Disk Kit II

Hard Disk Tool Kit II

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NOTICE

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IMPORTANT SOFTWARE DISKETTE INFORMATION

For your own protection, do not use this product until you have made a backup copy of your software diskette(s). The backup procedure is described in the user's guide for your computer.

Please read the DISKID file on your new software diskette. DISKID contains important information including:

- The part number of the diskette assembly.
- The software library disk number (for internal use only).
- The date of the DISKID file.
- A list of files on the diskette, with version number, date, and description for each one.
- Configuration information (when applicable).
- Notes giving special instructions for using the product.
- Information not contained in the current manual, including updates, any known bugs, additions, and deletions.

To read the DISKID file onscreen, follow these steps:

1. Load the operating system.
2. Remove your system diskette and insert your new software diskette.
3. Enter —

   type diskid(cr)

4. The contents of the DISKID file is displayed on the screen. If the file is large (more than 24 lines), the screen display will scroll. Type ALT-S to freeze the screen display; type ALT-S again to continue scrolling.

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This manual describes how to use these hard disk utilities from the *Hard Disk Tool Kit*:

- HDSETUP lets you create your own hard disk configuration, review the current configuration, or create a configuration file (used with AUTOSET to configure a hard disk).
- HDTEST is a hard disk confidence test. Run HDTEST when you first receive the hard disk or any time you suspect hardware errors.
- HDFIXUP finds, logs, and replaces defective media.
- HDFORMAT reformats the hard disk. When defects make your hard disk unusable, run HDFORMAT as a last resort before replacing the hard disk. You can also run HDFORMAT on a new hard disk to correct errors that may have occurred during shipment.
- HDPARK prevents "head crashes" by moving the read/write heads over the innermost cylinder of the drive. You may want to run HDPARK before turning off power to your computer, before moving your hard disk machine, or any time when electrical power is fluctuating or unreliable.
- HDRESTOR restores the hard disk label from the backup label. Use HDRESTOR if the disk label is damaged or otherwise unusable.

Error messages for these utilities and error codes for the boot ROM are listed in Appendix A.

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A. Hard Disk Error Messages ..... A

HDSETUP.EXE is an MS-DOS utility for setting up or configuring the hard disk. HDSETUP enables you to custom-design your own configuration. In setting up a hard disk with HDSETUP, you can vary volume characteristics such as size and type.

This chapter presents an overview of HDSETUP functions, summarizes HDSETUP operations beginning with the Main menu, and presents step-by-step instructions for each procedure. If you are setting up a new hard disk, you should follow each set of instructions in order as you read this chapter.

HDSETUP OVERVIEW 1.1

You can use HDSETUP to:

- Set up a new hard disk (divide it into volumes and prepare it for use). Volumes can run under MS-DOS, CP/M-86, UNIX, or OTHER operating systems.
- Revise volumes on a hard disk that is already set up.
- Review setup information about existing volumes.
- Create a .CFG configuration file to use later with AUTOSET, the automatic hard disk configuration utility.

There are four major steps in setting up a new hard disk with HDSETUP. Follow them in this order:

1

1. **Initialize** the hard disk to prepare it for setup.
2. **Configure** the hard disk to divide it into volumes and define volume characteristics.
3. **Assign** drives and designate the boot volume (the volume that boots the system).
4. **Reload** a hard disk operating system to activate the new setup.

You must reload a hard disk operating system, such as the one on the hard disk system diskette. The *Hard Disk Tool Kit* diskette contains a floppy disk operating system. If you reboot a floppy disk OS and try to access the hard disk using any MS-DOS command or utility not specifically designed for the hard disk, you get a "Not ready" or a "Bad Label" error message. However, you can load the HDTK diskette to run any of the hard disk utilities, such as AUTOSET, HDSETUP, and HDFORMAT.

After you set up the hard disk with HDSETUP or AUTOSET, use the SYS utility to copy a hard disk operating system onto the boot volume. (SYS.EXE is described in the *MS-DOS User's Guide* and in the *Hard Disk User's Guide.*) Make sure you copy a hard disk operating system, not a floppy disk operating system. Once a hard disk OS is on the boot volume, the system can boot automatically from the hard disk.

Once your hard disk is set up, you can use HDSETUP to:

- View the current configuration
- Delete existing volumes
- Create new volumes
- Change drive assignments

After you delete or create volumes or change drive assignments, you must reload a hard disk operating system to make the changes effective. Make sure that a hard disk OS diskette (not the HDTK diskette) is in the default drive before you reboot. For most configuration changes, HDSETUP prompts you to reboot by pressing any key. You can also reload by pressing the reset button.

CREATING AN AUTOSET FILE WITH HDSETUP 1.1.3

AUTOSET.EXE uses a .CFG file (rather than user input) to configure a hard disk. You can use any of the .CFG files that accompany AUTOSET, or you can use HDSETUP to create a custom .CFG file of your own. When you create an AUTOSET file, your keystrokes are stored in that .CFG file, and no changes are made to the hard disk until you run AUTOSET with that file. The *Operator's Reference Guide II* describes how to use AUTOSET.

Every .CFG file created with HDSETUP must go through the first three steps in setting up a new hard disk (initialize, configure, and assign). HDSETUP ignores the existing configuration of your hard disk, and creates a new hard disk configuration in the .CFG file. Therefore, when you run HDSETUP to create an AUTOSET file, you cannot view the current hard disk configuration. Instead, you see the new configuration in the AUTOSET file.

This error occurs because the AUTOSET file must go through the steps in order, starting with initialization.

1.2 HDSETUP OPERATION

HDSETUP is a menu-driven program. A menu line at the bottom of the screen displays the current set of choices (HDSETUP operations). Each operation is listed with the number of one of the function keys (F1 through F7) located at the top of the keyboard. You perform an HDSETUP operation by pressing the correct function key.

When you load HDSETUP, you start at the Main menu, shown in Figure 1-1. From there you use the top-row function keys to enter other menus where you can perform the HDSETUP functions. The other menus are named for their functions—Configure, Assign, and Init (Initialize). For example, you press F3 (CONFIG) at the Main menu to enter the Configure menu and display the current configuration.

1.2.1 ONSCREEN HELP

HDSETUP has three kinds of help:

- PROMPT LINE. The top line of the screen displays the name of the current menu and gives a one-sentence instruction about what to do next. For example, the prompt line for the Main menu tells you to select the Menu you want to work with:

```
MAIN MENU  Select Menu with Function Keys  HDSETUP ver 2.32
```

line for the Main menu is:

```
1 CANCEL  2 DONE  3 CONFIG  4 ASSIGN  5 INIT          7 HELP
```

The menu line always tells you the operation performed by each function key on the current menu.

- HELP SCREENS. Pressing key F7 always displays a HELP screen explaining your options. Different HELP screens are displayed for every step in the HDSETUP program.

Some HDSETUP procedures are complex. If you need assistance, consult the three kinds of onscreen help available to you: prompt line, menu line, and HELP screens.

PERFORMING HDSETUP FUNCTIONS 1.2.2

To perform most HDSETUP functions, you press function keys located at the top of the keyboard. Each menu line tells you the function performed by each key. For example, F7 is always the HELP key, and F1 is always the CANCEL key. F7 displays a HELP screen that tells you what to do next. F1 takes you back to the previous menu or to the beginning of the step you are doing.

On some menus you use the cursor keys to move a highlighted block that indicates where to make your next choice. Then you either type in a value (such as a volume name) or use the function keys to choose the action you want performed (such as CHANGE or DELETE).

The HDSETUP utility is the file HDSETUP.EXE on the *Hard Disk Tool Kit* diskette. To load the HDSETUP program, first load MS-DOS by inserting the HDTK diskette and pressing the reset button if necessary.

Unless you are creating an AUTOSET file, load HDSETUP by typing:

hdsetup(cr)

To create an AUTOSET file, load HDSETUP by typing:

hdsetup filespec(cr)

where **filespec** is the name of the configuration file you want to create. HDSETUP assigns a .CFG file extension even if you give another extension.

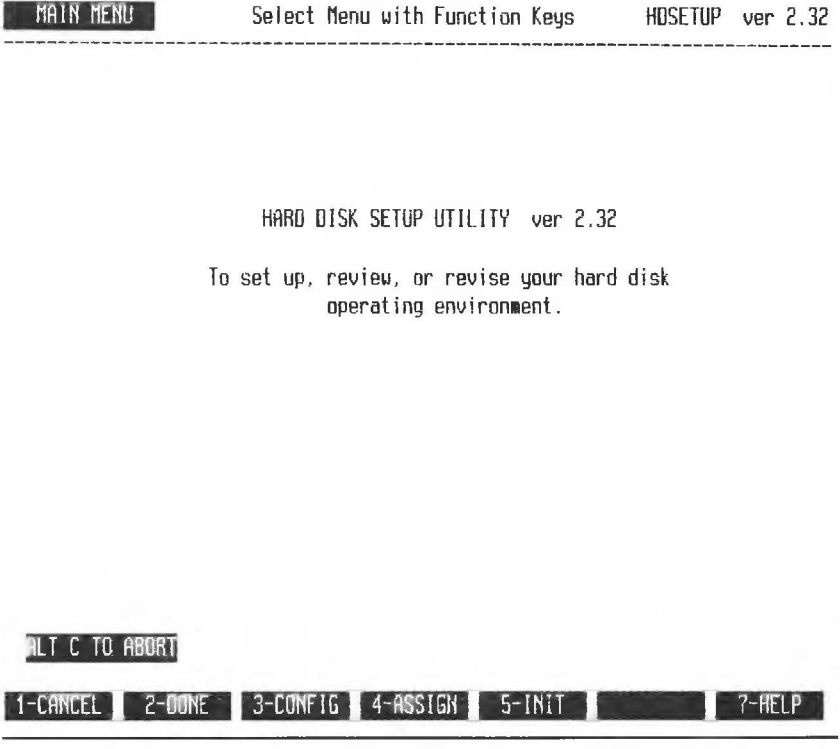
After you load HDSETUP, the Main menu appears.

1.4 THE MAIN MENU

Figure 1-1 shows the HDSETUP banner and Main menu.

The Main menu function keys do these functions:

- **F1 - CANCEL:** Cancel any changes made during this HDSETUP session. When you press F1, you are asked "ARE YOU SURE?" Press F2 for "yes" (cancel changes and return to MS-DOS). Press F3 for "no" (return to the Main menu).



- **F2 - DONE:** Log the changes made during this HDSETUP session. F2 either writes the configuration to disk or records the configuration in an AUTOSET file. No HDSETUP functions are performed on disk until you press F2 at the Main menu. Then HDSETUP checks your drive assignments for validity:

  — If drive assignments are valid, you return to MS-DOS, or a screen appears prompting you to reboot the system.

  — If invalid drive assignments are found, an error message appears and you return to the Main menu. Press F4 to go to the Assign menu, where you can correct the invalid assignments.

- **F4 - ASSIGN:** Go to the Assign menu, where you can designate a boot volume and assign drive names to the volumes and drives in your system. You can also view existing drive assignments.

- **F5 - INIT:** Go to the Initialize menu, where you can initialize the hard disk (the first step in preparing it to accept data).

CAUTION:

Initializing will destroy data already stored on the hard disk (unless you are creating an AUTOSET file). Use F5 only if you are setting up a new hard disk or creating an AUTOSET file.

- **F7 - HELP:** Display a short description of HDSETUP operation. HELP screens are different for each menu and for each task.
- **ALT-C - ABORT:** Exit from HDSETUP without making any changes to the hard disk. For example, you should type ALT-C if your keyboard configuration is not compatible with this program (i.e., the function keys do not operate as described). The "soft keyboard" is part of the operating system; you must load a standard version of MS-DOS to use HDSETUP.

To set up your new hard disk configuration, you must press F2 (DONE) at the Main menu when you finish using HDSETUP. No changes are made to your hard disk configuration until you press F2 (DONE).

The Main menu functions are described in more detail in the following sections.

A new hard disk must be initialized before it can be configured and used for data storage. Initialization creates a single large volume the size of the hard disk. Initializing is usually done only once—when you first set up your hard disk. If you have already set up your hard disk and now want to change the configuration or volume assignments, you do not have to reinitialize the disk. Reinitializing a hard disk that contains data destroys the data.

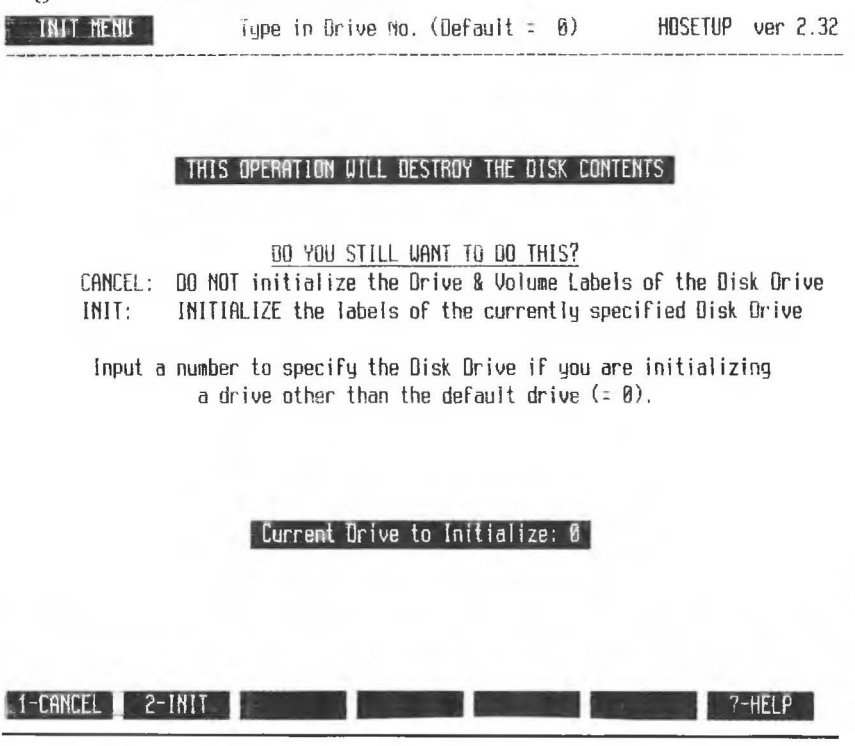
When creating an AUTOSET file, you must start by going through the steps for initializing. The hard disk is not initialized, however, until you run AUTOSET with the configuration file you created with HDSETUP.

Follow these three steps to initialize the hard disk:

1. Press F5 (INIT) at the Main menu.
2. A warning message and a new menu appear (Figure 1-2). HDSETUP warns you that initializing destroys the disk contents.
3. HDSETUP asks you to type the number of the hard disk to be initialized.

   The internal hard disk (or any disk with controller 0) is always disk number 0. Most external hard disks (or any disks with controller 1) are disk 2. Some early external models are controller 0 and are therefore disk 0. (The controller number is shown on the strapping for an external hard disk. Controllers 2, 3, and so on are drives 4, 6, and so on.)

   The default 0 is shown on the screen. Type the number of your hard disk if it is not 0.



4. Press F2 (INIT) to log the initialization and return to the Main menu. (F1 returns you to the Main menu without logging the initialization.)

   After you log the initialization, you can create volumes as described in Chapter 1.6. Changes are made to the hard disk after you finish the HDSETUP process. Therefore, the hard disk will not be initialized until you press F2 at the Main menu.

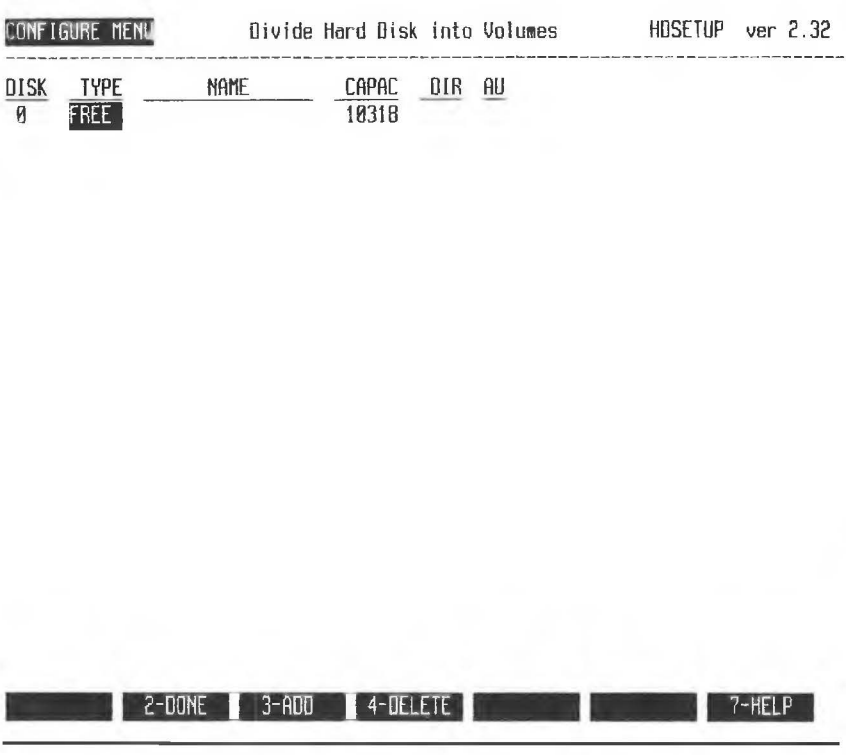
DELETING) VOLUMES

To configure volumes (or to record a configuration if you are creating an AUTOSET file), first press F3 (CONFIG) at the Main menu. The Configure menu and a volume list appear.

Figure 1-3 shows the Configure menu for an unconfigured hard disk. The prompt line at the top reads: Divide Hard Disk into Volumes. Below this is a list of the volumes on the disk. The volume list has these headings:

- DISK—the disk number (0 for an internal disk, and 2 for an external disk).
- TYPE—volume type (the operating system used with the volume—MS-DOS, CP/M-86, UNIX, or OTHER.)
- NAME—volume name. By default, volumes are numbered starting with 1, but you can also create your own volume names 1 to 11 characters long.
- CAPAC—volume capacity in Kbytes. The minimum is 20 Kbytes. (1 Kbyte is 1024 bytes.)
- DIR—number of directory entries (files that can be stored in the root directory of the volume).
- AU—size (in Kbytes) of the allocation unit (AU) for the volume. AUs are described in Chapter 1.6.3.

If you have not yet created volumes, the volume list shows only a single FREE volume the size of the total capacity of the hard disk (see Figure 1-3). For a configured hard disk, the volume list should include all the volumes currently set up.



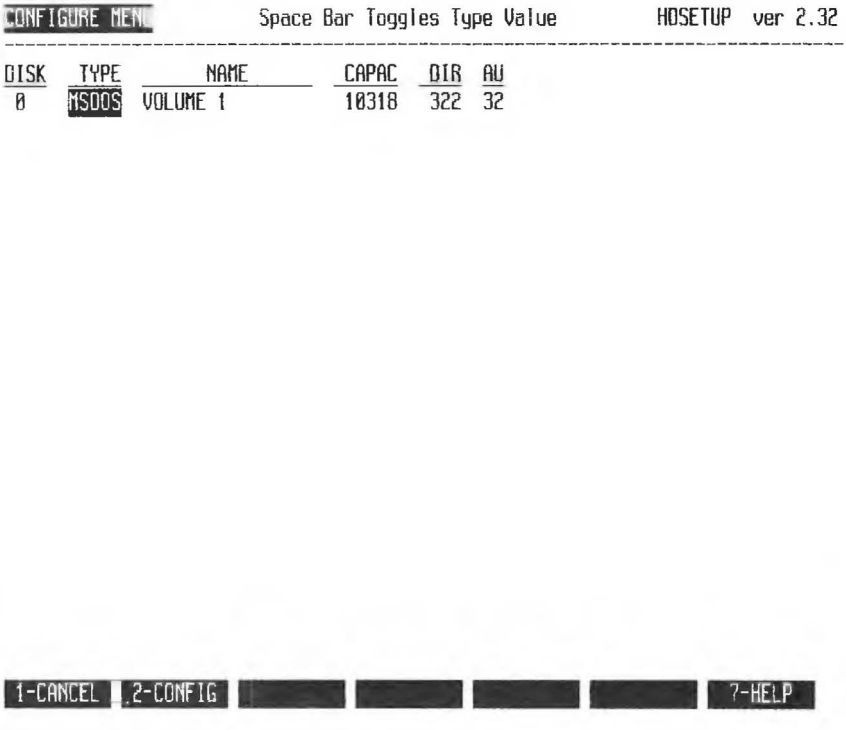
You are now ready to create a volume (Chapter 1.6.1) or delete an existing volume (Chapter 1.6.2). If you are creating an AUTOSET file, go to Chapter 1.6.1. If you don't want to add or delete volumes, press F2 (DONE) to return to the Main menu.

To create a new volume (or to record volume creation in an AUTOSET file), you must start with a FREE or unconfigured volume. If the Configure menu does not list a FREE volume, you can create one by deleting an existing volume, as described in Chapter 1.6.2. Deleting a volume, however, destroys any files on the volume.

Follow these twelve steps to create new volumes:

1. At the Configure menu (Figure 1-3), use the down-cursor key to move the cursor to the FREE volume. If you are setting up a new hard disk, the cursor is already at the FREE volume.
2. Press F3 (ADD) to add the FREE volume to the volume list.
3. Default values for the volume characteristics appear (Figure 1-4). The first choice you can make (TYPE) is highlighted (MS-DOS), and the prompt line reads: Space Bar Toggles Type Value.

(Defining a Volume)

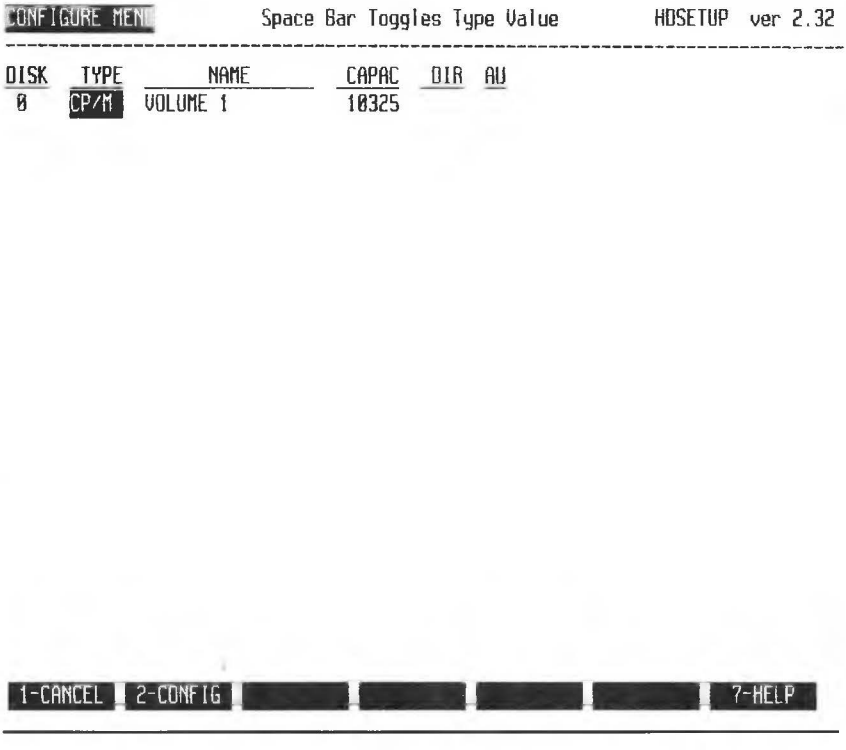


If you want to accept the default values, skip to step 8. To change the default values, go to step 4.

4. Pressing the Space bar changes the volume type from MS-DOS to UNIX to CP/M to OTHER. (This chapter gives the steps for setting up only MS-DOS on your hard disk. For your reference, however, the next paragraphs and figures describe and illustrate the screen displays for setting up CP/M, UNIX, and OTHER operating systems.)

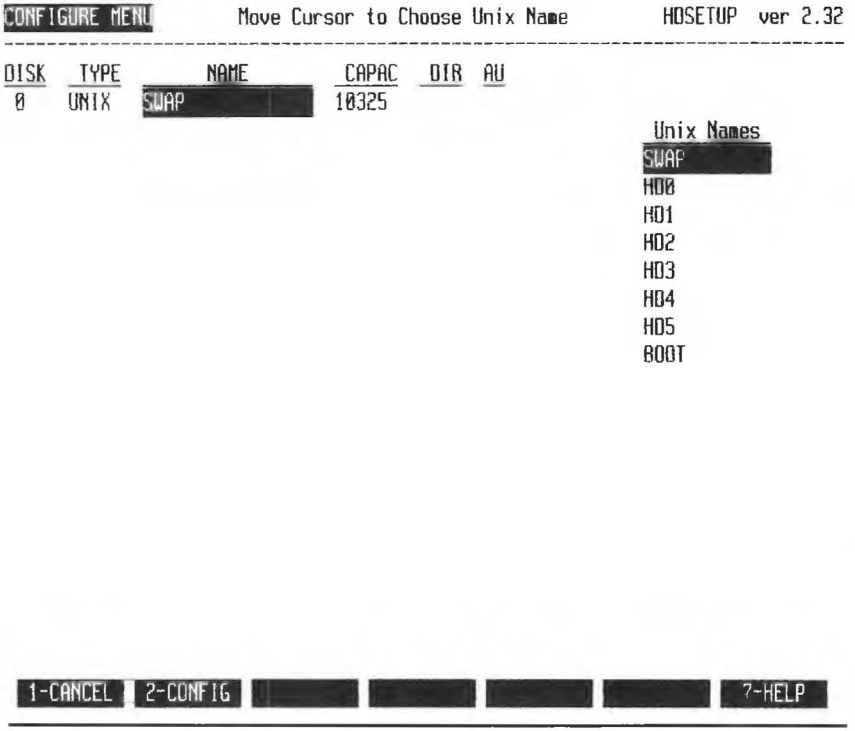
   For CP/M, you can choose only NAME and CAPAC characteristics (see Figure 1-5).

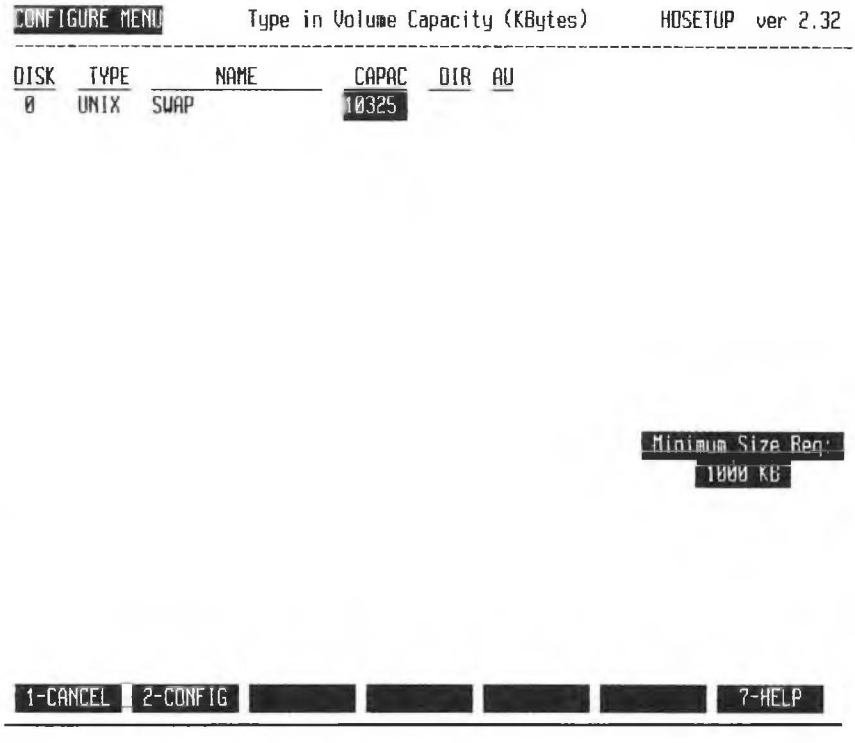
Figure 1-5. Configure Menu #3
(Selecting CP/M Type)



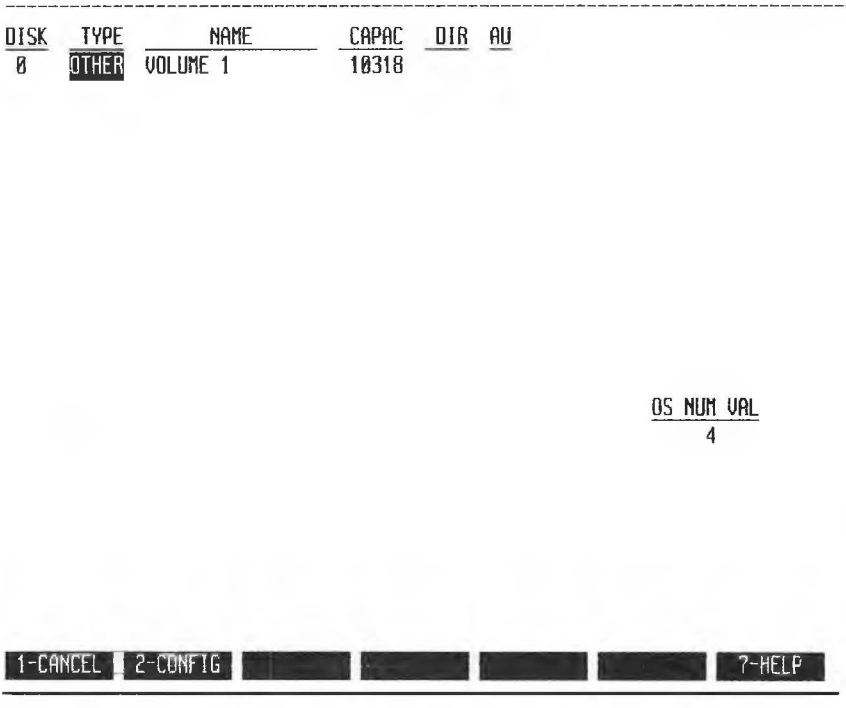
For UNIX, the default NAME is SWAP, a required volume name. Other choices for UNIX volumes are listed at the right of the screen (see Figure 1-6). You must select one of the listed names. When you choose CAPAC, a minimum volume size is shown at the right of the screen (Figure 1-7). Because the last two headings (DIR and AU) are not assignable, they are blank.

(Choosing UNIX Volume Name)





For any other operating system (OTHER), the prompt line asks you to input a TYPE number. If you have a special operating system, the developers of that OS should give you a number to input for the TYPE value. The number you type is shown in the special OS NUM VAL field at the lower right of the screen, shown in Figure 1-8.



In all following examples in this manual, all volumes are the default volume type (MS-DOS).

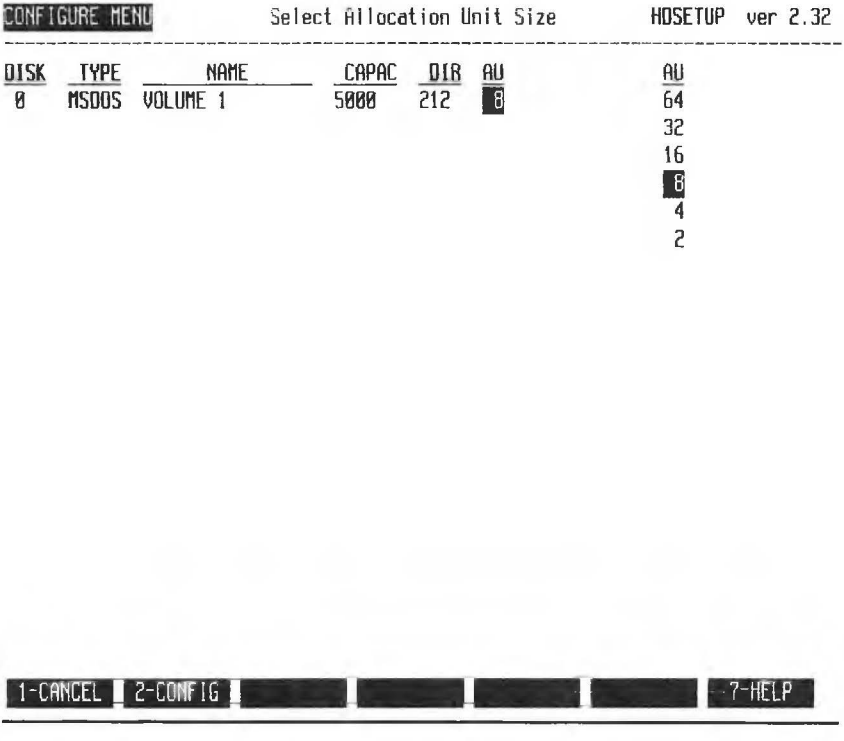
5. Move to the NAME column using the cursor keys. The default volume name appears inside the highlighted window. To accept the default (as shown in Figure 1-4), go to step 6. To change the volume name, type the new name over the old one. (Volume names are for your convenience only.)

the directory size is 212 entries.

7. To change the AU value, first use the cursor keys to highlight the AU field. A list of possible AU sizes appears on the right of the screen, and the default value (16) is highlighted. (See Chapter 1.6.3 for a description of AUs.)

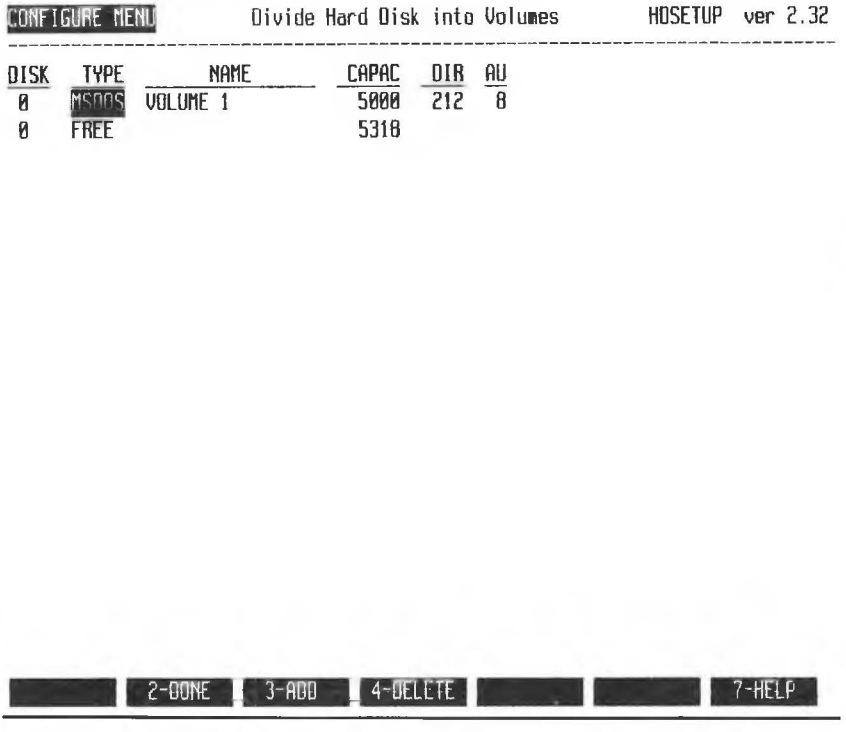
8. Use the up- and down-cursor keys to highlight the AU value you want. Log that value by moving left or right (out of the AU list). In Figure 1-9, the chosen AU size is 8K.

Figure 1-9: Configure Menu #7 with AU Window



10. The main Configure menu reappears. Note that the volume list shows a FREE volume the size of the space not yet configured on the hard disk (Figure 1-10).

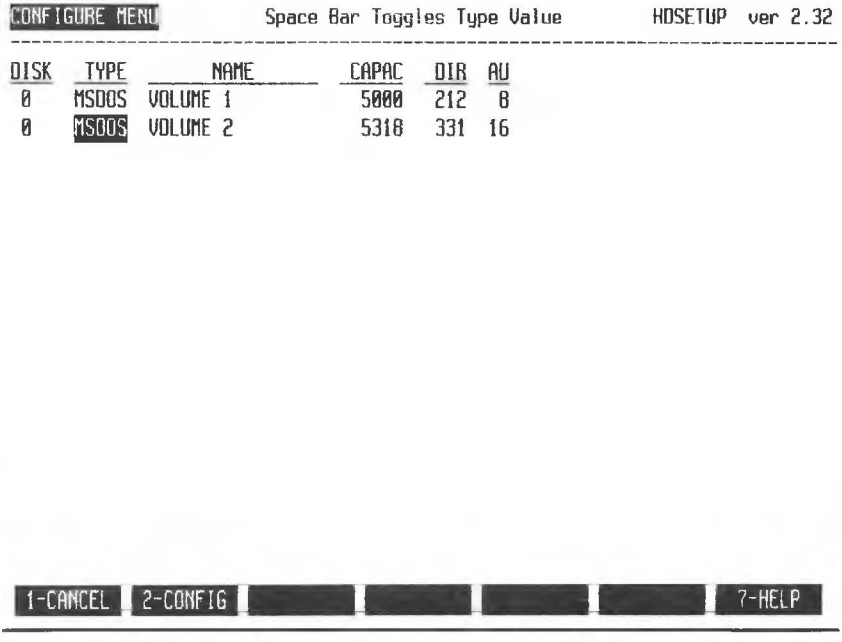
Figure 1-10: Main Configure Menu with One Free Volume and One MS-DOS Volume



changes and return to the Main menu.

Figure 1-11 shows the Configure menu for a hard disk configured into two volumes of approximately equal size. To change the hard disk from step 9 in the previous procedure to the status shown in Figure 1-11, you must create volume 2 using the default values for all the characteristics. Do this by moving the cursor to the FREE volume at the Configure menu (shown in Figure 1-10) and pressing F3 (ADD). Next, the configuration must be logged with F2 (CONFIG), followed by another F2 (DONE), both at the Configure menu.

Figure 1-11: Main Configure Menu after Configuring Two Volumes



1.6.2 DELETING A VOLUME

You need to delete a volume if you want to divide one volume into two or more smaller volumes. Deleting a volume also enables you to change its volume characteristics such as the OS type and the volume capacity.

CAUTION:

If you delete a volume that contains data, your data will be inaccessible. Before you delete the volume, back up any files you want to keep.

To delete a volume, first press F2 at the Main menu to get to the main Configure menu (shown in Figures 1-3 and 1-10). Then follow these steps:

1. Press the down-cursor key to highlight the volume you want to delete.
2. Press F4 (DELETE).
3. A new Configure menu appears and you are asked to verify the deletion. The yes/no prompt is shown in Figure 1-12, where VOLUME 2 is to be deleted.

4. Press F2 (YES) to verify the deletion. If you do not want to delete the volume, press F1 (CANCEL) or F3 (NO) to return to the main Configure menu.
5. The main Configure menu appears. The deleted volume is now listed as FREE, as in Figure 1-10.
6. Press F2 (DONE) to log the deletion. The Main menu reappears.

NOTE: If you delete a volume that is assigned to a drive, you must also reassign the drive. Chapter 1.7 tells how to change a drive assignment.

Allocation units (AUs) are the building blocks of disk files. All MS-DOS disk files are stored in AU-size blocks, and the minimum file size is one AU. If the size of a file exceeds the size of an AU by a single byte, an additional AU is needed to store the file.

The AU size can be 1K, 2K, 4K, 8K, 16K, 32K, or 64K. The minimum allowable AU size increases with volume size. The smaller AU sizes may not be available if your volume is large.

The operating system uses more memory to store files when the AU size is small. Also, efficient use of disk space depends on the AU size you choose. Larger AUs can waste disk space if most of your files are too small to fill each AU-size block. When copying files to or from diskette, keep in mind that the AU size for floppy diskettes is 4K.

When choosing the AU size, consider the average size of the files on the volume and the amount of disk space left unused by unfilled AUs. If most of your files are small (less than 20 or 30K) you should select a smaller AU size, such as 4K. For large files (over 100K), use a larger AU, such as 16K. If you have only a few files but they are exceptionally large (over 200K). you can probably use an even larger AU.

1.7 DESIGNATING THE BOOT VOLUME AND ASSIGNING DRIVES

After you create volumes on a new hard disk (or in an AUTOSET file), you must designate the boot volume and assign drive names to the volumes.

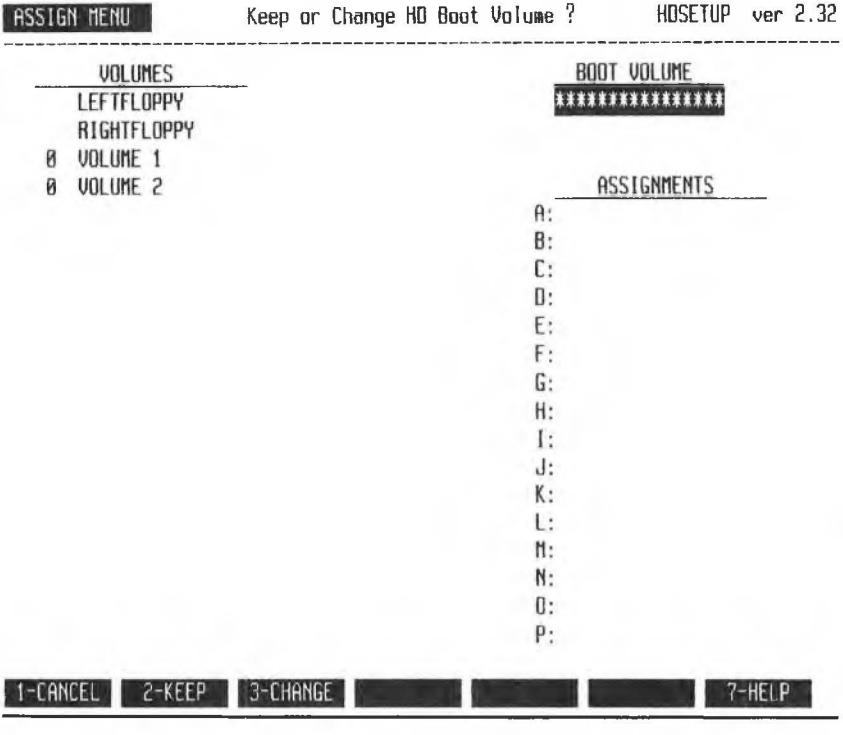
Designating the **boot volume** means selecting the volume that boots the hard disk (loads the operating system). You must copy a hard disk OS onto this volume using the SYS utility. If your system contains more than one hard disk, the primary boot volume must be on the first disk

Assigning drives means giving each volume a drive name, such as A, B, C, and so on. You assign drives in alphabetical order (A through P).

To begin the assignment procedures, first press F4 (ASSIGN) at the Main menu. The Assign menu and its three lists appear, as shown in Figure 1-13:

- VOLUMES, on the left, lists the volume names. Only MS-DOS volumes appear, and only MS-DOS volumes can be assigned to drives with HDSETUP.
- BOOT VOLUME, at the top right, shows the boot volume name. If no boot volume has been designated, this field is filled with asterisks.
- ASSIGNMENTS, below the boot volume field, shows drive assignments from A to P. If you haven't assigned drives, the assignment list is blank. (You do not have to use all the assignments in the list.)

Figure 1-13 shows the screen for this step. Two volumes are listed, but neither has been designated as the boot volume or assigned to drives.


ASSIGN MENU
Keep or Change HD Boot Volume ?
HDSETUP ver 2.32
VOLUMES
LEFTFLOPPY
RIGHTFLOPPY
0 VOLUME 1
0 VOLUME 2
BOOT VOLUME
ASSIGNMENTS
A:
B:
C:
D:
E:
F:
G:
H:
I:
J:
K:
L:
M:
N:
O:
P:
1-CANCEL
2-KEEP
3-CHANGE
7-HELP

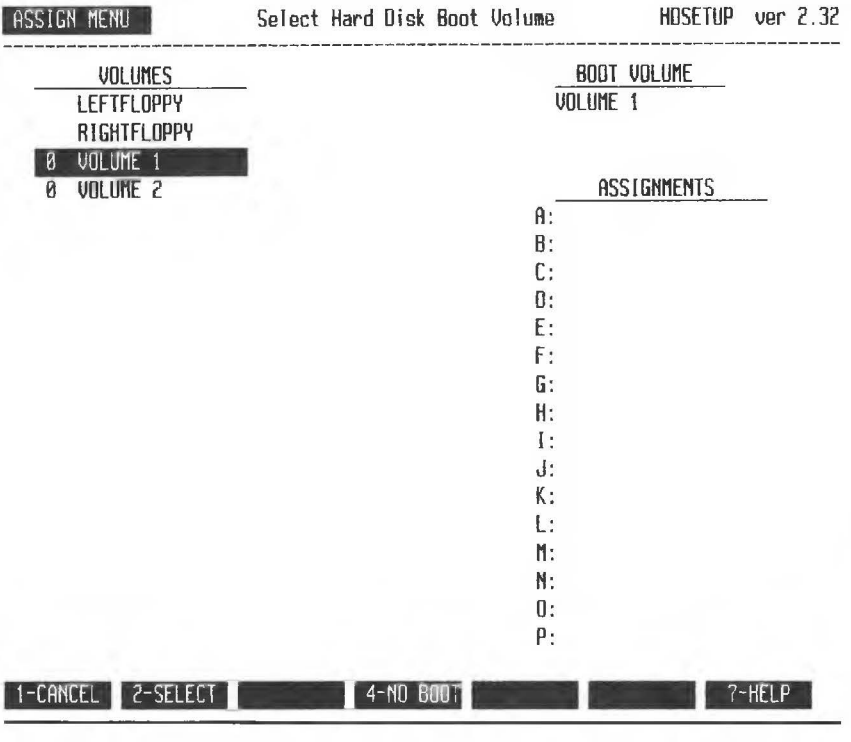
To designate a boot volume and assign drives, you perform three basic procedures, in this order:

- Decide whether to keep or change the boot volume. If no boot volume has been designated and you want to have an MS-DOS boot volume, you must elect to "change" it.
- Select the assignment(s) you want to change or delete.
- Select new volumes or drives for each assignment you want to change.

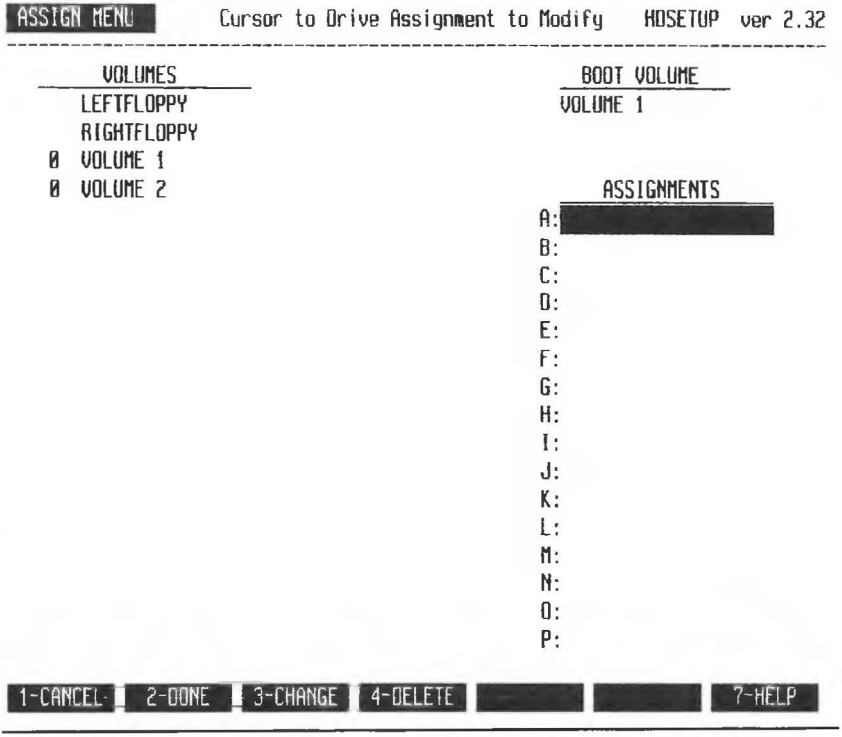
PROCEDURE FOR ASSIGN MENU TASKS 1.7.2

Start at the main Assign menu, shown in Figure 1-13. Follow these thirteen steps to designate the boot volume and assign drives:

1. The prompt line asks: Keep or Change HD Boot Volume? If you want to keep the current boot volume (for a hard disk that is already set up), press F2 (KEEP) and skip to step 5, assigning drives. To assign a new boot volume, press F3 (CHANGE).
2. A new menu line appears, and the name of the first hard disk volume in the volume list is highlighted. For a new hard disk, the same name appears under the boot volume heading at the right of the screen (Figure 1-14).



3. Use the cursor keys to highlight the volume you want to be the boot volume. You can change an existing boot volume to none by pressing F3 (CHANGE) followed by F4 (NO BOOT). If all the volumes do not fit on the screen, keep pressing the down-cursor key to reach volumes not shown.
4. Press F2 (SELECT) to log your boot volume choice.
5. The prompt line reads: Cursor to Drive Assignment to Modify. The space beside (drive) A: in the assignment list is now highlighted, and a new menu line appears (Figure 1-15).


ASSIGN MENU
Cursor to Drive Assignment to Modify
HDSETUP ver 2.32
VOLUMES
LEFTFLOPPY
RIGHTFLOPPY
0 VOLUME 1
0 VOLUME 2
BOOT VOLUME
VOLUME 1
ASSIGNMENTS
A:
B:
C:
D:
E:
F:
G:
H:
I:
J:
K:
L:
M:
N:
O:
P:
1-CANCEL
2-DONE
3-CHANGE
4-DELETE
7-HELP

To keep existing drive assignments (for a hard disk that is already set up), press F2 (DONE) to return to the Main menu.

To change an existing drive assignment:

a. Use the cursor keys to highlight the assignment you want to change.

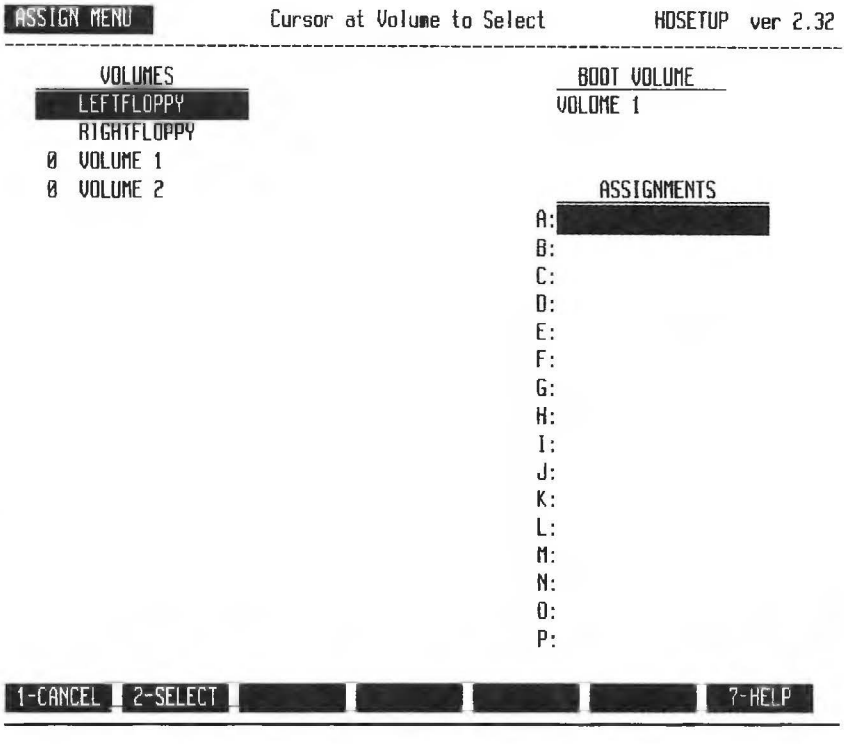
b. Press F3 (CHANGE).

c. The prompt line reads: Cursor at Volume to Select. Use the cursor keys to highlight the volume or drive in the volume list that you want to assign to the highlighted drive name in the assignment list.

d. Press F2 (SELECT).

To delete the assignment(s) following the highlighted one, press F4 (DELETE). To reassign any of the deleted assignments, move the cursor down to highlight the assignment you want to make, press F3 (CHANGE), and go to step 7.

7. Items on both the volume and assignment lists are highlighted, and a new menu line appears (Figure 1-16). The prompt line reads: Cursor at Volume to Select. In Figure 1-16, no drive assignments have been made.



8. Use the cursor keys to highlight individual names in the volumes list. As each volume or drive name is highlighted, that name appears in the assignment list at the right side of the screen.

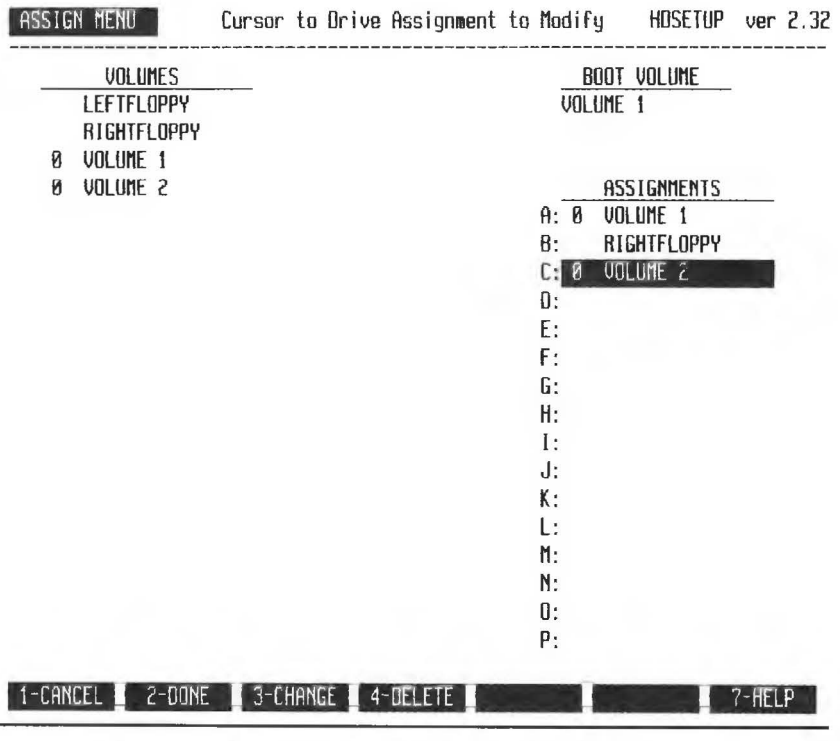
   Press F2 (SELECT) when the highlighting marks the volume or drive you want for that assignment.

9. The previous menu line appears, and only the final entry in the assignment list is highlighted. For this example, volume 1 was selected as the boot volume and assigned to drive A.

make, press F3 (CHANGE), and repeat steps 7 to 9.

11. Continue in this way until all the volumes are assigned. Be sure to assign at least one floppy drive also—RIGHTFLOPPY if your computer has an internal hard disk. Figure 1-17 shows a completed assignment list.

Figure 1-17: Assign Menu with Completed Assignment List



13. At the Main menu, you must press F2 (DONE) to write your new HDSETUP configuration and assignments to disk (or to an AUTOSET file).

RELOADING THE OPERATING SYSTEM 1.8

After using HDSETUP to create a new configuration or change drive assignments, you must reload the operating system to activate the new configuration and/or assignments.

If you initialized the hard disk, HDSETUP displays the message:

```
Insert a floppy containing a hard disk OS.
Press any key to reboot your system.
```

Remove the *Hard Disk Tool Kit* diskette if it is in the default drive, and insert a hard disk system diskette. Then press any key (or the reset button) to reload the OS.

Now your newly configured hard disk is ready to use. See Section 1.1.1 "Setting Up a New Hard Disk" for instructions on setting up a boot volume.

If your hard disk was already set up and the boot volume was not changed or deleted during this HDSETUP session, you can simply open the floppy drive door(s) and press any key to reboot from the hard disk.

HDTEST.EXE is a hard disk confidence test. Run HDTEST when you suspect hardware problems (such as damaged tracks) with your hard disk. You can also run HDTEST to check the hard disk when you first receive it. HDTEST does not affect any data stored on the hard disk.

HDTEST OPERATION 2.1

Load HDTEST by typing:

hdtest(cr)

HDTEST first identifies and reads the drive header label to see whether the drive is a valid drive type. If HDTEST cannot determine the drive type, an error message appears and the program terminates. (HDTEST error messages are given in Appendix A.)

After loading, HDTEST asks for the number of the hard disk controller in your system:

```
      HARD DISK CONFIGURATION OPTIONS
            Controller=> 0
If this is correct, press SPACE, else press any
other key
```

If your system has one hard disk (internal or external), that disk has controller 0. If your system has more than one hard disk, controller 0

HDTEST on only one hard disk at a time. You can, however, choose which disk to test first; run HDTEST with one controller, then run HDTEST with the other.

- To test an internal hard disk (controller 0), press the Space bar.
- For an external hard disk (or any controller other than 0), press any key. The screen then displays:


```
Only values 0 thru 7 are valid for Controller.
      Controller (0–7)=>
```

Type the number for your hard disk controller. Typically, the controller for an external hard disk is 1.

Now HDTEST displays its Test menu of seven options. To select an option, press one of the seven top-row function keys (F1 - F7). To choose the Exit option, press F7 while holding down the Shift key. Six of the eight menu options run hardware tests (F1 through F6). The six tests are:

- A quick or an extended electronics test.
- A quick or an extended media test.
- A quick or an extended electronics/media test.

In most cases, run F3, the quick electronics/media test, first. If more testing is needed, run the extended electronics/media test. The extended tests run continuously until you press the Space bar. Run the extended tests to locate intermittent problems.

After running tests, press F7 (unshifted) to determine if defective tracks were found during testing. If you want to see the results, you must press F7 before terminating HDTEST. If defective tracks are found, run HDFIXUP.

This section lists and describes the menu options for HDTEST.

Quick Electronics Test—F1

This test:

1. Writes data to and from the controller local memory and compares the data for discrepancies. This process is repeated for each of these interface variances in all possible combinations:
   - ▶ Block/byte data transfer (DMA or handshake).
   - ▶ CPU locked in/locked out.
   - ▶ Interrupts polled/not polled.
2. Identifies the inservice diagnostic track (reserved for diagnostic tests run by field service personnel). Repeats the test while writing data to and from the disk diagnostic track. If the diagnostic track cannot be identified, an error message appears (see Appendix A).
3. Runs internal controller diagnostics (a local RAM test and a local checksum process).
4. Runs other diagnostics, including an ECC test.

To get the results from the Quick Electronics Test (and any other tests you run), press F7.

Quick Media Test—F2

Scans one-fifth of the drive surface for defective tracks not already logged in the drive header label. The Quick Media Test makes a single pass of the drive surface. Press F7 to display the results of this test (and any other tests you run).

Quick Electronics and Media Test—F3

Automatically runs the Quick Electronics and Quick Media Tests. For results, press F7.

Runs the Quick Electronics Test plus an additional controller test. Also repeats the interface variance tests 10 times each. The entire test repeats until you press the Space bar.

Extended Media Test—F5

Does a full scan and then 1000 random reads of the media. The entire test repeats until you press the Space bar.

Extended Electronics and Media Test—F6

Runs the Extended Electronics and Media Tests until you press the Space bar.

Display New Bad Media—F7

Shows the location of any defective media found during HDTEST execution. For each defective media location, F7 shows the numbers of the cylinder, head, sector, track, and logical address. (Most hard disks have four read/write **heads**. **Sectors** on a hard disk are 512 bytes each. A **track** is made up of 17 sectors in a single band on the hard disk. A **cylinder** is a set of four tracks -- one on each side of the two platters in the hard disk, and with all four tracks in the same relative position on the platters. There are 1224 tracks and 306 cylinders on a hard disk. The **logical address** is the consecutive sector number.)

Always run F7 before terminating HDTEST. If defective media is found, run HDFIXUP.

Exit—Shifted F7

Moves the hard disk read/write heads to the innermost cylinder and ends the program.

HDFIXUP.EXE repairs media on a hard disk that has been set up with HDSETUP or AUTOSET. A hard disk contains a number of spare tracks set aside to replace tracks damaged during use. HDFIXUP searches for damaged tracks, recovers as much data as possible from them, transfers the data to the spare tracks, and reports the repairs.

CAUTION:

HDFIXUP can destroy data recorded on the hard disk. Be sure to back up your hard disk files before running HDFIXUP.

HDFIXUP OPERATION 3.1

Load HDFIXUP by typing:

hdfixup(cr)

HDFIXUP displays the warning prompt:

```
This utility will restore media errors by redirecting
them to spare tracks. You should FIRST BACKUP ALL
IMPORTANT DATA before running this utility as
unrecoverable errors may occur during the repair.

DO YOU WISH TO CONTINUE? (Y/N)
```

- To exit to MS-DOS, type N at the system prompt you can back up your hard disk files with COPY, MV, or SEARCH. Then invoke HDFIXUP again.

When HDFIXUP begins operation, the screen tells you to type ALT-S (hold-screen mode) to freeze the screen during repair reports, and control-P (ALT-P) to print the HDFIXUP output to your default printer.

HDFIXUP searches the entire hard disk for damaged tracks and inconsistencies in the disk layout. If HDFIXUP doesn't recognize the disk layout or finds nonmedia errors, it reports the problem and terminates without changing the media. Report nonmedia or disk layout problems to your service center.

After searching the hard disk, HDFIXUP compares the number of bad tracks to the number of spare tracks:

- If no errors are found, HDFIXUP reports an error-free search and terminates.
- If the hard disk has more spare tracks than bad tracks, HDFIXUP transfers the data to the spare tracks and reports the error type and location of each repair. (See Chapter 3.2.1)
- If the hard disk has more bad tracks than spare tracks, HDFIXUP gives an error message and terminates. (See Appendix A.) The media is damaged beyond acceptable limits, and should be referred to a service center.

Before updating the disk labels, HDFIXUP shows a yes/no prompt that lets you terminate without making changes to the hard disk. If you continue the program, HDFIXUP writes a new map to the disk label. MS-DOS uses this map at the next system boot.

When media repair is completed, HDFIXUP asks you to press the Space bar to reboot the system. Following a successful HDFIXUP, you do not need to restore your backup files (if you backed up your hard disk) because no data is lost.

HDFIXUP shows this message after repairing errors:

```
Data Retrieved from Logical Track XX.
```


HDFIXUP then lists the location of each error recovered or repaired:

```
Error XXXX was fully recovered at Sector:
Physical XX, Logical XX, Virtual XX in Volume XX.
```

OR:

```
Error XXXX was best repaired at Sector:
Physical XX, Logical XX, Virtual XX in Volume XX.
```

HDFIXUP then tells you:

```
Data Redirected to Logical Track XX.
```

In an HDFIXUP error report, the sector location is identified with three different numbers: physical, logical, and virtual. The logical number is assigned when the disk is formatted (defective sectors found

the volume's starting sector. The virtual number is used by the operating system in file operations.

The last number listed in error-location messages is the volume number. This number is also shown in the HDSETUP main Configure menu.

3.2.2 NONREPAIRABLE ERRORS

HDFIXUP displays one of these two messages to indicate nonrepairable errors:

```
Contact SERVICE CENTER.
Cannot repair media=> No changes made.
```

OR:

```
Contact Service Center.
Drive repair not completed.
```

An error description appears with the preceding message. Appendix A lists the errors identified by HDFIXUP.

HDFORMAT.EXE reformats the hard disk and leaves it in the same state it was when it left the factory. Run HDFORMAT on damaged hard disks that cannot be repaired with HDFIXUP. You can also run HDFORMAT on a new hard disk to correct errors that may have occurred during shipment.

CAUTION:

HDFORMAT destroys all data on the hard disk. Before reformatting a hard disk, first try to save your data with HDFIXUP. If that fails, back up your files and then run HDFORMAT. Use HDFORMAT as a last resort to replacing the hard disk.

You can run HDFORMAT only if the hard disk has a valid drive header label. In most cases, if your hard disk has a bad label, the disk will be inaccessible and unbootable, giving hard disk boot ROM error 98. Beyond the drive label, however, HDFORMAT does not test the hard disk media extensively. To verify the media, run HDTEST first.

Load HDFORMAT by typing:

```
hdformat(cr)
```

HDFORMAT first reads the drive header label and identifies the drive as a valid drive type. If the header label is unreadable or if the drive is the wrong type, HDFORMAT displays an error message and terminates.

```
WARNING !!  ALL DATA ON THE DISK WILL BE DESTROYED

      To PROCEED press 'SPACE'.
      To STOP press ANY OTHER KEY?
```

- ▶ To continue with the format, press the Space bar.
- ▶ To return to MS-DOS, press any other key.

During the format, HDFORMAT:

1. Deletes the inservice diagnostic track from the bad track list. (The inservice diagnostic track is reserved for field service tests, and is placed on the "bad list" so that data will not be written to that track.)
2. Reads the drive header label, formats and checks track 0, and writes the drive label to track 0.
3. Formats the entire disk.
4. Records newly discovered bad-track locations on the drive label.
5. Asks you to identify tracks to be permanently recorded on the defective media list:

```
Do you wish to permanently force any tracks
into the bad list (Y/N)?
```

You should answer Y and give numbers of additional bad tracks only if you know of bad tracks that are not listed in your drive label (step 2).

```
Adding a bad track for inservice diagnostics.
```

Reserving a "bad track" for diagnostics is done so that the disk will always have inservice diagnostic capabilities; it is not an error condition.

7. Logs the identified tracks in the drive header label and writes the new drive header label to the disk.
8. Displays the number of bad tracks and the percentage of tracks that are bad.
9. Moves the heads to the innermost cylinder and terminates.

If nonmedia errors are found, HDFORMAT terminates.

HDPARK

Hard disks are easily damaged by jarring or sudden power surges. The read/write heads ride close to the disk surface, and "head crashes" can occur, causing loss of data. To prevent head crashes, run HDPARK.EXE before powering off your hard disk, before moving the hard disk unit, or whenever power to the system is suspect (during storms, power outages, and so on).

HDPARK.EXE positions the read/write heads over the innermost cylinder of the hard disk. A **cylinder** is a set of tracks, each having the same position on a different surface of the hard disk. Most hard disks have four surfaces or two "platters." Therefore cylinders usually contain four tracks.

The operating system allocates tracks starting from the outermost cylinder of the drive. This cylinder (at track 0, sector 0) contains the drive label, a segment of code necessary for booting from the hard disk. The innermost cylinder, on the other hand, does not usually contain data. In fact, the inservice diagnostic track is often the last (innermost) track.

Load HDPARK by typing:

```
hdpark(cr)
```

HDPARK first identifies the drive type by reading the drive label. If no label is found, the drive is assumed to be a Tandon 502. HDPARK then calculates the highest cylinder, issues a seek, and returns to the system prompt.

HDRESTOR.EXE restores the disk label on a hard disk. The **disk label** for a hard disk is an encoded data field on track 0 that identifies the disk and its contents for the operating system.

If the disk label on your hard disk is erased or damaged, the hard disk unit may be inaccessible or unbootable. At bootup, the system may display hard disk boot error 98 (bad disk label). If all other aspects of the drive are operable, you can use HDRESTOR to restore the label.

HDRESTOR finds the system backup label (kept on the highest usable drive sector) and writes that label to track 0, sector 0 (the location of the disk label). Running HDRESTOR should not affect data on any track other than track/sector 0.

Load HDRESTOR by typing:

hdrestor(cr)

HDRESTOR first attempts to read the drive label on track 0. If HDRESTOR finds a valid label on track 0, it displays:

```
LABEL FOUND ON TRACK 0.
DO YOU WANT TO CONTINUE?? (Y/N)
```

HDRESTOR is not as particular about the label as the operating system is, so bad labels may appear good to HDRESTOR. If you type Y to continue or if HDRESTOR finds no valid label, HDRESTOR tries to find the backup label on the highest usable system sector.

Because hard disks can have different drive types, bad tracks, and diagnostic tracks, the highest sector is not known. HDRESTOR searches

is found, it is written to track 0. If no backup label is found, the program exits with an error message (see Appendix A).

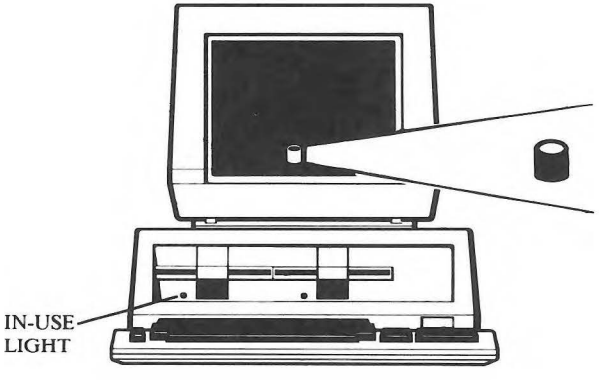
This appendix lists both hard disk boot ROM errors and error messages displayed by each of the utilities in the *Hard Disk Tool Kit*.

HARD DISK BOOT ROM ERRORS A.1

At bootup or reset, your computer's boot ROM first attempts to load the operating system from the floppy drive(s), then from the Network (if any), and finally from the hard disk. When the boot ROM tries the hard disk, the hard disk symbol or icon appears at the bottom of the screen, as shown in Figure A-1. If an error occurs during bootup from the hard disk, an X is displayed next to the hard disk symbol, along with one of the error codes listed in Table A-1.

If you get an error when booting the hard disk, make sure the designated boot volume contains a hard disk operating system. You may have to run HDSETUP (or AUTOSET) to assign a boot volume, and run SYS to copy a hard disk OS to the boot volume.

The *Hard Disk Tool Kit* diskette contains an operating system for a floppy diskette machine, but a hard disk operating system is included on the hard disk system diskette. In some error conditions you may be unable to boot the hard disk because MS-DOS retrieves drive assignments from the hard disk. In such an error situation, boot your HDTK diskette. Using a floppy-drive OS, you can run the hard disk utilities without requiring drive assignments from the hard disk.



A

Table A-1: Hard Disk Boot ROM Error Codes

ERROR CODE	MEANING
01	No index detected from disk drive.
02	No seek-complete signal from disk drive.
03	Write fault from disk drive.
04	Drive not ready after it was selected.
06	Track 00 not found.
10	ID field read error.
11	Uncorrectable data error.

14	Target sector not found.
15	Seek error (incorrect cylinder and/or track).
18	Correctable data error.
19	Bad-track flag detected.
1A	Format error.
20	Invalid command.
21	Illegal disk address.
30	RAM diagnostic failure.
31	Program memory checksum error.
32	ECC diagnostic failure.
3D	Internal error; invalid command.
3F	Time out on disk operation.
40	Internal error; bad operation.
41	Hard disk I/O error; bad region information in label.
4F	Internal error; invalid block count.
98	Bad hard disk label.
99	Label indicates no operating system on disk.

NOTE: Early boot ROMs add 80 hex to the error code (01 - 4F). For example, error 10 displays as 90, and error 4F as CF.

HDSETUP ERROR MESSAGES A.2

100 - Specified disk does not exist.

The disk you specified is not present on your system. Try specifying a disk number that is smaller than the one you entered.

101 - Cannot delete primary boot volume.

You tried to delete the boot volume. If you want to delete this volume, go to the HDSETUP Assign menu and redesignate a boot volume.

102 - Disk reading error.

Run HDTEST to check for errors. If HDTEST reports a media error, run HDFIXUP.

103 - Memory error.

HDSETUP ran out of memory while executing. You must add memory to accommodate your current volume configurations.

error, run HDFIXUP. If the problem persists, run HDFORMAT.

105 - Error writing new volume label with assignments.
Run HDTEST to check for errors. If HDTEST reports a media error, run HDFIXUP. If the problem persists, run HDFORMAT.

106 - Error writing new volume label.
Run HDTEST to check for errors. If HDTEST reports a media error, run HDFIXUP. If the problem persists, run HDFORMAT.

107 - Error writing volume label with new assignments.
Run HDTEST to check for errors. If HDTEST reports a media error, run HDFIXUP. If the problem persists, run HDFORMAT.

108 - Error writing newly freed volume label.
Run HDTEST to check for errors. If HDTEST reports a media error, run HDFIXUP. If the problem persists, run HDFORMAT.

109 - Error writing valid drive label.
Run HDTEST to check for errors. If HDTEST reports a media error, run HDFIXUP. If the problem persists, run HDFORMAT.

A

110 - Error writing drive label backup.
The hard disk is in the same state it was in before you ran HDSETUP. Run HDFORMAT if you just ran HDFIXUP and then tried to reinitialize the hard disk. HDFORMAT will set the mapping correctly.

111 - No configured volumes on disk 0.
You must create volumes on disk 0 before you can make drive assignments.

112 - Controller error. Unable to reset hard disk.
Indicates a hardware error. Make sure the power is on for all disk drives. If the power is on, run HDTEST.

113 - No hard disk drives exist.
No hard disk drives are connected to your system.

115 - The primary boot volume is invalid.

The boot volume is no longer valid. Go to the Assign menu and redesignate the boot volume.

116 - No assignments exist on the current primary boot volume.

Go to the Assign menu and assign drives for the volumes on your hard disk.

117 - One of the current drive assignments is invalid.

Go to the Assign menu to view your drive assignments. Reassign valid volumes to drives that are marked with a line of asterisks (*).

118 - The selected volume is not free. Please choose another volume to add.

You cannot add a non-free volume. Move the cursor to a free volume and try again.

119 - The selected volume is a free volume. You cannot delete it. Choose another.

Move the cursor to the non-free volume you want to delete and try again.

120 - Disk is not initialized. You cannot configure until disk is initialized.

You must initialize disk 0 before you can create volumes.

121 - The requested capacity is too large for current space availability.

You requested a capacity larger than the space available. The default capacity displayed is the current maximum.

122 - The entered number of directory entries was too large. It has been adjusted.

You requested a larger number of directory entries than is possible for the given capacity and AU size. The number has been adjusted to reflect the largest number of directory entries possible.

name.

124 - The same volume cannot be assigned twice.
Assign a different volume to the current drive letter.

125 - You must assign a floppy drive.
Go to the Assign menu and assign a floppy drive. If you have only one floppy drive, be sure to assign RIGHTFLOPPY.

126 - You must assign the primary boot volume.
Go to the Assign menu and assign the boot volume to a drive letter.

127 - The chosen capacity is too small. The minimum size is 20Kbytes.
Type another capacity that is equal to or greater than 20 Kbytes.

128 - You cannot make assignments without first choosing a boot volume.
The boot volume is invalid. Designate a valid boot volume.

130 - Bad filename. Cannot create file.
Can occur while creating an AUTOSET file. The program terminates; the hard disk is not affected. Try again using a legal file name.

131 - Error while writing data file.
Indicates a write error that can occur while creating an AUTOSET file. The program terminates; the hard disk is not affected.

132 - Cannot close data file.
Can occur while creating an AUTOSET file. The program terminates; the hard disk is not affected.

133 - Cannot create file with two hard disks present.
You cannot create a file for use with AUTOSET when more than one disk is present. Disconnect all but the first drive and try again.

running HDRESTOR. For any hard disk, run HDTEST, followed by HDFORMAT if necessary.

HDTEST ERROR MESSAGES A.3

ERROR = > CANNOT FIND DIAGNOSTIC TRACK
MUST RUN HDFORMAT IN ORDER TO RUN DIAGNOSTICS

You must reformat the disk with HDFORMAT.

ERROR = > UNABLE TO CONFIRM DRIVE LABEL.
CALL SERVICE CENTER.

Contact your service center. Report the exact error message you received.

ERROR = > DETECTED DEFECTIVE ELECTRONICS.
CALL SERVICE CENTER.

Contact your service center. Report the exact error message you received.

DETECTED THE FOLLOWING DEFECTIVE MEDIA:

Try running HDFIXUP. If HDFIXUP cannot repair the defective media, run HDFORMAT.

ERROR = > EXCESSIVE DEFECTIVE MEDIA.
CALL SERVICE CENTER.

Contact your service center. Report the exact error message you received.

A.4.1 ERROR MESSAGES FOR REPAIRABLE ERRORS

HDFIXUP reports the location of each error after repair. In the error-location messages, the sector is identified with three different numbers: physical, logical, and virtual. The logical number is assigned after the disk has been formatted (defective sectors found during formatting are excluded from the numbering scheme). The virtual number is the sector's logical number minus the logical number of the volume's starting sector. The virtual number is used by the operating system in file operations.

The volume number is also given in error-location messages. This number is shown in the HDSETUP Configure menu.

HDFIXUP shows this message after repairing errors:

```
Data Retrieved from Logical Track XX.
```

A

HDFIXUP then lists the location of each error recovered or repaired:

```
Error XXXX was fully recovered at Sector:
Physical XX, Logical XX, Virtual XX in Volume XX.
```

OR:

```
Error XXXX was best repaired at Sector:
Physical XX, Logical XX, Virtual XX in Volume XX.
```

```
Data Redirected to Logical Track XX.
```

ERROR MESSAGES FOR NONREPAIRABLE ERRORS A.4.2

HDFIXUP displays one of two basic messages to indicate nonrepairable errors:

```
Contact SERVICE CENTER.
Cannot repair media   No changes made.
```

OR:

```
Contact Service Center.
Drive repair not completed.
```

The following error descriptions can occur with the preceding messages. Be sure to report all error messages exactly when you contact your service center:

- Drive is not responding. Error *xx*
- Error is not media related.
- Read Error *xx* at Sector:
  Physical *xx*, Logical *xx*, Virtual *xx* in Volume *xx*.
- Write Error *xx* at Sector:
  Physical *xx*, Logical *xx*, Virtual *xx* in Volume *xx*.

- Bad Backup Drive Label:
- Bad Master Drive Label: Uninitialized or unknown Revision.
- Bad Master Drive Label: Null Working Media List.
- Bad Master Drive Label: Regions are not on track boundaries.
- Master Drive Label and Backup Drive Label do not match.
- Error while building New Label, System Error *x*.
- Error while building New Label, expanded beyond maximum size.
- Unrecoverable Error occurred while updating Backup Drive Label.
- Unrecoverable Error occurred while updating Master Drive Label.
- There are *xx* bad tracks and only *xx* spares available.

A.5 HDFORMAT ERROR MESSAGES

ERROR = > UNABLE TO CONFIRM DRIVE LABEL.
CALL SERVICE CENTER.

Contact your service center. Report the exact error message you received.

ERROR = > DETECTED DEFECTIVE ELECTRONICS.
CALL SERVICE CENTER.

Contact your service center. Report the exact error message you received.

DETECTED THE FOLLOWING DEFECTIVE MEDIA:

Try running HDFIXUP. If HDFIXUP cannot repair the defective media, run HDFORMAT.

ERROR = > EXCESSIVE DEFECTIVE MEDIA.
CALL SERVICE CENTER.

Contact your service center. Report the exact message you received.

ERROR = > UNABLE TO CONFIRM DRIVE LABEL. CALL SERVICE CENTER.

The drive label is invalid. Report the exact error message.

ERROR = > DETECTED DEFECTIVE ELECTRONICS CALL SERVICE CENTER.

Contact your service center. Report the exact error message.

HDRESTOR ERROR MESSAGES A.7

VALID DRIVE LABEL FOUND. DO YOU WANT TO CONTINUE. ?? (Y/N)

A drive label was found on track/sector 0 which appears to be valid. Are you sure the label is bad? If you still want to restore the backup label, answer Y. If you do not want to restore the backup label, answer N.

COULD NOT FIND BACKUP DRIVE LABEL

HDRESTOR could not find the backup drive label. The disk will probably have to be reformatted.

ERROR = > DETECTED DEFECTIVE ELECTRONICS. CALL SERVICE CENTER.

Contact your service center. Report the exact error message.

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Supplement for the 30 MB Hard Disk

This release of MS-DOS 2.11 (BIOS version 2.92) adds support for the internal 30 megabyte hard disk drive. AUTOSET.EXE (version 2.3) and SYS.EXE (version 2.15) have also been changed to support the larger capacity drives. **Do not use older versions** of these utilities on systems with 30 MB hard disk drives. Such use may result in loss of files, and could lead to unusability of the hard disk until it is reconfigured. This would result in the loss of all data on the hard disk.

Hard Disk Tool Kit II utilities HDSETUP.EXE (version 2.34) and HDFIXUP.EXE (version 2.1) have also been changed. Previous versions of these utilities **must not be used** on systems with 30 MB hard disk drives.

New configuration (.CFG) files, for use with AUTOSET.EXE on 30 MB internal hard disk systems **only**, have also been added. Brief descriptions of these new .CFG files are included on the attached pages. Note that the first character of the name is a "3".

MS-DOS 1.25 currently is not supported on the 30 MB systems.

3I6X5.CFG

Specifications					A: 0-5m (boot)
Disk	Capac	Dir	Au	Mem Req	B: Right Floppy
0	5000K	256	4K	2048b	C: 0-5m
0	5000K	256	4K	2048b	D: 0-5m
0	5000K	256	4K	2048b	E: 0-5m
0	5000K	256	4K	2048b	F: 0-5m
0	5000K	256	4K	2048b	G: 0-5m
0	5000K	256	4K	2048b	

Total Memory Requirements with double-sided floppy - 13K = 13312b

SYSTEM TYPE: INTERNAL 30 MB HARD DISK ONLY.

This configuration is for the user who wants a moderate number of fairly large separate volumes. It can be useful for running up to six similar applications on dedicated volumes.

3I3X10.CFG

Specifications					A: 0-10m (boot)
Disk	Capac	Dir	Au	Mem Req	B: Right Floppy
0	10000K	256	8K	2048b	C: 0-10m
0	10000K	256	8K	2048b	D: 0-10m
0	10000K	256	8K	2048b	

Total Memory Requirements with double-sided floppy - 7K = 7168b

SYSTEM TYPE: INTERNAL 30 MB HARD DISK ONLY.

This configuration is appropriate for the user who wants three equal but separate large regions of the hard disk. Large files are handled easily by the large capacities. Three applications can be separated between the volumes, allowing good file organization.

This release of MS-DOS 2.11 (BIOS version 2.92) adds support for the internal 30 megabyte hard disk drive. AUTOSET.EXE (version 2.3) and SYS.EXE (version 2.15) have also been changed to support the larger capacity drives. **Do not use older versions** of these utilities on systems with 30 MB hard disk drives. Such use may result in loss of files, and could lead to unusability of the hard disk until it is reconfigured. This would result in the loss of all data on the hard disk.

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New configuration (.CFG) files, for use with AUTOSET.EXE on 30 MB internal hard disk systems **only**, have also been added. Brief descriptions of these new .CFG files are included on the attached pages. Note that the first character of the name is a "3".

MS-DOS 1.25 currently is not supported on the 30 MB systems.

Specifications					A: 0-30m (boot)
Disk	Capac	Dir	Au	Mem Req	B: Right Floppy
0	30000K	384	8K	5632b	

Total Memory Requirements with double-sided floppy - 6.5K = 6656b

SYSTEM TYPE: INTERNAL 30 MB HARD DISK ONLY.

This configuration is for the user who stores files in subdirectories and wants the maximum possible available disk space. It can also be useful for dedicated systems which use only a few large files.

3I15N15.CFG

Specifications					A: 0-15m (boot)
Disk	Capac	Dir	Au	Mem Req	B: Right Floppy
0	15000K	256	8K	3072b	C: 0-15m
0	15000K	256	8K	3072b	

Total Memory Requirements with double-sided floppy - 7K = 7168b

SYSTEM TYPE: INTERNAL 30 MB HARD DISK ONLY.

This configuration is suitable for the user who wants two equal but separate regions of the hard disk. Large files are handled easily by the large capacities. Two applications can be separated between the volumes, allowing good file organization.

Specifications					A: 0-30m (boot)
Disk	Capac	Dir	Au	Mem Req	B: Right Floppy
0	3000K	128	4K	1024b	C: 0-3m
0	3000K	128	4K	1024b	D: 0-3m
0	3000K	128	4K	1024b	E: 0-3m
0	3000K	128	4K	1024b	F: 0-3m
0	3000K	128	4K	1024b	G: 0-3m
0	3000K	128	4K	1024b	H: 0-3m
0	3000K	128	4K	1024b	I: 0-3m
0	3000K	128	4K	1024b	J: 0-3m
0	3000K	128	4K	1024b	K: 0-3m
0	3000K	128	4K	1024b	

Total Memory Requirements with double-sided floppy - 11K = 11264b

SYSTEM TYPE: INTERNAL 30 MB HARD DISK ONLY.

This configuration is for the user who wants a large number of separate volumes for file organization by drive address, rather than by subdirectories.

3I6N24.CFG

Specifications					A: 0-6m (boot)
Disk	Capac	Dir	Au	Mem Req	B: Right Floppy
0	6000K	256	4K	2560b	C: 0-24m
0	24000K	384	8K	4608b	

Total Memory Requirements with double-sided floppy - 8K = 8192b

SYSTEM TYPE: INTERNAL 30 MB HARD DISK ONLY.

This configuration provides a large boot volume for programs and a very large volume for data storage. It can be useful for a single application that has large program files and very large data files.

Specifications					A: 0-5m (boot)
Disk	Capac	Dir	Au	Mem Req	B: Right Floppy
0	5000K	256	4K	2048b	C: 0-5m
0	5000K	256	4K	2048b	D: 0-5m
0	5000K	256	4K	2048b	E: 0-5m
0	5000K	256	4K	2048b	F: 0-5m
0	5000K	256	4K	2048b	G: 0-5m
0	5000K	256	4K	2048b	

Total Memory Requirements with double-sided floppy - 13K = 13312b

SYSTEM TYPE: INTERNAL 30 MB HARD DISK ONLY.

This configuration is for the user who wants a moderate number of fairly large separate volumes. It can be useful for running up to six similar applications on dedicated volumes.

3I3X10.CFG

Specifications					A: 0-10m (boot)
Disk	Capac	Dir	Au	Mem Req	B: Right Floppy
0	10000K	256	8K	2048b	C: 0-10m
0	10000K	256	8K	2048b	D: 0-10m
0	10000K	256	8K	2048b	

Total Memory Requirements with double-sided floppy - 7K = 7168b

SYSTEM TYPE: INTERNAL 30 MB HARD DISK ONLY.

This configuration is appropriate for the user who wants three equal but separate large regions of the hard disk. Large files are handled easily by the large capacities. Three applications can be separated between the volumes, allowing good file organization.