**



Class Error	Faulty Card's Slot #	Detailed Error Number
-------------	----------------------	-----------------------

Class Error	Indicates Faulty Card on Processor Bus
1	Processor Failure
2	Cache or Translation Lookaside Buffer
3	System Monitor Card
4	Assist Processor
5	Bus Protocol Error
6	Reserved

Class Error	Indicates Faulty Card on Processor Bus
7	Faulty Memory
8	Faulty I/O Card
9	Console Device Error
A	Boot Device Error
B	Operating System Software
C	Initialization
D	Reserved
E	Operating System or Environmental Warning
F	Run Time Messages

TG200076-012

© 1987 Hewlett-Packard Company

**Notes**

- C402 means the self-test has passed and is waiting to boot the system.
- F0FF means ready to "Log On".

• B007

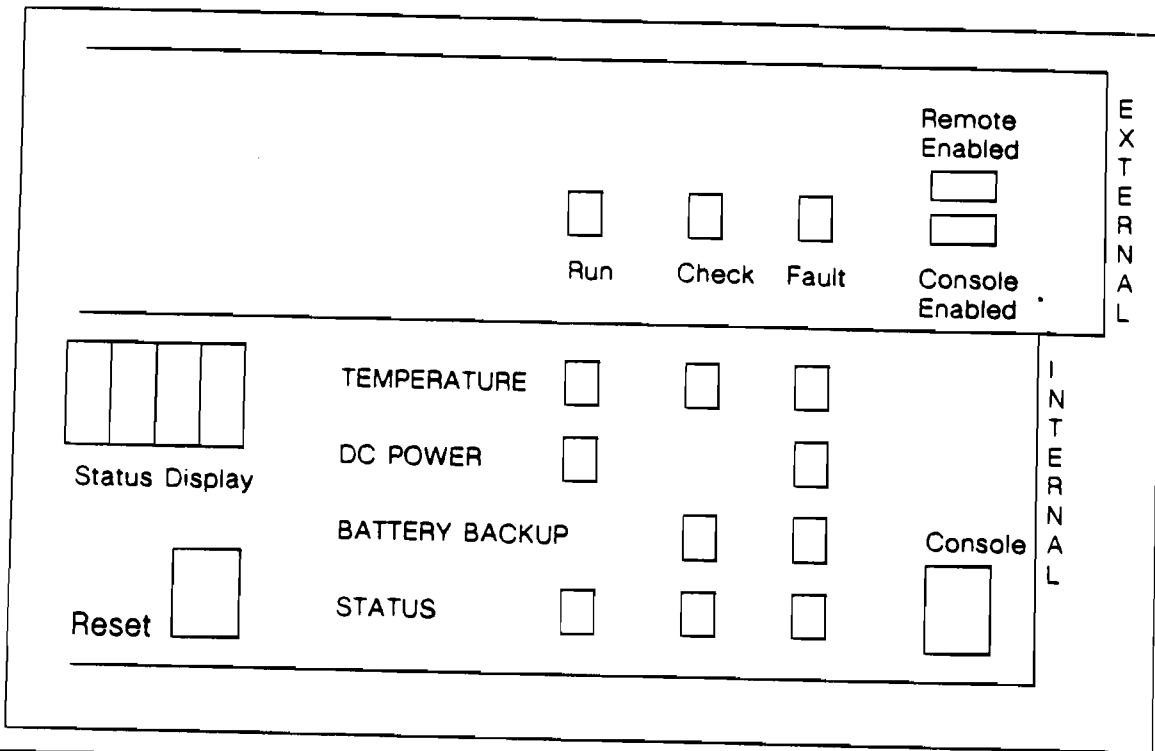
DEAD

# - WRITE down THIS #

A - A004 } System ABORT # + Subsystem causing ABORT  
 - B015 }

**Series 930 Hardware**

**Series 930 Front Panel**



TG200076-011

© 1987 Hewlett-Packard Company

**Notes**

- *RESET : CLEARS MEMORY - Power off/on does more self testing than Reset.*
- *green, orange, Red lights.*
- *Console - controls console enabled & Remote - Push = ON, Push off.*

**Series 930 Hardware**

**Series 930 Hardware: Self-test**

Self-test is invoked through:

- D    ■ Power On
- D    ■ External Reset
- ND  ■ Transfer of Control — *MAINTENANCE MODE - AREA Dumps*
- ND  ■ Return from Power Fail
- High Priority Machine Check

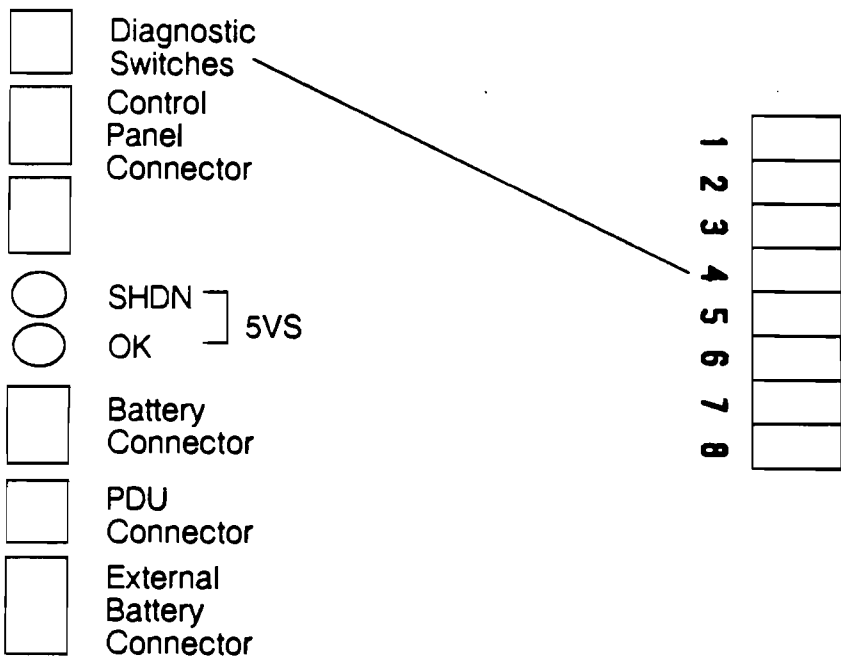
\* D = Destructive  
  ND = Non-destructive

**Notes**

- Destructive means that memory is cleared.

**Series 930 Hardware**

**System Monitor**



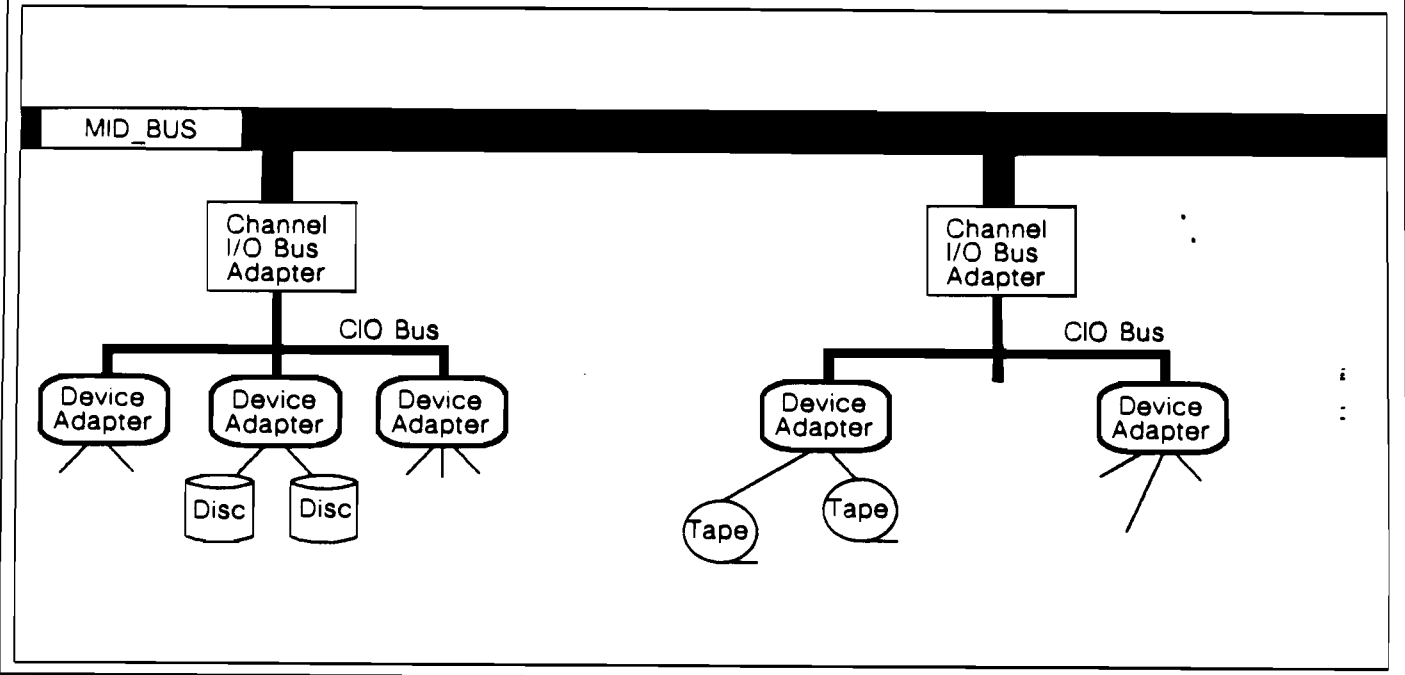
G200076-013

© 1987 Hewlett-Packard Company

**Notes**

**Series 930 Hardware**

**I/O Device**



TG200076-016

© 1987 Hewlett-Packard Company

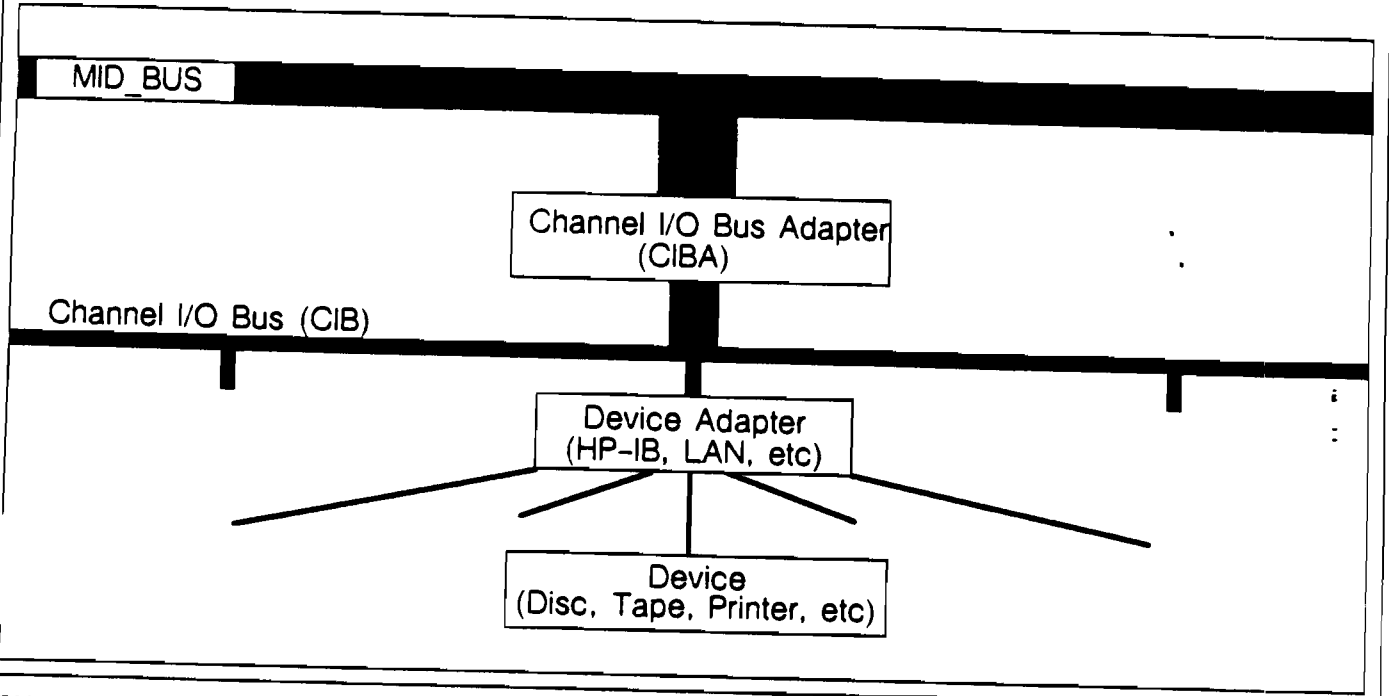
**Notes**

# Module 1 Hardware Overview

## Series 930 Hardware

### I/O Devices

### Tree Structure



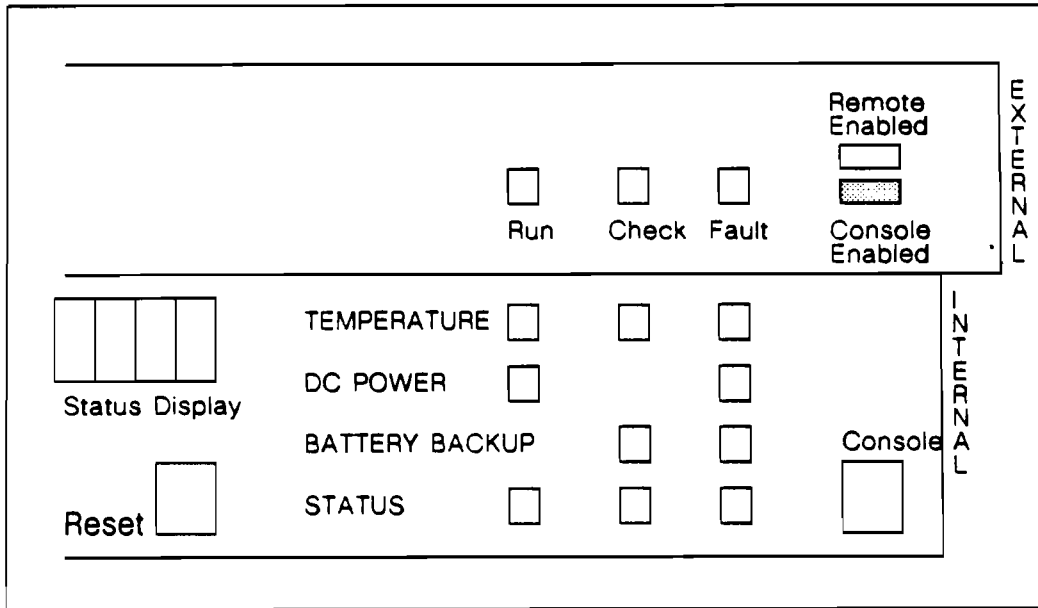
TG200076-015

© 1987 Hewlett-Packard Company

## Notes

**Series 930 Hardware**

**AP System Status Line Activation**



FG200076-018

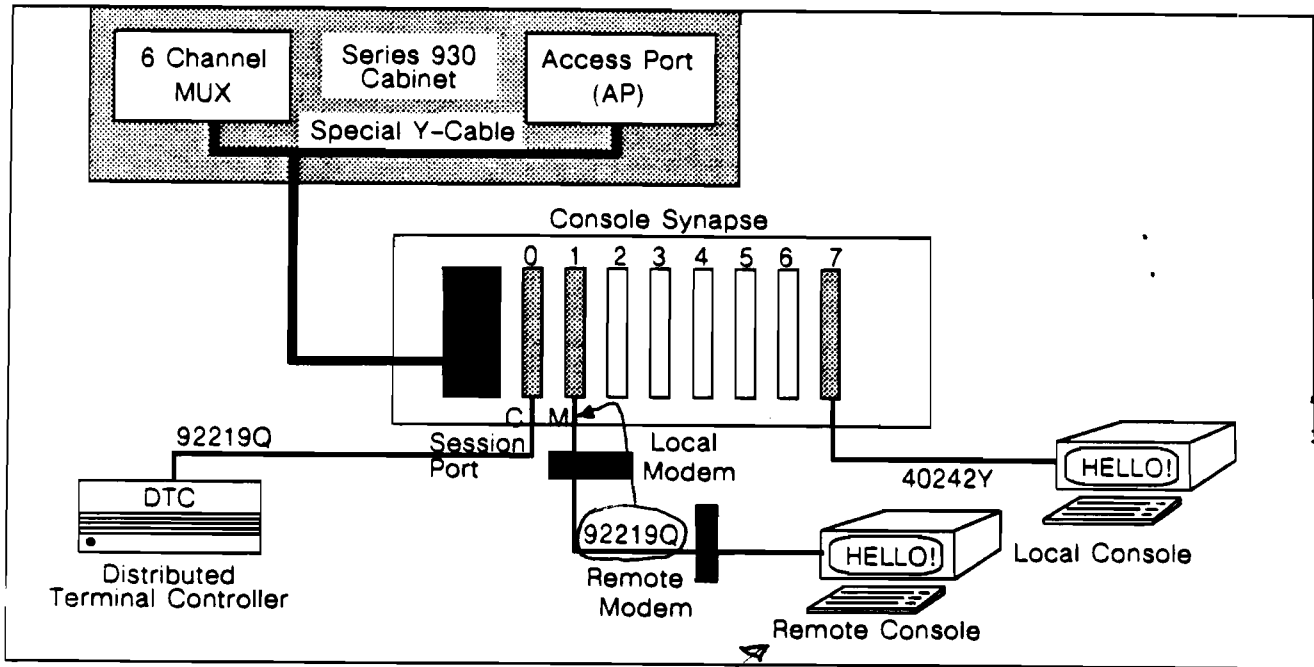
© 1987 Hewlett-Packard Company

**Notes**

- Activated by:
  - Pushing the console button (turns "console enabled" light on)
  - Entering Control-B at the console.
- The "remote enabled" light will be on when the remote access is enabled (or pending).
- Example display (last line on console screen):  
 CODE: FFFF REMOTE: disabled inactive single ACCESS FAULT: 00

**Series 930 Hardware**

**System Console Hardware Connection**



TG200076-017

*COMMAND SE - CONNECT TO DTC* © 1987 Hewlett-Packard Company

**Notes**

The synapse box has 'M' label and 'C' label. Match the 'M' label of the cable to the 'M' label of the synapse box.

C = Computer

M = Modem

*Switch Control of Consoles - hit Break Key*



**Series 930 Hardware**

**Access Port Card Self-test**

AP self-test is invoked by:

1. Powering on the 930.
2. Entering the 'TA' command from AP control mode at the console.
3. Pressing a button on the AP board.

**Notes**

Series 930 Hardware

AP Command Set

CM> he

- CA - Configure remote support modem port - *SPEED*
  - CO - Enter console mode
  - DI - Disconnect remote console
  - DR - Disable remote console
  - DS - Disable system status line *at bottom of console*
  - ER - Enable remote console
  - ES - Enable system status line
  - HE - Display this screen *HEAP*
  - RS - Stop processing, initiate SPU self-test - *RESET*
  - SE - Transfer to session mode - *VIA REMOTE console ONLY*
  - TA - Initiate AP self-test - *NOT DESTRUCTIVE (CLEAR MEMORY)*
  - TC - Transfer of control - *DUMPS*
  - TE - Send message between local/remote consoles
- CM>

CODE: F1FF    REMOTE: enabled active multiple    ACCESS FAULT: 00

Notes

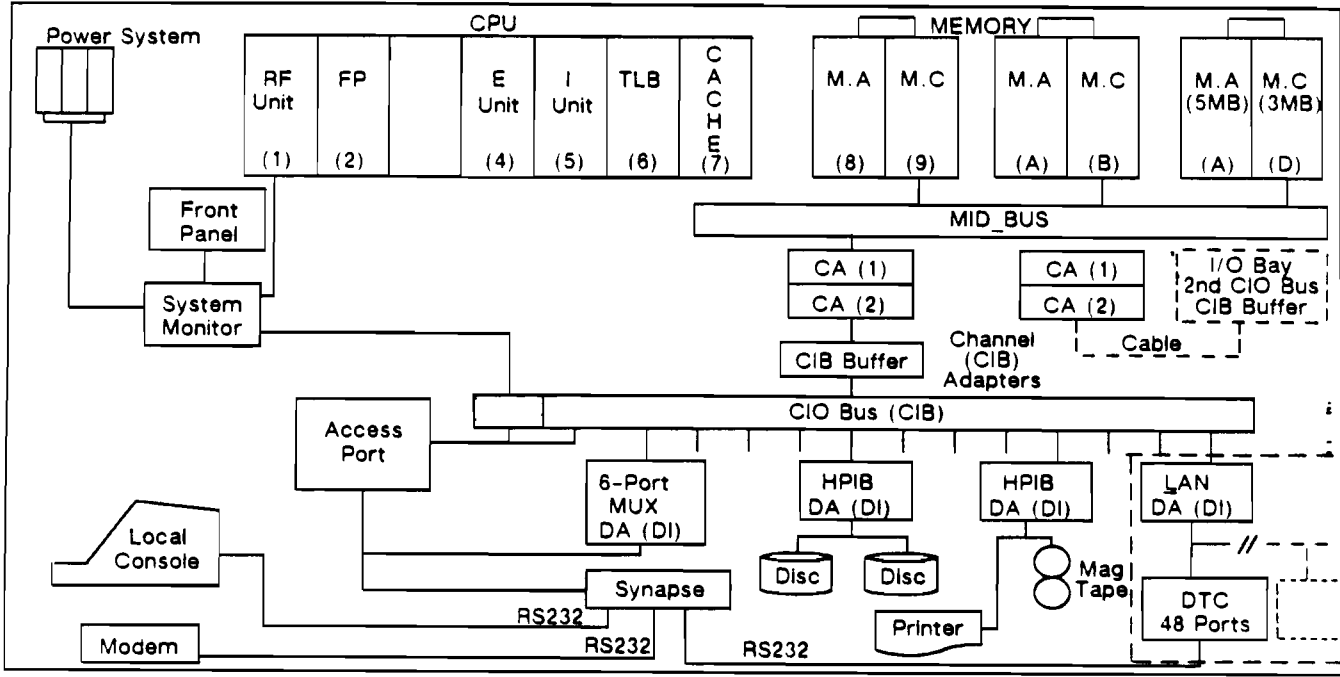
*CMAL/B = CM>*

*CA - Remote password: # of retries; CASE sensitive - CAPITALS*

**Series 930 Hardware**

**HP 3000 Series 930 and MPE XL**

**Functional Block Diagram**



TG200076-022

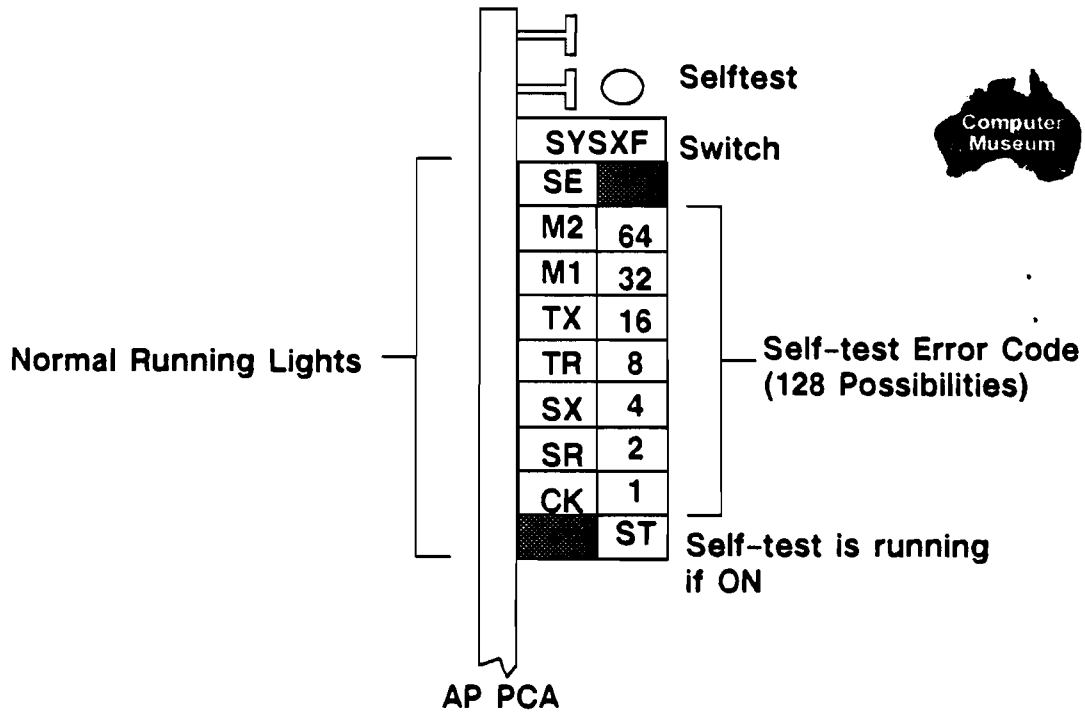
© 1987 Hewlett-Packard Company

**Notes**

- 3 CA per MID bus
- SEE Config Guide - # High Speed HPiB's per CIB.

**Series 930 Hardware**

**AP Self-test Display**



TG200076-021

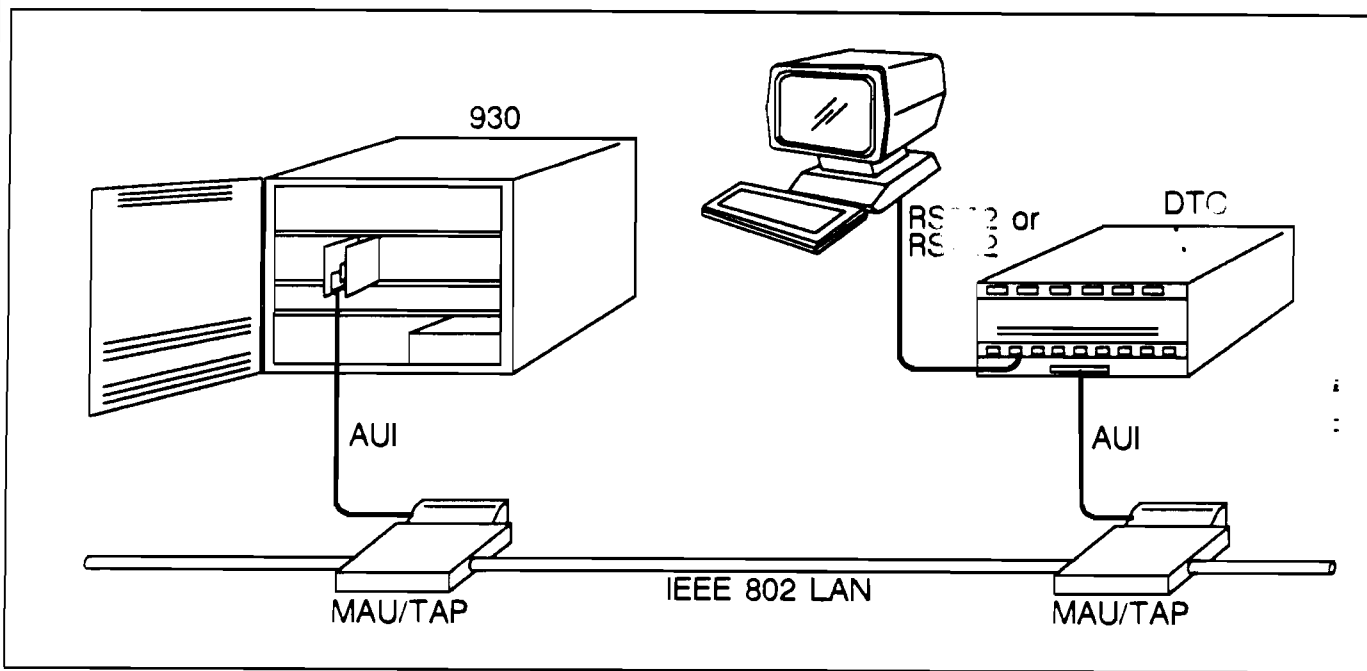
© 1987 Hewlett-Packard Company

**Notes**

M = Modem  
 T = Terminal Console X = transmit R = receive  
 S = Session

Series 930 Hardware

Local Area Network (LAN)



TG200076-024

© 1987 Hewlett-Packard Company

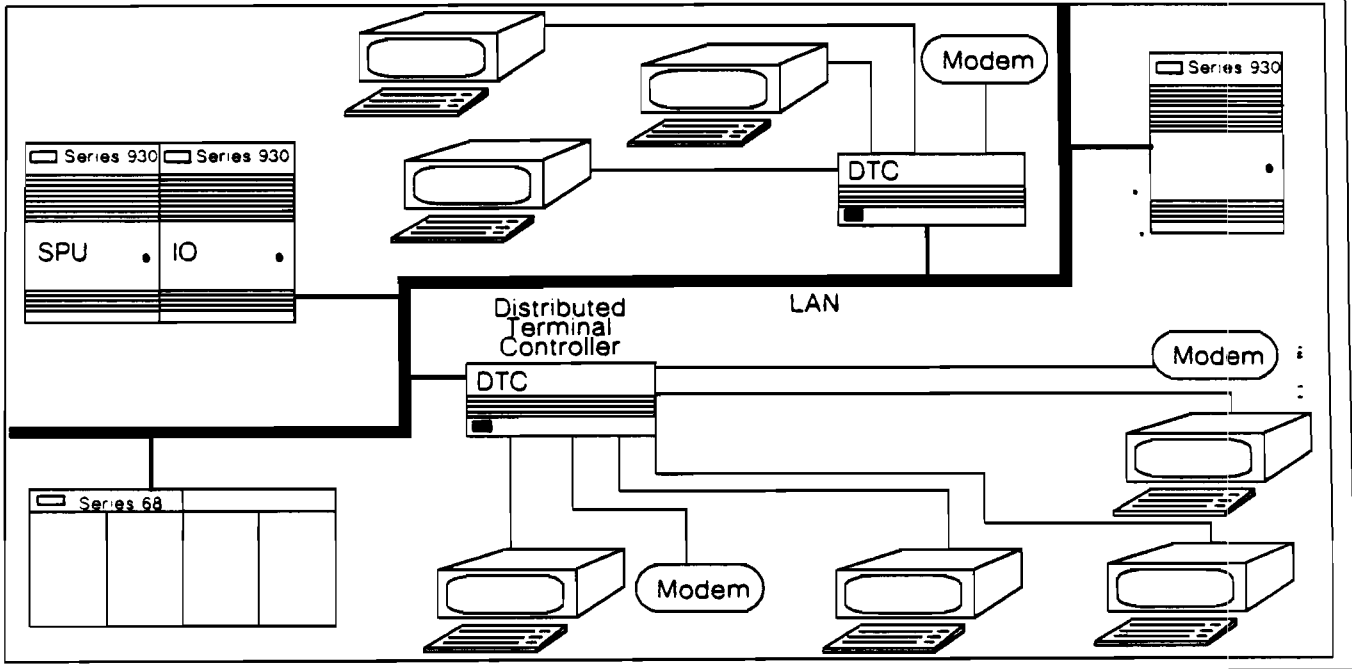
Notes

- THIN OR THICK
- NEW THIN LAN MAU
- DTC ADDRESS ON FRONT PANEL - Burnt into EEPROM
- - CONNECT TERMINAL TO PORT (DTC) HIT CN=RL/P => console of DTC
- - HELP

Series 930 Hardware

Local Area Network (LAN)

Overview



TG200076-023

© 1987 Hewlett-Packard Company

Notes

- AN<sup>2</sup> OCT 87: LAN / DTC performance*
- Release 2 - Terminal on DTC can connect to any system
  - Release 1.2 - Type ahead
  - Power Link - sessions logged off - transaction integrity maintained
  - X-25 sym Card plugged into DTC - after Release 2
  - LX, RX MICRO-3000 = SERVER

**Series 950 Hardware**

**Hardware Series 950 Specifications**

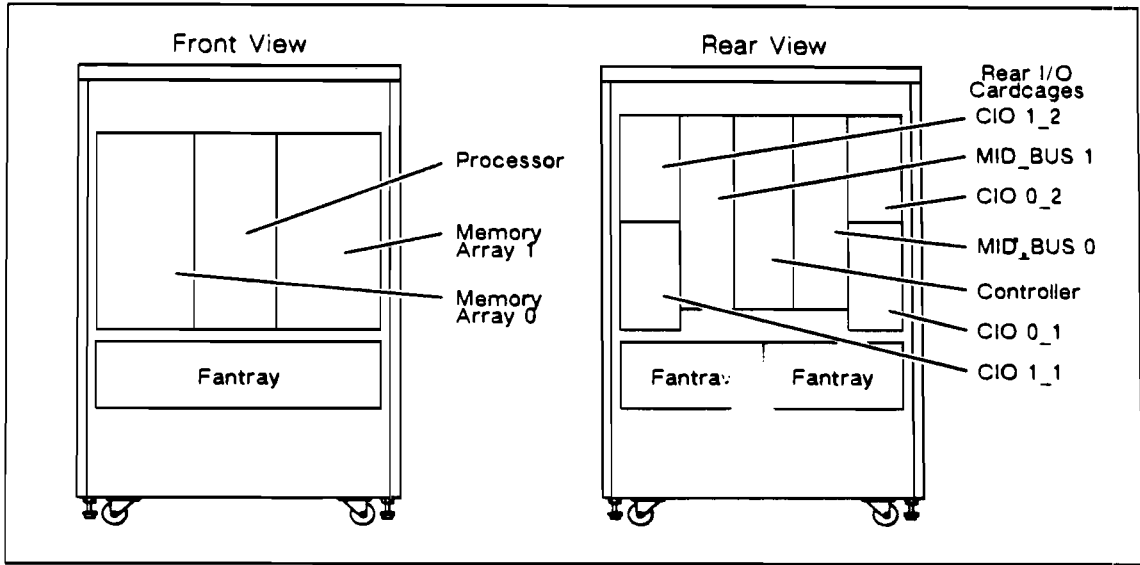
Power: 32.3 AMPS @ 5V Input (162 Watts)

Standard Features: Supports HPPA  
128 Kb Cache (2 set, integrated instr/data)  
4K Entry TLB (1 set, split instr/data)  
27.5 Mhz clock  
Up to 4 Processor's per system  
Optional Floating Point Chips (1 MFLOP)  
Single bit Error Detection and Correction on Cache  
Scan Path type testing provided for VLSI chips  
Self-test failure LEDs

**Notes**

**Series 950 Hardware**

**Processor Bay Cardcages and Components**



TG200076-025

© 1987 Hewlett-Packard Company

**Notes**



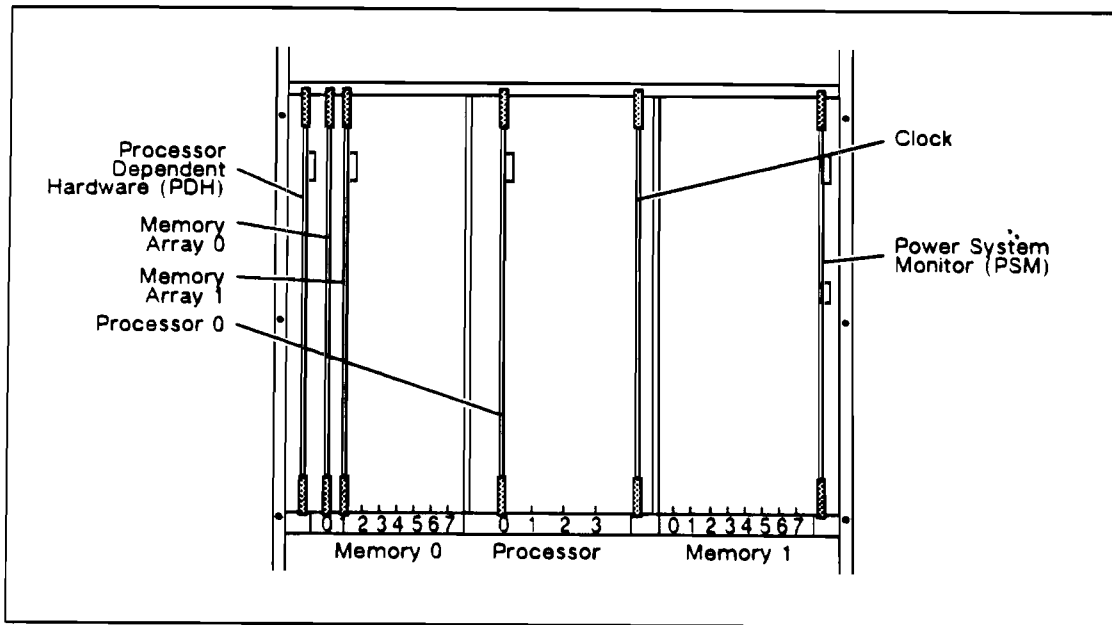
# Module 1 Hardware Overview

## Series 950 Hardware

### Series 950 Processor

(Front View)

*FIRST BAY*



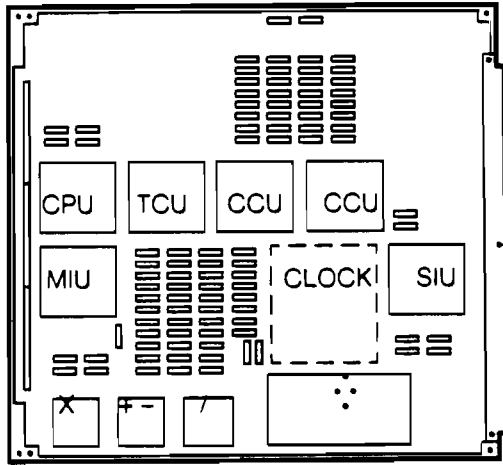
TG200076-028

© 1987 Hewlett-Packard Company

Notes

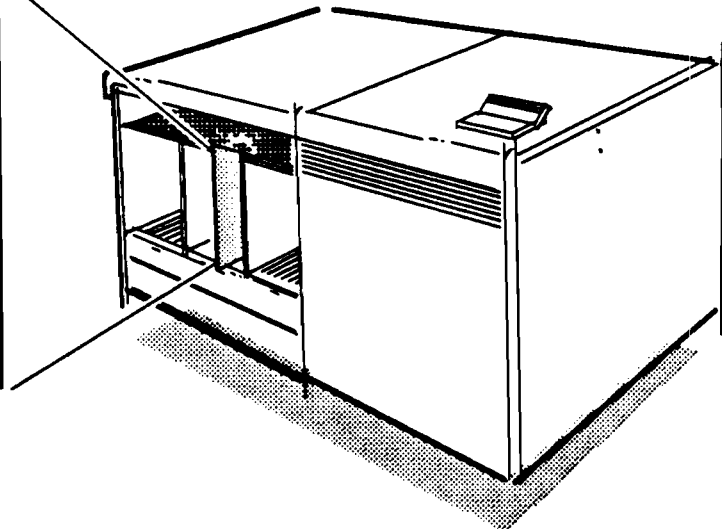
**Series 950 Hardware**

**Series 950 Processor Board**



**PROCESSOR BOARD**

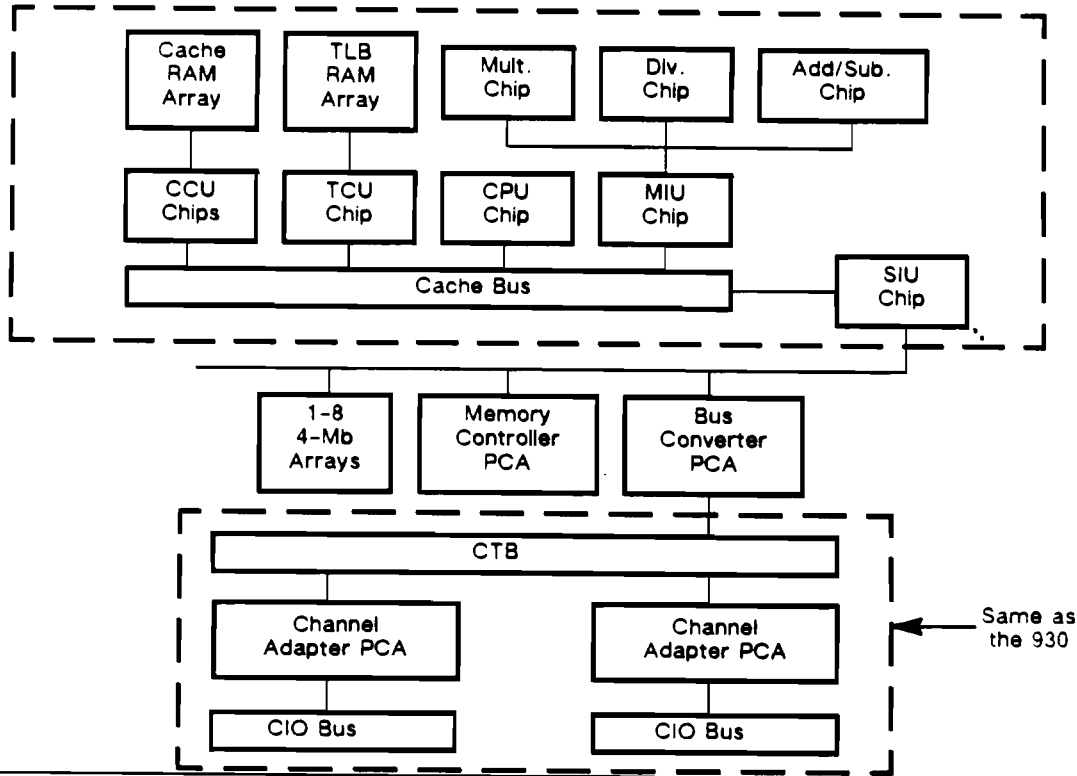
View of Model 950S Processor Board, and its relative location in the processor bay.



**Notes**

**Series 950 Hardware**

**Series 950 Hardware**



TG200076-030

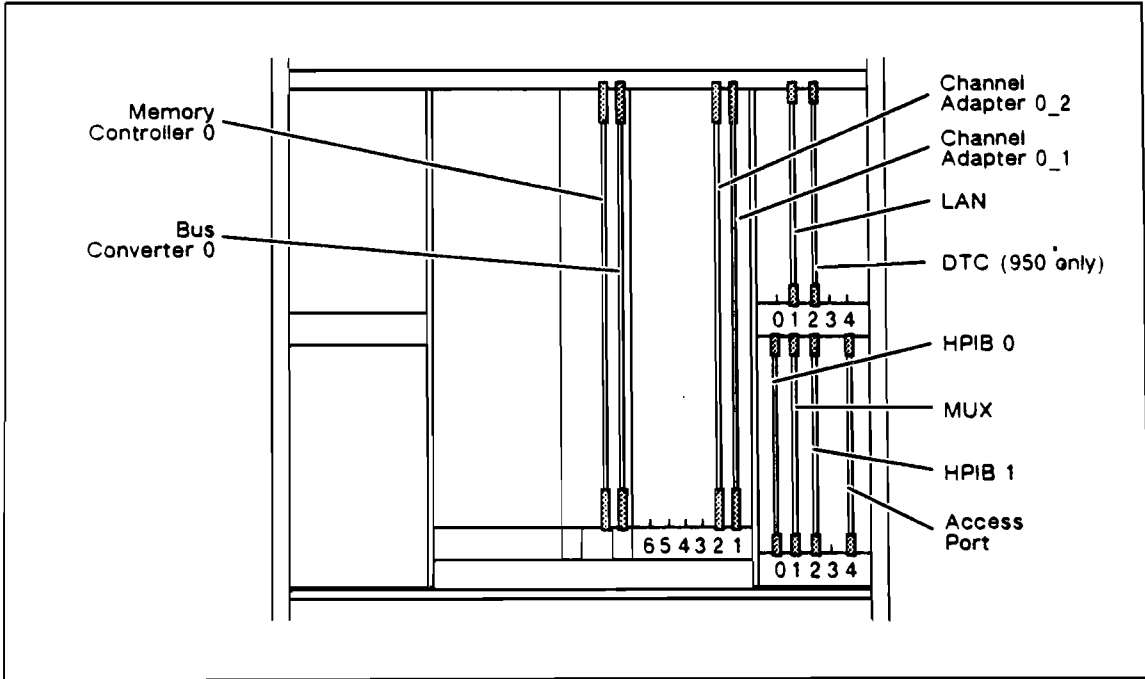
© 1987 Hewlett-Packard Company

**Notes** c.f. P 1-4

- Future: MORE than 1 Bus Converter
- CTB = MID Bus on 930.
- No Announcements on Multi-processors. For next 3 yrs single processor 950 will be enhanced by 50%

**Series 950 Hardware**

**Series 950 I/O Cardcage**



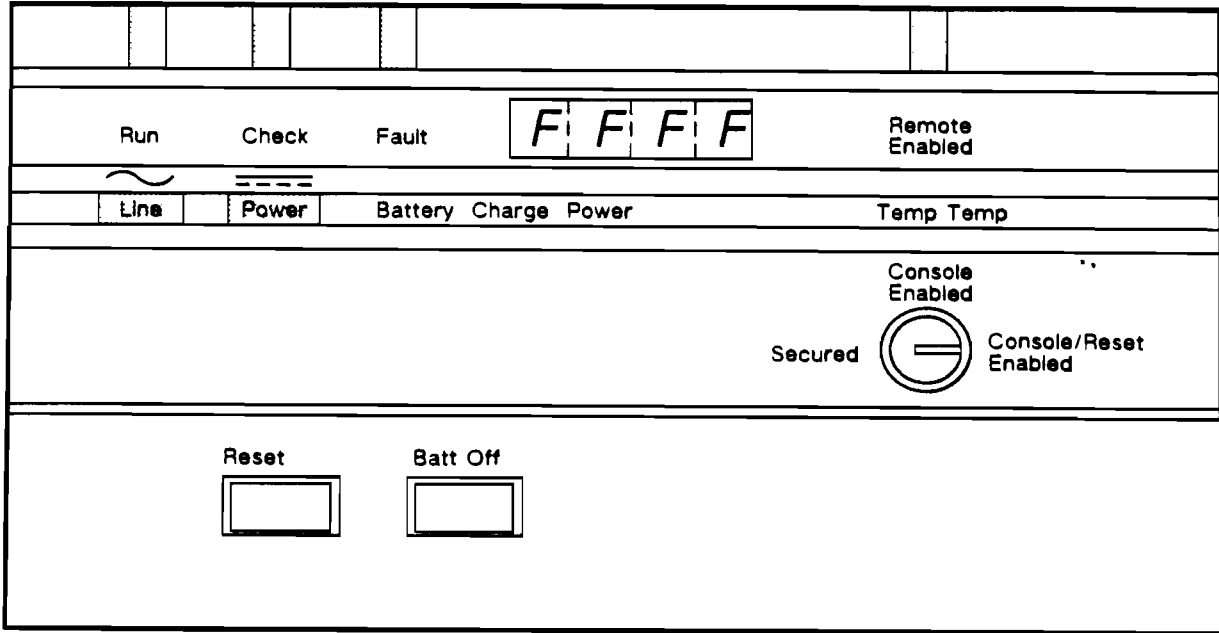
TG200076-029

© 1987 Hewlett-Packard Company

**Notes**

**Series 950 Hardware**

**Series 950 Front Panel**



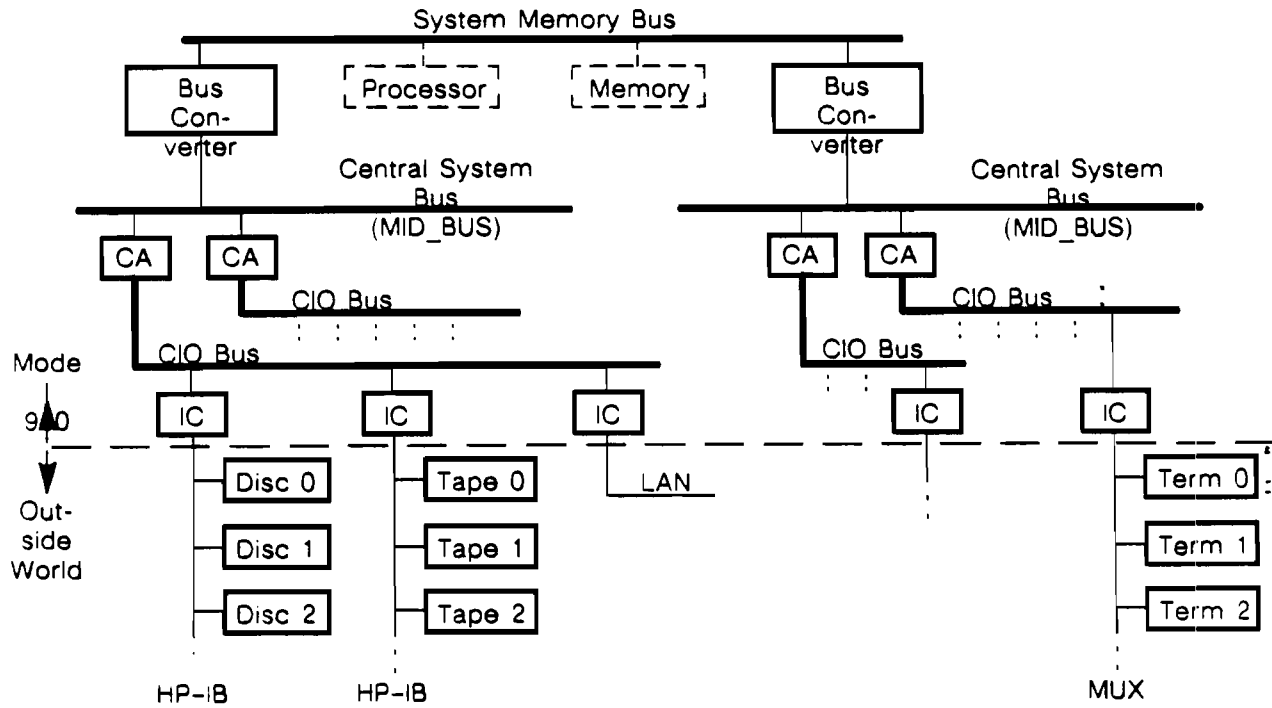
TG200076-032

© 1987 Hewlett-Packard Company

**Notes**

**Series 950 Hardware**

**Series 950 I/O Block Diagram**



G200076-031

© 1987 Hewlett-Packard Company

**Notes**

- ONLY 1 Bus CONVERTER for new Systems.
- 2 CA per Bus (MAX)

Series 930 Hardware

Series 930 Hardware Summary

- Components of a Series 930.
- Components of a Series 950.
- Differences Between Systems.

TG200076-034

© 1987 Hewlett-Packard Company

Notes

SLT - Sys. LOAD TAPE (COLDLOAD) 3 TAPES @ 1600 B.P.I.

7937 330 MB ON LDEV 1. ⇒ 571 MB

LDEV 1 ≤ 75% of CAPACITY FOR PERMANENT FILES

- ONE ENGLE FOR SYSTEM S/W

- TRANSACTION MANAGEMENT = 96 MB PER MASTER DISC

• NM PROG ≈ 4 TIMES CM PROG

• HAVE 3 × 7935 ⇒ ORDER 4 × 7937

• MEM. 32 MB MIN ; 64 MB INITIALLY

**Series 950 Hardware**

**Front Panel Status Indicator**

	<u>RUN</u>	<u>CHECK</u>	<u>FAULT</u>
Selftest Warn	ON	ON	OFF
Selftest Failure	OFF	OFF	ON
System Failure	OFF	OFF	ON
H/W Non-Fatal Error	ON	ON	OFF
H/W Fatal Error	OFF	OFF	ON

**Notes**



**Activity 1.1**

**Review Quiz (Continued)**

8. On the system monitor card is a row of switches. These switches are used primarily to obtain more information in troubleshooting different error conditions.

True or false \_\_\_\_\_

9. It is not important where the cable is connected between the synapse box and the Distributed Terminal Controller.

True or false \_\_\_\_\_

10. It is not necessary for a system manager to press the console enable switch on the front panel of the 930 system to allow access to the modem connected to the synapse box.

True or false \_\_\_\_\_

11. If the system manager wanted to perform a self-test of the access port without affecting the rest of the system, which command would they execute?

- a) RS      b) TA      c) TC      d) CA

12. The 950 system has one CPU card.

True or false \_\_\_\_\_

13. The major difference between the CPU of the 930 and the CPU of the 950 is that the 950 uses the VLSI technology and the 930 uses TTL.

True or false \_\_\_\_\_

14. The keyswitch on the 950 front panel performs the same function as the console enable push button switch on the 930.

True or false \_\_\_\_\_

**Activity 1.1**

**Review Quiz**

1. Which one of these items is NOT a component of a 930 system?

- a) Cache
- b) channel I/O adapter
- c) co-processor
- d) bus converter
- e) TLB

2. What does it mean if FOFF appears in the status display on the front panel of your 930 system?

3. What are some of the functions of the system monitor on the 930 system?

4. Of the 6 CPU cards, which card is connected to the MID\_BUS on a 930 system?

- a) Instruction unit
- b) Translation Lookaside buffer card
- c) Execution unit
- d) Cache unit

5. Fan filters should be replaced at least every 12 months or sooner depending on the environment.

True or False \_\_\_\_\_

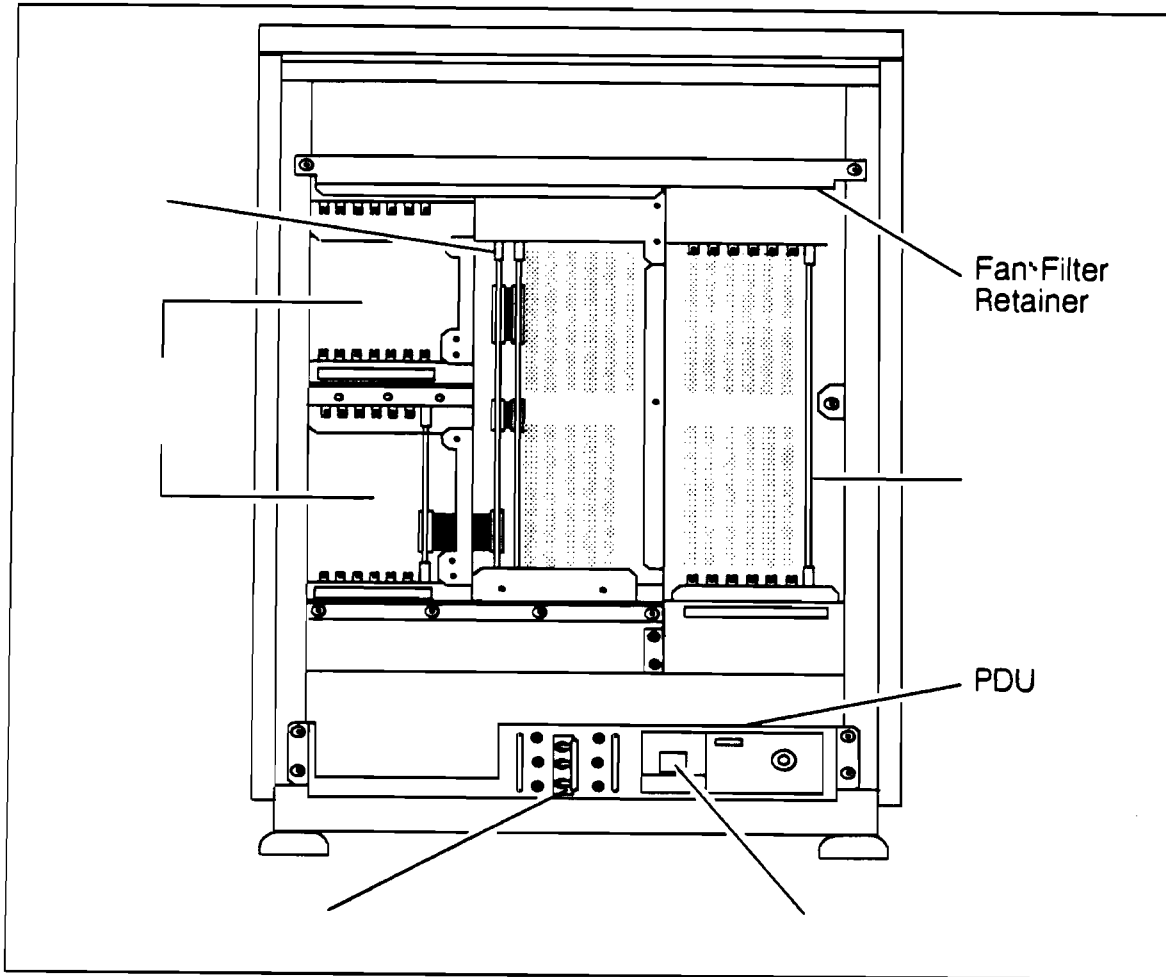
6. At what point during the boot-up process does the 930 system go to a Run (or green) condition?

- a) at ISL
- b) at system log on
- c) after self-test is complete
- d) at Console Enable

7. During the 930 system boot process, an error code of C402 is encountered. This error code indicates an error in which board?

- a) channel adapter
- b) device adapter
- c) memory
- d) no fault

17. Label the following diagram:



Rear View - Series 930

**Activity 1.1**

**Review Quiz (Continued)**

15. In what state would the Run, Check, and Fault LED's be in a system failure condition?

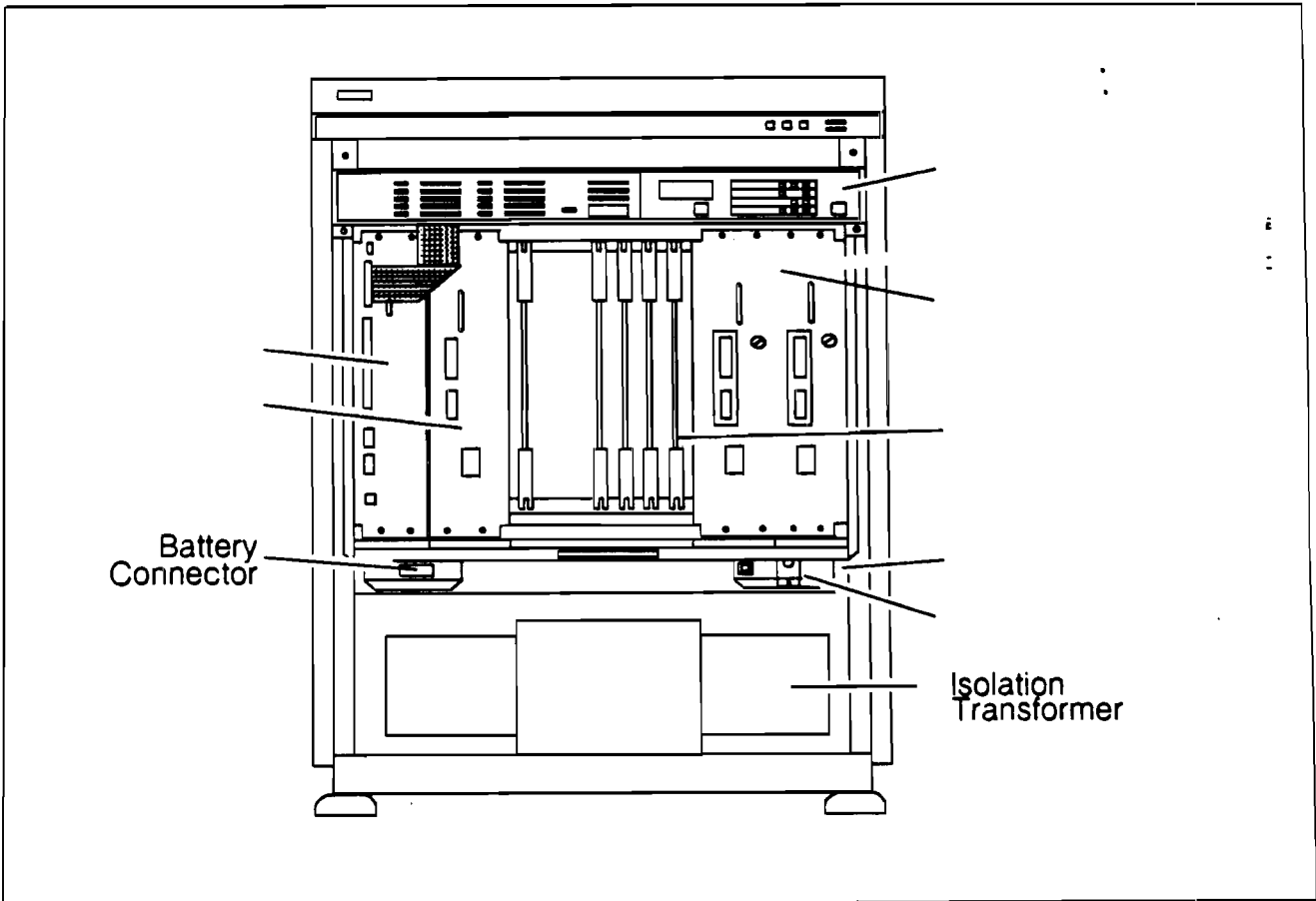
(Circle your answers.)

Run  
on/off

Check  
on/off

Fault  
on/off

16. Label the components:



Front View - Series 930



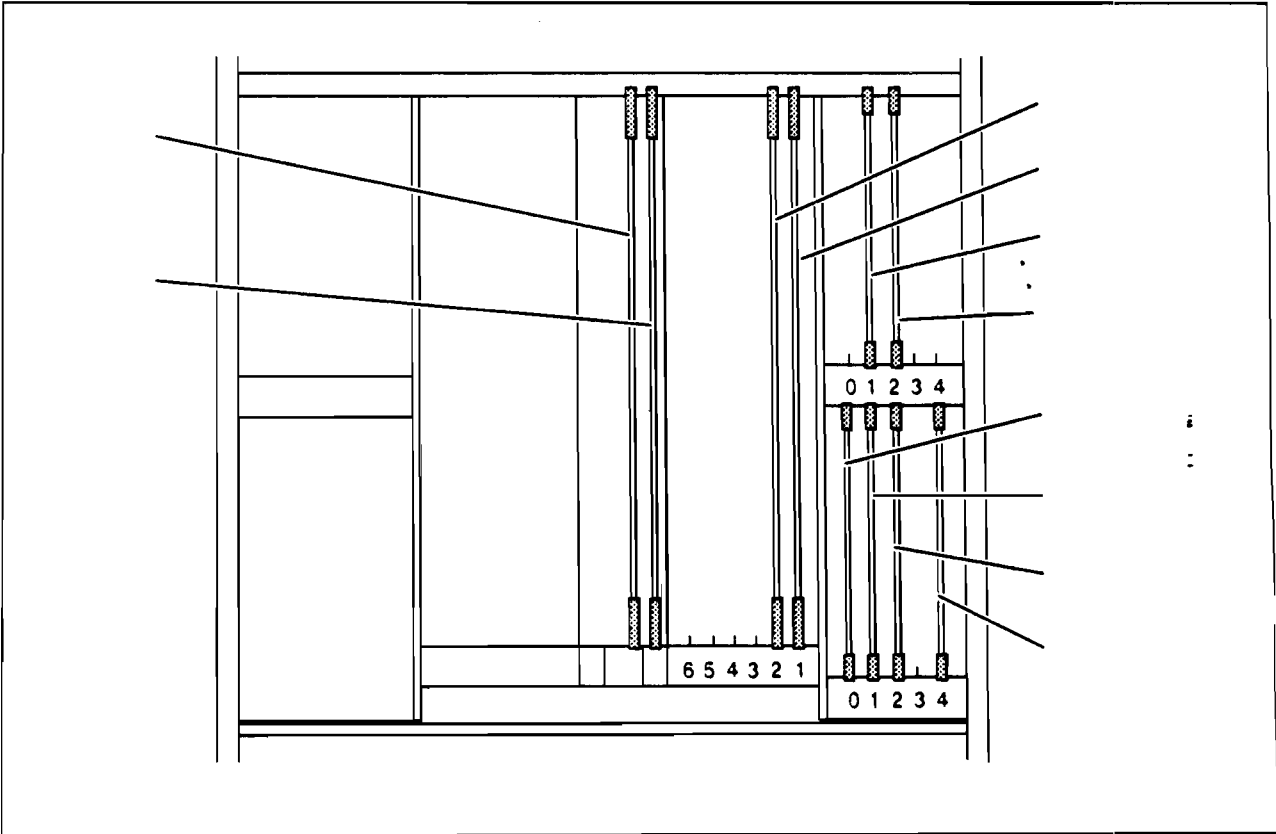
:

;



**Activity 1.1** **Review Quiz (Continued)**

18. Complete this diagram of a 950 card cage.



Implied :RUN

Implied :RUN

- May be used to run programs without typing :RUN.
- Not intended to replace :RUN.
- Accepts only two parameters:

INFO= and PARM=

<u>MPE V/E</u>	=	<u>MPE XL</u>
:RUN SPOOK.PUB.SYS		:SPOOK

TG200080-002

© 1987 Hewlett-Packard Company

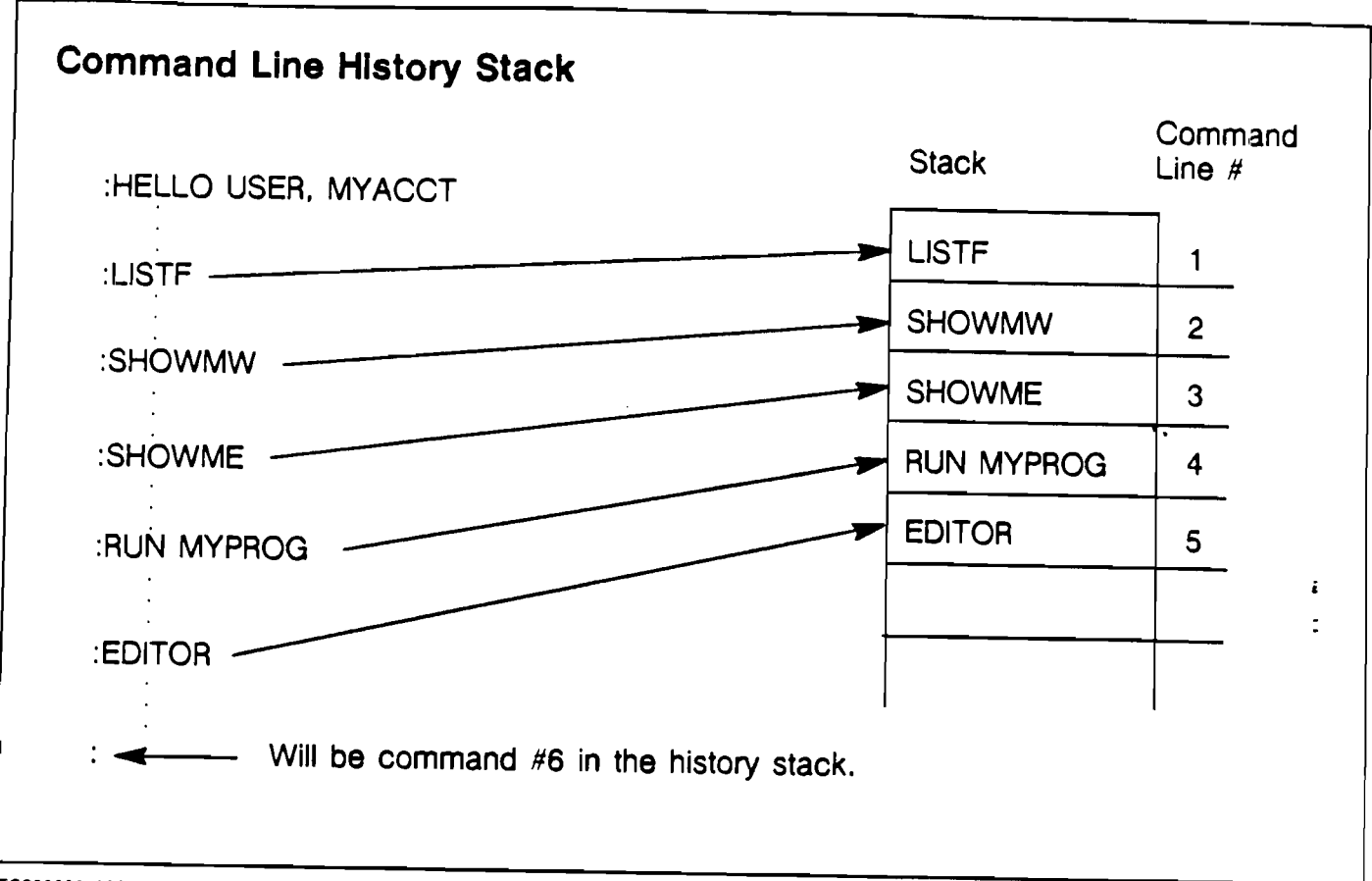
Notes

- See *MPE XL Commands Reference Manual*, the command :RUN, for more information about the INFO= and PARM= parameters.

PATHS - LIKE UNIX, MS-DOS

SPOOK, INFOPARM, PARMparam.

**Command Line History Stack**



TG200080-003

© 1987 Hewlett-Packard Company

**Notes**

- The default size of the history stack is twenty commands. (The size can be reset by the user; this is covered later in this module.)
- To see a listing of the history stack for the current session, use the new :LISTREDO command.





**Key Features**

**Welcome to the New  
MPE XL Command Interpreter**

Key Features:

- Upward compatibility from MPE V/E.
- Command language—more powerful than MPE V/E CI.
- Added convenience for developers of UDCs and programs.
- Added convenience for copying and printing files.

**Notes**

Specific New Features of the MPE XL Command Interpreter:

- Use of the "implied :RUN" ..... p. 2-2
- Command line history stack ..... p. 2-3
- New commands for working with files ..... p. 2-6
- Syntax changes for new commands ..... p. 2-9
- Command files ..... p. 2-10
- Enhanced UDC options ..... p. 2-12
- Modifiable "search paths" ..... p. 2-16
- System and user variables ..... p. 2-17
- Dereferencing variables ..... p. 2-20
- New expression evaluator ..... p. 2-24
- The CI as a user program ..... p. 2-26
- Volume sets ..... p. 2-27
- New commands for programmers ..... p. 2-28
- New command for system management ..... p. 2-29
- Changed utilities ..... p. 2-30
- Labs ..... p. 2-31

**Command Line History Stack**

**Command Line History Stack: Relative Numbering**

Relative Numbering	Stack	Absolute Numbering
-5	LISTF	1
-4	SHOWMW	2
-3	SHOWME	3
-2	RUN MYPROG	4
-1	EDITOR	5

- :REDO 5            Would REDO the EDITOR command.
- :REDO -5         Would REDO the LISTF command.
- :REDO SH         Would REDO the SHOWME command.

TG200080-004

© 1987 Hewlett-Packard Company

**Notes**

- If you type REDO without specifying a line number, the system will REDO the last command entered.
- The LISTREDO command can specify RELative numbering, ABSolute numbering, or UNNumbered. The default is absolute numbering.
- Examples:

:LISTREDO ;UNN     *ABSOLUTE* } *Target a file*  
 :LISTREDO ;REL     *±*

*LISTRED ; REL ; OUT = filename*

**Command Line History Stack**

**Command Line History Stack: :DO**

:REDO 5

Allows you to edit  
command #5 from the  
history stack before  
reexecuting it.

:DO 5

Immediately reexecutes ..  
command #5.

i  
:

TG200080-005

© 1987 Hewlett-Packard Company

**Notes**

- Both REDO and DO can specify, among other things, either an absolute or relative command line number from the history stack.
- Notice that when you enter the DO and REDO commands, they are not listed to the history stack--the commands that they cause to be reexecuted are the ones posted to the stack.
- Both REDO and DO allow you to do "same line" editing. That is, the syntax of these commands allows you to specify editorial changes on the same line as the command itself.

Example:

:DO 2;EDIT= >RE

would Replace the last character of command #2  
in the history stack (:SHOWMW) with an E and would  
then execute the revised command.

- Only :REDO allows next line editing.

For details on the edit string parameters, see the REDO and DO commands in the *MPE XL Commands Reference Manual*.

Working With Files

Working with Files: :COPY

:COPY from=Snoopy;to=Linus

or

:COPY Snoopy, Linus

<u>MPE V/E</u>		<u>MPE XL</u>	
DSCOPY	+ COPY =	DSCOPY	:
FCOPY		FCOPY	:
		COPY	

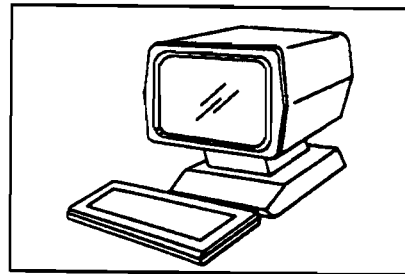
Notes

- :COPY only copies one file at a time.
- See *MPE XL Commands Reference Manual* for an explanation of the ;ASK/;YES/;NO options of the :COPY command.
- Pay particular attention to the :ASK option, which is the default.

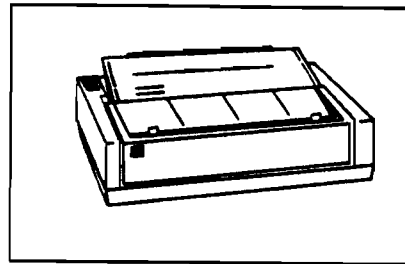
Working With Files

Working with Files: :PRINT

:PRINT MYFILE



:PRINT MYFILE, \* LP

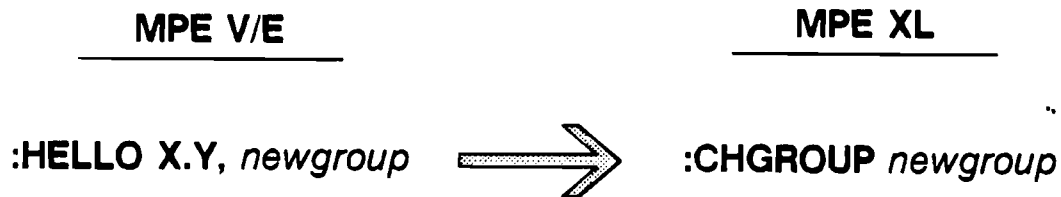


Notes

- :PRINT prints the contents of a file to any output device.
- All or part of a file may be printed to the standard list device using the START= and END= parameters.
- Page breaks may be specified using the PAGE= parameter. The default is a page break after every 23 lines for sessions. Page=0 will suppress page breaks and is the default for jobs.
- See Appendix B "Command Interpreter Reference Tables" or the *MPE XL Commands Reference Manual* for the complete syntax and explanation of the :PRINT command.

Working With Files

Working with Files: :CHGROUP



TG200080-008

© 1987 Hewlett-Packard Company

Notes

- To get back to your home group just enter :CHGROUP.

**IMPORTANT:** The :CHGROUP command cannot be used to change groups outside you logon account.

- Activity

1. Using the :COPY command, make a copy of the file "Fred" and call it "New".
2. Print the file "New" to your terminal screen.
3. Get into the group "Barney".
4. Copy the file "New.logon" to the group "Barney".
5. Check if your copy was successful.
6. Get back to your logon group.

Syntax Changes for New Commands

### Syntax for New Commands

New MPE XL commands can use:

- KEYWORD parameters

```
:PRINT FILE=myfile;OUT=*lp;END=30
```

- POSITIONAL parameters

```
:PRINT myfile,*lp,,30
```

- Combination of KEYWORD and POSITIONAL parameters

```
:PRINT myfile,*lp;END=30
```

TG200080-009

© 1987 Hewlett-Packard Company

Notes

- Only applies to new MPE XL commands.

- WARNING:

Once you have specified a KEYWORD parameter in a command line, you must continue using KEYWORD parameters in the rest of the line.

The following command line would be rejected:

```
:PRINT myfile;OUT=*lp,,30
```

Note the semicolon (;) before a KEYWORD parameter, and the comma (,) before a POSITIONAL parameter.

- Note: When using POSITIONAL parameters with Implied RUN, the first parameter specified will be passed as the INFO= string, and the second parameter will be passed as the PARM= value.



**Command Files**

**Command Files**

Imagine a file called "LR" that looks like this:

- 1 LISTREDO;REL
- 2 ECHO The LR command file has completed
- 3 ECHO its execution.

This file could be executed by simply entering the filename at the CI prompt:

:LR

TG200080-010

© 1987 Hewlett-Packard Company

**Notes**

■ **Example:**

---

:LR

- 6) LISTF
- 5) SHOWMW
- 4) SHOWME
- 3) RUN MYPROG
- 2) EDITOR
- 1) LR

The LR command file has completed its execution.

:

- 
- A Command File is an ASCII file that can execute MPE commands, UDCs, and other Command Files. When first created, it must be saved as an unnumbered file.

**Command Files and UDCs**

**Command File "PURGEME"**

```

PARM F1, F2=$NULL, F3=$NULL,
      F4=$NULL
PURGE !F1
PURGE !F2
PURGE !F3
PURGE !F4
    
```

**:PURGEME FILE1, FILE2,...**

**UDC "PURGEIT" in UDC File "REMOVE"**

```

PURGEIT
PARM F1, F2=$NULL, F3=$NULL,
      F4=$NULL
PURGE !F1
PURGE !F2
PURGE !F3
PURGE !F4
*
    
```

**:PURGEIT FILE1, FILE2,...**

TG200080-011

© 1987 Hewlett-Packard Company

**Notes**

**COMMAND FILES AND UDC SUMMARY SHEET**

Command Files	UDCs
Not catalogued.	Must be catalogued with the SETCATALOG command.
Consists of one definition.	Consists of one or more definitions which are separated by an *.
Cannot be invoked during a logon, except via a logon UDC.	Has LOGON OPTION.
Invoked by its file name. No command header/label is necessary.	Invoked by command header/label identifier.

Working With UDCs

Working With UDCs

```
:SETCATALOG TOKYO  
:SHOWCATALOG  
  
:SETCATALOG DALLAS ; APPEND  
:SHOWCATALOG  
  
:SETCATALOG TOKYO ; DELETE  
:SHOWCATALOG  
  
:SETCATALOG  
  
:SETCATALOG LONDON, TOKYO, DALLAS ; RESET
```

TG200080-012

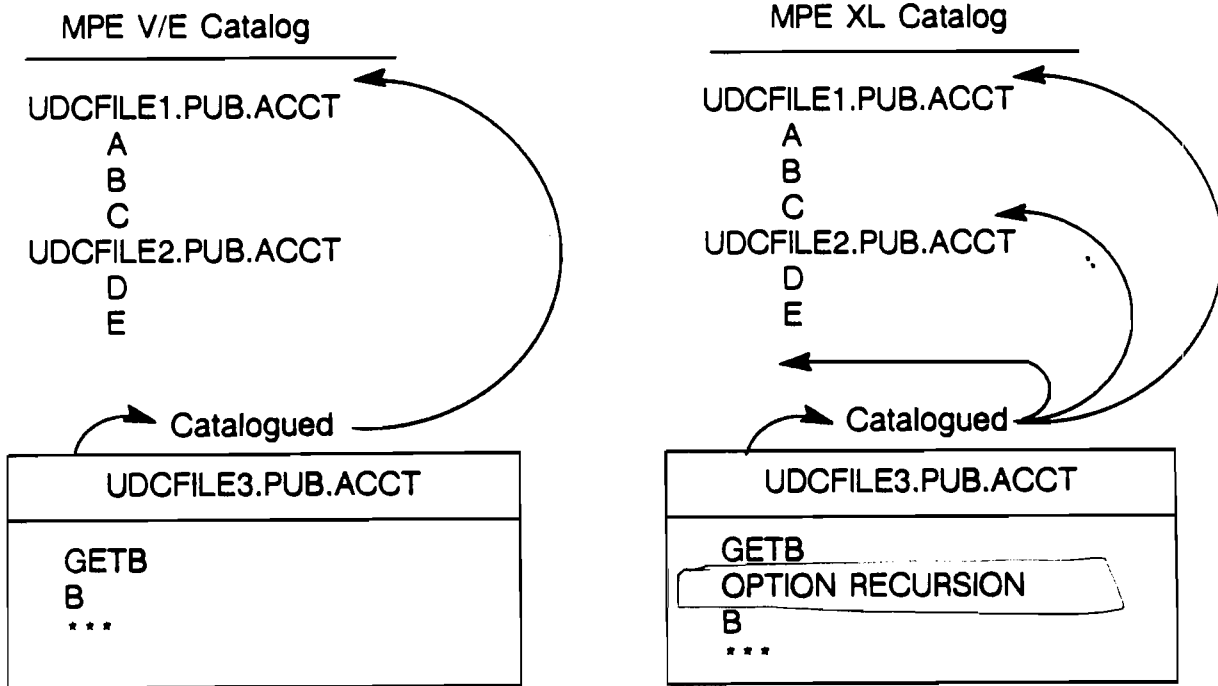
© 1987 Hewlett-Packard Company

Notes

- ;RESET is the default parameter of the :SETCATALOG command.

Working With UDCs

Working With UDCs: RECURSION



TG200080-013

© 1987 Hewlett-Packard Company

Notes

"Recursion" in this instance means the ability of one UDC to call another UDC that comes before it, either in the same file or in a different UDC file. (In MPE V/E, you may recall, a UDC can only call another UDC if the second one comes after the first in the catalog.)

The recursion option is good only for the UDC in which it is specified; if there are three UDCs in one UDC file and only one of them specified recursion, then only that one can call UDCs recursively.

*cf. Appendix B.*  
- - - c

*Don't have Recursion UDC at Bottom of UDC file*

**Working With UDCs**

**Working With UDCs: NORECURSION**

```
GETB
OPTION RECURSION ← Tells the system to
B                search the catalog from the
OPTION NORECURSION top for each command that
SHOWME          follows.
LISTF
FILE OUT;DEV=LP
EDITOR OUT
***
```

TG200C80-014

© 1987 Hewlett-Packard Company

**Notes**

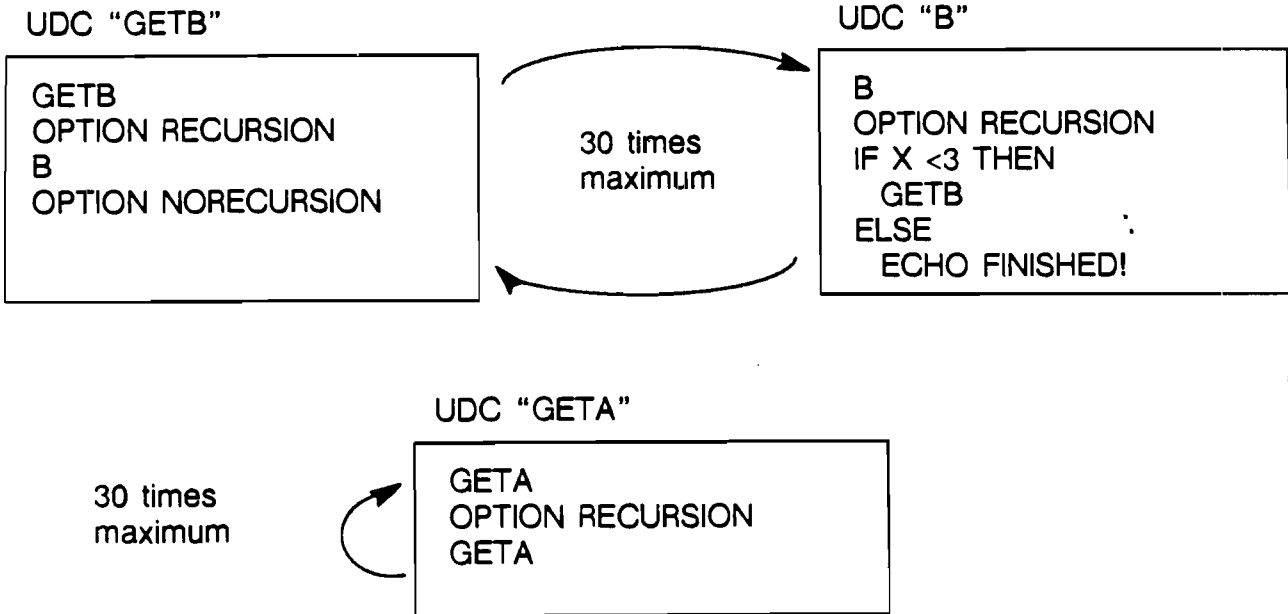
- If you do not want the recursion feature to apply throughout the whole UDC, then you may specify OPTION NORECURSION in the middle of the UDC. Example:

```
***
MYUDC
OPTION RECURSION ← Specifies recursion.
NEW             ← Calls a UDC called "NEW".
OPTION NORECURSION ← "Turns off" the recursion option.
CHGROUP PUB
***
```

- Both RECURSION/NORECURSION and LIST/NOLIST can be specified anywhere in the UDC. (On MPE V/E, options can only be specified on the first line after the UDC label.)

Working With UDCs

Working With UDCs: LOOPING



TG200080-015

© 1987 Hewlett-Packard Company

Notes

- Now that recursion allows two UDCs to call each other and enables a UDC to call itself, limitations have been put in place to prevent "endless loops"--for example, two commands calling each other over and over again without end. The maximum number of times that UDCs can call themselves, other UDCs, or command files is thirty. If that maximum is reached, the system interrupts the process with an error message.

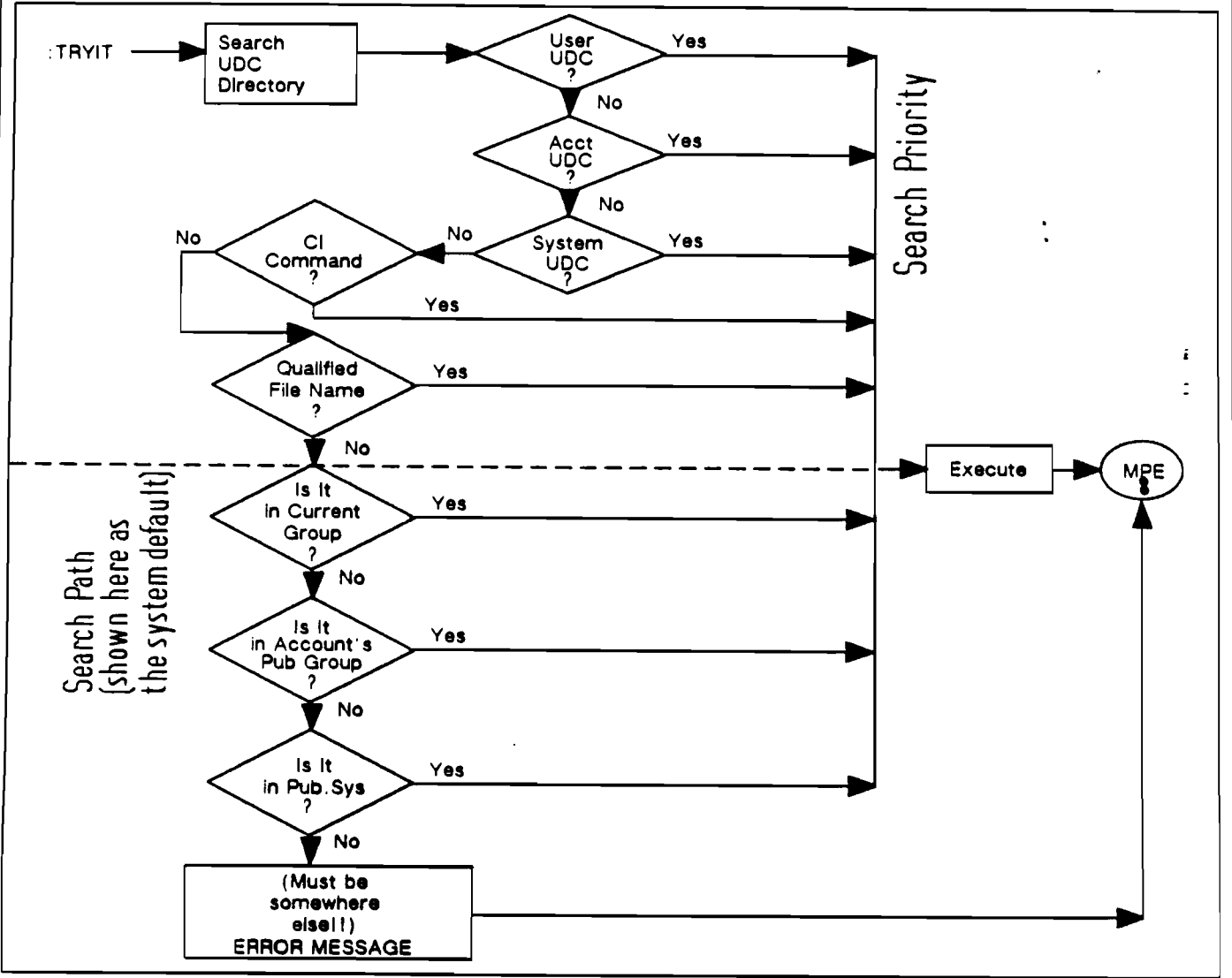
• Program can call UDC via `HP COMMAND` intrinsic NOT command intrinsic

• `KEY` - New Command

**Search Priority/Search Path**

**Search Priority/Search Path\***

Assume that "TRYIT" is a legitimate CI Command, UDC, program name or file name.



\* HPPATH can be user modified

**Notes**

- If a command file has the same name as a UDC or system command, the new :XEQ command will ensure that the command file is the one that will execute.

Working With Variables

Notes

- Variables on MPE XL are similar to JCWs on MPE V/E. JCWs only allowed integers (in the range 0...65535) as values. MPE XL variables allow for integer, string, Boolean and JCWs.  
  
NOTE: JCWs remain on the MPE XL system for compatibility.
- There are two major classes of variables on MPE XL:
  - User defined - user can define their own personal variables.
  - System defined - these are HP predefined variables (e.g., HPDATEF, HPTIMEF).
- Users can get information about the system environment via System defined variables. MPE XL has added quite a few system variables for your use. See the chart entitled "Command Interpreter Predefined Global Variables" in Appendix B.  
  
User can redefine some of the System Variables (e.g., HPPATH, HPPROMPT).
- Variables can be used in system commands, UDCs, jobs, programs and Command Files.

• 1 PATH PER SESSION

• HELLO User.Acd ; CI = is no longer an option.  
Security Violations.



**Working With Variables**

**Working With Variables: :SHOWVAR**

- **:SHOWVAR @**  
Displays all variables and their current values.
  
- **:SHOWVAR**  
Displays user created variables and their current values.
  
- **:SHOWVAR *variablename***  
Displays the value of the variable named.

TG200080-017

© 1987 Hewlett-Packard Company

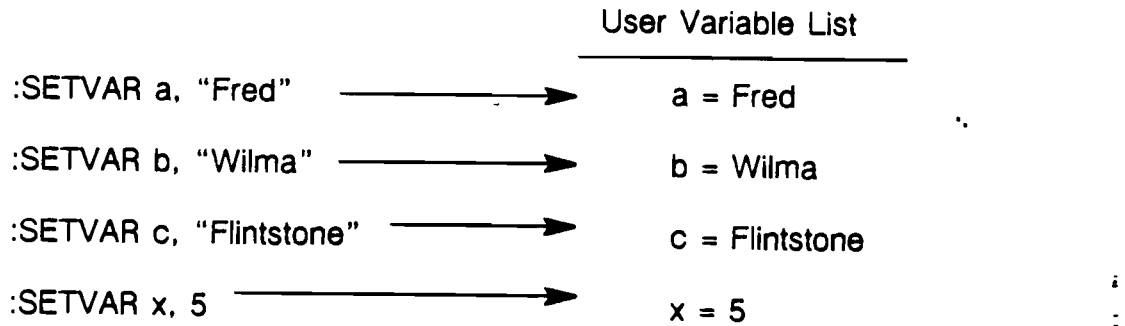
**Notes**

- JCWs are used in the same way on MPE V/E and MPE XL.
  
- :SHOWVAR shows the numeric value of JCWs, :SHOWJCW shows the keyworded value (e.g., "WARN10").
  
- Example:

```
:SETJCW FOO FATAL123
:SHOWJCW FOO
FOO = FATAL123
:SHOWVAR FOO
FOO = 32891
```

Working With Variables

Working With Variables: :SETVAR and :DELETEVAR



Notes

- :DELETEVAR @ erases all user variables, it does not affect system variables.
- A blank or a comma will work as a delimiter.
- Don't use "AP xx"

**Working With Variables**

**Working With Variables: Dereferencing with !**

```
:SETVAR x, "Blue"           (:SHOWVAR x → x = Blue)
:SETVAR y, "!x is best".    (:SHOWVAR y → y = Blue is best.)
```

```
:ECHO y → y
:ECHO !y → Blue is best.
```

```
:SETVAR x, "Red"
:ECHO !y → Blue is best.
```

**Notes**

- "Explicit Dereferencing" of a variable means, using an exclamation point before a variable name to tell the system to substitute the value of that variable.
- "Implicit Dereferencing" of a variable means using the variable name without preceding it with an "!".

For example:

```
:SETVAR A "Hi there"
:SETVAR B A + " friend." (concatenation)
:SHOWVAR B
B = Hi there friend.
```

Working With Variables

**Working With Variables: Dereferencing with !!**

Occasionally, you may want the system to substitute the variable name itself, rather than the value of the variable.

:SETVAR x, "Blue"	x = Blue
:SETVAR y, "!! x is best."	y = ! x is best.
:ECHO !y	Blue is best.
:SETVAR x, "Red"	x = Red
:ECHO !y	y = Red is best.



Notes

- This use of two !!'s to dereference is called "recursive dereferencing".
- For more information, look under "Dereferencing, Recursive" in the *MPE XL Commands Reference Manual*.

**Working With Variables**

**Working With Variables: Dereferencing System Variables**

Some commonly used system variables are:

HPCMDNUM	* HPPROMPT	HPMONTH	
* CIERROR	* HPPATH	HPDATE	:
HPCIERRMSG	* HPREDOSize	HPDATEF	Formatted
HPUSER	HPJOBFENCE	JCW	:
HPGROUP	HPSESLIMIT		:
HPACCOUNT			

TG200080-021

© 1987 Hewlett-Packard Company

**Notes**

- Notice that all system variables except CIERROR and JCW begin with "HP". (User variables can begin with any alpha character or an underbar(\_)).
  - Some of the system variables, such as HPTIMEOUT, can only be assigned numeric data (integers); others can accept any alphanumeric data.
- \*The variables with asterisks are some of the user-modifiable ones; the remaining variables on the slide are not user-modifiable.

**Working With Variables**

**Working With Variables: :INPUT Command**

Command file named "PR" (for "prompt"):

```
INPUT HPPROMPT, "What prompt do you want? "
```

TG200080-022

© 1987 Hewlett-Packard Company

**Notes**

- :INPUT can only assign string values to variables--it does not treat numbers as integers or Booleans.
- You may specify any user-created/user-definable variable name you wish after the :INPUT command. Whether you add anything in quotes (to be displayed on the screen) is up to you.
- Another way of programming the "PR" command file would be:

```
ECHO What prompt do you want?  
INPUT HPPROMPT
```

How would this differ, in effect, from the example on the slide?

## Module 2 Introduction to the MPE XL Command Interpreter

### Expression Evaluator

#### Notes

- The MPE XL system has a powerful Expression Evaluator.
- The Expression Evaluator evaluates complicated integer, string and logical expressions.
- It has 3 input and output bases:

Decimal  
Hexadecimal (\$)  
Octal (%)
- The Expression Evaluator has many functions. See the chart entitled "The Expression Evaluator Functions" in Appendix B.
- Evaluated expressions are allowed in user and system variables.
- The modified ":IF" and new ":SETVAR", "WHILE" and ":CALC commands allow expression evaluations.

Expression Evaluator

Expression Evaluator

Expression	Results
:CALC 3+3	6,\$6,%6 (numeric)
:CALC 1+1=3	FALSE (Boolean)
:CALC UPS ("fred")	FRED (string)
:	
:CALC 2+2	4,\$4,%4
:SETVAR x !HPRESULT + 3	x = 7
:ECHO !x	7
:	
:	
:SETVAR a 'aa'	a = aa
:SETVAR b 'BB' + '!a'	b = BBaa

Notes

- :CALC evaluates expressions and returns a numeric, Boolean or string value. The result is stored in the system variable HPRESULT.

*• INTEGER calculations*  
*• ECHO displays DECIMAL.*



## Module 2 Introduction to the MPE XL Command Interpreter

### The CI as a User Program

#### Notes

- On MPE XL the user can run the Command Interpreter as a program by typing :RUN CI.PUB.SYS.
- The user or program must have PH capability to run programs in the nested levels (any level other than the root level, HPCIDEPTH=1).
- Most user-set variables created in nested levels remain constant in all nested levels. Some exceptions are HPREDOSIZE, HPCMDNUM, HPCONTINUE, and HPUSERCMDEPTH.
- A new Command Line History Stack is created for each new nested level of the CI. As you exit back to previous levels of the CI, your History Stack for that level is restored.
- The :EXIT command exits the user out of nested levels, one level at a time. At the root level of the CI, :EXIT acts the same as :BYE.
- :BYE exits the user out of the session no matter which level of the CI the user is in.
- The :SETCATALOG command is only accepted at the ROOT level.
- If you are in a program (i.e., TDP), which allows you to run other programs from it, and you quickly want to test something, you can get into a nested level to do the testing. When you are finished testing, you can easily EXIT out of the nested level, back into your program.
- If you want to practice getting in and out of nested levels of the CI, you might want to reset the HPPROMPT to reflect the CI depth level for easy visual reference (:SETVAR HPPROMPT, "!!HPCIDEPTH:").

- *INVOKER COMMAND FILE FROM WITHIN TDP. - HPCOMMANDS INTRINSIC*

**Volume Sets**

**Notes**

- The function of Private Volumes has been included in MPE XL's Volume Management. Private Volume commands have been migrated over from MPE V/E to MPE XL for compatibility.

- MPE XL has added the following commands for Volume Management support:

VSCLOSE  
VSOPEN  
VSRELEASE  
VSRELEASESYS  
VSRESERVE  
VSRESERVESYS

- For more details regarding Volume Management, refer to the *MPE XL Commands Reference Manual* and to the *System Administrator Skills Migration Guide*.

## Module 2 Introduction to the MPE XL Command Interpreter

### Programming Commands on MPE XL

#### Notes

- All MPE V/E programming development commands are supported on MPE XL for compatibility (e.g., BASIC, PASCAL).
- New compiling commands are available on MPE XL that support the following languages:
  - COBOL II/XL (ANSI 1974/1985 standard entry point)
  - Pascal/XL
  - FORTRAN 77/XL
  - C
- **IMPORTANT NOTE:** The new compiling commands are only recognized if the language it supports is installed on your system. (These languages are not a part of the Fundamental Operating Software.)
- For more information refer to the *MPE XL Commands Reference Manual* or *Programmer's Skills Migration Guide*.

SYSGEN

Notes

- SYSDUMP has been replaced by SYSGEN on MPE XL.
- SYSGEN starts configuration dialog and/or installation tape creation.
- More details can be found in the *System Administrator Skills Migration Guide* and the *MPE XL Commands Reference Manual*.

• SyGEN creates SLT  
STORE = Directory + DATA

### Utilities

### Notes

- The MPE V/E utility LISTDIR5 does not exist on MPE XL; its functionality has been incorporated into the enhanced :LISTF command.
- The enhanced syntax for the LISTF command:

```
LISTF <filename> [ 0 ] [listfile]
                  1
                  2
                  3
                  4
                  -1
                  -3
```

#### *Parameters:*

- 3 is the "listf" function of the LISTDIR5 utility.
  - 4 is the "listsec" function of the LISTDIR5 utility.
  - 1 is a HEX output; LISTDIR5 had OCTAL output.
  - 3 does the same as in 3 plus password and creator (same as LISTDIR5 plus the ;PASS)
- The commands :LISTACCT, :LISTGROUP, and :LISTUSER display the attributes of accounts, groups and users in LISTDIR5 format.
  - Refer the Command Interpreter Reference Tables in Appendix B and the *MPE XL Commands Reference Manual* for more information.

**Labs**

**Notes**

- The following labs are for the Command Interpreter module.
- Please note that solutions for these labs can be found in Appendix F “Lab Solutions”.
- For a concise outline of the CI on MPE XL, refer to the article entitled, “MPE XL Command Interpreter”, in Appendix C.

## Module 2 Introduction to the MPE XL Command Interpreter

### Activity 2.1

1. Write a command file that will allow the user to purge up to nine files with a single command.
2. Write a command file that will print the current date and time, in the following format:  
Wednesday, January 1, 1987, 4:15 PM.
3. Write a command file that will serve as an alternative to the :SHOWME command. Include at least three of the following features:
  - LDEV (\$STDIN and/or \$STDLIST)
  - Current date (complete date)
  - Current time
  - Session number
  - How long the current session has been logged on.
  - Whether or not user is in break mode.
4. Create a logon UDC that prompts the user for what prompt character(s) he/she would like for that session, and that changes the prompt character accordingly.

**System Startup**

**Goal:** To provide students with experience in installing, starting, and updating an MPE XL system and with taking a dump of an MPE XL system.

**Objectives:** After you complete this module, you will be able to:

- Install an MPE XL system.
- Start an MPE XL system.
- Update an MPE XL system.
- Take a dump of an MPE XL system.
- Issue ISL Commands.

**Note:** This training module complements the *MPE XL Startup/Shutdown Reference Guide*. When you see the annotation "Pages xx/xx", it refers to the manual.

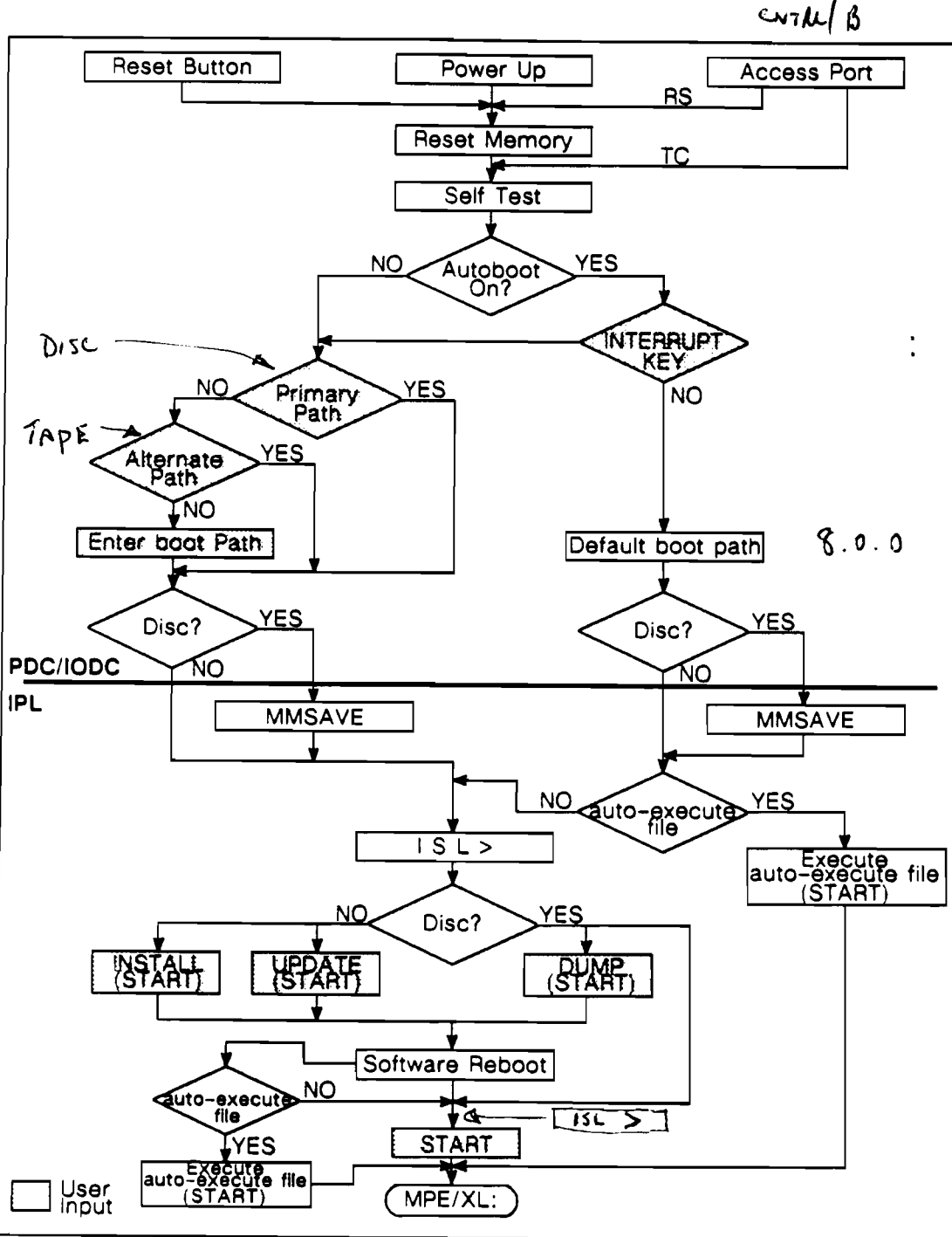
*ISL = interactive System Loader*



# Module 3 System Startup, Stop, Update, and DUMP

## Startup Flow

### System Startup Flow



*If console hung or System hung Dump Memory using Diagnostic Switch 3, then Reset Butt. - will m. reset sys. - system Memory Board.*

*FIRST 16 Mb of Memory into 'DISE' - To Boot System  
 • 100 Mb To READ Dump  
 • 1 TAPE @ 6250 ~ 5 MINS*

**Notes:** ■ When taking a dump, make sure to use paths that bypass "Reset Memory" and the execution of the "autoboot" file.

■ INSTALL, UPDATE, START and DUMP are ISL utilities.

• *ISL Initial Program Loader*

System Startup

Booting the System

- |                           |                                       |                |                   |
|---------------------------|---------------------------------------|----------------|-------------------|
| ■ <b>CTRL</b> B<br>CM> rs | <i>HARD<br/><del>SELF</del> RESET</i> | ■ RESET Button | <i>HARD RESET</i> |
| ■ <b>CTRL</b> B<br>CM> tc | <i>Soft RESET</i>                     | ■ POWER ON     |                   |

Notes

- To override the autoboot and get to ISL, press any key during the first 10 seconds.
- Always use a **CTRL** B command if the access port is functional.
- **CTRL** B rs, Reset Button and Power On are all hard resets and they perform a destructive self-test.
- **CTRL** B tc is a soft reset which performs a non-destructive (does not reset memory) self-test. ALWAYS use **CTRL** B tc when you are taking a dump. If you don't, the data will not be valid.
- Unless you are taking a dump, perform a hard reset. A soft reset bypasses diagnostic hardware testing.

System Startup

**Startup Dialogue**

**PDC Part 1 (Autoboot was overridden)**

Processor Dependent Code (PDC) revision 3

Console path = 8.1.0.0.0.0.0

Primary boot path = 8.0.0.0.0.0.0

Alternate boot path = 8.2.3.0.0.0.0

Autoboot from primary boot path enabled.

To override, press any key within 10 seconds.

{ a key was pressed }

Boot from primary boot path (Y or N)?> N

Boot from alternate boot path (Y or N)?> N

Enter boot path, command, or ?> 8.0.1

Booting.

TG200077\_002

See pages 1-6/1-13 for I/O path information and examples of bringing up the system. See Appendix C for error messages.

© 1987 Hewlett-Packard Company

Notes

By entering "8.0.1", you are specifying that the system disc is no longer on path "8.0.0" but has been physically moved to "8.0.1".

If you do not override the autoboot within the 10 second timeframe, the system will boot ISL and then look for an autoboot file to start the system.

**System Startup**

**Startup Dialogue**

**PDC Part 2**

```
Console IO Dependent Code (IODC) revision 2
Boot IO Dependent Code (IODC) revision 2
```

```
Booted
MMSAVE Version 9.60
DUMPAREA found, save main memory to disc
```

```
ISL Loaded
ISL Revision 2634 August, 1986
```

```
ISL> START
```

```
  :
  :
  :
```

TG200077\_003

© 1987 Hewlett-Packard Company

**Notes**

- If AUTOBOOT isn't overridden, and if there is an autoboot file, the ISL prompt is bypassed and the system is started from the autoboot file. An autoboot file is supplied with the system, but creation of new autoboot files is not currently supported.

ISL

**ISL Utilities: Options**

**START Options**

<b>GROUP = config</b>	Multiple configuration groups may exist on disc in SYS account. User can start with any one. Default is GROUP=CONFIG.
<b>SINGLE-USER</b> <b>MULTI-USER</b>	To bring up the system in a single user mode for diagnostic support. Default is MULTI-USER
<b>SYSSTART</b> <b>NOSYSSTART</b>	NOSYSSTART indicates that SYSSTART.PUB.SYS will not be executed after system has been started. Default is SYSSTART
<b>RECOVERY</b> <b>NORECOVERY</b>	RECOVERY indicates that restartable jobs should be started and spool files should be saved. Default is RECOVERY.
<b>SINGLE-DISC</b> <b>MULTI-DISC</b>	Use all discs or just the main system disc. Default is MULTI-DISC.
<b>LOGON=</b>	Used to specify which account will be logged on. Default is OPERATOR.SYS.

TG200077\_004

© 1987 Hewlett-Packard Company

**Notes**

Option SINGLE-DISC is valid only when SINGLE-USER is specified.

- Can specify Group
- Autoint is here

ISL

### ISL Utilities: START Example Re-Boot System From Disc

```
: CTRL A
= SHUTDOWN
SHUT
CTRL B
CM> RS
      { Press any key to override the autoboot }

Boot from primary path (Y or N)?> Y
      :
ISL> START GROUP = MYCONFIG
      :
: HELLO OPERATOR.SYS;HIPRI
```

TG200077\_005

© 1987 Hewlett-Packard Company

### Notes

- Starts the system with the configuration stored in the group MYCONFIG, with the default options RECOVERY and SYSSTART.
- Note that if you restart the system with "ISL>START", the default configuration group will be used.

ISL

**ISL Utilities= Options**

**UPDATE Options**

<b>CONFIG</b> <b>NOCONFIG</b>	CONFIG indicates that the configuration files on the disc should be replaced by those on tape. Default is NOCONFIG.
<b>START</b> <b>NOSTART</b>	Automatic start will be invoked if the START option is present. Default is START.
<i>The following options are only valid with START.</i>	
<b>GROUP= config</b>	Multiple configuration groups may exist on disc in SYS account. . User can start with any one. Default is GROUP=CONFIG.
<b>SINGLE-USER</b> <b>MULTI-USER</b>	To bring up the system in a single user mode for diagnostic support. Default is MULTI-USER.
<b>SYSSTART</b> <b>NOSYSSTART</b>	NOSYSSTART indicates that SYSSTART.PUB.SYS will not be executed after system has been started. Default is SYSSTART
<b>SINGLE-DISC</b> <b>MULTI-DISC</b>	Uses all discs or just the main system disc. Default is MULTI-DISC.
<b>LOGON=</b>	Used to specify which account will be logged on. Default is OPERATOR.SYS.

TG200077\_006

© 1987 Hewlett-Packard Company

**Notes**

- Option SINGLE-DISC is valid only when SINGLE-USER is specified.
- GROUP=*config* does not affect where UPDATE CONFIG puts the configuration files; they will always replace the files in CONFIG.SYS.

ISL

ISL Utilities: UPDATE Example

Re-Boot System From Tape

```

: CTRL A
= SHUTDOWN
SHUT
CTRL B
CM> RS          { Press any key to override the autoboot }

Boot from primary path (Y or N)?> N
Boot from alternate boot path (Y or N)?> Y

ISL> UPDATE CONFIG

: HELLO OPERATOR.SYS;HIPRI
    
```

TG200077\_007

© 1987 Hewlett-Packard Company

Notes

- Updates the Operating System and copies the configuration files in group CONFIG.SYS on tape to CONFIG.SYS on disc. It also replaces DSTRINS.PUB.SYS and DSTLID.PUB.SYS with the corresponding files from the tape.
- If UPDATE or UPDATE NOCONFIG were entered, the above mentioned files in CONFIG.SYS and PUB.SYS would not be restored.

*Logging ID*

*↑ Bug! NMCconfig will always be restored! will be fixed  
BACK IT UP, THEN RESTORE.*

*VIRMIC = migration from APE-V : PMS, Logging ID's are referred to APE-V*



ISL

**ISL Utilities: Options**

**INSTALL Options**

<b>START</b> <b>NOSTART</b>	Automatic start will be invoked if the START option is present. Default is START.
<i>The following options are valid only with START.</i>	
<b>SINGLE-USER</b> <b>MULTI-USER</b>	To bring up the system in a single user mode for diagnostic support. Default is MULTI-USER.
<b>SYSSTART</b> <b>NOSYSSTART</b>	NOSYSSTART indicates that SYSSTART.PUB.SYS will not be executed after the system has been started. Default is SYSSTART.
<b>SINGLE-DISC</b> <b>MULTI-DISC</b>	Use all discs or just the main system disc. Default is MULTI-DISC.
<b>LOGON=</b>	Used to specify which account will be logged on. Default is OPERATOR.SYS.

TG200077\_008

© 1987 Hewlett-Packard Company

**Notes**

- Option SINGLE-DISC is valid only when SINGLE-USER is specified.

A. 00. 10  
20

A. 01. 00 System Release ⇒ INSTALL (RELOAD)

ISL

**ISL Utilities: Options**

**DUMP Options**

<b>SUBSET= ALL MEMORY</b>	ALL indicates that both main memory and swapped data on disc should be dumped to tape. Default is ALL.
<b>START NOSTART</b>	Automatic start will be invoked if the START option is present. Default is START.
<i>The following options are valid only with START.</i>	
<b>GROUP= Config</b>	Multiple configuration groups may exist on disc in SYS account. User can start with any one. Default is GROUP=CONFIG.
<b>SINGLE-USER MULTI-USER</b>	To bring up the system in a single user mode for diagnostic support. Default is MULTI-USER.
<b>SYSSTART NOSYSSTART</b>	NOSYSSTART indicates that SYSSTART.PUB.SYS will not be executed after system has been started. Default is SYSSTART.
<b>RECOVERY NORECOVERY</b>	RECOVERY indicates that restartable jobs should be restarted and spool files should be saved. Default is RECOVERY.
<b>SINGLE-DISC MULTI-DISC</b>	Use all discs or just the main system disc. Default is MULTI-DISC.
<b>LOGON=</b>	Used to specify which account will be logged on. Default is OPERATOR.SYS.

TG200077\_009

© 1987 Hewlett-Packard Company

**Notes**

- Option SINGLE-DISC is valid only when SINGLE-USER is specified.
- SUBSET=MEMORY will be rarely used.

ISL

### ISL Utilities

### DUMP Example

**CTRL B**

CM> TC

{ Override autoboot }

ISL> DUMP

:

### Notes

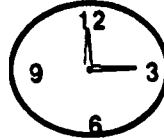
- Use of TC instead of RS in the "CM>" mode is imperative for obtaining a valid dump. (See flow chart on page 3-2). RS performs a destructive self-test (it resets memory) so the dump data would be lost.

ISL

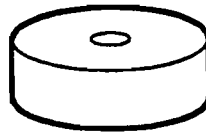
Additional ISL Utilities



■ CLKUTIL



■ DISCUTIL



■ PMEDAT



TG200077\_011

© 1987 Hewlett-Packard Company

Notes

- CLKUTIL: Read or set DATE and TIME.
- DISCUTIL: Standalone utility that allows users to request various disc operations. It replaces SADUTIL and the RECOVER option in VOLUTIL replaces RECOVER5.
- PMEDAT: Standalone utility which is used on a down system to diagnose system failures prior to taking a dump. It is for HP use only.

*• Not at System Release -  
• 99% of DEBUG*

ISL

**ISL Utilities and MPE V/E Counterparts**

MPE V/E		MPE XL
■ RELOAD	→	■ INSTALL
■ UPDATE	→	■ UPDATE NOCONFIG
■ COLDSTART	→	■ UPDATE CONFIG
■ COOLSTART	→	■ START NORECOVERY :
■ WARMSTART	→	■ START RECOVERY
■ SADUTIL	→	■ DISCUTIL
■ DUMP	→	■ DUMP

TG200077\_012

© 1987 Hewlett-Packard Company

**Notes**

- It is not possible to change the system configuration on the way up with MPE XL as it was on MPE V/E via a COOLSTART, COLDSTART, UPDATE or RELOAD.

**ISL**

**Commonly Used ISL Commands**

- |                     |                                |
|---------------------|--------------------------------|
| ■ <b>HELP</b>       | ■ <b>CONSPATH</b>              |
| ■ <b>LISTF (LS)</b> | ■ <b>LISTAUTOFL (LSAUTOFL)</b> |
| ■ <b>AUTOBOOT</b>   | ■ <b>DISPLAY</b>               |
| ■ <b>ALTPATH</b>    | ■ <b>PRIMPATH</b>              |

TG200077\_013

See pages 2-1/2-7 for a list of all the commands.

© 1987 Hewlett-Packard Company

**Notes**

- LISTF shows ISL utilities for selected boot media
- AUTOBOOT sets or clears the autoboot flag
- ALTPATH modifies the alternate boot path
- PRIMPATH modifies the primary boot path
- CONSPATH modifies the console path
- LISTAUTOFL shows contents of the autoboot file
- DISPLAY displays paths and flag settings
- All of the above commands, except LISTF, are for modifying/displaying information in stable storage.

**Activity 3.1 Lab: System Startup**

**Instructions:**

1. Press "**CTRL** B"
2. WHEN THE "CM>" prompt appears, type "RS".
3. If the system was previously active, you will be asked if you wish the system to be restarted: answer "Y".
4. If AUTOBOOT is OFF, you will be asked if you wish to boot from the primary path: answer "Y".

If AUTOBOOT is ON, you will be given 10 seconds to press any key to cause a prompt for boot path. If you do not press a key, the primary boot path will be used. Press a KEY.

5. When the "ISL>" prompt appears, type "START NORECOVERY".
6. The system will start to boot, the date and time will be displayed, and you will be asked to confirm if they are correct. If they are incorrect, type "N" and enter the correct values when you are prompted for them. If they are correct, enter "Y" or just wait a few seconds and the system will continue booting.

Be sure all sessions which are running through the DTC are logged off prior to restarting (CM>RS) the system. If there are sessions logged on, it may be necessary to reboot the DTC on this version of the operating system.

**Activity 3.2 Lab: ISL Commands and Utilities**

**Instructions:**

1. Press "**CTRL** B".
2. When the "CM>" prompt appears, type "RS" and follow the instructions from Lab 1 to get to the ISL prompt.
3. When the "ISL>" prompt appears, type "HELP" for a list of ISL commands.
4. Select the proper commands to answer the following questions. (Write down the command you used for each one.)

Is the AUTOBOOT flag on?

What is the console boot path?

What is the alternate boot path?

What is the primary boot path?

Is there an autoboot file?

What utilities are available for the boot media?

You are going to change some of the system defaults. Please write down the current defaults so you can reset them after you have done the following exercises.

Change the alternate boot path to: Device 7, Module Number 16, Device Adapter in slot 3.

Turn off the boot flag.

Verify the changes you made.

Reset everything back to its original state.

6. Determine the date and time.
7. Perform the equivalent of a COOLSTART.



**Access Port**

**Access Port (AP)**

**Purpose:** ■ Provides capability for versatile remote support.

**Security:** ■ Requires both hardware and software enabling

**Function:** ■ The following may be done remotely:

- Observe local console
- Act as full console
- Act as normal DTC terminal
- Boot and patch system
- Reset the system (hard or soft)

**MPE V/E Equivalent:** ■ Modem and TELESUP

TG200077\_014

Appendix B in the manual discusses the Access Port.

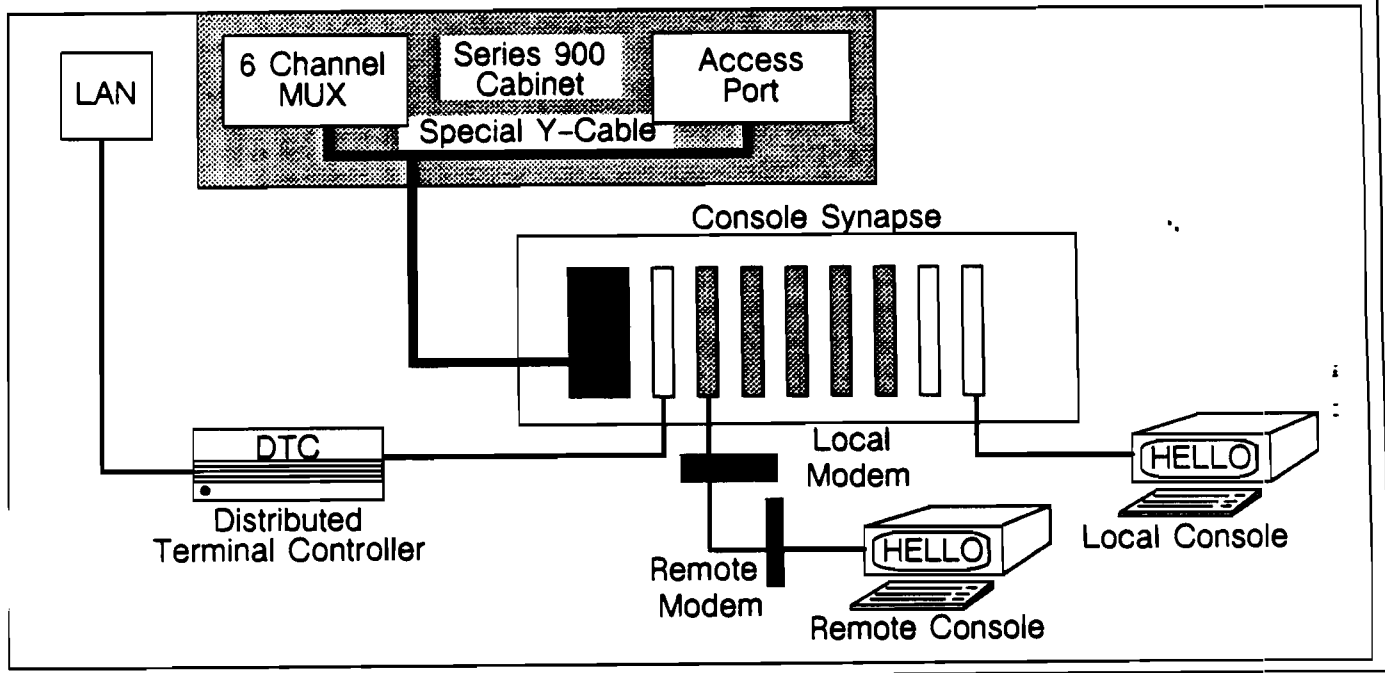
© 1987 Hewlett-Packard Company

**Notes**

- The Access Port functions as either the console, with access to all **CTRL** A and **CTRL** B commands, or as a session through the DTC.
- In console mode, it is a parallel console for the system console.

**Access Port**

**Access Port: Hardware Connections**



TG200077\_015

© 1987 Hewlett-Packard Company

**Notes**

- In console mode, you are going through the MUX; in session mode you are going through the DTC.
- Neither  nor  commands will work over a DTC.

**Access Port**

### Access Port: Enabling

**Hardware**

<div style="border: 1px solid black; display: inline-block; padding: 2px;">XXXX</div> Status Display	<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 50%;">Temperature</td><td style="width: 10%; text-align: center;">○</td><td style="width: 10%; text-align: center;">○</td><td style="width: 10%; text-align: center;">○</td></tr><tr><td>DC Power</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr><tr><td>Battery Backup</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr><tr><td>Self Test</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td><td style="text-align: center;">○</td></tr></table>	Temperature	○	○	○	DC Power	○	○	○	Battery Backup	○	○	○	Self Test	○	○	○	Console <input checked="" type="checkbox"/>
Temperature	○	○	○															
DC Power	○	○	○															
Battery Backup	○	○	○															
Self Test	○	○	○															

Reset

Press the button

**Software**

**CTRL B**

CM>er

Current remote console access configuration.

Mode:	Multiple (or Single)
Password:	itg
Password faults:	05

Do you wish to change the configuration (Y/N):n

Remote console access is now enabled.

Enter the commands

TG200077\_016

© 1987 Hewlett-Packard Company

### Notes

- Enabling the console, by pressing the Console Button, allows CTRL B commands.
- The "er" command allows remote dial-in to the Access Port.
- The password may be up to 24 characters.

*Console disabled / Remote disable - No Security Problem*

**Access Port**

**Access Port: Remote Usage**

**Logging ON:**

1. Do a **CTRL E** to enable remote support modem.
2. Type D for dial.
3. Type telephone number of remote system.
4. Hit RETURN key AFTER telephone number is echoed back (Remote system is automatically dialed.)
5. Give password

**Important Keystrokes:**

**CTRL A** MPE system console commands ("=")

**CTRL B** Access port control prompt ("CM")

**CTRL Q** Xon

**CTRL S** Xoff

**BREAK Key** Takes console ("slave" becomes "master")

**Notes**

- The BREAK key may only be used to "take console", not to "give console".

**Access Port**

**Access Port: Commands**

- CA - Configure system remote support modem port.
- CO - Enter console mode.
- DI - Disconnect line to remote console terminal
- DR - Disable access by a remote console terminal.
- DS - Disable display of system status line during console mode.
- ER - Enable access by a remote console terminal.
- ES - Enable display of system status line during console mode.
- HE - Display this screen.
- RS - Stop all processing, initiate SPU selftest, load software from load device if enabled for autoboot.
- SE - Transfer remote terminal from console/control to session mode.
- TA - Initiate Access Port selftest.
- TC - Transfer processor execution to operating system specific routine.
- TE - Send message between the local and remote console terminals.

TG200077\_018

See pages B-3/B-9 for details.

© 1987 Hewlett-Packard Company

**Notes**

This is a complete list of the Access Port commands. You have been exposed to the commonly used ones in previous slides.

**Access Port**

**Access Port: Errors and Messages**

**Error Codes:**

(An error has occurred)

APERRxx;                    xx =Error Number

**Error Messages:**

(Informational message - an error may occur)                    :

APMSGxx;                    xx =Message Number                    :

TG200077\_019

See pages B-11/B-14 in the manual.

© 1987 Hewlett-Packard Company

**Notes**

- Duplicate numbers may occur between Error Codes and Error Messages.

- Here are some examples of APERR and APMSG messages:

"SPU hardware was successfully set. (APMSG 02)"  
(In response to CM>RS)

"Illegal command, type HE for help. (APERR 10)"  
(In response to CM>AB)

"Command may not be executed by a local user. (APERR 15)"  
(In response to CM>SE on the local console.)

**Activity 3.3 Lab: Access Port Usage**

**Instructions:** Perform the following steps and write in the procedures you used to accomplish them.

1. Ensure that the Access Port may be accessed.
2. If it isn't set up for remote access, what two things must be done? \_\_\_\_\_  
\_\_\_\_\_
3. What command is used to enable remote access (hint: use HELP if needed). This area allows single access/multiple access. What is the difference between single and multiple access?  
\_\_\_\_\_  
\_\_\_\_\_
4. Check the modem port configuration (assume it is correct and don't make any changes).  
\_\_\_\_\_
5. Have remote user log in for parallel use. \_\_\_\_\_
6. Hitting the \_\_\_\_\_ key will allow the remote console to type on the terminal.
7. For the local console to issue commands again, the \_\_\_\_\_ key must be pressed.
8. How does the console go to a session or leave the AP CM>? \_\_\_\_\_
9. Does the remote user use the same command to get a console session? \_\_\_\_\_
10. How does the system console abort the remote user? \_\_\_\_\_
11. How does the remote user abort the parallel connection? \_\_\_\_\_  
In what way does this limit the remote user? \_\_\_\_\_  
\_\_\_\_\_

(Answer question #11 but don't enter the command.)

12. The CM>TA command is one way of testing the AP card. What happens when this command is issued? \_\_\_\_\_  
\_\_\_\_\_

**Activity 3.3 Lab: Access Port Usage (continued)**

13. Which terminal is the master terminal after the completion of the above test? \_\_\_\_\_  
\_\_\_\_\_
14. The CM>TC and CM>RS commands are for restarting the system. What is the difference between these commands? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
15. Start up the system from the remote console. What commands did you use? \_\_\_\_\_  
\_\_\_\_\_
16. To display the banner during session mode, use the CM>ES and then issue a CM>CO. To get rid of the banner display, a  B must be issued, then a CM>DS. Try it.

;  
:



File LABEL TABLE & LABELTABLE ON DISK

• CONTAINS FILE LABELS :- NOT IN FIRST BLOCK OF FILE (TYPE-V)



1  
2

## Module 4 System Configuration

### Goal and Objectives

**Goal:** To provide students with hands on experience with system configuration.

**Objectives:** After completing this module, you will be able to:

- Explain the purpose and capabilities of SYSGEN.
- Execute SYSGEN and use SYSGEN commands.
- Use SYSGEN to make system configuration changes.
- Use SYSGEN to make boot tapes.
- Boot up the system to use a new configuration.

**SYSGEN Overview**

**SYSGEN Utility**

**Purpose & Capabilities**

- Configure System I/O
- Configure System Parameters
- Add/Remove/Replace
  - System Libraries
  - Program Files
  - Boot Files
- Make Boot Tapes

**Notes**

## Module 4 System Configuration

### SYSGEN Overview

#### SYSGEN Execution

#### How to Run SYSGEN

```
:SYSGEN [ Base Configuration Group ]  
        [ .New Configuration Group ]  
        [ .Command Input File ] (Formal Designator = SYSGIN)  
        [ .Output File ] (Formal Designator = SYSGOUT)
```

⋮  
⋮

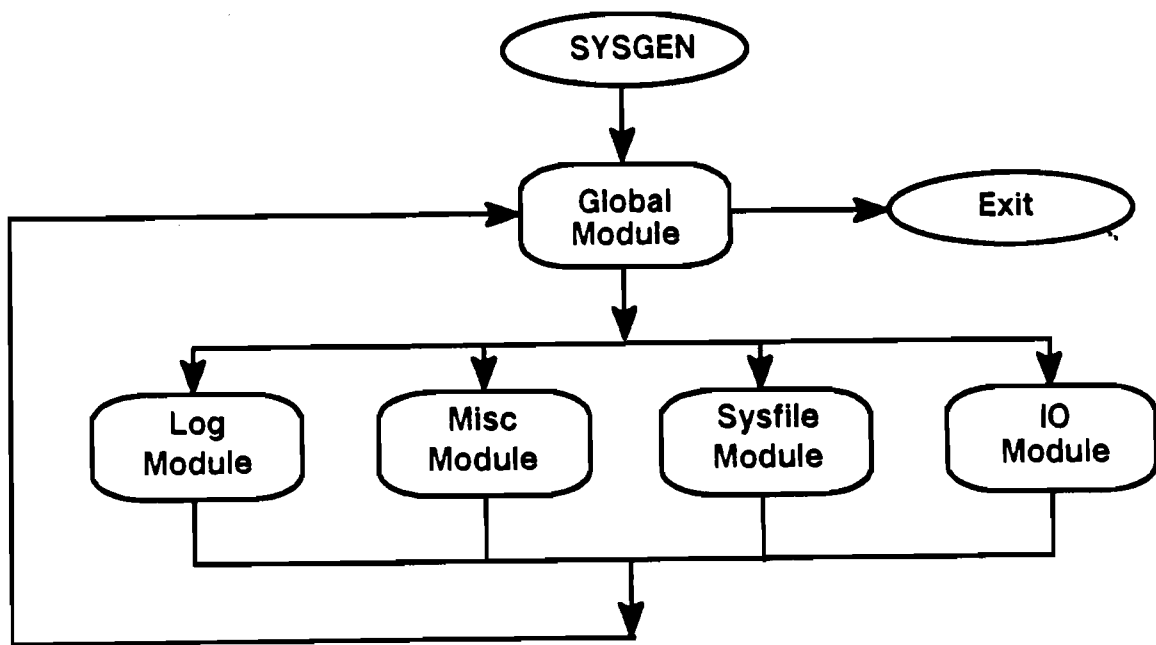
### Notes

- All parameters are optional. If you enter SYSGEN, you will use CONFIG.SYS as the "Base Configuration Group" and there will be no "New Configuration Group" specified.
- SYSGLIST is the file designator for the standard SYSGEN listing file; it is set by default to any device in the class LP.
- SYSGTAPE is the file designator for the tapedrive.

**SYSGEN Overview**

**SYSGEN Components**

**Configurator Modules**



G200079\_004

© 1987 Hewlett-Packard Company

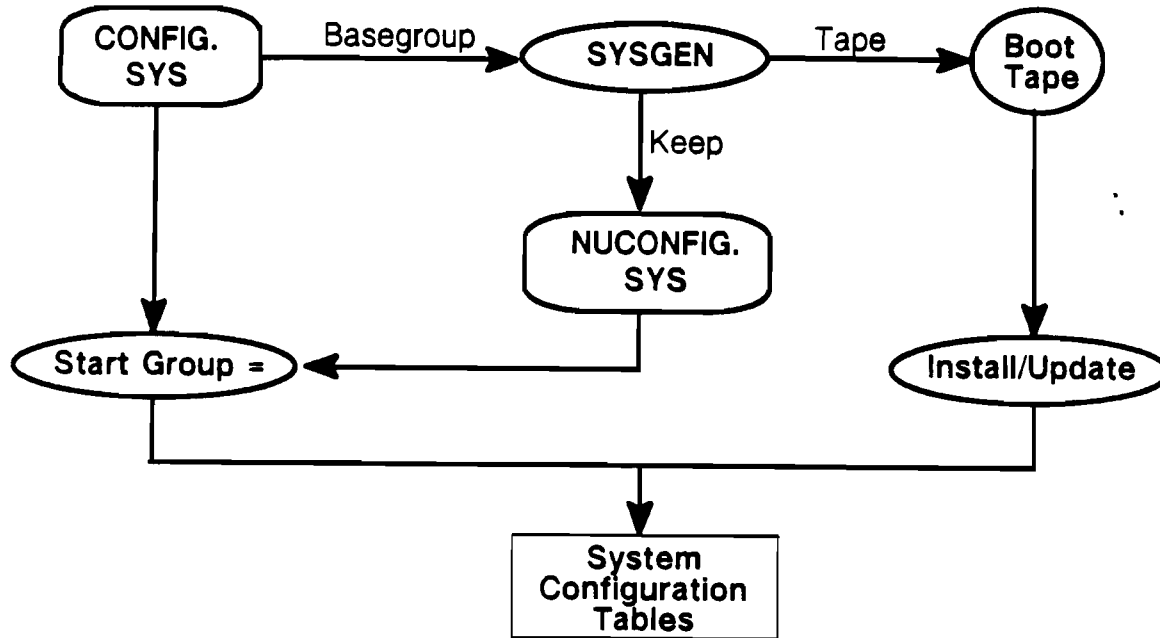
**Notes**

- The Global Module allows the setting of SYSGEN-wide parameters, access to other modules, and boot tape creation.
- The Log Module is for system and user logging changes.
- The Misc Module is for various changes, including resource limits.
- The Sysfile Module is for system file changes.
- The IO Module is for I/O configuration changes for the local devices.

**SYSGEN Overview**

**SYSGEN System Configuration**

**Configuration Files vs Configuration Tables**



TG200079\_005

© 1987 Hewlett-Packard Company

**Notes**

- MPE XL uses files created through SYSGEN to construct the tables it needs. You do not configure any tables directly.

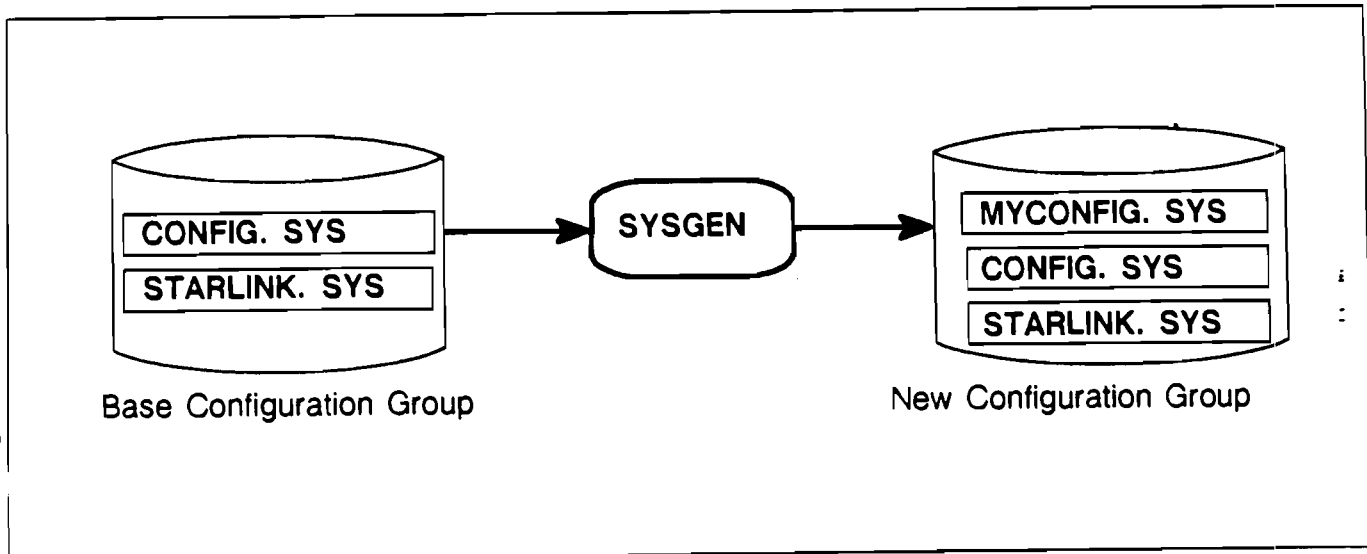
## SYSGEN Overview

### SYSGEN Configuration Groups

#### Base vs New Configuration Groups



You will always start with a "Base Configuration Group".  
You may keep to a different "New Configuration Group".



TG20079\_006

© 1987 Hewlett-Packard Company

## Notes

- SYSGEN requires that configuration files are kept in the SYS account. It will cross account boundaries if necessary. It will also place the files on LDEV 1 to guarantee they will be available at startup time.
- The group used to start the system is the default "Base Configuration Group".



**SYSGEN Overview**

**SYSGEN CONFIG.SYS**

**Sample Configuration**

■ Configuration in CONFIG.SYS

- 8 HP7935 Disc Drives
- 6 HP2624B Terminals → *Rev 3129 OR LATER Use Not Supported*
- 3 HP7978 Tape Drives (one for stream device)
- 1 HP2566A Line Printer
- 1 HP2688A Page Printer

■ Default settings for logging and limits

■ Default system libraries, system programs and boot files

TG200079\_007

© 1987 Hewlett-Packard Company

**Notes**


- This configuration will be changed.

*7937 ⇒ special procedures to boot system. (May change at Sys. Release)*

**SYSGEN Overview**

**SYSGEN Commands**

**Syntax, Indicators and Abbreviations**

Command Syntax	COMMAND NAME    [ <i>positional parameters</i> ] [ <i>keyword parameters</i> ] [ <i>{comments }</i> ]		
Number Base Indicators	Hexadecimal = \$	Decimal = # (default)	Octal = %
Continuation Character			
Abbreviations	Always the first two characters of the command except for "RCMSL" which is abbreviated "RCM":		

3200079\_008

© 1987 Hewlett-Packard Company

**Notes**

- You may use either spaces or commas between parameters.
- A command line has a maximum length of 280 characters.
- The continuation character "&", must be the last non-blank character on the line; an embedded "&" is treated as part of the command string.
- Control Y may be used inside SYSGEN to stop listings or to cancel a partially entered command.

**SYSGEN Modules**

**SYSGEN Global Module Commands**

**:SYSGEN**

**\*\* First level command\*\***

io	log (lo)	misc (mi)	sysfile (sy)
basegroup (ba) tape (ta)	keep (ke)	permyes(pe)	<b>show (sh)</b>
clear (cl)(c) redo	exit (ex)(e)	<b>help (he)(h)</b>	oclose (oc)

sysgen>

TG200079\_009

© 1987 Hewlett-Packard Company

**Notes**

- IO, LOG, MISC and SYSFILE are configurator commands; the rest are Global Commands.
- A ":" followed by an MPE command may be entered to execute an MPE command from any of the modules within SYSGEN.

• *HOLD is Submodule of IO, then keep before limit.*

**SYSGEN Modules**

**SYSGEN I/O Module Commands**

**SYSGEN> IO**

**\*\* IO configurator commands \*\***

<b>aclass (ac)</b>	<b>adev (ad)</b>	<b>apath (ap)</b>	<b>avol (av)</b>
<b>dclass (dc)</b>	<b>ddev (dd)</b>	<b>dpath (dp)</b>	<b>dvol (dv)</b>
<b>lclass (lc)</b>	<b>ldev (ld)</b>	<b>lpath (lp)</b>	<b>lvol (lv)</b>
<b>maddress (ma)</b>	<b>mclass (mc)</b>	<b>mdev (md)</b>	<b>mpath (mp)</b>
<b>mvol (mv)</b>			

**clear (cl)(c)**  
**oclose (oc)**

**exit (ex)(e)**  
**redo**

**help (he)(h)**

**hold (ho)**

**IO>**

**Notes**

- The IO module configures the local devices for the target machine. Remote devices and LANIC cards are configured through the Network Management Configurator (NMMGR.).

**SYSGEN Modules**

**SYSGEN Log Module Commands**

**SYSGEN> LO**

**\*\* LOG configurator commands \*\***

<b>show (sh)</b>	<b>slog (sl)</b>	<b>ulog (ul)</b>	
<b>clear (cl)(c)</b>	<b>exit (ex)(e)</b>	<b>help (he)(h)</b>	<b>hold (ho)</b>
<b>oclose (oc)</b>	<b>redo</b>		

LOG>

:  
:

TG200079\_011

© 1987 Hewlett-Packard Company

**Notes**

- This module allows you to turn System Logging events on/off and to set the limits for User Logging.

**SYSGEN Modules**

**SYSGEN MISC Module Commands**

SYSGEN> MI

\*\* MISC configurator commands \*\*

drin (dr)		job (jo)	lrin (lr)
resource (re)	session (se)	show (sh)	spool (sp)
stack (st)	system (sy)		
clear (cl)(c)	exit (ex)(e)	help (he)(h)	hold (ho)
oclose (oc)	redo		

MISC>

⋮

**Notes**

- This module deals primarily with system limits and startup values; especially those related to jobs, sessions and processes.

**SYSGEN Modules**

**SYSGEN SYSFILE Module Commands**

SYSGEN> SY

**\*\* SYSFILE configurator commands \*\***

about (ab)	acmsl (ac)	asprog (as)	cmsl (cm)
dboot (db)	dcmsl (dc)	dsprog (ds)	lcmsl (lc)
rboot (rb)	rcat (rc)	rcmsl (rcm)	rdcc (rd)
rnmlib (rn)	rsprog (rs)	show (sh)	:

clear (cl) (c)	exit (ex) (e)	help (he) (h)	hold (ho)	:
oclose (oc)	redo			:

SYSFILE>

TG200079\_013

© 1987 Hewlett-Packard Company

**Notes**

- This configurator allows changes to be made in the list of files to be dumped by SYSGEN when the TAPE command is issued.

**SYSGEN I/O Configuration**

**IO Module Configurable Subsets**

Add, Remove or Change

- Devices (Tape Drives, System Printers, etc.)
- Device Adapters (HP-IB Channels, etc.)
- System Disc Volumes
- Class Names
- I/O Paths (Associate Ldev with I/O Path)

**Notes**

- I/O Paths specify the actual hardware connections between the device and the SPU.

• *changes must be done hierarchically: CA, Device Adapter, Device*



**SYSGEN I/O Configuration**

**IO Reserved Devices**

THERE ARE 3 RESERVED LOGICAL DEVICE NUMBERS

- Main System Disc - LDEV 1
- Mag Tape - LDEV 7
- System Console - LDEV 20

Others are your choice

**Notes**

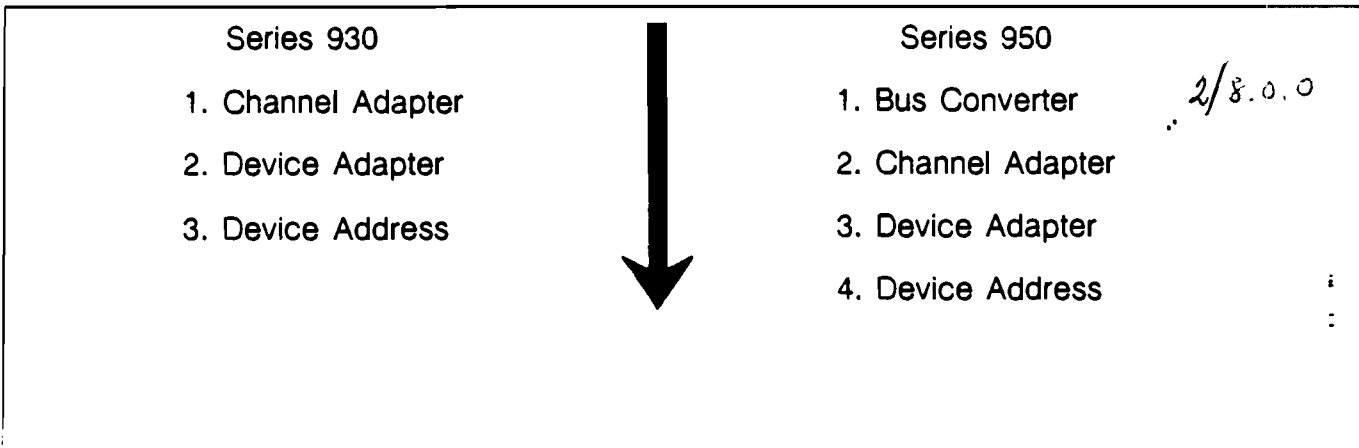
- SYSGEN will not allow you to delete these device numbers.

**SYSGEN I/O Configuration**

**I/O Device Paths**

Path Specification

Remember: I/O paths must be specified in a top down fashion.



For example: A channel adapter must be configured before a device adapter.  
A device adapter must be configured before a device.

**Notes**

- "Channel Adapter" is also referred to as "Module Number" when discussing its configuration value.

## Module 4 System Configuration

### SYSGEN I/O Configuration

#### I/O Device Path Series 930

#### Path Components

Module Number. Device Adapter. Device

(in3) Module Number = Second, Fourth or Sixth Central Bus Adapter Card Slot  
Number Multiplied by 4. ;

(G.c) Device Adapter = CIO Device Adapter Card Slot Number ;

Device = HP-IB Address or Port Number ;

TG200079\_017

© 1987 Hewlett-Packard Company

### Notes

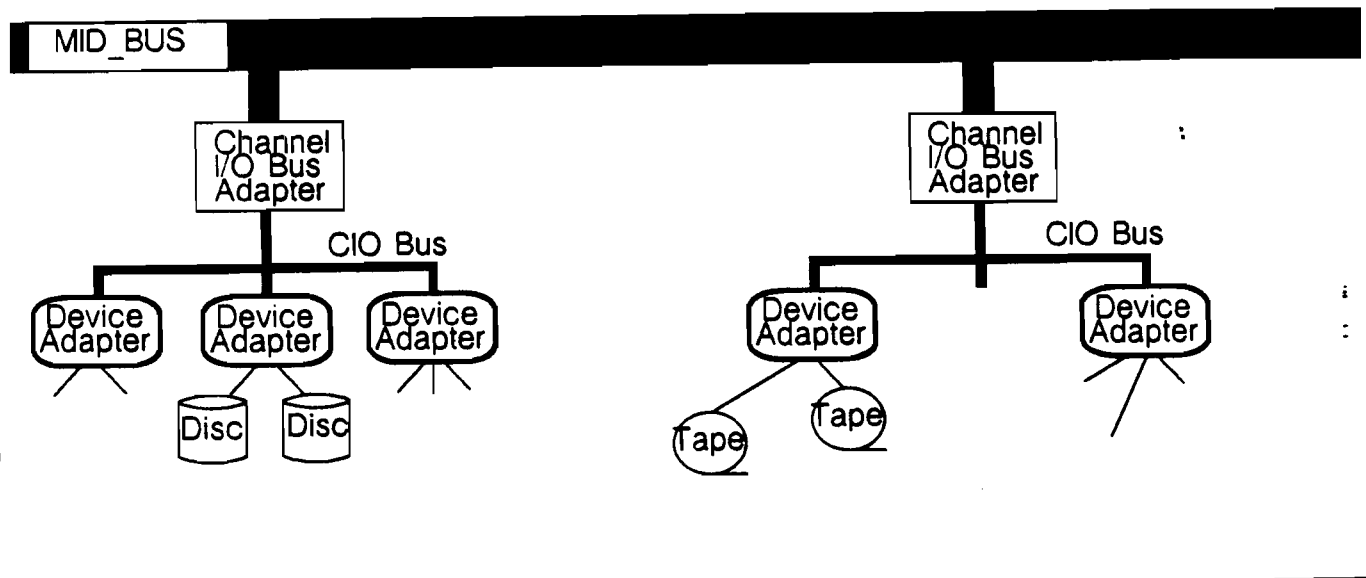
- Module Numbers = 8, 16 and 24.
- Device Adapter Numbers range from 0 to 13 for the first CIO card; from 0 to 15 on the second CIO card (if there is no third CIO card) or from 0 to 7 on both the second and the third CIO cards.

• LANIC configured via NMMGR

SYSGEN I/O Configuration

I/O Device Path Series 930

Hardware Connections



TG200079\_018

©1987 Hewlett-Packard Company

Notes

- The second Channel Adapter indicates there is an I/O Bay.

*LDEV1 8.0.0*

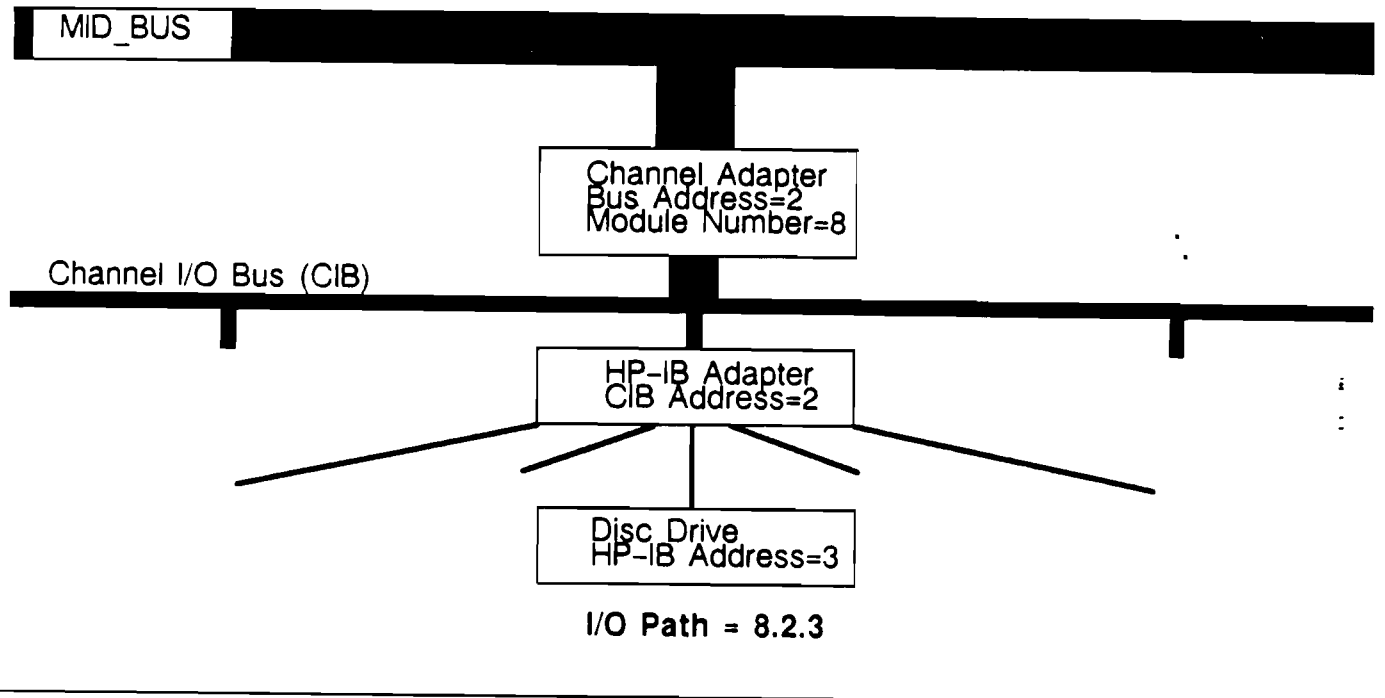
*TAPE 16.0.3*

## Module 4 System Configuration

### SYSGEN I/O Configuration

#### I/O Device Path Series 930

#### Path Numbering Example



TG200079-019

© 1987 Hewlett-Packard Company

### Notes

- The Channel Adapter is attached to card slot number 2 in the MID\_BUS.
- The Device Adapter is attached to card slot number 2 in the Channel I/O Bus.
- The disc drive has an HP-IB address of 3.

**SYSGEN I/O Configuration**

**I/O Device Path Series 950**

**Path Components**

**Bus Converter/Module Number. Device Adapter. Device**

Bus Converter = Either 2 or 6 (on MID\_BUS 0 or MID\_BUS 1)

Module Number = First through sixth Central Bus Adapter card slot number multiplied by 4.

Device Adapter = CIO Device Adapter Card Slot Number

Device = HP-IB address or port number

i  
:

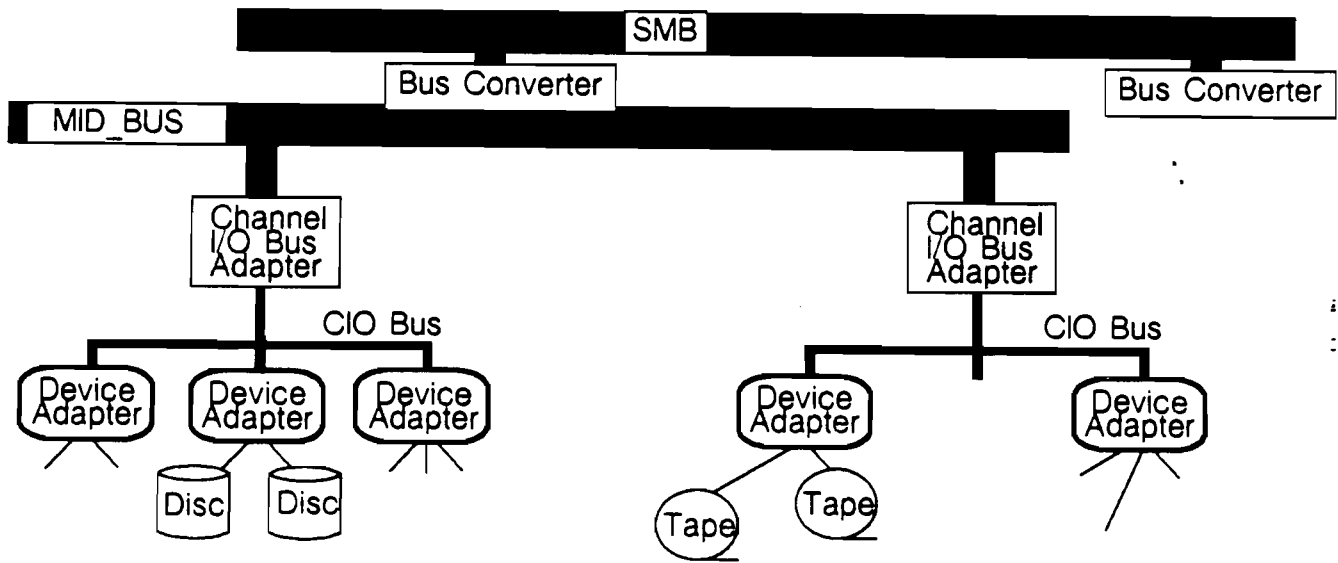
**Notes**

- Only the first and second MID\_BUS card slots may be used since there is no I/O expander bay.

**SYSGEN I/O Configuration**

**I/O Device Path Series 950**

**Hardware Connections**



TG200079\_021

© 1987 Hewlett-Packard Company

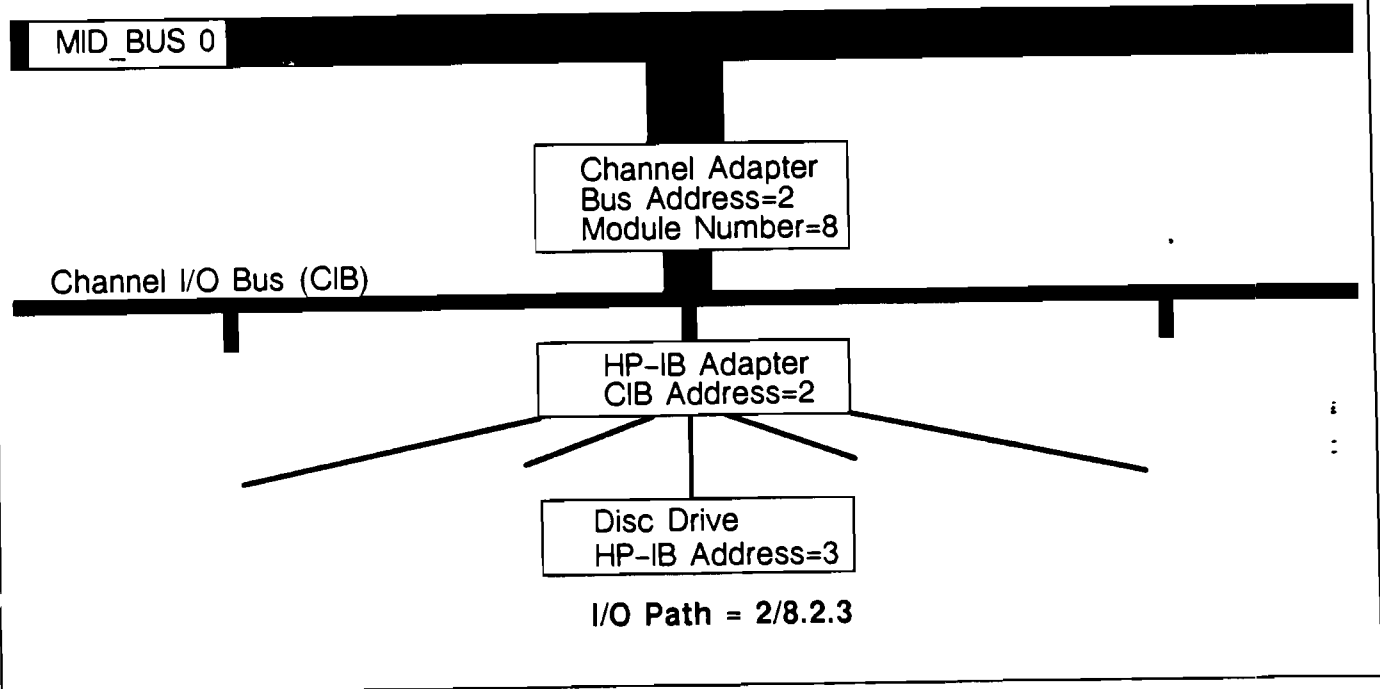
**Notes**

- Only the first and second MID\_BUS card slots may be used on each Bus Converter, since there is no I/O Bay.

SYSGEN I/O Configuration

I/O Device Path Series 950

Path Numbering Example



TG200079-022

© 1987 Hewlett-Packard Company

Notes

- If this were off MID\_BUS 1, the path would be 6/8.2.3 (MID\_BUS 0=2, MID\_BUS 1=6).



**SYSGEN I/O Configuration**

**Configuration Example**

**I/O Changes Wanted**

- Add I/O Devices
  - Four HP7935 Disc Drives on Module Number 16
  - One HP2680 Page Printer on Module Number 8
  - One HP7978 Tape Drive on Module Number 8
- Make the four new disc drives members of the system volume set.
- Change Path for original printer to use HP-IB Address 5.
- Change original tape to an HP7974.

**Notes**

- The Channel Adapter (Module Number) must be added before the Device Adapter.
- The Device Adapter must be added before the Device.
- Obtain a listing of currently configured paths and devices prior to configuring new devices.

SYSGEN I/O Configuration

**Configuration Example**

**Making the I/O changes**

*Part # of Boards*

```
Sysgen> IO { Enter I/O Configurator }
IO> apath 16 id=HP19744 { Add Module number 16 path }
IO> apath 16.0 id=HP27110 { Add Device Adapter path for new drives }
IO> adev ldev=14/17 path=16.0.0 & { Add four discs. Paths and logical device
IO> id=HP7935 { numbers are incremented }
IO> avol ldev=14 & { Add LDEV #14 as member5 of
IO> vname=member5 { System Volume Set }
IO> avol ldev=15 & { Add LDEV #15 as member6 of
IO> vname=member6 { System Volume Set }
IO> avol ldev=16 & { Add LDEV #16 as member7 of
IO> vname=member7 { System Volume Set }
IO> avol ldev=17 & { Add LDEV #17 as member8 of
IO> vname=member8 { System Volume Set }
```

**Notes**

- The I/O Path and product ID must be supplied for each path added.
- The logical device number, path and product ID must be supplied for each device added. If the device is an HP supported device, default values will be supplied for the other parameters.
- Parameters may be entered positionally. (e.g., adev 14/17 8.0.4 HP7935).
- If the device is not an HP supported device, "USER" must be entered as the product ID, and all parameters must be specified.
- IODFAULT.PUB.SYS lists all of the defaults.

**SYSGEN I/O Configuration**

**Configuration Example**

Making the I/O changes (Continued)

```
IO> apath path=8.3 id=HP27110           { Add path for New HP-IB Device
                                         Adapter }

IO> adev id=HP2680 ldev=11 &           { Add Printer As LDEV #11 With
IO> path=8.3.2 class=EPOC,PP           Device Classes EPOC & PP }

IO> adev ldev=12 path=8.2.1 &         { Add Tape Drive As LDEV #12}
   id=HP7978

IO> maddress from=8.2.6 to=8.2.5     { Change Address (Path) of Printer }

IO> mdev ldev=7 id=HP7974 &           { Change Product ID Of Tape Drive }
IO> class=TAPE, BUCKHORN

IO> ldev                               {List All Devices }
   {All LDEV Information Listed Here }

* IO> hold                             { Hold Changes }

IO> exit                               { Exit I/O Configurator }
* Sysgen> ke                           { Keep changes }
  Sysgen> ex                           { Exit SYSGEN }
```

**Notes**

- You hold changes temporarily in the configurator modules and "keep" them in the Global Module.

**SYSGEN I/O Configuration**

**Obtaining Information --Logical Device Listing (Part 1)**

io> ld

<u>LDEV</u>	<u>PATH</u>	<u>DEVICE ID</u>
1	8.0.0	HP7935
2	8.0.1	HP7935
3	8.0.2	HP7935
4	8.0.3	HP7935
6	8.2.7	HP2566A
7	8.2.3	HP7974
8	8.2.2	HP7978
10	8.2.4	HP7978
11	8.3.2	HP2680
12	8.2.1	HP7978
14	16.0.0	HP7935
15	16.0.1	HP7935
16	16.0.2	HP7935
17	16.0.3	HP7935
19	8.2.5	HP2688A
20	8.1.0	HP2624B
21	8.1.1	HP2624B
22	8.1.2	HP2624B
23	8.1.3	HP2624B
24	8.1.4	HP2624B
25	8.1.5	HP2624B

TG200079\_026

© 1987 Hewlett-Packard Company

**Notes**

- The above Logical Device listing is from a Series 930. A Series 950 listing would be the same except the Channel Adapter Bus Address would be shown as "2/8" instead of "8" (e.g. 2/8.0.0, 2/8.0.1, 2/8.0.2, 2/8.0.3., 2/8.2.7, etc.), if the second Channel Adapter were used along with MID\_BUS 0. If MID\_BUS 0 and the first Channel Adapter were used, it would be 2/4.0.0, 2/4.0.1, 2/4.0.2, etc. If MID\_BUS 1 were used, the "2/" would change to "6/".

**SYSGEN I/O Configuration**

**Obtaining Information --Logical Device Listing (Part 2)**

<u>LDEV</u>	<u>OUTDEV</u>	<u>DEV_TYPE</u>	<u>JAID</u>	<u>R</u>	<u>xS</u>	<u>RSIZE</u>	<u>CLASS</u>	<u>CLASS</u>	<u>CLASS</u>
1	0	DISC				128	DISC	SPOOL	
2	0	DISC				128	DISC	SPOOL	
3	0	DISC				128	DISC	SPOOL	
4	0	DISC				128	DISC	SPOOL	
6	0	LP				66	LP	CIPER	SLOWLP
7	0	TAPE				128	TAPE	BUCKHORN	
8	0	TAPE		R		128	TAPE8		
10	LP	TAPE	JA			128	JOBTAPE		
11	0	PP			OS	66	EPOC	PP	
12	0	TAPE				128	TAPE		
14	0	DISC				128	DISC	SPOOL	
15	0	DISC				128	DISC	SPOOL	
16		DISC				128	DISC	SPOOL	
17	0	DISC				128	DISC	SPOOL	
19	0	PP				66	EPOC	BONSAI	PP
							LP	FASTLP	:
20	20	TERM	JAID			40	CONSOLE	TERM	:
21	21	TERM	JAID			40	TERM		
22	22	TERM	JAID			40	TERM		
23	23	TERM	JAID			40	TERM		
24	24	TERM	JAID			40	TERM		
25	25	TERM	JAID			40	TERM		

iO>

TG200079\_027

© 1987 Hewlett-Packard Company

**Notes**

- Record size (RSIZE) is specified in 16-bit words.
- xS can be either OS (output spooled), or IS (input spooled), or blank if neither "Output" nor "Input" is specified as a MODE parameter. (Default is OS for a printer.)
- You don't need to specify device numbers multiple times in the disc class in order to spread files over drives, as you did on MPE V/E. The system automatically optimizes file allocation.

**SYSGEN I/O Configuration**

**Obtaining Information--A partial path Listing for Series 930**

io> lp

PATH:	8	LDEV:		
ID:	HP19744	TYPE:	CA	
PMGR:	SPECTRUM_CIO_CAM	PMGRPRI:		6
LMGR:		MAXIOS:		0
PATH:	8.0	LDEV:		
ID:	HP27110	TYPE:	DA	
PMGR:	HPIB_DAM	PMGRPRI:		6
LMGR:		MAXIOS:		0
PATH:	8.0.0	LDEV:		1
ID:	HP7935	TYPE:	DISC	
PMGR:	CS80-DISC_DM	PMGRPRI:		8
LMGR:	LOGICAL_DEVICE_MANAGER	MAXIOS:		0
PATH:	8.0.1	LDEV:		2
ID:	HP7935	TYPE:	DISC	
PMGR:	CS80-DISC_DM	PMGRPRI:		8
LMGR:	LOGICAL_DEVICE_MANAGER	MAXIOS:		0
PATH:	8.1	LDEV:		
ID:	HP27140	TYPE:	DA	
PMGR:	TMUX_DAM_ME	PMGRPRI:		6
LMGR:		MAXIOS:		0
PATH:	8.1.0	LDEV:		20
IO:	HP2624B	TYPE:	TERM	
PMGR:	TMUX_DAM_ME	PMGRPRI:		9
LMGR:	LOGICAL_DEVICE_MANAGER	MAXIOS:		0

TG200079\_028

© 1987 Hewlett-Packard Company

**Notes**

- PMGR = physical manager name (name of the physical device manager to be associated with the specific I/O path).
- LMGR = logical device manager name (name of the logical device manager to be associated with the specified I/O path).
- MAXIOS = maximum expected concurrent channel I/Os.
- PMGRPRI = physical manager priority (priority at which the physical device manager executes).

**SYSGEN I/O Configuration**

**Obtaining Information--A partial path Listing for Series 950**

io> lp

PATH:	2		LDEV:		
ID:	HPA1105	<i>PART # A Bus CONVERTER.</i>	TYPE:	BC	
PMGR:	BUS_CONV_MGR		PMGRPRI:		2
LMGR:			MAXIOS:		0
PATH:	2/4		LDEV:		
ID:	HP19744		TYPE:	CA	
PMGR:	SPECTRUM_CIO_CAM		PMGRPRI:		6
LMGR:			MAXIOS:		0
PATH:	2/4.0		LDEV:		1
ID:	HP27110		TYPE:	DA	
PMGR:	HPIB_DAM		PMGRPRI:		6
LMGR:			MAXIOS:		0
PATH:	2/4.0.0		LDEV:		1
ID:	HP7935		TYPE:	DISC	
PMGR:	CS80-DISC_DM		PMGRPRI:		8
LMGR:	LOGICAL_DEVICE_MANAGER		MAXIOS:		0
PATH:	2/4.0.1		LDEV:		2
ID:	HP7535		TYPE:	DISC	
PMGR:	CS80_DISC_DM		PMGRPRI:		8
LMGR:	LOGICAL_DEVICE_MANAGER		MAXIOS:		0
PATH:	2/4.1		LDEV:		
IO:	HP27140		TYPE:	DA	
PMGR:	TMUX_DAM_ME		PMGRPRI:		6
LMGR:			MAXIOS:		0
PATH:	2/4.1.0		LDEV:		20
ID:	HP2624B		TYPE:	TERM	
PMGR:	TMUX_DAM_ME		PMGRPRI:		9
LMGR:	LOGICAL_DEVICE_MANAGER		MAXIOS:		0

**Notes**

**I/O Configuration**

**Obtaining Information--Class Listing**

IO>LC

<u>Classname</u>	<u>Mode</u>	<u>Min Mode</u>	<u>DCC Mode</u>	<u>#DCC</u>	<u>Ldev</u>
DISC	default	random		0	1,2,3,4,14,15,16,17,
SPOOL	default	random		0	1,
CONSOLE	default	cio		0	20,
TERM	default	cio		0	20, 21,22,23,24,25
EPOC	default	out		0	11,19
BONSAI	default	out		0	19,
PP	default	out		0	11,19
LP	default	out		0	6, 19
FASTLP	default	out		0	19,
CIPER	default	out		0	6,
SLOWLP	default	out		0	6,
TAPE	default	ncio		0	7,12
BUCKHORN	default	ncio		0	7,
JOBTAPE	default	ncio		0	10,
TAPE8	default	ncio		0	8,

IO>

TG200079\_030

© 1987 Hewlett-Packard Company

**Notes**

- Class modes are:
  - in (input only device)
  - out (output only device)
  - cio (concurrent I/O)
  - ncio (non-concurrent I/O)
  - random (direct access device)
  - default (let system figure it out at startup)



**I/O Configuration**

**Obtaining information--Volume Listing**

IO>LV

<u>Volume Name</u>	<u>LDEV</u>	<u>TRAN</u>	<u>PERM</u>	<u>VOLUME CLASS</u>
MEMBER1	1	100%	100%	DISC
MEMBER2	2	100%	100%	DISC
MEMBER3	3	100%	100%	DISC
MEMBER4	4	100%	100%	DISC
MEMBER5	14	100%	100%	DISC
MEMBER6	15	100%	100%	DISC
MEMBER7	16	100%	100%	DISC
MEMBER8	17	100%	100%	DISC

*TOTAL 100/200*

IO>LV

TG200079\_031

© 1987 Hewlett-Packard Company

**Notes**

- The volume you added will be shown in the IO Configurator of SYSGEN, but will not be considered part of the system volume set unless you create a boot tape and INSTALL the system from that tape. DSTAT ALL will show the current volume set.
- VOLUTIL is the recommended way for adding system volumes.

*LDEV 1 = 75%, 75%*

*use DISCFREE to check*

**Activity 4.1 Lab: I/O Display and Deletion**

**Instructions:** Run SYSGEN and examine the system I/O configuration by invoking the I/O configurator and entering the appropriate command. DO NOT "KEEP" any of the changes you make below.

1. List information for the following at your terminal:
  - LDEV
  - PATH
  - CLASS
  - VOLUME



Experiment with the various parameters.

2. Create a SYSGEN command file to do step 1, but direct the listing to the line printer instead of your terminal. What commands did you use?

---

---

---

3. Delete all devices with an ID of "HP2624B". What command(s) did you use? Which devices were deleted? \_\_\_\_\_

---

4. Delete all devices with a class of LP or PP and show the command(s) used and LDEVs which were deleted. \_\_\_\_\_

---

5. Delete all devices with a class of "DISC".

What happened? \_\_\_\_\_

---

**Activity 4.2 Lab: I/O Configuration Changes**

**Instructions:**

When your system arrives, and is installed, you will have to configure devices into the system using SYSGEN. Assume your system is installed according to the I/O Hardware Interconnection diagram on the next page. Follow the instructions below to configure your new HP3000 Series 930.

1. Fill in the I/O worksheet using information obtained from the I/O Hardware Interconnection diagram. Choose your own LDEV numbers.
2. Log on as MANAGER.SYS and set the base configuration group to CONFIGXX. Make a copy of the group in account SYS and call it CONFIG $nn$  where  $nn$  are your initials.

---

**CAUTION**

DO NOT USE CONFIG.SYS!

---

3. Set the base configuration group to your new group and add all the devices to it that you listed on the I/O worksheet. Use default values for all but the necessary parameters. Remember to make entries in the volume table for the discs. Verify all additions.

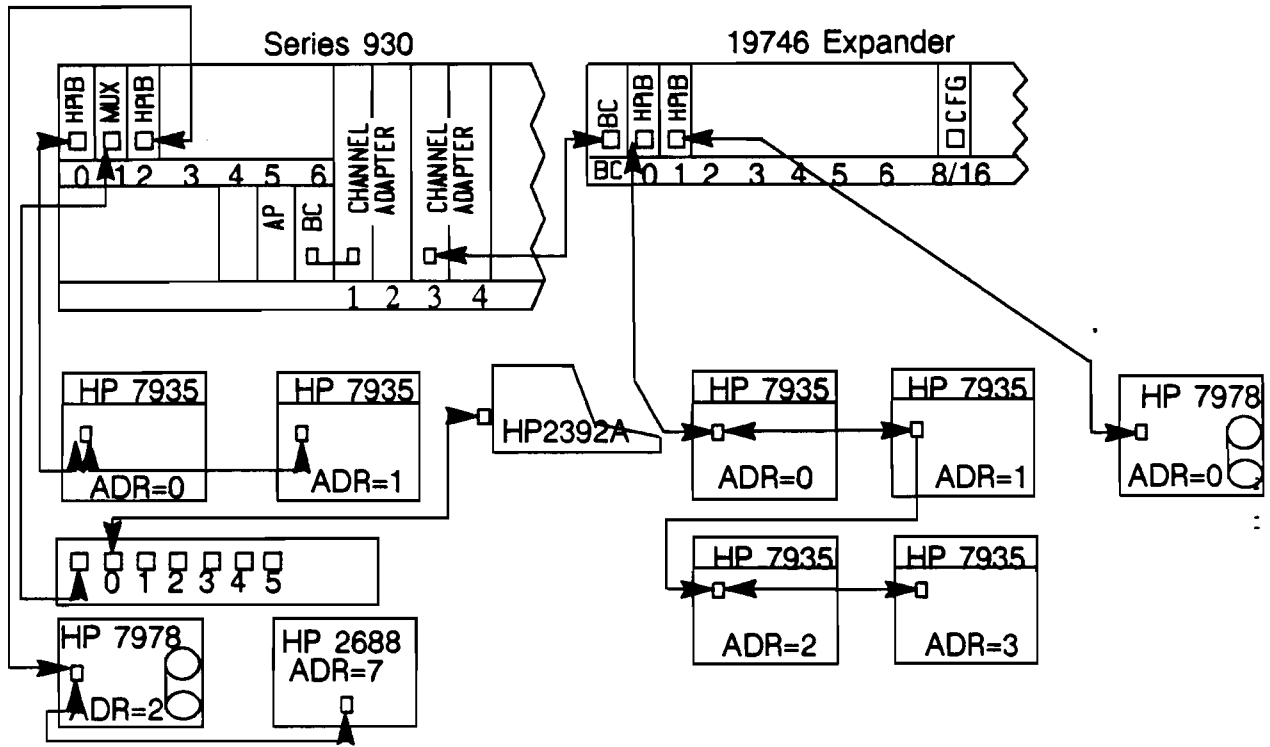
NOTE: Some devices are already configured.

4. Make all additions and changes permanent in your configuration group.
5. What changes would be necessary if you were configuring a Series 950? (Assume you are using MID\_BUS 0).



**Activity 4.2 Lab: IO Configuration Changes - Diagram**

**I/O Hardware Interconnections**



TG200079\_033.1

© 1987 Hewlett-Packard Company

**Notes**

- Answers in Appendix F "Lab Solutions".

**SYSGEN Miscellaneous Configuration**

**MISC Module Configurable Subsets**

- Job and Session Limits
- Default Stack Sizes for Native and HP 3000 Compatibility Modes
- Spooling Parameters
- System Resources and Table Sizes
- Process and Program Limits
- System Identifier
- Other Global System Values

**Notes**

**SYSGEN Miscellaneous Configuration**

**Configuration Example**

**Miscellaneous Changes Wanted**

- Change System ID to "X.B5.60"
- Change Job Limit to 5, maximum CPU time to 500
- Change Spool Space to 20,000, Spool File Count to 100
- Delete Global RINs 80 thru 84

**Notes**

**SYSGEN Miscellaneous Configuration**

**Configuration Example**

**Making the Miscellaneous Changes**

```
SYSGEN> misc { Enter MISC Configurator }
MISC> sy id = x.B5.60 { Change System ID }
MISC> job maxlimit=5 cputime=500 { Change Job Limit and CPU Time }
MISC> spool xsize=20000 maxopen=100 { Change Spool Space and Spool File Count }
MISC> drin global=80,81,82,83,84 { Delete Global RINs 80 through 84 }
MISC> show { Display New Limits }
      { New Limits Displayed Here }
MISC> hold { Hold Changes }
MISC> exit { Leave MISC Configurator }
SYSGEN
```

**Notes**

- Deleted RINs are only deleted in SYSGEN's local copy of the RIN table. You must create a boot tape and either INSTALL or UPDATE CONFIG to delete the RINs from the system.
- Changes to the GRINS and RINS parameters (via the RESOURCE command) also require an INSTALL or UPDATE CONFIG to take effect.



SYSGEN Miscellaneous Configuration

Obtaining Information--Current Configuraton

MISC> SH

<u>JOB command</u>	<u>parameter</u>	<u>MAX</u>		<u>CURRENT</u>
DEFAULT CPU LIMIT	<i>cputime</i>	32767	0	500
MAXIMUM LIMIT	<i>maxlimit</i>	500	0	5
POOL SIZE	<i>pool</i>	10000	1	8
<u>RESOURCE command</u>	<u>parameter</u>	<u>MAX</u>	<u>MIN</u>	<u>CURRENT</u>
GLOBAL RIN LIMIT	<i>grins</i>	1024	0	48
TOTAL RIN LIMIT	<i>rins</i>	1024	5	150
IOMONT LIMIT	<i>iomont</i>	100	10	20
MAX CM CODE SIZE	<i>maxcmcode</i>	16384	1024	16384
CM SEGS PER PROC	<i>cmsegs</i>	255	1	63
MAX XDATA	<i>maxxdata</i>	32764	0	32764
MAX XDATA PER PROC	<i>xdatapercproc</i>	255	0	255
<u>SESSION command</u>	<u>parameter</u>	<u>MAX</u>	<u>MIN</u>	<u>CURRENT</u>
MAXIMUM LIMIT	<i>maxlimit</i>	500	1	60
SECONDS TO LOGON	<i>logontimeout</i>	600	10	180
CI TIMEOUT (MIN)	<i>citimeout</i>	10000	0	0
POOL SIZE	<i>pool</i>	10000	0	20

TG200079\_037

© 1987 Hewlett-Packard Company

Notes

- The LRIN command must be issued to see the RINs which are being used.
- POOL SIZE configures a pool of JSMAINS. Setting them up in advance is better for performance, rather than having them created on demand.
- IOMONT is a circular queue of system events; it is the equivalent of the Monitor Table in MPE V/E.

■ A program is limited to 63 code segments on First Release.

*CONVERT to N.MODE,*

*• POOLS => # of JSMAINS [ of AUTOALLOCATE ]*

**SYSGEN Miscellaneous Configuration**

**Obtaining Information--Current Configuration (Continued)**

<u>SPOOL command</u>	<u>parameter</u>	<u>MAX</u>	<u>MIN</u>	<u>CURRENT</u>
SPOOL EXTENT SIZE	<i>xsize</i>	32764	128	20000
MAX # OPEN SP FILES	<i>maxopen</i>	1023	0	100

<u>STACK command</u>	<u>parameter</u>	<u>MAX</u>	<u>MIN</u>	<u>CURRENT</u>
DEFAULT NM STACK	<i>nm</i>	32767	256	3200
MAXIMUM NM STACK	<i>maxnm</i>	32767	256	3200
DEFAULT CM STACK	<i>cm</i>	4096	256	1200
MAXIMUM CM STACK	<i>maxcm</i>	31232	256	31232
DEFAULT HEAP	<i>heap</i>	32767	0	20000
MAXIMUM HEAP	<i>maxheap</i>	32767	0	32767

<u>SYSTEM command</u>	<u>parameter</u>	<u>VALUE</u>
ID	<i>id</i>	X.B5.60
LOGON PROMPT	<i>logonprompt</i>	MPE XL:
CI PROMPT	<i>ciprompt</i>	:
FACTORY ID	<i>factoryid</i>	9.20.24

**Notes**

**SYSGEN Log Configuration**

**Log Module Configurable Subsets**

- Set number of user log processes and users per log process (user logging)
  
- Enable/disable logging of system events (system logging)

**Notes**

- An INSTALL or UPDATE CONFIG is required to put the user Logging changes into effect.
- System logging Event #100 is a "master switch". If it is off, no user-specified system logging takes place.

**SYSGEN Log Configuration**

**Configuration Example**

**Log Changes Wanted**

- Change user logging processes to 40
- Start logging job termination, system shutdown, and powerfail
- Make sure file close and spooling are not logged

**Notes**

**SYSGEN Log Configuration**

**Configuration Example**

**Making the Log Changes**

```
SYSGEN> log { Enter Log Configurator }
LOG> show all { Display Current Settings }
      { Log Status Displayed Here }

LOG> ulog nlogprocs = 40 { Change Logging Processes To 40 }
LOG> slog on 103,106,107 off=105,108 { Start Logging Job Term, Shutdown, &
                                     Powerfail. Stop File Close & Spool }

LOG> exit { Try To Exit }
:
:
Configuration changes are not held yet!
Still want to exit (yes/no)? no

LOG> hold { Hold Changes }
LOG> exit { Exit Log Configurator }

SYSGEN>
```

TG200079\_041

© 1987 Hewlett-Packard Company

**Notes**

- If PERMYES has been turned "on" in the Global Module, the "exit" would have taken effect immediately, and all the changes would have been lost.

**SYSGEN Log Configuration**

**Obtaining Information--Current Configuration**

log>show

<u>Configurable Item</u>	<u>Max</u>	<u>Min</u>	<u>Current</u>
# of user logging processes	64	2	40
# users per logging process	256	1	128

<u>System Log Events</u>	<u>Event #</u>	<u>Status</u>
Log failure record	100	on
System up record	101	on
Job initiation record	102	off
Job termination record	103	on
Process termination record	104	off
File close record	105	off
System shutdown record	106	on
Power failure record	107	on
Spooling Log record	108	off
I/O error record	111	off
Physical mount/dismount	112	off
Logical/mount/dismount	113	off
Tape labels record	114	off
Console log record	115	on
Program file event	116	off
File open record	144	on
Auto-diag/SUM record	150	on

**Notes**

**SYSGEN System File Configuration**

**SYSFILE Module Configurable Subsets**

Add, Remove or Change:

- Boot files from system tape
- Compatibility Mode Segmented Library Segments (SLs)  
Using the Segmenter is Suggested
- Native Mode System Executable Libraries (replace only)
- System program files
- System message catalog

**Notes**

- An autoboot file is supplied with your system configuration. Making changes to it or replacing it with another file is not supported.
- For SYSFILE changes to become permanent, you must create a boot tape and update the system.

**SYSGEN System File Configuration**

**Configuration Example**

**System File Changes Wanted**

- Add NEWCOPY as System Program FCOPY
  
- Specify NEWSL.PUB.SYS as the Compatibility Mode SL

**Notes**





**SYSGEN System File Configuration**

**Configuration Example**

**Validating the Changes**

```
SYSGEN> keep name=nuconfig           { Write new configuration group  
                                       to disc under group NUCONFIG }  
  
SYSFILE> basegroup nuconfig  
  
SYSFILE> sysfile                       { Read NMCONFIG file to cross-validate and  
                                       list the DTS and NS Ldevs and Paths }  
  
SYSFILE> RDCC nmconfig.pub.sys  
  
SYSFILE> hold  
  
SYSFILE> exit  
  
SYSGEN> keep nuconfig                 { Save the info from the NM config file }  
  
SYSGEN> tape                           { Make boot tape }  
                                       { Tape mount requests appear on system  
                                       console }  
  
SYSGEN> exit                           { Exit SYSGEN }
```

TG200079\_046

© 1987 Hewlett-Packard Company

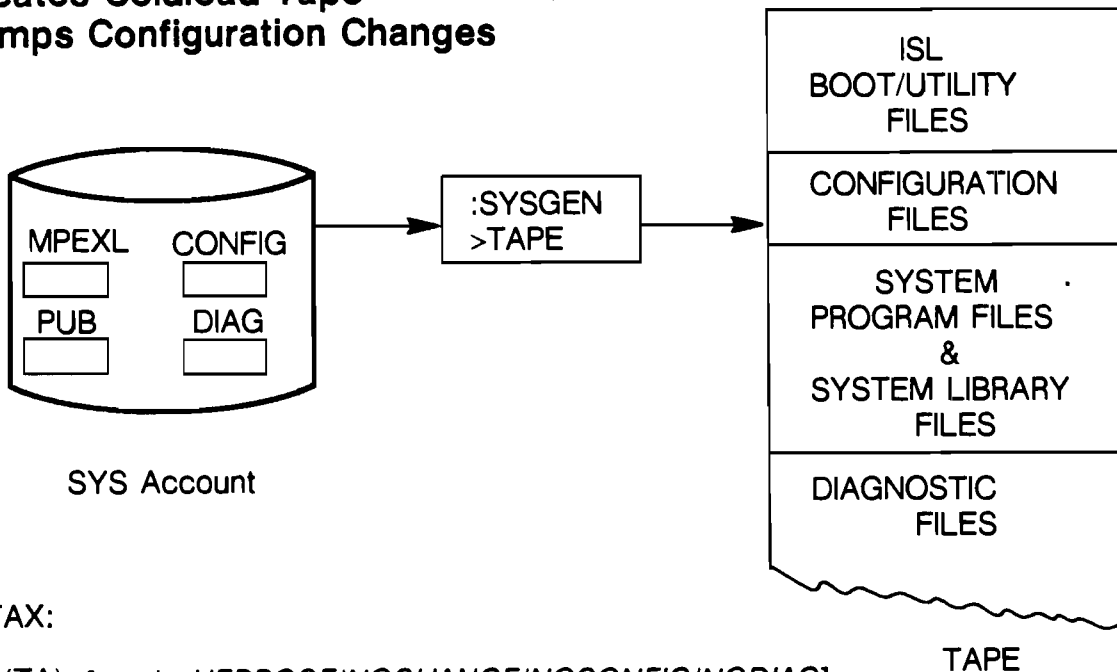
**Notes**

- If the RDCC and tape command had been issued without specifying "basegroup nuconfig", the tape would contain the files specified in the old configuration group, and the RDCC validation would have been performed against the old configuration group.

**SYSGEN TAPE Command**

**SYSGEN TAPE Command**

- Creates Coldload Tape
- Dumps Configuration Changes



SYNTAX:

TAPE(TA) [mode=VERBOSE/NOCHANGE/NOCONFIG/NODIAG]  
 [dest = OFFLINE]

TG200079\_047

©1987 Hewlett-Packard Company

**Notes**

- Configuration files are not copied to tape when NOCONFIG is specified.
- Diagnostic files are not copied to tape when NODIAG option is specified.
- "Tape" operation, followed by UPDATE CONFIG or INSTALL, is required for SYSFILE configurator changes, RINs and User Logging.
- *VERBOSE = Output Listing of NEW TAPE.*

**SYSGEN System File Configuration**

**Configuration Example**

**Device and Path Listing from Validation**

	<u>LDEV#</u>	<u>IO-PATH</u>	<u>TYPE</u>	<u>ID</u>	<u>OUTDEV</u>	<u>MODE</u>	<u>SIZE CLASS</u>		
	23	8.2.2	TAPE	HP7978	0		R 128 TAPE:23		
	24	8.0.4	DISC	HP7935	0		128 DISC		
	25	8.0.5	DISC	HP7935	0		128 DISC		
	26	8.0.6	DISC	HP7935	0		128 DISC		
DTS/NS Ldevs	100						NMGR		
	101						NMGR		
	102						NMGR		
	103						NMGR		
	104						NMGR		
		<u>I/O-PATH</u>	<u>TYPE</u>	<u>ID</u>	<u>LDEV#</u>	<u>P-MGR</u>	<u>P-PRI</u>	<u>L-MGR</u>	<u>MAX-IO\$</u>
	8.2.3	TAPE	HP7978	14	TAPE_797	8	LOGICAL_	0	
	8.2.4	TAPE	HP7978	15	TAPE_797	8	LOGICAL_	0	
	8.2.6	PP	HP2688A	12	PP_DM	8	LOGICAL_	0	
	8.2.7	LP	HP2566A	13	CIPER_DM	8	LOGICAL_	0	
LAN	8.4								NMGR

**Notes**

**SYSGEN System File Configuration**

**Obtaining Information--Current Configuration**

**SYSDIR>sh**

SYSTEM CATALOG	=	CATALOG.PUB.SYS	
CM SL	=	SL.PUB.SYS	
NMCONFIG FILE	=	NMCONFIG.PUB.SYS	
NMLIB FILE	=	NL.PUB.SYS	
<u>SYSTEM PROGRAM</u>		<u>FILENAME</u>	<u>TYPE</u>
JOB.PUB.SYS		JOB.PUB.SYS	system prog
JSMAN.PUB.SYS		JSMAN.PUB.SYS	system prog
■		■	■
■		■	■ .
■		■	■
SL.MPEXL.SYS		SL.MPEXL.SYS	system prog
<u>BOOT FILE</u>		<u>FILENAME</u>	<u>TYPE</u>
DUMP.MPEXL.SYS		DUMP.MPEXL.SYS	discboot
ISL.MPEXL.SYS		ISL.MPEXL.SYS	discboot
■		■	■
■		■	■
■		■	■
CLKUTIL.MPEXL.SYS		CLKUTIL.MPEXL.SYS	bothboot
AUTOBOOT.MPEXL.SYS		AUTOBOOT.MPEXL.SYS	discauto
MMSAVE.MPEXL.SYS		MMSAVE.MPEXL.SYS	discipl
ISL2.MPEXL.SYS		ISL2.MPEXL.SYS	tapeipl

TG200079\_049

© 1987 Hewlett-Packard Company

**Notes**

- These are a sample of the files put on the boot tape by the configuration shipped with the system.
- "Discipl" and "Tapeipl" are Initial Process Loader boot files.
- "Bothboot" means they are bootable from either disc or tape.

SYSGEN System File Configuration

**Points To Remember**

- The configuration group written to a boot tape will always be named:

CONFIG.SYS

- The network configuration file written to a boot tape will always be named:

NMCONFIG.PUB.SYS

TG200079\_050

© 1987 Hewlett-Packard Company

**Notes**

- Backup ORIGINAL Config. Sys. !!! via Sysgen
- NMconfig will be clobbered - BACK it up !!!
- CTRL/Y - Stop Sysgen
- Ad 14/17 OR Ad (14,15,16,17)

**Activity 4.3 Lab: MISC, LOG and SYSFILE Configuration**

**Instructions:**

1. Invoke the MISC, LOG and SYSFILE configurators and use the SHOW command to obtain a list of parameter values.
2. Set the maximum number of concurrent running jobs to 10.
3. Set the maximum number of concurrent running sessions to 32.
4. Enable logging and only log CONSOLE LOG, POWER FAILURE, SYSTEM SHUTDOWN and SPOOLING LOG RECORDS.
5. Change the SPOOL EXTENT SIZE to 3072 and MAXIMUM number OPEN SPOOL FILES to 50.
6. Change the system program MAKECAT to GENCAT.PUB.SYS.
7. Change the LOGON PROMPT to read: WELCOME TO MPE XL:
8. Save your changes in CONFIG $nn$ . (Substitute your initials for  $nn$ .)

## Module 5 MPE XL DTS Training

### Goal and Objectives

Goal: To teach the DTS configuration and 1st level troubleshooting with TERMDSM.

Objectives:

Upon completion of this course, the students will be able to:

- \* Describe the major activities involved in configuring DTS, including configuration planning, using NMGR and validation.
- \* Perform DTS configuration.
- \* Describe and use the DTS self-test and TERMDSM.



References:

The manuals which complement this module are:

- \* *Asynchronous Serial Communications System Administrator's Reference Manual*
- \* *Asynchronous Serial Communications Troubleshooting Manual*





1  
2



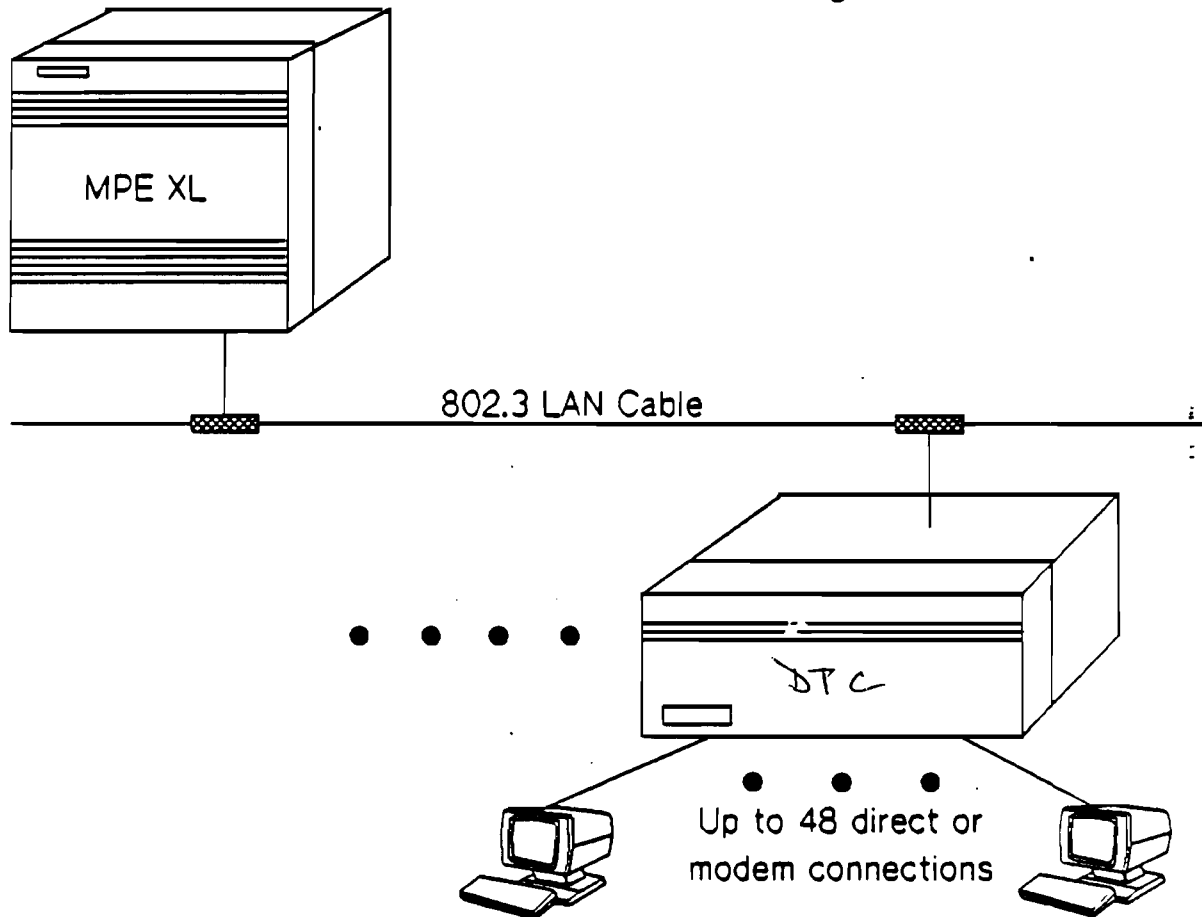
## Module 5 MPE XL DTS Training

### □ Goal and Objectives

#### Contents:

Goal and Objectives	Page 5-1
Introduction	Page 5-2
Configuration Design Concept	Page 5-3
NMGR Screens Overview	Page 5-4
Link Path	Page 5-5
Device Profile Path	Page 5-6
DTC & Port Path	Page 5-7
DTS Configuration	Page 5-8
System Preparation	Page 5-9
NMCONFIG Preparation	Page 5-10
Configuration Plan	Page 5-11
DTS Configuration (1)	Page 5-12
DTS Configuration (2)	Page 5-13
LAB 1	Page 5-14
Number of Link Users	Page 5-15
Size of Inbound Physical Buffer	Page 5-16
Number of Inbound Link Buffers	Page 5-17
Size of Outbound Physical Buffer	Page 5-18
US Modem	Page 5-19
European Modem	Page 5-20
NMGR Validation	Page 5-21
SYSGEN Cross-Validation	Page 5-22
1st Level Diagnostics Tools	Page 5-23
DTC Self-Test Sequence	Page 5-24
DTC Self-Diagnostics	Page 5-25
TERMDSM	Page 5-26
TERMDSM Commands	Page 5-27
TERMDSM Commands Parameters	Page 5-28
DIAG Commands	Page 5-29
DUMP Commands	Page 5-30
RESET Commands	Page 5-31
STATUS Commands	Page 5-32
LAB 2	Page 5-34
Review Questions	Page 5-35

## Distributed Terminal Subsystem (DTS)



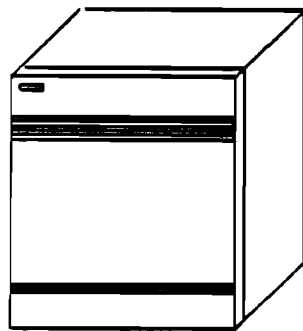
CORE1002

© 1987 Hewlett-Packard Company

### Notes:

- \* DTC - Distributed Terminal Controller
- \* DTS - Distributed Terminal Subsystem

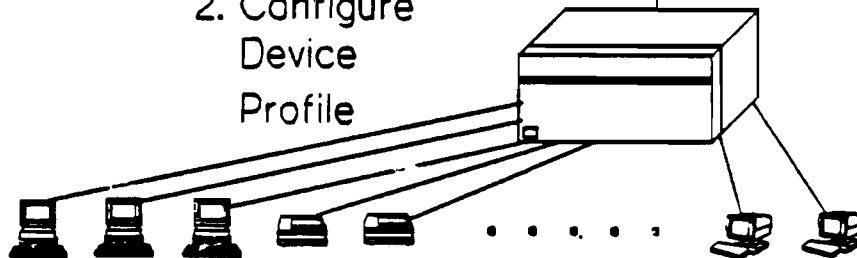
## DTC Configuration Design Concept



1. Configure 802.3 LAN Link



2. Configure Device Profile

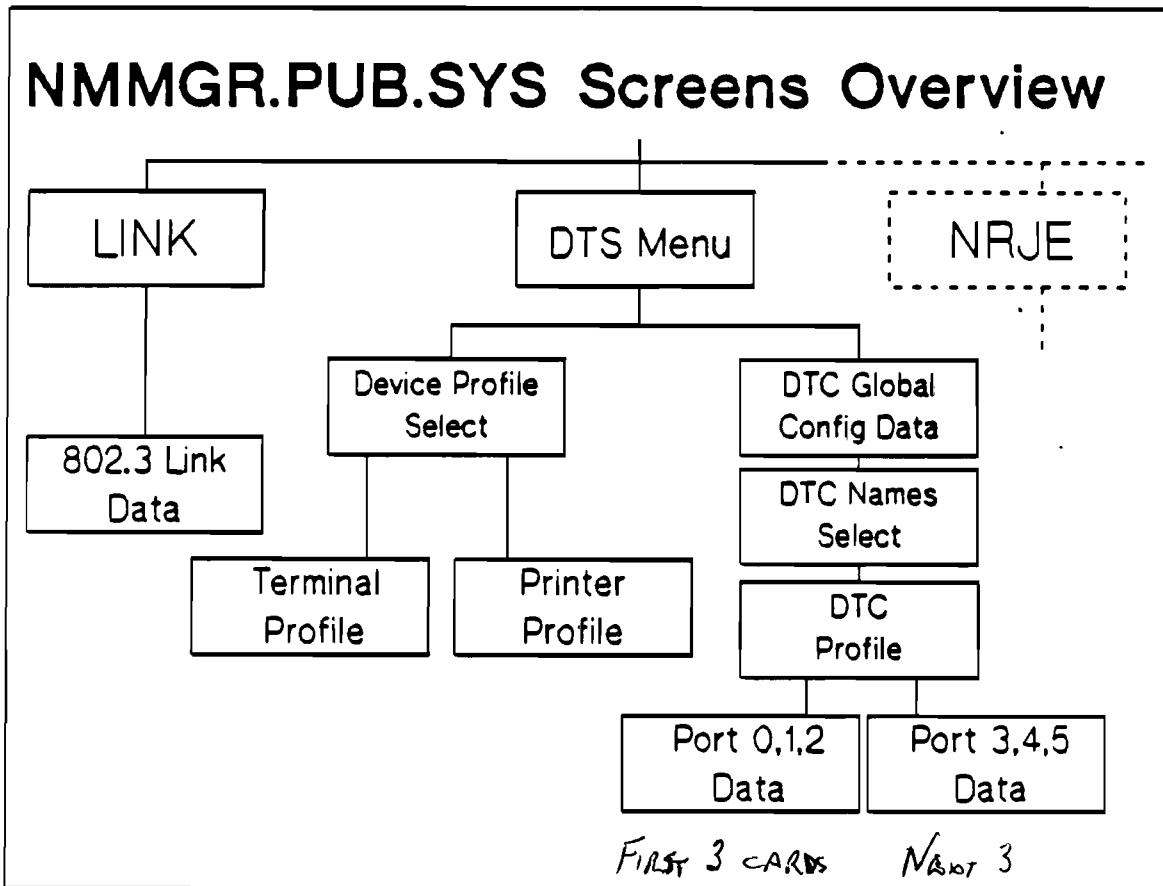


3. Configure DTC & Ports

### Notes:

\* Order of configuration:

1. LAN Link
2. Device Profile
3. DTC Ports



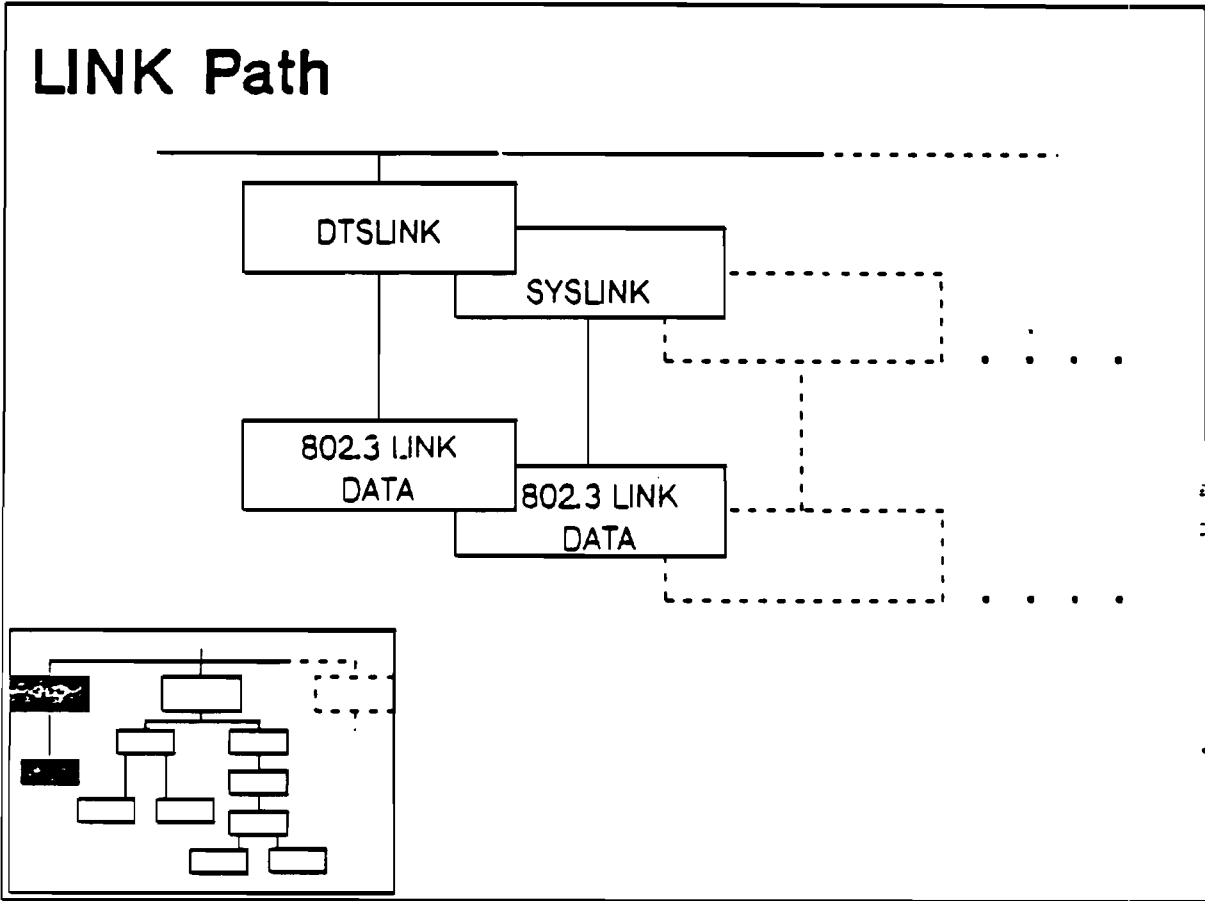
DDRE/COS

10/85

**Notes:**

- \* This slide shows only the DTS portion of the NMMGR screens. (NRJE is not part of DTS.)
- \* NMMGR.PUB.SYS is a Compatibility Mode program, ported from MPE V/E.
- \* Note how the branches match with the previous slide.

DTS Configuration

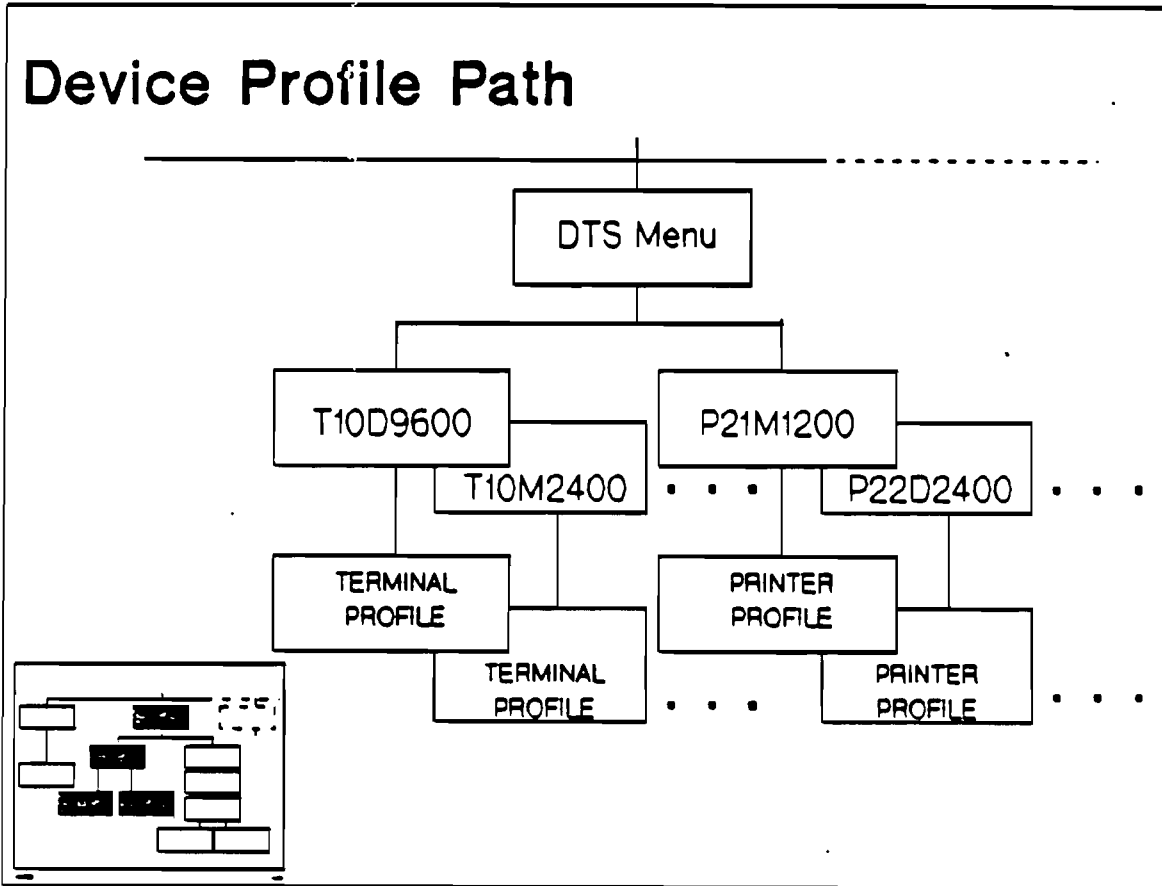


CORE/C06

© 1987 Hewlett-Packard Company

Notes:

- \* The blackened boxes on the lower left corner show the relative position.
- \* DTSLINK is for DTS. SYSLINK is for NS.



CCRE:007

10/85

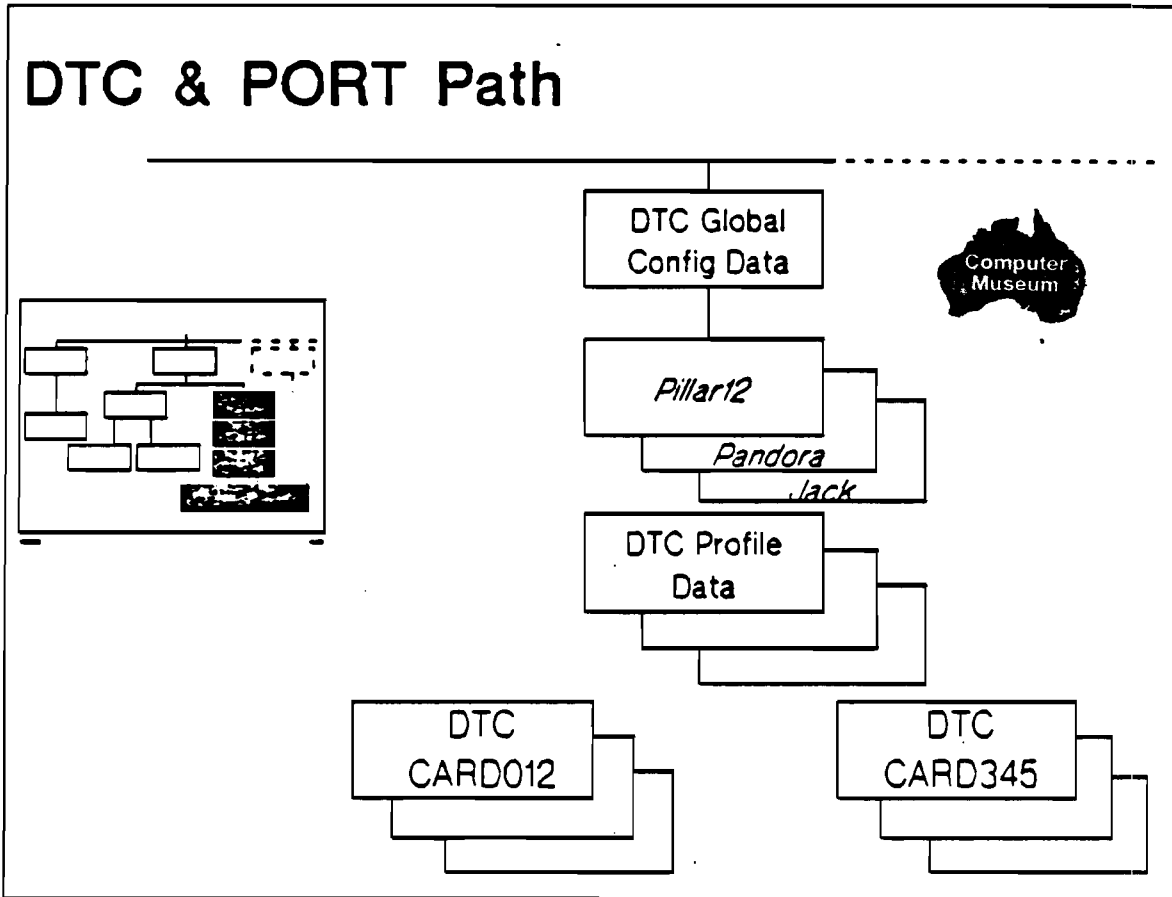
Notes:

\* In the TERMINAL PROFILE screen, the following information is asked for:

- Terminal Types?
- Modem attached (Y/N)?
- What type of modem?
- Line Speed (bps)?
- Record Width?
- Allow .HELLO logon (Y/N)?
- Allow .DATA Command (Y/N)?
- Optionally Device Class.

\* In the PRINTER PROFILE screen, the following information is asked for:

- Printer Types?
- Modem attached (Y/N)?
- What type of modem?
- Record Width?
- Line Speed (bps)?
- Initially Spooled (Y/N)?
- Optionally Device Class.



Notes:

\* Pillar 12, Pandora, and Jack are examples of DTC names.

\* It is easier to identify a DTC by its name than by its address.



## DTS Configuration

- System preparation
- NMCONFIG preparation
- Configuration plans
- NMMGR configuration
- NMMGR validation
- SYSGEN cross-validation

*INSTALL H/W*

stconf1

© 1986 Hewlett-Packard Company

Notes:

## DTS Configuration: System Preparation

- 802.3 CIO LAN cards
- LAN & DTC installation
- Data comm s/w versions (NMMMAINT)

stconf2

© 1986 Hewlett-Packard Company

Notes:

P. 5-11: LDEV 1

## DTS Configuration Plan

	Sample Value	Your Value
Physical Path	8.4	same
DTC Station Address	08-00-09-00-00-00	DTC address
① DTC Download File Name	DTCSW001.PUB.SYS	same
Local Station Address	FF-FF-FF-FF-FF-FF	same
Link Name	DTSLINK	same
Terminal Profiles	TR10D96, TR10M12	your profiles
Printer Profiles	PR22D96	your profiles

πconf4

© 1986 Hewlett-Packard Company

Notes:

3 SAMPLE FILES - SEE DTS MANUAL

① DON'T CHANGE FILENAME.

## DTS Configuration: NMMGR (minimum activities)

- Run NMMGR.PUB.SYS (NM or NA capability)
- Open NMCONFIG.PUB.SYS
- Do configuration:

@DTS.DTC.SELECT.dtc#

DTC Station Address  
DTC Download File Name

- Validate

nmconf5

1986 Hewlett-Packard Company

### Notes:

\* @DTS.DTC.SELEC.dtc# can take you directly to the screen that contains the DTC address.

## DTS Configuration: Other Significant Parameters

### @LINK.dtslink

- Number of Link Users
- Size of Inbound Physical Buffer
- Number of Inbound Link Buffers

### @DTS.DTC

- Size of Outbound Physical Buffer

### @DTS.PROFILE.profname

- US modem
- European modem

atconf6

© 1986 Hewlett-Packard Company

Notes:

<b>Module 5 MPE XL DTS Training</b>	
-------------------------------------	--

<input type="checkbox"/> <b>Acitivity 5.1 Lab: DTS Configuration</b>	
--	--

1. Copy NMSAMPDT.PUB.SYS to a file name unique to you (for example your name):

```
:file yourname.dev=1  
:fcopy from=nmsampdt.pub.sys;to=*yourname;new
```

**\*\* Note:** Don't use the COPY command, since you can't force it to Ldev 1.

2. Run NMGR and go to the UTILITY screen and print out a listing of the current DTS configuration for your reference. (Look only for DTS-related screens.)
3. Open your file in NMGR and make necessary changes to reflect the current DTS configuration. Remember VALIDATE before you exit.
4. The instructor will pick one group and use its DTS configuration to reboot the system, reset the DTC to re-download the new configuration, and verify the result by logging on to the terminals.

# USE MANUAL

## Module 5 MPE XL DTS Training

### DTS Configuration

## DTS Configuration: # Of Link Users

Number Of Configured Ports + Configured DTCs + Link

Default: 50

stconf7

© 1986 Hewlett-Packard Company

### Notes:

\* This slide assumes 1 DTC:

# of ports = 48  
Configured DTC = 1  
Link = 1

## DTS Configuration: Size Of Inbound Physical Buffer

128 ----> 1536

Default: 256

HP0018

© 1986 Hewlett-Packard Company

Notes:



## DTS Configuration: # Of Inbound Link Buffers

max (7 \* Number Of Link Users,  
128 \* 1536 / Size Of Inbound Physical Buffer)

Default: 768

itconf9

© 1986 Hewlett-Packard Company

Notes:

## DTS Configuration: Size Of Outbound Physical Buffer

128      ---->      1536

Default: 256      *Mod 128*

stconf10

© 1986 Hewlett-Packard Company

Notes:

## DTS Configuration: US Modem

CTS is not monitored  
(subtype 1/5)

dtconf11

© 1986 Hewlett-Packard Company

Notes:

*cf. 9000 cable layout.  
- USE US. MODEMS.*

## DTS Configuration: European Modem

CTS is monitored  
(subtype 9)

2300112

© 1986 Hewlett-Packard Company

Notes:

## DTS Configuration: NMMGR Validation

- Validate DTS/LINK

zconf13

© 1986 Hewlett-Packard Company

### Notes:

- \* Always remember to validate before you exit.
- \* Enter VALIDATE (or VAL) in the command field. It takes you directly to the validation screen.

*DTSINFO . Pub. Sys - Listing of DTS FREE. CONTRIBUTED utility*

## DTS Configuration: SYSGEN Cross-Validation

```
:SYSGEN {OP capability required}
```

```
SYSGEN> io
```

```
io>ld {optional}
```

```
io>exit
```

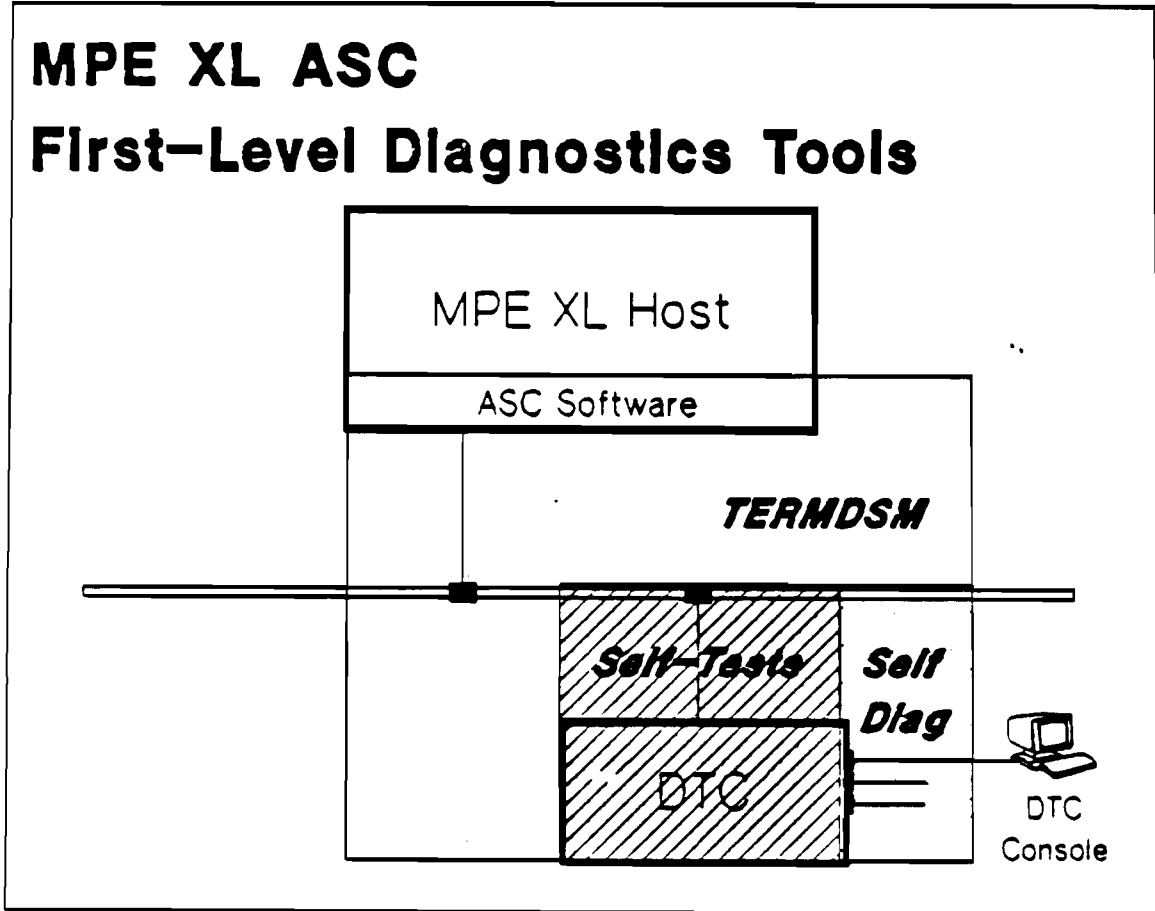
```
SYSGEN> exit
```

NOTE: Cross-validation occurs on KEEP, TAPE, IO, and RDCC commands.

atconf14

© 1986 Hewlett-Packard Company

Notes:

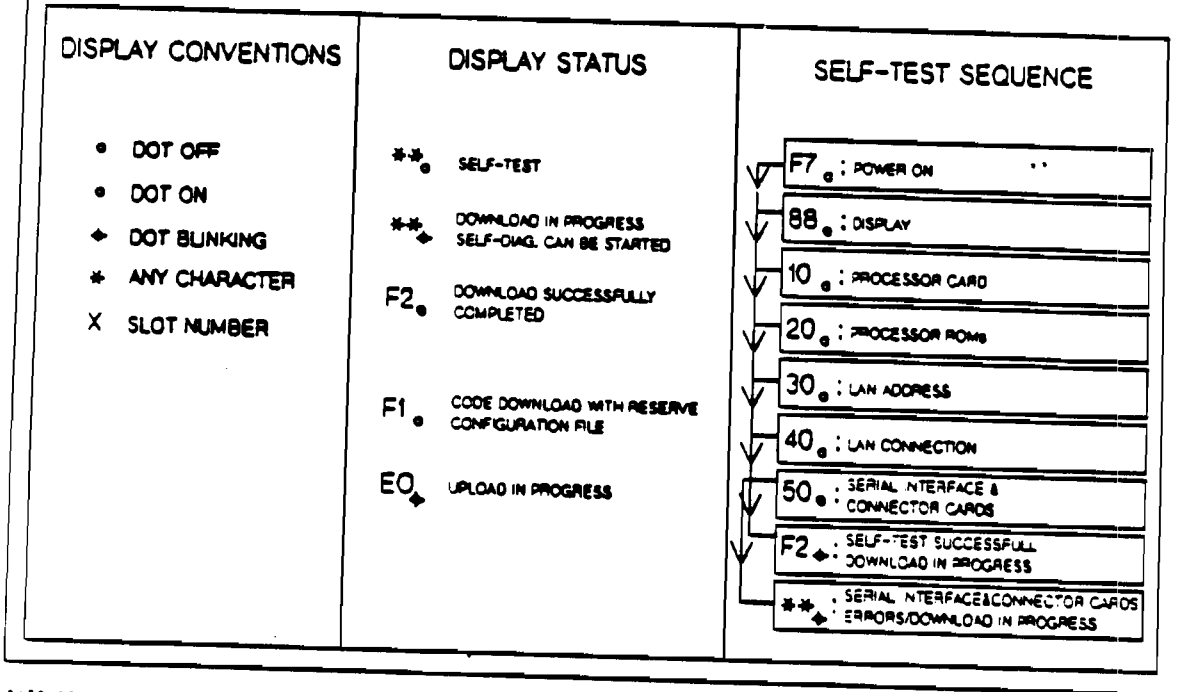


CE+2645A

08/87

Notes:

# SELF-TEST SEQUENCE



2436:08A

© 06/86 Hewlett-Packard Company

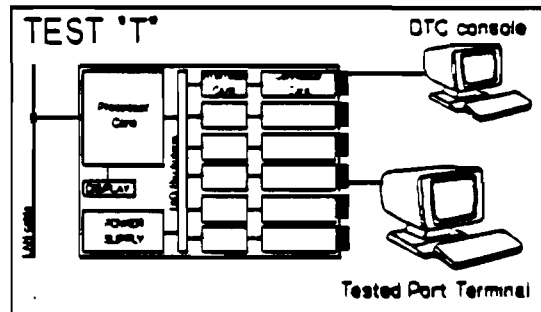
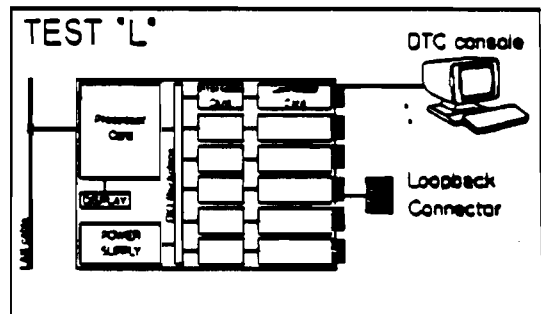
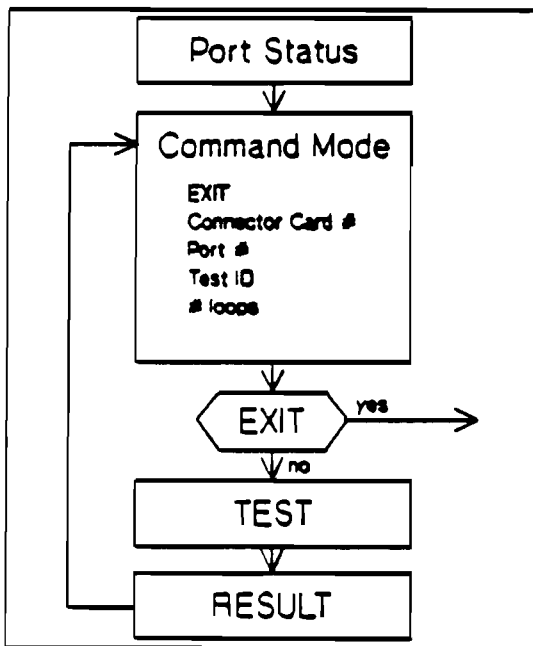
Notes:

- T-junction & Terminator.
- Power on DTC before connecting to LAN - Brown Man.



□ DTS Diagnostics Tools

# SELF - DIAGNOSTIC



0436110A

© 11/85 Hewlett-Packard Company

□ Notes:

## Use of TERMDSM

:sysdiag

DUI>run TERMDSM

3 levels of security:

H: SM or DI

M: SM or DI or OP

L: SM or DI or OP or AM

termdsm1

© 1986 Hewlett-Packard Company

Notes:

## TERMDSM Commands

- Diag

Selftest # (H)  
Internal #,#,# (M)  
*Loopback Connector* - External #,#,# (M)  
Print #,#,# (M)  
Terminal #,#,# (M)

- Reset

Ldev# (M)  
DTC # (H)  
SIC # (H)  
Port #,#,# (M)

- Dump

Ldev# (M)  
Port #,#,# (M)  
DTC # (H)

- Status

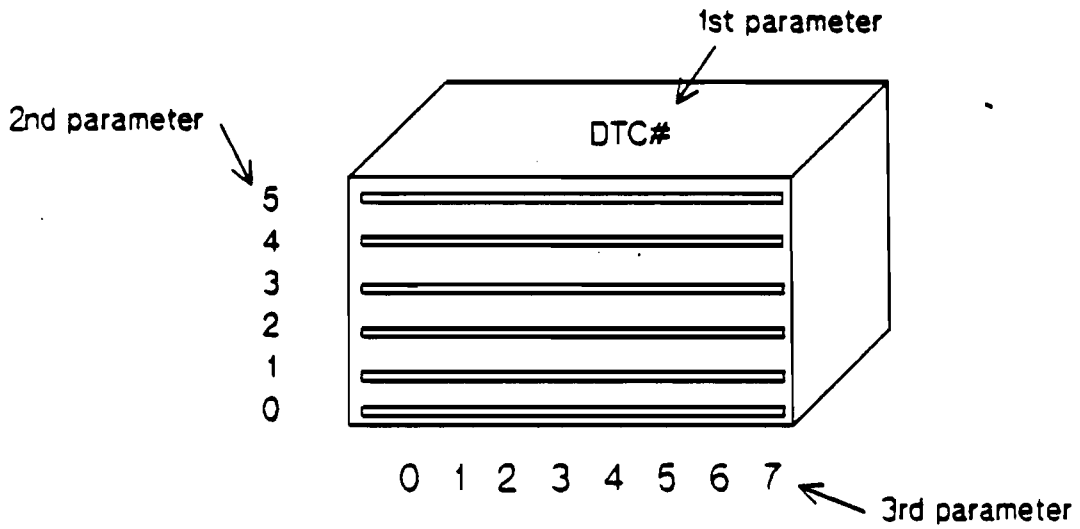
DTC # (U)  
Port #,#,# (U)

termdem2

© 1986 Hewlett-Packard Company

Notes:

# TERMDSM: Command Parameters

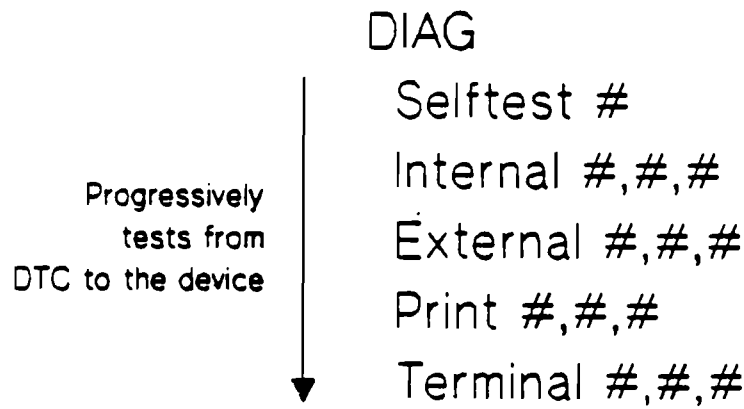


termgam3

© 1986 Hewlett-Packard Company

Notes:

# TERMDSM: DIAG Commands



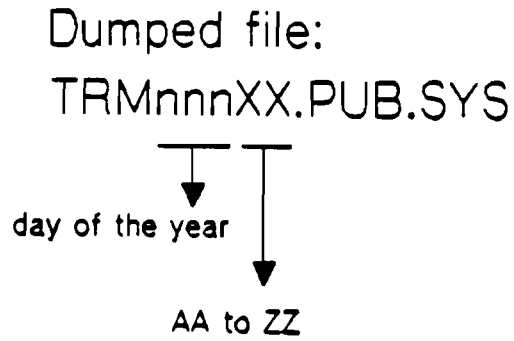
termasm4

© 1986 Hewlett-Packard Company

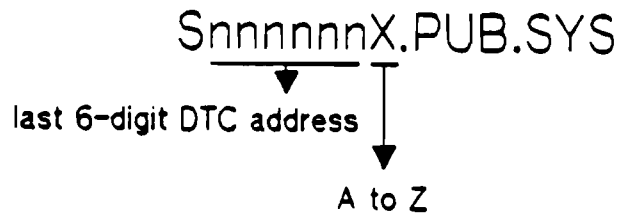
Notes:

# TERMDSM: DUMP Commands

Ldev#  
Port #,#,#



DTC #



termdsm5

© 1986 Hewlett-Packard Company

Notes:

## TERMDSM: RESET Commands

	Max User Affected	Perform Selftest?
Ldev Port	1	no
SIC	8	yes
DTC	48	yes

termasm6

© 1986 Hewlett-Packard Company

Notes:

## TERMDSM: STATUS Commands (DTC)

Machine Type = HP2345A

DTC Node Name =

DTC LAN Address =

DTC Self-test Result:

Version Number:

Counters:

Transmit Packets:

Receive Packets:

termasm7

© 1986 Hewlett-Packard Company

### Notes:

\* This slide shows the kind of information the STATUS command provides. A detailed listing is in Appendix D.5.



## TERMDSM: STATUS Commands (Port)

Port Type:

Connection State:

DIODAM State: (read/write pending)

Driver State: (read/write length, byte transferred)

Card State: (special char received, baud rate, parity...)

Read Option:

Handshake Options:

Asynchronous Events Enabled:

AFCP Counters:

termasm

© 1986 Hewlett-Packard Company

### Notes:

\* This slide shows what the STATUS command provides. A detailed listing is in Appendix D.5.

## Module 5 MPE XL DTS Training

### Activity 5.2 Lab: Using TERMDSM

#### Instructions:

This lab has to be conducted in a very controlled environment without multiple users running TERMDSM at the same time.

- (1) Designate a port as the 'target'. Logon to that port.
- (2) Have the groups take turns to do the following:
  1. Dump the port's Ldev#.
  2. Dump the port's Port###.

Compare the results.

3. Reset the port.
4. Perform an INTERNAL command to the port.
5. Perform a PRINT command to the port.
6. Perform a TERMINAL command to the port.
7. Reset the SIC#.
8. DUMP the DTC from the Console.

## Module 5 MPE XL DTS Training

### DTS Review Questions

- (1) A user tries to logon to a Series 930 from a terminal, connected via a DTC, by typing "HELLO MANAGER.SYS", followed by a carriage-return. Which of the following answers best describes how the characters are sent to the Series 930 host?
  - a. The characters are sent via the DTC to the host and echoed back to the terminal screen, one character at a time.
  - b. The characters are buffered and echoed by the DTC until the carriage-return is entered, and then the whole character string is sent to the host.
  - c. The characters are buffered and echoed by the DTC until a timer pops and then the whole character string is sent to the host.
  
- (2) There are 48 terminal users connected to the DTC, and they are all entering data. If you take a LANalyzer trace, how do the packets look on the LAN?
  - a. Each character entered generates an independent packet. Each packet carries the source and destination addresses, and the packets are multiplexed with no predictable sequence.
  - b. Same as choice "a" except the packets are in sequence for a particular user.
  - c. Each user's record (a character-string terminated by a carriage return) is encapsulated with the source/destination addresses and sent as a packet. The packets are intermixed with each other with no predictable sequence.
  - d. Same as choice "c" except the packets are in sequence for a particular user.
  - e. The characters are put into a central buffer and sent out either when a fixed length is reached, or a timer is popped. The sequence of the packets is guaranteed.

## Module 5 MPE XL DTS Training

### DTS Review Questions

- (3) The host is writing data to several terminal screens (e.g. the users are doing LISTFs). What do the packets look like on the LAN?
- a. The data is multiplexed and demultiplexed by the DTC. The data is encapsulated into packets regardless of the user. It is up to the DTC to decide which data packet goes to which user.
  - b. The data is concatenated for a particular user until a fixed length is reached. The data is encapsulated into packets and sent to the users.
  - c. The data is concatenated for a particular user until a timer pops. The data is encapsulated into packets and sent to the users.
  - d. Both b and c.
  - e. None of the above.
- (4) The user is hitting carriage-returns on the terminal before logging on. Which of the following statements are CORRECT.
- a. The DTC sends a connection request to the host, issues a DCI read request and prompts for input.
  - b. The DTC sends a connection request to the host, the host sends a DCI read request and prompts for input.
  - c. The DTC is totally transparent in this case. The host handles all the logon activities.
  - d. The host is totally transparent in this case. The DTC handles all the logon activities.
  - e. None of the above.

## Module 5 MPE XL DTS Training

### DTS Review Questions

(5) Which of the following statement(s) are CORRECT.

- a. I can use TERMDISM's RESET command to reset the console port.
- b. When I use TERMDISM's DUMP command to dump an active session's Ldev# and the corresponding Port#.#.#, the results are different.
- c. When I use TERMDISM's RESET command to reset an active session's Ldev# and the corresponding Port#.#.#, the results are different.
- d. Resetting the SIC#.# is the same as resetting 6 individual ports in that same SIC.
- e. When the TERMDISM RESET command is used on the SIC, it also performs an SIC self-test.
- f. When you dump a port, the port is also reset automatically.

(6) Which of the following statement(s) are INCORRECT?

- a. The dump file names you get when dumping Ldev#s and Port#.#.#s are the same.
- b. The dump file names you get when dumping Ldev#s and DTC#s are different.
- c. The dump file name you get when dumping SIC#.# is in the format of TRMnnnXX.PUB.SYS.
- d. The dump file name you get when dumping the DTC# is in the format of DTCnnnnn.PUB.SYS where nnnnn is the last 5 digits of the DTC address.
- e. You can have up to 676 unique port dumps per DTC.
- f. You can have up to 26 unique DTC dumps per DTC.

## Module 5 MPE XL DTS Training

### DTS Review Questions

- (7) To use the TERMDSM RESET Port#.#.# command, you must know the 3 parameters #.#.# associated with the port. Describe what each parameter represents and how to get it:
- 1st #: What: \_\_\_\_\_  
How: \_\_\_\_\_
- 2nd #: What: \_\_\_\_\_  
How: \_\_\_\_\_
- 3rd #: What: \_\_\_\_\_  
How: \_\_\_\_\_
- (8) Which of the following statements are INCORRECT for configuration?
- The VALIDATION in MMGR and the Cross-Validation in SYSGEN perform the same functions, and either one would be enough.
  - If I make sure I use the UPDATE DATA function key on all the MMGR screens, I don't need to do VALIDATION before exiting.
  - You can jump from one screen to another by entering the PATH name for the destination screen in the COMMAND field and hitting the ENTER key.
  - You can issue an MPE command prefixed by a colon (:) in the COMMAND field and hit the ENTER key to execute the MPE command.
  - To go to the VALIDATION screen, you can prefix the command VAL with an '@' and hit ENTER.
  - All of the above.
  - None of the above.

## Module 5 MPE XL DTS Training

### DTS Review Questions

(9) Which of the following statements are CORRECT?

- a. I would need to acquire an IP address from the Standard Group for each DTC I have.
- b. Since DTC requires downloading its software from a designated host, the DTC is not considered to be a 'node' on the LAN.
- c. For the 1st release, DTC's multicast address and its node address are the same.
- d. The configuration file is always named NMCONFIG.NET.SYS.
- e. The configuration file has to be on the system disc (dev=1).
- f. None of the above.

(10) Describe the 6 main activities involved in configuring DTS.

## Module 6 Recovery, Backup and Data Exchange

### Goal and Objectives

**Goal:** To become familiar with backup and exchange procedures on MPE XL.

**Objectives:** After completing this module, you will be able to:

- Understand and use the STORE/RESTORE commands and their parameters to perform system backups and data recovery.
- Use RESTORE to perform the functions previously in RELOAD on MPE V/E.
- Create a STORE tape which can be transported to an MPE V/E system.

### Notes

This training module complements the *Storing and Restoring Files Reference Manual*. When you see the annotation "Page xx-xx", it refers to the manual.



**Enhanced User Features of STORE/RESTORE**

**STORE/RESTORE**

**Enhanced User Features**

**FILESET**

Negative Filesets: maximum depth of nine

Wild Cards: may specify character sets

**MAXFILES**

MPE XL can store an unlimited number of files

**INDIRECT FILES**

Multiple indirect files are supported

**Notes**

- Indirect files must have a record length between 8 and 255 bytes.

**DIRECTORY**

STORE DIRECTORY TO TAPE.

**Multiple Minuses and Character Sets**

**STORE/RESTORE Examples**

**Negative Filesets**

**Purpose:** Store or restore selected files.

**Function:** Subtracts files from fileset.  
Up to 9 negative filesets per positive fileset.

**Character Sets**

**Purpose:** Store or restore groups of files.

**Function:** Specifies all files falling within a range of characters.

Commands:

```
:FILE mytape;DEV=TAPE
:STORE @.@.@-@.@.PAYROLL-@.@.ACCTNG,&
        @.DATA.PAYROLL,@.DATA.ACCTNG;&
        *mytape;SHOW

:STORE [a-f]@;*mytape;SHOW
:STORE [a-gp]@;*mytape;SHOW
:STORE [a-cl]@.@.@;*mytape;SHOW
```

TG200038-002

© 1987 Hewlett-Packard Company

**Notes**

- A maximum of 16 characters may be specified for each file-designator part and brackets may not be nested.

**New User Features of STORE/RESTORE**

**STORE/RESTORE**

**New User Features**

**TRANSPORT**

MPE XL tapes can be created for MPE V/E machines.

**FCRANGE**

Restricts fileset list by filecode.

**LISTDIR**

Displays information from the tape label and directory.

**Notes**

- TRANSPORT is not valid if STORESET, INTER, DIRECTORY or FCRANGE is specified.
- TRANSPORT must be used if you want to create a labeled tape. Native STORE does not support labeled tapes.

**FCRANGE and LISTDIR**

**STORE/RESTORE Examples**

**FCRANGE**

**Purpose:** Store or restore specific types of files.

**Function:** Limits files selected to those of a certain filecode. Up to 8 filecode ranges.

**LISTDIR**

**Purpose:** To list the files on a store tape.

**Function:** Displays tape label and directory information for all or a subset of files on the store tape. "

Commands:

```
:FILE mytape;DEV=TAPE
:STORE @.LETTERS.PERSONEL;*mytape;&
      FCRANGE=1100/1102, 1153/1153;&
      SHOW
:RESTORE *mytape;@.@.@;LISTDIR
:RESTORE *mytape;@.LETTERS.PERSONEL;LISTDIR
```

G200038-004

© 1987 Hewlett-Packard Company

**Notes**

- You cannot use LISTDIR with other RESTORE parameters. LISTDIR lists tape information but no files are restored.

LISTDIR Output

MPE XL Tape Directory

TAPE NAME : {tape name}  
TAPE VERSION : {version name}  
REEL NUMBER : {reel number}  
SET NUMBER : {set number}

MEDIA CREATION DATE  
{media creation date}

MEDIA CREATED WITH THE FOLLOWING OPTIONS

OPTION DATE >=  
OPTION DATE <=  
OPTION STORESET  
OPTION PURGE  
OPTION DIRECTORY  
OPTION INTER  
OPTION ONVS  
OPTION FILES

DIRECTORY OFFSET : { number}  
TAPE RECORD SIZE : { number}  
INTERLEAVE DEPTH : { number}

FILENAME GROUP                      ACCOUNT                      CREATOR                      REEL                      SET

Notes

- A >= sign indicates that a file is on the specified reel or a following reel.
- Example:

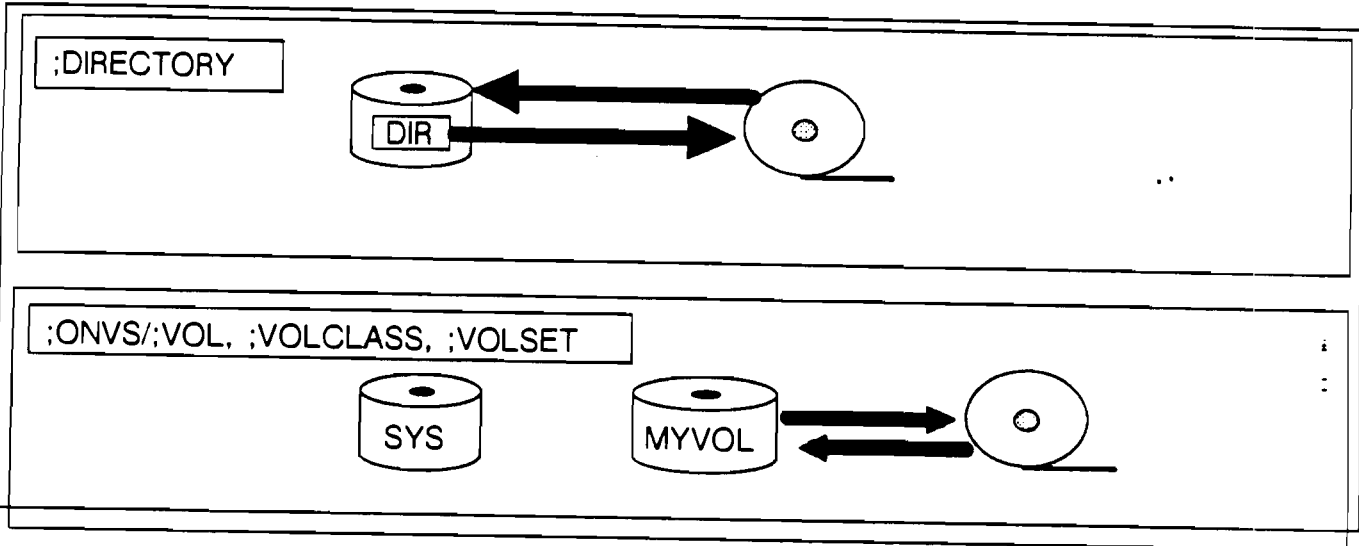
FCOPY      PUB                      SYS      MANAGER                      >=      1                      1

*• Do LISTDIR ON LAST REEL OF SET to give all file statistics*

Backup Features

STORE/RESTORE

Backup Features



G200038-006

Pages 3-24, 5-6 and 5-7

© 1987 Hewlett-Packard Company

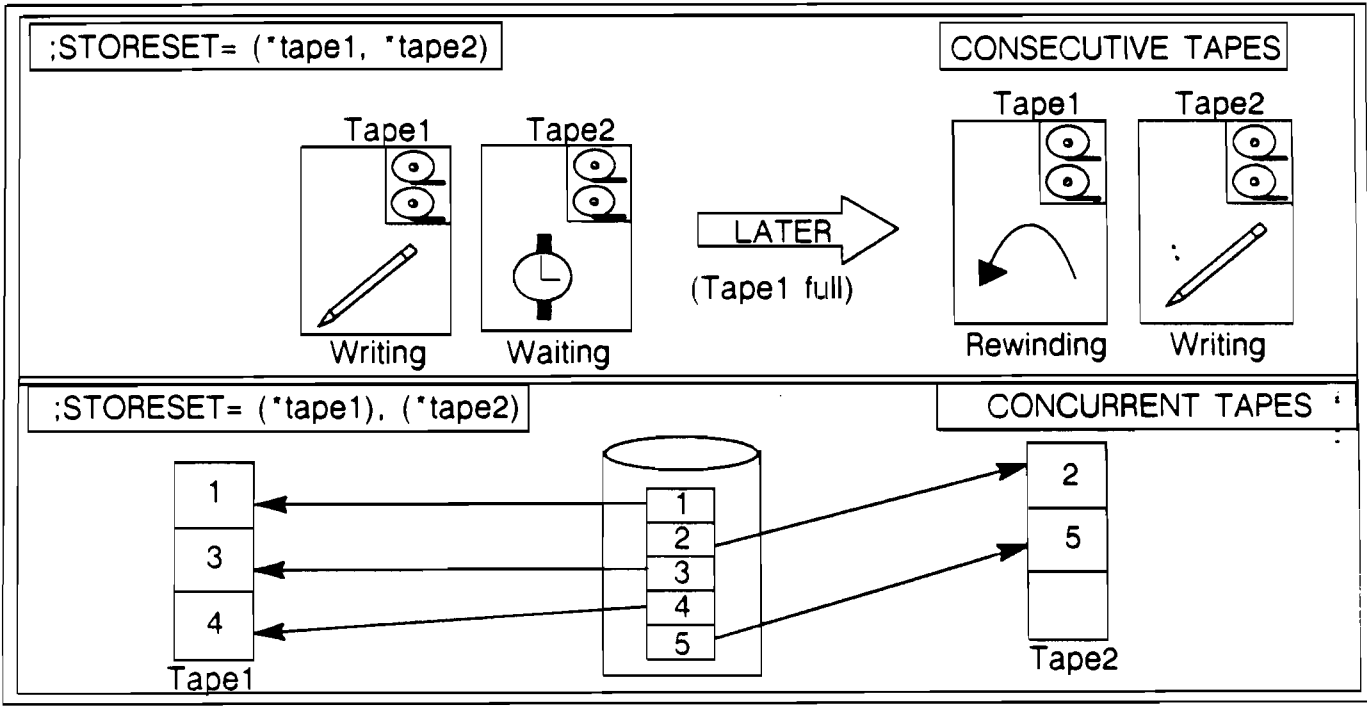
Notes

- You cannot use VOL, VOLCLASS or VOLSET with DEV. Maximum of 20 volumesets is supported with ONVS.
- The DIRECTORY option overrides default filesets. For example, "STORE \*t:;DIRECTORY" will only store the directory accounting structure.
- ONVS allows specific backup of volume sets. To store files from the system volume and from user volumes, specify the system volume set name in the ONVS parameter as well as the user volume set name.
- VOL, VOLCLASS and VOLSET are used with RESTORE. For example, "RESTORE \*t:@.@.@;VOLSET=PRIVATE VOL\_A; VOL=VOL\_C" would restore the files to the volume named VOL\_C within the PRIVATE\_VOL\_A volume set.

**Increased Efficiency**

**STORE/RESTORE**

**Increased Efficiency**



TG200038-007

Pages 3-1/3-4, 3-15, 3-22 and 3-23

© 1987 Hewlett-Packard Company

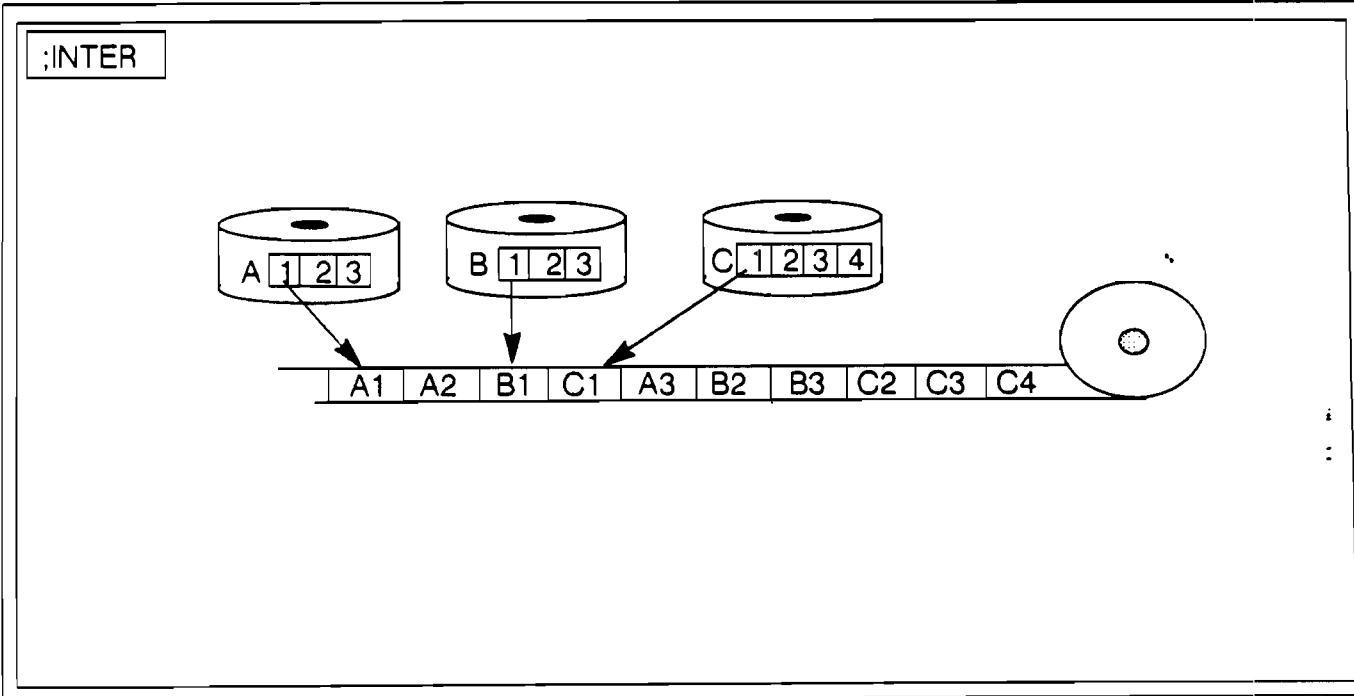
**Notes**

- Do not specify the storefile when using multiple backup devices.
- Consecutive tapes are specified `;STORESET=(*Tape1, *Tape2, *Tape3)`
- Concurrent devices are specified `;STORESET=(*Tape1), (*Tape2), (*Tape3)`
- Concurrently accessible consecutive tapes are specified `;STORESET=(*Tape1,*Tape2), (*Tape3,*Tape4)`

Increased Efficiency

STORE/RESTORE

Increased Efficiency



Notes

- File interleaving (INTER) is a technique in which information from multiple files is read concurrently from disc, blocked together, and stored to the backup device in a single operation. This is useful for tape drives which support "stream" operation. By accessing a number of different files (residing on different discs) simultaneously, the tape drive can be kept in stream mode.



**RELOAD Replacements**

**MPE V/E RELOAD Functions**

**Using INSTALL and RESTORE**

MPE V/E	MPE XL
RELOAD NULL	ISL>INSTALL
RELOAD ACCOUNTS	ISL>INSTALL :RESTORE *TAPE::DIRECTORY <i>No files</i>
RELOAD RESTORE	Not Available
RELOAD COMPACT	Not Available
RELOAD SPREAD	ISL>INSTALL :RESTORE *TAPE:@.@:DIRECTORY;KEEP

TG200038-009

© 1987 Hewlett-Packard Company

**Notes**

- The KEEP option is necessary to ensure that the boot files aren't restored to other than LDEV 1 and/or that the configuration files from the SYSGEN tape aren't overwritten.
- You may want to eliminate the "KEEP" option from the RESTORE command if you updated the configuration after your last SYSGEN tape was created. This way you will get your latest configuration. This could be dangerous if you don't have space on LDEV 1.

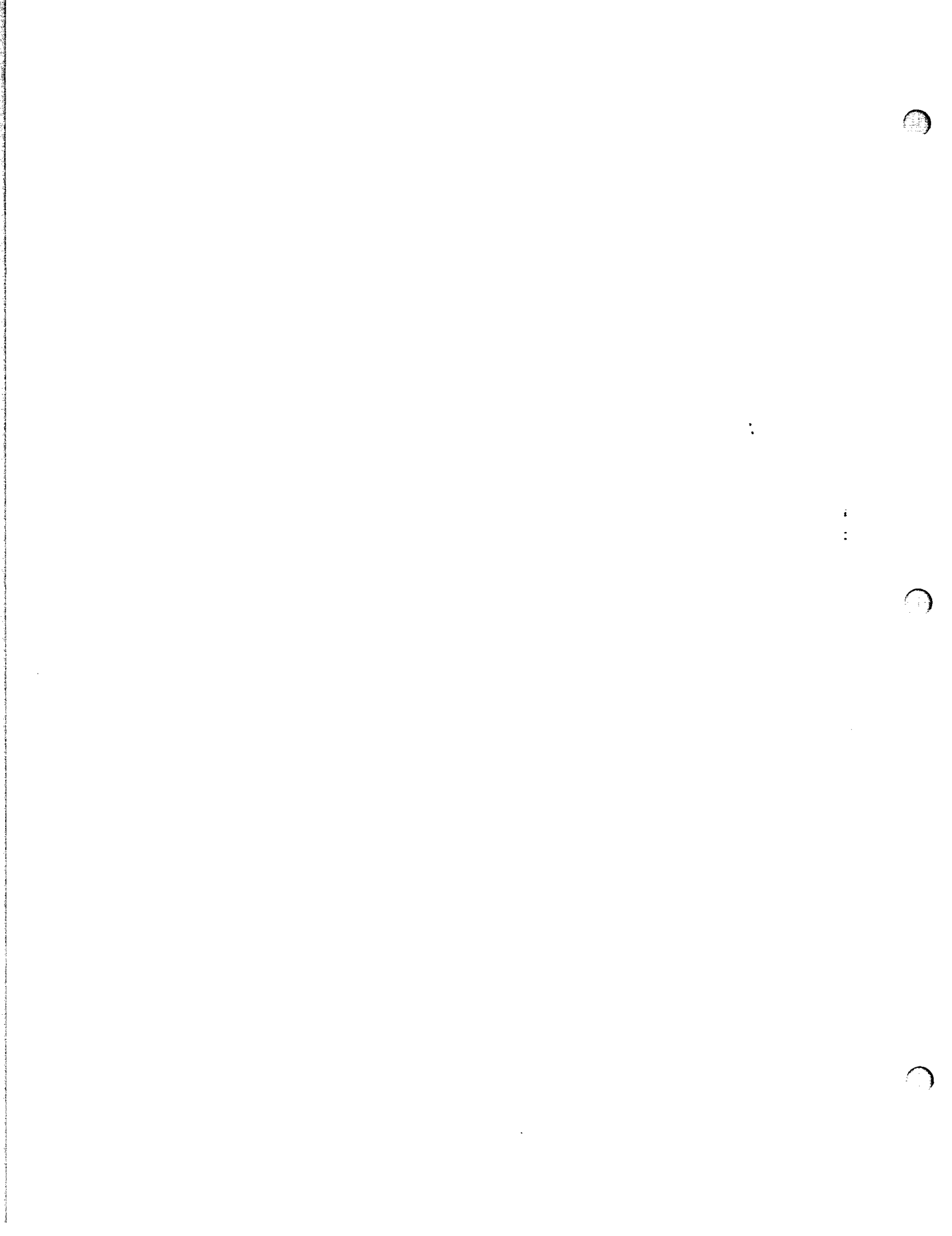
**Recovering from a Disaster**

**Recovering from a File System Disaster**

1. INSTALL using latest system load tape (SYSGEN)
2. RESTORE \*lastbu;@.@.;DIRECTORY;KEEP;OLDDATE  
Using most recent backup set (full or partial)
3. RESTORE \*fullbu;@.@.;KEEP;OLDDATE  
Using most recent full backup set

**Notes**

- If the SYSGEN tape does not contain the latest configuration files, do not specify the KEEP option when restoring from the most recent backup set.



## Module 7 Volume Management

### Goal and Objectives

**Goal:** To understand volume management on MPE XL.

**Objectives:**

- Explain the purpose and capabilities of Volume Management.
- Execute :VOLUTIL and use its commands.
- Use :VOLUTIL to create and display information about volume sets, volume classes, and volumes.
- Use MPE XL operator and user commands to manipulate volume sets, accounts and groups.

**Note:**

This training module complements the *System Administrator Skills Migration Guide*, Chapter 4 Volume Management. References are available in the *Volume Management Reference Manual* and the *MPE XL Commands Reference Manual*.

### Introduction

## What Does Volume Management Involve?

### Functions

- Volume initialization
- Volume maintenance
- Recognition of volume labels by the operating system
- Display of volume related information
- Access to files on volumes

TG200082\_001

© 1987 Hewlett-Packard Company

### Notes

- Although the term "volumes" is sometimes used to refer to magnetic tapes, we will only be referring to magnetic discs.
- MPE XL volume sets are not compatible with MPE V/E Private Volumes, although they are similar in function.

•  $VOLUTIL = (VINIT)$

### Introduction

## Why Should I Use Volume Management?

### Benefits

- Reduced down time due to system or disc failures
- Data partitioning for higher data availability
- Transportability between systems
- Efficient use of limited resources
- Improved security
- Comparable access time for system and non-system volumes

TG200082\_002

© 1987 Hewlett-Packard Company

### Notes

- EACH VOL. SET has own TRANSACTION Management System. - RECOVERY
- VOLUME CLASSES
- MASTER = Root directories, TRANSACTION Mgmt.
- opening file = directory on LDEV 1 then direct access via Mapped files
  - slight overhead on FOPEN.

### Benefits of Volume Management

#### Notes

Benefits of using volume management:

*(sessions hung)*

- If a drive goes offline for any reason, only the users currently accessing the drive will be blocked. Other users can continue normally unless they attempt to access that volume. If the drive is placed back online, and there is no damage to the drive, all users continue from where they left off.
- If discs are partitioned properly, a problem with one disc may only affect a small group of users, allowing other users to continue working. The problem may often be fixed without restarting the system.
- If the system fails for any reason (or if you want to easily move large amounts of data), you may move disc packs to another system and continue with your work.\*
- Sensitive data may be taken offline and placed in a secure location.\* Special capabilities also protect data on non-system volumes. For example, someone without the Use Volumes (UV) capability cannot access any files on a mountable volume, even if it is released.
- MPE XL volume management has been designed for many volume sets. The access time for system and non-system volumes is comparable.

\* Requires disc drives with removable media such as the HP 7935H

### Introduction

## What Is Volume Management?

### Data Management

A way to partition and allocate disk storage space into logical entities.

- Volume Sets
- Volume Classes
- Volumes

### Notes

- Restricting files to a volume set, a volume class or a volume gives you complete control of the storage of your data. The more specific the restriction, the more likely that data will not be lost in the rare event of a device or media failure. However, there may be a performance penalty for being more restrictive, especially for large, active files.



**Definitions**

**Volume States**

**Accessible (Mounted)**

MASTER	Contains volume set definition & data
MEMBER	Contains data

**Non-Accessible**

LONER	Closed volume or volume with no master
SCRATCH	Volume marked as having no valid data
UNKNOWN	Uninitialized volume or unrecognized label

**Notes**

### Volume States

#### Notes

**Accessible** means that the volume is mounted and the data on the volume is available to users.

- **MASTER** – A master volume is a superset of a MEMBER volume which contains volume set information and a directory root. The master volume of a set must be mounted in order to access any of the volumes of the set.
- **MEMBER** – A member volume is a disc pack that contains a label indicating the volume set to which it belongs. It may be included in one or more volume classes. The master volume of the set must be mounted for the volume to be in the MEMBER state.

**Non-Accessible** means that the data on the volume, if any, is not available to system users.

- **LONER** – A loner volume is a duplicate of another volume currently online or a volume recognized by MPE XL as a member volume but with no MASTER volume online. Also, when a volume set is closed, all volumes are placed in the LONER state.
- **SCRATCH** – A scratch volume has a bit turned on by the volume utility to indicate that the data on the disc is no longer needed and that the disc can be used for a new volume. As long as no one writes on a scratch volume, the volume utility may unscratch the volume.
- **UNKNOWN** – An unknown volume is not recognized by the MPE XL system. It may be used for a new volume. Be sure it does not contain data from another system.

---

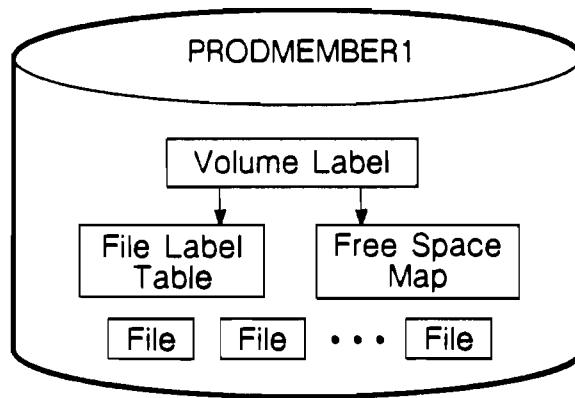
### WARNING

An MPE V/E Private Volume will not be recognized and will be placed in the UNKNOWN state when physically mounted on MPE XL. Make sure there is no valid data on the disc pack before initializing the volume.

---

**Definitions**

**Member Volume  
Description**



**Notes**

### Member Volume

#### Notes

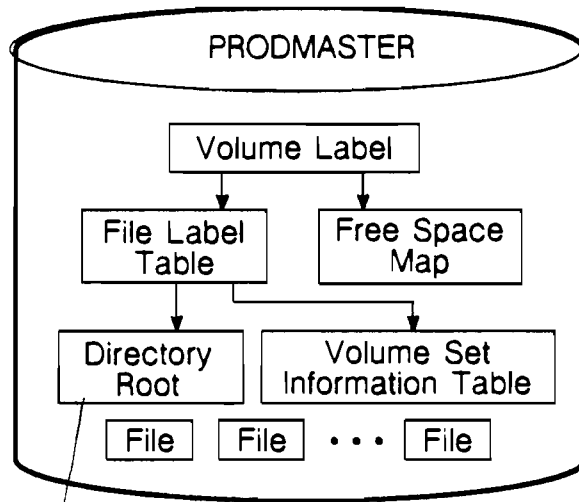
A member volume...

- Consists of one disc pack
- Must be a member of a volume set
- May be a member of one or more volume classes
- Name can be up to 16 characters (alphanumeric and underbar “\_”)
- ✖ ■ Contains own *Label Table* and *Free Space Map*
- Automatically recognized and mounted by the system, if master is mounted
- Non-system volumes are dismountable while system is running
- Operator is warned if volume goes offline while in use
- If a disc pack is removable, the pack may be moved to another disc drive
- Intrinsic (FOPEN and HPFOPEN) provide for directing data to a specific volume

# Module 7 Volume Management

Definitions

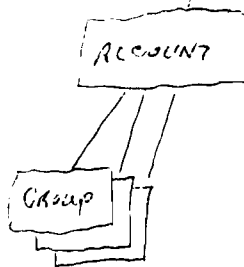
## Master Volume Description



TG200082\_006

© 1987 Hewlett-Packard Company

Notes



*Concurrent Access*

*X. Mgmt Log file*

PRE IMAGE	Post IMAGE	COMMIT IMAGE	
--------------	---------------	-----------------	--

- BLOCKED I/O
- BACKGROUND WRITES

- for Op. System & Turbo
- Log file on MASTER
- if Post - will Commit on Mount
- if PRE - will back out transaction
- 3 circular files of 32 Mb ≈ 96 Mb
- 10 mins ~~to~~ per Master to Boot System.

### Master Volume

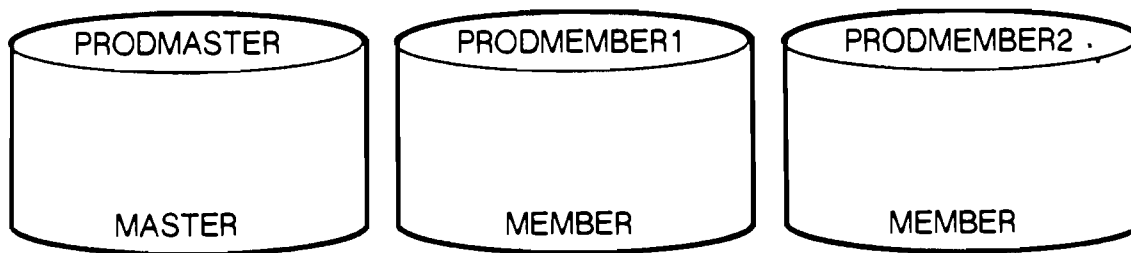
#### Notes

A master volume...

- Is the only volume needed to define a volume set.
- Contains *Volume Set Information Table* (VSIT) which defines volume set configuration. The VSIT contains information such as the volume set name, names of the volumes and classes in the set, and the volumes in each class.
- Contains the directory root for the volume set.
- Does not have to be a member of a volume class, unlike MPE V/E.
- Must be mounted to access files on other volumes in the set.
- System master volume (MPEXL\_SYSTEM\_VOLUME\_SET:MEMBER1) contains:
  - Bootable system image
  - System configuration(s)

### Definitions

#### Volume Set Description



TG200082\_007

© 1987 Hewlett-Packard Company

### Notes

A volume set...

- Consists of 1 to 255 volumes.
- May optionally contain 1 to 255 volume classes.
- Volume set names can be up to 32 characters (alphanumeric, underbar "\_", and period ".").
- There is a maximum of 32 volumes mounted on the system.
- Files cannot span volume sets.
- Requires one master volume that contains *Volume Set Information Table* (VSIT) and directory root.
- No need to purge volume sets since definition is stored on the media of the volume set, rather than on the system volume set, as in MPE V/E.

### Definitions

#### Types of Volume Sets System and Non-System

##### System Volume Set

- MPEXL\_SYSTEM\_VOLUME\_SET
- Always mounted
- Permanent and Transient Storage
- Master contains system image and configuration(s)
- Master must be present to boot system

##### Non-System Volume Sets

- Name may be WHAT\_EVER\_YOU\_WANT\_TO\_CALL\_IT
- Partitions user data into separate entities
- Migration path for MPE V/E Private Volumes
- Permanent storage only
- Master must be present to use set

TG200082\_008

© 1987 Hewlett-Packard Company

### Notes

- The term "Volume Sets" refers to both kinds of volume sets.
- Non-System Volume Sets are also called "Mountable" Volume Sets since they are not required for the system to execute.
- Permanent vs Transient Storage
  - **Permanent Storage** - Disc space used by permanent structures such as files (Permanent and Temporary), the label table, and the free space map.
  - **Transient Storage** - Disc space used for temporary structures such as stacks, heaps, and operating system data structures. This is similar to "Virtual Memory" on MPE V/E.
- The :DISCFREE utility will display the amount of permanent and transient storage used and available on each volume.

• 2 DRIVES IN Sys. Vol. SET - MIN

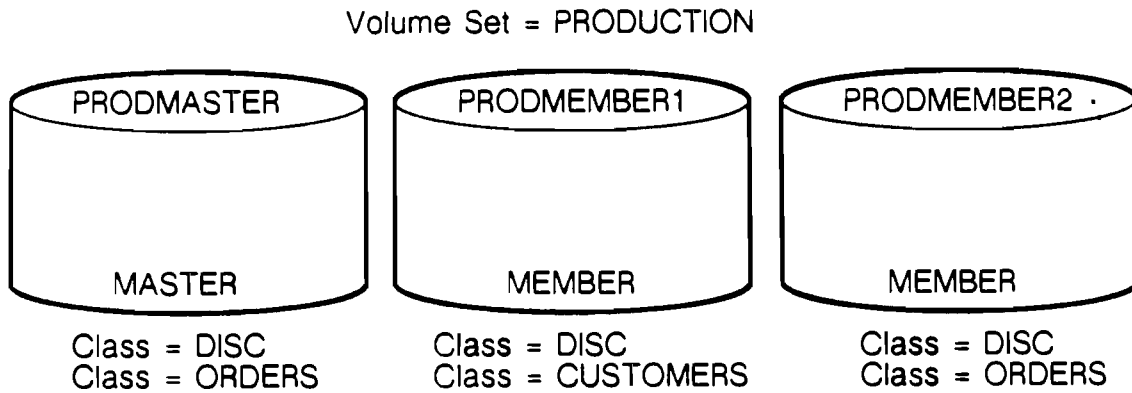


# Module 7 Volume Management

## Definitions

### Volume Class

### Description



TG200682\_009

© 1987 Hewlett-Packard Company

## Notes

### Volume Class

#### Notes

A volume class...

- May contain 1 to 255 volumes.
- Name can be up to 32 characters (alphanumeric, underbar "\_", and period ".").
- Used to partition and allocate disc storage space.
- ⊗ ■ Use of classes is optional, however all volume sets should contain the class "DISC" and most, if not all, volumes should be included in the class. This is necessary for certain compatibility mode utilities to function properly. *Copy, STORE etc.*
- Cannot span volume sets.
- Master volume not required to be in a class, but must be mounted to access any volume.
- Unlike MPE V/E, you cannot mount by volume class. This affects the :MOUNT, :DISMOUNT, :LMOUNT, :LDISMOUNT, and :VSUSER commands.
- Cannot purge volume classes. *use another class*
- Intrinsic (FOPEN and HPFOPEN) provide for directing data to a specific volume class.

■ *Problem with deleting entries (classes) from VSIT.*

### Creating a Volume Set

#### Creating a Non-System Volume Set

##### Steps

1. Plan
2. Prepare hardware
3. Define set & master volume
4. Define volumes
5. Define classes
6. Create accounts
7. Create groups

### Notes

## Module 7 Volume Management

### Creating A Volume Set

#### Volume Utility

:VOLUTIL

	Create	Show	Alter	Copy	Format	Verify	Recover
Volume Sets	X	X		X			X
Volume Classes	X	X	X				X
Volumes	X	X	X	X	X	X	X

TG200082\_011

© 1987 Hewlett-Packard Company

### Notes

## Creating a Volume Set

### :VOLUTIL Commands

Volume	Volume Set	Volume Class	Miscellaneous
ALTERVOL	COPYSET	EXPANDCLASS	DO
COPYVOL	NEWSET	NEWCLASS	EXIT
DSECTORVOL	SETDEFAULTSET	SHOWCLASS	HELP
FORMATVOL	SHOWDEFAULTSET		LISTREDO
INITVOL	SHOWSET		LOG
NEWVOL			RECOVER
SCRATCHVOL			REDO
SHOWVOL			USE
UNSCRATCHVOL			
VERIFYVOL			

TG200082\_0\*2

© 1987 Hewlett-Packard Company

## Notes

- Any command which modifies the media requires the user to have the Create Volumes (CV) capability, except for the RECOVER command which requires the System Manager (SM) capability. All users may use the SHOWxxx commands to display information.
- See *Volume Management Reference Manual* for detailed information about :VOLUTIL commands.

• INITVOL - FOR NEW Sys. DOMAIN DISC - INITIAL CONFIG IS 8 DRIVES

### Creating a Volume Set

#### Creating a Non-System Volume Set

##### Example

```
:volutil:
```

```
Volume Utility A.00.00, (C) Hewlett-Packard Co., 1987. All Rights Reserved.
```

```
volutil: newset sname=production master=prodmaster ldev=16
```

```
*Verify: Initialize new volume set PRODUCTION:PRODMASTER on ldev 16 [Y/N] ?y
```

```
beginning recovery
```

```
completed recovery of free space map and label table
```

```
  completed recovery of files
```

```
begin posting of recovered files
```

```
recovery completed
```

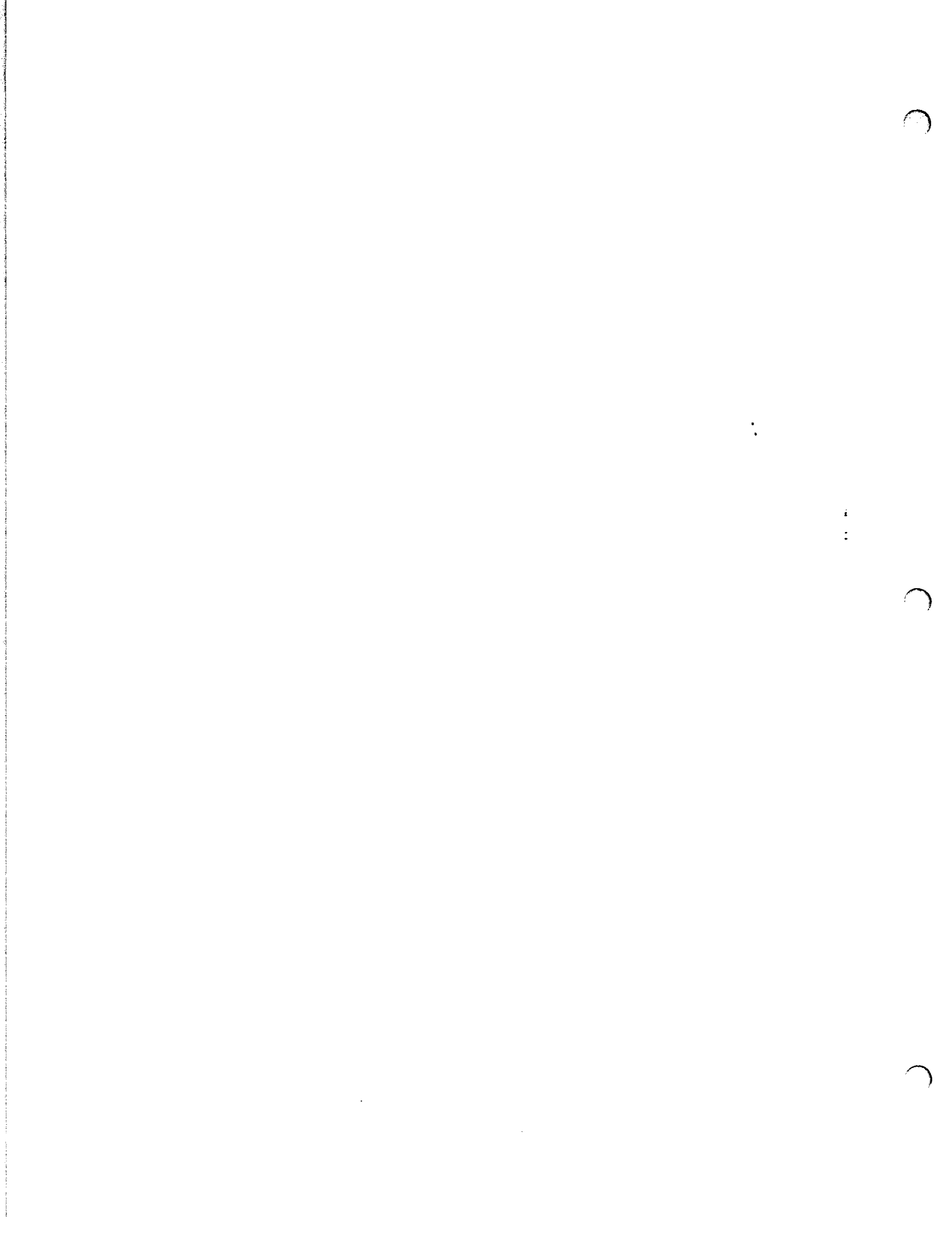
```
*Note: New master volume has been initialized on ldev 16.
```

T9200082\_013

© 1987 Hewlett-Packard Company

### Notes

- The **NEWSET** command is used to define a new volume set. The disc must have been in either the UNKNOWN or SCRATCH state.
- The "recovery" messages are from Transaction Management which maintains the consistency of the label table and free space map.



**Creating a Volume Set**

**Creating a Non-System Volume Example**

```
volutil: newvol vname=production:prodmember1 ldev=17
*Verify: Initialize new member volume PRODUCTION:PRODMEMBER1 on ldev 17 [Y/N] ?y
beginning recovery
completed recovery of free space map and label table
completed recovery of files
begin posting of recovered files
recovery completed
*Note: New member volume has been initialized on ldev 17.
volutil: newvol vname=production:prodmember2
*Verify: Define new member volume PRODUCTION:PRODMEMBER2 [Y/N] ?y
*Warning: Volume only defined and not physically initialized.
```

T3200082\_014

© 1987 Hewlett-Packard Company

**Notes**

- In the first command, the second volume, PRODMEMBER1, is defined and initialized into the PRODUCTION volume set by the **NEWVOL** command. To prevent user errors, the volume set name is required. The disc must have been originally in the UNKNOWN or SCRATCH state.
- The second **NEWVOL** command defines a volume, PRODMEMBER2, but does not initialize it. (Notice no Ldev parameter.) The volume may be initialized later by using the **INITVOL** command.

• cv,



## Module 7 Volume Management

### Creating a Volume Set

### Displaying Mounted Volume Information

#### Example

volutil: :dstat all

LDEV-TYPE	STATUS	VOLUME	(VOLUME SET - GEN)
1-079350	MASTER	MEMBER1	(MPEXL_SYSTEM_VOLUME_SET-0)
2-079350	MEMBER	MEMBER2	(MPEXL_SYSTEM_VOLUME_SET-0)
3-079350	MEMBER	MEMBER3	(MPEXL_SYSTEM_VOLUME_SET-0)
16-079350	MASTER	PRODMASTER	(PRODUCTION-0)
17-079350	MEMBER	PRODMEMBER1	(PRODUCTION-0)

TG200082\_015

© 1987 Hewlett-Packard Company

### Notes

- :DSTAT is a CI command used from within :VOLUTIL to display the status of all the volumes physically mounted on the system.

• Ignore (Don't type) "-Q"

### Creating a Volume Set

#### Creating Volume Classes

volutil: **newclass cname=production:orders volumes=prodmaster**

\*Verify: Create new volume class PRODUCTION:ORDERS [Y/N] ?y

volutil: **newclass cname=production:customers volumes=prodmember1** ..

\*Verify: Create new volume class PRODUCTION:CUSTOMERS [Y/N] ?y

volutil: **expandclass cname=production:orders volumes=prodmember2** :

\*Verify: Expand volume class PRODUCTION:ORDERS [Y/N] ?y :

TG200082\_016

© 1987 Hewlett-Packard Company

### Notes

- The **NEWCLASS** command is used to define volume classes within a set and associate them with a volume or volumes.
- ④ ■ The **EXPANDCLASS** command adds a volume(s) to a class.

### Creating a Volume Set

#### Displaying Volume Set Information Example

volutil: ~~showset sname=production info=struct~~

Volumes in set: PRODUCTION

PRODMASTER  
PRODMEMBER1  
PRODMEMBER2

Classes in set: PRODUCTION

DISC  
ORDERS  
CUSTOMERS

Volumes in class: PRODUCTION:DISC

PRODMASTER  
PRODMEMBER1  
PRODMEMBER2

Volumes in class: PRODUCTION:ORDERS

PRODMASTER  
PRODMEMBER2

Volumes in class: PRODUCTION:CUSTOMERS

PRODMEMBER1

TG200082\_017

© 1987 Hewlett-Packard Company

### Notes

- The **SHOWSET** command displays various information about the volume set. STRUCTURAL information about the volume set is shown here.
- The asterisk ('\*') before PRODMEMBER2 means that the volume has been defined but not initialized.

**Creating a Volume Set**

**Displaying More Volume Set Information**

**Example**

Volutil: **showset production setinfo**

*No KEYWORDS - PARAMS IN CORRECT ORDER*

Volume-set name: PRODUCTION  
Creation date: SUN, JUL 19, 1987, 2:44 AM  
Generation number: 0  
Number of volumes in set: 3  
Number of classes in set: 3

volutil: **showset production dstatus**

Volume name:	State:	Ldev:	Type:	Path:
-----	-----	-----	-----	-----
PRODMASTER	MASTER	16	079350	8.0.6
PRODMEMBER1	MEMBER	17	079350	8.0.7
PRODMEMBER2	(VOLUME NOT AVAILABLE)			

volutil: **exit**

**Notes**

**Module 7 Volume Management**

Using Volume Sets

**CI Command Summary  
For Volume Management**

User	Account Manager	Operator	System Manager
:DSTAT	:REPORT	:VMOUNT	:NEWACCT
:VSUSER	:NEWGROUP :ALTGROUP :PURGEGROUP	:LMOUNT :VSRESERVESYS	:ALTACCT :PURGEACCT :
:MOUNT :VSRESERVE		:LDISMOUNT :VSRELEASESYS	:VOLUTIL
:DISMOUNT :VSRELEASE		:VSOPEN :VSCLOSE	ISL> DISCUTIL :
		:STORE :RESTORE	:

TG200082\_019

© 1987 Hewlett-Packard Company

Notes

### Command Summary

#### Notes

##### ■ Changes from MPE V/E

Class names are no longer accepted by any CI commands, as they were on MPE V/E. Use the volume set name instead.

The "mount" commands (:MOUNT, :DISMOUNT, :LMOUNT, and :LDISMOUNT) only accept volume set names in the MPE V/E format (i.e. *vsname.group.account*) and are provided only for compatibility.

The "reserve" commands (:VSRESERVE, :VSRELEASE, :VSRESERVESYS; and :VSRELEASESYS) accept both naming formats and should be used in place of the "mount" commands. (If using the MPE V/E format, the group and account must be specified, as they will not default.)

##### ■ Capabilities

No special capabilities are required to execute VOLUTIL. The System Manager is expected to be the primary user.

In general, any user may use the informational commands. The Use Volumes (UV) capability is required to reserve/access volume sets, and the Create Volumes (CV) capability is required to change the accounting structure on a volume set. Of course, AM, OP, or SM are also required, as appropriate for each command.

- For detailed information about these commands, see the *MPE XL Commands Reference Manual*.

- DISCUTIL is an offline Initial System Loader (ISL) utility to store files from a damaged volume off to tape. It replaces the SADUTIL utility used on MPE V/E. Use the :VOLUTIL command **RECOVER** to restore the files to another disc. See the *Volume Management Reference Manual* for more information on DISCUTIL and RECOVER.

*The following table shows how MPE V/E commands (CI and :VINIT) are migrated into MPE XL (CI and :VOLUTIL) commands.*

## Module 7 Volume Management

Comparison With MPE V/E

### MPE V/E CI Commands

MPE V/E	MPE XL
:ALTVSET	volutil: ALTERNVOL volutil: EXPANDCLASS volutil: NEWCLASS
:DISMOUNT	:VSRELEASE :DISMOUNT
:DOWN	:VCLOSE
:DSTAT	:DSTAT
:FOREIGN	N/A *
:LDISMOUNT	:VSRELEASESYS :LDISMOUNT
:LISTVS	volutil: SHOWSET
:LMOUNT	:VSRESERVESYS :LMOUNT
:MOUNT	:VSRESERVE :MOUNT
:NEWVSET	volutil: NEWSET
:PURGEVSET	N/A *
:UP	:VSOPEN
:VMOUNT	:VMOUNT
:VSUSER	:VSUSER

### MPE V/E Utilities

MPE V/E	MPE XL
:RUN RECOVER5.PUB.SYS	volutil: RECOVER
SADUTIL (offline)	ISL> DISCUTIL
:VINIT	:VOLUTIL

**Comparison With MPE V/E****MPE V/E :VINIT Commands**

<b>MPE V/E :VINIT</b>	<b>MPE XL :VOLUTIL</b>
COND	N/A*
COPY	COPYVOL
DSTAT	:DSTAT
DTRACK	DSECTORVOL
FOREIGN	N/A*
FORMAT	FORMATVOL
INIT	INITVOL
PDEFN	SHOWSET VOLUMES
PDTRACK	N/A*
PFSPACE	SHOWVOL STORAGE
PLABEL	SHOWVOL LABEL
SCRATCH	SCRATCHVOL
SERIAL	N/A*
VERIFY	VERIFYVOL

 **Notes**

\*N/A means either that the command is no longer needed or that it is not an MPE XL Release 1.0 feature.



### Using Volume Sets

#### User and Operator Commands

#### Information & Mounting

##### Informational Commands

- **:VSUSER** – Displays all users accessing a volume set
- **:DSTAT** – Displays status of all volumes mounted

##### Mounting (& Dismounting) Commands

- **:VMOUNT** – Enables and disables user access to volume sets
- **:VSCLOSE** – Informs the system of intention to take volume set offline
- **:VSOPEN** – Opens a volume set previously closed
- **:VSRESERVE** – Reserves a volume set for future use
- **:VSRELEASE** – Releases a volume set previously reserved
- **:VSRESERVESYS** – Reserves a volume set for future use systemwide
- **:VSRELEASESYS** – Releases a volume set previously reserved systemwide

### Notes

### □ User and Operator Commands



### □ Notes

Since MPE XL has **Automatic Volume Recognition (AVR)**, there is no longer a need to explicitly mount a volume or volume set. As the disc is "spun up," the system recognizes the volume and automatically mounts it. Although the MPE V/E commands :MOUNT, :DISMOUNT, :LMOUNT, and :LDISMOUNT are supported, their use is limited to migration from Private Volumes.

When a volume set is mounted, the information from the VSIT is copied into an operating system structure called the *Mounted Volume Table (MVT)*. This table contains information such as the volume set name, class names, volume names, logical device (Ldev) of the disc drive, I/O device path, and pointers to the label table. When a volume is closed, this information is deleted.

The :VMOUNT command enables (ON) and disables (OFF) access to the volume management facility. If ON,AUTO is specified, then requests to access a volume set are automatically granted by the system. If ON is specified, then a mount request will appear on the console for the first access by each user and the user will wait for a reply from the operator. The : default after system startup is ON, AUTO.

The :VSCLOSE command provides an orderly way to remove a volume set from the system, replacing the :DOWN command for volume sets.

- Prevents further file opens and :VSRESERVEs on the volume set for new users. Current users of the volume set may continue to open files and may issue a :VSRESERVE until they close all files on the set and issue a corresponding :VSRELEASE.
- If issued to an "in use volume set" (see :VSUSER), the set will be closed when all files on the set have been closed and all reserves, if any, have been released.
- When a volume set is closed, the volumes are placed in a LONER state.
- The ;NOW option will abort users who have reserved or have files open on the volume set and then close the set immediately.

---

## WARNING

The :VSCLOSE *vol/set* ;NOW command is very dangerous and should be used rarely, if ever. A better policy is to issue :WARNs to those accessing the volume set (:VSUSER) after the :VSCLOSE and then to abort the particular jobs and sessions with :ABORTJOB.

---

## Module 7 Volume Management

### User and Operator Commands (Continued)

- The **:VSOPEN** command opens a set that was previously closed, or in the process of being closed, with a **:VSCLOSE** command. This command replaces the **:UP** command for volume sets.
- The **:VSRESERVE** command marks a volume set "in use" by your session, preventing the closing of the set until a **:VSRELEASE** command is issued. (The volume set is automatically released when the user logs off.) Corresponds to the **:MOUNT** command.
- The **:VSRELEASE** command releases a volume set that was previously reserved by the **:VSRESERVE** command. Corresponds to the **:DISMOUNT** command.
- **:VSRESERVESYS** and **:VSRELEASESYS** perform the same functions, although independently, as **:VSRESERVE** and **:VSRELEASE** on a system wide basis. (Only one **:VSRESERVESYS** may be issued until the corresponding **:VSRELEASESYS**.) Unlike **:VSRESERVE**, the volume set remains reserved even after the user logs off. A **:VSRELEASESYS** must be issued to release the volume set. These commands correspond to **:LMOUNT** and **:LDISMOUNT**.

**Using Volume Sets**

**:VMOUNT and Reserving a Volume Set**

**Example**

```
:vmount off
:vsreserve production
MOUNTABLE VOLUMES FACILITY DISABLED BY OPERATOR. (CIERR 10612)
:vmount on
:vsreserve production
212:57/#S26/51/ACCESS TO PRODUCTION BY MANAGER.SYS (Y/N) (MAX CHARS.=1)
CTRL A
=reply 51,y
:vsrelease production
:vmount on,auto
:vsreserve production
:vsuser
VOLUME SET NAME          JOBNUM          JOB NAME
-----
PRODUCTION                #S26           MANAGER.SYS
```

FG200082\_021

© 1987 Hewlett-Packard Company

**Notes**

- This is a demonstration of the use of :VMOUNT, :VSRESERVE and :VSRELEASE. Note how :VSRESERVE works depending on the setting of :VMOUNT.

# Module 7 Volume Management

## Using Volume Sets

### Closing a Volume Set Example

```
:vsclose production
:vsuser
  VOLUME SET NAME          JOBNUM   JOB NAME
  -----
  PRODUCTION                #S26    MANAGER.SYS
:dstat
LDEV-TYPE  STATUS  VOLUME (VOLUME SET - GEN)
-----
14-079330  MEMBER  PRODMASTER  (PRODUCTION--0)

:vsrelease production
:vsuser
NO VOLUME SETS CURRENTLY RESERVED (PVERR 269)
:dstat
LDEV-TYPE  STATUS  VOLUME (VOLUME SET - GEN)
-----
14-079330  LONER   PRODMASTER  (PRODUCTION--12224)
```

TG200082\_022

© 1987 Hewlett-Packard Company

## Notes

- Remember that a volume set is not closed until all users of the volume set stop accessing the volume and release the volume set. When a volume set is closed, it is placed in the LONER state.

**Using Volume Sets**

**Opening a Volume Set**

**Example**

```
:vsopen production
beginning recovery
completed recovery of free space map and label table
completed recovery of files
begin posting of recovered files
recovery completed
NEW and TEMP files deallocated for PRODUCTION:PRODMASTER (LDEV 16)
PRODUCTION VOLUME MOUNTED ON LDEV 16 (AVR 7)
```

TG200082\_023

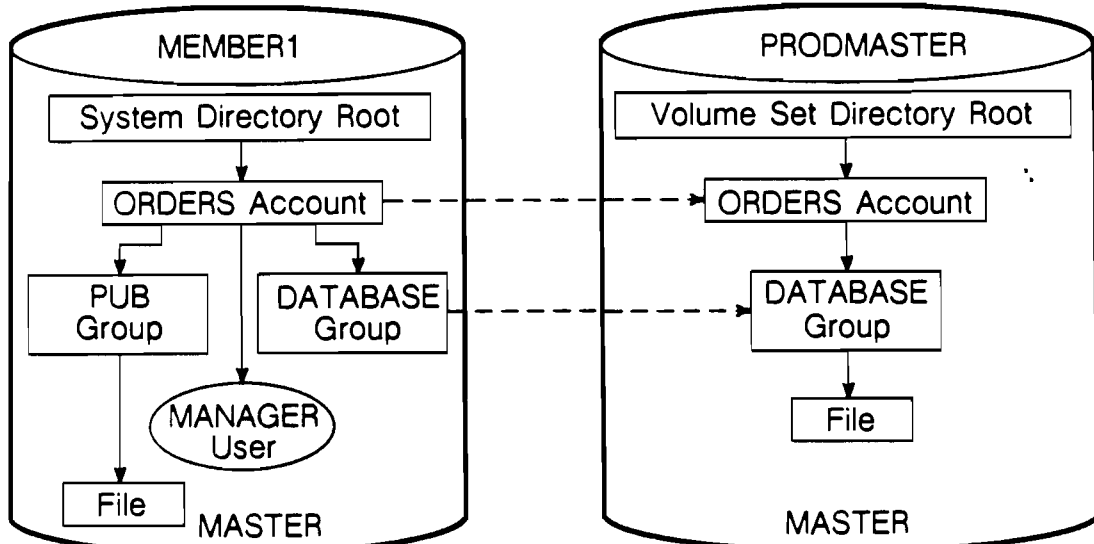
© 1987 Hewlett-Packard Company

**Notes**

- **:VSOPEN** opens a set previously closed with **:VSCLOSE**. Normally, a volume set is automatically recognized and opened when it is "spun up" (or physically mounted). The recovery and mounting messages would also appear for other volumes of the set (i.e. PRODUCTION:PRODMEMBER1, in this example).

**Creating the Accounting Structure**

**Directory Structure**



Volume Set = MPEXL\_SYSTEM\_VOLUME\_SET

Volume Set = PRODUCTION

T0200082\_024

© 1987 Hewlett-Packard Company

**Notes**

- Note that the directory structures on the system volume set and the user volume set are in parallel. The account structure commands must be used to keep them in parallel.

**Creating the Accounting Structure**

**Account and System Manager Commands**

Why the double vision?

```
:NEWACCT ORDERS.MGR.PASS=SECRET  
:NEWACCT ORDERS.MGR.ONVS=PRODUCTION ..  
:NEWGROUP DATABASE.ORDERS.HOMEVS=PRODUCTION HOMEVS =  
:NEWGROUP DATABASE.ORDERS.ONVS=PRODUCTION
```

**Notes**



### Creating the Accounting Structure

#### Notes

##### Accounts

Building a new account on a volume set:

- You must make entries into two directories: the system directory and the volume set directory. Therefore, two **:NEWACCT** commands are necessary.
- **:NEWACCT ORDERS,MGR** creates an account in the system directory (no **:ONVS=** parameter). The system directory contains all account information.
- **:NEWACCT ORDERS,MGR;ONVS=PRODUCTION** creates an account in the volume set directory (**:ONVS=vsname**).
- A file limit (**:FILES=limit**), stored in the VS directory, is the only parameter allowed with **:ONVS=**.
- For these reasons, you must issue two **:PURGEACCT** commands to fully purge an account from both directories.
- You only need to issue one **:ALTACCT** command (no **:ONVS=**) since most information (e.g. password) is stored in the system directory. To change the file limit (**:FILES=**), you only need one **:ALTACCT**, but it should be with the **:ONVS=** parameter since that information is stored in the volume set directory.

##### Groups

Building a new group on a volume set:

- You must make entries into both directories using two **:NEWGROUP** commands.
- **:NEWGROUP DATABASE.ORDERS;HOMEVS=PRODUCTION** creates a group in the system directory. The system directory contains most group information. The **:HOMEVS=** parameter specifies the volume set where the files in the group will be created.
- **:NEWGROUP DATABASE.ORDERS;ONVS=PRODUCTION** creates a group in the volume set directory.
- The home volume set of the PUB group is the system volume set by default. To change the home VS, you must issue an **:ALTGROUP ;HOMEVS=** and then create the group on the VS with the **:NEWGROUP ;ONVS=** command.
- A file limit (**:FILES=limit**), stored in the VS directory, is the only parameter allowed with **:ONVS=**.
- For these reasons, you must issue two **:PURGEGROUP** commands to fully purge a group from both directories.
- You only need to issue one **:ALTGROUP** command (no **:ONVS=**) since most of the information (e.g. password) is stored in the system directory. To change the file limit (**:FILES=**), you only need one **:ALTGROUP**, but it should be with the **:ONVS=** parameter since that information is stored in the volume set directory.

**Creating the Accounting Structure (Continued)**

**Notes**

---

**NOTE**

The master volume of the set must be mounted to build, alter or purge accounts and groups on the volume set.

---

**:REPORT** - The **;ONVS=** parameter specifies which directory information to display. The default is the system directory.

## Creating the Accounting Structure

### Where Do the Files Go?

#### ;ONVS vs ;HOMEVS

**;ONVS=** Specifies which directory to reference or modify.

(Default is MPEXL\_SYSTEM\_VOLUME\_SET

:ALTACCT  
:ALTGROUP  
:NEWACCT  
:NEWGROUP  
:PURGEACCT  
:PURGEGROUP  
:REPORT  
:STORE

**;HOMEVS=** Specifies home volume set of group (location of files).

(Default is MPEXL\_SYSTEM\_VOLUME\_SET

:ALTGROUP  
:NEWGROUP

TG200082\_026

© 1987 Hewlett-Packard Company

## Notes

- The **Home Volume Set** of a group is the volume set where all the group's files are stored.
- The **:LISTGROUP** command shows the home volume set.
- The **;VS=** parameter has been deleted from all commands and replaced with **;ONVS=**.
- You can only change the home volume set of a group if there are no files in the group.
- To move a volume set to another system, you would only have to create the accounting structure on that system (**;HOMEVS=**). The accounting structure for the volume set moves with the set.

**Creating the Accounting Structure**

**Creating the Accounting Structure**

**Example**

```

:newacct orders,mgr
:newacct orders,mgr;onvs=production;files=10000
:newgroup database.orders;homevs=production
:newgroup database.orders;onvs=production
:report @.orders
    
```

ACCOUNT /GROUP	FILESPACE-SECTORS		CPU-SECONDS		CONNECT-MINUTES	
	COUNT	LIMIT	COUNT	LIMIT	COUNT	LIMIT
ORDERS	0	**	0	**	0	**
/DATABASE	0	**	0	**	0	**
/PUB	0	**	0	**	0	**

```

:report @.orders;onvs=production
    
```

ACCOUNT /GROUP	FILESPACE-SECTORS		CPU-SECONDS		CONNECT-MINUTES	
	COUNT	LIMIT	COUNT	LIMIT	COUNT	LIMIT
ORDERS	0	10000	0	**	0	**
/DATABASE	0	**	0	**	0	**

TG200082\_027

© 1987 Hewlett-Packard Company

**Notes**

- Note the parallel structure in the commands. One changes the system directory, the other changes the volume set directory. All the files in the DATABASE.ORDERS group will be placed on the PRODUCTION volume set. The files in the PUB.ORDERS group will be on the system volume set.
- The :REPORT command shows the directory structure of the volume set specified by the ;ONVS= parameter.

## Module 7 Volume Management

### Using Volume Sets

#### Backing Up Volume Sets

#### :STORE/:RESTORE

- :STORE
  - ;ONVS=*volumesetname*
  - ;DIRECTORY
  
- :RESTORE
  - ;VOL=*volumename*
  - ;VOLCLASS=*volumeclasse*
  - ;VOLSET=*volumeset*
  - ;DIRECTORY

TG200082\_028

© 1987 Hewlett-Packard Company

### Notes

- :STORE will store only files and/or the directory from the volume set(s) specified.
- :RESTORE will restore files to the volume, volume class, or volume set specified. Only one of ;VOL= and ;VOLCLASS= may be specified. The ;DIRECTORY option will restore the accounting structure to a volume set being recreated.
- CM STORE/RESTORE requires the volume class DISC on all volumes accessed.
- *CREATE - default capabilities*

Creating Volume Sets

What's the Difference?

:VOLUTIL and :SYSGEN

:VOLUTIL

- For all your volume management needs

:SYSGEN

- Configure the device(LDev) for the disc drive
- Only for MPEXL\_SYSTEM\_VOLUME\_SET on first START after an INSTALL .

TG200082\_029

© 1987 Hewlett-Packard Company

Notes

- Use :VOLUTIL for all (system and non-system) volume management. The volume commands in the :SYSGEN I/O module (AVOL, DVOL, MVOL) are only used during the first START after an INSTALL. They are provided for convenience during the installation and for possible future enhancements.
- You must configure the disc drive device and Ldev in :SYSGEN using the ADEV command before you can initialize the media with :VOLUTIL.

*System*  
*AD 2/5, 8, 0, 2, HP7937*  
~~*DVOL*~~  
*Boot System*  
*VOLUTIL*  
*INITVOL*

## Module 7 Volume Management

### Using Volume Sets

#### Intrinsic Access

#### File Restrictions

Restriction	FOPEN (MPE V/E)	FOPEN (MPE XL)	HPFOPEN (MPE XL)
Ldev	Ldev	Converted to volume name	N/A*
Device Class	Device Class	Converted to volume name	N/A*
Volume	Volume	Volume	Volume
Volume Class	Volume Class	Volume Class	Volume Class
Volume Set	Group's Home VS	Group's Home VS	Group's Home VS

TG200082\_030

© 1987 Hewlett-Packard Company

### Notes

- When file system intrinsics are used to open a file, parameters are available to specify the restriction for the extents of that file. Some are no longer available on MPE XL. This table shows what restrictions are available on MPE V/E and MPE XL, and how they are mapped when using the FOPEN intrinsic on MPE XL.

\*N/A means that the file destination restriction is not available for that intrinsic.

### Summary

#### Summary

- Features (initialization, maintenance, recognition, information, file access)
- Benefits (partitioning, availability, transportability, security)
- Volume set structure (sets, classes, volumes)
- :VOLUTIL volume utility
- CI commands (mounting & dismounting, accounting structure)
- Interface with :SYSGEN and intrinsics

### Notes



### Activity 7.1 Lab: Using Volume Management

#### Instructions:

1. Your payroll department's application is due to move from the development system to your production machine in a few weeks. The programmer has requested you set up the volume set and accounting structure in advance. Space is needed for the programs, for regular data, and for sensitive data that the payroll department would like to keep locked up, except when needed for a weekly job run.

The account is named "PAYROLL" and there are two users: "MGR" for the programmer, and "USER" for the other users. The home group for "USER" is "DATA". Programs (60 Mb) are in the group "PUB" and non-sensitive data (350+ Mb) is stored in the "DATA" group. Sensitive data (200+ Mb) is only written to the class "SECURED" and is stored in the group "SECURE".

You have two HP7935H disc drives (404 Mb), but expect to order another as the data grows. Plan for your needs.

2. Make sure hardware is connected and configured properly. Physically mount disc pack. Use :DSTAT to display the state of the volumes. (Try to see a volume in each state as you move through the lab.)
3. Create the volume set and any member volumes needed.
4. Create any volume classes needed.
5. Create the accounting structure. Don't forget capabilities and access rights!
6. Logon to the account with each user. Try creating a file.
7. Display some of the volume set information available to you through :VOLUTIL (SHOWxxx) and CI commands (:VSUSER, :LISTxxxx, :REPORT, :DSTAT).
8. Remove the volume from the system and then try to remount it. Use the :DSTAT command to check the volume state.
9. Try some of the other :VOLUTIL commands, as time permits.
10. Scratch the volumes in the set before you finish. Display the state of the volumes using :DSTAT.



## Module 3 Troubleshooting

### Goal and Objectives

**Goal:** To familiarize students with some of the troubleshooting resources available for the Series 930 and 950.

**Objectives:** After completing this module, you will be able to:

- Use simple Diagnostic User Interface (DUI) commands.
- Demonstrate familiarity with some of the utilities available in the Online Diagnostics Subsystem.

### Notes

This module complements the following manual:

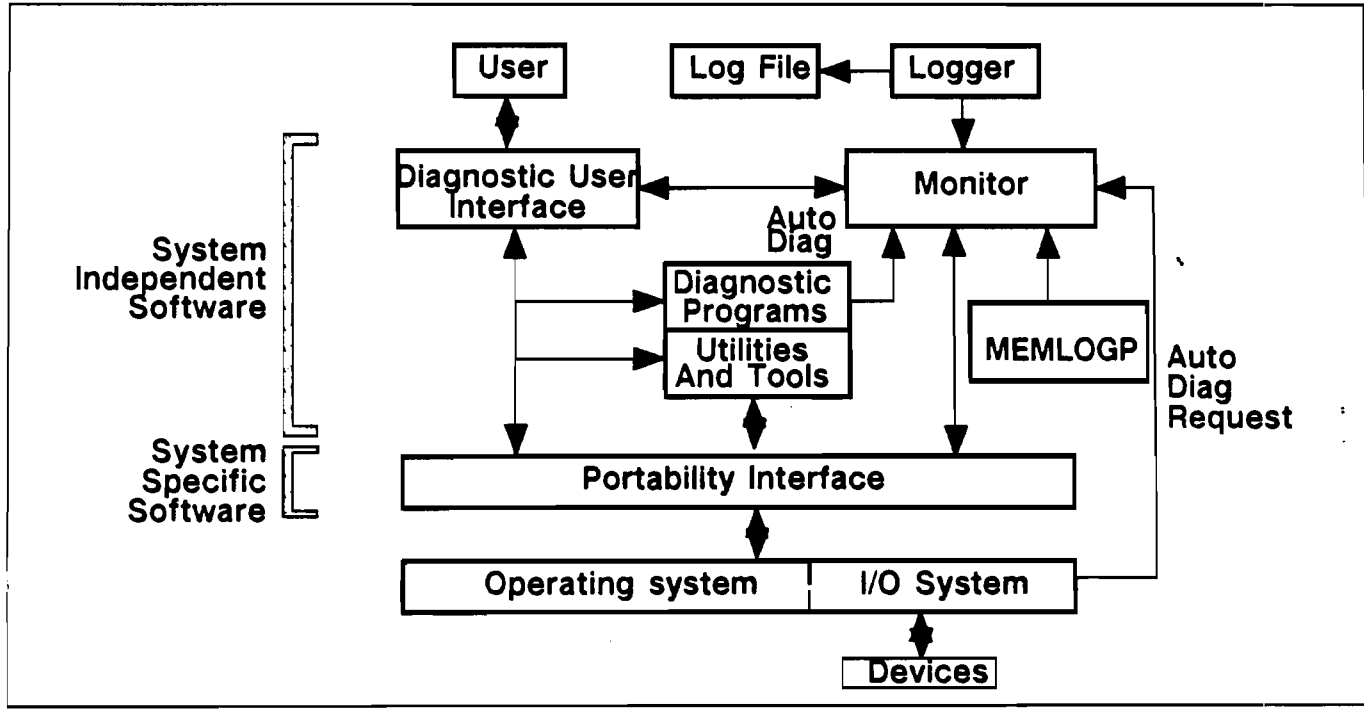
*Online Diagnostics Subsystem Utilities Manual.*

• SysDIAG  
- TERMDSM  
- CSSDWIL

updated with system - Part A 300Mb.

**Online Diagnostics Subsystem**

**Online Diagnostics Subsystem on MPE XL**



TG200078\_001

© 1987 Hewlett-Packard Company

**Notes**

- Functional block diagram of the MPE XL Online Diagnostic Subsystem.
- DUI - User interface to the subsystem.
- MONITOR - the controlling process which launches, controls, and monitors all invoked diagnostics.

*- DUI > LIST ALL*

**Online Diagnostics Subsystem**

**Online Diagnostics Subsystem**

**Modes of Operation**

There are 3 modes in which online diagnostics can be operative in:

**NORMAL** - No disruptive or destructive tests can be run.

**DISRUPTIVE** - Does not do data destructive test but can disrupt other users.

**DESTRUCTIVE** - As the word implies, it will write on the disc pack, and data may be lost during these tests.

The diagnostic system determines what mode the diagnostic can be run in. It bases its decision on such things as the device being tested, the user capability and autodiagnostic mode.

**Notes** *DESTRUCTIVE = Single User Mode (SUM)*

**Online Diagnostics Subsystem**

**Online Diagnostics Subsystem**

**User Capabilities**

There are 4 levels of user capabilities ranging from 0 to 3, with 0 being the highest level.

<b>Security Level</b>	<b>MPE XL</b>
Level 0	SM or DI
Level 1	SM or DI or OP
Level 2	SM or DI or OP or AM
Level 3	<All Others>

TG200078\_003

© 1987 Hewlett-Packard Company

**Notes**

**Online Diagnostics Subsystem**

**Online Diagnostics Subsystem**

**User Modes**

**SUM -** Single User Mode - If the user has level 0 capabilities, entering this mode will cause all jobs and sessions to be logged off, except for the caller. SUM can be used when testing may cause data integrity problems to the rest of the users.

**MUM -** Multi-user Mode - Normal set up for DUI. Multi-user system.

**SINGLE DISC MODE -**

This is selectable only on boot-up, whereas the other two modes are selectable from the DUI. Used when a major problem with the hardware exists! (Except for the boot disc!!!)

**Notes**

**Online Diagnostics Subsystem**

**Online Diagnostics Subsystem**

**Format of Online Diagnostics**

SECTION #1	Available for General Diagnostic Use
SECTION #2	Clear
SECTION #3	Identify
SECTION #4	Loopback
SECTION #5	Selftest
SECTION #6	Status
SECTION #7	Device Error Logs

**Notes**

- Many diagnostics will not contain one or more of the above sections because they may not apply to the device that is being tested.
- The diagnostic developer may choose section numbers 1 through 63, and step numbers from 1 to 160.



**Online Diagnostics Subsystem**

**Online Diagnostics Subsystem**

- Purpose:**
- Provides common user interface and serves for all diagnostics
  - Operating System independent
  - Normal, disruptive and destructive testing modes
    - Contains diagnostics, verifiers, utilities and exercisers

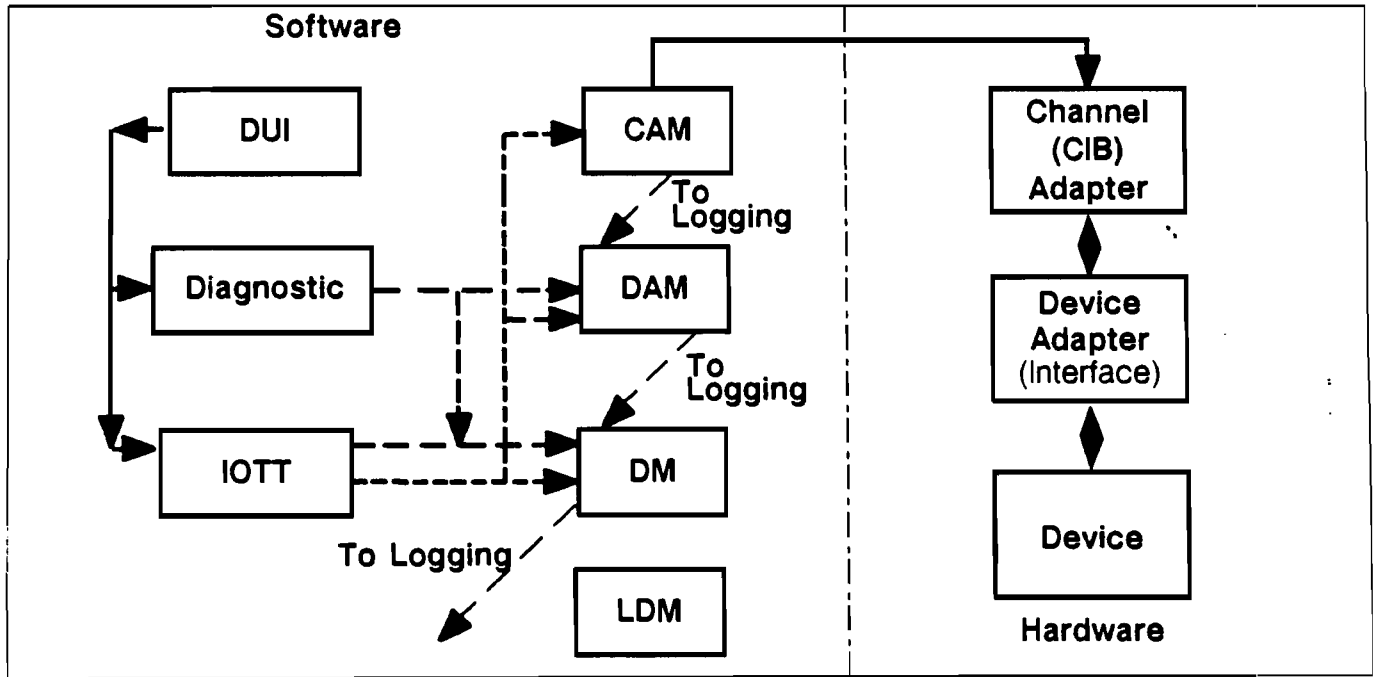
**MPE V/E Equivalent:** ■ Many separate utilities

**Command:** ■ :SYSDIAG

**Notes**

**Online Diagnostics Subsystem**

**Online Diagnostics Subsystem**



TG200078\_007

© 1987 Hewlett-Packard Company

**Notes**

- The I/O hardware is mirrored in the I/O Software. If we run a diagnostic against a device, the diagnostic opens a port to the Device Manager (DM). If we run a diagnostic against a Device Adapter, such as HPIB, we talk to the DAM. Notice the IOTT pokes everywhere. It depends again as to which device or adapter you are diagnosing.

*IOTT = I/O TEST TOOL*

**Online Diagnostics Subsystem****Online Diagnostics Subsystem****Diagnostic User Interface (DUI)**

The DUI has implemented the following commands.

<b>ABORT</b>	- Terminate a running module.
<b>CI</b>	- Create a system command interpreter as child process.
<b>EXIT/QUIT</b>	- Exit from the diagnostic system.
<b>HARDCOPY</b>	- Echo all information displayed to system printer.
<b>HELP</b>	- Access user assistance information.
<b>LIST</b>	- List the modules that are part of the diagnostic system.
<b>MODE</b>	- Display/change current system mode.
<b>REDO</b>	- Display and edit last DUI command.
<b>RESUME</b>	- Allow a suspended module to resume processing.
<b>RUN</b>	- Execute the specified module.
<b>SHOWACTIVE</b>	- List our/all modules running in diagnostic system.
<b>SUSPEND</b>	- Suspend the processing of the specified module.
<b>TEST</b>	- Test a module using the test package.
<b>UNLOCK</b>	- Release the specified device from malfunction lock.
<b>USE</b>	- Use the specified file as input.
<b>WAIT</b>	- Look for messages/terminations of background processes.

 **Notes**

Online Diagnostics Subsystem

**HELP**

*HELP or ?*

**or**

*HELP <module name>  
[Commands]  
[Sections] [Parms]*

**or**

*HELP <module name> [SYNTAX]*

TG200078\_009

© 1987 Hewlett-Packard Company

**Notes**

- **HELP** - gives command options and syntax.  
- provide information on any program or module in the diagnostics subsystem.

**Online Diagnostics Subsystem**

**HELP Example**

*DUI > HELP USE*

The USE command causes commands and program input to be read from the indicated file. All input and output are echoed to the screen (and printer if HARDCOPY was turned on) unless the QUIET option is supplied.

*QUIET* - Causes the input and output to NOT appear on the screen (also affects HARDCOPY).

**Notes**

**Online Diagnostics Subsystem**

**LIST**

*LIST* <program name> [ALL]

or

LIST [ PRODUCT = <product name> ]  
[TYPE = DIAGNOSTIC, EXERCISER,  
VERIFIER, UTILITY]  
[ALL]

**Notes**

## Module 8 Troubleshooting

### Online Diagnostics Subsystem

#### DUI > LIST ALL

Module Name	Module Version	Mod Type	Level	Sum Mod	Diagnosable Products
CADIAG	A.00.01	EXER	3	NO	*HP19744A (Standalone Tape)
CIPERLPD	A.00.02	DIAG	3	NO	*HP2563A, HP 2566A, HP 2567A
CS80DIAG	A.00.01	DIAG	3	NO	*HP7933A, HP 7935A, HP 7937A
DIAG7478	A.01.01	DIAG	3	NO	*HP7974A, HP 7978A; HP 7978B
HPIBDIAG	A.00.01	DIAG	3	NO	*HP27110B
LANDAD	A.00.01	DIAG	3	NO	HP27125B, 36291A LANIC
TERMDSM	A.00.01	UTIL	3	NO	HP2345A
IOTT	A.00.02	UTIL	0	NO	
LOGTOOL	A.00.00	UTIL	3	NO	
SYSMAP	A.00.00	UTIL	3	NO	

\* Indicates that the device is "Autodiagnosable" by the corresponding diagnostic module

TG200078\_012

© 1987 Hewlett-Packard Company

### Notes

**Online Diagnostics Subsystem**

**REDO**

*REDO* [*? OR <command number>*]  
*<string>* ..

*Use R, I, D as MPE REDO*

TG200078\_013

© 1987 Hewlett-Packard Company

**Notes**

- R - replace a character
- I - insert
- D - delete



**Online Diagnostics Subsystem**

**RUN Command  
Diagnostic User Interface (DUI)**

**RUN <program\_name>**

```
[ERRCOUNT= <integer>]
[LOOPCOUNT= <integer>]
[ERRONLY]
[ERRPAUSE]
[LDEV=<ldev_specifier> |
[PDEV=<pdev_specifier>]
[SECTIONS= <section_range_list>]
[STEPS= <steps_range_list>]
[AUTORESTART]
[BACKGROUND]
[INFILE=<filename>]
[OUTFILE=<filename>]
[MAXRESTARTS=<# of restarts>]
[RESTARTTIME=<# of minutes>]
[TRACE= ALL | LIBRARY | PROGRAM ]
[TESTFILE=<filename>]
```

**Notes**

- The specifier for a bus converter on the 950 system is "/" (e.g., 4/1.0.0.0).

Online Diagnostics Subsystem

**RUN Example**

```
DUI > run cs80diag errcount=10 &  
DUI > pdev=8.0.0 loop=2 sections=214,8 25, (2/4, 8)
```

**Notes**

- CS80DIAG - a diagnostic for the HP79xx disc drives.

**Online Diagnostics Subsystem**

**Diagnostics and Utilities**

**Diagnostic Programs**

- CS/80 Disc Diagnostic (CS80DIAG)
- HP 7974A/7978 Magnetic Tape Drive Diagnostic (DIAG7478)
- Ciper Line Printer Diagnostic (CIPERLPD)
- Page Printer Diagnostic (PPDIAG)
- HP-IB Device Adapter Diagnostic (HPIBDIAG)
- Six-Port Mux Diagnostic (MUXDIAG)
- LAN Diagnostic (LANDAD)

**Subsystem Utilities**

- System and Memory Log Analysis Tool (LOGTOOL)
- System Map (SYSMAP)
- Terminal Diagnostic System Monitor (TERMDSM)
- HP-CIO Channel Adapter Utility (CADIAG)
- I/O Test Tool (IOTT)
- MPE XL Outline Diagnostic Installer (INSTALL)

**Notes**

- Diagnostics and utilities currently supported on MPE XL.

**Online Diagnostics Subsystem**

**System Map (SYSMAP)**

**DUI Utility**

**Purpose:** ■ Helps determine the hardware configuration of a system.

**Function:** ■ Maps I/O devices, CPU boards, memory boards.

- Displays: device type, product number, logical device number (LDEV) and device address.  
Terminals mapped by TERMDISM.

**MPE V/E Equivalent** ■ I/O Map

**Command:** ■ :SYSDIAG

DUI> RUN SYSMAP

ENTER MAP>

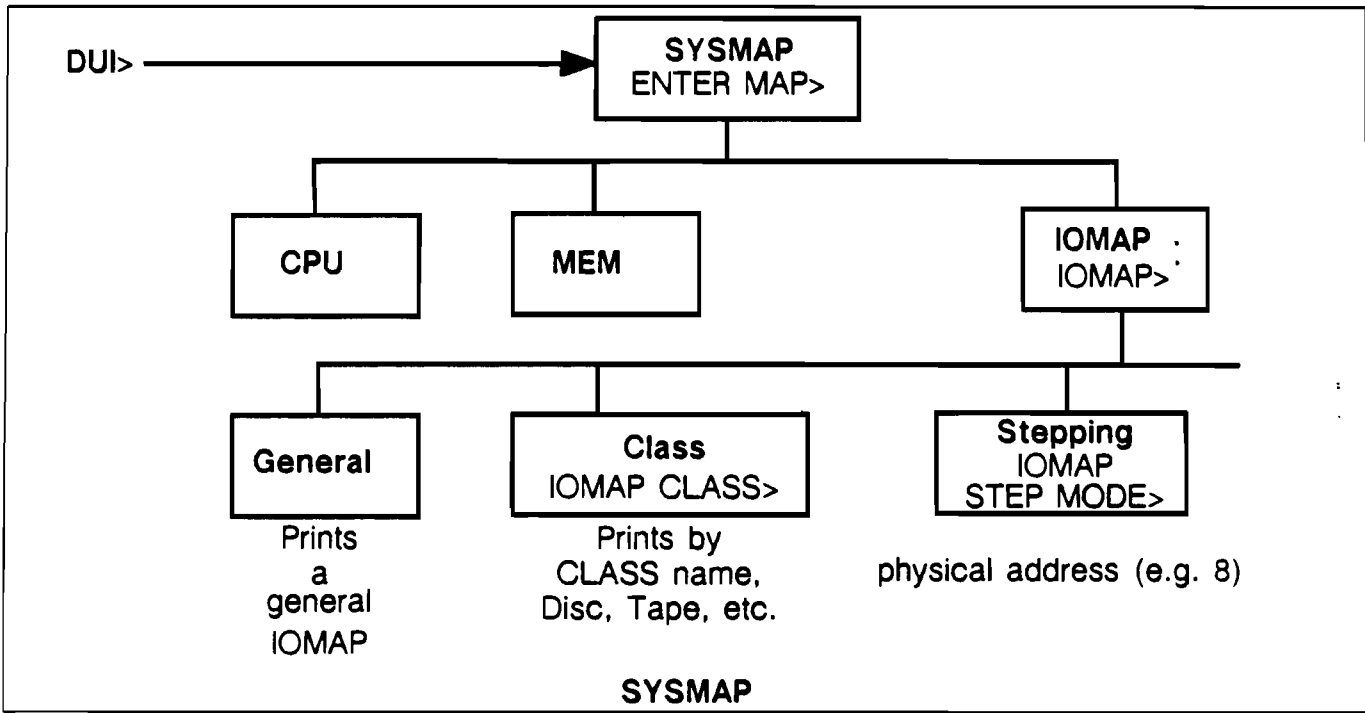
**Notes**

*SysMAP - 3/4 hr to run!!*

**Online Diagnostics Subsystem**

**Online Diagnostics Subsystem**

**SYSMAP**



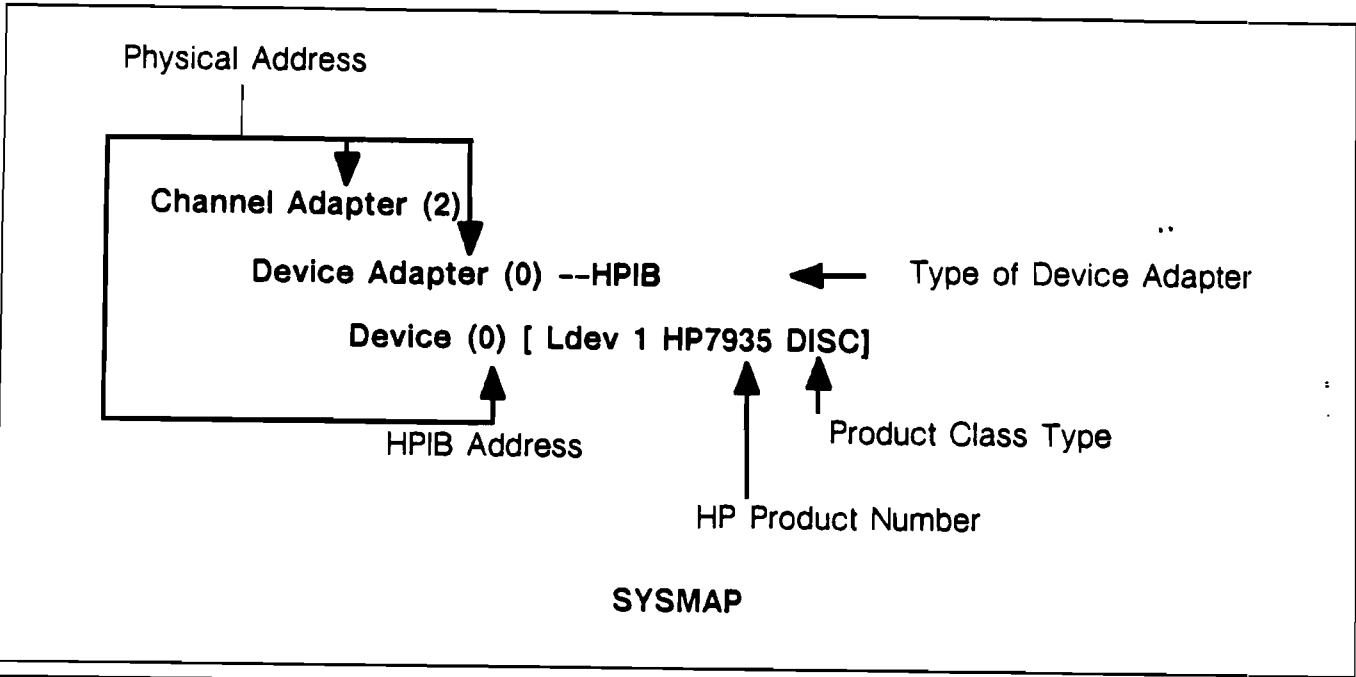
**Notes**

- 3 Types of maps:
  1. CPU MAP
  2. MEMORY MAP
  3. IOMAP
- No Sections on this Utility

Online Diagnostics Subsystem

Online Diagnostics Subsystem

IOMAP Output Interpretation



TG200078\_019

© 1987 Hewlett-Packard Company

Notes

*DOESN'T WORK*

**Online Diagnostics Subsystem**

**LOGTOOL**

**Diagnostic User Interface (DUI) Utility**

- Purpose:**
- Allows data in system log files to be searched and displayed.
  - Provides history information to the support groups.
  - Searches system log files.  
Extracts information from logs.  
Formats data using LAYOUT command

**MPE V/E Equivalent:** ■ LISTLOG

**Command:** ■ :SYSDIAG  
DUI> RUN LOGTOOL

**Notes**

**Online Diagnostics Subsystem**

**LOGTOOL**

**Diagnostic User Interface (DUI) Utility**

LOGTOOL Command Summary:

<u>Command Name</u>	<u>Description</u>
SUSPEND	Return control to the DUI - suspend LOGTOOL
EXIT	Exit LOGTOOL - return to the DUI
REDO	Edit the last line of text entered
HELP	Gives help on running LOGTOOL
LIST	List contents of a system error log
DISPLAYLOG	Display I/O entries as information is logged
PURGESYSLOG	Delete from disc the specified system error logs
PURGEWORK	Delete from disc the specified "work" files
LAYOUT	Read in layout file
SELECT	Select specified records from system log files
STATUS	Report on status of all system log files
SWITCHLOG	Cause the system to start a new system log file
MEMCLR	Clears MEMLOGP log file
MENTIMER	Alter timer value of MEMLOGP process
MEMRPT	Display contents of Memory Log File
TYPES	Describes System Log File "types"

TG200078\_021

© 1987 Hewlett-Packard Company

**Notes**

*Log ####, Pub. Sys.*



**Online Diagnostics Subsystem**

**Online Diagnostics Subsystem**

**MPE XL Online Diagnostics**

**LOGON**

**:HELLO STUDENT.CLASS**

**:SYSDIAG**

**DUI>LIST**

**CS80DIAG...**

**Notes**

**Activity 8.1 Lab: Using the Online Diagnostics Subsystem**



**Instructions:**

Please complete the following exercises. Pay particular attention to the information on your DUI slides and use the online HELP facility in both the DUI and the diagnostics and utilities.

1. Invoke the Online Diagnostics Subsystem and list all diagnostics for the HP7935. What command(s) did you use? \_\_\_\_\_  
\_\_\_\_\_
  
2. Now run SYSMAP and get a general map of the I/O system. Get a map of the HPIB Adapter(s).
  
3. Suspend the SYSMAP program. Run the HPIB Adapter diagnostic against one of the adapters (Hint: see exercise 2). What test(s) did it do as a default? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
  
4. Before you resume SYSMAP, check to see how many programs you have running in the diagnostic subsystem. How many are there currently active? \_\_\_\_\_  
\_\_\_\_\_
  
5. Return to SYSMAP. Obtain maps of the CPU(s) and memory on your system. What command did you use? \_\_\_\_\_
  
6. Run the System and Memory Log Analysis Tool (Logtool). Display the contents of the memory log file. List the currently existing system log files on your system. How would you get a detailed status listing of these files? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Module 8 Troubleshooting

### Activity 8.1 Lab: Using the Online Diagnostics Subsystem

Select one of the system log files and list it. (Use CONTROL-Y to interrupt the listing and return to the Logtool prompt.) What commands would you use to list records from the system log files for each of the following?

- (a) disc drives over the last 48 hrs. \_\_\_\_\_
- (b) tape drives \_\_\_\_\_
- (c) HP7935 \_\_\_\_\_
- (d) PDEV 8.2 over a specified time \_\_\_\_\_

7. Exit Logtool. How many processes or programs are active in the subsystem?  
\_\_\_\_\_ If any are active, abort all remaining processes and exit the DUI.



## Module 9 Migration of the MPE V/E Operating Environment

### Goal and Objectives

**Goal:** To be able to migrate files, accounts and private volumes.

**Objectives:** After you complete this module, you will be able to:

- Successfully migrate an MPE V/E accounting structure (Accounts, RINs, User Logging IDs, UDCs and Files) to an MPE XL system using DIRMIG.
- Solve basic problems with accounting structure migration.

### Notes

- This training module complements the *Migration Process Guide*. When you see the annotation "Pages xx-xx", it refers to the manual.

### Migration Summary

#### Migrating to a New MPE XL System

##### Summary Procedure

1. Take a full :SYSDUMP of MPE V/E System.
2. Install MPE XL from System Load Tape.
3. Use :SYSGEN to configure System.
4. Use :NMMGR to configure Datacomm Devices.
5. Create a boot tape using SYSGEN.
6. Restart System using new configurations (UPDATE CONFIG).
7. Migrate MPE V/E operating environment using :DIRMIG.
8. Install MPE XL subsystems with AUTOINST XL.
9. :RESTORE user files.
10. Backup the MPE XL system using :STORE with DIRECTORY option.

### Notes

## Module 9 Migration of the MPE V/E Operating Environment

### Directory Migration Utility

#### DIRMIG/XL

*MPE V/E DIRECTORY, RINS*

#### Directory Migration Utility

**Purpose:** ■ Migrates an MPE V/E based system operating environment to an MPE XL based system

**Function:** ■ Menu driven  
■ Migrates the following MPE structures:

- The RIN table
- User logging IDs
- System directory
- Private volume information
- All or a subset of user files
- UDC environment

**Command:** :RUN DIRMIG.PUB.SYS

TG200081-002

© 1987 Hewlett-Packard Company

#### Notes

*Don't Migrate Spook5 MPE V/E*  
*- Use BULDACT to Migrate Directory (works just fine - Ballarat)*

**Preparing for Migration - SYSDUMP**

**Preparing for Migration to MPE XL**

**Before you SYSDUMP:**

- Clean up RIN table by deleting global RINs you do not need (:FREERIN).
- Use :RELLOG to clean up user logging ID table.
- Eliminate unwanted UDCs (:SETCATALOG).
- Run UDC filename collection utility, GETUDC (optional).
- :STORE files from private volumes on a separate store set.
- Eliminate duplicate filenames (MPE V/E to MPE XL).

**During SYSDUMP:**

- Specify user file set to store (optional); full backup is recommended.
- Do not use a "Carriage-Return" :SYSDUMP.

**Notes**

- Files may be restored to the system volume set during the initial migration process, but private volume files require an intermediary step before being restored.
- DIRMIG specifies the KEEP option when it restores files.
- The following groups in the SYS account will not be migrated so be sure to move any files to other groups: CONFIG, CONFIG@, DIAG and MPEXL.



**Preparing for Migration - System**

**Preparing for Migration to MPE XL**

**System Considerations**

**On MPE V/E**

- You must be on U-MIT (G.02.00) or a later version of the system.
- IMAGE converted to TurboIMAGE.
- DS/3000 converted to NS/3000.
- Language update (optional).

**On MPE XL:**

- Single user, MANAGER.SYS. on system.
- MANAGER.SYS must have SM & OP capabilities.
- The groups and accounts listed in the file MPEXLDIR.PUB.SYS will not be migrated.  
(Currently CONFIG.SYS, DIAG.SYS, CONFIG925.SYS, CONFIG950.SYS and MPEXL.SYS.)

**Notes**

- If you have files in the above groups on your MPE V/E system that you want migrated, move them to a different group.

*MPEXLDIR - Accounts/groups Not to be migrated !!*

*- Add @. Pub. Sys*

**Running DIRMIG**

**Migrating Your Directory Structure**

**Running DIRMIG**

1. Logon as MANAGER.SYS
2. Mount the MPE V/E SYSDUMP tape
3. Make sure all other users are logged off (Single User Mode)  
 CTRL A  
= LOGOFF #Snn {#Snn is your session number}
4. If there is no "TAPE" device class configured issue:  
:FILE MIGTAPE; DEV=Classname
5. If there is no "LP" device class configured issue:  
:FILE LIST; DEV=Classname
6. :RUN DIRMIG.PUB.SYS

**Notes**

**DIRMIG Main Menu**

**DIRMIG**

**Main Menu**

```
:RUN DIRMIG.PUB.SYS
```

```
-----  
DIRMIG.PUB.SYS HP30362A.00.00 MPE XL Migration Utility  
COPYRIGHT (C) HEWLETT-PACKARD 1986. ALL RIGHTS RESERVED.  
FRI, JUL 10, 1987, 4:00 PM  
-----
```

Current Log File: DIRLOG00.PUB.SYS.

CHOOSE FROM MIGRATION OPTIONS BELOW

- 0 - EXIT
- 1 - HELP
- 2 - COMPLETE MIGRATION (No Dialog)
- 3 - COMPLETE MIGRATION (With Dialog)
- 4 - RINS
- 5 - USER-LOGGING ID's
- 6 - DIRECTORY
- 7 - PRIVATE VOLUME ENVIRONMENT

ENTER MIGRATION OPTION(S)

>> 3

**Notes**

- A new log file is created each time DIRMIG is run. (DIRLOG00, DIRLOG01, etc.).
- Option 7 may be selected only on subsequent runs of DIRMIG since it requires that PVASSIST.PUB.SYS be present. (PVASSIST.PUB.SYS is created during the Directory Migration.)

## Module 9 Migration of the MPE V/E Operating Environment

### DIRMIG RIN Menu

#### DIRMIG

#### RIN Migration Menu

```
13:32/#S7/25/Vol (Unlabelled) mounted on LDEV# 7
READING MPE SYSDUMP TAPE . . .
COMPLETED READING MPE SYSDUMP TAPE.
RIN MIGRATION _
CHOOSE FROM RIN OPTIONS BELOW
    0 - EXIT ( No RIN Migration)
    1 - HELP
    2 - LIST GLOBAL RINS
    3 - DELETE GLOBAL RINS
    4 - MIGRATE RINS
ENTER RIN OPTION
>> 2
OFFLINE LISTING (YES/[NO])?
>> yes
ENTER RIN OPTION
>> 4
```

TG200081-007

See page G-5.

© 1987 Hewlett-Packard Company

### Notes

- DIRMIG replaces the current RIN Table with the one from tape.

DIRMIG User Logging Menu

**DIRMIG**

**User Logging ID Migration Menu**

```
----- BEGINNING RIN MIGRATION -----  
RIN MIGRATION SUCCESSFUL  
----- END OF RIN MIGRATION -----  
USER-LOGGING ID MIGRATION  
-----  
CHOOSE FROM USER-LOGGING OPTIONS BELOW  
    0 - EXIT (No Logging ID Migration)  
    1 - HELP  
    2 - LIST USER-LOGGING IDs  
    3 - MIGRATE USER-LOGGING IDs  
  
ENTER USER-LOGGING OPTION  
>> 2  
OFFLINE LISTING (YES/[NO])?  
>> yes  
ENTER USER-LOGGING OPTION  
>> 3
```

**Notes**

- User-logging IDs are handled the same as RINs; the Table is completely replaced by the one from tape.

DIRMIG Directory Menu

**DIRMIG**

**Directory Migration Menu**

```
-----BEGINNING USER-LOGGING ID MIGRATION      -----
USER-LOGGING ID MIGRATION SUCCESSFUL
-----END OF USER-LOGGING ID MIGRATION          -----
DIRECTORY MIGRATION
CHOOSE FROM DIRECTORY OPTIONS BELOW
    0 - EXIT (No Directory Migration)
    1 - HELP
    2 - LIST ACCOUNTS
    3 - COMPLETE MIGRATION (All Accounts)
    4 - PARTIAL MIGRATION (Specified Accounts)
ENTER DIRECTORY OPTION
>> 4
ENTER ACCOUNT SUBSETS
@ -HPOFFICE
OVERRIDE DISC DIRECTORY INFORMATION IF DIRECTORY ENTRIES
FROM TAPE CONFLICT? (YES/[NO])?
>> yes
```

TG200081-009

See pages G-7/G-8

© 1987 Hewlett-Packard Company

**Notes**

- Messages will be displayed for each successful (and unsuccessful) account migration.
- If you specify "@", you are allowed only one "-". If you want to exclude more than one account, you must specify the individual accounts. E.g., A@, B@, C@, D@-DUM@, E@, HP@-HPOFFICE, etc.
- The Directory Migration will add new accounts or modify the existing accounting structure but it will not delete accounts on the MPE XL system.
- Any account containing Private Volume information must be migrated in order to perform Private Volume Migration for it (i.e., you must override the disc directory information if the account exists) and at least one account containing Private Volume information must be migrated in order to create the PVASSIST file.

## Module 9 Migration of the MPE V/E Operating Environment

DIRMIG Private Volume Menu

### DIRMIG

#### Private Volume Migration Menu

```
PRIVATE VOLUME MIGRATION
-----
CHOOSE FROM PRIVATE VOLUME OPTIONS BELOW
    0 - EXIT (No Volume Set Migration)
    1 - HELP
    2 - LIST VOLUME SETS
    3 - VISIT VOLUME SETS/(Specified Accounts)
    4 - GENERATE PVSUMMARY COMMAND FILE/
      (Specified Accounts)
ENTER PRIVATE VOLUME OPTION
>> 3
ENTER ACCOUNT SUBSETS
>> PV @ , SYS
```

### Notes

- Option 3 must be selected if you want to generate command files for specific accounts or review the components of a particular volume set.

DIRMIG Detailed Private Volume Menu

**DIRMIG**

**Detailed Private Volume Migration Menu**

```
-----BEGINNING PRIVATE VOLUME MIGRATION-----  
VOLUME SET MIGRATION FOR PVSET.PVGROUP.PVACCT.  
CHOOSE VOLUME SET OPTION BELOW
```

- 0 - EXIT (No Volume Set Migration)
- 1 - HELP
- 2 - LIST VOLUME SET DEFINITION
- 3 - GENERATE A COMMAND FILE
- 4 - DELETE VOLUME SET DEFINITION
- 5 - NEXT VOLUME SET DEFINITION

```
ENTER PRIVATE VOLUME OPTION  
>> 3
```

TG200081-011

© 1987 Hewlett-Packard Company

**Notes**

- Option 5 allows DIRMIG to display this menu for each volume set contained in PVASSIST for the specified accounts.
- If there are more volume sets than there are drives to hold them, PVSUMMARY cannot be used.



**DIRMIG Private Volume Dialog**

**DIRMIG**

**Private Volume Dialog**

```
ENTER COMMAND FILE NAME
>> pvsetin
ENTER LOGICAL DEVICE NUMBER FOR INITIALIZING MASTER PVSET
>> 23
ENTER LOGICAL DEVICE NUMBER FOR INITIALIZING MEMBER PVMEM2
>> 24
GENERATING COMMAND FILE . . .
SPAN PVGROUP.PVACCT TO VOLUME SET PVSET.PVGROUP.PVACCT
>> yes (YES/[NO])?
. . . COMMAND FILE PVSETIN SAVED.
(Returns to Previous Screen)
```

**Notes**

- Use a unique command file name for each volume set.
- Master and member LDEV numbers must not be the same but the same LDEV number may be used for multiple members.

**DIRMIG UDC/User-Files Menu**

**DIRMIG**

**UDC Environment/User-Files Migration Menu**

```
UDC ENVIRONMENT/USER-FILES MIGRATION
-----
CHOOSE FROM UDC/RESTORE OPTIONS BELOW

    0 - EXIT (No UDC Environment/User-files Migration)
    1 - HELP
    2 - MIGRATE UDC ENVIRONMENT ONLY
    3 - MIGRATE UDC ENVIRONMENT/RESTORE USER FILE SUBSETS
    4 - MIGRATE UDC ENVIRONMENT/RESTORE ALL FILES

ENTER UDC RESTORE OPTION
>> 3
-----BEGINNING UDC/USER-FILES MIGRATION-----

ENTER FILE SET(S) TO RESTORE.
@.@.@ - @.@.HP@
OFFLINE LISTING (YES/[NO])?
>> yes
```

**Notes**

- DIRMIG will not restore any files which are currently on the system. This protects the SYS account from being overwritten. If you do not restore @.@.SYS from within DIRMIG, be sure to use the KEEP option when you RESTORE.
- COMMAND.PUB.SYS must exist on the MPE V/E tape for a successful UDC environment migration. Existing MPE XL UDCs are preserved.

**Verifying the Directory Migration****Verifying Your Migrated Directory Structure**

Item	Commands/Utilities
RINs	:SYSGEN (MISC Configurator)
User Logging IDs	:LISTLOG :SYSGEN (LOG Configurator)
Directory	:REPORT :LISTACCT :LISTGROUP :LISTUSER
Mountable Volumes	:DSTAT :VOLUTIL
UDCs	:SHOWCATALOG
Files	:LISTF
DIRLOGnn	:PRINT

TG200081-014

© 1987 Hewlett-Packard Company

 **Notes**

- You can list the RINs with "LRIN" in SYSGEN.
- The 7 listlevels in LISTF allow you to obtain information previously available only through LISTDIR5.
- Display DIRLOGnn using the PRINT command and read through it to verify the migration was error-free.
- If additional information is desired, perform the migration again and "RUN DIRMIG; Parm=1." (Parm=1 causes a lot of additional information to be written in DIRLOGnn.)

**Completing Private Volume Migration - VOLUTIL**

**Completing Migration of Private Volumes**

**Using VOLUTIL**

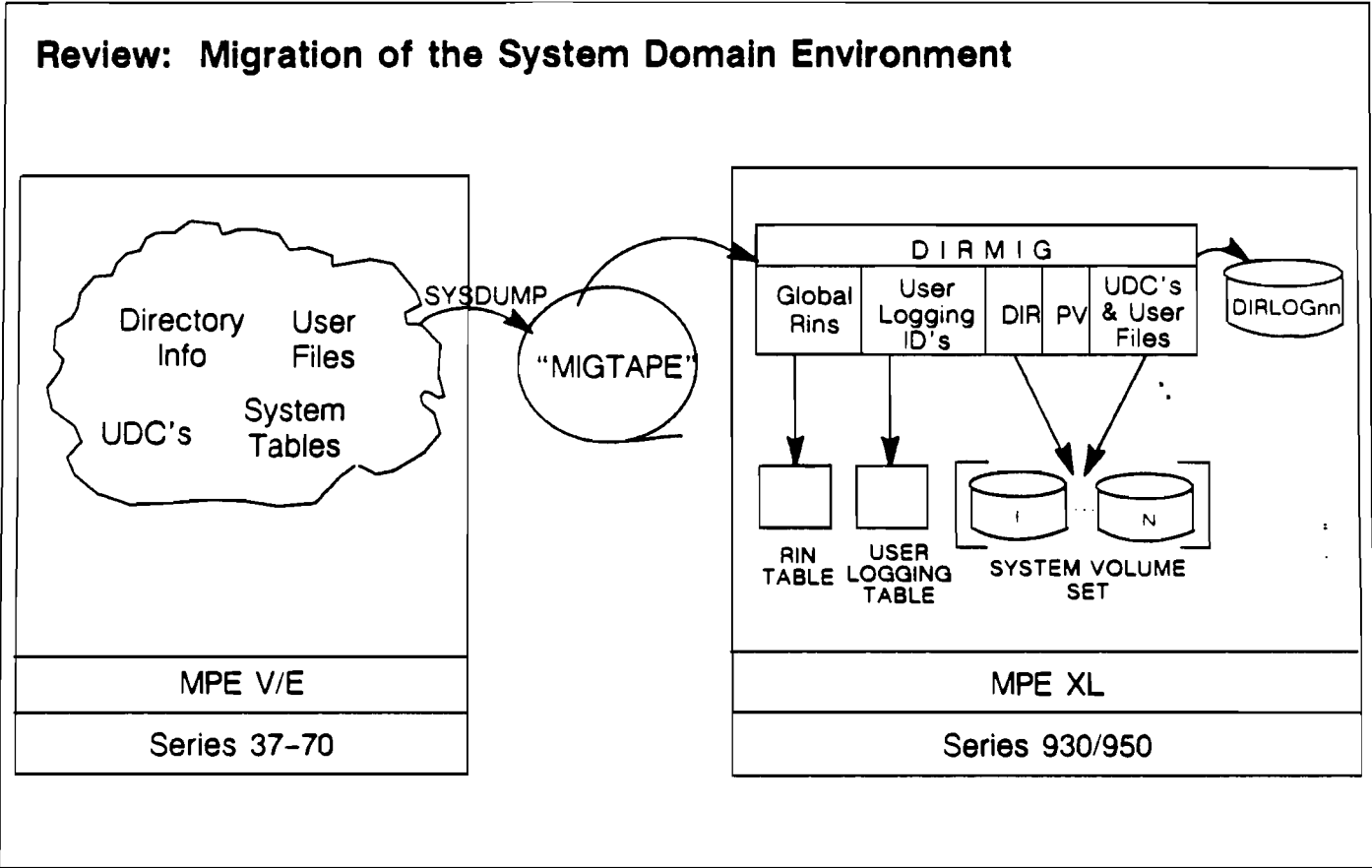
1. Check VOLUTIL command file(s) generated by DIRMIG (:PRINT PVSETIN)
2. Edit command file, if necessary
3. :RUN VOLUTIL.PUB.SYS
4. Execute the command file
  - > **use pvsetin**
5. Use SHOWSET and SHOWVOL to check migration
  - > **exit**
6. :RESTORE user files

**Notes**

- If you received errors during the Migration, and/or verifying your migrated directory structure reveals errors, do not run VOLUTIL until you have resolved them. (Any errors incurred in VOLUTIL won't show in DIRLOGnn.)
- SHOWSET gives information for the set, SHOWVOL gives information by volume.

# Module 9 Migration of the MPE V/E Operating Environment

Review



TG200081-016

© 1987 Hewlett-Packard Company

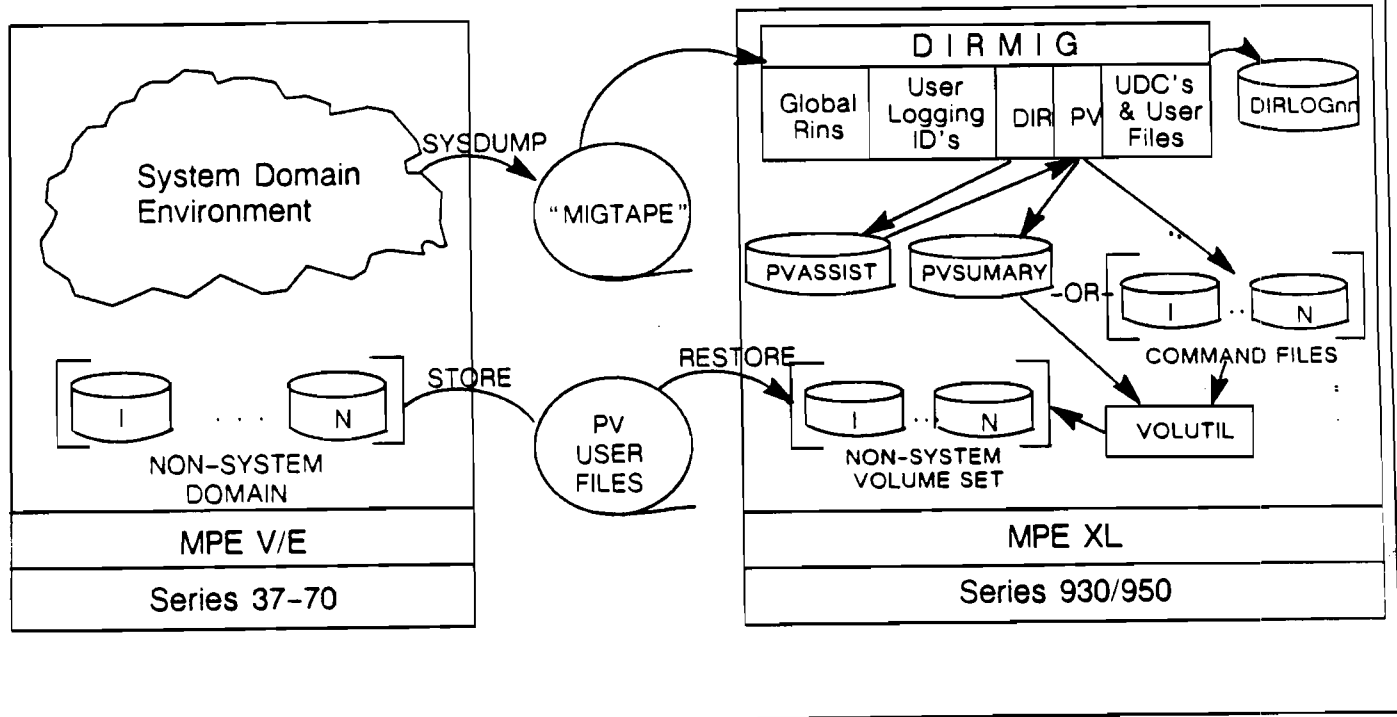
Notes

- Using DIRMIG to restore user files is optional (i.e., RESTORE can be used instead).

# Module 9 Migration of the MPE V/E Operating Environment

## Review

### Review: Migration of the Non-system Domain Environment



TG200081-017

© 1987 Hewlett-Packard Company

## Notes

- Home volume set information is migrated during DIRECTORY migration; volume set information is migrated during PRIVATE VOLUME migration.

**Error Isolation and Recovery**

**Directory Migration**

**Error Isolation**

■ **Print DIRLOGnn to Check for Errors**

**Possible Problems:**

- Corrupt tables and/or directory
- No private volume information
- System failure/cannot start system

**Possible Causes:**

- Corrupt MPE V/E directory
- Bad SYSDUMP tape

**Considerations:**

- Amount of corruption
- Percentage of migration successful

**Recovery Options:**

- Repair on MPE XL system
- Repair on MPE V/E system (:SYSDUMP & :DIRMIG again)
- Repair on both systems separately

**Notes**

- If there are DIRECTORY corruption problems, contact an HP Support Representative for recovery options.

**Error Isolation and Recovery**

**Directory Migration**

**Error Recovery Tools**

**Possible Tools:**

:PURGEACCT, :NEWACCT, :ALTACCT  
:PURGEGROUP, :NEWGROUP, :ALTGROUP  
:PURGEUSER, :NEWUSER, :ALTUSER  
:FREERIN, :GETRIN  
:RELLOG, :GETLOG  
:SETCATALOG  
:STORE, :RESTORE  
:SYSDUMP +  
:RELOAD +  
:VOLUTIL\*  
:SYSGEN\*  
:INSTALL\*

\* MPE XL Only  
+ MPE V/E Only

**Notes**



## Module 9 Migration of the MPE V/E Operating Environment

### Activity 9.1 Lab: Operating Environment Migration

**Purpose:** To have students practice doing an actual accounting structure migration from an MPE V/E system to an MPE XL system.

#### **Instructions:**

1. Run DIRMIG following the examples in this module and the information in Appendix G of the *Migration Process Guide*.
2. Do a complete migration with dialog.
  - a. Use HELP to get help
  - b. Obtain listings of several items (on terminal and printer)
  - c. Delete RINs belonging to non-migrated accounts
  - d. Migrate all accounts starting with ACCT, PV@, HPOffice and SYS
  - e. Perform a detailed migration of accounts with Private Volumes. (Create a PVSUMMARY file and individual command files.)
  - f. Migrate all UDCs and files for accounts starting with ACCT.
3. Use SYSGEN, LISTLOG, REPORT, SHOWCATALOG, LISTxxx and DSTAT to verify migration.
4. Review the DIRLOGnn file. Were there errors? What caused them?
5. Use VOLUTIL to complete the migration of Private Volumes. (Do not restore user files.)
6. Stream JCLEANUP.PUB.SYS to "undo" the migration so you may try again.

TurboIMAGE/XL Status Array

Notes

## TurboIMAGE/XL Status Array

### Compatibility Exceptions:

- new negative status codes and error messages
- in CM the PB-relative address points to the TurboIMAGE/XL CM stub & not to the NM intrinsic
- in NM the database address is 32-bits long
- in NM the ~~PB-relative and DB-relative offsets~~ are NOT returned to the status array

CM-235A

\*\*\* HP CONFIDENTIAL \*\*\*

© 1987

Hewlett-Packard Company

### Notes:

- after a successful DBOPEN the DBG size (word 3) and the DBU size (word 4) is limited to 32K, but the DBU can actually be larger
- if a DBOPEN fails due to a HPFOPEN failure, a status code of "-9" is returned in word 1 with additional information in:
  - word 2 = 1 (if DBG), 2 (if DBU), 3 (if DBR), 4 (if DBS), 5 (if DBUX)
  - word 3 = HPFOPEN file system error
- status codes for the TurboIMAGE/V ILR log file are no longer returned since there is no ILR log file with TurboIMAGE/XL



TurboIMAGE/XL Status Array

Notes

### TurboIMAGE/XL Status Array

array word	TurboIMAGE/V program	TurboIMAGE/XL CM program	TurboIMAGE/XL NM program
5	PB-relative offset of calling segment	same	0 (zero)
6	0 or open mode & intrinsic number	same	same
7	DB-relative offset of database parm	same	1st 16 bits of DB address
8	DB-relative offset of p/w,qual or dset	same	2nd 16 bits of DB address
9	mode parm value	same	same
10	PB-relative offset of Turbo segment	PB offset of stub	0 (zero)

3342188

\*\*\* HP CONFIDENTIAL \*\*\*

© 1987

Hewlett-Packard Company

**Notes:**

- the architecture-dependent information is returned on all intrinsic calls except a successful DBDELETE, DBFIND, DBGET, DBPUT, and DBUPDATE - these successful intrinsics return chain pointers and entry counts in words 5 to 10
  - the 32-bit database address points to the appropriate DBU
- indirectly via DBU → DBU*



## DBEXPLAIN & TurboIMAGE/XL Status Array

### for CM programs:

- the status array is compatible with TurboIMAGE/V
- therefore DBEXPLAIN is compatible: except...
- that the PB-offset of the CM stub is returned

### for NM programs:

- the status array is not compatible: but...
- the DBEXPLAIN display is made 90% compatible
- DBEXPLAIN merges status array and DBU values
- but DBU values are only valid for the last intrinsic

CS-4285C

\*\*\* HP CONFIDENTIAL \*\*\*

© 1987

Hewlett-Packard Company

### Notes:

- for Native Mode programs *only*:
  - DBEXPLAIN must be called before any other TurboIMAGE/XL intrinsic is called to obtain the correct display
  - values from an old status array cannot be saved and used to call DBEXPLAIN at a later time
- code in the CM and NM stubs map compatible values to the status array
- DBEXPLAIN examples from TurboIMAGE/V and TurboIMAGE/XL are on the next page



## Module 3-24 TurboIMAGE/V to TurboIMAGE/XL Migration

### □ DBEXPLAIN and Status Array Chalk Talk

DBEXPLAIN reflects the values passed in the status array. On TurboIMAGE/XL some of these values are too large for a 16-bit status array. Therefore, some values are stored in the DBU after each intrinsic call. DBEXPLAIN uses the 32-bit database address to locate the DBU and retrieve these values; it then merges the status array values and the DBU values together to produce as compatible a display as possible.

Below are some sample DBEXPLAINS. Indicate which display is from TurboIMAGE/V and which is from TurboIMAGE/XL, and explain why. Also identify which values were in the status array and which were in the DBU. We will discuss your answers in class.



#1.

IMAGE ERROR AT %001057: CONDITIONS WORDS--12  
DBPUT,MODE1, ON DATE-MASTER OF ORDERS  
DBPUT CALLED WITH DATA BASE NOT LOCKED

XL  
✓

#2.

IMAGE RESULT AT %00000144467: CONDITION WORD = 0  
DBOPEN, MODE 3, ON STORE  
SUCCESSFUL EXECUTION - NO ERRORS

✓

#3.

IMAGE RESULT AT %00000145307: CONDITION WORD = 0  
DBINFO, MODE 101, ON ACCOUNT OF STORE  
SUCCESSFUL EXECUTION - NO ERRORS

✓

#4.

IMAGE RESULT: CONDITION WORD=5349  
DBOPEN, MODE 3, ON crstiv  
UNRECOGNIZED CONDITION WORD: 5349  
OCTAL DUMP OF STATUS ARRAY FOLLOWS:  
012345 000003 000000 000000 177777 000630 000317 000637 000003 005615

XL  
✓

#5.

IMAGE RESULT: CONDITION WORD=5349  
DBOPEN, MODE 3, ON crstiv  
UNRECOGNIZED CONDITION WORD: 5349  
OCTAL DUMP OF STATUS ARRAY FOLLOWS:  
012345 000003 000000 000000 000000 000630 000000 155697 000003 000000

XL  
✓





New Status Codes & Error Messages

Notes

## New Status Code and Error Messages

- for run-time control blocks
- for MPE XL Transaction Management
- NOTE: all codes are negative

CSM236

\*\*\* HP CONFIDENTIAL \*\*\*

© 1987

Hewlett-Packard Company

### Notes:

- KEY ISSUE: the new codes are all negative values; check how the customer's program now handles negative status codes
- a "-9" status code is returned if mapped files cannot be created
- a "-198" status code is returned if the DBUX file is full; this means more than 127 DBOPENS were attempted by one process (63 DBOPENS is the current TurboIMAGE/V limit)
- status codes from "-16n" to "-18n" are returned if there are problems with MPE XL XM - for example:
  - "-167" means that a transaction cannot be started due to XM error #nnn
  - "-177" means that the XM log file and the database are not on the same volume set

-180 ILR.



Native Mode Code Issues

Notes

## Real Data Types and Data Alignment

- TurboIMAGE/XL assumes HP3000\_Reals:
  - but is insensitive to format
  - however, other products are sensitive
  - NM compiler options must be used
  - the stubs do not convert formats
- TurboIMAGE/XL assumes 16-bit alignment:
  - use the correct compiler options
  - watch for values greater than 64K

CSM237

\*\*\* HP CONFIDENTIAL \*\*\*

© 1987

Hewlett-Packard Company

### Notes:

- Real Data Type Issues:
  - TurboIMAGE/XL is insensitive to the differences between HP3000 and IEEE real data type formats (floating point)
  - CM Compilers, QUERY/CM, DBMIGRAT/CM, DBchange/V, VPLUS/V and other utilities, however, are sensitive to the format of the real data type
  - NM compilers have compiler options to indicate the real data type format
  - 900 Series coprocessors require IEEE reals
  - real formats can be converted by customer code or customer utilities using the HPFP\_CONVERT intrinsic
- Data Alignment Issues:
  - NM programs must use the HP3000-alignment compiler options
  - TurboIMAGE/XL data buffers as well as internal data structures are still aligned on 16-bit boundaries

*possible solution use  
two items (1) 32 bit IEEE  
(2) 16 bit real*





## Module 10 TurboIMAGE/V to TurboIMAGE/XL Migration

### Goal and Objectives

#### GOAL:

To describe the TurboIMAGE/V to TurboIMAGE/XL migration compatibility exceptions and issues.

#### Objectives:

After completing this module, you should be able to:

- list the steps for transporting TurboIMAGE databases between MPE V/E and MPE XL.
- contrast the following modes of operation between TurboIMAGE/V and TurboIMAGE/XL:
  - AUTODEFER enabled
  - "default" mode
  - ILR enabled
  - User Logging enabled
- state the differences between run-time control blocks in TurboIMAGE/V and TurboIMAGE/XL

• ILR - now handled by Transaction Management.

First Release

## First Release

### Compatibility Mode

Switch Stubs  
Query/V  
DBUTIL  
DBLOAD  
DBUNLOAD  
DBSTORE  
DBRESTOR

(no PROFILER)

### Native Mode

Switch Stubs  
DBFIND  
DBGET  
DBPUT  
•  
•  
•  
all other TurboIMAGE Intrinsic

(no database tracing)

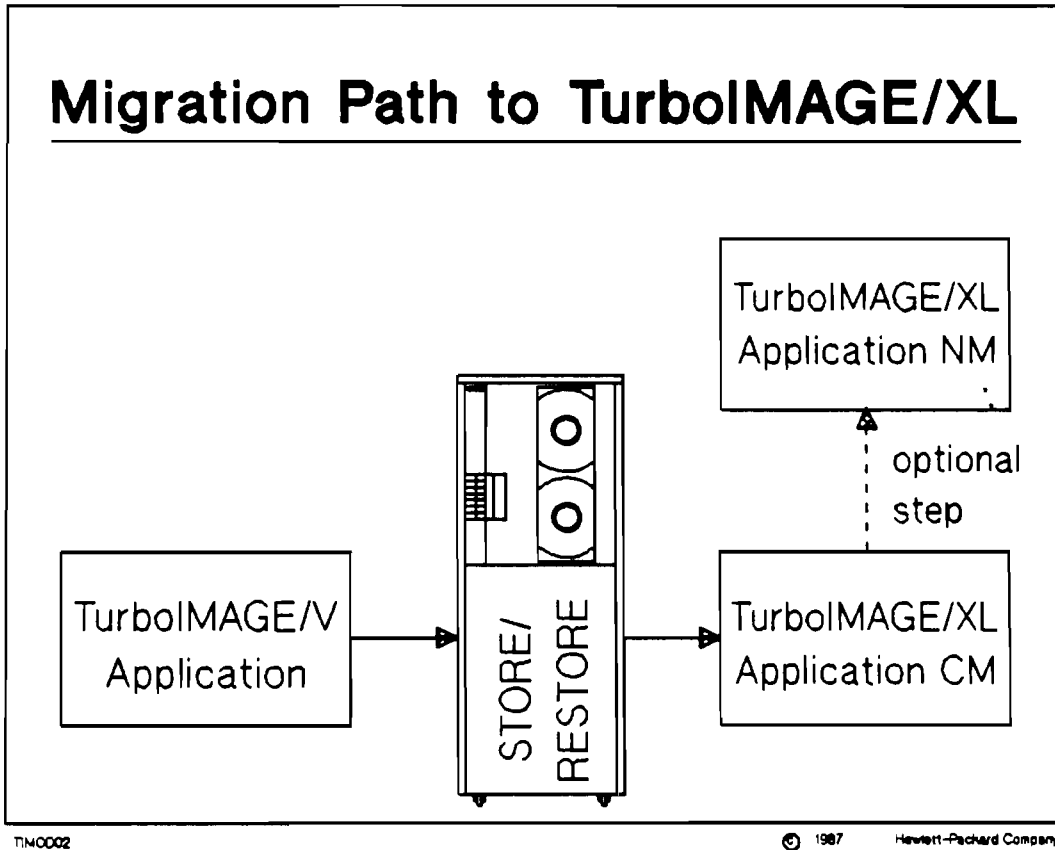
TM0001

© 1987 Hewlett-Packard Company

Notes



Migration Path to TurboIMAGE/XL



T1M0002

© 1987 Hewlett-Packard Company

Notes

The TurboIMAGE migration process consists of the following steps:

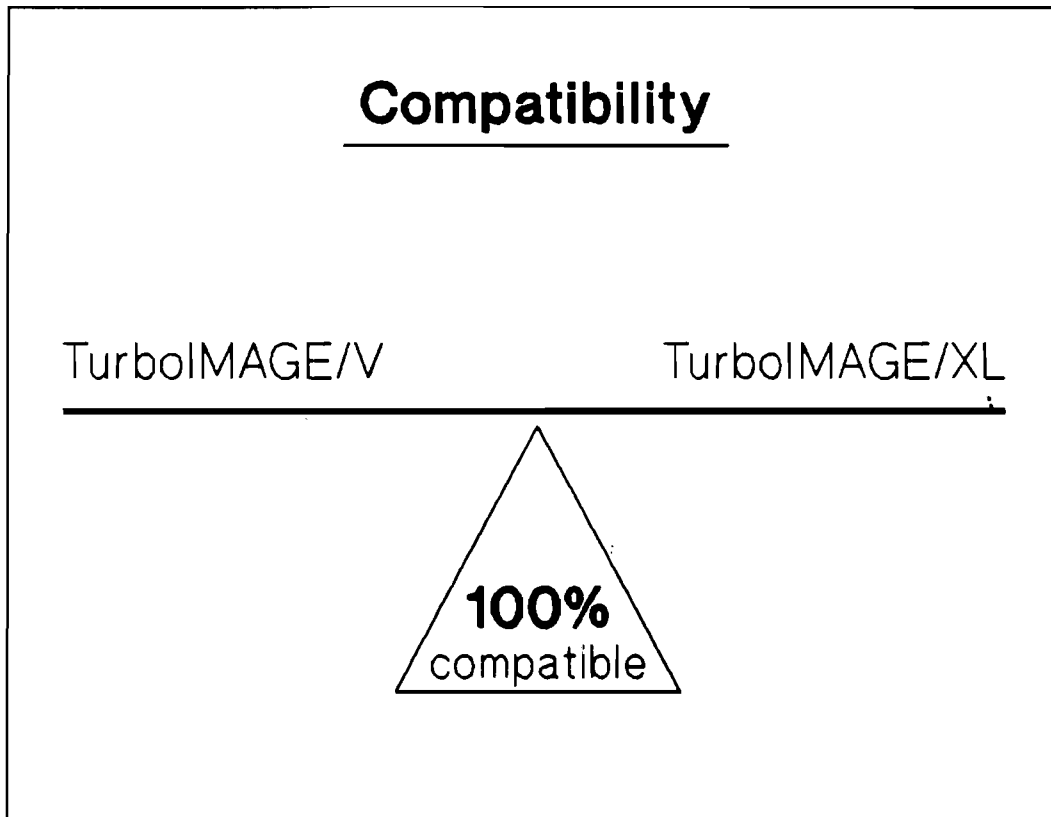
1. DISABLE ILR, Log on any enabled databases
2. STORE/RESTORE TurboIMAGE/V applications: databases, schemas, object and source code (DBSTORE/DBRESTOR OK for databases).
3. ENABLE ILR if desired on XL
4. Run programs in CM with TurboIMAGE/XL intrinsics.
5. OPTIONALLY continue migrating source code to Native Mode after resolving any:

NM compiler Issues, Exceptions etc.  
Turbo NM/CM incompatibilities 16 Bit/32 Bit alignment

More detailed information coming up later.

Big HEAD in going from NM to CM (switch Stubble)

Compatibility



T1M0003

© 1987

Hewlett-Packard Company

Notes

■ Compatibility Exceptions for CM Programs:

- new error codes and messages are returned (all new error codes are negative)
- no ILR recovery information is returned by DBINFO mode 402

■ Compatibility Exceptions for NM Programs:

- new error codes and messages are returned (all new error codes are negative)
- no ILR recovery information is returned by DBINFO mode 402
- "HP3000" compiler options are required
- architecture-dependent status array words have changed
- DBEXPLAIN has a timing window - *call immediately after Error!*

■ Operational and Performance Issues:

- MPE XL file size limit is larger than MPE V/E limit
  - RDBA on NS3000 only
  - disc write posting differs from MPE V/E
  - smaller buffers are likely to improve performance on DBPUTs and DBDELETES
- DS 3000 Not Supported on /XL*

**Database Consistency**

**Consistency** – a state in which all information  
is in agreement

**Transaction** – a series of one or more operations that move  
the database from one state of consistency  
to the next state of consistency

TH0004

© 1997

Hewlett-Packard Company

**Notes**

Consistency from TurboIMAGE Viewpoint

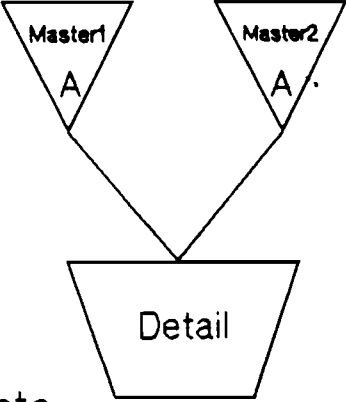
## Structural Consistency

### Consistency from TurboIMAGE Viewpoint

---

**DBPUT** (detail)

- Begin Intrinsic
- Write Detail record
- Write Master1 record
- Write Master2 record
- ... update free space list, etc...
- End Intrinsic



The diagram illustrates the relationship between master and detail records. At the top, two inverted triangles represent 'Master1' and 'Master2'. Each triangle contains a smaller inverted triangle labeled 'A'. Lines from the bottom of these two triangles converge and point to a larger trapezoidal shape at the bottom labeled 'Detail'.

TM0008

© 1987

Hewlett-Packard Company

Notes

Consistency from Applications Viewpoint

## Logical Consistency

### Consistency from Application Viewpoint

#### Transfer \$100 from savings to checking

		Savings	Checking
Begin Transaction	(consistent)	\$200	\$5
Subtract \$100 from savings			
	(inconsistent)	\$100	\$5
Add \$100 to checking			
End Transaction	(consistent)	\$100	\$105

TM0008

1087

Hardware-Platform Company

Notes

**Module 10 TurboIMAGE/V to TurboIMAGE/XL Migration**

**Activity 10.1 Discussion: TurboIMAGE/V Modes of Operation**

How can a system failure impact logical and structural integrity when the following TurboIMAGE modes of operation are used on MPE V/E?

"default mode

*Blows away logical & structural integrity*

ILR

*Structural Maintained*

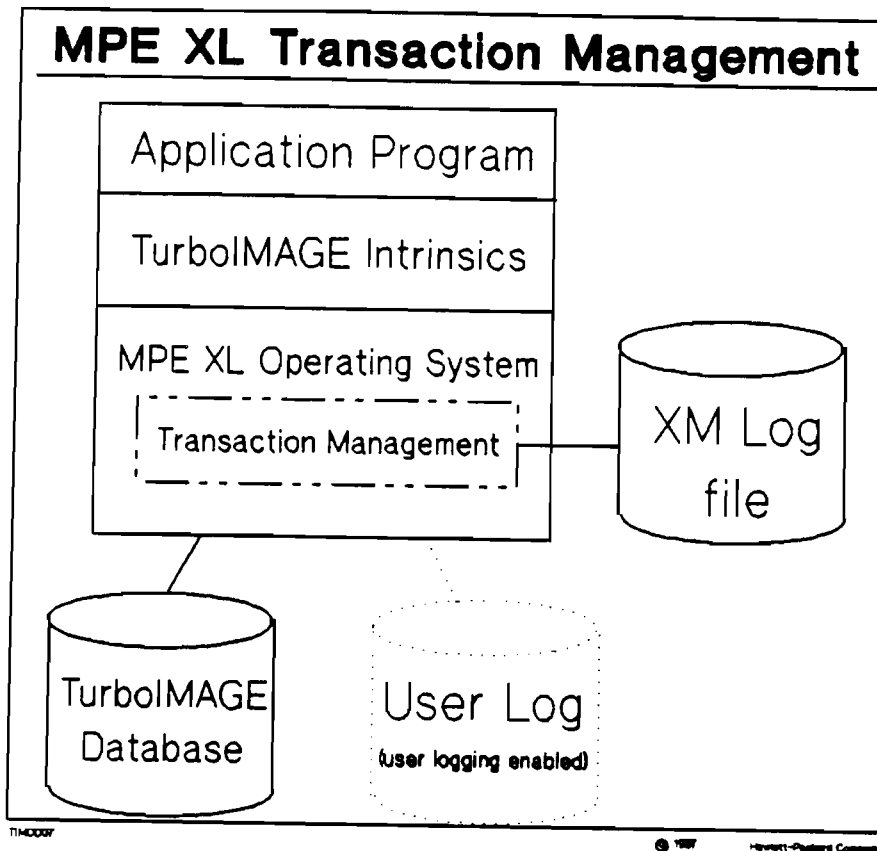
"User Logging

*Logical Maintained*

AUTODEFER

*Both*

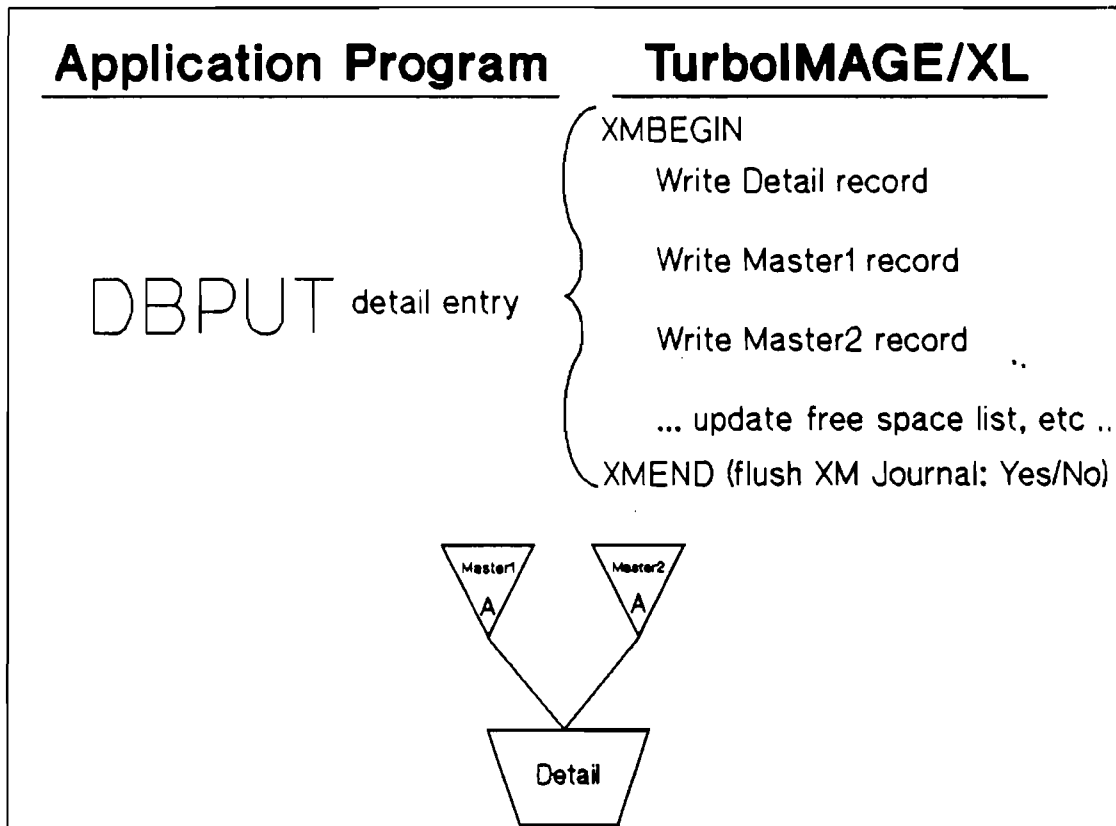
**MPE XL Transaction Management**



**Notes**

- MPE XL Transaction Management (XM) is an operating system service.
- XM uses its own log file. The memory-area associated with this file is called the XM journal.
- XM is used by TurboIMAGE/XL to reduce I/O and ensure structural integrity.
- TurboIMAGE/XL delimits each DBPUT DBUPDATE and DBDELETE as an XM transaction.
- XM logs all these transactions in its XM Log file and guarantees that these transactions are either Completed or NOT DONE AT ALL
- XM allows TurboIMAGE to request that the XM Journal be flushed to disc when ending a transaction.
- The XM unit of logging and recovery is a Volume Set  
*XM = Serial Work of for User Logging*

**MPE XL Transaction Management**



TI-M0008

© 1987

Hewlett-Packard Company

**Notes**

- TurboIMAGE/XL delimits each DBPUT, DBDELETE, and DBUPDATE as an XM transaction.
- XM logs all these transactions in its XM Log file.
- XM allows TurboIMAGE to request that XM journal be flushed to disc.
- Whether or not TurboIMAGE/XL requests XM journal flushing depends on the mode of operation.

*auto defls, ILR, default.*

*INSIDE DBPUT intranor*



TurboIMAGE/XL Modes of Operation

**Modes of Operation**

**"default" mode**

XM is used to guarantee structural consistency (no broken chains)

XM Journal is not flushed to disc

System failure may lose multiple intrinsics (DBPUT, DBUPDATE, DBDELETE)

**ILR**

XM is used to guarantee structural integrity (no broken chains)

XM Journal is flushed on DBPUTs and DBDELETES

System failure may lose multiple DBUPDATES

T1M0028 © 1987 Hewlett-Packard Company

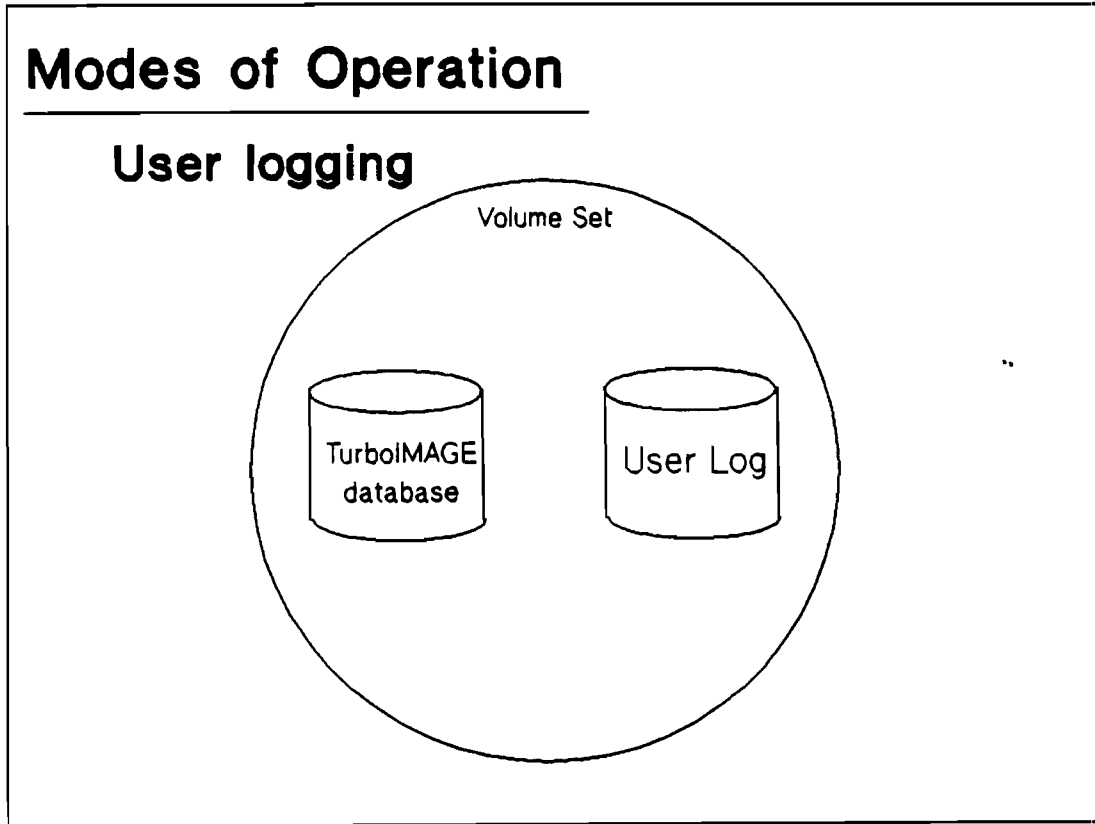
Notes

- On MPE V/E, ILR recovery completes the interrupted DBPUT or DBDELETE. On MPE XL, XM recovery will ROLL-BACK interrupted intrinsics.
- On MPE V/E, ILR recovery takes place when DB is flushed. On MPE XL, XM recovery takes place when Vol Set is mounted.

• Use Small Buffer - \$CONTROL BLOCKMAX

• Is ILR necessary for Roll-back as per MPE V/E ?

TurboIMAGE/XL Modes of Operation



TM000

© 1987

Hewlett-Packard Company

Notes

- User Log file and database must be on the same volume set if rollback is enabled.
- Database must be on the system volume set to log to tape with rollback enabled, because the disc buffer for logging to tape resides on the system volume set.

*Don't log to Tape - power fail.*

## Modes of Operation

### AUTODEFER

XM is not used with dataset files

MPE XL file system defaults are used for dataset files

Integrity is lost if system fails

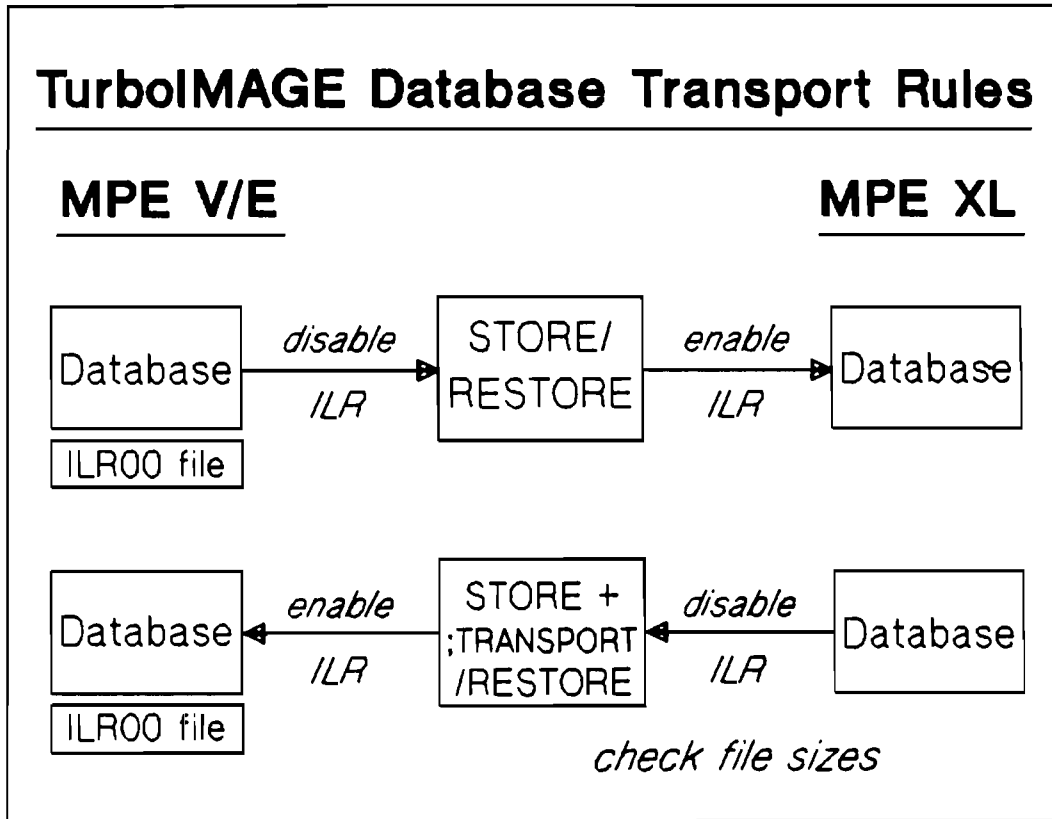
TH001

© 1987 Hewlett-Packard Company

Notes

*Use Autodefer for single Batch jobs*

Database Transport Rules



TM009

© 1987

Hewlett-Packard Company

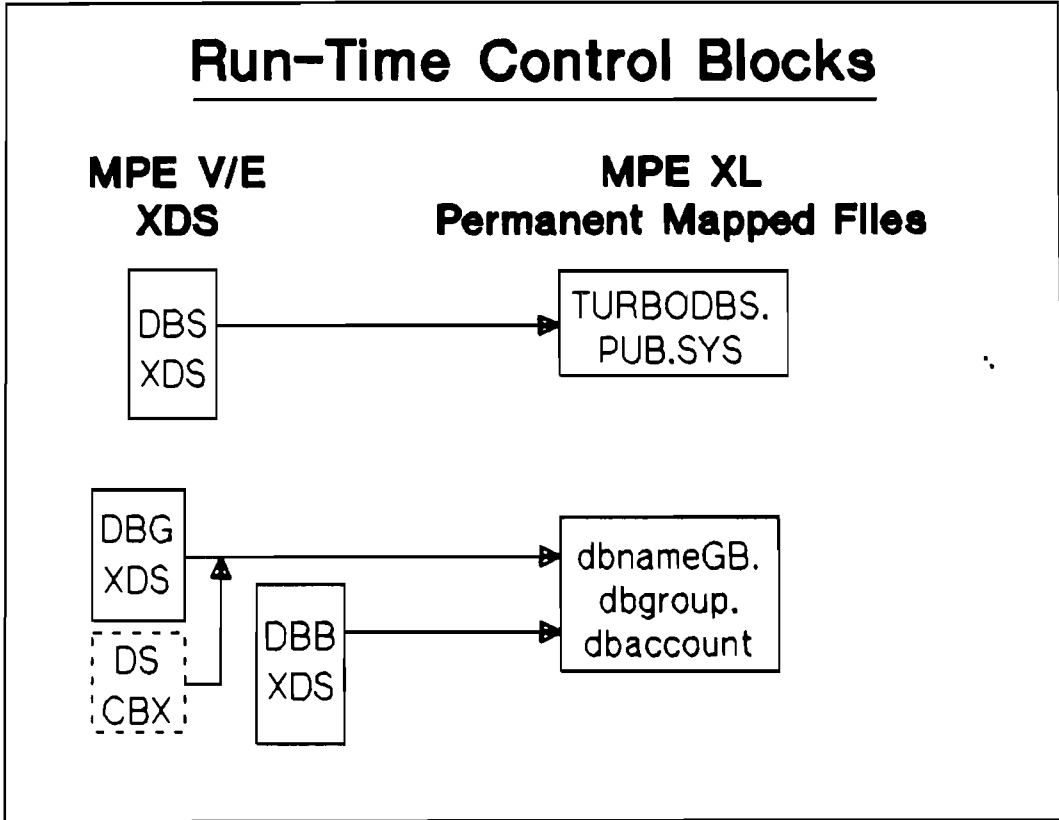
Notes

- Always disable ILR before transporting databases between MPE V/E and MPE XL.
- On MPE XL, DBSTORE has a new INFO="TRANSPORT" option for moving databases to MPE V/E.
- The file size limit on MPE XL is larger than MPE V/E.
- The STORE program with the TRANSPORT option will detect oversize files when it writes beyond MPE V/E limit.

*• ILR operates on CM - overhead.*

*• NM - disable ILR - XM anyway - Increase Performance*

**Run-Time Control Blocks**



TURBO

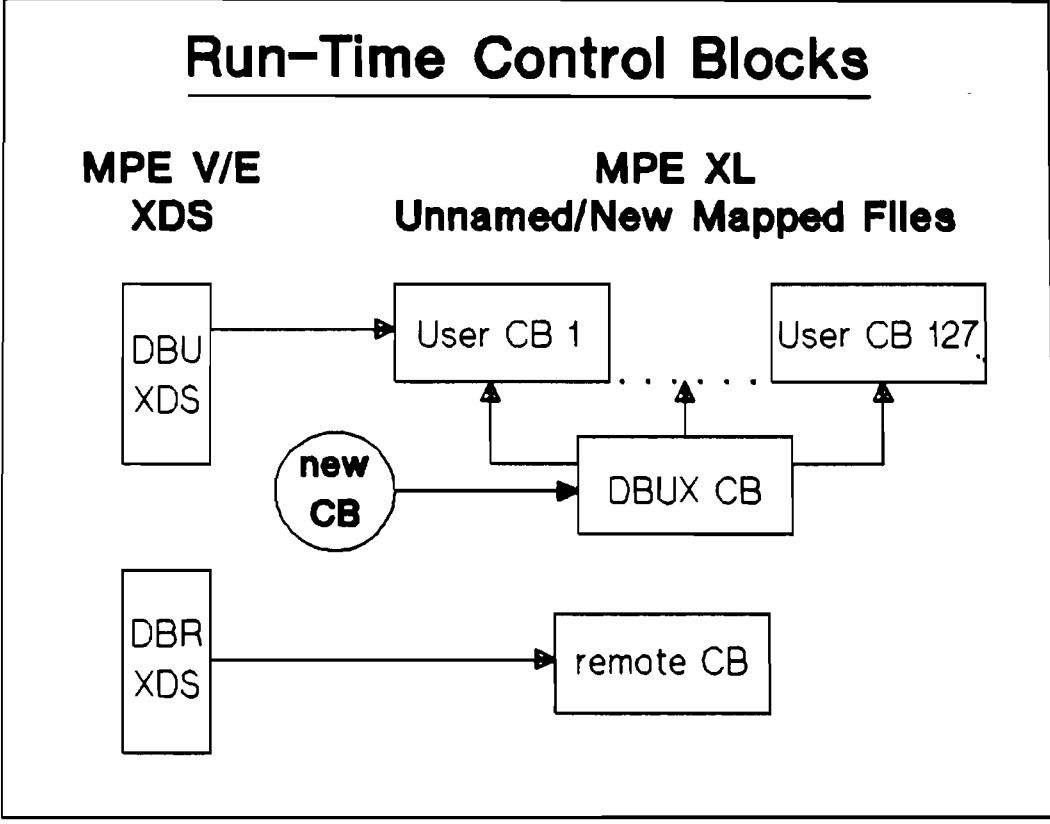
1987

Hewlett-Packard Company

**Notes**

- Watch for naming conflicts with existing files.

Run-Time Control Blocks



Notes

- TurboIMAGE/XL allows 127 DBOPENS per process (TurboIMAGE/V limit is 63).
- RDBA is only supported by NS3000 on a 900 Series system.

*DBUX = # entries which allows # of DBOPENS*

## Module 10 TurboIMAGE/V to TurboIMAGE/XL Migration

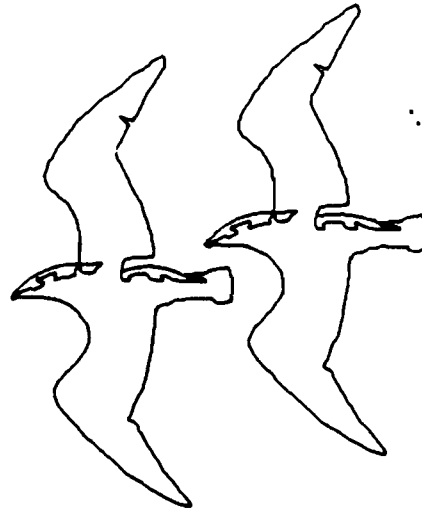
### □ Activity 10.2 QUIZ

1. True or False: PROFILER will run in CM mode to report statistics on TurboIMAGE/XL databases.
2. List the steps for migrating to TurboIMAGE/XL.
3. List the steps for moving a TurboIMAGE database from MPE XL to MPE V/E.
4. True or False: On MPE XL, ILR is required to guarantee structural integrity.
5. True or False: Like ILR recovery on MPE V/E, XM recovery on MPE XL completes the interrupted intrinsic.
6. True or False: To recover TurboIMAGE/XL databases you must type START RECOVERY at the ISL> prompt.





**MIGRATING  
from  
HP SQL/V  
to  
HP SQL/XL**



CSM2201

© 1987

Hewlett-Packard Company

Notes:

*Go to REL. 2.0 MPE/XL*

## Module 11 HP SQL/V to HP SQL/XL Migration

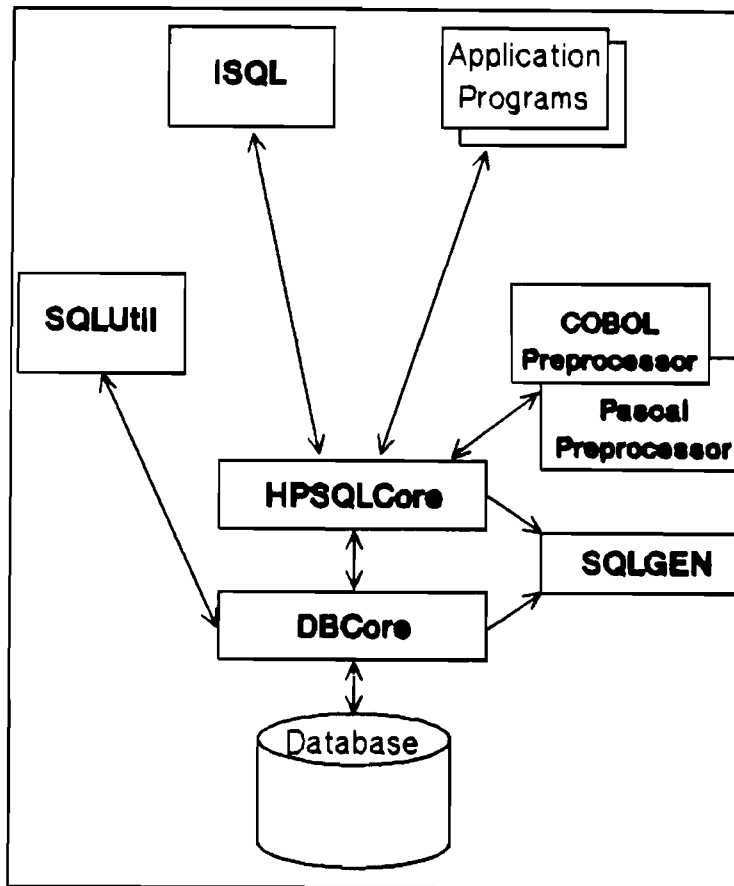
### □ Goal and Objectives

**Goal:** To become familiar with HP SQL migration issues, including the use of SQLGEN/V as a migration tool.

**Objectives:** After completing this module, students trained in HP SQL will be able to:

- List the steps in migrating from HP SQL/V to HP SQL/XL.
- Describe how to use SQLGEN/V to create ISQL command files to aid in the migration from HP SQL/V to HP SQL/XL.
- Describe product differences between HP SQL/V and HP SQL/XL.

## Overview of HP SQL Components



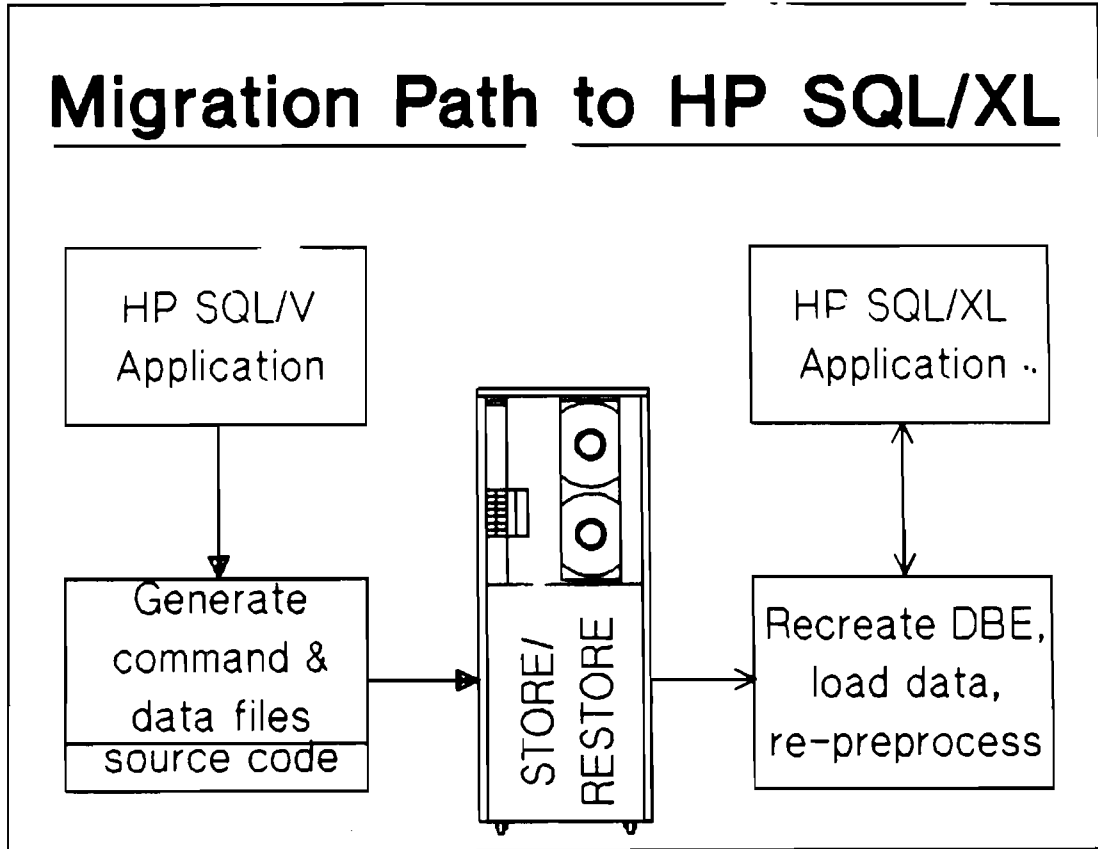
### Notes:

- SQLGEN is the component of HP SQL that was introduced with HP SQL/V Release 2.
- You must have DBA authority to use SQLGEN.
- SQLGEN documentation is included as an appendix in the HP SQL DBA manual.
- SQLGEN generates command files that can be directly used with ISQL's START command. For example, if SQLGEN created a command file called "SCHEMA 1", you would enter the following command at the ISQL prompt:

```
isql > START SCHEMA 1;
```

- SQLGEN can be used for the following purposes:
  - schema generation for recreating the DBE and its contents
  - migration tool
  - ISQL command file generator

**Overview of Migration**



CSM2103

© 1987

Hewlett-Packard Company

**Notes:**

■ **Migrate application from HP SQL/V to HP SQL/XL**

1. Run SQLGEN/V to generate schema and data unload/load command files.
2. Run ISQL/V to unload the data.
3. STORE command files, data files, and application programs.
4. RESTORE command files, data files, and application programs.
5. Recreate the DBE.
6. Load data into the new DBE.
7. Repreprocess, recompile, and relink application programs.

**NOTE:** Views will not be migrated. If you have saved the original commands for creating the views in a command file, you can use your command file to recreate them on MPE XL.

**Differences In Maximums between HP SQL/V and HP SQL/XL**

**HP SQL/V vs HP SQL/XL**

HP SQL/V		HP SQL/XL
64	Columns per table or view	255
64	Columns per query	1024
32,767	Pages per DBEFile0, log file, DBEFILE	16,777,215
192	Concurrent number of transactions	240

CSM2203

© 1987

Hewlett-Packard Company

**Notes:**

- Maximum transactions refers to the maximum number of concurrent transactions.
- Views are virtual tables.

**NOTE:** If, on MPE XL, you increase the number of columns per table beyond the MPE V/E limits, you will not be able to migrate the DBE back to MPE V/E.

## HP SQL/XL DBA Differences

- DBA authority cannot be revoked from the DBECreator
- DBA authority not automatically granted to MANAGER@SYS

CSM2205

© 1987

Hewlett-Packard Company

**Notes:**

- A user with DBA authority has extensive control over the data and structures in a DBE.
- The DBECreator is the user (ie. MPE user.account) who created the Database Environment. This user is automatically granted DBA authority.

**Differences between ISQL/V and ISQL/XL**

<b>ISQL/V vs ISQL/XL</b>		
ISQL/V		ISQL/XL
5 commands	Command history buffer	10 commands
1024 bytes	Command buffer size	2048 bytes
HP Float Format	Real Number representation	IEEE Float Format

CSM2204

© 1987 Hewlett-Packard Company

**Notes:**

- The command history buffer stores a list of the most recent commands issued via ISQL.
- The command buffer is a workspace for storing frequently used commands.
- On MPE XL, ISQL will convert real numbers from HP3000 floating point format to IEEE format when loading the data.

## SQLUTIL/XL Differences

- No STARTDBEMON or CLEANDBE commands are required

CSM2206

© 1987

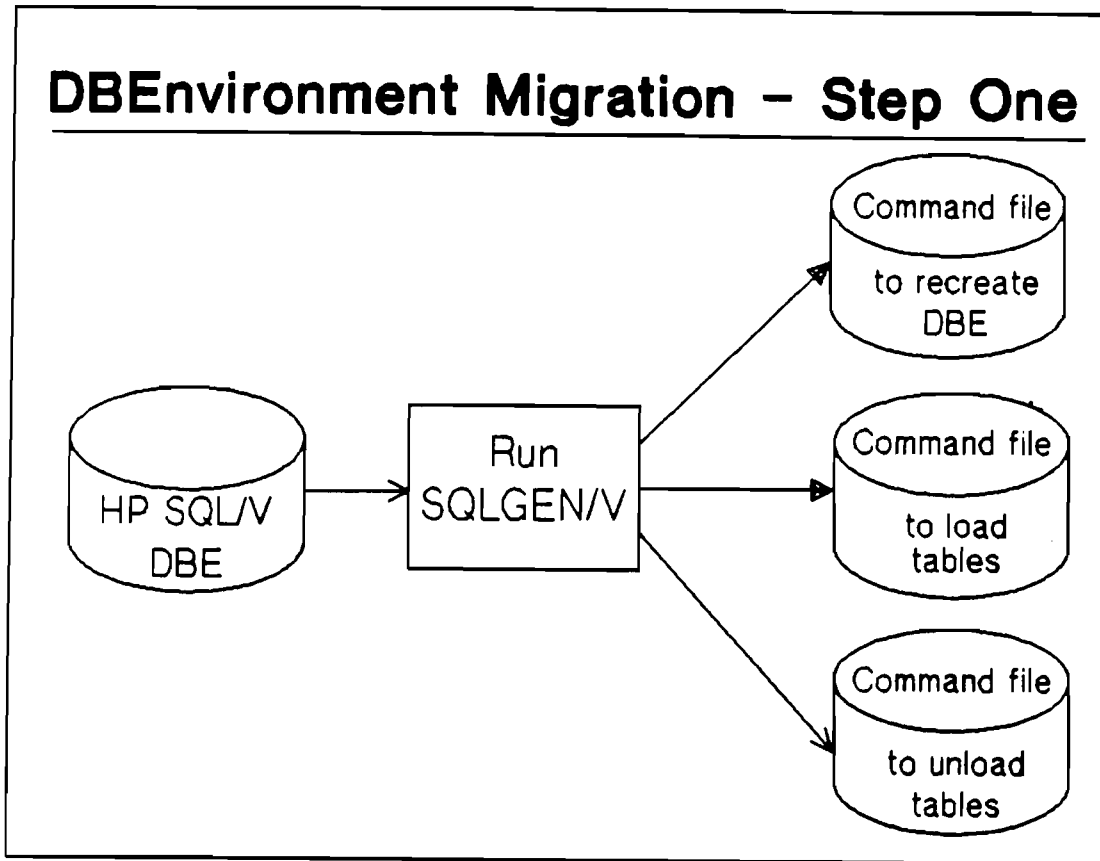
Hewlett-Packard Company

**Notes:**

- STARTDBEMON and CLEANDBE are commands in SQLUTIL/V. STARTDBEMON is a process that can be explicitly started to wake up every few seconds to check if cleanups are needed. CLEANDBE is a command that performs a global cleanup.
- These commands have been replaced by an automated cleanup process in HP SQL/XL.
- In HP SQL/XL, this cleanup process is notified whenever a transaction/program is terminated abnormally.



Migration Process - Step One



CSM2210

1987

Hewlett-Packard Company

Notes:

- Use SQLGEN/V's GENERATE ALL and GENERATE LOAD commands to generate the command files for recreating the DBE and unloading/loading the tables.

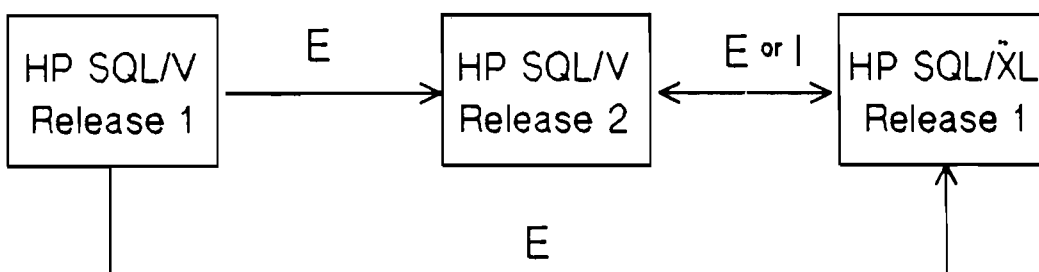
Example: :RUN SQLGEN.PUB.SYS

```
>> STARTDBE  
DBE Name >> PARTSDBE  
  
>> GENERATE ALL  
Schema File Name or '/' to STOP command >> SCHEMA 1  
...  
  
>> GENERATE LOAD  
Unload Schema File Name or '/' to STOP command >> TABUNLD  
Load Schema File Name or '/' to STOP command >> TABLOAD  
...  
Internal Format or External Format (Int/Ext) >> INT  
...
```

Reference: HP SQL Database Administration Guide (Appendix G).

**Migration Process – Step One (continued)**

**Unloading HP SQL/V Tables**  
**Internal vs. External Unloads**



I = internal data unload/load  
E = external data unload/load

CSM2216

© 1987 Hewlett-Packard Company

**Notes:**

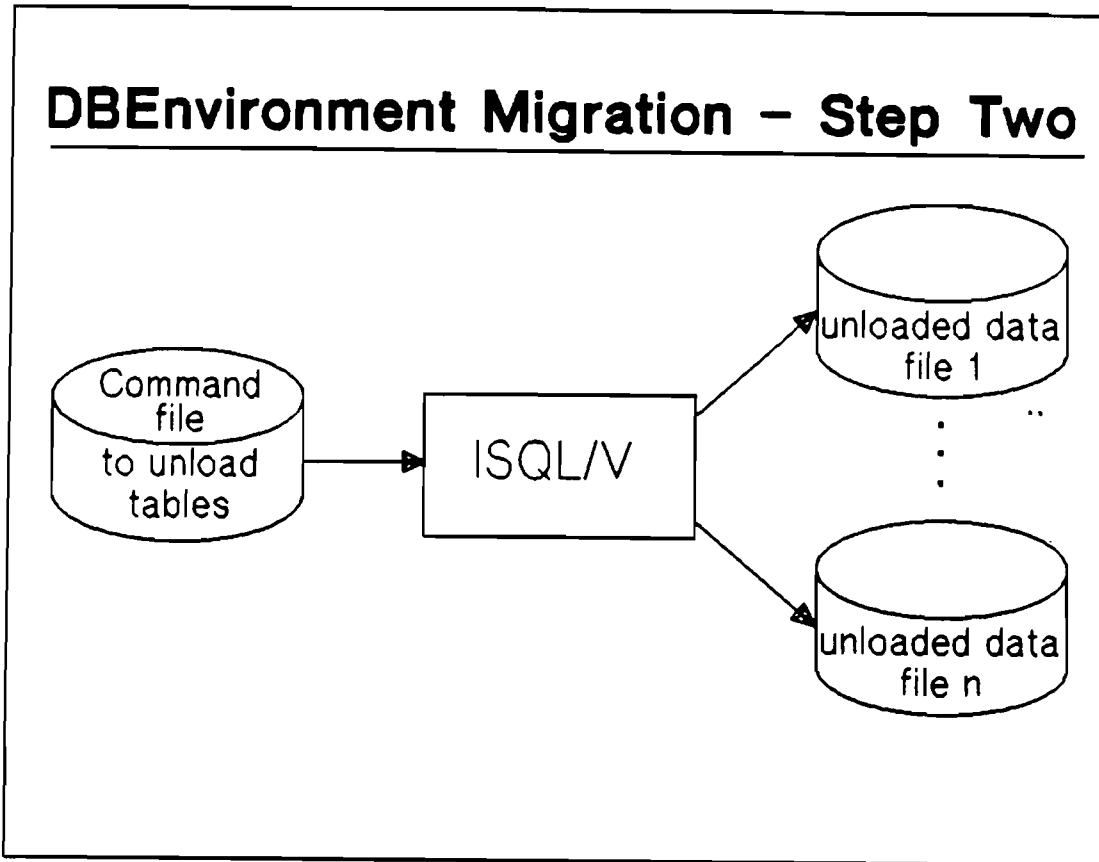
- Depending on the version of HP SQL/V, you must choose one of the following ways to unload data:

UNLOAD EXTERNAL - can always be used

UNLOAD INTERNAL - can only be used between HP SQL/V Release 2 and HP SQL/XL Release 1

**NOTE:** You should not move an HP SQL/XL application to HP SQL/V Release 1. If you need to migrate an HP SQL/XL DBE back to HP SQL/V, we strongly recommend moving to the latest HP SQL/V Release (Release 2).

**Migration Process - Step Two**



CSM221

© 1987

Hewlett-Packard Company

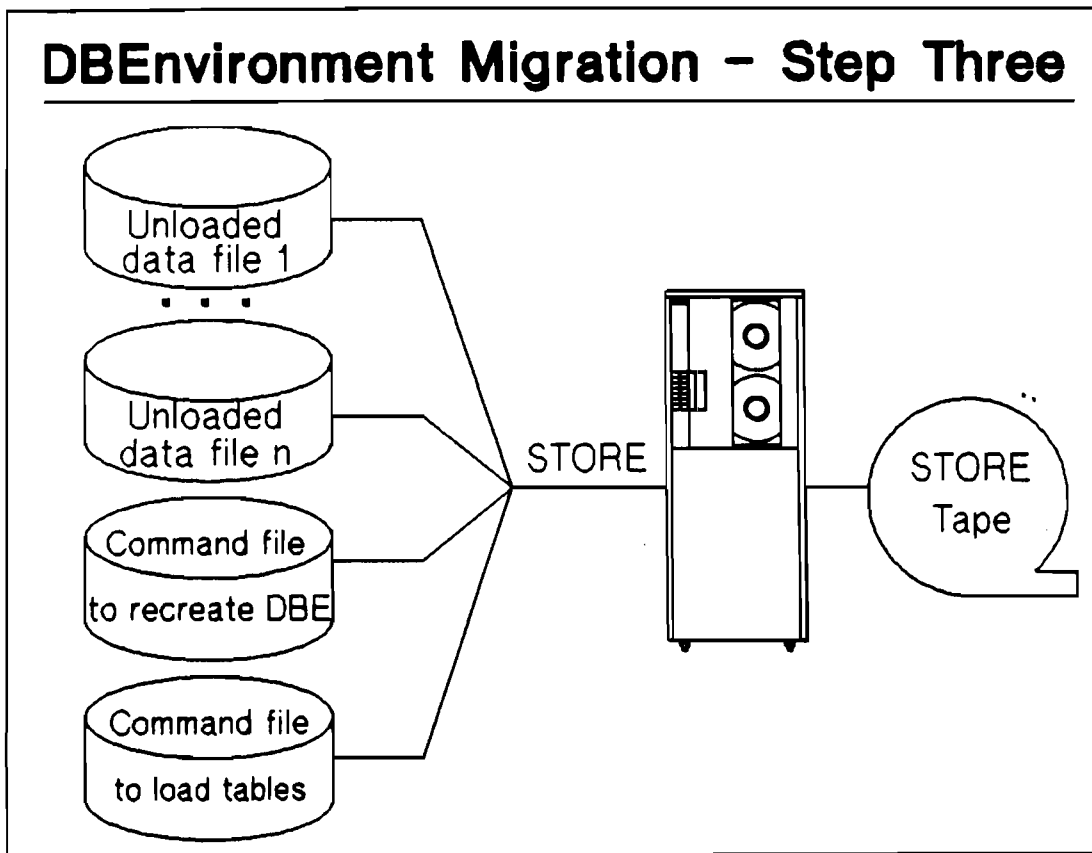
**Notes:**

Run ISQL/V to unload data.

Example:

```
isql> START TABUNLD;
```

**Migration Process - Step Three**



CSM2212

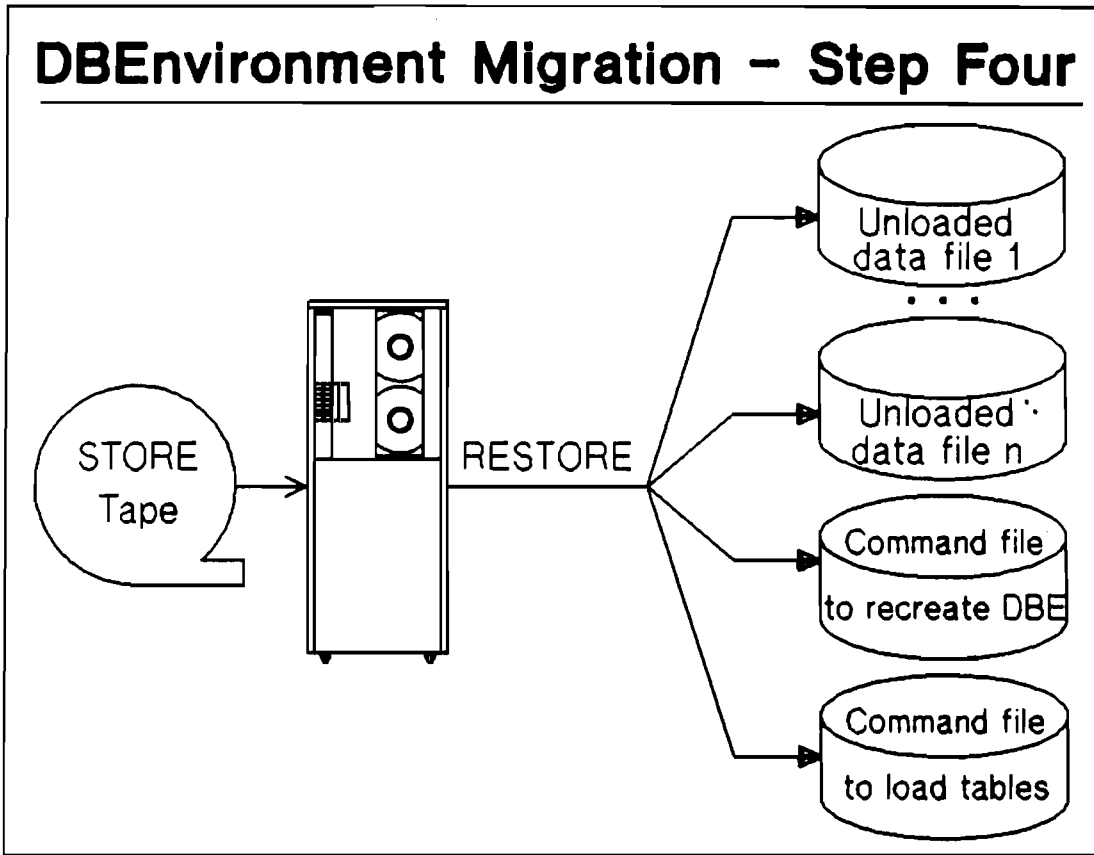
© 1987

Hewlett-Packard Company

**Notes:**

- STORE the data, application programs and command files from the MPE V/E system to tape.
- Users should also STORE stream files they use to preprocess, compile, and link their programs.

Migration Process - Step Four



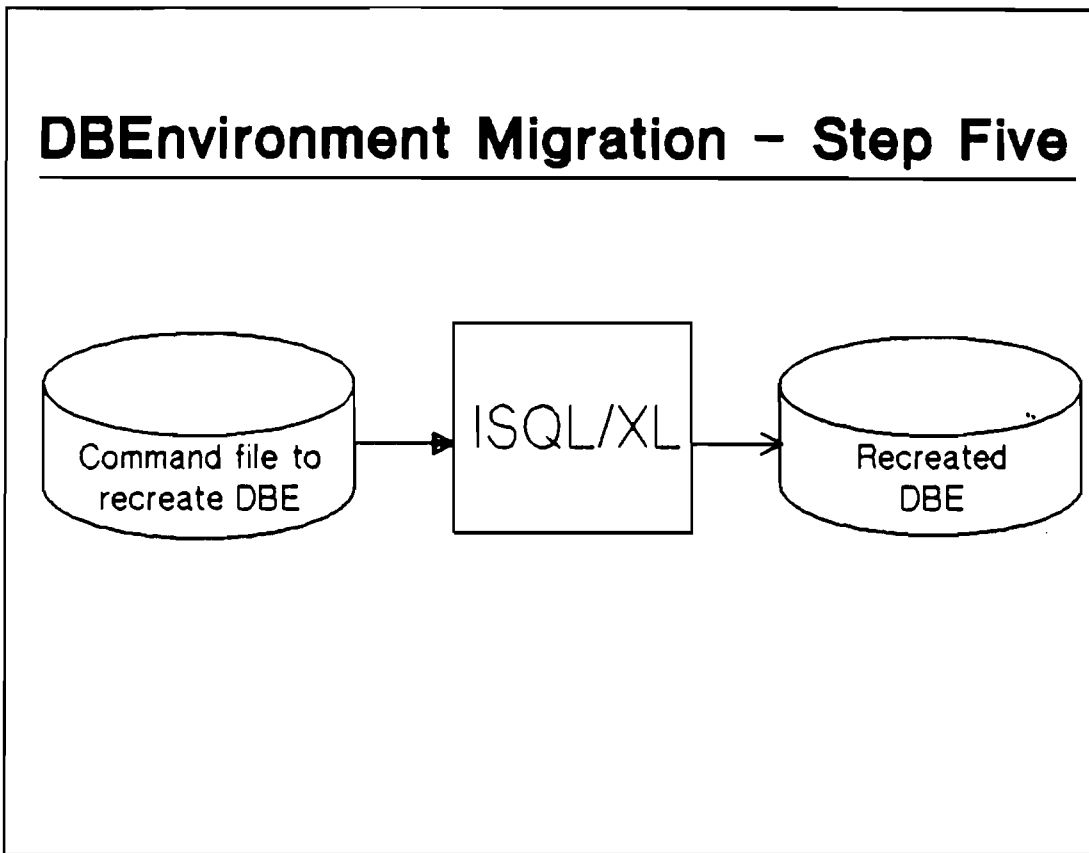
CSM2213

© 1987 Hewlett-Packard Company

Notes:

- Restore the files to the MPE XL machine.

**Migration Process – Step Five**



CSM2214

© 1987

Hewlett-Packard Company

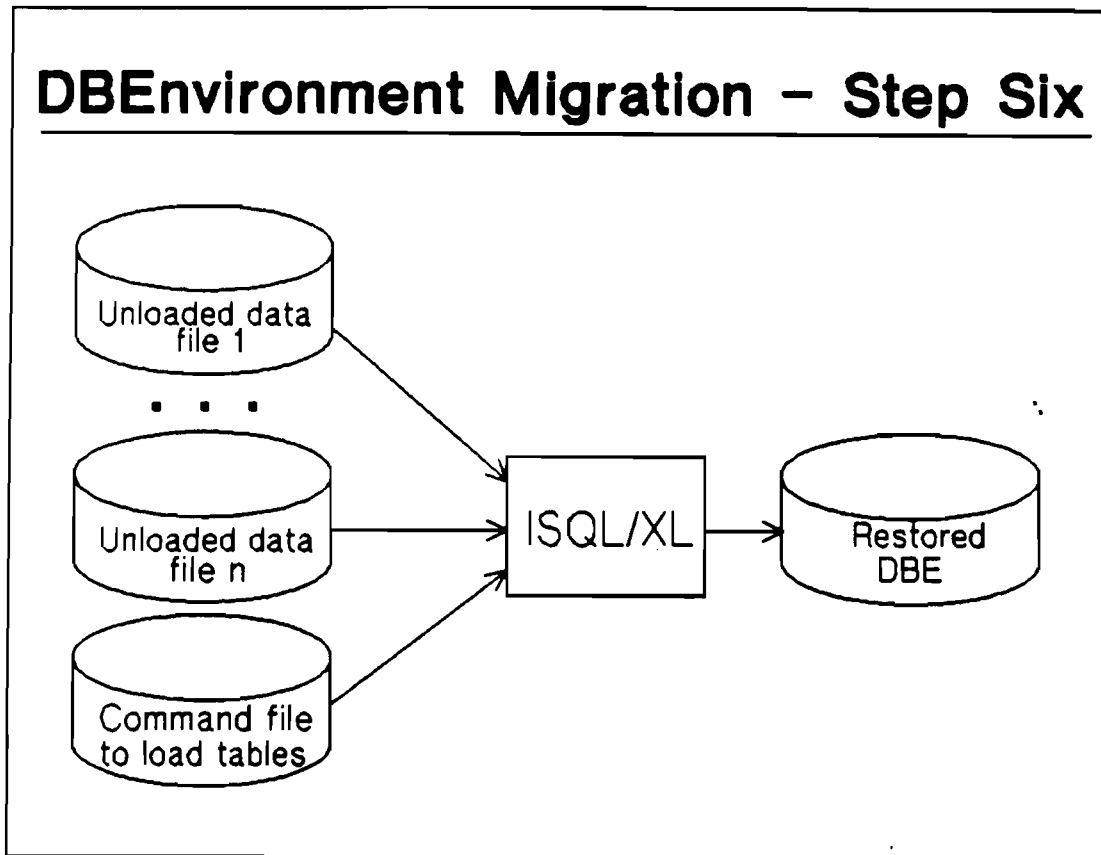
**Notes:**

- Recreate the HP SQL/V DBE on the MPE XL system using the command file generated by SQLGEN/V.

Example:

```
isql> START SCHEMA 1;
```

**Migration Process - Step Six**



CSM2215

© 1987

Hewlett-Packard Company

**Notes:**

- Reload the tables using the command file generated by SQLGEN/V.

Example:

```
isql> START TABLOAD;
```

**Migration Process – Step Seven**

**DBEnvironment Migration – Step Seven**  
**Migrating Applications**

- Application programs must be reprocessed, recompiled, and relinked

CSM2276

© 1987

Hewlett-Packard Company

**Notes:**

- The SQLDA structure holds fields essential for looking at the results of dynamic queries.

**NOTE:** The SQLDA has a new field on HP SQL/V Release 2 and HP SQL/XL. This new field contains the ROWLENGTH resulting from a dynamic query. A programmer may now check this value to get the length of the ROWs resulting from a dynamic query.



## Module 11 HP SQL/V to HP SQL/XL Migration

### Activity 11-1 Quiz

**Purpose:** Review the product differences and migration steps to move an HP SQL/V application to HP SQL/XL.

**Instructions:** Answer the questions listed below.

1. Can queries in HP SQL/XL contain more result columns than the maximum number of columns in a table or view? If so, why?

---

---

2. How are the STARTDBEMON and CLEANDBE commands implemented on HP SQL/XL?

---

---

3. What special steps do you take when migrating an HP SQL/V Release 1 application to an HP SQL/V Release 2 application?

---

---

---

4. Circle all possible uses of SQLGEN/V:

- a. Schema generating tool.
- b. Copying one user's database tables to another user.
- c. Performance testing.
- d. Migration tool.
- e. Checking the authorities granted on a DBE.

5. You have done an internal unload of your tables using HP SQL/V Release 1 and you have restored the files on the MPE XL machine. What will happen when you try to load the data into your HP SQL/XL database? Why?

---

---

## Module 11 HP SQL/V to HP SQL/XL Migration

### Activity 11-1 Quiz

6. List the seven steps needed to migrate an HP SQL/V DBE and its data to HP SQL/XL.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_
- g. \_\_\_\_\_

7. When must you reprocess, recompile, and relink application programs during the migration process?

\_\_\_\_\_

8. What HP SQL object is not migrated?

\_\_\_\_\_



# Review Confidence Test

YOUR NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

Please respond to the following statements by circling the answer which best reflects your confidence level.

EC	C	SC	NS	U
Extremely Confident	Confident	Somewhat Confident	Not Sure	Unable

Are you now able to:

## HARDWARE OVERVIEW

Degree of Confidence:

1. Locate and use system switches, displays and the console in order to startup, shutdown and operate Series 930 and/or Series 950 systems? [EC] [C] [SC] [NS] [U]
2. Determine what peripheral interfaces and memory cards are installed in Series 930 and/or Series 950 systems? [EC] [C] [SC] [NS] [U]
3. Explain some of the differences between Series 930 and Series 950 systems? [EC] [C] [SC] [NS] [U]
4. Perform various tasks under the direction of a CE or SE on a Series 930 and/or Series 950 system? [EC] [C] [SC] [NS] [U]

## MPE XL COMMAND INTERPRETER

5. Explain what Command Files are? [EC] [C] [SC] [NS] [U]
6. Use "Implied :RUN"? [EC] [C] [SC] [NS] [U]
7. Explain the system default command search path? [EC] [C] [SC] [NS] [U]
8. Explain and use the command lines history stack? [EC] [C] [SC] [NS] [U]
9. Explain the syntax changes for the new MPE XL commands? [EC] [C] [SC] [NS] [U]
10. Use dereferencing and recursive dereferencing of variables? [EC] [C] [SC] [NS] [U]
11. Explain the RECURSION/NORECURSION option in UDCs? [EC] [C] [SC] [NS] [U]

## Review Confidence Test

Degree of Confidence:

12. Use the following new CI commands:

DELETEVAR?	[EC]	[C]	[SC]	[NS]	[U]
SETVAR?	[EC]	[C]	[SC]	[NS]	[U]
SHOWVAR?	[EC]	[C]	[SC]	[NS]	[U]
INPUT?	[EC]	[C]	[SC]	[NS]	[U]
ECHO?	[EC]	[C]	[SC]	[NS]	[U]
DO?	[EC]	[C]	[SC]	[NS]	[U]
CHGROUP?	[EC]	[C]	[SC]	[NS]	[U]
COPY?	[EC]	[C]	[SC]	[NS]	[U]
LISTREDO?	[EC]	[C]	[SC]	[NS]	[U]
REDO?	[EC]	[C]	[SC]	[NS]	[U]

13. Explain the function of the following new/enhanced CI commands:

CALC?	[EC]	[C]	[SC]	[NS]	[U]
PRINT?	[EC]	[C]	[SC]	[NS]	[U]
SETCATALOG?	[EC]	[C]	[SC]	[NS]	[U]
XEQ?	[EC]	[C]	[SC]	[NS]	[U]

### SYSTEM STARTUP, STOP, UPDATE and DUMP

14. Describe a system startup flow?	[EC]	[C]	[SC]	[NS]	[U]
15. Use the ISL Utilities?	[EC]	[C]	[SC]	[NS]	[U]
16. Start and interact with the system until it is fully brought up?	[EC]	[C]	[SC]	[NS]	[U]
17. Issue ISL commands?	[EC]	[C]	[SC]	[NS]	[U]
18. List the steps involved in taking a DUMP?	[EC]	[C]	[SC]	[NS]	[U]
19. Issue Access Port commands?	[EC]	[C]	[SC]	[NS]	[U]
20. Describe the Access Port and its use?	[EC]	[C]	[SC]	[NS]	[U]

## Review Confidence Test

Degree of Confidence:

### SYSTEM CONFIGURATION

- |  |      |     |      |      |     |
|--|------|-----|------|------|-----|
| 21. Describe the major differences between SYSDUMP and SYSGEN? | [EC] | [C] | [SC] | [NS] | [U] |
| 22. Understand the MPE XL system generation process?           | [EC] | [C] | [SC] | [NS] | [U] |
| 23. Identify the major functions of SYSGEN?                    | [EC] | [C] | [SC] | [NS] | [U] |
| 24. Understand the relationship between SYSGEN and NMMGR?      | [EC] | [C] | [SC] | [NS] | [U] |
| 25. Configure a MPE XL system using SYSGEN?                    | [EC] | [C] | [SC] | [NS] | [U] |

### MPE XL DISTRIBUTED TERMINAL SUBSYSTEM (DTS)

- |   |      |     |      |      |     |
|---|------|-----|------|------|-----|
| 26. Describe the 3 NMMGR 'branches' for DTS?                        | [EC] | [C] | [SC] | [NS] | [U] |
| 27. Describe the major activities in configuring DTS with NMMGR?    | [EC] | [C] | [SC] | [NS] | [U] |
| 28. Describe the usage of the 'COMMAND' field on the NMMGR screens? | [EC] | [C] | [SC] | [NS] | [U] |
| 29. Locate the Station address for DTC?                             | [EC] | [C] | [SC] | [NS] | [U] |
| 30. Configure DTS with NMMGR?                                       | [EC] | [C] | [SC] | [NS] | [U] |
| 31. Describe the concept of a 'nailed' device?                      | [EC] | [C] | [SC] | [NS] | [U] |
| 32. Describe the purpose of a device profile?                       | [EC] | [C] | [SC] | [NS] | [U] |
| 33. Explain the environment that TERMDISM runs in?                  | [EC] | [C] | [SC] | [NS] | [U] |
| 34. Explain the purpose of each TERMDISM command?                   | [EC] | [C] | [SC] | [NS] | [U] |
| 35. Use the following TERMDISM commands:                            | [EC] | [C] | [SC] | [NS] | [U] |
| DTC?  | [EC] | [C] | [SC] | [NS] | [U] |
| DIAG?   | [EC] | [C] | [SC] | [NS] | [U] |
| RESET?  | [EC] | [C] | [SC] | [NS] | [U] |
| DUMP?   | [EC] | [C] | [SC] | [NS] | [U] |
| STATUS?   | [EC] | [C] | [SC] | [NS] | [U] |

### RECOVERY, BACKUP and DATA EXCHANGE

- |  |      |     |      |      |     |
|--|------|-----|------|------|-----|
| 36. Do partial and full backups on MPE XL? | [EC] | [C] | [SC] | [NS] | [U] |
|--|------|-----|------|------|-----|

## Review Confidence Test

Degree of Confidence:

- |   |      |     |      |      |     |
|---|------|-----|------|------|-----|
| 37. Use the enhanced backup features on MPE XL?   | [EC] | [C] | [SC] | [NS] | [U] |
| 38. Perform functions of RELOAD with INSTALL and RESTORE?   | [EC] | [C] | [SC] | [NS] | [U] |
| 39. Use the new functions of STORE/RESTORE?   | [EC] | [C] | [SC] | [NS] | [U] |
| 40. Transfer files from MPE XL to MPE V/E using STORE/RESTORE?  | [EC] | [C] | [SC] | [NS] | [U] |
| 41. Recover from a file system disaster?  | [EC] | [C] | [SC] | [NS] | [U] |
| <b>VOLUME MANAGEMENT</b>  |      |     |      |      |     |
| 42. Use MPE V/E Private Volumes?  | [EC] | [C] | [SC] | [NS] | [U] |
| 43. Describe MPE XL volume management structure?  | [EC] | [C] | [SC] | [NS] | [U] |
| 44. Create and use MPE XL volume sets?  | [EC] | [C] | [SC] | [NS] | [U] |
| 45. Create an accounting structure on a non-system volume set?  | [EC] | [C] | [SC] | [NS] | [U] |
| 46. Mount and dismount volume sets?   | [EC] | [C] | [SC] | [NS] | [U] |
| 47. Describe how to restrict a file to a volume set, class, or volume?  | [EC] | [C] | [SC] | [NS] | [U] |
| <b>TROUBLESHOOTING</b>  |      |     |      |      |     |
| 48. Invoke and use the DUI?   | [EC] | [C] | [SC] | [NS] | [U] |
| 49. Use simple DUI commands such as HELP, LIST, SUSPEND?  | [EC] | [C] | [SC] | [NS] | [U] |
| 50. Find product specific information concerning diagnostics and utilities available in the Online Diagnostics Subsystem? | [EC] | [C] | [SC] | [NS] | [U] |
| 51. Obtain a map of the CPU and I/O system using the Online DiagnosticSubsystem?  | [EC] | [C] | [SC] | [NS] | [U] |
| 52. Read the contents of system and memory log files?   | [EC] | [C] | [SC] | [NS] | [U] |
| <b>MIGRATION OF THE MPE V/E OPERATING ENVIRONMENT</b>   |      |     |      |      |     |
| 53. Make an optimal SYSDUMP tape for DIRMIG?  | [EC] | [C] | [SC] | [NS] | [U] |

## Review Confidence Test

### Degree of Confidence:

54. Use DIRMIG to migrate:

RINs?

[EC] [C] [SC] [NS] [U]

User logging ID's?

[EC] [C] [SC] [NS] [U]

Accounts?

[EC] [C] [SC] [NS] [U]

Private Volumes?

[EC] [C] [SC] [NS] [U]

UDC environments?

[EC] [C] [SC] [NS] [U]

### TURBOIMAGE/V TO TURBOIMAGE/XL MIGRATION

55. List the steps for transporting TurboIMAGE databases between MPE V/E and MPE XL?

[EC] [C] [SC] [NS] [U]

56. Contrast the following modes of operation between TurboIMAGE/V and TurboIMAGE/XL:

[EC] [C] [SC] [NS] [U]

Autodefer enabled?

[EC] [C] [SC] [NS] [U]

ILR enabled?

[EC] [C] [SC] [NS] [U]

User Logging enabled?

[EC] [C] [SC] [NS] [U]

"Default" mode?

[EC] [C] [SC] [NS] [U]

57. List the names of permanent files created by TurboIMAGE/XL for run-time control blocks?

[EC] [C] [SC] [NS] [U]

### HP SQL/V TO HP SQL/XL

58. List the steps in migrating from HP SQL/V to HP SQL/XL?

[EC] [C] [SC] [NS] [U]

59. Describe product differences between HP SQL/V and SQL/XL?

[EC] [C] [SC] [NS] [U]



### **Post to Disc Conditions**

1. **Page cache full.**
  - \* 8 pins or 30 virtual address ranges.
2. **Buffer full.**
  - \* more than 128 k.
3. **Time quantum exhausted.**
  - \* value of time quantum depends on number of XM users.

TG200146-039

© 1987 Hewlett-Packard Company

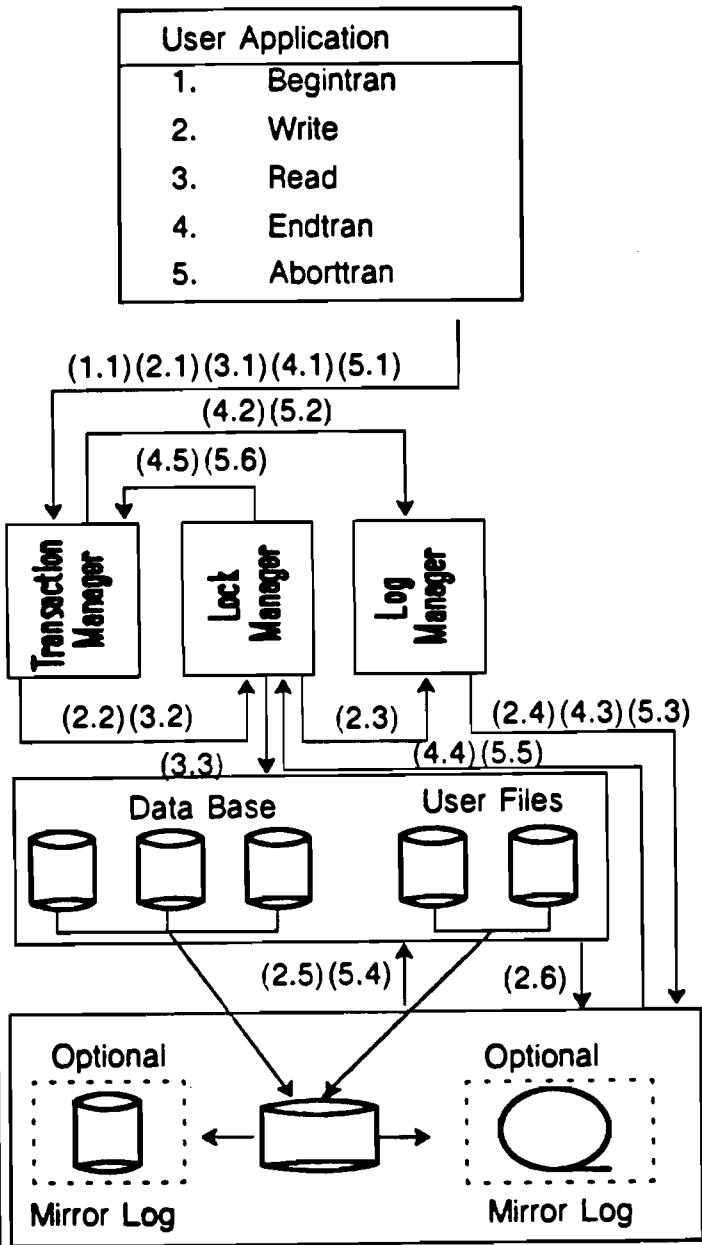
### **Notes**

**BUFFER FULL ALSO MEANS TOO MANY PAGES BE FROZEN IN REAL MEMORY.  
THE MORE USER ACTIVE, THE LESS TIME QUANTUM WILL BE SET.  
MAXIMUM TIME QUANTUM (ONE USER) IS 1.04 SECOND.**





**Flow of a transaction**



1. Begintran.
  - 1.1 Get tranID from XM GDS.
2. Write to a file.
  - 2.1 Find TransID.
  - 2.2 Place an exclusive lock.
  - 2.3 Update log memory data structure.
  - 2.4 Copy before image to the mapped log file.
  - 2.5 Write user's data to the user's mapped file.
  - 2.6 Write after image to the mapped log file.
3. Read from file.
  - 3.1 Find transID from XM GDS.
  - 3.2 Place a share lock.
  - 3.3 Read data from user's mapped file.
4. Endtran.
  - 4.1 Find transID from XM GDS.
  - 4.2 Log manager builds a commit record.
  - 4.3 Flush the commit record to the disc log.
  - 4.4 Release all lock for committed transactions.
  - 4.5 Delete tranID from transaction manager GDS.
5. Aborttran.
  - 5.1 Find transID from XM GDS.
  - 5.2 Get the last record updated by the transaction from the log manager data structure.
  - 5.3 Read before image from the mapped 3.3 Read data from user's mapped file.log file and update the user's file.
  - 5.4 Flush memory data related to the transaction to disc.
  - 5.5 Release locks.
  - 5.6 Delete tranID from XM GDS.



AS of 9/11/87

Tom J. Goulden's Presentation

Tentative MPE XL MIT Planning		Delta Candidates (20 or 30)	2nd Base (40)	Future
Disc Drives	First Release	7937H, 7933H, 7935H	ALINK/AMUX	7914P7, 7914CT/ST7
Tape Drive		7978, 7974		9144, 354017, 7914CT/ST7
Printers-HP1B		2565, 2565, 2600, 2608		2603, 26017, 26027
Printers-Serial		2934, 2686		
Terminals		2392, 2393, 2394, 2397 2622, 2624B, 2627 HP150, Vectra, Port+		
Plotters				
Other H/W				
MH Languages		COBOL II/XL, FORT77/XL HP Pascal/XL, HP C/XL	BusBASIC/XL	
CM Languages		SPL/V, RP6/V, BusBasic/V Transact/V, COBOL II/V, FORT66/V, FORT77/V BASIC/V, Pascal/V		
Information Management		TurboIMAGE/XL, MFSQL KSAH/V, DBchange/V SysDict/XL, Dict/V Toolset/XL, Report/V Inform/V, Query/V VPLUS/V	HPIMAGE, KSAH/XL TurboWindow	Dual Access
Office		TDP/V, Spell/V PSP/V (IFS/IDS/V) AdvanceLink		Telex Profs connect DISSOS connect
Manufacturing Financial				Bisynch RJE X.25, LU6.2
Datacom		MS LAN Datacom Server 2334A	DTC Switching	HP Security Monitor User Transaction Mgmt Concurrent Backup, SMT Online configuration 4GB/168 addressability
System S/U		MPE XL 1.0	TurboSTORE/XL CST/XCST expansion SL expansion HOT Printing MPE Powerfail	

(2)

12  
13  
14

3a

3b

predictive support 1??

Notes  
Support for xxx7 peripherals has not yet been determined











# MPE-XL ONLINE DIAGNOSTIC SUBSYSTEM IMPLEMENTATION

## INTRODUCTION

This appendix describes the components and conditions specific for implementation of the Online Diagnostic Subsystem under the MPE-XL operating system. These topics include a listing and brief description of all diagnostics and utilities along with the Diagnostic User Interface (DUI) and any background processes that may affect Subsystem performance. Additional information useful for diagnostic operation is also mentioned. A block diagram of MPE-XL Online Subsystem function follows this discussion.

## **MPE-XL Online Diagnostic Subsystem Software**

The following lists diagnostic programs and utilities along with the Diagnostic User Interface (DUI) and any background processes that are currently supported on the MPE-XL operating system. The diagnostic programs are listed first followed by utilities, the DUI and Diagnostic Monitor. Descriptions of these items begin after this list according to software class respectively.

### **DIAGNOSTIC PROGRAMS:**

- o CS/80 Disc Diagnostic ( CS80DIAG )
- o HP7974A/7978 Magnetic Tape Drive Diagnostic ( DIAG7478 )
- o Ciper Line Printer Diagnostic ( CIPERLPD )
- o Page Printer Diagnostic ( PPDIAG )
- o HP-IB Device Adapter Diagnostic ( HPIBDIAG )
- o Six-Port Mux Diagnostic ( MUXDIAG )
- o LAN Diagnostic ( LANDAD )

### **SUBSYSTEM UTILITIES:**

- o System and Memory Log Analysis Tool ( LOGTOOL )
- o System Map ( SYSMAP )
- o Terminal Diagnostic System Monitor ( TERMDSM )
- o HP-CIO Channel Adapter Utility ( CADIAG )
- o I/O Test Tool ( IOTT )
- o MPE-XL Online Diagnostic Installer ( INSTALL )

### **ONLINE DIAGNOSTIC SUBSYSTEM OPERATING SOFTWARE:**

- o Diagnostic User Interface ( DUI )
- o Diagnostic Monitor

## **DIAGNOSTIC PROGRAMS**

The CS/80 Disc Diagnostic (CS80DIAG) provides a means of testing CS/80 discs. The tests include verifying the integrity of the HP-IB data path and channel to the selected disc, identifying the product type of the selected disc, running the internal disc diagnostics, obtaining and decoding disc status messages and information from the disc error logs. Correct operation of CS/80 commands is also verified.

The HP7974A/7978 Online Magnetic Tape Diagnostic (DIAG7478) tests the HP-IB data path between the host system and the magnetic tape drive. It also requests internal selftests, displays decoded status and selftest results, reads and decodes internal error logs, and can conduct worst case and read/write tests.

The CIPER Line Printer Diagnostic (CIPERLPD) tests line printers which use the CIPER protocol. The diagnostic begins execution after termination of the currently printing job. It obtains access to the printer, tests the I/O path to the printer, and opens the communication link to the printer. The tests include identification of the product type, printing of test patterns, obtaining and decoding device status from the printer, and obtaining and displaying environmental and job status.

The Page Printer Diagnostic (PPDIAG) tests page printers for proper operation. Test execution begins after termination of the currently printing job. The diagnostic obtains access to the printer, tests the I/O path, and opens the communication link to the printer. Tests include identification of the product type, printing of test patterns, obtaining and decoding device status from the printer along with environmental and job status information.

The HP-IB Device Adapter Diagnostic (HPIBDAD) is a diagnostic system program that allows the user to test the HP-IB device adapter. It can also be executed as an auto-diagnostic by the low level I/O manager. HPIBDAD indicates the status of the device adapter before and after running the diagnostic, and the possible cause of errors if any are found. It also flags the HPIB Device Adapter PCA as the failing FRU.

The Six-Channel MUX Diagnostic (MUXDIAG) checks the functionality of the HP 27140A Asynchronous Six-DC Multiplexer Interface card. MUXDIAG tests communication from the computer to the MUX Card and can initiate the onboard Selftests resident in the MUX Card EPROM.

The LAN Device Adapter Diagnostic (LANDAD) tests the HP 36921A LAN Interface Controller. LANDAD is capable of detecting a failure in one or more FRU's. An FRU can be either the LAN interface controller card (LANIC), the LANIC connector cable, the attachment unit (AUI) cable, the medium attachment unit (MAU), or the medium dependent interface (MDI).

## **SUBSYSTEM UTILITIES**

System and Memory Log Analysis Tool (LOGTOOL) provides a means for managing various system error and event logs. Various log formats may be given to LOGTOOL and can then be listed to show a log in its entirety. Thus, LOGTOOL can display logs of differing structures. LOGTOOL enables the user to perform numerous functions on the various system log files. Error logs may be identified, deleted, and created. Timing intervals for background log analysis may be set. The user may generate summary and detailed reports based on the information contained in the various log files.

System Map (SYSMAP) provides a means of viewing the three main SPU computing elements as defined within the operating system device definition data structures, and compares them with the actual internal definitions stored in the PCA microprocessors. These main computing elements are the Central Processing Unit (CPU), Main Memory (MNMEM), and I/O System, (I/O).

Terminal Diagnostic System Monitor (TERMDSM) utility is a program designed to exercise various components of the Distributed Terminal system and to provide status information of both software and hardware elements.

HP-CIO Channel Adapter Utility (CADIAG) provides the user with a means of assessing CIO Channel adapter identity and current status.

I/O Test Tool (IOTT) provides a means of creating "scripts" for special purpose testing. It enables the user to directly access the I/O system without going through the file system. The user can also display information concerning the state of the I/O requested. This tool is intended for diagnosis of I/O related problems.

Online Installer (INSTALL) provides a means of expanding and revising the Online Diagnostic Facility and directory while the system is online.

## **ONLINE DIAGNOSTIC SUBSYSTEM OPERATING SOFTWARE**

The DUI provides the communication link between the user and the diagnostic programs. The DUI provides such functions as displaying messages to the user from diagnostic programs, and obtaining replies from the user and sending them to the programs.

The Monitor is created and initiated by the system boot process and remains as an active system process during the operating system active state. It is used primarily to receive and log asynchronous I/O events, such as device powerfail recoveries and internal device log data transfers. The Monitor is the parent process which initiates the proper diagnostic module upon receiving a request either from the DUI (request from an online user) or from an I/O manager (request for auto-diagnostic service). It assigns communication parameters for the diagnostic module being initiated, determines the mode under which the diagnostic module will operate, sets I/O device or manager access parameters, and notifies the DUI when a diagnostic program terminates. The monitor will also notify the operator when a device is logically removed for testing as well as displaying the results of destructive tests when this mode is allowed.

## **MPE-XL SPECIFIC DIAGNOSTIC INFORMATION**

Information concerning the MPE-XL system tables and configuration can be found by referring to the MPE-XL System Configuration manual (P/N 32650-90042).

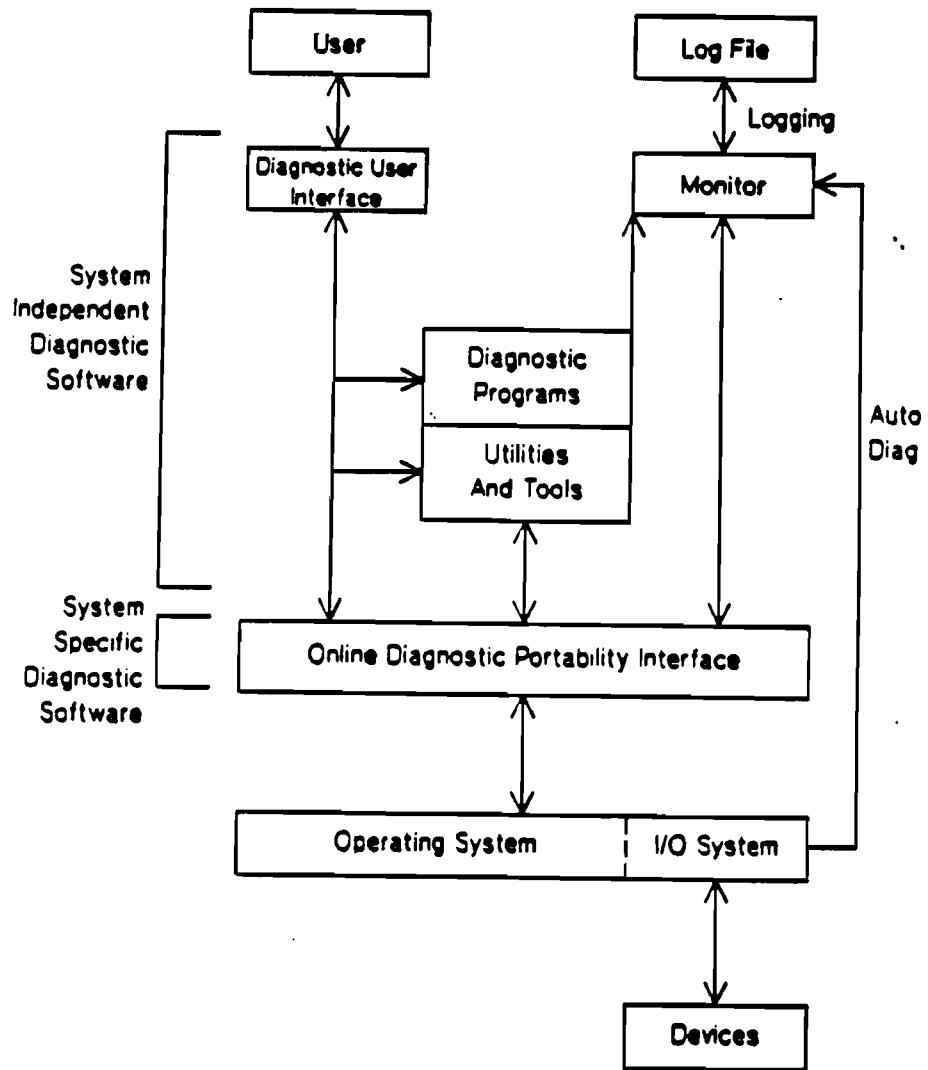


Figure A-1. MPE-XL Online Diagnostic Functional Block Diagram



# System Hangs and Failures

---

## Overview

Currently, there is no valid data available on system hangs and failures. Situations that lead to a system hang or failure are constantly tracked and debugged with each build. Information will be made available after the release of MPE XL on how to correct or recover from known problems.

## System Hangs and Failures Checklist

If you experience a system hang or failure, this checklist offers suggestions for recovery:

1. Check the Status Display. The second digit from the right represents activity. If it is changing, the system may be working. Also, check the disc access light. If it is blinking, the disc is being accessed by the system.
2. Free the system. Enter:  
:ABORTJOB and :ABORTIO
3. Try another terminal or terminal port for the Console.
4. Call Online Support and explain exactly what happened (complete error messages, etc.) and what was being done on the system. Be prepared to tell support personnel the current configuration and if something has changed on the system.
5. Shutdown the system. Enter:  
**CTRL** **A**  
=SHUTDOWN
6. Reset the system. Enter:  
:**CTRL** **B**  
CM>TC

---

## NOTE

You must execute a soft reset TC to obtain a valid DUMP. Do not enter RS or push the reset button on the front panel to reset the system.

---

7. Dump the system and follow Online Support's instructions on the tapes. Enter:  
ISL>DUMP
8. Attempt to start the system. Enter:  
ISL>START
9. Use START NORECOVERY if START doesn't work. Enter:  
ISL>START NORECOVERY
10. Use UPDATE if START NORECOVERY doesn't work. Enter:  
ISL>UPDATE
11. Use INSTALL if UPDATE doesn't work. Enter:  
ISL>INSTALL

## Data Recovery Checklist

1. RESTORE the last backup tape. Mount the proper tape on the system tape drive and enter:  
:RESTORE with the proper parameters.
2. If the last backup was a partial backup, RESTORE the last full backup tape to recover the rest of your files.

---

## NOTE

These checklists are not intended to be solutions, but should assist you in the unlikely event of a system failure or hang. Your HP Support team can provide you with further assistance.

---



Table 1 Unsupported Commands

MPE V/E Command	Description	MPE XL Equivalent
:(commandname) LOGON	Logs on, executes Cl Command.	Modified :HELLO command- INFO=cinfo;PARM=ciparm
:ALTVSET	Modifies volume set definition.	VOLUTIL utility. Ref: <i>Volume Management Reference Manual.</i>
:CACHECONTROL	Tunes system disc caching.	None. Disc caching now system function.
:DATA	Enters data from device other than \$STDIN.	None. No longer supported from terminal as Cl or logon command.
:EOD	Shows end of data on input stream, :DATA command.	None. No longer supported from terminal as Cl or logon command.
:FOREIGN	Treats disc drive as foreign; i.e., not the system disc.	None. Function now part of diagnostic subsystem.
:FULLBACKUP	Backs up MPE system and all files.	None. Function now part of SYSGEN. Ref: <i>System Configuration User's Guide.</i>
:GIVE	Assigns control of downed device to diagnostics.	None. Function now part of diagnostic subsystem.
:LISTVS	Lists volume set definition.	VOLUTIL utility. Ref: <i>Volume Management Reference Manual.</i>
:MPLINE	Executes the Multipoint Terminal Software (MTS/3000)	None.

Table 1 Unsupported Commands (Continued)

MPE V/E Command	Description	MPE XL Equivalent
:NEWVSET	Defines private volume sets and class.	VOLUTIL utility. Ref: <i>Volume Management Reference Manual</i> .
:PARTBACKUP	Back up MPE V/E system and modified files.	None. Function now part of SYSGEN. Ref: <i>System Configuration User's Guide</i> .
:PTAPE	Reads paper tape without X-OFF control.	None. Function no longer supported.
:PURGEVSET	Deletes volume set.	VOLUTIL utility. Ref: <i>Volume Management Reference Manual</i> .
:QUANTUM	Changes limits of circular subqueues.	None. No replacement.
:SHOWCACHE	Shows caching performance summary.	None. Disc caching now system function.
:SHOWCOM	Shows status of DS communication device.	None. MPE XL supports NS network communication, not DS.
:STARTCACHE	Enables caching on a single disc.	None. Disc caching scheme now a system function.
:STOPCACHE	Disables caching on a single disc.	None. Disc caching now system function.
:SYSDUMP	Start configurator dialogue.	:SYSGEN command. Ref: <i>System Configuration User's Guide</i> .

**Table 1 Unsupported Commands (Continued)**

MPE V/E Command	Description	MPE XL Equivalent
:TAKE	Releases device previously assigned to diagnostics.	None. Function now part of diagnostic subsystem.
:VINIT	Formats, initializes volumes, serial/foreign discs.	VOLUTIL. Ref: <i>Volume Management Reference Manual.</i>

Table 2 Modif. Commands

Command	SYNTAX	Enhancement	Functional Effect
ALTACCT	:ALTACCT acctname [:ONVS=[volumesetname]] (MODIFIED)	Modified parameter	Changes to the volset parameter.
ALTGROUP	:ALTGROUP groupname [.acctname] (ADDED) [:ONVS=[volumesetname]] (MODIFIED)	Modified and added parameters	Account specification; changes to the volset parameter.
ALTUSER	:ALTUSER username [.acctname] (ADDED)	Added parameter	Account specification added.
DEBUG	:DEBUG		Added parameter Permits execution of added debugger commands.
HELLO	:HELLO [sessionname.]username[/userpass].acctname[/acctpass] [.groupname[/grouppass]] [:CI=ciprog] (ADDED) [:INFO=ciinfo] (ADDED) [:PARM=ciparm] (ADDED)	Added parameters	Used to invoke and control user-created Command Interpreters.
HELP	:HELP (MODIFIED)	Enhanced capacity	Provides help on user command and program files.
IF	:IF [ ( ) expression [ ] ] THEN (MODIFIED)	Enhanced evaluation of expressions	Controls job/file execution with a conditional structure.
LISTACCT	:LISTACCT [acctset][./listfile] [:PASS] (ADDED)	Added parameter and display format	Uses the MPE V/E LISTDIR format. Displays the password associated with the account.
LISTF	:LISTF [filesel][./listlevel] [./listfile] 3 (ADDED) 4 (ADDED) -1 (MODIFIED)* -3 (ADDED)	Modified and added options	New listing levels; -1 produces hexadecimal output.
LISTFTEMP	:LISTFTEMP[filesel][./listlevel][./listfile] 3 (ADDED) -1 (MODIFIED) -3 (ADDED)	Added options	New listing levels; -1 produces hexadecimal output.



\* Level 1 serves a diagnostic purpose only in MPE XL and is subject to change.

Table 2 Modified Commands (Continued)

Command	SYNTAX	Enhancement	Functional Effect
LISTGROUP	:LISTGROUP [groupset][,listfile][:PASS] (ADDED)	Added parameter and format	Uses the MPE V/E LISTDIR format. Displays the password associated with the account.
LISTUSER	:LISTUSER [userset][,listfile][:PASS] (ADDED)	Added parameter and display format	Uses the LISTDIR format. Displays the password associated with the account.
=LOGOFF	=LOGOFF [#Snnn] or =LOGOFF [#Jnnn] (ADDED)	Added parameter	Keeps one session/job logged on while logging all else off.
NEWACCT	:NEWACCT acctname mgrname [:ONVS=[volumesetname]] (ADDED) [:PUBVS=[volumesetname]] (MODIFIED)	Added parameters; changes to volset parameter	Modification of volset parameter.
NEWGROUP	:NEWGROUP groupname [.acctname] [:ONVS=[volumesetname]] (MODIFIED) [:HOMEVS=[volumesetname]] (ADDED)	Added parameters; volset parameter	Modification of volset parameter.
NEWUSER	:NEWUSER username [.acctname] (ADDED)	Added parameter	Account specification.
PURGEACCT	:PURGEACCT acctname [:ONVS=[volumesetname]] (MODIFIED)	Modified parameter	Modification of volset parameter.
PURGEGROUP	:PURGEGROUP groupname [.acctname] (ADDED) [:ONVS=[volumesetname]] (ADDED)	Added parameters	Account specification; volset parameter.

Table 2 Modified Commands (Continued)

Command	SYNTAX	Enhancement	Functional Effect
PURGEUSER	:PURGEUSER user [ acctname ] (ADDED)	Added parameter	Account specification.
REDO	:REDO [(CMD=)cmdid] (ADDED) [:EDIT=editstring] (ADDED)	Functions expanded and enhanced; added parameters	Allows editing and re-execution of any command still retained in the command line history stack.
REPORT	:REPORT [groupset] [, listfile] [:ONVS= [volsetname]] (ADDED)	Modified parameter	Changes to the volset parameter. VS= changed to ONVS=.
RESETDUMP	:RESETDUMP (MODIFIED)	Modified function	Disarms the system debugger.
RESTORE	:RESTORE [restorefile] [, filesset] [, option] (MODIFIED)  where option is:  [:FILES=maxfiles] (MODIFIED)  [:RESTORESET=(device[...])] (ADDED) [:DIRECTORY] (ADDED) [:LISTDIR] (ADDED) [:FCRANGE=[filecode/filecode [...]]] (ADDED) [:VOLSET=volmesetname] (ADDED) [:VOL=volname] (ADDED) [:VOLCLASS=volmeclaname] (ADDED)	Modified and added parameters	Volume sets. Restoring ranges of files.

Table 2 Modified Commands (Continued)

Command	SYNTAX	Enhancement	Functional Effect
RUN	<pre> :RUN progfile, [entrypoint] [:NOPRIV] (MODIFIED) [:LMAP] (MODIFIED) [:NMSTACK=nmstacksize] (ADDED) [:NMHEAP=nmheapsize] (ADDED) [:XL="library[...]" ] (ADDED) {BS} [:PRI= {CS}{#}] (MODIFIED) {DS} {ES}                     </pre>	<p>Modified and added parameters</p>	<p>Enhancements to security, mapping, stack control, parameter passing, and linking.</p>
SET	<pre> :SET [STDLIST= {DELETE} ] {SAVE} [:ECHO= {ON} ] (ADDED) {OFF} [:MSG= {ON} ] (ADDED) {OFF} 300 1200 2400 [:SPEED = 4800 ] (ADDED) 9600 19200 19.2K                     </pre>	<p>Functions expanded and enhanced; added parameters</p>	<p>Controls terminal echoing, messages, and terminal speed. Available in sessions.</p>

Table 2 Modified Commands (Continued)

Command	SYNTAX	Enhancement	Functional Effect
SETCATALOG	:SETCATALOG [ <i>catalogname</i> [, <i>catalogname</i> ...] [, <i>catalogname</i> ]] [:RESET] (ADDED) [:APPEND] (ADDED) [:DELETE] (ADDED)	Added parameters	Permits the user to add UDCs or delete them from the catalog without having to recatalog the entire set of UDCs.
SETDUMP	:SETDUMP [DB [,ST [,QS]]] [:ASCII] [:DEBUG="commands"]	Altered function; added parameter	Arms system debugger. Accepts a command string.
SPEED	:SPEED <i>newspeed</i> , <i>newoutspeed</i> (MODIFIED) or :SET SPEED = <i>newspeed</i> (ADDED)	Added parameter	One parameter sets both input and output speeds of the terminal. Speed values 11,150, and 60 no longer supported.
STARTSESS	:STARTSESS [ <i>dev</i> / <i>sessionname</i> [, <i>user</i> / <i>userpass</i> / <i>acct</i> / <i>acctpass</i> ] [, <i>group</i> / <i>grouppass</i> ]] [:CI= <i>ciprog</i> ] (ADDED) [:INFO= <i>ciinfo</i> ] (ADDED) [:PARM= <i>ciparm</i> ] (ADDED)	Added parameters	Invokes and controls user-created Command Interpreters.
STORE	:STORE [ <i>fileslist</i> ] [, <i>storefile</i> ] (MODIFIED) [:option [:option [...]]] where option is: [:SHOW = <i>showparmslist</i> ] (MODIFIED) [:ONVS= <i>volumeset</i> [, <i>volumeset</i> [...]]] (ADDED) [:STORESET=( <i>device</i> [...])] [, ( <i>device</i> [...])] (ADDED) [:INTER] (ADDED) [:DYNAMIC] (ADDED) [:DIRECTORY] (ADDED) [:LOGONLY] (ADDED) [:TRANSPORT] (ADDED) [:FCRANGE= <i>filecode</i> / <i>filecode</i> [...]] (ADDED) [:PARTSTORE] (ADDED) [:FULLSTORE] (ADDED)	Added parameters	Volume sets. Storing ranges of files.



Table 2 Modified Commands (Continued)

Command	SYNTAX	Enhancement	Functional Effect
TUNE	:TUNE [ <i>minclockcycle</i> ;] {DQ} = [ <i>base</i> [, <i>limit</i> [, <i>min</i> [, <i>max</i> ]]]] [ <i>...</i> ] {EQ}	"minclockcycle" included for compatibility	Included for compatibility; not functional.
		:	

Table 3 New Commands

Command	SYNTAX	MPE XL Function
CALC	:CALC <i>expression</i>	Evaluates an expression.
CHGROUP	:CHGROUP [ <i>groupname</i> ][/ <i>grouppass</i> ]	Changes the user's current group.
COB74XL	:COB74XL [ <i>textfile</i> ][. <i>objectfile</i> ][. <i>listfile</i> ]]][: <i>INFO=info</i> ]	Compiles a COBOL II/XL program (1974 ANSI).
COB74XLG	:COB74XLG [ <i>textfile</i> ][. <i>listfile</i> ]]][: <i>INFO=info</i> ]	Compiles, links and executes a COBOL II/XL program (1974 ANSI).
COB74XLK	:COB74XLK [ <i>textfile</i> ][. <i>progfile</i> ] [ <i>listfile</i> ]]][: <i>INFO=info</i> ]	Compiles and links a COBOL II/XL program (1974 ANSI).
COB85XL	:COB85XL [ <i>textfile</i> ][. <i>objectfile</i> ][. <i>listfile</i> ]]][: <i>INFO=info</i> ]	Compiles a COBOL II/XL program (1985 ANSI).
COB85XLG	:COB85XLG [ <i>textfile</i> ][. <i>listfile</i> ]]][: <i>INFO=info</i> ]	Compiles, links, and executes a COBOL II/XL program (1985 ANSI).
COB85XLK	:COB85XLK [ <i>textfile</i> ][. <i>progfile</i> ] [ <i>listfile</i> ]]][: <i>INFO=info</i> ]	Compiles and links a COBOL II/XL program (1985 ANSI).
COPY	:COPY [FROM= <i>sourcefile</i> ][:TO= <i>targetfile</i> ] {ASK} [: {YES}] {NO }	Copies one disc file to another.
DELETEVAR	:DELETEVAR <i>varname</i> [ <i>varname</i> ]...[ <i>varname</i> ]	Deletes a specific MPE XL variable.
DO	:DO [[CMD= <i>cmdid</i> ][[:EDIT=] <i>editstring</i> ]	Re-executes (and edits) any command still retained in the command line history stack.
ECHO	:ECHO [ <i>message</i> ]	Echoes a message to the standard list device: for a SESSION, a terminal, for a JOB, a printer.

Table 3 New Commands (Continued)

Command	SYNTAX	MPE XL Function
ENDWHILE	:WHILE ... :ENDWHILE	Ends a :WHILE block.
EXIT	:EXIT	Terminates the Command Interpreter.
FTNXL	:FTNXL [textfile][,objfile][,listfile] [:INFO=into]	Compiles a FORTRAN 77/XL program.
FTNXLGO	:FTNXLGO [textfile][,listfile] [:INFO=into]	Compiles, links and executes a FORTRAN 77/XL program.
FTNXLLK	:FTNXLLK[textfile][,progfile][,listfile] [:INFO=into]	Compiles and links a FORTRAN 77/XL program.
INPUT	:INPUT [NAME=] varname [:PROMPT=]prompt [:WAIT=]seconds	Permits interactive assignment of values to variables. Optionally prompts the user.
LINK	:LINK [FROM=file[,file...]] [:TO=destfile]  [:RL=rfile[,rfile...]]...] [:XL=xfile[,xfile...]]...] [:CAP=caplist] [:NMSTACK=nmstacksize] [:NMHEAP=nmheapsize] [:UNSAT=unsatname] [:PARMCHECK=checklevel] [:ENTRY=entryname] [:NODEBUG] [:NOSYM] [:MAP] [:SHOW]	Merges relocatable object files to create an executable program file.

Table 3 Added Commands (Continued)

Command	SYNTAX	MPE XL Function
LISTREDO	:LISTREDO [[START= <i>m</i> ]][:END= <i>n</i> ]][:OUT= <i>outfile</i> ]  {ABS } [:REL }] {UNN}	Displays the contents of the command line history stack.
OCTCOMP	:OCTCOMP <i>input</i> [, <i>targetfile</i> ] [, <i>list</i> ] [:INFO="parms"]	Converts a compiled MPE V/E program into Native Mode code.
OPTION	[ {LIST}] [(RECURSION )] :OPTION[({NOLIST})] [,] [({NORECURSION})]	Now a command as well as a user-defined command (UDC) header option. It modifies the environment of the User Refined Commands and Command Files. Can be used in the body of a UDC or command file with List and Recursion options.
PASXL	:PASXL [ <i>textfile</i> ] [, [ <i>objectfile</i> ] [, [ <i>listfile</i> ] [, [ <i>libfile</i> ]]] [:INFO= <i>info</i> ]	Compiles an HP Pascal/XL program.
PASXLGO	:PASXLGO [ <i>textfile</i> ] [ <i>istfile</i> ] [:INFO= <i>quotedstring</i> ]	Compiles, links, and executes an HP Pascal/XL program.
PASXLLK	:PASXLLK [ <i>textfile</i> ] [, [ <i>progtfile</i> ] [, [ <i>listfile</i> ] [, [ <i>libfile</i> ]]] [:INFO= <i>info</i> ]	Compiles and links an HP Pascal/XL program.
PRINT	PRINT [ <i>FILE=</i> ] <i>filename</i> [:OUT= <i>outfile</i> ] [:START= <i>m</i> ] [:END= <i>n</i> ] [:PAGE= <i>p</i> ] [:UNN] {NUM}	Prints the contents of a file to the standard listing device or to a specified file.
SETVAR	:SETVAR <i>varname</i> { . } <i>expression</i> {: } }	Assigns a value to an MPE XL variable.
SHOWVAR	:SHOWVAR [ <i>varid</i> ] [, <i>varid</i> ] ... [, <i>varid</i> ]	Displays specific variables names and their values.

Table 3 Added Commands (Continued)

Command	SYNTAX	MPE XL Function
SYSGEN	:SYSGEN [basegroup][,newgroup][,inputfile] [,outputfile]	Starts configuration dialog and/or installation tape creation. This takes the place of SYSDUMP.
VSCLOSE	:VSCLOSE volsetname[:NOW]	Instructs the system to close a volume set.
VSOPEN	:VSOPEN volsetname	Reopens a volume set that was closed with VSCLOSE.
VSRELEASE	:VSRELEASE [volsetname]	Releases a volume set that was reserved with VSRESERVE.
VSRELEASESYS	:VSRELEASESYS [volsetname]	Releases a volume set system-wide.
VSRESERVE	:VSRESERVE [volsetname][:GEN=genindex]	Requests the operator to put a volume set on line and reserves the volume set for the user.
VSRESERVESYS	:VSRESERVESYS [volsetname]	Reserves a volume set system-wide.
WHILE	:WHILE [ ( ) expression [ ] ]	Controls job, UDC, or command file execution flow with a looping structure.
	:ENDWHILE	
:XEQ	:XEQ filename [parameter/list] ** for command file ** or :XEQ filename[:INFO=quotedstring] [:PARM=[parmvalue]] ** for program file **	Used to execute a program or command file that has the same name as a built-in command or UDC file.

Table 4 Utilities

MPE V/E Command	Description	MPE XL Equivalent
ASOCTBL5/ ASOCTABL	Associates user with device class.	ASOCTBL. Functions unchanged. Ref: <i>System Configuration User's Guide</i> .
DPANS	Produces formatted listing of memory after system failure.	DAT (Dump Analysis Tool). Enhanced format options, interactive window displays, NM, CM display differentiation.
DISKED5	Displays contents of disc.	DEBUG. All display functions incorporated into debugger intrinsic. Ref: <i>Using the MPE XL System Debugger Reference Manual</i> .
DUMP	Dumps a crashed system to tape; offline.	Remains the same.
FREE5	Displays disc space usage.	DISCFREE. Enhanced, more flexible display format (histogram or allocation of space). Ref: <i>MPE XL Managing Printers</i> .
GENCAT	Formats or modifies a source catalog; especially NLS.	Remains the same. Ref: <i>MPE XL Message Catalogs Programmer's Guide</i> .
INSTALL	Installs system, tape to disc; offline.	Remains the same.
KSAMUTIL	Initializes and maintains KSAM files.	Stays the same. Ref: <i>KSAM/3000 Reference Manual</i> .

Table 4 Utilities (Continued)

MPE V/E Command	Description	MPE XL Equivalent
LANGINST	In NLS it adds or removes a language, modifies formats and defaults.	Remains essentially the same. Ref: <i>MPE XL Localizing and Customizing System Information.</i>
LISTDIRS	Displays attributes of accounts, users, groups, files.	:LISTF, :LISTACCT, :LISTGROUP, :LISTUSER. Functions incorporated into new commands. <i>MPE XL Accounting and Security.</i>
LISTEQ	Displays file equations, temporary files.	:LISTTEMP. Function added to command. Ref: <i>MPE XL Accounting and Security.</i>
LISTLOGS	Analyzes files on system log file.	LOGTOOL. Function incorporated into online diagnostic subsystem utility. Ref: <i>Online Diagnostics Subsystem Utilities Manual.</i>
MAKECAT	Maintains and changes message catalogs.	Remains essentially the same. Ref: <i>MPE XL Message Catalogs Programmer's Guide.</i>
MEMLOGAN	Prints memory error-logging file.	LOGTOOL. Function incorporated into online diagnostic subsystem utility.
MEMTIMER	Sets update time interval for memory error-logging file.	LOGTOOL. Function incorporated into online diagnostic subsystem utility.

Table 4 Utilities (Continued)

MPE V/E Command	Description	MPE XL Equivalent
NLUTIL	Displays the NLS languages installed.	Remains basically the same. Ref: <i>MPE XL Localizing and Customizing System Information.</i>
PATCH	Patches. Compatibility Mode programs.	Remains pretty much the same.
RECOVER5	Restores files from tape after system crash.	VOLUTIL. Now a command used by utility to recreate disc files that have been copied to tape by DISCUTIL utility. Ref: <i>Volume Management Reference Manual.</i>
SADUTIL	Performs disc file storage to tape after system crash.	DISCUTIL. Function incorporated into standalone utility to save files to tape after system failure. Ref: <i>Volume Management Reference Manual.</i>
SEGMENTER	Manages object code modules.	Used in Compatibility Mode. Replaced by the :LINKEDIT command in Native Mode. Ref: <i>MPE XL Segmenter Reference Manual.</i>
SLPATCH	Modifies Segmented Library file.	Remains basically the same.
SPOOK	Manages/transfers spooled device files.	Remains the same.
SORT/MERGE	Sorts and merges base data.	Remains the same.
STORE/RESTORE	Saves and restores files to and from tape.	Remains essentially the same.





Table 4 Utilities (Continued)

MPE V/E Command	Description	MPE XL Equivalent
SYSDUMP	Reconfigures I/O; creates installation tape.	SYSGEN. Function incorporated into new utility. Ref: MPE XL System Configuration.
(NEW) Emulates CM 3000 instruction set.	EMULATOR: a Compatibility Mode tool.	
(NEW) Verifies and corrects directory integrity.	FSCHECK.	
(NEW) Makes 7-to-8 bit conversions.	NZMF8CNV: a Native Language Support tool.	
(NEW) Translates 3000 to CM.	OCT: a Compatibility Mode tool.	
(NEW) Reduces and displays system data.	SMT (System Measurement Tools). Ref: MPE XL SMT Reference Manual.	
(NEW) Updates a system from tape.	UPDATE: an offline utility.	
	:	

**Table 5 Command Interpreter Predefined Global Variables**

This section shows all the variables which have been pre-assigned to by the CI. These variables can be used anywhere a user would use his or her own variables.

Variable	Type*	Definition	Initial Value
CIERROR	W JCW	last CI error number	zero
HPACCOUNT	R S	user's account name	logon account
HPAUTOCONT	W B (NP)	enables (TRUE) / disables (FALSE) the automatic :CONTINUE feature	FALSE
HPCIDPTH	R I	number of nested CIs	1 (=Root CI)
HPCIERRMSG	R S	text error message for current CIERROR	(null) No message if no CIERROR value
HPCMDNUM	R I (NP)	current command sequence number	1
HPCMDTRACE	W B (NP)	enables TRUE/disables FALSE the user command tracing facility	FALSE
HPCMEVENTLOG	W 1	when set to N, \$STDLIST displays the following N occurrences of tos/reg trap	zero
HPCONNMIN	R I	current session connect time in minutes	zero
HPCONSOLE	R I	Idév of the Console	Console Idév at logon
HPCONTINUE	R B (NP)	CI's continue state FALSE=inactive, TRUE=active	FALSE
HPCPUname	R S	name of computer model, e.g., "SERIES 930"	name of your logon computer model
HPCPUSECS	R I	current session CPU time in seconds	zero

**Table 5 Command Interpreter Prec 8.1 Global Variables (Continued)**

This section shows all the variables which have been pre-assigned to by the CI. These variables can be used anywhere a user would use his or her own variables.

Variable	Type*	Definition	Initial Value
HPDATE	R I	current day of month	logon day of the month
HPDATEF	R S	current formatted date	logon date
HPDAY	R I	current day of the week (1=SUNDAY)	logon day of the week
HPDUPLICATIVE	R B	(TRUE) duplicative non-duplicative	as appropriate
HPGROUPS	R S	current group name	logon group name
HPHGROUP	R S	home group name	home group
HPHOUR	R I	current hour number (24 hour clock)	logon hour
HPINBREAK	R B (NP)	FALSE=not in break, TRUE=in break mode (includes process break and rit break)	FALSE
HPINPRI	R I	input priority	logon input priority
HPINTERACTIVE	R B	interactive (TRUE) / no FALSE	as appropriate
HPINTRODATE	R S	formatted job/session logon date	date of logon
HPINTROTIME	R S	job/session logon time	time of logon
HPJOBBCOUNT	R I	number of jobs executing	logon number of executing jobs
HPJOBBLIMIT	R I	current job limit	job limit at logon

**Table 5 Command Interpreter Predefined Global Variables (Continued)**

This section shows all the variables which have been pre-assigned to by the CI. These variables can be used anywhere a user would use his or her own variables.

Variable	Type*	Definition	Initial Value
HPJOBFENCE	R I	fence value for waiting jobs	logon jobfence
HPJOBNAME	R S	name of current job/session	logon job name
HPJOBNUM	R I	job/session number, e.g., 12	your job/session number
HPJOBTYPE	R S	"S"=session, "J"=job	your job type
HPLDEVIN	R I	ldev number for \$STDIN	logon input ldev
HPLDEVLIST	R I	ldev number for \$STDLIST	logon output ldev
HPMINUTE	R I	current minute number	logon minute
HPMONTH	R I	current month number	logon month
HPMSGFENCE	W I (NP)	fence for the level of error messages printed by the CI: 0=errors/warnings, 1=errors only, 2=no error/warning messages	0=all errors and warnings printed
HPNCOPIES	R I	number of \$STDLIST copies for jobs	copies subparm of outclass parm of :JOB command
HPOUTCLASS	R I	output device class	logon output device class
HPOUTFENCE	R I	output fence value	logon output fence value
HPPATH	W S	search path for Command Files and Implied RUN	"ihpgroup,pub,pub.sys"

**Table 5 Command Interpreter Predefined Global Variables (Continued)**

This section shows all the variables which have been pre-assigned to by the CI. These variables can be used anywhere a user would use his or her own variables.

Variable	Type*	Definition	Initial Value
HPXPROMPT	W S	CI's prompt string	": " (colon)
HPREDOSIZE	W I	number of entries in the CI's redo stack	20
HPRESULT	W S or W I or W B	last value calculated by the :CALC command (e.g., "abc", 12, TRUE)	
HPSESCOUNT	R I	number of sessions executing	logon number of sessions executing
HPSESLIMIT	R I	current session limit	session limit at logon
HPXSUSAN	R S	Software unique serially assigned number	a system serial number assigned to your system at manufacture
HPSSYSNAME	W S	name of computer system (user definable)	null string ("")
HPTIMEF	R S	current formatted time (h:m:s)	logon time
HPTIMEOUT	W I	number of minutes for CI reads (<=0 means no timeout)	zero
HPUSER	R S	current user name	logon user
HPUSERCAP	R I	current user's capability mask	logon user caps

**Table 5 Command Interpreter Predefined Global Variables (Continued)**

This section shows all the variables which have been pre-assigned to by the CI. These variables can be used anywhere a user would use his or her own variables

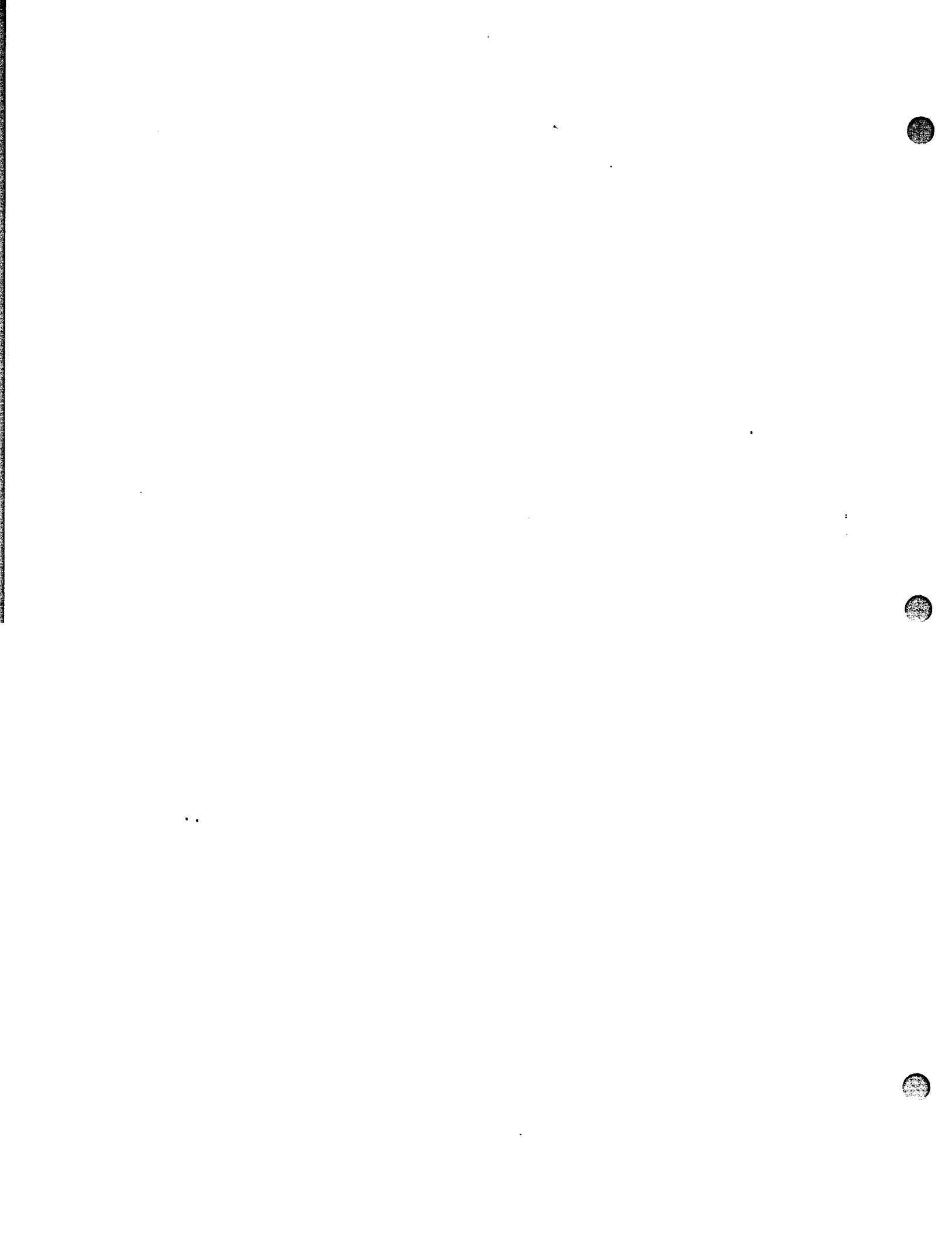
Variable	Type *	Definition	Initial Value
HPUSERCAPF	R S	current user's formatted capability mask, e.g., "A,BA,PH"	logon user caps
HPUSERCMDEPTH	R I (NP)	number of nested UDCs and/or Command Files	zero
HPVERSION	R S	MPE XL version id (vv.uu:ff)	current MPE XL version
HPWAITJOBS	R I	current number of jobs waiting	number of jobs waiting at logon time
HPYEAR	R I	last two digits of the current year	logon year number
JCW	W jcw	jobs control word (variable)	zero

**\* VARIABLE TYPES**

- R READ ONLY variable (cannot be modified).
- W READ/WRITE variable (can be modified).
- JCW A standard MPE V/E JCW.
- I Integer format.
- B Boolean format.
- S String (ASCII) format.
- (NP) Not programmatically accessible. They may be accessed through the COMMAND or HPCICOMMAND intrinsics, but not with HPCIGETVAR, HGPCIPUTVAR, HPCIDDELETEVAR intrinsics.

All user-created variables may be modified and deleted. However, HP defined variables may not be deleted.

JCWs may be considered integer variables with legal values ranging from 0 to 65535 and with bits 16 and 17 (bit 0 being the leftmost bit of 32 bits) having special interpretations (e.g., if bit 16 is set, the JCW setting is fatal).



**Table 6 Expression Evaluator Functions**

The expression evaluator uses algebraic notation. It supports the following functions:

Symbol	Function	Example	Results
+(numeric)	addition	4 + 5	9
+(string)	concatenate	"abc" + "de"	abcde
-(numeric)	subtraction	12 - 6	6
-(string)	deletion of first occurrence	"abc" - "b"	ac
*	multiplication	4 * 5	20
/	integer division	79 / 10	7
^	exponentiation (10)	2^3	8
'or'	string identifier	"abc" or 'abc'	abc
()	parentheses (order of evaluation) (11)	(3 + 4) * 2	14
<	less than (1)	5 < 6	TRUE
<=	less than or equal (1)	"abc" <= "abc"	TRUE
>=	greater than or equal (1)	"abc" >= "abc"	TRUE
<>	not equal (1)	5 <> 6	TRUE
=	equal to (1)	"xyz" = "xyz"	TRUE



**Table 6 Expression Evaluator Functions (Continued)**

The expression evaluator uses algebraic notation. It supports the following functions:

Symbol	Function	Example	Results
Abs( <i>integer</i> )	absolute value	Abs(-4)	4
And	logical and	7=7 And 5=5	TRUE
Band	bitwise and	7 Band 5	5
Bnot	bitwise not	Bnot 5	-6
Bor	bitwise or	5 Bor 2	7
Bound( <i>varname</i> )	Variable definition test (2)	Bound(HPPATH)	TRUE
Bxor	bitwise exclusive or	7 Bxor 5	2
Chr ( <i>integer</i> )	ASCII value ( <i>integer</i> ) → ASCII char (9)	Chr(65)	A
Csl	circular shift left (3)	-2 Csl 2	-5
Csr	circular shift right	-7 Csr 1	-4
Dwns( <i>string</i> )	shift string to lowercase (8)	Dwns('ABC&#dE')	abc&#de
Finfo( <i>filename, option</i> )	file information (7)	Finfo('x.pub',0)	TRUE (if file exists)
Hex ( <i>integer</i> )	convert to hexadecimal string	Hex(21)	\$15
Len( <i>string</i> )	string length	Len("abc")	3
Lit( <i>string, # chars</i> )	left string extraction	Lit('abc',2)	ab

Table 6 Expression Evaluator Functions (Continued)

The expression evaluator uses algebraic notation. It supports the following functions:

Symbol	Function	Example	Results
Lsl	logical shift left (4)	7 Lsl 1	14
Lsr	logical shift right (4)	-7 Lsr 1	2147483644
Mod	Modulo (5)	25 Mod 2	1
Not	logical not	Not(2>1)	FALSE
Octal( integer)	convert to octal string	Octal(21)	%25
Or	logical or	5=5 Or 2<>2	TRUE
Ord(string)	ordinal (for ASCII)(9)	Ord('A')	65
Pos(target,source)	string find: find first occurrence of target in source	Pos('ab','cgabd')	3
Rht(string, # chars)	right string extraction	Rht("abcde",2)	de
Str(string, start position, # chars)	general string extraction	Str('abcde',2,3)	bcd
Typeof(expression)	type of variable or expression (6)	Typeof(HPPATH)	2 (string type)
Ups(string)	shift string to uppercase (8)	Ups('ABC&#dE') . .	ABC&#dE
Xor	logical or	1=1 xor 1=2	TRUE

**NOTE**

- (1) Special rules apply when you use the comparison operators with strings. The strings are compared, character by character, until an inequality is found. This becomes the inequality of the strings. For example: 'ba' > 'abcd' and 'abcc' < 'abdc'. If Str1 is longer than Str2, and if Str1 and Str2 are equal up to the length of the Str2, it follows that Str1 > Str2 evaluates as TRUE.
- (2) The Bound(varname) function returns the value TRUE if varname has been defined (assigned a value) and FALSE if it has not been defined:

Bound(name of a defined variable) = TRUE  
Bound(name of an undefined variable) = FALSE  
Bound(valid numeric value or expression) = TRUE  
Bound(valid string value or expression) = TRUE

Examples:

```
SETVAR A 6  
CALC Bound(a)  
TRUE  
DELETEVAR a  
CALC Bound (A)  
FALSE  
CALC Bound (1+2)  
TRUE  
CALC Bound ('a'+ 'b')  
TRUE
```

In BOUND (expression), if expression is not a valid expression, an error message will be displayed.

- (3) The circular shift operators, Csl and Csr, shift the specified number of bits in a 32 bit word in the specified direction. When 1 or 0 is shifted off one end, it comes back onto the other end.
- (4) The logical shift operators, Lsl and Lsr, perform the same shifting as the circular shift operators, but when 1 or 0 is shifted off one end, only 0 comes back at the other end.
- (5) The logical shift operators, Lsl and Lsr, perform the same shifting as the circular shift operators, but when 1 or 0 is shifted off one end, only 0 comes back at the other end.

1. The logical shift operators, Lsl and Lsr, perform the same shifting as the circular shift operators, but when 1 or 0 is shifted off one end, only 0 comes back at the other end.

Publishing Co., Reading, MA; Second ed., 1973; Volume I, p. 38.

## NOTE

(6) The `Typeof(expression)` returns an integer value that depends upon the type of expression:

- 0 Expression is invalid.
- 1 Expression evaluates to an integer.
- 2 Expression evaluates to a string.
- 3 Expression evaluates to a Boolean value.

(7) `Finfo` returns a string, Boolean or an integer value. The result depends upon the option you specify.

The first parameter, *filename*, is a string, the name of the file for which you want the information. This must be a fully or partly qualified file name, or a string expression that yields such a file name.

This parameter can also be a string that specifies a file equation by backreference, e.g., `Finfo("XIN", 1)`, which encodes the equation `:FILE XIN=...`

The second parameter *option* is an integer or an expression that yields an integer. It indicates the information desired.

With the exception of options 0 and 1 the negative options, all other option numbers are the same option numbers used by the `FLABELINFO` intrinsic.

Some options have two formats, one indicated by a positive number, the other indicated by a negative number. These options will always yield information corresponding to that available through the `FLABELINFO` intrinsic, but not always in the same form; that is, the date returned by `FLABELINFO` with option 6 is an unformatted integer date.

### OPTION RETURNS

- 0 Boolean: TRUE if file exists, FALSE if it does not
- 1 string: fully qualified file name
- 4 string: user ID of the file creator
- 6 string: creation date DAY, MMM DD, YYYY
- 6 integer: creation date YYYYMMDD
- 8 string: last modified date DAY, MMM DD, YYYY
- 8 integer: last modified date YYYYMMDD
- 9 string: file code mnemonic or integer file code in string

**NOTE**

**OPTION RETURNS (Continued)**

- 9 integer: file code
- 12 integer: file limit
- 13 string: FOPTIONS displayed in the format used in LISTF.3
- 13 integer: FOPTIONS
- 14 integer: record size (negative value indicates bytes)
- 15 integer: block size in words (2 bytes per word)
- 19 integer: end of file
- 24 string: last modified time HH:MM AM/PM
- 24 integer: last modified time HHMMSS
- 33 string: lockword

Users having SM capabilities may use options 4 and 33 on any file within the system. Users having AM capabilities may use those options only on files within their account.

- (8) The Dwns() and Ups() functions operate only on ASCII characters in the ranges 'a'..'z' and 'A'..'Z'.
- (9) The Ord() and Chr() functions operate only on ASCII characters in the range 0..255.
- (10) 0`0 (zero to the zero power) yields 1.
- (11) The rules of precedence determine which operations are performed before others.



**MPE XL COMMAND INTERPRETER**

***by Denis Rachal, John Korondy, & Jeff Vance  
Hewlett-Packard***



removes the need for the user to remember the location of program files as well as eliminating the need for explicitly type the RUN command and the group and access program.

For convenience for interactive users, a timed read is added. The CI will wait for HPTIMEOUT minutes but if the HPTIMEOUT variable is positive. The timeout is zero, meaning that no time-out occurs. A CI is equivalent to executing the BYE command. This is active while the user is actively running the CI. If the user was currently running the EDITOR, the CI would be inactive. If a user forgets to log prompt the CI will log the session off automatically of the set time period.

The colon prompt may soon be a thing of the past as their own prompt through the HPPROMPT variable. set to any ASCII string. Escape sequences which are, inverse video, blinking, etc. are permitted. Anything the user types is allowed, thus when using control and escape characters in any variables may also be included in the prompt, such as "HPSYSNAME:". If the system name was "STARS" the "STARS:". The CI will now, under most conditions, its own prompt on input and delete that prompt. Users use the ENTER key to enter a command line on terminal screen without first deleting the command line.

## NEW COMMANDS & INTRINSICS

Added many new and modified commands to it's commands as well as new intrinsics have been added to such more productive environment for the user. The following will break up the commands and intrinsics into different groups. They are in order of display manipulation, UDC & Command File Control, User File & Directory Reporting, File Utilities, Account Management & Volume Set Manipulation, Management, Backup Utilities, and Programming. Short explanation and examples will be given of the commands provided in MPE XL. Only a short explanation for intrinsics.

## DEFINITION

The variables necessitated a need to add several new and manipulate those variables. A list of the variables have been added as a reference. The commands are DSWAR DELETEVAR, & CALC.



files, UDC's and job streams. The HPREDOSize variable, for example, will allow a user to set the number of entries kept in the CI's command line history stack. This history stack is a new facility which will be discussed further. The HPCPUNAME variable will allow a command file to check the name of the computer model before executing a command sequence. The exclamation, '!', character is used to dereference a variable. An example of this case using the new ECHO command would be:

```
:ECHO !HPCPUNAME  
SERIES 930
```

Double-dereferencing (!! ) resolves to (!) and no further substitution will be made. For example:

```
:ECHO !!HPCPUNAME  
!HPCPUNAME
```

There are three commands provided to manipulate these variables. They are SETVAR, SHOWVAR & DELETEVAR. Along with these commands are three new intrinsics HPCIPUTVAR, HPCIGETVAR & HPCIDELETEVAR which will allow a programmer to access and manipulate the variables from within a program.

#### COMMAND RESOLUTION

At logon, as in MPE V/E, logon UDC's will be executed first before any user input is allowed. User input, once a command has been accepted, needs to be resolved. Command recognition, which is independent of the input method (terminal, disc, batch, etc...), needs to determine if the command is a UDC, MPE command, program file or command file. The UDC directory is always searched first, followed by the MPE command directory. If no match is yet found, the CI will search for a program file or command file. If a program file is found, a run is implied and the program will be loaded and execution will begin. Finding a command file will cause the CI to begin executing each line in the command file as command input. The new CI has the capability to search for the program or command file beyond the current logon group and account. A search path may be specified to search several groups and accounts for command and program files. The search path, as a default, is set to current group, PUB.current account, and lastly PUB.SYS. Users may alter this search path by modifying the HPPATH variable using the SETVAR command. Variables will be discussed in more detail.

As suggested previously, modifications have been made to allow users to simply enter a program name to invoke the execution of a program. The RUN command itself is optional. This new MPE XL facility is referred to as an implied run. For example ':RUN progfile' and ':progfile' would have the same effect. Since the search path is controllable by the user via the HPPATH variable, programs may now be installed and appear as custom commands to the end users. The HPPATH variable could be set by a logon UDC to search a particular set of groups and accounts for program file

EXPRESSION	HPRELULT	(type)
:CALC 1+2+3	6	(integer)
:SETVAR name "John"		
:CALC len(name)	4	(integer)
:SETVAR lastname "Doe"		
:CALC name+" "+lastname	John Doe	(string)
:CALC ups(hprelult)	JOHN DOE	(string)
:CALC name.lastname	FALSE	(boolean)

Along with the new commands to manipulate variables are new intrinsics to provide the programmer easy access to the variables. These new intrinsics are HPCIPUTVAR, HPCIGETVAR, HPCIDELETEVAR.

The HPCIPUTVAR intrinsic allows the programmer to set the value of the session local variable. If the variable does not already exist it will be created. The variable name must abide by the MPE XL variable naming convention. The HPCIGETVAR intrinsic allows the programmer to retrieve the value of a specified variable from the session local variable table. In this case the variable must exist. The HPCIDELETEVAR will remove an existing variable the the session local variable table. Please refer to the MPE XL Intrinsics Reference Manual for complete syntax.

#### UDC & COMMAND FILE CONTROL

With the addition of command files are several commands, which have been added or enhanced to increase the power and ease of use of command and UDC files. These commands are INPUT, ECHO, IF, WHILE, OPTION, SHOWCATALOG, and SETCATALOG.

The INPUT command assigns \$stdin input from the user to the specified variable. There is an optional ";PROMPT" parameter which will write a user supplied prompt string to \$stdlist in the form of a standard prompt, i.e. excluding any carriage return/line feed after the prompt and before reading from \$stdin. A ";WAIT" parameter is also optional and specifies the number of seconds the read will wait before timing out. All input is interpreted literally as a string. If it is desired for a specified variable to be evaluated, then the SETVAR command must be used after the INPUT command. For example, the command sequence "input foo" followed by "setvar foo !foo" will cause the variable foo to be evaluated to integer, boolean or string format. An example follows:

```
:INPUT logfile_num;PROMPT="Enter Logfile Number: ";WAIT=10
:SETVAR logfile_num !logfile_num
```

The INPUT command will prompt the user with "Enter Logfile Number:" and then wait for 10 seconds for user input. If the user enters 101, for example, it will be stored in logfile\_num as a string. The SETVAR command, which follows, will change logfile\_num to contain an integer instead of a string.

The SETVAR command allows you to create new, and reset existing variables. For example, if a user were running a test program many times, but with a different string each time, he could save quite a few keystrokes by equating the program name to a variable.

```
:SETVAR X "testprog.pub.sys;info"
```

To dereference the variable, the user would simply place an explanation character, "!", in front of the variable name. Given the info strings input1, input2, ... inputN, the following would be an example of the users input:

```
!X"input1"  
!X"input2"  
: . . .  
: . . .  
!X"inputN"
```

Note here that the RUN command itself is omitted. The example simply takes advantage of the implied run feature of the CI.

The SHOWVAR command allows the user to display any of the CI environment variables that are currently set. The user may specify a particular variable or list of variables as an optional parameter. Wild card characters are allowed as part of the optional parameters. For example SHOWVAR HP\*,DR\* will display all variables in the users variable table which begin with the characters HP & DR. SHOWVAR with no parameters will display all user-defined variables.

The DELETEVAR command allows users to delete variables they have created during their current session. Taking the example variable "X" above, the user input would be DELETEVAR X. Wild cards may also be used with the DELETEVAR command and DELETEVAR @ will delete all non-permanent variables. A list of variables may also be supplied, for example DELETEVAR X,Y would delete both variables X & Y. At least one parameter is required.

The CALC command will evaluate a supplied expression and place the result in the variable HPREMRESULT as well as displaying the result to \$stdlist. In summary, the following expressions can be evaluated: integer, string, and boolean literals, logical operators (AND, OR, NOT, XOR), shifts (LSL, LSR, CSR, CSL), arithmetic operators (MOD, \*, /, +, -, ^, ABS), string functions (+, -, LEN, CHR, ORD, RHT, LFT, UPS, DOWNS), comparison operators (<, <=, >, >=, <>, =), and numerical base operators (OCTAL, HEX). A complete list of the operators with full explanations may be found in the MPE XL Commands Reference Manual. Examples of some possible uses follow:

The ECHO command simply echoes the contents of message to \$stdout. The message is an ASCII string and may contain substitution variables. Take the following example:

```
:ECHO The !group_name group contains !num_files files
```

If the variable 'group\_name' was equal to 'PUB' and the variable 'num\_files' was equal to '6' the output to \$stdout would be:

```
The PUB group contains 6 files
```

The WHILE command adds a looping capability to the CI and is used to control command execution sequence. An example of it's use is given.

```
:WHILE (file_num >= 0)
:   PURGE tfile!file_num
:   SETVAR file_num !file_num - 1
:ENDWHILE
```

This example purges all numbered occurrences of the file 'TFILE', i.e. if file\_num was 3 the files 'TFILE3', 'TFILE2', 'TFILE1', & 'TFILE0' would be purged.

The IF command allows a user to evaluate a test condition before continuing on with the following command sequence. It follows the typical programming syntax of:

```
:IF (expression) THEN
    command sequence
:ELSE
    command sequence
:ENDIF
```

OPTION, which has been enhanced beyond it's current use with UDC's and provides some new options, is now an actual MPE XL command. Options allow the user to set up an environment for User Commands to execute in. These options are specified in the command's header after the parameter line. Only one line is accepted and it begins with the word 'OPTION'. The exception to this are the options LIST and RECURSION which may be executed anywhere throughout a User Command. The other options are set up in the command header and remain in effect until the User Command has finished executing. Those options which are allowed to be controlled by the user are LOGON/NOLOGON, BREAK/NOBREAK, HELP/NOHELP, LIST/NOLIST, RECURSION/NORECURSION, and PROGRAM/NOPROGRAM. Defaults are NOLOGON, BREAK, HELP, NOLIST, NORECURSION, and PROGRAM. An example UDC 'startup' would be:

```
:
:
:
```



...



in other accounts. Given the logon to be `MANAGER.SYS`, the following would show all catalogued files for the user `MGR.HPOFFICE`:

```
:SHOWCATALOG ;USER=MGR.HPOFFICE
```

Three new parameters have been added to the current `SETCATALOG` command. They are `;;APPEND`, `;;RESET` and `;;DELETE`. The addition of these new parameters will simplify the maintenance of the user's UDC catalogues. The `;;APPEND` parameter allows a user to append a new catalogue file to the current set of files catalogued. The `;;RESET` parameter is the complement of the `;;APPEND` parameter. This is the default option and will reset the current catalogue to only those files specified in the command. The `;;DELETE` parameter allows the user to delete individual files from the catalogue directory. Several examples follow:

```
:SETCATALOG udca,udcb,udcc;RESET
```

This has the same effect with or without the `;;RESET` parameter since it is the default, and functions as it did in `MPE V/E` without the parameter.

```
:SETCATALOG udcz;APPEND
```

This will add the catalogue file `'udcz'` to the current set which is `'udca, udcb, udcc'`.

```
:SETCATALOG udcb;DELETE
```

In this case the catalogued files would now be `'udca, udcc, udcz'`.

## USER ENVIRONMENT CONTROL

In `MPE` there are several ways to alter the user's environment such as logging on, logging off, starting a program or a job, changing the baud rate, etc... In `MPE XL` the `HELLO`, `JOB`, `STREAM`, `RUN`, `SET`, & `SPEED` commands have been changed to add new additional parameters. Three new commands, `CHGROUP`, `EXIT` and `XEQ` have also been added. These new and modified commands are investigated in the following.

The addition of a new CI created a need for changes in the `HELLO`, `JOB` and `STREAM` commands to better utilize the CI enhancements. Since the new CI is a program which resides in `PUB.SYS` and may be run using the `RUN` command, it will accept `;;PARAM` and `;;INFO` parameters just as any other program will. This new CI may also be run from within another program, if the program and user capabilities allow, or from within the CI itself. The information supplied with the `;;INFO` parameter is the first command to be executed by the Command Interpreter. The `;;PARAM` parameter allows the user to select one of three different execution modes. The `;;PARAM=1` parameter specifies the CI to terminate after executing the command supplied with the `'INFO'` parameter. The `;;PARAM=2`

```

startup
OPTION LOGON,NOHELP,NOBREAK,NOLIST
SETVAR hpsysname 'STARS'
OPTION LIST
run acctprog.pub
bye
.
```

The two new parameters for the OPTION command are RECURSION/NORECURSION and PROGRAM/NOPROGRAM. The RECURSION option allows the user to search for UDC's recursively. Searching will start with the first file catalogued and the first command in that file. An example follows:

```

pwd
ECHO Your logon directory is: !HPCGROUP.!HPACCOUNT
pwd
.
me
OPTION RECURSION
ECHO Your user is: !HPUSER
pwd
.
pwd
ECHO Files residing here are:
LISTF
.
```

In this example the UDC 'me' specifies RECURSION, therefore, when it executes the UDC 'pwd' it will execute the first one in the UDC file. This UDC also references the UDC 'pwd', but has not specified RECURSION and hence will execute the second 'pwd' in the UDC file. If the logon were MANAGER.SYS,PUB the output would look like the following:

```

:me
Your user name is: MANAGER
Your logon directory is: PUB.SYS
Files residing here are:
BASIC  COBOL  .....

:pwd
Your logon directory is: PUB.SYS
Files residing here are:
BASIC  COBOL  .....
```

The PROGRAM option allows a user to execute a user command programmatically. Thus, the UDC or Command File may be executed programmatically by using the new HPCICOMMAND intrinsic.

SHOW-CATALOG now allows the user to list other users' catalogued files. Account Manager capability (AM) is needed to show catalogued files for other users within your logon account. System Manager capability (SM); is needed to show users' catalogued files

Manual. The DI parameter is recognized only for compatibility mode programs.

Three new parameters have been added: MAXPRIV, LIBLIST, and UNSAT. MAXPRIV allows the user to specify the execution level of the program to be run. Execution levels are 0, 1, 2, and 3 as specified for HP Precision Architecture Systems. Zero is the most privileged and reserved for the OS Kernel. Three is the least privileged and is used for user mode programs. For compatibility mode programs, any value other than three will be ignored. LIBLIST specifies the library or libraries that are to be searched, and the order in which they are to be searched in order to resolve any external references. UNSAT specifies the (fall-through) procedure that will be linked in the event that any of the external references cannot be resolved at load time. LIBLIST and UNSAT are only available for native mode programs.

The names of command files and programs may be the same as an MPE XL command or a user UDC. To allow the user the ability to execute these programs or command files the XEQ command was added. If the first parameter is a command file, a list of parameters may be passed to the command file. For example `!XEQ LISTP *`, where LISTP is a command file and `*` is a parameter passed to it. If the parameter is a program file the `!INFO` and `!PARAM` parameters are allowed as in the RUN command.

The SET command is the same as in MPE V/E with the addition of three new parameters. The first is the `!ECHO` parameter and allows the user to control the terminal echoing. Escape colon and escape semicolon, used to control echoing on MPE V/E, will not be supported on MPE XL. The second is the `!MSG` parameter which allows the user to control whether or not `!TELL` messages are displayed on the user's terminal. The third is `!SPEED` which allows the user to control the terminal's data transmission rate. An example is given:

```
!SET ECHO=on;MSG=off;SPEED=9600
```

This will set the terminal echoing on, `!TELL` messages disabled, and the terminal input and output speed to 9600 baud.

Although the `!SPEED` and `!MSG` parameters are provided in the SET command, the SPEED and SETMSG commands are also provided in MPE XL just as they are in MPE V/E. The syntax for the SPEED command has not changed, except that inspeed and outspeed must be exactly the same. Also, speeds 110, 150 and 600 are not supported on MPE XL.

## FILE & DIRECTORY REPORTING

The LISTDIR utility will not be included with MPE XL. Instead the current group of list commands have been enhanced to provide functionality which the LISTDIR utility previously provided. Those commands are LISTP, LISTPTMP, LISTACCT, LISTGROUP, and LISTUSER.



parameter specifies that UDC's are not to be catalogued. Logon UDC's are not executed and the welcome message is suppressed. For security reasons this mode is permitted only if the CI is not the top level logon CI. The ";PARM-3" parameter specifies both options 1 and 2.

The HELLO and JOB commands have added the ";INFO-" and ";PARM-" parameters, as well as a ";CI-" parameter which will allow the user to specify the name of the CI program he wishes to run. The STREAM command will now accept the new parameters in the JOB command line. Examples of HELLO and JOB are given:

```
:HELLO operator.sys;INFO="showjob";PARM-1
```

This will logon to operator.sys, execute the SHOWJOB command and then immediately log off.

```
:HELLO user.account;CI=tdp.pub.sys;INFO="t file1"
```

This will logon to user.account, execute the TDP editor as the CI and text up file1. Note, even though the standard CI is not run, all logon UDC's are executed before the TDP editor is executed. This is done for security purposes. Upon exiting TDP the user will be logged off.

```
:JOB user.account;INFO="showme"
```

This will logon to user.account and then execute the command SHOWME before proceeding with the remainder of the commands in the job stream.

To switch groups within an account, users have always been required to re-logon. A new command, CHGROUP, has been added to allow users to change groups without initiating a new logon. All of the users logon environment, such as variables and file equations, remain as is. The users logon group is simply changed. For security reasons the group password will be required. For example 'CHGROUP pub' would change the users logon group to be 'pub'. If the 'pub' group had a password the OS would prompt the user for it.

Since the CI may be run from within another program an exit command was needed which would not log the user off as the BYE command now does. The EXIT command was added just for this purpose. If the CI is the first level CI, the EXIT command will have the same effect as the BYE command, otherwise the CI will simply return control to the process which created it.

MPE XL's new capabilities necessitated additions and changes to the RUN command parameters. Changes were made to parameters NOPRIV, LMAP, MAXDATA, PARM, STACK, and LIB to handle the new native mode programs and data structures provided in MPE XL. For complete details please refer to the MPE XL Commands Reference

```
:COPY FROM=paylist.pub;TO=paylist;As .
:COPY paylist.pub,paylist
:COPY paylist.pub
```

In each case paylist.pub will be copied to paylist.tax.payroll.

The new PRINT command is provided to allow the user to print the contents of a file to the standard list device, unless another destination is specified with the ";OUT" parameter. Just like the COPY command it is available in BREAK mode and from a program. The syntax is as follows:

```
PRINT filename[[:OUT=]outfile]
                [[:START=]n]
                [[:END=]n]
                [[:PAGE=]p]
                [(UNN){NUM}]
```

The ";OUT" parameter allows the user to specify an outfile other than \$STDLIST. ";START" and ";END" parameters allow the user to specify the starting and ending record numbers of the file to be printed. On a terminal, the PRINT command will print one page at a time and then wait for user input before printing the next page. The ";PAGE" parameter allows the user to specify the number of lines per page. Default is 23. PRINT will print the file unnumbered unless the user specifies the option ";NUM". The example ":PRINT mem01;START=5" will print mem01 to \$STDLIST starting with the fifth record in the file and continuing to the end of the file.

## REDO EXTENSIONS

In MPE V/E the user had the ability to re-execute the last command entered via the REDO command. MPE XL has expanded upon the capabilities of this command by providing the user with a Command Line History Stack and two new commands: LISTREDO and DO.

The Command Line History Stack is a stack maintained for the user by the CI, which will keep track of the last "n" number of commands entered by the user. The value "n" is kept in the system variable HPREDO SIZE and is set to a default of 20 at logon time. Users may list, access, modify and re-execute the commands maintained in this stack via the LISTREDO, DO and REDO commands.

LISTREDO allows the user to list out the Command Line History Stack. Several parameters are allowed and the syntax is as follows:

```
LISTREDO [[:START=]n] [[:END=]n] [[:OUT=]outfile] [:(REL)]
                                                [:(ABS)]
                                                (UNN)
```

The user has the option of referencing a command in the history stack with either a relative or absolute number. An absolute

The output of LISTACCT, LISTGROUP, and LISTUSER has been changed to now display a formatted list very similar to that currently produced by the LISTDIR utility. A ";PASS" parameter has also been added to these commands to allow the optional display of the password associated with the user, group, or account.

Changes in LISTF and LISTFTEMP include additions of new options as well as changes to the output of the ",-1" option. The ",-1" option will now display the file label as it did in MPE V/E with the exception that it will be in hexadecimal and ASCII instead of octal and ASCII. A ",3" option has been added to replace the functionality previously provided by the LISTDIR utility for files. It will format all the information, excluding the lockword, about the file found in the file label. A ",-3" option has been provided to format all the label information, including the lockword. LISTF has an additional new option, "4", which will display the security matrix for the file similar to the LISTSEC command in LISTDIR.

## FILE UTILITIES

Users should find it much easier to duplicate and view files with the new COPY and PRINT commands. COPY will copy one permanent disc file to another. PRINT will print the contents of a file.

The new COPY command may be invoked during BREAK or from a program, such as EDITOR or TDP. The syntax is as follows:

```
COPY [FROM=]sourcefile[[:TO=]targetfile][:(ASK)(YES)(NO)]
```

":FROM=" and ":TO=" are optional in the command. The user need only specify the sourcefile and targetfile in the specified order. If the targetfile is omitted, the sourcefile is copied to sourcefile.logongroup.logonaccount. ";YES" instructs COPY to purge the targetfile if it already exists, and is the default for jobs or in other cases where user input is not using the interactive mode, such as UDC's and command files. ";NO" instructs COPY to terminate if targetfile already exists. ";ASK", which is the default option for interactive mode, will prompt the user with the following prompt:

```
PURGE OLD targetfile.group.account?
```

if the file already exists. Valid replies are:

```
Y or YES  
N or NO
```

YES will overwrite the current targetfile. NO will terminate the COPY command. If the user was logged on to JOE.PAYROLL,TAX the following COPY commands would all have the same effect.

The `;EDIT` parameter provides for changes to be made to the command before re-executing it. This edit string is very similar to what one would enter to edit a command in MPE V/E, only with a few new enhancements. Several directives in addition to the `i` (insert), `r` (replace), `d` (delete), and `u` (undo) directives provided in MPE V/E have been added to MPE XL. These new directives are:

`d>` - Deletes to the end of the current line from the position specified by `'d>'`.

`>` - Appends the following text to the end of the line.

`>d` - Begins deletion from the current end of line, moving right-to-left. Multiple `d`'s may be specified after `>`, as well as insert and replace strings.

`>r` - Replace characters at the end of the command line, moving right-to-left.

`c` - Change one character to another.

`other` - simple replacement if any other character is encountered first.

Using the above history stack, a few examples would be:

```
:DO 2, '>addmemo'  
:build temp.memo  
:
```

```
:DO 3, '>.pub'  
:purge temp.pub  
:
```

```
:DO 2, '>rest'  
:build test  
:
```

```
:DO 1, 'c/me/out'  
:showout  
(showout listing)
```

The `REDO` command in MPE V/E has been enhanced to offer the user the same new facilities found in the `DO` command. That is, all the new editing features, both in the normal `REDO` edit facility and in a new `;EDIT` parameter, and the ability to specify which command to execute in the history stack via the new `;CMD` parameter. Syntax is as follows:

```
REDO [[CMD=]cmdid] [[EDIT=]editstring]
```

number references the first command entered in this session as number 1 and each subsequent command increments by one. A relative number references the last command entered as -1 and each prior command decrements by one. The ";REL" parameter allows the user to list the history stack with relative numbers next to the commands. The ";ABS" parameter lists the history stack with absolute numbers next to the command. The ";UNN" parameter will simply list the history stack with no number attached. Default is the ";ABS" parameter. Take the following examples:

```
:LISTREDO
  1) showme
  2) build temp.pub
  3) purge temp
  4) LISTREDO

or

:LISTREDO ;REL
  -4) showme
  -3) build temp.pub
  -2) purge temp
  -1) LISTREDO ;REL

or

:LISTREDO ;UNN
showme
build temp.pub
purge temp
LISTREDO ;UNN
```

These numbers, both relative and absolute, may be dereferenced just like any other variable. Taking the example above, if the user were to enter "!-4" the CI would interpret that as a "showme" command. Similarly "!1" would cause the exact same results. The absolute number of the current command is kept in the HPCOMNUM variable provided by the CI.

The ";START" and ";END" parameters allow the user to specify which portion of the history stack to list. The numbers used here may be either relative or absolute. No input will specify the entire history stack to be listed. The remaining option, ";OUT", will allow the user to specify where to list the history stack other than the default, \$stdlist.

DO allows the user to re-execute any command still retained in the history stack. It also permits the user to edit the command before re-executing it. Syntax is as follows:

```
DO [[CMD=]cmdid] [[:EDIT=]editstring]
```

The ";CMD" parameter allows the user to specify the relative or absolute command number to re-execute. The default for "cmdid" is -1, i.e. the most recently executed command. Unlike the REDO command, this command will not prompt the user for changes in the command. If changes to the command are desired the user will need to supply the ";EDIT" parameter, or use the REDO command itself.

There is a new native mode STORE/RESTORE on MPE XL. This rewritten facility provides the user with many new options, among them are multiple minuses on the file list, an option to store/restore the accounting structure, an option to store/restore files on a particular volume set, and performance enhancements to allow full streaming capability.

## PROGRAMMING

All the programming commands provided in MPE V/E are provided in MPE XL. For example, to compile and prep an SPL program the user would use the SPL and PREP, or SPLPREP commands. This would compile and prepare a compatibility mode program which could be run on either MPE XL or MPE V/E. The new native mode compilers are initiated via command files residing in PUB.SYS. The command files to compile are PASXL, FTNXL, COB74XL, and COB85XL. The command files to compile and link are PASXLLK, FTNXLLK, COB74XLK, and COB85XLK. The command files to compile, link, and run are PASXLCG, FTNXLCG, COB74XLCG, and COB85XLCG.

The output of the native compilers is called a SOM, System Object Module, as opposed to a USL, which is the output from the compatibility mode compilers. Instead of using the PREP command to create an executable program file from this SOM, a new LINK command is provided. This LINK command has many new options. A typical link would be 'LINK somfile,progfile'. For complete details and syntax please refer to the MPE XL Commands Reference Manual and the Link Editor XL Reference Manual, part number 32650-90030.

For program debugging the DEBUG command exists as it did before. Initiation of the debug subsystem has not changed. The subsystem itself has been totally rewritten. Extensive enhancements have been added as well as the ability to handle both native and compatibility mode code, register sets, and data structures. Some of the enhancements include windows, a macro facility user-defined and environment variables, symbolic access at the procedure level, symbolic formatting, and a screen formatting capability. For complete details please refer to the MPE XL System Debugger Reference Manual, part number 32650-90013.

The SETDUMP, and RESDUMP commands have been provided as they were in MPE V/E. They arm and disarm the system debugger call for process abort. The parameters DS, ST, QS, and ASCII are accepted as in MPE V/E, but are ignored by MPE XL. Instead a new parameter has been added, ";DEBUG". This new parameter will accept a string of debug commands to execute at process abort. Syntax is:

```
SETDUMP [DS [,ST [,QS]] [;ASCII] [;DEBUG="commands"]
```

A new intrinsic has been added, which is very similar to the current COMMAND intrinsic, but offers some new enhancements not found in COMMAND. This new intrinsic is HPCICOMMAND. As with the COMMAND intrinsic, most MPE XL commands may be executed programmatically via HPCICOMMAND. In addition, though, the new

## ACCOUNT MANAGEMENT & VOLUME SET MANIPULATION

'Private Volumes' are now divided into two classes of volume sets: mountable system volumes and mountable non-system volumes. The commands associated with volume sets include: VSRELEASE, VSRESERVE, NEWACCT, NEWGROUP, ALTACCT, ALTGROUP, PURGEACCT, PURGEGROUP, and REPORT.

VSRELEASE and VSRESERVE are new commands which provide very similar functionality to the DISMOUNT and MOUNT commands respectively. VSRESERVE reserves a volume set, such that it prevents the console operator from taking a particular volume set offline. VSRELEASE will release a previously reserved volume set.

The remaining commands, NEWACCT, NEWGROUP, ALTACCT, ALTGROUP, PURGEACCT, PURGEGROUP, and REPORT, have replaced the ';VS' parameter with a new parameter ';ONVS'. This provides very similar functionality to ';VS'. The ALTGROUP and NEWGROUP commands have an additional new parameter, ';HOMEVS' which will allow the user to specify a home volume set. For further information on these and related private volume commands, please refer to the MPE XL Commands Reference Manual and the System Administrator's Migration Guide.

Account maintenance for the system administrator has been made simpler with a small modification to the NEWGROUP, NEWUSER, ALTGROUP, ALTUSER, PURGEGROUP, and PURGEUSER commands. The user may now fully qualify the user or group name in the command. For example the command ':PURGEGROUP temp.payroll' executed by manager.sys would purge the 'temp' group in the 'payroll' account. SM capability is required to execute these commands across account boundaries. AM is required for groups and users within an account.

## SYSTEM OPERATION MANAGEMENT

For System Operation Management the TUNE command has been modified. The TUNE command accepts the minimum clock cycle parameter as before, but it will ignore this parameter. It is not supported on MPE XL.

## BACKUP UTILITIES

With the advent of the new OS and I/O system (no more DRT's), comes a new system configuration utility, SYSGEN, and modifications to the current STORE and RESTORE utilities. Only a very small introduction of these utilities is given here.

SYSGEN allows System Managers to configure their systems and create system load tapes. This command replaces the SYSDUMP command, which is no longer supported. SYSGEN can be used to create new system configurations, modify existing ones, and create system load tapes for any MPE XL system.

## BIOGRAPHICAL SKETCH

**Name:** Denis Rachal  
**Title:** Member of Technical Staff  
**Employer:** Hewlett-Packard Information Technology Group, Field Engineering Support  
**Job Description:** Provide support for the MPE XL operating system through development and teaching of internal training, and problem analysis.  
**Background:** Joined Hewlett-Packard in 1979 and worked as a Customer Engineer for one and a half years in the Neely Santa Clara Office. He was then promoted to an MP3000 Technical Support Engineer and moved to the Neely Brisbane Office, where he remained for five years. Denis has held his current position in Field Engineering Support for one and a half years.  
**Education:** BSIX, University of Southern California, 1979

**Name:** John Korondy  
**Title:** Project Manager, User Interfaces, Operating Systems Laboratory  
**Employer:** Hewlett-Packard Information Software Operation  
**Job Description:** Responsible for the design, development, and integration of User Interface Software of the MPE XL Operating system.  
**Background:** Joined Hewlett-Packard in 1979 and spent over three years in Information Systems development and management. In the past four years, John has contributed to the design and development of the MPE XL Operating System, in the implementation of the Low-Level I/O software subsystem, and more recently, the User Interface software. He has been a project manager for three years.  
**Education:** BSCS Magna cum Laude, University of California at Los Angeles, 1979

**Name:** Jeff Vance  
**Title:** Member of the Technical Staff  
**Employer:** Hewlett-Packard Information Software Operation  
**Job Description:** Design/Implementation of the new MPE XL Command Interpreter.  
**Background:** Joined Hewlett-Packard in 1979 and worked four years in MIS applications for Inventory Control and MRP systems. He has held his current position for three years.  
**Education:** BS, University of California at Davis, 1979



HPCICOMMAND intrinsic will also search for and execute UDC's, command files, and program files. The parameters are the same as the COMMAND intrinsic to allow programmers to easily port their code to the new intrinsic. An extra parameter, which is optional, has also been added to allow the programmer control over the printing of error and warning messages. In both the COMMAND and HPCICOMMAND intrinsics the meaning of the 'parmnum' parameter has changed. If parmnum is negative, parmnum is the column number where the error occurred. If parmnum is positive then it is the file system error which prevented the command from executing. Zero means that no file system error occurred and no caret needs to be printed under the offending parameter. Zero does not necessarily mean that no error occurred. Use the errnum parameter to determine this.

### III. CONCLUSION

With all the new facilities provided, users and programmers should find the MPE XL CI a much more friendly and productive environment in which to work. It is hoped that with the addition of these new facilities, users will find a very powerful tool in the MPE XL CI. Many functions which would have previously required a custom program may now be achieved via the CI. Remember, CI stands for Command Interpreter, and the MPE XL CI is a programming language interpreter for the user.

## Appendix D#1

### DTS Troubleshooting Overview

1. Check your terminal configuration (XmitPace/RecvPace= XON/XOFF, Parity= 0, BaudRate = configured baudrate) and special keys (ctrl-s, STOP, REMOTE MODE, etc).
2. Check your cable connections (RS232/LAN...). Use Termdsm TERMINAL Loopback to verify the terminal path.
3. Check your DTS configuration (ldev, Baudrate, profile, etc).
4. AbortIO. (On MPE/V, AbortIO will not log off the port. On XL since CI is a program, enough AbortIOs will log off the port).
5. AbortJob

If at least one port is ok on that SIC:

6. use TERMDSM to dump the hung Ldev#(s) or port(s) on that SIC.

If all ports on a SIC are hung:

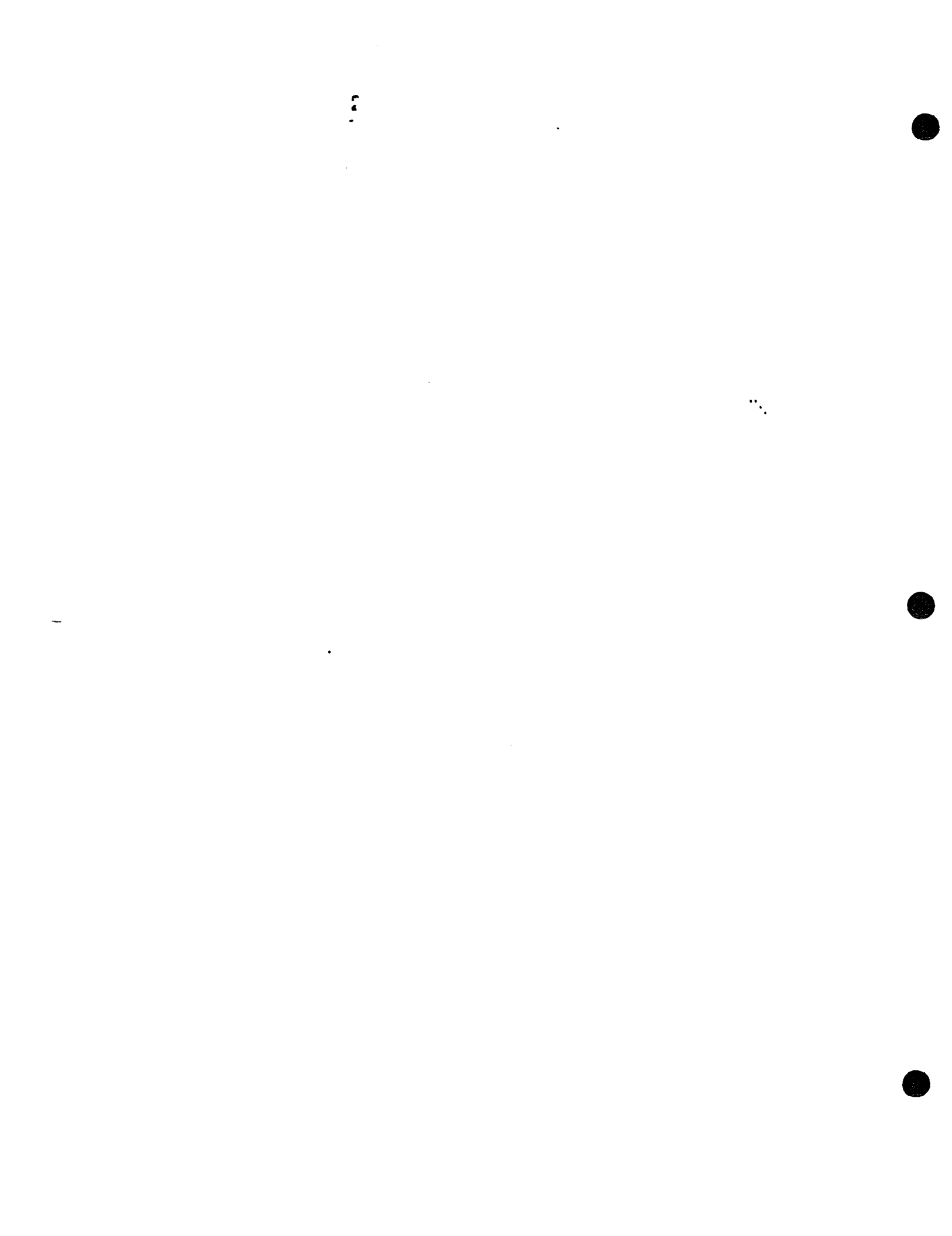
Repeat step 6 for all ports.

7. Use TERMDSM to reset that SIC.

(RESET a SIC resets all ports on that SIC. Resetting a SIC does more than resetting each port on that SIC).

8. Use TERMDSM DUMP to dump the DTC\* if necessary.

\* DTC = HP 2345A



## Appendix D-2

### DTS Troubleshooting Activities

The system is booted normally; DTC is turned on and the message:

**"/DTCM/.../ Bad download file. Download stopped. Please check"** appears on the console.

- The DTC download file DTCSW001 is not binary

The system is booted normally; DTC is turned on and the message:

**"/DTCM/.../ Remote machine firmware not supported"** appears on the console.

- The firmware of your DTC is not up to date.

The system is booted normally; DTC has been booted but the message:

**"/DTCM/.../ Just booted DTC did not ask its configuration data"** appears on the console.

- The DTC download file DTCSW001.PUB.SYS is old. Run the program DTCHECK.PUB.SYS on it and wait 40 seconds. When the program ends, it display the version number of the DTC download file. If it is not > X.00.03.002 then your DTCSW001 is old.

The system is booted normally; DTC has been booted too, but during the download of its configuration the following messages are displayed on the console:

**"/DTCM/.../ Boot\_complete packet received before expected"**

**"/DTCM/.../ Unexpected packet from DTC"**

- The DTC download file DTCSW001.PUB.SYS is old. Run the program DTCHECK.PUB.SYS on it and wait 40 seconds. When the program ends, it display the version number of the DTC download file. If it is not X.00.03.002 then your DTCSW001 is old.

## Appendix D- ?

### DTS Troubleshooting Activities

The system is booted normally, DTC is turned on and nothing is responding:

- The DTC has been turned on for less than one minute, wait at least one minute.
- Check if the DTC and the 900 Series are well connected to the LAN.
- Verify if the DTC address matches the address that is currently configured in the file NMCONFIG.

The system is booted normally, DTC is downloaded properly but the DTC's terminals don't seem to respond:

- Hit the key "R" on one of the terminals, the DTC software version numbers must appear on the screen. If not it is probably a hardware problem.
- Check the version of the DTC download file (DTCSW001.PUB.SYS). Run the program DTCHECK.PUB.SYS on it and wait 40 seconds. When the program ends, it displays the version number of the DTC download file. If it is not > X.00.03.002 then your DTCSW001 is old.

The system is booted normally, DTC is turned on and the message:

"/DTCM/.../ File system error: open" appears on the console.

- Check the write access of the group and account containing the DTC download file DTCSW001.
- Check if the DTC download file DTCSW001 exists
- Check which file has been specified for this DTC in the NMCONFIG file.

## Appendix D-3

### DTC Event Codes

#### \* Event Code Ranges

- \* 1 - 511 : Common Error Codes.
- \* 512 - 1023 : Avesta Operating System (AOS).
- \* 1024 - 1279 : DTC Manager.
- \* 1280 - 1535 : LAN Protocol.
- \* 1536 - 1791 : AFCP Protocol.
- \* 1792 - 2303 : ADCP Protocol.
- \* 2304 - 4095 : Probe Protocol.

#### \* Common Error Codes

- \* -1 \* level 7 IT, upload triggered by the push button.
- 0 \* Upload requested by the host
- 1 \* Cannot get an AOS message.
- 2 \* Cannot get a data buffer.
- 3 \* Cannot allocate a timer (catastrophic at initialization).
- 4 \* Cannot find the connection.
- 5 \* Unexpected CPU Trap instruction.
- 6 \* Unknown parameter number.
- 7 \* Unexpected Timer Message.
- 8 \* Unrecognized or Unsupported AOS message event.
- 9 \* Unknown Protocol address
- 10 \* Message missing data buffer
- \* 11 \* Packet was longer/shorter than expected.
- 12 \* Unrecognized request.
- 13 \* Access not authorized
- 14 \* Unused
- 15 \* Unable to initialize (catastrophic).
- 16 \* Unexpected Error Response.
- 17 \* Serial Port or SIC are already busy.
- 18 \* Bad parameter number.
- 19 \* Bad Serial Port or Connection number.
- 20 \* Message from unexpected AOS task.
- \* 21 \* Message contains invalid information.
- 22 \* Unable to find matching request.
- 23 \* Data buffer is too small.
- 24 \* Bad Packet format.
- \*

## Appendix D-2

### DTS Troubleshooting Activities

The system is booted normally; DTC is turned on and the message:

"/DTCM/.../ Boot process started for DTC address 08000900x1xx" doesn't stop to appear on the system console.

- Turn off your DTC. Then after a few seconds if you have the message "/DTCM/.../ DCC did not give back the DTC configuration data" then you little joker are running a software (trace for example) that slow down so much the system that the DCC has not the time to fetch the DTC configuration data.

The system is booted normally, but during the configuration of DTS an error -138 from the module FCM:

- The field "Number of outbounds buffer" of the path "DTS.DTC" in the file NMCONFIG is set incorrectly. This number must be equal to 40 times the number of configured devices.

I was quietly working on a DTC terminal and suddenly everything stopped and some messages on the console show that an upload process is going on:

- Your DTC is encountered a severe internal error and is currently sending to your 900 Series the content of its whole memory for diagnostic purpose. At the end of the process, its memory will be stored in the file Sxxxxxx where xxxxxx are the last 6 digits of the DTC LAN address.

## Appendix D-3

### □ DTC Event Codes

- \*
  - 808 • CPU Bus Error
  - 809 • Address error
  - 810 • Illegal instruction
  - 811 • Division by 0
  - 812 • CHK instruction
  - 813 • Integer overflow
  - 814 • Privilege violation
  - 815 • Trace instruction
  - 816 • 1010 opcode
  - 817 • 1111 opcode
- \*
  - \* DTC Manager (cautionary)
  - \*
    - 1025 • Invalid Entity Instance Element.
  - \*
    - \* 802.3 LAN Driver
    - \*
      - 1280 • lan\_unknown\_error (cautionary)
      - 1281 • no\_wagon\_in\_message\_to\_parse (cautionary)
      - 1282 • NIL\_in\_transmit\_message\_ring\_to\_release (cautionary)
      - 1283 • message\_to\_send\_without\_wagon (cautionary)
      - 1284 • unexpected\_control\_field\_value (cautionary)
      - 1285 • first\_buffer\_of\_frame\_too\_short (cautionary)
      - 1286 • XID\_or\_TEST\_response (cautionary)
      - 1287 • unexpected\_event (cautionary)
      - 1289 • invalid\_token\_extension (cautionary)
      - 1289 • lan\_no\_heart\_beat (cautionary)
      - 1290 • lan\_babble (cautionary)
      - 1291 • lan\_memory (catastrophic)
      - 1292 • lan\_underflow (catastrophic)
      - 1293 • lan\_tx\_no\_buf (catastrophic)
      - 1294 • lan\_lance\_init\_failure (catastrophic)
  - \*
    - \* DTC Flow Control Protocol (AFCP) Codes
    - \*
      - 1536 • event\_open (informative)
    - \*
      - \* AFCP protocol errors (cautionary)
      - \*
        - 1546 • pe\_undefined\_packet\_type
        - 1547 • pe\_abort\_received\_in\_idle
        - 1548 • pe\_unexpected\_packet\_in\_idle
        - 1549 • pe\_ptcreq\_received\_in\_wconreply
        - 1550 • pe\_unexpected\_packet\_in\_wconreply
        - 1551 • pe\_unexpected\_packet\_in\_wcloseresp
        - 1552 • pe\_ptabort\_received\_in\_wcloseresp
        - 1553 • pe\_duplicate\_ptcreq\_in\_wopenresp
        - 1554 • pe\_unavailable\_canonical\_address
        - 1555 • pe\_receive\_window\_upper\_bound\_violation
        - 1556 • pe\_connection\_number\_not\_valid



## Appendix D-3

### □ DTC Event Codes

- 101 • Too many connections or commands active.
- 102 • Remote refused the connection request.
- 103 • Remote did not respond to connection request.
- 104 • Resending Connection Request.
- 105 • Incompatible Versions.
- \*
- 201 • Resending data packet.
- 202 • Too many retries.
- \*
- \*     Avesta Operating System (AOS) Codes (catastrophic)
- \*
- 512 • TRY RECOVER general (G01)
- 513 • idle\_loop:            Bad destination\_task
- 514 • sch\_send:            Sending token, timer or threshold
- 515 • release\_message:    Releasing token timer or threshold
- 516 • sweep\_message:     Message not in eligible\_queue
- 517 • con\_send\_token:     Token number not allowed
- \*
- 519 • ready:               No free message for "start"
- 20 • build\_wait\_message:  No wait\_definition
- 21 • build\_wait\_wagon:    No wait\_definition
- 522 • queue:               Item already queued
- 523 • queue\_masked:       Item already queued under mask
- 524 • queue:               Item is a token, timer or threshold
- 525 • restart/stop\_timer: Timer is not allocated
- 526 • release\_timer:      Timer is running
- 527 • get\_wagon:          Free wagon pool is empty
- 528 • send:                Data\_ptr points outside wagon boundry
- 529 • send:                Used\_size larger than wagon size
- 530 • queue:               Last object pointer not NIL
- 531 • insert:             Last object not in queue
- 532 • Release\_message:    Message has 0 used count
- 533 • restart\_timer:     Destination task has been altered
- 534 • init:                Fewer than minimum number of wagons
- 535 • watchdog:
- \*
- 770 • trap 2
- 771 • trap 3
- \*
- 779 • trap 11
- 780 • trap 12
- 781 • trap 13
- 782 • trap 14
- 783 • trap 15
  
- 792 • trap 4. Integer overflow
- 793 • trap 5. Division by 0
- 794 • trap 6. Case range error
- 795 • trap 7. Value or Subscript rangeerror
- 796 • trap 8. Dereference NIL pointer
- 797 • trap 9. non local code

## Appendix D-3

### □ DTC Event Codes

\*  
\* DTC Device Control Protocol (ADCP) Codes  
\*

- 1793 = c\_simultaneous\_wr (catastrophic)
- 1794 = c\_no\_wagon\_in\_message (catastrophic)
- 1795 = c\_wrrd\_not\_allowed (catastrophic)
- 1796 = c\_ctrl\_not\_allowed (catastrophic)
- 1797 = c\_bad\_interrupt (catastrophic)
- 1798 = c\_not\_yet\_implemented (cautionary)
- 1799 = c\_write\_not\_initiated (catastrophic)
- 1800 = c\_link\_isr (catastrophic)
- 1801 = c\_no\_message (catastrophic)
- 1802 = c\_no\_wagon (catastrophic)
- 1803 = c\_no\_write\_pending (cautionary)
- 1804 = c\_no\_write\_read\_pending (catastrophic)
- 1805 = c\_no\_control\_pending (catastrophic)
- 1806 = c\_no\_more\_wagon\_in\_managt\_req (catastrophic)
- 1807 = c\_message\_pool\_empty (catastrophic)
- 1808 = c\_wagon\_pool\_empty (catastrophic)
- 1809 = c\_unknown\_request (catastrophic)
- 1810 = c\_unknown\_state (catastrophic)
- 1811 = c\_unexpected\_mux\_reply (catastrophic)
- 1812 = c\_missing\_message (cautionary)
- 1813 = c\_unexpected\_empty\_queue (cautionary)
- 1814 = c\_unknown\_adcp\_request\_code (cautionary)
- 1815 = c\_unexpected\_extention\_value (cautionary)
- 1816 = c\_unexpected\_event\_type (catastrophic)
- 1817 = c\_unexpected\_reply\_state (catastrophic)
- 1818 = c\_unexpected\_mgt\_request (catastrophic)
- 1819 = c\_no\_timer (catastrophic)
- 1820 = c\_msg\_lack (cautionary)
- 1821 = c\_wagon\_lack (cautionary)
- 1822 = c\_no\_port (cautionary)
- 1823 = c\_bad\_case (catastrophic)
- 1824 = c\_bad\_command (cautionary)
- 1825 = c\_fail\_to\_access\_semaphore (catastrophic)

\*  
\* PROBE Codes  
\*

- 2304 = address\_request\_without\_wagon (cautionary)

## Appendix D-3

### □ DTC Event Codes

```
*
*   AFCP internal errors (catastrophic)
*
1566 • ie_unexpected_state
1567 • ie_unexpected_timeout
1568 • ie_unexpected_timer_purpose
1569 • ie_data_indication_message_without_wagon
1570 • ie_data_request_message_without_wagon
1571 • ie_retrans_queue_empty_when_acked
1572 • ie_wait_queue_empty_when_window_opened
1573 • ie_message_without_wagon_in_wait_queue
1574 • ie_retrans_queue_empty_when_retransmit
1575 • ie_message_without_wagon_in_retrans_queue
1576 • ie_no_timer_available_at_init
1577 • ie_retry_count_negative
1578 • ie_wagon_count_not_0_at_open
1579 • ie_frame_not_txed_after_tx_timer
1580 • ie_not_enough_wagons_per_connection
*
1586 • Upper interface error (cautionary)
*
*   AFCP Connection Closed Locally Reasons (informative)
*
1596 • version_not_matching
1597 • connection_number_not_valid
1598 • unexpected_packet_in_idle      (idle state)
1599 • connection_refused
1600 • aborted_by_upper_layer
1601 • refused_by_upper_layer
1602 • ptcrcq_received_in_wconreply   (wait connection response state)
1603 • unexpected_packet_in_wconreply (wait connection response state)
1604 • unexpected_packet_in_estab     (established state)
1605 • unexpected_packet_in_wopenresp (wait open response state)
1606 • unexpected_packet_in_wcloseresp (wait close response state)
1607 • too_many_retries_in_estab     (established state)
1608 • too_many_retries_in_wconreply (wait connection response state)
1609 • unavailable_canonical_address
*
*   AFCP Connection Closed by Remote Reasons (informative)
*
1626 • version_not_matching
1627 • connection_number_not_valid
1628 • unexpected_packet_in_idle      (idle state)
1629 • connection_refused
1630 • aborted_by_upper_layer        ( Normal Closing Reason )
1631 • refused_by_upper_layer
1632 • ptcrcq_received_in_wconreply   (wait connection response state)
1633 • unexpected_packet_in_wconreply (wait connection response state)
1634 • unexpected_packet_in_estab     (established state)
1635 • unexpected_packet_in_wopenresp (wait connection response state)
```

# Appendix D-4

## TERMDSM Status

MGR Pending MGR Requests •	1
MGR Pending Port Dumps •	0
MGR Cant Get Message •	0
MGR Unknown MP request •	0
MGR MP error Responses •	0
MGR Port Mux Busy •	0
RMP Uploads Not ACKED •	0
RMP Total Retries •	0
AFCP counters :	
Active Connections •	0
Receive Packets :	
Data Packets •	0
Acknowledgments •	0
Negative Acknowledgments •	0
Duplicate •	0
Out Of Order •	0
Status Requests •	0
Transmit Packets :	
Data Packets •	0
Acknowledgments •	0
Negative Acknowledgments •	0
Retransmit •	0
Window Probe •	0
LAN counters :	
Receive :	
All Frames •	0
To My Addr Frames •	1
CRC Errors •	0
No Resources •	0
Missed •	0
Transmit :	
Total Sent •	0
One Collision •	0
More Collisions •	0
Too Many Collisions •	0
Lost Carrier •	0
No Heart Beat •	0
No Ring Space •	0
Deferred •	0
Late Collision •	0

## Appendix D-4

### TERMDSM Status

Two options are available to describe the configuration and state of the DTC. The user will specify which is desired by responding to the prompt:

(status)

DTC 3  
Port #, #, #

(carriage return to exit) ?

This command does not affect the operation of the system or DTC.

The following is an example of DTC status:

Machine Type = HP2345A  
DTC Node Name = DTC08000900011A

NOVRAM Value :

00-00  
Nodal address = 08-00-09-00-01-1A  
Boot Multicast address = 09-00-09-00-00-04  
00-42

Host Node Address = 08-00-09-00-0E-7B

DTC Lan Multicast Address :

Probe Primary = 00-00-00-00-00-00  
Probe Secondary = 00-00-00-00-00-00  
LAN Analyst = 00-00-00-00-00-00

SIC Ports : 0 = Port available, 1 = Port down. Port # 0 leftmost bit

SIC # 0 Ports = 00000011 Self Test = \$00 Type = Modem Connect Card

SIC # 1 Ports = 11111111 Self Test = \$06 Type = Undefined

SIC # 2 Ports = 11111111 Self Test = \$06 Type = Undefined

SIC # 3 Ports = 11111111 Self Test = \$06 Type = Undefined

SIC # 4 Ports = 11111111 Self Test = \$06 Type = Undefined

SIC # 5 Ports = 11111111 Self Test = \$06 Type = Undefined

Version Number :

Management Version = X.00.05.001

Lan Version = X.00.05.000

AFCP Version = X.00.05.001

ADCP Version = X.00.05.006

CPU ROM Version = A.00.01.019

SIC 1 ROM Version = A.00.01.014

SIC 2 ROM Version =

SIC 3 ROM Version =

SIC 4 ROM Version =

SIC 5 ROM Version =

SIC 6 ROM Version =

Appendix D-4

TERMDSM Status

Asynchronous Even Enable On :  
Flow Control Timeout = OFF  
Critical Write Done = OFF

Subsystem Break = OFF  
Break = OFF  
Console Attention Character = OFF

AFCP counters :

Receive Packets :

Data Packets	0
Acknowledgments	0
Negative Acknowledgments	0
Duplicate	0
Out Of Order	0
Status Requests	0

Transmit Packets :

Data Packets	0
Acknowledgments	0
Negative Acknowledgments	0
Retransmit	0
Window Probe	0

Appendix D-4

TERMDSM Status

The following is an example of Port Status:

Revision Number :

Hardware = \$0000

Software = \$5006

Current Host Name =

Port Type = Direct Connector 232

Connection State = Disconnect

DIODAM State :

Read Pending

Driver State :

Current Read Length = 1 Current Write Length = 0

Number Of Bytes Transferred From The SIC To The CPU = 0

Card State :

Read Pending

Number Of User Characters Received By SIC = 0

Last Special Character Received By SIC = \$00

Backspace = \$00

Line Delete = \$00

EOR Character = \$00

Subsystem Break Character = \$00

Alternate EOR Character = \$00

Read Trigger Character = \$11

Block Mode Signal Char. = \$00

Console Attention Character = \$00

Baud Rate = 9600 bds

Parity = NONE

Flow Control Timer = 30

Read Timeout = 0

Read Option :

Send CRLF = ON

Edit Mode = OFF

Echo Mode = OFF

VPlus Block Mode = OFF

Block Mode = OFF

Type Ahead Mode = OFF

Read Trigger Option = ON

Device Handshake Option :

Binary Mode = OFF

Echo III CR LF = OFF

Host XON/XOFF = OFF

Device XON/XOFF = OFF

Enable Flow Control = OFF

# INTRODUCTION

---

## TurboIMAGE/V vs TurboIMAGE/XL: An Overview

TurboIMAGE/XL is now available on the 900 Series HP 3000. It is very similar to TurboIMAGE/V. However, because of the new architecture of the 900 series and because TurboIMAGE/XL takes advantage of certain MPE/XL features, some changes have occurred. Specifically:

- MPE/XL transaction management, an internal MPE XL service, is used to:
  - ensure physical consistency of the data base unless AUTODEFER is enabled.
  - perform Intrinsic Level Recovery. Only completed intrinsics are recovered.
  - provide Serial Write Queue functionality.
- Mapped files replace extra data segments for run-time control blocks. A new control block, the DBUX Index Table, has been added.
- The maximum number of DBOPENS per process is now 127.
- Some status area information returned by TurboIMAGE/XL library procedures is different for MPE XL applications because of the change from 16 to 32 bit architecture.
- Some information returned by DBINFO Mode 402 is different because of the change in how ILR is implemented.
- DBSTORE has a new TRANSPORT option for moving TurboIMAGE/XL data bases to MPE V.

The remaining sections of this document discuss major changes in detail. They include:

- Section 1: Intrinsic Level Recovery
- Section 2: Control Blocks
- Section 3: Status Area
- Section 4: Moving from MPE XL to MPE V

## MOVING TO TurboIMAGE/XL

Follow these steps:

1. If ILR or roll-back recovery is enabled, it must be disabled. To do this, use the DISABLE command of DBUTIL.
2. On MPE V, DBSTORE the data base or use MPE V STORE.
3. On MPE XL, DBRESTOR the data base or use MPE XL RESTORE.





...



# INTRINSIC LEVEL RECOVERY

---

TurboIMAGE/XL does not perform its own Intrinsic Level Recovery. Instead, TurboIMAGE/XL takes advantage of an internal MPE XL file system service, transaction management, that provides transaction level backup and recovery. Unless AUTODEFER is enabled, all transactions that modify the data base (DBPUTS, DBDELETES, and DBUPDATES) are written to a log file by MPE XL. Transaction recovery is performed at system startup time when necessary.

When ILR is not enabled, the transaction log file buffer is only written to disc when either 1) a specified time has elapsed, 2) the buffer is relatively full, or 3) the amount of main memory available is limited. Thus, intrinsics that have completed may not yet be written to disc. If a system failure occurs, those intrinsics that have not been written to disc are not recovered.

When ILR is enabled, the transaction log file is written to disc at the end of each completed DBDELETE and DBPUT. Only incomplete intrinsics are not recovered. (Note that a completed DBUPDATE does not force a log write to disc.) Because of these differences in implementation, ILR on TurboIMAGE/V is not 100% compatible with ILR on TurboIMAGE/XL.

---

## NOTE

Before moving TurboIMAGE data bases between MPE V and MPE XL, ILR and roll-back recovery must be disabled.

---

If you move a TurboIMAGE/V data base with ILR or roll-back recovery enabled to MPE XL, the following error message is displayed:

-180 ILR LOG INVALID - ILR INCOMPATIBLE ON MPE XL

If you move a TurboIMAGE/XL data base with ILR or roll-back recovery enabled to MPE V, the following error message is displayed:

-170 CANNOT OPEN ILR LOG FILE: FILE SYSTEM ERROR *nn*

## Major Differences

- ILR is performed by MPE XL transaction management. Because of this, the ILR file, *DataBaseName.DD*, does not exist. All transactions are logged to the MPE XL transaction management log file.

The changes to TurboIMAGE/XL are summarized in the following table.

Table 1-1. TurboIMAGE/XL Changes

AREA AFFECTED	CHANGES/ADDITIONS
DBSTORE COMMAND	<ul style="list-style-type: none"> <li>- A TRANSPORT option has been added for use when moving a TurboIMAGE/XL data base to MPE V.</li> <li>- The move from MPE XL to MPE V may not be possible if data set files are larger than MPE V file size limit.</li> </ul>
INTRINSIC LEVEL RECOVERY	<ul style="list-style-type: none"> <li>- ILR is performed by MPE XL transaction management.</li> <li>- ILR log file is replaced by MPE XL transaction management log file.</li> <li>- Only completed intrinsics are recovered.</li> <li>- DBUPDATE is included in the recovery.</li> <li>- To synchronize ILR with user logging for roll-back recovery, the user log file and the data base must be stored in the same volume set.</li> <li>- DBINFO Mode 402 no longer contains ILR recovery information.</li> <li>- To move between MPE V and MPE XL, ILR and roll-back recovery must be disabled.</li> </ul>
RUN-TIME CONTROL BLOCKS	<ul style="list-style-type: none"> <li>- Control blocks are stored in mapped files.</li> <li>- A new control block, the DBUX Index Table, now exists.</li> </ul>
STATUS AREA	<ul style="list-style-type: none"> <li>- Status words 5, 7, 8, and 10 are modified for Native Mode applications.</li> <li>- For condition code -9, words 2, 3, and 4 have a new format for both Compatibility and Native Mode applications.</li> </ul>
DBEXPLAIN	<ul style="list-style-type: none"> <li>- Information for DBEXPLAIN is stored in the DBU.</li> <li>- Calls to DBEXPLAIN must be made immediately after receiving an error status.</li> </ul>
TURBO Trace; Profiler	<ul style="list-style-type: none"> <li>- TURBO Trace and Profiler are not available on first release.</li> </ul>
DATA SET SIZE	<ul style="list-style-type: none"> <li>- Maximum data set size is 2 gigabytes.</li> </ul>
REMOTE DATABASE ACCESS	<ul style="list-style-type: none"> <li>- Only NS/3000 is supported on MPE XL.</li> </ul>
NUMBER OF DBOPENS	<ul style="list-style-type: none"> <li>- 127 DBOPENS allowed per process.</li> </ul>

# CONTROL BLOCKS

---

Run-time control blocks are created differently on MPE XL. In addition, a new control block, the DBUX, now exists.

## Major Differences

Run-time control blocks are no longer created as privileged extra data segments. Instead, on MPE XL privileged mapped files are used. If an error occurs when MPE XL opens a mapped file, the following error is returned:

-9 CANNOT CREATE *controlblockname*. FILE SYSTEM ERROR *nn*

where *controlblockname* is one of the following:

DBS  
DBG  
DBU  
DBR  
DBUX

and *nn* is the number of the file system error.

Specifically, control blocks are created as follows:

- The Data Base System Control Block (DBS) is stored in a permanent mapped file called TURBODBS PL'B SYS. It is created when the first data base is accessed and purged when there is no longer any data base activity on the system.
- The Data Base Globals Control Block (DBG) and the Data Base Buffer Area Control Block (DBR) are stored in a permanent mapped file called *DataBaseName*GB which resides in the same group and account as the data base. *DataBaseName*GB is created when the first user opens the data base and purged when the last user exits.
- Each Data Base User Local Control Block (DBU) is stored in an unnamed temporary mapped file. A DBU is created each time a user does a DBOPEN for local data base access.
- Each Data Base Remote Control Block (DBR) is stored in an unnamed temporary mapped file. A DBR is created each time a user does a DBOPEN for remote data base access.
- The DBUX Index Table is a new run-time control block stored in an unnamed temporary mapped file. One DBUX is created per user. The data base ID number serves as an index into the DBUX and points to the virtual addresses of all current DBU/DBRs belonging to that user. This new control block is necessary because on MPE XL the data base ID number can no longer be the extra data segment number of the DBU/DBR. 127 entries are allowed. This means that each user (process) is allowed 127 DBOPENS. If the DBUX is full and the user attempts to open another data base the following error is displayed:

- DBUPDATE is now included with DBPUT and DBDELETE in Intrinsic Level Recovery. However, complete DBUPDATES are not guaranteed to be committed to the log file for recovery.
- On TurboIMAGE/XL, only completed DBPUTs and DBDELETES are recovered by ILR. Therefore, if these intrinsics are interrupted by a system failure or other abnormal termination, they are not recovered.
- To synchronize ILR with user logging for roll-back recovery, the user log file and the data base with ILR enabled must be stored in the same volume set. DBOPEN verifies this for you.
- Recovery is performed at system startup time. This may cause a slightly longer startup time when a recovery is necessary. (If a program accessing a TurboIMAGE/XL data base aborts during the execution of an intrinsic, the incomplete intrinsic will be undone.)
- On TurboIMAGE/XL, DBINFO Mode 402 no longer returns information about whether or not ILR recovery has been done on the last DBPUT or DBDELETE. (Since data base recovery is now performed at system startup time, this information is not available.)

The following table compares DBINFO Mode 402 on TurboIMAGE/V with DBINFO Mode 402 on TurboIMAGE/XL.

Table 2-1. DBINFO Mode 402 Changes

WORD	TurboIMAGE/V	TurboIMAGE/XL
1	ILR log flag: 1 if enabled, 0 if not enabled.	No change.
2	Calendar date ILR was enabled.	No change.
3, 4	Clock time ILR was enabled.	No change.
5	1 if ILR used; 0 if ILR not used.	Always 0.
6	P if DBPUT, D if DBDELETE, otherwise blank.	Always blank.
7 - 14	Data set name, when ILR used; otherwise blank.	Always blank.
15 - 16	Reserved.	No change.

- DBEXPLAIN can no longer find complete information in the status area for its explanation. To solve this problem, TurboIMAGE/XL places the missing information in the DBU, which DBEXPLAIN now references. However, the application must call DBEXPLAIN immediately after the status information is received. If any other library procedure is called between the time the error status is returned and DBEXPLAIN is called, DBEXPLAIN displays the last information stored in the DBU, which may or may not belong to the library procedure that encountered the error. This affects applications that use two different status arrays.

For applications in Compatibility Mode:

- Switch stubs translate the information returned to the status area by TurboIMAGE/XL. After translation, each word of the status area contains the information expected by TurboIMAGE/V applications with one exception. Word 10 contains the relative word address of the switch stub rather than that of the actual library procedure.

The following table compares words 5 to 10 of the TurboIMAGE/V status area with words 5 to 10 of the TurboIMAGE/XL status area. If an error occurs, this information is returned for all library procedures. If the procedure executes successfully, this information is returned for DBBEGIN, DBCLOSE, DBCONTROL, DBEND, DBINFO, DBLOCK, DBMEMO, and DBOPEN.

Table 4-2. Status Area Changes for MPE XL Applications

WORD	TurboIMAGE/V AND COMPATIBILITY MODE	TurboIMAGE/XL
5	PB-relative address of the caller.	0
6	Bits 7 - 15: Intrinsic number of called library procedure. Bits 0 - 3: Zero or access mode in which data base is opened.	No change.
7	16 bit address of the data base.	First 16 bits of the data base address.
8	16 bit address of the data set name or qualifier.	Second 16 bits of data base address
9	Value of the mode parameter.	No change.
10	PB-relative address of the library procedure or the Compatibility Mode switch stub.	0

# STATUS AREA

---

All addresses on MPE/XL are 32-bit. This has necessitated a change in some of the information returned in the status area by TurboIMAGE/XL library procedures.

## Major Differences

Because TurboIMAGE/XL uses MPE XL mapped files, DBOPEN calls HPFOPEN to open these mapped files. If an error occurs during this process, the condition code -9, formerly used to indicate an MPE GETDSEG failure, is now used to indicate an MPE XL HPFOPEN failure. DBOPEN returns the HPFOPEN status, using the following format:

Table 4-1. Condition Code -9: HPFOPEN Status

WORD	CONTENT
1	-9
2	Control Block Code DBG = 1 DBU = 2 DBR = 3 DBS = 4 DBUX = 5
3	HPFOPEN File System Error (16 bits)
4	File System Intrinsic Code

When DBOPEN is successful, words 3 and 4 still contain the word size of DBG and DBU respectively. However, since the maximum value that can be reported is 32K half words (16-bit), if the DBG or the DBU/DBR is larger than that, only 32K half words are reported in the status area. Note that although on MPE XL words are 32-bit words, TurboIMAGE/XL still returns all lengths in the status area as the number of 16-bit half-words.

For applications in Native Mode:

- On TurboIMAGE/XL, words 5 and 10 of the status area no longer contain code offsets since they are now 32-bits. Words 5 and 10 return 0.
- Words 7 and 8 now contain the 32-bit address of the database parameter

# NEW ERROR MESSAGES

---

## New Intrinsic Error Messages

---

-167	MESSAGE	Cannot begin MPE XL XM transaction: XM error <i>nn</i>
	CAUSE	The logical beginning of an MPE XL transaction failed. <i>nn</i> is the error number returned.
	ACTION	Notify HP support personnel.
-168	MESSAGE	Cannot attach <i>n</i> to MPE XL XM: File system error <i>nn</i>
	CAUSE	The data set <i>n</i> could not be "attached" to the MPE XL transaction recovery mechanism. The MPE XL intrinsic FILEINFO or FLABELINFO failed. <i>nn</i> is the file system error number returned. Refer to the <i>MPE XL Intrinsic Manual</i> for the meaning of the error message.
	ACTION	Notify HP support personnel.
-169	MESSAGE	Invalid code for XM attach options
	CAUSE	TurboIMAGE/XL internal error.
	ACTION	Notify HP support personnel.
-175	MESSAGE	Cannot attach <i>n</i> TO MPE XL XM: XM error <i>nn</i>
	CAUSE	The data set <i>n</i> could not be "attached" to the transaction recovery mechanism. <i>nn</i> is the MPE XL error number returned.
	ACTION	Notify HP support personnel.
-176	MESSAGE	Cannot detach <i>n</i> from MPE XL XM: XM error <i>nn</i>
	CAUSE	The data set number <i>n</i> could not be "detached" from the transaction recovery mechanism. <i>nn</i> is the MPE XL error number returned.
	ACTION	Notify HP support personnel.

---



# MOVING from MPE XL to MPE V

---

When moving TurboIMAGE data bases from MPE XL to MPE V:

1. Disable ILR and roll-back recovery.
2. Use the new TRANSPORT option of DBSTORE.

## Major Differences

- A TRANSPORT option has been added to the DBSTORE command. When you are transporting data bases from MPE XL to MPE V, you must use this TRANSPORT option. To do this, supply an INFO parameter as follows:

```
RUN DBSTORE;INFO="TRANSPORT"
```

- You must disable ILR before transporting TurboIMAGE/XL data bases to MPE V.

---

## NOTE

Your TurboIMAGE data base may be too large to move to the MPE V system. This is because with the expanded file size available on MPE XL (2 gigabytes), data sets can exceed the MPE V file size limit (.5 gigabytes). If you DBSTORE a data base on MPE XL using the TRANSPORT option, you will receive an MPE XL error if the data base contains a data set larger than the MPE V limit.

---

-177	MESSAGE	MPE log file is not in the same volume set as the data base
	CAUSE	MPE XL transaction recovery requires that the MPE XL user log file must reside on the same volume set as the data base.
	ACTION	Build the MPE XL user log file in the same volume set as the data base. NOTE: since all files in a particular group are in the same volume set, the MPE XL command LISTGROUP will indicate the volume set where a particular data base resides. Refer to the <i>MPE XL Commands Manual</i> for the LISTGROUP command.
-178	MESSAGE	Cannot detach <i>n</i> from MPE XL XM: File System error <i>nn</i>
	CAUSE	The data set number <i>n</i> could not be "detached" from the MPE XL transaction recovery mechanism. The MPE XL intrinsic FLABELINFO failed. <i>nn</i> is the file system error number returned. Refer to the <i>MPE XL Intrinsic Manual</i> for the meaning of the error message.
	ACTION	Notify HP support personnel.
-179	MESSAGE	Cannot begin MPE XL XM transaction for attach: XM error <i>nn</i>
	CAUSE	Before "attaching" the entire data base to the MPE XL transaction recovery mechanism, a logical beginning of a transaction is specified. The beginning of the transaction failed. <i>nn</i> is the error number returned.
	ACTION	Notify HP support personnel.
-198	MESSAGE	Total DBOPEN count/user exceeds limit
	CAUSE	The DBU index table, the DBUX, is full. This table is used to map the BaseID to the user's DBU. The DBUX holds a maximum of 127 entries.
	ACTION	Notify HP support personnel.
-199	MESSAGE	Cannot end MPE XL XM transaction: XM error <i>nn</i>
	CAUSE	The logical ending of an MPE XL transaction failed. <i>nn</i> is the error number returned. Any writes done on behalf of the intrinsic will be rolled out. NOTE this error is only possible from DBPUT, DBDELETE, or DBUPDATE.
	ACTION	Notify HP support personnel.
-208	MESSAGE	MPE error <i>nn</i> returned by FLABELINFO
	CAUSE	The MPE XL file system error <i>nn</i> was returned by the intrinsic FLABELINFO. Refer to the <i>MPE XL Intrinsic Manual</i> for the meaning of the error message.
	ACTION	Notify HP support personnel.

---

-209 MESSAGE Invalid mode for XM detach options

CAUSE TurboIMAGE/XL internal error.

ACTION Notify HP support personnel

---

-210 MESSAGE HPE error *nn* while getting log file name

CAUSE The user log file name could not be obtained, where *nn* could be:  
2 = parameter out of bounds  
7 = user must have LG or OP capability  
8 = incorrect password  
16 = lcgid does not exist

ACTION Correct condition, if possible. If not, notify HP support personnel.

---

## New DBUTIL Error Messages

---

104	MESSAGE	WARNING: user log file is not on the same volume set as the database
	CAUSE	MPE XL transaction recovery requires that the MPE XL user log file must reside on the same volume set as the data base.
	ACTION	Build the MPE XL user log file on the same volume set as the data base. NOTE: since all files in a particular group are in the same volume set, the MPE XL command LISTGROUP will indicate the volume set a where a particular data base resides. Refer to the <i>MPE XL Commands Manual</i> for the LISTGROUP command.

---

105	MESSAGE	Rollback log file must be on the same volume set as the database
	CAUSE	MPE XL transaction recovery requires that the MPE XL user log file must reside on the same volume set as the data base.
	ACTION	Build the MPE XL user log file on the same volume set as the data base. NOTE: since all files in a particular group are on the same volume set, the MPE XL command LISTGROUP will indicate the volume set a where a particular data base resides. Refer to the <i>MPE XL Commands Manual</i> for the LISTGROUP command.

---

725	MESSAGE	Switch to Nn to detach database from XM log failed: Switch error nn
	CAUSE	It is necessary to switch to Native Mode in order to "detach" the data base from the MPE XL transaction recovery mechanism. The switch failed. nn is the Switch to Native Mode error number returned.
	ACTION	Notify HP support personnel.

---

726	MESSAGE	Could not detach dataset n from XM log file: File system error nn
	CAUSE	The data set n could not be "detached" from the MPE XL transaction recovery mechanism. The MPE XL intrinsic FLABELOPEN failed. nn is file system error number returned. Refer to the <i>MPE XL Intrinsic Manual</i> for the meaning of the file system message.
	ACTION	Notify HP support personnel.

---

727	MESSAGE	Could not detach data set <i>n</i> from XM log file: XM error <i>nn</i>
	CAUSE	The data set <i>n</i> could not be "detached" from the MPE XL transaction recovery mechanism. <i>nn</i> is the error number returned.
	ACTION	Notify HP support personnel.
728	MESSAGE	Switch to NM to attach data base to XM log file failed: XM error <i>nn</i>
	CAUSE	It is necessary to switch to Native Mode in order to "attach" the data base to the MPE XL recovery mechanism. The switch failed. <i>nn</i> is the Switch to Native Mode error number returned.
	ACTION	Notify HP support personnel.
729	MESSAGE	Could not attach data set <i>n</i> to XM log file: File system error <i>nn</i>
	CAUSE	The data set number <i>n</i> could not be "attached" to the MPE XL transaction recovery mechanism. The MPE XL intrinsic failed. <i>nn</i> is the file system error number returned. Refer to the <i>MPE XL Intrinsic Manual</i> for the meaning of the file system error message.
	ACTION	Notify HP support personnel.
730	MESSAGE	Could not attach dataset <i>n</i> to XM log file: XM error <i>nn</i>
	CAUSE	The data set <i>n</i> could not be "attached" to the MPE XL transaction recovery mechanism. <i>nn</i> is the error number returned.
	ACTION	Notify HP support personnel.

TurboIMAGE/XL Status Array

Notes

## TurboIMAGE/XL Status Array

### Compatibility Exceptions:

- new negative status codes and error messages
- in CM the PB-relative address points to the TurboIMAGE/XL CM stub & not to the NM intrinsic
- in NM the database address is 32-bits long
- in NM the ~~PB-relative and DB-relative offsets~~ are NOT returned to the status array

CM4231A

\*\*\* HP CONFIDENTIAL \*\*\*

© 1987

Hewlett-Packard Company

### Notes:

- after a successful DBOPEN the DBG size (word 3) and the DBU size (word 4) is limited to 32K, but the DBU can actually be larger
- if a DBOPEN fails due to a HPFOPEN failure, a status code of "-9" is returned in word 1 with additional information in:
  - word 2 = 1 (if DBG), 2 (if DBU), 3 (if DBR), 4 (if DBS), 5 (if DBUX)
  - word 3 = HPFOPEN file system error
- status codes for the TurboIMAGE/V ILR log file are no longer returned since there is no ILR log file with TurboIMAGE/XL



TurboIMAGE/XL Status Array

Notes

### TurboIMAGE/XL Status Array

array word	TurboIMAGE/V	TurboIMAGE/XL	
	program	CM program	NM program
5	PB-relative offset of calling segment	same	0 (zero)
6	0 or open mode & intrinsic number	same	same
7	DB-relative offset of database parm	same	1st 16 bits of DB address
8	DB-relative offset of p/w,qual or dset	same	2nd 16 bits of DB address
9	mode parm value	same	same
10	PB-relative offset of Turbo segment	PB offset of stub	0 (zero)



34318 \*\*\* HP CONFIDENTIAL \*\*\* © 1987 Hewlett-Packard Company

**Notes:**

- the architecture-dependent information is returned on all intrinsic calls except a successful DBDELETE, DBFIND, DBGET, DBPUT, and DBUPDATE - these successful intrinsics return chain pointers and entry counts in words 5 to 10 *indirectly via DBX → DBU*
- the 32-bit database address points to the appropriate DBU





DBEXPLAIN & TurboIMAGE/XL Status Array

Notes

## DBEXPLAIN & TurboIMAGE/XL Status Array

### for CM programs:

- the status array is compatible with TurboIMAGE/V
- therefore DBEXPLAIN is compatible: except...
- that the PB-offset of the CM stub is returned

### for NM programs:

- the status array is not compatible: but...
- the DBEXPLAIN display is made 90% compatible
- DBEXPLAIN merges status array and DBU values
- but DBU values are only valid for the last intrinsic

CSM239C

\*\*\* HP CONFIDENTIAL \*\*\*

© 1987

Hewlett-Packard Company

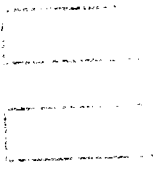
### Notes:

- for Native Mode programs *only*:

DBEXPLAIN must be called before any other TurboIMAGE/XL intrinsic is called to obtain the correct display

values from an old status array cannot be saved and used to call DBEXPLAIN at a later time

- code in the CM and NM stubs map compatible values to the status array
- DBEXPLAIN examples from TurboIMAGE/V and TurboIMAGE/XL are on the next page



12-15-11  
12-15-11  
12-15-11

12-15-11  
12-15-11



## Module 3-24 TurboIMAGE/V to TurboIMAGE/XL Migration

### DBEXPLAIN and Status Array Chalk Talk

DBEXPLAIN reflects the values passed in the status array. On TurboIMAGE/XL some of these values are too large for a 16-bit status array. Therefore, some values are stored in the DBU after each intrinsic call. DBEXPLAIN uses the 32-bit database address to locate the DBU and retrieve these values; it then merges the status array values and the DBU values together to produce as compatible a display as possible.

Below are some sample DBEXPLAINS. Indicate which display is from TurboIMAGE/V and which is from TurboIMAGE/XL, and explain why. Also identify which values were in the status array and which were in the DBU. We will discuss your answers in class.

#1.

↓ C/V  
+L  
IMAGE ERROR AT %001057: CONDITIONS WORDS=-12  
DBPUT, MODE 1, ON DATE-MASTER OF ORDERS  
DBPUT CALLED WITH DATA BASE NOT LOCKED

#2.

↑  
IMAGE RESULT AT %00000144467: CONDITION WORD = 0  
DBOPEN, MODE 3, ON STORE  
+L  
SUCCESSFUL EXECUTION - NO ERRORS

#3.

+L  
IMAGE RESULT AT %00000145307: CONDITION WORD = 0  
DBINFO, MODE 101, ON ACCOUNT OF STORE  
SUCCESSFUL EXECUTION - NO ERRORS

#4.

C/V  
+L  
IMAGE RESULT: CONDITION WORD=5349  
DBOPEN, MODE 3, ON crstiv  
UNRECOGNIZED CONDITION WORD: 5349  
OCTAL DUMP OF STATUS ARRAY FOLLOWS:  
012345 000003 000000 000000 177777 000630 000317 000637 000003 005615

#5.

+L  
IMAGE RESULT: CONDITION WORD=5349  
DBOPEN, MODE 3, ON crstiv  
UNRECOGNIZED CONDITION WORD: 5349  
OCTAL DUMP OF STATUS ARRAY FOLLOWS:  
012345 000003 000000 000000 000000 000630 000000 155697 000003 000000

11-11-11  
11-11-11  
11-11-11  
11-11-11





Module 1 Hardware Overview

Activity 1.1

1. (d) bus converter
2. answer: The computer has loaded a system and is ready for operation.
3. answer:
  - access port interface
  - power supply tests
  - temperature monitor and shutdown
  - battery back up
  - power on and power fail signals
4. (d) Cache unit
5. TRUE
6. (b) at system log on
7. (d) no fault
8. TRUE
9. FALSE
10. FALSE
11. (b) TA
12. TRUE
13. TRUE
14. TRUE
15. Run off      Check off      Fault on

1950  
1951  
1952

1953  
1954

1955  
1956

1957  
1958

1959  
1960

1961  
1962

1963  
1964

1965  
1966

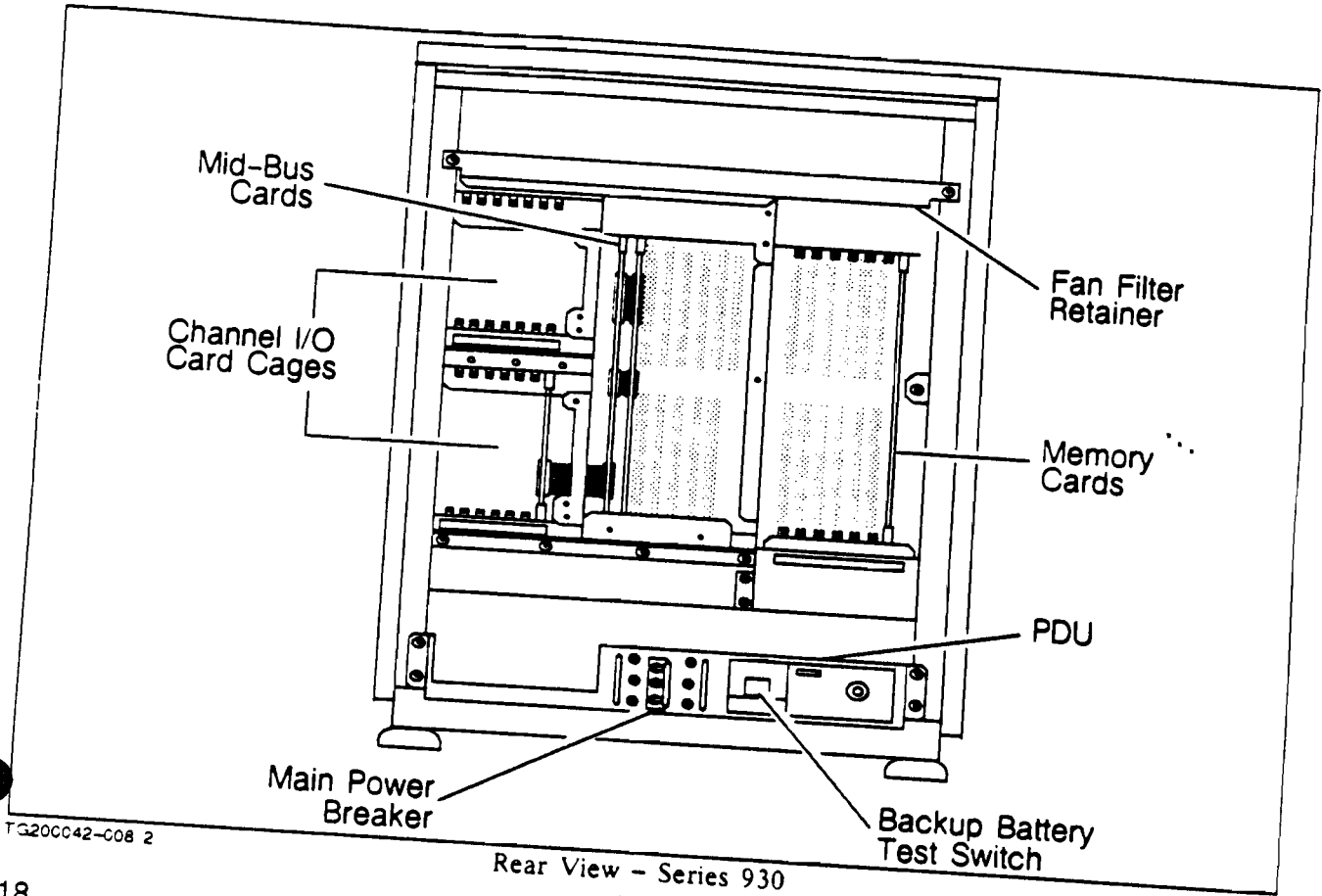
1967  
1968

1969  
1970

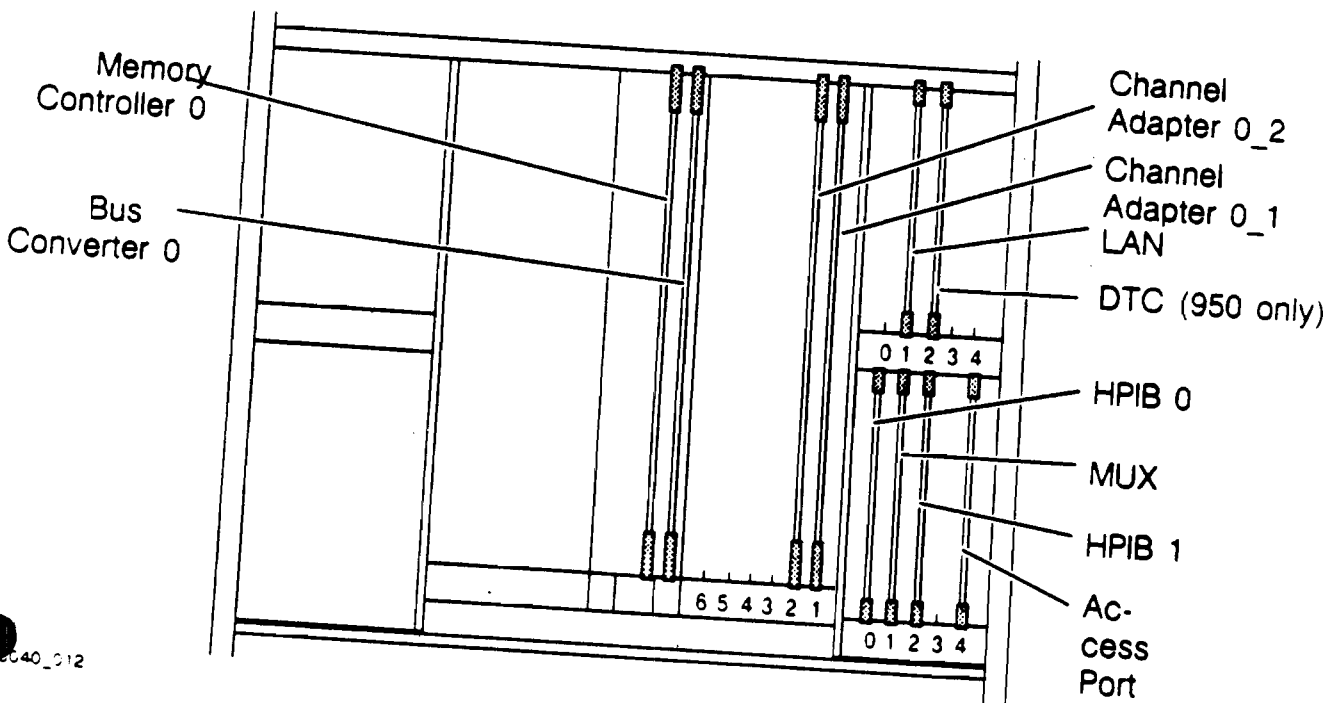
Module 1 Hardware Overview

Activity 1.

17.

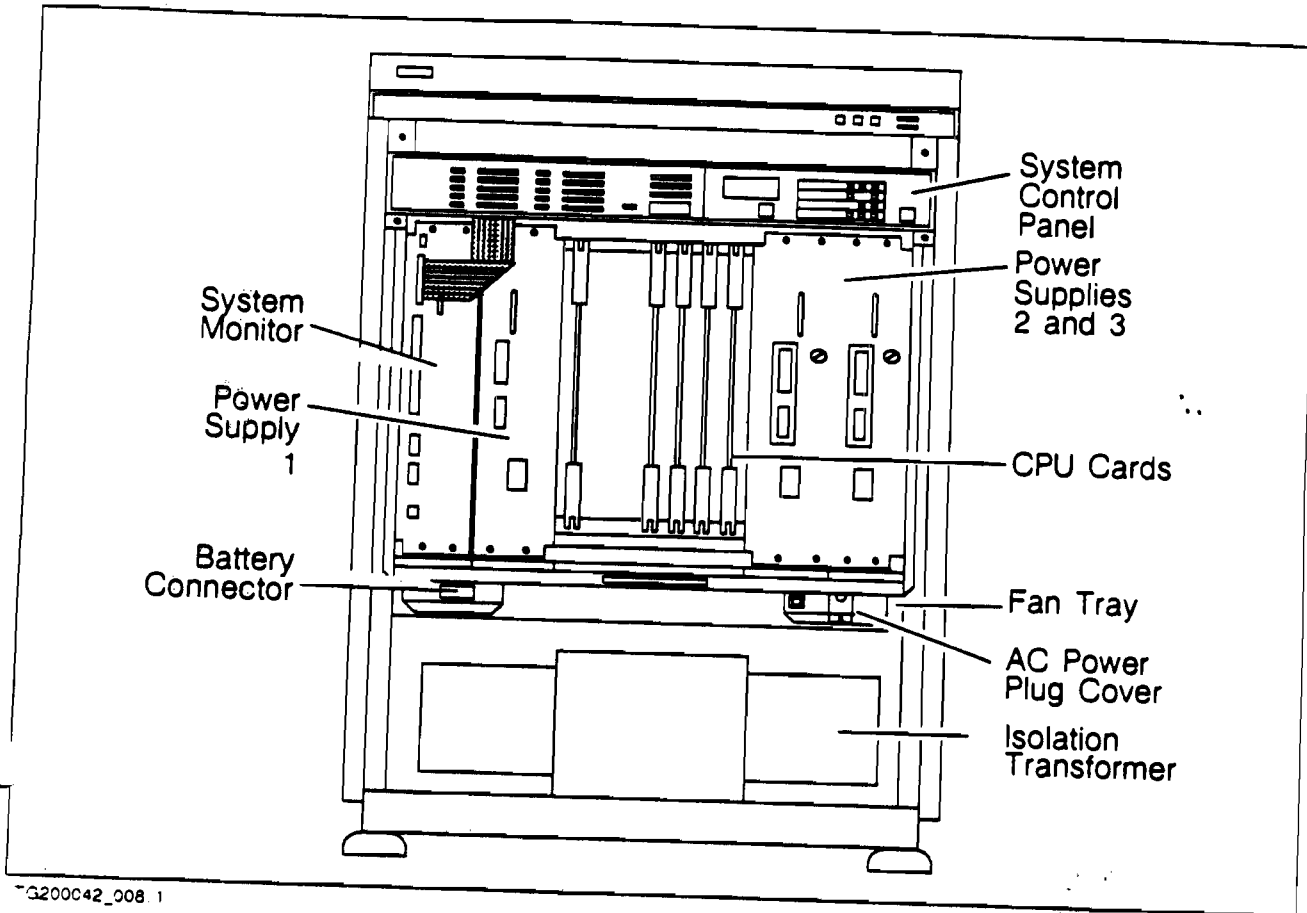


18.





16



G200042\_008.1

Front View - Series 930

Module 2 Introduction to the MPE XL Command Interpreter Activity 2.

2.

DATE:

```

setvar mo1 'January'
setvar mo2 'February'
setvar mo3 'March'
setvar mo4 'April'
setvar mo5 'May'
setvar mo6 'June'
setvar mo7 'July'
setvar mo8 'August'
setvar mo9 'September'
setvar mo10 'October'
setvar mo11 'November'
setvar mo12 'December'
setvar da1 'Sunday'
setvar da2 'Monday'
setvar da3 'Tuesday'
setvar da4 'Wednesday'
setvar da5 'Thursday'
setvar da6 'Friday'
setvar da7 'Saturday'
setvar curdate '!!da!hpday, !!mo!hpmonth !hpdate, &
19!hpyear'
setvar curtime '!curdate, !!hptimef,'
echo !curtime
continue
deletevar mo@ ,da@ ,curdate

```

3.

Filename LGON

PROMPT

OPTION LOGON

INPUT HPPROMPT , "WHAT PROMPT WOULD YOU LIKE? "

\*\*\*

:SETCATALOG LGON;APPEND

Module 2 Introduction to the MPE XL Command Interpreter Activity 2.1

1.

PUR (short for "PURGE"):

Param a=\$null b=\$null c=\$null d=\$null e=\$null &  
f=\$null g=\$null h=\$null i=\$null

purge ! a

purge ! b

purge ! c

purge ! d

purge ! e

purge ! f

purge ! g

purge ! h

purge ! i



Module 3 System Startup, Stop, Update, and DUMP

- 3. Pages 2-1/2-7 of the *MPE XL Startup/Shutdown Reference Guide* discusses the ISL commands.
- 4. DISPLAY shows the autoboot flag and the paths. LISTAUTOFL lists the contents of the autoboot file. (This command is somewhat erratic in its operation, but should be fixed for First Release.) LISTF lists the utilities available.
- 5. Use DISPLAY to obtain the current values.
  - ALTPATH 16.3.7 (changes alternate boot path).
  - AUTOBOOT - toggles the autoboot flag.
  - AUTOSEARCH - toggles the autosearch flag.

Use DISPLAY to verify the changes. Use the same commands (substitute the alternate path information you wrote down in the ALTPATH command) to return the system to its original state.
- 6. CLKUTIL displays date and time.
- 7. START NORECOVERY is the equivalent of a COOLSTART.

Appendix F

Module 2-Introduction to the MPE XL Command Interpreter Activity 2.1

4.2.4 v01/10A

Filename ME

```

ECHO .....
ECHO      IHPDATEF          !HPTIMEF
ECHO .....
ECHO      SESSION = !HPJOBNUM          LOGON TIME = !HPCONNMIN MINUTES
ECHO .....
IF !HPINBREAK <> FALSE THEN
  ECHO      USER IS IN BREAK MODE. . . .
ELSE
  ECHO      USER IS NOT IN BREAK MODE. . . .
ENDIF
ECHO .....
ECHO .....
ECHO .....
ECHO      $STDIN = !HPLDEVIN          $STDLIST = !HPLDEVLIST
ECHO .....

```

```

TUE, JUL 28, 1987          11:00 AM
SESSION = 16          LOGON TIME = 79 MINUTES
USER IS NOT IN BREAK MODE.
$STDIN = 219          $STDLIST = 219

```

# Appendix F

## Module 4 System Configuration Activity 4.1

1.

ldev (ld) [ldev = #/#,#,...] [id = product number] [type = device type] [class = classname,...] [dest = OFFLINE]	lpath (lp) [path = device path] [level = #] [manager = manager-name,...] [dest = OFFLINE]
lclass (lc) [class = classname,...] [dest = OFFLINE]	lvol (lv) [vname = volume name,...] [dest = OFFLINE]

2.

```

COMMANDS:          :SYSGEN,, SYSCOMM
                   or :SYSGEN,, SYSCOMM

SYSCOMM            LD  DEST=OFFLINE
contains:          LP  DEST=OFFLINE
                   LC  DEST=OFFLINE
                   LV  DEST=OFFLINE
  
```

3. DD ID=HP2624B. Get error "can't delete system console" but one of the other terminals is deleted. (On First Release, all of the other terminals will be deleted.)

4. DD Class=LP,PP LDEVs 6 and 19 will be deleted. (If "DD Class=LP" is entered, only LDEV 6 will be deleted until you enter it again. Fixed on First Release.) (KPR 4700-460105: "DD Class=", "DD ID=", "DD Type="deletes one device at a time.")

5. "DD CLASS=DISC" gives these error messages but LDEV 14 was deleted.

```

**error**      can't delete system disc
**error**      ldev 2 is configured as a system volume, it can not be deleted.
**error**      ldev 3 is configured as a system volume, it can not be deleted.
**error**      ldev 4 is configured as a system volume, it can not be deleted.
  
```

Module 3 System Startup, Stop, Update, and DUMP Activity 3.3

S.A. VIVITOA

1. Check the lights on the front panel. "Remote Enabled" and "Console Enabled" will be on if the Access Port is enabled.
2. Press the "Console" button on the front panel and enable access at the CM prompt.
3. Control-B ER enables remote access. Single access means there are no retries if the password is incorrect. Multiple access means you may specify the number of retries.
4. Control-B CA will list the support modem port configuration and allow it to be changed.
5. Dial-in and issue the password.
6. Issuing a BREAK key will allow the remote console to type on the terminal.
7. For the Console to issue commands again, the BREAK key must be pressed.
8. CO
9. Yes, the remote user uses the same command to get a console session but not to get a DTC session.
10. DR
11. DI (to disconnect) or SE to go through the DTC. In what way does this limit the remote user? If DI is chosen, he is logged off; if SE is chosen, he may not issue any Control-A or Control-B commands.
12. When the CM > TC command is issued, an AP self-test is initiated and all messages from it will be displayed on both terminals.
13. The master terminal, when a self-test was initiated, will remain the master terminal.
14. TC performs a non-destructive self-test; RS performs a destructive self-test. Always use TC when taking a memory dump.
15. Control-B RS and START at the ISL prompt will start up the system from the remote console.
16. No answer required.

Module 4 System Configuration

Activity 4.2

4. Make all the additions and changes permanent in your configuration group.

```

HELLO nn.MANAGER.SYS
SYSGEN CONFIGXX
sysgen> KE CONFIGnn
sysgen> BA CONFIGnn
system> IO
io> AD 2 8.0.1 HP7935
io> AP 16 HP19744
io> AP 16.0 HP27110
io> AD 3 16.0.0 HP7935
io> AD 4 16.0.1 HP7935
io> AD 5 16.0.2 HP7935
io> AD 6 16.0.3 HP7935
io> AD 8 8.2.2 HP7978
io> AP 16.1 HP27110
io> AD 9 16.1.0 HP7978
io> AD 11 8.2.7 HP2688
io> MD 20 HP2392A TERM
io> AV MEMBER2.2 DISC
io> AV MEMBER3.3 DISC
io> AV MEMBER4.4 DISC
io> AV MEMBER5.5 DISC
io> AV MEMBER6.6 DISC
io> HO
io> LP
io> LD
io> LV
io> EX
sysgen> KE
sysgen> EX

```

1. Press the "Control" button on the front panel of the Access Point to enter the configuration menu.

2. Press the "Control" button on the front panel of the Access Point to enter the configuration menu.

3. Control-B or Control-C will list the system program.

4. Control-B or Control-C will list the system program.

5. Issue a BREAK key will allow you to enter the system.

6. For the Console to issue commands again, the ESC key must be pressed.

7. Yes, the remote user uses the same command to enter the session.

NOTE: The AVOL command is only looked at on the first START after an INSTALL. If there is an installation convenience use VOLUTC to add volume sets for both system and non-system domain.

5. Paths would be shown as 2/4.X.X and 2/8.X.X since the Series 950 uses Channel Adapter slot numbers 1 and 2 instead of 2 and 4. (MID\_BUS 0 is always shown as "2/" while MID\_BUS is shown as "6/").



1. Fill in the I/O worksheet using information obtained from the I/O Hardware Interconnection diagram. Choose your own LDEV numbers. (See Worksheet and Diagram answers.)
2. Log on as MANAGER.SYS and set the base configuration group to CONFIGXX. Make a copy of the group in account SYS and call it CONFIGnn where nn are your initials.

---

**CAUTION**

DO NOT USE CONFIG.SYS!

---

3. Set the base configuration group to your new group and add all the devices to it that you listed on the I/O worksheet. Use default values for all but the necessary parameters. Remember to make entries in the volume table for the discs. Verify all additions.

**Note:** Some devices are already configured.

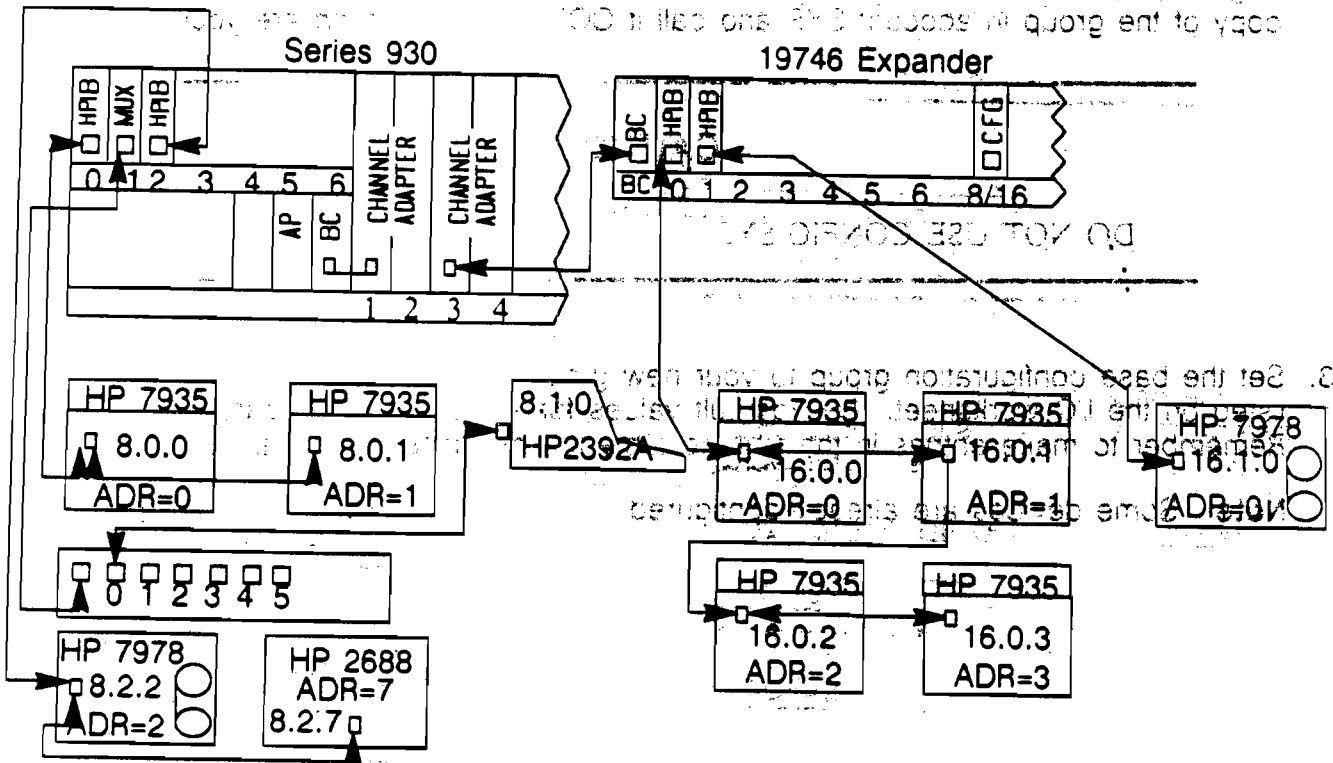
20081	20081
S=FQA	S=FQA

20081	20081
S=FQA	S=FQA

Module 4 System Configuration

Activity 4.2

I/O Hardware Interconnections



Module 4 System Configuration

Activity 4.2

Activity 4.2

Ldev	Channel Adapter Slot Number	Path		Device Address	Device ID
		MID BUS Module #	Device Adapter Slot Number		
1	2	8	0	0	HP7935
2	2	8	0	1	HP7935
3	4	16	0	0	HP7935
4	4	16	0	1	HP7935
5	4	16	0	2	HP7935
6	4	16	0	3	HP7935
8	2	8	2	2	HP7978
9	4	16	1	0	HP7978
11	2	8	2	7	HP2688
20	2	8	1	0	HP2392A

TG200079\_032

© 1987 Hewlett-Packard Company

LDEVs 1, 7 and 20 are on the system, since they can't be deleted.

The answers on the worksheet above assume that the tape drive on path 8.2.2 is in addition to LDEV 7.

All LDEV numbers except 1, 7 and 20 are strictly your choice.

DTS Review Answers

- 1. B
- 2. D
- 3. D
- 4. A
- 5. E
- 6. C, D, E
- 7. DTC#, TERMDISM DTC command card#, 0-5  
part# 0-7 or 0-5
- 8. A, B, C, E
- 9. E
- 10. Refer to slide

Case	Slot Number	Channel Address	Module #	Device
1	2	2	1	1
2	2	2	1	1
3	4	4	16	0
4	4	4	16	0
5	4	4	16	0
6	4	4	16	0
7	4	4	16	0
8	4	4	16	0
9	2	2	1	1
10	2	2	1	1

All LDEV numbers except 1, 2 and 30 are strictly your choice.

The answers on the worksheet above assume that the tape drive on pair 16, 0 is LDEV 7.

LDEVs 1, 2 and 30 are of the system, since they can't be deleted.

# Appendix F

## Module 4 System Configuration

### Activity 4.3

1. :SYSGEN  
sysgen> MI  
misc> SH  
misc> EX  
sysgen> LO  
log> SH  
log> EX  
sysgen> SY  
sysfile> SH  
sysfile> EX
- 2 & 3. sysgen> MI  
misc> JO maxlimit=10  
misc> SE maxlimit=32  
misc> HO  
misc> EX
4. sysgen> LO  
log> SL ON=100 OFF=101, 111, 116, 150  
log> HO  
log> EX
5. sysgen> MI  
misc> SP 3072 50  
misc> HO  
misc> EX
6. sysgen> SY  
sysfile> RS MAKECAT.PUB.SYS GENCAT.PUB.SYS  
sysfile> HO  
sysfile> EX
7. sysgen> MI  
misc> SY .WELCOME\_TO\_MPE\_XL  
misc> HO  
misc> EX  
sysgen> KE CONFIGnn  
sysgen> EX



Module 7 Volume Management

Activity 7.1

Many solutions are possible as long as the conditions specified are met. Here is one:

- Two volumes :PAYROLL:MEMBER1 and PAYROLL:MEMBER2
- One class :PAYROLL:SECURED containing volume MEMBER2
- Account PAYROLL with minimum capabilities of AM, SF, ND, UV, CV, IA, BA
- User MGR with PUB home group on system volume set. Minimum capabilities of AM, SF, ND, UV, CV, IA, BA. Default access rights on PUB.
- User USER with DATA home group on PAYROLL volume set. Minimum capabilities of SF, ND, UV, IA, BA.
- Group DATA on PAYROLL volume set with access rights: (R,W,A,L:AC;X;S:GU).
- Group SECURE on PAYROLL volume set with access rights: (R,W,A,L:AC;X;S:GU).
- Did everyone see a volume in each of the five states (UNKNOWN, MASTER, MEMBER, LONER, SCRATCH)?
- Was everyone able to dismount a pack in an orderly manner and then remount it?

Module 10 TurboIMAGE/V to TurboIMAGE/XL Migration Activity 10.1

1. False
2. a) DISABLE ILR on any enables databases
- b) STORE/RESTORE TurboIMAGE/V applications
- c) ENABLE ILR, if desired
- d) Run programs in CM with TurboIMAGE/XL intrinsics
- e) OPTIONALLY, continue migrating source code to NM
3. a) DISABLE ILR, if it is enabled
- b) Check database file sizes if capacities have been increased on MPE XL  
*Checking file sized before attempting the STORE may save time since you may end up STOREing several files before hitting one that is too large.*
- c) STORE database;TRANSPORT/RESTORE  
*NOTE: There is no TRANSPORT option on RESTORE.*
- d) ENABLE ILR, if desired
4. False "Default" mode uses the MPE XL Transaction Management (XM) service which guarantees structural integrity.
5. False  
*XM rollback interrupted intrinsics.*
6. False  
*XM recovery is performed when the volume set is mounted or, if it is the system volume set, when the system is booted.*  
*ISL> START RECOVERY is for recovering JOBS and SPOOL files.*
7. True  
*It is the highest performance, highest risk, mode of operation on both operating systems.*  
*Differences are internal. Performance characteristics in relation to buffer size are different. Smaller buffers may provide better performance on MPE XL while larger buffers may provide better performance on MPE V/E.*
- True  
*Other than this new requirement, User Logging on MPE XL is essentially the same as it is on MPE V/E.*



1977

Activity 101

acid formed by the acid...

MEGAM

## Appendix F

### Module 10 TurboIMAGE/V to TurboIMAGE/XL Migration Activity 10.1

9. TURBODBS.PUB.SYS system control block  
dbnameGB.dbgroup.dbaccount global control block and buffer control block

10. True

*TurboIMAGE/XL limit is 127*

*TurboIMAGE/V limit is 63*

## Appendix F

### Module 11 HP SQL/V to HP SQL/XL Migration

### Activity 11.1

1. Yes a query can select data from more than one table, and with HP SQL/XL, queries can return up to 1024 columns while tables are limited to 256 columns.
2. On HP SQL/XL, the STARTDBEMON and CLEANDBE commands are done automatically when HP SQL determines that an abnormal termination has occurred.
3.
  - a. You must specify an EXTERNAL UNLOAD when generating the unload and load command files with SQLGEN.
  - b. You can now check the SQLDA for the length of a row returned from a dynamic query.
4.
  - \*a. Schema generating tool.
  - \*b. Copying one user's database tables to another user.
  - \*d Migration tool.
  - \*e. Checking the authorities granted on a DBE.
5. You will get an error message and HP SQL/XL will not be able to load the data. Since the format of the data is incompatible between HP SQL/V Release 1 and HP SQL/XL, an internal unload is not possible.
6.
  - a. RUN SQLGEN/V to generate schema and data load/unload command files.
  - b. Unload data by running ISQL/V and "starting" the unload command file.
  - c. STORE the command files, data files, and application programs.
  - d. RESTORE the command files, data files, and application programs.
  - e. Recreate the DBE by running ISQL/XL and "starting" the schema generation command file.
  - f. Load data into the new DBE by running ISQL/XL and "starting" the load command file.
  - g. Preprocess, compile and link the application programs on MPE XL.
7. You must ALWAYS reprocess, recompile and relink application programs during migration from HP SQL/V to HP SQL/XL, even if no changes were made to the program.
8. A view.