

Entry Systems Plans

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mention variety of followup sessions on monday and tuesday.

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MS7006758

*see brief
9/16/91*

Plaintiff's Exhibit

5364

Comes V. Microsoft

RBC 002945

MS-DOS 5: Thank You!



**heard loud and clear from oems: get us involved early, give us successive
pre-release code drops, improve the documentation better and easier to adapt,
and above all, build a solid product.**

we did our best to make that happen.

140 oem's world wide

account for 90% of ww pc units

15 languages by october

most shipping now except those with old inventory

**want to build on these positive steps as work with you on dos and windows in the
future**

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MS-DOS 5 ROM Version

- ◆ Complete MS-DOS 5 functionality
- ◆ Fully ROM executable
- ◆ Low memory footprint of 18K
- ◆ ROM disk emulator
- ◆ Localized versions



In beta test now, release in October

instant on

like disk-based, small footprint

markets. targeted for general-purpose portable PC's; various special purpose small form factor machines like hand-helds and pocket organizers that run dos apps; and embedded applications

flexible, modular configurations.

minimal configuration 58k - no config.sys processing, mini-command interpreter. 64k for config.sys processing. 120k for everything. 40k resident, 80k transient.

rom disk emulator provides capability for placing FAT file images in ROM. ideal for builtin applications, transient pieces of rom-dos, pieces of ROM Windows

rom image tool

localized in 9 languages: english, german, french, portuguese, italian, japanese, spanish, dutch, swedish

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MS-DOS 5 Laptop Support

- ◆ Advanced power management
- ◆ PCMCIA memory card driver
- ◆ Flash file system driver
- ◆ File transfer



support for solid state memory cards. memory cards appear as disk drives. we have a block device driver for pcmcia cards so the file system can talk to them.

FAT for dram, sram, rom. FFS for flash devices.

future support: XIP -- loaders, tools. I/O cards -- device support for transient devices

file transfer -- very handy to have. host uses drives from remote pc as if they were local. like a two-node directly connected network. transparent use. can launch applications from remote pc on host pc. transparent to windows 3.0. even does remote printing.

supports auto-install, serial and parallel communications, and is very fast. with parallel connection, almost transparent.

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Advanced Power Management: A New PC Standard

- ◆ Defined by Intel and Microsoft
- ◆ CPU independent
- ◆ New BIOS API set
- ◆ Partnership between firmware and operating system
- ◆ Supported in DOS 5.0 and Windows 3.1



defines a cooperative interface between system bios and os to reduce power consumption.

at the firmware level level is an APM system. at the os level is a loadable driver that acts as a partner with the APM bios

the dos pm device driver is supplied by microsoft with dos5; you develop the APM BIOS yourself or get from a BIOS vendor.

Both can work without the other to provide some power savings.

this means that even if you don't have APM bios, can use power mgt driver alone to get power savings.

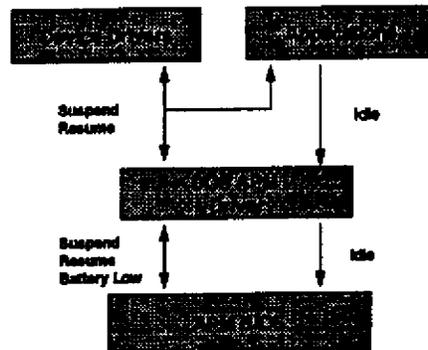
when both are active, they cooperate to provide even better power management.

Alone, the power management driver can detect idle and put the system in a reduced power state. idle call by default it Halt; is customizable by oem.

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APM Diagram



apm driver connects to apm bios

- initiates. information pump to firmware.

detects idle time and informs apm bios. eg, between keystrokes, the os tells firmware, I am idle.

power-aware apps can notify it of idle, which it passes on to bios.

up to bios on how to handle idle notification.

- responds. on power-transition event (suspend, resume), firmware posts an event notification

os listens for power transition events from bios. broadcasts pm-event to pm-aware device drivers, tsr's and apps.

any device can accept and act appropriately, or reject. pm driver acks firmware request or rejects.

restore system state after resume (eg, reinitialize device).

communicate suspend request to interested apps and drivers

allowance for critical events, like dangerously low battery level. sw notified only on return to ready state

- monitors. provides power status info to user, such as battery low notifications and fuel gauge.

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Flash File System II

◆Flash memory is different

- Erase is very slow, write is slow, read is fast
- Parts go bad after too many erasures
- Limited capacity

◆File compression built in

◆Background reclamation and usage balancing

We'll be delivering early next year, a file system specifically for flash memory.

Flash has peculiar characteristics which make FAT file system inappropriate.

Block erase - can only erase in big chunks, 32K and up. erase is very slow, write is slow, and read is fast. Moreover, parts go bad if erased too many times.

with ffs II, you'll be able to use flash as a "normal" read-write storage device like a hard drive.

Since you can't erase a part too many times, you can't have on disk structures, like a FAT, in a fixed place. Requires a special file system design for flash

In addition, FFS keeps erasure counts and will, in the background, balance block usage.

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Windows in ROM

- ◆ Executes "in place" in ROM
- ◆ Runs all Windows applications
- ◆ Supports all Windows 3.1 features
- ◆ OEM configurable



Rom advantages: instant-on, faster execution, more ram for apps, power savings, embedded applications.

oem adaption: add extensions such as pen; applications; drivers; truetype fonts.

flexible configuration – xip; compressed in rom, execute in ram.

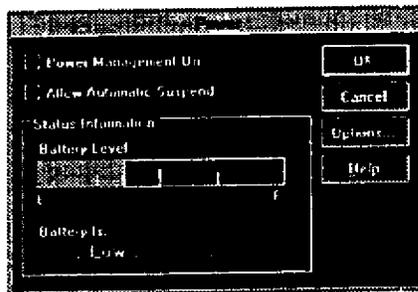
min 1 MB rom for standard mode windows + DOS 5.0. full enhanced mode, including truetype fonts, requires 4 MB.

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Windows Power Management

- ◆ Installable driver and VxD
- ◆ OEM value added options via DLL



firmware needs more help in a virtual or protect-mode environment.
harder for firmware to detect when truly idle.

other problems such as "time warp" when a system leaves suspended
state and system clock doesn't reflect time spent suspended

control panel icon and dialog

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MS-DOS 6 Objectives

- ◆ 100% DOS 5 compatibility
- ◆ End-user sex appeal
- ◆ Real-mode and 386 enhanced mode
- ◆ Increased synergy with Windows
- ◆ Enhanced performance and robustness



success. investing. with the success of dos5, win3 and the growth of portables and low end machines, it's clear that dos has a healthy life ahead and we're investing very aggressively in it.

feedback. while we're pretty far along in the design of dos6, we're eager to get input and feedback from you.

100% dos 5 application and device driver compatibility

we learned with dos5 and win3 how worthwhile it was be to end-user focused and deliver user goodies. we'll continue that with dos6 with new utilities, improved mem mgt, make it easier to use, etc.

very broad range of machines. take a page from the windows book: dos6 will support both real and enhanced moded.

real mode will focus on low-end and embedded markets. will always be a need for a real mode ms-dos. improved low memory footprint.

enhanced mode will fully exploit 386 to provide improved perf, robustness and additional capabilities.

we're designing dos6 to be the platform for enh mode windows. we look at dos6 from win perspective and ask what can dos6 do to make win better. fast paths.

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MS-DOS 6 Objectives

- ◆ Integrated networking
- ◆ Improved installation, configuration, administration
- ◆ Unified approach to localization: EJAL
- ◆ Support for mobile computing
- ◆ Open file system design

making networking an integral part of dos6
easier to install, ...
easier to adapt and ship multilingual versions.

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MS-DOS 6 Architecture: Enhanced Mode

- ◆ **Reentrant 32-bit operating system**
- ◆ **Protect-mode file system**
- ◆ **Installable file system architecture**
- ◆ **VxD based 32-bit device drivers**
- ◆ **Multiple virtual DOS machines**
- ◆ **Platform for Win32/DOS**

these sound like great objectives. how are we going to build such a dos for enh mode?

we'll start by migrating windows function into dos. virtual machine manager: memory management, mvdm support, preemptive multitasking

build on that to make a fully reentrant 386-based 32-bit os running in protect mode with a protect mode file system and other protect mode subsystems (like networking). particularly suitable for network and comm apps.

will support existing real mode device drivers as well as 32-bit protect mode device drivers. taken from windows, namely windows vxd's. this includes the fastdisk vxd, which will be the dos protect mode disk driver.

provides preemptive multitasking platform for win32

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MS-DOS 6: Integrated Networking

- ◆ Protect-mode network architecture
- ◆ Peer file and print service
- ◆ Mail service

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Win32 / DOS

- ◆Runs on DOS 6
- ◆Supports Win32 API
 - Common API between NT and DOS
 - Patterned after Win16 API
- ◆Basis for advanced windows services

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Summary

- ◆DOS is very healthy today
- ◆Aggressive efforts to advance entry systems
- ◆Today and in the future

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MS-DOS 6: Current Thoughts

- z Protect mode, reentrant 32-bit operating system
- z Windows VxD's for 32-bit device drivers
- z Virtual DOS machines
- z Real-mode DOS 5 kernel for 100% compatibility
- z Tightly coupled with Windows 4

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Windows 3.1 Feature Overview

- z Improved robustness**
- z Easier to setup**
- z TrueType scalable outline fonts**
- z Shell improvements**
- z Performance improvements**

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Windows 3.1 Feature Overview

- z Network improvements
- z Improved DOS application support
- z Application integration: OLE
- z Laptop support

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TrueType

- z Great looking fonts on screen and printer
- z 100% WYSIWYG
- z No changes needed for applications

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Object Linking and Embedding

- z Integrate information from one application into document managed by another
- z Compound documents, hot-links, voice annotations
- z Easy for developers to support

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Insert Pen extensions slide here

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