

# USING DISKSAVE

## Master Boot Record Backup Utility

### Microsoft Corporation

## Introduction

Disksave is a utility you can use to save the Master Boot Record and Partition Boot Sector as binary image files. Once these critical disk structures have been saved, they can be easily restored if they become corrupted later on.

The Master Boot Record (MBR) contains the partition table for the disk and a small amount of executable code. On x86-based computers, the executable code examines the partition table and identifies the system (or bootable) partition, finds the system partition's starting location on the disk, and loads an image of its Partition Boot Sector into memory. The MBR then transfers execution to the Boot Sector. When the MBR becomes damaged, the computer will not boot.

Typical symptoms include hanging with a black screen immediately after the machine POST routine, or messages such as "Invalid partition table" or "Missing operating system." Disksave saves the MBR of the boot drive only.

The Partition Boot Sector contains code that loads the operating system kernel or a multi-boot loader. A corrupted Boot Sector can result in STOP:0x0000007B failures during Windows NT startup. The computer may also hang prior to loading NTLDR, which displays the boot selections. Disksave saves the Partition Boot Sector of the system partition only (the partition that contains the files used to load Windows NT).

The most common problems with the MBR and Boot Sector are caused by viruses that are independent of the operating system and file system. They do their damage while the machine is booting, before the operating system is loaded.

This utility will not run under Windows NT or Windows® 95. To run it, you must first boot MS-DOS.

## Function Reference

The following functions are available:

Function key	Function	Details
F2	Back up the Master Boot Record	Saves the MBR image to the path and file name you specify. The path and file name are limited to 64 characters. The resulting file is a binary image, 512 bytes in size. The MBR is always located at Cylinder 0, Side 0, Sector 1 of the boot disk.
F3	Restore the Master Boot Record	Restores the MBR image file with the path and file name you specify. The only error checking done is to verify the file size, which must be 512 bytes. Copying an incorrect file to the MBR permanently destroys partition table information. In addition, the computer will not boot without a valid MBR.

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F4	Back up the Boot Sector	Saves the Boot Sector image to the path and file name you specify. The path and file name are limited to 64 characters. The resulting file is a binary image of the sector, and is 512 bytes in size. This function opens the partition table, searches for an active partition, then jumps to the starting location of that partition. The sector at that location is then saved under the file name entered. There are no checks to determine whether the sector is a valid boot sector.
F5	Restore the Boot Sector	Restores the Boot Sector image file. The only error checking done is to verify the file size, which must be 512 bytes. Copying an incorrect file to the Boot Sector permanently destroys Boot Sector information. In addition, the computer will not boot without a valid Boot Sector.
F6	Disable FT on the Boot Drive	This function may be useful when Windows NT cannot boot from a mirrored system drive. The function looks for the bootable partition (marked active), then checks to see if the high bit of the SystemType byte is set. Windows NT sets the high bit of the SystemType byte if the partition is a member of a fault-tolerant disk set. Disabling this bit has the same effect as breaking the mirror. There is no provision for re-enabling the bit once it has been disabled.

## Return Values

Disksave uses the `_bios_disk` function, a Microsoft® runtime library function which implements a low-level int 13 BIOS call and returns an error value in the AX register after the BIOS interrupt.

If the `_bios_disk` function call returns an error, an error message is displayed in the status bar at the bottom of the Disksave window. Expected errors generate the following messages:

- "Memory allocation failure: Press any key."
- "BIOS Call Failed: Press any key."
- "No Active Partition Found. Press any key"
- "Interrupt 13 returned %0X at line %u. Verify sector."
- "FT Bit successfully disabled. Press any key."
- "Unable to find FT Bit. Press any key."

If the error is an unexpected one, the message "BIOS call failed" is displayed along with an error code. Following is a table of these codes and their meanings.

Code	Meaning
0x00	No error
0x01	Invalid request or bad command
0x02	Address mark not found
0x03	Disk write-protected
0x04	Sector not found

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0x05	Reset failed
0x06	Floppy disk removed
0x07	Drive parameter activity failed
0x08	Direct Memory Access (DMA) overrun
0x09	DMA crossed 64 KB boundary
0x0A	Bad sector flag detected
0x0B	Bad track flag detected
0x0C	Media type not found
0x0D	Invalid number of sectors on format
0x0E	Control data access mark detected
0x0F	DMA arbitration level out of range
0x10	Data read (CRC or ECC) error
0x11	Corrected data read (ECC) error
0x20	Controller failure
0x40	Seek error
0x80	Disk timed out or failed to respond
0xAA	Drive not ready
0xBB	Undefined error
0xCC	Write fault on drive
0xE0	Status error
0xFF	Sense operation failed

**Feedback**

For questions or feedback concerning this utility, please contact [rkinput@microsoft.com](mailto:rkinput@microsoft.com).