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## MS-DOS 5 vs. DR-DOS 5 Comparison

### Introduction

This document discusses the primary differences between MS-DOS 5 and DR-DOS 5. We cover two key areas: compatibility and memory management.

### Compatibility

An independent testing lab, NSTL, tested DR-DOS in a networked environment together with 34 applications. In their report dated 28 June 1991, NSTL reported the following *incompatibilities*:

DR-DOS 5.0 was found to be incompatible with Lantastic and LanManager. Digital Research technical documents confirmed test results that DR-DOS 5 was incompatible with both of these networks.

Many applications also seem to have problems working alone or with DR-DOS on a Novell network (or on other networks). For example, NSTL (June 28, 1991 report) found the following problems:

| APPLICATION                | NOVELL 286 | NOVELL 386 | BANYAN VINES |
|----------------------------|------------|------------|--------------|
| dBASE IV with Lan Pack 1.1 | N          | N          | Y            |
| Sidekick Plus 1.01C        | N          | N          | N            |
| Software Carousel 4.0      | N          | N          | N            |
| PC-KWIK Power Pak 1.55     | N          | N          | N            |
| QDOS                       | Y          | Y          | N            |

N = Incompatible

Y = Compatible

The test results demonstrate that while DR-DOS may claim compatibility with numerous applications, when tested in a networked environment, DR-DOS suddenly cannot ensure compatibility.

#### Other compatibility issues:

Infoworld review's of DR-DOS 5 (5/27/91) states clearly that DR-DOS EMM386 driver is *incompatible* with Windows in enhanced mode. It is a major incompatibility to not support Windows in Enhanced mode. This means that any 386 Windows user who uses DOS applications under Windows (there are probably close to 3 million 386 Windows users and a large number use DOS applications) can only take advantage of Upper Memory with MS-DOS 5.

#### Why does MS-DOS include the Setver command and how does it differ from DR-DOS?

- o We implemented the Setver command for two reasons: the first is that we support larger partitions than DR-DOS and so we must report a version number greater than 3.31. The second is that we avoid incompatibilities with programs or networks that are version bound to MS-DOS 3.x or 4.x.
- o DR-DOS 5 must report DOS 3.31 because of their implementation of large disk support. DR-DOS 5 supports disk partitions up to 512MB. However, MS-DOS 4.01 and 5.0 support partitions of up to 2 gigabytes. Disk utility programs are aware of how MS-DOS 4.01 and 5.0 supports greater than 512MB partitions. If DR-DOS, with its 512MB limit, reports version 5.0 then these disk utility programs would not function correctly.

#### DOS Debug Utility

- o DR-DOS 5 does not have the DOS Debug utility. Even if a user attempted to use an older version of Debug it won't run under DR-DOS because of the differences in versions.

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## Memory Management

When evaluating free memory it is important that we evaluate free memory from 0-1MB as opposed to 0-640K. Now that a user can load TSRs and device drivers into Upper Memory, this area becomes important when comparing total available free memory on 286, 386 and higher systems. For clarity refer to the following memory table:

|                               |   |  |
|-------------------------------|---|--|
| Conventional Memory<br>0-640K | Upper Memory - contains<br>upper memory blocks (UMBs)<br>- the area between 640K and<br>1MB | Extended Memory - the first<br>64K is called the High Memory<br>Area (HMA) |
|-------------------------------|---|--|

MS-DOS 5 has a much smaller memory footprint on 386, 286 and 8086/8088 systems. Specifically on a 386, MS-DOS 5 delivers around 50K more memory under 1MB for users to load their device drivers, TSRs and network drivers. This is true even when DR-DOS 5 occupies the High Memory Area (HMA).

On a 286 under the same conditions, MS-DOS 5 provides more room for DOS applications and drivers because it has a conventional memory footprint that is about 30K less than DR-DOS 5.

MS-DOS 5 also provides better memory management with Windows 3.0. It supports loading drivers in Upper Memory in Windows 386 Enhanced Mode. DR-DOS does not. In addition, MS-DOS 5 provides much more conventional memory for Windows users or users of third party memory managers because in both of these cases DR-DOS 5 forces users to load HIMEM.SYS, DR-DOS memory manager, to load DR-DOS in the HMA. Consequently, users lose almost half of the 38K benefit of loading DR-DOS in the HMA. MS-DOS 5 does not have this limitation.

### MS-DOS 5/DR-DOS 5 Memory Handling

In a recent review of MS-DOS 5 by Infoworld, the writer, Brett Glass, states that an operating system which has great memory handling is the one that "provides the most free memory under 1 megabyte that DOS leaves for DOS applications."

On a 386 system, DR-DOS must load part of its kernel in the UMB area (even when it is also loaded in the HMA), not that MS-DOS 5 can't. DR-DOS loads their EMS drivers, Command.Com and buffers into upper memory, the same area where free memory blocks reside for loading TSRs, device drivers and network drivers. Because it loads these items into upper memory, DR-DOS occupies more available upper memory than our product. In MS-DOS 5, we load our XMS drivers, Command.Com and buffers into space above 1MB.

This means that DR-DOS takes up significantly more memory under 1 megabyte than MS-DOS 5. In fact, on most 386s MS-DOS 5 will provide 50K more memory for the user to load device drivers, TSRs and network drivers in Upper memory than DR-DOS. The DOS memory footprint on three 386/486 machines is summarized on the next page:

Memory Usage between 0-1MB on a 386/486s:

|          | IBM PS/2<br>70 | Compaq Deskpro<br>386/20e | HP Vectra 486 |
|----------|----------------|---------------------------|---------------|
| DR-DOS 5 | 71.6K          | 71.4K                     | 78.5K         |

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|          |       |       |       |
|----------|-------|-------|-------|
| MS-DOS 5 | 26.7K | 26.7K | 26.7K |
|----------|-------|-------|-------|

Configuration - Buffers = 30, Files = 30, Loadrive = g, EMM386 loaded, DR DOS 5 and MS-DOS 5 loaded into the HMA

We believe MS-DOS 5 clearly provides superior memory handling on a 386.

**MS-DOS 5 / DR DOS 5 286 Memory Handling**

DRJ claims superior memory handling on a 286 because the DR DOS memory manager supports the creation of an Upper Memory Area (UMBA) on the 286 Neat and Leap chip sets. While this is an advantage on some of these machines, it is an advantage only on a very small number of 286 machines overall (as no analyst tracks the marketshare of this chip set among the 286 sales, we called a Chips and Technologies product manager who told us the Neat and Leap sets have around a 10% worldwide marketshare).

On almost all the other 90% of 286 machines (the ones that have 1 megabyte of RAM), MS-DOS 5 has a conventional footprint approximately 30K smaller than DR DOS. This is because without upper memory blocks, DR DOS is forced to load much of its kernel or services into conventional memory. In addition, DR DOS' XMS driver takes up more conventional memory on 286s (around 17K). The MS-DOS 5 XMS driver loads into the HMA, leaving just over 1Kb of conventional memory used. This is a substantial difference.

Three 286 PCs and their memory footprint with each product are summarized below:

|          | Vectra ES/12 | Olivetti M290 | Compaq Deskpro 286 |
|----------|--------------|---------------|--------------------|
| DR DOS 5 | 49.9K        | 50.0K         | 49.9K              |
| MS-DOS 5 | 18.6K        | 18.6K         | 18.6K              |

Configuration - Buffers = 30, Files = 30, Loadrive = g, EMM386 loaded, DR DOS 5 and MS-DOS 5 loaded into the HMA.

Note: When doing these memory comparisons on 286s we seemed to have discovered a bug in the DR DOS "Mem" command. DR DOS reports 14K more free than there actually is. All these numbers have been adjusted to compensate.

Given these facts, we believe MS-DOS 5 memory management is superior on a 286 as well.

**Memory Handling on 8088/8086s**

To complete the memory analysis we compared DR DOS 5 and MS-DOS 5 on 8088s.

|          | ATT PC 6300<br>(8086 system) | Eagle<br>Portable<br>(8088 system) | Leading Edge model<br>D (8088 system) | IBM XT |
|----------|------------------------------|------------------------------------|---------------------------------------|--------|
| DR DOS 5 | **                           | **                                 | 77K                                   | 77K    |
| MS-DOS 5 | 70K                          | 70K                                | 68K                                   | 68K    |

\*\* Would not boot - received error "cannot load file"

We believe MS-DOS 5 memory management is superior (because MS-DOS 5 is smaller) on a 8088/86 as well.

**Memory Handling with Windows**

In addition to MS-DOS 5's superiority handling memory on a 286 and 386, we handle memory management with Windows better as well. As explained in depth in the Compatibility section, MS-

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DOS 5 supports loading drivers into Upper Memory, even in conjunction with Windows 386 Enhanced Mode. DR DOS 5 does not.

In addition, to run with Windows, DR DOS requires that its memory drivers (HIDOS.SYS and HIMEM.SYS) be loaded. This is less efficient because HIDOS takes up a lot of memory (about 31K). Therefore the user must load 31K low to save 38K by loading DR DOS high. Net Gain - only 7K. It is also worth noting that, again unlike MS-DOS 5, DR DOS 5 users must also load HIDOS when using third party memory managers like QEMM or 386 to the Max. The net effect is the same, users end up loading 31K low to get 38K of DR DOS 5 high.

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