LEOPARD
Engineering Specification

Notice? Version to Kerk.

Version 1.02
18 December 1989

Draft

John Constant
Digital Research (EDC)

C0048950

MS-CCP-MDL 5010580

MS-CCPMDL 000005010580

Table of Contents

MS-CCP-MDL 5010581

Overview

This document summarises all the enhancements and changes that are to be made to the current release of DR DOS (version 3.41) during the next development, code named *LEOPARD*.

In many cases full details of functional changes can be found in the corresponding Engineering, Documentation or Marketing specification. All reference documents are listed in the final section of this specification as well as in the text.

Document History

Throughout this document paragraphs that have been changed since the previous version of this document are marked in the left hand margin with a "Change Bar". This paragraph is always marked with a change bar as an example.

V1.00 29/Nov/89 - Initial Limited Release
V1.01 11/Dec/89 - Internal Engineering Release
V1.02 15/Dec/89 - Engineering Time Scales Complete

Design Goals

Design decisions for elements of the *LEOPARD* kernel will be made based of the following prioritised design goals. For the purposes of this document the kernel is regarded as the

    BIOS (DRBIOS.SYS)
    Basic Disk Operating System (DRBDOS.SYS)
    Command Interpreter (COMMAND.COM)

MS DOS Compatibility

Compatibility with MS DOS 3.31 as shipped by COMPAQ is the primary goal of this development. All external data structures and code interfaces will mimic the action of 3.31. This means in some cases that functional improvements cannot be made to the system in order to retain compatibility.

Run Time Size

The run time size of the operating system has a fundamental affect on the compatibility of the system. Many of todays major applications are extremely sensitive to the available TPA (Transient Program Area) especially when network software is loaded Our goal is to increase the TPA available to applications over that provided by DR DOS 3.41. Despite the considerable increase in code and data size caused by the enhanced network support.

Performance

The performance goal for this release of DR DOS is to get within 10% of the times achieved by a similarly configured copy of COMPAQ MS DOS 3.31

Obviously different benchmarks will highlight differences in architecture (8080/Small Model), algorithms, functionality and coding between the two products. These differences will not be allowed to significantly degrade the performance of DR DOS as compared to MS DOS for the following industry standard benchmarks.

?? Do I really mean this !!!!
?? Are these benchmarks appropriate

    PC LABS Benchmarks
    BYTE Benchmarks
    PC Tech Journal Benchmarks

Product Generation and Translation

With this release of DR DOS it is our intention that an OEM or translator only requires Borlands Turbo C Professional in addition to the tools supplied by Digital Research in order to complete any system modification or enhancement.

?? Goals for other parts of the system.

MS-CCP-MDL 5010583

MS-CCPMDL 000005010583

Functional Enhancements

Microsoft MS-NET Support

In order to run the MS NET redirector DR DOS must support the following structures and interfaces:-

1) The operating system kernel must interrogate the network extension using the multiplex interrupt INT2F. The order, parameters and conventions used by this interface must be determined by inspection.

2) As well as trapping some multiplex functions the network also uses this interface to call support functions provided by the OS. These functions vary in complexity from case conversion to critical error generation. Again no specifications exists and the parameters and functions must be determined by inspection.

3) The network extension also make extensive use of internal DOS data structures. These include "standard" structures like the DOS Handles and absolute offsets hard coded into the network for various versions of DOS.

In order to run the MS NET server DR DOS must support the following structures and interfaces:-

1) The operating system kernel must support more of the INT21/5D sub-functions which allow the machine and session ID to be specified for file functions. Normally a Machine and Session ID of zero is assumed. These values are used to close files for a remote machine that has been reset or disconnected.

Testing/Validation

These modifications will be tested by the EDC against the following versions of the IBM PC Lan program on Token Ring hardware.

- PC Lan Version 1.1 or 1.2 depending on which version has the largest installed base.
- PC Lan Version 1.3 which is the current release version of the product.

At least one other commonly available implementation of MS NET will be tested Possibilities include:-

- Aronet based implementation of MS NET using OS/2 server. This product is already available at the EDC.
- 3 Com version of MS NET.

At least one network system will be validated by external test facility.

Documentation

MS NET has a minimal effect on the user documentation. Although some new utilities ie JOIN will be added a as result of this development.

In the *DR DOS Systems and Programmers Guide* the DOS network functions, INT21/5E and INT21/5F will be included. NOTE These functions are only supported by the network extension and not by DR DOS itself.

MS-CCP-MDL 5010584

MS-CCPMDL 000005010584

Support for other DOS Networks

Support for Non MS NET networks will be enhanced by the *LEOPARD* release of DR DOS. This work falls into two separate categories.

1) Networks like Novell Netware and Banyan Vines which work on the current release of DR DOS will be subjected to rigorous regression testing. To ensure no loss of compatibly because of the kernel changes made to support MS NET.

2) The following networks will be targeted by engineers at the EDC and investigated in the following priority order.

Powerlan
Network OS
Lantastic
D-Link
DNA

No indication of success can be made until at least a week has been spent investigating each individual product.

Amstrad/CORVUS Network

This networking product will *NOT* be supported by the *LEOPARD* release of DR DOS CORVUS do not support the 3.31 release of MS DOS which is the version we are compatible with. Changing DR DOS to work with the current CORVUS networking products would severely affect our DOS compatibility.

Testing/Validation

The overhead for network testing is severe in both man power and machines. Even the most cursory examination of a networked system will take 1 to 2 man weeks using 2/3 machines.

In order to maximise the effectiveness of the *LEOPARD* development the testing will carried out by EDC Q/A, an outside test house and network vendors themselves.

Support for CD ROMs (Microsoft's MSCDEX)

In the DOS environment CD ROM's are support by the MSCDEX operating system extension. This software is supplied by Microsoft to drive manufacturers who ship this with an MSCDEX specific device driver customised for their drive and controller.

MSCDEX uses the "MultiPlex Interrupt", (INT 2Fh) to interface to the operating system. Using this interface MSCDEX can intercept all DOS file functions at a very high level. These calls are translated into CD ROM read requests which the device drive executes.

The current released versions of MSCDEX, 1.1x and 1.2x, support the "ISO 9660" and the "High Sierra Group" (HSG) CD ROM disk formats. In addition it defines the device driver interface for audio control of the CD ROM drive.

The next release of MSCDEX, currently being beta tested, will support CD ROM/XA. This enhanced CD ROM standard supports the interleaving of audio and digital data. Using a CD ROM drive and the XA audio chip set applications can simultaneously control the output of stereo sound and digital data.

Testing/Validation

Versions of MSCDEX will be tested with applications using both HSG and ISO 9660 format CD ROMs. The Expanded memory and MS-NET server support added to the latest version MSCDEX will also be tested.

    MSCDEX V1.01 HSG format ONLY.
    MSCDEX V2.00 as V1.01 plus ISO9660 Format.
    MSCDEX V2.1b as V2.00 plus Expanded Memory and Network Server
    Support.

Testing of the CD ROM/XA versions of MSCDEX will be carried out by one of the targeted *LEOPARD* beta sites.

Documentation

No documentation issues are envisaged because of CD ROM support.

MS-CCP-MDL 5010586

MS-CCPMDL 000005010586

New and Enhanced Utilities

Filelist support

Currently only the XCOPY program support the Filelist concept, where an ASCII text file contains a free format list of filenames which are to be copied. This concept is to be extended to the following utiltes

ATTRIB.EXE
FIND.EXE
PASSWORD.EXE
REPLACE.EXE
TOUCH.EXE
XDEL.EXE

?? AH to provide complete list of utilities.

As a result of this enhancement these utilties will allow multiple filespecs on the same command line. This means that a utility can be invoked once where currently two separate commands would be required. Therefore "ATTRIB -R *.COM" and "ATTRIB -R *.EXE" can be replaced by "ATTRIB -R *.COM *.EXE" with the *LEOPARD* version of the utilties.

Command Line Options

In the current release of DR DOS white space, TABs or SPACE characters, must appear between the filespec and any options. This restriction will be removed by *LEOPARD* so both the following command lines will be valid:-

ATTRIB -R FRED /S
ATTRIB -R FRED/S

In addition the restrictions on the order of the file specifications and options will be relaxed. This means that the following commands will both be valid:-

ATTRIB -R CHARLES
ATTRIB CHARLES -R

Documentation

For clarity all documentation examples will include white space between the filespec and any options. If the users omits this the command will still function correctly.

Disk Cache Software

Hard Disk Cache program implementing a write through disk cache with track read ahead. This implementation will take advantage of all types of memory available in the PC. The user can specify the type and amount of memory used using command line switches.

MS-CCP-MDL 5010587

MS-CCPMDL 000005010587

/H - Help
/S - Buffer size in KiloBytes
/X - Use eXpanded Memory for Buffers
/E - Use Extended Memory for Buffers
/t - /t:d Disable caching on drive d:

CACHE.EXE can be loaded as a TSR from the command line or as a device driver from CONFIG.SYS. It then intercepts all INT13s to support caching on all hard disk drives. NOTE Only devices using the INT13 ROM BIOS interface with drive numbers greater than 80h will be supported by CACHE.EXE.

Cache status is reported when the cache program is loaded and detects that the cache driver is present. The program then displays the percentage of the cache buffer in use and the hit rate.

Test/Validation

Compatibility of the DR DOS cache program with removable media ie Bernoulli drives and Tandon DataPacs.

DOS 4.0 Compatible MEM Command

The functionality of a PC DOS 4.xx compatible MEM command will be incorporated into the memory display utility provided with the LEOPARD High Memory support See "DOS Extender and High Memory Support".

INSTALL

INSTALL will now present the user with a menu to select the size of the default configuration. The three options SMALL, MEDIUM and LARGE will change the defaults used by the INSTALL program for different environments.

- SMALL Maximum TPA with Minimum functionality, for networked environments.
- MEDIUM Optimum mix of TPA size and functionality for general purpose computing.
- LARGE Maximum functionality with smaller TPA

Enhanced CHKDSK

CHKDSK will be enhanced to report the available and total amounts on Expanded and Extended memory. This gives CHKDSK the same level functionality as the PC DOS 4.xx program.

EXE2BIN

EXE2BIN converts a .EXE format file which contains information about the initial stack, execution address and relocation data for a program into a pure binary image. It is required to generate the DR DOS BIOS file DRBIOS.SYS. This utility will be included on the utilities disk and documented in the *DR DOS Users Guide*.

SID86.EXE

SID86.EXE will be modified to support the features used by hard disk controllers during a low level format.

- Support for DEBUG's G=XXXX, rYYY syntax.

MS-CCP-MDL 5010588

MS-CCPMDL 000005010588

- Generate a debug environment compatible with MS DOS DEBUG. Including initial memory allocation and register contents.

NOTE Only these limited changes will be made to SID86. Therefore SID86's command interface will *NOT* be DEBUG compatible.

MS-CCP-MDL 5010589

DR DOS Desktop

For *LEOPARD* the standard GEM Desktop is being enhanced and integrated into the DR DOS product. The following features, listed in priority order, will be added to the Desktop:-

Keyboard only operation.

This means that all aspects of the Desktop can be controlled from the keyboard. This will be achieved using CUA compatible keyboard short codes and not by simulating the mouse with the cursor keys.

The following standard short codes will be supported.

Backtab	Activates previous window or selects previous dialogue field
TAB	Activates next window or selects next dialogue field
Down arrow	Moves to object below current one
Up arrow	Moves to object above current one
Left arrow	Moves to object to the left of current one
Right arrow	Moves to object to the right of current one
Page up/down	Scrolls current window down/up 1 window full
Home/End	Scrolls current window to start/end of data
Enter	Opens current object or submits dialogue for processing
Spacebar	Highlight the current object or field. (make default)
Alt or F10	Activate the menu bar
Alt+F4	Close the active window
Alt+Letter	Select menu title or item
F1	Help system

In addition every menu item will be accessible by a series of translatable ALT key sequences. For instance the Rename option in the File menu will be activated by ALT-F then ALT-R key sequence. ALT-F will drop the File menu and ALT-R will select the Rename option.

DR DOS Password Support

The Desktop will be enhanced in two ways to support the DR DOS password protection system.

First the user will be able to set and change a file or directories password using a standard menu entry.

Second password errors will be detected by the Desktop. A dialogue box will be displayed allowing the user to correct the password and continue the operation.

Directory Tree Display

A new option to display the sub-directory structure of a drive is being added to the desktop. The output will be similar in format to DR DOS TREE command when the /G option is used. Double Clicking on an entry in the display will change the default sub-directory for the active window.

C0048960

MS-CCP-MDL 5010590

MS-CCPMDL 000005010590

Show File Menu Option

This menu option is the equivalent of the COMMAND.COM TYPE command. When a text file is selected this option will cause a new window to be created on the DESKTOP. This window will display the first *PAGE* of the selected text file. Using the window scroll bars, manipulated by the keyboard or mouse, the user can move through the document.

Screen Driver Font (CodePage 850)

The SYSTEM and 8*8 fonts in the screen device driver currently use the GEM codepage. In the *LEOPARD* release this will be updated to standard IBM codepage 850. This means that all characters above 80 hexadecimal contained in filenames and text files can be displayed.

Miscellaneous

Various other minor enhancements are planned these include:-

- Stripped down Accessories
- Country dependent date display

Installation

The DR DOS install program will copy all the DESKTOP files to the destination sub-directory. The screen driver is then configured for the correct mouse type. All the current GEM mouse pointing devices will be supported.

?? Confirm with JL that the DESKTOP will use \DRDOS

INSTALL will only copy and configure the DESKTOP if the disk is supplied by OEM Otherwise the user is not prompted either for the disk or for any configuation information.

<u>DOS Extender and High Memory Support</u>

Terms and Acronyms

Expanded Memory

Expanded Memory is usually configured to appear as a series of 16Kb memory pages which can be mapped into a contiguous 64Kb window in high memory. The physical implementation of this memory mapping system is normally hidden from an application by a device driver which implements the LIM interface.

Extended Memory

Extended memory refers to all memory above 1Mb.

High Memory

This region of memory lies between the video display adaptor and ROM BIOS For Monochrome and CGA Video adaptors memory between 640Kb (Segment A000h) and the video display adaptor (Segment B000h or B800h) is regarded as High Memory.

LIM

Lotus Intel and Microsoft defined a set of expanded memory control functions accessed by INT67. These functions allow an application to allocate, map and deallocate expanded memory in a hardware independent manner. Three major versions of the specification are used:-

    LIM Version 3.0 sponsored by Lotus Intel & Microsoft
    LIM Version 3.2 sponsored by AST InterQuadRam ???
    LIM Version 4.0 sponsored by Lotus Intel & Microsoft

VCPI

The Pharlap Virtual Control Program Interface defines the extensions to the INT67 (LIM) interface that are required to transfer control of the processor between an application and operating system extension. This transfer of control is required when an OS extension and an application which to use the protected mode of a 386 or 486 processor.

XVCPI

The Intel sponsored eXtended Virtual Control Program Interface extends the VCPI specification to preserve the normal OS application relationship. This means the OS retains control of the processor, hardware emulation, scheduling etc. This superior specification is required by multi-tasking environments and for non-PC architectures however it has NO application support.

XMS

eXtended Memory Specification this Microsoft specification defines a protocol to control access to the 64Kb of memory beginning at 1Mb in 286, 386 and 486 based personal computers.

C0048962

MS-CCP-MDL 5010592

MS-CCPMDL 000005010592

General

A new **HIDEVICE** statement will be supported by CONFIG.SYS which will allow any device driver to be loaded high in memory. This feature will only be effective after a device driver supporting High Memory has been loaded.

A similar **HILOAD** command will be added to the command processor which will force TSR's or applications to be loaded into High Memory. Again this feature is only active after a device driver supporting High Memory has been loaded.

For Intel 80286 based Personal Computers

The new HIMEM.SYS will support the Microsoft XMS specification and optionally relocate the BDOS into Extended memory.

- Microsoft XMS Support
- Relocation of the BDOS (@ 40Kb) to Extended Memory.

For Intel 80386 and 80486 based Personal Computers

The EMM386.SYS device driver will be extended to add the following functionality to all 386 and 486 processors:-

- LIM 4.0 Support with a 64Kb window and 16Kb Pages (Optional).
- Microsoft XMS Support
- Pharlap VCPI Support (NO XVCPI Support)
- High Memory will be appended to the standard TPA for application and device driver execution.
- Relocation of the BDOS (@ 40Kb) to High or Extended Memory.

LIM 4.0 support is optional, if no 64Kb window exists in High Memory or this feature is not required. All other features of the device driver are still fully functional when LIM is disabled.

Support Microsoft's XMS and Pharlap's VCPI may be mutually exclusive at run time. Further investigation of VCPI applications is required.

COMPAQ 386 Personal Computers

All COMPAQ 386 systems allow 64Kb of 32 bit RAM to be mapped into the segment E000h. The COMPAQ ROM Bios copies the video adaptor's BIOS into this region to improve the performance of the display. However at least 40Kb is left unused, this is large enough to copy the DR DOS kernel to segment E000h.

For Personal Computers using the NEAT Chip Set

A new EMMNEAT.SYS device driver will be written to add the following functionality to the Chips and Technologies NEAT chip set:-

- High Memory will be appended to the standard TPA for application and device driver execution.
- Relocation of the BDOS (@ 40Kb) to High Memory. When relocated the BDOS code will be write protected.

The following Chips and Technologies parts will be supported:-

- ?? Obtain Part Numbers and Documentation from UK distributor.

C0048963

MS-CCP-MDL 5010593

MS-CCPMDL 000005010593

For IBM PS/2 XMA Compatible memory cards

The EMMXMA.SYS device driver will be extended to add the following functionality to ALL the IBM XMA PS/2 Memory cards:-

- LIM 4.0 Support with a 64Kb window and 16Kb Pages (Optional).
- Microsoft XMS Support
- High Memory will be appended to the standard TPA for application and device driver execution.
- Relocation of the BDOS (@ 40Kb) to Extended or High Memory.
- Support for IBM 2Mb and 0 - 8Mb XMA Memory Cards

The following IBM PS/2 memory cards are supported:-

- 2Mb Memory Expansion Opt. for PS/2 Model 50/60 (Part No. 6451001, POS ID. FEFE)
- 2Mb Memory Expanded Memory Adaptor for PS/2 Model 50/60 (Part No. 1497252, POS ID. F7FE)
- 0/8Mb Memory Expanded Memory Adaptor for PS/2 Model 50/60 (Part No. 1497259, POS ID. ?? F7FE)

MEM Utility

The MEM utility will display detailed information about the location of memory in the system and how it is being used. The size and location of the following memory types will be displayed:-

Standard Memory (0 to 640Kb)
Expanded Memory.
Extended Memory.
High Memory.

By adding a new field to the DOS Memory Descriptor the process that owns the Standard or High memory will also be displayed.

INSTALL Utility

The INSTALL utility must support the installation and configuration of the appropriate drivers.

The high memory options of EMM386.SYS will be disabled by default as in Concurrent DOS. This ensures the maximum degree of compatibility. The user will be prompted to modify these defaults at a later stage with the SETUP program

MS-CCP-MDL 5010594

MS-CCPMDL 000005010594

Laptop Enhancements

The following enhancements are intended to make DR DOS more attractive to the Laptop OEM. They take advantage of technologies applicable to that market.

Dynamic Idle Detection

This feature will detect an application which is *IDLE*, waiting for an external event. The event could be a keystroke or a time delay. When this is detected the kernel will call a hardware specific device driver. The driver will qualify the information based on its knowledge of the environment and then switch the system into a low power state. This condition will be terminated by a keystroke or after a fixed period of time has elapsed.

COMMAND.COM supports the new command "IDLE = [ON|OFF]" which allows the user enable or disable IDLE detection at the command line.

A new INT21 function has been introduced in *LEOPARD* which allows application to request the system to enter a "Power Saving" mode for a fixed period of time or till a particular event occurs. This removes the overhead of *IDLE Detection* from the operating system while this application is running.

INTEL FLASH Memory Support

In the LAPTOP environment FLASH memory can be used in two ways.

FLASH "ROMS"

In new LAPTOP designs FLASH memory can be used in place of the standard ROM or EPROM devices. This means that system software, ROM BIOS and/or Operating System, can be updated under program control.

A configurable version of the ROMDISK program would allow the OEM to write a program to update a FLASH based system with little programming effort.

FLASH disks

No support for Read/Write FLASH disks will be provided with the *LEOPARD* product because no standard disk format exists. The current Microsoft proposal, announced to the PCMCIA standards committee, is only suitable for small FLASH media. FLASH memory will be supported for ROMDISKs (See Enhanced ROMDISK Support).

Cursor Control Utility

The CURSOR utility allows the user to specify the shape and blinking rate of his cursor. This overcomes the problems with the persistence on a laptop system which makes a flashing underline cursor difficult to locate.

There is no hardware support for changing the cursors blink rate. Therefore the CURSOR utility must simulate a blinking cursor by turning a non blinking cursor on and off at the selected rate.

File Transfer Program

The File Transfer Program (FTP) will copy selected files between two DOS based personal computers using a 3 wire serial link. The following features are included:-

MS-CCP-MDL 5010595

MS-CCPMDL 000005010595

- 16 or 32 bit Error-Detecting/Correcting serial protocol which can synchronise the data transfer without using any hardware control lines.
- Filenames, Attributes and Time/Date stamps are maintained.
- Path and ambiguous file specification supported
- All standard COM? ports supported.
- Support for all baud rates from 300 to 38400. Use of the higher transfer rates may be limited by the hardware of the machine or performance differences of the source and target.
- Self installation across the serial link. Once the physical serial link has been established FTP will give the user simple instructions so that program can be installed on the remote machine using the serial link.

Command Examples

FTP /I /DCOM1:9600
Install FTP on remote system using COM1 at a 9600 baud. The initial stages of the installation may take place at much slow transfers speed to cater for the largest possible difference is system speed.

FTP /R /DCOM1:9600
Set the default port and baud rate

FTP SEND \DOC*.TXT
Transfer all .TXT files to the remote system using the default port and baud rate.

FTP /DCOM4:38400 RECEIVE \DATA
Receive all files transmitted by the remote machine using COM4 at 38400 and place all files in the \DATA sub-directory.

Command Options.

/H	. . . . . Standard DR DOS utility help screen
/I	. . . . . . Self Install
/R	. . . . . Remember current configuration
/DCOMn:r	. . Set Serial Port and Baud Rate
/M	. . . . . Only send modified files

Enhanced ROMDISK Support

The following features are being added to the existing ROMDISK system
- Sub-directory support
- Compatibility with DOS disk maintenance utilities (Norton Utilities and PC Tools)
- User configurable file attributes
- Simplified status information
- Binary and INTEL HEX format output files
- Direct programming FLASH devices

Embedded System Support

Configurable Generic BIOS Initialisation

Two of the generic BIOS initialisation modules can optionally be linked to the DRBIOS.SYS file.

- GENERCFG.OBJ - Process' the CONFIG.SYS file. If the target system has a static configuration where no loadable device drivers are required this module can be omitted.
- BDOSLDR.OBJ - In a ROM based implementation where the file DRBDOS.SYS is already present in memory this module can be omitted

This feature allows a smaller BIOS file to be generated for embedded systems where the full flexibility provided for the PC environment is not required.

PC Compatible BIOS

The existing PC compatible BIOS will be enhanced to support *ROM Execution*. Executing the BIOS code from ROM will increase the available TPA by approximately 3 to 6Kb. However some loss in compatibility is possible with applications that have an intimate knowledge of the BIOS ie Microsoft Windows 386.

The BIOS will be identical to the standard retail product. ROM Execution will be enabled by parameters passed in registers to the BIOS from the bootstrap loader. In a normal floppy or hard disk boot this feature will be disabled.

Testing/Validation

The ROM executable BIOS will be tested on an Award DOS card

Skeleton BIOS

A Skeleton BIOS with all hardware specific code removed will be supplied as a sample for non clone machines. All areas of the BIOS source which require modification will be extensively commented.

The skeleton has been designed so the OEM only has to implement the initialisation code and a console driver to have a *WORKING* system. This *VERY* primitive system can then be enhanced a device at a time until the implementation is complete.

The Skeleton BIOS will be supplied a single disk and documentation supplement to the OEM kit.

Testing/Validation

A sample implementation has been carried out on a NEC Single Board Computer (SBC). When the *LEOPARD* development has been completed a more commonly available SBC will be used as a demonstration system.

Documentation

A supplement describing the options available to an OEM when implementing DR DOS in different environments. The following topics will be discussed:-

PC and Non PC Systems
ROM and Disk based implementations
Use of optional BIOS Modules
Embedded Applications

C0048968

MS-CCP-MDL 5010598

MS-CCPMDL 000005010598

Enhanced Password Protection

Password Protection of Disks

New partition types will be supported by FDISK which are compatible with the existing but only recognised by *LEOPARD* and future releases of Concurrent DOS. This will prevent an unauthorised user booting MS DOS on the machine to circumnavigate the password protection system.

Disk Logon

Disk Logon passwords cannot be supported for the following reasons

- DOS compatibility would be reduced because the media would have to be accessed when selected. This would effect utilities like Norton's FORMAT/SAVE and disk cache programs.
- The kernel would be unable to display a prompt because the video display would be in an unknown state.

No echo of Passwords

The existing "filespec;*" syntax will be extended to all utilities and the command processor. When the asterisk is encountered in a command line the user will be prompted with a message, including the filespec. The user will then be expected to enter the correct password which will **NOT** be echoed or entered in the command line history. ie

    TYPE C:\JOHN\PRIVATE;*
    Enter password for C:\JOHN\PRIVATE ?

Full Screen Password Entry

Only the EDITOR could logically be enhanced to use a full screen prompt for a valid password. All other utilities have been designed to work in a Teletype environment and therefore cannot prompt for a password in this manner. Therefore utilities will continue to prompt for the correct password in the current manner.

Encryption of File and Directory Entries

Under Investigation

Supervisor Password

Under Investigation

Get/Set Encrypted Password

The Change File Mode function (CHMOD or INT21/43) will be further enhanced to support GETTING and SETTING a files encrypted password. This means that COPY and XCOPY transfer the existing password and attributes when files are copied.

Generic Double Byte Character support.

The kernel and all utilities will be updated to support Double Byte Characters generically. This is achieved using the DBCS Table contained in the COUNTRY SYS file. This table specifies the valid *LEAD IN* bytes used by any double byte character. Therefore the kernel and utilities can detect the start of a DBC and process the following byte appropriately.

LCAL language support

C0048970

MS-CCP-MDL 5010600

MS-CCPMDL 000005010600

Test/Validation

Internal QA

To Be Completed

External Certification

LEOPARD will be submitted to an independent external test facility for the following reasons:-

- Certification of the *LEOPARD* release against the Top 50 applications.
- Certification against a standard implementation of MS NET, either 3 Com or IBM PC LAN.
- Independent regression test.

Testing will done using *LEOPARD* Beta 2 and be completed within 1 month.

Beta Program

LEOPARD will have a 12 week Beta cycle with TWO Beta releases. This gives Beta sites time to respond and the EDC time to fix the problems before the next Beta is released.

The ENGLISH version will be used throughout the development cycle and will be the only language variant used in the *LEOPARD* Beta cycle.

Beta I - 5 February 1990

The following major features will be available with the first Beta release:-

- Both SERVER and REQUESTER variants of MS NET will be supported
- MicroSoft CD ROM Extensions (MSCDEX).
- GEM Desktop with enhanced keyboard operation.
- Enhanced EMM386.SYS (VCPI may not be available till Beta II)
- Dynamic Idle Detection
- ROM Executable PC BIOS
- First draft of the new *DR DOS Users Guide* .

Beta II - 19 March 1990 (Provisional)

C0048971

MS-CCP-MDL 5010601

Documentation Overview

Documentation Content

The DR DOS documentation set is being reviewed as part of the *LEOPARD* project. At present it consists of:

- **The DR DOS User Guide**
- **The DR DOS Reference Guide**
- **The DR DOS Code Page User Guide**
- **The DR DOS Quick Reference Card**
- **The DR DOS System and Programmers Guide**

NOTE Currently the User and Reference Guide are bound together.

As part of the *LEOPARD* project the User and Reference Guide will be combined into one complete "user" manual. This single manual will be updated and restructured, making it easier to use for people new to DR DOS or PC operating systems in general as well a more advanced users.

The Code Page User Guide will no longer be a separate booklet but will become a chapter in the new User Guide.

The DR DOS Quick Reference Card will be revised to incorporate new information from the *LEOPARD* release.

The DR DOS System and Programmers Guide will also be revised to incorporate new information and any necessary updates since it was last reviewed.

There will be an entirely new manual on the DR DOS Shell. Its provisional title is "The DR DOS Shell User Guide".

So the new DR DOS documentation set will comprise:

- **The DR DOS User Guide**
- **The DR DOS Shell User Guide**
- **The DR DOS Quick Reference Card**
- **The DR DOS System and Programmers Guide**

Also as part of the *LEOPARD* development, three Application Notes will be produced on the following subjects:

- **Idle Detection**
- **Cut-down BIOS for embedded systems**
- **ROMming DR DOS**

Documentation Style and Size

With the *LEOPARD* release all manuals will be printed on a 9 by 7 page with a second spot colour. In addition the appearance of the manuals (page layout and so on) will be brought in line with the proposals made by the GEM group in the States

MS-CCP-MDL 5010602

MS-CCPMDL 000005010602

Product Format

Language Variants

Four language versions of *LEOPARD* will be produced and released by Digital Research. They are listed below in priority order:-

English
German
French
Japanese (KANJI)

Other languages will be translated by OEMs using the message files and tools supplied with the DR DOS Translation Kit.

Copy Protected System

Only the 5.25" ENGLISH version of copy protected DR DOS will be generated

Retail Product

Documentation
  The DR DOS User Guide
  The DR DOS Quick Reference Card
  The DR DOS Shell User Guide *(Optional)*

5.25" 360Kb Retail Disk Set
  DR DOS System and Installation Disk
  DR DOS Utilities Disk 1
  DR DOS Utilities Disk 2
  DR DOS Shell Disk *(Optional)*

3.5" 720Kb Retail Disk Set
  DR DOS System and Installation Disk
  DR DOS Utilities Disk 1
  DR DOS Shell Disk *(Optional)*

OEM Kit

Documentation
  Retail Kit Documentation
  The DR DOS System and Programmers Guide
  Idle Detection Supplement
  Cut-down BIOS for embedded systems
  ROMming DR DOS

5.25" 360Kb OEM Kit
  5.25" 360Kb Retail Disk Set
  DR DOS PC BIOS Disk
  DR DOS Idle Detection Supplement
  DR DOS Skeleton BIOS

3.5" 720Kb OEM Kit

3.5" 720Kb Retail Disk Set
DR DOS PC BIOS Disk
DR DOS Idle Detection Supplement
DR DOS Skeleton BIOS

Translation Kit

Documentation
  To be Specified

5.25" 360Kb Translation Kit
  DR DOS Message Files
  DR DOS Utility Object Files 1
  DR DOS Utility Object Files 2
  DR DOS Shell Translation Kit

3.5" 720Kb Translation Kit
  DR DOS Message Files
  DR DOS Utility Object Files 1
  DR DOS Shell Translation Kit

MS-CCP-MDL 5010604

MS-CCPMDL 000005010604

Development Time Scales

Development Mile Stones
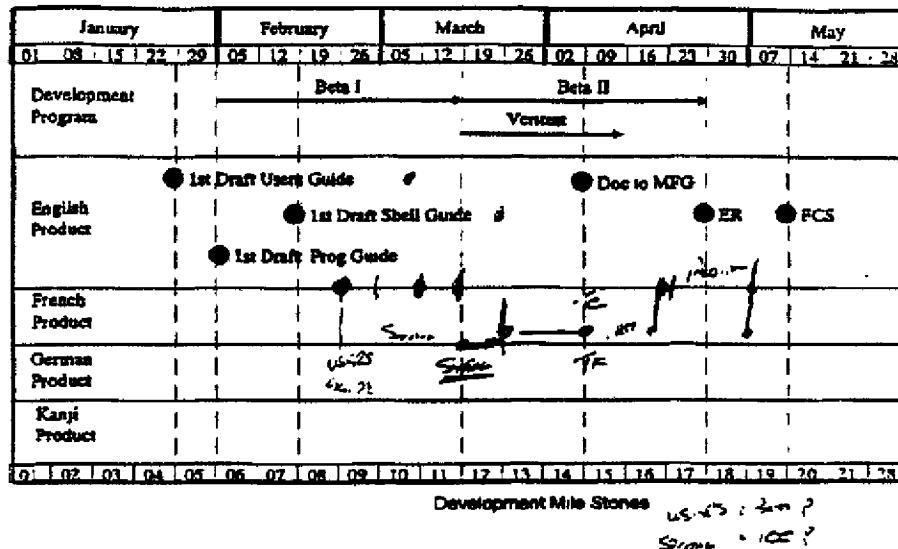
Key Development Mile Stones

Beta I Release	*5 Feb 1990*
Programmers Guide First Draft	*5 Feb 1990*
Beta II Release (Provisional)	*19 Mar 1990*
Vertest Validation Begins (Provisional)	*19 Mar 1990*
Engineering Release (ER)	*30 Apr 1990*
First Customer Ship (FCS)	*14 May 1990*

English/US Product Mile Stones

User Guide First Draft	*26 Jan 1990*
Shell User Guide First Draft	*19 Feb 1990*
Engineering Release (ER)	*30 Apr 1990*
First Customer Ship (FCS)	*14 May 1990*

French Product Mile Stones

Translated Software	*TBD*
Translated User Guide First Draft	*TBD*
Translated Shell User Guide First Draft	*TBD*
Engineering Release (ER)	*TBD*
First Customer Ship (FCS)	*TBD*

C0048975

MS-CCP-MDL 5010605

MS-CCPMDL 000005010605

German Product Mile Stones

Translated Software	TBD
Translated User Guide First Draft	TBD
Translated Shell User Guide First Draft	TBD
Engineering Release (ER)	TBD
First Customer Ship (FCS)	TBD

Japanese (KANJI) Product Mile Stones

Translated Software	TBD
Translated User Guide First Draft	TBD
Translated Shell User Guide First Draft	TBD
Engineering Release (ER)	TBD
First Customer Ship (FCS)	TBD

Engineering Timescales
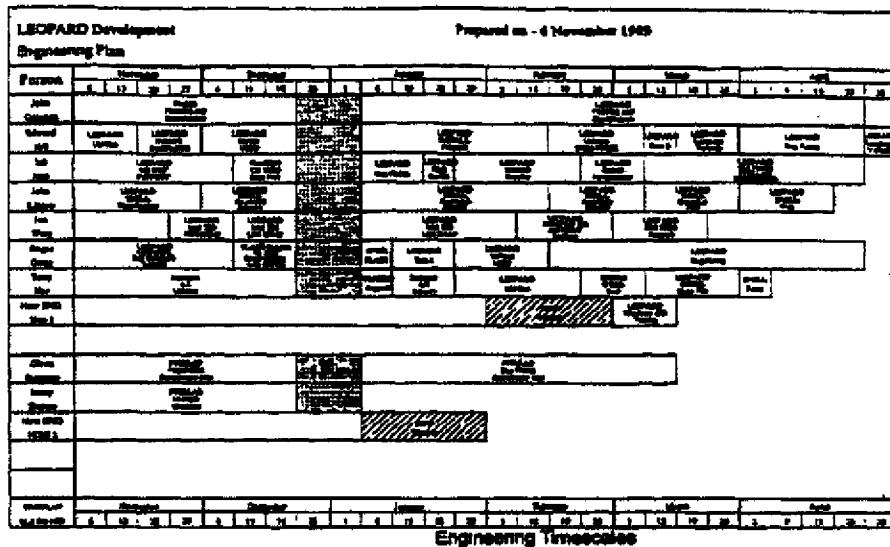
Performance and Size Issues

Run Time Size	*Complete*
Performance	10 Days

Microsoft MS-NET Support

Implementation	*Complete*

Support for other DOS Networks

Investigation	*>30 Days*

Support for CD ROMs (Microsoft's MSCDEX)

Implementation	*Complete*

C0048977

MS-CCP-MDL 5010607

MS-CCPMDL 000005010607

New and Enhanced Utilities

Filelist support	5 Days
Command Line Options	@5 Days
Disk Cache Software	TBD
INSTALL	25-30 Days
Enhanced CHKDSK	2 Days
EXE2BIN	*Complete*
SID86	5 Days

DR DOS Desktop

Keyboard only operation.	45 Days
DR DOS Password Support	15 Days
Directory Tree Display	15 Days
Show File Menu Option	?? 15 Days
Screen Driver Font (CodePage 850)	4 Days
Miscellaneous	15 Days
Installation	*See INSTALL*

DOS Extender and High Memory Support

General	5 Days
Intel 80286 based PCs	1-2 Days
Intel 80386 and 80486 based PCs	20 Days
VCPI Support for EMM386.SYS	15 Days
COMPAQ 386 Personal Computers	4-5 Days
Personal Computers using the NEAT Chip Set	10 Days
IBM PS/2 XMA Compatible memory cards	15 Days
MEM Utility	>10 Days
Installation	*See INSTALL*

Laptop Enhancements

Dynamic Idle Detection	*Complete*
Cursor Control Utility	15 Days
File Transfer Program	*Sub-Contract*
Enhanced ROMDISK Support	*Complete*

Embedded System Support

Configurable Generic BIOS Installation	*Complete*
PC Compatible BIOS	*Complete*
Skeleton BIOS	*Complete*

Enhanced Password Protection

Password Protection of Disks	5 Days
No echo of Passwords	5 Days
Encryption of Directory Entries	TBD
Supervisor Password	TBD
Get/Set Encrypted Password	2 Days

Generic Double Byte Character support.

Implementation	*Complete*

QA and Documentation Timescales

C0048979

MS-CCPMDL 000005010609

Reference Documents

The following documents are referenced in the *LEOPARD* Engineering Specification and contain detailed information about specific aspects of this development

LEOPARD Product Definition Requirements (Final Version)
LEOPARD Documentation Plan (2/Nov/89)
DR DOS Shell Program Specification (Version 1.03)
DR DOS Idle Detection Specification (Version 1.20)
ROMDISK Sub-directory Support (RDC-DP-001-02)
Multi Language Support (8/Nov/89)

km)

VCFl

Ln 40