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Microsoft Corporation

Final Report

DR-DOS v6.0

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Table of Contents

1. Executive Summary ..... 1

2. Introduction ..... 2

3. Test Methodology ..... 2

    3.1 Part I - Software Application Testing ..... 2

        3.1.1 System Configurations ..... 2

        3.1.2 Phase I - Stand-Alone Software Application Testing ..... 2

        3.1.3 Phase II - Network Operating System Software Application Testing ..... 3

        3.1.4 Phase III - Lan Workstation Testing ..... 3

    3.2 Part 2 - DR-DOS Features/Functions Testing ..... 3

        3.2.1 Phase I - Install, PC-Kwik, Undelete, Unformat, and Uninstall ..... 3

            3.2.1.1 System Configurations ..... 3

        3.2.2 Phase II - SuperStor Data Compression Testing ..... 4

            3.2.2.1 System Configurations ..... 4

        3.2.3 Phase III - Task Swapper Testing ..... 4

            3.2.3.1 System Configurations ..... 5

        3.2.4 Phase IV - MSCDEX Compatibility Testing ..... 5

            3.2.4.1 System Configurations ..... 5

        3.2.5 Phase V - Read-Writable Optical Disks ..... 5

            3.2.5.1 System Configurations ..... 5

4. Proposal Changes ..... 5

5. Test Status Classification ..... 6

6. Regression Testing ..... 6

7. Test Results ..... 6

    7.1 Part I - Software Application Testing ..... 6

    7.2 Part II - DR-DOS Features Testing ..... 7

        7.2.1 Phase I - Installation and Related Features Testing ..... 7

        7.2.2 Phase II - SuperStor Testing ..... 7

        7.2.3 Phase III - TaskMax Task Swapper Testing ..... 7

        7.2.4 Phase IV - MSCDEX Testing ..... 7

        7.2.5 Phase V - Read/Writable Optical Disk Testing ..... 7

Appendix A ..... 9

Appendix B ..... 21

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## 1. Executive Summary

Microsoft Corporation contracted with XXCAL Testing Laboratories to perform a series of compatibility tests upon Digital Research's operating system DR-DOS 6.0. The intention of this test was to uncover any anomalies that the DR-DOS 6.0 operating system might have with a variety of third party software applications, peripheral devices and local area network hardware and software on several platforms utilizing the Intel 80286, 80386-DX and 80386-SX processors during both normal and stress operations. Testing was designed to find errors and inconsistencies with DR-DOS 6.0 in comparison with MS-DOS 5.0. The goal of testing was to determine the functionality and compatibility of the DR-DOS 6.0 operating system with an assortment of hardware and software packages designed for use with the MS and PC-DOS line of operating systems.

Testing was split into two parts, each with a series of distinct phases.

Part I focused on software application testing and was split into three phases. Phase I consisted of testing 50 software applications on three 80386 based platforms in stand-alone configurations under DR-DOS 6.0. Phase II consisted of testing 36 applications under four network operating systems. Phase III verified basic functionality of three test platforms running DR-DOS 6.0 in workstation configurations for three network operating systems.

Part II stressed various features of DR-DOS 6.0 and was split into five phases. Phase I testing focussed on several features of DR-DOS 6.0 such as Install, Uninstall, Undelete and Unformat. Phase II focused on DR-DOS' SuperStor data compression utility. Phase III testing determined the functionality of TaskMax, the DR-DOS 6.0 task swapper. Phase IV tested the Microsoft CD-ROM Extension software and two CD-ROM readers for compatibility with DR-DOS 6.0. Phase V testing was designed to check the functionality and compatibility of the Iomega LaserSafe and Microdesign International Read-Writable Optical disks.

Throughout the course of testing several errors were discovered. Of these errors the majority were attributable to incompatibilities between Super PC-Kwik, a disk caching module of DR-DOS 6.0, and several third party software applications. Other errors were attributable to incompatibilities between modules and features of DR-DOS 6.0, such as SuperStor and various software applications.

## 2. Introduction

This document is XXCAL Testing Laboratories' Final Report on XXCAL's testing of Digital Research's DR-DOS 6.0 operating system for Microsoft Corporation. This report summarizes XXCAL's execution and results of a compatibility test suite agreed on by Microsoft Corporation and XXCAL Inc. XXCAL executed these tests from October 10th, 1991 through November 11th, 1991 in XXCAL's Laboratories in Los Angeles, California. These test suites were summarized in the test plan, which is described in detail in Section 4. Test Methodology. XXCAL's goal was to provide quality product testing to Microsoft Corporation. Testing was intended to identify bugs, inconsistencies, and functionality errors related to the operation of the Digital Research DR-DOS 6.0 operating system with various third party software applications, peripherals and LAN software items. 'Compatibility' is defined as correct operation with the various software applications and hardware devices tested. These test plan objectives were conducted and accomplished. Information regarding these problems was delivered to the client in a clear, concise and timely manner. XXCAL was also responsible to the client's requests and ideas that changed the scope of work in the original proposal.

## 3. Test Methodology

### 3.1 Part 1 - Software Application Testing

Utilizing three 386 based platforms, as detailed below in section 3.1.1 System Configuration, a total of 38 software applications were tested once each within phase I. During phase II, 36 software applications were tested once each per LAN operating system. In Phase III each platform was configured as a workstation for the following networks: Lantastic v1.02, LAN Manager v2.0, and Novell Netware 286 and tested for basic functionality. DR-DOS 6.0 was installed for each platform onto a non-formatted drive.

#### 3.1.1 System Configurations

The following test platforms were employed during testing of Part 1:

- IBM PS/2 Model 55sx
- IBM PS/2 Model 70
- Compaq 386sx/20

Each of these platforms had a minimum of 2Mb of memory. Default DR-DOS 6.0 system files AUTOEXEC.BAT and CONFIG.SYS were used throughout testing of part 1 with the following exceptions:

- DR-DOS was loaded into the High Memory Area and supporting Upper Memory Blocks whenever possible.
- Super PC-Kwik was loaded into Upper Memory Blocks, caching into Extended memory, and enabled for use under Windows whenever possible.
- SuperStor compression was active and enabled using the default settings.
- Network files were loaded into Upper Memory Blocks when possible using HIDEVICE or HILOAD.
- Network files included with DR-DOS for Novell were used.

#### 3.1.2 Phase I - Stand-Alone Software Application Testing

Phase I consisted of verifying the compatibility and functionality of DR-DOS 6.0 with 50 third party software applications upon three platforms in stand-alone configurations. As noted previously, default configuration files were employed with the appropriate modifications listed in 3.1.1 System Configurations made.

### 3.1.3 Phase II - Network Operating System Software Application Testing

The purpose of Phase II was to ascertain the compatibility and functionality of the DR-DOS 6.0 operating system with several third party software applications under the following network environments: Novell Netware 386 3.11, IBM PC-LAN Program, Novell Netware Lite, and IBM DOS Lan Requestor. A total of 36 software applications were tested on each network. When possible network drivers were loaded into Upper Memory Blocks using the HIDEVICE and HILOAD commands. Default configuration files were used with the above modifications listed in 3.1.1 System Configurations made.

### 3.1.4 Phase III - Lan Workstation Testing

Phase III was designed to test the basic functionality of each test platform running DR-DOS 6.0 in a workstation configuration under the following networks: Lantastic v3.02, Novell Netware 286 v2.2, and LAN Manager v2.0. Default configuration files were used with the above modifications listed in 3.1.1 System Configurations made.

## 3.2 Part 2 - DR-DOS Features/Functions Testing

Employing a combination of 286 and 386 based platforms various features of DR-DOS 6.0 were tested for basic functionality. Each set of features was broken down into 4 distinct phases. Phase I focused on Installation, Uninstallation, the use of PC-Kwik, Uninstall and Unformat. Phase II focused on the SuperStor data compression utility. Phase III was used to test the functionality of the TaskMAX task swapper of DR-DOS 6.0. Phase IV determined the compatibility of DR-DOS 6.0 with the MSCDEX CD-ROM software and Phase V checked for compatibility of Read/Writable Optical disks.

### 3.2.1 Phase I - Install, PC-Kwik, Undelete, Unformat, and Uninstall

The purpose of Phase I was to determine the functionality of the Install, Uninstall, Undelete, Unformat and PC-Kwik functions of DR-DOS 6.0 on a set of 286 systems. Using 6 80286 based platforms DR-DOS 6.0 was installed as an upgrade over a pre-existing DOS version, as listed below in 3.2.1.1 System Configurations. Installation was interrupted during critical stages (writing to disk, modifying files, etc.) with power cycles. The hard disk was then checked for corruption.

In addition to this a test suite consisting of several applications was tested for no more than 8 hours on each platform in a test designed to simulate actual working conditions. The applications used in this test were: Lotus 123 v2.2, WordPerfect v5.1, Windows v3.0, Excel v3.0, and the PC Labs Benchmarks program. Normal and stress operations were used with each application during which the Undelete and Unformat utilities were used intermittently. After this testing, DR-DOS was Uninstalled and the system was checked for missing or changed files.

The Undelete function was used unaided, as well as with Delwatch and Diskmap activated. Unformat was performed on both floppy diskettes and hard disks. Testing included the Bernoulli Box and Hardcard 80 (see below 3.2.1.1 System Configurations).

#### 3.2.1.1 System Configurations

The following systems were used for testing of Phase I:

- IBM PC/AT with PC-DOS 3.3. Disk Manager was used to give a partition greater than 32Mb.
- IBM PS/2 Model 30/286 with PC-DOS 4.0.

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November 13, 1991

- IBM PS/2 Model 50z with DR-DOS 5.0.
- Compaq Deskpro 286 with Compaq DOS 3.31 and a Plus Hardcard 80 with one partition greater than 32Mb as drive D:.
- AST Premium 286 with MS-DOS 3.3 and a Bernoulli Box configured for one partition set as drive D:.
- NEC APC IV PowerMate I 286 with PC-DOS 5.0.

Each of these platforms had a minimum of 2Mb of memory and used disk partitions larger than 32Mb except in the case of the AST 286 as MS-DOS 3.3 does not support this. Default AUTOEXEC.BAT and CONFIG.SYS files were used with the modifications noted in 3.1.1 System Configurations and with a modification in the CONFIG.SYS that allowed DR-DOS to load into the HMA.

### 3.2.2 Phase II - SuperStor Data Compression Testing

This test verified the basic functionality of the DR-DOS 6.0 data compression utility, SuperStor on three 286 and three 386 based platforms. Each system had the hard drive from 50% to 75% full. CHKDSK was run in order to verify size of drive and available disk space. DR-DOS 6.0 was installed as an upgrade from a pre-existing DOS version as outlined in 3.2.2.1 System Configurations. SuperStor was installed via Setup, after which the hard drives were compressed with the SSTOR program. Lotus 123 v2.2, WordPerfect v5.4, and Excel v3.0 were run in order to verify that data was still accessible from the compressed drive.

#### 3.2.2.1 System Configurations

The following systems were used during testing of Phase II.

- IBM PS/2 Model 55sx with PC-DOS 3.3. Disk Manager was used to create a disk partition greater than 32Mb.
- IBM PS/2 Model 70 with PC-DOS 4.0
- Compaq Deskpro 386s/20 with PC-DOS 5.0
- IBM PS/2 Model 50z with PC-DOS 3.3. Speedstor was used to create a partition greater than 32Mb.
- Compaq Deskpro 286 with Compaq DOS 4.01
- NEC APC IV PowerMate I 286 with IBM DOS 5.0

Each of these platforms had a minimum of 2Mb of memory and used disk partitions larger than 32Mb. Default AUTOEXEC.BAT and CONFIG.SYS files were used with the modifications noted in 3.1.1 System Configurations and with a modification in the CONFIG.SYS files of the 286 based platforms that allowed DR-DOS to load into the HMA.

### 3.2.3 Phase III - Task Swapper Testing

This test was designed to verify the functionality of The DR-DOS Task Swapper, TaskMAX. A single IBM PS/2 Model 55sx platform was used for this test. The following applications were loaded under the Task Swapper and swapped among to verify functionality: Paradox v3.5, AutoCAD 386, ViewMAX, Microsoft Word v5.5 and WordPerfect v5.1. Word v5.5 and WordPerfect v5.1 were configured so as to have some data stored in EMS memory.

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### 3.2.3.1 System Configurations

- IBM PS/2 Model 55sx

Installation of DR-DOS to the Model 55sx was performed onto a clean system. Default CONFIG.SYS and AUTOEXEC.BAT files were used with the modifications noted in 3.1.1 System Configuration. In addition the EMM386.SYS driver was loaded in order to provide an EMS page frame and a Microsoft Serial Mouse was installed with the drivers loaded into UMBs. TaskMAX was configured to swap into EMS memory.

### 3.2.4 Phase IV - MSCDEX Compatibility Testing

This phase of testing was designed to evaluate compatibility of the MSCDEX CD-ROM software v2.2 with DR-DOS 6.0. This was performed by running the NEC CDR-36 and Sony CDU-6101 CD-ROMS under DR-DOS 6.0 on a Compaq 386sx/20. The Computer Select line of CD-ROM software was employed to verify correct functionality of MSCDEX under DR-DOS 6.0.

#### 3.2.4.1 System Configurations

- Compaq Deskpro 386sx/20

Installation of DR-DOS to the Compaq Deskpro 386sx/20 was performed on a clean system. Default CONFIG.SYS and AUTOEXEC.BAT files were used with the modifications noted in 3.1.1 System Configuration. MSCDEX v2.2 was loaded into UMBs.

### 3.2.5 Phase V - Read-Writable Optical Disks

This phase of testing was designed to evaluate compatibility of the Iomega LaserSafe and Microdesign International Read-Writable Optical disks with DR-DOS 6.0. This was performed by running these hardware peripherals under DR-DOS 6.0 on the Compaq 386sx/20.

#### 3.2.5.1 System Configurations

- Compaq Deskpro 386sx/20

Installation of DR-DOS to the Compaq Deskpro 386sx/20 was performed on a clean system. Default CONFIG.SYS and AUTOEXEC.BAT files were used with the modifications noted in 3.1.1 System Configuration.

## 4. Proposal Changes

Several changes were made to the original proposal during the course of testing. These changes are:

1. The IBM PS/1 was replaced with the NEC APC IV PowerMate I 286.
2. The Northgate 286 was replaced with the AST Premium 286.
2. GeoWorks and Disk Manager were dropped from all network testing.
3. The Amdek and Hitachi CD-ROM readers were dropped and replaced with the Iomega LaserSafe and Microdesign International Read/Writable Optical disks.
4. Compaq DOS 4.01 was used in place of Compaq DOS 5.0 during Part II Phase I testing.
5. Testing of the HardCard 80 was performed upon the Compaq Deskpro 286 instead of the IBM PS/2 Model 50z.
6. Twelve stand-alone software applications were added to the list of applications to be tested bringing the number to 50.