

Lite Edition: This manual was prepared for System Commander v3, and shows features and capabilities not available in this Lite edition. In particular, SC Lite supports up to 4 OSeS in primary partitions, and does not have the MultiFAT feature to include multiple OSeS in the same partition. To install this Lite edition, run SETUP from the installation CDROM directory. The installation instructions in this manual about using a diskette are not applicable.

System Commander®

User Manual



SYSTEM COMMANDER USER MANUAL

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EDITION

April 2000
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Part Number S0400-301
Printed in the United States

PUBLISHED BY

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Notes



Preface

In an attempt to ensure that you get all the information you need before you undertake installing multiple operating systems (hereafter referred to as OSES) on your PC, we have included as much information in this manual as is feasibly possible. Some of the information is of a very technical nature, and we recommend that you read it carefully before you proceed. We have tried to conceive of every possible situation and include it here.

This manual is organized into very distinct chapters. The first chapter gives you an introduction to System Commander and an introduction to common terminology used through out this manual.

The second chapter gives you an overview of how System Commander works and what it can do for you. It also gives you some suggestions of things you can do before you actually install System Commander.

In the third chapter we will walk you through installing System Commander on your machine, what to do if there are problems and finally where to go from there.

The fourth chapter covers common installations of multiple OSES on your computer. It covers almost every major OS, some of their quirks, and how to get them to work for you. Here, we have tried to cover almost every circumstance you will encounter.

Chapter Five is a detailed explanation of the inner workings of System Commander, it's internal options and the utilities that are installed with it.

Chapters Six, Seven, Eight and Nine cover some of the most frequently asked questions (Ch. 6), troubleshooting assistance (Ch. 7), recovery from crashes or other OS disasters (Ch. 8), and the limitations of specific operating systems (Ch. 9).

Finally, the five appendices detail more technical information on System Commander (Appendix A), our company and some of its other products (Appendices B and C) as well as products from other companies which work well with or require special handling when using System Commander (Appendix D) and an in-depth explanation of some specific OS commands (Appendix E).

In each chapter there are technical highlights and tips. And, of course, some contain warnings and troubleshooting help that may get you out of any unforeseen bind. In addition, there is a very detailed index to point you to the location of whatever topic you wish.

The length of the manual may be daunting to some, but we strongly urge you to read through it at least once before you install System Commander. The organization of the chapters is intended to make finding information easier for you and hopefully the information contained within these pages will make it easier to accomplish your objective with System Commander.

Conventions and Icons used throughout this manual

Chapters are organized for ease of use and like information is grouped together where possible.

Step by step instructions follow almost every process or procedure. These steps are noted by their order numerically.

Key-stroke commands are noted in **bold** letters. Command key combinations are separated by the "-". This indicates that the noted keys are to be pressed simultaneously. For example, **ALT-S** signifies that you should hold down the **ALT** key while pressing the **S** key.

OS filenames, for example, AUTOEXEC.BAT, are noted in ALL CAPS.

OS commands and command lines are indicated by **bold lower case letters**. As in, "**copy *.***".

Besides icons noting specific operating systems throughout this manual, the following are used to indicate specific types of information. The

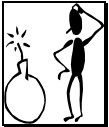
applicable information follows each icon in indented paragraph format as shown below:



Troubleshooting Help. This icon may save you a call to technical support.



Tip. Read information highlighted by this icon carefully. It lets you know that we are about to impart some great wisdom.



Warning! Information following this icon may help you avoid a problem!



Technical Information. An in-depth explanation of a process follows this icon.

How to Contact Us

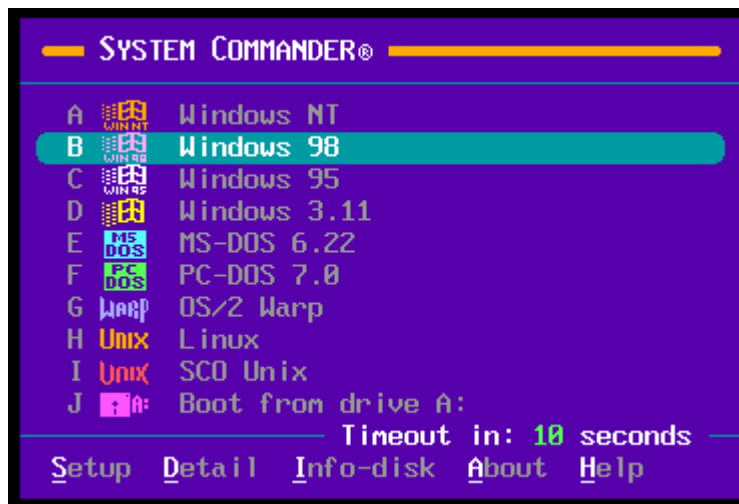
Please refer to the back of the title page for our address and other information on contacting V Communications.

A Note on *beta* OSes

We make every effort to provide support under System Commander for each new release of every operating system, including *beta* releases. There is sometimes a difference in time to market for our product and a *beta* release of a new OS. It is for this reason that it is not always possible to have built-in support for some *betas* under System Commander. If you encounter any problems using a *beta* release of any operating system, we will try our best to provide technical support; however, there are some instances where we may not be able to give you 100% resolution of any problems you may encounter. We do make every effort to incorporate new OSes and *betas* into our product as quickly as possible, and have yet to find an OS which we cannot successfully boot!

Introduction

With System Commander, you will be able to have multiple operating systems function on a single PC. Before any operating system starts, a menu of selections will appear, with the OSe you currently have installed. For example:



Simply select the operating system you want, and System Commander takes care of the rest! This makes the migration to a new operating system much easier and less risky, by allowing you to keep your current reliable operating system. It is also easier to evaluate new operating systems such as Windows 95/98, Windows NT, OS/2, or even beta test versions of new operating systems that may not be stable.

Key Benefits

System Commander provides a number of unique capabilities.

- ☐ Management of over 100 different operating systems in primary and logical partitions, the ability to boot from floppy drives A and B, or through specific master boot records [4 in SC Lite]
- ☐ Management of up to 32 different FAT compatible operating systems in a single primary DOS partition, including different DOS versions, Windows 95/98, Windows NT, and OS/2 [Not available in SC Lite]
- ☐ Optional security protection against unauthorized system use prevents hard disk access and booting from floppy disks [Not available in SC Lite]
- ☐ Automatically saves *and* maintains key hidden files and critical configuration files such as CONFIG.SYS, AUTOEXEC.BAT, BOOT.INI, and others [Not available in SC Lite]
- ☐ DOS boot sector virus protection checks for infections on every boot with instant replacement of infected boot sector and hidden system files. [Not available in SC Lite]

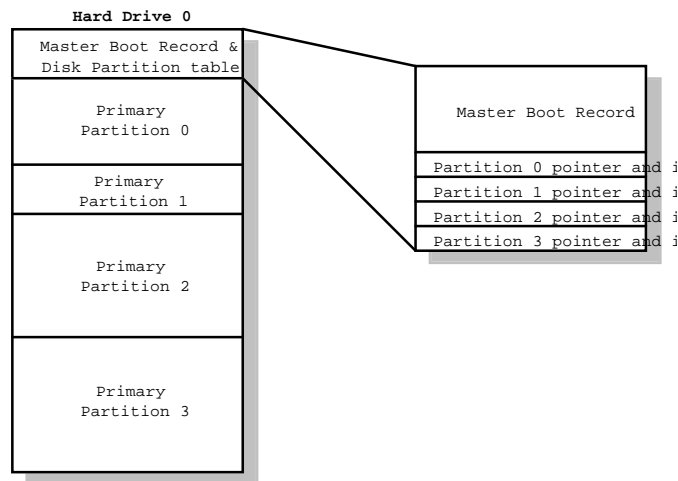
Technical Highlights

- ☐ Fully compatible with Windows 95/98, Windows NT/2000, OS/2, PC UNIXes, NetWare and most other 80x86 compatible OSes
- ☐ MS/PC-DOS compatible, all released and beta versions 3.3 and later
- ☐ DR-DOS/Novell DOS and OpenDOS compatible, all released and beta versions 5.0 and later
- ☐ Menu selections offered before any operating system runs
- ☐ After an operating system is selected, System Commander uses no resident memory
- ☐ Makes uninstall and reinstall simple, quick and painless

Common Terminology

A few key words are used later in the manual that you may not be familiar with, but these terms are very important to understanding where operating systems reside on a hard disk. Figure 1-1 shows the basic hard disk organization, independent of any operating systems.

Figure 1-1. Hard Drive Partition Layout.



Master Boot Record - This is the first sector on the hard disk, controlling which operating system will be used. System Commander will replace the master boot record with its own master boot record to control the boot up process. The old master boot record is automatically saved during the System Commander installation to allow for easy disable/uninstalls.

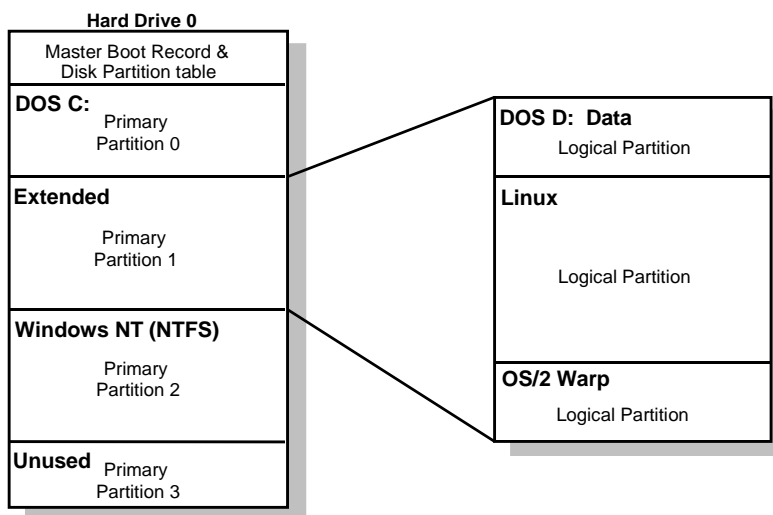
Disk Partition Table - This hidden part of the hard disk specifies how the hard disk is divided. It provides a means to allocate up to four separate sections, called primary partitions. Each operating system provides some means to access and alter the partition table. Under DOS or Windows 95/98, the **FDISK** program is used to view and change the partition information. In most cases, you cannot change the partition sizes without losing the data stored in a partition (see Appendix D for exceptions). System Commander does not change the partition table sizes, but uses this information in the selection of an operating system. See Chapter 3 for additional details.

Type of Partition - An operating system defines partition types for its own use. For example, Windows 95/98 and DOS define a partition using the FAT (File Allocation Table) method. Other operating systems can use FAT as well as other partition types, such as HPFS (High Performance File System) for OS/2, or NTFS (NT File System) for Windows NT. Other partition types are used for operating systems such as UNIX or NetWare. The partition where System Commander resides is the *MutliFAT* partition, allowing more than one OS in the partition. [Not available in SC Lite]

Some partitions can be defined as being bootable, meaning that the partition can start the operating system within that partition. A non-bootable partition cannot start the operating system. If a simple system has two drives, each with one primary partition, the first drive's partition will always be bootable, while the second drive's partition will not be bootable. The ability for a partition to be bootable is defined when installing an operating system.

Extended and Logical Partitions - In some configurations, a primary partition is divided into smaller logical partitions. This group of logical partitions is referred to as an extended partition. For example, a drive with an extended partition is shown in Figure 1-2. Some operating systems, like OS/2 or Linux can be installed to allow a logical partition to be bootable. Others, like Windows NT, must boot from a primary partition on the first drive, but can place most of the OS in any primary or logical partition. System Commander supports booting from up to 16 logical partitions per drive. [Not available in SC Lite]

Figure 1-2. Example of a Drive with Logical Partitions.



Notes

Operating Systems, Disks and Partitions

How It All Works!

Each operating system is usually installed in a separate section of the hard disk called a partition. The hard disk can be divided into a maximum of four primary partitions. This allows the first drive in the system to hold up to four different operating systems.

At the very beginning of the hard drive is a very small area reserved for the Master Boot Record. This area holds data about each of the four partitions, such as the size and starting location of each partition. In addition, the Master Boot Record holds the code to start the partition's operating system who has been marked *Bootable*.

Figure 2-1 helps illustrate how a 450 MB drive might be divided among different operating systems.

Figure 2-1. Multi-Partition Example

| Master Boot Record | |
|--------------------|--------|
| DOS | 60 MB |
| OS/2 | 150 MB |
| NT | 120 MB |
| UNIX | 100 MB |

Normally only the partition that is marked *bootable* can be accessed and only one operating system can be marked *bootable* at a time. System Commander solves this limitation by making the selected operating system *bootable*. To do this, System Commander executes from the Master Boot Record, before any other operating system.

What System Commander Does

When you install System Commander, it saves the old Master Boot Record (for our disable option), and inserts its own new Master Boot Record (MBR). All of the current partition table information about existing operating systems is retained.

When you boot the system, the main system BIOS loads and executes the System Commander MBR. This in turn loads the balance of the System Commander program into memory. System Commander stores its program file on an available primary FAT partition on the first disk, in the root directory. It does not care if the FAT partition is really bootable or not, nor which OS is in the partition (DOS, OS/2, Windows NT, Windows 95/98).

After System Commander has been loaded and started, System Commander looks at each disk's partition table, and collects information about each OS installed. These are presented on the System Commander OS selection menu.

In addition, System Commander's MultiFAT feature supports up to 32 FAT compatible OSES in a single FAT partition. This includes common OSES, such as OS/2, Windows NT, Windows 95/98, or even multiple versions of DOS. [Not available in SC Lite]

As part of the System Commander start up process, it looks to see if the FAT boot record has changed or if new or changed hidden system files have appeared. Changes normally indicate a new OS installation, and trigger System Commander to save key information and files about the new OS. This includes the boot record, hidden system files (like IO.SYS and MSDOS.SYS), as well as any configuration files (like CONFIG.SYS, AUTOEXEC.BAT or BOOT.INI). The additional OS choices from the MultiFAT partition are also included on the OS selection menu.

When an OS selection is made, System Commander moves any necessary startup files into place, and loads the selected OSES boot record. In addition, the associated partition(s) are marked active and System Commander hides any partitions that are configured to be hidden.

The new OS is launched, and System Commander completely disappears. This means the OS has no knowledge of System Commander's activities, and is never affected by System Commander.

Setting up the Disk

To set up the disk partitions, a utility such as FDISK is run. Every operating system provides a similar utility to change the partition information. This is normally done before any operating system is installed, even before formatting the disk. The disk partition information is saved in the disk partition table at the very beginning of the drive. This is shown in Figure 1-1 (see Chapter 1).

Once the partitions are set, each partition is formatted using the utility from the specific operating system. This reads the Master Boot Record for the size of the partition and initializes a single partition. The format process also defines the file system, used to allocate disk space by the operating system.



Different versions of DOS and Windows support different file allocation systems. The following table shows the differences, and how each newer OS version has increased the maximum partition

size.

| Operating System | Fat Type | Comments |
|---------------------------------------|----------|------------------------------------------------------------------------------------------------------|
| MS-DOS v2.1 and below | FAT-12 | Limited to 15MB partitions. Future versions of DOS also use FAT-12 for partitions smaller than 16MB. |
| MS-DOS v3.0-v3.3 | FAT-16 | Limited to 32MB partitions. |
| MS-DOS v4.0 and above | FAT-16 | Limited to 2GB partitions. |
| Windows 95/98/ME Windows 2000 | FAT-16 | Supports long filenames Limited to 2 GB partitions |
| Windows 95 OSR2 Windows 98/ME/2000 | FAT-32 | Supports partitions over 100 GB in size |

Some operating systems allow the user the option of a DOS compatible (FAT) file system or an alternate file system. Both Windows NT (with its NTFS file system) and OS/2 (with its HPFS file system) fall into this category. Each file system is just a different record keeping method for managing the disk space in a given operating system partition.

After the disk partition has been formatted for the operating system, the operating system can be loaded. This is accomplished with the installation program that came with the operating system.

Partition Limitations

Once the disk partitions are set, they normally cannot be changed without deleting the data within the partition (see Tip below). This means you cannot easily move free space from one partition to another. When the operating system formats the partition, it sets up the file

allocation tables based on the specific size. Changing the partition size or location will scramble the file allocation tables, usually making all the data in the partition inaccessible (and unrecoverable).



There are a number of products which can be used to change partition sizes without losing the contents, such as V Communication's Partition Commander or System Commander 2000. See Appendix C for additional details.

When not using a commercial partitioning product, the most reliable way to change a partition size is to first back up the data in every partition. Then run FDISK or the equivalent partition facility, and delete all of the partitions. Once all the partitions are deleted, you can create the new partitions as desired. Each partition must then be formatted to the specific operating system, and the files re-loaded into each partition.

For advanced users, there is a shortcut to adjusting the partition sizes in some situations, and avoids deleting all partitions. For example, if you had three partitions, and you wanted to divide one partition in half, the other two partitions will not be affected. In this case, only the partition that is going to be divided needs to be backed up. After the backup, the partition can be deleted and then two new partitions created, at half the size of the original partition.



Important: To be safe, before altering any partitions, backup your data from all partitions.

Your operating system should document the specific use of partitioning and formatting software. You should refer to the related documentation supplied by the OS vendor before installing a new operating system.

Drives greater than 504 MB

System Commander supports drives up to 2,047 GB (yes, that's 2 *terabytes*!) in size, but your BIOS and or OS may have problems if using more than 1024 cylinders or a total size above 504 MB. For SCSI and ESDI type drives, this is not usually a problem when in translate mode (or sometimes referred to the "greater than 1 GB option"). Also, if your

system is Pentium based or later (non-486), the BIOS normally supports large drives.

For IDE drives, the older BIOS standard only allowed for a maximum of 504 MB. This limitation was caused by combination limit between the BIOS and the IDE drive of 16 heads, 63 sectors, and 1024 cylinders with a 512 byte sector size.

There are several approaches to solving this 504 MB limitation for older systems, but each has its own set of drawbacks!

SOFTWARE - One product that helps solve this problem is Disk Manager from On Track Software. This product makes large drives appear to have less than 1024 cylinders, with a larger number of heads (since the BIOS allows up to 255 heads).

System Commander is fully compatible with Disk Manager as long as Disk Manager was previously installed with the first drive greater than 504 MB. System Commander is always installed some time after Disk Manager, and never before it.

Disk Manager version 6 is not compatible with NT, OS/2, or any UNIX OS. It is limited to DOS, and has a special driver for Windows 32-bit file access, and Windows 95/98. Disk Manager version 7 adds support for OS/2 and NT in some situations and allows multiple primary partitions. Contact OnTrack Computer Systems to purchase the product and to see if other OSes will be supported. See Appendix D for additional details.

System Commander also supports the current version of EZ-Drive. Like Disk Manager, EZ-Drive only supports DOS and Windows. If you plan to use any other OSes, it will be necessary to switch to a hardware solution.

HARDWARE - Currently a number of vendors make EIDE controller cards that support LBA (Logical Block Addressing). LBA provides full access to your large drive by making the drive appear to the OS as having less than 1024 cylinders (and having up to 255 heads).



Be aware you cannot turn the LBA features on or off without losing all data on the disk! It should be set on before the drive is partitioned and formatted.

LBA works fine on all operating systems that access the disk through the system BIOS. Unless specific support is provided by the controller manufacturer, LBA may not work with Windows 3.11/95/98 32-bit file access or older NT and OS/2 versions.

Current systems (1995 and later) include LBA support in the main system BIOS. In these cases, no special hardware or software disk managers are required. Refer to your system BIOS information to see if LBA is available and how to activate LBA. Although the industry has standardized on the term “LBA” some vendors refer to this feature in other ways, such as “support for IDE drives greater than 504 MB” or “special C-H-S”.

Notes

System Commander Installation

Before installing System Commander and other operating systems, we recommend you:



Back up your system



Make a bootable diskette for your current OS

To make a bootable diskette, insert a blank formatted diskette into drive A. At the C: prompt on the hard disk (for DOS) or from the Run menu (in Windows 95/98), type **sys a:** and press **Enter**. This makes the bootable system disk. (You cannot boot from drive B unless you use System Commander's boot from drive B feature). After the **sys** command has been completed, you should copy these files from your hard disk to the diskette: SYS.COM, FDISK.EXE, FORMAT.COM and ATTRIB.EXE. For example, if you currently have DOS, the following commands (in bold) would be used:

```
C:\> sys a:  
C:\> copy \dos\sys.* a:  
C:\> copy \dos\fdisk.* a:  
C:\> copy \dos\format.* a:  
C:\> copy \dos\attrib.* a:
```

For Windows 95/98 users, these files are usually located in the \WINDOWS\COMMAND subdirectory.

Although the backup and boot diskette may never be necessary, they provide a safety net, should you later install an operating system with serious bugs or problems that overwrite critical areas of the disk. Before System Commander installs, it will save the master boot record, the partition table, and the DOS boot record onto the System Commander diskette as extra protection against disk corruption and viruses.

Installing System Commander is very easy, and takes only a few minutes. Installing a new operating system can take a little longer, but that's controlled by the operating system. System Commander works with OSes that are installed prior to System Commander as well as OSes installed after System Commander.

It is important to make the proper choices now, in planning how to install your multiple operating systems. Chapter 4 covers many common installations with OS/2, Windows 95/98, NT, UNIX, and/or multiple DOS versions.

Choosing a Solution

If you have already installed all the operating systems you want, the basic installation is all that is necessary. In this case, go to *System Commander Installation* on page 18. If you plan to install additional operating systems, you must decide an overall strategy. The next two questions should help you decide the best way to proceed. You should also look at chapter 4, Common Installations for specific notes about OS/2, Windows 95/98, NT, UNIX, NetWare, and DOS.

1) *Do you want install a new OS together in the same partition with your existing OS?* [Not available in SC Lite]

YES: The MultiFAT feature of System Commander allows you to install multiple OSes into the same partition as your existing OS. No partitioning or special actions are necessary, so long as you have space for the new OS. System Commander is always installed into a partition along with another OS. This partition becomes the MultiFAT partition.

This technique works for all FAT compatible OSes, including Windows 95/98/NT, DOS, and OS/2. If you have Windows 95/98

installed in a partition that is larger than 2 GB (which uses FAT-32) only Windows 95 OSR2, Windows 98 and NT 5.0 can be installed in this same partition. If you wish to install DOS, OS/2, or older versions of Windows NT on a FAT-32 system, the YES portion of question 2 below will apply to you.

All other non-FAT compatible OSes must be installed in their own isolated partition. This includes most Unixes and specialized OSes. Again, see the YES portion of question 2 for these OSes.

If the new FAT compatible OS will not fit into the MultiFAT partition, you can either use the isolated method described in the YES answer of Question 2, or you will need to repartition the disk. Go to Option A: Repartition Drive, then perform Option B: Installing a new OS.

NO: You can install the new operating system in a new partition (see question 2 below).

2) *Does the new operating system require a different partition or do you wish to keep the OS isolated?*

YES: In this situation, the new OS is installed into a separate partition by itself. UNIX, OS/2's HPFS, NT's NTFS, and most other non-FAT operating systems require a separate partition to operate on the first drive. HPFS and NTFS are optional file systems used when not installing OS/2 or NT into a FAT partition. If you already have an unused partition available and it has enough room to load the new operating system, you will use Option B: Installing a new OS after System Commander is installed.

If you need a new partition, or the partition is not large enough to fit the operating system, you will need to repartition the disk. Go to Option A: Repartition Drive, then see Option B: Installing a new OS later in this chapter.

NO: This means the operating system will work in an existing partition. The most common example of this is the installation of Windows 95/98, NT, OS/2, or DOS in a FAT partition. See YES in Question 1 above for this case.

System Commander Installation

System Commander can be installed from Windows 95/98 or DOS. You can also boot from a DOS boot disk to install System Commander. Do not use DOS box inside OS/2 or Windows NT/2000 and do not boot into MS-DOS mode of Windows 95/98. Nor should you attempt to copy the files to and install from the hard disk.



Installing from Windows 95/98

Insert the System Commander diskette into any drive. Click on START, then click on RUN, and enter the drive letter where the diskette resides, followed by the word INSTALL. For example:

a:install



Installing from DOS, or a Windows 95/98 DOS prompt

Insert the System Commander diskette into any drive. At the DOS prompt, select the drive letter where the diskette resides. For example, insert the diskette in drive A, and at the DOS prompt type:

C:\ > a:

Then at the DOS prompt type:

A:\ > install

Balance of Installation (Windows 95/98 or DOS)

Follow the on screen installation instructions. System Commander does not alter your CONFIG.SYS or AUTOEXEC.BAT files.

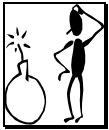
Once System Commander is installed, you may reboot the system. After system information is saved, you will be presented with a menu of operating system choices. If you wish to change the descriptions, the order or other functions, press **Alt-S** for the Setup menu. These are explained in more detail in chapter 5.



Put the System Commander diskette in a safe place. It contains duplicate backup data that may be needed if you later wish to remove System Commander from your system. It also holds key disk information to recover from some disk corruption and/or viruses that other disk utilities may not handle.

Disk Compression Users

System Commander is fully compatible with disk compression, so long as System Commander is installed on the non-compressed drive. We recommend each new OS be added in it's own separate partition.



For multiple OSes in the same partition, it is possible to use disk compression software on drive C, but we strongly recommend against it. We cannot assist users with disk compression who place multiple OSes in the compressed partition.

You could have problems with disk compression if you place more than one OSes in the same partition, because disk compression software operates differently depending on the OS version and manufacturer. Switching OS versions beneath it might cause problems and may even corrupt the disk. This should be thoroughly tested before assuming all is fine. Some products, like Microsoft's DoubleSpace/DoubleDisk will only work on a single version of DOS or Windows.

System Commander must be installed on the non-compressed portion of the disk. Normally System Commander will automatically detect this for you during installation. To verify the correct drive letter, consult your OS manual or disk compression manual for information about the non-compressed portion of the disk. For example, on two systems using Microsoft's DoubleSpace disk compression, one uses drive D, and another uses drive H as the non-compressed boot disk. It is never drive C. Perform a DIR command from each drive's root directory to help locate which drive is the non-compressed boot drive. Only a few files reside on the boot drive. One hidden file, used for disk compression, will be very large.

When you reboot after the System Commander installation, if you get a "Boot #." message, it indicates either you selected the wrong drive to install System Commander and/or the disk compression method

prevents access to System Commander's files. See the section "System Fails to boot up" under Troubleshooting for solutions.

Installing from Windows NT or OS/2

To install System Commander on a machine with only Windows NT or OS/2, the system must be booted from an MS-DOS or Windows 95/98 startup disk first. After the system is at the DOS/Windows prompt, run the INSTALL program as described above.

Option A: Repartition Drive

This option is only performed if you must change the size of a partition or add a new partition to your first drive. We are only concerned with the first drive since most operating systems (except OS/2, Coherent, Linux, and Solaris) must boot from the first drive, but may access other programs and files from all drives.

If you wish to create two or more primary FAT partitions, you cannot directly use DOS's FDISK utility. You can use any of the following options instead:

- OS/2's FDISK
- Disk Manager (see page 35)
- System Commander's SCDISK utility with your FDISK (see page 33)
- Use Partition Commander or System Commander 2000, which includes partition create, delete and non-destructive resize (among many other features). See appendix C for more details.
- Other third party partitioning utility.

As an alternative, you can use the FDISK utility that comes with Windows 95/98 or DOS, using the following method:

After backing up any data you wish to keep from EVERY partition that has data or programs, run the partition utility supplied with your

operating system from a diskette. The most common method is to reboot from a Windows or DOS diskette, and run DOS's FDISK utility. Other operating systems provide similar approaches.

The partition utility will allow you to add a new partition if space is available, or delete an existing partition. To change the size of a partition, you must first delete it, and then re-create it. Once the partitions are created the way you want, save the new information and exit the partition utility.

Format each partition with the FORMAT utility from each operating system. For example, if you have created two partitions, one for DOS, one for UNIX, the disk might be organized as shown:

Figure 3-1. New Partition Layout

| | |
|--------------------|--------|
| Master Boot Record | |
| DOS | 150 MB |
| Unix | 200 MB |

You would run the DOS format utility on the first partition, and the UNIX format utility for the second partition. The disk is now ready for the next option.



Before deleting the primary partition on the first drive into which you installed System Commander, you must disable our product. Run SCIN from either the hard disk or floppy, and select *Disable/Uninstall System Commander*.

Option B: Installing a New OS

Once System Commander is installed, you simply follow the manufacturer's recommended installation procedure to install an additional OS. System Commander will automatically handle new OSes installed in the MultiFAT partition (i.e., multiple OSes in the same FAT partition where you installed System Commander). [Not available in SC Lite]. System Commander also supports OS installations in other primary or logical partitions on any accessible drive. If you are installing Windows 95/98, be sure to review the Windows 95/98 notes in Chapter 4.

Booting from an OS Boot Diskette

When installing a new OS which boots from a diskette for installation, we recommend using the boot from A: or B: selections from the System Commander selection menu. [Not available in SC Lite] For the most part, the boot from A: selection is identical to booting from a diskette before System Commander appears, with one important difference. A flag is set internal to System Commander to prevent updates of the files of the current OS (such as AUTOEXEC, CONFIG, and COMMAND.COM). This flag is cleared after the next OS selection is made from System Commander.

In most situations, the boot from floppy method does not matter. A problem can occur if the new OS installation fails before installing new hidden files in the MultiFAT partition, and the new install changed AUTOEXEC, CONFIG or COMMAND.COM. In this weird case, when you next boot from the hard disk, System Commander would normally attempt to update the last selected OS's files with the new (and incorrect) AUTOEXEC, CONFIG, and/or COMMAND.COM, making the OS unusable! This problem scenario is prevented when you use System Commander's boot from A: selection.

When installing an OS into its own partition (except NT), the boot method does not matter (Boot from A: within System Commander, or boot directly after a reset, without going to System Commander).

Making a partition Bootable or Active

In rare situations, an OS might require an *active* or *bootable* partition before installation. Most FDISKs provide some option to do this. For example, the DOS FDISK allows you to mark any partition as active (including non-DOS partitions).

As an alternative, you could use the SCDISK utility provided with System Commander. To do this, at the DOS prompt, run SCDISK. Select the option *Change boot status for OS install*. This allows you to set the partition for the new operating system to be bootable. Be aware the SCDISK utility will also hide all other non-bootable partitions when you boot directly from a boot diskette (without going through System Commander). The hiding process is automatically cleared when System Commander boots up.

Never Delete other OSes

If during the installation of your OS, the installation program asks if you wish to delete an older OS, select NO unless you truly wish to delete the old OS. In addition, when installing an OS into the MultiFAT partition, do not install the OS on top of (in the same directory as) the old operating system! Instruct the new OS to use a new directory.

Making a new OS selection appear

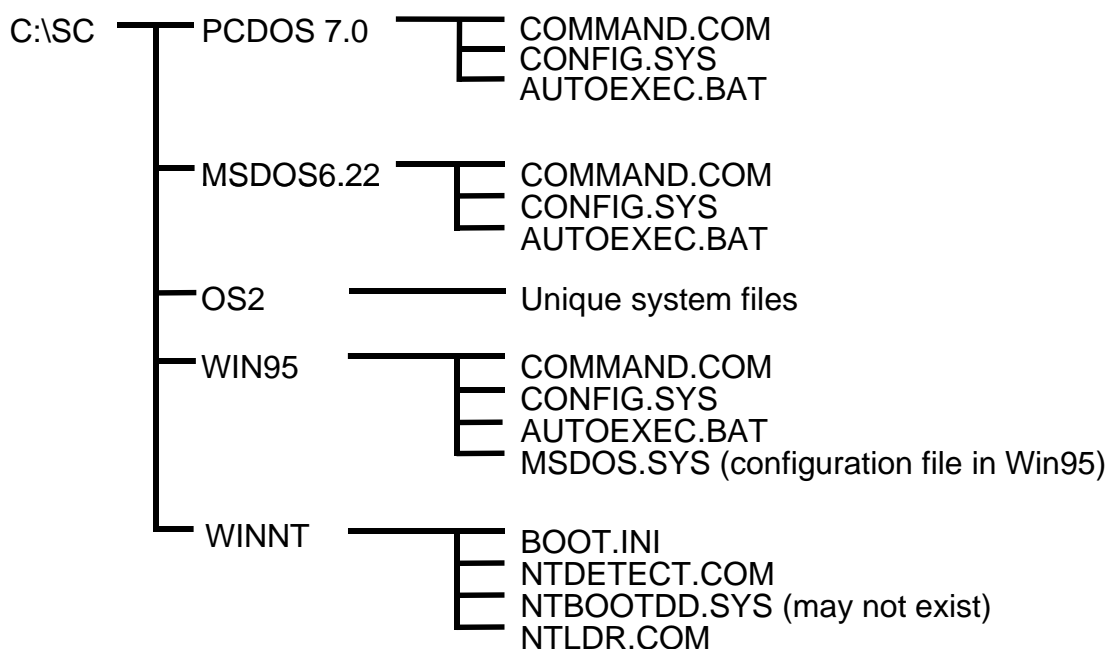
Once the OS is installed, simply reboot, and the new choice should appear on the System Commander OS selection menu. In rare cases, the OS selection might not appear. To add an OS selection to the menu, press **Alt-S** (Setup), and select the *Order, add and remove menu*. Press **Alt-A** (Add), and then select Partition. You can then toggle the bootable status for the OS you just added to Yes (**Alt-T** for Toggle).

Although rare, some new OS installations destroy System Commander's master boot record during installation. For example, Windows 95/98 and Japanese DOS/V version 6 do this. In these cases, System Commander will not run after rebooting the system. This is not a critical problem, and is easily solved. At a Windows 95/98 or DOS prompt, switch to the System Commander directory and run SCIN and select *Enable/Reinstall*. You can also perform this action directly from Windows 95/98 Run command. SCIN will reinstall the master boot

record without changing any options you have set. Exit SCIN and reboot. Now System Commander will come up normally.

Multiple OSes In the MultiFAT partition Summary [Not available in SC Lite]

After loading four OSes, the directory structure might appear as shown below. You can use any directory names you wish, but using the vendor and version as part of the name is helpful in keeping everything straight.



As the various files, like CONFIG.SYS and AUTOEXEC.BAT are changed in the root directory, System Commander will automatically update the saved images in the subdirectories.

Hidden system files, like IO.SYS and MSDOS.SYS, are saved and managed in the System Commander SCDOS.SYS file. Windows 95/98's MSDOS.SYS is saved as a separate configuration file, to allow System Commander to automatically update this file if changed.

Special Case - Booting through the MBR [Not available in SC Lite]

In very rare cases, an operating system fails to follow the PC architecture standard and requires its own Master Boot Record (MBR) to boot properly. The only two cases we've encountered are the pSOS operating system, and Linux's optional LILO MBR installation. Linux is normally installed with a partition boot (call a superblock in Linux terminology), and should not need this MBR file feature.

To setup the MBR boot selection, you will need a binary file image of the MBR. If the OSes MBR was installed prior to System Commander, we will have saved the MBR in the file `BOOT.DAT` in the subdirectory where you installed System Commander (`C:\SC` is the default). The boot file will always be 512 bytes long. Copy this file into the root directory. It is wise to rename the file so you are aware what it is. For example the Linux MBR could be renamed **LINUX.MBR**.

To add a new OS selection that loads the MBR file, reboot into System Commander. Press **Alt-S** for Setup, and select the *Order, add and remove menu*. Press **Alt-A** (Add), and then press **M** for MBR. The next three dialog boxes will appear in sequence:

MBR Filename - Enter the filename of the MBR file. The file does not need to exist yet, as it only needs to exist when you select it from the OS selection menu. A subdirectory is not allowed, as the file you supply will be on the root directory of the C drive (non-compressed).

MBR Partition Option - A portion of the MBR normally holds the partition table. When System Commander loads the MBR into memory, it can transfer the current partition information to the MBR in memory, so that the data is current with the drive layout. Select **OK** to allow the transfer. Select **Bypass** if you want to leave the MBR in memory untouched. If you are unsure which option to use, try OK first. If this fails to boot up properly, you can remove the MBR choice and then add it back, changing this option to **Bypass**.

MBR Active Partition Option - This specifies which partition should be associated with the MBR. For example, if you use the Linux MBR, then you must enter the drive and partition where Linux resides (not the swap partition). If the Linux partition is on the first drive (0) and last partition (3), enter 0-3. You can also elect to make no partition bootable by making the field blank. Press **Alt-I** to see the location of every partition.

Once these three items are answered, the new MBR choice will appear on the menu. You can have up to four different MBR boot choices on the menu. If needed, you can control access to different partitions for each MBR choice from the Local special options menu.

If a drive and partition were specified, these will appear on all System Commander menus that show the drive and partition. A small "m" will appear after the partition number. For example, **0-2m**, indicates that partition 2 on the first drive (0) will be made active/bootable when the MBR choice is made.

Common OS Installations

This chapter covers specific common installations, and some of the special steps we recommend when installing operating systems like DOS, Windows 95/98, Windows NT, OS/2, UNIX or NetWare. Also, the chapter covers the special case of installing multiple OS versions in a single partition and information about multiple primary DOS partitions. The chapter wraps up with special limitations, and methods for speeding up the boot process.

The following list is a quick page index for different OSes:

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Before attempting to install any operating system, you may wish to consult chapter 9, **OS and Product Limitations** to see any limitations imposed by your particular OS. Specifically, be aware that DOS and Windows 95/98 will not boot from any partition other than a primary on the first physical drive. You cannot install DOS or Windows 95/98 into an extended partition or onto the second or third hard disk. If you attempt this and call for technical support when you encounter problems, our support technicians will simply tell you that it is not possible. System Commander does not overcome these types of limitations imposed by the operating system.

DOS/V (Japanese version of DOS)



For Japa

DOS/V versions can be easily installed along with other versions of DOS in the same partition. The next section provides more details about multiple DOSes.

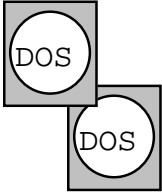
Recent versions of DOS/V will destroy System Commander's master boot record. This is not a serious problem. When the DOS/V installation completes, a reboot will skip System Commander and simply run DOS/V. To correct this, at the DOS prompt, switch to the System Commander directory. Next run SCIN, and select *Enable/Reinstall* from the main menu. Now when you reboot, System Commander will save DOS/V along with all prior saved OSeS. No loss of information occurs by DOS/V's quirk.

If you plan to install multiple versions or vendors of DOS/V, you will need to address other DOS/V files in the root directory. For example, DOS/V usually places several font files in the root. These are usually version specific, and must be handled to avoid overlap with the next installed DOS/V. Those files referenced from CONFIG.SYS can be moved to a unique directory and the CONFIG.SYS updated to point to the new location. Other files may need to be copied by System Commander before a specific DOS/V is launched. Specify those files to be copied using the Setup option (Alt-S), under the selection *File management menu*. On older versions of DOS/V there are usually many files to copy. Even though System Commander has only eight file copy slots, you can use wildcards to copy many more files. For example, the filename *.FNT would copy every file with the extension .FNT.

Limitations from OS

- DOS/V must be installed in a primary FAT partition on the first drive.

Multiple DOS Versions and Vendors



System Commander provides the ability to have multiple versions and vendors of DOS on the same system. This means you can have DOS from Microsoft, IBM, or Novell, and retain old, new and even beta versions of DOS. The different DOSes all reside in the same disk partition, so all your programs and data files are accessible regardless of the currently active DOS.

To install another DOS, simply follow the instructions in Chapter 3, under Option B: Installing a new OS.



When System Commander is installed, it creates a hidden file SCDOS.SYS. This file holds information about each OS, including several hidden system files for each DOS loaded. If you delete this file, you will be unable to access any DOS operating system other than the one currently active.

Limitations from OS

- The bootable DOS portion must reside in a primary FAT partition on the first drive.

Special DOS Issues

Most utilities that come with DOS are version dependent and will not work if another DOS version is operating. To overcome this issue, System Commander will automatically copy key files from a subdirectory to the root directory. In most cases this will include COMMAND.COM, CONFIG.SYS, and AUTOEXEC.BAT. The CONFIG.SYS and AUTOEXEC.BAT files should be customized for the specific DOS version. For example, the path statement in the AUTOEXEC.BAT file must point to the system directory for the related version of DOS. If the

system files were loaded into a directory \PCDOS7, then a portion of the AUTOEXEC.BAT path statement would appear as:

```
PATH = C:\PCDOS7;
```

You may already use a SHELL statement in CONFIG.SYS or a COMSPEC variable in AUTOEXEC.BAT to point to the directory where COMMAND.COM resides. Be aware that many programs that "shell-out" do not follow the path, but expect COMMAND.COM to be in the root directory. For this reason, System Commander copies the file COMMAND.COM into the root directory when a new DOS is selected.

CONFIG.SYS Issues

Some commands in CONFIG.SYS are unique to specific DOS versions and will generate an error message if they are run from a different DOS version. In addition, some device drivers are specific to a version of DOS and may not function with older or newer DOS versions. Make sure the SHELL points to the correct COMMAND.COM and is in the proper form for the specific DOS version. Some of the more recent command differences are shown below. A blank indicates the command is not supported.

| Supported in DOS Versions | | | | | | | | |
|---------------------------|--------|------------|-----|--------|-----|--------|-----|-----|
| CONFIG Command | DR 6.0 | Novell 7.0 | 3/4 | MS-DOS | | PC-DOS | | |
| | | | | 5.0 | 6.x | 3/4 | 5.0 | 6/7 |
| chain | yes | yes | | | | | | |
| cls | yes | yes | | | | | | |
| cpos | yes | yes | | | | | | |
| devicehigh | | | | yes | yes | | yes | yes |
| devicehi | | yes | | | | | | |
| dos | | yes | | yes | yes | | yes | yes |
| echo | yes | yes | | | | | | |
| exit | yes | yes | | | | | | |
| gosub | yes | yes | | | | | | |
| goto | yes | yes | | | | | | |
| hibuffers | yes | | | | | | | |
| hidevice | yes | yes | | | | | | |
| hidos | yes | | | | | | | |
| hiinstall | | yes | | | | | | |
| history | yes | | | | | | | |
| include | | | | | yes | | | yes |
| menucolor | | | | | yes | | | yes |
| menudefault | | | | | yes | | | yes |
| menuitem | | | | | yes | | | yes |
| numloc | | | | | yes | | | yes |
| rem | yes | yes | | yes | yes | | yes | yes |
| return | yes | yes | | | | | | |
| set | yes | yes | | | | | | |
| shell | yes | yes | yes | yes | yes | yes | yes | yes |
| submenu | | | | | yes | | | yes |
| switch | yes | yes | | | | | | |
| switches | | | | yes | yes | | yes | yes |
| timeout | yes | yes | | | | | | |

AUTOEXEC.BAT Issues

Some commands in AUTOEXEC.BAT are unique to specific DOS versions and will generate an error message if they run from a different DOS version. Specifically check your path statement carefully, as it usually will point to the system subdirectory, which will be different for each version. If you use a COMSPEC statement, also check that it points to COMMAND.COM for this operating system. Recent differences are shown below. A blank indicates the command is not supported.

Supported in DOS Versions

| AUTOEXEC Command | DR 6.0 | Novell 7.0 | MS-DOS | | | PC-DOS | | |
|---------------------|-----------|---------------|--------|-----|-----|--------|-----|-----|
| | | | 3/4 | 5.0 | 6.x | 3/4 | 5.0 | 6/7 |
| choice | yes | yes | | | yes | | | yes |
| comspec | yes | yes | yes | yes | yes | yes | yes | yes |
| gosub | yes | yes | | | | | | |
| path | yes | yes | yes | yes | yes | yes | yes | yes |
| return | yes | yes | | | | | | |
| switch | yes | yes | | | | | | |

Multiple Primary DOS Partitions

Although somewhat rare, it is possible to have a system with more than one DOS primary partition on the first drive. DOS by itself (and DOS's FDISK) will NEVER create such a configuration. If additional drives are necessary, FDISK will only allow one primary DOS partition, but makes no restrictions on the number of DOS logical partitions given enough disk space.

System Commander is designed to work on systems with multiple DOS partitions. One common configuration, made possible with System Commander, is DOS/Windows 3.1 in one primary partition and Windows 95/98 in another primary partition.

Making multiple Primary DOS Partitions

One easy way to accomplish this is to use OS/2's FDISK, which allows the creation of multiple primary FAT partitions. An alternate way uses our SCDISK utility and the FDISK from DOS or Windows 95/98.

Requirements

- One primary FAT partition already exists
- System Commander is installed and working
- You are **not** using On Track's Disk Manager for large IDE drives (See page 35 for using Disk Manager)
- The first disk has unallocated disk space (space unallocated to an existing partition) for the new partition
- You will not exceed the PC's limit of four primary partitions or three primaries and one extended partition

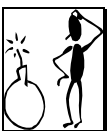
What to do if all the disk space is allocated

To free up allocated disk space, it is necessary to delete one or more partitions, and then re-create smaller partition(s) to make available disk space. Remember to back up your data before deleting the partition, since all of the data will be destroyed. Further details are available in chapter 3, under option A: Repartition Drive, on page 20. You might also consider using a software tool (Appendix D), which allows changing the size of a partition without deleting the data within the partition.

Steps for making another primary partition

- 1 Hide the existing primary FAT partition(s).

Run our SCDISK utility, and select *Change boot status for OS install*. Press **9** to make no partitions bootable. The SCDISK utility will hide the partitions temporarily. Hidden partitions are never hidden from System Commander. Now reboot directly from a DOS or Windows 95/98 boot diskette.



Do **not** boot through System Commander (even from the "Boot from

Drive A:” option) since this will expose the hidden partitions.

2 Create the new primary partition.

Run FDISK and create another primary partition. Ignore any partitions labeled as Non-DOS, as these are other temporarily hidden partitions.

FDISK will not let you create another primary partition if you do not have unallocated disk space. If this is a problem, see our prior note above on *What to do if all drive space is allocated*.

Once the new primary partition is created, exit FDISK. It will force a reboot. Use the DOS boot diskette for this reboot.

3 Format the partition and make it bootable.

Before formatting, issue a DIR on the C: drive. It should return an error, since the drive is not formatted yet. If you do not get an error, DO NOT FORMAT, since something is wrong. The following command formats and transfers the system to the new partition:

```
A:\> format c: /s
```

Remember, you can only make DOS bootable from the first drive. DOS and Windows 95/98 are hard coded internally to always assume they boot from the first drive. They do allow booting from any of the four primary partitions on the first drive. If your second primary partition is past the first 2 GBs of your hard drive, please refer to page 101 (Transfer System) for information on placing your system files properly into this partition.



DOS BUG: We have seen a minor bug in all versions of DOS that can affect some configurations. With two primary FAT partitions, and an extended partition (on any drive) that has the last logical drive as non-FAT, DOS cannot see the other primary partition. This DOS bug does not occur when no extended partition exists, or if the last logical partition in the extended partition is FAT.

Creating Multiple Primaries with Disk Manager v7.0 and greater

This procedure will step you through creating a second primary partition using OnTrack's Disk Manager software.

This procedure will only work with Disk Manager version 7.0 or greater. Should you encounter any problems with this procedure, or have a version prior to 7.0, please contact OnTrack directly for assistance.

- 1) While booting your computer, wait for a message from Disk Manager saying "Press spacebar to boot from floppy." Press the spacebar and, when prompted, insert your bootable floppy.
- 2) At the A:> prompt, type **DM** to run Disk Manager.
- 3) Continue on to the Disk Manager main menu.
- 4) At the main menu, press **ALT-M** to enter Maintenance mode (this is not intended to enter the Maintenance menu, which is different). This should change the "(A)dd/Remove" partitions menu option to "(E)dit/View partitions."
- 5) Press **E** to *Edit/View Partitions*.
- 6) Select a physical drive, and press **ENTER** to continue.
- 7) On this menu, use the arrow keys to highlight an empty area of the disk, and use the **Ins** key to create a new primary partition.
- 8) Select the *Other* choice and press **ENTER**.
- 9) Enter **06** when prompted for the partition type. This specifies a primary FAT partition.
- 10) Enter the size of the new partition.
- 11) Save the configuration.
- 12) Return to the previous menu. Exit Disk Manager.

Multiple Selections for One DOS

In some situations, more than one OS selection choice is desired for a single version of DOS. In these cases, a different CONFIG and AUTOEXEC file are desired for each DOS selection.

Normally we would recommend using V Communications' Boot Commander as a better approach to handling the functionality of multiple CONFIG and AUTOEXEC choices for a single DOS (it works with all DOS versions). It handles up to 100 different configurations. When you only need a few duplicates, System Commander can do the job.

To create an additional entry on the System Commander OS selection menu, from the OS selection menu, press **Alt-S** (Setup), and select the *Order, add and remove menu*. Highlight the selection you wish to duplicate (which must be in the DOS partition), and press **Alt-A** (Add). Press **D** to duplicate the choice. You will be prompted for a description and new subdirectory to use.

Return to the OS selection menu and select this new choice. At the DOS prompt, remember to update your CONFIG.SYS and AUTOEXEC.BAT files to reflect any changes you wish on this duplicate set.



Windows 3.x and DOS as separate selections

Throughout this manual, we talk very little about Windows 3.1 because it is not a operating system by itself. It always requires DOS to be running first, and operates like a application program from DOS (a real complex application). It is not possible for System Commander to detect Windows 3.x as a separate selection automatically, but it is easy to set up two choices on the menu for DOS and Windows 3.x.

If you do not have DOS installed, you must install DOS before you can install Windows 3.x. Once DOS is installed, boot into DOS from System Commander, and install Windows. DO NOT use the same directory name (i.e. C:\WINDOWS) if you previously have Windows 95/98 installed in that directory.

Once you have DOS and Windows 3.x installed and working, you can duplicate your single DOS selection on System Commander's menu. Boot into System Commander and highlight the DOS choice (but do not select it). Press **Alt-S** (Setup), and select the choice *Order, add and remove menu*. Press **Alt-A** (Add), then press **D** to duplicate the choice. You will be prompted for a description to use. You might use a description like "Windows 3.x". When complete, return to the main selection menu (press Escape twice), and go into the new Windows 3.x choice.

Assuming this only goes to a DOS prompt, edit the AUTOEXEC.BAT file in the C: root directory. Add the line at the end of this file:

WIN

This will automatically launch Windows at the completion of DOS processing the AUTOEXEC.BAT file.

If your Window 3.x selection from System Commander already boots directly into Windows, reboot and try the DOS selection. If the DOS selection also goes into Windows 3.x, edit the AUTOEXEC.BAT file in the C root directory. One line in the file will launch windows, typically just the word "WIN". Remove this line so the DOS selection will not launch Windows automatically.

Windows 95/98 Configurations



System Commander is fully compatible with Windows 95/98. Normally Windows 95/98 is installed (at least the bootup portion) in the primary MultiFAT C: partition. The Windows 95/98 installation provides an option to install the remaining Windows portion on any FAT drive and directory.

Installing Windows 95/98 after System Commander

Windows 95/98 installation has a number of quirks, which will change and delete a number of important files, and will destroy System Commander's master boot record. The following tips will guide you through a successful Windows 95/98 installation.

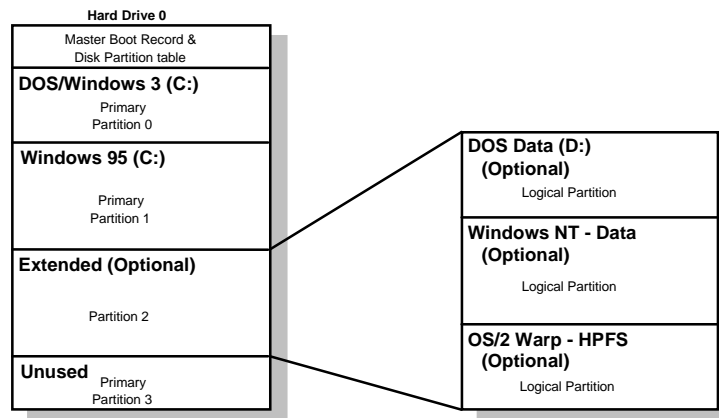
While the easiest install is to place Windows 95/98 in the existing MultiFAT (DOS) partition, the Windows 95/98 installation forces you to make one of these, less than desirable, choices when you already have Windows 3.x:

- 1) You can leave all your applications working with Windows 3.x, but none will work with Windows 95/98.
- 2) Migrate all your applications to Windows 95/98, which means they will no longer work under Windows 3.x.
- 3) Leave or migrate applications, and then reinstall every application in unique directories for the other Windows.

Keep in mind that even if you attempt to install Windows 95/98 in any drive other than C, Windows 95/98 will always add and remove many files on drive C, and the migration problems are still present.

Although System Commander can let you switch between Windows 95/98 and DOS/Windows 3.x in the same partition, you can also create a separate duplicate partition of your current DOS/Windows programs, and then install Windows 95/98 in this separate partition. You can then safely migrate the duplicate applications, since you still have your original applications on another primary partition. One common drive layout, which many users like, appears in figure 4-1.

Figure 4-1. Windows 95/98 in a separate Partition.



In this layout, when you boot into partition 0, you can run Windows 3.1 on drive C. Drive D is on the logical partition, which contains application data. Partition 1 can either be hidden or will appear as drive E at your option.

When you boot partition 1, Windows 95/98 will appear as drive C, and drive D is the same logical partition as appears when booting DOS/Windows 3.1. Partition 0 can either be hidden or you can elect to have it appear as drive E in this example.

This table summarizes the different 95/98 installations:

| Windows 3.1 | Action |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Does not exist | Install Windows 95/98 anywhere (no issues) |
| No long wanted | Install Windows 95/98 on top of Windows 3.1 (applications are transferred to Win95/98) |
| Need to keep 3.1 | Install Windows 95/98 in a new subdirectory (applications will need to be re-installed under Windows 95/98 to use) |
| Need to keep 3.1 | Install Windows 95/98 in a separate primary partition using the Risk Free Windows approach (applications will work under both Windows 3.1 and Windows 95/98). |

If you prefer to install Windows 95/98 in the existing MultiFAT (DOS) partition, skip over the next section.



Risk Free Windows 95/98 Installation (Separate Partitions)

This is the cleanest approach to installing Windows 95/98. It keeps Windows 95/98 completely isolated from your DOS/Windows 3.1 partition, and avoids having to load all your applications again. On some systems, this approach may require repartitioning, so one of the other alternative installations may be preferred.

Starting Assumptions and Requirements

- You have an **upgrade** release of Windows 95/98
- DOS and Windows 3.x are installed and working on drive C: (this approach requires Windows 3.x on drive C:)
- System Commander has been installed and booted at least once (this saves the DOS/Windows 3.x configuration)
- Your first drive has unallocated disk space approximately the size of your current DOS/Windows partition

What to do if all drive space is allocated

For the risk free process, it is necessary to create another partition on your first drive. This can only be done when unallocated disk space is available. Often systems are pre-configured with all of the disk space already allocated.

To free up allocated disk space, it is necessary to delete one or more partitions, and then re-create smaller partition(s) to make available disk space. Remember to back up your data before deleting the partition, since all of the data will be destroyed. Further details are available in chapter 3, under Option A: Repartition Drive, on page 20. You might also consider using a third party partitioning software (Appendix D), which easily allows changing the size of a partition, without deleting the data within the partition.

Optional Extended Partition(s)

It does not matter if you wish to create extended (logical) partitions now or later for additional OSes or for data and applications. Logical FAT (DOS) partitions will change your drive lettering, since they appear after the C: drive.



We have seen a minor bug in all versions of DOS that can affect some configurations. With two primary FAT partitions, and an extended partition (on any drive) that has the last logical drive as non-FAT, DOS cannot see the other primary partition.

Risk Free Installation Steps

- 1** Create a second FAT (DOS) primary partition, which will become the Windows 95/98 Partition.

Since the DOS FDISK cannot normally create a second primary partition, follow the instructions under "Making multiple Primary DOS Partitions" on page 32. This shows how to use System Commander's SCDISK utility in conjunction with FDISK from DOS or Windows 95/98 to create the second primary DOS partition.

Format the new primary partition and load the system files (i.e., use **format /s**, or after formatting, use **sys c:**). Now reboot from the hard drive. System Commander will appear. Select the first DOS partition to boot (not the new one).

- 2** Now copy the DOS and Windows 3.1 files and applications to the newly created partition.

At the DOS prompt, run DIR on various drive letters to find out what drive letter DOS has assigned the new partition. It could be D, E or higher, depending on the number of logical drives and if any other physical drives exist in the system. The new partition will only have two or three hidden files and the file COMMAND.COM.

Now use the XCOPY command to copy all the files to the new partition. For example, if the new partition appears as drive E, then use the DOS command:

```
C:\> xcopy c: e: /e /v /h      (if /e or /h are not supported by your
                                version of DOS/Win95/98, use /s
                                instead)
```

Once the copy is complete (which may take a few minutes), reboot the PC to the System Commander OS selection menu.

- 3 Make the new DOS partition appear as an OS selection and hide the old DOS partition from Windows 95/98.

If the new DOS partition does not appear on the OS selection menu, press **Alt-S** (Setup), and select the *Order, add and remove menu*. Press **Alt-A** (Add), and then press **P** for partition. Highlight the new partition, and press **Alt-T** to toggle the boot status to YES. Press Esc three times to return to the OS selection menu.

Press **Alt-S** (Setup), and select the *Local special options menu*. Use **PgUp** and **PgDn** to switch to the new DOS primary partition. Select the option *Primary partitions visible on drive 0*, and hide the other primary DOS partition (set to **NONE**). Return to the OS selection menu, and select the new primary partition. It should boot up just like your original DOS primary partition.

- 4 Install Windows 95/98!

Now run the Windows 95/98 installation program. At some point it will ask if you wish to install Windows 95/98 on top of Windows 3.x (i.e., typically to the **C:\WINDOWS** directory). Keep this directory name. By installing Windows 95/98 on top of the duplicate copy of Windows 3.x, all of the applications are automatically transferred to Windows 95/98. This avoids having to load every application again! Remember that you still have your original set of Windows 3.x files and applications in the other partition hidden from Windows 95/98.

During the Windows 95/98 installation, you may get several messages about OS/2 and/or NT indicating that they will no longer will work. You can safely ignore these warnings.

- 5 Restore System Commander.

When Windows 95/98 installation is complete and working, you will find that after a reboot, System Commander fails to appear. Windows 95/98 destroys the System Commander master boot record.

To recover from this annoying quirk, in Windows 95/98, click on the START box, then click on RUN. Enter the path to the SCIN program (i.e., **C:\SC\SCIN**). In the SCIN program select *Enable/Reinstall* and exit. Shutdown Windows using the option Restart computer. During the boot up, System Commander will appear and save the new Windows

95/98 information. All of your prior options and selections will not be affected by a reinstall.



Installing Windows 95/98 into the DOS partition

This is the best choice when Windows 3.x does not exist, or you no longer want Windows 3.x. This option is also useful when you need to keep Windows 3.x, but prefer not to use the prior “Risk-Free” approach, and you do not mind re-installing your applications into Windows 95/98 or if you are going to install new Windows 95/98 exclusive applications.

Installation Steps

1 Save DOS from destruction!

Copy all the files in your current DOS directory to a temporary directory. The current DOS directory has all your DOS programs and files. A pointer to this directory appears in your path statement (in AUTOEXEC.BAT). **In some installations, Windows 95/98 will delete these files without first warning you and without backing the files up!**

2 Install Windows 95/98.

Now run the Windows 95/98 installation program. At some point it will ask if you wish to install Windows 95/98 on top of Windows 3.x if it exists (i.e., typically to the **C:\WINDOWS** directory). You have two key options at this point.

Should you install Windows 95/98 on top of Windows 3.x (i.e., on the same drive and directory), all of your applications are migrated to Windows 95/98 and Windows 3.x will no longer work.

If you choose a new directory and/or drive, Windows 95/98 will leave Windows 3.x alone. In this case, applications in Windows 3.x are **not** migrated to Windows 95/98. Those applications you need under Windows 95/98 must be installed again.

During the Windows 95/98 installation, you may get several messages about OS/2 and/or NT indicating that they will no longer will work. These warnings can be safely ignored, since System Commander has already saved away the key files that Windows 95/98 will destroy.

3 Restore System Commander.

When Windows 95/98 installation is complete and working, you will find that after a reboot, System Commander fails to appear. Windows 95/98 destroys the System Commander master boot record.

To recover from this annoying quirk, in Windows 95/98, click on the START box, then click on RUN. Enter the program SCIN to run (i.e., **C:\SC\SCIN**). In the SCIN program select *Enable/Reinstall* and exit. Shutdown Windows using the option Restart computer. During the boot up, System Commander will appear and save the new Windows 95/98 information. All of your prior options and selections will not be affected by a reinstall.

4 Restore any deleted DOS files (optional).

Windows 95/98 may delete some or all of the DOS files. With programs like DEFRAG and SCANDISK, the programs are replaced with batch files that simply recommend to run the Windows 95/98 versions (which only run under Windows 95/98). Windows 95/98 no longer provides DOS equivalent programs.



Be aware that the DOS system programs do not handle long filenames. We suggest either avoiding Windows 95/98 long filenames, or do not use the older DOS programs which alter directory entries (like DEFRAG or SCANDISK). Should you use programs which are unaware of long filenames, the file contents are never at risk, only the long filename.

Restore any or all the DOS files you want from the previously saved temporary directory.



Multiple Windows 95/98 Installations

In some cases, it is important to have multiple Windows 95/98 installations. This occurs if you may need two or more language variations of Windows 95/98. There are two ways to achieve this.

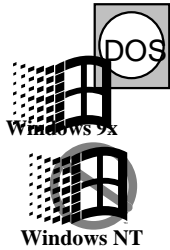
Installation in Separate Partitions

The installation of Windows 95/98 in separate partitions is the cleanest and most reliable way to install multiple Windows 95/98s in a system. Since Windows 95/98 must be installed in a primary partition on the first drive, you are limited to a maximum of four Windows 95/98 installations with this method.

To install multiple Windows 95/98s, refer back to the Risk-Free Windows 95/98 installation instructions on page 40 for the creation of another primary partition for Windows 95/98. If you are not installing an upgrade version of Windows 95/98, you can skip step 2, since it is not necessary to have a copy of Windows (3.1 or 95/98) in the new partition.

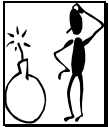
Multiple Windows 95/98 installations in the same partition

This type of installation for Windows 95/98 is strongly discouraged as it may not result in a stable installation. Windows 95/98 installation writes additional subdirectories outside of the Windows subdirectory without prompting and without giving you the option to rename (for example, the Program Files subdirectory). Since Windows 95/98 cannot effectively share this subdirectory with other installations, multiple 95/98's in the same partition can be very unstable. As well, Windows 95/98 virtual memory will cause swapfile overlaps, which means that you will not be able to use virtual memory in one of the installs of Windows 95/98. We encourage you to install multiple versions and languages of Windows 95/98 into separate primary partitions.



Windows 95/98 Installed prior to System Commander (and add DOS as menu selection, no NT)

If Windows 95/98 was installed prior to System Commander, and NT is not installed, just perform a normal System Commander installation from Windows 95/98. You can use the Windows 95/98 DOS box, or run A:INSTALL from the Run box.



Do not reboot Windows 95/98 into MS-DOS mode for the installation! If you use MS-DOS mode to install System Commander, the System Commander installation will use the wrong Windows 95/98 configuration when creating the Windows 95/98 entry on the menu.

If DOS was installed prior to Windows 95/98, then on the next reboot, both DOS and Windows 95/98 should appear on System Commander's OS selection menu.

If no DOS choice is available on the OS selection menu (i.e., DOS has not been installed), the following will add it. To create a separate DOS choice, boot from a real DOS diskette (not the Windows 95/98 boot diskette). At the DOS prompt run the SYS program to load the DOS hidden files:

A:\> **SYS C:**

You may also perform a full install of DOS at this point which will put the entire DOS operating system on your machine.



In rare situations, the SYS program may return an error like "no room to fit OS". See more about the SYS command on page 165 for fixes and alternative ways to transfer the system.

Next create the AUTOEXEC.BAT and CONFIG.SYS files for the DOS selection on the C: drive. You do not need to be concerned with the Windows 95/98 AUTOEXEC and CONFIG files, as System Commander has already saved these in a separate subdirectory for you.

Now reboot from the hard disk. System Commander will save the key files for DOS, and add a new selection to the menu. To fully install

DOS, boot into this DOS selection and run the MS-DOS setup program from the installation diskette.



Windows 95/98 and NT Installed prior to System Commander

If you had NT loaded prior to installing Windows 95/98, normally Windows 95/98 will install itself into NT's OS Loader. If you are not using OS Loader to access Windows 95/98, the prior notes on Windows 95/98 installed prior to System Commander are correct, and you can skip this alternate approach.

Perform a normal System Commander installation from Windows 95/98. You can use the Windows 95/98 DOS box, or run A:INSTALL from the Run box.



Do not reboot Windows 95/98 into MS-DOS mode for the installation! If you use MS-DOS mode to install System Commander, the System Commander installation will use the wrong Windows 95/98 configuration when creating the Windows 95/98 entry on the menu.

When you reboot, you should have an NT selection and possibly other choices such as DOS and Windows 95/98. If your other, previously installed operating systems do not appear and if OS Loader was used to access Windows 95/98, the following instructions will create a separate choice on the System Commander OS selection menu to directly boot Windows 95/98.

- 1) First complete the System Commander installation by booting once. This saves the information that will be used for the NT selection. When you get to the NT OS Loader question, select Windows 95/98 (which may be labeled incorrectly as DOS), and launch Windows 95/98.
- 2) Copy the hidden system file MSDOS.SYS to a temporary file like MSDOS.TMP. At a DOS/Win95/98 prompt:

```
C:\> attrib -h -s -r msdos.sys
C:\> copy msdos.sys msdos.tmp
```

- 3) Insert the Windows 95/98 boot floppy created when you installed Windows 95/98. Shutdown Windows 95/98 (i.e., Restart the computer).

- 4) Once the floppy disk boots up, it should leave you at a DOS/Win95/98 prompt on drive A, where you can run the SYS program and reload the correct MSDOS.SYS file:

```
A:\> sys c:  
A:\> attrib -h -s -r c:\msdos.sys  
A:\> copy c:\msdos.tmp c:\msdos.sys
```

- 5) Remove the floppy, and reboot. System Commander will detect the new OS. Select **Save** to save the Windows 95/98 selection.

Other Windows 95/98 Issues

Windows Plus can Destroy other OSes!

Microsoft offers a separate package of utilities, icons, and wallpaper for Windows 95/98. One of these utilities is the compression software called DriveSpace. This utility can compress your FAT partition and all OSes installed on that partition. In most cases, these OSes will no longer work. A reboot may present a "Boot" error message and hang the system.

If you get into this weird situation, boot from a DOS or Windows 95/98 boot diskette. Change to the System Commander diskette and run SCIN. Select *Disable/Uninstall*.

You may be able to run Windows 95/98, but the other OSes are not likely to be recoverable. A full installation of System Commander (run INSTALL from the System Commander diskette) will get System Commander running again, but the other OSes must be loaded again. Remember that System Commander **MUST** be installed on the non-compressed drive, which will no longer be drive C:.

In general, with Windows Plus, **NEVER** select the option to install everything. If you want other DOS versions, NT, or OS/2, you should not compress the C: drive using DriveSpace.

Windows 95/98 and Novell NetWare 4.x

If you are using Novell NetWare, the installation of Windows 95/98 into the DOS partition may alter the STARTNET.BAT file under the \NWCLIENT subdirectory. The network may no longer work under DOS in this case. If you encounter this problem, it is fairly easy to correct, since Windows 95/98 is nice enough to make a backup copy of the DOS version as STARTNET.--- in the \NWCLIENT directory.

System Commander can be used to swap the appropriate STARTNET files between DOS and Windows 95/98. To set this up, you will keep two separate copies of the STARTNET file. System Commander is then instructed to copy the appropriate STARTNET file when switching between OSes. The following example assumes the Windows 95 files

that System Commander copies (like CONFIG.SYS) are in the directory \SC\WIN95, and the DOS files are in the directory \SC\MSDOS6.22 (use the directories that match your system).

Perform the following copies:

```
C:\> copy \nwclient\startnet.bat \sc\win95\startnet.bat
C:\> copy \nwclient\startnet.--- \sc\msdos6.22\startnet.bat
```

Next, reboot the system, and highlight the Windows 95 menu choice, and press **Alt-S** (Setup), and select the *File management menu*. Move down to an empty slot, and add the following entry (+ or - toggles the settings):

| action | update | source | target |
|--------|--------|--------------------------|--------------|
| COPY | PROMPT | C:\SC\WIN95\STARTNET.BAT | C:\NWCLIENT\ |

Press **PgUp** or **PgDn** to change to your DOS choice. Add the following entry:

| action | update | source | target |
|--------|--------|------------------------------|--------------|
| COPY | PROMPT | C:\SC\MSDOS6.22\STARTNET.BAT | C:\NWCLIENT\ |

Now NetWare should work properly from both DOS and Windows 95/98. Try out DOS and Windows 95/98 to be sure it works. If your first OS selection causes System Commander to prompt whether or not you wish to update STARTNET.BAT, specify **Skip** to avoid overwriting the file this very first time. After that, it is acceptable to update the file.

Windows 95/98 MSDOS.SYS File

Unlike any version of DOS, Windows 95/98 stores textual configuration information in the MSDOS.SYS file. This file may be updated by users, Windows 95/98 itself, and installation programs. With DOS installations, System Commander detects any changes to MSDOS.SYS as a possible new operating system. With Windows 95/98, System Commander saves and maintains MSDOS.SYS file in the Windows 95/98 save directory. As changes are made, the saved MSDOS.SYS file is automatically updated on the next reboot.

Creating Multiple Windows 95/98 Configurations

One handy feature of System Commander is the ability to provide multiple selections for the same OS (i.e., Windows 95/98) and copy files between subdirectories. This is often useful to have a different sets of .INI files and/or MSDOS.SYS. You might have one set for a network, another for a laptop's docking station, and yet another while on the road with a laptop.

To duplicate a Windows 95/98 choice, after booting into Windows 95/98, reboot, and press **Alt-S** (Setup) at the OS selection menu. Select *Order, add and remove menu* and highlight the Windows 95/98 choice. Next select **Alt-A** (Add), and then select **D** for Duplicate. A duplicate choice is created. Escape from the menu, and then select the *File management menu*. In this menu you can specify additional files to copy, such as a specific .INI file.

Once the duplicate is made, return to the OS selection menu and select the new duplicate choice. When Windows 95/98 boots up, edit files to take your specific actions (like MSDOS.SYS, CONFIG.SYS and/or AUTOEXEC.BAT).

As an example, two choices are set up for Windows 95/98. One selection will go to the normal Windows 95/98 graphics mode, and the other selection goes to the Windows/DOS command line prompt.

To set this up, first duplicate the single Windows 95/98 choice as described above. After creating the duplicate choice, boot into the new duplicate. Change the attributes of this root directory file so it can be edited:

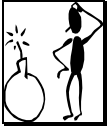
```
C:\> attrib -h -r -s msdos.sys
```

At the root directory edit the MSDOS.SYS text file. Once in the editor, the line "BootGUI = *n*" indicates how Windows 95/98 will start. The default Windows 95/98 installation sets this to "BootGUI = 1" to launch the graphical interface of Windows 95/98. Change this to "BootGUI = 0" so this new selection will boot to the Windows 95/98 DOS prompt.

Exiting Windows 95/98

When shutting down Windows 95/98, the shutdown menu provides a number of alternatives. We suggest you select the option *Restart the*

computer. This will always go to the System Commander menu, where you can select any OS you want. Other shutdown options will not affect System Commander, but they will not bring up the System Commander OS selection menu.



Note: In most cases, it is better not to use the Windows 95/98 *Restart the computer in MS-DOS mode* option. Using this option may load an old set of configuration files. It is better to reboot and select a true DOS from the System Commander menu.

Limitations from OS

- The Windows 95/98 boot up partition (under 4 MB) must be installed in a primary FAT partition on the first drive, while the balance can go on any primary or logical FAT partition on any drive.
- Long filenames can only be seen by Windows 95/98 and Windows NT.
- Long filenames can be lost if a DOS file utility such as DEFRAG, SCANDISK, or an old version of Norton Disk Doctor is run which does not understand long filenames.
- Use of the optional FAT-32 partition type is fully compatible with System Commander. Only Windows 95 OSR2 version, Windows 98 and Windows NT 5.0 can see FAT-32 partitions. All other OSes cannot see files in a FAT-32 partition.

Windows NT Configurations



NT can be installed in three different ways. The most common installation places NT in a primary or logical partition, and a small amount of start up code in the DOS partition. As an alternative, NT can be completely installed in the DOS partition.

In rare cases, NT is completely self contained in a single primary partition on the first drive. This occurs when NT is the first OS installed on the system.

System Commander supports all three types of NT installations.

NT Installed prior to System Commander with OS Loader

NT is typically installed so that NT's OS Loader menu is used to select between DOS and NT. In this situation, System Commander will bring up OS Loader like an operating system and show any previous DOS or Windows 95/98 installations as separate choices.

The following instructions will separate this into two System Commander menu selections, to boot DOS directly and NT directly if you do not have both selections on the System Commander selection menu. The current System Commander "OS Loader" choice will become an NT only choice.



If you have Windows 95/98 installed with NT, see the Windows 95/98 section "Windows 95/98 and NT Installed prior to System Commander". The following process is for NT and DOS only.

To create a separate DOS choice on the System Commander selection menu, boot from a DOS diskette (with the same version and vendor as your current DOS). At the DOS prompt run the SYS program to reload the DOS hidden files:

A:\> **SYS C:**

Once complete, remove the boot diskette and reboot again. This time System Commander will save the DOS hidden system files and other key files such as AUTOEXEC.BAT and CONFIG.SYS. Once at the

DOS prompt, reboot again to verify you now have both the DOS and NT menu choices.

Next, make the NT selection, to bring up OS Loader with both NT and DOS choices. Select NT. Once NT is running, click on the MAIN group and select the Control Panel. Next, click on the System icon within the Control Panel. Pick NT as the startup operating system, and change the settings for "Show List for" to zero. This will skip NT's extra questions at Boot time, since you will be selecting NT and DOS directly from System Commander.

NT Installed prior to System Commander - Stand Alone

In the rare case of NT completely self contained in a single partition (i.e., no DOS existed when NT was installed), the NT choice will usually appear on the System Commander menu without further action. If no NT choice appears when NT is installed this way, select **Alt-S** Setup, and then select the *Order, add, and remove menu*. Select **Alt-A** (Add), and then **P** for Partition. Toggle the NT partition to be bootable with **Alt-T**.

NT Installed prior to System Commander - Adding DOS

DOS must be installed into a FAT style primary partition. If NT is currently installed into the FAT primary, then DOS can be added into this partition, otherwise a new primary FAT partition must be created. To add DOS into the NT partition after System Commander has been installed, boot from the first DOS installation disk. This will take you into the DOS setup program. In some cases you will receive a message indicating that DOS will not install because it detects another OS already on your machine. Should this occur, exit the setup program. At the A:> prompt, type **SYS C:.** After you receive the message "System Transferred", type **SETUP** to launch the DOS installation again. This time it will be *recommended* that you exit the setup, but you will be given the option to continue. You may safely continue the installation at this point. After the installation of DOS has been completed, you will be prompted to reboot the machine. Upon reboot, System Commander will prompt you that a possible new operating sytem has been detected. Save this choice as it will be your new DOS installation.

Installing NT after System Commander

After System Commander is installed and the existing OS information has been saved by System Commander (i.e., reboot once), make sure your last boot was to either the DOS or Windows 95/98 that exist in the same partition in which System Commander has been installed (the MultiFAT partition). Do not proceed if the last choice was OS/2. Proceed to install NT per the NT instructions.

As part of the NT installation the system will be rebooted. At this point the NT installation is not complete. System Commander will detect the new OS ask you if you wish to save it. Select **Save**, and if you desire, change the description. At this point the NT installation will proceed as if System Commander was never present.

If you have problems with the NT installation (i.e., system incompatibilities, disk problems, etc.) and you later attempt to re-install NT, upon NT requiring a reboot, the OS selection menu will appear. Be sure to select the NT selection so no files are changed and the NT installation will continue normally.

Once NT has completed the installation, issue a system shutdown (**Ctrl-Alt-Del** will display the shutdown option). Upon reboot, System Commander will now present NT as another menu choice.

Getting Rid of OS Loader Messages

Select NT from the OS selection menu to bring up the NT OS loader with both NT and DOS choices. Select NT. Once NT is running, click on the MAIN group and select the Control Panel. Next, click on the System icon within the Control Panel. Pick NT as the startup operating system, and change the settings for "Show List for" to zero. This will skip NT's extra questions at Boot time, since you will be selecting NT and DOS directly from the System Commander Menu.

Non-bootable NT selection on the Selection Menu

When NT is installed with NT's OS Loader (i.e., a DOS partition exists during NT's installation), you might get an extra NT choice on the System Commander menu that fails to boot. This is the real NT partition, which is not directly bootable. NT goes through several of its own hidden files on the DOS partition to start up the other partition.

To remove the selection from the menu, press **Alt-S** (Setup), and select the *Order, add, or remove menu*. Highlight the NT choice to remove, and press **Alt-R** (Remove). Be careful not to remove your real NT selection, which resides on the same drive and partition as your DOS choice.

Creating Multiple NT Configurations (same version of NT)

System Commander can manage different configuration selections for NT and copy files between subdirectories. This is often useful to have a different sets of .INI files. You might have one set for a network, another for a laptop's docking station, and yet another while on the road with a laptop. Multiple configurations is only supported when NT boots through the DOS partition, and NT is using the FAT file system.

To duplicate the NT choice, boot into System Commander and press **Alt-S** (Setup) at the OS selection menu. Select *Order, add and remove menu* and highlight the NT choice. Next select **Alt-A** (Add), and then select **D** for Duplicate. A duplicate choice is created. Escape from the menu, and then select the *File management menu*. In this menu you can specify additional files to copy, such as a specific .INI file.

Multiple NT OSes

System Commander can also manage multiple NTs in separate partitions. This is handy when you need multiple different versions of NT on one system. NT does not normally boot directly into the partition where it is installed. As you add additional NTs to the system, each installation will alter the BOOT.INI file in the DOS partition to include the added NT. This results in having a list of NT's (from NT's OS loader) appearing after you select NT from System Commander.

If you wish to split this list of NTs into individual selections on the System Commander OS selection menu, simply follow the process described in the prior section "Creating Multiple NT Configurations". Each instance of BOOT.INI can be edited to default to the desired selection.

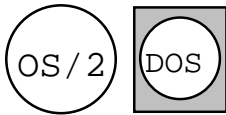
Special Protection for NT

System Commander will automatically save and maintain the BOOT.INI, NTLDR.COM and NTDETECT.COM files, critical to NT's operation. During the installation of some OSes, these files are purposely destroyed to disable NT. When the NT selection is made, System Commander will detect the missing files and automatically restore it from System Commander's previously saved image.

Limitations from OS

- NT can be installed in a primary or logical partition on any accessible drive, but must boot through a primary partition on the first drive.
- The primary boot partition for NT must reside below 2 GB
- The partition can be FAT or for higher performance, HPFS or NTFS.
- Windows NT 5.0 also supports FAT-32 type partitions.
- Long filenames can only be seen by NT and Windows 95/98.

OS/2 and DOS in Separate Partitions



If OS/2 is already installed, System Commander should already show OS/2 as a boot selection after a reboot. In addition, a selection for OS/2's Boot Manager may appear. In some installations, OS/2's installation incorrectly marks other non-bootable partitions as being bootable, so you may see other choices on the menu that should be removed.

If OS/2 does not appear as a selection, press **Alt-S** (Setup), and select the *Order, add and remove menu*. Press **Alt-A** (Add), and then select **Partition**. Move the highlight bar to the OS/2 partition and press **Alt-T** (Toggle) to set the bootable status to **YES**. Press Escape three times to return to the selection menu.

Once you verify the OS/2 partition boots properly from System Commander, you can remove any bogus entries and remove Boot Manager if desired. To remove a menu choice, from the OS selection menu, press **Alt-S** (Setup). Select the *Order, add and remove menu*. Highlight the choice to remove, and press **Alt-R**.

If you are installing OS/2 now, OS/2 requires Boot Manager to install OS/2 in a separate primary or logical partition. The OS/2 installation will handle this for you. Once OS/2 is fully installed, Boot Manager is no longer needed, and the partition can be reused for other purposes.

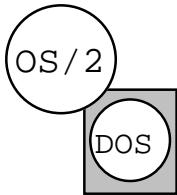
If you do not have any free space to install Boot Manager (it requires a primary partition on your first drive), A software tool can be used to change the size of an existing partition without deleting data. See Appendix D for additional information on partitioning software.

Limitations from OS

- OS/2 can be installed in primary or logical partitions on any accessible drive.
- Boot Manager must be installed in a primary partition on the first drive to install OS/2 (It can be discarded after OS/2 is installed).

- Only one OS/2 configuration is allowed for the one installation (see next section for multiple configurations).
- The partition can be FAT or HPFS for higher performance.
- Long filenames can only be seen by OS/2

OS/2 in the DOS Partition



OS/2 can be installed in your current DOS partition. No special partitioning is required, providing you have enough disk space free. System Commander is automatically used instead of Dual Boot, to switch between OS/2 and DOS. During the booting process, OS/2 requires its own unique CONFIG.SYS and AUTOEXEC.BAT files transferred from the C:\OS2\SYSTEM directory. System Commander automatically takes care of this.

If OS/2 was installed prior to System Commander, the following steps are taken to provide an OS/2 boot selection.

- 1) If you have not yet rebooted once after System Commander was installed, do so now (Ctrl-Alt-Del) to save the current DOS.
- 2) From the DOS prompt (not inside OS/2) run:
`C:\> \OS2\BOOT /OS2`
- 3) When the OS/2 boot program asks, enter “y” to reboot.
- 4) After rebooting, System Commander will provide the choice to save the new OS. Press **S** (Save) to save the OS/2 selection.

Understanding OS/2 and DOS file swapping

System Commander by default emulates OS/2 dual boot operation for the quickest switch between DOS and OS/2. This also protects against accidentally exiting OS/2 through the dual boot option (which will not affect System Commander). It is useful to understand how the CONFIG and AUTOEXEC files are handled by System Commander with OS/2.

While in DOS, two files appear in the C:\OS2\SYSTEM\ directory, CONFIG.OS2 and AUTOEXEC.OS2. Just after OS/2 is selected from the system menu, these files are swapped with the DOS CONFIG.SYS and AUTOEXEC.BAT files in the root directory, and the old root directory names are changed. These actions appear as:

| Prior OS is DOS | After selecting OS/2, file is: |
|----------------------------|--------------------------------|
| C:\CONFIG.SYS | C:\OS2\SYSTEM\CONFIG.DOS |
| C:\AUTOEXEC.BAT | C:\OS2\SYSTEM\AUTOEXEC.DOS |
| C:\OS2\SYSTEM\CONFIG.OS2 | C:\CONFIG.SYS |
| C:\OS2\SYSTEM\AUTOEXEC.OS2 | C:\AUTOEXEC.BAT |

When rebooting and selecting another operating system other than OS/2, the files are returned to normal, as illustrated in the next table.

| Prior OS is OS/2 | After selecting DOS, file is: |
|----------------------------|-------------------------------|
| C:\OS2\SYSTEM\CONFIG.DOS | C:\CONFIG.SYS |
| C:\OS2\SYSTEM\AUTOEXEC.DOS | C:\AUTOEXEC.BAT |
| C:\CONFIG.SYS | C:\OS2\SYSTEM\CONFIG.OS2 |
| C:\AUTOEXEC.BAT | C:\OS2\SYSTEM\AUTOEXEC.OS2 |

Alternate method for OS/2 in the DOS Partition

If for some reason you would like to bypass the dual boot emulation of System Commander, a special option turns off System Commander's file swapping for OS/2. Instead of file swapping, individual files are copied into the root directory as desired. This is controlled from the Setup menu, under Global special options menu. Set the selection *For OS/2 in DOS partition, skip fast boot* to **YES**.

If an OS/2 menu choice was already created, be sure to specify the subdirectory and files to copy from the setup menu by selecting the File management menu. OS/2 , at a minimum requires a set of unique CONFIG.SYS and AUTOEXEC.BAT files.

Multiple OS/2 Configurations

With a single OS/2 configuration in the DOS partition, System Commander fully emulates the OS/2 dual boot operation, where the CONFIG and AUTOEXEC files reside in the \OS2\SYSTEM directory.

To have multiple OS/2 configurations, the *Order, add and remove menu* is selected, and the OS/2 selection is highlighted. Press **Alt-A** (Add) and then **Duplicate**.

This will force the global option *For OS/2 in DOS partition, skip fast boot* to **YES**, which turns off the dual boot emulation. Instead of dual boot, individual sets of the CONFIG and AUTOEXEC files are used from each selection's file save subdirectory.

Since dual boot is no longer active, and the proper files have not been setup yet, avoid OS/2 choices since they will not boot up properly. Once set up, the file structure on the C: drive will look something like:

```

C:\
(Root) └─ \SC\OS2.A ┌─ CONFIG.SYS (not specified nor saved)
                  └─ AUTOEXEC.BAT (not specified nor saved)
                  └─ \SC\OS2.B ┌─ CONFIG.SYS (not saved yet)
                                └─ AUTOEXEC.BAT (not saved yet)

```

The Basic Steps

To setup two configurations, take the following steps:

- 1) Upon exiting the Order menu duplicate function, select the *File management menu*, which shows the OS/2 duplicate (if not, use **PgUp** and **PgDn** to switch to it). Jot down the subdirectory for CONFIG.SYS.
- 2) Use **PgUp** and **PgDn** to select the original OS/2 entry from which the duplicate was made from. Add two entries for AUTOEXEC.BAT and CONFIG.SYS with a different subdirectory from step 1. Use the Default option to do this for you (press **Alt-D**). The action will be **COPY**, and the update type will be **AUTO**. Jot the subdirectory name down for later use.
- 3) Exit System Commander setup and select a DOS choice. Assuming the two directories are \SC\OS2.A and \SC\OS2.B, perform the following copies, changing the filenames at the same time:

```

C:\> copy \os2\system\config.os2      \sc\os2.a\config.sys
C:\> copy \os2\system\autoexec.os2    \sc\os2.a\autoexec.bat
C:\> mkdir os2.b
C:\> copy \os2\system\config.os2      \sc\os2.b\config.sys
C:\> copy \os2\system\autoexec.os2    \sc\os2.b\autoexec.bat

```

- 4) Edit one or both sets of CONFIG and AUTOEXEC files in the subdirectories to make the two different configurations as desired. For

example, the files in directory \SC\OS2.A are used to connect to a network, while the configuration files in \SC\OS2.B do not.

Additional Configurations

As you add a third or more configurations using the Duplicate function under the Order menu, most of this work will be done automatically by System Commander. You simply need to exit to DOS or OS/2 and update the new set of configuration files that System Commander copies into the subdirectory you specified for the duplicate.

Displaying OS/2 Configuration Help

You can view this help information from the File management menu or from the Order menu by pressing **Alt-O** for OS/2 multiple configurations.

Limitations from OS

- OS/2 is installed in a DOS primary partition on the first drive.
- Long filenames can only be seen by OS/2

OS/2 and Windows NT (Same Partition)

If you already have Windows NT installed and functioning on your machine, and you would like to add OS/2 into the same (MultiFAT) partition, there are additional steps you must take prior to the OS/2 installation. OS/2 typically will not install into a partition that already has Windows NT installed.

Before the OS/2 installation, you must remove certain Windows NT files which OS/2 looks for during its installation process. These files are **boot.ini**, **ntdetect.com** and **ntldr**. These are hidden files residing in the root of your file system. The easiest method to remove these files is to boot from the system disk you made prior to the System Commander installation (see Chapter 3). From the A:> prompt, use the attrib.exe program to change the attributes of the NT system files on the hard drive to non-hidden, non-system, and non-read-only. An example of these command lines, if your NT partition was C:, would be:

```
attrib -r -h -s c:\boot.ini
attrib -r -h -s c:\ntdetect.com
attrib -r -h -s c:\ntldr
```

At this point, these files should be visible in the root of the NT partition and can be renamed with a **.tmp** extension. Since NT is in the same partition in which System commander is installed (the MultiFAT partition), System Commander has a back-up of these files and NT will still function properly.

```
rename c:\boot.ini      boot.tmp
rename c:\ntdetect.com  ntdetect.tmp
rename c:\ntldr         ntldr.tmp
```

In addition, you must rename the WINNT directory:

```
rename c:\winnt  winnt.sav
```

You may now install OS/2 following the instructions provided with the operating system. Remember, in this scenario, you must use FAT file format when prompted. You may not choose HPFS since NT and System Commander are installed into this partition.



Warning: If NT exists prior to OS/2 Warp Installation, OS/2's installation may offer to delete the NT partition. Do not do this! If you tell it to delete the NT data, OS/2 does not ask for confirmation, and will immediately begin erasing the partition data, including System Commander and other MultiFAT OSes.

After OS/2 is installed, when NT is next selected, System Commander will automatically rename the directory back again, and load the correct NT files.

UNIX Configurations

UNIX

Although System Commander can boot from any partition on any drive, most UNIX variants require installation on drive 0. If your UNIX allows installation on other drives, System Commander can boot it. Coherent, Linux, and Solaris all allow booting from any disk. Linux even allows booting from a logical partition.

Some UNIX installations may overwrite System Commander's master boot record. For example, running SCO UNIX's FDISK will cause this minor problem. When the master boot record is changed, a reboot will not bring up System Commander, but will run SCO instead. To correct this, boot to a prompt using a Windows 95/98 or DOS boot diskette. At the prompt, run SCIN from the System Commander diskette or from the hard disk. Select *Enable/Reinstall* from the main menu. Now when you reboot, System Commander will appear. No loss of information occurs from this quirk in SCO.

System Commander also supports selection from multiple UNIX operating systems installed on one system. When a specific UNIX is selected, the other UNIX partitions on the same drive are automatically hidden to avoid conflicts. To override this feature, use the *Setup* menu, selecting *Local special options menu*.

System Commander also makes any DOS partitions accessible to UNIX. Again, this feature can be overridden using the *Local special options menu*.

The following sub-sections cover issues related to specific UNIX implementations.

Linux

System Commander is fully compatible with Linux. To boot properly into Linux, we recommend having LILO's target location set to the root superblock. This option is typically selected from within Linux while installing Linux. For the fastest and easiest boot, we suggest only making LILO boot Linux and no other OS.



To install LILO into the root superblock on an existing partition, modify the LILO configuration file (typically `/etc/lilo.conf`) so that the **boot=** line refers to your Linux root partition, and not your first hard disk (i.e. **boot=/dev/hda5** instead of **boot=/dev/hda**).

In some Linux releases, we've found that if you were using the MBR method (LILO installs its own MBR), that despite making the correct change to LILO's configuration, it fails to truly make the partition bootable.



If you are having problems with installing LILO into the root superblock, we recommend an alternate approach that has System Commander launch the Linux MBR. In this case, install LILO into the MBR. Having System Commander load a MBR is explained in detail on page 25.

If you use a Linux swap partition (partition id 82), it may appear on the main menu as a potential OS to boot. It is not bootable. To remove the UNIX-82 selection from the OS selection menu, press **Alt-S** (Setup), and select the *Order, add, and remove menu*. Highlight the swap partition and press **Alt-R** (Remove). This removes the selection from the menu (but has no effect to the swap partition).

Solaris

Solaris can be installed on any drive. The Solaris installation instructions indicate that you must use a special Solaris boot diskette if you elect to install on any drive other than the first.



Avoid using the Solaris "Automatic" installation, as it usually erases all existing partitions on the drive!

System Commander will boot Solaris from any IDE disk without using the Solaris boot diskette. Just install Solaris as if a boot diskette was going to be used. When the installation is complete, you can boot directly to Solaris from System Commander. On some SCSI controllers, it may not be possible for System Commander to properly launch Solaris from any drive other than the first drive.

Solaris and SCSI Drives greater than 1 GB

Solaris 2.4 does not allow drive translation (or often referred to as an option for drives greater than 1 GB). This means Solaris must be installed on the disk below cylinder 1024 (1 GB).

Solaris and Linux on the same System

The Linux swap partition and Solaris both use the same partition id, 82. When using a Linux swap partition and Solaris partitions in the same system, it is necessary to prevent Solaris from accessing the Linux swap partition and Linux from accessing the Solaris partition.

System Commander normally handles this automatically. To perform these actions yourself, at the OS Selection Menu press **ALT-S** (Setup) then select *Local special options*, and set the *primary partitions visible* option for each OS selection. With Solaris selected, make the Linux swap partition hidden. With Linux selected (id 81 or 83), make Solaris hidden.

SCO Open Server UNIX System V SCO UnixWare

Most operating systems expect to see a single partition bootable, with all other primary partitions marked as non-bootable. SCO UNIX System V and UnixWare require that all of its partitions be marked as bootable, even if the partition is not truly bootable. Bootable status is often referred to as the "active partition" by partitioning software like FDISK.

When System Commander is first installed, it will automatically set an option for UNIX partitions to make all identical partitions active. If you install SCO UNIX System V or UnixWare *after* System Commander was installed, you may need to set this option manually.

To change the handling of the bootable/active status across partitions, first highlight the UNIX choice on the OS selection menu and press **Alt-S** (Setup). Select *Local special options menu*. Set the option *Bootable/active status across partitions* to **OVERRIDE ON**. All other operating systems, including other UNIX variants, should use the default setting of **AUTO**.

Although rare, if you get a boot error message from UNIX, see the troubleshooting section for UNIX.

FreeBSD

FreeBSD normally installs its own boot loader program into the MBR. When installing FreeBSD, use its boot loader to verify that the FreeBSD installation is working properly, then boot from a DOS floppy disk, run the SCIN program, and select *Enable/Reinstall System Commander*. Then reboot into the System Commander menu. System Commander will automatically detect the FreeBSD installation, and add it to the OS Selection menu.

Coherent UNIX (Mark Williams Company)

Coherent is one of the few OSes that can be installed and booted from any primary partition on any drive. System Commander fully supports booting Coherent from any drive. When installing Coherent after System Commander is installed, Coherent will ask if you want to install Coherent's master boot record. Select NO so System Commander will remain active.

The Coherent documentation and partition handler software during installation refer, incorrectly, to primary partitions as logical partitions. Coherent only works on primary partitions.

A few users have reported a problem when attempting to go into Coherent UNIX after DOS was active. It does not matter if a warm reboot (Ctrl-Alt-Del) or a hardware reset was issued while in DOS. Coherent either hangs or reboots. The second attempt at selecting Coherent will always work. Powering the system down also allows immediate access to Coherent if the prior selection was DOS.

We have verified this problem with Coherent version 4.02.05, and it is bug in Coherent initialization. It can be easily duplicated using the Coherent master boot record without System Commander installed. Using version 4.02.10 or a later release of Coherent fixes the problem. Unfortunately, it is our understanding that Mark Williams Company is no longer in business, so obtaining the last release may be difficult.

NetWare Installations



Novell's NetWare versions 3 and 4 use DOS to start, and then takes over the system using its own partition. System Commander can create separate boot choices for each NetWare you install. In essence, a duplicate DOS choice is made so NetWare starts with its unique CONFIG and AUTOEXEC files and a separate set of files for DOS.

To split a single DOS/NetWare selection into two separate selections, press **Alt-S** (Setup) and select the *Order, add and remove menu*. Highlight the current DOS choice, and press **Alt-A** (Add), followed by **D** (Duplicate). You can now enter the name and new subdirectory for the duplicate menu selection. When complete, exit to the new "Duplicate" DOS choice. Update the AUTOEXEC.BAT file to go directly to NetWare.

NetWare version 2.x does not boot through the DOS partition, but has its own bootable partition. System Commander will boot directly into a NetWare version 2 partition.

Installing NetWare after System Commander

To install NetWare version 3 or version 4 after System Commander is installed, you must follow these steps:

- 1) Your hard disk must be partitioned such that the space you want to allocate to NetWare is unpartitioned. The NetWare installation procedure will create the NetWare partition in this space.
- 2) From the System Commander OS Selection menu, press **Alt-S** (Setup) and duplicate the current DOS choice from the *Order, Add and Remove menu* (see the start of the NetWare Installations for complete duplicate instructions). This new duplicate will become the NetWare choice, so enter an appropriate description. Exit to the selection menu, and select the NetWare choice. DOS will come up at this point.
- 3) Install NetWare. NetWare will grab the undefined area of the disk and make it a NetWare partition for its use.

Multiple NetWare Oses on one system

System Commander lets you manage multiple versions of NetWare on the same system. Because the NetWare installation makes many automatic assumptions, the following is a 'real world' example of how to have Multiple versions of NetWare on one system. To our knowledge it is otherwise impossible to do this without System Commander.

This example case uses a 800 MB drive. Upon completion, DOS will have a 100 MB partition, NetWare v3 will get a 300 MB partition, and NetWare v4 will get a 400 MB partition. These sizes are completely arbitrary, and you should select sizes appropriate for your needs. The steps to accomplish this are:

- 1) Using DOS FDISK, partition the disk for one DOS 100 MB partition, and one Extended partition of 400 MB. Leave the last 300 MB undefined, as NetWare v3 will use this. Install DOS, without using the extended partition (don't bother to format it, since it will be deleted later). Then install System Commander.
- 2) Reboot once to save the DOS files. This first selection will always be used for DOS. Select the DOS choice and verify that it boots up properly.
- 3) Reboot again to the System Commander OS selection menu. Press **Alt-S** (Setup) and duplicate the current DOS choice from the *Order, Add and Remove menu* (see the start of the NetWare Installations for complete duplicate instructions). This new duplicate will become the NetWare 3 choice, so enter an appropriate description. Exit to the selection menu, and select the NetWare 3 choice. DOS will come up at this point.
- 4) Install NetWare v3. NetWare will grab the 300 MB undefined area of the disk and make it a NetWare partition for its use.
- 5) Using FDISK again, delete the extended DOS partition (400 MB). Reboot and press **Alt-S** to go into Setup for the NetWare 3 choice. Select *Local special options menu*. On the line *Primary partition visible on drive 0*, verify that one partition named (NET WARE) is set to YES. Also jot the partition number down for later use, as you will need to remember this is the v3 NetWare partition.

- 6) Return to the OS selection menu and highlight (but don't select) the DOS choice. Press **Alt-S** (Setup) and duplicate the current DOS choice from the *Order, Add and Remove menu* (see the start of the NetWare Installations for complete duplicate instructions). This new duplicate will become the NetWare 4 choice, so enter an appropriate description.

Next, return to the Setup menu, and select *Local special options menu*. On the line *Primary partitions visible on drive 0*, change the one partition named NET WARE to "hidden". This will prevent the NetWare 4 installation from seeing the NetWare 3 partition.

Exit to the selection menu, and select NetWare 4. DOS will again come up at this point.

- 7) Install NetWare v4. NetWare will grab the 400 MB undefined area of the disk and make it a NetWare partition for its use.
- 8) Reboot to the selection menu, and highlight the NetWare 3 choice. Press **Alt-S** (Setup) and select the *Local special options menu*. On the line *Primary partitions visible on drive 0*, set the v4 NetWare partition to "hidden". This is not the same NetWare partition you had in step 5 earlier.
- 9) At this point you are done! If you did not elect to have NetWare change your AUTOEXEC/CONFIG set of files you may wish to do so now.

Limitations from OS

- NetWare versions 3 and later must be installed in a primary partition on any accessible drive.
- Older versions of NetWare will automatically take all free (unallocated) disk space on the selected drive. Some of the latest versions now allow you to specify how much space to use.

Limitations

Boot Drive

Most PC based operating systems are written in a manner that assumes they will be installed and booted from drive C: (also referred as hard drive 0). This limitation can not be overcome by System Commander. However, if the operating system allows it, System Commander can boot it from another drive. OS/2 versions 2.x, Warp, and Linux allow installation and booting from any drive and even allow booting from a logical drive in an extended partition. Solaris and Coherent also allow booting from any drive's primary partition.

Be aware that NT solves this problem by actually booting through files in the MultiFAT partition on drive 0. Therefore, System Commander simply treats NT like another OS in the MultiFAT partition.

System Commander File Location

System Commander must be installed in a primary FAT partition on drive C: (also referred to as hard drive 0). The FAT partition does not need to be the first partition on the disk. System Commander will install SYSCMDR.SYS, SCDOS.SYS, and SYSCMNDR.HLP into the root directory as hidden system files. These files control the operation of System Commander, and must remain in the root directory. The active status of partitions as set by FDISK or the use of DEFRAG programs do not affect System Commander operation.

Disk Compression

All System Commander files must be installed on the non-compressed boot drive. Remember that System Commander runs before any DOS or decompression software runs. This includes hidden disk compression methods used by DriveSpace, DoubleSpace, Stacker 3.1/4, and DoubleDisk. If you are using multiple operating systems in the DOS partition, you would be wise to avoid disk compression altogether. Although not an issue with System Commander itself, different versions of DOS, Windows 95/98, NT, and OS/2 may be

incompatible with disk compression software. Be aware, you are on your own if you attempt to use disk compression software! See page 19 for additional notes.

Anti-Virus Software

System Commander must modify the Master Boot Record. In addition, it will swap out the partition's boot record when different OSES are selected that are installed in the same partition. Some Anti-Virus software will complain about both of these changes with a possible note about a possible boot sector virus or operating system change.

This is normal if you just installed System Commander or just changed operating systems. Instruct the virus-detection software that the operating system has changed, and it will save the new information without altering the boot sector.

If you have not changed the selected operating system and the virus-detect software all of a sudden pops up with a warning about the boot sector, you should be concerned that a virus may have attached itself to the boot sector.

One way to correct this is to simply reboot the system. System Commander will detect the change and ask if a new operating system was installed. If no OS was just installed, select **B** for Bypass. This forces System Commander to overwrite the boot sector AND hidden system files with new non-infected copies.

This should remove the virus from the system files, but other executables may be affected. Run your virus checking software to clean up other files that may be infected.

Special Partitioning Software (Disk Spanning)

In very rare situations, special software can make multiple disk drives appear as one very large drive. This is called disk spanning. The ability to Span Disks is not supported with the operating system's utilities, but requires special software and drivers.

If your system is set up with disk spanning, where multiple drives appear as one drive, do not use System Commander.

Some large drives can divide themselves into two smaller drives. This hardware approach is not related to disk spanning and works fine with System Commander.

Speeding Up the Boot Process

There are a number of ways to dramatically speed up the booting process. The following tips can help speed the time it takes from when you press **Ctrl-Alt-Del** to when the System Commander OS selection menu appears.

System Selection

Surprisingly all systems are not alike! Unfortunately, if you have a slow booting system, it can be costly to get rid of it. Some of the slowest systems rely on the EISA or early Plug n' Play designs. These systems slowly check through each card in the system, every time you boot. Although the features these systems offer is nice, the excessive boot up delays are not.

BIOS Options

Some system BIOSes have options to speed up the booting process. Since there is no standard between vendors you will have to examine your specific setup program and menus to see if any provided options are similar to those described below. Setup is typically activated immediately after a reboot. Often a short description is presented, such as "Press Del for Setup". Older machines sometimes use special key combinations, such as **Ctrl-Alt-Esc**, **Ctrl-Alt-Ins**, or **Ctrl-Alt-S**. Some laptops access setup by holding down the Escape key during bootup.

Some PC vendors do not allow any setup options which will help performance. At the other end of the spectrum, vendors like AMI often provide extensive options. Some OEMs who license BIOSes may remove some or all performance options in an attempt to reduce confusion to non-technical users or help reduce potential customer support.

Memory Test

Some BIOSes provide an option to skip the detailed test of all the memory in the system. This test can easily take 10 to 30 seconds depending on the system speed and amount of memory to be tested. Disabling this option will eliminate most of this delay. On most AMI BIOSes, this option appears under Advanced CMOS setup as *Above 1 MB Memory Test*.

Floppy Drive Seek

This option bypasses a seek operation during boot up. It is rarely necessary, since the first diskette drive access will perform the seek anyway. When disabled, it shaves 1 to 5 seconds off the boot process. On most AMI BIOSes, this option appears under Advanced CMOS setup as *Floppy Drive Seek At Boot*.

System Boot Up Sequence

Normally the BIOS attempts to boot from the A: drive. Upon failure, it then boots from the hard disk. This wastes another few seconds in the boot up process. By selecting a boot sequence first using C:, and only using A: if C: fails, another 2 to 8 seconds are eliminated out of the boot up process. On most AMI BIOSes, this option appears under Advanced CMOS setup as *System Boot Up Sequence*.

To still allow booting from a diskette, we suggest adding the “Boot from A:” option as one of the OS selections if it does not already appear. To do this, press **Alt-S** (Setup), and select *Order, add and remove menu*. Press **Alt-A** (Add) and press **F** for Floppy.

Hard Disk Selection

Although difficult to change at this point, the hard disk and controller often have the biggest effect on the time required to boot. See Appendix D for additional details.

Hard Disk Controllers

SCSI controllers often waste 20 to 60 seconds during the boot up process for initialization and checking for non-existent SCSI devices. IDE and ESDI controllers require no significant initialization time.

Disk Drives

A less significant factor is the performance of the disk drive. The faster the access time, the faster the boot process can proceed. System Commander will also appear faster if the SYSCMNDR.SYS and SCDOS.SYS files appear near the start of the disk and are not fragmented. Use a disk defragmenter program to minimize the load times for System Commander and operating system files.

Speeding Up DOS boots

In addition to using the tips from the prior section, the following suggestions can help speed up the DOS boot process.

In general, each item in your CONFIG.SYS and AUTOEXEC.BAT file, such as device drivers and TSRs slow the boot process. You might want to review these files to see if any unnecessary programs can be removed.

You can also add the line inside the CONFIG.SYS file for MS or PC-DOS version 6 or later:

```
SWITCHES = /F
```

This eliminates a 2 second wait for detection of several bypass keys, such as F5, or F8.

Speeding Up Windows 95/98 boots

In addition to using the tips from the prior sections (including the section on *Speeding Up DOS boots*), the following suggestion can help speed up the boot process.

Edit the hidden system file MSDOS.SYS and change the line **Logo=1** to **Logo=0**. This will skip the Windows Logo from appearing, saving several more seconds in the boot up process. To edit this file, first enter the following commands in a Windows 95/98 DOS box:

```
C:\> attrib -h -r -s c:\msdos.sys
```

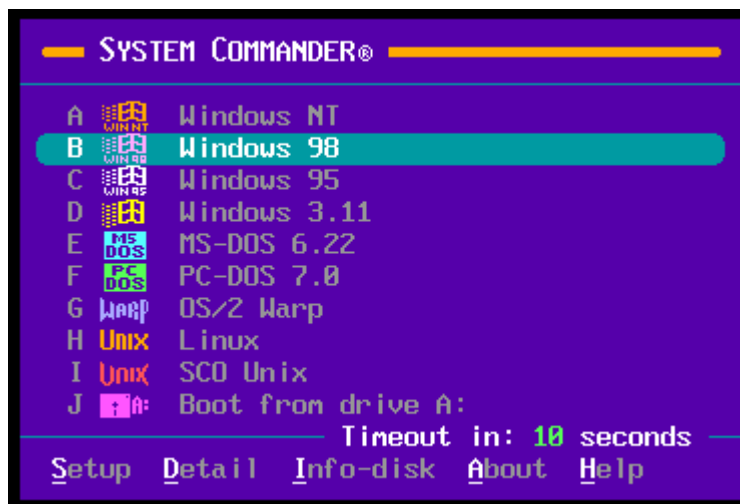
When the editing is complete, you can hide the file again:

```
C:\> attrib +h +r +s c:\msdos.sys
```


System Commander Options

Menu Options

When the System Commander option screen appears after a re-boot, it shows all of the operating system choices. The menu might appear as:



You can make a selection by using the up/down arrow keys and then pressing Enter. Press an indicated letter to instantly make a selection. To select a System Commander option from the bottom row, hold the Alt key down and press the desired highlighted letter. For example, press **Alt-S** for Setup.

Functions available include:

Setup Use this menu for setting timeout options, adding and removing OS selections, passwords, descriptions, icons, and many other features. See Setup on page 81 for complete details (for Setup, press **Alt-S** or **F2**).

Detail Toggle additional details about each operating system (press **Alt-D** or **F3**).

This option toggles between showing the product information that System Commander identifies, showing the OEM name from the OS vendor, and showing no extra information.

When extra information is shown, the drive and partition numbers are also shown. An “e” appears after the partition number if the partition is an extended partition handling one or more logical partitions. An “m” appears after the partition number if the selection is an MBR file load. Other letters may appear after the partition number; consult the online help (press **Alt-H** or **F1**) for more information.



With some operating systems, the OEM name is cryptic or misleading. Do not rely on it. See *Inaccurate OEM names* on page 133 for more information.

Info-Disk Shows primary and logical partition information for the drives on your system (press **Alt-I** or **F4**). While viewing disk information, use the up and down arrow keys to move the highlighted selection bar and see detailed information about each partition and see the drive letter assignments for the selection. Subfunctions of the Info-Disk screen include:

Help for help about this screen (press **Alt-H**).

Empties to see empty partitions (press **Alt-E**).

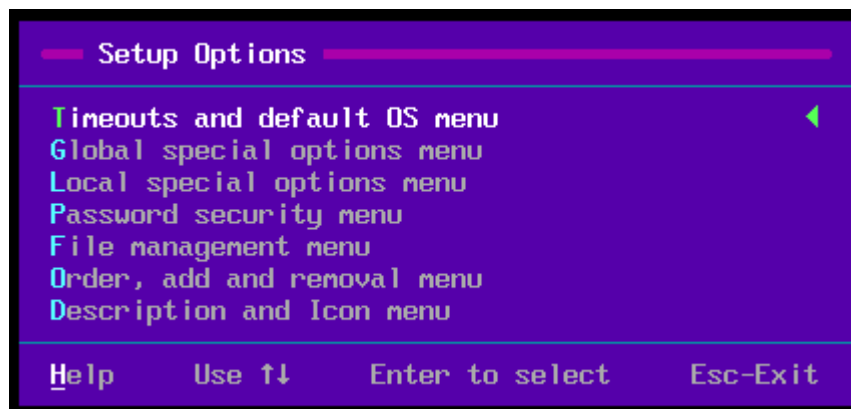
Detail to toggle the type of information (press **Alt-D**).

About Display information about System Commander (press **Alt-A** or **F5**).

- Password** Toggle the global password option on or off (press **Alt-P** or **F6**).
- This option will only appear when a global password is set and the option *Allow global password toggle on/off?* is set to YES.
- This option is handy when you would like the global password active in some situations and inactive in other situations. For example, a laptop used in the office might not need passwords, yet when traveling the laptop could have passwords active.
- Help** Display help about the OS selection menu (press **Alt-H** or **F1**).
- Back** This minor option does not appear on the menu. It allows you to view the background screen prior to System Commander appearing (press **Alt-B**).

Setup Menu

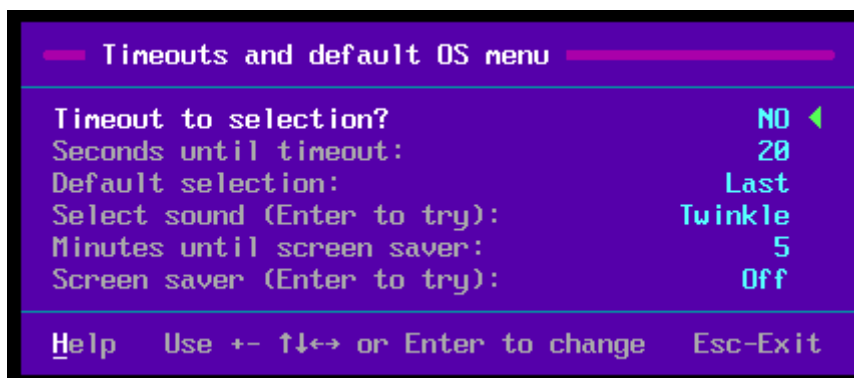
The setup menu is accessed from the OS selection menu by pressing **Alt-S** or **F2**. Use Setup to select from a number of System Commander options and features. The setup menu appears as:



Use the Up and Down arrow keys to move between options, and Enter to select the desired menu option. Press Escape to return to the OS selection menu.

Timeout and Default OS Menu

This menu provides options to set the timeout delay, default OS, and screen saver options. The Timeout and Default OS menu appears as:



Timeout to selection (Bar-Yes/Yes/No)

When the System Commander selection screen appears, a time-out can be set for the length of time System Commander will stay on screen before it automatically makes the default selection. Select YES if you want this option, otherwise use NO to have System Commander wait for a manual selection.

Use BAR-YES to have the last 20 seconds of timeout run up a graphical bar on the side of the screen.

Seconds until timeout (1-99)

If the Timeout to selection option is set to YES, you can set the number of seconds to wait before using the default selection from 1 second to 99 seconds.

Default selection (A-Z, Last)

After a reboot, System Commander will highlight the default menu selection. You can choose any of the first 26 possible operating systems A to Z as the default, or have System Commander remember the last OS you selected.

Select sound

This lets you choose from any of 15 different alert sounds, which will occur at boot time. You can choose no sound with the QUIET option, or have System Commander select a different sound every time with the RANDOM option. Pressing **ENTER** while in the sound selection field lets you hear the current sound choice.

Minutes until screen saver (1-99)

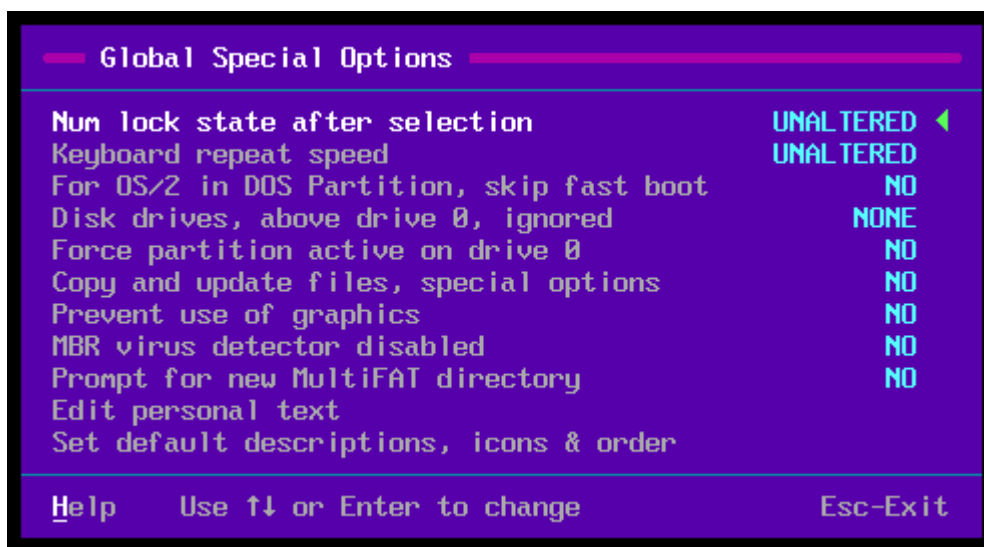
If the Screen Saver option is not off, this option specifies the number of minutes to wait before activating the screen saver selection.

Screen Saver [Not available in SC Lite]

This options allows you to choose from different screen savers included with System Commander. Pressing **ENTER** while this option is selected will preview the screen saver. Use the *Off* setting to disable the screen saver.

Global Special Options Menu

This menu provides global options not specific to the selected OS. [Most options are not available in SC Lite] The global options menu appears as:



Num lock state after selection - Specify the num lock state as UNALTERED, ON or OFF.

Keyboard repeat speed - Specify how fast the keyboard repeats a held key as UNALTERED, FAST or FASTEST.

For OS/2 in DOS Partition, skip fast boot - Normally this option is left at NO to have System Commander emulate OS/2's dual boot operation when OS/2 is installed in a DOS partition. This is the fastest way to switch between a DOS and OS/2.

With the option set to YES, System Commander will not swap CONFIG and AUTOEXEC files with those in the \OS2 directory. You will then need to specify these files in the file management menu to be copied to the root directory.

Disk drives, above drive 0, ignored - Specify drives to be completely ignored. This is useful for drives that do not function properly without special device drivers. For example, some older hardcards are read-only until a device driver is loaded.

Force partition active on drive 0 - Depending on the OS choice and the OS drive location, it may be normal to have no partitions marked active on the first drive. In very rare cases, the system BIOS detects this as a fault and prevents normal bootup. This option can be set to YES to ensure at least one partition is active on the first drive. If you do not get any BIOS error messages, leave this option set to NO.



If you are using Disk Manager from OnTrack Systems, this option should be set to YES when booting any operating system (such as some UNIXes or OS/2) that boots from a drive other than the first drive in the system. If this option is not set to YES, Disk Manager will not allow you to reboot from your hard disk because no partitions will be marked active on drive zero.

Copy and update files, special options - This selection has four options, often used to identify file copy problems. These options include:

NO - This is the default, and instructs System Commander to automatically update any changed configuration files.

ALWAYS COPY - When a new OS selection is made, any configuration and hidden files for the selection are copied, even if the date, time and size are the same.

PROMPT ALL - When switching to a different OS selection, configuration files which are updated will force a prompt to confirm the update, even if the File management menu update option is set to AUTO (i.e., no prompt would normally appear). The prompt that appears displays the source and target files with file date and time. This option is useful if you are confused as to when and where file updates occur.

When the prompt appears, additional information is shown at the bottom of the screen for the type of copy (normal or update) . An update copy indicates the file was changed, and needs to be saved back to the unique directory for the OS, before the new OS selection files are loaded. A normal copy would never be prompted with this global option set to NO. For normal copies, the file date and time do not matter, as the files must be copied for the OS to work.

PROMPT & COPY – Activates both the ALWAYS COPY and PROMPT ALL options.

Prevent use of graphics - For Color VGA systems, System Commander uses a special graphics style. Set this option to NO if you prefer a simpler style without icons or if your video adapter is not 100% IBM VGA compatible.

MBR virus detector disabled - Set to YES to disable the built in Master boot record virus checks. The default NO provides virus detection and repair.

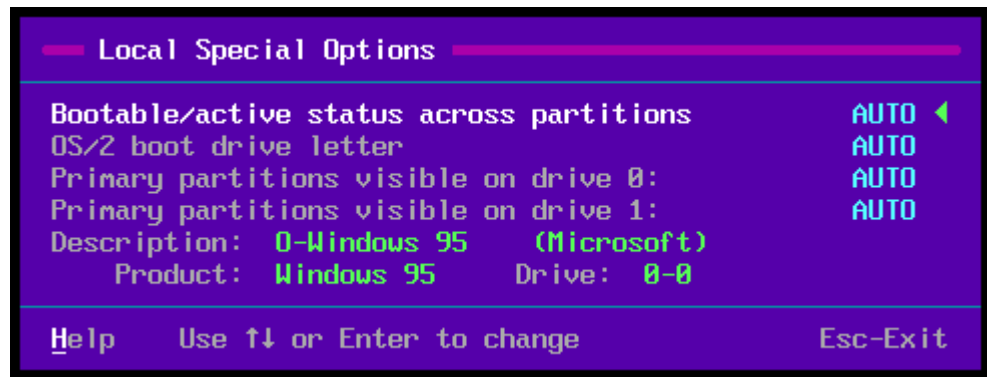
Prompt for new MultiFAT directory - Set to YES if you want to be prompted for a unique directory for each new OS installed in the MultiFAT partition. If this is set to NO, System Commander automatically creates a unique directory under the directory where System Commander was installed (typically under C:\SC).

Edit personal text - Press Enter to edit the personal text string that appears when the About option is selected from the OS selection menu. You may wish to include your phone number and/or driver's license as identification. This can help in the recovery of your computer if it is lost or stolen. This information is even accessible when a password is required at bootup.

Set default descriptions, icons & order - Pressing Enter on this option will allow you to reset all the descriptions and icons to the System Commander defaults. This option is **NOT** reversible once invoked. It will ask for confirmation before setting the defaults. After the defaults are loaded, you can edit the descriptions and icons as desired.

Local Special Options Menu

This secondary menu provides options specific to the currently selected OS. The local special option menu will appear similar to:



Bootable/active status across partitions - This option makes all similar partitions appear bootable when a selection is made. The only operating systems we've found that require this unusual state are SCO UNIX System V and UnixWare. See page 67 for more information about these OSes.

OS/2 boot drive letter - The boot drive letter is normally selected by System Commander when set to AUTO. It is based on the placement of the bootable OS/2 partition relative to other partitions. In very rare situations, it may be necessary to override System Commander's default, and force a different drive letter, C to P. This would be used if OS/2 fails to boot with an error message about not finding COUNTRY.SYS or AUTOEXEC.BAT.

Primary partitions visible on drive *n* - For each drive on the system, a sub-menu overrides System Commander's defaults and can either hide or expose different primary partitions from the selected OS. The default AUTO mode will select the correct partitions to be active in all but the most unusual cases. Use help for additional information and an example (**Alt-H**).

Password Security Menu [Not available in SC Lite]

The password security menu allows you to set a wide variety of security features to limit access and protect your system. The use of security features is completely optional.



Important: Although System Commander provides a high level of security, someone with sufficient technical knowledge, access, time and equipment can break through any computer security system. The best possible system security prevents physical access to your system in the first place!

Security Basics

When access is required through the password security system, the user enters the appropriate user name and password. The passwords are case sensitive, but the user names are not. This means the password ABC123 is not the same password as AbC123.

A special user in every system is Administrator. The administrator always has access to all features and OS selections. The administrator can also set up other users and rights for each user. The initial password for the administrator is *password*. We strongly recommend you change this to your own private password and record the new password in case you later forget it. Should you lose or forget your password, V Communications can provide an emergency master password. This service is not free, so **DO NOT LOSE** your password! See Appendix F for more details on getting a master password.

Password Prompting

The default operation asks for a user name and related password before the OS selection menu appears. A valid user name and password must be entered to proceed. Once validated, the user is granted all privileges that were defined by the administrator.

To allow anyone limited access to your system, where no password is required, the AutoLogin feature is used. A special user name called **AutoLogin** is created. If desired, the AutoLogin user profile can assign specific OS choices and prevent setup access. When the system boots

up, no password is requested, but the user is limited to the choices you granted.

This feature is useful for test systems where controlled access to some features is desired. It can also be used where a system reboot (such as caused by a power failure) will allow the system to boot to the desired choice automatically without requiring a password.

When using the AutoLogin feature, you might want to set a fixed timeout and/or a default OS choice that is not changeable by any user. These are made under the Setup menu, under *Timeouts and Default OS* menu. The timeout value and default OS value is saved for each user.

To make changes to these values, you must:

- Login as an administrator
- Go to the AutoLogin user profile
- Set the option *Setup Menu Allowed* to YES
- Exit and make an OS selection
- Reboot the machine
- Enter the *Setup Menu*
- Set the desired settings under *Timeouts and default OS Menu*.

To prevent the user from making changes or accessing setup, exit to the main OS selection menu and press **Alt-P** to specify a new user. Log in as the administrator. Go to the AutoLogin user profile and set the option *Setup menu allowed* to **NO**.

Access Protection

The Access Protection feature prevents any kind of access to your system. When activated, it prevents both diskette drives from operating, and locks out all hard disks from use (other than System Commander). The password must be correctly entered to turn off access protection during any login.

To activate access protection, have a password set within the password security menu. From any OS, reboot to System Commander. When you are prompted for the login, select Shutdown (**Alt-S**). Access protection will be set and you will be prompted to turn off the system.

If access protection is not active, it is automatically activated after three failed attempts to successfully login.

System Administration

When selecting the password security menu, the following selections appear when you are the administrator, or if passwords are disabled.

| <u>P</u> assword Security | | | | | |
|---------------------------|-------------------|--------|---|--|--|
| User Name | Last Access | Status | | | |
| A dministrator | 24-Jan-98 12:51pm | Active | ◀ | | |
| Elsa | -- -- -- -- -- | New | | | |
| Frank | 24-Jan-98 12:50pm | Ok | | | |
| Jim | -- -- -- -- -- | New | | | |
| Kerry | -- -- -- -- -- | New | | | |
| Sam | 24-Jan-98 12:50pm | Ok | | | |
| Mike | -- -- -- -- -- | New | | | |
| John | -- -- -- -- -- | New | | | |
| | -- -- -- -- -- | Unused | | | |
| | -- -- -- -- -- | Unused | | | |
| | -- -- -- -- -- | Unused | | | |
| | -- -- -- -- -- | Unused | | | |
| | -- -- -- -- -- | Unused | | | |
| | -- -- -- -- -- | Unused | | | |
| | -- -- -- -- -- | Unused | | | |
| | -- -- -- -- -- | Unused | | | |

Help
 Edit
 Change-Password
 Remove
 Passwords-off
 Esc-exit

This screen shows you all the current users and the last time the user accessed the system. The status column shows one of the following states:

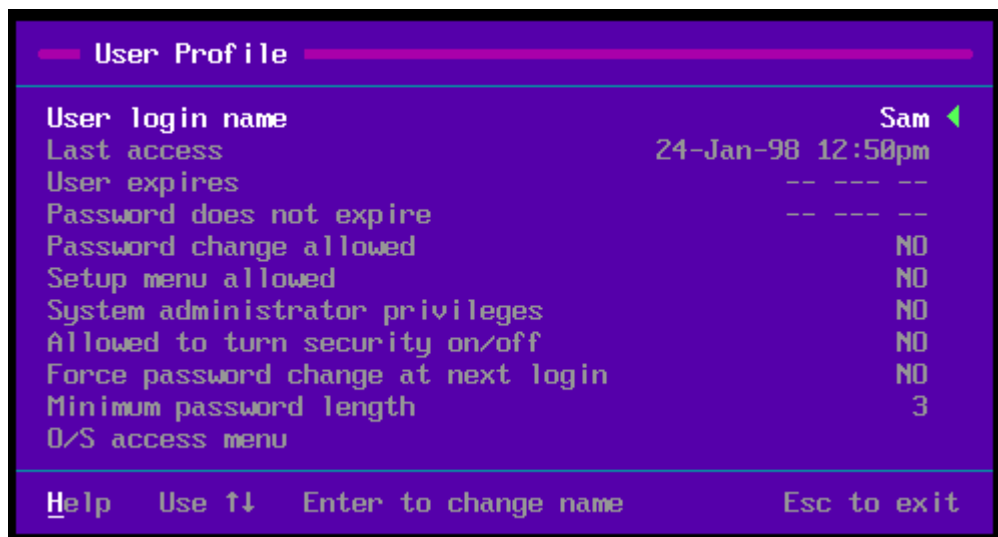
| | |
|--------|--------------------------------|
| Active | The user currently logged in |
| OK | The user is a valid user |
| New | A user who has never logged in |

| | |
|---------|--------------------------------------|
| Expired | The user is no longer allowed access |
| Unused | An available slot for a new user |

From this menu, you can issue the following commands:

| | |
|-----------------|--------------------------------------------------------------------------------------------|
| Help | Get additional help (Alt-H) |
| Edit | Edit the user profile information on the highlighted line (Alt-E or Enter) |
| Change Password | Specify a new password for the highlighted user (Alt-C) |
| Remove User | The user information is deleted (Alt-R) |
| Password On/Off | Activate or deactivate the password security system (Alt-P) |

When editing the user profile, a new screen appears:



From this screen the following options are available:

User login name - Enter the user name. Each user has a unique password. This allows different layers of control for different users of this PC.

Names can be up to 32 characters long and can include spaces and most symbols. User names are not case sensitive.

Two special user names are available. The user name Administrator is reserved for administrative functions and cannot be changed. The user name AutoLogin is reserved for the AutoLogin feature.

Last Access - This is an information only line. It shows the date and time the system was last accessed by this user.

User expires - Set the optional date and time when this specific user can no longer access the system. If this field is left blank, no user expiration date is set.

Password expires - Set the optional number of days that the user can use a single password. After the number of days go by with the same password, upon the next access of this user, the user is prompted to change the password.

Password change allowed - When set to YES the user is allowed to change the related password. When set to NO, the user is prevented from changing the password.

Setup menu allowed - When set to YES, the user is allowed to enter the setup menu.

System administrator privileges - The user can access these screens to add, remove and change user security information. When this option is set to NO, the user cannot access the password security menus, but may be allowed to change the one password associated with the user.

Allowed to turn security on/off? - This option, when set to YES and a password is used, allows you to instantly toggle the password on and off from the main OS selection menu. This is handy for a single laptop user, who may not want to bother with a password while at work or at home, but need password protection when out on the road.

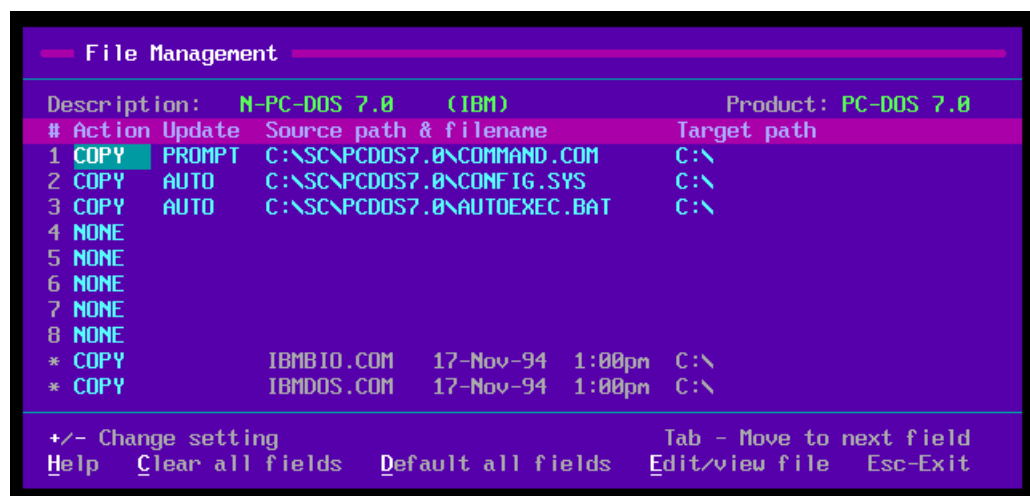
Force password change at next login - Once this user logs in, the user will be prompted to enter a new password.

Minimum Password Length - This is the minimum number of characters required in a new password for this user.

Operating System access menu - select which operating systems are accessible by the user. Any user that has System Administrator privileges will always have access to all OSes. When a user logs on that does not have access to a specific OS selection, the selection is shown in black.

File Management Menu

This secondary menu provides options specific to the currently selected MultiFAT. If the current selection is not a MultiFAT choice (i.e., not an OS in the partition where System Commander is installed), the next MultiFAT entry is selected. The file management will appear similar to:



When a new OS is installed, System Commander will automatically manage files, such as CONFIG.SYS, AUTOEXEC.BAT, COMMAND.COM as well as hidden files. These files are shown on the file management menu. You can add, remove or change entries as needed.

To move to different entries, use the following keys:

TAB - Move to the next field
Shift-Tab - Move to the prior field
Up or Down - Move up or down

To select a different MultiFAT entry, use **PgUp or PgDn**.

For the first eight entries, you can specify the following actions (while in the action or update columns, use **+** or **-** to change).

NONE Take no action for this entry
DELETE Delete the target file
RENAME Change the filename in the directory specified. When the OS is selected, the file is renamed from the source filename to the target filename (the paths must be the same). When a different OS selection is made, the target filename is renamed to the source filename.
RESTOR Restore the filename or directory to the specified name. This is similar to RENAME, but it only renames from the source to the target. It will proceed without an error if the specified file or directory does not exist or cannot be renamed.
COPY Copy the specified file from one directory to another.
 Wildcards (the * character) are allowed in the source filename to copy up to 32 files in one entry. If the target subdirectory does not exist, it is created.

When COPY is selected, you can specify three update options, using **+** or **-**, which have the following effects:

NO No updates, just perform a copy.
PROMPT Normal copy, but when switching between OS selections, if the target file is newer than the source file, you are prompted to update the older file.
AUTO Normal copy, but no prompting occurs if the target file is newer than the source file. The older file is updated.
IGNORE Same as "Prompt" except if the file does not exist, no warnings or errors occur. This is used when a file might exist, such as the NTBOOTDD.SYS file under NT.

Other File management options:

Clear-All - Set all actions to NONE, except for the hidden file entries, which remain unaffected (**Alt-C**).

Defaults - Reset all entries to the System Commander defaults. You will be asked for a source subdirectory to use, but it does not need to exist at this time (**Alt-D**).

Normally spaces are not allowed in a filename. OS/2 in the DOS partition uses two file names with spaces for extended attributes. These filenames are "EA DATA. SF" and "WP ROOT. SF". If you need to enter a space in a filename, while holding the ALT key down, press 127 on the numeric keypad.











To help troubleshoot file copy problems, see the option *Copy and update files, special options* on the global options menu (page 85).

Alt-O - Display detailed help on setting up multiple configurations for OS/2.

Order, Add, and Removal Menu

This menu is used to change the order of selections, add and remove selections, and to duplicate an OS selection in the FAT (DOS) partition. The Order menu is similar to the OS selection menu:

| Selection Order, Add and Removal | | | |
|-----------------------------------------------------|-------------------------------------------------------------------------------------|--------------------|-------------------|
| | | Product | Drive |
| A |  | MS-DOS 6.22 | MS-DOS 6.22 0-0 |
| B |  | PC-DOS 7.0 | PC-DOS 7.0 0-0 |
| C |  | Novell DOS 7.0 | DOS 7.0 0-0 |
| D |  | MS-DOS/V 6.20 | MS-DOS/V 6.20 0-0 |
| E |  | Windows NT 4.0 | Windows NT 0-0 |
| F |  | Windows 95 | Windows 95 0-0 ◀ |
| G |  | OS/2 Warp 4.0 | OS/2 0-0 |
| H |  | Boot from drive A: | Drive A: A: |
| Help move-to-Top move-to-Bottom Add Remove Esc-Exit | | | |

Changing the order of OS selections

Using the Down and Up arrow keys, move to the selection you wish to move. Press **Alt-T** to move that selection to the top, or press **Alt-B** to move the selection to the bottom.

Adding a new selection to the menu

Press **Alt-A** to add a new selection to the menu. You can choose between adding a duplicate of the current MultiFAT selection (if the highlight selection is a MultiFAT), a primary or logical partition, a master boot record (MBR), or add a selection to boot from a floppy drive A or B.

When adding a primary or logical partition, you will be presented with a list of all partitions. Move to the desired partition, and press **Alt-T** to toggle the bootable status to Yes.

For the rare case of MBR boots, press **Alt-M** at the Order, add and remove menu, or see page 25 for more information.

Removing a selection from the menu

Press **Alt-R** to remove the highlighted entry. At the removal confirmation question, select **OK**.

Notes on the Boot from A: or B: feature

System Commander allows up to four OS selection entries to be added which can boot from either the A or B drives. Use the Add and Remove functions to insert or delete a boot from floppy selection.

Each floppy OS selection can have specific partitions made accessible or hidden. Use the local special options menu to set this up.

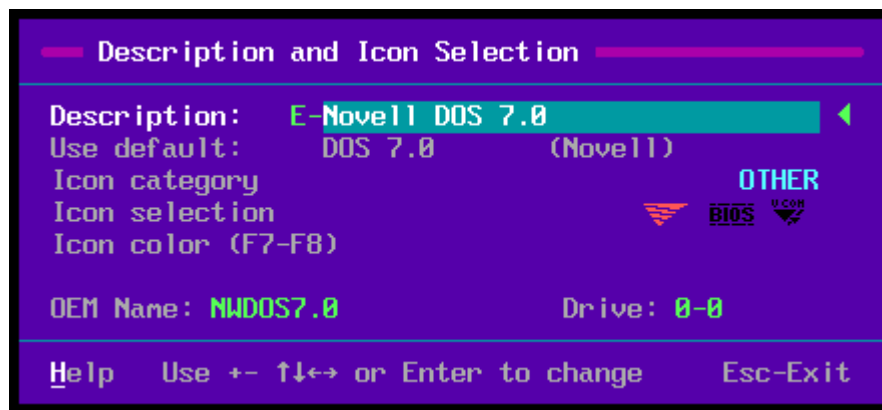


Note: When booting from drive B:, System Commander swaps drives A: and B:. Some operating systems which bypass the system BIOS and communicate directly with the floppy controller may not boot properly. This includes OS/2 and NT. The IDE BIOS on the GSI controller card does not follow the IBM standard for floppy operation, and will also prevent System Commander's "Boot from B:" feature

from working. The "Boot from A:" feature will always work.

Description and Icon Menu

Use this menu to set your own OS menu descriptions and to select or change icons. The description and icon menu appears similar to:



Changing the Description

Highlight the description line and edit the current description for the indicated selection. To make a different selection, use **PgUp** or **PgDn**. To use the System Commander default description, move to *Use default* and press **Enter**.

Icon Control

For systems equipped with an IBM compatible color VGA adapter or better, icons can be selected for each OS selection. Use the following options:

Icon Category - Select the type of icons from DOS, OS/2, Windows, UNIX, Diskette, Other, or None.

Icon Selection - Use the left and right arrow keys to select from the available icons for the current category.

Icon Color - To change the color of the current icon, press **Enter**, **+** or **-**. Use **F7** or **F8** at any time to also change the color of the current icon.

Icons are not available on monochrome systems and some laptops that use a non-standard font size.

Using SCIN - Installation & Configuration

To read the latest installation notes and change the configuration of System Commander, run **SCIN** from the System Commander directory. It provides seven options:

Installation Notes - View important notes about System Commander and any new notes not in this manual.

Disable/Uninstall System Commander - To disable System Commander, select this option. The System Commander master boot record is replaced with the original master boot record saved when System Commander was first installed.

At this point, System Commander is no longer in the bootup loop, and the OS you last booted from will boot directly. System Commander leaves all other files and options in place, if you wish to later enable System Commander using the *Enable/Reinstall* menu choice. After a disable, you can run FDISK to specify a different active primary partition to boot from.

Enable System Commander - This updates the master boot record. All prior System Commander user options and settings are unaffected.

Special Options - These provide less frequently used options. The next section details these options.

Troubleshooting - Use this section to get detailed solutions to problems. It also contains details on common questions and answers. A section also explain how to get technical support from V Communications and other vendors.

V Communications Info - See more about V Communications products. This option also presents System Commander information such as the version and serial number.

Exit to DOS - Return to DOS.

Special Options

The following menu choices are available under Special options:

Change MultiFAT option [Not available in SC Lite]

The MultiFAT feature allows having multiple OSes in the FAT (DOS) partition, and adds support for NT and Windows 95/98. This feature automatically defaults on, but can be overridden from this option. If you only need one FAT OS, and do not plan to add NT, Windows 95/98, OS/2 in the DOS partition, or other DOS versions, you can safely turn this option off. Even in this special case, there is no real benefit to having the MultiFAT option set off.

Expose System Commander files for deletion

Use this option to remove the hidden and system attributes from System Commander files in the root directory. The files can then be deleted if desired. The files do not need to be deleted if you are performing a temporary disable/uninstall, since the enable/reinstall command will need to use these files.

Specify non-compressed boot drive

If you are using disk compression, including DoubleDisk, DoubleSpace, Stacker, or SuperStor, the **non-compressed disk must be identified** so System Commander can properly install its files. The non-compressed drive is rarely C. Often the drive has only a few files and holds one very large hidden file representing the compressed disk.

Alter the current boot record serial number

This option is used if you need to create two or more System Commander menu choices for the identical operating system. This option simply changes the boot record serial number so that the boot record appears different to System Commander.

When the system reboots, System Commander detects the change and asks if you wish to save the new OS. Saving the new OS adds a second entry for essentially the same OS. In most cases, we recommend using the duplicate feature built into System Commander. At the OS selection menu, press **Alt-S** (Setup), and select the *Order, add and remove menu*. Highlight the desired selection, and press **Alt-A** (Add). Then press **D** for Duplicate.

Restore DOS boot record

System Commander provides this disk recovery feature should a virus, system crash, or program defect destroy the current DOS boot record. Often this extremely serious fault cannot be corrected with most hard disk tools available today.

This option is only used when a "Boot" error number 2, 3, 4, or 5 occurs, indicating there may be a defective MultiFAT partition boot record. In this situation, even booting from a Windows 95/98 or DOS diskette does not provide access to the C: drive. See the troubleshooting section, under *Invalid Drive* for details on how to properly use this option (page **124**).

This option only functions when run from the diskette you used to install System Commander.

Diagnostic Checks

Three diagnostics are available to validate the partition tables, check the DOS boot record information, and check for proper access to key System Commander files from the BIOS. Each check will indicate if

the test passed (validated), show any warnings, or show if the test failed.

Any failures indicate potential problems that may prevent System Commander from properly operating. Warnings are less serious in nature, and will not usually affect System Commander operation. Press **Alt-H** or **F1** for additional help and explanations of error messages.

Transfer System (Advanced SYS) [Not available in SC Lite]

This option replaces the limited DOS and Windows 95/98 SYS command. It transfers the bootable OS from a diskette in drive A to hard drive C. It supports all DOS versions 4.0 to 7.0 from Microsoft, IBM, and Novell, as well as Windows 95/98.

Unlike the SYS Command, the Transfer System option has the following features:

- Fixes a bug in all DOS versions that prevent DOS from booting past the 2 GB boundary on most SCSI drives.
- Corrects a number of limitations in the SYS command, including dealing with non-system files in the first two directory entries.
- Provides an option to perform selective portions of the system transfer.
- Extensive progress reports and error detection with explanations.
- Detects a damaged MSDOS.SYS file on a Windows 95/98 boot diskette and creates a new valid MSDOS.SYS file (Windows 95/98 boot disks created by Windows 95/98 usually have a bad MSDOS.SYS file).
- If no AUTOEXEC.BAT or CONFIG.SYS exists, an option is provided to create generic ones.
- It works when SYS fails!

SCIN Command Line Options

The installation and information program SCIN has a number of options to control the screen colors and display. Options are normally set automatically, but in unusual cases, can be overridden. These options are memorized the first time used, and are not required again.

| | |
|--------------|-------------------------------------------------|
| color | standard colors |
| mono | monochrome colors |
| lcd | monochrome for LCD screens |
| grey | grey scale colors, for VGA greyscale monitors |
| -v | prevent EGA/VGA fonts and custom colors |
| +v | allow EGA/VGA fonts and custom colors (default) |

For example, to change to mono, without VGA fonts, enter:

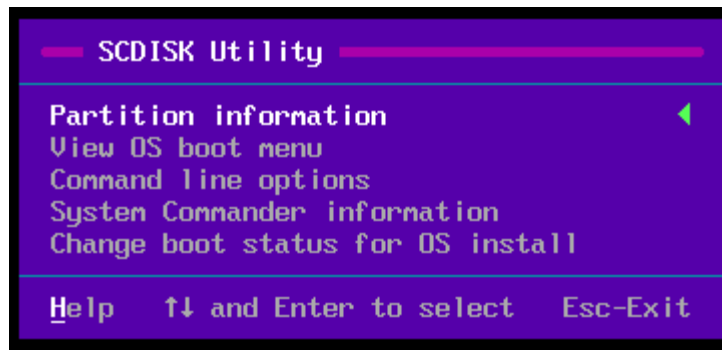
```
C:\SC > scin mono -v
```

Using SCDISK

The SCDISK utility allows you to examine disk information, view the current OS selections, preset some System Commander boot options, and preset the bootable partition for special OS installations. To use SCDISK, at a DOS prompt, run:

```
C:\SC\ > scdisk
```

A menu of choices appears:



Use the Up and Down arrow keys to move to a choice, and press Enter to select. Press **Alt-H** to see help information. Press Escape to exit back to DOS.

Partition Information

Shows primary and logical partition information for the drives on your system. While viewing disk information, use the up and down arrow keys to move the highlighted selection bar and see detailed information about each partition and see the drive letter assignments for the selection.

Subfunctions for partition information include:

Help for detailed explanations about this screen (**Alt-H**).

Empties to toggle inclusion of empty partitions (**Alt-E**).

Details to toggle the type of detailed information. Toggle between details about the highlighted partition and information about the highlighted drive (**Alt-D**).

Boot Record to show the contents of the currently selected boot record (**Alt-B**). Press any key to toggle between a DOS descriptive view and a hex byte view.

In most cases, the primary partition's boot status is the internal System Commander boot status. This is shown with an asterisk following the boot status. If the SYSCMNDR.SYS file does not exist or is not readable, the boot status from the partition is shown.

View OS Boot Menu

The OS boot menu shows available current OS selections. Although you can scroll through the available choices, you cannot make a choice from this menu. You can toggle the detail information using **Alt-D** while at this screen.

Command Line Options

This shows command line options available for SCDISK. All command line options are case insensitive. Command line options include:

- | | |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A to Z | Set the next default OS selection to the specified letter A to Z. |
| Boot | Issue a warm boot after all the command line options are examined. |
| Dlimit<i>n</i> | Limit System Commander to the drive number specified and all drives with a lower number. For example, on a 3 drive system, the option "Dlimit1" will only look at the first drive for possible OS selections. The 2nd and 3rd drives are ignored. |
| Font8 | Use this option to force System Commander to use an 8-bit wide font, even if a 9-bit wide font would be clearer. This option is useful for taking a screen shot of the OS selection menu with a screen capture program that is 9-bit font unaware. |
| No_Font | Turn off graphic option on the boot time portion of System Commander. |

- Timeout** Turn on the timeout at bootup feature, and set the timeout period to five seconds.
- Wait** Turn off the timeout feature, so System Commander will wait for a user entered selection.
- V** Do not use custom fonts on the display.

As an example of using command line options, the following line will set the default OS to selection "E", turn the timeout feature on with a 5 second wait, and initiate a warm reboot.

```
C:\SC > scdisk e timeout boot
```

System Commander Information

This shows information about System Commander, including the version and serial number.

Change Boot Status for OS Install

In some situations it is necessary to define one partition as bootable for the installation of a non-DOS operating system, and hide all other partitions on that drive. With this option you can specify a specific partition on any disk as bootable, or specify all partitions on a disk as non-bootable if required. The bootable status information is not used by System Commander and has no effect on System Commander's operation or which operating systems are truly bootable.

Press a number 0 to 3 to mark a partition as bootable. Enter 9 to make all partitions non-bootable.

In addition to changing the boot status, all partitions that are marked as non-bootable are marked hidden (except for extended partitions). When booting from a diskette, only the bootable partition is visible. When booting from the hard disk through System Commander, the hidden status is ignored. System Commander will function normally, and clear the hidden partition information.

Notes

Common Questions and Answers

- 1** How can I create a second selection for the same DOS (or any other OS)? [Not available in SC Lite]

You can create a duplicate of an OS selection at boot time, if the OS is installed into the MultiFAT partition, by selecting **Alt-S** (Setup) and then the *Order add and remove menu*. Highlight the choice you wish to duplicate, and press **Alt-A** (Add). Press **D** for Duplicate, to create a second choice. This will automatically copy the necessary start-up files from the highlighted selection to the new selection's subdirectory. You may then use the built-in editor to change the configuration of the new start-up files should you choose.

- 2** Will I have any problems with EZ-BIOS, EZ-Drive, Drive-Pro, Disk Manager, or MaxBlast with System Commander?

Currently Drive-Pro is not compatible with System Commander or most non-DOS operating systems. All of these other products are compatible with System Commander, but are not compatible with OSes other than DOS and Windows. You might consider purchasing a low cost EIDE controller for improved OS compatibility. See Appendix D for more about disk managers and EIDE controllers.

- 3** How should I partition my disk?

Wow, this is a complex question, but we'll try to give you a few guidelines! First we assume you know that removing a partition will erase all the data in the partition. You should always have a complete backup of important data.

Make a list of the OSes you want to install now, and a list of OSes you may want to install in the near future. Include on the list the space you want to allocate for each OS, the number of partitions you wish to use for each OS, and any limitations you may need to follow. Limitations might include items like the OS must be on the first drive, or must be in a primary partition. See Chapter 9 OS Limitations for more detailed information.

With the list of OSes, you assign each OS to a partition and drive, based on the space you have available and the limitations. Keep in mind each drive has a limit of four primary partitions. The use of any logical partitions (one or more) on a drive takes away one (and only one) primary partition on that drive.

Your plan, at your option, can also place up to 32 FAT compatible OSes into a single FAT primary partition. [Not available in SC Lite] This is the MultiFAT partition on the first drive where you installed System Commander. You can include different versions of DOS, NT, OS/2, or Windows 95/98. Refer to chapter 4 on each of these OSes for additional details on each OS.

If you plan to install OS/2 anywhere other than the MultiFAT partition on the first drive, you must leave one partition free for OS/2's Boot Manager (it must be 1 MB or larger). It is required by OS/2 during its installation. Once the OS/2 installation is complete, you can reuse the partition for another OS.

The actual partitioning is handled by a utility program that comes with your OS. For example, Windows 95/98, DOS, OS/2, and others have a utility called FDISK. The FDISK program allows you to create and delete partitions. Refer to your operating system manual for detailed instructions on using the partitioning utility that comes with it. See page 32 if you need to create multiple FAT primary partitions on one drive.

4 A new OS installation failed, and I think System Commander is the cause!

We hope this is never the case, but there is an easy way to confirm the problem is not System Commander. Run the SCIN program (from DOS or Windows 95/98) and select *Disable/Uninstall*. This puts back the original master boot record, so System Commander will no longer be active. The partition table is not changed, so partition changes after you installed System Commander are preserved.

Now install the new OS. In most cases we expect the same problem will occur, and you may need to contact the OS manufacturer to resolve the problem. Once the problem is resolved, and the OS is working, simply reboot from a DOS or Windows 95/98 diskette and run the SCIN program again (from the hard disk or the System Commander diskette). Select *Enable/Reinstall*. This restores System Commander with all your prior OS selections.

A Disable/Uninstall does not delete our configuration files, so a later enable/reinstall from the SCIN program brings back System Commander with all your OS selections and options.

5 At boot time, the product name is wrong (Details, Alt-D). Can this be corrected?

While the description field can be changed, you cannot override the product name information. The product name is created every time the system is booted to accommodate any system changes. It is based on the boot record, and in some cases, other files in the partition.

We would like to hear about any product names that appear wrong. It might indicate a new version of an OS we have not seen before, or is caused by some other issue. While we can't promise an immediate correction, we will try to ensure future versions correctly identifies the OS.

6 At boot time, the OEM name is wrong (Details, Alt-D). Can this be corrected?

In all cases, except for UNIX OSes, the OEM name is specified by the OS vendor. It is typically the identification string in the partition boot record. For more about inaccurate OEM names, see page 132.

7 How do I get rid of an OS selection from the menu?

At boot time, press **Alt-S** (Setup), and select the *Order, add and remove menu*. Highlight the OS you wish to remove from the menu and press **Alt-R** (Remove). Next select **OK** to confirm the removal. This does not affect contents of the related partition.

8 What are the advantages of using System Commander over other products like OS/2's Boot Manager?

The key benefit is the ability of System Commander to boot many OSes that are impossible to boot through Boot Manager. In addition System Commander provides the following unique advantages:

- Supports over 100 OSes on a single system
- Supports multiple FAT compatible OSes in a single partition, including OS/2, Windows 95/98, NT, and multiple DOS versions
- System Commander can manage multiple configurations of a single OS in the FAT partition. This includes different configurations of OS/2, Windows 95/98, NT, and DOS.
- All setup options, menu descriptions, and features are all accessible at boot time. There is no need to boot into an OS just to make changes.
- System Commander does not require repartitioning to install, nor a separate partition like Boot Manager.
- You can view and edit configuration files before the OS runs.

Some of the other significant built in features include a partition viewer, ability to hide partitions from an OS selection, passwords, automatic file management, automatic OS detection, boot from floppy drives A or B, and complete help at boot time.

9 Why must some Oses only be installed on the first drive?

This is a limitation of the OS initialization process. The early initialization code blindly assumes the first drive, regardless of where the OS actually

resides. In these cases, even if you were to somehow be able to get the OS on a second or third drive, System Commander could attempt to boot the OS, but the OS will quickly hang. The OS erroneously attempts to read data from the first drive rather than the drive where it actually resides.

The OSes that we've seen so far that allow installation on any drive include OS/2, Linux, Solaris, and Coherent. In rare cases, an OS could be installed on the first drive, and then moved to another drive position (i.e., drive jumper changes). QNX is one such OS, as long as the QNX configuration file is updated to point to the new disk position. Other OSes like DOS, Windows 95/98, and most UNIX variants not already mentioned, must be installed on the first drive.

Windows 95/98 does provide the option to install most (but not all) of its files into any FAT partition on any drive. When Windows 95/98 installs, it asks which drive and path Windows 95/98 should be installed to. Regardless of what drive you specify, Windows 95/98 will always place about 4 MB of boot up files on the first disk (in a primary partition).

10 How do I hide a partition from an OS selection?

System Commander allows you to hide primary partitions from a selected OS. System Commander will never let you hide the partition you are booting into, or extended partitions.

To specify which partitions are accessible and which are hidden, at the OS selection menu, press **Alt-S** (Setup). Select *Local special options menu*. This menu allows you to indicate which primary partitions should be accessible for each drive. Move down to the desired line *Primary partitions visible on drive n* and press **Enter**. A new menu will show the partition status for each of the four primary partitions. Partitions are marked as visible, hidden or no access. Partitions which have a status that cannot be changed are grayed out.

Notes

Troubleshooting



This chapter is intended to give you answers to the most common problems that might arise. If you do not see your problem detailed in this chapter, check the online documentation included with System Commander or our Web site at WWW.V-COM.COM.

To access this online help, run the SCIN utility. Choose Troubleshooting from the Main Menu. Follow the appropriate menu selection to technical assistance for your specific problem. Always check this documentation if you encounter a problem; it may save you a call to technical support! Also remember, context sensitive help is available for most functions by pressing the F1 key.

Depending on the nature of the problem, one of the following sections should help guide you to a solution. Start with the section that seems most appropriate. Also use the SCIN program for the latest up-to-date troubleshooting information.

- Problems Without Messages (page 114)
- Messages from System Commander at bootup (page 116)
- Messages from SCIN diagnostics (page 122)
- Messages from DOS (page 124)
- Messages from OS/2 (page 128)
- Messages from NT (page 129)
- Messages from Windows 95/98 (page 129)
- Messages from a UNIX OS (page 129)
- Inaccurate OEM names (page 132)

Problems Without Messages

New OS installer complains about seeing a bootable OS

In this case, the operating system sees another operating system as bootable. To correct this, just run the SCDISK program from the System Commander directory, select *Change boot status for OS install*, and mark all partitions as non-bootable (press **9**).

System Commander Fails to detect new DOS installation

Although rare, if the newly installed DOS has a boot record identical to a prior installed DOS and the hidden system files have the same date and time, System Commander may not offer the choice to save the new DOS. In this case, do not make a new selection from the System Commander menu, but use the default choice to avoid System Commander overwriting the new DOS information. At the DOS prompt, run SCIN from the System Commander directory, and select *Special options*. Then select *Alter Current Boot Record Serial Number*. Select YES, and then exit SCIN. Reboot, and System Commander should detect and save the new DOS.

System Commander Menu does not appear after reboot

This might occur if a newly installed OS overwrites System Commander's master boot record. If this is the case, you need to first boot DOS or Windows 95/98 from a diskette or the hard disk. If you just installed OS/2 or NT in the DOS partition, then boot from a DOS floppy. Do not use the DOS box from these OSes. The DOS prompt of Windows 95/98 is acceptable.

Once DOS or Windows 95/98 is running, switch to the System Commander installation diskette or the subdirectory SC on the hard disk. Run SCIN and select *Enable/Reinstall*. This updates the master boot record without changing any options you have set. Exit SCIN, and reboot.

If no new operating system was installed, it might mean that the hidden system file SCDOS.SYS was deleted or destroyed. This important file in the C: root directory holds other hidden system files for each FAT operating system. If it is destroyed, you must restore it from a backup or

must re-install each operating system. Assuming all other OS files are intact, as an alternative, you can take these steps rather than reinstalling each OS.

- 1) Boot from a floppy of the desired OS.
- 2) From the floppy, type `SYS C:` to transfer the hidden files onto the hard disk.
- 3) From the hard disk directory where the same OS has all of the system files, copy `COMMAND.COM`, `CONFIG.SYS` and `AUTOEXEC.BAT` to the C: root directory.
- 4) Reboot from the hard disk to make System Commander save the new OS. It will prompt for the new menu name.

System Commander appears twice to get into a selection

Some versions of QEMM will force the system to reboot twice, or multiple times when performing optimization. Select the same choice until QEMM is satisfied. There may be options in QEMM to prevent this behavior.

Colors have problem or screen unreadable

If the installation program has difficulties displaying, or the color combinations are hard to read, there are a number of options to control this. Refer to Chapter 5 under *SCIN Command Line Options* (page 102).

If this occurs with the SCDISK utility, use the command line option **-V** (for example, `C:\>scdisk -V`).

If this occurs at boot time with System Commander, press **Alt-S** (Setup), and select the *Global special options menu*. Then toggle the option *Prevent use of graphics* to YES. An alternative way to set this option is to run the SCDISK utility with the following switch:

```
C:\SC\>scdisk no_font
```

Disk Compression Software

Disk compression software such as DoubleSpace, Stacker and SuperStor compress the disk and may change the drive lettering. System Commander is fully compatible, but it **must** be installed in the non-compressed portion of the disk. This is necessary, since it is impossible to read any files from the compressed portion until the compression software driver is running.

Consult your compression software manual to find where the non-compressed software resides.

In general, we do not recommend you use any disk compression if you plan to multiple OSes into a single partition (the MultiFAT). Non-DOS operating systems generally do not work with disk compression systems. Older versions of DOS may also have problems, and might cause data loss. See page 19 for additional information.

Messages from System Commander at Bootup

Boot ##.

Cause: This indicates a problem in starting up the system or reading the disk drive. The first character of the error code number indicates the basic type of problem that occurred. These problems include

- 0 - Disk error reading the master boot record

- 1 - No FAT partition found on drive 0

- 2/3/4/5 - FAT partition found, but unable to locate SYSCMNDR.SYS file in root directory, or a disk error occurred reading the file, or the partition is not 512 bytes per sector (the DOS/Windows 95/98 standard).

- A - Disk error reading FAT

- B - Disk error reading SYSCMNDR.SYS

- C - Defective cluster encountered

- F - Could not find SYSCMNDR.SYS file in the root directory, or a bad cluster area was encountered (Windows 95/98 FAT-32 only).

- G - Problem reading the SYSCMNDR.SYS file (Windows 95/98 FAT-32 only)

- H - Contents of SYSCMNDR.SYS file are wrong (Windows 95/98 FAT-32 only)

The second character indicates the error code returned from the hard disk BIOS. It may indicate the hard disk or controller has some type of problem, or could indicate bad partition information on the disk. The second character errors "0" and ">" are not BIOS errors, but indicate our files were not found on the disk. BIOS error codes include:

- 0 - invalid or missing data (not a BIOS error)

- 1 - invalid drive or command

- 2 - missing address mark

- 3 - write protected

4 - sector not found
8 - DMA overrun (timeout)
: - bad sector detected
;- bad track detected
> - invalid or missing data (not from BIOS)
@ - ECC error during read
A - ECC error during read
P - disk controller/drive problem
p - seek operation failed

Other characters indicate undocumented BIOS errors.

Action: The codes given help identify the source of the problem. Several combinations we've seen on occasion include:

Boot 0x. (where **x** is any character) This could indicate a bug in the BIOS of the hard drive controller or main system BIOS. System Commander has a special option which may bypass the bug. To set this up, boot from a DOS or Windows 95/98 startup diskette, run **SCIN MBR80** from the hard disk or the System Commander installation diskette, and select the *Enable/Reinstall System Commander option*. Exit SCIN and reboot from the hard disk.

Boot 2> or Boot 3>. This error indicates that the file SYSCMNDR.SYS could not be found in any primary partition on the first drive. To fix this, boot from a DOS or Windows 95/98 startup diskette and perform a full installation.

Boot A@. This indicates that System Commander was attempting to read the FAT, but the controller found an ECC error (which indicates a defective sector in the FAT data area.) At a minimum, run DOS's SCANDISK on the drive, making sure to perform the optional surface scan, and have it correct any errors.

Assuming no physical drive problems, see the next entry about "System Fails to boot up". If the C: drive is inaccessible even from a DOS boot diskette, see the message "Can't access drive C:" under Messages from DOS (page 124).

Disk compression often makes files inaccessible and can also cause some of these conditions.

The SYSCMNDR.SYS file must reside in the root directory on the real (non-compressed) hard drive 0. SYSCMNDR.SYS is installed as a hidden system file. The SCIN disable/uninstall option can switch these attributes too non-hidden, non-system so the file appears when viewing the directory contents. The attributes of SYSCMNDR.SYS do not affect the operation of System Commander.

System Commander does not care which partition on drive 0 is DOS, as it checks all four partitions, looking for a valid DOS partition that has SYSCMNDR.SYS.

In some cases, the SCIN diagnostic can help locate the source of the problem. Select *Diagnostic checks*, under *Special options*.

System Fails to boot up

Cause: If you have some DOS partitions you have created on the first drive, but have not formatted them yet, this condition may occur. If you failed to take our advice about not using disk compression or for some unexplained reason the system fails to boot up properly, the following instructions will restore the original master boot record.

Action: First boot the system from a DOS or Windows 95/98 startup diskette. If possible, switch to the directory on the hard disk where you installed System Commander. Run SCIN and select *Disable/Uninstall System Commander*. Exit System Commander and reboot normally (without System Commander).

If you could not locate the System Commander directory on the hard disk, Run SCIN from the System Commander installation diskette and select *Disable/Uninstall System Commander*. System Commander restores the master boot record which was previously saved on the diskette during the original installation.

If this still does not correct the problem and you were using disk compression, it is likely the DOS bootable disk also has the disk compression software hidden on it, and the boot drive is being masked. To fix the DOS boot diskette, you need to rename the hidden file DBLSPACE.BIN on the diskette. To do this, you must first change the attributes. Use the commands:

```
A:\> attrib -r -s -h a:dblspace.bin
```

```
A:\> ren a:dblspace.bin dblspace.tmp
```

Now reboot off this diskette, and disable/uninstall again. This will work for Stacker 3.1/4.0 and for DOS 6's DoubleSpace/DoubleDisk. Other disk compression products may use other hidden files that need to be temporarily changed.



NOTE: Disable/Uninstall only replaces the master boot record. It does not change the current partition information. There is no problem performing an disable, even if you had changed the partition information after System Commander was installed. The original master boot record information is saved in a hidden read only file BOOT.DAT on both the hard disk and the System Commander diskette.

Possible Defective Boot Record

Cause: When this message appears after a non-DOS boot selection is made, the selected OS does not have a boot record, or uses a non-standard format. If you selected (B) to boot anyway and the OS works, we would like to hear from you. It appears the OS you are using does not follow any prior standard.

If the OS fails to boot, it indicates the OS has not properly built the boot record or other critical files are missing from the partition. It may also indicate the OS does not allow booting from the selected partition, and it should be removed from the OS selection menu.

Action: To remove a selection, select Setup (**Alt-S**) from the OS selection menu, and move to the *Order, add and remove menu*. Highlight the OS partition you wish to remove, and press **Alt-R** (Remove).

Some operating systems may boot through the DOS partition, even though the OS is in a separate partition. NT is a prime example of this. NT does not normally boot directly into the NTFS partition until the NT bootup files in the DOS partition are run. See chapter 4 for more about NT operation.

Disk Error Message after OS Selection

Cause: If you have non-standard hard drives which cannot be properly accessed without a special device driver, System Commander may not be able to update partition information on that drive. IDE, EIDE, ESDI, MFM, and SCSI drives do not usually fall into this category.

For example, some hardcards remain in a read-only mode until their device driver runs. These types of drives are usually limited to DOS, since device drivers are rarely available for other operating systems.

Action: It is safe to select *Ignore* instead of the recommended *Reboot* from the disk error warning message. To eliminate the problem (without replacing the drive), from the OS selection menu, press **Alt-S** (Setup), and select the *Global special options menu*.

Select the choice *Disk drives, above drive 0, ignored*. If the problem drive is the third drive, select 2. If the drive is the second drive, select 1. This option forces System Commander to ignore the specified drives. Drive 0 must always be accessible.

Messages from SCIN's diagnostics



For information on the messages, warnings, and errors from SCIN, consult the online help for SCIN by pressing **Alt-H** or **F1** when the message, warning, or error is displayed.

Partition Table Checks

Partition Table Analysis Failed

- Cause:** Values in the partition table are not valid, such as a partition size of 64 GB or larger, a starting address larger than the drive parameters reported by the BIOS, or a starting or ending sector value of zero (invalid).
- Action:** The values in error are shown in magenta or red. It may be the partition does not exist and has bad values. Use FDISK if you are sure this is the case to delete the invalid partition.

Partition Table Analysis Warning - First sector size mismatch

- Cause:** Each partition table entry points to the start of a partition by the start head, sector and cylinder, and through an alternate way, the starting sector count. The two methods should point to the same place on the disk, but they do not in this case.
- Action:** System Commander and many OSes only use the starting head, sector and cylinder values. If these values are wrong, you will not be able to boot the partition. If on the other hand, the first sector value is wrong, everything is likely to work fine. There is no easy fix, other than deleting the partition and re-creating it (which of course, loses all the data in that partition).

Partition Table Analysis Warning - Ending address too large

Cause: The ending head, sector, or cylinder numbers exceed the disk limits as specified by the BIOS.

Action: System Commander and many OSes ignore the ending values. If your system is working fine, you might ignore the problem. The only fix is to delete the partition, and re-create it (which will cause the loss of all data in the partition).

Partition Table Analysis Warning - Sector mismatch & Ending address

The prior two warning conditions occurred on the drive. See the prior warnings for complete details.

Unable to read drive parameters.

Cause: The BIOS returned an error while attempting to read the drive parameters.

Action: The BIOS is not working properly - try another disk controller card or the CMOS has values for a drive that does not exist.

Unable to read partition table on drive x.

Cause: The BIOS returned an error when attempting to read the master boot record.

Action: There may be a serious problem with the drive or disk controller. If this one sector is truly bad, the disk drive is unusable.

DOS Boot Record Checks

Serious errors are highlighted in red, which indicate source of problem. Minor warnings are highlighted in orange.

Serious errors will likely make OSes fail, and may make System Commander unusable. The specific values and limits are shown on each line of the display. A new DOS or Windows 95/98 boot record can be created using the SYS command from a bootable diskette.

File Access Verification



For information regarding messages returned from the *File Access Verification*, about any of these errors consult the online help by pressing **ALT-H** or **F1**. The online help contains to most up-to-date information available about these messages.

Messages From DOS

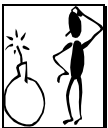
Can't Access drive C: Invalid Drive/Media Type

Cause: When booting from a diskette, the C: drive has "disappeared" and/or is invalid with either of these messages. Attempting to boot from the hard disk just generates the System Commander error message "**Boot 1x**". Proceed with this solution only if BOTH these conditions occur.

The problem may be caused by CMOS memory loss or an incorrect drive type specified in setup. This problem can also be caused by the DOS boot record being altered or erased, possibly due to a virus or application program defect.

User's of Novell DOS 7 are limited to one primary FAT partition, and attempts to boot another primary partition will cause these types of errors.

Action: If you suspect CMOS loss or the wrong drive type was set in the BIOS setup program, attempt to correct this first and try rebooting from the hard disk.

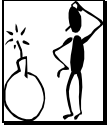


WARNING! Do not alter the BIOS setup unless you are absolutely sure of what you are doing!

You may need to contact service personnel for your computer if you are unfamiliar with using setup and/or the proper disk types for your system.

If you conclude that the DOS boot sector has been damaged, System Commander has a built in feature to replace the DOS boot record. First boot the system from a DOS diskette.

Now insert the System Commander installation disk used when installing System Commander. As part of the installation, System Commander saved the DOS boot record.



WARNING: Do not proceed if the System Commander installation disk was used in another system! The saved DOS boot record is rarely the same from system to system and replacement of the wrong DOS boot record will likely cause strange unrecoverable problems, and may even affect other non-DOS partitions.

From the diskette, run SCIN, select *Special options*, and then select *Restore DOS Boot record*.

Once the operation is complete, remove the diskette and reboot. Assuming no other damage occurred, System Commander's OS selection menu should appear. In this special case, we recommend not selecting the default choice, but another DOS choice if available. This will force System Commander to replace the boot record and hidden files in case these were also damaged.

Can't Find COMMAND.COM

Invalid COMMAND.COM

Wrong COMMAND.COM version

Cause: Most likely the COMMAND.COM file is the wrong version for the current OS booted. This will occur under several situations, as explained below.

Action: It is usually necessary to use your boot diskette at this point so the problem can be resolved.

First, the CONFIG.SYS file for this version of DOS/Windows 95/98 should have a SHELL statement that points to the COMMAND.COM for this version. If you are unfamiliar with the SHELL statement, this critical line in CONFIG.SYS instructs where COMMAND.COM resides. For example, in DOS 6, the default SHELL statement might appear as:

```
SHELL=C:\DOS\COMMAND.COM C:\DOS /P
```

Normally you would have created a unique sub-directory for each operating system, such as "MSDOS6.2". In this case, the SHELL statement must be changed when booting MS-DOS 6.2 to point to the directory where COMMAND.COM resides for MS-DOS version 6.2. This new SHELL line might appear as:

```
SHELL=C:\MSDOS6.2\COMMAND.COM C:\MSDOS6.2 /P
```

You might have other options or use a different subdirectory instead of "MSDOS6.2" shown. In any case, the drive and path should always point to the subdirectory for COMMAND.COM related to the DOS version selected.

Also check if the AUTOEXEC.BAT file has a COMSPEC statement, which must also point to the COMMAND.COM for this version. You do not need COMSPEC if the CONFIG.SYS file has a SHELL statement.

Verify that System Commander was properly set up to copy the unique version of COMMAND.COM into the root directory. Some programs ignore the path and assume COMMAND.COM is in the root directory.

To have System Commander automatically copy COMMAND.COM into the root directory, press **Alt-S** (Setup) from the OS selection menu, and select the *File management menu*. Verify the files and subdirectories are correct.

The files to copy will not be copied if the last boot was the same OS. This means you may need to select another OS in the DOS partition, and then reboot and select the desired OS.

These error messages will also appear if the wrong version of COMMAND.COM resides in the unique subdirectory you made for the DOS having the problem. To correct this, copy the correct COMMAND.COM version for the selected DOS from the diskette into the unique subdirectory.

Incorrect DOS Version

Cause: A device driver or TSR was run that does not match the current DOS version. This is usually due to an incorrect directory specification or path statement.

Action: First you must determine which driver or TSR causes this message. If it is occurring in the CONFIG.SYS file, check to see which drivers are loading before and after the message appears. Unfortunately, many device drivers do not display anything when they run. Newer DOS versions allow a step by step confirmation of each CONFIG statement by pressing F8 when the phrase "Starting MS/PC-DOS..." appears on screen.

You might also look in the CONFIG.SYS file for each DEVICE= line, verify the path for the device driver is correct, and it points to the subdirectory where the current OS files reside. If the problem is occurring in AUTOEXEC.BAT, you can remove the statement ECHO OFF, and reboot to see which is the offending line. Once the problem line is found, change the subdirectory to point to the current DOS directory.

Additional notes about getting the CONFIG.SYS and AUTOEXEC.BAT files setup properly are reviewed in the section on *Special DOS Issues* starting at page 29.

Your Current Operating System on drive C is not DOS

Cause: This message might appear while attempting to load a new operating system from a special update version of the DOS OS. The update version of some older DOS versions does not correctly detect DOS or will not accept a system with a newer version of DOS than the one attempting to be loaded.

Action: There is no way around this limitation of the update version. You will need to load DOS from a non-update version of DOS. If you have a bootable system diskette (which is not provided with the update version) you boot from it, create a unique directory, and copy all the desired files from the diskette to this directory. In addition, you need to run the SYS program from the diskette. At the DOS prompt, run:

A:> sys c:

This will transfer the system to the C: drive. Remember to update CONFIG.SYS and AUTOEXEC.BAT files. Reboot to have System Commander save the new OS.

Messages From OS/2

Can't find x:\COUNTRY.SYS Drive Invalid

Cause: If the operating system properly boots up using Boot Manager, but not directly from System Commander, this message usually indicates a non-standard drive lettering arrangement. In rare cases, it might also mean the OS/2 CONFIG.SYS file is missing or built incorrectly.

Action: If your system is configured with more than one primary FAT/HPFS partition, and OS/2 is in a primary partition, it may be necessary to hide all but the one OS/2 primary partition. To do this, reboot to System Commander's OS selection menu. Highlight, but do not select the OS/2. Press **Alt-S** (Setup) and select the *Local special options menu*. The option *Primary partitions visible on drive 0* should be set to **NONE** (this will always keep the booted partition accessible, but hides all other primaries).

If OS/2 is installed in a logical drive, in some configurations the drive letter may be set wrong by System Commander. To correct this, reboot into System Commander. Press **Alt-S** (Setup) and select the *Local special options menu*. Change the option *OS/2 boot drive letter* from **AUTO** to the drive letter that matches what OS/2 normally boots to. If you are not sure which drive letter this is, you can experiment by starting at C:, and trying the OS/2 selection. If it fails, try the next drive letter.

If you suspect the OS/2 CONFIG.SYS file, check the file to verify its existence and the "COUNTRY=" line is correct. With OS/2 in the DOS partition, the config file will appear in the system directory as C:\OS2\SYSTEM\CONFIG.OS2.

Messages From NT

Fatal System Error

Missing File <winnt root> \system32\ntoskrnl.exe

Cause: If the NT partition is not accessible, the undocumented NT error message appears indicating "The Session Manager Initialization system process terminated" or with NT 3.5 "Windows NT could not start because of the following file is missing or corrupt".

This can be caused by a new partition being created by another OS, such that it displaces the NT partition.

Action: This usually indicates the hidden file BOOT.INI has the wrong partition to find NT on. This critical file resides in the DOS root directory. To change or examine this file, first update the attributes:

```
C:\> attrib -r -h -s c:\boot.ini
```

One or more lines appear in BOOT.INI that have **\winnt** on them. If only one NT is in the system, then all lines with **\winnt** should point to the same disk, rdisk, and partition. For example, the following line indicates where the WINNT program will be found on one system.

```
default=multi(0)disk(0)rdisk(0)partition(2)\winnt
```

It may be the wrong disk number or partition is specified such that the NT loader can't find WINNT. (It would be nice if NT simply explained this in English). Make the corrections, and reboot.

If you are at a complete loss, try changing the partition number by adding one or subtracting one. In the above example, you might first try partition(3), and if that fails, try partition(1).

Messages From Windows 95/98

Warning SU-0012 (OS/2 or NT will no longer work)

Cause: If an OS/2 or NT partition is present, this message will appear during the Windows 95/98 installation.

Action: No action is necessary. System Commander protects both OS/2 and NT from Windows 95/98.

Warning SU-0015 (NT will no longer work)

Cause: If NT was installed prior to Windows 95/98, this message will appear during the Windows 95/98 installation.

Action: No action is necessary. System Commander protects NT from Windows 95/98.

Warning SU-0016 (OS/2 will no longer work)

Cause: If OS/2 was installed prior to Windows 95/98, this message will appear during the Windows 95/98 installation.

Action: No action is necessary. System Commander protects OS/2 from Windows 95/98.

Windows 95/98 fails to appear, and drops into a Windows 4.0 DOS prompt.

Cause: This occurs when Windows has some problem during the boot up process.

Action: Check the contents of the MSDOS.SYS text file. When Windows 4.0 DOS is active, this appears in the root directory as a hidden system file. To list hidden files, at the Windows 95/98 DOS prompt, type:

```
C:\> dir /ah
```

To access the file, change the attributes:

```
C:\> attrib -h -r -s msdos.sys
```

The MSDOS.SYS file is typically about 1500 bytes. If the file is missing, set to zero length, or has been replaced with the

older DOS MSDOS.SYS executable (10 KB or larger), Windows 95/98 will not come up. Correct the file if damaged or missing. If the file is completely lost, we have included a generic MSDOS.SYS file for Windows 95/98 on the System Commander installation diskette. It is under the filename MSDOS.BAK and is a hidden file. Be sure to edit the entries in this file for the drives and path as appropriate for your system.

If the MSDOS.SYS file is Windows 95/98 (i.e., about 1500 bytes), check that a line appears "BootGUI=1" under "[options]". Without this line, or if the value is set to zero, Windows 95/98 will go directly to a Windows 95/98/DOS prompt without going into the graphical portion of Windows.

You also might try pressing F8 immediately after you select Windows 95/98 from System Commander. This will issue a menu of options, such as safe mode, and a logging mode. The Windows 95/98 manuals and on-line readme files should have other suggestions and recommendations, and explain the use of these options.

Incorrect version of DBLSPACE.BIN

Cause: If DOS 6.x was installed on top of Windows 95/98, DOS will install an old version of DBLSPACE.BIN.

Action: If you are not using disk compression, we recommend renaming or removing DBLSPACE.BIN. It is not needed nor used if disk compression is off. The file appears in the C:\ root directory as a hidden system file.

Messages From a UNIX OS

Boot Error Message from UNIX

Cause: If using SCO UNIX System V or UnixWare, depending on other partitions and how UNIX was installed, it may be necessary to make the selected UNIX partition the only accessible partition on drive 0. System Commander defaults to making both the DOS and UNIX partitions accessible.

Action: To make only the UNIX partition accessible, on the System Commander OS selection menu, highlight UNIX and press **Alt-S** (Setup). Select the *Local special options menu*, and move down to the selection *Primary partitions visible on drive 0:*. Select *hidden* for all partitions except the UNIX partition. You can also select *NONE*, as System Commander will never allow the selected boot partition (UNIX in this case) to be set to *hidden*. Press Escape three times to return to the OS selection menu and try the UNIX selection again.

Two Boots are required to get into the OS

Cause: Some UNIX OSes, like old versions of Coherent and UnixWare 1.x have a bug.

Action: Use a cold boot, or update to a more recent version.

Inaccurate OEM Names

In several places, System Commander will display the OEM vendor name from the boot record. Often the vendor has left a misleading name in a newer version of the product. For example the OEM name for Microsoft DOS version 6.22 is MSDOS5.0.

The following table shows some of the more common names for different operating systems.

| Operating System | OEM Name |
|-----------------------------------|----------|
| DR-DOS 5.0 (Digital Research) | IBM 3.3 |
| DR-DOS 6.0 (Digital Research) | IBM 3.3 |
| MS-DOS 3.3 (Microsoft) | MSDOS3.3 |
| MS-DOS 5.0 (Microsoft) | MSDOS5.0 |
| MS-DOS 6.0 (Microsoft) | MSDOS5.0 |
| MS-DOS 6.2 (Microsoft) | MSDOS5.0 |
| MS-DOS 6.22 (Microsoft) | MSDOS5.0 |
| Novell DOS 7.0 (Novell) | NWDOS7.0 |
| OS/2 Boot Manager (IBM) | BOOT MGR |
| OS/2 v1.x in DOS partition (IBM) | IBM 10.0 |
| OS/2 v2.x in DOS partition (IBM) | IBM 20.0 |
| OS/2 v2.x in HPFS partition (IBM) | OS2 20.0 |
| PC-DOS 3.3 (IBM) | IBM 3.3 |
| PC-DOS 4.0 (IBM) | IBM 4.0 |
| PC-DOS 5.0 (IBM) | IBM 5.0 |
| PC-DOS 6.1 (IBM) | IBM 6.0 |
| PC-DOS 6.3 (IBM) | IBM 6.0 |
| PC-DOS 7.0 (IBM) | IBM 7.0 |
| PTS-DOS | PARAGON |
| ROM DOS 5.0 (Datalight) | DLDOS5.0 |
| ROM DOS 6.0 (Datalight) | DLDOS6.0 |
| UNIX (most vendors) | UNIX-xx |
| Windows NT/2000 (FAT) | MSDOS5.0 |
| Windows NT/2000 in NTFS partition | NTFS |
| Windows 95 | MSWIN4.0 |
| Windows 95B & C (SR2, SR2.5) | MSWIN4.1 |
| Windows 98, 98SE | MSWIN4.1 |

When Windows 95/98 installs, it changes all boot records on all FAT type primary and logical partitions to Windows 95/98. While this does not normally affect any OS already installed, the partition may be seen incorrectly as Windows 95/98, with an OEM boot name MSWIN4.x.

OS Recovery Techniques

If a working OS no longer boots due to a virus, disk crash, or other errors that corrupted or destroyed key system files, the following suggestions can help in the recovery of some OSes. The OS manufacturer may have additional suggestions and notes.

As a starting point, we suggest booting into the OS selection that fails. This will ensure System Commander has loaded any files specific to the OS, and made the selected partition active (bootable). In addition, if changes are made to correct the problem, the changes are automatically updated to the related choice after the next reboot through System Commander.

Once the boot selection is made, then boot directly from a boot diskette that matches the OS (do **not** boot through System Commander's boot from A: option). If the OS boot disk is not available, in some cases a DOS boot disk can be used to examine potential problems and files.

Windows 95/98

In addition to the boot record, there are five files that must be in place for Windows 95/98 to get to a DOS/Win95/98 prompt. These files reside in the C:\ root directory, and include:

| | |
|-----------|--------------------------------------------------------------------------------------------------------|
| IO.SYS | This 200 KB+ file is the first Win95/98 program to start after the boot record runs. |
| MSDOS.SYS | This is a text editable configuration file, normally about 1500 bytes long, but never 10 KB or larger. |

| | |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COMMAND.COM | DOS commands are processed through COMMAND.COM and should have a file date of 1995 or later. |
| CONFIG.SYS | This is similar to a DOS CONFIG.SYS file. Some device drivers and the shell statement will point to the Windows 95/98 subdirectory. |
| AUTOEXEC.BAT | This is similar to a DOS AUTOEXEC.BAT file. One portion of the PATH statement should point to the Windows 95/98 COMMAND subdirectory and not to the old DOS directory. |

Each of these files should be examined to determine which file(s) are damaged or incorrect. The text files, CONFIG.SYS and AUTOEXEC.BAT can be corrected by editing in desired changes. Some valid Windows 95/98 configurations have zero length CONFIG.SYS and AUTOEXEC.BAT files. They are not always necessary for Windows 95/98.

If the wrong MSDOS.SYS file appears, first search the drive for another possible instance of the file. System Commander usually saves a copy in the Windows directory (\SC\WIN95 or \SC\WIN95.A). If no valid copy can be found, you can use the hidden MSDOS.BAK file from the System Commander diskette as a starting point. Comments are included in the file. It may be necessary to edit some lines to match your configuration.

If the IO.SYS or COMMAND.COM files are suspect, you can get a copy from the Windows 95/98 boot diskette (IO.SYS is a hidden system file).

Since System Commander saves the boot record in its own file, it is unlikely to be damaged unless the Windows 95/98 selection was removed from the System Commander selection menu.

To reload the boot record, it is necessary to first save the Windows 95/98 MSDOS.SYS file in the hard disk root directory. The SYS command that will be used in a moment to load the boot record will overwrite the real MSDOS.SYS file with a useless 6 byte file. To do this:

```
C:\> attrib -h -s -r msdos.sys
C:\> copy msdos.sys msdos.tmp
```

Insert the Windows 95/98 boot diskette that was created when you installed Windows 95/98. Shutdown Windows 95/98 (i.e., Restart the

computer). Once the diskette boots up, it should leave you at a DOS/Win95/98 prompt on drive A, where you can run the SYS program. After the system is transferred, restore the correct MSDOS.SYS file by issuing the following commands:

```
A:\> sys c:  
A:\> c:  
C:\> attrib -h -s -r msdos.sys  
C:\> copy msdos.tmp msdos.sys
```

After all the files are properly restored, remove the boot diskette, and reboot through System Commander to save the new files and configurations.

Windows NT

Most NT installations place a custom boot record that will load the file NTLDR. A weird quirk of the NT install is the old boot record OEM name (like MSDOS5.0) will be copied into the NT boot record.

These three additional files are critical to the NT boot process:

| | |
|--------------|----------------------------------------------------------|
| NTLDR | This is the NT OS Loader file that actually launches NT. |
| NTDETECT.COM | This program is run by NTLDR to detect NT's presence. |
| BOOT.INI | A text configuration file for NTLDR. |

Windows NT v3.5 or v3.51

Basic Windows NT boot problems are very easy to correct. Reboot directly from the NT emergency repair diskette, and follow the instructions. In most cases no other diskettes or CDs are necessary.

If you did not make an NT emergency repair diskette, the NT installation diskette can be used as an alternative. In this case, reboot from the diskette. You will be prompted to either perform an NT installation or an emergency repair.

Windows NT v4.0 and 5.0

Under Windows NT, to correct the problem, boot the machine into the NT Setup Program (usually by using the three boot disks you made during the initial installation of NT). At the Setup screen you will be given the option of repairing the current NT installation. Choose this option and insert the NT Emergency Repair disk into the machine when prompted.

DOS

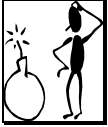
DOS has five files critical to its operation and a boot record. These files reside in the C:\ root directory, and include:

| | |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IO.SYS <i>or</i> IBMBIO.COM | This is the file first run by the DOS boot record. It contains the DOS initialization code and key parts of DOS. It is a hidden system file, and often (but not always) has a file creation time that matches the version. |
| MSDOS.SYS <i>or</i> IBMDOS.COM | This contains the balance of the resident parts of DOS. It is a hidden system file, and often (but not always) has a file creation time that matches the version. |
| COMMAND.COM | This program is used to process the DOS command line (it does not stay resident). |
| CONFIG.SYS | This is the standard configuration file for DOS. See page 30 for specific issues about this file. |
| AUTOEXEC.BAT | Additional TSRs and commands run from AUTOEXEC.BAT. See page 32 for specific issues about this file. |

To load a new copy of the two hidden files and the boot record, boot from a diskette that has the identical version of DOS. At the DOS prompt run:

```
A:\> sys c:
```


The SYS program, with DOS 5 and later, will also insert a new copy of COMMAND.COM. For older DOS versions, the COMMAND.COM file must be copied from the diskette manually.



Note: If you made your DOS boot diskette after NT was installed, the DOS boot disk will have an NT boot record and not the standard DOS boot record! Use a real DOS boot diskette in this case. After all the files are properly restored, reboot through System Commander to save the new files and configuration.

Notes

OS and Product Limitations

Each operating system has its own quirks and limitations. We have included a few of the major limitations we have documented. To our knowledge at the time of this writing, there is no way to overcome these limitations.

As well, there are certain products with which we are not compatible. Those are detailed here including suggestions or workarounds where available.

In all cases, the OS or product vendor has the final word on what their product can and cannot do. If you see anything in this chapter that you question please contact the vendor for absolute verification.

OS Limitations

Limitations of DOS

- 1) DOS must be installed into a primary partition on the first physical drive (also called the master drive). DOS installed into either a second hard drive or an extended/logical partition will not boot.
- 2) When your system has more than one primary FAT partition, the inactive primary partitions(s) may not be visible. This DOS bug will occur when either:
 - a) an extended partition exists without any logical drives defined.

- b) the extended partition has no FAT logical partitions defined.
- 3) Novell DOS 7 and OpenDOS have a bug that will stop it from running if more than one primary FAT partition is visible. To fix this bug, hide all primary partitions except the DOS partition.

Limitations of Windows 95/98

Like DOS, Windows 95/98 must be installed onto the first physical hard drive in a primary partition. It is possible to install the start up files into a primary partition with the remainder of the program files in an extended partition or even on a second physical hard drive.

Windows 95 OSR2 (dated 1996 or later) and Windows 98 support a new file system FAT-32. FAT-32 supports a partition size beyond 2 GB and uses a smaller cluster size for efficiency. No other OS can read or access a FAT-32 partition other than Windows NT 5.0.

Limitations of Windows NT (3.x to 5.x)

NTFS file format can only be seen from Windows NT. Windows 95/98, DOS and others cannot see a partition with the NTFS file format.

Limitations of OS/2

- 1) Only one primary partition can be visible to OS/2 at one time. Usually, this is the OS/2 Boot Manager partition, unless OS/2 has been installed in a primary partition on the first hard drive.
- 2) Like NT, OS/2 has a high performance file system (HPFS). Windows NT can access HPFS partitions, other operating systems cannot.

Limitations of other OSes

Linux, Solaris, SCO UNIX, NextStep, and other UNIX variants use their own unique file formats, which are typically not visible to any other OS.

Product Limitations

Memory Optimizers (QEMM, MemMaker, etc)

Memory optimizers attempt to look at your system's startup files and optimize them to free up conventional memory or provide smoother booting. While we are not incompatible with these types programs, they force multiple reboots of your machine during the optimization process while rewriting start up files during each reboot.

We strongly recommend disabling System Commander before beginning the optimization process. To do this, simply boot into DOS or Windows 95/98 and run our SCIN program. From the Main Menu, choose *Disable/Uninstall*. Exit SCIN and begin the optimization process. After the optimization, go back into the SCIN program and choose *Enable/Reinstall System Commander*. Reboot the machine and choose the OS you just optimized to save the new start up files.

EIDE Disk controller emulation (in software)

Older system that fail to support IDE drives greater than 504MB require an EIDE controller card, or, in some cases can use an EIDE emulation in software to access large drives. EIDE emulation is not compatible with all OSes, and may not allow System Commander to complete its installation.

The nature of these software EIDE emulation products is such that they must install themselves into the hard disk's master boot record, so that they can load before anything else, and boot the operating system on the hard disk. Because System Commander must also load in the master boot record, older software EIDE emulation might conflict with the installation of System Commander.

We recommend switching to a true EIDE controller. This will make your system compatible with all OSes and will significantly boost your hard disk performance. Alternatively, several software EIDE products, Disk Manager and EZ-Drive are compatible with System Commander. For Disk Manager, the first drive in the system must be larger than 504MB or Disk Manager will not let System Commander install. See Appendix D for more information on Disk Manager and EZ-Drive.

Anti-Virus Software (Norton, McAfee, etc.)

Virus detection programs scan the MBR for viruses. If they see anything out of the ordinary, they try to repair it. In rare cases, these programs may see System Commander as a virus, and should you choose to repair the MBR, you will wipe out System Commander. If this should happen, run SCIN and select *Enable/Reinstall System Commander* to restore the System Commander MBR.

In no case should you choose to repair the MBR if System Commander has been installed. System Commander monitors the boot record, and will tell you if we detect any changes which could indicate a virus. Most of these virus detection programs will allow you to manually disable MBR virus detection.

Disk Compression Software (DriveSpace, Stacker, DoubleSpace)

System Commander is fully compatible with disk compression, but it must be installed on the non-compressed boot drive. Be aware that disk compression is often incompatible with different OSes. We recommend avoiding disk compression in the MultiFAT partition. Generally disk compression will cause no problems when avoided on the true C boot drive.

Compression is a fairly outdated necessity. The purchase price of extremely large hard drives has fallen steeply in the last year. In terms of man hours spent getting compression set up and stable (unrelated to System Commander), simply purchasing a larger drive is worth considering.

Norton Disk Lock

Disk Lock is a security package that runs from the MBR. If you are using Disk Lock, System Commander will not install. You may not need Disk Lock with System Commander because of System Commander's built-in security system.



About System Commander

Interrupts and Memory

System Commander is non-resident and uses no memory once a menu selection is made. System Commander does not intercept any interrupts nor is any part of System Commander active while an operating system is running. System Commander is only active for the brief time the operating system selection menu appears on screen. This means that, once selected, System Commander cannot affect the way an operating system is working.

Specifications

Handles over 100 operating systems, split as 32 OSeS in the MultiFAT partition, up to 16 OSeS in logical partitions, and up to 56 OSeS in primary partitions across fourteen drives (additional drives are ignored, but usable by operating systems).

- Ability to boot other Master Boot Records
- Requires 512KB RAM minimum, but no bytes remain resident after a selection is made.
- Works with all drive types, IDE, EIDE, SCSI, ESDI and others.
- Year 2000 compliant
- Works with all standard display adapters

Summary of System Commander files

| File name | Description |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTALL.BAT | Installs System Commander from the diskette |
| SCBOOT.DAT | System Commander's data file |
| SCDISK.EXE | Program to view partition information and to temporally mark partitions bootable or non-bootable. Also used to pre-set some System Commander options. |
| SCEDIT.SYS | The System Commander file viewer/editor. |
| SCHELP.HLP | Installation help file |
| SCIN.EXE | System Commander Disable, Enable/Reinstall and configuration program |
| SCNOTES.DAT | Installation notes file used by SCIN |
| SCNOTES.TXT | Text only version of installation notes. |
| SYSCMNDR.HLP | Help file for System Commander |
| SYSCMNDR.SYS | Boot executable - This is NOT a device driver and is only used during the system selection process. It is installed in the root directory as a hidden system file. |
| MSDOS.BAK | Generic MSDOS.SYS file for Windows 95/98. |
| SCSCREEN.ZIP | This ZIP file holds several screen captures in the PCX file format. This file is not copied to the hard disk. See page 148 for more about screen captures. |
| VCOM.MSG | Information file for SCIN. |

Files Created by System Commander

| File name | Description |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BOOT.DAT | The original master boot sector saved during the first time installation, both on the hard disk and on the installation diskette. It is used when uninstalling System Commander and should not be deleted. |
| DOSBOOT.DAT | The DOS boot sector before System Commander is installed. It is only saved on the installation diskette as part of System Commander's special recovery feature. The file should not be deleted. |
| SCDOS.SYS | This file is created by System Commander to hold FAT OS hidden system files like IO.SYS and MSDOS.SYS for DOS. SCDOS is also marked as a hidden system file. It may change in size as new operating systems are added to the FAT partition. |

Screen Captures

System Commander poses two complexities to making a screen capture. For this reason, we include several screen captures on the diskette in the file SCSCREEN.ZIP. If you wish to capture your own OS selection screen, use the following steps.

First, since System Commander appears before any other OS, it is not possible to have a screen capture program running. To get around this limitation, you can load a DOS screen capture program and run the SCDISK utility. Select the option *View OS Boot Menu*. This will bring up the OS selection menu under DOS, so a screen capture can be made.

System Commander uses a sophisticated graphics on text technology that provides a graphics appearance without the normal reductions in display performance. To properly capture the screen, you will need a screen capture program that understands custom fonts. As an alternative, use the **-V** command line option on SCDISK to turn off custom fonts. Be aware that icons cannot be shown when -v is used.

We recommend using the screen capture program Collage Plus from Inner Media, Inc. at 603-465-3216. To correctly load the Collage screen saver, at the DOS prompt run:

```
save /cg /h
```

Then run SCDISK with the FONT8 option, since the Collage program does not understand the VGA's 9-bit wide font:

```
scdisk font8
```

Now select *View OS Boot Menu*, and capture your OS selection screen by pressing **Print Scrn**. From the Save screen menu of Collage Plus, select Color PCX (or other file format). Highlight the filename and press **Enter** to capture the screen.

Upgrading from a previous version of System Commander

To upgrade from a prior version of System Commander, install the new System Commander as though it were a first time install (i.e., switch to the diskette drive and run INSTALL). We recommend you use the same subdirectory as the original install, but this is not important. After the files are copied, you will be presented with an option to transfer all menu names and other options to the new installation (from versions 1.05 and later only). Select "Use Prior Settings" to do this.

If you have OS selections that boot from a logical partition, in a few rare cases the new installation may not transfer the OS selection description. In these cases, System Commander will automatically assign a name based on the operating system name.

System Commander (and the manual) assume the MultiFAT feature is always on. If you had the option off before, it is automatically set on during the new installation.

Version 1 to Version 3 Special Notes

New Protection Features

If you use NT or Windows 95/98, this new version of System Commander provides additional protections against damage to key hidden files for each of these OSes. These features are activated automatically when one of these OSes is installed, but must be manually activated if you upgrade from version 1 of System Commander.

To activate protection for a specific OS, such as NT, or Windows 95/98, from the OS selection menu, select the OS. After the OS comes up, reboot, and press **Alt-S** (Setup), and select *File management menu*. Press **Alt-D** (Default), and enter a unique subdirectory name for the OS.

System Commander will fill in the remaining file management fields to activate the protection feature.

Add and Removal of an OS

To add or remove a primary partition selection from the OS menu, in version 1, you would go into the Partition Information screen. This process has been relocated to the Setup function under the *Order, add and remove menu*. This move prevents changes to the Partition information when a setup password is active, and helps consolidate all add and removal functions into a single menu.

Version 3 New features to Explore

Some of the new features include:

- A built in viewer/editor to make start up file editing possible at boot time (without loading an OS)
- Automatically detects multiple installed operating systems (e.g. Windows NT on top of Windows 95/98 on top of DOS) during installation
- A boot time screen saver
- Support for new OSes

Microsoft Windows 95 OSR2 FAT-32

Microsoft Windows 98

Microsoft Windows NT v4/v5

IBM's OS/2 Warp v4

Next/Apple's OpenStep v4

Be's BeOS

Btron 1B

- Security Improvements

Multiple Users

Access Log

System Commander Applications

As a result of booting multiple operating systems, System Commander also serves the following applications:

Games

System Commander will allow you to keep your DOS games while still migrating up to Windows 95/98. Conversely, if you already have Windows 95/98, you can keep your '95/98 games and add games that run under your DOS installation.

Another feature of System Commander will allow you to create different DOS configurations for games designed to run under DOS. Rather than create the dreaded boot disk for every game you have, you can use the System Commander boot menu to manage DOS boots designed specifically for the game you wish to run. See the section "Multiple Selections for One DOS" on page 36.

Development

Rather than having multiple machines, each running a different OS under which you are developing, you can use System Commander to boot all of them on the same machine. This allows you to develop applications either across multiple platforms or for an individual platform while cutting costs for expensive hardware.

QA/Testing

After you have developed your applications, it is often necessary to run them through rigorous testing using multiple OS installations or software scenarios. With System Commander you can either boot multiple OSes or boot the same OS with different startup configurations. This will allow you to test your application on the same machine, again cutting expensive hardware costs.

OS Migration

First came DOS, then Windows 95 and Windows NT 4, and now Windows 98, Windows NT 5 and OS/2 4. Operating systems are being developed and revamped at an ever increasing rate. Unfortunately, it is often a difficult decision to migrate to these new and improved OSes. System Commander will allow you to continue to run your preferred operating systems while learning and testing out each new OS.

Multi-Lingual OSes

System Commander allows those who are multi-lingual to use the language variants of operating systems with which they are comfortable. Work requires that you use English Windows 95/98, but you grew up programming Japanese? Use System Commander to get back and forth between what you need and what you want!

Training

System Commander can be used to cut hardware costs for training facilities by allowing you to boot the operating system you need. If your developers

are using Windows NT while your support staff is using Windows 95 or Windows 98, it can sometimes be difficult to arrange training. With System Commander, you can install the OSes you need onto the same machine reducing costs and space in training facilities.

Sales Demonstrations

Field salespeople will love System Commander. It unburdens them from carrying two or even three laptops to demonstrate their products on. If your firm develops applications across multiple platforms, you can use System Commander to install all of these OSes on a single laptop your field salespeople can use for demonstrations.

Technical Support Groups

Does your support organization support a product than runs under multiple operating systems? If so, you can use System Commander to boot different OSes on the same machine. This will enable the support engineer to easily replicate the circumstances the user is experiencing.

Password Security

System Commander provides advanced password security for a PC while using no resident memory and with zero degradation to application speed or performance.

Notes

V Communications Products

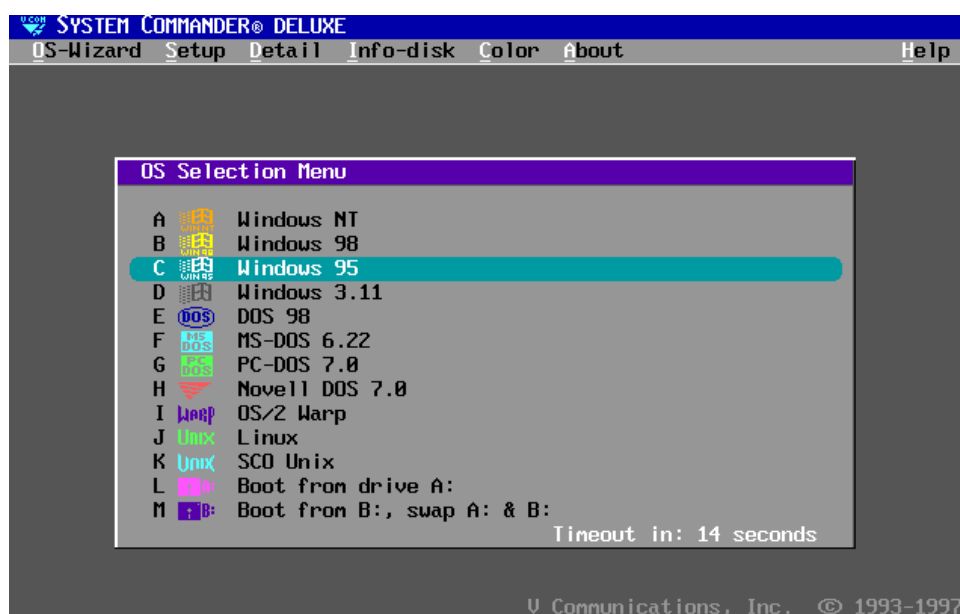
V Communications produces a number of high performance products for the PC. Additional details on all our products also appear when running SCIN, using the *V Communications Information* selection or check out our Web site at WWW.V-COM.COM.

General Products

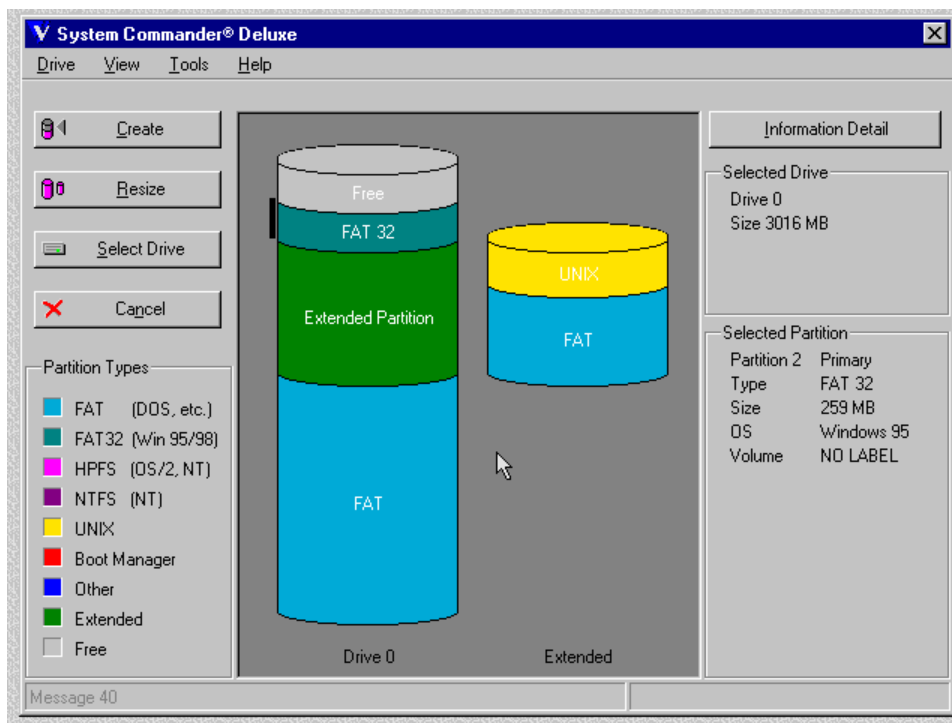
System Commander® 2000

Any Operating System - Any Time - Automaticall.- Includes Partitioning!

System Commander 2000 provides many additional features over prior System Commander versions. It adds automatic partitioning with the OS Wizard. Simply select which OS you plan to install, and OS Wizard will scan your system to find the best configuration. It can automatically resize existing partitions, create and format a new partition.



System Commander 2000 also offers full manual partitioning with create, delete, resize, validate, conversion, and other key functions. You will also enjoy the new graphics style options and universal mouse support.



Bundled with the packaged System Commander 2000 are free copies of TurboLinux and Sun's StarOffice.

Partition Commander®

Automatic Partitioning!

The most advanced partitioning product available! With our exclusive Partition Wizard™ easily gain more disk space, move unused space on a drive from one drive letter to another, optimize disk usage, and much more.

Partition Commander® even makes manual partitioning operations easy with complete GUI operation – no painful and risky FDISK to hassle with. Provides safe and easy Create, non-destructive resize, delete, copy, move, and FAT to FAT32 conversions and back.

AutoSave™

Automatic Backup! No tapes, no effort, no hassles, Painless!

AutoSave works in the background to automatically save your work files to an alternate location, such as another hard disk, network drive, or removable media like zip, jazz, LS120, or Orb. No scheduling required, since AutoSave works silently in the background, backing up your work files shortly after you create or modify them.

AutoSave works on Windows 95/98/NT/2000.



Other Products

This section lists products that may be useful to you, which are available from other vendors.

Software

System Commander 2000

Upgrading to System Commander 2000 makes it even easier to add new OSes. It includes built in automatic and manual partitioning to create, delete and resize partitions. See Appendix C for more details.

EZ-Drive (also called MaxBlast and EZ-BIOS)

This provides LBA support in software for IDE drives larger than 504 MB. EZ-Drive must be installed prior to partitioning the disk. It normally installs in the master boot record, in a way that does not conflict with System Commander. You should always install System Commander after EZ-Drive is installed. Old versions of EZ-Drive will prevent System Commander from installing (preventing our MBR from being written). You can upgrade to the current EZ-Drive by contacting MicroHouse.

MicroHouse can be reached at 303-443-3388. Their web site is at WWW.MICROHOUSE.COM.

Disk Manager

This provides LBA support in software for IDE drives larger than 504 MB. Disk Manager must be installed prior to partitioning the disk. It

normally installs in the master boot record, in a way that does not conflict with System Commander as long as the first physical disk is greater than 504 MB in size. If your first disk is smaller than 504 MB, Disk Manager will not allow System Commander to complete its installation.

Disk Manager version 6 is not compatible with UNIX, NT or OS/2. Special drivers make it compatible with Windows 32-bit file access and Windows 95/98. Version 7 adds support for NT and OS/2 in certain situations.

If Disk Manager is used with an OS that boots from any drive other than the first, a bug in Disk Manager will force the next reboot to occur from a floppy disk. System Commander will not come up. To fix this, run FDISK and make any partition active on the first drive. Reboot from the hard disk, and in System Commander, press **Alt-S** (Setup). Select the *Global special options menu*. Toggle the option *Force partition active on drive 0* to **YES**. This gets around the bug in Disk Manager.

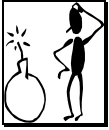
Contact Ontrack Data Recovery for more information at 1-800-872-2599, or in the UK, 44 81 974 5522.

EIDE Drive Controllers

EIDE controllers have just about taken over market from the older IDE controllers. EIDE indicates the controller supports LBA, or logical block addressing, to access drive space above 504 MB on large drives. This works very well for DOS, Windows 95/98 and other OSes.

EIDE controllers almost always provide a much smoother way to access drives larger than 504MB than software solutions. Some operating systems, however, may not operate properly with LBA. OSes that are fully LBA compatible include all DOS versions, Windows 95/98, Windows NT, OS/2 Warp, and more. We recommend you contact the OS vendor and/or EIDE controller manufacturer for a definitive answer.

To support LBA, EIDE vendors must replace the main BIOS hard disk routines. All approaches we've seen to date have a few minor annoyances.



Never change the state of LBA (on or off) unless you are prepared to repartition and reformat the entire drive.

The most common method uses a ROM on the disk controller card. This is not as nice as the standard IDE designs, since the user needs to ensure the ROM address does not conflict with other ROMs. The space that the ROM takes will also reduce the amount of high loading space available.

A second method relies only on a device driver. We do not recommend using this type of EIDE controller, since LBA access is not active until the device driver runs. Early OS initialization code will fail if any portion resides beyond the 1024 cylinder boundary (i.e., 504 MB).

Many of the EIDE cards we've seen also steal memory from the top of the main memory area. For example, a DOS **mem** command may show less than the standard 640KB.

SCSI Drive Controllers

Some SCSI controllers limit access to SCSI drives during the boot up process. In these cases, the SCSI controller will only allow booting from the first two drives. In addition, these controllers usually limit the number of SCSI boot drives by any IDE drives that are in the system. For example, if a system has one IDE drive, and three SCSI drives, only the IDE drive and the first SCSI drive can be used for booting.

For SCSI drives greater than 1 GB, you need to set the translate option on (sometimes referred to as the “greater than 1 GB” option). This allows access to the entire drive by most OSes. Some UNIXes (SCO UNIX) are incompatible with translate mode, and the option must be left off. In this case, all OSes you wish to boot from must be installed within the first 1 GB of the drive.

For example, if you are using the Adaptec 2940 series SCSI controllers, these options are available from the SCSISelect! Utility provided by Adaptec. To enter the SCSISelect! Utility, press **CTRL-A** when prompted during your system startup. From the main menu, choose the *Configure/View Host Adapter Settings* option, and then the *Advanced Configuration Options* selection. In this menu, the option that controls how many hard disks the controller will support through its BIOS is labeled as “BIOS Support for More Than 2 Drives (MS-DOS 5.0 and above)”. The option that controls drive translation is labeled “Drive translation for drives > 1 GB”.

For other options and other controllers, refer to the documentation supplied with the SCSI controller.

Common OS Commands

This section describes common commands available in DOS and Windows 95/98 that are often used in the installation and setup of FAT compatible operating systems. Your DOS and/or Windows 95/98 manuals should provide greater detail about these commands.

ATTRIB

The attribute command changes the file attributes. In most cases one of the following two commands are used:

To make the MSDOS.SYS hidden file visible, non read-only, and non-system (which allows you to delete or copy the file):

```
C:\> attrib -h -r -s msdos.sys
```

To make the IO.SYS file hidden, read-only, and system:

```
C:\> attrib +h +r +s io.sys
```

FDISK

This utility allows you to display current partitions and add or remove partitions on multiple hard disks. Keep in mind that when you delete a partition all of the data within the partition is lost and is not recoverable. Make a backup of important data and programs before deleting a partition.

If the partition you wish to remove is the partition you installed System Commander in, be sure to disable System Commander before deleting the partition.

To run the FDISK utility, at the DOS/Windows 95/98 prompt:

```
C:\> fdisk
```

FDISK provides the following options:

- | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">1 - Create a DOS partition or Logical DOS drive2 - Set active partition3 - Delete partition or Logical DOS drive4 - Display partition information5 - Change drive |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Keep in mind that you can only create a partition when unused disk space is available. If no space is available, FDISK cannot create a new partition. If you need to create more than one primary partition on a single drive, you must follow the steps on page 32.

FDISK can only create FAT partitions. These are suitable for DOS, Windows 95/98, OS/2 or NT. It cannot create special partition types for UNIXes, NetWare, OS/2's HPFS type, nor NT's NTFS type. Version 6 and later FDISK can delete any type partition (i.e. DOS as well as non-DOS). Older FDISK versions can only delete DOS partitions.

A partition cannot be booted unless it is active. If System Commander is already installed, you do not need to be concerned with the active status, since System Commander automatically handles this. If System Commander is not installed, be sure to make the partition you wish to first boot to as *active*.

After the creation of a partition it is necessary to format the partition. See the next section for instructions using the format command.

Alternative, simpler to use, tools for repartitioning drives are explained in more detail in Appendix C and D.

FORMAT

This prepares a new disk partition for use and creates a boot record for the partition. A format will erase the data in the partition and makes the partition ready to accept files. When accessing a new partition from

DOS that has not been formatted, the error message appears ***Invalid media type.***

To format a partition, the format command is issued with the drive letter. The ***/S*** option will also load a set of minimal start up files from the boot diskette so the partition (if active) will boot. To format drive E and load the system into drive E, the following command is issued:

```
A:\> format e: /s
```

SYS

The SYS command loads the operating system startup files onto the specified drive. For MS-DOS and Windows 95/98, this includes IO.SYS and MSDOS.SYS. Versions 5 or later of the SYS command will also copy the COMMAND.COM file to the target disk. With PC-DOS, Novell DOS, and DR-DOS, the SYS command loads the files IBMIO.COM and IBMDOS.COM.

To issue SYS from a boot diskette to place the system onto the C: drive, the command is issued:

```
A:\> sys c:
```

It is not necessary to boot from the diskette drive before issuing the SYS command. After the SYS command completes, it returns the notice "System Transferred".

The SYS command has a number of quirks that may prevent it from working. We would recommend you use System Commander's *Transfer System* option instead. This is run from **SCIN**, under the *Special options* menu (see page 101).

If the SYS command detects a newer version of the OS already installed, it may complain and do nothing. In this case, delete the files on the target disk root directory, IO.SYS and MSDOS.SYS (or if PC-DOS or Novell DOS, delete the files IBMIO.COM and IBMDOS.COM). Remember that the files are usually hidden read-only files, and the attributes must be changed before deletion.

If the SYS command returns the confusing message “Write failure, diskette unusable”, it means the target partition has not been formatted.

A third alternative to the SYS command or System Commander’s *Transfer System* option is provided with the Norton Utilities. If you have this useful tool, run the DISKTOOL program, and select the option “Make a disk bootable”. DISKTOOL, like System Commander, avoids a number of annoying limitations of the SYS command.



Contacting Technical Support

We hope that you will never encounter problems with System Commander. We strongly encourage you check the table of contents or index of this manual to see if you can save yourself a phone call. Also remember, there is very detailed Troubleshooting assistance provided with the SCIN program and you can press F1 in most places to get context sensitive help with System Commander.

Should you find yourself at a loss and need to contact us directly, we will do our best to assist you with using System Commander in every way we can.

When You Call

Before you call technical support, please have your version and serial number ready. This information will be verified. As well, we need to know the exact nature of your problem and what you have done to attempt to remedy it. Please have a credit card ready, as this System Commander Lite edition does not include free technical support.

Our technical support hours are **Monday through Friday, 9 a.m. to 5 p.m.** Pacific Standard Time. *Technical support is on a first come, first served basis.* Our paid support line is at 408-965-4018.

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