DR DOS 5.0 Competitive Analysis

Marketing Overview

DRI announced the next version of DR DOS, version 5.0, on 4/26 in the U.K. for mid-June, 1990 delivery to OEMs. This is a very significant release. It addresses many of the compatibility problems that plagued earlier DR DOS releases while also introducing several important new features. Based on input from OEMs who have been briefed by DRI, DRI is particularly focusing on the laptop/notebook OEM market with this release. They will be positioning DR DOS 5.0 against the current Microsoft offerings, and will be attempting to exploit their 2-3 month time to market advantage over MS-DOS 5.0. They are telling OEMs that Microsoft has no on-going commitment to MS-DOS, and are hoping to get some quick OEM design wins before MS-DOS 5.0 becomes generally available.

DRI has also indicated that they have plans to market in the U.S. a packaged version of DR DOS 5.0 through retailers as a general purpose DOS upgrade product. However, at this point they have discussed this product with only a couple of large resellers in the U.S., and have given no indication to resellers that such a product will be available soon. So the retail upgrade market appears to be of lesser importance to DRI.

Product Overview

The following are the major features of DR DOS 5.0:

* **Compatibility.** DRI claims that they have solved the compatibility problems that they had with earlier DR DOS releases. They now are claiming compatibility with MS Net and LAN Manager based redirectors (3 COM, IBM PC LAN, etc.), MS CD ROM Extensions and Windows/386 v2.03 and v2.11. DRI is also assuring OEMs that DR DOS 5.0 works fine with Windows 3.0.

* **Memory Management.** DR DOS 5.0 provides the capability to run the DR DOS kernel and BIOS from either the High Memory Area (HMA) or expanded memory, which reduces the resident size of DR DOS in low memory to 20K. DR DOS 5.0 also includes an expanded memory manager with the ability to load drivers and TSR's high for 386/486 machines, and for 286 systems which use the Chips & Technologies NEAT chip set (which supports LIM 4.0 in hardware).

* **Shell.** DR DOS 5.0 now includes a graphical, CUA compliant shell ("Navigator"). Navigator appears to provide the same level of functionality as the MS-DOS 4.0 shell, with some additional desktop applications like clock and calculator included as well. Navigator has a file view capability, equivalent to what we provide in the MS-DOS 4.0 shell. Navigator does not support "native view" (the ability to view a file as it appears when running the application, a la Lotus Magellan and Norton Commander).

* **Utilities.** Like the previous version of DR DOS (3.41), DR DOS 5.0 includes a command line edit and recall utility, and a full screen text editor. DR DOS 5.0 also now includes built-in help screens for all commands (whereas 3.41 included help text for only a few commands). Another major new utility introduced in this release is a file transfer program ("FileLink"). FileLink provides basic file transfer capability between 2 PCs (typically a laptop and desktop) at speeds up to 115K baud using a serial connection. The only other new utility in DR DOS 5.0 is file find, which provides the

ability to recursively search all directories and subdirectories for files that match user-supplied search criteria.

✗ ROM Execution. The kernel and DOS BIOS modules of DR DOS 5.0 are both ROM executable. command.com and the DR DOS utilities are not ROM executable, but can be stored in ROM for execution in RAM. The total ROM space occupied by the DR DOS 5.0 kernel, BIOS and command.com is about 96K (the same as DR DOS 3.41). With the DR DOS kernel and BIOS executing from ROM, total low memory used by DR DOS is about 20K.

✗ Power Management. DR DOS 5.0 includes a power management utility known as "BatteryMAX". BatteryMAX is an external utility that appears to monitor DOS idles and includes an algorithm for determining when the system is actually idle. This seems to be the only functionality that BatteryMAX provides. DRI provides BatteryMAX in source form, and it is up to the OEM to provide the additional pieces (ROM BIOS, device drivers and the necessary interfaces) that would complement BatteryMAX to reduce overall system power consumption.

✗ Localization. DRI claims to offer the following localized versions of DR DOS 5.0: French, German, Spanish, Italian, Swedish, Portugese, Japanese "and many other language versions".

✗ Availability. June, 1990.

MS-DOS 5.0 vs. DR DOS 5.0

Assuming that all of DRI's claims about DR DOS 5.0 are true, it appears that the two releases are fairly comparable, but on balance MS-DOS 5.0 is a little stronger[1]. For the laptop/notebook OEMs (DRI's primary target), MS offers a more complete power management implementation, and a smaller DOS in both ROM and RAM space required. The only edge that DR DOS 5.0 currently has for these OEMs is the file transfer utility, which we hope to be able to address with a late addition to the DOS 5.0 product. A complete feature comparison of MS-DOS 5.0 vs. DR DOS 5.0 is attached.

The major areas in which MS-DOS 5.0 seems to be better than DR DOS 5.0 are:

✗ Power Management. MS-DOS 5.0 takes a broader, system-wide approach to power management than does DR DOS 5.0. We provide a system "power monitor" that provides similar functionality to DRI's BatteryMAX, but we also go well beyond that. The MS-DOS power monitor will have the capability of halting or even slowing down the CPU, in a way that is compatible with power saving chip sets such as Intel's unannounced 386SX chipset code-named "Genesis". MS-DOS 5.0 will also define a device driver interface that would allow the MS-DOS power monitor to shut down system peripherals via power-aware device drivers. It will also define an API for applications that wish to become power aware to take advantage of, and explicit user commands for suspend and shutdown.

Microsoft's system-wide approach to power management is superior to DRI's, and we should emphasize this as a key differentiator to laptop/notebook OEMs. Our approach better reduces the total OEM effort required to implement system-wide power management, and best insures that the OEM can take full advantage of future hardware platforms such as Intel Genesis.

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[1] This was the opinion of two U.S. OEMs who had been briefed by both Microsoft and DRI (AST and Tandon)

$\times$ **ROM Economy.** The MS-DOS 5.0 ROM Implementation occupies about 70K of ROM space - 26K less than DR DOS 5.0 in ROM. This is a cost of goods issue for the OEM. Some OEMs may find that, with MS-DOS (assuming that they may have applications, utilities, etc. in ROM as well as DOS and the ROM BIOS), the 26K ROM space savings allows them to fit everything into two 64 K ROM chips - whereas with DR DOS they might have to ship a third 64K ROM. For price sensitive laptop/notebook OEMs, which appears to be DRI's primary target, this could be a real issue.

$\times$ **RAM Economy.** Both ROM and disk-based Implementations of MS-DOS 5.0 take up less low memory than the equivalent DR DOS 5.0 implementations. Because MS-DOS allows command.com to execute from the High Memory Area (disk based) or ROM (ROM based), it takes up about 5 K less of low memory than DR DOS.

$\times$ **QuickBASIC Interpreter (QBI).** Microsoft will bundle the QBI with MS-DOS 5.0, while DRI offers no BASIC at all. QBI is essentially the Microsoft QuickBASIC product that retails for $99 U.S., minus the compiler. It provides a modern, structured programming environment and will be perceived by many users as significant value added to DOS.[2]

$\times$ **Media Support.** MS-DOS 5.0 supports disk partitions up to 2 GB, while DR DOS supports a maximum partition size of 512 MB. MS-DOS 5.0 will also include support for 2.88 MB 3.5 inch media, while DR DOS 5.0 will not.

$\times$ **Localization.** We plan to localize MS-DOS 5.0 in more languages: Chinese, Korean, Dutch and Swedish, in addition to the languages that DR DOS 5.0 supports.

DR DOS 5.0 appears to be stronger than MS-DOS 5.0 in these areas:

$\times$ **Implementation Flexibility.** Disk-based DR DOS 5.0 can be implemented in either the High Memory Area or expanded memory, while MS-DOS 5.0 cannot be implemented in expanded memory. DR DOS is also more modular than MS-DOS, in that the OEM can load the kernel only high, while keeping the DOS BIOS low (true for both the disk and ROM implementations).

"Load High". The ability to load TSRs, device drivers, etc. high provides a nice benefit. DRI claims that the entire Novell redirector, for example, can be loaded high, which in combination with running DR DOS in the HMA or EMS can significantly increase the amount of low memory available to applications. However, this is mainly useful to those OEMs who offer 386 based systems, and even for these OEMs there are issues which reduce its appeal. For many 386 systems, particularly EISA or MCA machines, much of the area between 640K and 1 MB (which is where the load high feature relocates TSRs and drivers) is already being used, and so there may not be available space to load something like the Novell redirector into.

$\times$ **File Transfer Utility.** This is a nice value-added feature for laptop PC users. It is not clear how functional this utility is, however. If it provides comparable functionality to Traveling Software's LapLink, then it will have strong appeal to laptop/notebook OEMs (as many of these OEMs today license LapLink, or something comparable).

Password Protection. This was a standard feature of previous DR DOS releases as well. So far there has not been any widespread OEM or end user enthusiasm for this feature.

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[2] 1988 Griggs Anderson Attitude and Awareness study indicates that 25% of PC users had done some programming in BASIC in the preceding year.

Competitive Response to DR DOS 5.0

On the PR side, we have begun an "aggressive leak" campaign for MS-DOS 5.0. The goal is to build anticipation for MS-DOS 5.0, and diffuse potential excitement/momentum from the DR DOS 5.0 announcement. At this point, we are telling the press that a major new release from Microsoft is coming this year which will provide significant memory relief and other important features. This was picked up by the major weeklies in the U.S. and was the page 1 story in PC Week on 4/30 (see attached articles).

On the product side, we are looking at adding 2 additional utilities to MS-DOS 5.0: a file transfer program, and an undelete utility. We are looking at acquiring a file transfer, and we have already done some work on the undelete which could possibly still be included in MS-DOS 5.0. The file transfer utility is important in that it would eliminate the only real advantage that DRI might have for laptop/notebook OEMs. Undelete would be an important addition, as it would give us a significant new utility that DRI does not offer. We will make a final decision on whether or not to include these utilities in DOS 5.0 within 2 weeks.

In addition to all of the above, we have for the past several weeks been implementing a competitive response plan (which was put into effect when we first learned of DRI's plans for this new release). The purpose of the plan was to get the MS-DOS 5.0 message out quickly to OEMs worldwide, and to resellers in the U.S. Attached is a summary of this plan and its current status.

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Feature Comparison: MS-DOS 5.0 vs. DR DOS 5.0

FEATURE	MS-DOS 5.0	DR DOS 5.0
Load DOS into High Memory Area (HMA)	Yes	Yes
Low memory used by DOS[1]	15K	20K
ROM executable	Yes	Yes
ROM space occupied	70K	96K
Low memory used when DOS is in ROM	15K	20K
DOS power monitor	Yes	Yes
System-wide power management	Yes	No
Graphical shell	Yes	Yes
Command line edit and recall	Yes	Yes
Command macro facility	Yes	No
Full screen editor	Yes	Yes
QuickBASIC Interpreter	Yes	No
On-line help for DOS commands	Yes	Yes
Safe format and unformat	Yes	No
Disk cache software included	Yes	Yes
Maximum disk partition size	2 GB	512 MB
Support for 2.88 MB floppy media	Yes	No
Support for more than 2 hard drives	Yes	No
Load TSRs, drivers high	No	Yes
File transfer utility	No[2]	Yes
OEM availability	late August, 1990	mid June, 1990

[1] Assuming DOS is loaded in HMA

[2] Not currently in MS-DOS 5.0 plan but may be a late addition