CTIX™ ADMINISTRATION TOOLS MANUAL
(Preliminary Edition)

CONTENTS

LIST OF FIGURES

LIST OF TABLES

RELATED DOCUMENTATION

The CTIX Administration Tools manual refers you to
the following manuals for additional information:

The CTIX Operating System Manual describes CTIX,
an operating system derived from the UNIX System V
operating system. The manual describes CTIX com-
mands, games, and system maintenance facilities.
This manual is the starting point for detailed
information about CTIX features.

The MightyFrame Administrator's Reference Manual
defines the responsibilities of a MightyFrame
system administrator and provides procedures for
the administrator to follow. The manual explains
concepts an administrator must understand to
maintain the proper functioning of a MightyFrame
system, including: user support, CTIX modes, CTIX
file systems, peripheral devices, and trouble-
shooting.

The MegaFrame Administrator's Reference Manual
explains concepts an administrator must understand
to maintain the CTIX operating system on a
MegaFrame computer system. The manual documents
certain files that reside in the CTOS file system.

The MiniFrame Administrator's Reference Manual is
a guide for CTIX system administrators for the
MiniFrame computer system.

The CTIX Programmer's Guide provides detailed
information on the CTIX operating system's
structure and operation. It discusses basic
interaction with the operating system, text
editors, major tools, and source code control.

1   INTRODUCTION

This manual provides an introduction to CTIX system administration and describes tools used to automate certain system administration responsibilities. Used in conjunction with the appropriate administrator's reference manual for your system, you will have the complete set of system administration instructions.

System administration is necessary to keep the computer system operating properly and running smoothly. Just as an office needs a manager, a system needs an administrator: the system administrator is _dedicated_ to helping users and performing system maintenance tasks. Good system administration provides a secure, reliable environment for all users to work in.

WHO SHOULD USE THIS MANUAL

CTIX Administration Tools should be used by all users of a CTIX system for the following purposes:

SYSTEM ADMINISTRATORS

If you are new to CTIX, and are responsible for the well-being of your system, read this manual to learn how to perform system administration using the administration tools.

If you are familiar with UNIX and system administration, read this manual to perform system administration in a friendly environment.

NONPRIVILEGED USERS

If you are new to CTIX, read this manual to learn
how to use the administration tools, and to learn
more about the system.

If you are familiar with UNIX, read this manual to
learn how to perform some of your tasks in a
friendly environment, and to learn more about the
CTIX system.

WHO IS THE SYSTEM ADMINISTRATOR?

You are the system administrator if you are the
person responsible for the overall well-being of
the system. The system administrator is the focal
point for all system related problems and user
questions; when users need assistance with the
system, they see you, the system administrator.
Your responsibilities as system administrator
include:

  o adding and removing users from the **system**

  o performing backups to safeguard the
     system from accidental loss of data

  o assuring the best level of security
     possible to protect against tampering

  o turning the system on and off and
     scheduling maintenance

System administration also includes installing
software onto the system. Instructions for
installing software can be found in the release
notice that accompanies the software.

SUPERUSER PRIVILEGES

As system administrator, you are distinguished
from other users by your superuser privileges.
The superuser refers to an account on the system
called root that has superior privileges. Root
may read or modify any file in the system,
regardless of the security level, but
nonprivileged users need express permission to
read or modify files other than their own (see
Appendix A for more information on security
levels).

In order to use your superuser privileges, you
must enter superuser mode. You enter superuser
mode by giving the system root's password after
you log into the system. Superuser mode is also
accessible by logging directly into the system as
root. See "Entering the Administration Tools" in
Chapter 2 for instructions on accessing superuser
mode.

CAUTION

Never leave your terminal in superuser mode
when you are not present, and do not disclose
the superuser password to anyone! Having
superuser status allows you to accidentally
destroy the entire system, or invade other
users' privacy.

WHAT ARE THE ADMINISTRATION TOOLS?

The administration tools allow you to perform
certain system administration functions in a
friendly environment, without using shell
commands. The shell refers to your CTIX working
environment; shell commands instruct the system to
perform a task. The administration tools are a

bridge between you and the shell: they allow you
to instruct the system to perform a task without
having to type in the command.

The administration tools also allow the
nonprivileged user to perform certain
nonprivileged functions, such as changing his
password or checking the printer status.

The administration tools consist of a series of
menus you can use to perform all of the system
administration responsibilities listed earlier in
this chapter. Figure 1-1 shows how these menus
are organized. Items with asterisks are
restricted for use by the system administrator
only. Chapter 2 explains how to use the menus.

USER ADMINISTRATION	SYSTEM BACKUP	SYSTEM RESTORE	SYSTEM STATUS	PRINTER ADMINISTRATION	*DISK ADMINISTRATION	TERMINAL ADMINISTRATION	*ELECTRONIC MAIL ADMINISTRATION
List User Accounts	*Complete Backup	View Tape Contents	View Hardware Inventory	View LP System Status	View the Disk Description	*Enable Serial Port	List Other Systems
Change Your Password	*Incremental Backup	Complete Restore	Error Log Functions o View Summary Report o View Detailed Report o *Reset	*Add a Printer	Create a File System	*Disable Serial Port	Rename This System
*Add a User	Partial Backup	Partial Restore	Console Log Functions o View Contents o *Reset	*Change Printer Status		*Set Cluster Port Logins	Add a System
*Add a Group	User Backup		System Activity Reporting o Enable o Disable	*Remove a Printer		View Port Status	Change System Information
*Change User Information			Process Accounting o Enable o Disable	*Set the Default Printer			Delete a System
*User Restrictions o Change a User's Password o Delete a User o Bar a User o Readmit a User				*Enable/Disable LP Scheduling o Enable o Disable			
				*Make a Printer Model			

Figure 1-1. Overview of the Administration Tools

NOTE

The administration tools perform many of the
functions you need to perform as system
administrator. However, you should use the
appropriate administrator's reference manual
for your system to learn more about the full
responsibilities of system administration.

HOW THIS MANUAL IS ORGANIZED

This chapter gives an overview of CTIX system
administration, and introduces you to the
administration tools that help you perform system
administration.

The second chapter, "Getting Started" explains
what you need to know before you begin, and
introduces you to **adman**. Adman is the key that
opens the door to the administration tools.

The next several chapters describe the major
functions of the administration tools:

o   Chapter 3, "User Administration" shows
    the system administrator how to manage
    the user accounts on the system. It also
    shows the nonprivileged user how to
    perform management functions on his own
    account.

o   Chapter 4, "System Backup" discusses
    principles and procedures for preserving
    data.

o   Chapter 5, "System Restore" describes how
    to recover from system damage by
    restoring the information preserved using
    the system backup functions.

o   Chapter 6, "System Status" shows how to
    gather and interpret information about
    the status of your system from various
    viewpoints.

o   Chapter 7, "Printer Administration"
    describes the printer administration
    tool. Printer management functions are
    provided for the system administrator;
    the overall printer status is displayed
    for the nonpriviliged user.

o   Chapter 8, "Disk Administration"
    discusses disk descriptions and
    organizing a new disk.

o   Chapter 9, "Terminal Administration"
    shows how to allow more people to log in
    to the system from additional terminals.

o   Chapter 10, "Electronic Mail
    Administration" shows how to set up and
    maintain electronic mail on your computer
    and other systems, in order to exchange
    information between systems.

Chapter 11, "Troubleshooting," contains tips on
problem solving and preventive maintenance. It
also describes common problems that may occur and
their solutions.

Appendix A explains fundamental CTIX concepts. It
is provided for those unfamiliar with the CTIX
system.

Appendix B provides a list of terminals you can
use with the administration tools, and their
associated CTIX terminal types.

POINTS OF INTEREST

BASIC CONCEPTS

If you are new to CTIX, read Appendix A to
better understand CTIX and the administration
tools.

SETTING UP A NEW SYSTEM

If you are setting up a new system, the
administration tools can help you with:

o   Configuring your disk.   See "Creating a
    File System" in Chapter 8.

o   Adding   terminals.   See   "Enabling   a
    Terminal on a Serial Port" and "Enabling
    Terminals on Cluster Channels" in Chapter
    9.

o   Setting up your printer system.   See
    "Adding a Printer," "Setting the Default
    Printer," and "Enabling LP Scheduling" in
    Chapter 7.

o   Setting up user accounts.   See "Adding a
    User," "Adding a Group," and "Change a
    User's Password" in Chapter 3.

o   Backing up your system.   See "Complete
    Backup" in Chapter 4.

o   Starting system status checking.   See
    "Monitoring System Activity Reporting"
    and "Monitoring Process Accounting" in
    Chapter 6.

o   Adding systems to the electronic mail
    system. See "Adding a System" in Chapter
    10.

MAINTAINING A PREVIOUSLY CONFIGURED SYSTEM

If you are maintaining a previously configured
system, the administration tools can help you
with:

o   Managing user accounts. See Chapter 3.

o   Safeguarding the system. See User
    "Restrictions" in Chapter 3, "Complete
    Backup" and "Incremental Backup" in
    Chapter 4, "Monitoring the System
    Console" in Chapter 6, and "Disabling a
    Terminal on a Serial Port" in Chapter 9.

o   Restoring lost files. See Chapter 5.

o   Looking over your system. See "Listing
    User Accounts" in Chapter 3, "Viewing the
    Hardware Inventory," "Monitoring the
    System Error Log," and "Monitoring the
    System Console" in Chapter 6, "Viewing
    the LP System Status" in Chapter 7,
    "Viewing the Disk Description" in Chapter
    8, "Viewing Port Status" in Chapter 9,
    and "Listing Other Systems" in Chapter
    10.

o   Solving problems that may occur on your
    system. See Chapter 11.

NONPRIVILEGED FUNCTIONS

If you are not a system administrator, the
functions below may be of interest:

o   Seeing who the other users are. See
    "Listing User Accounts" in Chapter 3, and
    "Viewing Port Status" in Chapter 9.

o   Managing your account. See "Changing
    Your Password" in Chapter 3.

o   Getting to know your system. See
    "Viewing the Hardware Inventory,"
    "Monitoring the System Error Log," and
    "Monitoring the System Console" in
    Chapter 6.

o   Checking the printer status. See
    "Viewing the LP System Status" in Chapter
    7.

CONVENTIONS USED IN THIS MANUAL

The following conventions are used throughout this
manual:

o   The keystrokes that are specified in this
    manual correspond to the keys on
    Programmable and Graphics Terminals. If
    you are not using either one of these
    terminals, press the question mark (?) to
    see the equivalent keys on your terminal.

o   Boldface (**adman**) indicates that the item
    is a CTIX command and must be typed
    exactly as shown.

o   Boldface with the first letter
    capitalized (**Return**) refers to the
    keyboard character to press.

o   Underlining (menu) followed by a
    definition indicates the item can be
    found in the glossary.

o   The ^ symbol (as in **^Tab**) indicates that
    you should press the **Code** key at the same
    time you press the **Tab** key, for example.

o   The dash (as in **Shift-Next** Page)
    indicates that you should press the **Shift**
    key at the same time you press the **Next**
    Page key, for example.

o   The dollar sign (**$**) represents the shell
    prompt; type the command that follows the
    prompt, not the dollar sign itself.

o   The pound sign (**#**) represents the
    superuser prompt; type the command that
    follows the prompt, not the pound sign
    itself.

2   GETTING STARTED

This chapter introduces you to the administration tools, and **adman**, the CTIX command that allows you to use the administration tools.   This chapter also describes the terminal and the display, and shows you what you need to know to get started, including:

- o   how to enter and leave the administration tools

- o   how to get help

- o   how to move the cursor

- o   how to use the windows

OVERVIEW OF THE ADMINISTRATION TOOLS

The administration tools consist of a series of menus and windows that allow you to perform certain system administration functions.   A menu is a list of choices from which you make a selection.   A window is the information displayed on the terminal after you make a choice.

Figure 2-1 shows the overall organization of the administration tools.   Each system administration category contains several functions.

NOTE

Functions with asterisks (*) indicate the function is restricted to the superuser only. Restricted functions do not appear on the menu for nonprivileged users.

USER ADMINISTRATION	SYSTEM BACKUP	SYSTEM RESTORE	SYSTEM STATUS	PRINTER ADMINISTRATION	*DISK ADMINISTRATION	TERMINAL ADMINISTRATION	*ELECTRONIC MAIL ADMINISTRATION
List User Accounts	*Complete Backup	View Tape Contents	View Hardware Inventory	View if System Status	View the Disk Description	*Enable Serial Port	List Other Systems
Change Your Password	*Incremental Backup	Complete Restore	Error Log Functions o View Summary Report o View Detailed Report o *Reset	*Add a Printer	Create a file System	*Disable Serial Port	Rename This System
*Add a User	Partial Backup	Partial Restore	Console Log Functions o View Contents o *Reset	*Change Printer Status		*Set Cluster Port Logins	Add a System
*Add a Group	User Backup		*System Activity Reporting o Enable o Disable	*Remove a Printer		View Port Status	Change System Information
*Change User Information			*Process Accounting o Enable o Disable	*Set the Default Printer			Delete a System
*User Restrictions o Change a User's Password o Delete a User o Bar a User o Readmit a User				*Enable/Disable LP Scheduling o Enable o Disable			
				*Make a Printer Model			

Figure 1-1.   Overview of the Administration Tools

ENTERING THE ADMINISTRATION TOOLS

NOTE

The keystrokes specified in this manual cor-
respond to the keys on Programmable and
Graphics Terminals.   If you are not using
either one of these terminals, press the
question mark (?) to see the equivalent keys
on your terminal.

To perform nonprivileged functions within the
administration tools:

1.   Log into the system.

2.   Type

     $ adman

3.   Press Return.

To perform system administration functions that require superuser status:

1. Log into the system.

2. Type

   $ **su**

3. Press **Return**.

4. Enter the superuser password.

5. Press **Return**.

6. You have attained superuser status when you receive the "#" prompt. Be careful!

7. Type

   # **adman**

8. Press **Return**.

The first window that appears on the terminal is titled "System Administration" and is called the main menu. The main menu allows you to select one of the system administration function categories, as shown in Figure 2-2.

```
┌─────────────────────────────────────────────────┐
│ System Administration                           │
│                                                 │
│        System Administration Functions          │
│                                                 │
│           ▐User Administration▌                 │
│            System Backup                        │
│            System Restore                       │
│            System Status                        │
│            Printer Administration               │
│            Disk Administration                  │
│            Terminal Administration              │
│            Electronic Mail Administration       │
│                                                 │
│    Please select the desired function and press 'Go'. │
│    Press 'Help' for further explanation.        │
│    Press 'Finish' to exit.                      │
│                                                 │
└─────────────────────────────────────────────────┘
```

Figure 2-2.   Main Menu

SELECTING AND USING WINDOWS

MOVING BETWEEN WINDOWS

From the main menu, you can go to another menu or
window by moving the cursor to your selection and
pressing the Go key. If you are not using a PT or
GT, press the question mark (?) to access a list
of available keys for your terminal.   Press the
key that performs the specified function.

To continue moving down through the series of
menus, choose an option and press Go.   To move up
through the series of menus, press the Finish key,
or the key that terminates the current form
(specified in the list of available keys for your
terminal).

Movement between windows is confined to the
particular category. You cannot move lat-
erally through the series of menus. For
example, if the User Restrictions menu is
displayed, you can move down to Bar a User or
up to User Administration, but you cannot jump
sideways to Partial Backup.

If you wanted to access the Partial Backup
window from the User Restrictions menu, you
would need to go up to the main menu, select
the System Backup function, and then go down
to the Partial Backup window.

WINDOWS FOR VIEWING ONLY

Some windows, like Listing User Accounts in
Chapter 3, are meant for viewing only, and do not
have fields or separate blocks of information you
can enter information into. The format of these
windows is unique to the information being
displayed.

WINDOW LAYOUT

Windows within the administration tools follow a
general layout. Figure 2-3 illustrates the Adding
a New Printer window which contains many of the
standard window features. Each area of the window
is labeled and a description of the area follows
the illustration.
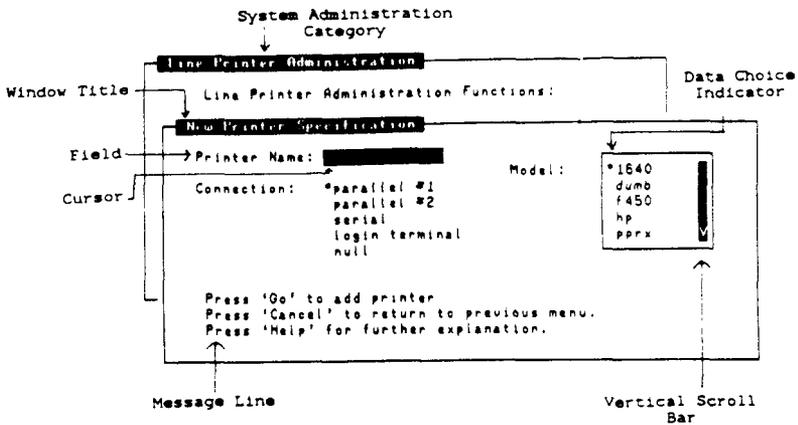
Figure 2-3. General Window Layout

System Administration Category
Each window falls under a particular category of functions; this field names the particular system administration category under which the window falls.

Window Title
The title or name of this window. Window titles are always displayed in a highlighted bar in the window outline. If this window were another level down, an additional box outline would enclose this window, and so on.

Field
Windows are separated into fields. Fields contain information regarding your task. The administration tools provide the information for some fields, you provide the information for others.

Cursor	When the main menu is displayed, a bar highlights the first field. This is the cursor. The cursor indicates your position in the window and indicates a selection. You can move the cursor within fields and between fields.
	In fields that require you to enter information, the cursor is the blinking underline character, and indicates the location of the next character you type.
Data Choice Indicator	The asterisk is the data choice indicator. A menu with a data choice indicator gives the system information about the function, for example, whether a printer is serial or parallel. A menu without a data choice indicator instructs the system to perform a task.
	When you move the cursor within a menu, the asterisk also moves, marking your choice. When you move the cursor to a different field, the asterisk shows you which selection you made in the previous field.
Vertical Scroll Bar	The shaded vertical bar with an arrow at the top or bottom (or both) indicates there is more information in the direction of the arrow than is shown. You can scroll through the additional information by moving the cursor in the direction of the arrow.

Message Line   The message line is the area of
                 the window in which messages are
                 displayed: for example, "Press
                 Help for further explanation".

MOVING WITHIN WINDOWS

Moving within windows means moving the cursor
within a field, or from one field to another.
Some windows only allow you to move the cursor up
and down to display the additional information as
described in "Window Layout".   These windows are
clearly labeled by a vertical scroll bar.

Most windows allow you to move the cursor freely
within them.   You can move the cursor within a
window, by using the keys described following
Figure 2-4.
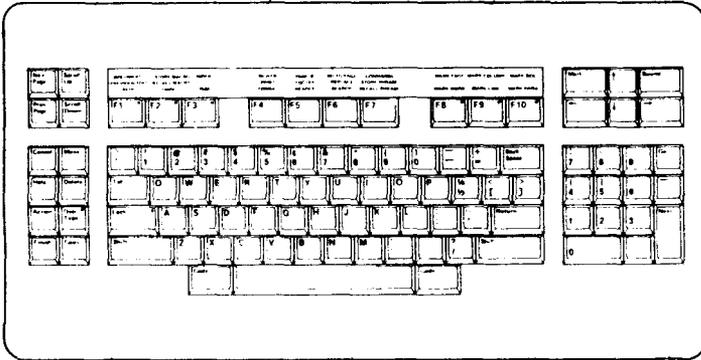
Figure 2-4.   PT Keyboard Layout

The following keys move the cursor between fields:

Tab   The **Tab** key moves the cursor to the
                   next field, cycling through all
                   fields and returning to the first
                   field.

^Tab   **^Tab** (**Code-Tab**) moves the cursor to
                   the previous field, cycling in the
                   opposite direction as **Tab**. See
                   Code for more information.

The following keys move the cursor within fields:

Return   The **Return** key moves the cursor to
                   the next item in a menu or field.
                   The menu scrolls if there is a
                   vertical bar indicating additional
                   choices.   If there is only one
                   option in a field, **Return** moves the
                   cursor to the next field.

Down Arrow   The **Down Arrow** key moves the cursor
                   lower one item at a time.

Up Arrow   The **Up Arrow** key moves the cursor
                   higher one item at a time.

a-z and A-Z   In menus, letters **a-z** and **A-Z** move
                   the cursor to the next item
                   beginning with the letter typed.
                   Otherwise, letters **a-z** and **A-Z**
                   appear as you type them.

Back Space   The **Back Space** key erases the
                   previous character.

Left Arrow   The **Left Arrow** key moves the cursor
                   to the left one character at a
                   time.   It does not erase the
                   characters as it moves over them.

Right Arrow   The **Right Arrow** key moves the cur-
                   sor to the right one character at a
                   time.   Like the **Left Arrow** key, it
                   does not erase the characters as it
                   moves over them.

The following keys perform an action:

Go   The **Go** key performs or executes the
                   specified function.   The **Go** key
                   signals that you have completed the
                   selection process and are ready to
                   proceed.

Finish   The **Finish** key closes the current
                   window and returns you to the pre-
                   vious window.   It moves you one
                   step higher through the series of
                   menus.   In the main menu, **Finish**
                   exits the administration tools.

Cancel   The **Cancel** key also closes the
                   current window, returns you to the
                   previous window, and moves you one
                   step higher through the series of
                   menus as does the **Finish** key.

                           CAUTION

   Using the **Cancel** key on a serial port may pre-
   vent your terminal from responding to further
   keystrokes.   See Terminal Usage Problems in
   Chapter 11, "Troubleshooting" if this occurs.

Delete   The **Delete** key allows you to
                   interrupt the function being per-
                   formed, and exit the administration
                   tools without moving back up
                   through the series of menus window
                   by window.

CAUTION

The **Delete** key should only be used when you urgently need to exit the administration tools: using the **Delete** key may leave the administration tools in an incomplete state.

Help

        The **Help** key displays further information regarding the function at hand.

?

        The question mark key (?) displays a list of valid keys. This shows you the correct keys to use for your terminal. Substitute the appropriate key for the key specified in the instructions in this manual if you are not using a PT or GT.

Code

        The **Code** key is pressed simultaneously with another key to perform an alternate function of the other key. The **Code** key is designated by the ^ symbol. For example, when the alternate function of the **Tab** key is required, it is displayed as **^Tab**.

The following keys perform other movements:

Next Page

        The **Next Page** key displays the next page of information. It scrolls one page at a time and may beep if no more information is available. This key is especially useful for scrolling quickly through viewing-only windows such as Listing User Accounts in Chapter 3.

Prev Page   The **Prev Page** key is similar to the
                   Next Page key above, scrolling the
                   opposite direction.

Scroll Up   The **Scroll Up** key moves the text up
                   several lines at a time, allowing
                   you to see further down the page.
                   It can be used in menus as well as
                   viewing-only windows.

Scroll Down   The **Scroll Down** key is similar to
                   the **Scroll Up** key, but it moves the
                   text down, allowing you to see what
                   is ahead of the data in the window.

MAKING MISTAKES

Mistakes are common. Read this list before they
happen so you are better prepared:

o   If you do not understand the function, you
    can press the **Help** key to display more in-
    formation.   If a Help window is not cur-
    rently available for the particular window
    you are using, the system either displays a
    message indicating this, or it displays the
    Help window for the system administration
    category the window falls under.

o   If you type an invalid character, the
    terminal may beep and the list of valid keys
    may be displayed. Press **Finish** to return to
    the previous window.

o   If you type in the wrong character, you can
    use the **Back Space** key to erase the in-
    correct character and type in the correction
    (make sure the **Overtype** key is unlit).

o   If you encounter a problem using the admin-
    istration tools, or you make a mistake, see
    Chapter 11 for help and instructions.

EXITING THE ADMINISTRATION TOOLS

To exit the administration tools:

    1.   Press **Finish**. If you are not in the main menu, you must press **Finish** once for every window level you are below it. Keep pressing **Finish** until you exit the administration tools.

NOTE

If you are not using a PT or a GT, press the question mark (?) to determine the appropriate key to press instead of **Finish**. This function applies to every terminal.

3 USER ADMINISTRATION

User administration helps you:

o   maintain a secure environment

o   manage user accounts

This chapter tells you how to use passwords to
secure the system from tampering, whether or not
you are a system administrator. It also shows you
how to keep user accounts current and accurate.

NOTE

Security does not lie solely with the system
administrator; it is the responsiblity of
every user. Each user can contribute to the
overall system security by maintaining a
personal level of security. (See Appendix A,
"Basic Concepts" for more information on
security levels.)

To enter the User Administration menu from the
main menu:

1.   Move the cursor to the User
     Administration option.

2.   Press Go.

USER ADMINISTRATION FUNCTIONS

The User Administration menu allows you to
perform the functions illustrated in Figure 3-
1.

```
┌─System Administration───────────────────────────────────┐
│  ┌─User Administration──────────────────────────────────┐│
│  │        User Administration Functions                 ││
│  │                                                      ││
│  │           ███List User Accounts███                   ││
│  │              Change Your Password                    ││
│  │              Add a User                              ││
│  │              Add a Group                             ││
│  │              Change User Information                 ││
│  │              User Restrictions                       ││
│  │                                                      ││
│  │    Please select the desired function and press 'Go'.││
│  │    Press 'Help' for further explanation.             ││
│  │                                                      ││
│  └──────────────────────────────────────────────────────┘│
└──────────────────────────────────────────────────────────┘
```
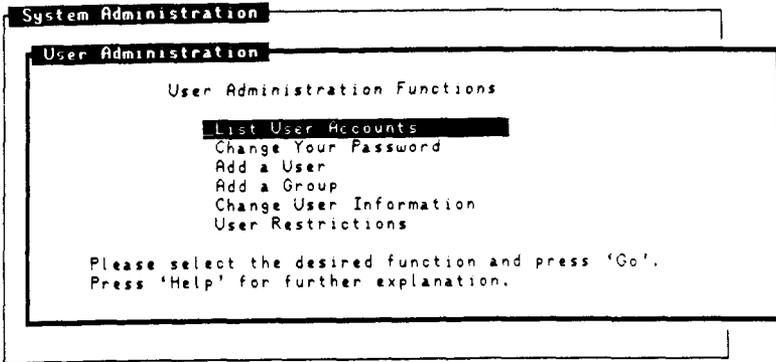
Figure 3-1.   User Administration Menu

LISTING USER ACCOUNTS

Listing user accounts shows you who the users
are on your system.   It tells you their login
names, full names, home directory, and type of
shell.   This window is for viewing only: you
cannot modify any of the information displayed,
you can only scroll through it.

To list the user accounts on your system:

  1.   Move   the   cursor   to   the   List   User
       Accounts option.

  2.   Press Go.

Figure 3-2 shows sample user accounts from the
User List window.

```
┌─────────────────────────────────────────────────────────────┐
│ ▐Uฺerฺ Lฺ iฺ sฺ tฺ▌                                              │
│ ┌───────────────────────────────────────────────────────┐   │
│ │ Login    Name                   Home          Shell   │   │
│ │                                                        │   │
│ │ sync     MightyFrame sync command /          /bin/sync│▲│ │
│ │ lp       lp Administrator        /bin                 │ │ │
│ │ isam     ISAM Administrator      /user/isam           │ │ │
│ │ sccs     SCCS Pools              /source              │ │ │
│ │ user1    Sample Login            /usr/tmp             │ │ │
│ │ user2    Sample Login            /usr/tmp             │ │ │
│ │ user3    Sample Login            /usr/tmp             │ │ │
│ │ tdl      Ft/Gt 232 auto-download /        /usr-local/bin/tdl│ │
│ │ ptdl     Pt 1.0 232 auto-download /       /usr/local/bin/ptdl│ │
│ │ PTDL     Pt 1.0 232 auto-download /       /usr/local/bin/ptdl│ │
│ │ gtdl     Gt 1.0 232 auto-download /       /usr/local/bin/gtdl│ │
│ │ GTDL     Gt 1.0 232 auto-download /       /usr/local/bin/gtdl│ │
│ │ demo     Demo id                 /usr/tmp            │ │ │
│ │ john     John Henderson          /u/john     /bin/sh  │ │ │
│ │ joe      Joe Smith               /u/joe      /usr/local/bin/csh│▼│ │
│ │                                                        │   │
│ │   Press 'Finish' to return to previous menu           │   │
│ └───────────────────────────────────────────────────────┘   │
└─────────────────────────────────────────────────────────────┘
```

Figure 3-2. Sample User Accounts

This window contains the following fields:

Login   The first column lists all the
                login accounts on the system.
                Login accounts may refer to names
                of actual users, like john, or to
                system users, like lp. The lp
                account is used in the LP Spooling
                System. Refer to Chapter 7, "Line
                Printer Administration" for more
                information on the LP Spooling
                System.

Name   The second column provides more
                information about the login
                account. It lists the full name of
                the user, or the name of the system
                application.

Home   The third column shows you the
                user's home directory.   A home
                directory is like an office on the
                system: it is the first place you
                go when you get to work (log in),
                it is where you reside, and it is
                where you perform the majority of
                your work.

Shell   The last column tells you which
                shell the user is using. There are
                two standard shells.   The Bourne
                shell   is   the   default   shell,
                designated as "/bin/sh". The other
                standard shell is the C shell,
                which some users prefer.   The C
                shell   is   designated   as
                "/usr/local/bin/csh".   Appendix A
                contains   more   information   on
                shells.

                When this column is blank, the user
                is   using   the   default   (Bourne)
                shell.   This   column   may   also
                contain a full pathname to a file
                which is executed when the user
                logs in.

CHANGING YOUR PASSWORD

This window allows you to change your password,
whether you are a nonprivileged user or the system
adminsitrator.   Passwords are the principal form
of   security   on   the   system.   Good   password
protection prevents unauthorized people from using
the system and damaging your files.

This function clears the screen and takes you
outside of the window.   When you enter your
password, you do not see the characters you type.
The system confirms your password by asking you to

reenter it. Give the system your new password the next time you log in.

To change your password:

1. Move the cursor to the Change Your Password option.

2. Press Go.

3. Type in the new password. Do not use login names or words that can be easily guessed, such as the name of someone close to you. Be creative!

4. Press **Return**.

5. Re-enter the new password.

6. Press **Return**.

NOTE

The following conditions are imperative for system security:

o You should always have a password.

o You should change your password regularly.

o You should not disclose your password to other people.

ADDING A USER

As a system administrator, you will frequently be asked to "put someone on the system" or "give someone an account." This means adding a user.

NOTE

After you have added a user, assign a password
immediately. See the Change a User's Password
function for instructions.

You can determine whether the user addition was
successful by logging in as the user without any
problems. If there is a problem, refer to Chapter
11, "Troubleshooting" for help.

The elements of this window are described
following Figure 3-3.
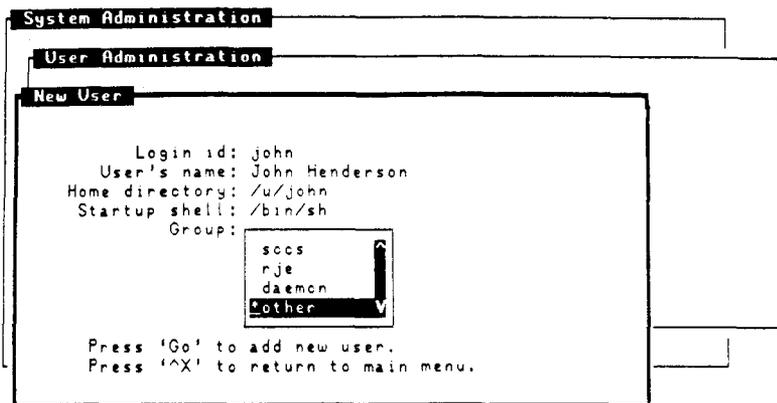
Figure 3-3. Add a User Window

Login ID   In the first field, type in the
                login name of the user. This is
                customarily the user's first name
                or three initials in lowercase

letters. In the example, the
user's login name is john. Login
names must be seven or fewer
characters.

User's Name   The second field contains the
user's full name, typed as you
would normally type a person's
name. For example, john's full
name is John Henderson.

Home   The home directory should have the
Directory   same name as the login id. Specify
the full pathname, for example,
john's home directory is "/u/john".

Startup Shell If the user prefers to work in the
C shell, backspace over the default
shell and substitute the entry
"/usr/local/bin/csh". See Appendix
A for an explanation on shells.

Group   The available groups the user can
join are in the boxed field. Move
the cursor through the choices to
determine the appropriate group to
assign the user. In the example,
john is a member of the group
"other".

You can change the original group
assignment by using the Change User
Information window described later
in this chapter.

To add a user:

1. Move the cursor to the Add a User
   option.

2. Press Go.

3. Enter the login identification name of the user.

4. Enter the full name of the user.

5. Enter the home directory of the user.

6. Enter the startup shell.

7. Enter the group identification name.

8. Press Go to execute.

9. The system displays the message "User john has been added."

ADDING A GROUP

Most systems have one group to which all users are originally assigned. Depending on the security level of your files, any member of this group may read or modify your files (see Appendix A, "Basic Concepts" for more information on security levels). However, if a smaller number of users are working on the same project, and they do not want everyone in the large, originally assigned group to be able to view or modify their files, adding a group just for them allows them to limit the access of their files to members in their group only.

CAUTION

Groups can be useful, but they pose a security risk: if security is of the utmost importance on your system, disallow group access (see Appendix A for information on designating security levels).

To add a group:

1. Move the cursor to the Add a Group
    option.

2. Press **Go**.

3. Enter the group identification name.

4. Press **Go** to execute.

5. The system displays the message "Group
    other has been added," where "other" is
    the name of the group you entered.

There are two ways give a user membership into a
new group. The first way is to change the user's
assigned group by using the Change User
Information window. In this case, the user
remains a member of one group.

The second way to give a user membership into a
new group is to assign the user to the new group
in addition to the originally assigned group. See
the chapter in the appropriate administrator's
reference manual for your system that discusses
adding users to groups for instructions on
allowing users to be members of more than one
group.

CHANGING USER INFORMATION

The Change User Information window allows you to
make changes to the information you entered when
you added a user. You cannot change the user's
login id, but you can change the following
information:

o   full name

o   home directory

o   startup shell

o   group

The first window displayed in this function is the
list of users from which to choose.   The next
window displays the information just as you
entered it when you added the user.   (See Figure
3-3 for an example.)

To change any or all of the information regarding
a user, perform the following steps

1.   Move the cursor to the Change Use.
     Information option.

2.   Press Go.

3.   Move the cursor to select the user.

4.   Press Go to execute your selection.

5.   Move the cursor to the desired field and
     enter the changes.

6.   Press Go to execute.

7.   The system displays the message "User
     john has been changed."

USER RESTRICTIONS

There are several variations of user restrictions,
ranging from password protection to account
removal.   Preventing unauthorized persons from
logging in (and possibly causing harm to your
system) is a basic security requirement.
Restricting access to your system is a critical
part of your responsibilities as system
administrator.

To enter the User Restrictions menu from the User
Administration menu:

1. Move the cursor to the User Restrictions
    option.

2. Press Go.

Figure 3-4 shows the user restrictions you can
select.

```
┌─System Administration─────────────────────────────────┐
│ ┌─User Administration──────────────────────────────┐   │
│ │ ┌─User Restrictions─────────────────────────────┐    │
│ │ │                                               │    │
│ │ │         User Restriction Functions            │    │
│ │ │                                               │    │
│ │ │         ███Change a User's Password███         │    │
│ │ │           Delete a User                       │    │
│ │ │           Bar a User                          │    │
│ │ │           Readmit a User                      │    │
│ │ │                                               │    │
│ │ │    Please select the desired function and press 'Go'. │
│ └ │    Press 'Help' for further explanation.      │    │
│   │                                               │    │
└───┴───────────────────────────────────────────────┘    │
```
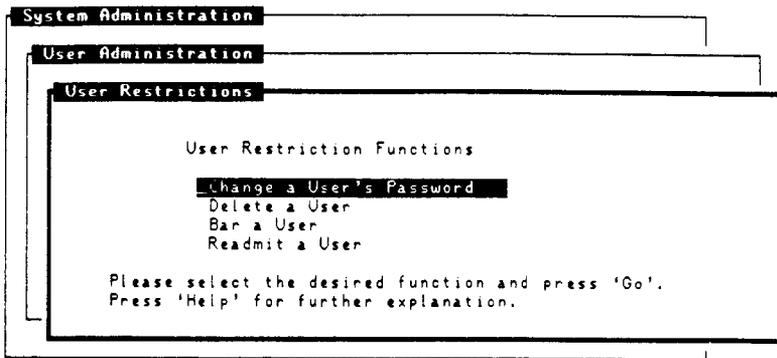
Figure 3-4.   User Restrictions Menu

Changing A User's Password

Use this function after using the Add a User
function to assign the user a password. This
function also allows you to give the user a new
password if the user forgets his password. Keep
in mind that some users would like to keep the
same password indefinitely. In this case, you
should inform the user of the security risk this
poses and strongly encourage him to change it; do
not change it for him.

To change a user's password:

1. Move the cursor to the Change a User's Password option.

2. Press **Go**.

3. Move the cursor to select the desired user.

4. Press **Go** to execute.

5. Enter the new password.

6. Press **Return**.

7. Re-enter the new password.

8. Press **Return**.

Deleting A User

When a user should not have access to the system, for example when an employee has left the company, it is wise to delete his account. Advise the user's manager of your plans prior to taking any action, as the manager may need access to the account.

NOTE

Deleting a user does not remove his files from the system, it only prohibits his access to the system.

Also, consult the user's manager for the appropriate action to take with his files, and archive them before you take the action. An archive is a copy of a file which is put on a tape separate from any complete or incremental backup tape the file may already be on. Archive tapes

should be recorded in the log along with backup
tapes. Refer to the User Backup window in the
System Backup chapter for instructions on
archiving files.

The manager may tell you to do one of the
following:

If the task   You should:
is:

Leave them   Archive them, then leave them
alone   alone. It is important to keep a
                copy of a user's files exactly as
                the user left them; archiving
                allows you to do this.

Move them   Archive them, then move them to the
                directory the manager specified.
                Refer to the chapter in the
                appropriate administrator's
                reference manual for your system
                that discusses moving a user's
                files.

Archive them   Archive them.

Remove them   Archive them, then delete them.
                Refer to the chapter in the
                appropriate administrator's
                reference manual for your system
                that discusses permanently removing
                a user for instructions.

To delete a user's account:

    1. Move the cursor to the Delete a User
        option.

    2. Press Go.

3. Move the cursor to select the desired user.

4. Press Go to delete the user.

5. The system asks you to confirm the removal of the user from the system.

6. Move the cursor to the "yes" entry.

7. Press Go.

8. The system displays the message "User john has been removed."

Barring a User

Barring a user from the system is different from deleting a user. When you bar a user from the system, you prevent him from logging in, but you leave his account intact. For example, a consultant may work on a particular project on your system for a few months, leave, then return a few months later. It is more efficient to bar and readmit him than to delete and recreate his account.

To bar a user from the system:

1. Move the cursor to the Bar a User option.

2. Press Go.

3. Move the cursor to select the desired user.

4. Press Go to execute.

5. The system displays the message "User john is now barred from further logins."

Readmitting A User

When you readmit a user, you return his login
privilege.   His password does not change, it is
the same as it was when the user was barred from
the system.

To readmit a user to the system:

1. Move the cursor to the Readmit a User
    option.

2. Press **Go**.

3. Move the cursor to select the desired
    user.

4. Press **Go** to readmit the user.

5. The system displays the message "User
    john's password has been restored."

WHERE TO GO FROM HERE

For more specific information about the files and
commands the administration tools use to perform
user administration, refer to the following items
in   the   appropriate   administrator's   reference
manual   for   your   system   and   the   CTIX Operating
System Manual:

/etc/passwd

   This   is   the   file   that   contains   user
   account information.

/etc/group

   This   is   the   file   that   contains   group
   account information.

passwd

This is the command used to change
passwords. It allows the nonprivileged
user to change his own password; the
superuser to change any user's password.

4 SYSTEM BACKUP

Backups protect you from losing valuable work if your system is damaged. A **backup** is a duplicate of your system preserved on tape. Providing good backups is one of your key responsibilities as system administrator. Good backups are:

o   thorough

o   current

o   easy to restore

This chapter discusses the types of backups, how to do them, and when to do them. It also shows how to assure their success.

To enter the System Backup menu from the main menu:

1.   Move the cursor to the System Backup option.

2.   Press **Go**.

BACKUP FUNCTIONS AND SCHEDULING

Using a combination of the four types of backups, shown in Figure 4-1, provides you with thorough backup coverage. The goal is to have the latest version of every file easily available.

```
┌─────────────────────┐
│ System Administration │
│ ┌───────────────┐
│ │ System Backup │
│ │
│ │          System Backup Functions:
│ │
│ │              ▓▓Complete Backup▓▓▓▓▓▓▓▓
│ │              Incremental Backup
│ │              Partial Backup
│ │              User Backup
│ │
│ │      Please select the desired function and press 'Go'.
│ │      Press 'Help' for further explanation.
│ │
│ │   Press 'Finish' to exit.
│ └─────────────────────────────────────────
```
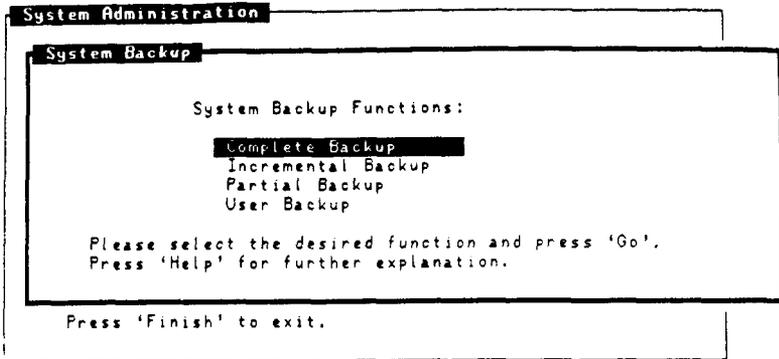
Figure 4-1.   System Backup Menu

The best time to do a backup is when the system is
quiet: the least activity on the system occurs
early in the morning, and after most users have
left for the day.   Pick the time convenient for
you, and try to perform the backup during the same
time each day.

NOTE

  Backups are for your users, so let them know
  your schedule. Most users try to stay off the
  system when they know you are backing up their
  files.

Backups are not just to protect against system
damage; they are also used to retrieve an older
version of a particular file. Keep the backup
tapes for a reasonable length of time before you
recycle them. Table 4-1 summarizes a good backup
schedule and suggested retention periods.

Table 4-1.

BACKUP SUMMARY CHART

Backup	Frequency	Retention
Permanent Complete	Monthly	Indefinitely
Regular Complete	Weekly	Four weeks
Incremental	Daily	Two weeks
Partial	As needed	Indefinitely
User	As needed	Indefinitely

COMPLETE BACKUP

A complete backup copies your entire system onto
one or more tapes. Complete backups can be
regular or permanent. The only difference between
the two is the length of retention.

Regular Complete Backup	You should completely back up your system every week. These backup tapes should be kept for four weeks and are called <u>regular complete backups</u>.

Permanent Complete Backup	Every fourth week, a regular complete backup should be performed as usual, and should be set aside for permanent safekeeping. These backups are called **permanent complete backups**.

To perform a complete backup:

1. Move the cursor to the Complete Backup option.

2. Press **Go**.

3. Insert a tape in the drive, first making sure the write protect arrow is away from "SAFE", and close the door.

4. Press **Go**.

5. See "Backup Status Messages" later in this chapter for further instructions.

INCREMENTAL BACKUP

Incremental backups contain only the files that have changed since the last complete backup. These backups are smaller, take less time, and should be performed more often than complete backups. Perform incremental backups daily to ensure adequate coverage.

To perform an incremental backup:

1. Move the cursor to the Incremental Backup option.

2. Press **Go**.

4. Press **Go**.

5. See "Backup Status Messages" later in
    this chapter for further instructions.

PARTIAL BACKUP

Partial backups allow you to select a particular
file or directory to archive, specified by the
full pathname. Partial backups are also one way
to to move files from one system to another.
Figure 4-2 displays the Partial Backup window.

```
┌─System Administration────────────────────────────┐
│┌─Partial Backup──────────────────────────────────┐
││                                                  │
││   Pathname to backup:                            │
││   ████████████████████████████████████████████   │
││                                                  │
││   Press 'Go' to continue backup procedure.       │
││   Press '^X' to return to the previous menu.     │
││                                                  │
│└──────────────────────────────────────────────────
│      Press 'Help' for further explanation.        │
│                                                   │
│    Press 'Finish' to exit.                        │
└───────────────────────────────────────────────────
```

Figure 4-2. Partial Backup Window

To perform a partial backup:

1. Move the cursor to the Partial Backup
    option.

2. Press **Go**.

3. Enter the full pathname of the file or
    directory to be backed up.

4. Press Go.

5. Insert a tape in the drive, first making
    sure the write protect arrow is away
    from "SAFE", and close the door.

6. Press Go.

7. See "Backup Status Messages" for further
    instructions.

USER BACKUP

User backups allow you to archive the files in a
user's home directory. Always do a user backup
before removing a user's files.

To perform a user backup:

1. Move the cursor to the User Backup
    option.

2. Press Go.

3. Move the cursor to select the desired
    user.

4. Press Go.

5. Insert a tape in the drive, first making
    sure the write protect arrow is away
    from "SAFE", and close the door.

6. Press Go.

7. See "Backup Status Messages" for further
    instructions.

BACKUP STATUS MESSAGES

A backup may take several minutes or over an hour,
depending on the amount of information to be
backed up. You do not need to stay at your
terminal during the backup: however, pay attention
to the following status messages which may be
displayed:

File list build begins...

   This message informs you that the backup is
   building the list of files to be backed up.

Removing fileX from filelist.

   If you get this message, the file called "fileX"
   is not included in the backup. See "Where to go
   from here" later in this chapter for more
   information.

Backup begins...

   This message informs you that the file list has
   been created and the files are starting to be
   copied to tape. The files are displayed on the
   screen as they are copied.

Backup interrupted by user.

   This message is displayed if you stop the backup
   before it is complete. It asks you to confirm
   whether the interruption is intentional, or
   whether it is accidental and you want to
   continue the backup.

Insert reel number X, then type Return.

   This message indicates the backup has filled one
   tape, and it is safe to remove the tape and
   insert another one.

Backup complete.

This message indicates the backup finished
successfully. It is followed by the number of
blocks of information that were transferred to
the tape.

Backup failed.

This message indicates the backup did not finish
successfully. Refer to Chapter 11,
"Troubleshooting" for help.

BACKUP QUALITY

The best way to achieve good backups is to do them
regularly and faithfully. Another part of doing
good backups is keeping records. Good records
help you find the right backup tape quickly and
also make restoring files easier. Keep a log of
the following items:

o   tape number

o   date of backup

o   type of backup

o   contents

o   volume number (if the backup uses more
    than one tape)

The other major factor in backup quality is the
tape itself. Occasionally tapes suffer from wear
and tear, or arrive in defective condition from
the factory. Receiving defective tapes from the
factory is rare, but it does occasionally occur.

If you are uncertain about the quality of a backup
tape, try to read the contents of the tape (see

the View Tape Contents function in Chapter 5,
"System Restore" for instructions). It is not
necessary for you to verify every backup, or every
tape. However, you should perform this test from
time to time even if you do not suspect any tape
faults.

WHERE TO GO FROM HERE

For more specific information about the commands
used to perform system backups, refer to the
following items in the appropriate administrator's
reference manual for your system and the CTIX
Operating System Manual:

cpio

   This command is used to backup and restore
   information using a tape. It can also be
   used to move large directories within the
   system.

find

   This is the command used to search through
   the system for certain files, and perform
   the backup on those files.

In addition to the above commands, the
administration tools use the following files to
perform system backups:

/usr/lib/adman/logXX

   This is a log created in the backup process that
   contains the list of files that were backed up.
   If you want to check the contents of a backup
   tape, you can look at this log instead of
   loading the tape and using the View Tape
   Contents function. This log can be found in the
   above file where XX is the day of the backup.

The other important thing to note is that when
space is getting scarce, these logs can be
removed without harming the system.

/usr/lib/adman/compexcl.l
/usr/lib/adman/incexcl.l

These are files used to exclude certain files
from the backup. If there are files displayed
in the "Removing fileX from filelist" message
that you do want backed up, read the chapter in
appropriate programmer's guide for your system
to learn how to use an editor to modify this
file.

5   SYSTEM RESTORE

System restores are the opposite of system
backups. A backup takes information from the disk
and copies it onto tape. A _restore_ takes
information from the tape and copies it onto the
disk.

In Chapter 4, "System Backup," the goal of
performing system backups was defined as having
the latest version of every file easily available.
The reason for this is to make the restore as
efficient as possible.

NOTE

When a restore is needed, attend to it as
quickly as possible, whether it is a single
file you need to restore, or an entire file
system you need to reconstruct. See Chapter
8, "Disk Administration" for more information
on file systems.

This chapter explains the different types of
restores, when you should use which type, and how
to assure their success.

To enter the System Restore menu from the main
menu:

1.   Move the cursor to the System Restore
     option.

2.   Press Go.

RESTORE FUNCTIONS

The restore functions, as shown in Figure 5-1, are
designed to take advantage of the different types
of backups. Use Table 5-1 as a reference and read
the   following   descriptions   for   restore
instructions.

```
┌─System Administration────────────────────────────────────┐
│ ┌─System Restore───────────────────────────────────────┐ │
│ │                                                       │ │
│ │          System Restore Functions:                    │ │
│ │                                                       │ │
│ │              ███View Tape Contents███                 │ │
│ │              Complete Restore                         │ │
│ │              Partial Restore                          │ │
│ │                                                       │ │
│ │                                                       │ │
│ │      Please select the desired function and press 'Go'.│ │
│ │      Press 'Help' for further explanation.            │ │
│ └───────────────────────────────────────────────────────┘ │
│                                                           │
│     Press 'Finish' to exit.                               │
└───────────────────────────────────────────────────────────┘
```
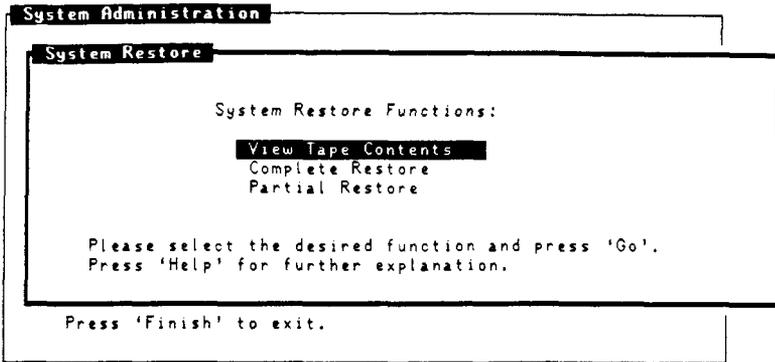
Figure 5-1.   System Restore Menu

NOTE

Regardless   of   restore   type,   you   can   save
precious time by immediately determining which
tape you need and finding it fast from your
backup log.

Table 5-1.

RESTORE SUMMARY CHART

Type of Restore	From Type of Backup	In Order to Restore
Partial	Complete	The latest version of a file or a directory
Partial	Incremental	The latest version of a file or a directory
Partial	Partial	A file or a directory from an archive
Partial	User	A file or directory from a user's home directory
Complete	Complete	An entire file system
Complete	Incremental	All files on a file system that have changed since the last complete backup
Complete	Partial	An entire archive
Complete	User	A user's home directory

VIEWING THE CONTENTS OF A BACKUP TAPE

This option allows you to look at the contents of a backup tape, which helps you determine whether or not it contains the file(s) you want to restore. Viewing the contents of a backup tape

lists the files with their full pathnames, size,
date of last modification, owner and security
level (mode). For more information on security
levels, see Appendix A, "Basic Concepts." If the
file you need to restore is not listed, it is not
the correct tape. Figure 5-2 is an example of the
contents of a backup tape.

```
┌─ System Administration ─────────────────────────────────────┐
│  ┌─ Disk Restore ──────────────────────────────────────────┐│
│ ┌ View Tape ───────────────────────────────────────────────┐│
│ ┌Mode    Owner    Size    Date              Name────────────┐│
│ │                                                           ││
│ │ 100755 isaac      80  Mar 10 12:37:47 1986  /u/isaac/ttt.a││
│ │ 100644 isaac      16  Mar 10 15:03:09 1986  /u/isaac/.cshrc│
│ │ 100644 isaac    6600  Mar 10 15:05:17 1986  /u/isaac/screen/emilisd.c│
│ │ 100644 isaac    6818  Mar 12 08:56:50 1986  /u/isaac/screen/isd.c│
│ │ 100666 isaac   64815  Mar 12 09:02:55 1986  /u/isaac/screen/test│
│ │ 100666 isaac      18  Mar 12 09:01:10 1986  /u/isaac/screen/setup│
│ │ 100755 isaac   23951  Mar 12 08:57:28 1986  /u/isaac/screen/isd│
│ │ 100644 isaac   28672  Mar 12 09:43:24 1986  /u/isaac/core│
│ │                                                           ││
│ │                                                           ││
│ │                                                           ││
│ │                                                           ││
│ └───────────────────────────────────────────────────────────│
│    Press 'Finish' to return to previous menu.                │
└──────────────────────────────────────────────────────────────┘
```

Figure 5-2.   Sample Backup Tape Contents

To view the contents of a backup tape:

1.   Move   the   cursor   to   the   View   Tape
      Contents option.

2.   Press **Go**.

3.   Insert the tape into the drive and close
      the door.

4.   Press **Go**.

NOTE

It may take the system several minutes to build the list of files on the tape before they are displayed.

You can also view the contents of a tape without the tape. See "Where to Go from Here" later in this chapter for more information.

COMPLETELY RESTORING FILES FROM A BACKUP TAPE

Restoring completely means copying all the files on the tape onto the disk.

NOTE

You will probably need to do a complete restore if your system has suffered major damage. The only other time you should do a complete restore is to restore a special archive, for example, a user's files if his account was removed from the system.

CAUTION

Doing a complete restore overwrites existing files with older versions of the files. For example, if a file changed after you did a backup, the older version (the version on tape) is restored and overwrites the newer version.

To completely restore a backup tape:

1. Determine the correct tape from your backup records.

2. Move the cursor to the Complete Restore option.

3. Press Go.

4. Insert the tape into the drive and close the door.

5. Press Go.

6. See "Restore Screen Messages" later in this chapter for further instructions.

PARTIALLY RESTORING FILES FROM A BACKUP TAPE

Partially restoring files from a backup tape means you selectively choose which files on the tape you want to restore, as opposed to restoring everything on the tape. If a user has requested the restore, find out the following facts:

o the full pathname of file or directory to be restored

o the date the file was last modified or the date of the version the user wants

Check your backup log to determine the correct tape to use. For example, if the user requested that you restore the file "/u/john/memo.sk", and the last time he modified it was three days ago, it would probably be on the next incremental backup taken after that date.

Figure 5-3 illustrates the Partial Restore window. Note that you can restore up to four pathnames at

a time. Wild cards allow you to refer to more
than one file using a particular character. For
example, you could restore all of /u/john and
/u/joe by entering "/u/jo*" as a pathname. The
asterisk is a wild card as it refers to anything
that may come after the "/u/jo".

Another wild card is the question mark. The
question mark matches a single character, as
opposed to the asterisk, which matches any number
of characters. For example, entering
"/u/john/report?" would refer to the files in
john's directory named "report1," report2," and so
on.

The Partial Restore window also allows you to
choose whether to restore the lost files only, or
restore unconditionally. Restoring the lost files
only does not overwrite a newer version of a file
on the system with an older version of the same
file on the tape. Restoring unconditionally
overwrites the file on the system with the file of
the same name on the tape, regardless of version.

```
┌─System Administration────────────────────────────┐
│┌─Partial Restore───────────────────────────────┐ │
││                                                │ │
││   Pathnames to restore:                        │ │
││   #1 ████████████████████████████████████████ │ │
││   #2                                           │ │
││   #3                                           │ │
││   #4                                           │ │
││                                                │ │
││   *Lost Files Only                             │ │
││    Unconditionally                             │ │
││                                                │ │
││   Enter up to four different pathnames to restore. │ │
││   Shell wild cards may be used.                │ │
││                                                │ │
││   Press 'Go' to restore files.                 │ │
││   Press '^X' to return to the previous menu.   │ │
││                                                │ │
│└────────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────┘
```
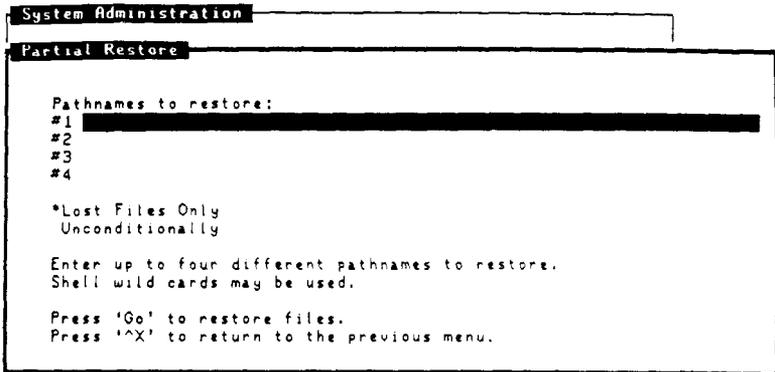
Figure 5-3.   Partial Restore Window

To partially restore a backup tape:

1. Determine the correct tape.

2. Move the cursor to the Partial Restore option.

3. Press **Go**.

4. Enter the full pathnames of the files or directories to be restored.

5. Select either the Lost Files Only option or the Unconditional restore option.

6. Press **Go**.

7. Insert the tape into the drive and close the door.

8. Press **Go**.

9. See "Restore Status Messages" for further instructions.

The restore is successful when you have confirmed that the file has been restored to the correct place, and the requestor has permission to read and write to the file. Do not forget to inform the requester that you have completed the restore.

You can check the success of the restore by using the ls command from the shell. This is the command that displays information about a file, such as the size, date it was last modified, owner, and security level. Refer to the CTIX Operating System Manual for details.

RESTORE STATUS MESSAGES

A restore may take several minutes or over an hour, depending on the amount of information to be restored. You do not need to stay at your terminal during the restore; however, pay attention to the following status messages which may be displayed:

Attempting to restore unconditionally (or lost **files only).**

This message indicates your selection has been confirmed and is being searched for on the tape.

Restore begins...

This message informs you that the files are starting to be copied from the tape to the disk. The files are displayed on the screen as they are restored.

Restore interrupted by user.

This message is displayed if you stop the restore before it is complete. It asks you to confirm whether the interruption is intentional, or it is accidental and you want to continue the restore.

Insert reel number X, then type Return.

This message indicates the backup used more than one tape. It is safe to remove the tape and insert the next one in the series.

Restore complete.

This message indicates the restore finished successfully. It is followed by the number of blocks of information that were restored.

Restore failed.

This message indicates the restore did not finish
successfully.   Refer   to   Chapter   11,
"Troubleshooting" for help.

WHERE TO GO FROM HERE

For more specific information about the files and
commands used to perform system restores, refer to
the   following   items   in   the   appropriate
administrator's reference manual for your system
and the CTIX Operating System Manual:

   cpio

      This is the command used to restore and
      backup information using a tape. It can
      also be used to move large directories
      within the system.

   find

      This is the command used to search through
      the system for certain files, and perform
      the restore on the files it finds.

In addition to the above commands, the following
file used to perform system backups functions may
be of interest:

   /usr/lib/adman/logXX

      This   is   the   log   file   created   that
      contains   the   list   of   files   that   were
      backed up.   If you want to check the
      contents of a backup tape, you can look
      at this log instead of loading the tape
      and   using   the   View   Tape   Contents
      function.   This log can be found in the
      above file where XX is the day of the

backup.   When space is becoming scarce,
these logs can be removed without harming
the system.
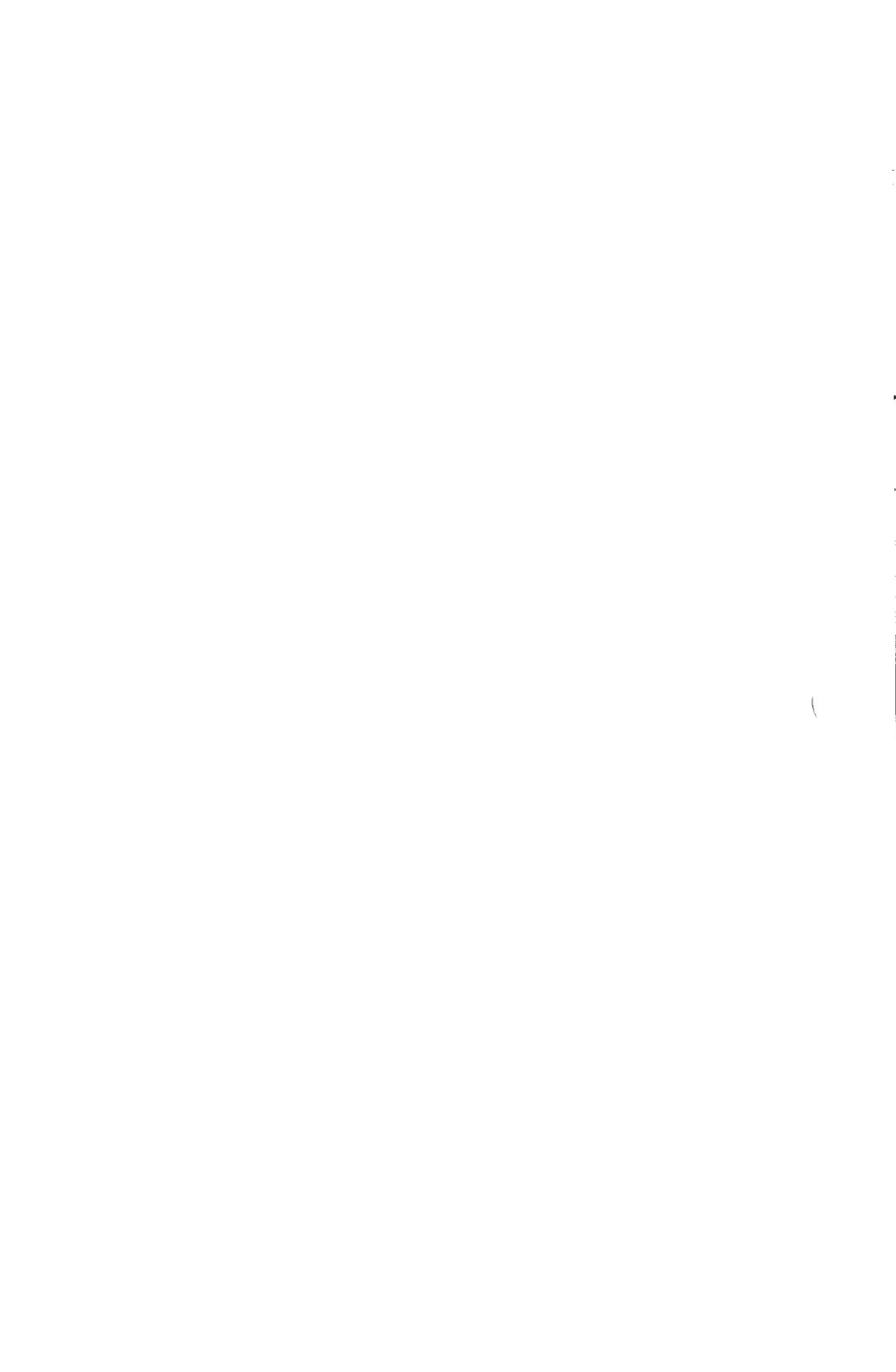
6 SYSTEM STATUS

The system provides several ways for you to monitor its status. Monitoring the system allows you to:

o   detect potential problems before they occur

o   account for the use of system resources

o   keep records of system activity

This chapter discusses the various types of system monitoring functions, the differences between them, how to start and stop them, and how to reset them and clear old statistics.

To enter the System Status menu from the main menu:

1.   Move the cursor to the System Status option.

2.   Press Go.

STATUS MONITORING FUNCTIONS

The System Status menu allows you to perform the functions illustrated in Figure 6-1.

```
┌─────────────────────────────────────────────────────┐
│ ▉System Administration▉───────────────────────────┐  │
│ │ ▉System Status▉──────────────────────────────┐  │  │
│ │ │                                             │  │  │
│ │ │     System Status Functions:                │  │  │
│ │ │                                             │  │  │
│ │ │         ▉View Hardware Inventory▉▉▉▉▉        │  │  │
│ │ │         Error Log Functions                 │  │  │
│ │ │         Console Log Functions               │  │  │
│ │ │         System Activity Reporting           │  │  │
│ │ │         Process Accounting                  │  │  │
│ │ │                                             │  │  │
│ │ │   Please select the desried function and press 'Go'. │
│ │ │   Press 'Finish' to return to the previous menu.     │
│ │ │                                             │  │  │
│ │ └─────────────────────────────────────────────┘  │  │
│ └───────────────────────────────────────────────────┘  │
└─────────────────────────────────────────────────────┘
```
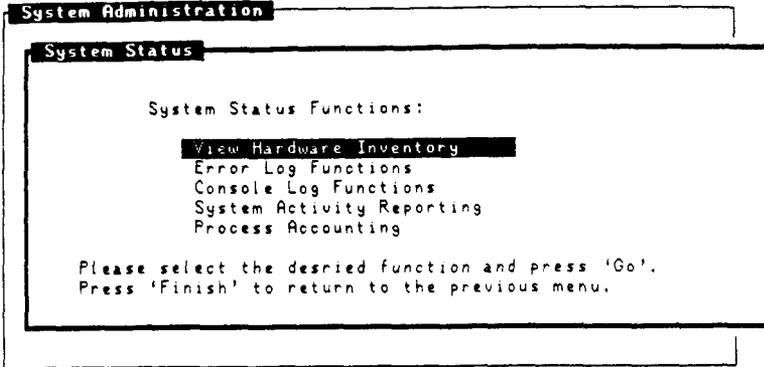
Figure 6-1. System Status Menu

VIEWING THE HARDWARE INVENTORY

The View Hardware Inventory window lists the basic
hardware elements of your system, as shown in
Figure 6-2. You should be aware of these elements
because they affect your system's operation.
Also, you will probably be asked about them at one
time or another by a service representative or a
product vendor.

To view the hardware currently on your system:

  1. Move the cursor to the View Hardware
      Inventory option.

  2. Press Go.

```
System Administration
    Hardware Inventory

    5242880 bytes memory
    16 maximum users
    68020
    68881
    232 Board #1
    422
    controller #0 drive #0 drive #1 drive #2




    Press 'Finish' to return to the previous menu.
```
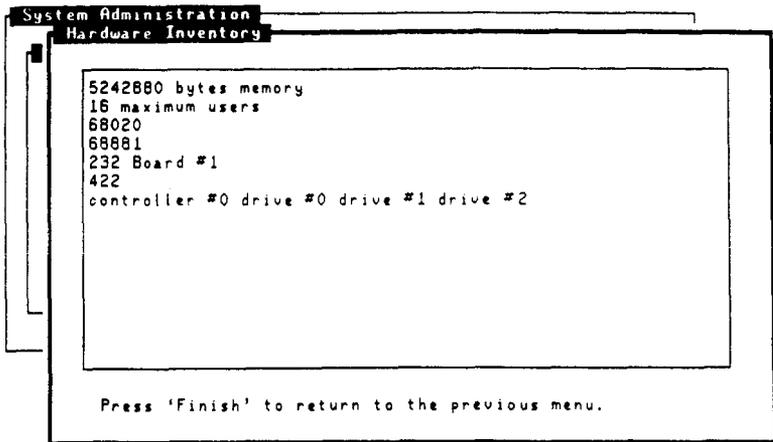
Figure 6-2.   Hardware Inventory Window

The basic hardware elements are:

Memory   This refers to the quantity of
                  memory in your system. Memory is
                  where the system stores information
                  before it is transferred to the
                  disk.

                  The system shown in Figure 6-2 has
                  five megabytes, designated as 5
                  Mbytes. For more information on
                  system measuring units, see "block"
                  in the Glossary.

Maximum Users This represents the maximum number
                  of users that can be logged into
                  your system at one time.

68020   This number refers to the
                  microprocessor used in your system.

232/422 Board These entries show you which type
                  of board (whether serial or cluster

respectively), is in which slot. If there is no board number after the type, the board is not present in the system.

Controller   This line displays the disk controller number and the disk drives that are controlled by this controller.

MONITORING THE SYSTEM ERROR LOG

The system error-detecting process generates a log with general error information. The error log functions allow you to:

o   view a summarized error report

o   view a summarized error report with a system profile

o   reset the log

To enter the Error Log Functions menu from the System Status menu:

1. Move the cursor to the Error Log Functions option.

2. Press **Go**.

Viewing the Summary Error Report

The summary error report shows you the error status of your system. It displays what types of errors are included in the report, the limitations of the report, and the date of the earliest and latest entry into the report. If this window shows more than just a few errors and your system is experiencing operating problems, contact your service representative. Figure 6-3 shows an example of a summary error report.

```
┌─System Administration────────────────────────────────────────┐
│ Error Log                                                     │
│  ┌─────────────────────────────────────────────────────────┐ │
│  │ ─                                                       █ │ │
│  │    Summary Error Report    Prepared on Apr 23 20:35    Page  1 █ │ │
│  │                                                         █ │ │
│  │        Error Types: All                                 │ │
│  │        Limitations:                                     │ │
│  │        Date of Earliest Entry: Mon Apr 21 05:00:04 1986 │ │
│  │        Date of Latest   Entry: Wed Apr 23 11:21:03 1986 │ │
│  │                                                         │ │
│  │        Total Stray Interrupts        -    0             │ │
│  │                                                         │ │
│  │        Total Serial Driver Errors    -    0             │ │
│  │                                                         │ │
│  │        Total Memory Parity Errors    -    0             │ │
│  │                                                         │ │
│  │        Total Bus Faults              -    1             │ │
│  │ QIC0    Unit  0                                         █ │ │
│  │                                                         ▼ │ │
│  └─────────────────────────────────────────────────────────┘ │
│    Press 'Finish' to return to the previous menu.             │
└───────────────────────────────────────────────────────────────┘
```

Figure 6-3.   Sample Summary Error Report

To view the summary error report:

1.   Move the cursor to the View Summary
     Report option.

2.   Press Go.

Viewing the Detailed Error Report

The detailed error report includes a system
profile in addition to all of the information in
the summary error report.   The system profile
displays the operating system version, the system
type, the amount of system memory, and the last
time the error log was reset.   Figure 6-4 shows an
example of a detailed error report.

```
┌─────────────────────────────────────────────────────────┐
│ ▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄                                     │
│ █ System Administration █───────────────────────────────┐ │
│ █ Error Log █                                            │ │
│ ▀▀▀▀▀▀▀▀▀▀▀▀                                             │ │
│ ┌──────────────────────────────────────────────────────┐│ │
│ │   SYSTEM ERROR REPORT   Prepared on Apr 23 20:36    Page  1 █│
│ │ ERROR LOGGING SYSTEM STARTED - Mon Apr 21 05:00:04 1986  █│
│ │                                                      █│ │
│ │        System Profile:                               █│ │
│ │                                                      █│ │
│ │            CTIX/S5.2.2  Operating System (CTIX422fix). Node name o█│
│ │            MitiFrame  System                         █│ │
│ │            System Memory Size - 5242880 Bytes        █│ │
│ │            Reset                                     █│ │
│ │ QICO    Error Logged On   Mon Apr 21 16:37:45 1986   █│ │
│ │                                                      █│ │
│ │        Physical Device                0              █│ │
│ │        Logical Device              0 (00)            █│ │
│ │        Device Address              7F837328          ▼│ │
│ └──────────────────────────────────────────────────────┘│ │
│   Press 'Finish' to return to the previous menu.         │ │
└─────────────────────────────────────────────────────────┘
```

Figure 6-4.   Sample Detailed Error Report

To view the detailed error report:

   1.   Move the cursor to the View Detailed
        Report option.

   2.   Press Go.

Resetting the System Error Log

Resetting the system error log clears the old data
out of the log and copies it into another log.
Resetting the error log helps keep the log current
and brief.

To reset the error log:

   1.   Move the cursor to the Reset Log option.

   2.   Press Go.

   3.   The system displays the message "System
        error log has been reset."

MONITORING THE SYSTEM CONSOLE

The console is a very important part of your
system; the console is an imaginary terminal to
which the system sends important status
information. The system console log differs from
the system error log in that it records system
status and activity messages in addition to
errors. Monitoring the system console log
involves viewing its contents and resetting it.

To enter the Console Log Functions menu:

1. Move the cursor to the Console Log
    Functions option.

2. Press Go.

Viewing the Console Log Contents

NOTE

It is very important that you monitor the
console log frequently. This log informs you
when your system needs immediate attention:
for example, when you are out of resources
such as disk space. Refer to Chapter 11,
"Troubleshooting" for more information on what
to do when you receive serious error messages.

To monitor the console log:

1. Move the cursor to the View Contents
    option.

2. Press Go.

Figure 6-5 shows the contents of a sample console
log.

```
┌─ System Administration ─────────────────────────────────┐
│ ┌─ System Console Log ───────────────────────────────────┐
│ │                                                        │
│ │  Date of last entry: Mar 10 05:00                      │
│ │ ┌──────────────────────────────────────────────────┐  │
│ │ │Wed Mar 12 08:15:00 PST 1986                    ▲  │  │
│ │ │Wed Mar 12 08:30:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 08:45:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 09:00:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 09:15:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 09:30:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 09:45:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 10:00:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 10:15:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 10:30:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 10:45:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 11:00:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 11:15:00 PST 1986                    █  │  │
│ │ │Wed Mar 12 11:30:00 PST 1986                    █  │  │
│ │ └──────────────────────────────────────────────────┘  │
│ │                                                        │
│ │   Press 'Cancel' to return to the previous menu.       │
│ │                                                        │
└─┴────────────────────────────────────────────────────────┘
```

Figure 6-5.   Sample Console Log Contents

Notice that the arrow in this window is at the top
of the vertical scroll bar; the console log
displays the most current information first.
Scroll down to view older information.

Also notice that in Figure 6-5, the only messages
displayed are the date messages.   The date is
entered into the log to help you determine the
approximate time a problem occurred.   These are
the most frequent messages; scrolling back through
the older information may display messages
indicating the system was turned on or off.

Resetting the System Console

Since the date is printed in the console log every
fifteen minutes, the number of messages rapidly
builds up, and the console log quickly grows.   The
system automatically resets the console log;
however, every now and then you might want to
reset the log yourself (for example, when it gets
difficult to view all the contents).   Resetting

the console log keeps a copy of the old messages
and starts a fresh log for the new ones.

NOTE

Do not reset the console log until you have
established that you have attended to all
messages, and none require further
investigation.

To reset the system console:

1. Move the cursor to the Reset option.

2. Press Go to reset.

3. The system displays the message, "System
    console log has been reset".

MONITORING SYSTEM ACTIVITY REPORTING

The system activity report includes detailed
statistics regarding the disk input and output
activities, file-access activities, and other
system-wide measurements. You can turn the
reporting process on or off, thereby opening the
report to accept entries, or closing it to further
entries.

To perform either of these functions:

1. Move the cursor to the System Activity
    Reporting option.

2. Press Go.

3. Move the cursor to select either
    "Enable" or "Disable".

4.   Press Go to execute.

5.   The system displays the message, "System
     Activity   Reporting   has   been
     enabled/disabled".

Notice that the current status of the System
Activity Reporting function is displayed.

MONITORING SYSTEM PROCESS ACCOUNTING

The final option on the System Status menu
contains the system Process Accounting
function. Process Accounting records resource
utilization, and monitors system activities
such as login records and system shutdowns.
Process Accounting also allows you to charge
fees to specific login accounts for disk usage.
As with the System Activity Reporting option,
you can either turn the Process Accounting on
or off.

To perform either one of these options from the
System Status menu:

1.   Move   the   cursor   to   the   Process
     Accounting option.

2.   Press Go.

3.   Move   the   cursor   to   select   either
     "Enable" or "Disable".

4.   Press Go to execute.

5.   The   system   displays   the   message,
     "Process   Accounting   has   been
     enabled/disabled".

Notice that the current state of the Process
Accounting function is displayed.

WHERE TO GO FROM HERE

For more information on the console and the console log, read the chapter in the appropriate administrator's reference manual for your system that discusses system maintenance and troubleshooting. Also refer to Chapter 11 later in this manual.

For more information on viewing a System Activity Report, read the chapter in the appropriate administrator's reference manual for your system that discusses the system activity package, particularly the sar command. You might want to print the activity reports on a weekly or biweekly basis, and then remove them as they can grow quite large.

For more information on viewing a Process Accounting report, read the chapter in the appropriate administrator's reference manual for your system that discusses process accounting. You might want to print the accounting reports on a weekly or biweekly basis, and then remove them as they can grow quite large.

For more specific information about the files and commands used to perform system status functions, refer to the following items in the appropriate administrator's reference manual for your system and the CTIX Operating System Manual:

/etc/log/confile

   This is the console log file.

hinv

   This is the command that inventories the system hardware.

sar

This is the command that invokes the system activity reporter.

acct

This command represents the set of commands involved in process accounting.

7   PRINTER ADMINISTRATION

Printer administration allows you to easily manage
the printers on your system.   Printer management
involves:

o   adding and removing printers

o   redirecting files to a particular printer

o   starting and stopping the flow of files
    to be printed

o   monitoring and modifying printer status

This chapter explains your computer's printer
system, the basic information about printers, how
to manage them, and what you need from the printer
manual.

PRINTER ADMINISTRATION FUNCTIONS

Before you can perform a printer administration
function, you need to understand the concepts
behind the printer system, called the LP system.
LP stands for line printer: the administration
tools consider a line printer to be a printer
connected to either your computer or your
terminal.   The LP system contains several
components, which are described in detail in the
chapter in the appropriate administrator's
reference manual for your system that discusses
the LP system.

However, note that the term printer refers to a
destination, which can be an individual printer or
a group of printers (called a class of printers).
The administration tools allow you to perform
certain functions regarding printers; keep in mind

that with the exception of the Adding a Printer
function, a printer may actually refer to a class
of printers.

There are two procedures to enter the Printer
Administration menu. Normally you would access
the menu from the main menu; however, it is
possible to enter the Printer Administration menu
directly if you need to take care of something
urgent, or if you do not plan to perform any other
system administration tasks.

The first procedure to enter the Printer
Administration menu is:

1. From the main menu, move the cursor to
    the Printer Administration option.

2. Press Go.

The second procedure to enter the Printer
Administration menu is:

1. From the shell, type

    $ lptool

2. Press Return.

The Printer Administration options are presented
in Figure 7-1.

```
┌─────────────────────────────────────────────┐
│ Line Printer Administration ├──────────     │
│                                              │
│     Line Printer Administration Functions:   │
│                                              │
│           ▓View LP System Status▓            │
│           Add a Printer                      │
│           Change Printer Status              │
│           Remove a Printer                   │
│           Set the Default Printer            │
│           Enable/Disable LP Scheduling       │
│           Make a Printer Model               │
│                                              │
│   Please select the desired item and press 'Go'. │
│   Press 'Help' for further explanation.      │
│                                              │
└─────────────────────────────────────────────┘
```

Figure 7-1.   Printer Administration Menu

VIEWING THE LP SYSTEM STATUS

Viewing the LP system status allows you to monitor
the state of the printers on your system.

NOTE

It is important for you to monitor the LP
system status regularly. As system
administrator, you are the focal point for the
system. Monitoring the printer status may
help you detect and remedy a potential problem
before it occurs.

To check the LP system status from the main menu:

   1.   Move the cursor to the View LP System
        Status option.

   2.   Press Go.

The fields in the LP System Status Window are described following Figure 7-2.
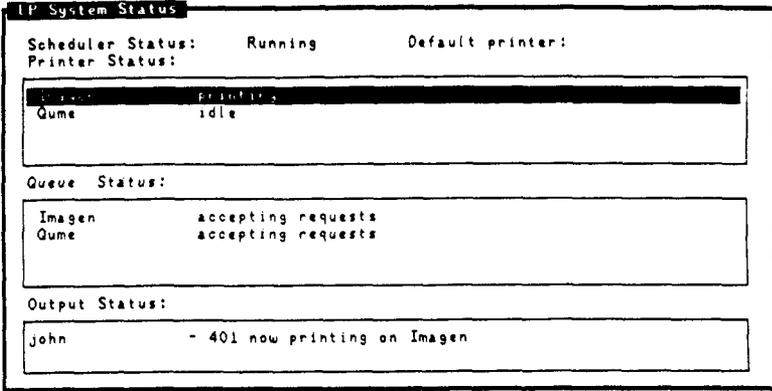
Figure 7-2. LP System Status Window

| Scheduler Status | If the scheduler is running, print requests are being sent to the printer. If the scheduler is not running, the printer does not receive the print request. |

Printer Status — Printer status displays the status of all printers. In Figure 7-2, the status of Imagen is printing and the status of Qume is idle.

Default Printer — This field shows which printer automatically receives all print requests.

If you want to send a print request to a different printer, you can use the Set the Default Printer window, or you can use the lp command. (See "Where to Go from Here" later in this chapter for more information on lp.)

Queue Status   Queue status lists whether or not
                each printer is accepting print
                requests.

Output Status   The output status shows you the
                status of print requests waiting to
                print or printing.   When you
                submitted your print request the
                system gave you a job number.   In
                Figure 7-2, user john's lp request,
                number 401, is printing on the
                Imagen printer.

Viewing the LP system status also allows you to
change the printer status in the following ways:

   1.   Moving the cursor to the appropriate
        printer and pressing **Go** brings you to
        the Change Printer Status window. This
        allows you to change either the printer
        or queue status.

   2.   Moving the cursor to the appropriate
        queue and pressing **Go** brings you to the
        Change Queue Status window. This allows
        you to change only the queue status.

See Change Printer Status later in this chapter
for more information.

ADDING A PRINTER

Before you add a printer using the administration
tools, make sure the printer functions correctly
on its own.   Follow the instructions in the
printer manual to set it up and perform the self
test.

Figure 7-3 displays the important characteristics
of adding a new printer, which are described
following the figure.

```
┌─ Line Printer Administration ──────────────────────────────┐
│ ┌────────────────────────────┐                             │
│ │ Line Printer Administration Functions:                   │
│ │ ┌─ New Printer Specification ──────────────────────────┐ │
│ │ │ Printer Name: ███████████                            │ │
│ │ │                            Model:   ┌─────────────┐  │ │
│ │ │ Connection:   *parallel #1          │*1640      █ │  │ │
│ │ │               parallel #2           │ dumb      █ │  │ │
│ │ │               serial                │ f450      █ │  │ │
│ │ │               login terminal        │ hp        █ │  │ │
│ │ │               null                  │ pprx      ▼ │  │ │
│ │ │                                     └─────────────┘  │ │
│ │ │ Press 'Go' to add printer                            │ │
│ │ │ Press 'Cancel' to return to previous menu.           │ │
│ │ │ Press 'Help' for further explanation.                │ │
│ │ └──────────────────────────────────────────────────────┘ │
└────────────────────────────────────────────────────────────┘
```
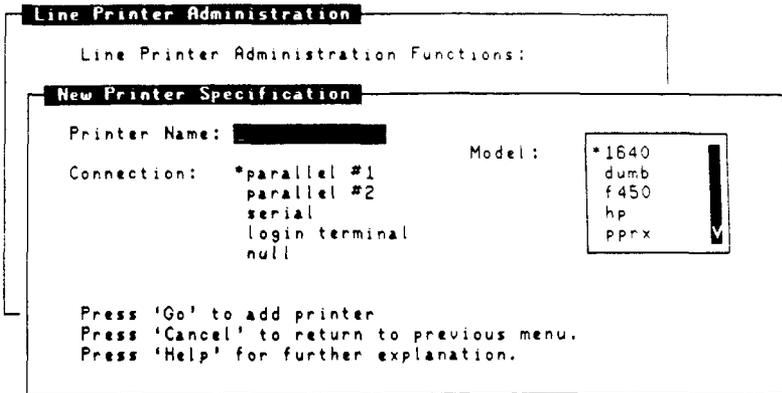
Figure 7-3.   Add a Printer Window

Name	Select a name that is meaningful for the printer. For example, the name of a Diablo 630 printer could be the brand name, Diablo.
Connection	The steps involved in adding a printer depend on the type of connection between the printer and your system. Read the descriptions starting on the next page for the four types of connections: parallel, serial, login terminal, and remote (null).
Model	Selecting a model gives the LP system detailed information about your printer, including how to format your printout. A _model_ is a file describing a printer. Table 7-1, following the connection descriptions, shows the model options and the printers they describe.

Connecting a Parallel Printer. The system can have two parallel printers, parallel #1 and parallel #2 (the other types are limited only by the number of available ports). A parallel connection means the information is transferred from the computer to the printer in groups.

Connecting a Serial Printer. A serial connection means the information is transferred from the computer to the printer one bit at a time. Think of a serial connection as a one-lane highway, as distinct from a parallel connection, which is like an eight lane highway.

When you add a serial printer, you need to determine the port the printer is attached to. Figure 7-4 shows your port choices and reflects the hardware in the back of your computer. Generally, choose the first port available. Read the chapter in the appropriate administrator's reference manual for your system that discusses the terminal numbering scheme for more information on determining the correct connector and slot number for a serial printer.

```
┌─ Line Printer Administration ──────────────┐
│─ Printer Connection ─┐                      │
│  Connector:  Bottom    I/O Slot number: CPEU│
│             •Second                I/O Slot 0│
│              Third                 I/O Slot 1│
│              Fourth                I/O Slot 2│
│              Fifth                 I/O Slot 3│
│              Sixth                          │ 1640
│              Seventh                        │•dumb
│              Eight                          │ f450
│              Ninth                          │ hp
│              Top                            │ pprx
│                                             │
└─────────────────────────────────────────────┘
     Press 'Cancel' to return to previous menu.
     Press 'Help' for further explanation.
```
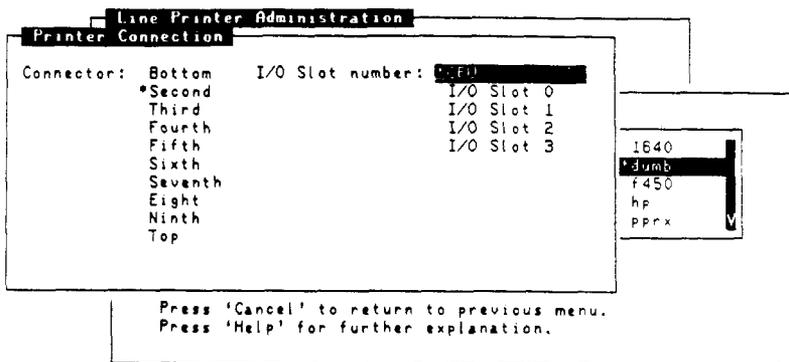
Figure 7-4. Determining the Serial Printer Port

CAUTION

Make sure there are no logins enabled on the
port you are attaching the printer to before
you add the printer. Adding a serial printer
to a previously enabled port disables the
terminal attached to that port. Use Table 9-1
in Chapter 9, "Terminal Administration" to
determine whether the port is enabled.

Connecting a Login Terminal. A _login terminal_ is
a type of printer that is like a typewriter: it
is a terminal on which the keys you type are
displayed on paper instead of a screen. You
cannot use the administration tools on a login
terminal.

Connecting a Remote (Null) Printer. A _remote_
printer is a printer attached to a different
system from yours. You can add a remote printer
to the LP system on your own system, but the
printer must be configured on the remote system
also in order for you to be able to access it.

Selecting a printer model. If your printer does
not _exactly_ match one of the models in Table 7-1,
use the Make A Printer Model function later in
this chapter to add an appropriate model, or
select the "dumb" model.

Table 7-1.

PRINTER MODELS

Model Option	Type of Printer
1640	DASI 1640
dumb	Standard (generic) printer
f450	DASI 450
hp	Hewlett Packard hp2361a line printer
prx	Printronix line printer
pprx	Printronix line printer with a parallel interface

Adding the Printer

If the printer passed the self test, follow the
instructions below to add it to your system. Keep
in mind that there are additional steps involved
in adding a serial printer to those required for
other types of printers. To add a login terminal
or a remote printer, perform the steps outlined in
the appropriate administrator's reference manual
for your system that discusses setting up a login
or remote device as an lp printer, in addition to
using the administration tools.

To add a printer:

1. Move the cursor to the Add a Printer
    option.

2. Press Go.

3. Enter the name of the printer.

4. Select the type of connection.

5. Select the printer model.

6. Press **Go** to execute.

7. Select the connector placement (serial printers only).

8. Select the I/O slot number (serial printers only).

9. Press **Go** to execute (serial printers only).

10. If the scheduler was off (for example, because it is the first time you have added a printer), the Scheduler Status window is displayed. Turn the scheduler on by moving the cursor to the Start Always option; it should be left on.

11. Press **Go**.

The printer works when you can print something to it. To test the printer:

1. Exit the administration tools.

2. Type

   $ lp file

   where file is the name of a file to print.

3. Press **Return.**

A good test file is "/etc/rc". If the file prints out the same as it looks on the terminal, your printer addition was successful. If the file does not come out looking just like it did on the terminal, refer to Chapter 11, "Troubleshooting" for help.

To see how the file looks on the terminal:

1. From the shell, type

    $ cat file

2. Press Return.

CHANGING PRINTER STATUS

Changing the printer status allows you to enable
or disable a printer, or instruct a printer queue
to accept or reject print requests.

Figure 7-5 shows the Change Printer Status window.
The current status of the printer and queue are
highlighted. When you change the status, you can
enter a reason for the change. If you do not
enter a reason for changing the status, the system
provides a default reason.


```
 Line Printer Administration
    Change Printer Status

    Printer name: Imagen

    Print Status:    *Enabled
                      Disabled

    Reason:

    Queue Status:    *Accepting
                      Rejecting

    Reason:

    Press 'Go' to set status.
    Press '^X' to return to status window.
```
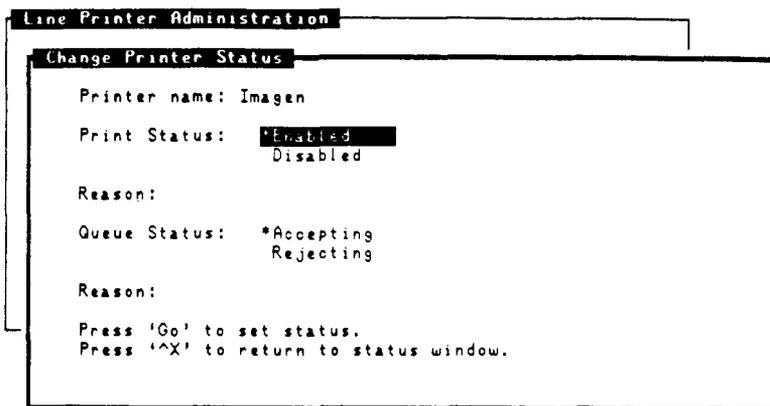
Figure 7-5.   Change Printer Status Window

To change the printer or queue status:

1. Move the cursor to the Change Printer
    Status option.

2. Press **Go**.

3. Select the printer.

4. Press **Go**.

5. Move the cursor to change either the
    print or queue status.

6. Enter the reason you are changing the
    status.

7. Press **Go** to execute the change.

REMOVING A PRINTER

To remove a printer:

1. Move the cursor to the Remove a Printer
    option.

2. Press **Go**.

3. Move the cursor to select the printer.

4. Press **Go** to remove the printer.

5. As a precaution, the system asks you if
    you are sure you want to remove the
    printer.

6. Press **Go** if you do.

7. If you do not, move the cursor to the No
    option.

8. Press **Go**.

9. The system may produce the Scheduler
   Status window. If it does, turn the
   scheduler on by moving the cursor to the
   Start Always option.

10. Press **Go**.

11. The system displays the message,
    "Deleting destination oldprinter" where
    oldprinter is the name of the printer
    you selected.

12. If the printer you are removing has a
    serial connection, you are asked whether
    or not you want logins to be allowed on
    that port after you remove the printer.
    Move the cursor to the No option unless
    you are planning to connect a terminal
    to that port.

13. Press **Go**.

SETTING THE DEFAULT PRINTER

There can only be one default printer at a time on
the system to automatically receive all print
requests. When the default printer refers to a
class, the print request goes to the first
available member in the class.

To establish the default printer:

1. Move the cursor to the Set the Default
   Printer option.

2. Press **Go**.

3. Move the cursor to select the desired
   default printer.

4. Press **Go** to execute.

If you want your print requests to go to a
destination different from the system default
printer, you can set up a personal default
destination. Refer to the chapter in the
appropriate administrator's reference manual for
your system that discusses setting up the user
environment.

ENABLING/DISABLING LP SCHEDULING

Enabling the scheduler allows the it to send print
requests to a printer. Disabling the scheduler
prevents it from sending print requests to a
printer. The scheduler should always be enabled
unless you are working on the system, or for some
other reason do not want to print anything.

To enable or disable the scheduler:

1. Move the cursor to the Enable/Disable LP
    Scheduling option.

2. Press Go.

3. Move the cursor to select either
    "Enable" or "Disable."

4. Press Go to execute.

MAKING A PRINTER MODEL

Making a printer model allows you to add a printer
description file to the system. If the system
does not already contain an appropriate
description file for your printer, it is necessary
to customize a new one. Figure 7-6 illustrates
the window used to make a new printer model.

```
┌─ Line Printer Administration ─────────────────────┐
│ Make Model ──────────────────────────────────────┐
│               Model name:  ████████████████       │
│               Banner page: *Yes                   │
│                             No                    │
│                                                   │
│ Pages to eject after printing: *None              │
│                             1                     │
│                             2                     │
│                             3                     │
│               Connection type: *Serial            │
│                             Parallel              │
│                             Login terminal        │
│                             Remote                │
│                                                   │
└───────────────────────────────────────────────────┘
```

Figure 7-6.   Make a Printer Model Window

The fields of the window used in making a printer
model are as follows:

Model Name   Select a model name that clearly
                  identifies your printer. Printers
                  can be very similar, with only one
                  or two unique characteristics. For
                  example, supposing you have two
                  Diablo printers: Diablo-A, which
                  prints at 9600 baud, and Diablo-B,
                  which only prints at 1200 baud.
                  Give them names that make it easy
                  to tell them apart, like Diablo96
                  and Diablo12, rather than Diablo-A
                  and Diablo-B.

Banner Page   A banner page is a page printed
                  before the print request that shows
                  the login name of the user who
                  submitted the print request, the
                  name of the file printed, and the
                  date and time the file is printed.

Pages to   Specifying the number of pages to
Eject After   eject after printing instructs the
Printing   printer to insert that number of
                  blank pages between the files being
                  printed.

Connection   The steps involved in making a
Type   printer model depend on the type of
               connection between the printer and
               your system, as described below.
               Additional information on the
               different types of connections can
               be found in the Adding a Printer
               function, described earlier in this
               chapter.

Making a Printer Model for a Serial Printer

If you are making a printer model for a serial
printer, you need to specify the appropriate
serial line characteristics, as shown in Figure 7-
7.

NOTE

In addition to setting the serial line
characteristics through the administration
tools, certain switches may need to be reset
on the printer itself.

```
┌─Line Printer Administration─┬──────────────┐
│ ┌─Serial Line Specification─┴────────────┐ │
│ │                                        │ │
│ │ Communication Speed:    Parity:        │ │
│ │                                      ┌─┐│
│ │   110                   *Odd         │ ││
│ │   300                    Even        │ ││
│ │   1200                   Disabled    │ ││
│ │   2400                               │ ││
│ │   4800                  Hardware tabs:│ ││
│ │  ▓9600▓                 *Yes         │ ││
│ │                          No          │ ││
│ │                                      │ ││
│ │ Stop bits                            │ ││
│ │   One                   Carriage Motion:│ │
│ │  *Two                   *NL -> CR-NL │ ││
│ │                          CR -> NL    └─┘│
│ │                          None           │
│ │                                        │ │
│ │ The printer should use X-on / X-off software handshaking. │─┘
│ │                                        │
│ └────────────────────────────────────────┘
└──────────────────────────────────────────┘
```
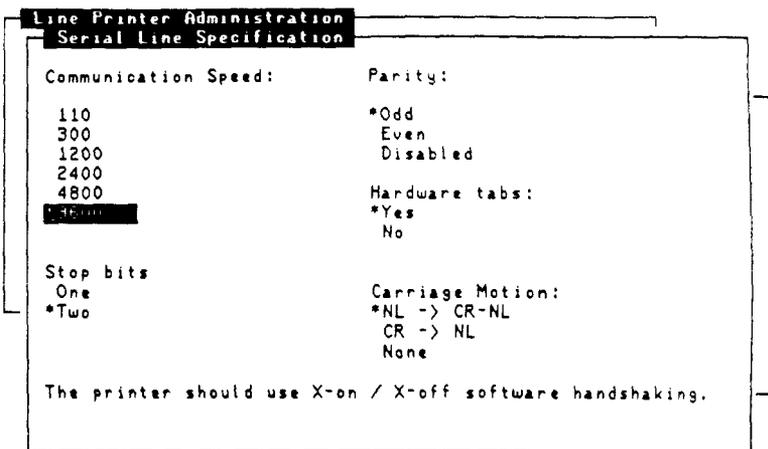
Figure 7-7.   Serial Line Specifications Window

It is recommended that you set your printer up to use the default options designated by the asterisks in Figure 7-7 if possible, but it is not required.   However, it is important for you to match the characteristics you specify with your printer's actual setup.   For example, if your printer does not print at 9600 baud, change the baud rate option in the Serial Line Specifications window to match the speed of your printer.   Refer to the printer manual for instructions on setting up these specifications:

Baud Rate   The Baud rate is the communication speed, optimally 9600 baud.

Stop Bits   Stop bits are the bits that inform the system when one character ends and another begins.

Parity   Parity is a method of checking for communication errors.

Hardware Tabs   Hardware tabs are tabstops that are set with the printer, as opposed to with the software.

Carriage Motion	The Carriage motion is what the system generates at the end of line, usually a carriage return and a line feed.
Xon/Xoff Handshaking	Xon/xoff handshaking is the only specification that is required. Xon/xoff handshaking is the way the printer informs the computer it is ready for more information (the printer cannot print as fast as the computer can send it information).

Making a Printer Model for a Remote Printer

If you are making a printer model for a printer on another system, you need to specify the name of the other system and the name of the printer on the other system. Figure 7-8 shows the Remote Printer Model window.


```
        ┌── Line Printer Administration ──────────────────────┐
     ┌─ Make Model ────────────────────────────────────────┐  │
     │             Model name:  diablo.r                 │  │
   ┌─ Remote Model ──────────────────────────────────────┐
   │
   │   Please Select the Remote Machine:
   │
   │    ┌─────────────────────────────┐
   │    │ ground                      │
   │    │ home                        │
   │    │ Roobear                     │
   │    │ pasha                       │
   │    │ begonia                     │
   │    │ billy                       │
   │    │ myS4                        │
   │    │ gronk                       │
   │    │ pyramid            ▼        │
   │    └─────────────────────────────┘
   │
   │   Remote printer name if not default:
   │
   │   Press 'Go' to make model.
   │   Press '^X' to return to previous window.
   │
   └──────────────────────────────────────────────────────┘
```
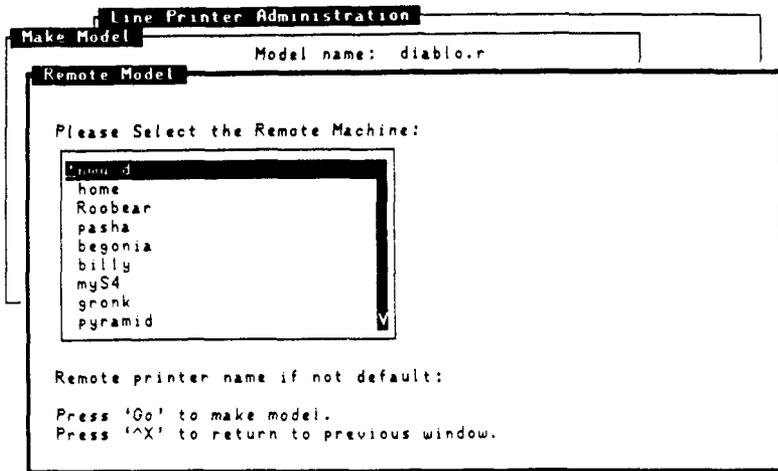
Figure 7-8.   Remote Printer Model Window

Making a new printer model

Perform the following steps to add a new printer model:

1. Move the cursor to the Make a Printer Model.

2. Press Go.

3. Enter the name of the new printer model.

4. Select whether or not to have a banner page.

5. Select the number of pages to eject after printing.

6. Select the type of connection.

7. Press Go to add the printer model.

8. For serial printers, select the following serial line specifications:

    o   communication speed

    o   number of stop bits

    o   type of parity, if used at all

    o   whether or not to use hardware tabs

    o   type of carriage motion

9. Press Go to add a serial printer model.

10. For remote printers, select the name of the remote system to create the printer model on.

11. For remote printers, enter the name of the printer on the remote system which is to use this model.

12. Press **Go** to add a remote printer model.

There are a few additional printer administration
functions the system administrator might find
useful, for example, assigning a class name to a
group of printers and moving print requests from
one destination to another. Read the chapter in
the appropriate administrator's reference manual
for your system that discusses the LP system for
more information and instructions.

For more specific information about the files and
commands used to perform printer administration,
refer to the following items in the appropriate
administrator's reference manual for your system
and the CTIX Operating System Manual:

accept

> This is the command that allows a destination
> to accept print requests.

enable

> This is the command that allows a destination
> to print a request.

disable

> This is the command that prevents a destination
> from printing a request.

lpstat

> This is the command that displays LP status
> information.

lpsched

This is the command that starts the LP scheduler.

lpshut

This is the command that stops the LP scheduler.

lptool

This is the command that allows you enter the Printer Administration function without invoking **adman**.

reject

This is the command that prevents a destination from accepting print requests.

8 DISK ADMINISTRATION

Disk administration involves managing the storage
space on your system. Disk administration
includes:

o organizing the storage space

o making the space available to users

This chapter describes how to determine a disk's
characteristics and how to organize a disk.

To enter the Disk Administration menu from the
main menu:

1. Move the cursor to the Disk
    Administration option.

2. Press Go.

DISK ADMINISTRATION FUNCTIONS

Before you can perform a disk administration
function, you need to understand a few concepts.
A disk is a mass storage unit on your system.
Disks come in various sizes. Disk size refers to
the amount of information a disk can hold: the
larger the disk, the more information it can hold.
To make the disk easier to manage, it is organized
into smaller units, called slices.

A new disk comes with two slices, except a system
disk.   A system disk is the disk the system
initially uses when it is turned on.   The first
slice is a special slice that contains information
about the disk's confiugration.   Do not disturb
the contents of the first slice.   The second slice
is for the user's work area.   If you want to
separate the second slice into smaller slices,
read the chapter in the appropriate

administrator's reference manual for your system
that discusses disk configuration.

Disk administration allows you to create file
systems on your disk slices. Each slice can have
one file system. A _file system_ consists of files
and slice configuration information.

File systems are a convenient way to organize your
system. For example, all the programs, commands,
and files that are a fundamental part of the
system are in one file system, called "root". The
users' home directories are usually in a different
file system, which might be called "/u". (See
Appendix A for an explanation of the CTIX file
system and directory structures.)

Figure 8-1 illustrates the Disk Administration
menu.

```
┌─────────────────────────────────────────────────────────┐
│ ███████████████████████                                  │
│ █System Administration█                                 │
│ █████████████████████████████████                       │
│   █Disk Administration█                                 │
│   ██████████████████████                                │
│   ┌───────────────────────────────────────────────────┐ │
│   │         Disk Administration Functions             │ │
│   │                                                   │ │
│   │      ████████████████████████████████             │ │
│   │      █ View Disk Description      █                │ │
│   │      ████████████████████████████████             │ │
│   │         Create a File System                      │ │
│   │                                                   │ │
│   │   Please select the desired function and press 'Go'. │
│   │   Press 'Help' for further explanation.           │ │
│   └───────────────────────────────────────────────────┘ │
│     Press 'Help' for further explanation.                │
│     Press 'Finish' to exit.                              │
└─────────────────────────────────────────────────────────┘
```
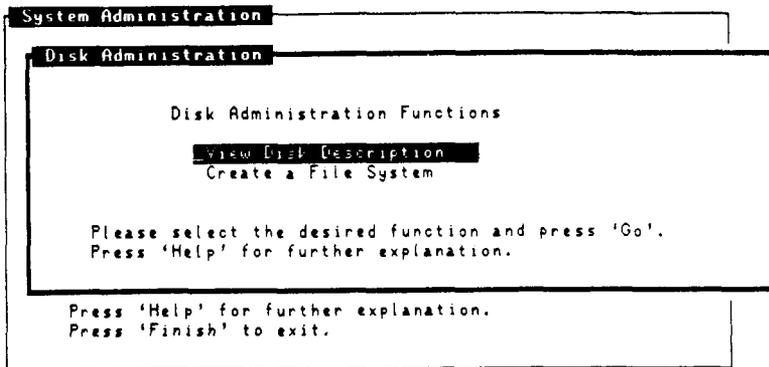
Figure 8-1. Disk Administration Menu

VIEWING THE DISK DESCRIPTION

Viewing the Disk Description allows you to see the
physical characteristics of the disks on your
system.

To view your disk description:

1. Move the cursor to the View Disk
    Description option.

2. Press **Go**.

3. Move the cursor to select the disk.

4. Press **Go**.

Selecting the Disk

When you choose the disk description option, you
need to select a disk. In Figure 8-2, the circled
numbers show an example of how the disks might be
ordered on a MightyFrame system. However, the
system uses another method to represent the disk
number: this method is shown by the "c#d#s#",
which correspond to the controller, disk, and
slice numbers, respectively.

Back of MightyFrame System

X-BOX	X-BOX	X-BOX	V-BOX	A-BOX	
(14) c6d0s0	(10) c4d0s0	(6) c2d0s0	(4) c1d0s0	(2) c0d1s0	(1) c0d0s0
(15) c6d1s0	(11) c4d1s0	(7) c2d1s0	(5) c1d1s0		
(16) c7d0s0	(12) c5d0s0	(8) c3d0s0			
(17) c7d1s0	(13) c5d1s0	(9) c3d1s0		(3) c0d2s0	tape

Front of MightyFrame System

Figure 8-2. Disk Naming and Numbering Scheme

The controller is the board that controls the disk drive(s). One disk controller can manage three on-board disks, or two Storage Module Devices (SMD drives).

NOTE

The administration tools do not currently allow you to create file systems on SMD drives.

For more information on disk hardware and controllers, refer to the appropriate installation

and administrator's reference manuals for your
system.

To refer to a disk, refer to the first slice on
the disk. This is illustrated by the way the
disks are listed in Figure 8-3, such as
/dev/rdsk/c0d0s0.

```
┌─System Administration────────────────────────────────────┐
│ ┌─Disk Administration────────────────────────────────┐
│ │ ┌─View Disk Description───────────────────────────┐
│ │ │
│ │ │     Please Select a Disk
│ │ │        ┌──────────────────────────────┐
│ │ │        │ dev/rdsk/c0d0s0              │
│ │ │        │ /dev/rdsk/c0d1s0             │
│ │ │        │ /dev/rdsk/c0d2s0             │        Go
│ │ │        │                              │
│ │ │        │                              │
│ │ │        └──────────────────────────────┘
│ │ │
│ │ │  Press '^X' to return to previous menu.
└─┴─┴───────────────────────────────────────────────────────┘
```
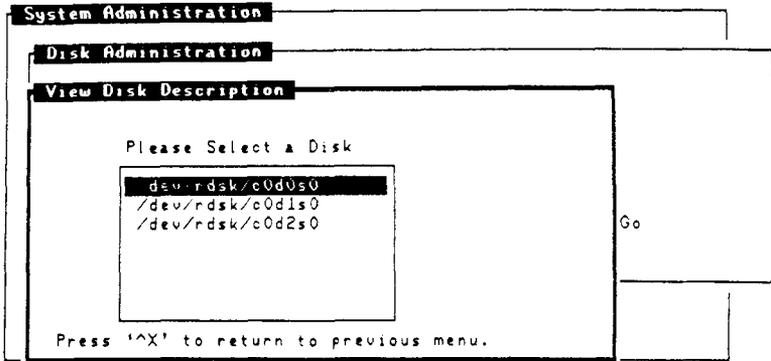
Figure 8-3. Disk Selection Window

For more information on naming conventions,
read the chapter in the appropriate
administrator's reference manual for your
system that discusses disk configuration.

Evaluating the Disk Description

As mentioned earlier in the chapter, the disk
description can provide you with an example to
work from in configuring a new disk. You
should note how many slices your disk has, and
the differences between the first disk and
other disks.

A disk description is shown in Figure 8-4.

```
┌──────────────────────────────────────────────────────────────────────┐
│ ▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄                                                      │
│ █ Disk Description █                                                   │
│                                                                        │
│   Fixed disk: /dev/rdsk/c0d0s0        type         HD                  │
│   Slice list:                         name         mfg                 │
│   #       Size in blocks              cylinders     823                │
│                                       heads        10                  │
│   ┌─────────────────────┐             sectors      17                  │
│   │0      1360           │             steprate      14                │
│   │1      16000          │             hitech                          │
│   │2      8000           │             ecc                             │
│   │3      20000          │             badblocktable   1               │
│   │4      86320          │             loader      /usr/lib/iv/loade   │
│   └─────────────────────┘             dump        1024                 │
│                                       downloadarea    290              │
│   Terminal download images:                                            │
│   ┌─────────────────────────────┐                                      │
│   │100     /usr/lib/iv/ws100.422 │                                     │
│   │200     /usr/lib/iv/ws200.422 │                                     │
│   │                              │                                     │
│   │                              │                                     │
│   └─────────────────────────────┘                                      │
│                                                                        │
│            Press 'Finish' to return to the previous menu.              │
└──────────────────────────────────────────────────────────────────────┘
```

Figure 8-4.   Sample Disk Description

The following are the elements of the window:

Fixed Disk   This is the full pathname of the
                disk.

Slice List   The slice list shows how many
                slices there are on the disk,
                the number of each slice, and
                the size of each slice in
                logical blocks. A block is a
                unit of measurement for data,
                and can be either physical (512
                bytes) or logical (1024 bytes).

Terminal   This field displays the terminal
Download   download images on the system.
Image   A terminal download image is the
                software required to run a PT or
                GT on a cluster channel.   The
                download image is transferred to

the terminal when you turn the
terminal on.

The other information in the window displays
characteristics pertaining to the disk type,
and disk partitioning. **Partitioning** means
dividing the disk into slices. For more
information, see the chapter in the appropriate
administrator's reference manual for your
system that discusses disk configuration.

CREATING A FILE SYSTEM

You must create a file system on a disk in order
to use it. It is assumed that you want to create
a file system on a clean disk, that is, one that
has just arrived from the factory.

NOTE

The administration tools do not allow you to
create file systems over previously configured
file systems.

If you would prefer more slices, or if you want to
recreate the file systems on a previously
configured disk, read the chapter in the
appropriate administrator's reference manual for
your system for instructions.

CAUTION

Although the administration tools do not allow you to create file systems over previously configured file systems, it is always wise to perform complete backups prior to creating any file systems, or doing any repartitioning. There is a risk of losing or damaging part of your system when you perform these functions.

To create a new file system:

1. Move the cursor to the Create a File System option.

2. Press Go.

3. Select the disk number.

4. Select the slice number.

5. Enter the mount path.

6. Press Go.

The elements of creating a file system are shown in Figure 8-5.

```
┌─System Administration──────────────────────────────────┐
│─Create File System─────                                 │
│                                                         │
│    Please Select a Disk:                                │
│                                                         │
│    ▐Disk 0▌   ┌─────────────┐                          │
│    Disk 1    │ •Slice 1   ▐█▌│                         │
│    Disk 2    │  Slice 2     │                          │
│              │  Slice 3     │                          │
│              │  Slice 4     │                          │
│              │  Slice 5   ▼ │                          │
│              └─────────────┘                           │
│    Mount path:                                          │
│                                                         │
│      Go       - Proceed with creation.                  │
│      ^X       - Return to main menu.                    │
│                                                         │
└─────────────────────────────────────────────────────────┘
```
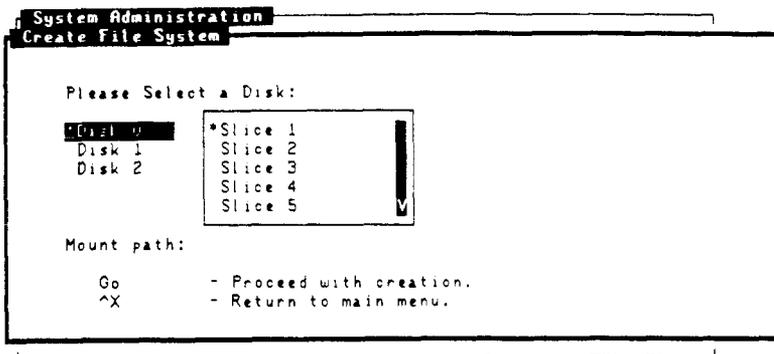
Figure 8-5.   Create a File System Window

Disk Number   See "Selecting a Disk" earlier in
               this chapter for information on
               determining the disk number.

Slice Number   You can only create a file system
               on the second slice, slice 1. The
               first slice, slice 0, is reserved
               for the slice configuration
               information.

Mount Path   You must mount a file system before
               you can use it. The mount path is
               the place your file system takes in
               the directory hierarchy. The mount
               path must be a full pathname, like
               "/usr", and must reference an empty
               directory.

WHERE TO GO FROM HERE

Check the file system before you create any
directories or files in it. When a file system is
checked it is examined by the system for errors
and inconsistencies within its structure. Read

the chapter in the appropriate administrator's
reference manual for your system that discusses
checking the file system consistency using the
command, **fsck**.

CAUTION

Unmount the file system before running the
file system checking program, **fsck** (except for
the root file system, which is always
mounted). This is to make sure there is no
user activity on the file system while **fsck** is
running: leaving the file system mounted and
available to users during the check can cause
it severe damage.

For more specific information about the files and
commands used to perform disk administration,
refer to the following items in the appropriate
administrator's reference manual for your system
and the CTIX Operating System Manual:

/etc/mountable

This is a file that instructs the system
where to mount a particular file system
when the system is turned on.

mkfs

This is the command that creates a file
system.

mount

This is the command that mounts a file
system in the directory structure.

9 TERMINAL ADMINISTRATION

Terminal adminstration allows you to support
terminal access to your system. Terminal
administration involves:

- o making more terminals available on your
   system

- o effectively removing terminals from your
   system

- o viewing the activity of terminals on your
   system

This chapter shows you how to enable and disable
terminals, how to set up multiple capabilities on
one port, explains the different types of ports,
and the correct port to use. This chapter also
allows you to view the status of the ports on your
system.

To enter the Terminal Administration menu from the
main menu:

1. Move the cursor to the Terminal
   Administration option.

2. Press Go.

```
┌─────────────────────────────────────────────────────────┐
│ System Administration ├──────────────────────────────┐  │
│┌────────────────────────────────────────────────────┐ │  │
││ Terminal Administration ├─────────────────────────┐ │ │  │
││                                                    │ │ │  │
││      Terminal Administration Functions:            │ │ │  │
││                                                    │ │ │  │
││            ████████████████████████████            │ │ │  │
││            Enable a Serial Port                    │ │ │  │
││            Disable a Serial Port                   │ │ │  │
││            Set Cluster Port Logins                 │ │ │  │
││            View Port Status                        │ │ │  │
││                                                    │ │ │  │
││      Please select the desired function and press 'Go'. │ │
││      Press 'Finish' to exit.                       │ │ │  │
││                                                    │ │ │  │
││                                                    │ │ │  │
│└────────────────────────────────────────────────────┘ │  │
│                                                        │  │
│   Press 'Finish' to exit.                              │  ⊢
│                                                        │  │
└────────────────────────────────────────────────────────┘  │
```
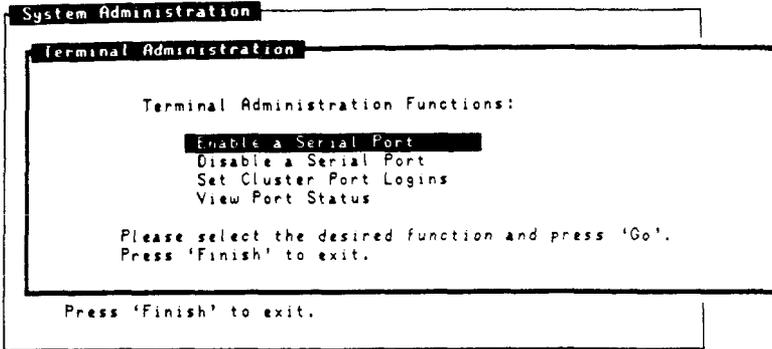
Figure 9-1.   Terminal Administration Menu

TERMINAL ADMINISTRATION FUNCTIONS

You cannot use a terminal physically connected
to the system until it is enabled. Enabling a
terminal means allowing a login to occur on
that port.

There are two types of ports on which you can
enable terminals, serial and cluster. A serial
port supports one terminal of any make.   A
cluster port is called a channel and supports
multiple Programmable and Graphics Terminals.

ENABLING A TERMINAL ON A SERIAL PORT

When you enable a terminal on a serial port,
you need to specify the type of port it is on
and which port it is on, as shown in Figure 9-
2.

```
┌─────────────────────────────────────────────────────────────┐
│ ▓System Administration ─────────────────────────────────┐    │
│ ┌─▌Enable Serial Port──────────────────────────────────────┐ │
│ │                                                          │ │
│ │  Terminal type:    ▐dumb_        ▓▓▓▓▓▓▓                  │ │
│ │                                                          │ │
│ │  Connector:        I/O Slot number:                      │ │
│ │   *Bottom           *CPU                                 │ │
│ │    Second           I/O Slot 0                           │ │
│ │    Third            I/O Slot 1                           │ │
│ │    Fourth           I/O Slot 2                           │ │
│ │    Fifth            I/O Slot 3                           │ │
│ │    Sixth                                                 │ │
│ │    Seventh                                               │ │
│ └─  Eight                                                  │ │
│    Ninth                                                   │ │
│    Top                                                     │ │
│ └──┐                                                       │ │
│    │                Press 'Go' to enable serial port.      │ │
│    │                Press '^X' to return to previous menu. │ │
│    └───────────────────────────────────────────────────────┘ │
└─────────────────────────────────────────────────────────────┘
```
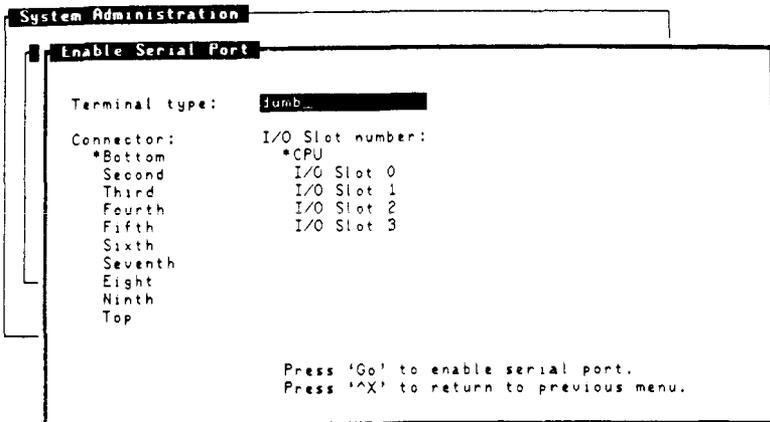
Figure 9-2.   Enable Serial Port Window

There are three items you must determine:

Determining the Type

The type refers to the particular brand and
model of your terminal. If you are enabling a
terminal that is not on the list in Appendix B,
refer to the chapter in the appropriate admini-
strator's reference manual for your system that
discusses I/O channels and terminal types.

NOTE

The administration tools do not run on "dumb"
terminals.

Determining the I/O Slot Number

Choose the slot with the next available serial port in the back of your system. If you try to enable a terminal on a port without having a board in the slot, the system displays the message "Your machine does not have serial board #4" (or the particular slot number you chose).

Determining the Connector

Choose the next available connector in the slot and note its placement on the board.

To enable a terminal on a serial port:

1. Move the cursor to the Enable Serial Port option.

2. Press **Go**.

3. Enter the terminal type (backspace over the default and enter the correct type).

4. Select the connector number.

5. Select the I/O slot number.

6. Press **Go** to enable the port.

7. The system displays the message "Logins are now permitted from ttyXXX" where XXX is the port number.

The port is enabled when you can log into the system from a terminal connected to it.

DISABLING A TERMINAL ON A SERIAL PORT

Disabling a terminal removes the login privilege on a port. You can disable a terminal and make it unavailable without physically removing it from the system.

To disable a terminal on a serial port:

1. Move the cursor to the Disable Serial Port option.

2. Press **Go**.

3. Enter the connector number. Read "Enabling a Terminal on a Serial Port" earlier in this chapter to see how to identify the connector number.

4. Select the I/O slot number. Read "Enabling a Terminal on a Serial Port" earlier in this chapter to see how to identify the connector number.

5. Press **Go** to disable the port.

ENABLING TERMINALS ON CLUSTER CHANNELS

There are two things for you to decide before you enable multiple terminals on cluster channels:

o the channel number

o the number of logins to allow

Determining the Channel Number and Number of Logins to Allow

Choosing the channel number, and deciding how many logins to enable per channel should be primarily based on the cabling configuration. Also, if you are enabling multiple terminals, try to distribute them as evenly as possible over the available channels.

For example, supposing you are enabling a terminal in an office, called Office A. Office A is next to another office, Office B, which is cabled to a particular channel. It would be better to enable another login on the Office B channel than to wire a new cable for Office A. (See the chapter in the appropriate installation manual for your system that discusses cabling for more information.)

NOTE

A Cluster Expansion board, and a PT or GT is required to support cluster channels.

To enable multiple logins on a cluster channel:

1. Move the cursor to the Set Cluster Port Logins option.

2. Press Go.

3. Select the channel number.

4. Select the number of logins to be permitted.

5. Press Go to execute.

The channels have been enabled when you can log into the system from terminals connected to them. It is a good idea to write down the number of logins allowed on each channel as you enable them.
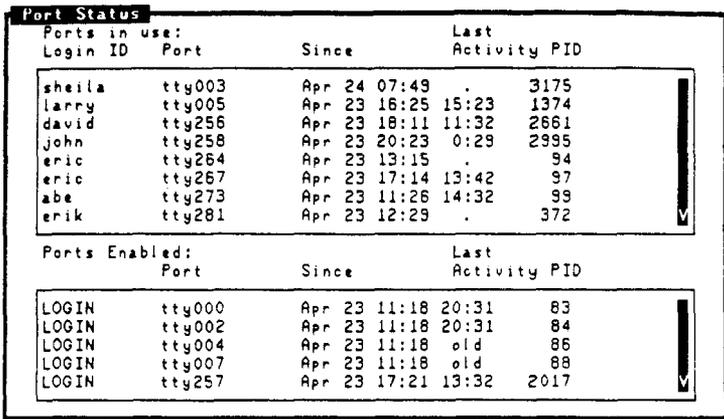
VIEWING PORT STATUS

Viewing the port status allows you to see which users are logged into the system, and which ports are enabled.

To view the status and activity of terminals on your system:

1. Move the cursor to the View Port Status option.

2. Press Go.

Figure 9-4 illustrates the Port Status window.

```
┌─Port Status┐──────────────────────────────────────────
│ Ports in use:                    Last
│ Login ID   Port       Since      Activity PID
│
│ sheila     tty003     Apr 24 07:49   .      3175    ▮
│ larry      tty005     Apr 23 16:25 15:23    1374
│ david      tty256     Apr 23 18:11 11:32    2661
│ john       tty258     Apr 23 20:23  0:29    2995
│ eric       tty264     Apr 23 13:15   .        94
│ eric       tty267     Apr 23 17:14 13:42      97
│ abe        tty273     Apr 23 11:26 14:32      99
│ erik       tty281     Apr 23 12:29   .       372    ▼
│
│ Ports Enabled:                   Last
│            Port       Since      Activity PID
│
│ LOGIN      tty000     Apr 23 11:18 20:31     83     ▮
│ LOGIN      tty002     Apr 23 11:18 20:31     84
│ LOGIN      tty004     Apr 23 11:18  old      86
│ LOGIN      tty007     Apr 23 11:18  old      88
│ LOGIN      tty257     Apr 23 17:21 13:32    2017    ▼
```

Figure 9-4.   Port Status Window

The top half of the Port Status window shows the login name of the user and the date and time the user logged in. It also shows you which port the user is using, how long it has been since the user entered any keystrokes, and the process identification number the system assigned to the user when the user logged in.

The bottom half of the Port Status window shows the ports with logins enabled on them, the date and time the port was enabled, how long it has been since any activity has taken place on the port, and the process identification number of the process that keeps the port enabled.

Notice that the port number in this window is referred to as "ttyXXX". This number corresponds to the connector and I/O slot number of the terminal used in the "Enabling a Terminal on a Serial Port" and the "Disabling a Terminal on a Serial Port" functions. Use Table 9-1 to place the tty number (the "." entry represents the port you are currently logged in to).

Table 9-1.

PORT NUMBERING

TTY	Connection	I/O Slot	Connector
000-001	serial	main CPU	0-1
002-011	serial	I01	0-9
002-021	serial	I01-I02	0-19
012-021	serial	I02	0-9
012-031	serial	I02-I03	0-19
022-031	serial	I03	0-9
022-041	serial	I03-I04	0-19
032-041	serial	I04	0-9
256-263	cluster	CEB	0
264-271	cluster	CEB	1
272-279	cluster	CEB	2
280-287	cluster	CEB	3

Note that CEB is the Cluster Expansion Board. Also note that port 0 is the bottom connector, and port 9 is the top connector.

WHERE TO GO FROM HERE

For more information on configuring terminals, read the chapter in the appropriate administrator's reference manual for your system that discusses configuring new terminals and the terminal numbering scheme.

For more specific information about the files and commands used to perform terminal administration, refer to the following items in the appropriate administrator's reference manual for your system and the CTIX Operating System Manual:

/etc/inittab

   This is a file modified by the administration tools. It instructs the system how to configure all the ports on the system. For example, it designates whether or not a login should be allowed on the port, the type of port, and so on.

/etc/ttytype

   This is the file that designates what type of terminal is assigned to each port on the system.

telinit

   This is the command used to instruct the system to reread /etc/inittab when you change the login privilege on a port, in order to make the change take effect immediately. Otherwise, the system waits until a user logs in or out, at which time it automatically reads /etc/inittab. Telinit is also used to change the run level of the system. (See the chapter in the appropriate administrator's reference manual for your system that discusses system initialization procedures for more information.)
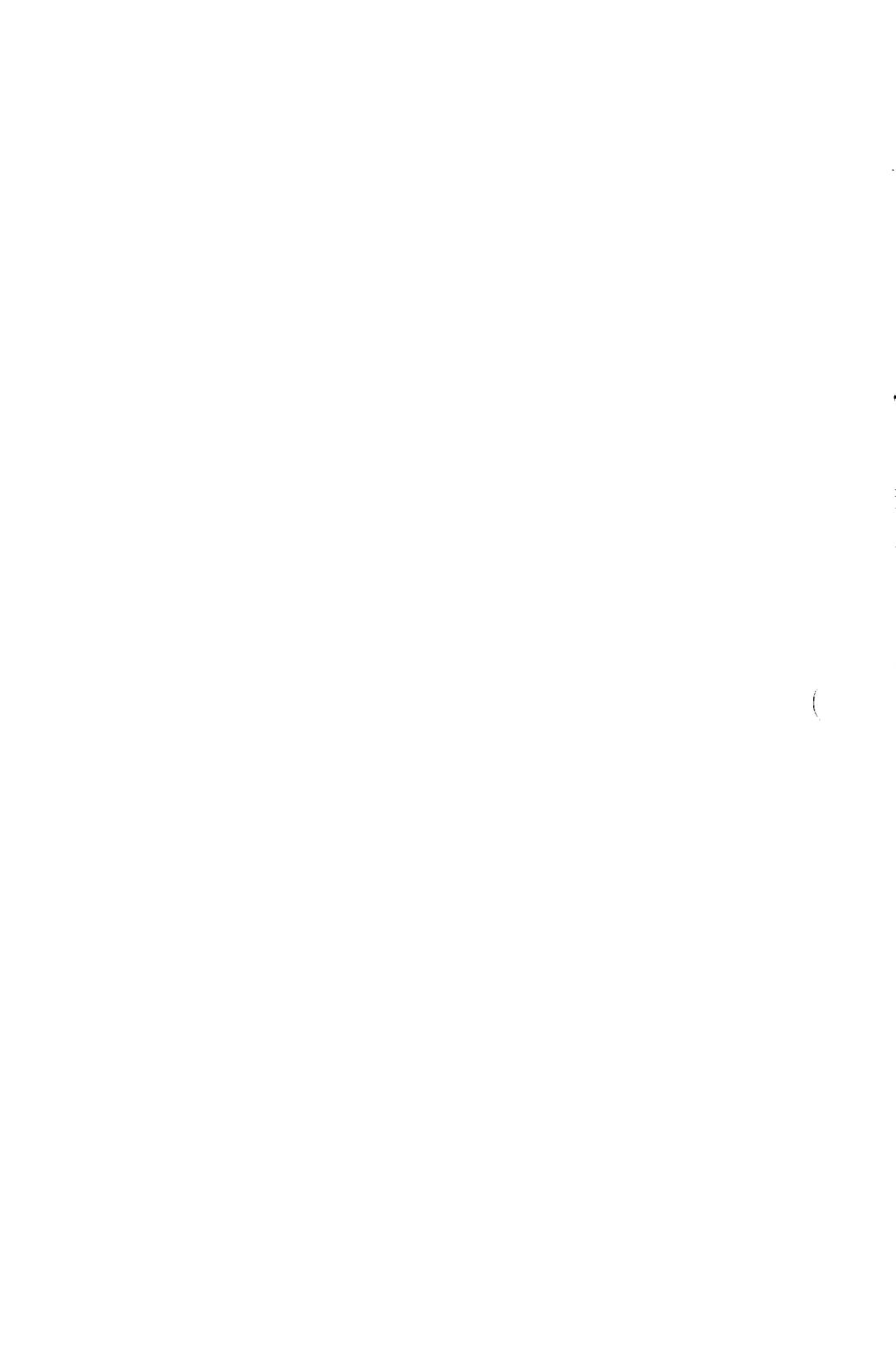
10   ELECTRONIC MAIL ADMINISTRATION

Electronic mail allows you to exchange mail and
other files with other computers; Electronic Mail
administration helps you support electronic mail
on your system and remote systems.   This chapter
shows you how to:

o   add and remove mail systems

o   make changes to mail systems

o   list the remote systems available within
    your electronic mail system

To enter the Electronic Mail Administration menu
from the main menu:

1.   Move the cursor to the Electronic Mail
     Administration option.

2.   Press Go.

```
┌─────────────────────────────────────────────────────────────────┐
│ System Administration ┐                                          │
│ ┌─────────────────────┴──────────────────────────────────────┐  │
│ │ Mail Administration ┐                                       │  │
│ │ ┌───────────────────┴─────────────────────────────────────┐ │  │
│ │ │                                                         │ │  │
│ │ │         Mail Administration Functions                   │ │  │
│ │ │                                                         │ │  │
│ │ │           ▐ List Other Systems ▌                        │ │  │
│ │ │             Rename this System                          │ │  │
│ │ │             Add a System                                │ │  │
│ │ │             Change System Information                   │ │  │
│ │ │             Delete a System                             │ │  │
│ │ │                                                         │ │  │
│ │ │     Please Select the desired function and press 'Go'.  │ │  │
│ │ │     Press 'Help' for further explanation.               │ │  │
│ │ └─────────────────────────────────────────────────────────┘ │  │
│ └─────────────────────────────────────────────────────────────┘  │
└─────────────────────────────────────────────────────────────────┘
```
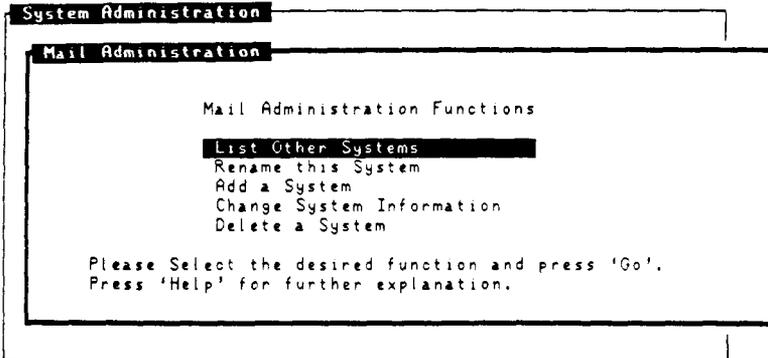
Figure 10-1.   Electronic Mail Administration Menu

ELECTRONIC MAIL ADMINISTRATION FUNCTIONS

LISTING OTHER SYSTEMS

Listing the other mail systems shows you the
names of the remote systems with whom you can
exchange mail.   A remote system is another
system linked to your system over a telephone
line, directly with a serial port, or through a
network.   A network refers to a group of
systems using a special protocol to communicate
with one another.

To list the remote mail systems:

  1.   Move   the   cursor   to   the   List   Other
       Systems option.

  2.   Press Go.

                          NOTE

  System administrators can see more information
  about the remote mail systems than is shown in
  the List Other Systems window by using the
  Change System Information function described
  later in this chapter.

_____

Figure 10-2 illustrates the List Other Systems
window.   For more information on how to exchange
mail with these systems, see **mail** in the CTIX
Operating System Manual.

```
┌─System Administration────────────────────────────────────┐
│┌─Mail Administration─────────────────────────────────────┐│
││ ┌─List Mail Names of Other Systems───────────┐          ││
││ │   Mail names of other systems              │          ││
││ │        ┌──────────────┬─┐                  │          ││
││ │        │nwuxd         │█│                  │          ││
││ │        │home          │█│                  │          ││
│ P│        │Roobear       │█│      s 'Go'.     │          ││
│ Pr│       │pasha         │█│                  │          ││
│   │        │begonia       │█│                  │          ││
│   │        │billy         │█│                  │          ││
│   │        │myS4          │█│                  │          ││
│   │        │gronk         │█│                  │          ││
│   │        │pyramid      ▼│█│                  │          ││
│   │        └──────────────┴─┘                  │          ││
│   │   Press 'Finish' to return                 │          ││
│   │   to the previous menu.                     │          ││
│   └────────────────────────────────────────────┘          ││
```
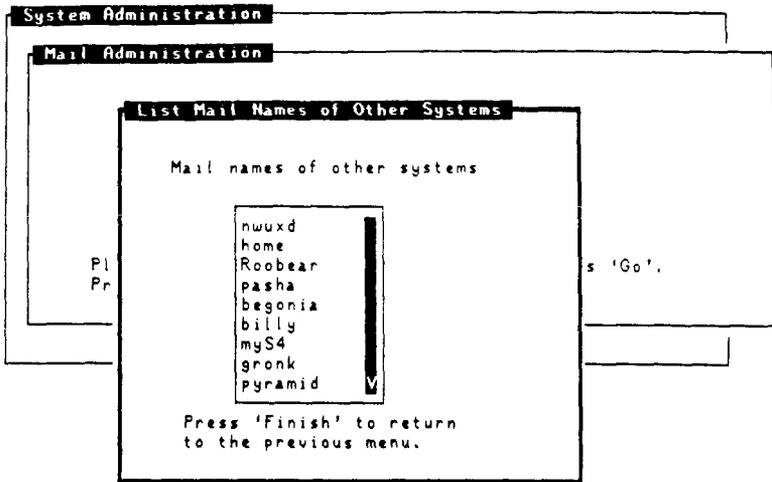
Figure 10-2. List Other Systems Window

RENAMING THIS SYSTEM

You should rename your mail system immediately
after a CTIX operating system installation, to
distinquish your system from the default CTIX mail
system name. You can also use this function to
determine the name of your system. Figure 10-3
illustrates the Rename This System window.

NOTE

  Be sure to inform the users on both your
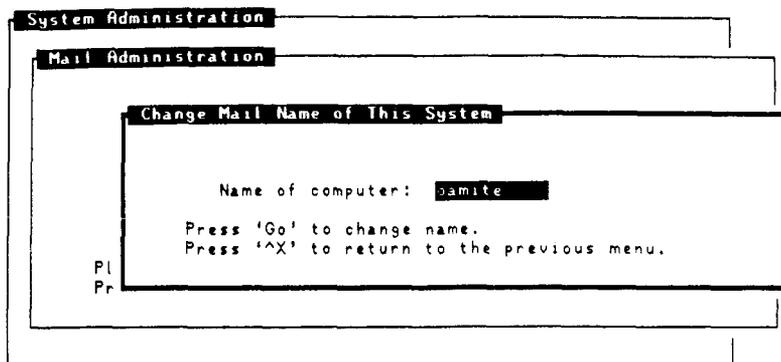 system and the remote systems when you rename
  your system!

```
┌─────────────────────────────────────────────────────────┐
│■System Administration ─────────────────────────────────┐ │
│ ┌─────────────────────────────────────────────────────┐ │
│ │■Mail Administration ───────────────────────────────┐ │ │
│ │ ┌───────────────────────────────────────────────┐ │ │ │
│ │ │■Change Mail Name of This System ─────────────┐ │ │ │
│ │ │                                               │ │ │ │
│ │ │                                               │ │ │ │
│ │ │      Name of computer:  ■amite■              │ │ │ │
│ │ │                                               │ │ │ │
│ │ │     Press 'Go' to change name.               │ │ │ │
│ │ │     Press '^X' to return to the previous menu.│ │ │ │
│ │ Pl                                              │ │ │
│ │ Pr └──────────────────────────────────────────────┘ │ │
│ └─────────────────────────────────────────────────────┘ │
│                                                          │
└──────────────────────────────────────────────────────────┘
```

Figure 10-3.   Rename This System Window

To change the mail name of your system:

1. Move the cursor to the Rename This
    System option.

2. Press **Go**.

3. **Backspace** over the current name and
    enter the new one.
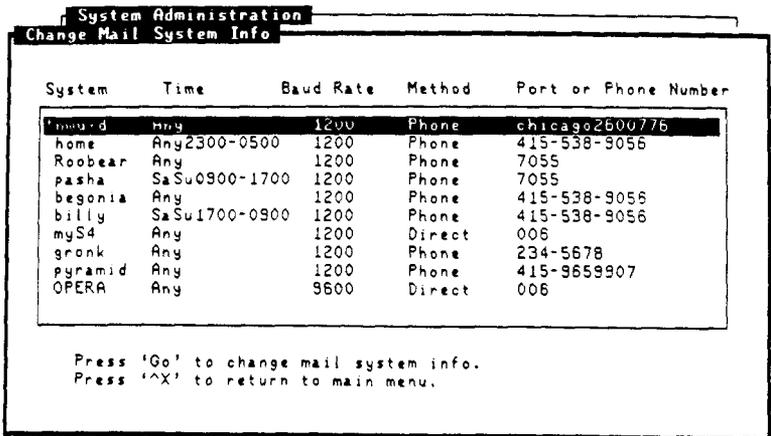
4. Press **Go**.

ADDING A SYSTEM

<To be supplied.>

CHANGING SYSTEM INFORMATION

The Change System Information window allows you to make changes to any or all of the specifications involved in adding a system. Note that changing the specifications of a mail system removes the old specifications: if you want to keep more than one set of specifications for the same system, add another system with the same mail login name.

The first window displayed in this function is a snapshot of all the systems within your electronic mail system. This window can be used to gather more information about the other systems than is displayed in the List Other Systems window. Figure 10-4 illustrates the Change Mail System Info window.

```
┌─System Administration──────────────────────────────┐
│ Change Mail System Info ├───────────────────────────┐
│                                                      │
│   System     Time       Baud Rate   Method    Port or Phone Number │
│  ┌──────────────────────────────────────────────────────────────┐ │
│  │ imgurd    Any          1200       Phone     chicago2600776   │ │
│  │ home      Any2300-0500  1200       Phone     415-538-9056    │ │
│  │ Roobear   Any           1200       Phone     7055            │ │
│  │ pasha     SaSu0900-1700 1200       Phone     7055            │ │
│  │ begonia   Any           1200       Phone     415-538-9056    │ │
│  │ billy     SaSu1700-0900 1200       Phone     415-538-9056    │ │
│  │ myS4      Any           1200       Direct    006             │ │
│  │ gronk     Any           1200       Phone     234-5678        │ │
│  │ pyramid   Any           1200       Phone     415-9659907     │ │
│  │ OPERA     Any           9600       Direct    006             │ │
│  └──────────────────────────────────────────────────────────────┘ │
│                                                      │
│    Press 'Go' to change mail system info.            │
│    Press '^X' to return to main menu.                │
│                                                      │
└──────────────────────────────────────────────────────┘
```

Figure 10-4. Change Mail System Info Window

Once you select the system to change, the next
window displays the information just as you
entered it when you added the system, as shown in
Figure 10-5.

```
┌─────────────────────────────────────────────────────────────────┐
│ System Administration                                            │
│ ┌──────────────────────────────────────────────────────────┐    │
│ │ Add or Change Mail System Info                            │    │
│ │                                                           │    │
│ │         Mail system name: ██████████                      │    │
│ │         Mail login name: nuucp                            │    │
│ │            Mail password:                                 │    │
│ │  Days of week calls allowed: *All days                    │    │
│ │                              Weekdays only                │    │
│ │                              Weekends only                │    │
│ │                              Never                        │    │
│ │    Hours when calls allowed: *All times                   │    │
│ │                              Working hours (9am-5pm)       │    │
│ │                              Night only (5pm-9am)          │    │
│ │                              Late night (11pm-5am)         │    │
│ │      Method of sending mail: *Phone                       │    │
│ │                              Direct                       │    │
│ │                              Ethernet                     │    │
│ │                                                           │    │
│ │    Press 'Go' to Add new mail system                      │    │
│ │    Press '^X' to return to main menu                      │    │
│ └──────────────────────────────────────────────────────────┘    │
└─────────────────────────────────────────────────────────────────┘
```

Figure 10-5.   Add or Change Mail System Window

For more information on the system information
specifications, refer to the chapter in the
appropriate administrator's reference manual for
your system that discusses configuring the uucp
system.   Uucp stands for UNIX-to-UNIX copy, and
uucp is a command used to send and receive files
between systems.

To change any or all of the mail system
characteristics, perform the following steps:

1. Move the cursor to the Change System
    Information option.

2. Press Go.

3. Move the cursor to select the system.

4. Press Go to execute your selection.

5. Move the cursor to the desired fields and enter the changes.

6. Press Go to execute.

7. Enter any changes to the dialing sequence and baud rate (phone link only).

8. Press Go.

9. Enter any changes to the port number and baud rate (direct links only).

10. Press Go.

11. The system displays the message "The info for system Newsystem has been changed."

DELETING A SYSTEM

To delete a remote mail system:

1. Move the cursor to the Delete a System option.

2. Press Go.

3. Move the cursor to select the desired system.

4. Press Go to delete the system.

5. The system displays the message "The entry "Newsystem" has been removed from the Systems file.

WHERE TO GO FROM HERE

For more information on configuring electronic
mail systems, read the chapter in the appropriate
administrator's reference manual for your system
that discusses configuring uucp.

For more specific information about the files and
commands used to perform electronic mail admini-
stration, refer to the following items in the
appropriate administrator's reference manual for
your system and the CTIX Operating System Manual:

/usr/lib/uucp/Systems

    This is a file modified by the administration
    tools that describes the remote electronic mail
    systems linked to your system.

/usr/lib/uucp/Devices

    This is the file that designates the char-
    acteristics of the port the remote system uses
    for sending and receiving mail. Each port used
    to send and receive electronic mail must have
    an entry in the Devices file.

/usr/lib/uucp/Dialers

    This is the file that describes the call-
    placing protocols for dial-out modems and
    automatic call units (ACUs).   It contains a
    login script necessary to establish communi-
    cation with the modem on the new system.

/etc/rc

    This is a file modified by the administration
    tools that contains the name of the mail
    system, along with other CTIX system speci-
    fications. In addition, this file configures
    the CTIX system when it is first turned on.

mail

> This is the command used for sending and reading mail messages within your system, or from one system to another.

uucp

> This is the command used that actually sends mail from one system to another using a direct, phone, or network link.

11 TROUBLESHOOTING

Troubleshooting is nothing more than problem solving. Troubleshooting is the act of searching for the cause of a problem and correcting it. The following are the most important keys to effective troubleshooting:

o Do Relax. It is always easier to fix a problem when you are calm.

o Don't Panic! Don't worry, either. The problem will get fixed.

o Don't be afraid to ask for help. If you need help, it is much better to ask for it than to not ask and not solve the problem. You can receive help from other users as well as your service representative.

o Do perform preventive maintenance.

This chapter describes common problems that may occur and solutions for solving them. It also discusses what to do when all else fails, and ways to prevent problems before they occur.

TERMINAL USAGE PROBLEMS

Problem: Typing mistake.

Solution: Back Space over the incorrect char-
                acter and type in the correction.

Problem: The screen format looks abnormal or
                has unusual characters in odd
                places.

Solution   Press **Code-L** to redraw the screen.

Problem: You received your shell prompt
                unexpectedly, and nothing happens
                when you try to type something.

Solution: Follow these steps to reset the
                terminal:

                1. Press **Next**.

                2. Type

                   $ **stty sane**

                3. Press **Next**.

Problem: Terminal doesn't respond or it
                seems like the function has taken
                an unusually long time to complete.

Solution: This could be caused by one of
                several problems. In this order,
                check:

                o Your terminal; the keyboard may
                   have come unplugged. If the
                   keyboard is fully plugged in,
                   make sure the connector in the
                   back of your terminal is also
                   completely plugged in.

o The **adman** process; it may have hung if you used the **Cancel** key on a serial (RS-232-C) port (or for another reason). Press **Delete**. If you still do not receive your prompt, reboot your terminal (turn it off and back on). You should then receive a login prompt.

o Your system; it may have shut down unexpectedly. Follow the instructions in the chapter in the appropriate administrator's reference manual for your system that discusses CTIX modes to bring the system back up.

USER ADMINISTRATION PROBLEMS

Problem: You have added a user but he receives a "login incorrect" message and is unable to log in.

Solution: Verify his account using the List User Account function. If his account is present, give him a new password, using the Change a User's Password function.

Problem: You have added a user and he is able to log in, but he receives a "no shell" or "no home directory" message before he receives his prompt.

Solution: Use the Change User Information
                function or the List User Accounts
                function to make sure his account
                uses the correct shell and home
                directory.

Problem: You have added a group, but users
                are unable to access files even
                though they have the appropriate
                group privileges.

Solution: Read the chapter in the appropriate
                administrator's reference manual
                for your system that discusses
                adding users to groups. Also read
                about the chgrp command in the CTIX
                Operating System Manual.

Problem: You deleted a user accidentally.

Solution: If you have also removed his files,
                use the Add a User function. Then
                perform a partial restore to
                retrieve his files.

                If you have not already removed his
                files, use the Add a User function
                and add him again. Give him a dif-
                ferent home directory, for example,
                "/tmp/john", then use the Change
                User Information function to change
                his home directory back to his
                original one.

                If you need to move his files from
                one directory to another, see the
                chapter in the appropriate adminis-
                trator's reference manual for your
                system that discusses moving a
                user's files.

Problem: You have deleted a user's account
                 and have removed his files without
                 archiving them.

Solution: The user's files should be on a
                 permanent complete backup. Restore
                 them and then archive them.

Problem: You have barred a user mistakenly.

Solution: Readmit the user by using the
                 Readmit a User function.

Problem: You have readmitted a user but he
                 is unable to log in.

Solution: Use the Change a User's Password
                 function to give the user a new
                 password.

                 If he is still unable to log in,
                 read the solution for deleting a
                 user accidentally without removing
                 his files.

SYSTEM BACKUP PROBLEMS

Problem: The backup is removing files from
                 the filelist that you do want
                 backed up.

Solution: Interrupt the backup by pressing
                 Delete, then add those files to the
                 filelist by removing them from the
                 exclusion list.   See "Where To Go
                 From Here" in Chapter 4, "System
                 Backup" for more information on the
                 filelist. Start the backup over.

Problem: You accidentally interrupted the
                 backup.

Solution: Run **adman** again and start the
                 backup over.

Problem: You started the next sequence of
                 the backup without inserting the
                 next tape (overwriting the tape
                 with the new information).

Solution: Interrupt the backup by pressing
                 Delete, run **adman** again and start
                 the backup over.   The first backup
                 is damaged and you cannot restore
                 any files from it.

Problem: You received the "Backup Failed"
                 message.

Solution: Extract the tape and make sure the
                 write-protect arrow is pointing
                 away from "SAFE".

                 If you still cannot write to the
                 tape, exchange the tape for
                 another.   Try a few tapes from
                 different boxes if necessary.

If tape quality is not the problem,
insert an old, successful backup
tape and perform the View Tape
Contents function in Chapter 5,
"System Restore". Do not backup
over this tape; this test is only
to see if your tape drive is
functioning properly.

If you cannot read the tape but you
know it is a good tape, try reading
another one (just to make sure).
Call the service representative if
your tape drive is unable to read
or write tapes that you know are
good.

SYSTEM RESTORE PROBLEMS

Problem: You are unable to read the contents
               of a backup tape.

Solution: Read the solution for receiving the
               "Backup Failed" message.

Problem: You started a restore mistakenly.

Solution: Interrupt the restore by pressing
               Delete.

               Try to determine which files may
               have been accidentally restored
               before you interrupted the process.
               What was the last message
               displayed? If you had not received
               the "Restore Begins" before you
               interrupted it, no files were
               restored.

If it was a complete restore, then use the View Tape Contents function to see the order the files were restored in. If it was a partial restore, you should already know which files were to be restored.

If you know who the owner of the file is, ask him to check the status of the file. You may have to restore the latest version of that file if the restore overwrote it with an older version.

If the file is a system file, and the older version overwrote the newer version, try to restore the latest version of the file.

Problem: The wrong file was restored.

Solution: Confirm the full pathname with the owner.

               If you had the right file but the wrong version, ask him if he wants a later or earlier version. Tell him when you last did backups, and ask him which tape is appropriate.

Problem: You received the "Restore Failed" message.

Solution: Read the solution for receiving the "Backup Failed" message.

SYSTEM STATUS PROBLEMS

Problem: There are more than just a few
                number of errors present in the
                error report.

Solution: Call your service representative.

Problem: Serious error messages are present
                in the console log.

Solution: Determine when the message occurred
                and if it has already been
                attended.

                If it is a recent message,
                displaying a file system is out of
                space for example, try to remedy
                the situation.   Determine what
                files are causing the file system
                to run out of space and tell their
                owner you need to remove them (if
                possible). Read the chapter in the
                appropriate   administrator's
                reference manual for your system
                that discusses checking the console
                file and files that grow.

PRINTER ADMINISTRATION PROBLEMS

Problem: The scheduler status or default
                printer in the LP System Status
                window is not what it should be.

Solution: Use the Enable/Disable LP
                Scheduling function or the Set
                Default Printer function to correct
                the scheduler status.

Problem: The printer or queue status in the
                LP System Status window is not what
                it should be.

Solution: Use the Change Printer Status
                function. In addition, read the
                chapter in the appropriate admini-
                strator's reference manual for your
                system that discusses the LP system
                for information on changing these
                configurations.

Problem: The printer did not produce your
                print request.

Solution: Check your mail; the LP system
                sends you mail if it encounters an
                error trying to print your request.
                For more information on reading
                your mail, see mail in the CTIX
                Operating System Manual.

Also, use the LP System Status
window to see if the printer is
disabled, or there is another valid
reason for your file not to be
printed. If there is a vaild
reason for the error, read the
above two solutions to correct the
situation. If everything appears
correct in the LP System Status
window, print your file again.

Problem: You have added a printer but it
does not print.

Solution: Make sure it passes the self test.
If it does not, refer to the
printer manual for the service num-
ber, or call the dealer from whom
you purchased the printer.

If it passes the self test, deter-
mine the port number. From the
shell, follow these steps:

1. Type

$ cat /etc/rc > /dev/ttyXXX

where XXX is the port the
printer is attached to.

2. Press **Return**.

If the printer now prints, the pro-
blem is in the LP spooling system.
Try adding the printer again using
the Add a Printer function. If it
still does not print, read the
chapter in the appropriate adminis-
trator's reference manual for your
system that discusses the LP system
for detailed information.

If the printer doesn't print via
the **cat** or the **lp**, the problem lies
in the communication between the
printer and the system. Make sure
the cables are attached correctly
and there are no loose wires (see
the chapter in the appropriate
installation manual for your system
that discusses cabling and
connectors for more information.)

Also make sure the switches on the
printer are set correctly. If
everything is correct, but the
printer does not print, contact
your service representative for
assistance.

Problem: The printer prints, but your
               printout is unrecognizable or looks
               cluttered with unusual characters.

Solution: Make sure you have the baud rate
               switches set correctly, and the
               printer is able to print at that
               speed.

Problem: The printer beeps and a parity
                light goes on.

Solution: The problem is probably in the
                parity and bit switches. If your
                switches are set correctly, call
                your service representative for
                assistance.

Problem: You have changed the status of a
                printer, but the change does not
                actually occur. For example, you
                enabled a printer, but your print
                request is not produced.

Solution: Verify the printer is enabled by
                using the View LP System Status
                function. If this window indicates
                the printer should be printing, try
                submitting your print request
                again. If the printer is not
                functioning properly, see the
                solution for what to do when you
                have added a printer but it does
                not print.

Problem: A printer model exists for your
                printer, but the characteristics
                are set up incorrectly.

Solution: Either add another model, using a
                name that distinguishes it from the
                other printer model, or modify the
                existing model (see the chapter in
                the appropriate administrator's
                reference manual for your system
                that discusses printer models for
                instructions).

DISK ADMINISTRATION PROBLEMS

Problem: You specified the wrong slice to
                 create a file system in.

Solution: Read the chapter in the appropriate
                 administrator's   reference   manual
                 for   your   system   that   discusses
                 making file systems: the file
                 system   should   be   unmounted   and
                 remounted, and the /etc/checklist
                 and /etc/mountable files need to be
                 modified.

Problem: You specified the wrong mount path.

Solution: Read the chapter in the appropriate
                 administrator's   reference   manual
                 for   your   system   that   discusses
                 making file systems: the file
                 system   should   be   unmounted   and
                 remounted, and the /etc/mountable
                 file needs to be modified.

TERMINAL ADMINISTRATION PROBLEMS

Problem: You are unable to log in on a
                 terminal you have enabled.

Solution: Turn up the brightness on the
                 screen to make sure you can see the
                 login message if it is displayed.

Use the View Port Status function
to ensure the port is enabled (use
Table 9-1 to determine the correct
tty number).

Confirm the port or channel, board,
and slot numbers. If the numbers
match, make sure the terminal works
by testing it while unconnected to
the system, or while connected to a
port that is known to work
correctly.

If everything looks correct, read
the chapter in the appropriate
administrator's reference manual
for your system that discusses
adding terminals and devices for
additional information.

Problem: You are unable to use the
administration tools on a terminal
you have enabled.

Solution: Select the correct terminal type
for your terminal (see Appendix B
for a list of valid terminal
types): the administration tools
do not run on "dumb" terminals.
Next, you can either disable and
enable your port again, or from the
shell, follow these steps:

1. Type

$ TERM=type; export TERM

where type is your selection
from the list in Appendix B.

2. Press Return.

ELECTRONIC MAIL ADMINISTRATION PROBLEMS

Problem: You are unable to exchange mail
                with a system using a phone link.

Solution: Make sure the phone number is the
                dialing sequence that your system
                must use, not just the phone number
                of the remote system. For example,
                the correct phone number may be
                123-4567, but your system may need
                to dial 9 first to get an outside
                line: the correct dialing sequence
                in this case might be 91234567.

                You can also examine the
                /usr/lib/uucp/LOGFILE for error
                messages the systems encountered
                trying to communicate.

                See the modem manual and the
                chapter in the appropriate
                administrator's reference manual
                for your system that discusses
                dialing sequences (sometimes called
                "chat" or "expect/send" sequences).

WHEN ALL ELSE FAILS

Ask for help. Or, if the problem is not serious,
leave it alone for a while and come back to it.
Intuition plays a major part in most
troubleshooting, so if you have run out of good
ideas, maybe someone else has one, or you will
think of one later. Do not forget you can always
call your service representative; that is what
they are there for.

PREVENTIVE MAINTENANCE

Preventive maintenance is troubleshooting a potential problem before it occurs. These are the things to watch for:

o   Unexpected system shutdown. You can watch out for this by monitoring the console log. Usually (although not always), the system sends an error message to the console when it is experiencing a problem. Read "Viewing the Console Log Contents" in Chapter 6, "System Status."

o   Disk space. Each file on the system uses a certain amount of disk space. Some files use more space than others, and some files keep growing in size until you reset or clear them. Keep a close watch on disk space, especially looking out for major reductions of available space in a short amount of time. For a list of specific files to monitor, read the chapter in the appropriate adminis- trator's reference manual for your system that discusses files that grow.

You might also want to turn your system on and off, or run the **shutdown** program followed by **init 2** approximately once a month. Doing this resets several files that can grow quite large, and also checks the file systems. However, be sure to follow the instructions in the appropriate administrator's reference manual doing either of these.

WHERE TO GO FROM HERE

The appropriate administrator's reference manual
for your system is your best source of information
regarding the details of the functions the
administration tools perform.

In addition, the appropriate administrator's
reference manual for your system and the CTIX
Operating System Manual provide detailed
information on some commands used to prevent
problems before they occur. Two of the commands
that help prevent space inadequacy and abuse are:

df

> This command checks the amount of
> available disk space per file system.

du

> This command checks the amount of disk
> space used by any file or any user.

APPENDIX A: BASIC CONCEPTS

WHAT IS CTIX?

CTIX is the operating system that runs **adman**, and is based on the UNIX System V operating system. An operating system is the software that supports the computer.

THE CTIX ENVIRONMENT

CTIX allows you to set up and alter your working environment to suit your needs. Your working environment is called your shell, and is determined by which shell you use. There are two standard shells, the Bourne shell and the C shell.

The Bourne shell is the default shell, designated as "/bin/sh". Some users prefer the C shell, which is designated by "/usr/local/bin/csh". The primary difference between the two is that the C shell provides a history mechanism, which allows you to abbreviate and repeat commands easily. Refer to the chapter in the appropriate administrator's reference manual for your system that discusses setting up a user's environment for more information on modifying your shell.

A QUICK TOUR THROUGH THE DIRECTORY STRUCTURE

A directory is where the files you create reside in the system. The system may contain hundreds of directories, organized into an upside-down tree structure. At the top of the directory tree is the root directory. Underneath it are more directories, called sub-directories (underneath them are more sub-directories, and so on).

Figure A-1 shows the basic CTIX directory structure.
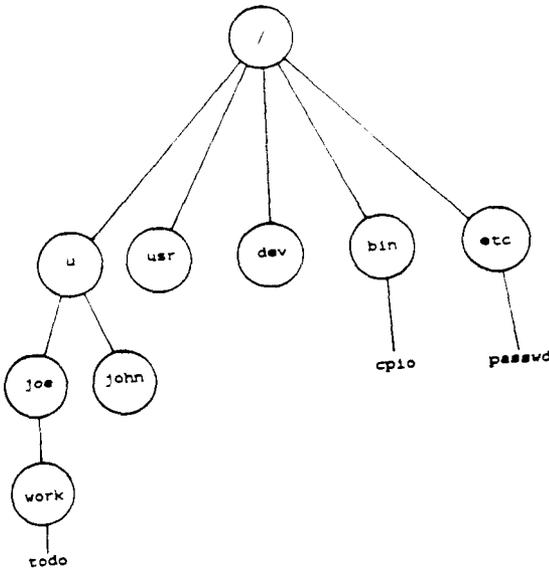
Figure A-1. CTIX Directory Structure

Where a file resides in the directory structure is specified by its pathname. For example, in Figure A-1, the file "temp" resides in "/u/john" (the slashes indicate directory levels). The full pathname of this file is "/u/john/temp".

NOTE

Use the full pathname for a file when using the administration tools.

Each user has a special directory for his files, called a home directory. Your home directory is like your office on the system: it is the first place you go when you get to work (log in), it is where you reside at work, and its subdirectories are where you perform the majority of your work. In Figure A-1, John's home directory is "/u/john".

Root's home directory is "/". Notice the name "root" matches the top of the directory tree; this is because everything on the system stems from the root directory.

Some other important directories shown in Figure A-1 are:

/u   The /u directory contains the home directories of the users on the system; for example, /u/john and /u/joe.

/dev   The /dev directory contains all the devices in the system. For example, it contains the filenames associated with terminals, printers, and disks.

/bin   The /bin directory contains many of the commands and utility programs that you type in from the shell, for example, ls and cpio. For more information on these and other commands, refer to the CTIX Operating System Manual.

/etc   The /etc directory contains system administration commands and files. For example, the password file, and the file system mount command (mount) reside in /etc.

/usr   The /usr directory is a file system
              that contains various system
              directories, commands, and utility
              programs; for example, the
              accounting and LP system
              directories.

For more information on the CTIX directory
structure, refer to the chapter in the appropriate
administrator's reference manual for your system
that discusses CTIX system directories.

WHAT IS THE FILE SYSTEM STRUCTURE?

The file system structure lies underneath the
directory structure. Each directory on the system
is part of a file system, and cannot be accessed
unless the file system is mounted. Mounting a
file system on a directory is like opening the
door to the directory: you can enter when it is
open (mounted), but you cannot when it is closed
(unmounted). File systems are mounted when you
turn the system on or use the mount command.

File systems are generally not referenced in daily
applications. However, it is important to know
how the directory structure is divided into file
systems. Chapter 8, "Disk Administration"
contains more information on file systems.

MAINTAINING SYSTEM SECURITY

There are two measures of maintaining security on
the system: password protection and file
protection. Password protection prevents
unauthorized people from using your system. File
protection prevents unauthorized people from
viewing and modifying your files. Note that these
security measures apply to nonprivileged users as
well as system administrators.

Password Protection

The three keys to maintaining good password
protection are as follows:

o   you should always have a password

o   you should change your password regularly

o   you should not disclose your password to
     other people

For instructions on implementing and ensuring good
password protection, read about Changing Your
Password in Chapter 3, "User Administration," and
Adding a System in Chapter 10, "Electronic Mail
Administration."

File Protection

File protection involves designating the mode of a
file.   The mode represents the security level:
that is, who can read, modify, and/or execute your
files.   For   example,   you   should   protect
confidential files from being viewed and modified
by other people.

Groups of Privileges

Security modes are categorized into three groups
of privileges:

user   User privileges refer to the type
                  of access allowed the owner of the
                  file; the user is the owner of the
                  file.

group   Group privileges refer to the type
                  of access allowed other members in
                  the group the owner is assigned to.

other   Other privileges refer to the type
                 of access that is allowed users
                 with no special permission or
                 password: others are anyone and
                 everyone on the system.

Types of Privileges

In turn, each of the three groups above (user,
group, and other) may have the following different
types of privileges:

read   Read permission provides viewing
                 access. If a file is read-only, it
                 cannot be modified.

write   Write permission provides
                 modification access. Write
                 permission on directories allows
                 you to remove the files in that
                 directory: be careful about
                 allowing write permissions on your
                 files and directories.

execute   Execute permission provides the
                 privilege to execute the file, or
                 search a directory. You cannot
                 look at the contents of a directory
                 unless you have permission to read
                 the directory as well as execute
                 it.

Determining the Mode

You can tell what the security mode of a file is
by using the ls command from the shell, or using
the Viewing the Tape Contents function described
in Chapter 5, "System Restore."

There are two forms of modes: alphabetic and numeric. You see the alphabetic form when you use the **ls** command from the shell. You see the numeric form when you use the Viewing the Tape Contents function in Chapter 5, "System Restore." Shown below are both forms of file protection modes:

Alphabetic: drwxrwxrwx

Numeric: 100777

Alphabetic Form. Notice that there are ten positions in the alphabetic mode. The positions are described as follows:

1   The first position shows the type of file. A file can be a directory (designated by a "**d**"), or a special file (designated by a "**b**" or a "**c**"). For more information on special files, see **mknod** in the CTIX Operating System Manual, and the chapter in the appropriate administrator's reference manual for your system that discusses special files.

2-4   The next three positions show the user's privileges (read, write, execute).

5-7   The next three positions show the group's privileges (read, write, execute).

8-10   The last three positions show the
                other privileges (read, write,
                execute).

Numeric Form.   To understand the numeric form,
translate it into alphabetic form by adding the
numeric values of the characters where read (r)
equals 4; write (w) equals 2; and execute (x)
equals 1.

See the examples below in Table A-1.

Table A-1.

SECURITY MODE EXAMPLES

Example	Alphabetic Form	Numeric Form and Value
1	drwxr-xr-x	755 (4+2+1,4+0+1,4+0+1)
2	-rw-r--r--	644 (4+2+0,4+0+0,4+0+0)
3	-rw-rw-rw-	666 (4+2+0,4+2+0,4+2+0)
4	drwx------	700 (4+2+1,0+0+0,0+0+0)

Note that the first three numbers in the numeric
form are excluded from Table A-2. For information
on them, see **chmod** in the CTIX Operating System
Manual.   Table A-2 explains how to read the mode
of the examples in Table A-1.

Table A-2.

SECURITY LEVEL EXAMPLES

Example	Security Level
1	readable, writable, and executable by the user
	readable and executable by the group
	readable and executable by other users
2	readable and writable by the user
	readable by the group
	readable by other users
3	readable and writable by the user
	readable and writable by the group
	readable and writable by other users
4	readable, writable, and executable by the user
	unreadable, unwritable, and unexecutable by the group
	unreadable, unwritable, and unexecutable by other users

Designating the mode. To designate the appropriate level of protection for a file, use the **chmod** command. Refer to the CTIX Operating System Manual for more information on **chmod**.

WHERE TO GO FROM HERE

If you want to learn more about the basic
concepts of a CTIX system, refer to the
computer section in your local bookstore for
books that discuss the UNIX operating system:
there are several books on the market, ranging
from introductory to advanced.

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APPENDIX B: TERMINAL TYPES

To enable a terminal on a serial port, locate your
terminal type in Table B-1, and enter the type in
the Enable Serial Port window.

Table B-1.
TERMINAL TYPES
(Page 1 of 10)

Type	Model
ADDS (Applied Digital Data Systems)	
addrinfo	addrinfo
viewpoint	adds viewpoint
regent	Adds Regent Series
regent20	Adds Regent 20
regent25	Adds Regent 25
regent40	Adds Regent 40
regent60	Adds Regent 60
regent60-na	regent 60 w/no arrow keys
regent100	Adds Regent 100
a980	adds consul 980
Alto	
alto	alto
altoh19	alto
altoheath	alto
Ampex	
d80	ampex dialogue 80
Anderson Jacobson	
aj	anderson jacobson
Ann Arbor Ambassador	
aaa-db	ann arbor ambassador
aaa18	aaa18
aaa20	aaa20
aaa22	aaa22
aaa24	aaa24
aaa26	aaa26

Type	Model
<u>Ann Arbor Ambassador</u> (continued)	
aaa28	aaa28
aaa29	aaa29
aaa30	aaa30
aaa36	aaa36
aaa40	aaa40
aaa48	aaa48
aaa59	aaa59
aaa60	aaa60
aaadb	aaadb
4080	ann arbor 4080
<u>Apple</u>	
apple	apple emulating soroc 120
<u>BBN</u>	
bg-ni	bbn bitgraph (no init)
bg-nv	bbn bitgraph (normal video)
bg-rv	bbn bitgraph (reverse video)
obitgraph	bbn bitgraph terminal
<u>Beehive</u>	
superbee	beehive superbee at Indiana U.
bh3m	beehiveIIIm
sb2	fixed superbee
microbee	micro bee series
<u>Chromatics</u>	
chromatics	chromatics 7900
<u>Compucolor</u>	
compucolorii	compucolorii
<u>Computer Automation</u>	
ca	computer automation 22851

Type	Model
Concept	
concept	concept 100
c108-4p	concept 108 w/4 pages
c108	concept 108 w/8 pages
Control Data Corporation	
cdc	cdc
cdc456tst	cdc456tst
cdi	cdi1203
Convergent	
gt-c	Convergent GT Cluster Terminal
gt-e	Convergent Graphics Terminal Boot ROM
pt-c	Convergent PT Cluster Terminal
aws	Convergent Tech. A.T.E.
pt-e	Convergent Technologies PT Boot ROM
gt	Convergent Technologies PT-GT
pt	Convergent Technologies PT-GT
Cybernex	
x183	cybernex XL-83
mdl110	cybernex mdl-110
Data General	
dg6053	data general 6053
d200	data general dasher 200
Datagraphix	
datagraphix	datagraphix 132a
Datamedia	
1520	datamedia 1520
dm2500	datamedia 2500
dm3025	datamedia 3025a
3045	datamedia 3045a
dm80	datamedia dt80/1

Type	Model
Datapoint	
unitrm18	datapoint 'UNITRM18' terminal
emulator	
dp3360	datapoint 3360
DEC (Digital Equipment Corporation)	
gigi	dec gigi graphics terminal
gt40	dec gt40
gt42	dec gt42
vt50	dec vt50
vt52	dec vt52
dw1	decwriter I
dw2	decwriter II
dw3	decwriter III
dw4	decwriter IV
vt100	vt100 w/no am
vt125	vt125 graphics terminal
vt132	vt132
Delta	
delta	delta data 5000
Digilog	
digilog	digilog 333
Direct	
direct	direct 800/a
Envision	
env230	envision 230 graphics terminal
Execuport	
ex3000	ex3000
ep4000	execuport 4000
ep4080	execuport 4080

Type	Model
Exidy	
sexidy	exidy smart
exidy2500	exidy sorcerer as dm2500
Falco	
falco	falco ts-1
FCG Beacon Systems	
beacon	FCG Beacon System
Fluke	
f1720a	fluke 1720A
Freedom	
f100	freedom100
General Electric	
terminet1200	ge terminet 1200
General Terminal	
gt100a	General Terminal 100A (formerly
Infoton 100)	
Hazeltine	
h1000	hazeltine 1000
h1420	hazeltine 1420
h1500	hazeltine 1500
h1510	hazeltine 1510
h1520	hazeltine 1520
h1552	hazeltine 1552
h2000	hazeltine 2000
esprit	Hazeltine Esprit I
Heathkit	
h19	heathkit h19
h89	h89 running reach
reach	h89 running reach

Table B-1.

TERMINAL TYPES

(Page 6 of 10)

Type	Model

Hewlett Packard
2621A	hp 2621
2626-12	2626-12
2648	HP 2648a graphics terminal
hp	hewlett-packard
2622	hp 2622
2623	hp 2623
2626	hp 2626
2640	hp 2640a
2640b	hp 264x series

IBM
ibm3101	ibm system/1 computer

Infoton
infoton	infoton
i400	infoton 400

Interactive
intext	Interactive Systems Corporation modified owl 1200
intext2	INTERACTIVE modified owl 1251

Intertec
intertec	intertec
it2	intertec data systems intertube 2
superbrain	intertec superbrain

Lear Siegler
adm1a	lsi adm1a
adm2	lsi adm2
adm3	lsi adm3
adm3a	lsi adm3a
adm5	lsi adm5

Type	Model

Lear Siegler (continued)
adm21	lear siegler adm21
adm31	lsi adm31
oadm31	old adm31
adm36	lsi adm36
adm42	lsi adm42

Microkit
| microkit | microkit terminal computer |

Microterm
microterm	microterm act iv
microterm5	microterm act v
mime	microterm mime1
mime2a	microterm mime2a (emulating an enhanced vt52)
mime-adm3a	mime1 emulating adm3a
mime2as	mime2as
mime2av	mime2av
mimefb	mimefb
mimehb	mimehb
mime-fb	full bright mime1
mime-hb	half bright mime1

Netronics
netronics	netronics
smarterm terminal	netronics smarterm 80x24 naked
smartvid	Netronics Smartvid 80

Pegasus
| megatek Emulator | Pegasus Work Station Terminal |

Type	Model
Perkin Elmer	
fox	perkin elmer 1100
owl	perkin elmer 1200
pe550	perkin elmer 550
Radio Shack	
trs80	Radio Shack TRS-80 model I
Ramtek	
ramtek	ramtek 6000
Sol	
sol	sol terminal computer
Soroc	
soroc	soroc 120
iq140	soroc 140
Southwest Technical Products	
swtp	southwest technical products ct82
Sun Microsystems	
sun	sun microsystems inc workstation
Tektronix	
t500	Tek series 500
4012	tektronix 4012
tek4013	tektronix 4013
tek4014	tektronix 4014
tek4015	tektronix 4015
tek4023	tektronix 4023
4024	tektronix 4024/4025/4027
tek4112	tektronix 4110 series
4112-d	tek 4112 in dialog area
ct8500	tektronix ct8500

Type	Model

<u>Teleray</u>
t16	teleray 16
t1061	teleray 1061
t3800	teleray 3800 series
teletec	teletec datascreen

<u>Teletype</u>
4424	teletype 4424
tty40	teletype dataspeed 40/2

<u>Televideo</u>
tvi912b	new televideo 912
tvi912c	new televideo 912
tvi920b	new televideo 920
tvi920c	new televideo 920
tvi925	televideo 925
tvi950	televideo950

<u>Terak</u>
terak	Terak emulating Datamedia 1520

<u>TI (Texas Instruments)</u>
ti800	ti omni 800
ti700	ti silent 700
ti745	ti silent 745

<u>Visual</u>
visual	visual 200 no function keys
vi200-rv	visual 200 reverse video
vi300	visual 300 ansi x3.64
vi300-aw	visual 300 no autowrap
ovi300	visual 300 old
vi300-rv	visual 300 reverse video
vi300-ss	visual 300 slow scroll
vi550	visual 550 ansi x3.64

Table B-1.

TERMINAL TYPES

(Page 10 of 10)

Type	Model
Volker-Craig	
vc103	volker-craig 303
vc303-a	volker-craig 303a
vc404	volker-craig 404
vc415	volker-craig 415
Wyse	
wy100	wyse 100
Xitex	
xitex	xitex sct-100
Zentec	
z30	zentec 30
Miscellaneous	
aed512	AED 512
dialup	dialup
dtc300s	dtc 300s
dumb	dumb
ansi	generic ansi standard terminal
minansi	minimum ansi standard terminal
pc	personal computer emulating a
terminal	
ubellchar	ubellchar
unknown	unknown

GLOSSARY

adman. Adman is the CTIX command that allows you to use the administration tools.

archive. An archive is a copy of a file which is put on a tape separate from any complete or incremental backup tape the file may already be on. Archive tapes should be recorded in the log along with backup tapes. An archive may also refer to any form of offline storage.

backup. A backup is a copy of the information on the system preserved on a separate medium, usually tape. Backups come in these forms: a complete backup of the system, a backup of only the changes since the last complete backup was taken (called an incremental backup), or a backup of part of the system (called a partial or user backup).

baud rate. The baud rate refers to the speed at which data is communicated over a serial line, measured in bits per second (bps).

block. A block is a unit of measurement of information, and is either physical or logical. The smallest unit of information is a single character, called a binary digit (bit). Eight bits equal one byte. Physical blocks contain 512 bytes; logical blocks contain 1024 bytes.

carriage motion. The carriage motion is what the system generates when you signal the end of a line, usually a carriage return and a line feed.

class. A class is a group of printers.

cluster channel. A cluster channel is a channel supporting RS-422 communication. Cluster channel connections can be found on a Cluster Expansion Board and on PTs and GTs.

console. The console is an imaginary terminal to which the system sends important status information. Information sent to the console is entered into the console log, which should be monitored frequently. On some systems, the console is a dedicated terminal you use when you turn the system on or off, and the status messages may be printed in addition to being stored in a log.)

controller. A controller is a board installed in your system that manages peripheral devices, for example, disk and tape drives.

cursor. The cursor indicates your position in a window and indicates a selection. In the administration tools, the cursor is either the highlight bar, the blinking underline character, or both.

data choice. A data choice is a type or characteristic of an option in a field or menu. For example, the type of printer you select is a data choice.

default printer. The default printer is the destination that automatically receives all print requests, unless you request a different one.

destination. A destination can either be a printer or a class of printers.

direct link. A direct link refers to a cable that runs directly from a port on your system to a port on another system, which can be used to exchange electronic mail.

directory. A directory is a place where a collection of files reside in the system. If one of the files in a directory is itself a directory, it is called a subdirectory of the first directory. When you log in to the system you are placed in a directory called your home directory.

disk. A disk is a mass storage device on the system. The disk holds all the information on your system execpt what is stored in memory. Disks retain the information stored on them when the system is powered off; memory does not.

Ethernet link. The term Ethernet refers to a type of network that uses special communications protocols and supporting hardware. An Ethernet link may be used between systems to exchange electronic mail.

field. A field is a part of a window that contains information about a function. The information in fields is used to perform a task, and can be provided by you or by the administration tools.

file system. A file system consists of CTIX files and slice configuration information. A file system is a convenient way to organize a disk; every file system is associated with a slice, but every slice does not necessarily contain a file system (for example, slice 0 and swap areas).

function. A function is a category of tasks and menus. A function is also used to describe a task.

hardware tabs. Hardware tabs are a method for implementing tabstops with the hardware as opposed to with the software. Not all printers have the capability to implement tabstops, in which case the software can implement them.

line printer. A line printer is technically a printer that prints an entire line at a time. However, the term "LP" is used to represent any type of printer, as in the phrase "LP system," which refers to the general printer population. Not all printers in the LP system are in fact line printers.

login terminal. The LP system considers a login
terminal is a hardcopy terminal, which more
closely resembles a typewriter than a terminal
with a screen display: a login terminal is a type
of serial printer.

main menu. The main menu is the top of the menu
hierarchy, providing access to the major functions
within the administration tools.

memory. Memory is the storage space on your
system that stores information for short term use.
The information in memory is temporary and is not
retained when the system is powered off, as
opposed to the information on a disk.

menu. A menu is a list of choices from which you
make a selection. The choices can be windows to
see next, actions to perform, or data choices.

mode. The mode of a file determines its security
level. There are two forms of modes: alphabetic
(drwxrwxrwx), and numeric (100777). See Appendix
A for more information on security modes.

model. A model is a file that the LP system uses
to interact with a printer; a model describes the
characteristics of a printer.

modem. A modem is a device connected to a
computer and a telephone that translates the
signals coming over a telephone line into data
signals the computer understands. See also **phone
link.**

mount path. A mount path is a pathname indicating
where a file system is to reside in the directory
structure. In order to create a file system, you
must specify a mount path.

network. The administration tools consider a
network to be a group of systems using a

particular comunication protocol. A network can
also refer to the entire community of systems that
your system can communicate with, through any type
of link.

operating system. The operating system is the
software that is installed on a computer to
support the hardware: it allows you to enter
commands and perform tasks on the computer, it
controls access to the system thorugh security
mechanisms, and it allocates resources among the
users on a system.

parallel connection. A parallel connection is a
type of connection between the computer and the
printer which transfers data from the computer to
the printer in groups of bits.

parallel printer. A parallel printer is a printer
connected to the computer with a parallel
connection.

parity. Parity is a method of checking for
communication errors.

partition. A partition is a section of a disk.
Slices are disk partitions.

password. A password is a unique set of
characters used as part of a user's
identification. To access the system, you enter
your login name and your password.

pathname. A pathname is the way to designate a
file's location in the directory structure. When
the pathname starts with a slash, it is called the
full pathname, because it shows each directory
level starting from root. For example, if user
john has a file named "todo" in his subdirectory
named "work", the full pathname of "todo" is
"/u/john/work/todo".

phone link. A phone link is a method used used by the electronic mail system to exchange mail over telephone lines. See also **modem.**

printer. A printer is a particular physical device used to print documents. See also **serial printer, remote printer,** and **parallel printer.**

queue. The queue is the part of the LP system that holds the print requests until the printer is ready to print them.

remote printer. A remote printer is a printer you can access from your system, which is not directly connected to your system.

remote system. A remote system is another system linked to your system over a telephone line, directly, or through a network.

restore. A restore is the act of returning the system to a previous state, by copying the contents of a backup tape onto the system. You can either restore an entire backup tape, or certain files from a backup tape.

root. Root has two meanings: root is the superuser account on the system that has superior privileges and may read or modify any file on the system. Root is also the name of the directory at the top of the directory tree, designated by a slash (/). Full pathnames always start from the root, for example, /u/john/testfile.

scheduler. The scheduler is the part of the LP system that directs certain files to be printed on certain printers.

serial connection. A serial connection is a type of connection between the computer and the printer that transfers data from the computer to the printer one bit at a time.

serial port. A serial port is a place on the system to connect a terminal. A serial port supports a single terminal. It also supports a serial printer or modem.

serial printer. A serial printer is a printer connected to the computer with a serial connection.

shell. The shell is the command interpreter for the CTIX operating system. The shell is how you interact with the operating system in order to perform a task; it represents your working environment.

slice. A slice is a unit of disk partitioning. Disks are divided into slices.

spooler. The spooler queues print requests and sends them to the printer.

stop bits. Stop bits are used to inform the system when one character ends and the next one begins.

superuser. The superuser has the privilege to act as root. The superuser acquires complete access to the system by giving the system the root password and entering superuser mode. The superuser may turn the system on or off, view any file on the system, or reconfigure the system.

terminal download image. A terminal download image is the software necessary to operate a PT or GT on a cluster channel.

troubleshooting. Troubleshooting is the act of isolating and correcting problems (problem solving).

Xon/Xoff handshaking. Xon/xoff handshaking is a particular type of signal the printer sends to the computer to inform it when it is ready for more data. It is required because the printer cannot print as fast as the computer can send it information.

wild card. A wild card is a character used for pattern matching in file searches. When a wild card is used in a file name, the system searches for all files that match the characters in the file name except the wild card. For example, if you wanted to print all the files that have the characters "tmp" without listing each one individually, you could instruct the system to print "*tmp*" and it would print "today.tmp", "tmp.old", and "thistmp", for example. The asterisk wild card (*) matches any number of characters; the question mark (?) wild card matches one character.

window. A window represents the information displayed on the screen for a particular function.