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IBM Personal Computer XENIX
Library Overview

The XENIX\(^1\) System has three available products. They are the:

- Operating System
- Software Development System
- Text Formatting System

The following pages outline the XENIX Operating System library.

\(^1\) XENIX is a trademark of Microsoft Corporation.
An introduction to the XENIX system, outlining the fundamental concepts and procedures you need to operate the system.

A description of the Visual Shell, the interface between you and the Operating System. Offers hands-on examples.
For the System Installer

- Fixed disk preparation
- Operating, Software Development, and Text Formatting System installation
- Creating a Super-User password
- Co-residence with other operating systems

A guide to the installation and management of the XENIX system on your computer.

For the System Administrator

- Starting and stopping the system
- Using, maintaining and backing up files
- Solving system problems
- Using peripheral devices
- Adding users to the system

A guide to managing and maintaining the system.
For All Users

- Alphabetic command listing
- Command definition
- Command syntax
- Command usage
- System commands, functions, and files

A comprehensive command reference, including a concise and complete description of (C) commands, (M) (F) system commands, functions and files.
About This Book

This guide explains how to install the IBM Personal Computer XENIX Operating System on the IBM Personal Computer AT. The IBM Personal Computer XENIX Operating System has a broad selection of powerful programs and utilities that give your computer the same multiuser, multitasking capabilities as many large and expensive computers. The system provides everything you need to create multiple user accounts, manage file systems, and perform system maintenance tasks.

To do its work, the operating system must be installed on your computer's fixed disk. This means you must prepare the disk to receive the system, then copy the system's programs and files to the prepared disk. Each operating system has an installation diskette, which is used to prepare your fixed disk for the system, and several distribution diskettes from which you copy the operating system programs and files.

Once the operating system is installed on your computer you may install other XENIX systems. These are: the IBM Personal Computer XENIX Text Formatting System, which contains the programs needed to create, edit, format, and typeset documents; the IBM Personal Computer XENIX Software Development System, which contains the XENIX programs needed to create, compile, link, and debug C and assembly language programs.

Each system is installed separately. Installation of the operating system is required before you can install the text processing or software development systems.
What You Need

To install the operating system, on your computer, you need an IBM Personal Computer AT with:

- At least 512K-bytes of system memory
- One fixed disk with at least 20M-bytes of storage
- One high-density diskette drive (96 tracks per inch)
- All the diskettes from the IBM Personal Computer XENIX Operating System and any IBM Personal Computer XENIX options.

Before You Start

Before you begin the installation procedure, make sure that your computer is fully assembled and that you are familiar with its operation. In particular, you should:

- Be familiar with the computer system and keyboard
- Know how to switch the computer on and off
- Know how to insert diskettes into the diskette drive
- Know how to start the computer with a diskette from diskette drive A.

If you have just assembled your computer, or if you are unsure about the items listed above, take a few moments to review the IBM Personal Computer AT Guide to Operations.
Related XENIX Publications

- IBM Personal Computer XENIX System Administration
- IBM Personal Computer XENIX Basic Operations Guide
- IBM Personal Computer XENIX Visual Shell
- IBM Personal Computer XENIX Command Reference
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The operating system installation procedure has 12 steps. Read each step carefully before you attempt installation. This will keep the installation trouble-free.

The order of installation is important and the success of each step depends on the previous steps, so complete each step correctly before proceeding. If you make a mistake or think that something is wrong, you can stop the current step by pressing the Del key. You can correct the mistake by repeating the step in which it occurred, and all successive steps that follow. If you are not sure where the mistake occurred, start again with step 1.

During the installation, always type requested names and numbers exactly as shown. If you make a typing error, delete the character you just typed by pressing the ← (backspace) key.

When you have finished the installation, keep this guide, and the XENIX diskettes in a safe place. You will need them again if you wish to reinstall the system for any reason.

Note: If you are reinstalling the IBM Personal Computer XENIX Operating System, you may want to backup your files on diskette. You can copy the files back to the system after this installation. For information on copying diskettes, see IBM Personal Computer XENIX System Administration.
STEP 1 - Load and Start the XENIX Boot Program

The boot program lets you load and execute programs necessary to prepare the fixed disk for installation. The boot program is on the Installation diskette provided with the distribution set. To load the boot program:

a. Insert the Installation diskette into diskette drive A and close the drive latch.

b. Switch on the computer. (If the computer is already on, press the Ctrl, Alt, and Del keys at the same time.) The computer does a few tests, then loads the boot program from the diskette. The boot program displays the following prompt:

   XENIX 286 boot

   Enter: device program

   Press Enter for default: hd /xenix

   :

   Do not press Enter at this time.

   Note: If you do not see the colon (:) prompt on the display, it is possible you did not push the diskette all the way into the drive. If you do not see the (:) prompt, remove the diskette, switch the power off and do this STEP again.

You are now ready to create the bad track table.
STEP 2 - Create the Bad Track Table

You will now create a bad track table for your fixed disk to let the XENIX system know which tracks to avoid. To create the table, you load the badtrack program from the Installation diskette. The badtrack program scans the fixed disk for bad tracks, displays a list of the bad tracks it finds, then creates a table of the bad tracks on the fixed disk. If you have a second fixed disk, badtrack creates a bad track table for it too.

To create the bad track table, do the following:

a. Type:
   \[ fd /etc/badtrack \]

b. Press Enter.

The line:
   \[ Loading \]

then:
   \[ Loaded, press Enter to start \]

is displayed.

c. Press Enter.

The badtrack program is loaded from the Installation diskette. The program first displays the number and type of the first fixed disk. It then displays the number of each cylinder as it proceeds with its tests. There are 615 cylinders on the fixed disk and each cylinder has four tracks. After scanning all cylinders on the first disk, badtrack displays a list of the bad tracks it has found (listed by cylinder and track). It then displays the prompt:

   Enter additional bad tracks for drive 0
   Enter cylinder [1-613]
   (press Enter to terminate):
d. Press Enter. (For the first installation, you do not have to supply additional track information.) The program again displays a list of the bad tracks, then it creates the actual table on the fixed disk.

If you have a second fixed disk, badtrack repeats the same operation for that disk. After completing all operations, badtrack returns control to the XENIX boot program which displays the prompt:

```
XENIX 286 boot
Enter: device program
Press Enter for default: hd /xenix
```

You are now ready to start the XENIX Installation system.

**STEP 3 - Start the XENIX Installation System**

The XENIX installation system initializes the fixed disk and copies important files to the fixed disk. The XENIX system is on the Installation diskette. To load the XENIX Installation system:

a. Type:

```
fd /xenix.fd
```

b. Press Enter.

The XENIX Installation system is loaded from a file named xenix.fd on the Installation diskette. The line:

```
Loading
```

is displayed while the contents of the file is loading. When it has finished the line:

```
Loaded, press Enter to start
```

is displayed.

4 Operating System Installation
c. Wait for the red light on the diskette drive to go out, then press Enter. The system displays some copyright information, some system facts, and then displays the message prompt:

```
No single-user login present
Entering System Maintenance Mode
Terminal type is ansi
#
```

You are now ready to prepare the fixed disk for the XENIX system.

**STEP 4 - Start the hdinit Program**

The hdinit (hard disk initialization) program lets you create a partition table for your fixed disk, prepare the fixed disk to receive XENIX programs and files, and copy important files to the fixed disk. To start hdinit:

a. Type:

```
hdinit
```

b. Press Enter.

The program displays a message about itself and the information you need to complete the installation.

Before proceeding with the installation, you need to know the following:

- Your time zone.
- The printer adapter your line printer is connected to.
- Your XENIX user file system size (in 1K-byte blocks), if you have another system in addition to XENIX already installed on your fixed disk.

Your time zone depends on your distance from Greenwich, England. Hdinit provides several predefined timezones for users.
in the United States. Other users can create a time zone by supplying the difference in hours between their local time and Greenwich time.

Your line printer can be connected to a Serial/Parallel Adapter, an alternate Serial/Parallel Adapter, or a Monochrome and Printer Adapter.

To ensure that you have all the necessary information, hdinit displays the prompt:

Are you ready to continue?

If you do not have the information and wish to stop the installation, type the letter n and press Enter. Otherwise, type the letter y and press Enter.

If you choose to continue the installation, hdinit displays the message:

Now Set Up the Hard Disk Partition Table

You are now ready to create the XENIX disk partitions.

STEP 5 - Create Disk Partitions

A partition is an area on your fixed disk that has been reserved for a specific use. The XENIX system requires two disk partitions: a root partition for the main body of XENIX files and a user partition for user programs and files. You can also reserve space for a third disk partition for additional XENIX file systems, or for non-XENIX file systems.
To create the disk partitions, follow these steps:

a. Make sure hdinit displays the message:

Choose one of the following options for setting the partition table.
1) Dedicate the entire disk to XENIX.
2) Dedicate disk to XENIX but leave a gap at the end.
3) Add partitions to the existing partition table.

Enter the desired partition option:

Warning: If you choose option 1 or 2, the hdinit program will write over any existing data on fixed disk.

b. Choose:

- Option 1 if XENIX is going to be the only operating system on your fixed disk.
- Option 2 if you want to reserve space for another operating system in addition to XENIX.
- Option 3 if you are modifying the standard installation procedure. Option 3 is not recommended for first installation. For more information about this option, see “Making a Nonstandard Installation,” the last section of this guide. Option 3 should also be used if IBM Personal Computer (DOS) is already installed on your fixed disk and you want to add a partition for XENIX.

If you choose option 3, go to “Making a Nonstandard Installation,” the last section of this guide.

Type an option number and press the Enter key.

If you choose option 1, hdinit proceeds with creating the root and user disk partitions without asking for additional information. If you choose option 2, hdinit displays the message:

Enter the size of the gap that will remain at the end of the disk (in K blocks) [0-5500]:
c. For option 2 only, type the size (in 1K-byte blocks) of the gap (third partition) and press the Enter key. Make sure the size you give is within the range 0 to 5500.

**Note:** The total number of blocks for the XENIX user file system and the third disk partition combined is 11,500. Because the XENIX user file system requires at least 6000 1K-byte blocks, you cannot allocate more than 5500 blocks for the third partition. If you want your user file partition to be larger than 6000 blocks, then you must specify a number less than 5500 blocks for the gap.

If the hdinit program finds a valid partition already established on your fixed disk, you will see the message:

```
A valid partition was detected during disk initialization. The partition was cleared and the initialization procedure should be restarted.

The machine will now be halted. Restart the installation procedure by running /etc/badtrack. Wait for the shutdown message and press ENTER to reboot XENIX from the diskette.
```

If the above message appears on your screen, press Enter and restart the installation procedure again from **STEP 2**. The fixed disk must be initialized again.

d. The hdinit program now completes the creation of the root and user disk partitions.

**Note:** When creating the disk partition table, hdinit may display the message

```
Warning: invalid partition table on drive 0
```

This message simply indicates that no partition table has been created for the fixed disk yet and can be ignored.

8 Operating System Installation
STEP 6 - Set the Line Printer Port

To set the line printer port:

a. Make sure hdinit displays the message:

Please enter the line printer configuration that suits your system. You may enter one of the following options:
   1 for no line printer
   2 for Serial/Parallel Adapter, Parallel port
   3 for alternate Serial/Parallel Adapter, Parallel port
   4 for Monochrome and Printer Adapter

   Enter printer option:

b. Select a port by typing an option number and pressing the Enter key.

The hdinit program uses your choice to prepare a device file for the line printer.

STEP 7 - Set the Time Zone

After you set the line printer port, hdinit asks for your time zone. It displays the message:

Please enter the name of your local time zone. The system will be set up to use this whenever you invoke the date command. You may enter any one of the following time zones:

   Greenwich
   Atlantic
   Eastern
   Central
   Mountain
   Pacific
   Other

Enter time zone:

Type the correct name and press Enter. For example, if you are in the Eastern time zone, type Eastern and press Enter.
If you are not in one of the predefined time zones, you can create your own time zone by typing **Other**. To create your own time zone, follow these steps:

a. Type

    **Other**

    and press Enter. The program displays the message:

    **Three pieces of information are necessary:**
    1) The three letter abbreviation for the current timezone.
    2) The difference in hours from GMT. The difference can be negative if the position is east of England.
    3) The three letter abbreviation for the daylight-saving local timezone if applicable.

    Enter timezone abbreviation:

b. Type a three-letter abbreviation and press Enter. The program displays the message:

    Enter hours difference from GMT (range -11 to 12):

c. Type the number of hours difference between your local time and Greenwich, England and press Enter. The program displays the message:

    Enter daylight timezone abbreviation
    Press Enter if not applicable:

    Type a three-letter abbreviation and press Enter if you wish to use daylight-saving time. Otherwise, just press Enter.
STEP 8 - Making the Root and User File System

Further processing of the hdinit program does not require any intervention from you. Let the program run until you see the message XENIX SYSTEM INSTALLATION COMPLETED. Do not press any keys or touch the system until then. To let you know that it is working, hdinit prints messages about its progress on the screen. The complete process takes a few minutes.

STEP 9 - Stop the Installation System

When hdinit has finished, you must stop the computer and remove the Installation diskette. Follow these steps:

a. Wait for the red light on the diskette drive to go out.

b. Type:

    haltsys

    and press Enter. The program stops the computer and displays the message:

    ** Normal System Shutdown **

    Press ENTER to reboot:

c. Remove the Installation diskette from diskette drive A and leave the drive empty. In this case, you can remove the diskette even if the red light on the diskette drive is still on.
STEP 10 - Start the Newly Installed XENIX System

You can now start the XENIX system from the newly installed root file system on your fixed disk. Follow these steps:

a. Make sure diskette drive A is empty.

b. Press Enter. The computer loads the XENIX boot program from the fixed disk and displays the following message and prompt:

   XENIX 286 boot

   Enter: device program

   Press Enter for default: hd /xenix

   :

c. Press Enter. The program displays the message:

   : hd /xenix
   Loading

   and begins to load the XENIX operating system from the fixed disk. The system displays some copyright information, some system facts, then the following message and prompt:

   No single-user login present
   Entering System Maintenance Mode
   Terminal type is ansi
   #

You are now ready to install the rest of the XENIX Operating System using the xinstall program.
STEP 11 - Install the Programs and Files

You must now copy the programs and files of the IBM Personal Computer XENIX Operating System from the XENIX Operating System distribution diskettes to the fixed disk. Follow these steps:

a. Examine your distribution diskettes to make sure that all diskettes are present and that they are in the proper order. The first diskette is numbered Base #1.

b. Type:

\texttt{xinstall base}

and press Enter. The argument \textit{base} tells xinstall that the XENIX Operating System is to be loaded.

\textbf{Note:} The argument \textit{text} is used for the Text Processing System, and \textit{soft} for the Software Development System. You will need to use these arguments when you install those systems. For now, make sure you type \textit{base}.

The xinstall program first performs a five- or six-step check of the file system. It then explains how to insert the distribution diskettes and displays the message

\texttt{First Diskette? [y,n]}

c. Choose the first distribution diskette (#1) from the Base distribution set.

d. Insert the distribution diskette into drive A.

e. Type:

\texttt{y}

and press Enter. The program copies files from the diskette. It displays the names of the files as they are copied.
f. Wait for the message:

Insert the next diskette when the drive light goes out.
Next Diskette? [y,n]

or the message:

tar: please mount new volume

then insert the next base distribution diskette into drive A.

If you see the message:

Next Diskette? [y,n]

type  y and press Enter. Otherwise, just press Enter.

Continue this procedure until all base distribution diskettes have been copied.

g. When all base diskettes have been copied, type:

n

(for “ no ”) and press Enter when you see the:

Next Diskette? [y,n]

message.

This program establishes directories for the system and assigns permissions for each file. When it is finished, the program displays the following message:

Installation complete

The IBM Personal Computer XENIX Operating System is now installed on your fixed disk. You will now create the super-user password.
STEP 12 - Create the Super-User Password

The super-user password keeps the system safe from unauthorized use. It is important that you create a super-user password immediately after the system has been installed to ensure maximum protection of the system and prevent unnecessary use of the super-user account.

To create the super-user password, follow these steps:

a. Type:

    passwd root

    and press Enter. The system displays the message:

    New password:

    The new password can be any sequence of letters, numbers, and/or punctuation marks, but must be at least five characters long.

b. Type the new password and press Enter. The password is not displayed nor does the cursor move as you type, so type carefully. After you press the Enter key, the system displays the message:

    Retype new password:

c. Type the new password once more and press Enter. Make sure you type it correctly, otherwise the program ignores the change.

The super-user password is now in place. From now on, the password will be required whenever you attempt to access the system as the super-user.

Do not forget the super-user password. Restoring a forgotten super-user password requires reinstallation of the XENIX system. If necessary, keep a copy of the password in a safe place.
If you are installing XENIX options, text formatting or software development, continue with the next section. If you are only installing the operating system, skip to “After Installation” at the end of XENIX options section.
Installing XENIX Options

This section describes the installation of the IBM Personal Computer XENIX Software Development System and the IBM Personal Computer XENIX Text Formatting System. You can install the options immediately following installation of the operating system or after using the operating system. You will copy the programs and files from the XENIX diskettes to your fixed disk.

System Maintenance Mode

To install XENIX options on the fixed disk, your computer must be in the system maintenance mode. You must be in system maintenance mode to install XENIX system files or to reconstruct the system.

If you have just switched your computer on, go to step number 2 on the next page.

1. You must halt the operating system to enter system maintenance mode.

   **Note:** You should notify all other users to log-off the system.

   a. Log in as the super-user.

      **Note:** If you have just finish installing the operating system, you are already signed on as super-user. Go to step b.

      To log in as the super-user:

      1) At the login prompt type:

         `root`

      2) Press Enter.
3) Type the super-user password.

b. Type:

```
haltsys
```

c. Press Enter.

The operating system halts and the following message is displayed:

```
** Normal System Shutdown **
Press Enter to reboot:
```

d. Press Enter as indicated.

2. When the prompt:

```
XENIX 286 boot
Enter: device program
Press Enter for default: hd /xenix :
```

appears on the screen, press Enter.

3. When the prompt:

```
Type Ctrl-d to proceed with normal startup,
(or give root password for System Maintenance):
```

appears on the screen, type the super-user (root) password.

You are now in system maintenance mode and ready to install the XENIX options. Follow the appropriate steps in the next two sections for the XENIX option you are installing.
Installing the Text Formatting System

Note: Your computer must be in system maintenance mode to install the XENIX Text Formatting System.

Follow these steps:

1. Remove the Text Formatting System diskette from the back of the binder.

2. At the prompt:

   Terminal type is ansi
   #

   Type:

   xinstall text

   and press Enter.

   The program first performs a five- or six-step check of the file system. Read the explanation about how to insert the diskette.

   When the message appears:

   First Diskette? [y,n]

3. Insert the diskette into diskette drive A. Type:

   y

   and press Enter. The program begins to copy files from the diskette. It displays the names of the files as they are copied.

4. Wait for the message:

   Next Diskette? [y,n]
5. Type

n

(for “no”) and press Enter.

The program displays a message while it establishes directories for the system and assigns permissions for each file. When it is done, the program displays the following message:

Installation complete.

If you are installing both the XENIX Software Development System and the XENIX Text Formatting System, you must complete this section and continue with the next section. If you are installing only the XENIX Text Formatting System skip the next section.
Installing the Software Development System

Note: You computer must be in system maintenance mode to install XENIX Software Development.

Follow these steps:

1. Remove the three Software Development System diskettes from the back of the binder.

2. Type:

   `xinstall soft`

   and press Enter.

   The program first performs a five- or six-step check of the file system. Read the explanation about how to insert the distribution diskettes. When the message appears:

   `First Diskette? [y,n]`

3. Choose the first diskette labeled (#1) from the set.

4. Insert the diskette into diskette drive A. Type:

   `y`

   and press Enter. The program begins to copy files from the diskette. It displays the names of the files as they are copied.

5. Wait for the message:

   `Next Diskette? [y,n]`

   Remove the diskette from drive A and insert the next diskette from the set and type:

   `y`

   Continue this procedure until all diskettes for XENIX Software Development have been copied.
6. When all diskettes have been copied and you see the:

Next Diskette? [y,n]

message, Type:

n

(for “no”) and press Enter.

The program displays a message while it establishes directories for the system and assigns permissions for each file. When it is done, the program displays the following message:

Installation complete.

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After Installation

If you are familiar with the XENIX operating system, you can continue with normal startup of the XENIX system and begin working with it. Just hold down the Ctrl key and type the letter d. Refer to the explanation of normal startup in the IBM Personal Computer XENIX Basic Operations Guide if you have problems.

If you want to add more user accounts or user terminals, see Chapter 3, “Preparing XENIX for Users” and Chapter 7, “Using Peripheral Devices” in the IBM Personal Computer XENIX System Administration book.

If you are not familiar with the XENIX Operating System, halt the system and turn to the XENIX Basic Operations Guide to learn how to start the system, how to log in, and how to run programs.

To halt the system, follow these steps:

1. Type:
   
   \texttt{haltsys}
   
   and press the Enter key. The system displays the following message:
   
   ** Normal System Shutdown **
   
   Press ENTER to reboot:

2. Switch off power to the computer.

Make sure you see the shutdown message before you switch off the computer.
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You can use option 3 in step 5 of the standard installation to modify the standard procedure and allow the creation of your own disk partitions. Option 3 lets you define the location and size of a disk partition and use this partition for your user file system. This option is useful when reinstalling the XENIX system to allow for nonstandard use of the fixed disk space. This option is also useful if DOS is installed first and you want to add XENIX.

**Note:** If DOS or another operating system is already installed and you want to add XENIX, you need the following:

- A contiguous area on your fixed disk of 9000K-bytes for the root file system. (9 mega bytes)
- A contiguous area of at least 6000K-bytes for the user file system. (6 mega bytes)

In general, the installation is identical to a standard installation. Follow the standard installation procedure until you get to **STEP 5** and return here.

1. Make sure the hdinit program displays the message:

   Choose one of the following options for setting the partition table.
   1) Dedicate the entire disk to xenix.
   2) Dedicate disk to XENIX but leave a gap at the end.
   3) Add partitions to the existing partition table.

   Enter the desired partition option:

2. Choose option 3 by typing the number 3 and pressing the Enter key. The program displays a table defining the type and sizes of partitions already on the fixed disk, followed by the message:

   Enter the root partition number [1-4]:

Nonstandard Installation 25
3. Make sure a partition is already defined for the bad track table. This partition is labeled BTT. Also, make sure there are at least two empty (not defined) partitions available for the XENIX root file system and the XENIX user file system.

4. Choose a partition number for the XENIX root file system by typing the partition number and pressing the Enter key. After you enter a number, the program displays the message:

   Enter the user partition number [1-4]

5. Choose a partition number for the XENIX user file system by typing the partition number and pressing the Enter key. After you enter a number, the program displays the message:

   Enter the starting root cylinder number [0-615]:

6. Type the starting cylinder number for the root partition and press the Enter key. The starting cylinder must start an area on fixed disk that has 9000 contiguous 1K-byte blocks. Once you have made your choice, the program displays the new partition information and the message:

   Enter the starting user cylinder number [0-615]:

7. Type the starting cylinder number for the user partition and press the Enter key. The starting cylinder must start an area on fixed disk that has 6000 contiguous 1K-byte blocks. Once you have made your choice, the program displays the message:

   Enter the size of the user partition in K blocks (at least 6000 blocks):

8. Type the size of the user file system in 1K-byte blocks and press the Enter key. The size must be in blocks. If the partition occupies all of the fixed disk except for the XENIX root file system and the bad track table partition, the size can be 11,500. If you have another partition, the combined size of the new partition and the other partition must not exceed 11,500 blocks. After you enter the size, the program displays the new partition information and the message
Is this information correct? (y,n):

9. If the information is correct, type \textit{y} and press the Enter key. Otherwise, type \textit{n} to enter the information again. If you choose \textit{y}, the program continues with the standard installation, STEP 6, asking you for the line printer port.
Reader’s Comment Form

XENIX™
Installation Guide

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