

To Do List:

- * Add Description of command switches for both programs
- * Data Flow Diagram of entire process
- * Incorporate Setup (and Setup help) Screen dumps
- * Incorporate Schedule

Distribution

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Plaintiff's Exhibit

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Comes V. Microsoft

RBC 002243

Merged DOS/Windows Product

Document Custodian: Eric Straub
Revision: ~~0.4~~ .34
Last Changed Date: 5/2/91 by Eric J. Straub
Last Printed Date: 5/2/91

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Introduction

Our main objective is to get DOS 5.0 and Windows on as many machines as possible. To facilitate this, a product will be developed which installs both DOS 5.0 and Windows 3.0.

This specification describes some alternate implementations for a single DOS/WIN product which includes a single setup for both DOS and Windows. The main work in this product will be development of the installation program, and adjusting product documentation to be consistent with the DOS 5/Win 3 environment.

The following approaches are discussed:

- Slick Approach - Integrate the two installs, merging the setup screens and making it appear as one single setup program. Support uninstall of DOS (but not Windows), and support installing either Windows or DOS separately.
- Rejected Slick Enhancements - Several enhancements to the Slick approach were considered, but rejected. These are discussed in this section.
- Hack Approach - Run DOS 5.0 setup to completion, then reboot and run Windows Setup to completion.

Each of these is described in more detail below. The Hack approach has been ruled out since it is only slightly better than just sticking the boxes together.

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Slick

The Slick approach involves merging the DOS Setup functionality into the Windows setup program. Uninstall of DOS is supported, as is install of DOS/Windows separately. In addition, all existing DOS Setup switches are supported when installing only DOS, and the same is true when installing only Windows.

Changes to DOS 5.0 Only Setup

The following changes to DOS 5.0 Setup will be implemented (these effect DOS 5.0 Setup when user chooses DOS only option):

- * DOS 5.0 Setup will be modified to support a new switch, /i, which disables Setup's video detection. This option is intended for systems on which DOS setup doesn't work. It will allow users to complete installation.

- * Final message in DOS 5.0 Setup will say something like:

"MS-DOS 5.0 Setup is complete. Press any key to reboot your system. To install Windows, run Setup after restarting your system and choose the "Only install Windows" option.

Processing Narrative for Slick Approach

The Slick setup proceeds as follows:¹

- 1) If DOS 3.1 or later, Setup displays merged DOS/Win welcome screen, with following choices:

- Install DOS and Windows
- Install DOS Only
- Install Windows Only

If the user chooses Install DOS Only, the existing DOS 5.0 Setup is spawned. If they choose install Windows only, the existing Windows Setup is completed. The rest of this processing narrative discusses what happens if they choose both.

If DOS 2.11-3.0, DOS prints a message something like.

"Windows Setup requires DOS 3.1 or later. To install Windows, you need to install DOS 5.0 and then install Windows. To do this, press the F5 key to install

¹ User Ed will be involved in design of the Setup screens from the beginning.

MS-DOS 5.0". Then after your restart your system with MS-DOS 5.0, run Setup again to install Windows"

Install MS-DOS 5.0
Exit Setup

If the user Chooses Install MS-DOS 5.0, the DOS 5.0 Setup program is spawned.

If Setup detects that no local fixed disk is installed, it will default to windows only setup, since DOS 5.0 setup will not be able to proceed.

- 2) DOS Network warning screen with Windows Network choice integrated. Something like:

"network warning stuff (from DOS 5.0)"

Network: *User chooses network - Setup defaults to whatever is detected.*

Continue Setup
Exit Setup

(After user sets network, they select either Continue or Exit Setup)

The Network the equivalent of the line in the Windows 3.0 Setup System Info screen.

If no network is detected, the default action is Continue Setup. If ANY network is detected, the default action is to Exit Setup²

- 3) Offer the user the option of backing up their hard disk. If they choose yes, run HDBACKUP.
- 4) The Sysinfo screen^{3,4} This is identical to the Windows 3.0 System info screen, except for the following changes:
- * Add field for Windows directory
 - * Add field for DOS Directory (Setup will not accept any driver other than C: for DOS Setup - It *MUST* be obvious to the user that they cannot change the C:, as this is a common complaint about DOS 5.0 Setup Windows can be put anywhere).

² We will use the Windows network detection code (perhaps with bug fixes). Note that windows detects a lot more networks than are listed. Thus, the default action (exit or continue) will be correct almost all of the time.

³ Philba wanted an option to avoid this screen and just take the Windows defaults. Do we want to do this? Perhaps we could make this an option on the first screen.

⁴ Windows prompts for language/keyboard layout, but doesn't change the code page to match the language. Should we enhance the setup to adjust the DOS language/keyboard information.

- 5) Enough files are copied to HD to start windows
- 6) User gets option dialog with checkboxes for:
 - viewing readme files
 - setup printers
 - setup applications.
 (This is identical to Win 3.0).
- 7) User gets gas gauge while the files are copied to the HD. Setup proceeds as windows 3.0 does until it gets to the end of windows setup:
 - * Gas gauge till all files copied. This will be the same as when installing Win 3.0, except that the user will be prompted for an uninstall disk.

If user interrupts (by rebooting, power off, etc.) Setup prior to the start of copying the DOS files, they will have part of Windows on their disk, with their old DOS. If they interrupt Setup during DOS files (eg after the master boot record is written), they will get the "DOS installation incomplete - insert the uninstall disk" message. ~~Then they will get the option of continuing Setup or only choice at this point will be to uninstalling the DOS- (using the uninstall diskette).~~⁵

Note: If the user installs Windows to a drive other than C:, they may not be able to run Windows when Setup is complete, since the drive may not be accessible under DOS 5.0.

- * Printer Setup
- * Ask user about Config.sys/Autoexec adjustments:⁶
 - Accept changes to System files?
 - View/Edit changes to System files?

And a check box at the bottom saying
"Run Windows on System Startup?"⁷

- * application setup

- 8) Setup displays message saying Setup is complete press any key to reboot.⁸

⁵ This is different from the DOS Only setup. In that case, the user also has the option to continue with Setup. Support for continuation of setup is discussed in the Rejected Slick Enhancements section.

⁶ This is a change from the processing order of DOS 5.0 upgrade. DOS 5.0 upgrade modifies the system files prior to copying the files to the HD.

⁷ Default will be YES.

Pros/Cons of Slick Approach

Pros	Cons
User gets to Win-GUI quickly	Requires Windows GUI developer to implement <u>the Windows portion</u> .
Product appears to be a single integrated product.	Requires DOS 3.1 to run setup for both (since Windows setup needs 3.1 to run). However, DOS 2.11-3.0 can be updated by running DOS setup, then Windows.
Some common complaints with DOS 5.0 Setup are addressed: view readme, control of config/autoexec modification.	May be harder to differentiate between DOS/Windows setup problems since both DOS and Windows are put on the system at the same time
Supports installation over the network without <u>requiring the network to be restarted by the user/user intervention</u> .	<u>Uninstall only removes DOS 5 (not Windows) and does not offer Continue option.</u>

Schedule Estimate for Slick approach⁹

DOS Development: 8 weeks, (plus 1 day for /i switch) of Johnhe, or 5 weeks¹⁰ (plus 1 day for /i switch) of Johnhe and, 5 weeks of Davebe or Daviddi full time then 20% for duration of test.

If Win 3.0 is used, 2 days will be needed to incorporate the following problem fixes into Setup:

- 1) Multiple Ctl-Z at end of WIN.INI causes crash
- 2) Save com port settings during mouse detection
- 3) Oliver's M86 keyboard crash

⁸ Reboot is required since their HD may have changed. This is different from Win 3.0 in that they also offer options to restart windows and to exit to DOS.

⁹ Work efforts are developer estimates, assuming 40 hour weeks with a "Leave me alone mandate". That is, they will refuse to do any other work which will impact this deliverable.

¹⁰ Longer duration accounts for communication inefficiencies and learning curve of new developer.

Philba feels we shouldn't fix the following problems (Johnen agrees since he doesn't want to fix any of the 5 if avoidable; Ericst thinks we should understand 4) better before blowing it off)

- 4) "SYSTEM." file in Windows directory causes upgrade crash
- 5) SSTOR.SYS detection in SWAPFILE

Test 1 test SDE for duration, plus 2 test SDE's beginning week 5 (or week 3 if doing 5 week development approach)
1 week of a Test SDE to develop test plan.
1 day/wk of builder

Pre-Beta Test 2 Weeks (3 SDE's)

Beta: 5 week¹¹

Final Test: 1 week

User Ed:

Rewrite Getting Started (to incorporate Win Q&A, Win text files, etc.):
2 Months of a Technical Writer,
6 weeks of an Editor

Review Setup Setup Screens:

1 week of Technical writer
1 week of editor.

Review DOS/Windows documentation to ensure that they are consistent with a merged product (disk numbers are correct, EMM386 description, etc):
1 week of Technical Writer.

Program Management: 1 program manager full time for 3 weeks to spec/plan, then 50% for duration. Also,

Beta: The following resource requirements assume we have an 800 site beta program with 4 shipments (200/wk), each shipment a week apart:

1 Program manager (100% for 8 weeks prior to beta - 75% from beta start till RTM). This person will coordinate both domestic and international beta, will sign up sites, coordinate call downs, hire/manage temps, etc.

¹¹ This 5 week period should accommodate 4 weekly beta shipments (allowing 2 weeks to collect information after each beta shipment). Beta test is only testing Setup. Once user has installed and system is working, no further beta testing is required for this product. It should be easy to get beta testers by telling them they will have golden DOS 5/Win 3 after install is complete.

- 1 Tech support technician for 8 weeks (3 weeks prior to beta to get up to speed on issues, then for duration of beta to support product).
- 1 admin for 14 weeks (8 weeks before beta till end of beta)
- 1 admin for 9 weeks (4 weeks before beta plus first 5 weeks of beta period)

Estimate for DOS development allows for time spent fixing problems throughout development. Assumption is that testing is ongoing during development. Upon completion of development, beta candidate will be built.

Assumptions

- Slick will be based on DOS 5.0 and Windows 3.0.
- We will examine the possibility of incorporating better network detection into Setup, but at this time it is not in the plan.
- 3-rd party disk stuff, Windows Q&A, will be moved from the Readme to the Getting Started Guide.
- Media is: 1.2Meg and 1.44Meg.
- The schedule above assumes we are doing none of the enhancements described later in this specification.
- Development estimates assume developers have a mandate that this is their only priority, eg they refuse to accept any other work which may impact this schedule.
- DOS Error messages will not be incorporated into DOS User Guide, even though the error message documentation will be complete in time to do this (work estimate is 1 month of a tech writer plus 2 weeks of an editor). Reason for not doing is international schedule impact.
- We will not merge the readme's. We need to still support DOS only and Windows only setup. We will need to address problem that both products have file called README.TXT. One way to do this is to create README_W.TXT and README_D.TXT. Then we just describe the available readme files in the README.TXT file

Issues/Risks with Slick Approach

Depending on when we decide to announce Slick (eg how long after RTM), we may be forced to finalize the Docs prior to getting Beta input. We need to fully understand the Docs schedule and decide how to do adequate usability testing in time to adjust the Docs.

How will we support installation onto clean machines (eg an OEM product)? One straight forward alternative to simply run OEM Setup to completion, instruct the user to insert the appropriate disk and reboot (this would then cause the windows

setup to be invoked). There would need to be some adjustments (view/edit config.sys/autoexec changes would be silly on a clean machine).

Should we support command line switches to force mode of setup (eg Win Only, DOS Only, and Slick).

Should Slick prevent user from installing Windows onto an unformatted partition? If we let users do this, they will not be able to run windows after booting DOS 5.0 since they will not be able to access the partition.

Should View Changes (to Config.sys/Autoexec) be modified to unsynch the windows? Since DOS will shift a lot of stuff around in these files, it may not be possible for users to see both original and final lines in the files since scrolling either windows causes the other to scroll.

We should review all issues addressed by the Windows Setup Strike team.

We should review the postponed DOS 5.0 Setup problems and decide which ones to fix in this product.

The combined Getting Started guide will be on the order of 100 pages. Is the size going to be too intimidating?

Should we support a /A switch to expand and copy all files to a specified directory?

According to Terrib, this is one of the biggest complaints from MIS people who try to set Windows up so User's can Setup /n.

If we implemented a similar switch for DOS Setup, it would allow the user to do a manual install w/o needing Setup /F. This switch doesn't do any of the disk adjustments, it just copies and expands the files. Thus, a user who wants to install to a drive other than C: would run Setup/M, reboot, if all works well, then they would do a Setup/A to put the DOS files onto the alternate drive. Since Setup /A is not doing any disk munging, uninstall is less of an issue (there is still the case where the user installs over existing DOS files). Unfortunately, Johnhe reports that this switch would be a lot of work.

Are there license issues that need to be worked (for the 3-rd party software included in DOS 5.0 upgrade)?

Which OEM's will be in the Beta test? How secret is this product?

How will we ensure that a DOS 5/Win 3.1 product is available at Win 3.1 announce? Seems that this is important since as soon as Win 3.1 is announced, Slick becomes obsolete.

We may wish to revisit the Setup messages after DOS 5.0 has shipped (when we have some input from PSS on what is causing calls).

8514 Support

At a minimum, we will ship 8514 files and have an 8514 option for display. However, we may not autodetect 8514 (eg we'd detect VGAMono).

~~IBM believes they have a fix for the 8514 detection which is compatible with the ARCNET cards. We will be getting this code from them. If it appears to be a reasonable approach, we will implement it in Slick (and DOS-Only-Setup code can be bypassed with /i switch). Our fallback if this is a problem would be to remove the detection code and just add a choice for 8514 w/o detecting it.~~

~~IBM's "fix" still broke the network. At this point, our plan remains to just include 8514 as an option (but display will be detected as VGA Mono).~~

Note: Test plan should explicitly address how mods for 8514 will be tested.

Bernouli hooks (used in DOS 5.0 setup) have never been tested under windows.

There is risk - we don't think it will be a problem, but it has never been tested. The Bernouli code in DOS 5.0 Setup hooks INT 13.

What languages do we intend to ship in?

I assume we'd want this to be international. Windows setup has not been DBCS enabled. We will involve IPG as soon as the becomes an official project.

Do we want new Doc Covers (windows are blue, DOS are grey)?

Rejected Slick Enhancements

This section describes some proposed enhancements to Slick which were discussed, but recommended for rejection by the Slick team in order to avoid risk and to get the product to market sooner.

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Install DOS to Drive other than C: and Optional Uninstall

Two of the more common complaints about DOS 5.0 Setup are that it forces install to C: and that the user must create the Uninstall disk. These two items are related since the reason C: is forced is that we cannot guarantee that any other drive will be accessible under DOS 5.0 (and Uninstall runs under DOS 5.0).

Disabling Uninstall will also cause Setup to not touch the master boot record.

Implementation of this feature involves the following.

- * Add switch to Setup to disable uninstall
- * Allow user to specify drive letter for DOS directory.
 - If user chooses drive other than C: and "disable uninstall" switch was not specified, display a message something like:

"Warning: Uninstall will be disabled if you setup to a drive other than C:"

<Adjust Drive Letter> <Accept Drive other than C:>
Default action will be "Adjust Drive Letter"

Schedule estimate:

DOS Development: 4 [5] days including 2 [2.5] days to examine existing setup code for uninstall dependencies.

Win Development: 1 [1.2] days

Test: 1 week

DOS Only Setup Installation of DOS Mouse driver

Windows Setup detects whether an MS DOS mouse driver is installed and then installs an updated mouse driver if one is found. Support for installation of the mouse driver in DOS Setup would mean adding a line for mouse (similar to the line in the Windows sysinfo setup screen). Then we'd detect (use windows algorithm) whether a mouse is installed on the system. If a mouse is detected, we'd default to install the mouse driver, otherwise we'd default to none.

Work Estimate:

DOS Development: 4 [5] days

Test: 1 week

Automatic Config Changes For 3-Rd Party Disk Drivers

This would simply setup of DOS for users who utilize Disk Manager and Speedstor. It would work as follows: Enhancement to disable uninstall is also required if we are to support fully hands-off installation over the network.

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- 1) Setup detects a DM (or Speedstor partition)
- 2) Setup checks Config.sys for the disk device driver. If it sees the appropriate file, it offers the user a dialog something like:

"Setup has detected an older version of Disk Manager disk partitioning software. A newer version of this Disk Manager is required for MS-DOS 5.0. The necessary file is included in MS-DOS 5.0. If you wish, Setup can put these files on your hard disk and modify CONFIG.SYS to use the newer file.

Note: the new Disk Manager file is compatible with versions of DOS 3.?? through 5.0. However, once you use this version of the driver, you must continue to use it, even if you go back to your older version of DOS.

<Make Config.sys adjustments and continue setup>
<Exit Setup>

The default action will be to make the adjustments.

If Setup doesn't see the disk device driver in CONFIG.SYS, it displays a warning to the user saying that it has detected an incompatible partition and points the user to the readme.

Work Estimates:

DOS Development: 1 [1.2] week plus whatever problems crop up.
Test: 1 week

Support for Setup Scripts

Support a switch on Setup which specifies a script file for Setup to use. This would allow for hands off installation of DOS/Windows. Since this is a planned feature of Windows 3.1, the estimates to support in Slick vary depending on which version of Windows is used:

DOS Development:	2 [2.5] days
Win Development (assume Win 3.1):	2 [2.5] days
Test:	1 week
Win Development (assume win 3.0)	2 [2.5] weeks
Test:	Feels this is too risky to try.

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Incorporate DOS Error Message Descriptions into DOS User's Guide

The documentation of the DOS error messages is already underway. It should be completed in July. We could add these as appendix to the DOS User's Guide

Work Estimates:

Editor: 3 days

Translation: TBD (This would be new text to localize)

Automatic Update of Network Files

More thought on this is required prior to an estimate. We believe that the amount of development will be on the order of a month, but that there will need to be around a month of research to determine how to detect the different networks before we can produce a reliable estimate for the amount of work here.

Network Specific Text with Option to Print

One suggested enhancement is to prompt the user for a network, with a default and a list to choose from. The list of choices includes all networks which Windows needs to know about, or for which adjustments are necessary to work properly with DOS. In addition, the list includes a "Don't Know". Default in the list is based on which network is running.

If the user picks a network which requires modifications to work with DOS 5, Slick presents the user with the specific description of what they need to do. At this point, they can either print the directions, write them to a file, exit setup, or continue with setup.

This was rejected because there is no reliable way to print from DOS (don't know which port to print to, which printer drivers are needed, etc). Also, it would be a fair amount of work for Setup.

Automatic Configuration to use Upper Memory Blocks

Slick setup could adjust config.sys to utilize upper memory on 386 machines. There are potentially a lot of issues with this one however. It will require further thought before a schedule estimate can be provided.

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Setup /n (install user only stuff to Network dir) Support

There are some issues with this. For example, which files must be put on the hard disk? All files which are used before starting the network must be put on the local drive. We have no way of knowing where the network is started.

One option would be to support a /N:file option where file contains a list of files which need to be installed on the fixed disk.

This one needs to be thought through more carefully prior to estimating, if we wish to pursue it.

Improved Error Messages from DOS Setup

There are several messages in the DOS Setup which could be improved. For example, the message for invalid media doesn't specify which drive has the problem. Although it is non-trivial, it is possible to detect the drive letter of the offending drive.

Error message improvements are an open ended area. Schedule assessment depends on which messages are addressed.

Hack Alternative

The Hack approach is to modify the DOS 5.0 Setup to cause windows setup to be invoked after DOS 5.0 installation has rebooted the system. The biggest issue with this approach is that the network disappears when DOS 5.0 Setup reboots the system. We do not know of any good work around for this, and thus have decided to not investigate this approach any further than what is provided below.

Processing Narrative for Hack Approach

The hack approach works as follows

- 1) DOS 5.0 setup is run to completion.
- 2) When DOS 5.0 Setup is complete, it makes the following additional adjustments:
 - a) Adds line to Autoexec.bat to invoke "How to continue message"
 - b) Creates a batch file, C:\SETUP2.BAT, to invoke windows setup
- 3) Reboots system
- 4) System boots and first line in Autoexec is the "how to continue message" which works something like this:
 - a) Prints:

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"DOS 5.0 is now installed on your system. To complete the installation of DOS/Windows, do the following:

- 1) Start your network, using the command you normally use to start your network.
- 2) Type c:\SETUP2 and press enter
- b) Returns user to DOS prompt. At this point, the user must start their network and run C:\SETUP2
- 5) SETUP2 prompts the user to insert Disk N (which contains windows setup) When the user does this, Setup2.bat invokes the Windows setup program.

Pros/Cons of Hack Approach

While this approach sounds ugly, it does have some benefits. The following table shows the pros and cons:

<u>Pros</u>	<u>Cons</u>
Easy to develop/test (requires no changes to Windows setup)	Only slightly better than just sticking the boxes together. User must manually start their network after DOS portion completes, then restart Setup.
Easy to support setup of only DOS or only Windows (Win only is important for PSS).	Complicates setup over network (requires user to manually start network after DOS 5.0 is booted)
Works with DOS 2.11 or later	Obviously not a single product.
Setup/M & Setup/F for DOS	
Easy to allow user to setup DOS w/o setting up Windows and vice versa.	

Detailed Description of DOS Setup Development Effort for Slick Implementation.

The following changes to DOS Setup (from Johnhe) will need to be completed to implement slick:

1. Joint effort with Windows developer to develop a detailed specification of new combined program code flow and interface points/design.
2. Convert original setup code to allow it to use small/medium memory model C run-time library calls. Approximately 15 major source file conversions plus 146 smaller library module source files.

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3. Create a user interface adaptation layer to replace all of the DOS Setup program's generic user interface functions with similar functions using the Window's Setup character mode interfaces. Isolate all warning and error messages needed by the new character mode portion of the combined Setup.
4. Isolate and convert all needed DOS Setup messages into resources which are useable by the Window's GUI Setup
5. Convert DOS Setup initialization code to obtain hardware information along with command line switch information from the Windows Setup detection code via function arguments.
6. Port DOS Setup hard disk detection validation and warning code to Windows character mode module.
7. Rework all DOS Setup code which deals with copying the DOS files so that it will use the Windows Setup file copy functions. Also need to handle the case where files are renamed as they are copied such as with the DOS Shell configuration dependent files.
8. Port code which creates the Uninstall Disk . Will require lots of work because Window's Setup does not allow drive A: to A: file copying. Also need to deal with file names which need to change as they are copied to the Uninstall disk.
9. Port code from DOS Setup for formatting and validating floppy disks (needed for creating the Uninstall disk).
10. Port code for creating/updating config.sys and autoexec.bat files. Also some changes to allow accessing the original copies of the files if they existed.
11. Port DOS Setup OEM database searching/extraction code to work in both the Window's GUI and character mode Setup programs.
12. Port DOS Setup hard disk fix-up code to the Windows GUI Setup.
13. New packet passing code to pass information from the character mode Setup to the GUI mode Setup which is required by the DOS upgrade code.
14. There may be changes needed in the DOS 5.0 Uninstall program which will not be realized until a final code design is complete.

Test Plan for Slick

Test plan will be put here.

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Document Revision History

EJS Rev 0.4 Added comments from initial reviewers. Initiated Change control.

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