Table 20.19 MS-DOS Technical Papers	
File Name	**Subject**
PD0456.TXT	Running MS-DOS in the High Memory Area
PD0457.TXT	HIMEM.SYS "ERROR: Unable to Control A20 Line"
PD0459.TXT	EMM386.EXE: No Expanded Memory Available
PD0460.TXT	Running Both Extended and Expanded Memory
PD0462.TXT	Mouse Doesn't Work with MS-DOS Shell
PD0463.TXT	Using the Setver Command
PD0465.TXT	Problems Formatting or Reading a Floppy Disk
PD0470.TXT	System Fails When You Are Using EMM.386
PD0471.TXT	Explanation of the WINA20.386 File
PD0473.TXT	Installing MS-DOS from Drive B
PD0474.TXT	Windows 3.0 Doesn't Run in 386 Enhanced Mode
PD0476.TXT	IBM PS/1 Fails After MS-DOS Is Installed
PD0477.TXT	Setup Stops Before Completing Upgrade to MS
PD0743.TXT	MS-DOS 6.0 Installation and Partition Q&A
PD0744.TXT	MS-DOS 6.0 General Installation Q&A
PD0745.TXT	DoubleSpace Questions and Answers
PD0746.TXT	MemMaker Questions and Answers
PD0747.TXT	MS-DOS 6.0 Configuration Q&A
PD0748.TXT	Backup and Miscellaneous Q&A
PD0771.TXT	Repartitioning Your Hard Disk To Upgrade to MS-DOS 6.0
PD0785.TXT	Upgrading DR DOS to MS-DOS 6

IBM has since released PC DOS 6.3, which has many fixes and updates. You can get a free upgrade from the IBM BBS if you have earlier versions of IBM DOS.

PS/2 BIOS Update (DASDDRVR.SYS)

The DASDDRVR.SYS (direct access storage device driver) file is a set of software patches that fixes various ROM BIOS bugs in several models of the IBM PS/2. DASDDRVR.SYS is required for specific PS/2 systems using IBM's PC DOS versions 3.30 or later, to correct several bugs in the IBM PS/2 ROM BIOS. Before IBM's PC DOS 4.00 was released, conflicting information indicated that PC DOS 4.00 would include the updates to correct the PS/2 ROM BIOS problems fixed by DASDDRVR.SYS under PC DOS 3.30. This information was not accurate, however. In fact, an IBM PS/2 system needs DASDDRVR.SYS with IBM DOS 5.00 (or any higher version of DOS) even with the most current corrective service disk (CSD) update.

The PS/2 needs the DASDDRVR.SYS fixes only in the DOS environment. Some users assume, therefore, that the PS/2 problems with DOS are DOS bugs; they are not. The DASDDRVR.SYS program is provided on the PS/2 Reference disk (included with every PS/2 system) and is available separately on a special PS/2 system update disk. The disks contain the device driver program (DASDDRVR.SYS) and an installation program.

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Troubleshooting

The PS/2 ROM BIOS bugs in the following list are fixed by DASDDRVR.SYS (the problem numbers are shown in table 20.19, and more detailed information is provided later in this section):

1. Failures occur in reading some 720K program floppy disks (Models 8530, 8550, 8560, and 8580).

2. Intermittent `Not ready` or `General failure` error messages appear (Models 8550, 8560, and 8580).

3. 3 1/2-inch floppy disk format fails when user tries to format more than one floppy disk (Models 8550, 8560, 8570, and 8580).

4. Combined 301 and 8602 error messages appear at power-on or after power interruption (Models 8550 and 8560).

5. System clock loses time, or combined 162 and 163 errors appear during system initialization (Models 8550 and 8560).

6. User is unable to install Power-On Password program with DASDDRVR.SYS installed (Models 8550, 8560, and 8580).

7. Devices attached to COM2:, COM3:, or COM4: are not detected (Model 8530).

8. Devices that use Interrupt Request level 2 (IRQ2) fail (Model 8530).

9. System performance degradation occurs from processor intensive devices (Models 8550, 8555, and 8560).

10. Error occurs in a microcode routine that enhances long-term reliability of 60/120M disk drives (Models 8550, 8555, 8570, and 8573).

11. Time and date errors occur when user resets the time or date. Intermittent date changes occur when the system is restarted by pressing Ctrl-Alt-Del (Model 8530).

If you are an IBM PS/2-system user running PC DOS 3.3 or higher and experiencing any of these problems, load the DASDDRVR.SYS file. The problems are system specific, and DASDDRVR.SYS fixes the problems for only the systems listed. IBM requires its dealers to distribute the System Update disk containing DASDDRVR.SYS to anyone who requests it. Neither the dealer nor the customer pays a fee for the System Update disk. You also can obtain copies directly from IBM by calling (800) IBM-PCTB (800-426-7282) and ordering the PS/2 System Update disk.

Check table 20.20 for detailed descriptions of each of these problems and for the specific systems affected. Models not listed for a particular problem do not need DASDDRVR.SYS, and no benefit results from installing it.

Table 20.20	DASDDRVR.SYS Version Summary		
Version	**File Size**	**Problems Fixed**	**Source**
1.10	648 bytes	1-3	DOS 3.3 Fix Disk (08/24/87)
1.20	698 bytes	1-5	Reference Disk, DOS 3.3 Fix Disk (09/09/87)
1.30	734 bytes	1-6	Reference Disk
1.56	1170 bytes	1-9	Reference Disk (03/90), System Update Disk 1.01 (part number 64F1500)
1.56	3068 bytes	1-11	Reference Disk (xx/xx), System Update Disk 1.02 (part number 04G3288)

The first three problem fixes originally were provided by the DASDDRVR.SYS version 1.10 file supplied on the first PC DOS 3.3 fix disk. Fixes for problems 4 and 5 were added in DASDDRVR.SYS version 1.20, included on all IBM PS/2 Reference disks (30-286, 50/60, and 70/80) version 1.02 or later, as well as on an updated version of the PC DOS 3.3 fix disk. The fix for problem 6 was added in DASDDRVR.SYS version 1.30, included on all 50/60 and 70/80 Reference disks version 1.03 or later. Fixes for problems 7 through 9 were added to DASDDRVR.SYS version 1.56, included on all IBM PS/2 Reference disks dated March 1990 or later. This version of DASDDRVR.SYS also was available separately, on the IBM PS/2 System Update disk version 1.01. The latest DASDDRVR.SYS (also called version 1.56, but dated January 1991) can be found on newer Reference disks or on the IBM PS/2 System Update disk version 1.02.

By using the DASDDRVR.SYS driver file, IBM can correct specific ROM BIOS problems and bugs without having to issue a new set of ROM chips for a specific system. Using this file eliminates service time or expense in fixing simple problems, but causes the inconvenience of having to load the driver. The driver does not consume memory, nor does it remain in memory (as does a typical driver or memory-resident program); it either performs functions on boot only and then terminates, or overlays existing code or tables in memory, thereby consuming no additional space. Because DASDDRVR.SYS checks the exact ROM BIOS by model, submodel, and revision, it performs functions only on those for which it is designed. If it detects a BIOS that does not need fixing, the program terminates without doing anything. You can load DASDDRVR.SYS on any system; it functions only on systems for which it is designed.

Because a system BIOS occasionally needs revising or updating, IBM used disk-based BIOS programs for most newer PS/2 systems. The Models 57, P75, 90, and 95, in fact, load the system BIOS from the hard disk every time the system is powered up, during a procedure called *initial microcode load* (IML). You can get a ROM upgrade for these systems by obtaining a new Reference disk and loading the new IML file on the hard disk. This system makes DASDDRVR.SYS or other such patches obsolete.

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Installing DASDDRVR.SYS. To install DASDDRVR.SYS, you must update the CONFIG.SYS file with the following entry and restart the system:

DEVICE=[*d:\path*]DASDDRVR.SYS

The drive and path values must match the location and name of the DASDDRVR.SYS file on your system.

Detailed Problem Descriptions. This section gives a detailed description of the problems corrected by the most current release of DASDDRVR.SYS and indicates for which systems the corrections are necessary.

1. Failures occur in reading some 720K program disks.

IBM PS/2 systems affected:

Model 30 286 8530-E01, -E21

Model 50 8550-021

Model 60 8560-041, -071

Model 80 8580-041, -071

Intermittent read failures on some 720K original application software disks. Example: `Not ready reading drive A:` appears when a user attempts to install an application program. Attempting to perform DIR or COPY commands from the floppy disk also produces the error message.

2. Intermittent `Not ready` or `General failure` error messages are displayed.

IBM PS/2 systems affected:

Model 50 8550-021

Model 60 8560-041, -071

Model 80 8580-041, -071

A very intermittent problem with a floppy disk drive `Not ready` or a fixed disk `General failure` message. This problem can be aggravated by certain programming practices that mask off (or disable) interrupts for long periods. The update ensures that interrupts are unmasked on each disk or floppy disk request.

3. A 3 1/2-inch floppy disk format fails when the user tries to format more than one disk.

IBM PS/2 systems affected:

Model 50 8550-021

Model 60 8560-041, -071

Model 70 8570-Axx (all)

Model 80 8580-Axx (all)

The DOS FORMAT command fails when a user tries to format multiple 3 1/2-inch disks. The failure appears as an `Invalid media` or `Track 0 bad—disk unusable` message when the user replies **Y**es to the prompt `Format another (Y/N)?` after the format of the first disk is complete. The error message appears when the user tries to format the second disk. If a system is booted from a floppy disk, the problem does not occur. This problem occurs only with DOS 3.3, not with later versions.

4. Combined 301 and 8602 error messages at power-on or after power interruption.

IBM PS/2 systems affected:

Model 50 8550-021

Model 60 8560-041, -071

When power is interrupted momentarily or a system is otherwise switched on and off quickly, a 301 (keyboard) and 8602 (pointing device) error message may appear during the Power On Self Test (POST). This error occurs because the system powers on before the keyboard is ready. The problem is more likely to occur if the system was reset previously by pressing Ctrl-Alt-Del.

5. System clock loses time or combined 162 and 163 errors during system initialization.

IBM PS/2 systems affected:

Model 50 8550-021

Model 60 8560-041, -071

Intermittent 162 (CMOS checksum or configuration) and 163 (clock not updating) Power-On Self Test (POST) errors occur. Various time-of-day problems on specified IBM PS/2 Model 50 systems; for example, the user turns on the machine in the morning and finds the time set to the same time the machine was turned off the day before.

6. User is unable to install Power-On Password program with DASDDRVR.SYS installed.

IBM PS/2 systems affected:

Model 50 8550-021

Model 60 8560-041, -071

Model 80 8580-041, -071

When a user tries to install the Power-On Password feature with DASDDRVR.SYS version 1.3 or earlier installed, a message appears that states (incorrectly) that a password already exists. The user also may be prompted for a password (on warm boot), even though password security has not been implemented.

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7. Devices attached to COM2:, COM3:, or COM4: are not detected.

IBM PS/2 systems affected:

Model 30 286 8530-E01, -E21

8. Devices that use Interrupt Request level 2 (IRQ2) fail.

IBM PS/2 systems affected:

Model 30 286 8530-E01, -E21

9. System performance degradation occurs from processor intensive devices.

IBM PS/2 systems affected:

Model 50 8550-021, -031, -061

Model 55 SX 8555-031, -061

Model 60 8560-041, -071

10. Error occurs in a microcode routine that enhances long-term reliability of 60/120M disk drives.

IBM PS/2 systems affected:

Model 50 8550-061

Model 55 SX 8555-061

Model 70 8570-061, -121, -A61, -A21, -B61, -B21

Model P70 8573-061, -121

11. Time and date errors occur when the user resets the time or date. Intermittent date changes occur when the system is restarted by pressing Ctrl-Alt-Del.

IBM PS/2 systems affected:

Model 30 8530 (all)

OS/2 versions 1.2 and earlier contained these BIOS fixes in the form of a .BIO file for each specific BIOS needing corrections. These files were automatically loaded by OS/2 at boot time, depending on the specific system on which it was being loaded.

OS/2 versions 1.3 and later contain the fixes directly in-line in the system files, not as separate files. When a system running one of these OS/2 versions is booted, OS/2 determines the model, submodel, and revision bytes for the particular BIOS under which it is running. Based on this information, OS/2 determines the correct .BIO file to load or the correct in-line code to run. For example, the IBM PS/2 55SX BIOS is Model F8, Submodel 0C, Revision 00, which causes IBM OS/2 version 1.2 to load the file F80C00.BIO automatically during boot-up. OS/2 versions 1.3 or later use this information to run the proper fix code contained in the system files. This procedure enables execution of only those BIOS fixes necessary for this particular system.

Any symptom described as being resolved by the DASDDRVR.SYS update may have other causes. If you install the DASDDRVR.SYS update and continue to have problems, consider the errors valid and follow normal troubleshooting procedures to find the causes.

DOS Disk and Data Recovery

The CHKDSK, RECOVER, and DEBUG commands are the DOS damaged disk recovery team. These commands are crude, and their actions sometimes are drastic, but at times they are all that is available or needed. RECOVER is best known for its function as a data recovery program, and CHKDSK usually is used for inspection of the file structure. Many users are unaware that CHKDSK can implement repairs to a damaged file structure. DE-BUG, a crude, manually controlled program, can help in the case of a disk disaster, if you know exactly what you are doing.

The CHKDSK Command. The useful and powerful DOS CHKDSK command also is generally misunderstood. To casual users, the primary function of CHKDSK seems to be providing a disk space allocation report for a given volume and a memory allocation report. CHKDSK does those things, but its primary value is in discovering, defining, and repairing problems with the DOS directory and FAT system on a disk volume. In handling data recovery problems, CHKDSK is a valuable tool, although it is crude and simplistic compared to some of the after-market utilities that perform similar functions.

The output of the CHKDSK command which runs on a typical (well maybe not typical, but from my own) hard disk is as follows:

```
Volume 4GB_SCSI    created 08-31-1994 5:05p
Volume Serial Number is 1882-18CF

2,146,631,680 bytes total disk space
      163,840 bytes in 3 hidden files
   16,220,160 bytes in 495 directories
  861,634,560 bytes in 10,355 user files
1,268,613,120 bytes available on disk

       32,768 bytes in each allocation unit
       65,510 total allocation units on disk
       38,715 available allocation units on disk

      655,360 total bytes memory
      632,736 bytes free
```

A little known CHKDSK function is reporting a specified file's (or files') level of fragmentation. CHKDSK also can produce a list of all files (including hidden and system files) on a particular volume, similar to a super DIR command. By far, the most important CHKDSK capabilities are its detection and correction of problems with the DOS file management system.

The name of the CHKDSK program is misleading: it seems to be a contraction of CHECK DISK. The program does not actually check a disk, or even the files on a disk, for integrity. CHKDSK cannot even truly show how many bad sectors are on a disk, much less locate and mark them. The real function of CHKDSK is to inspect the directories and FATs to see whether they correspond with each other or contain discrepancies. CHKDSK

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