FOXBORO®

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REV H

I/A Series®
System Operations Guide

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Preface

This document describes components of the I/A Series System that are pertinent to basic system operations and provides procedures for those operations. It should be read by all those who use the system, whether they are operators, engineers, programmers, or general plant personnel. Read the I/A Series document *Hardware Descriptions* to obtain an overview of system components and how they relate to one another.

The document contains information on operating environments, using the equipment, bulk storage operations, and system startup and shutdown. It also contains information on file utilities.

Revision Information

For Release 6.0, the following changes were made to this document:

Throughout the manual there are miscellaneous editorial revisions.

Section 1. Introduction

Added references to: GE Controllers, Micro-I/A Station, and SINGLE STATION MICRO Controllers.

Section 2. Operating Environments

Added material for FoxView.

Section 3. Workstations and Processors

Added material for FoxView.

Section 8. File Utilities

Added procedures for using FoxView.

Reference Documents

Depending on the file server (AP50, AP51, AW50, AW51, AP10, or AP20), knowledge of either UNIX or VENIX commands for use in the VT-100 mode is useful for performing backup procedures, checking files, and so on. Use DOS commands for Windows on I/A Series applications. See the following reference documents for information on Foxboro and Sun software:

- *SunOS Documentation Tools*
- *SunOS User's Guide*
- *SunOS Reference Manual*
- *Solaris 2.2 Advanced User's Guide*
- *Solaris 2.2 Advanced User's Guide to System and Network Tasks*
- *System and Network Administration*

- *Solaris 2.4 Advanced User's Guide*
- Complete AP51, WP51, AW51 (B0193VA) Solaris (Tab) contains extracts from:
  - *Solaris 2.4 Advanced User's Guide*
  - *Common Administration Tasks*
  - *File System Administration*
  - *TCP/IP Network Administration Guide*
- *SunPC Commands Guide*
- *SunPC Version 4.1 for Solaris 2 User's Guide*
- *VENIX User's Guide* (B0193BY)
- *VENIX User Reference Manual* (B0193BV)
- *System Administration Guide for 50 Series Systems (Solaris 2.X)* (B0193ND)

1. Introduction

The *System Operations Guide* presents information on the components of the I/A Series System and procedures for basic system operation. The equipment available at an I/A Series System site may vary from a single Application Workstation (AW) or a single node of stations and peripherals communicating on a nodebus, to multiple nodes of equipment communicating via Carrierband LAN and/or fiber optic cabling.

Although sites vary, as a typical system user you can operate or use some or all of the following types of equipment:

- Applications Processor (AP), Control Processor (CP), Workstation Processor (WP), Application Workstation (AW), Panel Display Processor (DP), Hydrostatic Tank Gauge Processor (TP), Communication Processor (CMP)
- Gateways, controllers and interfaces, such as the: Instrument Gateway (IG), Allen-Bradley Data Highway Gateway (AB), Modicon Gateway (MOD), Foreign Device Gateway (FDG), SPECTRUM Slave Gateway (SSG), SPECTRUM Interface Processor (SIP), SPECTRUM Master Gateway, SPECTRUM Control Integrator, SPEC 200 Control Integrator, Information Network Interface (INI15), Carrierband LAN Interface (CLI), Hydrostatic Tank Gauge Interface Unit (HIU), Integrator 30 Gateways (Allen-Bradley, Device, INTERSPEC, Modicon), Allen-Bradley Station, GE Controllers, SINGLE STATION MICRO Controllers
- Modular Industrial Workstation (MIW) and Modular Industrial Console
- Personal Workstations (PWs)
- Touchscreen
- Mouse, trackball, or industrial pointing device
- Annunciator, Annunciator/Numeric keypanel
- Alphanumeric keyboard
- VT-100-compatible terminal (system terminal)
- Various printers (dot-matrix, line, ink-jet)
- Various bulk storage devices (tape drive, floppy drive, hard disk drive, CD-ROM drive)
- Fieldbus Modules
- Fieldbus Processors
- Field Automation Subsystem Micro-I/A Station
- 70 Series Workstation Processor (WP70)

You can interface with intelligent field devices such as the 820/860 Series Intelligent Transmitters, Intelligent Differential pressure Transmitters, Intelligent Electrochemical Transmitters, RTT10/RTT20 Temperature Transmitters, IMT Magnetic Flowmeters, CFT10 Mass Flowmeter, 931D Gas Chromatograph, HTG/HIU, Vortex and Intelligent Vortex Transmitters.

Following is a summary of workstations and processors that may be found at your site.

Module	Style	Function
A-size Module	Style A	Application Processor 50 or 51 Application Workstation 50 or 51 1.3 GB Hard Disk Drive Workstation Processor 50 or 51
B-size Module	N/A	Data storage devices
C-size Module	Style B	Application Processor 51 Application Workstation 51 Workstation Processor 51 Model 51 X Terminal
	Style B1	Application Processor 51 Application Workstation 51 Workstation Processor 51
	Style C	Application Workstation 51
X-Module	N/A	Control Processor 10 Streaming Tape and Dual Floppy Disk Drives Various Gateways
Z-Module	N/A	Application Processor 20 Communications Processors 10, 15, 30 Control Processor 30, 40 Workstation Processor 30 Various storage and interface modules such as Dual Nodebus Interface and 120 MB Hard Disk Drive Various integrators such as Integrator 30 for Modicon
Y-Module	N/A	Fieldbus Module
WP70	N/A	Workstation Processors running the Windows NT Operating System

The following figures show typical devices that may be found at your site.

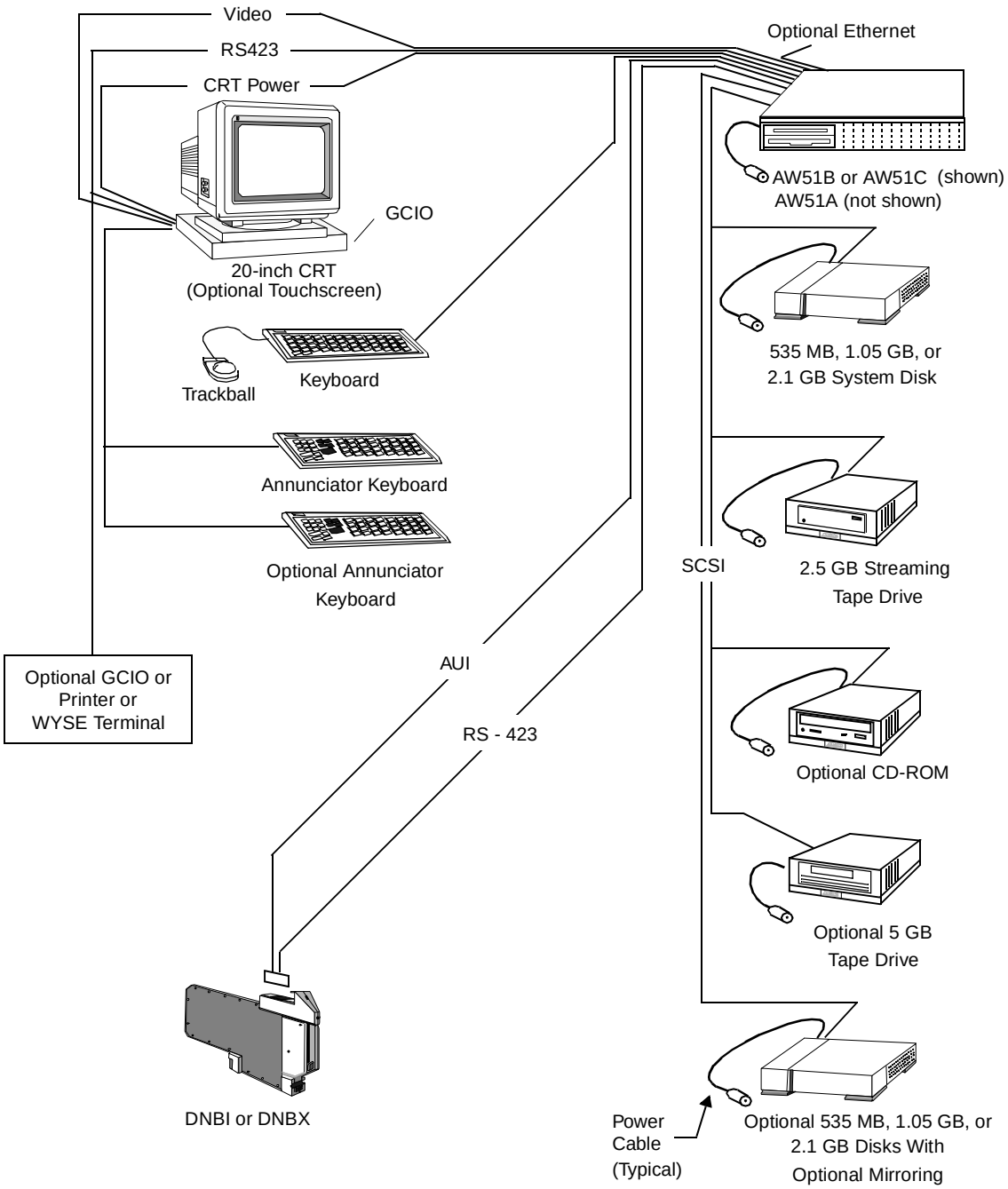


Figure 1-1. Typical Application Workstation 51 with Associated Devices

If you are using a Modular Industrial Workstation (MIW) or Modular Industrial Console (MIC), processors and data storage devices may be installed so that you access them from the rear of the unit. The following figure shows typical AW51 Style B or Style C processors with their diskette drives.

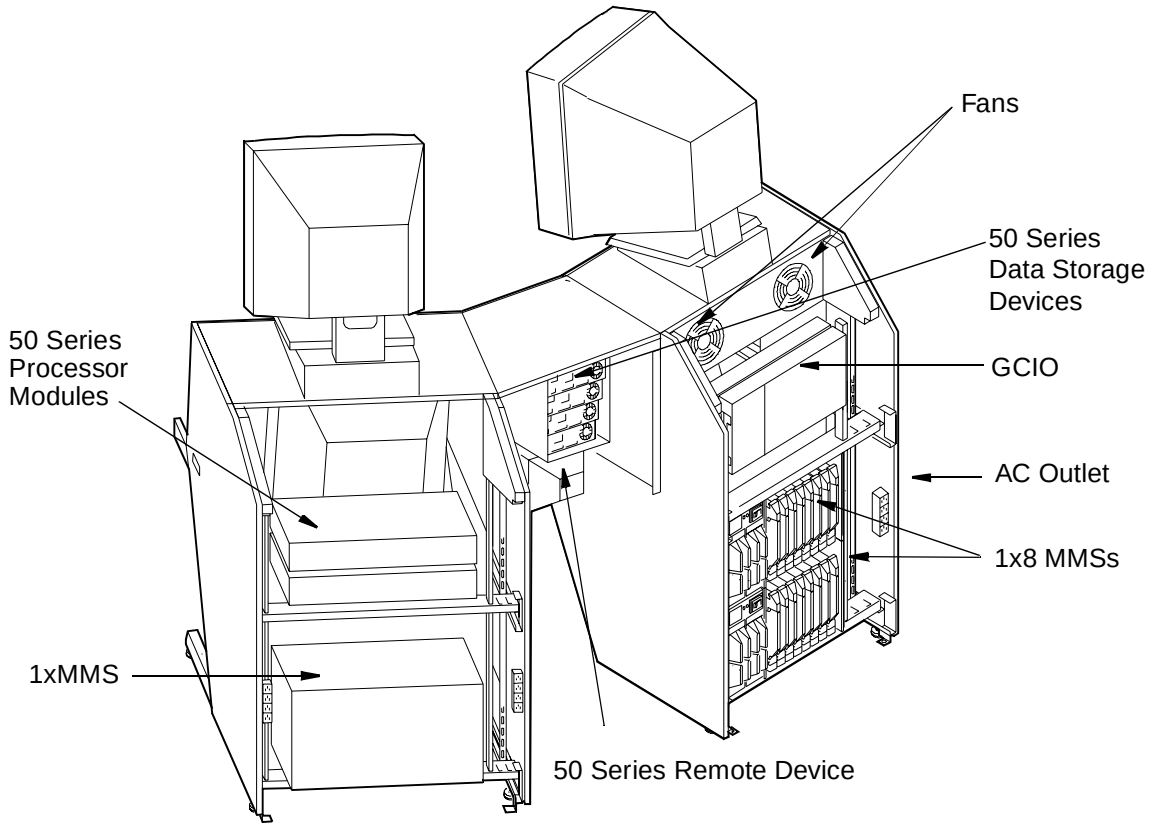


Figure 1-2. Typical MIC Bay (Rear View)

As a system user, you can perform typical system operations tasks such as:

- Using the various types of equipment, such as workstations, printers, and bulk storage devices.
- Printing display screens.
- Viewing a list of the compounds and blocks in the control database for each AW or CP; viewing block detail displays.
- Performing file maintenance and using file utilities (such as format disk, file copy and move, file transfer between APs, file delete).
- Performing software diskette backup.

While some system operations tasks, such as using file utilities and printing display screens, should be available to any system user, other system operations should be performed by authorized personnel only. Restricted operations include the backup and restore of system files.

Operating Prerequisites

Prior to using the procedures in this document, ensure that the hardware is installed and is up and running. All software should be installed, databases should be in place, and the process control and application package configurators should be implemented. Specific software will vary from system to system based on operating tasks assigned to that system. For example, if your workstation is set up for use by process operators only, it may lack configurator software.

Before a process can be monitored or controlled, the control scheme must be implemented via the various configurators. The Integrated Control Configurator or FoxCAE is the starting place for scheme implementation. Through the configurator, compounds, blocks, and their parameters are defined. Limits are set on parameters, parameters to be alarmed are defined, elements for which historical data is to be gathered are specified.

If there are Annunciators or Annunciator keyboards, they must be configured using workstation alarm management and/or FoxPanels software. Selections for gathering historic data are done through the Historian. Display building software and other configurator software is used to develop displays for your site. Your interface to the system and the process is through displays that are described in this document and in the document *Process Operations and Displays*.

2. Operating Environments

An operating environment represents any collection of programs, utilities and displays grouped functionally according to the users and the tasks they perform. Foxboro provides a standard set of operating environments that can be modified to represent your site requirements. The process operator, process engineer, and plant manager can each be assigned a specific operating environment that defines the tasks performed by and the databases and functions accessible to that user.

The default screen in the I/A Series system display hierarchy is the software title page. The menu bar for the Initial Environment appears horizontally at the top of this screen.

In the menu bar for each environment, selectable buttons determine the tasks you can perform (see Figure 2-1 below). Clicking some of these buttons displays pull-down menus listing selectable software and functions while clicking others takes you directly to an application display.

NOTE: Depending on your system configuration, the pull-down menus associated with the environment menu bars may vary.

For an AP10/20/50 or WP10/20/50 or AW/WP50, Figure 2-1 shows you how to access any of the standard environments by selecting **SYS** (System) from the menu bar, then **Change_Env** (Change Environment) from the **Sys** menu. The **Change_Env** menu lists the standard environments for your system. Select **Sys** in any environment to change to another environment.

Some environments may have been password protected by plant management to secure the environments against unauthorized use. Also, some menu entries may be disabled based on the current environment or because the Display Manager for WP/AW 51 is displayed remotely.

For further information on environment configuration, see the documents *Workstation Configuration* and D*isplay Engineering for 50 Series Stations.*

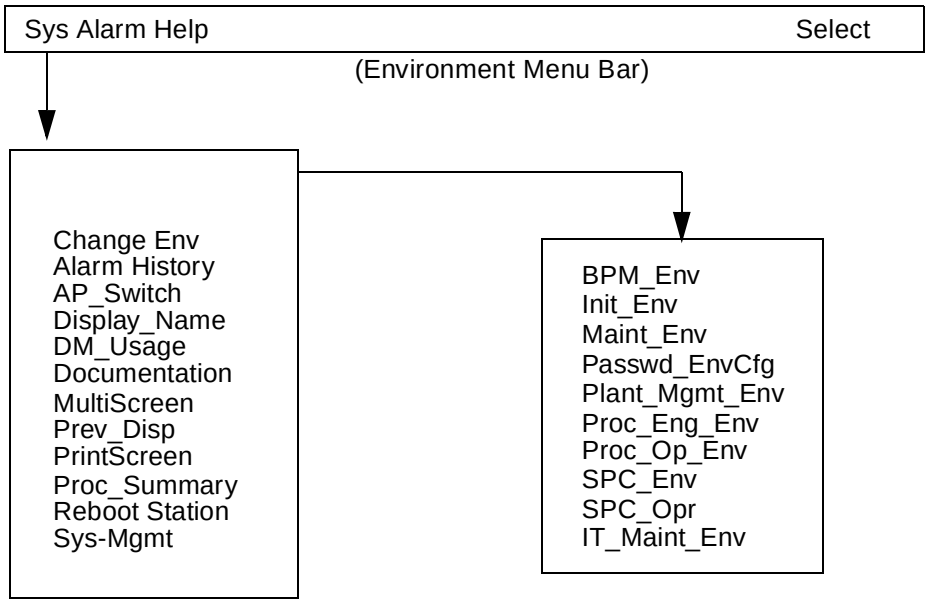
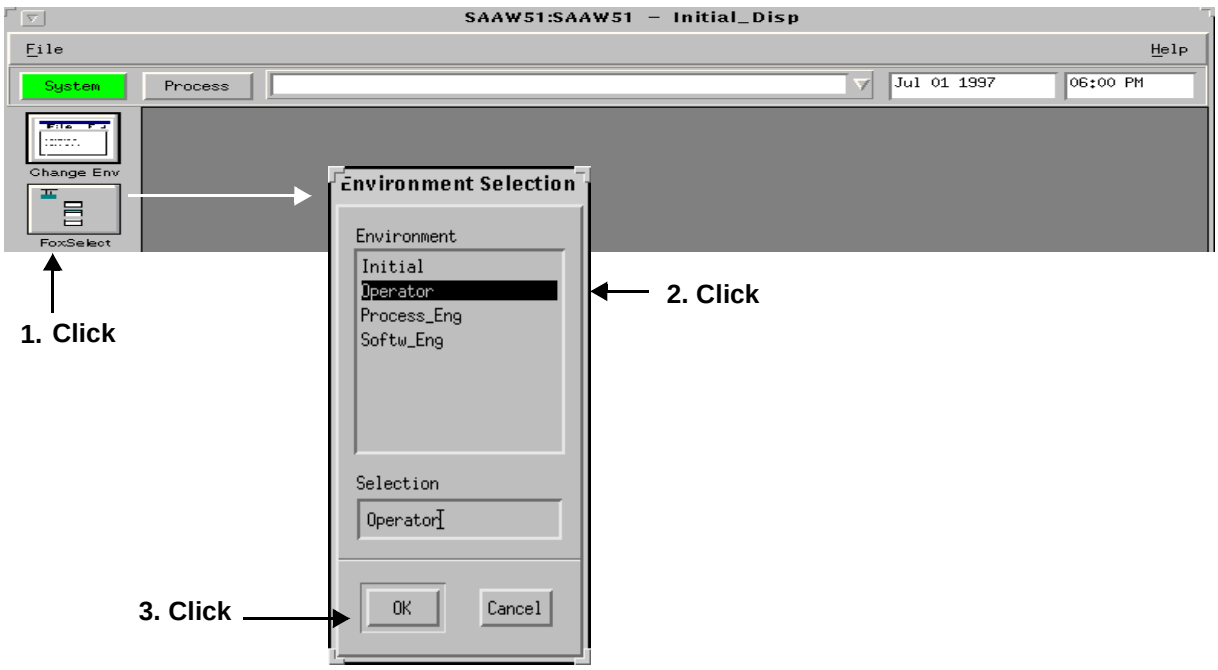


Figure 2-1. AP/WP10/20, AP/WP50 Initial Environment Menu Bar with Typical Pull-Down Menus

For Model 51 stations, use the FoxView display and either click the **Change Env** icon, or click **File**, then move the cursor to **Change_Env**.



Standard Environments

Foxboro provides a standard environment configuration for your system. For Model 51 stations, use the FoxView online help available from the initial I/A Series screen for information on environments.

For AP10/20/50 or WP10/20/50, the **Change_Env** menu lists the names of these standard environments:

BPM_Env	Batch Plant Management
Init_Env	Initial Environment
Maint_Env	Maintenance Environment
Passwd_EnvCfg	Password and Environment Configurator (not on 50 Series stations)
Plant_Mgmt_Env	Plant Manager's Environment
Proc_Eng_Env	Process Engineer's Environment
Proc_Op_Env	Process Operator's Environment
Softw_Eng_Env	Software Engineer's Environment
SPC_Env	Statistical Process Control Environment
SPC_Opr	Statistical Process Control Operator's Environment
IT_Maint_Env	Intelligent Transmitter (IT) Maintenance Environment

Table 2-1 lists the menu bar fields for the standard environments. Plant management can change the standard environments by using the Password and Environment Configurator.

Table 2-1. Menu Bar Fields for Standard Environments

Environment	Menu Bar Fields
Batch Plant Management	**Sys, Alarm, Help, BPM, BPMSys, Select**
Initial	**Sys, Alarm, Help, Select**
Maintenance	**Sys, Alarm, Help, Disp, Select**
Password and Environment Configurator	**Sys, Alarm, Help, UtlCfg, Select (WP20/30 and PW only)**
Plant Management	**Sys, Alarm, Help, Tools, Select**
Process Engineer's	**Sys, Alarm, Help, Config, Disp, Disp_1, Disp_2, SftMnt, AMS, Select**
Process Operator's	**Sys, Alarm, Help, Disp, Disp_1, Disp_2, AMS, Select**
Software Engineer's	**Sys, Alarm, Help, Config, Disp, SftMnt, Select**
Statistical Process Control Engineer	**Sys, Alarm, Help, SPCcfg, SPCopr, Select**
Statistical Process Control Operator	**Sys, Alarm, Help, SPCopr, Select**
Intelligent Transmitter Maintenance Environment	**IT_Mnt**

Environment Menu Bar Fields

Selectable fields in the standard environment menu bars are:

Alarm On the WP20/30, WP/AW50, and PW workstations (excluding WP10) Alarm accesses the latest process alarms in order of priority on the Current Alarms Display (CAD). From this display you can select the Top Priority Alarm Display and the Alarm History display. On WP51s and AW51s (as of Release 4.2) with multiple Display Managers (DMs) and multiple Alarm Managers (AMs), each instance of a DM can access the same set or different sets of Alarm Displays. The initial default display is the Current Alarm Display. When a process alarm occurs, the Alarm field changes from green to blinking red. Blinking indicates the alarm is unacknowledged. See the document *Process Operations and Displays.*

AMS On the AP, WP, AW this field accesses Analyzer Management Software which integrates the 931D Process Gas Chromatograph into the I/A Series system.

BPM Provides access to Batch Plant Management. Ingredients and instructions for batch processing are coordinated with control processes via BPM. **BPM** is not available on an AP50-hosted WP.

BPMSys Starts a particular BPM application. Before selecting BPM, you must select **BPMSys**. BPM is not available on an AP10-hosted WP.

Config Displays a pull-down menu from which you can access configuration software and other software for the system. See “Config Menu Definition” on page 13.

Disp Accesses a pull-down menu listing directory submenus d1, d2, d3, and d4 from which you can access user graphic files. See “Disp Menu Definition” on page 17.

Disp_1
Disp_2
Disp_3
Disp_4 Disp_1, 2, 3 or 4 accesses a pull-down menu listing graphic display files.

Help Provides menus and text on the screen with information for the procedures and tasks that you are currently performing. Not all application subsystems and programs have available Help.

Select Displays the Compound and Block Selection display which is a live display showing all compounds and blocks in the system accessible to the WP. The compound menu includes the compound name, On/Off status, and the current alarm priority (ALMLEV). The block menu includes the block name, block type, A/M status, and current alarm priority. The Select Screen also allows you to turn a compound or group of compounds on or off. Detail displays, which provide relevant parameter data for the selected compound or block are accessible from the Select display. See “SELECT Screen (Compound/Block Overview)” on page 48 for additional information.

SftMnt Displays a pull-down menu from which you can access the VT-100 environment and other software maintenance tools. See “SftMnt Menu Definition” on page 18.

Sys Displays a pull-down menu from which you can access system functions. See “Sys Menu Definition” on page 11. When this field is red, it indicates a system fault condition (either a system hardware problem or a network communication hardware problem). If blinking, it indicates an unacknowledged change of state. See the *System Management Displays* document.

SPCcfg Provides access to the Statistical Process Control configurator for configuring charts and printing a configuration report.

SPCopr Provides access to Statistical Process Control operations. You can display the configured charts, chart calculations, and point information as well as print any screen display.

Tools Displays a pull-down menu from which you can access software useful for plant management functions. See “Tools Menu Definition” on page 20.

UtlCfg Displays a pull-down menu from which you can access the Password and Environment Configurator. See “UtlCfg Menu Definition” on page 20. (Not available on 50 Series systems.)

Sys Menu Definition

The **Sys** (System) menu contains the following selections:

AlarmHistory Displays a history of plant/process alarms on your screen. See the document *Process Operations and Displays*.

AP_Switch Allows a WP20 or WP30 to automatically switch to a designated backup AP to access process display files if its host AP fails. See “Workstation Process Display Backup on WP20/30” on page 44.

Change_Env Displays a submenu that gives you access to one of the standard environments or user-defined environments.

Display_Name Displays the complete name of the most recent display in the upper left corner of the screen in the message line.

DM_Usage Appears on a WP51 or AW51. It invokes a display that allows you to select and activate/deactivate DMs in various windows. See “Invoking the DM_Usage Display” on page 56.

Documentation Displays a menu of all I/A Series loadable electronic documentation categories (submenus) from which you can select the document you

want. (FoxDOC is available for systems or stations having a CD-ROM.)

- Maintenance
- Installation
- Operation
- Engineering

MultiScreen Accesses the Multi-Screen Overlay. This overlay displays the physical orientation of the screen cluster. From this overlay, you can redirect displays, reassign the mouse (WP20/WP30), and switch between multi-screen and single station modes. See "Multi-Screen Workstation" on page 38.

Prev_Disp Returns you to where you were previously in the display hierarchy.

PrintScreen Captures and prints a screen image. A number of screen images can be queued for printing. The maximum number of images is dependent on the complexity of the images. This is an alternative to the <Ctrl> <PrtScr> function. See "Print Screen Function" on page 42.

Proc_Summary Accesses the Process Summary Reporter. It allows you to reconfigure a file listing the status of a set of compounds and blocks, make additional selections, and generate a report of the control state of those compounds and blocks that are in an exception condition (for example, in alarm, in manual, not on control). See the document *Process Summary Report Configurator*.

Reboot_Station Gives you access to the Reboot function. Should you need to restart your workstation, select Reboot. This is not available on the personal workstation.

Sys_Mgmt Gives you access to System Management. You can then monitor the health and performance of all components of the configured system and intervene in local network operations. See the document *System Management Displays*.

Update_Lights Allows you to reset the annunciator lights associated with a WP (not WP10) according to the information in the Alarm Alert internal state table located in the WP. This option is primarily used to restore the state of the annunciator lights after a loss of power to the annunciator panels. (When the WP is rebooted, the Alarm Alert internal state table is not preserved.) After power is restored, wait at least 30 seconds to allow the panels to initialize before selecting Update_Lights. Prior to invoking this command, call up a display other than the Current Alarm Display.

Config Menu Definition

The standard Config (Configuration) menu provides the following selections:

AlarmPanel_Cfg Accesses the Alarm Panel Configurator. You can assign a display or program to be invoked when a specific alarm panel key is pressed (WP20/30, PW only). See the P*rocess Alarm Configuration* document.

AlarmTable_Cfg Accesses the Alarm Table Configurator. You can assign control blocks to annunciator panel keys, which causes the annunciator LED/key associated with the block in alarm to light. When used with the AlarmPanel_Cfg, it also allows you to preselect the display that you want for interaction when a plant/process alarm occurs (WP20/30 or PW only). See the *Process Alarm Configuration* document.

AnnunciatorCfg Accesses the Annunciator Configurator on WP/AW51 workstations for configuring displays, programs, commands to annunciator keys and compound:blocks to annunciator lights. It also provides horn configuration options. See the *Workstation Alarm Management* document.

AMS Accesses the Analyzer Management Software and allows you to interact with 931D Process Gas Chromatograph database and configurators. You can Startup_AMS, Shutdown_AMS, Start_CLI (Command Line Interface), Start_CVT (Chromatogram Viewing Tool), Start_TET (Text Editing Tool), Start_TVT (Trend Viewing Tool), Start_WOI (Window Oriented Interface).

Control_Cfg Provides access to the Integrated Control Configurator, which is both a configurator and a compound/block editor. The configurator allows you to create, edit, and manipulate the control database. You can:

- Create and integrate continuous, sequence, and ladder logic blocks in a single compound structure.
- Group and connect compounds.
- Modify, copy, and delete compounds and blocks.
- Configure and modify Fieldbus Modules and Intelligent Transmitters.
- Assign control schemes to stations in a distributed processing environment.
- Build and maintain compound libraries.
- Assign process alarm notification to device groups (historian, workstation processors, printers).

This selection initially provides access to a submenu for configuring direct access menus listing APs, stations, and/or volumes located throughout the network. The initial submenu is as follows:

AP50/51,WP50/51	AP20
CIO_Config	CIO_Config
CIO_AP_Cfg	CIO_AP_Cfg
CIO_STN_Cfg	CIO_STN_Cfg
CIO_VOL_Cfg	CIO_VOL_Cfg
	CIO_SeqEdt

The CIO_Config selection provides the first screen of the control configurator, the CSA Search Utility. When configured, the other choices present a list of APs, CPs, or volume names from which you directly access the Control Configurator.

On AP20s the CIO_SeqEdt submenu selection allows you to configure the Sequence Editor (vi or ice) to be used when that AP20 is accessed. See the *Integrated Control Software Concepts* and the *Integrated Control Configurator* documents.

Coord_Disp_Cfg Accesses the Coordinated Display Configurator. You can configure a set of display names, each of which is assigned to a screen in the multi-screen cluster. This display set can be called using an annunciator key, a menu pick, a display pick, for example (WP20/30 only). See the *Workstation Configuration* document.

DispAlarmCfg Accesses the Alarm/Display Manager Configurator on WP/AW51 stations for configuring multiple Display Managers and Alarm Managers. You can configure the names and properties of each DM and AM as well as configure associations between DMs and the AM that is called when the **`Alarm`** field is accessed in the I/A Series environment. Additionally, you can customize the set of AM Displays in terms of command buttons, alarm layout and contents, and menus. See the *Workstation Alarm Management* document.

Display_Build Accesses the Display Builder, which allows you to construct and edit sophisticated, interactive displays using an object-oriented database. See the documents *Display Builder* and *Display Configurator*.

Display_Cfg Accesses the Display Configurator, which allows you to convert static displays created with Display Builder into dynamic displays that interact with the control process. You can also configure trends and X/Y plots. See the *Display Configurator* document.

DspConventions Allows you to build and edit named conventions. Configured conventions can be accessed by the Display Configurator to connect a preconfigured display object attribute to a BLKSTA parameter, ALMSTA parameter, or any other parameter or global variable. See the *Display Conventions Configurator* document.

File_Utilities Allows you to perform the following file operations (on AP10- or AP20-hosted WPs or PWs only):

- Copy to Destination
- Move to Destination
- Rename
- Send to Printer
- Format Floppy Diskette
- Store on Floppy Diskette
- Load from Floppy Diskette
- Transfer to Machine
- Delete File

NOTE: For AP50/51-hosted WPs and WP50/51s, use the VT-100 mode to access file commands.

Font_Editor Allows you to create and edit font files. See the *Graphics Utilities* document. (Note that on 50 Series stations marker files are treated as font files.)

Grp_Display_Cfg Provides access to the Group Display Configurator. For WP20/30 only; not available on WP50/51. For 50 Series stations, use the Display Builder. This configurator allows you to develop more operation-specific displays by grouping information (faceplates, trends, and/or X/Y plots) for up to eight control blocks in a four-over-four screen layout. Each block type has a unique faceplate. See the document *Group Display Configurator*.

Historian Displays a menu that allows you to configure and operate the Historian and display historical data. It also allows you to maintain archive data. See “Historian Menu Definition” on page 17.

INI10_Config
INI15_Config Accesses the INI10 or INI15 Configurator with which you can configure the Information Network Interface 10 or INI15. See the document *Information Network Interface 10 and Information Network Interface 15*.

Install_AP Allows you to load system software into an application processor, workstation processor, application workstation, or personal workstation via floppy diskettes. See the *Software Installation* document.

Marker_Editor Allows you to create and edit markers (not necessary on 50 Series stations; see Font_Editor). It is useful for creating customized markers or user-defined displays and group displays. See the *Graphics Utilities* document.

MsgFile_Cfg Accesses the Message File Configurator. You can create new message files, search and retrieve existing message files, and/or configure message file parameters. These message files are connected to message area dialog boxes in displays to instruct, notify, and inform process operators of events. See the document *Operator Message Interface*.

OperActJourn Accesses the Operator Action Journal Configurator, which is a record of specific operator actions performed during process control operations. The Operator Action Journal may be configured to be printed as actions occur, stored for retrieval at a later date, or both. See the *Operator Action Journal* document.

Palette_Editor Allows you to alter the system palette file or create palette work files. When customized, the colors in the system palette file are used to enhance display files, specifically user-application displays. See the *Graphics Utilities* document.

PLB_Monitor Accesses the Programmable Logic Block (PLB) Monitor. It shows the Compound and Block Overview display, which is a live display of all PLB blocks in the system. Detail displays for individual PLB blocks are accessible through this overview display.

Through the PLB's detail display, you can monitor the status of ladder logic contacts, timers, counters, and coils. The PLB's detail display allows you to force contacts and coils on or off to verify correct operation of the logic under simulated process conditions. See the *Integrated Control Software Concepts* document.

RptCfg Accesses the Report Writer Configurator optional package, which allows you to specify the format and content of a printed report for the following data:

- Historian reduced data
- Process point data from Object manager
- Point data from Realtime Database Manager

Sched Accesses the Report Writer Scheduler optional package, which allows you to schedule the running of configured reports at regular time intervals. You can also print reports on demand.

Select_Printer Allows you to select a printer for the next printer task when there are multiple printers on the system. Before requesting a print screen, you must designate the appropriate ink-jet printer. See "Printer Selection" on page 43.

SSG_Cfg Accesses the SPECTRUM Slave Gateway (SSG) Configurator (not on WP50/51; available on AP10- or AP20-hosted WPs or PWs). You can generate or modify a configuration database file for an SSG, which allows SPECTRUM hosts to communicate with I/A Series control processors. It is optional; therefore, it may not appear on your menu. See the document *SPECTRUM Slave Gateway*.

System_Cfg Accesses the System Configurator, which allows you to specify the system network and packaging, and to document the system hardware, software, networking, and packaging selected. It is an option and runs on AWs, PWs and 50 Series APs. See the document *System Configurator*.

TrendPen_Setup Accesses the Trend Pen Configurator. You can configure the MEAS parameter for the AOUT blocks for which you desire hardcopy output from the pen recorders. See the *Trend Pen Configurator* document.

760_Cfg
761_Cfg Accesses the 760 Configurator or 761 Configurator (not on WP50/51) which allows you to generate or modify a configured database for Foxboro Model 760 or 761 single station controllers. These configurators are optional and therefore may not appear on your menu.

Disp Menu Definition

Selecting **Disp** (Display) brings up a standard menu that lists directory submenus d1, d2, d3, and d4 from which you can access displays.

The directory submenus are used to store graphic displays representing a process unit and other Foxboro or user-built displays. You may have one graphic file (for example, top-level display) calling another so you can select a more detailed view of a section of the process. You can link your displays to provide you with a total view of the plant.

Historian Menu Definition

The standard Historian menu selections are:

Configurator Accesses the Historian Configurator. You can configure data collection for the following four classes of data:

- Point samples
- Reduced values
- Messages
- Manual Data Entry (MDE) groups and variables

Point samples are collected in separate files, one for each point. Points are either compound:block.parameters or shared variables. You specify the points for sample collection.

For MDE groups and variables, you can add, modify, and delete configurations for variables and groups. See the document *Historian*.

For reduced values and messages, data collection is organized around three types of user-configured groups:

- Reduction
- Message
- Archive

For reduction and archive groups, you can add, copy, modify, and delete groups and group members. For reduction groups, you can add, copy, modify, and delete reduction operations.

Messages are grouped by the format name (class) that application programs have registered with the Historian. See the *Historian* document.

Scheduler Accesses the Historian Operation displays, which allow you to start and stop a Historian, or data reduction, message, or archive groups. They also allow you to see the operational status of collection groups. See the document *Historian*.

Data_Display Accesses Historian Data retrieval displays, which allow you to produce tabular displays of historical data on a workstation screen. See the document *Historian*.

Archive_Backup Accesses Historian Archiving displays, which allow you to back up, restore, or delete archive databases. You can back up archive databases to streaming tape or floppy disk. You can restore archive data from these media to the hard disk. You can also delete restored archives from the hard disk. See the document *Historian*.

Local_DB_Backup

Accesses the local database backup display. See the document *Historian*.

MDE_EDIT Accesses the Manual_Data_Entry Editor, which allows you to enter or edit values and their time stamps for configured MDE variables.

SftMnt Menu Definition

The standard SftMnt (Software Maintenance) menu selections are:

AP_Shutdown Allows you to shut down an AP or AW from an I/A Series environment. Use the Sync_File_Svr selection to perform the **sync;sync** command before turning the power off.

Calibrate Allows you to run an executable file designed to calibrate the touchscreen. This option is used if the cursor does not move to the proper location when the screen is touched. You are requested to touch various positions on the screen in order to determine the cursor/touch relationship.

Doc_Print Accesses Document Print, which allows you to select, from floppy diskette or hard disk, any loadable document to be printed at a selected printer.

PW_Shutdown Allows you to shut down the Personal Workstation from an I/A Series environment.

Restart_DM Allows you to restart the Display Manager on the WP30, WP50 and WP51 when necessary. On the WP30, the DM returns to the same environment in effect before it was restarted.

On the WP50/51, the DM comes up in its initial boot-up state, which consists of the following: Initial Environment menu buttons in the top menu bar, the default initial display, Operator Action Journal in its configured startup state, and the logical host AP is the AP mounted.

Shutdown_WP
Shutdown_AW Applies to the 50 Series WP and AW only and allows you to shut down the station to the single-user mode for backup and restore procedures. The # prompt appears on WP50s. The prompt on WP51 is:

Type Ctrl-d to proceed with normal startup
(or give root password for system maintenance):

After typing the root password, the prompt <letterbug># appears, where <letterbug> is the station letterbug.

Sync_File_Svr Allows you to ensure file system integrity by saving all file modifications up to that point. **Sync_Disk** performs the same task on the WP50/51 and AW50/51.

Sync_Disk Allows you to ensure the file system integrity of the local disk on a WP50/51 or AW50/51 by saving all file modifications up to that point.

VT100 For diskless WPs this option accesses the host AP operating system via a shell and the tools it provides. On WP50s and WP51s the following three options provide access to the VT-100 mode:

- VT100.HOST_AP
- VT100.local
- VT100.remote

When you select VT-100.remote, a menu appears that allows you to add or delete APs (Configure selection), or pick an AP from a list of VT100.<AP names>. The same applies to access VT100.local or VT100.remote on an AW50 or AW51.

For additional information, refer to the appropriate documents:

- *Realtime Database Manager*: INFORMIX-SQL 1.0
- *VENIX User's Guide* (AP20)
- *VENIX User Reference Manual* (AP20)

- *VENIX Support Tools Guide* (AP20)
- *Realtime Database Manager*: INFORMIX-SQL 4.1 (AP50)
- *SunOS User's Guide* (AP/WP/AW50)
- *SunOS Reference Manual* (AP/WP/AW50)
- *SunOS Documentation Tools* (AP/WP/AW50)
- *Solaris 2.2 Advanced User's Guide* (AP/WP/AW51)
- *Solaris 2.2 User's Guide to System and Network Tasks* (AP/WP/AW51)
- Solaris 2.4 Advanced User's Guide

Tools Menu Definition

The standard **Tools** menu allows you to select the following as well as provide access to optional software packages listed in "Optional Software Packages" on page 21.

VT100 Accesses the host AP operating system via a shell and the tools it provides (not available under tools on the 50 Series AW/WP).

SpreadSheet Appears on WP50/51s and WPs hosted by AP50/51s. From here, the letterbugs of each AP hosting a Spreadsheet package can be listed to provide direct access to the desired spreadsheet package. WPs hosted by AP20s also have this pick; it calls the local Spreadsheet directly.

UtlCfg Menu Definition

The standard UtlCfg menu selections for the WP20/30 and PW only, are:

AP_Backup Is used to select an AP backup for process displays. Should the original AP fail, the WP can switch to the AP backup for process displays in order to maintain a window to the process. See the section on "AP_Backup" on page 45.

PassWd_Env_Cfg

Accesses the Password and Environment Configurator. You can:

- Assign the software and functions available to a user by placing selectable fields in the environment menu bar.
- Build pull-down menus for accessing programs, displays, and utilities and then assign these menus to environment menu bars.
- Assign passwords to environments to limit access to them.

See the *Workstation Configuration* document.

Optional Software Packages

The following additional workstation-oriented software packages are available:

- Analyzer Management Software
- Automation Equipment Manager
- Data Validator
- FoxAMI
- FoxBatch
- Optimizer
- PmEdit
- Report Writer
- Spreadsheet
- Statistical Process Control Package

Analyzer Management Software

Is a collection of interface tools that allow you to effectively manage and maintain multiple 931D Process Gas Chromatographs (PGCs) on an I/A Series System. These tools provide access to the instrument interface of the PGC as well as the historical data in the AP or AW. They perform tasks such as editing instrument configuration, obtaining status information, controlling the instrument, and viewing the results of an analysis.

Automation Equipment Manager

Is a software tool for scheduling plant and equipment maintenance. Reports (screen or printed) detail the scheduled date, the maintenance tasks to be performed, and the parts associated with the maintenance tasks. Equipment status and runtime information are also available. See the *Automation Equipment Manager* document.

Data Validator

Is a menu-driven software package that is used for Validator production control. It adjusts process variable data, obtained from the Historian or keyboard, by applying statistical methods to identify and correct errors. It adjusts variables based on a known relationship among the variables, that is, mass conservation, and displays the results. See the *Data Validator* document.

Fox AMI
AMI_Arc
AMI_Rtv

Is an alarm and message retrieval software package. It captures messages and alarms generated by I/A Series systems and applications and stores them in the AMI Repository, an integrated set of databases. These messages can be retrieved based on a variety of selection criteria for display, printing, or use in other applications. AMI also provides archival functions allowing you to backup and restore messages. See the *Fox AMI Alarm and Message Interface Software* document.

FoxBatch Is a fully-configurable graphical software package that provides automated plant batch production control activities and provides an integrated environment for recipe management, materials tracking, process management, unit supervision, and production information. See the *FoxBatch User's Guide*, *FoxBatch Reference Manual*, and *FoxBatch Toolkit* documents.

Optimizer Is a production control software package that allows you to build a mathematical model of your processes. It uses mixed-integer, linear-programming algorithms for solving optimization problems and displays the results. See the *Optimizer* document.

PmEdit Accesses the Production Model Editor, which allows you to build a model that describes the activities of your plant. You organize the compound/block control strategies of your plant into a production view by relating these strategies to the concepts of the view, the unit, and the connection.

Report Writer Is a general purpose report package that allows you to specify the format and content of a printed report based on historian data and process control point data. Report types, which are based on time periods, include monthly, weekly, daily, shift, and hourly reports. Reports can be scheduled to run at regular time intervals or on-demand. See the *Report Writer* document.

Spreadsheet Is a workstation-operated software package that allows you to perform row/column operations, including "what if" calculations with live process data, Historian data, and keyboard-entered data. You can display spreadsheet data in graphic form as well as print the spreadsheet and the plotted graphs. The spreadsheet available on the AP20 is based on Prelude; the spreadsheet available on the AP50 or AP51 is based on Lotus. See the *Spreadsheet* document or the *50 Series Extensions to Lotus 1-2-3* documents as well as the Lotus documentation.

Statistical Process Control

Is a production control software package that provides online displays of Statistical Process Control (SPC) charts for analysis of process quality variables. The various charts establish the "statistical state" of a process using variable information from any Historian database in the I/A Series network. See the *Statistical Process Control Package* document.

3. Workstations and Processors

A workstation can be set up as a single operating unit (WP20, WP30, WP50, WP51, or PW) or as part of a multi-screen cluster (WP20s, WP30s, and/or WP50/51s) for use by the process operator, the process engineer, or the plant manager.

From the workstation, standard displays provide a basic operating environment, a collection of displays around which the entire plant display structure can be built. You can be assigned a specific operating environment that defines your tasks and databases accessible to you. Multiple application windows are available on the 50 Series stations allowing you to access an operation in one window while continuing to work in another window.

"Pick and point" interaction and the use of menu bars with pull-down menus simplify operations so that procedures are evident.

A Help field in the menu bar is used to provide information on the use of functions available to the user at that time.

Alarming is designated in the top menu bar or system bar (Model 51 stations) by the color of the following fields:

For AP10, 20, 50 and WP10, 20, 30:

- The **`Sys`** field which indicates the health of system equipment
- The **`Alarm`** field which indicates the health of the process

For Model 51 Stations:

- The **`System`** button which indicates the health of system equipment
- The **`Process`** button which indicates the health of the process

An alarm causes the appropriate field to blink until the alarm is acknowledged. See *Process Alarm Configuration*, *Workstation Alarm Management* (for WP/AW51), *System Management Displays*, and *Process Operations and Displays* documents for information on alarming.

Using a Touchscreen or Pointer Device

In an I/A Series environment, select the item you want from a display by using a touchscreen or pointer device (mouse, trackball, or industrial pointing device) as shown in Figure 3-1.

With a touchscreen, touch a selection with your finger to move the cursor arrow to that point and remove your finger to confirm the selection. If you touch the screen and then decide you do not want to make a selection, slide your finger to an unpickable area before removing it.

With a pointer device, move the device to position the cursor arrow on your choice. If the menu or function is selectable, it is highlighted or the field is highlighted/framed when the cursor moves over it. Click (press and release quickly) a button on the pointing device to select the option. When you click on a data entry field, a box appears around the field to highlight it.

The industrial pointing device, which is completely sealed, enables finger pressure to determine the direction and speed of the CRT pointer. Two click pads provide you with selections similar to the primary and secondary click buttons found on a conventional mouse.

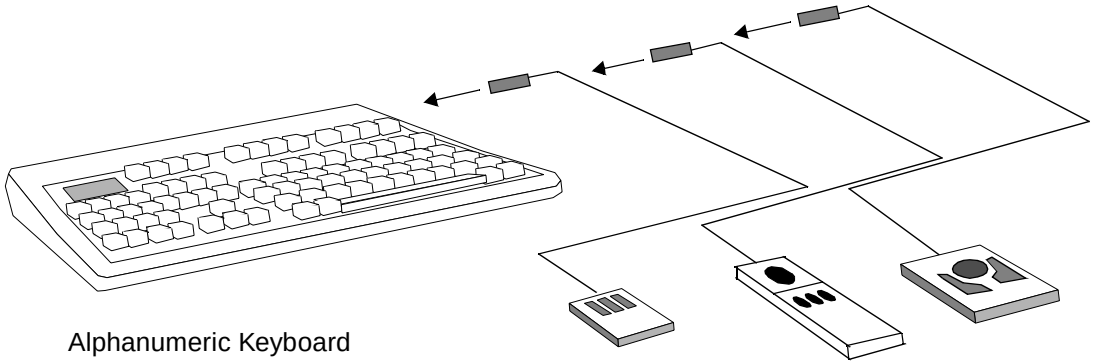


Figure 3-1. Mouse, Trackball, and Pointing Device as Connected to WP50/51 or AW50/51 Keyboard

When a selection is made on a System Management display, the arrow may change briefly to a solid hourglass shape or a partially-filled hourglass. If a solid hourglass appears, it indicates that information is being processed. When the cursor arrow returns, you may make another selection. When a partially-filled hourglass appears, you may make another selection immediately.

Use this procedure for making selections in the menu bar, screen listings or menus, data entry fields, and soft keys (which are simulated keys on the display).

NOTES:
1. The touchscreen option alone is not sufficient to use with the applications accessible from the Configurator pull-down menu. Another pointing device such as a mouse, trackball, and/or keyboard may be required.
2. The use of the touchscreen in a WP50/51 windows environment is addressed in the section on "Using a Mouse/Keyboard in the Windows Environment" on page 31.

In the windows environment available on the WP50/51, the three buttons of the pointer device have specific functions. Refer to "Enabling/Disabling the Windows Feature" on page 30 for a complete explanation of using the pointer device buttons.

Workstation Keyboards

Alphanumeric and/or annunciator keyboards can be connected to an I/A Series Workstation. The alphanumeric keyboard is used for those workstations where text entry is required to support software applications used primarily by process engineers, software engineers, and plant management personnel. The annunciator keyboard or annunciator/numeric keyboard includes annunciator keys or annunciator keys and a set of numeric keys.

It is used for process operator workstations.

Alphanumeric Keyboard

Use the alphanumeric keyboard for entering text. This keyboard on the WP10, WP20, and WP30 consists of:

- A full set of alphanumeric keys plus punctuation and special symbol keys laid out in the standard QWERTY format
- A numeric data entry pad (with cursor control)
- A 10-key software definable function pad
- A built-in audible horn
- An Acknowledge key (for silencing the horn)

The WP50/51 keyboard is similar to the alphanumeric keyboard on other workstations. However, the keys to the left of the standard keyboard are for specific tasks related to windows.

Annunciator Keyboard

There are two types of annunciator keyboards:

- Annunciator
- Annunciator/numeric

These keyboards contain:

- Either 48 LED/keyswitch pairs or 32 LED/keyswitch pairs and a 16-key numeric keypad
- A built-in audible horn supporting multiple pitches
- A horn silence key

The keyboard is either free-standing or workstation/panel-mounted.

Annunciator Keypad Section

The annunciator keys section has a pocket for user-definable inserts that label the keyswitch functions and light-emitting diodes (LEDs) for each column of four switches for all 48 or 32 LED/keyswitch pairs. Each LED, under control of the workstation processor software, may be ON, OFF, or FLASHING as determined by process alarm conditions. The LEDs are either red or yellow.

These LEDs, in combination with the audible annunciator in the basic unit, call the operator's attention to process alarm conditions. The mylar keyswitch associated with each LED may be used to invoke a specific preconfigured display or program.

If there is a loss of power to the annunciator panels, selecting **`Update_Lights`** in the Sys pull-down menu updates all the annunciator lights according to the current internal alarm state table.

NOTES:
1. Update_lights is functional only if power is lost to the annunciator keyboard while the WP is online. Rebooting the WP clears the internal alarm table unless a backup WP is configured in the Current Alarm Group (refer to Process Alarm Configuration document).
2. To disable or eliminate the Update_Lights feature, remove the file ***/usr/fox/sys/Update_Lights****.*

If alarm recovery is configured in Common Alarm Group file, the current alarm information and annunciator assignments are requested from a backup WP when the WP is rebooted.

See *Process Alarm Configuration* (for WP20/30, WP/AW50, and PW stations), *Workstation Alarm Management* (for WP/AW51), and *Process Operations and Displays* documents for details on process alarming.

Numeric Keypad Section

The numeric keypad section is used for entering numeric data into the system. Functionally, it is equivalent to the data entry pad of the alphanumeric keyboard. It contains data entry keys (with cursor control), an Enter key, and a numeric Lock key with an LED status light.

FoxPanels

For Model 51 stations, refer to the FoxPanels online Help for procedures and descriptions of "soft" annunciator keyboards.

Keystroke Commands

You can use simple keystroke commands to select the item you want from displays. However, it is much faster to use the pointer device except when moving from one dialogue box to another during data configuration entry. If you use an incorrect keystroke, the station "beeps."

When an I/A Series application displays the environment menu bar at the top of the screen, you can use the following keystrokes to select an item:

- Arrow keys (up, down, left, and right arrows in the numeric keypad) move the system cursor arrow in the corresponding direction.
- The number **5** key (in the numeric keypad) serves as a "click" button to confirm your selection.

When an I/A Series application, such as a configurator, displays an application menu bar at the top of the screen, you can use the following keystrokes to select an item from the menu bar:

- Arrows (up, down, left, and right arrows in the numeric keypad) move the cursor from one entry field to another.

You can use the following keystrokes in any display where a dialogue box appears when you select a data entry field:

- **Return** or **Enter** following data that you type in an entry field enters the data in memory.
- **Backspace** deletes one character to the left of the cursor within an entry field.
- **Del** deletes the character at the cursor position within an entry field.
- **Ins** toggles between the insert and the overtype modes.
- **Shift/arrow** (left and right arrows in the numeric keypad) moves the cursor within an entry field.
- **Shift/Home** moves the cursor to the beginning of an entry field.
- **Shift/End** moves the cursor to the end of an entry field.
- **Shift/Del** deletes characters from the cursor position to the end of the field.

---

*NOTE: The changes made on the screen must be recorded in memory by pressing the **Return** key and then copied into the database itself by selecting the OK soft key in those applications that display the OK soft key.*

Dialogue Box Selection Commands

Within various configurators and other software subsystems, interactive dialog boxes provide both an area for you to enter required information and a static "window" for viewing, searching, and selecting from a list of available options or file names.

The following control icons are used to view a multi-screen listing in a given dialogue box:

ICON	ACTION
Single Green Up/Down Arrow	Scroll Up or Down List by One Entry
Double Green Up/Down Arrows	Page Up or Page Down List
Overscored Double Green Up Arrow	Home (first page of list)
Underscored Double Green Down Arrow	End (last page of list)
Octagonal Green Stop Sign	Close Pull-Down Menu

In addition to the scrolling options, one of two different shortcut methods can be used to quickly access a particular option in a listing. These methods are:

- SEARCH to locate a particular name or group of names.
- CHOICE to enter a name directly without having to scroll through a listing.

NOTE: Both methods are upper/lowercase sensitive. In the CHOICE field, you must enter the name exactly as it appears in the database. Since spaces are considered part of the name, make sure there are no spaces following the name.

If using the SEARCH option:

1. Select the * and then enter a combination of wildcards and partial name string. Wildcards can be used to represent an unknown character or characters. The question mark (**?**) wildcard represents only one character in the name and its use is

position-dependent. The asterisk (*) wildcard represents any string of characters including the null string.

For example, the **?D*** search pattern lists all files with D as the second character. The ***D*** search pattern lists all files with D anywhere in the name; **D*1** lists all files with D as the first character and 1 as the last character.

2. Press the **Return** key to confirm your entry and generate a subset of the original list with similar characters (depending on wildcards used).
3. Select the desired name from the sublist. That selection appears in the CHOICE box.

If using the CHOICE option:

1. Select the box to the right of CHOICE and enter the desired name directly.
2. Press the **Return** key to confirm your entry. You cannot use wildcards with the CHOICE option.

VT-100 Mode

The VT-100 mode, accessed from the host AP of a WP10/WP20/WP30 or an AP50/51 or WP50/51, is available for running utilities and for accessing a text editor (**ice** or **vi** on an AP20 or **vi** on an AP50/51 or WP50/51).

The following functions cannot be used:

- Do not use INFORMIX in the VT-100 mode on WPs (PW is OK).
- Do not “cat” non-ASCII files in the VT-100 mode.
- Do not type a command greater than 132 characters at the shell prompt in the VT-100 mode.
- After remote-mounting a station, do not change directory (cd) into the remote file system.
- <Ctrl> C does not function on a WP in the VT-100 mode.

To exit the VT-100 mode:

1. Type sync;sync;sync and press the **Return** key.
2. Type exit or press <Ctrl> D.

OPEN LOOK Windows on WP50 and WP51

The OPEN LOOK Graphic User Interface on the 50 Series WPs and AWs employs easy-to-use window functions and menus rather than commands to provide an intuitive interface to the X Window environment. Windowing takes advantage of the multi-tasking operating system environment. It allows you to begin an operation in one window while continuing work in another window.

The Display Manager window, which presents the initial Foxboro I/A Series display, is always present on the screen (as a window or icon) and is used to view process displays. It also provides access to other application windows, such as System Management, the Integrated Con-

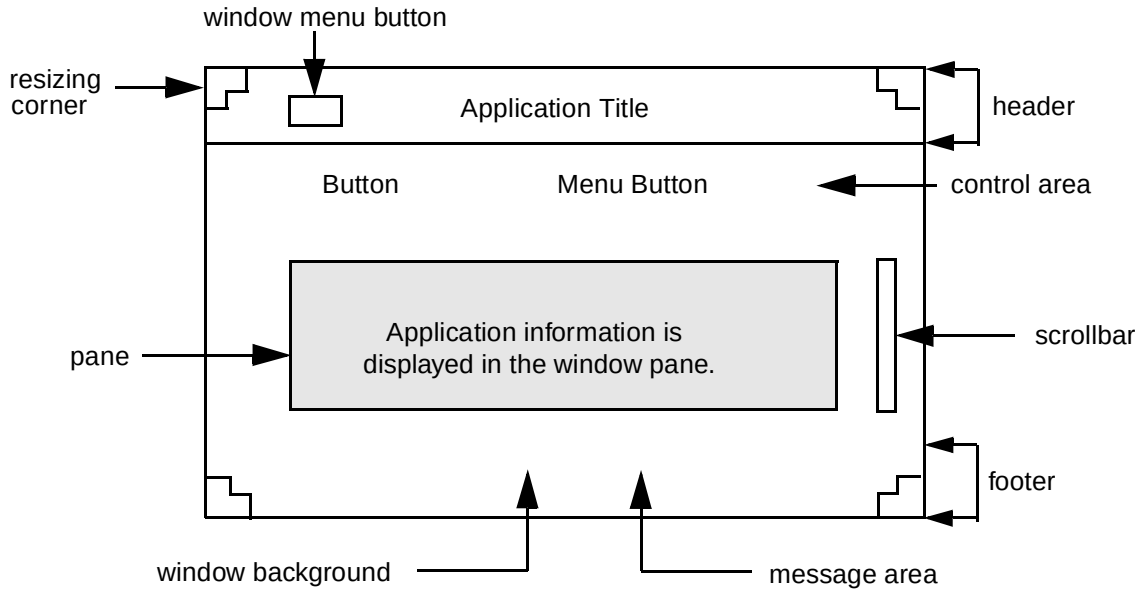
trol Configurator, or the Historian, via the top menu bar and pull-down menus. Using multiple windows allows you, for example, to monitor the information on a process control display (in the Display Manager window) as well as view System Management information or perform Historian tasks. See Figure 3-2.

Figure 3-2. Multiple Windows

The contents of a selected application are displayed in a base window on the background screen area. This background screen area is known as the workspace. Control of the workspace is handled by using the mouse/trackball buttons and function keys (alphanumeric keyboard) to perform actions such as the following:

- Access function menus, windows, and icons
- Make selections from menus
- Manipulate the size and location of windows
- Scroll the contents of the application in a window
- Dismiss or iconify a window

The basic elements of a base window are as follows:



Window and workspace functions are performed by manipulating the window directly with a mouse, making selections from menus, and/or using function keys. The types of menus available are:

- A window menu for performing functions related to the window, such as resizing, moving, restacking, opening/closing.
- A workspace menu for accessing a function or submenu of functions, such as programs, utilities, and properties.
- Scroll bar menu, for scrolling specified text in the application pane to new locations within the pane or back to the previous position.
- Pop-up windows for filling in information or making choices.

These menus are available under menu buttons in the control area or as pop-up menus at the pointer location. Menus are accessible on a temporary basis, available until dismissed, or push pinned to the workspace for ready access.

Enabling/Disabling the Windows Feature

On a 50 Series Workstation, you can enable or disable the windows feature via a command entered in the VT-100 mode. When windows are disabled, the 50 Series Workstation functions as a WP20/30.

To enable or disable the Window manager:

1. Enter the VT-100 mode using the following VT-100 menu option available from the SftMnt pull-down menu (see “VT-100 Options” on page 37):

   `VT100.local` (to run commands locally)

2. Type one of the following commands:
   - windows on
   - windows off
3. Reboot the 50 Series Workstation using the **`Sys`** menu **`reboot`** command.

Using a Mouse/Keyboard in the Windows Environment

You access and control the objects on the workspace and in the open windows by using the mouse to move the pointer (arrow cursor) around the screen. By pressing and releasing the appropriate mouse button, you have access to the following functions:

- **Select** (left-most button) used to select objects or manipulate controls. (The touchscreen emulates this button.)
- **Adjust** (middle button) used to extend or reduce the number of selected objects. For example, in cut and paste operations, it is used to adjust the amount of text to cut and paste.
- **Menu** (right-most button) displays a menu associated with the pointer location or the selected object.

Mouse button actions include:

- Press a mouse button and hold it.
- Release a mouse button to initiate the action.
- Click a mouse button by pressing and releasing it before you move the pointer. (On touchscreen, touch and lift finger once.)
- Double-click a mouse button by clicking twice quickly before moving the pointer. (On touchscreen, touch and lift finger twice quickly.)
- Move the pointer by sliding the mouse with no buttons pressed.
- Drag the pointer by sliding the mouse with one or more buttons pressed.

NOTE: In a multi-window environment, keyboard input is directed by clicking in the desired window prior to entering data. You cannot make proper keyboard selections or window entries unless the window is selected first.

The left button or the **5** key (NumLock off) is used to select the window in which keyboard entries are to be made. A black rectangle appears at the position selected for data entry.

On the WP50/51 keyboard, the **5** key (when pressed with NumLock off) simulates clicking the **Select** (left-most) mouse button.

Use the cursor keys on the keyboard to move the pointer (cursor arrow) around the screen for object selection.

The **Del** key toggles between single pixel and multiple pixel movement to change the distance the pointer moves when the cursor keys are used.

The WP50/51 function keys located at the left-most section of the keyboard include:

Stop	**Again**
Props	**Undo**
Front	**Copy**
Open	**Paste**
Find	**Cut**
HELP	

The **Front** and **Open** keys each serve two purposes. The **Front** function key moves a selected window to the front or back depending on its current location; the **Open** key opens a selected window from an icon or iconifies an opened window. The other keys are not currently utilized by I/A Series.

Accessing Function Menus

Menus of window, workspace, or task functions are available by positioning the pointer on a specified area and using the **Menu** (right-most) mouse button in one of the following ways:

- Press-drag-release
- Click-move-click

Some menus and pop-up windows have pushpins that allow you to pin the menu to the screen to keep it available for repeated use rather than having it removed from the screen. Clicking on an unpinned pushpin "pins" the menu to the screen; you can then move the menu to the desired location. Clicking on a pinned pushpin removes the menu from the screen.

A window menu is available for each window. It is used to change window characteristics. The window menu allows you to:

- Open or close (iconify) the window
- Change a window to full size or restore it to its original size
- Push the window or group of windows to the background
- Move the window
- Resize the window
- Refresh the window
- Quit the application (you cannot exit the default Display Manager window)

---

*NOTE: To exit most I/A Series applications (those using the Foxboro HI Library API), use the standard EXIT, QUIT, or CLOSE selections associated with the package. The **Quit** entry in the window menu does not apply to these packages. However, you can exit applications such as VT-100, 50 Series Spreadsheet package, Display Builder, Quittable Display Managers on stations with multiple Display Managers, and Calculator using the **Quit** option in the window menu.*

To access the window menu:

1. Move the pointer to the window menu button at the left side of the header, the window background, or the window icon.
2. Press or click the **Menu** button. The following window menu is displayed:
   - Open/Close
   - Full Size/Restore Size
   - Move Resize
   - Properties (Not Enabled)

- Back/Front
- Refresh
- Quit

3. Select the desired option by dragging the pointer (if pressing the **Menu** button) or moving the pointer (if **Menu** button previously clicked) to the option and clicking the **Select** (left-most) button.

The workspace menu has a pushpin and allows you to:

- Access a submenu of application programs that can be run from the workspace.
- Access a submenu of utilities, such as refresh, window controls, screensaver.
- Set global properties such as window color and the location of mouse button functions.

To access the workspace menu:

1. Move the pointer anywhere on the workspace.
2. Press or click the **Menu** button. The following workspace menu is displayed:
   - Programs
   - Utilities
   - Properties
3. Select the desired option by dragging the pointer (if pressing the **Menu** button) or moving the pointer (if **Menu** button clicked) to the option and clicking the **Select** (left-most) button. Some options, such as programs access a submenu of options. Use the **Menu** button to access the submenu.

Opening/Exiting a Window

To open an application window, select an application from the current I/A Series environment or select a program or utility from the workspace menu. (The workspace menu is accessed by clicking the **Menu** button in the workspace area.)

To exit a window (without creating an icon):

1. From an I/A Series application window, select the standard method of closing the application via the top menu bar or pull-down menu (for example, **`CLOSE`**, **`QUIT`**, **`EXIT`**). The application window does not become an icon.
2. From a program or utility such as VT-100, Spreadsheet 50 (Lotus), Display Builder, the Calculator, and quittable Display Managers (on 51-type stations), select the **`Quit`** option in the window menu.

Iconifying a Window

You can change the application window to an icon that represents the window. This icon is located at a preselected position on the screen and remains on the screen for later selection.

To change the window to an icon:

1. Move the pointer to the window menu button.

2. Click the **Select** (left-most) mouse button, then select CLOSE. You can also press the right-most button, drag to CLOSE, and release the button.

To open a window via its icon:

1. Move the pointer onto the icon to be opened.
2. Double-click the **`Select`** (left-most) button.

Resizing a Window

You can change the dimensions of any window that has resize corners. Selecting a resize corner allows you to shrink or expand the borders of the individual window. The window is anchored at the corner that is diagonal to the selected resize corner. In text-oriented applications like VT-100, although the area of the window is adjusted, the contents do not change scale.

To resize a window:

- Move the pointer to one of the four resize corner icons (resize handles). Then, press the **Select** (left-most) mouse button and drag the resize corner to increase or decrease the area of the window.

  – or –

- Position the cursor over the header of the window.

1. Hold down the **Menu** (right-most) mouse button.
2. Select **`Full Size`** from the pull-down window menu.

Toggling Between Two Window Sizes

You can toggle between two window sizes – the current size and full size or full size and the previous size.

To toggle between two window sizes:

1. Double-click the **Select** (left-most) button on the window background or the application title. If this window is in the back, it is moved to the front surface in the alternate size.
2. Position the cursor over the header of the window, hold down the **Menu** (right-most) mouse button, and select **`Full Size`** or **`Restore Size`** from the pull-down window menu.

Moving a Window or Icon

When moving a window or icon to a new location, the size of the window or icon is not changed.

To move a window or icon:

1. Move the pointer to the header (title bar) or footer (message area) of the window, or onto the icon.
2. Press the **Select** (left-most) button and drag the window or icon to the new location. Release the button.

Restacking Windows

Windows can be restacked by positioning a window in front of another window.

To position a window in front of another window:

1. Move the pointer to the window header of the window to be moved.
2. Click the **Select** (left-most) button to bring the window to the front of the screen.

– or –

1. Move the pointer into the window.
2. Press the **Front** function key in the left-most set of keys.

To position a window in the back or bottom of the stack:

1. Move the pointer on the window header of the window to be moved.
2. Access the window menu and select the Back option.

– or –

1. Move the pointer into the window.
2. Press the **Front** function key. The **Front** key positions a window in back if it is currently in the front.

Using a Touchscreen in a Window Environment

The touchscreen on the WP50/51 mimics the operation of the **Select** (left-most) button. It allows you to touch various sections of the display to perform basic functions on the window. The functions are as follows:

- Touch the window menu button in the window header to access the window menu functions, such as: **`open/close`**, **`full/restore size`**, **`move`**, **`resize`**, **`front/back`**, and **`refresh`**.
- Touch the application icon twice to open the window.
- Touch the resizing corner and drag the window to increase or decrease the size of the window.
- Touch the header or footer and drag the window to move it to another location.
- Pull down the window menu, drag and select Back to move the front window to the back.
- Place the cursor over a window and press the **Front** function key to move the window to the front.

Icons

When iconified, the icon of the Display Manager window displays the current state of the Alarm and Sys blink fields as follows:

DM: A# S#

where **#** indicates the blink state:

1 Normal Blink

2 Solid Red

3 Blinking Red

The AW50/51 can be in the connected or stand-alone mode. An icon is displayed indicating the mode of the AW at boot time. The icon may be **opened** to view a textual message, **closed** to restore the message to the icon, and **quit** to remove it from the display completely.

Optimizing Windows Performance

The performance of windows on the 50 Series WPs or AWs can be optimized by observing the following guidelines:

- Quit applications not being used rather than iconifying them. When applications are iconified they are still running. Minimizing the number of active windows being used enhances performance.
- Do not use the **clock** or **perfmeter** application programs that continuously use memory.
- Avoid using the DeskSet tools, such as File Manager and Calendar Manager.
- Use a plain (solid-colored) screen background.
- Avoid using applications from different toolkits at the same time. For example, the OpenWindows DeskSet tools are based on XView, but third-party applications may use OLIT (OPENLOOK Intrinsics Toolkit based on Xt) or TNT (The NeWs Toolkit based on PostScript). Using applications from several different toolkits simultaneously diminishes the advantage of shared libraries and increases memory requirements.

WP50 and WP51 Characteristics

Remote Draw

Diskfull 50 Series WPs contain hard disks with their own operating systems and display software. However, some software, such as the Historian and Integrated Control Configurator, continues to be stored and run on an AP. When accessed, those applications remote to the 50 Series WPs disk require remote draws to the WPs. The 50 Series WPs support only one remote draw application at a time.

WP50 or WP51 Logical Host

The diskfull 50 Series WPs are self-hosting. Rather than having an AP boot host as do WP10s, WP20s, and WP30s, the diskfull 50 Series WPs have a logical AP host from which they retrieve the following information:

- Alarm History file
- Sequence Code data
- PLB Displays

At startup the logical host is mounted. The default Historian for recent history trending is the logical host. The name of the logical AP host is specified during System Configuration and is found in the **/etc/fox/loghost** file on the WP50.

Information for the Alarm History Display and Operator Action Journal reports are generated from the currently mounted AP.

VT-100 Options

On 50 Series WPs there are three VT-100 menu options available from the **`SftMnt`** pull-down menu:

- **`VT100.local`** to run commands locally on the WP50/51
- **`VT100.HOST_AP`** to run commands on the logical host AP (not on AW50/51)
- **`VT100.remote`** to run commands on any other specified AP (a pull-down menu of specific APs can be configured)

It is possible to access both local and remote VT-100 windows at the same time. However, both VT-100.remote and VT-100.HOST_AP are remote draw applications and therefore, no other remote draw application, such as the Control or Historian Configurators, can be open at the same time as either of these applications.

Scroll History Log

By default, the OpenWindows shelltool provides a window where the text scrolls upward and is not stored when scrolled out of the window to a history file.

To enable scroll history logging for text in the VT-100 window:

1. Press the Menu (right-most) mouse (or trackball) button when in the window pane and select **`Enable Scrolling`** from the pop-up menu.
2. The text is temporarily stored in a history file while the VT-100 window is open and automatically deleted when the VT-100 window is exited.

The history file is created in **/tmp** and is named **Text<pid>.<n>**, where **<pid>** is the process id of the shelltool and where **<n>** starts at 0 and increments whenever the log file is cleared.

To delete the scroll history log:

- Press the **`Menu`** (right-most) button in the window and select “Clear History Log” from the pop-up menu.

  – or –

- Exit the VT-100 window.

NOTE: When the history file is enabled, it is advisable to clear the history file periodically, particularly if the VT-100 window is left open for a long period or has had substantial activity. This action prevents the history log file from growing so large that it fills the file space on the disk.

Running AP Programs

The local VT-100 window on a WP50/51 cannot be used to run programs on an AP50/51 mounted as a remote AP. To run programs on a remote AP:

1. From the **SftMnt** pull-down menu, select **VT100.HOST_AP** or **VT100.remote** and select the appropriate AP from the configured list. From the remote VT-100 window on the desired AP, access the program from the shell.
2. Run the program in the usual manner.

Multi-Screen Workstation

The multi-screen workstation feature allows you to configure a group of WP20s, WP30s having the same host AP, and/or WP50s or WP51s to form a multi-screen cluster. The WPs then can be operated as a single multi-screen workstation. This assignment is made during system configuration. From a multi-screen workstation, you can:

- Redirect displays from one WP screen in the cluster to another WP screen.
- Reassign the mouse and alphanumeric keyboard to another WP screen in the cluster (excluding the 50 Series WPs).
- Initiate a set of coordinated displays to appear on multiple cluster screens with a single request.
- Toggle any WP screen in the cluster between the multi-station and single station modes (excluding the 50 Series WPs).

For WP51s with dual CRTs, there is a common keyboard and mouse and the coordinated display support is the same as for WP50s. If there are multiple Display Managers, coordinated display clusters can be configured on a Display Manager name basis rather than a WP basis. This means that multi-screen operations can cross from one CRT to the other.

Refer to the *System Configurator* document for information on configuring a multi-screen workstation. Refer to the *Workstation Configuration* document for information on configuring coordinated display sets for a multi-screen workstation.

Multi-Screen Overlay for WP20/30

The multi-screen overlay, accessed from the **Sys** pull-down menu, displays the physical orientation of the screen cluster as defined at system configuration and the soft keys for multi-screen actions. This overlay is used to perform the following actions:

- Redirect displays
- Reassign the mouse
- Switch between multi- and single-station modes

Figure 3-3 shows a configuration of two rows with five screens per row. However, no more than six should configured. Figure 3-4 shows the overlay for a three-screen cluster with a two-over-one configuration.

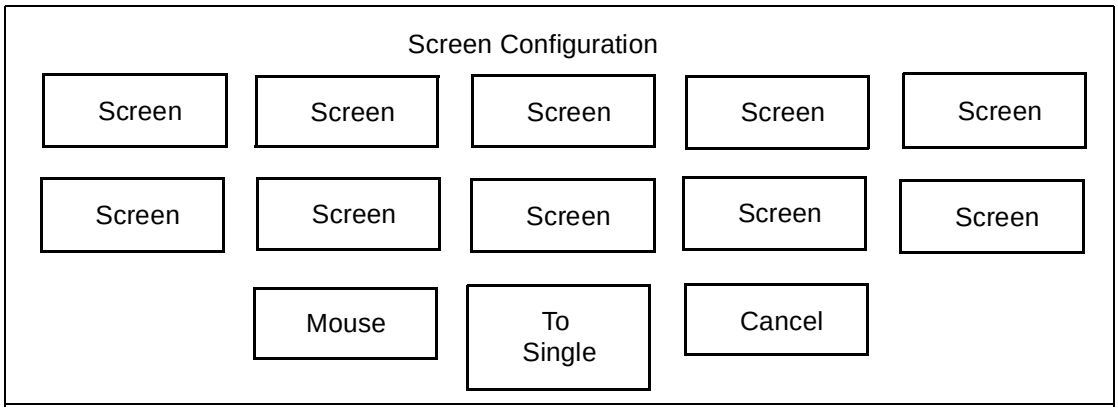


Figure 3-3. Multi-Screen Overlay (Maximum Configuration)

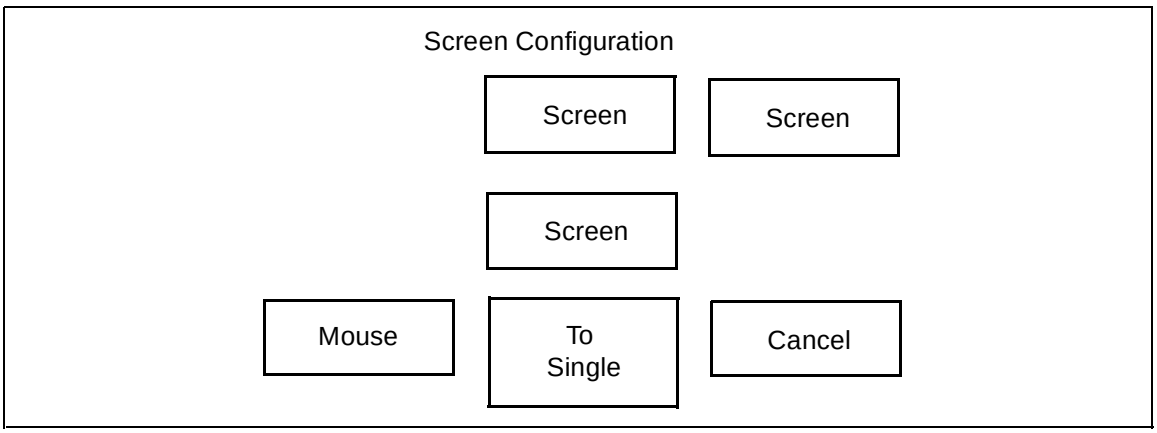


Figure 3-4. Multi-Screen Overlay (Typical 3-Screen Configuration)

Access to Multi-Screen Overlay on WP20/30

The multi-screen overlay is currently accessed in the following manner:

1. Select **`Sys`** in the top menu bar.
2. From the **`Sys`** pull-down menu, select **`MultiScreen`**.

You can also assign a field to the top menu bar in any environment. Using the Password/Environment Configurator, assign a field named **Multi**. This field assignment requires the path name of **/usr/fox/sys/MultiScreen** associated with it.

Refer to the *Workstation Configuration* document for complete instructions on adding a field to the top menu bar in an environment.

Multi-Screen Overlay Actions

From the Multi-Screen Overlay, you can access the following actions:

- Redirect displays.
- Reassign the mouse (does not apply to WP50/51 mouse).

- Switch between multi- and single station modes (does not apply to WP50/51 mouse).

The procedures for performing each of the actions are explained in the following sections.

Display Redirection

In order to redirect a display to another WP screen in the multi-screen cluster use the following procedure:

1. From the **Sys** pull-down menu, select **MultiScreen** to access the multi-screen overlay.

NOTE: On the WP50/51 this overlay is a Display manager dialog box. Any displays that are to be redirected must be accessible by the WP. In the case of WP20s and WP30s, these display files must be located on the disk of the hosting AP. For WP50/51s, the display files must be either on the WP50/51's local disk or on the disk of the currently mounted AP.

---

2. Select the screen on the multi-screen overlay to which the display is to be redirected. The overlay closes.
3. Select the display to be redirected to the previously selected screen. This display is the next display chosen (for example, user-defined group display, process display, Recent Alarm Display, and so on).

Note that display redirection can also be accomplished among multiple Display Managers using an annunciator keyboard if the keyboard has been configured with displays attached to the keys.

Mouse and Alphanumeric Keyboard Reassignment on WP20/30

During system configuration, the WPs (excluding the WP50/51s) in a multi-screen cluster can be optionally configured to share a common mouse and alphanumeric keyboard. A cluster can contain a mix of some WPs with dedicated peripherals and some with shared peripherals.

Annunciator keyboards and touchscreens are always dedicated and cannot be shared. The touchscreen is always enabled even if the mouse has been assigned to another screen. There is a maximum of two annunciator keyboards per WP.

WPs with shared peripherals must be cabled for a shared bus. If any WP or monitor on a shared bus is removed for maintenance, the shared bus is unaffected. However, prior to removing a monitor, any mouse/trackball or keyboard assigned to that monitor should be reassigned.

To reassign the peripherals using the multi-screen overlay:

1. From the **Sys** pull-down menu, select **MultiScreen** to access the multi-screen overlay.
2. Select the **MOUSE** soft key on the overlay. It becomes highlighted.
3. Select a screen on the overlay. The overlay closes and both the mouse and alphanumeric keyboard are reassigned to the selected screen.

NOTES:
1. The WP for the selected screen must be configured and cabled for the shared peripherals.
2. If both a mouse and an alphanumeric keyboard are present, they are reassigned.

You can also reassign peripherals in the multi-screen cluster using the mouse buttons as follows (only when the Display manager window is on the screen):

- To move the peripherals to the next WP in the sequence, press and hold the **Left** mouse button, momentarily press and release the **Right** mouse button, and then release the **Left** button.
- To move the peripherals to the previous WP in the sequence, press and hold the **Right** mouse button, momentarily press and release the **Left** mouse button, and then release the **Right** button.

The Display Manager command `sdjump` may also be used in a display button pick, a script file, an HIxcfile, or an annunciator pick to reassign the peripherals in a multi-screen cluster. Refer to the *Display Manager Calls* document for an explanation.

Multi/Single Screen Mode Switching on WP20/30

Toggling between the multi and single screen modes allows or disallows the callup of a display on your screen from another WP in the cluster. Displays directed to a screen in single mode from another WP screen are discarded. The single mode does not affect mouse/keyboard reassignment.

To switch the screen mode via the multi-screen overlay:

1. From the **`Sys`** pull-down menu, select **`MultiScreen`** to access the multi-screen overlay.
2. On the overlay, select the **`TO SINGLE`** soft key if in multi-screen mode or **`TO MULTI`** if in single mode. The overlay closes and the screen switches to the selected mode.
3. If a top menu bar field has been assigned to access the multi-screen overlay as described in "Access to Multi-Screen Overlay on WP20/30" on page 39, the field switches to display the correct mode (Multi or Single).

Coordinated Displays

A coordinated display set is a file containing a set of display file names. Each display is assigned to a screen in the cluster. The coordinated display set is called using an annunciator key, menu pick, display pick, and so forth. Each display in the set is simultaneously generated on its assigned screen in the cluster when the set is selected.

The coordinated display sets are configured using the Coordinated Display Configurator described in the *Workstation Configuration* document.

Alarming

Alarming on a multi-screen workstation is the same as alarming on a single screen workstation. See the *Process Operations and Displays* document for detailed system alarm and process alarm information.

Each WP in the multi-screen arrangement serves as an independent alarm destination for the Current Alarm Display, annunciator lights, and horns. The alarm destinations are configured in the System Monitor software for system alarms (hardware failures) and in the Integrated Control Configurator group devices for process alarms.

A Common Alarm Group (CAG) file initially based on the multi-screen configuration file is available. If this file is not customized, all horns in a multi-screen cluster are silenced from any workstation in the cluster. When the CAG file is configured, all horns are silenced and alarms cleared for all workstations in the group from any member of the CAG group. See the *Process Alarm Configuration* (for WP20/30, WP/AW50, and PW stations) and the *Workstation Alarm Management* (for WP/AW51 stations) documents for detailed information on alarm configuration.

For Model 50 stations, refer to the Workstation Alarm Manager online Help for procedures and descriptions of alarm functions and capabilities.

Print Screen Function

The print screen function is used to capture and print a screen image. It is supported on a WP on an I/A Series network having a communications processor with at least one ink-jet color printer configured, on a PW with an ink-jet color printer, and on a WP hosted by an AP10 or an AP50/51 with a local printer.

With the WP50/51 only, when a print screen is requested, a single beep indicates that the request has been accepted; a double beep indicates that the screen image has been captured.

For a WP20 or WP30, the entire screen is printed. For the WP50/51 with a PaintJet printer, a single window or portion of the full screen is printed due to the high resolution of the WP50/51 screen. When a PostScript printer is used, you can capture the full screen.

When the printer is attached to an AP10, AP50/51, or AW50/51 the number of print screen requests that can be queued is determined by the buffer file (AP10) or the available space in the /var partition (AP50/51, AW50/51). While the image is being saved, the screen is frozen. The maximum number of images that can be queued is dependent on the complexity of the image.

When a WP20 or WP30 utilizes a printer attached to a communication processor, the buffer file provides for printscreen queuing. However, when the WP50/51 utilizes a printer attached to a communication processor, there is no queuing mechanism. The minimum delay between printscreen requests is the total time it takes to print the image.

If the CMP10, PW, AP50/51, or AW50/51 does not have sufficient buffer space for the data image, the print screen request is terminated. The portion of the image in the buffer is discarded and an error message appears on the workstation screen.

Images can be cleared from the buffer by turning the printer power off for a short period of time. Be aware that this procedure also clears any other information that is in the buffer (for example, messages).

Printer Selection

The first ink-jet printer configured is automatically selected. When a subsequent printer is selected, that printer remains as the selected printer until another printer is chosen.

To select the desired ink-jet printer for the printscreen function:

1. From the **CONFIG** field in the Process Engineer's Environment, access the **Configurator** pull-down menu.
2. From the pull-down menu, choose **Select_Printer**.
3. Select the printer desired from the list.

Access to Print Screen Function

The print screen function is accessed and initiated in one of the following ways:

- From the **Sys** pull-down menu, select **PrintScreen**

  – or –

- Simultaneously press the **Ctrl** and **Prtsc** keys on an alphanumeric keyboard

  – or –

- By sending a pref command to the Display Manager requesting a print screen

On the WP20/WP30, whichever print screen method is used, the entire screen is always printed.

On the WP50/51 and AW50/51 when **Ctrl Prtsc** is used, the contents of the window under the cursor are printed. Only the visible portions of a window are printed. Ensure that the window to be printed is not obscured by any other window. If the cursor is on the background workspace, as much of the screen that will fit within the resolution of the printer is printed. Screen resolution is 1152 x 900; PaintJet resolution is 972 x 720.

On the WP50/51 and AW50/51, using the **Printscreen** option from the **Sys** menu or the pref command always prints the Display Manager window.

On the WP50/51 and AW50/51, **Alt_PrSc** can be used to resize a window to the Foxboro default size prior to initiating a printscreen so that the window can fit on a sheet of paper.

PrintScreen Outside a Configurator

On a WP20 or a WP30, performing a print screen request when not in a configurator results in the following actions:

- The image on the screen freezes for about 16 seconds (no updating to display takes place) while the image is saved to the communication processor print buffer.
- Menu selections and annunciator keys are still enabled. The only exception is if a specific **PrtScr** field has been configured in a top menu bar by the user (dmcmd

psc for initiating a print screen request). This field is not enabled until the request is completed.

- However, selecting any menu selection or annunciator key display while the screen is frozen results in the print screen function being terminated. The menu or annunciator key request is then performed.
- Alarm notification still occurs to designated devices (workstation processor **ALARM** and **Sys** fields on the initial menu bar, printers, annunciator LEDs, horn, historian).

NOTE: It is recommended that a printscreen request not be sent to a printer designated for alarm messages. Otherwise, spontaneous alarm messages can interrupt the printing of the requested screen. Both the alarm messages and the screen printout are then unreadable and unrecoverable.

PrintScreen Within a Configurator

On a WP20 or WP30, performing a print screen request when in a configurator results in the following actions:

- A message is sent to the message line indicating **Printscreen Data Capture in Progress** for the duration of the data image capture. The message line is cleared when the image capture is complete.
- Since the screen is *not* frozen, any operator action to change the content of the screen during data capture results in a composite printout of the two images.

On a WP50/51 or AW50/51, place the cursor in the configurator window and simultaneously press the CTRL and PRTSC keys.

Workstation Process Display Backup on WP20/30

When an AP fails, each workstation (excluding the WP50/51, which has its own disk) hosted by the AP can automatically switch to a designated backup AP to access process display files only. You can call up block displays, group displays, and user-defined displays in order to maintain control of the process. Other functions must *not* be selected; if they are, the WP stops and must be rebooted.

NOTE: The Current Alarm Display (CAD) selection works on a "switched" WP only if the backup AP contains the two template files, ***/usr/fox/tmplts/CAD10*** *and* ***/usr/fox/tmplts/CAD20*** *for WP20;* ***/usr/fox/tmplts/CAD1-CAD4*** *for a WP30.*

To utilize this feature, you must perform the following steps prior to the primary AP failure:

1. Copy all user-generated or modified process display files to the backup AP (that is, copy files from the **/usr/menus** directory on the primary AP to the **/usr/menus** directory on the backup AP).
2. Designate an AP as a backup. This backup AP must be running at the time of the primary AP failure.

3. Prior to the AP failure, you must have accessed the **Sys** pull-down menu at least once and you must have access to an environment top menu bar at the time of the AP failure to initiate the AP switch.

AP_Backup

The AP backup procedure is normally performed after initial software installation of the same software revision level on each AP. The procedure requires that the AP to be designated as a backup is running and system activity is minimal. User-generated and modified process display files need to be copied to the backup AP.

Use the procedure below to designate an AP backup for continuous process display access:

1. From a WP hosted by the primary AP, select **Sys** from the top menu bar.
2. From the **Sys** pull-down menu select **Change Environment**. Select the Password & Environment Configurator (**PassWd_EnvCfg**) from the pull-down menu.
3. Select **UtlCfg** from the top menu bar to access the pull-down menu.
4. Select **AP_Backup** from the **UtlCfg** pull-down menu. A list of all APs on the system appears.

NOTE: Prior to selecting the backup AP, be sure the backup AP is running and system activity is minimal. An error occurs if a connection cannot be made to the backup AP. You must then rerun the procedure.

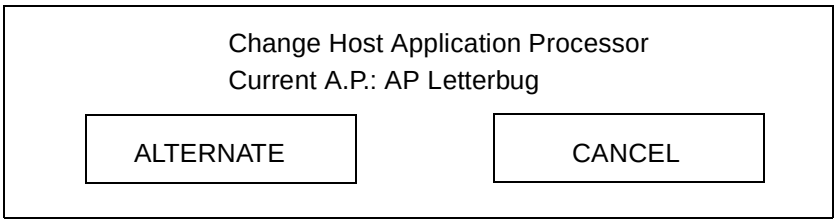
---

5. Select the letterbug of the desired AP backup. The screen goes blank while the setup procedure is taking place. After procedure completion, the following message appears on the screen: **Backup File Server Established. WPs should be rebooted**.

NOTE: After you perform this procedure, ALL the workstation processors hosted by the primary AP will have access to the backup AP. The more WPs hosted by the AP, the longer the initial setup procedure takes.

---

6. Reboot each of the WPs on the primary AP in order to update each one with the backup AP letterbug information. Use one of following reboot options for each WP:
   - Select **Reboot** from the **Sys** pull-down menu.
   - Simultaneously press Ctrl Alt F1.
   - From one WP, access System Management and use the Reboot equipment change action for each selected WP hosted by the primary AP and within the same System Monitor domain.
7. To verify that the desired backup AP will be selected, pick **AP_Switch** from the **Sys** pull-down menu. The following dialog box appears:



Select **ALTERNATE** to switch to the backup AP. Select **AP_Switch** again to see if the Current AP now indicates the backup AP letterbug. When verified, select **ALTERNATE** to switch back to the primary AP.

NOTES:
1. Be sure to rerun the AP_Backup procedure when new WPs are added to an AP. Otherwise, the new WPs will not have AP Switching capability.
2. Be sure to update the process display files on the backup AP whenever process displays are created or modified.

AP Switching

When the original AP fails, the WPs attached to the original AP can be automatically switched to the designated AP backup to access process displays.

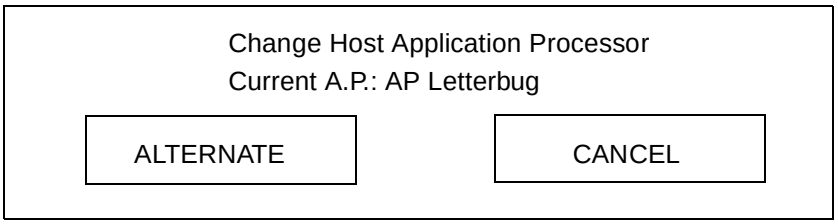
To switch a WP to the backup AP:

1. From an environment top menu bar, select an option with a pull-down menu (for example, **Sys**, **Disp**, **Disp 1**, **Disp 2**.). Since the workstation must access the file server for this information, this action alerts the WP to the fact that the original AP is unavailable.
2. Select the option a second time to complete the file access on the backup AP. You can then switch environments, if necessary, and access the process displays resident on the backup AP.

NOTE: The AP Switching procedure is primarily for accessing process displays only from the backup AP when the original AP is disabled.

To switch a WP back to the original AP:

1. When the primary AP is running, from the WP select **AP_Switch** located in the **Sys** pull-down menu.
2. When the dialog box appears, select **ALTERNATE** to change from the current backup AP to the original AP. If the switch is successful, the dialog box disappears.

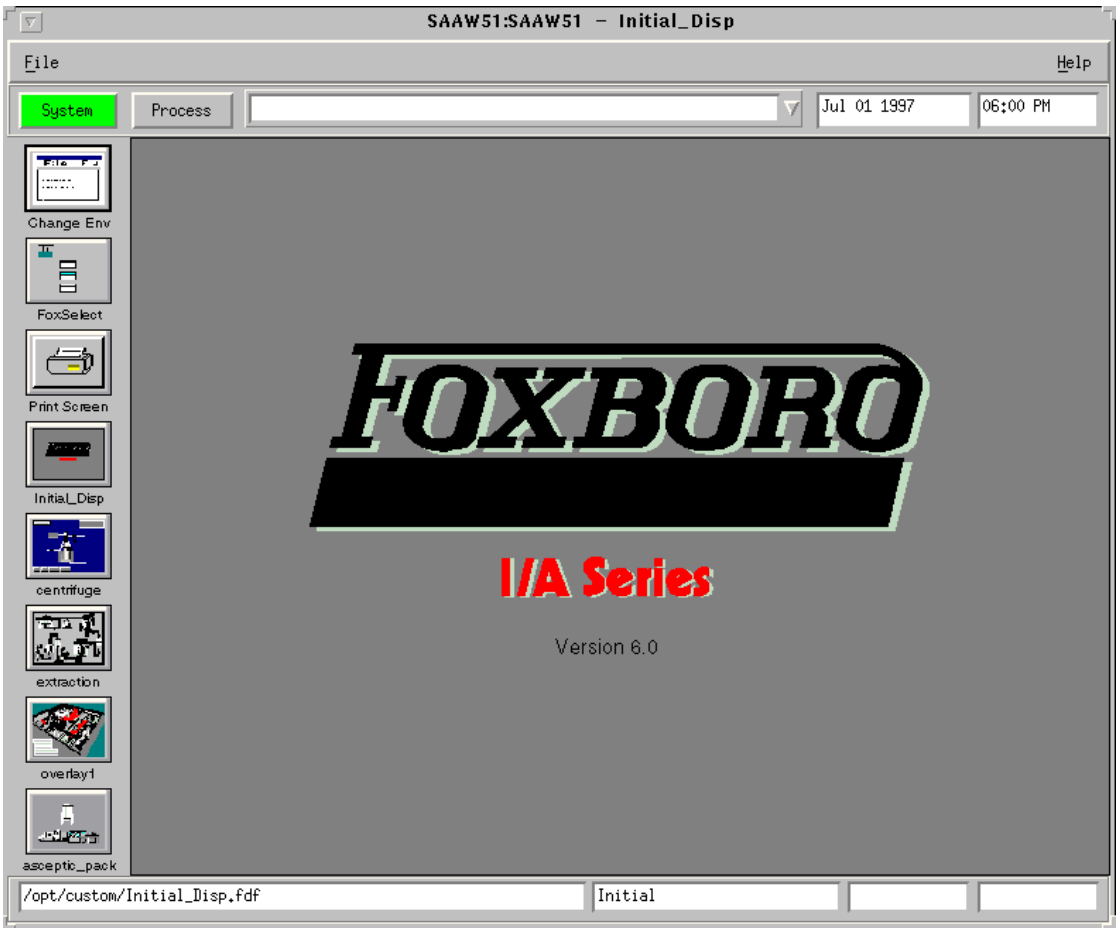


NOTE: If the primary AP to which you were switching was not running, you must first restore the primary AP and reboot the WP by pressing ***Ctrl Alt F1*** *simultaneously. The WP then boots from the primary AP.*

FoxView for AW/WP51 Stations

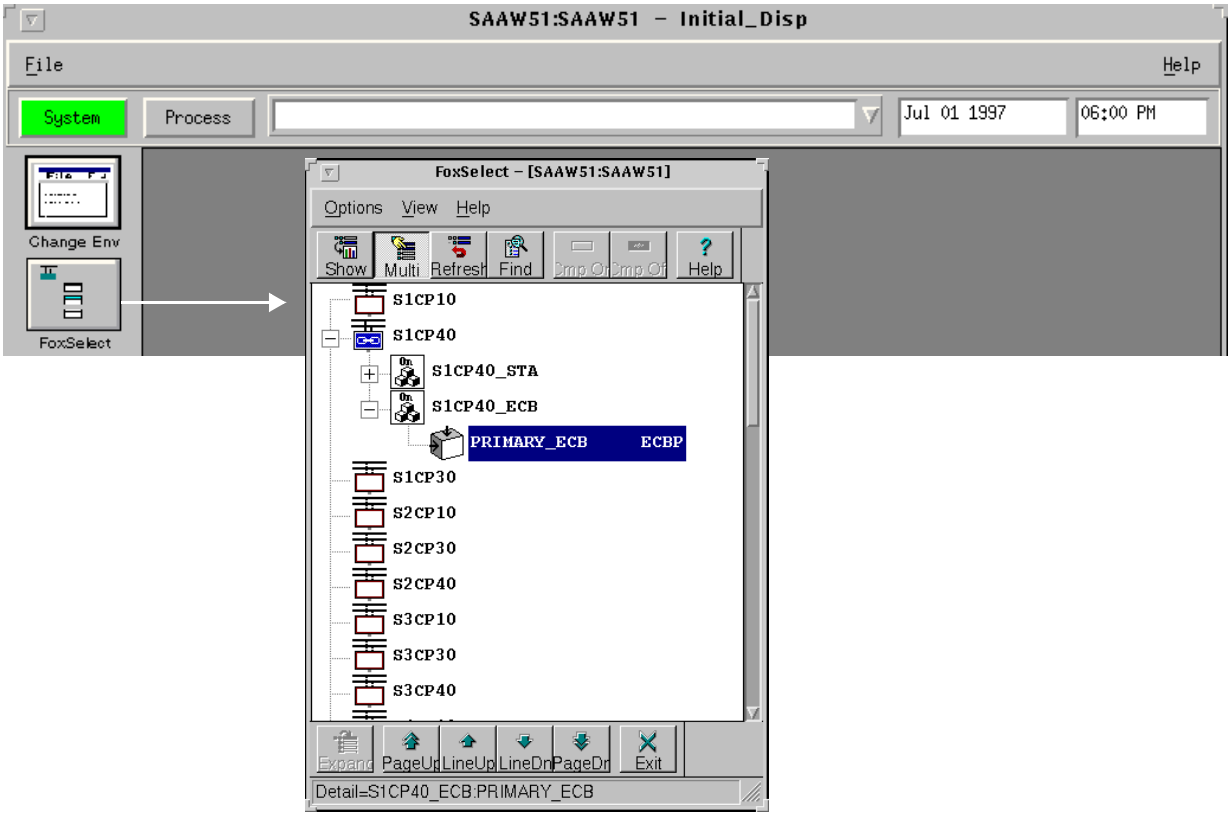
FoxView is the Display Manager for AW/WP51 stations. The initial display, shown below, appears after the station boots.

FoxView is the major user interface to the I/A Series system, its programs, software and functions. For a complete description of FoxView and its functions, refer to the online Help.



SELECT Screen (Compound/Block Overview)

For Model 51 stations, refer to FoxView online Help for FoxSelect procedures and descriptions.



For stations other than the Model 51, the **SELECT** field in the standard environment menu bars provides the Select Screen (Compound/Block Overview display) for accessing a list of all the compounds and blocks resident in CPs throughout the system. In addition, it provides access to compound and block detail displays. See Figure 3-5.

The Select Screen display is accessed by picking **SELECT** on the environment menu bar, or picking any object configured to execute the display manager command: dmcmd stddisp.

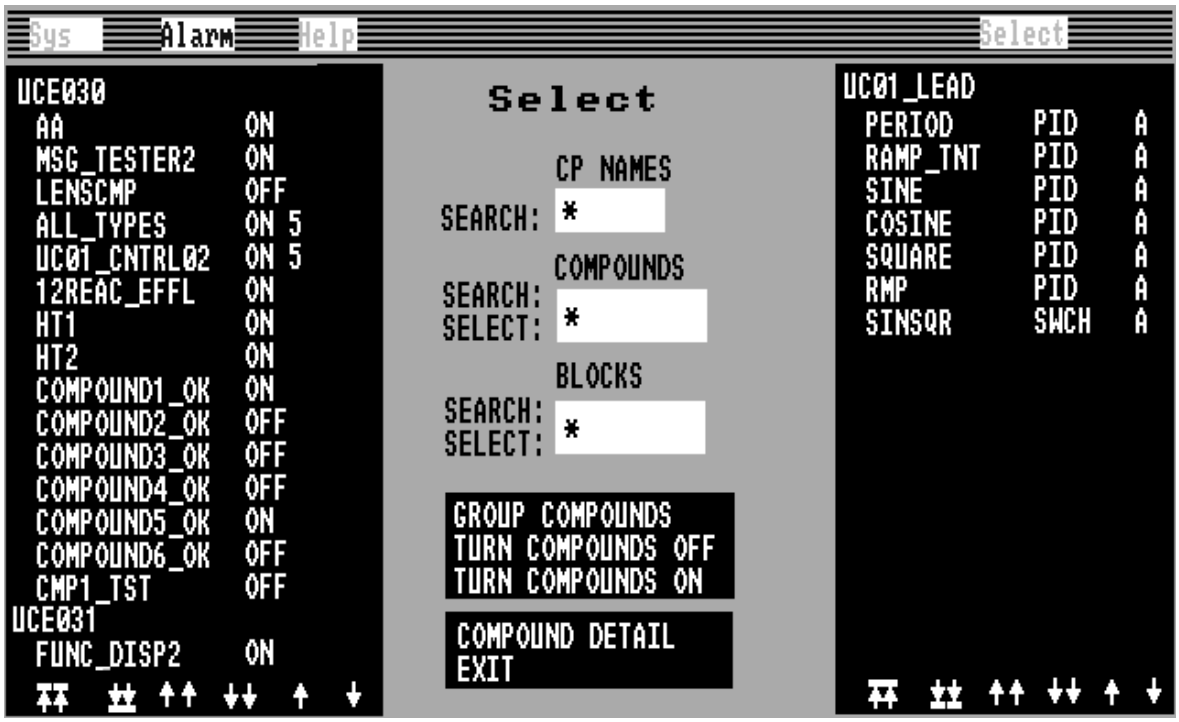


Figure 3-5. Select Screen (Compound/Block Overview)

The display includes the following sections:

- A **Compound** Menu located at the left side of the display shows all compounds in CPs which are in the current search filter. Each menu entry includes the compound name, ON/OFF status, and the current alarm state (ALMLEV8). All compounds from the same CP are grouped together; the entry immediately above the group contains the name of the CP in which the group of compounds exists.
- A **Block** Menu located at the right side of the display shows all the blocks in the compound selected from the **Compound** Menu. Each entry in this menu includes the block name, block type, A/M (auto/manual) status, and color-coded current alarm state.
- Search input fields and soft keys in the center of the display allow you to perform search filtering and display actions.

The following operations can be performed using the Select Screen Display menus, soft keys, and field input boxes.

1. Filtering Control Processors – The CP Names Search box is used to limit the CP names that appear in the scrollable list from the selected directory. Select the **SEARCH** box and key in the desired search pattern to access a subset of CPs. For example, UC01* accesses those compounds (or blocks) starting with UC01; *U* accesses those compounds with a U anywhere in the name.

   If a search pattern is not entered, the complete list of CPs in the system appears. If the list of CPs exceeds WP memory requirements (255 compounds and CPs), the message **Compound menu capacity reached. List incomplete.** appears. Either make a selection from the current CP list or enter a search filter to access a subset

of the original list. Refer to "Dialogue Box Selection Commands" on page 27 for information on using the Search option.

Normally, the compounds listed in the **Compound** MENU are those whose CPs are listed in the **/etc/wpcplns** file used by the WP. By default, this file is identical to the **/etc/cplns** file, which contains a list of all the CPs in the system. You may create an alias **/etc/wpcplns** file to reflect just those CPs for which the WP has responsibility. See "Changing the CP Domain for a Workstation Processor" on page 51.

If the **/etc/wpcplns** file has been aliased and does not contain the CP with the desired compounds, enter the desired compound name directly (via the keyboard) in the **COMPOUND SELECT** input field.

NOTE: Control processor names are not selectable in the Compound menu.

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2. Scroll List – When a list of compounds (blocks) is shown in the **Compound** (**Block**) Menu, the list can be scrolled up or down one compound (block) at a time, one page at a time, or to the TOP or BOTTOM using the single arrows, double arrows, or underscored double arrows, respectively.
3. Access List of Blocks within Compound – Select a compound from the **Compound** Menu or enter a compound name directly in the Compound SELECT field to display the list of all the blocks within that compound in the BLOCK Menu.
4. Access Compound Detail Display – Select a compound (see operation 3) and select the **COMPOUND DETAIL** soft key to display the Compound Detail Display.
5. Access Block Detail Display – Select a block from the Block Menu or enter a block name in the BLOCK SELECT field to display the Detail Display for that block.
6. Turn Compound ON/OFF – After selecting a compound, select the soft key **TURN COMPOUNDS ON** or **TURN COMPOUNDS OFF**.
7. Group Compounds – Select the **GROUP COMPOUND** soft key, which turns RED when selected, to activate the grouping function. In the grouping mode, any number of compounds can be selected from the **Compound** Menu to be part of the group. Each compound selected appears highlighted in the **Compound** Menu.

   This button can be protected (not pickable) using Foxboro's access level protection scheme. Refer to the *Display Manager Calls* document for information on protecting the Select Screen buttons.
8. De-select Compound from Group – Reselect the highlighted compound in the **Compound** Menu. The entry is no longer highlighted and part of a compound group.
9. Ungroup Compounds – Reselect the **GROUP COMPOUND** soft key to clear any previously defined group of compounds. Or, enter a name in any of the input field boxes in the center of the display to clear any previously defined group of compounds.

10. Turn Group of Compounds ON/OFF – After selecting a group of compounds (see number 7), select **TURN COMPOUNDS ON** or **TURN COMPOUNDS OFF** to change the On/Off status of all the compounds in the selected group.

    This button can be protected (not pickable) using Foxboro's access level protection scheme. Refer to the *Display Manager Calls* document for information on protecting the Select Screen buttons.

11. Exit Select Screen (Compound/Block Display) – Select the **EXIT** soft key to return to the previous display.

Changing the CP Domain for a Workstation Processor

The CP domain in a workstation processor is used by the **Select** display to determine which CP compounds are to be listed in the **Compound** menu. The list of CPs in the workstation domain file defaults to the entire list of CPs throughout the system. However, this workstation domain file (**/etc/wpcplns on AP10/AP20** or **/etc/fox/wpcplns on AP50/51**) can be edited to provide a customized alias file for each workstation on the system.

NOTES:
1. Any compound on the system can still be accessed by entering the compound name in the entry field.
*2. Only the **vi** editor is available on an AP50/51 or a system with both AP50/51s and AP20s.*

The procedure for changing the CP domain for an individual workstation is as follows:

1. Determine the CPs that contain compounds of interest to a given WP.
2. Access the VT-100 mode from the **SftMnt** or **Tools** pull-down menu.
3. Change to the /usr/diskless/<wplbug> directory, where <wplbug> represents the letterbug of the workstation processor.
4. Copy the file <wplbug>.alias to <wplbug>.old using the cp command. This file will serve as a backup of the original file should you wish to restore it.
5. Using the **vi** or **ice** editor in the VT-100 mode, edit <wplbug>.alias to include the following line at the end of the file:

   /etc/wpcplns <tab> /usr/diskless/<wplbug>/wpcplns.cp

   Note that <tab> references the tab character and that the file wpcplns.cp need not be placed in the /usr/diskless directory. It can be placed in any subdirectory within the /usr directory.
6. Copy /etc/wpcplns (or if AP50/51, /etc/fox/wpcplns) to /usr/diskless/<wplbug>/wpcplns.cp or to wherever you have specified it to be within the /usr directory.
7. Using **vi** or **ice**, edit /usr/diskless/<wplbug>/wpcplns.cp to contain only the CP letterbugs that the WP should view and exit the editor.
8. Reboot the WP by selecting **Reboot** from the **Sys** pull-down menu or by pressing Ctrl Alt F1 simultaneously. The select screen views as its default the CPs listed in

the **/usr/diskless/<wplbug>/wpcplns.cp** file. You can still access any compound from any CP on the system by entering that compound name in the search field on the select screen.

This procedure can be repeated for any other workstation processor in the system, if desired.

Multi-Head Workstations

The WP51 and AW51 can support two CRTs per workstation. This is known as multi-head operation. The two CRTs share a single keyboard and pointing device, a common bus for a touchscreen, and a common I/O bus. The CRTs can be configured so that cursor action moves from one CRT to the other.

Configure the orientation of the two CRTs by typing:

```
echo n > /usr/fox/sp/crt_location
```

where:	n = L (Left)	Location of the secondary screen with respect
R (Right)	to the primary screen	
A (Above)		
B (Below)		

Multi-head CRTs can also support four annunciator keyboards or annunciator numeric/keyboards, four annunciator keyboard horns, two console horns, and two external horns. Annunciator key commands from any of the four keyboards can be directed to any Display Manager on any workstation processor on the I/A Series network.

Multiple Display Managers/Multiple Alarm Managers

For Model 51 stations, refer to the online Help for FoxView and Workstation Alarm Manager.

In WP51 workstations or AW51s, you have the ability to invoke and run multiple Display Managers (DMs) and Alarm Managers (AMs) on a single workstation processor (or AW). This provides multiple DM windows and/or multiple sets of AM windows on:

- The same physical screen
- Different screens of a dual-headed workstation
- Remote screens

Each instance of the DM and each DM window is independent of any other DM. This means that each DM is configured with its own unique name and functions as though it were running on a separate processor. Figure 3-6 shows a display with multiple DM windows opened. At run time, no data or operator actions are shared among the DMs, but any DM can independently call up an Alarm Manager for access to the set of Alarm Displays. A DM invokes an assigned or default AM via the **Alarm** field in an I/A Series environment. Each instance of the AM, which unlike the DM supports a set of six AM display windows, is independent of any other AM. See Figure 3-7 and Figure 3-8. This means that each AM is configured with its own unique name and functions as though it were running on a separate processor.

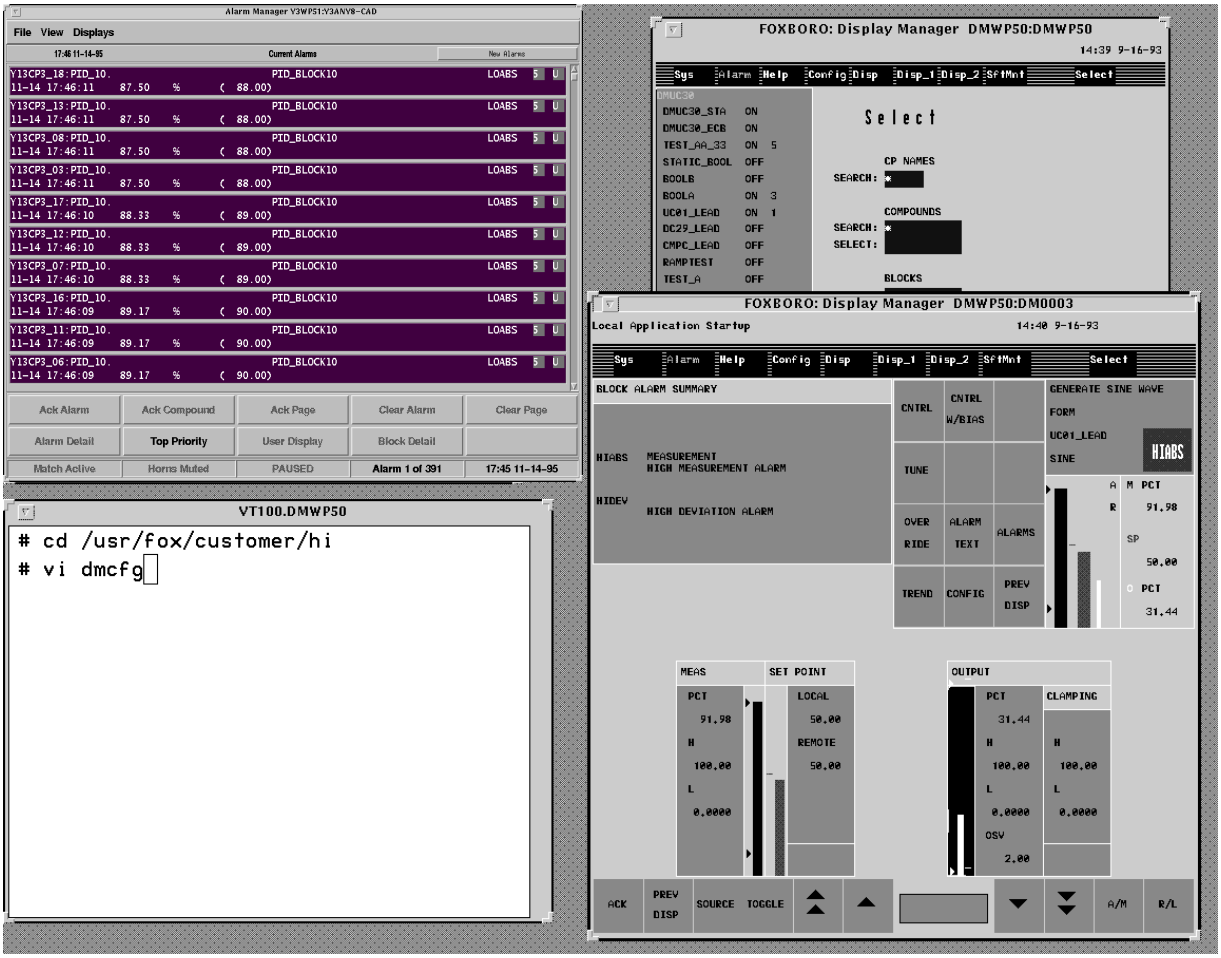


Figure 3-6. Multiple Display Managers with Initial Alarm Display in Upper Left Corner AP20/50 and WP20/30/50

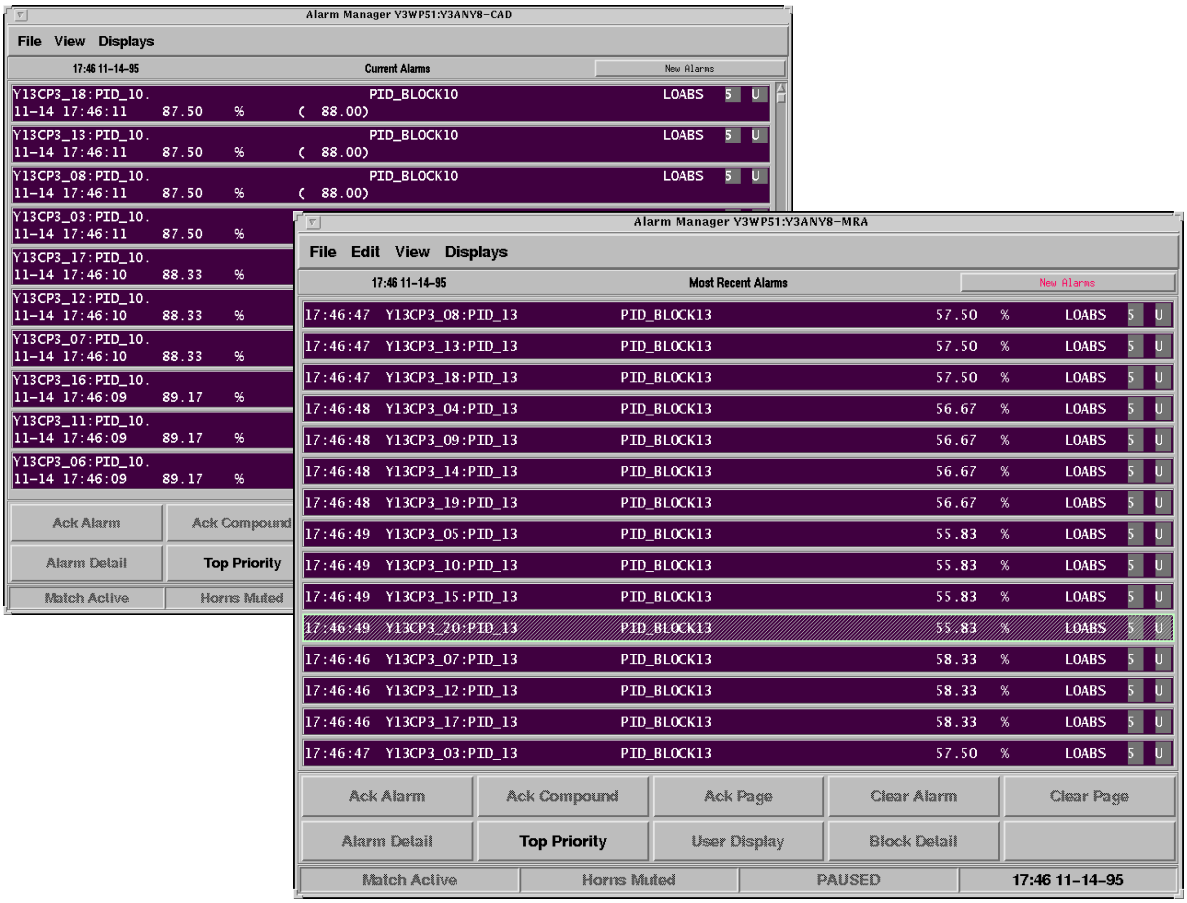


Figure 3-7. Most Recent Alarms and Current Alarms Displays (AP20/30/50 and WP20/30/50)

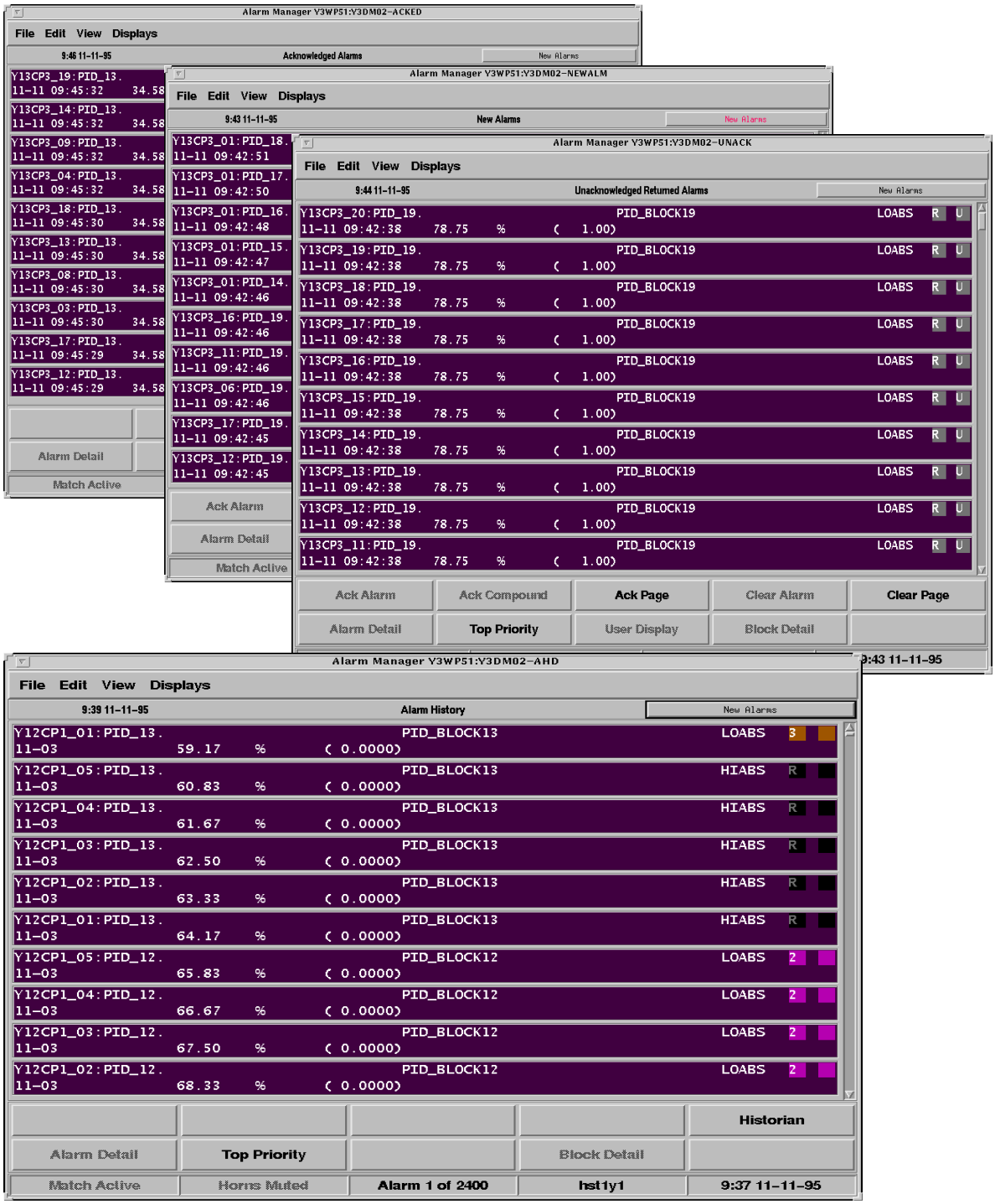


Figure 3-8. Examples of Alarm Summary Displays (AP20/50 and WP20/30/50)

Invoking the DM_Usage Display

For AP/WP50, to invoke the multiple Display Manager function, select **Sys** from the main menu bar, then select **DM_Usage** from the menu. A display/dialogue box resembling Figure 3-9 appears.

The display contains:

- A list of all configured Display Managers for the workstation
- Name of the current workstation
- Status, selectability, and DM type information
- Total number of licenses for the workstation and the number of dedicated DMs
- Soft keys to start and stop the DM, and to return to the previous display

The display is partitioned into five columns for name and usage information and 16 rows for individual DM entries as follows:.

Display Manager Entry	Description
DMNAME	Pickable name of the current workstation. Highlights in yellow when selected.
ACTIVE SCREEN	Updates to show what is currently running. Indicates the name of the workstation where it is active.
DEDICATED	An * in this field indicates that the DM is dedicated to a specific screen as configured in the DM configuration file. Otherwise it is non-dedicated.
TYPE	DM type as configured during the DM configuration process.
REASON NOT SELECTABLE	Indicates why the DM is not pickable.

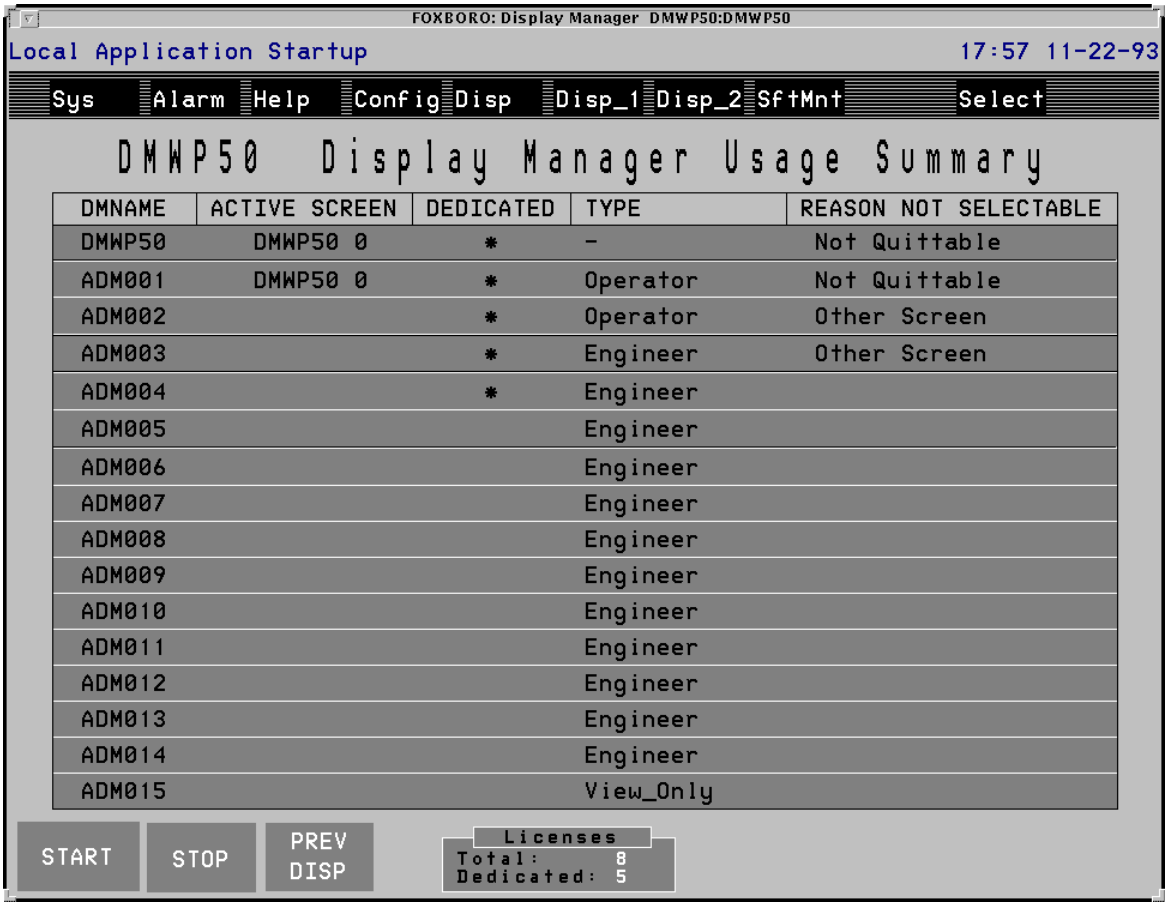


Figure 3-9. DM_Usage Display/Dialogue Box for AP50, WP30/50

A Display Manager may not be pickable because:

- It is active but is not quittable (bootable), therefore it can not be stopped. It is configured to appear at boot time.
- It is inactive but is a dedicated DM for another screen, therefore it can not be started.
- It is inactive but there are no licenses available.
- The current DM is running in WP30 emulation mode with the window manager turned off.

To start a Display Manager, select the DM name. After it becomes highlighted, select the START soft key at the bottom left of the display.

To stop a Display Manager, select the DM name. After it becomes highlighted, select the **STOP** soft key at the bottom of the display. A dialogue box appears at the destination DM notifying you that the DM is about to exit, and the name of the DM requesting the exit. This action is also logged through the error reporter.

To return to a previous display, select the **PREV DISP** soft key.

The workspace menu pick **I/A Display Manager** starts a DM on the current screen where the menu pick was made.

DM startup fails if the named DM is already running, is not configured or available for the current screen, or there are no available licenses. If startup fails, a temporary dialogue box is displayed notifying you of the reason for the failure.

Operations with Multiple Display Managers

The title bar on the DM window contains the letterbug of the hosting processor and the DM name; for example:

Host Processor Letterbug: DM Name(6 characters) GCLBUG:DMTNK1

The Operator Action Journal Configurator and On-Line Trend Configurator include both the workstation letterbug and the DM name in their titles.

When working with the Operator Action Journal, either the workstation letterbug or the DM name is logged into the printer field or Historian. This defaults to the DM name but can be changed by resetting the WP read-only variable OJL (Operator Journal Log) to GCLBUG (workstation letterbug).

When iconified, the DM icon displays the DM name by default.

Operations with Multiple Alarm Managers

The title bar on the AM window contains the letterbug of the hosting processor and the AM name; for example:

Host Processor Letterbug: AM Name(6 characters) GCLBUG:DMTNK1

The initial alarm display accessed from the Alarm field in the I/A Series environment defaults to the Current Alarm Display. The Display field in the menu bar provides access to the other Alarm Manager Displays:

- Most Recent Alarms (MRA) Display
- New Alarms Display (NEWALM)
- Acknowledged Alarms Display (ACKED)
- Unacknowledged and Returned-To-Normal Alarms Display (UNACK)
- Alarm History Display (AHD)
- Operations Display (OPR)

The Operator Action Journal additionally logs selected Alarm Manager actions. Refer to the *Operator Action Journal* document. Each display can be individually iconified.

Refer to the *Process Operations and Displays* and *Workstation Alarm Management* documents for information on using Alarm Manager Displays.

Windows Off Mode

If the WP is in Windows Off mode (no window manager is running), the Display Manager's window is always a full size window located in the upper left corner of the screen. The configured window location is not used, and the DM_Usage display will not allow any additional DMs to be started on the current screen. Because there is no workspace menu pick without a window manager, there is no way to start a DM for the second head of a multi-head system, unless it is configured to come up at boot.

When the **`Alarm`** field in the DM I/A Series environment is selected, the Alarm Display, running in the background, appears in the foreground.

Model 51X Terminal

The Model 51 X Terminal used with the AW51 Style B or C, or the WP51 Style B, provides you with another interface to the system, and allows you to perform remote supervisory and monitoring functions. It can access system information and other applications on the Ethernet network, but is not intended for performing process operator functions such as controlling the process. It can be used to remotely perform engineering functions such as using configurators (for example, the Historian).

The terminal can be connected locally to the AW51 or WP51 host, or can reside on the Ethernet network and connect remotely to the host. It is not connected to the Nodebus. The terminal does not support windows off (WP30 emulation), disk drives, touchscreen, annunciator keyboards, alarm horn, or any other form of alarm annunciation. It does use an alphanumeric keyboard, mouse, trackball, or industrial pointing device.

The terminal is provided with startup support and its image and Display Manager by the boot host (AW51 or WP51). This means that when the terminal is turned on, it is automatically booted from the host and, by default, a Display Manager window appears. An Alarm Manager can also be configured to appear on the X Terminal. As the terminal always uses an X window base, the systems from which the terminal reads data must also support X windows.

When a station running an X Terminal goes down or there is a break in the connection, you may not be aware until you try to interact with that station. The terminal may hang and require a restart or reboot.

To shut down an X Terminal, leave the process that you are monitoring, and close all applications (for example, Alarm display, Spreadsheet). Power down using the command:

```
Stop a
```

and disconnect the power. To reboot, turn the power on.

4. Printing Devices/System Terminal

The standard printers associated with the I/A Series are as follows:

- B/W Dot-Matrix Printer 80
- Color Dot-Matrix Printer 132
- Color PostScript Printer

You may find two printers attached to the AP51 or AW51. For example, a dot-matrix printer on the serial port for alarms, and a PostScript printer on the parallel port for printscreens and reports. In this case, the AW51 cannot have touchscreen or modular keyboards as these devices are connected to the serial port.

The following sections discuss the control panel options, powering on and off procedures, and the printer self-test for each of the printers supported.

For information on initial setup procedures, power-up, paper, ink and ribbon cartridge installation, maintenance, and troubleshooting, see the user manual supplied with the printer.

The system terminal or console emulates the VT-100 mode and provides:

- A means of viewing and modifying the system terminal configuration parameters.
- Access to the application processor file systems.

Additional information can be found in the section on “System Terminal” on page 70.

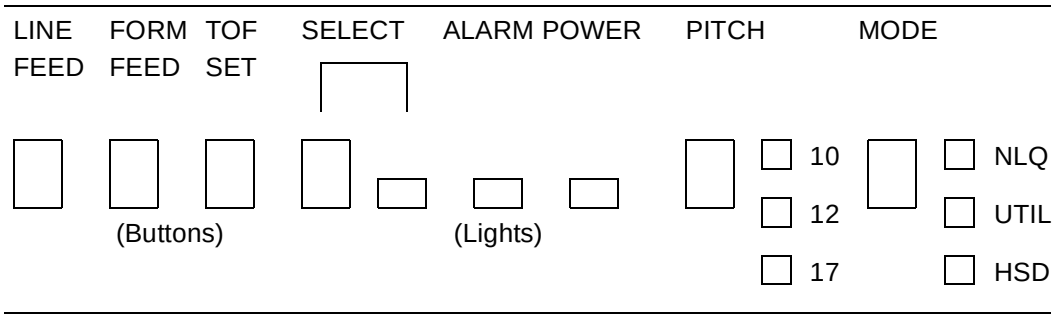
Dot-Matrix Printers

The Black and White dot-matrix 80 printer is used for black and white text and graphics applications such as log and alarm printing. It supports 80-column printing (80 characters per line at 10 cpi or 137 characters at 17 cpi) at 120 characters per second. Graphic resolution is 144 x 144 dots per inch.

The Color dot-matrix 132 printer supports both black/white and color ASCII text. The printer supports 132-column printing. Draft quality print is 400 cps; memo mode print speed is 200 cps; and letter quality is 80 cps. This printer can be used for printing alarm messages in red.

Printer Control Panels

The Dot-matrix 80 printer provides the following lights and buttons for printer control:

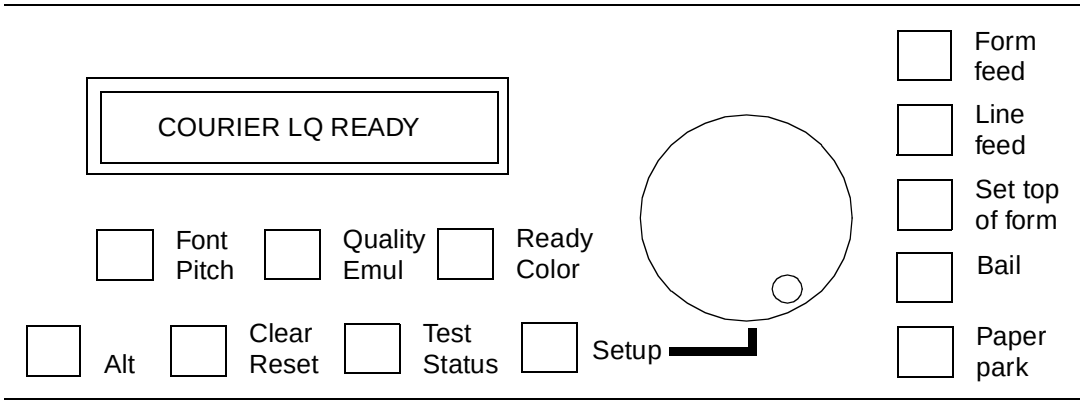


NOTE: Your dot-matrix printer may not have the PITCH and MODE buttons.

Power Light	Lights when the power is switched on.
Alarm Light	Lights when the printer runs out of paper, if the paper or ribbon jams, or if the access cover is not fully seated.
Select Light	Lights when the printer is selected (ready to print); and it is off when the printer is deselected (not ready to print).
Pitch Light	Lights to indicate selected pitch – 10, 12, or 17.
Mode Light	Lights to indicate the selected mode – near-letter quality, utility, or high speed draft.
SELECT	Selects or deselects the printer. When the printer is selected, the SEL light comes on and the printer is ready to receive data from the computer. When the printer is deselected, it does not print (unless you are running a self-test), but you can perform some of the printer functions described below. If you hold down the SELECT button while turning the printer on, the printer enters hexadecimal mode.
TOF	Sets the first printing line of each page. Press this button when the printer is deselected.
FORM FEED	Advances paper to the top of the next page. Press this button when the printer is deselected. You can also use this button to activate the printer's **Menu Select** mode described in the printer reference guide supplied with your printer.
LINE FEED	Advances the paper one line. Press this button when the printer is deselected. You can also use this button to perform a self-test. Hold this button down while switching on the printer for the self-test.
PITCH	Sets the pitch to one of the following options: 10, 12, or 17 characters per inch.

MODE Sets the print mode to one of the following options: near-letter quality, utility, and high speed draft.

The Color dot-matrix 132 printer provides the following indicators and switches that is, push-button for printer control:



Display Displays assorted information categorized as follows:

Status (for example, COURIER LQ READY) – Shows current font and quality and whether printer is ready, paused, printing a self-test or in the demand document mode. Applicable message appears when power is turned on and during normal print operation.

Alternate Status (for example, 10 DIAB630 BLACK) – Indicates character pitch, printer emulation and color. Applicable message appears when alternate function of a pushbutton is selected; the alternate function is presented in blue adjacent to the pushbutton.

Operator/Error (for example, LOAD PAPER) – Various messages are displayed; the messages correspond to conditions, actions required and error messages.

Setup Menu (for example, 33 INTRFCE: Par) – Setup selection list; it contains operations, print modes, page settings, tabs, communication settings and special modes.

Select Dial Used to perform the following:

Move Paper – Press Ready to disable printing then rotate the Dial clockwise or counterclockwise to respectively advance or reverse the paper. Press Ready to re-enable printing.

Move Carriage – Hold down Alt and rotate the Dial clockwise or counterclockwise to respectively move the carriage right and left.

NOTE: Moving the carriage does not affect the printing position; when printing begins, the carriage moves back to its original position.

View Setup Menu – Press Setup and rotate dial to scroll through menu and make selections. (Refer to the description of the Setup pushbutton for more information.)

Ready

Turns printing on or off and displays READY or PAUSE to respectively indicate the printing can occur or is suspended. If the switch is depressed while printing is in progress, printing will halt at the end of the current line; when the switch is depressed again, printing will resume.

When the demand document mode is on, pressing Ready displays DEMND and advances the bottom edge of the last printed page up to the serrated tear bar. Pressing Ready again performs either of the following:

- If the last printed page *was* removed or the tear option is being used, the paper reverse feeds to the next top-of-form, the READY message reappears and printing continues.
- If the last printed page was *not* removed, the paper reverse feeds to the original position, the READY message reappears and printing continues at the point where it left off.

Also when the demand document mode is on, pressing Ready twice in succession displays PAUSE and disables printing. Pressing Ready again re-enables printing and the READY message reappears.

NOTE: When the printer is turned on or reset, printing is turned on. However, the interface is active at all times and can receive data even with printing turned off.

Emul

Holding down the Alt button and pressing the Emul button selects the next available printer emulation and displays the name of the printer being emulated. When you select an emulation, all current printer settings remain in effect.

Quality

Pressing the Quality button selects the next text quality and displays LQ, MQ, or DQ. LQ is letter-quality printing at 80 characters per second; MQ is memo-quality printing at 200 characters per second; DQ is draft-quality printing at 400 to 480 characters per second, depending on the current pitch. In addition to LQ, MQ, and DQ, EQ can also be selected if the current font contains an optional executive-quality character set. EQ is executive-quality printing at 45 characters per second. EQ offers the best text quality available.

Font

Pressing the Font button selects the next available font (type style) and displays the font name. Each font has a default pitch, which is the pitch that you normally use to print the font. When a font is selected, pitch changes to the default pitch of that font.

Pitch

Holding down the Alt button and pressing the Pitch button selects the next available pitch (number of characters per inch) and displays the pitch setting. Select 10, 12, 13.3, 15, 17.1 or 20 characters per inch. If the current font is a proportionally-spaced font, PS is also selectable. If your software application sets the pitch to some nonstandard value,

such as 5- or 8-pitch, NS (nonstandard) appears as the current pitch. When a pitch is selected, characters in the current font expand or compress to fit the new spacing.

Color — Holding down the Alt button and pressing the Color button selects the next available color and displays the name of the color. Select black, blue, red, yellow, purple, green, or orange. If a monochrome ribbon is installed in the printer, select only black.

Form feed — Pressing the Form feed button causes one of the following actions to occur:

- When loading a single sheet with or without a sheetfeeder, the sheet advances to the top-of-form.
- If a single sheet is already loaded, the sheet ejects.
- When loading or using pin-feed paper, the paper advances to the next top-of-form.

Line feed — Pressing the Line feed button advances the paper one line space; holding down the Line feed button causes continuous line feeding. The actual distance that the paper advances for a line feed depends on the current lines per inch (lpi) setting. During line feed, the printer increments its internal line count. If the Line feed button is used to move paper to the top-of-form, press the Set top of form button to initialize the printer's line count to zero.

Set top of form — Pressing the Set top of form button sets the top-of-form at the current print line. When top-of-form is set, the printer recognizes the current print line as the first line on the page (line 0) and starts counting lines from that point.

Bail — Pressing the Bail button moves the bail back and forth. During normal printing operations, it is not necessary to use the Bail button since the printer moves the bail automatically.

Paper park — Pressing the Paper park button with pin-feed paper loaded in the printer causes the paper to reverse feed until the top edge of the first sheet is halfway through the tractors. Before pressing the Paper park button, however, tear off the last printed sheet that has fed beyond the tear bar. With paper park, removing pin-feed paper from the printer is quick and easy. To reload the paper, just press Form feed.

Clear — Pressing the Clear button erases any data in the printer input buffer. Since the printer receives incoming data faster than it can be printed, the printer temporarily stores data in a buffer in memory. If printing is turned off or an error occurs, all of the data in the buffer waiting to be printed can be erased. Clearing the buffer does not reset any printing parameters; all of the current settings remain in effect.

Reset	Holding down the Alt button and pressing the Reset button resets printer logic, clears the input buffer, and initializes all printing parameters to the defaults. Using the Reset button is like turning the printer off and then back on, except that downloaded fonts remain in effect.
Test	Prints an 8-inch, 13.6-inch or 16-inch wide test pattern. Refer to the Dot-Matrix Printer Self-Test paragraph for more information.
Status	Holding down the Alt button and pressing the Status button prints a *Printer Status Report*. The report consists of a list of the available printer emulations and fonts, a printout of the Setup menu, and a printout of all characters in the current font. The Setup menu is a snap-shot view of current printer settings. To terminate the printing of the report, press the Ready button. Printing will stop at the end of the current line.
Setup	Pressing the Setup button displays the Setup menu. From the Setup menu, you can view and change most printer settings. If the Setup menu is displayed but not used for more than three minutes, the status message will reappear automatically. Pressing any control panel button, except the Alt button, also redisplays the status message.

Powering On and Off

For the Dot-Matrix 80 printer, use the ON/OFF switch located on the right side of the printer (located near the back) to power the printer on and off. The power light illuminates when the power is on.

For the Color Dot-Matrix 132 printer, use the ON/OFF switch. Press the I side of the switch to turn the printer on; press the O side of the switch to turn it off.

Dot-Matrix Printer Self-Test

For a quick printout of the printing capabilities of your printer, use the self-test. Place the power switch in the OFF position, the power cord in an outlet, and the ribbon and paper in the applicable printer.

Dot-Matrix Printer 80

Use the following procedure to perform a self-test for the dot-matrix 80 printer:

1. While holding down the LINE FEED Button, switch the printer ON.
2. After about 3 seconds, release the button. A test pattern begins printing.

NOTE: You can use the Menu Select Mode described in your printer reference guide to print self-tests that show special features like color printing, near-letter quality, and double-width printing.

---

3. Select LINE FEED to stop the printer test.

Dot-Matrix Printer 132

Use the following procedure to perform a self-test for the dot-matrix 132 printer:

1. With the printer turned on, press Test to print an 8-inch wide test pattern of some of the characters in the current font (ASCII codes 33 to 126), using the current print modes. Pressing Test twice in succession prints a 13.6-inch wide or (if the maximum print width is set to 16 inches) 16-inch wide test pattern.
2. Press Ready to terminate the test.

Color PostScript Printer

The Color PostScript printer is a single-sheet feed printer that provides high-resolution, full-screen imaging without the need to shrink the screen image. The high-quality color images on letter or legal size paper or overhead transparencies supply a permanent record of plant/process variables, conditions, and events. It utilizes four color cartridges (black, cyan, magenta, and yellow) to create a full palette of colors.

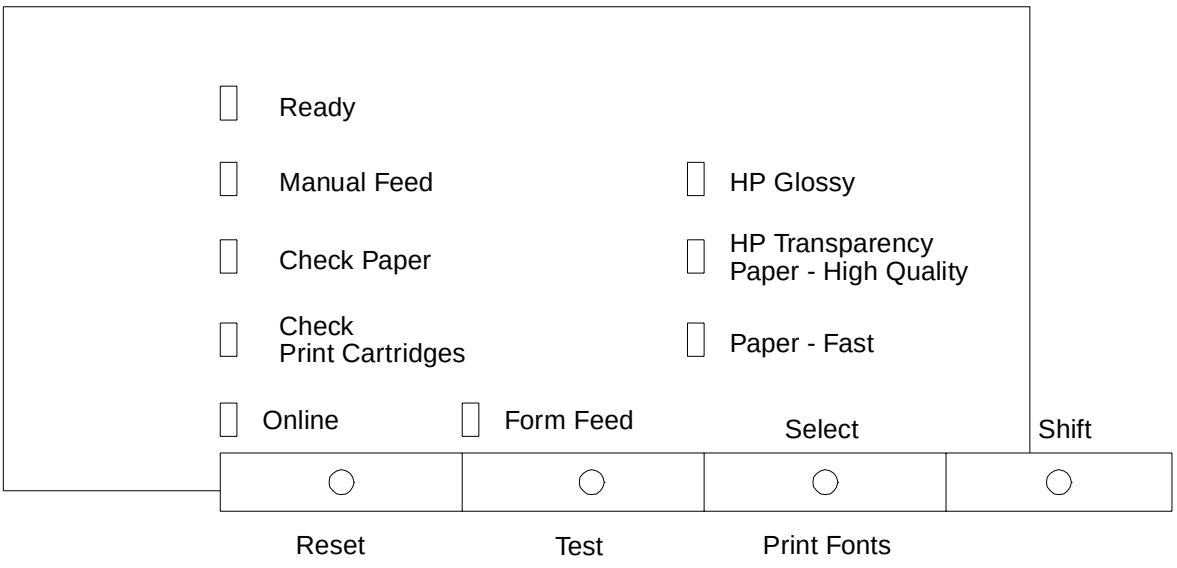
Throughput is six pages per minute for normal print mode for text, and four minutes per page for a printscreen. Fast and high quality print modes are also available. The graphics resolution is 300 x 300 dots per inch and the image size is 1152 x 900 pixels.

The printer can be a network printer connected to serial ports, or it can be directly connected to parallel ports on the AP51, WP51, and AW51. Alarms will not appear at this printer.

All operational indicators and controls are at the front of the printer.

Printer Controls

The Color PostScript printer provides the following controls and lights:



LIGHTS:

Print Mode	**HP Glossy** lights when the printer is set to print on glossy paper. **HP Transparency/Paper High Quality** lights when the printer is set to print on transparency film or paper for jobs that require high quality text and graphics. **Paper - Fast** lights when the printer is set to its fastest print mode. Software at your site may override control panel settings.
Ready	Lights when the printer is turned on and initialized. It flashes when data is being processed, indicating that the printer is busy.
Manual Feed	Lights when the printer is ready to manually feed media through the feed chute at the top rear of the printer. Use this mode if you are printing on label stock or envelopes.
Check Paper	Lights and remains lit when the printer is out of paper, or paper is misfed into the printer. The light flashes when the printer has a paper jam, or when transparency film has been loaded with the white strip at the wrong end.
Check Print Cartridges	Lights and remains lit when one or more print cartridges is clogged or out of ink. The light flashes when one or more print cartridges is not seated properly or has an electrical connection problem.
Online	Lights and remains lit when the printer is able to communicate with the system. When not lit, functions on the control panel can be performed. Self test can be performed while **Online** is lit.
Form Feed	Lights and remains lit when you use the **Form Feed** button.

BUTTONS:

Online	Allows the printer to communicate with the system. Pressing **Online** turns the **Online** light on or off. The printer must be offline to perform control panel functions.
Reset	Use this button to clear all data from the printers memory. To reset the printer, put the printer offline, hold down the **Shift** button, depress the **Reset** button, then release both.
Form Feed	Put the printer offline and depress **Form Feed** to eject paper that is loaded in the printer.
Test	To perform a self-test, hold down the **Shift** button, depress **Test**, then release both.
Select	Use this button only if your software does not allow you to select media and quality. To choose the proper print mode for your media, put the

	printer offline and depress **Select**. The print mode light corresponding to your selection will light.
Print Fonts	Prints a list of fonts in the printer's memory and any installed font cartridges. Put the printer offline, hold down the **Shift** button, depress **Print Fonts**, then release both.
Shift	Allows you to reset the printer, print a self test sheet, and print a fonts list.

Refer to the printer manual that came with your printer for additional function information.

Powering On and Off

With the power cable connected, the four ink cartridges and paper installed, use the following procedures to power the printer on and off.

To power on the printer:

1. Before turning on the printer, be sure the paper tray is full with no paper protruding, that the media size switch is set to the proper size, that the top cover is closed, and that paper trays are fully seated on their rails. Otherwise, the printer does not initialize properly.
2. Press the ON/OFF button located on the lower left front of the printer. The Ready light is on when the printer is turned on and initialized.

To power off the printer:

Press the ON/OFF button located on the lower left front of the printer. The Ready light goes out. When in the Off (raised) position, the printer is in a standby condition, and data in the printer's memory is erased. Power is still applied even though the printer is not functional.

Printer Self-Test

The printer self-test is used to determine if the printer is functioning properly, to assess print quality, or to determine whether a cartridge is out of ink. The self test printout also provides information for rear panel switch settings, amount of memory in the printer, font cartridges installed, and any printer error messages. Use the following procedure to initiate a self-test:

1. Make sure paper is loaded in the media tray, print cartridges are loaded and pushed fully forward, and the top cover is closed.
2. Turn the printer on by pressing the On/Off button.
3. Make sure the Ready and Online lights are on.
4. Press and hold the Shift button, press the Test button, then release both to print the self test.

Printer Functions

Printer situations regarding paper outages and heavy alarm traffic are handled as follows by the I/A Series software:

- When the select button is pressed to deselect the printer or a paper outage occurs, the XON/XOFF protocol reports the printer as temporarily busy. Messages are saved by the communication processor for the printer and not redirected to a backup device. When paper is restored or the select button is pressed, messages resume printing, resources are freed, and the communication processor functions normally.

NOTE: If paper is not restored or the select key is not pressed to resume printing, the communication processor uses up all its allowed buffer space and begins to drop messages.

- When a CMP10 is approaching an out-of-memory resource condition due to heavy alarm message traffic, the CMP10 checks for a remotely configured backup printer and redirects new incoming messages to the configured remote print device. The local print device appears as failed to system management and alerts the device monitor to notify a print servers generating alarm messages to redirect messages to the remote printer.

System Terminal

The system terminal(s) on the communication processor (CMP10) or directly connected to an AP provides a means of viewing the parameter value settings for the current terminal session. If the system terminal is on a CMP10, you can modify the following terminal session parameter values (command mode): ECHO, EOM, IDLE, and TIMEOUT.

Once a terminal session is established (that is via log-in procedure) with an AP (terminal mode), the user may:

- Enter shell commands greater than 132 characters.
- After remote-mounting a station, change the directory in the remote file system.
- Access INFORMIX.
- Perform AP tape backup and restore procedures.

NOTE: The previously mentioned tasks are not available in the VT-100 mode of WP10s, WP20s, and WP30s.

Command Mode

The command mode of a system terminal (on a CMP10 only) supports the following help and parameter related commands:

Command	Description
HELP	Entered without an argument, HELP provides a list of all legal user commands. Entered with the name of a parameter, it provides a list of allowable parameter settings. For example, HELP EOM provides the following EOM SETTINGS: ♦ NONE (no data terminating character) ♦ CR (carriage return)
SET	Entered with the name of the parameter and the desired value, changes the current value of the specified parameter to a new value, for example, SET ECHO ON.
STATUS	Lists all the current parameter settings for a given port, for example, STATUS.

The command mode also supports the following commands related to establishing and terminating a session with an application processor:

CALL XXXX	Requests the operating system to set up a session with the called AP.
LOGOUT	Terminates a session established with the application processor. The mode of operation is then changed from terminal mode to local command mode.
RET	Returns to the terminal mode.

The modifiable system terminal configuration parameters are:

Mnemonic	Description	Options
ECHO	Provides the ability to echo characters back to the device. This parameter is device dependent.	OFF = no echo ON = echo
EOM	Allows selection of data forwarding signal. Indicates the signal required to assemble a message and send it.	NONE = no signal CR = <enter>
IDLE	Defines the maximum amount of idle time allowed between character inputs before data is assembled and sent.	0 = no timeout 1-255 = 1/20 second
TIMEOUT	Defines the maximum idle time allowed for a connection between a remote process and device. Idle connections are automatically terminated after a fixed time.	0 = none 1-255 = minutes

Terminal Mode

The terminal mode is used when access to a host application processor is desired. This mode is used for:

- AP10 and AP20 startup and shutdown procedures. See sections “AP10 Startup Procedure” on page 94, “AP20 Startup Procedure” on page 95, and “AP10 and AP20 Shutdown Procedure” on page 96.
- AP50/51 and AW50/51 startup and shutdown procedures. See sections “AP50/51 and AW50/51 Startup Procedures” on page 96 and “AP50/51 and AW50/51 Shutdown Procedure” on page 97.
- AP Backup and Restore procedures. See the section “Streaming Tape Backup and Hard Disk Restore” on page 85.
- AP operating system related activities, such as C or shell programming.

When the system terminal is on a CMP10, the BREAK key is used to switch from the terminal mode to the command mode.

5. Storage Devices

The storage devices associated with the I/A Series file servers are as follows:

Storage Devices	AP10*	AP20	AP50, AP51
Hard Disk Drive	80 MB	80 MB, 120 MB (as of Release 3.2)	424 MB, 1.3 GB (AP50); 535 MB, 1.05 GB(AP51), 2.1 GB (AP51)
Floppy Drive	1.2 MB	1.2 MB, 1.44 MB (as of Release 4.0)	1.44 MB
Tape Drive	60 MB	60 MB, 150 MB (as of Release 3.2)	150 MB, 2.5 GB, 5 GB
Compact Disk Drive			644 MB

* Not supported on Version 4.0 or later systems.

AW50/51s have the same devices as AP50/51s.

A Wangtek Tapeport streaming tape unit is available for PW media distribution.

NOTE: The 60 MB tapes produced using an AP20 can be read by an AP50/51 but cannot be written to. The 150 MB tapes produced using an AP50/51 cannot be accessed by an AP20.

During the installation of equipment, the default jumper settings for each drive (on an AP10 or AP20) or the thumbwheel switches (on an AP50/51) may need to be changed depending on your configuration.

When installed on the SCSI bus, the storage devices (tape drives, floppy drives, hard disks, CD-ROMs) at either end of the SCSI bus must have terminating resistors (AP10 or AP20) or terminal plugs (AP50/51) installed. All other peripherals on the bus must have their terminating resistor packs or terminal plugs removed.

See the *System Equipment Installation* document for complete information on setting jumper switches or thumbwheel switches and installing peripherals on the SCSI bus.

Device/File Command Usage

Do not use the VENIX `tar` command to or from tape as the data transfer is not reliable. Use `tar` to and from diskette only. (Applies to pre-4.0 versions of VENIX.)

Do not use the raw device `rfh0` or `rfh1` on an AP20 with SMS diskette SCSI controller as transfer may occur with unreported errors. Use block device `fh0` or `fh1`.

Do not use the `bar` command on a system running the Solaris 2.2 operating system. The `bar` command is valid only for SunOS 4.1.1. To retrieve files from a diskette that was created using the `bar` command:

- Change to the destination directory.
- Type:

```
cpio -ivdh bar < /dev/fd0
```

Drive Designations

Operators responsible for the system hard disk backup and restore, diskette backup, and file procedures must be aware of the drive address designations associated with each of the configured drives.

The following sections discuss the possible drive designations for the various storage devices.

Hard Drive

The addresses associated with the AP10, AP20, AP50/51, AW50/51 and PW hard drives are as follows:

Hard Disk Drive	AP10	AP20 or AP20FT	AP/AW50 or drive mirrored	AP/AW51 or AP/AW51 mirrored	PW
System Hard Disk	1	3	3	3	w0
Extended Disk	–	5	–	–	–
Additional Hard Disks		4	2, 1, 0	2, 1, 0	w1
Compact Disk	–	–	6	6	–

NOTES

1. The extended disk is a disk dedicated to historian sample data collection.
2. For the AP20FT (fault tolerant module), the mirrored hard drives (one on each SCSI bus) must have the same address.
3. For the AP50 system mirrored disk, the address is md0; for the user mirrored disks, the address is md1, md2, and md3.
4. On AP/AW51 stations, **d** is used to reference device names and partitions regardless of their mirrored state. However, when booting from tape to restore file systems or when creating the new file system, you must use **sd**. d6, d7, d8 are pooled mirrored devices.
5. The compact disk drive is a read-only drive.

AP20 Mirrored Hard Disks

The fault-tolerant AP20 is two AP20 modules (each having its own SCSI bus) installed side-by-side with fault-tolerant software. Each module must have a system hard disk of the same size with the same SCSI bus address (address 3). These system disks become mirror images of one another. Any other hard disks associated with the fault-tolerant AP20 with the same SCSI bus addresses (such as address 5 for extended disks) also must be mirrored disks.

You can have only one floppy and one tape drive associated with a fault-tolerant pair; these can be located on the SCSI bus of the primary or shadow AP module.

At startup, the system automatically determines the primary module.

The mirror disk task runs in the background and copies the contents of its disk (source disk) to the destination disk on the shadow AP20 module. With an 80 MB disk, this task takes approximately 45 minutes to one hour to complete. Other system activity may occur simultaneously with the disk mirroring and not interfere with the file systems.

CAUTION: *Do not perform any of the following operations on the primary module while it is in the process of running the mirror task: OFF-LINE DIAGNOSTICS, EEPROM UPDATE, REBOOT, or a PHYSICAL PULL-PUSH.*

When the mirroring task is complete, the system performs simultaneous read/writes to both disks. If there are multiple pairs of mirrored disks, sequential mirroring takes place.

To determine if the mirroring task has been completed and the disks are currently doing simultaneous read/writes or the mirroring task is currently running, observe the following:

- If the disk access lights on each of the mirrored drives appear to be flashing simultaneously when the disks are performing read/writes, the mirroring task is already completed.
- If the disk access light on the source hard disk (attached to primary module) appears to be flashing two to three times more frequently than the disk access light on the destination hard disk (attached to shadow), the mirroring task is in progress. The shadow drive shows a short burst of activity every second during the mirroring. The primary module is the module with the more active disk drive.

The file **/usr/adm/Mirror_Status** can be viewed to determine the status of the current mirroring task: starting, % completed, done.

Within System Management, the Equipment Information Display for the AP20FT indicates the MAC addresses for the primary module (PRIM ROM ADDRESS) and the shadow module (SHAD ROM ADDRESS). On initial startup, you should physically mark these addresses on the face of the hardware for easy reference. If the primary module fails, the shadow module automatically changes its role and becomes the primary module. You should keep track of primary/shadow role changes. Refer to the Equipment Information Display for the AP20FT and the addresses marked on the face of the hardware to determine the current primary and shadow roles of the modules.

If the mirroring task will not run to completion without manual intervention, refer to the VENIX telmirror_dsk command and options in the *VENIX User Reference Manual*. This command should only be used by authorized personnel.

AP50/51 and AW50/51 Mirrored Hard Disks

Refer to the *System Administration Guide for 50 Series Systems* documentation(B0193LL for SunOs; B0193ND for Solaris 2.x) for information concerning AP50/51 and AW50/51 Mirrored Hard Disks.

Tape Drive

The tape drive addresses are shown below:

Tape Drive	AP10*	AP20	AP50/51	AW50/51	PW
80 MB	2	2	–	–	–
150 MB	–	2	4	4	–
2.5 GB	–	–	4	4	–
5 GB	–	–	5	5	–

* AP10 is not supported on Version 4.0 systems.

The jumper settings (for drives on AP10 and AP20) or thumbwheel switches (for drives on AP50/51 and AW50/51) must reflect the appropriate drive address.

Floppy Drives

Floppy drives are numbered in sequence starting with 0 (zero). High-density drives have the **fh**, **fmh** or **fd** designation before the drive address number. Low-density drives have the **f** designation before the drive address number. Refer to the table below for drive addresses:

Floppy Drives	AP10*	AP20	AP50/51 AW50/51	PW
1st Floppy Drive	fh0	fh0	fd0 or fh0	fh0
2nd Floppy Drive	-	fh1	-	fh1, fmh1, or f1

* AP10 is not supported on Version 4.0 systems.

In order for the AP20 high-density floppy drive to read low-density diskettes, internal jumper settings must be changed from the default high-density setting to the low-density setting.

NOTE: Do not change the high-density floppy drive used for the AP boot diskette to read low-density diskettes.

The PW may have one or two 1.2 MB floppy drives or both a 1.2 MB floppy drive and a 360K floppy drive. Beginning with Software Release 3.0, PWs may have a 1.44 MB drive as the second diskette drive. Beginning with Version 4.0, the PW must have a 1.44 MB floppy drive as the first diskette drive. PWs may also have a 1.2 MB floppy as the second diskette drive.

High-density 5.25 inch diskettes are used in the 1.2 MB drive and 3.5 inch diskettes in the 1.4 MB drive. Low-density diskettes are used in the 360K floppy drive. Be sure to format and use diskettes in the proper drives.

*NOTE: Diskettes to be used in both PW and AP50/51 1.4 MB drives must be formatted without a file system. Use the **tar** commands for file compatibility between the drives.*

Floppy Diskettes

The 1.2 megabyte floppy disk drives configured with the AP10 and the AP20 require standard commercially-available 5.25 inch floppy diskettes. These diskettes are double-sided, high-density. They are typically unformatted when purchased.

The 1.44 megabyte floppy disk drive configured with the AP50/51, AW50/51, AP20, and PW requires standard 3.5 inch double-sided, high-density diskettes.

NOTE: Unlike the AP10 and AP20 drives, the ***eject*** *command must be used to remove the diskette from the AP50/51 or AW50/51 drive.*

See the "System Parts List" section of the *System Maintenance* document for a list of approved vendors of diskettes for Foxboro I/A Series Systems.

Diskette Handling

Observe the following precautions when handling flexible diskettes:

- When not in use, store diskettes in protective envelopes (for 5.25 inch diskettes) or containers (for 3.5 inch diskettes).
- Replace envelopes on the 5.25 inch diskettes when they become worn, cracked, or distorted.
- Keep diskettes away from magnetic fields (for example, CRTs, power supplies).
- Do not write on the plastic jacket of the 5.25 inch diskette with a lead pencil or ballpoint pen; use a felt-tip pen.
- Do not expose diskettes to temperatures below 10°C (50°F) or above 46°C (115°F); protect them from sunlight and any foreign contaminants.
- Do not touch or attempt to clean the exposed magnetic surface (recording slot) of the 5.25 inch diskettes; abrasions may cause loss of stored data.
- Avoid excessive diskette flexing with the 5.25 inch diskettes.

Loading and Releasing Diskettes

For AP10 and AP20 Disk Drives:

1. When loading the 5.25 inch diskette in an AP10 or AP20 floppy disk drive, insert the diskette (label facing the drive latch, recording slot first) completely into the drive. Turn the latch clockwise to its horizontal position.
2. When the indicator is illuminated, the diskette is being read or written to. Do not attempt to turn the diskette drive latch when reading or writing of the diskette is taking place. (No indicators are available on AP50/51 or AW50/51 drives.)
3. When the indicator is off, turn the drive latch counter clockwise to its vertical position. This action releases the drive and partially ejects the diskette. Remove the diskette from the drive and return it to its protective envelope.
4. When loading 3.5 inch diskettes on AP20, insert the diskette with the label facing away from the Eject button.

5. Do not remove diskettes when indicator is illuminated.
6. Use the Eject button to remove diskette from drive.

For AP50/51 or AW50/51 Disk Drives:

1. When loading a 3.5 inch diskette in an AP50/51 or AW50/51 floppy disk drive, insert the diskette (label facing up or to the left, recording slot first) completely into the drive until the disk clicks in place.
2. When the indicator is illuminated, the diskette is being read or written to. Do not attempt to eject the diskette when reading or writing of the diskette is taking place.
3. When the indicator is off, in the VT-100 mode enter the command `eject /dev/fd0` or `eject`. This command releases the drive and partially ejects the diskette. Remove the diskette from the drive.

NOTE: Under emergency conditions (loss of power), the diskette can be removed by placing the end of a paper clip in the small hole in the drive.

Formatting Diskettes

Each new diskette must be formatted to prepare it for storing information. You can also reformat a diskette to erase existing information for the purpose of reusing the diskette.

Diskettes may be formatted using the "Format Floppy Diskette" File Utility explained in the section "Format Floppy Diskette" on page 102 or using the operating system formatting command in the VT-100 mode as explained below.

1. To format high-density diskettes, insert the high-density diskette into the high-density floppy drive.

   To format low-density diskettes using a PW with a low-density drive, insert the 5.25 inch low-density diskette in the proper drive.
2. From the Process Engineer's environment or the Software Engineer's environment select **`SftMnt`**; from the Plant Management environment select **`Tools`**.
3. Access the VT-100 mode from the **`SftMnt`** pull-down menu, from the **`Tools`** pull-down menu, or from a system terminal.
4. At the **#** prompt within VT-100, enter the formatting command:

   ```
   format /dev/<appropriate drive address>  <CR>
   ```

   For the high-density floppy drive 0 on an AP10, AP20, or PW, the formatting command is:

   ```
   format /dev/fh0  <CR>
   ```

   Drive fh0 on an AP20 or PW accommodates either a 5.25 inch or 3.5 inch diskette.

   For the high-density floppy drive on an AP50/51 or AW50/51, the command is:

   ```
   fdformat /dev/fd0  <CR>
   ```

5. While formatting, the message **Formatting /dev/<drive address>** appears and the activity indicator is illuminated. (No indicators are available on AP50/51 or AW50/51 drive.)
6. When completed, the **#** prompt returns. On the AP10, AP20, or PW, you may remove the diskette or initiate filing procedures, such as copy or delete file. With the 50 Series diskette, use the following **eject** command prior to removing the diskette:

   ```
   eject /dev/fd0
   ```

7. Press **Ctrl** d to exit VT-100 mode.

Diskette Write-Protection

Floppy 5.25 inch diskettes come with a write-protect notch on one side. If this notch is exposed, you can read and write to the diskette. Floppy 3.5 inch diskettes are encased in hard plastic with a small slide lever in one corner. When the small square opening in the corner is covered, you can read and write to the diskette.

To guard against information on the diskette being written over,

- On the 5.25 inch diskette, place a tag (supplied with diskettes) over the notch, or
- On the corner of the 3.5 inch diskette, move the small slide lever so that the small square opening is visible.

The diskette can still be read, but no write operations can be performed.

Streaming Tape

For the AP10 and AP20, the cartridge tape drive uses an industry-standard 1/4-inch magnetic tape cartridge with 60 MB of storage (600 feet).

For the AP20, the cartridge tape drive uses either a 60 MB tape cartridge with Part Numbers P0400QK and P0900DU, or a 150 MB tape cartridge with Part Numbers P0911SM and P0911WE.

For the AP50/51 and AW50/51, there are the following types of cartridge tape drives:

- The QIC-150 1/4inch cartridge tape drive which uses a 1/4inch magnetic tape cartridge with 150 MB of storage.
- The 2.5 GB QIC 1/4inch cartridge tape drive which uses a 1/4inch magnetic tape cartridge.
- The 8 mm SCSI cartridge tape drive, which uses an 8 mm tape cartridge with 5 GB of storage.
- The 4 mm DAT cartridge tape drive, which uses a 4 mm tape cartridge with 5 GB of storage.

Refer to the parts list for your system for a list of approved vendors of tape cartridges for Foxboro I/A Series Systems.

Handling Streaming Tape Cartridges

Observe the following precautions when handling streaming tape cartridges:

- Use tapes in an environment with a temperature range of 5°C to 45°C and store tapes in a temperature range of -40°C to 45°C. Do not expose the cartridge to direct heat or sunlight.
- Allow the tape cartridge to acclimate to the operating environment, if necessary.
- Return the cartridge to its storage container whenever it is removed from the drive. Be careful not to drop the cartridge.
- Keep the cartridge away from magnetic fields, including CRTs.
- Prior to using a cartridge tape for the first time, or when it has been stored for more than a week, retension the tape using the stcopy retension command. The retension command for SunOS and Solaris environments is:

  mt -f /dev/rst0 retension

Loading and Removing a Streaming Tape Cartridge

The streamer tape drive is a front-loaded, compact bulk storage device utilizing tape cartridges.

To load a 60 MB or 150 MB streaming tape cartridge:

1. Rotate the write-protect pointer on the tape cartridge to point to the position opposite **SAFE** to indicate that the tape is not write-protected.
2. Insert the cartridge fully into the loading slot with the metal backing of the cartridge facing the access light of the tape unit.
3. Move the slide lever at the top of the drive toward the inserted cartridge, latching the cartridge in place. The indicator is illuminated when there is a tape in the drive.

To remove a 60 MB or a 150 MB streaming tape cartridge:

1. Wait until you no longer hear activity before removing the tape. Do not attempt to remove the streaming tape cartridge while there is activity. To do so could cause tape read/write errors. Move the tape drive slide lever away from the inserted cartridge to partially eject the tape cartridge from the loading aperture.
2. Remove the cartridge from the drive and return it to its plastic storage container.

NOTE: For the AP50 or AW50, refer to the SunOS User's Guide and/or the SunOS Reference Manual for ***mt*** *(move tape) command information. For AP51 or AW51 information, refer to Solaris 2.2 Advanced User's Guide.*

To load a 5 GB tape cartridge (AP50/51 or AW50/51):

1. The indicator is illuminated when there is a tape in the drive. To indicate that the tape is not write-protected, slide the red slider on the back of the cartridge to the retracted position.

2. Insert the cartridge fully into the loading slot with the label of the cartridge facing up or to the left depending on how the tape unit is mounted.
3. Push the drive door until it is closed.

To remove a 5 GB tape cartridge (AP50/51 or AW50/51):

1. Wait until you no longer hear activity before removing the tape. Do not attempt to remove the streaming tape cartridge while there is activity. To do so could cause tape read/write errors. Press the front panel button (5 GB tape) to eject the cartridge.
2. Remove the cartridge from the drive and return it to its plastic storage container.

Compact Disk Drive (CD-ROM)

The CD-ROM is an optional device on the AP/AW50 and a standard device on the AP/AW51. Operating system software and other optional software is loaded from the CD-ROM on the AP/AW51 stations, and the device is also used for system reboot. CD-ROMs may be accessed and mounted or unmounted either locally or remotely.

To load the CD-ROM:

1. Mount the CD-ROM in the CD drive by inserting it directly into the drive. If your model of CD drive has a caddy, insert as described in Steps 2 and 3. The Model 51 Style B and C do not have caddies, but external CD-ROM drives may have caddies.
2. Remove the CD-ROM from its plastic case and place it in its caddy. When it is properly inserted into the caddy the label is visible.

***CAUTION**: If the drive is mounted vertically, the CD-ROM must be secured with retaining clips.*

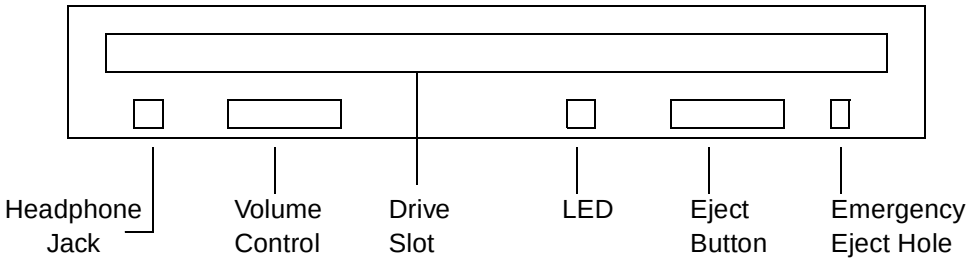
---

3. Insert the caddy, face up, into the drive slot, shown in the diagram below. Ensure that the CD drive is powered on.

To unload the CD-ROM:

1. Wait until the LED indicates that drive activity has ceased, then depress the Eject button.
2. Remove any retaining clips and remove the CD from the caddy and replace it in its plastic case.

The same precautions should be taken as for floppy diskettes.



Media Distribution for PWs

Software for PW Release 4.0 and 4.1 is available on streaming tape using the Wangtek, Inc. TapePort magnetic tape drive. You can also back up application software and data. The drive is available as a stand-alone unit that connects to a parallel printer port via a parallel-to-SCSI connector. You disconnect the printer cable and install the tape drive cable which has a printer pass-through connector on one end and a SCSI connector at the other end, so that both the printer and tape drive can be simultaneously connected to the PW.

Loading the Cartridge

To load the cartridge, hold it with the label side up. The side of the cartridge with the tape access door must face the drive select LED while it is being inserted into the loading slot. The tape is loaded by pushing the cartridge into the drive until resistance is met, the locking arm clicks into position, and the cartridge will slide no further inward. **Quickly** release the cartridge so it will slide out partially, locking into position. The cartridge is now ready for operation.

Unloading the Cartridge

To release the cartridge, push it into the tape drive until resistance is felt and the latch releases. This is signified by an audible click. At this time, release the cartridge and it will be ejected partially. You can now remove it.

Write Protect Feature

Data on the cartridge can be protected from erasure by turning the write protect indicator to the SAFE position. It also prevents you from appending files to the tape.

Drive Select Indicator

The drive select indicator is located on the front panel of the drive. When illuminated, the tape cartridge is being accessed by the host computer and must not be removed. When the indicator is not illuminated, it is safe to remove the tape cartridge.

6. Backup Procedures for Diskettes and Hard Disks

A floppy diskette backup provides for a duplicate diskette in the event that the original diskette becomes unreadable or misplaced.

A hard disk backup provides for recovery from a hard disk failure. The failed hard disk can be replaced with a spare disk previously loaded from a recent tape backup, or a disk restoration from a recent tape backup can be performed on a new hard disk.

Hard disk recovery procedures assume that a spare hard disk is available with a recent tape backup of the current hard disk software, current database information, file additions and updates.

Copying Floppy Diskettes

High-density software diskettes can be copied for backup purposes using an AP10, an AP20, an AP50/51, AW50/51, or a PW.

The procedure for copying diskettes varies slightly depending on the availability of two high-density drives or a single high-density drive.

With AP20 Dual Floppy Drives

For an AP20 with dual floppy 5 1/4 inch high-density drives of the same size:

1. Insert the high-density source diskette (the diskette to be copied) into Drive 0.
2. Insert a high-density target diskette (blank diskette) into Drive 1.
3. Access the VT-100 mode from the Sft_Mnt pull-down menu if using a workstation processor (WP) or from the system terminal on the communication processor (CMP).
4. Type the following command at the # prompt:

   ```
   dd  if=/dev/fh0  of=/dev/fh1  count=2400  <CR>
   ```

NOTE: Use the floppy drive addresses associated with your configuration. Count= 2400 indicates the number of input blocks associated with a high-density diskette.

   Copying a high-density diskette takes approximately twelve minutes to complete.

5. For improved copying speed, use the following command in place of that specified in Step 4:

   ```
   dd  if=/dev/fh0  of=/dev/fh1  bs=30b  count=80  <CR>
   ```

With AP10, AP20 or PW Single Drive

For an AP10, AP20 or PW with a single 3.5 inch or 5.25 inch high-density floppy drive:

1. Insert the high-density source diskette into Drive 0.
2. Copy the source diskette image to the AP10, AP20 or PW hard disk in order to later transfer the information to the target floppy. Type the following command at the # prompt:

   For a 3.5 inch diskette:

   ```
   dd  if=/dev/rfh1  of=/usr/tmp/diskette  count=2880   <CR>
   ```

   For a 5.25 inch diskette:

   ```
   dd  if=/dev/rfh0  of=/usr/tmp/diskette  count=2400   <CR>
   ```

NOTE: Use the floppy drive addresses associated with your configuration. Use ***r*** *before the drive address to perform a raw (faster) copy. Count=2400 indicates the number of input blocks associated with a high-density diskette.*

---

3. After the copy to the AP10, AP20 or PW hard disk is complete, replace the source diskette with the target diskette.
4. Copy the file from the hard disk to the target floppy diskette using the following command at the # prompt:

   For a 3.5 inch diskette:

   ```
   dd  if=/usr/tmp/diskette  of=/dev/rfh1  count=2880   <CR>
   ```

   For a 5.25 inch diskette:

   ```
   dd  if=/usr/tmp/diskette  of=/dev/rfh0  count=2400   <CR>
   ```

5. Additional copies can be made by replacing the target diskette with a blank diskette and following Step 3 and Step 4 for as many copies as are needed.

With AP50/51 or AW50/51 Single Drive

For an AP50/51 or AW50/51 with a single 3.5 inch high-density floppy drive:

1. Insert the high-density source diskette into Drive 0.
2. Copy the source diskette image to the AP or AW in order to later transfer the information to the target floppy. Type the following command at the # prompt:

   ```
   dd  if=/dev/rfd0  of=/usr/tmp/diskette  bs=48b <CR>
   ```

NOTE: Use the floppy drive addresses associated with your configuration. Also, use **r** *before the drive address to perform a raw (faster) copy.*

---

3. After the copy to the AP50/51 or AW50/51 is complete, replace the source diskette with the target diskette.
4. Copy the file from the hard disk to the target floppy diskette using the following command at the # prompt:

```
dd  if=/usr/tmp/diskette  of=/dev/rfd0  bs =48b<CR>
```

5. Additional copies can be made by replacing the target diskette with a blank diskette and following Steps 3 and 4 for as many copies as are needed.

Streaming Tape Backup and Hard Disk Restore

Hard disk backup is a recommended procedure. The procedure for backing up the system disk to tape or restoring a disk takes approximately 20 minutes.

For an AP10 backup and restore, the procedure requires a system terminal connected directly to the AP10. For an AP20 or AP20FT backup and restore, the procedure requires a system terminal connected to Port 4 of a communication processor (CMP10). The tape drive and the floppy diskette drive for the AP20FT must be on the same SCSI bus as the hard disk to be backed up.

There are two ways to back up data from the hard disk to tape and one to restore data from tape to the hard disk.

NOTES:

1. The AP(10, 20, or 20FT) must be taken off-line to perform either a tape backup or a restore of the hard disk.
2. Resistor packs must have been removed from all installed peripherals except for the last one on each end of the SCSI bus. Refer to the *System Equipment Installation* document for details.
3. Tapes made with the **stcopy** command and the AP Backup and Restore diskette are the only tapes supported. Do not use the VENIX **tar** command to or from tape; the data transfer is not reliable. The **tar** command is only for diskettes.
4. When restoring the system disk of an AP from tape, the AP must be booted from a special boot floppy containing the tape copy commands. The AP10 and the AP20 have separate boot floppies. The AP20 boot floppy also boots up a CMP10 to allow a system terminal to be attached to communicate with the AP20.
5. For the AP20, the CMP10 timeout value must be set to 0. At the system terminal, type the following command at the CMP> prompt to accomplish this:

   ```
   set  timeout  0          <CR>
   ```

   If this is not done, the CMP10 session terminates in the middle of the tape backup or hard disk restore process. The procedure must then be restarted.
6. When rebooting a module using the pull-push method, you must disengage the peripheral connection (elevator) prior to pulling out the module and engage the connection (elevator) after pushing in the module. Refer to the *System Equipment Installation* document for complete instructions on engaging and disengaging the peripheral connection.

Streaming Tape Backup Method 1 for AP10 and AP20

The procedure for making a tape backup of a hard disk is the same for an AP10 and AP20. However, additional steps are required for the AP20FT. For the AP10, the system terminal

must be connected directly to the AP10. For the AP20 and AP20FT, the system terminal must be attached to Port 4 of the CMP10. Two or more cartridges (with blank labels) are required for a full disk copy.

The tape backup procedure is as follows:

1. Follow an AP shutdown procedure (Steps 1- 3) as detailed in "AP10 and AP20 Shutdown Procedure" on page 96.

   For a mirrored AP20FT, disengage the AP module without the tape unit/diskette drive and back the module out of the rack.

2. Rotate the write-protect pointers on each tape cartridge to the position opposite **SAFE** to indicate that the tape is no longer write-protected.
3. Insert the first tape cartridge into the streaming tape drive.
4. It is necessary to know the SCSI address for both the hard disk and the tape drive. The following numbers are used to designate hard disks and tape drives:

AP10	AP20
System disk =1	System disk = 3
Tape drive = 2	Extended (optional) disk = 5
	Tape drive = 2

   Assuming the SCSI address for the system hard disk and the tape drive are set to the defaults, insert a tape into the drive and check the drive status by typing the following command:

   ```
   st -f /dev/tape2 status        <CR>
   ```

   This command should return the drive status and information about the tape. If a bad status is returned, check the cabling to the drive and the correct placement of terminating resistors. See the *System Equipment Installation* document for additional information on resistors.

5. Copy the AP hard disk information to the tape by doing the following:
   a. Type one of the following commands using the appropriate hard disk number for the AP20, the AP20 extended drive, or the AP10:

   ```
   stcopy /dev/rshd3.all /dev/tape2   <CR>
   ```

   – or –

   ```
   stcopy /dev/rshd5.all /dev/tape2   <CR>
   ```

   – or–

   ```
   stcopy /dev/rshd1.all /dev/tape2   <CR>
   ```

NOTE: The numbers shown within the Paths indicate the SCSI bus addresses. Use the appropriate disk drive address (such as 5 for Drive 5).

---

   b. If you want to provide a software tape label, include -l and the label name in the command. For example, to label the backup tape of an AP20 with the name **Foxboro** type:

```
stcopy -l Foxboro /dev/rshd3.all /dev/tape2 <CR>
```

6. When prompted by a message on the screen to insert the next tape, remove the first tape cartridge, rotate the write-protect pointer to the SAFE position, and label the tape cartridge as #1.

NOTE: The following message may appear after the completion of a tape transaction: ***stcopy: command completed but received recovery error****. This message indicates that the tape drive controller error handling logic detected an error, took corrective action, and the corrective action allowed the tape transfer to complete without any fatal errors. The recovery error typically occurs when the tape drive detects a bad block during a write to tape. In this case, the tape drive bypasses writing to that block, marks the block as bad, and writes the data to the next good block on the tape.*

---

7. Insert the next tape cartridge and press RETURN after all tape movement ceases. When prompted, remove the tape cartridge, rotate the write-protect pointer to the SAFE position, and label the tape cartridge with the next sequential number. Repeat Step 7 until the tape backup process is completed.

NOTE: The copy utility is able to recover from most errors it encounters during the copy. If the copy aborts a portion of the way through the tape, restart the procedure. If successive aborts occur, use a new tape or readjust the tension on the tape using the appropriate option of the ***stcopy*** *command. See the VENIX User Reference Manual.*

---

8. To complete the backup procedure:
   a. For the AP20FT, insert the AP module currently backed out of the rack and engage the peripheral connection (elevator).
   b. Return the AP to its normal multi-user mode by typing:

      ```
      telinit 2        <CR>
      ```

      The single module has returned from the Maintenance mode to its normal Multi-User mode when the SUPER prompt appears at the system terminal. (**cron** and **lpsched** are started eliminating the need to reboot the AP20.)
9. Following the tape backup procedure, all tape cartridges should have the write-protect pointer rotated to the SAFE position and be numbered sequentially. Store the backup tape cartridges in an appropriate place for protection.

Streaming Tape Backup Method 2 for AP10 and AP20

Another method of doing a streaming tape backup is also available. For the AP10, the system terminal must be connected directly to the AP10. For the AP20 and AP20FT, the system terminal must be attached to Port 4 of the CMP10. Two or more cartridges (with blank labels) are required for a full hard disk copy.

The tape backup procedure is as follows:

1. For an AP20 and an AP20FT

a. Install the letterbug STCOPY in the operational communication processor (CMP10).

b. Issue a reboot request to the CMP10 with the STCOPY letterbug using a WP to access System Management. Select the REBOOT action from the Equipment Change Display for the original CMP10 letterbug.

NOTE: The CMP10 does not reboot until the AP is rebooted from the backup and restore diskette.

---

2. Follow an AP shutdown procedure as detailed in "Application Shutdown" on page 94.

For a mirrored AP20FT, disengage the peripheral connection (elevator) on the AP module without the tape unit/diskette drive and back the module out of the rack.

3. Insert the appropriate AP Backup and Restore diskette into floppy drive 0.

NOTE: There are two versions of the AP Backup and Restore diskette – one for the AP10 and one for the AP20. The AP20 diskette supports backing up and restoring the extended sampling hard drive.

---

4. Reboot the AP module by pull-pushing the module or by cycling power to the cell if the AP and its peripherals are the only modules affected.

5. For an AP20 and the AP20FT

a. After both the AP20 and the CMP10 have rebooted, the CMP10 timeout value must be set to 0. At the system terminal, type the following command at the CMP> prompt to accomplish this:

```
set timeout 0          <CR>
```

NOTE: If this is not done, the CMP10 session terminates in the middle of the hard disk backup to streaming tape. The procedure must then be restarted.

---

b. Log into the AP (using the appropriate letterbug) from the system terminal by typing:

```
call <appropriate AP letterbug>    <CR>
```

6. Rotate the write-protect pointers on each tape cartridge to the position opposite SAFE to indicate that the tape is no longer write-protected.

7. Insert the first tape cartridge into the streaming tape drive.

8. The system terminal displays the following menu selections.

a. From the first menu, select menu option **b**.

a Restore Disk from Tape Backup
b Backup Disk to Tape
c Check File Systems on Disk
d Retension the Tape
e Exit

b. From the second menu, select the appropriate disk.
- **s** System Disk
- **e** Extended Sampling Disk
- **q** Quit

NOTE: The copy procedure aborts the first time the menu choice is entered.

c. Re-enter the menu choice to start the tape streaming.

9. When prompted by a message on the screen to insert the next tape, remove the first tape cartridge, rotate its write-protect pointer to the SAFE position, and label the tape cartridge as #1.

10. Insert the next tape cartridge and press **Return** after all initial tape movement ceases. When prompted, remove the tape cartridge, rotate the write-protect point to the SAFE position, and label the tape cartridge with the next sequential number. Repeat Step 10 until the tape backup process is completed.

11. To complete the backup procedures,

a. Remove the last tape cartridge from the streaming tape unit and label as stated in Step 10.

b. Select the EXIT option from the menu. The message **Rebooting the system, please remove diskette** appears.

c. After the AP steps to the RED/GREEN state, remove the AP10 (or AP20) Tape Backup and Restore diskette from Floppy Drive 0. Otherwise, a pull/push reboot is required.

d. For an AP20 or an AP20FT, replace the STCOPY letterbug with the configured letterbug on the CMP10 and reboot the CMP10 by pull-pushing the module.

For the AP20FT, reboot the AP20 module currently backed out of the drive by pushing it in and engaging the peripheral connection.

12. Following the tape backup procedure, all tape cartridges should have the write-protect pointer rotated to the SAFE position and be numbered sequentially. Store the backup tape cartridges in an appropriate place for protection.

AP50/51 or AW50/51 Streaming Tape Backup

Refer to *System Administration Guide for 50 Series Systems* (B0193LL for SunOS, or B0193ND for Solaris 2.x) for procedures on backing up file systems and raw partitions to tape.

AP10 Hard Disk Restore

Use the sequentially numbered tape cartridges from a previous backup. The AP10 procedure for restoring the hard disk with the tape backup is as follows:

1. Follow the AP shutdown procedure using a system terminal as detailed in section “AP and PW Startup and Shutdown Procedures” on page 94.

2. Insert the AP10 Backup and Restore diskette into floppy drive 0.

NOTE: There are two versions of the AP Backup and Restore diskette – one for the AP10 and one for the AP20.

---

3. Reboot the AP by pull-pushing the module.
4. Insert the tape cartridge labeled #1 into the streaming tape drive.

NOTE: Check to be sure the write-protect pointer on each tape cartridge (containing the disk backup information) points to the SAFE position to indicate that the tape is write-protected.

---

5. The system terminal displays the following menu selections:
   a. From the first menu, select menu option **a**.
      a Restore Disk from Tape Backup
      b Backup Disk to Tape
      c Check File Systems on Disk
      d Retension the Tape
      e Exit
   b. From the second menu, select the appropriate disk.
      s System Disk
      e Extended Sampling Disk
      q Quit

NOTE: The copy procedure aborts the first time the menu choice is entered.

---

   c. Re-enter the menu choice to start the tape streaming.
6. When prompted by a message on the screen, remove the tape cartridge and insert the next sequential backup tape and press RETURN. Repeat Step 6 until the tape restore process is completed.
7. To complete the procedures:
   a. Remove the last tape cartridge from the streaming tape unit.
   b. Select the EXIT option from the menu. The message **Rebooting the system, please remove diskette** appears.
   c. After the AP steps to the RED/GREEN state, remove the AP10 Tape Backup and Restore diskette from Floppy Drive 0. Otherwise, the AP requires a pull/push reboot.

AP20 Hard Disk Restore

Use the sequentially numbered tape cartridges from a previous backup. The system terminal must be attached to Port 4 of the communication processor (CMP10). The procedure for restoring the hard disk is as follows:

1. For an AP20 and the AP20FT:

a. Install the letterbug STCOPY in the operational communication processor (CMP10).

b. Issue a Reboot request to the CMP10 with the STCOPY letterbug using a WP to access System Management. Select the REBOOT action from the Equipment Change Display for the original CMP10 letterbug.

NOTE: The CMP10 does not reboot until the AP is rebooted from the backup and restore diskette.

---

2. Follow an AP shutdown procedure as detailed in "Application Shutdown" on page 94.

For a mirrored AP20FT, disengage the peripheral connection (elevator) on the AP module without the tape unit/diskette drive and back the module out of the rack.

3. Insert the AP 20 Backup and Restore diskette into floppy drive 0.

NOTE: There are two versions of the AP Backup and Restore diskette – one for the AP10 and one for the AP20.

---

4. Reboot the AP module by pull-pushing the module or by cycling power to the cell if the AP and its peripherals are the only modules affected.

5. After both the AP20 and the CMP10 have rebooted, the CMP10 timeout value must be set to 0 and you must log into the AP.

a. Therefore, at the system terminal, type the following command at the CMP> prompt to accomplish this:

```
set timeout 0          <CR>
```

NOTE: If this is not done, the CMP10 session terminates in the middle of the hard disk backup to streaming tape. The procedure must then be restarted.

---

b. Log into the AP (using the appropriate letterbug) from the system terminal by typing:

```
call <appropriate AP letterbug>    <CR>
```

6. Insert the tape cartridge labeled #1 into the streaming tape drive.

NOTE: Check to be sure the write-protect pointer on each tape cartridge (containing the disk backup information) points to the SAFE position to indicate that the tape is write-protected.

---

7. The system terminal displays the following menu selections:

a. From the first menu, select menu option **a**.

a Restore Disk from Tape Backup
b Backup Disk to Tape
c Check File Systems on Disk

d Retension the Tape
e Exit

b. From the second menu, select the appropriate disk.
s System Disk
e Extended Sampling Disk
q Quit

NOTE: The copy procedure aborts the first time the menu choice is entered.

---

c. Re-enter the menu choice to start the tape streaming.

8. When prompted by a message on the screen, remove the tape cartridge and insert the next sequential backup tape and press RETURN. Repeat Step 8 until the tape restore process is completed.

9. To complete the restore procedure:

a. Remove the last tape cartridge from the streaming tape unit.

b. Select the EXIT option from the menu. The message **Rebooting the system, please remove diskette** appears.

c. Remove the AP20 Tape Backup and Restore diskette from Floppy Drive 0.

d. Replace the STCOPY letterbug of the operational CMP10 with its configured letterbug.

e. Reboot the CMP10 by pull-pushing the module.

f. For an AP20FT, reboot the AP20 module currently backed out of the rack by pushing it in and engaging the peripheral connection. Rebooting must be done after the restored AP module has already booted.

AP50/51 or AW50/51 Hard Disk Restore

Refer to *System Administration Guide for 50 Series Systems* (B0193LL for SunOS, or B0193ND for Solaris 2.x) for restoring the file systems or individual files from tape to the AP50/51 or AW50/51 hard disk.

7. System Startup and Shutdown Procedures

Startup and shutdown procedures for the control process vary from plant to plant depending on the needs of the process. Therefore, each plant must determine the logical order for shutting down the process and bringing the system back online after a shutdown.

Two files are available for customizing application startup and shutdown procedures (for AP10, AP20). These two files eliminate the necessity of modifying the standard **inittab** or **shutdown** files:

- /usr/applic/start
- /etc/appl_shtdwn
- /usr/applic/shtdwn

Application Startup

The **/usr/applic/start** file allows applications to be started from **/etc/inittab** without using edit inittab. When customized, the **file /usr/applic/**start performs as follows:

- It waits until all stations hosted by the AP are booted, all **cron** entries are removed with the **crontab -r** command, and **cron** requests are made from the file **/usr/applic/mastercron.**
- Any applications that have been included in the file (using **vi** or **ice** editor) at the point indicated by comments are started.

Applications that normally execute **crontab** from **inittab** must be changed to indicate execution from the **/usr/applic/mastercron** or the two **crontab** statements in **/usr/applic/start** must be removed.

The scripts standard output and standard errors appear in the **/usr/applic/start.log**.

Using **cron** to schedule activities is a common practice, but there are sometimes misunderstandings about the interaction of **cron** among multiple users, and uncertainty about which **cron** file is active. As a user, you may have only one active **cron** file at any time.

Since you need your **cron** files to have superuser capabilities, it is recommended that all **cron** entries be added to a central file, **/usr/applic/mastercron**. This action prevents you from inadvertently removing another user's **cron** entries, and also aids users in knowing what is active in a system, what should be active, and how to enable or disable the normal **cron** functions. Consistent use of this file aids users who need a better understanding of what is active in an Application Processor.

Application Shutdown

Whenever an AP is brought down to Maintenance Mode with the intent of resuming normal (**telinit2**) mode, standard Foxboro applications may need to be shut down in a more graceful manner which includes the closing and deletion of OM lists created by standard Foxboro applications.

The shutdown procedure now executes the **/etc/appl_shtdown** file whenever the user invokes **shutdown**. If standard Foxboro application software shutdown programs are kept in **/etc/appl_shtdown**, Foxboro can update the file without requiring the user to update the file to include custom shutdown programs. Custom programs belong in the **/usr/applic/shtdwn** file. The default action of the shutdown script is to stop the Historian.

Custom Application Shutdown

The **/usr/applic/shtdwn** file may be customized using the **vi** or **ice** editor to include the graceful shutdown of the various application packages and user programs that are not Foxboro standard packages.

AP and PW Startup and Shutdown Procedures

Starting up the AP10, AP20, or PW after an orderly shutdown is automatic. Simply power up the unit.

Starting up the AP10, AP20, or PW after a disorderly powerdown requires that a specific procedure be followed for each device. The following sections address startup and shutdown procedures for all three devices.

AP10 Startup Procedure

When powering up an AP10 with a system terminal attached the following occurs:

1. After VENIX is loaded, the default mode (normal mode) performs a file system check and leaves the AP port enabled for a printer. During the file check, information concerning that check appears on the screen.
2. After bootup is complete, no further output is made to the terminal.

   When online, the AP10 begins booting the other stations on the network. As a station comes online, the red and green LEDs on the module come on; when the download of files is completed, the red LED goes off.
3. If you want the terminal mode to perform any VENIX tasks (such as file transfers), do the following:
   a. Press CTRL **c** to switch to the terminal mode.
   b. At the login prompt, type:

      root <CR>
   c. At the password prompt, type:

      gnomes <CR>

NOTE: At this point, you have root permissions, which means any files can be deleted either intentionally or unintentionally. Refer to VENIX User Reference Manual to create user accounts without root permissions.

d. Press CTRL **d** to log out and switch back to the printer port mode. It is necessary to log out if the terminal is configured to display system messages.

AP20 Startup Procedure

When powering up an AP20 with a system terminal attached to the communication processor, the following occurs:

1. After VENIX is loaded, the default mode (normal mode) performs a file system check and tries to correct any problems it finds. This is a blind file check so no output is made to the terminal.

   When the communication processor boots, standard identification information appears on the screen: for example, letterbug, device name, port #, Status, Session.

2. The AP20 then begins booting the other stations on the network. As each station comes on-line, the green and red LEDs on the module come on. The red LED goes off when the download of files for the station is completed.

   If AP boot is not successful (that is, cannot boot other stations or cannot call in from CMP> prompt as discussed in Step 3), it may be necessary to try successive boots. If successive boots are unsuccessful, reload the hard disk with new software.

3. If you want the terminal mode to perform tasks in VENIX, do the following:

   a. At the CMP> prompt, type:

   call <appropriate AP letterbug> <CR>

   b. At the login, type:

   root <CR>

   c. At the password prompt, type:

   gnomes <CR>

   d. To log out, press BREAK and at the CMP-BREAK> prompt type:

   logout <CR>

   The session is terminated. From the CMP> prompt you may log in to another file server.

NOTES:
1. After login, you have root permissions which means any files can be deleted either intentionally or unintentionally. Refer to the VENIX User Reference Manual to create user accounts without root permissions.
2. No keyboard activity for 30 minutes causes the terminal session to close. The timeout setting can be changed to no timeout by typing ***set timeout 0*** *at the CMP> prompt. Typing status shows the current timeout status.*

AP50/51 and AW50/51 Startup Procedures

Upon bootup, these stations initialize with the FoxView initial display which is your primary interface to the system. For additional information about startup, refer to the *System Administration Guide* for startup procedures.

AP10 and AP20 Shutdown Procedure

For an orderly shutdown of an AP10 or an AP20, use one of the following two procedures:

NOTE: Special procedures may be required to ensure a graceful shutdown of some programs. Before typing the shutdown command, stop any customized applications and all BPM procedures; or use the script file ***/etc/appl_shtdown*** *that you have customized for shutting down processes in an orderly fashion.*

Procedure 1

From any Foxboro I/A Series environment do the following:

1. Select the **Sys** field in the top menu.
2. Select **Chg_Env** and then **Softw_Eng_Env** to access the Software Engineer's Environment.
3. Then select **SftMnt**. From the software maintenance pull-down menu, select the **AP_Shutdown** option and then the **Sync_File_Svr** option.
4. Wait until all disk activity stops (approximately 1 minute). Power down the AP.

Procedure 2

At the system terminal attached to the AP (if a WP is not available), do the following:

1. Stop all programs that are currently running so that the disk is not being accessed. Then type in the following commands at the # prompt:

   ```
   cd /          <CR>
   shutdown      <CR>
   ```

2. The message **SYSTEM BEING BROUGHT DOWN NOW, Do you want to continue? (y or n)** appears. If you wish to continue, type:

   ```
   y      <CR>
   ```

3. At the MAINT> prompt. Type:

   ```
   sync;sync   <CR>
   ```

NOTE: To display the MAINT> prompt, it may be necessary to press CTRL c a number of times. DO NOT press CTRL c in rapid succession. Watch the disk drive access light for activity. If there is no activity for at least 15 seconds, press CTRL C. Wait several seconds for disk drive access to stop or the MAINT> prompt to appear. If there is no activity, repeat by pressing CTRL c again and watching for activity. Repeat CTRL c procedure until the MAINT> prompt appears.

4. Wait 10 seconds. Then power down.

AP50/51 and AW50/51 Shutdown Procedure

When you shut down a Model 50 station, you get a "#" prompt in response.

For Model 51 stations, refer to the *System Administration Guide* for shutdown procedures.

PW Startup Procedure

To start up after properly shutting down the PW, power up the unit. Automatic startup takes place.

To start up the PW after an improper or uncontrolled shutdown (for example, PW hang-up or disorderly power down) use the following procedure:

1. Check to be sure Disk Drive A does not contain a diskette.
2. Power on the unit.
3. Wait until the message **LOADING VRTX and &** appears on the screen.
4. Quickly type: venix.novrtx <CR>

   Do this before VRTX automatically loads the standard VENIX/VRTX image.
5. Quickly type **n** in response to the question concerning the mode (normal, maintenance, or graphic mode). Type:

   n <CR>

   This indicates the normal mode. Do this before the graphics mode is automatically loaded.

*NOTE: If the graphics mode is automatically loaded, wait until the files have been checked, if possible. Then press **Ctrl Alt Del** to reboot and follow Steps 3 – 8.*

6. In response to the question concerning checking files, type:

   y <CR>

   This indicates that a file system check should be performed.

NOTE: During file system checking, the hard disk becomes very active. Prompts appearing at the terminal may ask you if you would like to ADJUST, FIX, RECONNECT, CLEAR, or REMOVE something.
The system attempts to self-correct damaged file systems as best it can. It normally fixes or adjusts things automatically. If serious inconsistencies exist it asks for permission to clear or remove damaged files or reconnect files for which it cannot find directories.
*Cleared or removed files are deleted. Reconnected files are found in the lost and found directories in the respective **sys** (/) and **usr** (/usr) file system directories. You are normally advised on the screen as to which file names and corresponding inode numbers are being cleared or reconnected. Write this information down as it appears on the terminal so the files can be replaced.*
*Files deleted or cleared from the **sys** file system should always be replaced. User data files deleted from the **usr** file system that are Foxboro standard files should also be replaced. If more than a few files are damaged, it is wise to assume that the file system is widely corrupted. Reload the hard disk.*

7. After the file system check, type the following as requested:
   a. In response to log-in, type:
      root <CR>
   b. In response to password, type:
      gnomes <CR>
   c. At SUPER> prompt type:
      sync; sync <CR>
8. Wait 10 seconds. Press **Ctrl Alt Del** to reboot the PW. The system should boot up with the I/A Series initial display.

PW Shutdown Procedure

For an orderly shutdown of the Personal Workstation use one of the following procedures:

1. From the **SftMnt** menu, select **PW_Shutdown**. A dialog box appears; it gives you the option of confirming or cancelling the **PW_Shutdown** request.
2. When prompted on the screen, power off the Personal Workstation.

– or –

1. From the VT-100 mode, at the # prompt, type:
   sync;sync <CR>
2. Wait 10 seconds.
3. Power off the Personal Workstation.

8. File Utilities

File utilities are available from AP10 and AP20-hosted WPs in the Process Engineer's Environment from the **Config** pull-down menu. The file utilities include:

- Copy to destination
- Move to destination
- Rename
- Send to printer
- Format floppy diskette (high or low)
- Store on floppy diskette
- Load from floppy diskette
- Append to Floppy
- Copy: Host/Remote
- Copy: Remote/Host
- Copy Remote/Remote
- Delete: Host
- Delete: Remote

File commands are available for AP50/51-hosted WPs in the VT-100 mode. In both the Process Engineer's Environment and the Software Engineer's Environment, VT-100 is accessed from the **SftMnt** pull-down menu.

***CAUTION:** File utilities and file commands should be used only by authorized personnel since there is the potential for removing or deleting system files.*

Access to File Utilities (AP10, AP20, PW) or File Commands (AP50/51, AW50/51)

File Utilities are accessed in the following manner:

1. For the following systems:
   a. For AP10/20/50, AW50, PW:
      - Select **Sys** from the top menu bar of any environment.
      - From the resulting pull-down menu, select **Change_Env**.
      - From the Environment pull-down menu, select **Proc_Eng_Env** or **Soft_Eng_Env**.

   b. For AP/AW51:
      - From FoxView, click the **Change Env** icon.

- From the Foxboro Change Environment dialog box, select **Softw_Eng** then click **OK**.

2. Select **Config** (for file utilities) or **SftMnt** (for VT-100 mode access to file commands for AP50/51 and AW50/51) from the menu bar within the Process Engineer's environment or the Software Engineer's environment.
3. From the Config pull-down menu select **File Utilities** or from the **SftMnt** pull-down menu select **VT100** for AP50/51 or AW50/51.

File Utility Actions

Using the file utilities (for AP10, AP20, and PW) requires that you know the source and destination of files. The following features are available when you select the **SERVER** box, the **DISK** box, or the **FILE** box:

- A list of the file servers, directories and subdirectories, or files within subdirectories from which the appropriate information can be directly selected.
- A filtering feature which allows you to access a list of servers, directories, or files with similar names before making a selection from the list. You select the wildcard (*) and then enter a character string with * in the field. Only those files containing the same character string appear.

Within File Utilities, all of the available actions are listed in the Action List. These actions are discussed in the following sections.

Entering Choices

Entries to the file action fields can be made in one of two ways:

- Type the information in the yellow entry box using the standard keyboard and press **Return** to confirm the entry.
- Select the information from a list generated by selecting one of the boxes listed below:

Source	Destination
SERVER	SERVER
DISK (path name)	DISK (path name)
FILE	FILE
	PRINTER

For SERVER Information:

- Select the Server Field beside the **SERVER** box. Type the appropriate server name in the Server Field entry box and press **Return** to confirm the entry.

  – or –

- Select the **SERVER** box. A list of the current servers appears.

Select a file server from the list. The selected file server appears in the Server Field entry box.

For DISK (path name) Information:

- Select the Disk Field beside the **DISK** box. Type the appropriate path name in the Disk Field and press **Return** to confirm the entry.

  – or –

- Select the **DISK** box. A list of the root directory and default subdirectories appears.

  Select the root (/) directory from the upper box; next select the appropriate subdirectory from the bottom box. Continue to make subdirectory selections until you have the complete path name listed in the DISK field.

For FILE Names Information:

- Select the File Field beside the **FILE** box. Type the appropriate file name in the File field entry box and press **Return** to confirm the entry.

  – or –

- Select the **FILE** box. A list of all the files in the given DISK path directory appears below this field.

  Select the desired file from the list. This file name then appears in the File field to the right of the **FILE** box.

  If you do not select a file from the list, all the files in the current directory are included. Not all procedures permit this.

For PRINTER information

- Select the Printer field beside the **PRINTER** box. Type the appropriate printer name in the Printer field and press **Return** to confirm the entry.

  – or –

- Select the **PRINTER** box to display a list of printers. Select the appropriate printer.

Copy to Destination

Copy to Destination allows you to copy individual files between directories within the same file server (hard disk). Refer to the previous section for the methods used to enter field information. The procedure for copying is:

1. From the **Action List** select **Copy to Destination.**
2. Enter the Source Disk information.
3. Enter the Source File information.
4. Enter the Destination Disk information.
5. Select **EXECUTE** to begin the copy action.

Move to Destination

Move to Destination allows you to move individual files between directories within the same file server (hard disk). Refer to the section titled “Entering Choices” for the methods used to enter field information.

1. From the **Action List** select **Move to Destination**.
2. Enter the Source Disk information.
3. Enter the Source File information.
4. Enter the Destination Disk information.
5. Select **EXECUTE** to begin the move action.

Rename

Rename is used to rename the selected file within a directory. The file remains in the same directory, but has a new name. Refer to the section titled “Entering Choices” for the methods used to enter field information.

1. From the **Action List** select **Rename**.
2. Enter the Source Disk information.
3. Enter the Source File information.
4. Enter the Destination File information.
5. Select **EXECUTE** to start the renaming function.

Send to Printer

Send to Printer is used to send the selected file to the printer. Refer to the section titled “Entering Choices” for the methods used to enter field information.

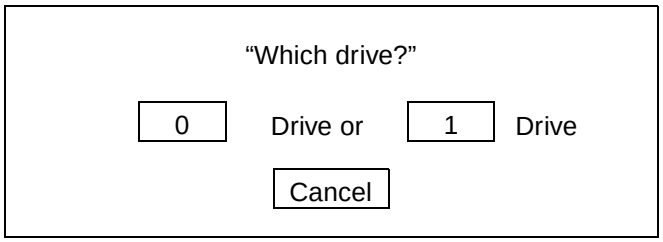
1. From the **Action List** select **Send To Printer**.
2. Enter the Source Disk information.
3. Enter the Source File information.
4. Enter the Printer information.
5. Select **EXECUTE** to send the file to the printer.

Format Floppy Diskette

Both high-density and low-density diskettes can be formatted in the VENIX format using this utility.

The procedure for formatting is as follows:

1. Load the floppy diskette in the appropriate drive.
2. Select **Format Floppy** from the Action List.
3. Select **EXECUTE**.
4. The system prompts:



Select the appropriate response. The message **format in progress** appears during the formatting. The message is removed when formatting is complete.

Store on Floppy Diskette

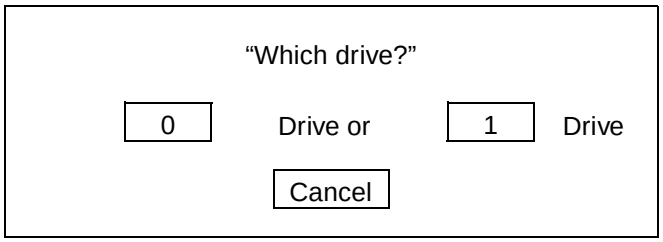
`Store on Floppy` allows you to copy a file or directory of files to a floppy diskette. Files are written onto diskette with their relative path names.

CAUTION: *This procedure will eliminate existing files on the diskette. It is the same as the* ***tar cvf*** *VENIX command, which clears the diskette prior to writing new files to it.*

Refer to "Entering Choices" for the methods used to enter field information. The procedure to Store on Floppy is as follows:

1. Load the floppy diskette in the appropriate drive.
2. Select **`Store on Floppy`** from the **`Action Lis`**t.
3. Enter the Source Disk information.
4. Enter the Source File information.

   If no file is chosen all files in the selected directory are stored on the floppy, if diskette space permits.
5. Select **`EXECUTE`** to begin the file store.
6. The system prompts:



   Select the appropriate response. The message **file store in progress** appears on the screen. The message is removed when the action is completed.
7. If desired, you may cancel out of a multiple diskette **`Store on Floppy`** operation.

*NOTE: The file is stored on the diskette with the same path name (directory) as indicated on the source disk (**./usr/fox/test.txt**).*

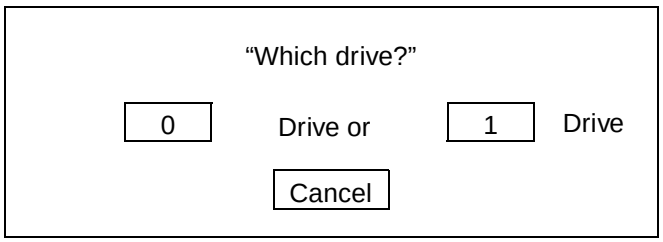
Load from Floppy Diskette

`Load from Floppy` is used to copy a file or files from a floppy diskette to the hard disk. Refer to "Entering Choices" for the methods used to enter field information. The procedure to Load from Diskette is:

1. Select **`Load From Floppy`** from the Action list.
2. Enter the Destination Disk information.

*NOTE: Since the file on the diskette contains a complete path name (**./usr/fox/test.txt**), the file is loaded in the same directory structure as indicated by its complete path name.*

3. **`EXECUTE`** to begin the load procedure. The system prompts:



Select the appropriate response. The message **file load in progress** appears on the screen. The message is removed when the action is complete.

Append to Floppy

The **`Append to Floppy`** option allows you to add directories and files to a diskette by using the following procedure:

1. Select **`Append to Floppy`** from the Action List.
2. Entries for disk and file selection appear under the Source heading as shown below.

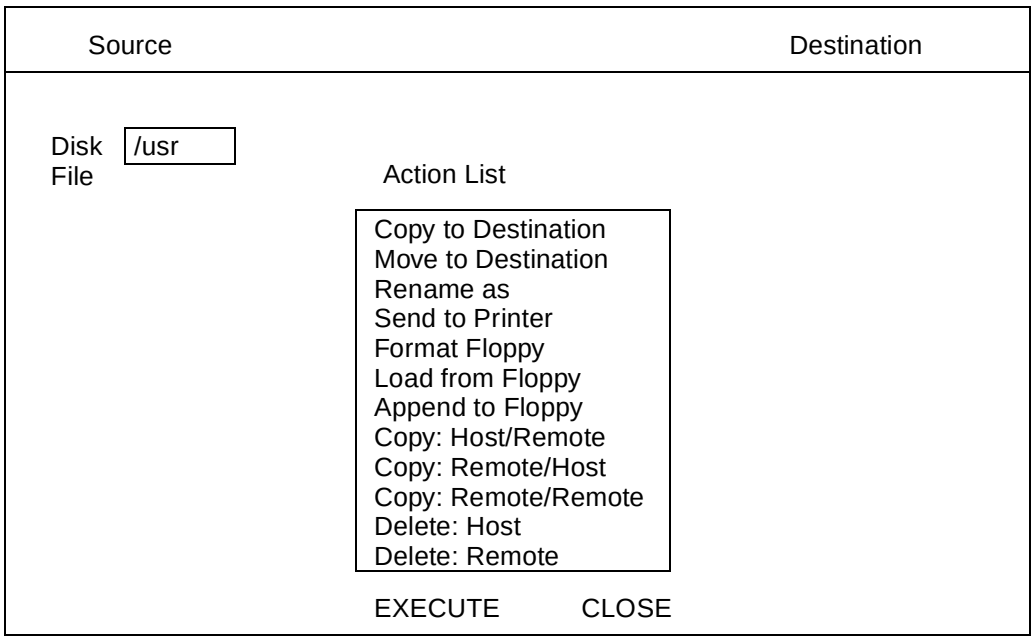


Figure 8-1. Append to Floppy Initial Display

3. Select **Disk** or **File**. When **Disk** is selected, a menu for the disk name appears and a menu for the disk filter appears below it. When **File** is selected, a menu of file/directory names appears. Scroll up or down the list to find the entry desired. Type or select the desired disk designation or file/directory name to be appended. The selection appears in the path designation field. Figure 8-2 shows selections after **Disk** is picked. Figure 8-3 shows selections after **File** is picked.
4. Select **EXECUTE** to append the directory/file to the diskette. Select **CLOSE** to return to the previous screen.

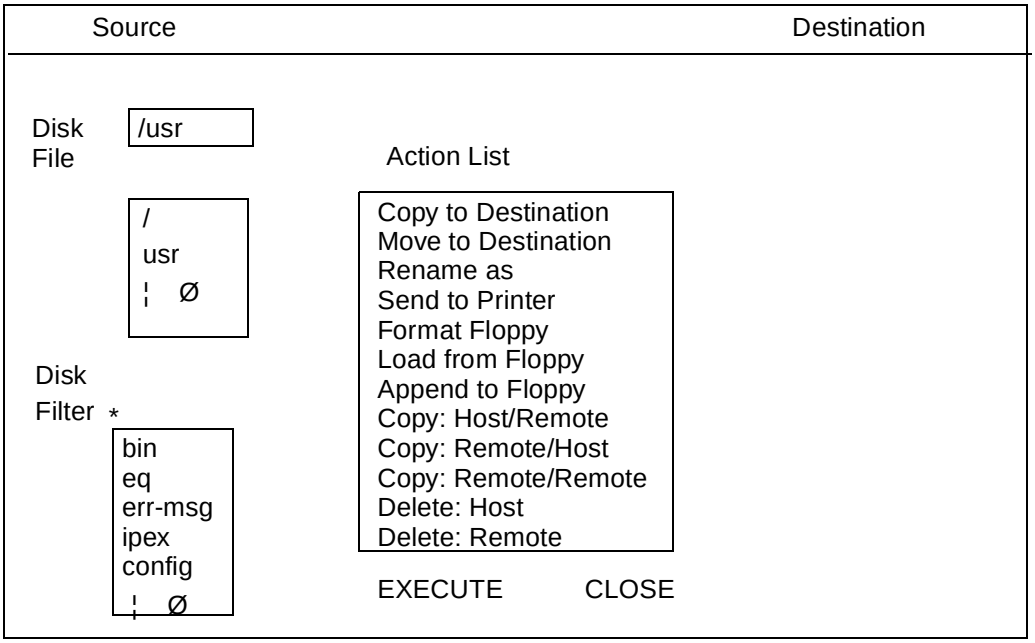


Figure 8-2. Menus for Disk Selection

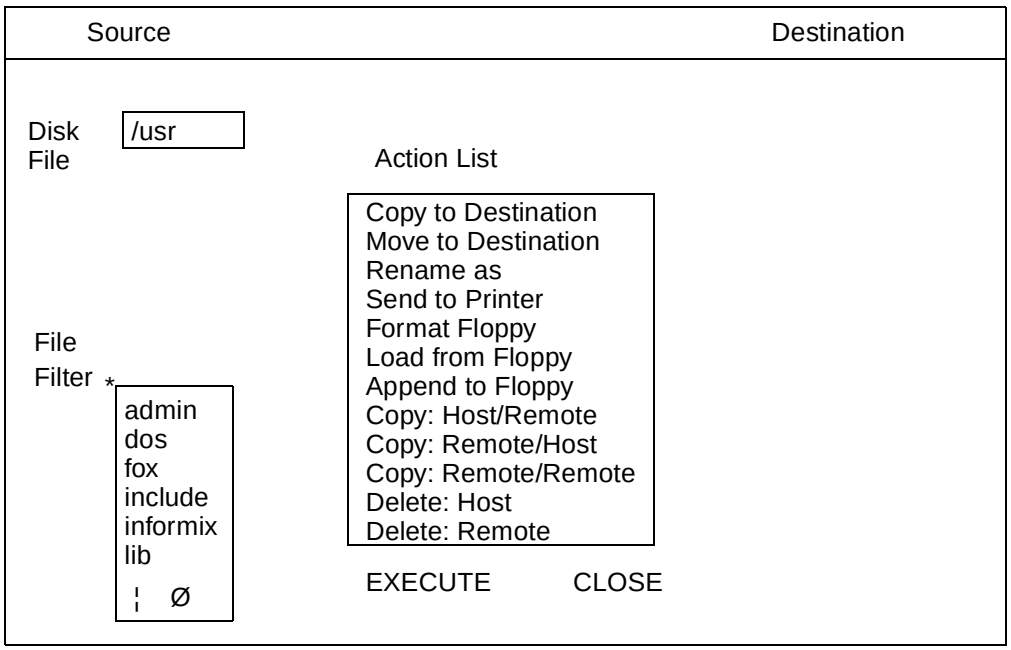


Figure 8-3. Menu for File selection

Copy: Host/Remote

The **`Copy: Host/Remote`** option allows you to copy a directory/file from an AP/AW to a remote station by using the following procedures.

1. Select **`Copy: Host/Remote`** from the Action List.

2. Entries for disk and file selection appear under the Source and Destination headings, and a field for remote server appears under the Destination heading as shown in Figure 8-4.

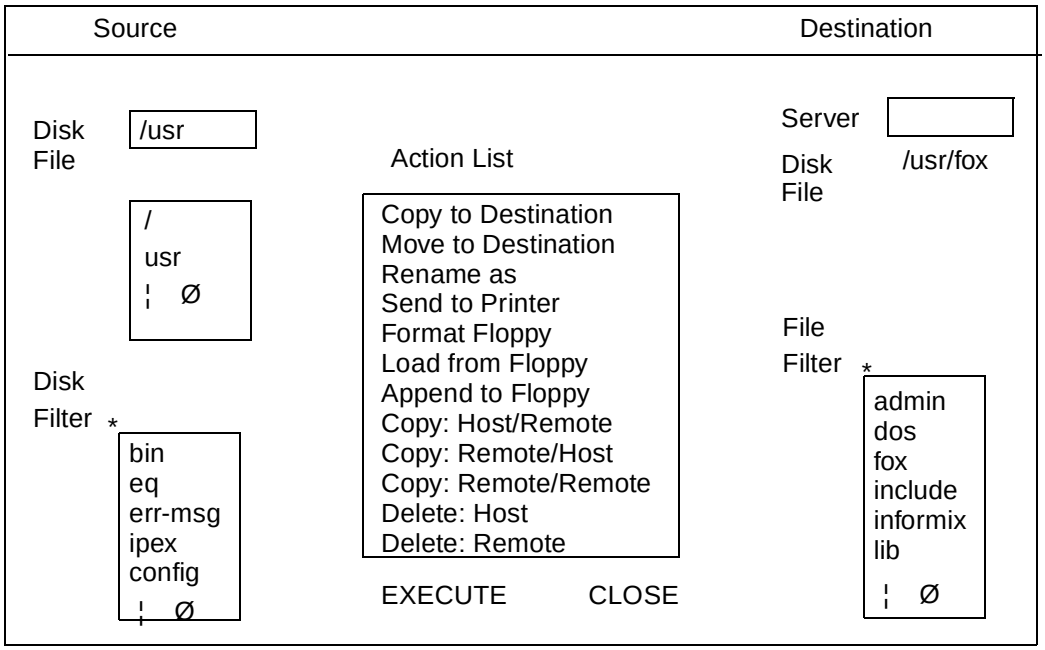


Figure 8-4. Copy Host to Remote Selections

3. Select **SERVER** and enter the name for the remote server.
4. Select **Disk** or **File**. Type in the directory and file for the remote host; do not use information in the selections menu. Entries appear in the path designation field.
5. Select **EXECUTE** to copy the directory/file to the remote station. Select **CLOSE** to return to the previous screen.

Copy: Remote/Host

The **Copy: Remote/Host** option allows you to copy a directory/file from a remote station to an AP/AW host by using the following procedures.

1. Select **Copy: Remote/Host** from the Action List. Entries for disk and file selection appear under the Source and Destination headings, and a field for remote server appears under the Source heading.
2. Select **SERVER** and enter the name for the remote server.
3. Select **Disk** or **File**. Type in the directory and file for the remote host; do not use information in the selections menu. Entries appear in the path designation field.
4. Select **EXECUTE** to copy the directory/file to the remote station. Select **CLOSE** to return to the previous screen.

Copy: Remote/Remote

The **Copy: Remote/Remote** option allows you to copy a directory/file from a remote station to another remote station by using the following procedures.

1. Select **Copy: Remote/Remote** from the Action List.
2. Entries for both remote servers and disk and file selections appear under the Source and Destination headings in the same format as for Copy:Host/Remote.
3. For both source and destination devices, select **SERVER** and type in the name of the remote station. Select **Disk** or **File**. Type in the directory and file; do not use information in the selections menu. Entries appear in the path designation field.
4. Select **EXECUTE** to copy the directory/file from one remote station to the other. Select **CLOSE** to return to the previous screen.

Delete: Host

The **Delete: Host** option allows you to remove directories/files from the host station.

1. Select **Delete: Host** from the Action List.
2. Entries for disk and file selection appear under the Source heading.
3. Select **Disk** or **File**. Type in or select the directory/file to be deleted. Entries appear in the path designation field.
4. Select **EXECUTE** to delete the directory/file from the host. Select **CLOSE** to return to the previous screen.

Delete: Remote

The **Delete: Remote** option allows you to remove directories/files from the remote station.

1. Select **Delete: Remote** from the Action List.
2. Entries for the remote server and disk and file selection appear under the Source heading.
3. Select **SERVER** and enter the name of the remote server.
4. Select **Disk** or **File**. Type in the directory/file to be deleted; do not use information in the selections menu. Entries appear in the path designation field.
5. Select **EXECUTE** to delete the directory/file from the remote station. Select **CLOSE** to return to the previous screen.

File Commands

File Utilities are not available on WPs hosted by an AP50/51 or WP50s or AW50/51s. Using the VT-100 mode to access operating system commands allows you to perform the following standard file operations for these stations:

- Copy file
- Move file
- Rename file
- Send file to printer
- Format a floppy disk
- Store a file or files on a floppy disk
- Load a file or files on to the hard disk
- Transfer a file to another file server
- Delete a file

Refer to the *SunOS User's Guide*, *SunOS Reference Manual*, *Solaris 2.2 Advanced User's Guide*, and *Solaris 2.2 Advanced User's Guide to System and Network Tasks*, or for Solaris 2.4 systems, refer to the Solaris 2.4 *Advanced User's Guide* and the Solaris (Tab) documents in the *Complete AP51, WP51, AW51* book for additional information regarding the file commands.

Copying a File

To copy the contents of one file to the contents of another file on the AP50/51 or AW50/51, enter the following command in the VT-100 mode:

```
cp <filename1> <filename2>
```

To copy the contents of one directory to the contents of another directory, enter the following command in the VT-100 mode:

```
cp -r <directory1> <directory2>
```

Moving a File

To move the contents from one file to another file on the AP50/51 or AW50/51, enter the following command in the VT-100 mode:

```
mv <filename1> <filename2>
```

To move the contents from one directory to another directory on the same system, enter the following command in the VT-100 mode:

```
mv <directory1> <directory2>
```

*NOTE: **mv** cannot be used to move a directory from one file server to another.*

Renaming a File

To rename a file on the AP50/51 or AW50/51, enter the following command in the VT-100 mode:

```
mv <filename1> <filename2>
```

Sending File to Printer

To send a designated file to the printer designated by DEST, enter the following command in the VT-100 mode:

lp -d<DEST> <filename1>

e.g., lp -dLP40 myfile

Formatting a Diskette

To format an unmountable 3.5 inch diskette for the AP50/51 or AW50/51, enter the following command in the VT-100 mode:

```
fdformat
```

– or –

```
fdformat -e
```

NOTE: Use the ***-e*** *option if the diskette needs to be ejected after formatting is complete.*

To format a mountable 3.5 inch diskette for the AP50/51 or AW50/51:

1. Enter the format command:

   ```
   fdformat
   ```

2. Enter the following command to make the diskette mountable:

   ```
   newfs /dev/rfd0c
   ```

Storing a File on Diskette

To store a file currently on the AP50/51 or AW50/51 to an unmountable diskette, enter the following command in the VT-100 mode:

```
tar cvf /dev/rfd0 <filename>
```

To store a directory currently on the AP50/51 or AW50/51 to an unmountable diskette, enter the following command in the VT-100 mode:

```
tar cvf /dev/rfd0 <directory>
```

NOTES:
*1. With the **tar** command, the system will not prompt for additional diskettes. The files or directory must be less than 1.4 MB.*
*2. If the diskette is to be used in a 1.4 MB drive on both the PW and AP50/51 or AW50/51, verify that the file(s) or directory is less than 1.4MB and use the **tar** command to store and retrieve the information.*
*3. The **bar** command on the AP50 and **tar** command on other APs are not compatible. You cannot read **tar** diskettes with **bar** commands or vice-versa. The **bar** command is not available on 51 stations.*

Loading a File onto the File Server

To load a file from an unmountable diskette to the file server, enter the following command in the VT-100 mode:

```
tar xvf /dev/fd0 <filename>
```

To load a directory from an unmountable diskette to the file server, enter the following command in the VT-100 mode:

```
tar xvf /dev/fd0 <directory>
```

*NOTE: If the diskette is to be used in a 1.4 MB drive on both the PW and AP50/51 or AW50/51, verify that the file(s) or directory is less than 1.4 MB and use the **tar** command to store and retrieve the information.*

Transferring a File to Another File Server

To transfer a file from one file server to another file server using the network, type:

```
cp filename /rem/<LBUG>/completefilename
```

NOTE: See RFS (Remote File Sharing service) information in the SunOS Reference Manual and the SunOS System and Network Administration.

Deleting a File or Directory

To delete a file on the AP50/51 or AW50/51, enter the following command in the VT-100 mode:

```
rm <filename>
```

To delete a directory on the AP50/51 or AW50/51, enter the following command in the VT-100 mode:

```
rmdir <directory>
```

*NOTE: Be sure all the files have been removed from the directory prior to using the **rmdir** command.*

WP50/51 File Transfer Utility

The WP50/51 file transfer utility provided with the display software package enables you to copy files from remote file servers to the local WP50 disk and to other remote destinations. Any type of file may be copied. An option provides for display files built on 16-bit platforms to be converted to SPARC and repacked automatically.

The program is available in the command-tool window on the WP50/51 or a terminal on an AP50/51 with the appropriate display software package. A question and answer dialogue provides input to the program. The copying and conversion begin at the end of the dialogue.

In addition, the dialog may be saved in a log file. With the command line option **-c**, the dialogue saved to the log file can be used as the input file to the program rather than dialogue prompting. The *Display Engineering for 50 Series Workstations* document contains a more detailed description of **getremfiles**.

At a standard UNIX prompt, type the name of the WP50/51 file transfer program and an option, if desired:

```
getremfiles [-c cmd-list]
```

Option:

-c cmd-list take commands from cmd_list instead of prompting

Dialog is as follows:

```
getremfiles
--- File Propagation Utility Version 1.0 ---
Enter a path for saving a log file of user responses.
Enter the path (<CR> only to skip this option):
/usr/tmp/log_fl.out
Enter earliest creation/modification date of files to be copied.
Default is 01/01/70. Enter date (mm/dd/yy). (<CR> only for default):
1/31/91
Enter destination path if different than source path.
Default is the same as source path. (<CR> only for default):
<blank line>
Do you want display files to be converted and repacked automatically?
Default is YES.
 (Y/N): Y
Enter Destination Letterbug. One entry per line (<CR> only to end):
WP5001
Enter Destination Letterbug. One entry per line (<CR> only to end):
WP5002
```

Enter Destination Letterbug. One entry per line (<CR> only to end):

<blank line>

Enter Source Letterbug. One entry per line (<CR> only to end):

1A16AA

Enter Source File(s). One entry per line (<CR> only to end):

/usr/abc*

/usr/fox/disp/uc*

<blank line>

Enter Source Letterbug. One entry per line (<CR> only to end):

IA16BB

Enter Source File(s). One entry per line (<CR> only to end):

/usr/fox/sys/*

/usr/nec/bar

/usr/tmp/scripts/*.oaj

<blank line>

Enter Source Letterbug. One entry per line (<CR> only to end):

<blank line>

View command list? Default is YES.

(Y/N): Y

#File transfer Commands
#Created Tue Feb 25 19:04:09 1992

log_path=/usr/tmp/log_fl.out
cdate=01/31/91
dest_path=
convert_disps=YES

destination=
WP5001
WP5002

source=
IA16AA

/usr/foo

/usr/abc*

/usr/fox/disp/uc*

IA16BB

/usr/fox/sys/*

/usr/nec/bar

/usr/tmp/scripts/*.oaj

Proceed with copy? Default is YES. (Y/N): Y

copying.

From IA16AA:

To WP5001: /usr/foo

To WP5002: /usr/foo
To WP5001: /usr/abc1
/usr/abc2
/usr/abc3
To WP5002: /usr/abc1
/usr/abc2
/usr/abc3
To WP5001: /usr/fox/disp/uc001
/usr/fox/disp/uc002
To WP5002: /usr/fox/disp/uc001
/usr/fox/disp/uc002
From IA16BB:
To WP5001: /usr/fox/sys/Display_Name
/usr/fox/sys/SMDH
To WP5002: /usr/fox/sys/Display_Name
/usr/fox/sys/SMDH
/usr/nec/bar **no such file or directory**
To WP5001: /usr/tmp/scripts/shift1.oaj
/usr/tmp/scripts/shift2.oaj
To WP5002: /usr/tmp/scripts/shift1.oaj
/usr/tmp/scripts/shift2.oaj
... done.

The log input file that is generated and saved can be used with the **-c** option as input to the program. The following is the format for the log input file:

```
#File Transfer Commands                    #two comment lines
#Created Tue Feb 25 19:04:09 1992          #ending with a blank line
log_path=          #log file for saving the commands, null in this example
cdate=01/01/70     #date from which to start copying (default date here)
dest_path=/usr/tmp #destination path for files to be copied (path or null)
convert_disps=YES  #convert display files flag (Yes or No)
#a blank line
destination=
wp5001                  #destination Letterbug(s)
wp5002                  #ending with a blank line
source=
IA16AA                  #source Letterbug(s)
 /usr/foo                 #source file(s) to be copied
 /usr/abc*                #one file per line, indented three spaces
 /usr/fox/disp/uc*        #ending with a blank line
IA16BB
 /usr/fox/sys/*
 /usr/nec/bar
```

```
 /usr/tmp/scripts/*.oaj    #last line
Examples of a log input file are:
File #1:
#File Transfer Commands
#Created Tue Mar 31 17:42:46 1992
log_path=/usr/tmp/log.out
cdate=12/05/91
dest_path=
convert_disps=YES
destination=
WP5003
WP5002
source=
SUNW59
 /usr/fox/alarms/GC*pan
 /usr/fox/alarms/GC3500AAtab
EYS015
 /usr/menus/d1/UC*
 /usr/menus/d2
File #2:
#File Transfer Commands
#Created Tue Mar 31 09:44:20 1992
log_path=/usr/tmp/log.out2
cdate=06/09/90
dest_path=
convert_disp=YES
destination=
WP5003
source=
WP5002
 /usr/menus/d1/line*
 /usr/menus/d1/carc*
 /usr/menus/d1/circ*
 /usr/menus/d1/log*
WP5002
 /usr/fox/alarms/*
```

9. PW Backup Utility

The following material provides instructions for using the backup and restore procedures made available by the Foxboro software that supports the Archive VP250e tape drive with Archive VP402 adapter card, and Wangtek, Inc. TapePort parallel interface tape drive.

The backup streaming tape system may be used with any I/A Series Personal Workstation to back up, off-line, entry level PW systems. Used with the recommended tape cartridge, the backup streaming tape drive will save and restore up to 150MB of data files contained in the PW hard disk drive. The PW supports either total or partial backup and restore activities.

Each PW using the Archive VP250e must have an installed interface card. This allows one portable tape unit to be used with several PWs.

The PW Backup Utility is available on the XFER diskette and through venix.novrtx. Booting the XFER diskette provides access to all the listed functions.

Backup and Restore Operations

You can use three methods to perform backup and restore operations:

- Back up and restore the entire **usr** and **sys** file systems using functions accessible through the **XFER** menu.
- Access the **tar**, **volcopy**, and **cpio** commands by running the shell on the **XFER** diskette.

Using the XFER Menu

The preferred method for backup and restore is the use of the **XFER** menu to back up and restore the entire contents of the **usr** and **sys** file systems. The main **XFER** menu offers the following choices:

```
Choose 'a' to install all or part of VENIX on the hard disk. Choose 'b'
to perform some of the installation functions separately or to
run the shell.

a. Install I/A PC OpSys on the hard disk.
b. Other functions.
```

To back up the file system to tape:

1. Type b (**Other functions**) and press Return.

The following menu appears:

```
a. Run the shell on the hard disk.
b. Run the shell on the floppy.
c. Set the system letterbug name.
d. Back up hard drive to streaming tape.
```

2. Type d and press Return.

   The following message appears:

```
Ready to save files to Tape.
Insert Tape in the drive and press Return.
```

3. Insert the tape cartridge in the tape drive and press Return.

This operation mounts the **sys** and **usr** files systems and saves the files to tape in the following format:

```
tar cvf  /dev/tape .
```

To restore the file system from tape:

1. Type **a** and press Return to select Install I/A PC OpSys on the hard disk from the main **XFER** menu.
2. Set or select hard disk parameters.
3. Set or select hard disk section sizes.

   The system displays the following options:

```
a. Install using Day 0 tape.
b. Install using floppy diskettes.
c. Restore using backup streaming tape.
```

4. Type c and press Return.

   If a VENIX system already exists, the following message appears:

```
WARNING: Any VENIX files on the hard disk will be destroyed.
Do you wish to continue?
```

5. Type y and press Return.

   The system prompts you to insert the tape cartridge.

6. Insert the tape cartridge in the tape drive and press Return.

This operation makes or remakes the **sys** and **usr** file systems. Data that may have existed in these file systems is thereby destroyed.

After the data is extracted and placed on the hard drive, the program asks you to set or change the letterbug, if necessary.

Using the tar, volcopy, and cpio Commands

You can back up and restore data to and from the tape drive using the **tar**, **volcopy**, and **cpio** commands. These commands are available from a shell that you can run from the **XFER** diskette.

To run a shell from the **XFER** diskette:

1. Select **Other functions** (b) from the main **XFER** menu.
2. Select **Run the shell on the hard disk** (a) or **Run the shell on the floppy** (b).

When the shell is executed, the system displays the # prompt.

Using the tar Command

You can tar to tape the entire disk, a group of files, or a single file. If you back up the entire system using the **tar** command, you may later restore the data using the **XFER** diskette menu commands. Note also that it is easier to back up and restore the entire system using the **XFER** menu than the following commands.

To back up the **sys** and **usr** file systems using **tar** from the **XFER** diskette shell, run the shell from the hard drive or floppy. When the # prompt appears, enter the following commands:

```
mount  /dev/w0.sys  /u0
mount  /dev/w0.usr  /u0/usr
cd  /u0
tar  cvf  /dev/tape  .
```

To restore the **sys** and **usr** file systems using **tar** from the **XFER** diskette shell, run the shell from the hard drive or floppy. When the # prompt appears, enter the following commands:

```
mount  /dev/w0.sys  /u0
mount  /dev/w0.usr  /u0/usr
cd  /u0
tar  xvf  /dev/tape
```

Using the volcopy Command

You can use the **volcopy** command to back up or restore a file system with label checking. This is the fastest of the back up and restore methods, but the destination of the restore must be a file system of exactly the same size. Use a new tape each time you execute **volcopy**.

The following commands let you back up and restore the **sys** and **usr** file systems both from the XFER diskette shell.

To back up the **sys** file system to tape, enter the commands:

```
/etc/labelit  /dev/tape  / win0
/etc/volcopy  -buf  /  /dev/rw0.sys  win0  /dev/tape  win0
```

To restore the sys file system to the hard disk, enter the commands:

```
/etc/volcopy -buf / /dev/tape win0 /dev/rw0.sys win0
/etc/fsck /dev/rw0.sys
```

To back up the **usr** file system to tape, enter the commands:

```
/etc/labelit /dev/tape usr win0
/etc/volcopy -buf usr /dev/rw0.usr win0 /dev/tape win0
```

To restore the **usr** file system to the hard disk, enter the commands:

```
/etc/volcopy -buf usr /dev/tape win0 /dev/rw0.usr win0
/etc/fsck /dev/rw0.usr
```

---

*NOTE: You cannot use the **XFER** menu commands to restore data backed up with the **volcopy** command. Files backed up with the **volcopy** command can be restored only with the **volcopy** command. Hard disk partition and section size must be exactly the same size as when the system was backed up. If a replacement hard disk's cylinder, head, sector configuration differs from that of the removed disk, it may be impossible to set the I/A Series section size to the exact number of blocks needed to restore the system.*

Using the cpio Command

You can use the **cpio** command to back up and restore file archives.To back up the **sys** and **usr** file systems using **cpio** from the **XFER** diskette shell, run the shell from the hard drive or floppy. When the **#** prompt appears, enter the following commands:

```
mount /dev/w0.sys /u0
mount /dev/w0.usr /u0/usr
cd /u0
find . -print |cpio -ovdB >/dev/tape
```

To restore the **sys** and **usr** file systems using **cpio** from the **XFER** diskette shell, run the shell from the hard drive or floppy. When the **#** prompt appears, enter the following commands:

```
mount /dev/w0.sys /u0
mount /dev/w0.usr /u0/usr
cd /u0
cpio -idv </dev/tape
```

---

*NOTE: You cannot use the **XFER** diskette menu commands to restore data backed up with the **cpio** commands. Files backed up with the **cpio** command can be restored only with the **cpio** command. Hard disk partition and section sizes do not need to be exactly the same as when backed up.*

---

10. Windows on I/A Series Systems

The Windows on I/A Series option utilizes the SunPC product from SunSoft to allow users to run Microsoft DOS and Window programs on an Application Workstation 51 Style B or Style C. This option is not supported on a dual headed Application Workstation 51 configuration. The following describes the procedures for starting Windows on I/A Series systems, and using it to run Microsoft DOS (MS-DOS) programs and Microsoft Windows.

The SunPC X Window cannot be resized using the sizing handles. When running DOS, the X Window can be set to one of three sizes; standard, medium, or large. (See the *SunPC Version 4.1 for Solaris 2 User's Guide*.) When Microsoft Windows is started, the SunPC X Window is automatically sized to one of the three fixed sizes based on the configured display resolution. While running Windows, the desktop fills the entire X Window. All interaction with DOS or Windows programs is handled by, and is through, this single X Window. Multiple Windows applications can be open and running at one time, limited only by the usual constraints of Microsoft Windows.

Software Loading Procedure

1. In the VT100 mode, check that there is a /cdrom directory. If not, make a /cdrom directory by typing:

   mkdir /cdrom

2. Mount the CD-ROM disk. If the unit is an internal CD-ROM, or if it is external, and is locally connected (and assuming the thumbwheel switch SCSI address is set to 6), type the following command:

   mount -F hsfs -r /dev/sd6c /cdrom

3. Type:

   cd /cdrom

4. Type:

   pkgadd -d . (including the 'dot')

5. The system prompts you to select the packages you wish to process. Select by package number, or type:

   all

6. The system prompts: **Want to continue installation?** Type:

   Y

7. When the software is complete, you will see a message: **Installation was successful, select package or quit**, If successful, type:

   q

8. If you need a copy of Windows on your station, a copy is provided on the CD-ROM. Assuming you are still in the /cdrom, the following command will copy Windows (3.11) from the CD-ROM to the /opt directory.

   cp -r win311 /opt

9. Your software installation is now complete. In order to unmount the CD-ROM type the following commands:

   cd

   umount /cdrom

10. Eject the CD-ROM by typing:

    eject cdrom

11. Reboot the station.

Initial Start-up of Windows on I/A Series SunPC

Please refer to your *SunPC Version 4.1 for Solaris 2 User's Guide*, Chapters 2 and 3 provided with this package.

1. To start SunPC from VT100 mode, at the prompt type:

   start_sunpc

   During this process a dialog box may appear stating a COMM2 error, select

   Properties; COM ports,

   and delete the **"/dev/term/b"** next to COMM2.

2. You will then be prompted to pick a Language.
3. Edit the **autoexec.bat** file as it is noted below:

NOTE: Comment line referencing drive e.

```
@echo off
c:\sunpc\net use f: $SUNPCHOME/dos6
path=c:\;c:\dos;c:\sunpc;f:\msdos;f:\unix
REM Change the Drive G mapping below to point to your preinstalled
REM MS Windows area and uncomment the following 3 lines.
net use g: /opt
set path=g:\WIN311;%path%
set TEMP=g:\WIN311
net use r: /
net use h: $HOME
rem net use e: $PWD
c:\sunpc\nmlckoff.com
c:\sunpc\mouse.com
c:\sunpc\suncp.com
prompt $p$g
```

```
if exist e:autoexec.bat e:autoexec
if exist h:\pc\autoexec.bat h:\pc\autoexec
echo on
```

4. Restart SunPC by entering:

   Ctrl-Alt-Delete

5. At the "c:" prompt type: **win**

Starting SunPC

To start SunPC, perform the following:

1. Select **SftMnt** from the Foxboro top menu bar, then select **VT100.local** to access the VT-100 command window. Or, use the command shell.
2. At the prompt, type:

   start_sunpc

   This invokes the I/A Series SunPC startup script located in /usr/local.

   This method is the only supported way to start SunPC on an I/A Series system. Using the SunPC script supplied by SunSoft will produce unpredictable results and could interfere with system performance.

The SunPC program starts, and a SunPC window appears as shown in Figure 10-1, overlaying the Foxboro VT-100 display. The words **Running** and **Accelerator** are displayed in a status bar at the bottom of the window.

You cannot run more than one instance of the SunPC. If you try to do so, you will get the following message:

Multiple SunPC windows are not supported by I/A!

The initial window provides the DOS command prompt, from which you run your MS-DOS programs. A summary of MS-DOS commands is provided in Appendix A.

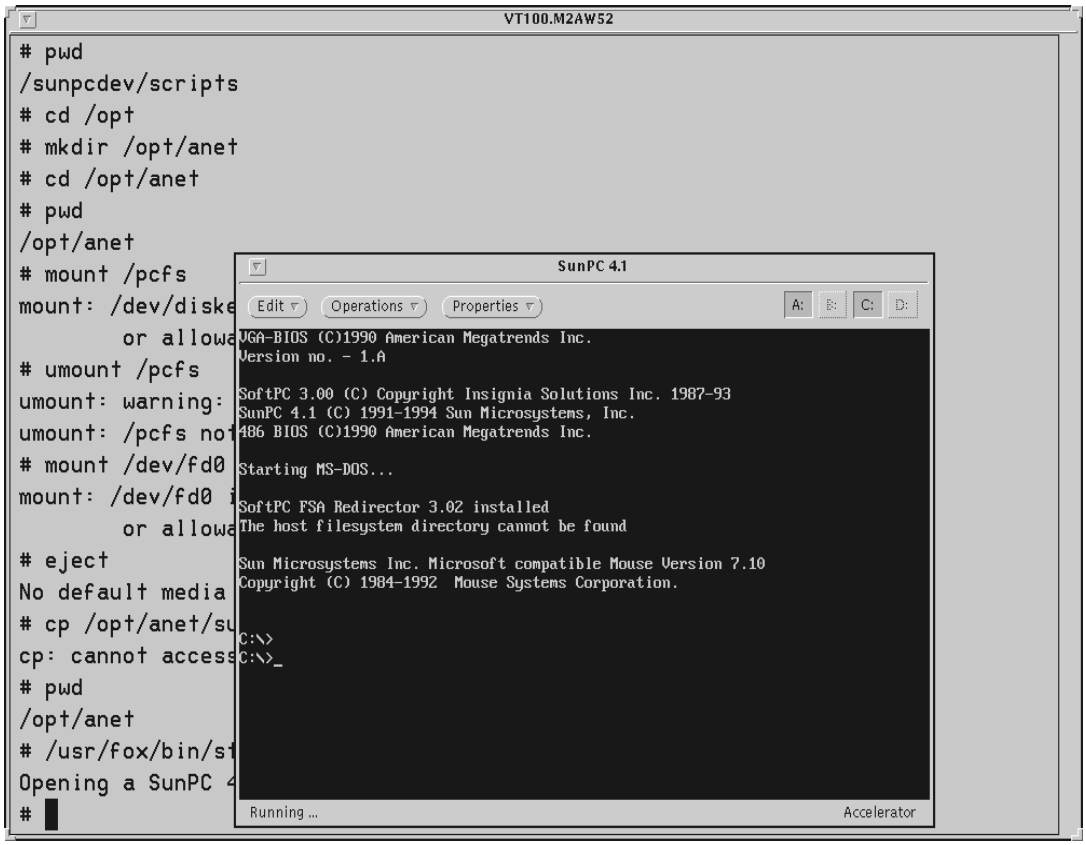
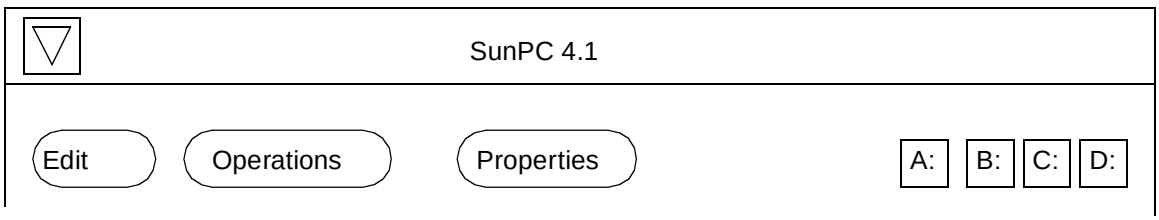


Figure 10-1. Initial SunPC Display with DOS Prompt

Near the top of the window at the left are the **`Edit`**, **`Operations`** and **`Properties`** buttons. Each button provides a command menu that allows you to perform various functions or control various aspects of the window as follows:



Edit	Operations	Properties
Copy	Attach Mouse: Meta+m	LPT Ports...
Paste	Attach COM1: Meta+s	COM Ports
Copy then paste	Attach COM2: Meta+t	Display...
	Send to LPT	Drive...
	Eject A:	Miscellaneous...
	Pause Meta+p	
	Reboot Meta+r	

Following is a brief description of the commands found in the menus. A more complete description is found in the *SunPC Version 4.1 for Solaris 2 User's Guide*.

Table 10-1. SunPC Menus

Command	Description
Edit Menu	
Copy	Copies the selected text on the OpenWindows clipboard. The text can be pasted one or more times into the same or another window.
Paste	Inserts the contents of the OpenWindows clipboard at the current cursor location.
Copy then Paste	Copies the selected text on the OpenWindows clipboard, and pastes the clipboard contents to the current cursor location.
Operations Menu	
Attach/Detach Mouse	Attaches (enables) or detaches the emulated Microsoft Mouse.
Attach/Detach COM1/COM2	Attaches or detaches serial communications ports COM1 or COM2.
Send to LPT	Manually sends data in the printer queue to the selected printer port (LPT1, LPT2, OR LPT3).
Eject A	Ejects a diskette from diskette drive A:. The diskette drive in the AW51 is seen as the A: drive.
Pause/Run	Pauses (suspends) the current SunPC window, but dos not affect other SunPC windows that may be open.
Reboot	Restarts the current SunPC window; same as pressing Ctrl+Alt+Del.
Properties Menu	
LPT Ports	Enables you to assign printer, file, and send settings to parallel ports LPT1, LPT2, AND LPT3.
COM Ports	Enables you to associate a Sun operating system serial communications (COM) port with a DOS COM port. This can be useful in situations such as using a modem with an application running in a SunPC window.
Display	Lets you select display monitor type and SunPC text mode window size.
Drive	Lets you define *emulated* hard drives (drives C: and D:), and configure diskette drives (drives A: and B:).
Miscellaneous	Enables you to set sound, memory size for DOS applications, auto pause, and Sun operating system output.

Near the top of the window at the upper right are four disk drive icons labeled A;, B:, C:, and D:. They refer to the diskette drives and emulated hard drives that are currently active on your system. The emulated drives are UNIX files, static in size, that contain an emulated DOS directory structure in which you can store DOS files. Emulated drives are used for drives C: and D:, and are the drives from which the windows get their boot information.

SunPC supports up to two emulated DOS drives; C: and D:.Drive C: is created during installation and is the default boot drive.

Accessing the Windows Program Manager Display

After you have displayed the initial SunPC screen, you are in the DOS environment as shown in Figure 10-1. You can issue DOS commands and perform other DOS functions from this window. A list of commands is presented in Appendix A.

To access the DOS Program Manager window (Figure 10-2), type win at the C:\> prompt. The window in Figure 10-2 shows the File Manager application window open.

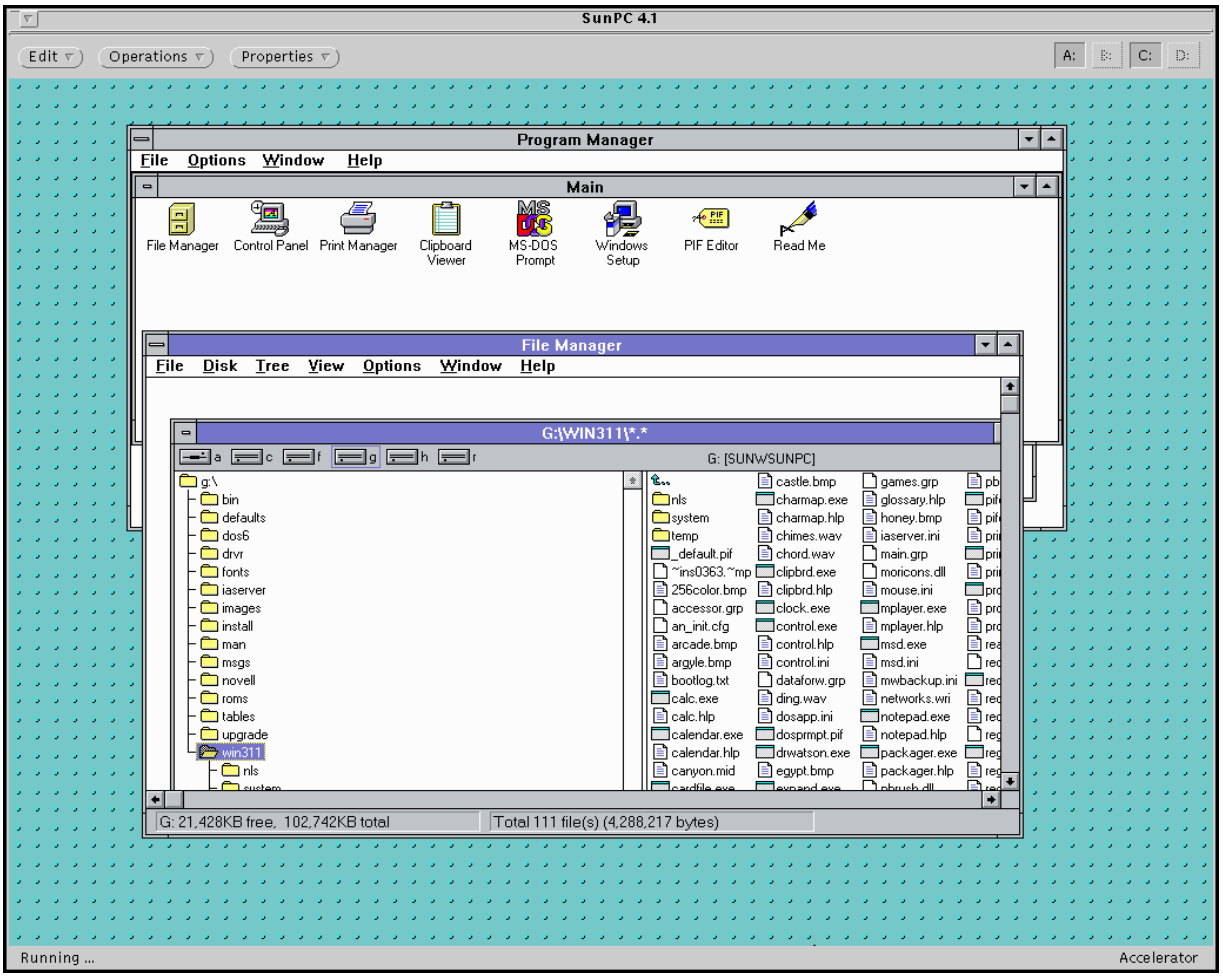


Figure 10-2. Initial Program Manager Display

From this window, you can perform any of the standard Microsoft Windows functions and run any of the applications. You can also add applications to the initial window and iconize them as shown in Figure 10-3.

For a complete description of Microsoft Windows operations and functions, refer to the standard Microsoft Windows documentation.

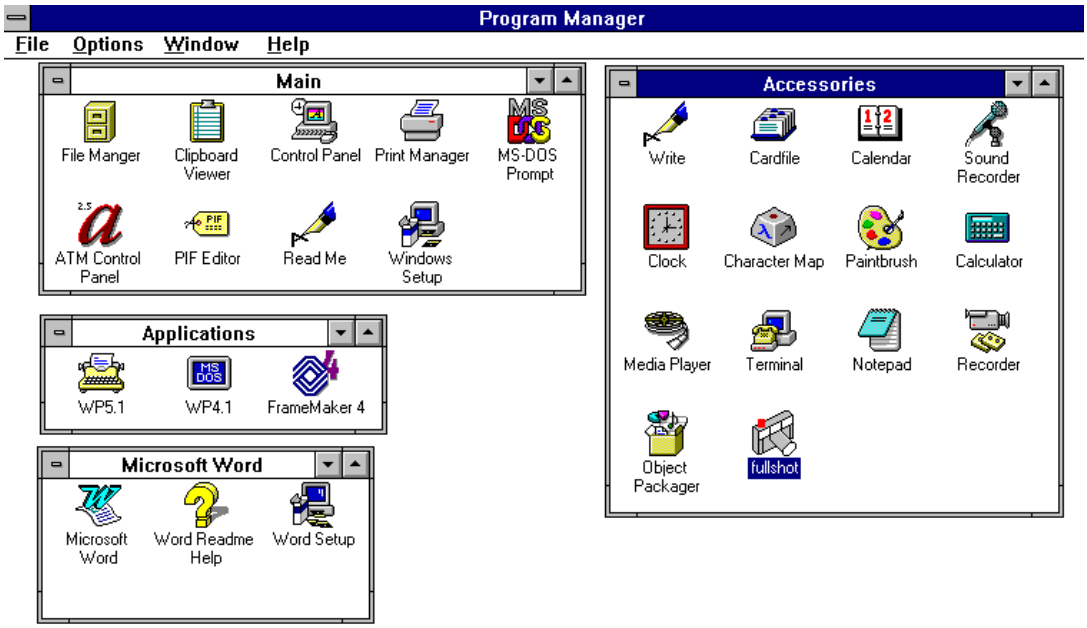


Figure 10-3. Typical Additional Windows Applications

Once you have accessed the Program Manager window, you must activate the Microsoft Mouse so that you can navigate within the SunPC window.

Using the Mouse

Working in the SunPC window requires that you use Microsoft Mouse. Your SunPC program comes with an emulated Microsoft Mouse already configured in your AUTOEXEC.BAT file. When you open the window, the mouse is automatically loaded, but is not attached. This allows you to use your standard OpenWindows mouse before you capture/attach your Microsoft Mouse. Once you capture/attach the Microsoft Mouse, you cannot use the OpenWindows mouse without first detaching the Microsoft Mouse.

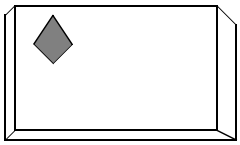
The mouse menu item on the Operations and SunPC menus functions by toggling back and forth between Attach and Detach. The option shown reflects the opposite of the current state of the mouse. For example, **Attach Mouse** means that the mouse is currently detached.

When you use the emulated Microsoft Mouse, the left and middle buttons on the mouse work like the left and right buttons of the actual Microsoft Mouse. The right button opens the SunPC menu but you do not have access to any of the SunPC buttons or menu items.

When no mouse capture is in effect, you can move across Display Manager windows boundaries to the VT-100 mode, multiple Display Managers, and Foxboro applications, but you cannot move in the SunPC window.

When mouse capture is in effect, the cursor arrow is black and you can navigate only in the SunPC window, not VT-100 mode (Sun operating system mode) or Foxboro applications. There are two ways to capture/attach the mouse:

1. Depress the Meta key and m key combination. The Meta key, shown below, is found at the bottom of your keyboard. The word **Mouse** is displayed in the SunPC status bar.



2. Select **Attach Mouse** from the SunPC Operations menu; you can also iconify the mouse.

There are two ways to detach the mouse:

1. Depress the Meta key and m key combination. The word **Mouse** is no longer displayed in the SunPC status bar.
2. Select **Detach Mouse** from the SunPC Window menu. You cannot detach the mouse by using the Operations menu because the OpenWindows mouse is needed to use this menu. Once you attached your Microsoft Mouse, you lost the use of the OpenWindows mouse.

To simplify mouse capture operations, you can iconify the mouse using Program Manager functions.

Closing a Window

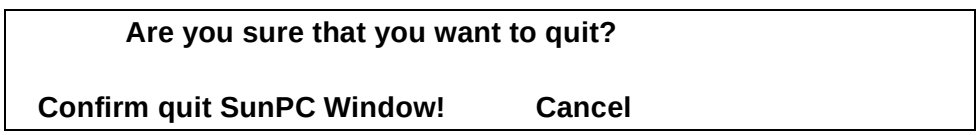
Closing a window reduces the window to an icon. The window is suspended; the program remains open but does not use system resources. Closing does not exit the program.

1. To close the window, select the down arrow at the top left of the window (see Figure 10-2).
2. Select **Close** from the menu that appears.

Quitting a Window

Quitting a window actually exits the program (closes the application).

1. To quit (exit) the window, select the down arrow at the top left of the window (see Figure 10-2).
2. Select **Quit** from the window menu that appears.
3. A dialogue box appears as follows:



Select the confirm quit option to exit the program.

4. Alternatively, you can type quit at the DOS command prompt in the window.

Rebooting a SunPC Window

The most common reasons for rebooting your system include enabling changes made to the system as a result of installing certain software packages, or modifying files like AUTOEXEC.BAT or CONFIG.SYS. Other reasons are to enable a different emulated hard drive, or to reactivate a keyboard or SunPC window application that is no longer responding.

Rebooting the SunPC window is the same as performing a warm boot in the Foxboro VT-100 mode, using **Ctrl+Alt+Delete**. There are three ways to reboot the window.

1. Move the mouse pointer anywhere in the SunPC window, and press **Ctrl+Alt+Delete**. Use the **Delete** (**Del**) key on the right keypad.
2. Select the **Reboot** command from the SunPC Operations menu.
3. Press the **Meta+r** key combination on the keyboard.

For additional information, refer to the SunPC documents.

Recommendations

Following are recommendations for installing and using the Windows option:

1. Do not use the COM 1 port (tty a) on the Application Workstation. It is used for I/A Series connectivity.
2. To access CD-ROMs:
   a. Switch to the SunPC mouse.
   b. Go into VT-100 mode.
   c. Type
      ```
      mount -r /dev/sd6a /cdrom
      ```
3. Default drive designations are:

   C: = Boot drive
   H: = Home drive
   R: = Root drive

4. When configuring your Sun Workstation, allow eight MB for Windows when you have 32 MB RAM, and a maximum of 16 MB when you have 64 MB RAM. Additional memory may be desirable for enhanced performance.
5. When you respond to an Annunciator alarm, you do not automatically get the SunPC cursor. Detach/iconify the mouse to have full access to the I/A Series system.

Appendix A. MS-DOS Commands Summary

This section provides a summary of the MS-DOS commands used in the Windows on I/A Series application. Synonyms for commands are shown in parentheses, following the descriptions.

Command	Description
append	Sets a search path for data files.
assign	Assigns a drive letter to a different drive.
attrib	Sets or displays file attributes.
backup	Backs up one or more files from one disk to another.
break	Sets CONTROL+C check.
chcp	Displays or changes the current code page for the command processor command.com.
chdir	Changes directories or displays the working directory (cd).
chkdsk	Scans the disk in the specified drive and checks it for errors.
cls	Clears the screen.
command	Starts the command processor.
comp	Compares the contents of two sets of files.
copy	Copies the specified file(s).
ctty	Lets you change the device from which you issue commands.
date	Displays and sets the date.
del	Deletes the specified file(s) (erase).
dir	Lists the files in a directory.
diskcomp	Compares disks.
diskcopy	Copies disks.
exe2bin	Converts executable (.exe) files to binary format.
exit	Exits the command processor and returns to the previous level.
fastopen	Decreases the amount of time needed to open frequently-used files and directories.
fc	Compares files and displays differences between them.
fdisk	Configures hard disks for MS-DOS.
find	Searches for a specific string of text.
format	Formats a disk to receive MS-DOS files.
graftabl	Loads a table of graphics characters.
graphics	Prepares MS-DOS for printing graphics.

Command	Description
join	Joins a disk drive to a path.
keyb	Loads a keyboard program.
label	Labels disks.
mem	Displays memory information.
mkdir	Makes a directory (md).
mode	Sets operation modes for devices.
more	Displays output one screen at a time.
nlsfunc	Loads country-specific information.
path	Sets a command search path.
print	Prints files.
prompt	Changes the MS-DOS command prompt.
recover	Recovers a bad disk or file.
ren	Renames the first file as second file (rename).
replace	Replaces previous versions of files.
restore	Restores backed-up files.
rmdir	Removes a directory (rd).
select	Installs MS-DOS on a new floppy disk with desired country-specific information and keyboard layout.
set	Sets one string value to another in the environment, or displays the environment.
share	Installs file sharing and locking.
sort	Sorts data forward or backward.
subst	Substitutes a string for a path.
sys	Transfers MS-DOS system files from one drive to the drive specified.
time	Displays and sets the time.
tree	Displays directory and file names.
type	Displays the contents of a file.
ver	Prints the MS-DOS version number.
verify	Verifies all writes to a disk.
vol	Displays the volume label.
xcopy	Copies files and subdirectories.

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