

The XENIX™
Operating System

for the IBM PC™
Installation Guide

The Santa Cruz Operation, Inc.

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The Santa Cruz Operation, Inc.
500 Chestnut Street
P.O. Box 1900
Santa Cruz, California 95061
(408) 425-7222 · TWX: 910-598-4510 SCO SACZ

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1. Overview

This guide explains how to install the XENIX™ system on an IBM PC XT™ or compatible computer. The XENIX Operating System is a powerful system of programs that gives your computer the same multi-user, multi-tasking capabilities as many large and expensive computers. Installing the system involves initializing the hard disk, then copying the XENIX utilities from the XENIX distribution floppies to the initialized hard disk.

2. XENIX System Distribution

The complete XENIX System consists of the following three distribution packages:

- The Operating System
- The Text Processing System
- The Development System

The Operating System contains the XENIX programs you need to create multiple user accounts, manage file systems, create and manage files and perform system maintenance tasks.

The Text Processing System contains the XENIX programs you need to create, edit, and typeset documents.

The Development System contains the XENIX programs you need to create, compile, and debug assembly and high-level language programs.

3. How To Use This Guide

Read through this guide thoroughly before beginning the installation procedure so that you become familiar with the various steps and with the terminology used in each section. If you run into difficulties during the installation, call the SoftCare Center at The Santa Cruz Operation for assistance.

A few rules of thumb:

1. During the installation you will be using the keyboard to enter information. Always:
 - Begin each command after a prompt (often a \$, % or # symbol).
 - Type all requested names and numbers exactly as shown.
 - Complete a line by pressing RETURN.

NOTE: The RETURN key is sometimes denoted on the keyboard by a "down-left" arrow.

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2. If you make a typing error, you can erase the character:
 - By using the backspace key OR
 - By holding down the CONTROL key as you type the letter "h".
3. To delete everything you have typed on a line, hold down the CONTROL key as you type the letter "u".
4. A couple of additional items to be aware of:
 - <y/n>? is asking "yes or no?", and always requires a response from you (type "y" or "n" and press the RETURN key).
 - the ^ symbol refers to the CONTROL key, and will be followed by a letter which used in combination with the CONTROL key has a special meaning.
Example: ^h means backspace
 - The RETURN key on the keyboard of your IBM PC may have a large single arrow pointing left on it rather than the word "return". In this guide, however, it is written this way:
RETURN
 - Commands referred to in text are shown in boldface with the reference manual section next to the command in parentheses (for example cat(C)). Refer to the preface of the XENIX *Reference* for a guide to the various reference sections.

4. Installation Procedure

4.1 Overview

The installation procedure has six steps:

1. Starting XENIX from the Bootable Floppy Set.
2. Initializing the hard disk with the `hdinit` program and, if desired, modifying the hard disk partition table to share space with the DOS operating system. Note: DOS refers to the MS-DOS™ and PC-DOS™ operating systems.
3. Re-starting the system from the newly initialized hard disk.
4. Copying the XENIX utilities.
5. Creating the super-user password.
6. Creating the first user account.

The following sections describe each step. When you have completed the installation, be sure to store this guide and the distribution floppies in a safe place. You will need them again if you wish to reinstall the system for any reason.

4.2 What You Need

To install the XENIX System you need:

- An IBM XT Personal Computer, or an IBM PC with an XT upgrade unit with at least 256K bytes of memory.
- One hard disk with at least 10 megabytes of storage.
- One double-sided floppy disk drive.
- The XENIX System Distribution disks.

The XENIX System Distribution set contains these floppies:

- The XENIX Operating System floppies. The *Release Notes* delivered with this guide contain a list of the floppies in this set and the files included on each floppy.
- Optional: Text Processing floppies. The *Release Notes* delivered with the *Text Processing Guide* contain a list of the floppies in this set and the files included on each floppy.
- Optional: Development floppies. The *Release Notes* delivered with the *Programmer's Guide* contain a list of the floppies in this set and the files included on each floppy.

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4.3 Before You Start

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

1. How to turn the computer off and on.
2. How to insert floppies into the floppy disk drive.
3. How to reset the computer.
4. There is currently no XENIX utility that locks the hard disk. To do this, refer to the appropriate IBM PC documentation for information about locking the hard disk. It is advised that you lock the hard disk if you move your computer.

If you have just assembled your computer for the first time or are unsure about the items listed above, briefly review the hardware manuals provided with your computer and hard disk. The hard disk or XT upgrade unit must be connected to your computer according to manufacturer's specifications. Also, we suggest you run a system self-test as described in the *IBM PC Guide to Operations* in order to detect possible hardware problems.

4.4 Starting XENIX From The Bootable Floppy Set

You are ready to start the actual installation process. Find the distribution disks labeled "Bootable" and "Root" and follow these steps:

1. Insert the Bootable floppy into the floppy drive. If there are two drives, use the primary, or left drive, (sometimes called the boot drive).
2. Turn on your computer and the hard disk (If you have an IBM PC with an XT expansion unit, turn the XT expansion unit on first).

The computer loads the XENIX bootstrap program from the disk and begins to execute it. Note the total amount of memory available. This number will be displayed in the upper left corner of the screen. You will use this value when selecting the small version or the full version XENIX in the section *Installing the XENIX Distribution Floppies*. The copyright message is displayed, then the system performs a self-check to determine if there are any problems with the hardware. The letters A-H appear in succession. After XENIX is loaded in memory the system displays a message about the amount of memory remaining.

Bootable sequence:

H

mem = xxxK

Insert root floppy and hit RETURN

3. Remove the Bootable floppy and insert the Root floppy. Press RETURN.

4. The remaining letters of the alphabet are displayed. After Z, the message appears:

No single-user login present
Entering System Maintenance Mode

If the letters stop displaying before the letter "Z" is reached, run hardware diagnostics as explained in your computer manual, correct any identified problems and start the installation procedure again. If the letters stop again, call The Santa Cruz Operation SoftCare Center and be prepared to tell them at what letter the display ended.

The self-check using letters A-Z will occur every time you bring up your XENIX system. However, after this initial installation, the self-check won't display messages referring to Bootable and Root.

5. Once the system begins to run, the following is message displayed:

XENIX V3.0 Hard Disk Initialization Floppy
(backspace is ^h, erase line is ^u)
Use "hdinit" to initialize hard disk
<Installation>

When you see this message you are ready to proceed with the second installation step, *Initializing the Hard Disk*.

4.5 Initializing The Hard Disk

You use the `hdinit` program to install the XENIX Operating System on the hard disk. As part of the initialization process, you may partition the hard disk, using the `fdisk(C)` utility, to support both DOS and XENIX on the same hard disk, or allow XENIX to use the whole disk.

The following steps describe how to initialize the hard disk.

1. After the <Installation> prompt type:

`hdinit`

and press RETURN.

Watch for this message:

WARNING: This installation program could destroy the
the present contents of your hard disk.
Refer to DOS documentation to preserve
an existing DOS filesystem.

Do you wish to continue (y/n)?

NOTE: If you have any files on the hard disk that you wish to save before installing XENIX follow this procedure.

Type:

`n`

and press RETURN.

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The following message appears:

Aborting initialization procedure

At this point the system shuts down automatically, as the following message is displayed on the screen:

**** NORMAL SYSTEM SHUTDOWN ****

Remove the floppy disk, and reboot your existing operating system. After you have backed up the files you want to save, restart the XENIX installation procedure from the beginning.

2. If you don't have any files you want to save, overwrite your hard disk with the XENIX Operating System, by typing:

y

and press RETURN.

hdinit invokes fdisk(C) (for more information about fdisk, see Appendix C of the XENIX *Operations Guide* and the fdisk(C) manual page in the XENIX *Reference*). After a moment, information generated by fdisk(C) will appear on the screen. You will see a list of options as follows.

1. Create Partition
2. Change Active Partition
3. Delete Partition
4. Display Partition Table
5. Create XENIX Partition for Whole Disk

Enter Choice:

Enter option "4" and press RETURN to see the partition table. The result may look like this:

PARTITION	STATUS	TYPE	START	END	SIZE
1	A	XENIX	000	304	305
2	N	XENIX	000	000	000
3	N	XENIX	000	000	000
4	N	XENIX	000	000	000

If the partition table looks like this, and you would like XENIX to occupy the whole disk, then type "q" and press RETURN. If your disk has been formatted for DOS and you want XENIX to reside with it on the hard disk, refer to the fdisk(C) manual page, Appendix C of the XENIX *Operations Guide*, and the "Partitioning Your Fixed Disk" section of the "Preparing Your Fixed Disk" chapter in the DOS documentation. Refer to the *Release Notes* section on "Dos Support" for a table with various XENIX System configuration space requirements.

To create a DOS partition, you need to create the partition under DOS using DOS fdisk.

NOTE: Under DOS the XENIX partition(s) will be displayed as "OTHER". Under XENIX the DOS partition(s) will be displayed as "DOS".

Check that you have partitioned the disk as desired by using the Display Partition Table command. If it is correct, you can then type 'q'. You can also add a DOS filesystem after you have completed installing XENIX.

3. The following message appears:

Analyzing hard disk:
this procedure will take at least 5 minutes.

Scanning blocks XXXX-XXXX

Wait a few minutes while the `hdinit` program creates a file system and copies XENIX utilities to it. Messages appear on the screen to report the progress of the program.

If the disk is perfect this message appears:

0 bad blocks in bad block table.

If bad blocks exist, the system will see that they are not used. A table of bad blocks will be displayed. Refer to `bad blkutil(M)` manual page in the XENIX Reference. In any case, installation will continue.

The next message is:

Making hard disk bootable

Information about the filesystem size is displayed. Ignore the following error message:

```
mkfs: file /hdboot bad format -- ignored
```

It is possible at this point to vary the number of blocks allocated for the swap space within the range 1000-6064. If you don't enter a value, 1200 blocks will be allocated for swap space. This is the recommended size.

When the `hdinit` program is finished the system shuts down and displays the following message:

```
** NORMAL SYSTEM SHUTDOWN **
```

Now the system can be started from the hard disk. Remove the Root floppy from the floppy drive.

4.6 Starting XENIX From the Hard Disk

This section explains how to start the XENIX system by loading a copy of it from the hard disk into the computer's memory.

1. Reset the computer. To do this, open the door of the floppy drive, turn off the power to the computer, wait 15 seconds, then turn the power back on to reboot the system. The floppy drive light may stay on.
2. As the system reboots, numbers display on the screen. Write down the last number that displays at the top of the screen. This number indicates how much RAM (random access memory) your computer has and is necessary later in the process of installing XENIX. For example:

640KB RAM (Memory) ok

3. Wait a few minutes. Booting from the hard disk normally takes about 45 seconds, depending on how much memory your computer has.

NOTE: If nothing happens within 10 minutes, check that the hard disk is connected properly to your computer and is receiving power. If it still hasn't booted, turn your computer off, wait 20 seconds, then turn the power on again. Also try running hardware diagnostics as explained in your computer manual. Correct any identified problems and start the XENIX installation procedure again.

After you have completed the above steps, the computer reads a copy of the XENIX Operating System from the hard disk into memory. Then the system begins to execute. As before, the system performs a self-check to determine where any problems exist with the hardware. The letters A-Z appear successively on screen. If the letters displaying stop before the letter "Z" is reached, run hardware diagnostics as explained in your computer manual. Correct any identified problems and start the XENIX installation procedure again. If the letters stop again at this point, call The Santa Cruz Operation SoftCare Center and be prepared to tell them the last letter displayed.

After you start the system from the hard disk `fsck(C)` is run to check the integrity of the filesystem. See the `fsck(C)` manual page for the function of this program.

The next section describes points to be aware of before installing the distribution floppies. Please read all of the section "Special Notes on Installing the XENIX Operating System" before continuing with installation. The installation procedure continues in the section "Installing the XENIX Distribution Floppies".

4.7 Special Notes on Installing the XENIX Operating System

4.7.1 Small Version XENIX vs. Standard Version XENIX

While installing Operating System floppy #1 you will be asked if your system has 384K Random Access Memory (RAM) or more. The Operating System floppy # 1 contains both a small version and a standard version of XENIX. Small version XENIX is designed to run on machines with less than 384K RAM and has one console screen rather than the 1 console and 9 additional screens supported by the standard XENIX kernel. There is also less buffer size available in the small version of XENIX. Standard XENIX contains full functionality of 10 screens and maximum buffer size. Answer "y" or "n" depending on the amount of RAM available on your machine.

If you are currently installing the small version of XENIX, and you later increase the amount of RAM available, you may re-install this floppy independently. You do not need to re-install the entire Operating System Package. To install standard XENIX instead of the existing small version of XENIX, login as "root". Type

```
# /etc/install
```

Then insert Operating System floppy #1. When you reboot with the additional memory, the bootstrap program will display the increased memory size. Answer "y" when asked, if you have 384K or more RAM.

4.7.2 uucp

One of the Operating System floppies installs `uucp(C)` and files on which `cu(C)` depends on your XENIX system. The `uucp` system is designed to permit communication between XENIX systems using dial-up or direct communication lines. `uucp(C)` provides file transfer and remote command execution through a batch-type operation. It is necessary to install this program if you want to be able to communicate with The Santa Cruz Operation via electronic mail for support purposes. See the chapter "Building a UUCP System" in the *XENIX User's Guide* and the `uucp(C)` manual page in the *XENIX Reference* for more information about `uucp`.

NOTE: You may use `cu(C)` without the `uucp` floppy by creating your own *L-devices* file. An example *L-devices* file is given in Chapter 7 of the *XENIX Operations Guide*.

You may not wish to install `uucp` at this time. If you don't have a modem available or do not intend to use `uucp` to communicate with other XENIX systems, you can skip this floppy. You will be informed when the `uucp` floppy is the next to install by the following prompt:

```
The next floppy contains networking programs.  
These are used for communication between computers via  
phone lines or direct lines. If you don't need this  
feature and would like to save disk space,  
do not install this floppy.
```

If there are more floppies in the Operating System package insert the next floppy (after the `uucp` floppy) and type "y". You may then continue the installation.

The `uucp` floppy can be installed at a later time. Login as "root" and type

```
# /etc/install
```

(similar to the procedure described above for changing small version XENIX). Insert the `uucp` floppy in the disk drive.

4.7.3 Time zone

During the installation of the last XENIX Operating System floppy you will be prompted for your time zone. The time zone is represented by three letter designations (such as PST for Pacific Standard Time). The program will also ask whether you are in an area which observes daylight saving time.

4.8 Installing the XENIX Distribution Floppies

The next stage of the installation installs the XENIX distribution floppies you purchased.

To copy the floppy disks onto the hard disk, you will need to be able to perform the following steps:

1. You must install the Operating System set first, before the Text Processing or Development set.

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2. Floppies in each set must be installed in numeric order (you should start with floppy # 1 and progress through the last numbered floppy in each set).
3. Insert the floppy in the floppy drive (if there are two drives, insert the floppy in the primary, or left, drive) and press RETURN. The name of each file is displayed as it is installed.
4. Remove each disk when the floppy drive light goes off and you see the message:

Next Floppy <y/n>?

Insert the next floppy. After you have inserted all the floppies in a set, answer "n" to this question.

You will be prompted for installation of the three separate packages (Operating System, Development System, and Text Processing System) that comprise the complete XENIX system. The following message is displayed:

For each floppy in the distribution set, insert the floppy, type 'y', and press the RETURN key. Type the letter 'n' after the last floppy. Should you ever see the message:

'tar: please insert new volume, then press RETURN'

insert the next floppy, and press the RETURN key.

Do not interrupt the installation procedure when you see a "tar" message.

1. First, you will be asked

Install Operating System package? <y/n>

This package must be installed before either the Text Processing or Development packages. Its installation is not optional. Answer "y" to install this package.

2. Then you will see the message:

First Floppy <y,n>?

Proceed by inserting Operating System floppy # 1 in the floppy drive, type "y" and press RETURN. The message

Extracting files from floppy

will be displayed on your screen, followed by a listing of files currently being taken from the floppy disk.

3. You will be asked

Does your system have 384k RAM or more <y/n>?

Answer appropriately for your system.

If you answered "y", the installation procedure reports:

Removing small XENIX, fsck and ttys

If you answered "n", the message

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Moving small XENIX, fsck and ttys into place.
will be displayed.

4. In both cases, the process continues:

Installing XENIX on hard disk.

followed by a report of the number of records copied in and copied out. You will be prompted with the message:

Continue with installation...

Next floppy <y/n>?

Continue as described above, by inserting the next numbered floppy in the sequence, answering "y" and pressing RETURN.

One of the programs on the last XENIX Operating System disk will automatically set your system to the correct time zone.

1. You will see the following displayed:

This program will set the correct timezone.

Does daylight savings time apply here (y/n)?

Answer by typing a "y" or an "n" and press RETURN.

2. Next you will see:

Are you in the United States (y/n)?

If you answer "y" and press RETURN, the following is displayed:

- | | |
|--------|--------------------------------|
| 1) AST | Atlantic Standard Time |
| 2) EST | Eastern Standard Time |
| 3) CST | Central Standard Time |
| 4) MST | Mountain Standard Time |
| 5) PST | Pacific Standard Time |
| 6) YST | Yukon Standard Time |
| 7) HST | Hawaiian/Alaskan Standard Time |
| 8) NST | Nome Standard Time |

Please select the number that represents your timezone:

Answer with a 1,2,3,4,5,6,7 or 8 and press RETURN.

If you are not in the United States (or one of the time zones represented above), and answered "n", the following is displayed:

What is the standard abbreviation of your timezone (3 capital letters)?

Type three upper case letters which represent your time zone and press RETURN. Next you will see this message:

How many hours west of Greenwich Mean Time are you?

Answer with a number between -23 and 23 and press RETURN.

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3. The time zone variable, `TZ`, in the files `/etc/rc` and `/etc/profile` are changed accordingly. The original copy of the file is saved, and you see this message:

```
Backing up /etc/rc as /etc/rc.old.  
Backing up /etc/profile as /etc/profile.old.
```

Timezone successfully updated.

Your time zone is now set. There is no need to change the `.profile` for a user, unless they call in from a different time zone, and want to override the local standard. There is no way to automatically change the time zone for `csb` users. Each `csb` user will need to modify their `.login` with the appropriate `TZ` setting.

5. Then you see the prompt:

```
Next floppy <y/n>?
```

Answer "n" after the last floppy in the Operating System package has been installed.

The XENIX Operating System is now installed on your hard disk.

6. The following message is displayed on the screen.

```
XENIX Operating System Installation complete.  
Install Software Development Package? <y/n>
```

If you have purchased this package as part of your XENIX system, type "y". Perform the necessary steps as before. Otherwise, type "n". If desired, you can install this package later. Type `/etc/install` and the utility will prompt you for the series of floppies.

7. Finally, you will be asked:

```
Install Text Processing Package? <y/n>
```

Again, answer appropriately for the XENIX package you purchased and install as before. This may also be installed later using `/etc/install`.

8. Then the message:

```
Setting up empty directories
```

```
** NORMAL SYSTEM SHUTDOWN **
```

```
** Safe to Power Off **
```

```
-or-
```

```
** Hit Any Key to Reboot**
```

will be displayed on your screen. When this happens, open the floppy drive door and hit any key. The system will proceed to reboot. You will see the message:

Type CONTROL-D to proceed with normal startup,
(or give root password for system maintenance mode):

9. Press RETURN to create a root (super-user) password. The system displays a message and a prompt:

Entering System Maintenance Mode

Terminal type is ibm
Erase is CONTROL-H
Kill is CONTROL-U

#

4.9 Creating 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 (also known as "root") account. It is very easy to make errors when logged in as super-user that could result in the destruction of files. It is extremely important that you login as super-user only to install programs and to do system maintenance tasks. For a complete description of the super-user, see the XENIX Operations Guide.

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

1. Type

passwd root

and press RETURN.

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 5 characters long.

2. Type the new password and press RETURN.

The system does not display the password as you type so type carefully. After you press RETURN the system displays the message:

Retype new password:

3. Type the new password once more and press RETURN. Make sure you type it correctly, otherwise the program will ignore 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 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 super-user password in a safe place.

4.10 Creating the First User Account

The last step in the installation is to create the system's first user account, "guest". This guest account is a temporary workspace on the system that you may use to practice with the XENIX system. Later, after installation is complete and you are familiar with the XENIX commands, you can remove the guest account and create private accounts for all the system users.

To create the first user account, follow these steps:

1. Type
 mkuser
and press RETURN. The system displays the message:
 Newuser
 Add a new user to the system

 Do you require detailed instructions? (y/n/q):
Type
 n
and press RETURN (you can examine the instructions at some other time).
 2. The system will ask for more information:
 Enter new user's login name:
Type
 guest
and press RETURN. The name "guest" is now the login name for the new user account.
 3. Next, the program asks for a group name:
 Do you want to use the default group? (y/n)?
Type
 y
This will set the group to "group".
 4. Next, the program asks for the new user's password.
 Enter password
Press RETURN. This allows you to use the guest account without giving a password.
- Next, 5.
5. ENTER shell type (1, 2, or 3) and press ENTER:
Type "1" and press ENTER. The guest account has an sh(C) shell.

6. Finally, the program asks for comments.
please Enter Comment >.....
>
Type
guest account RETURN
7. The system asks if you want to change anything. Type:
n
and press RETURN.

The new guest account is ready. Later, when you turn to the XENIX User's Guide, you may use this account to, for instance, practice logging in, make directories and run programs.

5. The Next Step

If you are familiar with the XENIX Operating System, you may continue with normal startup and begin working. Just hold down the CONTROL key and type "d". Refer to the explanation of normal startup in the *XENIX Operations Guide* if you have problems.

If you are not familiar with the XENIX Operating System, we recommend that you halt the system and turn to the *XENIX User's Guide* and the *XENIX 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
/etc/haltsys
and press RETURN.
2. Wait for the following message:
** NORMAL SYSTEM SHUTDOWN **
** Safe to Power Off **
-or-
** Hit Any Key to Reboot**
3. When you see the shutdown message, it is safe to turn off the power to the computer and the XT expansion unit.