Note: This need to Win Plans be revised. This is FYI.

Windows Release Plans
for
August 1990 - May 1992
June 18, 1990

Introduction
Following the release of Windows 3.0, there are a number of market needs which must be satisfied, not all of which can be done in a single Windows release. This document outlines plans for Windows releases from August 1990 to May 1992, with emphasis on Windows 3.1.

It's worth noting that not all market requirements are known yet, we are pro-actively seeking feedback from ISVs, Corporate Accounts, PSS, the SE's, End Users and various MS groups and will incorporate their feedback into the release plans as appropriate. We expect to get additional feedback in the areas of usability/performance, hardware support, and software compatibility.

Organization
This document is organized as follows:

Summary Information
Included below is a quick summary of information contained in this document.

Planned Windows releases:
- Windows 3.00a.....July 90
- Supplemental Drivers Disk....August 90
- True Type Font Kit.....Sept 90
- Windows 3.10.....Feb 91
- Windows 4.0 .....May 92

Special Releases to prioritize:
- ROM Windows.....Q3 FY91 (use Win 3.1 as source base)
- Right to Left Windows.....Q1 92? (Does this really to be earlier?)
- Handwriting Windows .....SDK in Q2 91? (Retail as part of Win 4.0?)

Open Issues for Win 3.1:
- Should we do threads
- New game?
- Trash can?
- CIE Lab color model, is it worth putting in.
- Configuration API, need feedback from DOS group.
- How much do Win 3.1 and OS/2 2.0 shells and new APIs need to be in sync
- Do we support stdio calls from a Windows app
- Should we support 2 debugging-in-a-window solutions (message queue hack, and VM debugging)

A. Customer needs/Release objectives

Customer needs and therefore our release objectives are organized below into several generic categories. (A "Customer" is roughly defined as any group who wants something from Windows.) Most of these are obvious needs and objectives for the period following a major release of a product. Also included are some long term goals which we need to start migrating toward, although the emphasis is on short term goals. Where appropriate I've included which Windows release each will be addressed in, question marks indicate management feedback needed.

Hardware Design Objectives

Windows hardware requirements and design objectives will not change over the next 12-18 months. In 2 years time, mainstream hardware may advance enough to allow us dropping EMS and CGA support.

- Memory Required 640kb *(Issue: Will/Can TrueType require 1 Meg p-mode?)*
- Memory design point: 1 meg.
- We will shoot for 1 meg in 386 enhanced mode.
- Display: EGA or better

Short Term Customer Needs - Reduce PSS phone calls

- Critical bug fixes..... Win 3.00a, Win 3.10
- Remove purchase barriers ..... Win 3.10
- Reduce phone calls to PSS..... Win 3.00a, Win 3.10
- Performance Improvements ..... Win 3.00a, Sup. Drv. Disk, Win 3.1, Win 4.0
- Correct usability annoyances..... Win 3.10
- Additional device support ..... Sup. Drv. Disk, Win 3.10
- Better DOS app compatibility/memory..... Win 3.10
- More net support, ie Sun pc-nfs, Tops ..... Sup. Drv. Disk, Win 3.10

Short Term: Advance Windows' technology

- TrueType Support..... TrueType Kit, Win 3.1
- Better development environment ..... Win 3.1, Win 4.0
- Install LAN Client..... Win 3.1
- Open development environment..... Win 3.1, Win 4.0
- More Drag/Drop in the Shell ..... Win 3.1
- Address competitive pressure ..... Win 3.1, Win 4.0

Long Term: Advance Windows' technology

- New application services..... Win 4.0
- Improve end user environment..... Win 4.0

Strategic International Issues

- Maintain DBCS code..... Win 3.1
- Right to Left Windows..... Use Win 3.1 as source base
- User Verification/Copy Protection..... Win 3.1

Strategic Special Releases

- MMSys 2.0 requirements..... Win 3.1
- ROM Windows..... Use Win 3.1 as source base?
- R2L Windows ..... Use Win 3.1 as source base??
- Win-H ..... Win 3.1 SDK??

Strategic OS concerns

- Application Integration..... Win 3.1, Win 4.0
- Shell strategy as regards OS/2 2.0 ..... Win 3.1, Win 4.0
- The OS "socket" strategy..... Win 4.0??

B. Marketing Considerations/Constraints

Due to the large marketing effort and promised success of Windows 3.0 throughout the year, there are a number of unusual marketing constraints for new Windows releases in the short term. The considerations and constraints are listed below:

- **Managing the Retail Channel.** We are doing our best to keep the retail channel filled throughout the year so as no dealers wind up starving for Win 3.0. This is essentially trimester based with the biggest buy-in cycle (the "holiday" season) starting in August. Shipping an announced update before Feb 91 is very difficult without taking a large quantity of product back for rework. It's also very risky to "dry up" the channel in the fall for an anticipated release.

- **Free Update Policy.** We traditionally provide free updates to end users who have purchased the "old" product within a specified time (4-8 weeks) of the shipped the new product. Updating a large volume product like Windows 3.0 is very costly in this regard. (100K free updates?)

- **High Cost of Updating.** Updating a significant/high volume product like Windows 3.0 is very expensive for customers and the industry as a whole. A large number of 3rd party products, corporate training, training materials, application development, and application documentation will center around Windows 3.0. There is also a huge OEM, MS International, and PSS investment in Windows 3.0. Product changes in Windows which require re-training and/or changing training materials or applications will be expensive for all.

- **Compatibility.** A tremendous number of Windows 3.0 applications will be shipping soon which means new releases of Windows MUST be compatible with all Win 3.0 apps. (Win 3.0 apps which mess around with internal data structures of Windows are likely to not work in future releases of Windows)

- **TrueType Support.** Getting TrueType for Windows to market as quickly as possible is absolutely critical to address competitive pressure from ATM. Getting support into Windows is also critical for serious consideration of TrueImage, as IHVs and ISVs want to "see" TrueType and not just listen to us talk about it.

Conclusions:

I've taken the liberty of drawing conclusions regarding what we should do in the next releases of Windows given the above customer needs combined with marketing conditions and constraints.

- A release of Windows is needed within a year to address short term needs. (Win 3.1)
- A release of Windows is needed in 2 years to advance Windows' technology. (Win 4.0)
- Can't release an announced update to Windows until at least February 1991 due to MS costs.
- Future releases must be compatible with Win 3.0 apps and drivers.
- Need to get TrueType Support out very quickly.

In the next 12 months we should,

- Focus around maintaining a solid Windows 3.0 base product.
- A release should not require any retraining for end users to use existing functionality.
- A release should not be compelling enough for most ISVs to require it.
- Don't add APIs required for apps to support.
- APIs will be added in a very controlled way. (New APIs can be retrofitted to Win 3.0 via a DLL.)
- Don't release a product so compelling that the entire industry will update.

C. Planned Releases and Schedules

This section outlines our current Windows release plans which are designed to address the customer needs while meeting the current marketing conditions and constraints. Details on the precise content of each release is provided in sections following this. (No additional detail is provided for Win 3.00a and only high level objective are provided for Win 4.0.)

Windows 3.00A

Rel to Mfg.....July-August 1990

Objectives .....Fix critical bugs, selected performance improvements

This is a "silent release" in which the software is marked as Windows 3.00A, but the product packaging remains Windows 3.00. This release is rolled into the standard retail build and an update disk is provided for customers who already have Windows 3.00 and ask for the fixes. Almost completely driven by problems reported to PSS and the SE force. So far we've identified a handful of bug fixes and performance improvements. The DDK will also need to be updated to include any changes to driver code.

Critical Bug Fixes

- Int 2 problem with VPICD and Novell
- File Manager bugs
- Fonts >64kb in enhanced mode
- A few Win386 bugs

Performance Improvements

- HPPCL improvements
- Program Manager resource usage. (?)

Resource Summary

Development Resources.....10 MW (est)
Testing Resources.....30 MW
User Ed Resources.....none

Supplemental Drivers Program

Rel to Mfg.....August 10, 1990

Objectives .....Provide additional/improved device support

The focus of the Supplemental Drivers Program is to ship a Supplemental Drivers Disk which contains "2Nd tier" strategic drivers, including the generic printer driver from the PBU. See Appendix A for a list of targeted drivers. We plan to re-release this every 90 days if enough new drivers are available. We'll also post drivers up on Compuserve as soon as they are ready.

A second focus of this program is to provide customers with information on where to locate "3rd tier" drivers for their hardware. Although the plan is not completely worked out, the intent is to publish a directory of 3rd party driver availability. This list will be made available to the MS Info Center, PSS, sales force, SEs, dealers, etc.

Possible Issue: Are there any negative implications of providing information about drivers we've never tested? Are we liable for bugs?

Resource Summary

Development Resources.....12 MM (1 head annually)
Testing Resources.....6 MM (1/2 head annually)
User Ed Resources.....none (readme's only)

Windows True Type Font Kit

Rel to Mfg.....~~**September**~~ **1990** Oct 1990

Objectives .....**Provide TrueType for the Windows market**

Due to customer needs, we need to provide TrueType for Windows prior to the time marketing constraints allow us to update Windows. We'll do this by creating a "kit" which ISVs can bundle with their apps. This "TrueType Font kit" contains everything needed to upgrade a Windows 3.0 installation to utilize scalable TrueType outline fonts on the screen and printer. Included is a TrueType rasterizer, GDI.EXE, the "base 13" Postscript compatible fonts, 12 Lucida fonts (maybe), and printer drivers capable of printing TrueType outlines.

Issue: Getting fonts in time is the biggest risk to this schedule.

We will provide this kit free for ISVs to bundle with their apps and will make it available through Microsoft fulfillment at a very small charge. We're now presenting this idea to various ISVs and will refine the plan as appropriate to meet ISV needs. Additional detail is provided Appendix B.

We are starting to talk with ISVs now and will ramp up the evangelism effort starting the last week of June 1990 since that's when we'll have good demoware.

Resource Summary

Development Resources.....20 MW
Testing Resources.....15 MW
User Ed Resources.....? (Font addendum in WUG?, API for SDK and DDK)

Windows 3.10

Rel to Mfg.....**February 1991 (retail)**
Rel to Mfg.....**March 1991 (SDK, DDK, OAK)**
Objectives .....**Remove purchase barriers**
Reduce PSS calls
Correct usability annoyances
Improved Performance ← Key!
Address short term market needs
Better development environment

This is an announced release of Windows which focuses on removing purchase barriers and reducing PSS phone calls. Since this release is targeted for Feb 1991, it's heavily constrained by the "Marketing Considerations/Constraints" listed above. Improving performance is key to this release of Windows. We're currently in the process of defining exactly how to measure performance in a meaningful way. The Windows 3.1 feature set is described in Section E.

The greatest risk to meeting the defined constraints is the impact of having the OS/2 2.0 shell sync with Windows. We've scheduled a meeting on July 3rd to resolve remaining Win 3.1 - OS/2 2.0 shell issues. There are also a few API issues which remain open; color standards, config API. (The issue is whether we do them or not for Win 3.1.)

Management feedback on the degree the 2 environment must sync regarding the shell and API along with feedback on defined Windows constraints will aid in resolving the issues for Win 3.1.

Resource Summary

Development Resources.....**330 MW Available**
Testing Resources.....**348 MW**
User Ed Resources.....**?**

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Special Releases

A number of special releases are under consideration right now and management feedback on priorities is needed. I've quickly summarized each release and have included a proposed schedule where appropriate.

- **ROM Windows**

OEM interest in a ROM version of Windows has increased in the past few months. There are a couple of approaches we can use to create ROM Windows, depending on the targeted hardware and timing. Creating a version of Windows which executes out of ROM is fairly straight forward, the difficult part is what to do with peripheral device drivers, help files, applets, etc which are all key parts of Windows. Since 2 of the interested OEMs want ROM Windows for floppy disk based general purpose machines, this problem is even more difficult.

• Need to Six on how to subset Windows enough to do this.

Resource Summary

Research Effort .....4 MW
Development Resources ..20 MW (includes OEM support)
Testing Resources .....24 MW (includes OEM support)
User Ed Resources .....?

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Note that this estimate does not include changes to core windows that support floppy based operation. This would require between 20 and 30 MW to make work reliably.

Proposed Timing

→ maybe based on Win 3.00a

ROM Windows should be based on final Windows 3.1 source, done in Feb 91. This means we could have a product offering for OEM as early as Q3 CY 1991.

Possible Opportunities

An outline of possible opportunities for selling ROM Windows is listed below. I suspect that many OEMs (particularly for laptops) will jump at a ROM version of Windows.

Tandy Corp. wants ROM Windows for

- General purpose floppy based PC (timing unknown)
- TV top CD player. This needs a special limited version of Multimedia Windows, there are no external devices other than a joystick and the TV screen. (Timing unknown)

Apparently Tandy is willing to dump Deskmate in favor of Windows on all Windows capable machines.

let multisys subset this

IBM wants ROM Windows for

- General purpose floppy based PC (the low end of the PS/1 line, Q1 1992)

Apparently IBM wants Windows on the PS/1 line of machines (place machines), they will start with Multimedia Windows on the top model (Place 1) Q1 1991.

Need to think about this more.

- **Right to Left Windows**

Greenhalgh

We've looked at the proposed spec distributed by Richard Heroun , but development has not yet had time to work through the details and determine if the spec is reasonable for Windows.

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Ideally we would release something which is based on Windows 3.1 source. But the effort is unknown at this time. It seems reasonable the earliest we could release bidi Windows is approximately ~~9-12~~ months after Win 3.1 was released....Q1 92. (yes)

→ too long.

→ Do this based on Win 3.00.

We need management feedback on the timing for such a release.

+ Need to spend time on this.

- Don't want different standards.
- We need to solve this problem, buy or fix.
- 2 years is too far out!
- Get serious.

- **Handwriting Windows**

The applications group is currently researching handwriting Windows and working with OEMs on plans for handwriting machines. Win-H is planned as a base part of the standard retail Windows, not as a separate set of extensions as is the case for Multimedia Windows.

The 2 main components for handwriting Windows are listed below, these components can easily be separated:

- Additions to Windows to handle handwriting as defined in Llyodfr's spec. This is a 2+ man year effort. (estimates are very rough)
- ROM Windows (execute in place) and PowerManagement. (Estimates in ROM Window section.)

Don't need to do the PM specific stuff

Set up a meeting

Proposed Timing

One possible plan would be to incorporate the handwriting stuff into Win 3.1 (or just the SDK?), then base ROM Windows on the 3.1 source. This would provide a platform to develop handwriting apps on with a ROM product for upcoming hardware in Q3-Q4 CY 1991.

Possible Opportunities

A machine called Momenta is slated to ship in Q2 1991. According to the apps group they are shopping for an OS and are considering GO. Kyrocera plans to ship a machine in Q4 91.

- **Other Special Releases**

There are a number of other special release which we have put no time into thinking about.
Management feedback on these possible release is required.
~~**Cyrillic**~~
~~**East Europe**~~
~~**Middle East**~~
Asian Support (Vertical Writing/input methods) - DBCS
Multi-lingual ←

Windows 4.0

Rel to Mfg.....**Q2 CY 1992**
Objective.....**Advance Windows technology**
Dramatically improve end user environment
Robust application interoperability services
Sync with OS/2 on shell and API

This is a major release of Windows and is where we want to apply the majority of our resources. It includes a completely integrated shell; integrated email; browsing; application interoperability, 32 bit API, and more. Making this release successful will take a major ISV evangelism effort. I've outlined some of the objectives of Windows 4.0 in Section F.

Development Resources..... 2760 MW available
Testing Resources..... 1077 MW available
User Ed Resources.....?

D. Windows Resource Summary

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12.5 weeks/quarter/person

	Q3 CY90	Q4 CY90	Q1 CY91	Q2 CY91	Q3 CY91	Q4 CY91	Q1 CY92	Q2 CY92	Q3 CY92	Total MW
Capacity										
Development MW	300	337.5	387.5	387.5	387.5	387.5	387.5	387.5	387.5	3350
Testing MW	125	150	187.5	187.5	187.5	187.5	187.5	187.5	187.5	1588
Usage										
Development MW	292.5	312.5	372.5	374.5	374.5	382.5	382.5	382.5	382.5	3257
Testing MW	116.25	146.25	186.25	178.25	178.25	186.25	186.25	186.25	186.25	1550.25
Development %	98%	93%	96%	97%	97%	99%	99%	99%	99%	
Testing %	93%	98%	99%	95%	95%	99%	99%	99%	99%	
Available										
Development MW	7.5	25	15	13	13	5	5	5	5	
Testing MW	8.75	3.75	1.25	9.25	9.25	1.25	1.25	1.25	1.25	
Windows 3.00a										
Development MW	10									10
Testing MW	30									30
Supp. Drv. Disk										
Development MW	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	113
Testing MW	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	56
TrueType Kit										
Development MW	20									20
Testing MW	15									15
Windows 3.1										
Development MW	150	100	80							330
Testing MW	53	115	120	60						348
Special (Just ROM)										
Development MW				12	12					24
Testing MW				12	12					24
Windows 4.0										
Development MW	100	200	280	350	350	370	370	370	370	2760
Testing MW	12	25	60	100	160	180	180	180	180	1077

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E. Windows 3.10 Development Plan

This section describes the proposed content of Windows 3.1 and is organized as follows. (Sorry for the lack of a complete table of contents.)

1.0 General Shell Issues - Overview

1.0.1 Performance

Performance is one of the key areas we will focus on for File Manager, Program Manager and Print Manager. We've outlined several areas for improvement (further details in sections below).

In summary, Program Manager will be re-written to require less system memory resources. This will allow users to have more groups defined, without eating up lots of precious memory. A side effect of doing this will be a faster refresh time and reduced window management.

There are several things we can do in File Manager to help better performance. When the screen is updated during file manipulation, methods for drive searching, background processing and the ability to abort time consuming processes (i.e. a complete search of a CD-ROM drive) will be addressed.

Printing throughput will be evaluated further in Print Manager and in the Comm driver.

1.0.2 Fixing Usability Annoyances

A number of usablity annoyances have been defined from feedback on our Beta program. These include areas of unexpected or strange behaviour, inconsistency of behaviour between shell and system components and lack of expected or critical functionality.

We are in the process of gathering more data from PSS, the field SEs, the media and our corporate customers for further problem areas and for prioritizing the areas outlined on the 3.1 Tasklist.

We will be improving confusing error messages. Data on which messages are the most problematic will be gathered from PSS, the field SEs and corporate accounts.

1.0.3 Network Enhancements

Network persistance. Automatic connections will be made at Windows boot time. The interface for providing this option is still being evaluated. Customer feedback should help us decide the best alternative. Regardless of the interface, the user will be prompted for passwords at boot time (to maintain security). Visual feedback will also be given to the user while connecting at boot time.

Support for UNC connections for auto printer port net connections when printing is being evaluated. We are also planning auto reconnect for printer ports (same as for drive connections).

File Manager and Print Manager will provide new hooks for network specific connect dialogs.

1.0.4 Drag/Drop Enhancements

Drag/Drop enhancements are planned in File Manager, Program Manager, and Print Manager. New API for associative actions and class registration will be published for applications to write to. We are proposing file level support for open, print, properties and help. We are working with the OS/2 and application groups in defining common Associative Actions API for both Windows and OS/2.

Associative actions support will be added to all the applets.

Drag/Drop functionality will include the ability to:

Source	Target	Action	Effects
File Mgr file*	Print Mgr icon	print file on default printer	File and Print Mgr
	Print Mgr min. window	print file on default printer	File and Print Mgr
	print queue in Print Mgr	print file on that queue	File and Print Mgr
	application icon	boot app and open that file	File Mgr and app (assoc actions)
	application opened window	(depends on application)	app (DDE)
	application min. window	(depends on application)	app (DDE)
	Program Mgr group icon	create new group item	File Mgr and Prog. Mgr
	Program Mgr group window	create new group item	File Mgr and Prog. Mgr
	File Mgr folder icon	move or copy file(s) to folder	File Mgr
	File Mgr directory window	move or copy file(s) to directory	File Mgr
File Mgr folder or min. folder window	File Mgr folder icon	move or copy folder into new folder	File Mgr
	File Mgr directory window	move or copy folder into directory	File Mgr

* Dropping multiple files will be evaluated for Print Mgr and Program Mgr. It is unclear how useful it may be for multiple files to be dropped on an Application icon or window targets. File Mgr supports multiple files in Windows 3.0. Multiple files support can apply to File Mgr folders.

Note: no support for drag/drop planned for MS-DOS Executive.

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1.0.5 Startup Configuration

Early feedback indicates there is allot of confusion with the "save settings" options in File Manager and Program Manager. The purpose of "save settings" will be redefined to behave as users expect. File Manager will be enhanced to save open windows and positions. A bug in Program Manager's handle of icon arrangement will also be fixed. The ability to save setttings at any time (other than on exiting) will be added to File Manager and Program Manager.

A number of customers have requested a way to define which apps to load or run when booting Windows (e.g. run= and load= in win.ini). Requiring users to edit win.ini is not acceptable. We will be gathering end user feedback on the best interface to provide. Our current plans are to add a new item property in Program Manager for selecting the state of an application on Windows startup (opened, minimized or closed). Another alternative is to special case a "startup" group in Program Manager. All items in this group would be loaded (minimized) automatically at boot time.

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→ should do this in 4.0 Questionable.

1.0.6 Visual Enhancements

We will be completing the 3D look in dialogs, menus and icons. This will include work from Virginia's group, which is also planned for OS/2 2.0.

1.0.7 OPEN ISSUES

There are a number of open issues which need further evaluation for Windows 3.1. The outcome of these issues will be determined by the type of feedback we get from our customers, on decisions of our system wide shell strategy and development and testing resource availablity. These include:

- Convergence with OS/2 2.0 shell (to be discussed in a separate meeting)
- Enhancements to Control Panel's Desktop, Color, Keyboard and Mouse dialogs
- Inconsistancies in File Manager's drag/drop interface between drives vs. to the same drive
- New color picker and underlying color technology
- File Manager's search command is very limited. Do we add the same level of functionality to the search window as we have for directory windows?
- Should Setup create an "Online Document" group for all readme files? (PSS request)
- Fix inconsistancies in File Manager's and Program Managers FILE menus
- Ability to drag/drop multiple files. (complicates drag/drop work in print manager and program manager. File manager already does this. Would be really nice for printing lots of files and creating groups).
- Support for UNC connections (auto connect with printing) in Print Manager

1.1 Program Manager

1.1.1 Performance tuning

Priority: 1 Dev Requirements: 0 md (work is completed)

1.1.1.1 Fix ProgMan's use of system resource space, means reduced windowing overhead and increased screen refresh speed. Less system resources are required as more group items are created. This change will require a complete retest of Program Manager.

1.1.1.2 Perform transparent back to front screen painting for further speed enhancements.

1.1.2 Fix Usability Annoyances

Priority: 1 Dev Requirements: 0 md (work is completed)

1.1.2.1 Don't search path when full path is given and the file is not found. Unexpected behaviour (different from DOS and from MS-DOS Executive).

1.1.2.2 Include *.com, *.pif, and *.bat as assumed executables in the File Run menu command. This was supported previously in MS-DOS Executive.

Priority: 2 Dev Requirements: 1 md

1.1.2.3 Clean up error messages. Listen to the market for the most problematic dialogs.

Priority: 3 Dev Requirements: 6 md

1.1.2.4 Make Auto Arrange work for group icons in the parent Program Manager window (not just item icons in group "child" windows).

1.1.2.5 Pressing first letter of an item's title in a group window selects that item. Make consistent to listbox behaviour.

1.1.3 Add Critical or Expected Functionality

Priority: 1 Dev Requirements: 0 md (work is completed)

1.1.3.1 Add "default directory" property for items within groups. Minor user interface changes.

Priority: 2 Dev Requirements: 4 md

1.1.3.2 Make 3.0 .grp files compatible to 3.1 Program Manager. New property options have been added to group files, while maintaining compatibility with 3.1 Program Manager. Note, 3.1 group files will NOT be compatible with 3.0 Program Manager. The user will get an "invalid group" error if used under 3.0.

1.1.3.3 Enhance DDE for updating 3.0 .grps to 3.1 in Setup. Also addresses the needs for application vendors to setup groups.

1.1.3.4 Add a new property for user assigned hot keys for Windows and Non-Windows applications. This will be consistant with the support we have for DOS applications via PIF files in 3.0. Program Manager assigned hot keys will over ride hot key assignments in PIF files. If no hot key is assigned in Program Manager, then the hot key assignment in the PIF file will be used (to be compatible with 3.0). Minor interface changes need to be made.

Priority: 3 Dev Requirements: 4 md

1.1.3.5 Ability to save settings other than on exiting will be added to the Window menu. Window and icon positions will be saved. The exit dialog will be reworded for saving window and icon positions to Program Manager specifically.

1.1.3.6 Save menu settings automatically. Remove the need to "save settings" for menus. Be more consistent with Print Manager and Control Panel.

1.1.3.7 User interface mechanism for setting which programs "run" or "load" automatically when Windows boots (to avoid editing WIN.INI).

1.1.4 Drag/Drop Enhancements

Priority: 2 Dev Requirements: 1 md

Support new drag/drop messages. See section 1.1.4 for further information on the level of support.

1.2 File Manager

1.2.1 Drive Search Tuning

Priority: 1 Dev Requirements: 5 md

1.2.1.1 Searching the drive tree is a big performance problem on networks and other drive types like CD-ROMs. Currently, the feature requiring a complete drive search (i.e. every file must be opened) is the placement of a "+" on directory folders if subdirectories exist. Several beta users have complained about this. In some cases, users have placed higher priority to performance over this feature. For 3.1, we will give the users a choice to turn this feature on or off. This will require a minor user interface change.

1.2.1.2 Only add "+" once. Win 3.0 added "+" twice. This has gained us, roughly, a 50% speed improvement when this feature is in use.

1.2.1.3 Allow ESC to interupt drive search. Pressing ESC will interrupt the current drive search process. The directory tree found up to that point will be displayed. The user will be warned a partial tree is displayed. The status bar will also indicate the state of the directory window.

1.2.1.4 Selecting on a different drive in the same directory tree window should interupt any current drive searches. *Note, the benefit of this change depends on the interface for adding more than one drive tree.*

Priority: 2 Dev Requirements: 0 md (work is completed)

1.2.1.5 Background drive searching will be enabled. The user will be able to choose menu commands, manipulate files within opened directory windows and be able to switch away from File Manager when a drive search is in process.

Priority: 3 Dev Requirements: 4 md

1.2.1.6 Don't discard expanded directory tree data when you collapse. We will be evaluating ways to store tree data, eliminating the need to perform a new drive search if no file system changes have occured.

1.2.2 Screen Updates

Priority: 2 Dev Requirements: 0 md (work is completed)

1.2.2.1 Perform a window refresh after a complete copy, delete or move action is executed (vs. for each individual file change).

Priority: 3 Dev Requirements: 3 md

1.2.2.2 Perform a window refresh after a completed set of file system changes are made from a non-Windows application. This will be done by setting a timer and measuring the time between FileSysChange messages.

1.2.3 Fix Usability Annoyances

Priority: 1 Dev Requirements: 0 md (work is completed)

1.2.3.1 Include *.com, *.pif, and *.bat as assumed executables in the File Run menu command. This was supported previously in MS-DOS Executive.

1.2.3.2 Don't delete a parent directory ([..]) from a child directory window. If the user has opted to turn off confirmation notices, they can easily delete a parent directory and all of its subdirectories by accidently deleting "[..]" in a child window. This is a very dangerous feature for file manager. The user should only be able to use this directory for returning to the parent directory. All file deletions can occur only from the parent directory down.

Priority: 2 Dev Requirements: 3 md

1.2.3.3 Bring up the File Manager window automatically if a second instance is run. Remove unnecessary error message. Behave like Control Panel and Print Manager.

1.2.3.4 Make the File Attribute check boxes tri-state when multiple files are selected.

1.2.3.5 Better placement of focus when deleting files from a directory window. Place focus on the file following the last deleted file (not at the top of directory window) when a file is deleted.

1.2.3.6 Clean up error messages. Listen to the market for the most problematic dialogs.

Priority: 3 Dev Requirements: 7 md

1.2.3.7 Insert the selected file name into the Run command dialog box. Very useful for adding additional parameters to the command line. Also, gives the user functionality which was provided in MS-DOS Executive.

1.2.3.8 Better initial window placement for directory tree windows. The tree is generally more vertical than it is horizontal. The window will be opened to make more of the tree visible vertically. Less screen space will be wasted horizontally.

1.2.3.9 Position directory tree windows below disk drive icons in drive tree window. *Note, the need to add this functionality may be less important with the ability to save window positions. This will be evaluated further.*

1.2.3.10 Remove confirmation dialog when disconnecting from network drives. This is redundant, since the user needs to confirm the action to execute the command.

1.2.3.11 Standardize common accelerators with Program Manager.

1.2.4 Network Enhancements

Priority: 2 Dev Requirements: 7 md

1.2.4.1 Auto reconnect network drives and printer ports when booting Windows. Requires little if any interface changes. We are evaluating the best interface for determining how to "remember" these connections. 3 options are:

- "remember" what was connected when the user last closed Windows,
- add a "make permanent" option when you connect to the driver (like "add to previous list")
- tie to the "save settings" option in File Manager (for both drive and printer port connections)

1.2.4.2 Display network connection labels at all times for network drives.

1.2.4.3 Show network connection labels when disconnecting network drives in the Disk, Disconnect Net Drive dialog box.

1.2.4.4 Call network drivers for more detailed network error messages.

Priority: 3 Dev Requirements: 3 md

1.2.4.5 Check for open files on network drive before disconnecting (specifically for Lanman).

1.2.4.6 Provide hooks for network drivers to display a network specific dialog box for connecting to network drives (Disk, Connect Net Drive dialog).

1.2.4.7 Support for mixed case (upper and lower) volume labels for future LAN support.

1.2.5 Needed Functionality

Priority: 2 Dev Requirements: 19 md

1.2.5.1 Allow more than one disk directory tree. This requires a user interface change. There are a couple of options we can choose from, which would require the least amount of impact to the current interface. Each option is currently being evaluated.

1.2.5.2 Save menu settings automatically. Remove the need to confirm "save settings" for menus. Be more consistent with Print Manager and Control Panel.

1.2.5.3 Save directory window and icon positions if the user chooses.

1.2.5.4 Ability to save settings other than on exiting will be added to the Window menu. Window and icon positions will be saved. The exit dialog will be called only if File Manager is setup as the "shell" in SYSTEM.INI. It will be reworded for saving window and icon positions specifically to File Manager and for confirming to exit Windows.

Priority: 3 Dev Requirements: 4 md

1.2.5.5 The File Search menu command needs to offer a list of individual drives (or all) to choose from when searching. This requires a user interface change.

1.2.5.6 Add the ability to arrange folder and drive tree icons. This will be a new command on the Windows menu called "Arrange Icons" (same as for Program Manager).

1.2.5.7 Option to expand drive tree(s) always. A new option will be added to the Options Menu called "Expand tree".

1.2.6 Drag/Drop Enhancements

Priority: 2 Dev Requirements: 5 md

Support new drag/drop messages. See section 1.1.4 for further information on the level of support.

1.3 Print Manager

1.3.1 Printing Throughput

Priority: 1 Dev Requirements: 4 md

Work to better printing performance will be done in GDI, the Comm driver and in Print Manager.

1.3.2 Support for Drag/Drop

Priority: 2 Dev Requirements: 1 md

As outlined in the shell overview (section 1.1.4), drag/drop support for printing files which are dropped on the Print Manager icon or on a printer queue in the Print Manager window will be added. No user interface changes are required.

1.4 User Interface and Visuals

1.4.1 Complete 3D Look

Priority: 3 Dev Requirements: 21 md

1.4.1.1 Add 3D dialog boxes, check boxes, radio buttons and menus. Work required in USER. Resource files for all display drivers will need to be updated, but not required (i.e. we won't be breaking 3rd party display drivers). The development work requirements may be overly conservative. We will be looking at the option of taking the work which has been done already in OS/2 2.0.

1.4.1.2 Add 3D icons. All icons will be replaced in all the applets, control panel, file manager, program manager and print manager. No new code is necessary. These applications only need to be rebuilt with the new icon resources.

1.4.2 Converge Listbox Scroll Bars with OS/2 and SDM

Priority: 3 Dev Requirements: 2 md

Make scroll bar behaviour more like OS/2 and SDM when the list does not extend beyond the listbox window. An option is available for an application to have the scroll bars remain on the screen in this case (by default we remove them). If this option is used, Windows will gray the arrows and fill the elevator with white (no thumb). This will be consistent with OS/2 1.2 and 2.0 and with the next version of SDM.

1.4.3 Wrapping Icon Titles

Priority: 3 Dev Requirements: 5 md

Provide the ability for the user to set the maximum string length horizontally and the number of lines an icon title can extend in the Control Panel (Desktop enhnancement). By default, the settings would be the same as they are for 3.0.

1.5 Control Panel

1.5.1 Add setting for keyboard repeat delay

Priority:1 Development Est: 1 day

Add a setting to the Keyboard section of Control Panel to adjust the keyboard repeat delay, as well as the key repeat rate.

1.5.2 Create LCD/Plasma color schemes

Priority:1 Development Est: ?

We will create selectable color schemes that work better for users with LCD or Plasma displays. This item does not require any work from a developer. This depends on having more color elements controlled by Control Panel. This is a minor development effort, but a major program manager effort to drive defining the correct color schemes.

1.5.3 Provide settings for all color elements

Priority:1 Development Est: 1 day

All settings that are currently user configurable, should be configurable from the Control Panel. In 3.0, the following screen elements are missing from Control Panel: GrayText, Highlight, HighlightText, ButtonShadow, ButtonFace, ButtonText.

Depending on the OS/2 group, we may add additional user-defined elements. At the minimum, we will add the missing elements to the Screen Element list box in the Color dialog box. In addition, we may add to the sample screen for mouse selection of screen elements.

1.5.4 Modify Screen Font Installer to add Truetype fonts

Priority:1 Development Est: ?

Title says it all.

1.5.5 Read from printers.inf

Priority: 2 Development Est: ?

The setup.inf file is growing too large. We will break the printers out of setup.inf into its own file, printers.inf. Control Panel needs to be modified to read printers.inf when installing printers, instead of reading setup.inf.

1.5.6 Handle 3rd party install better

This is a place holder for market feedback. We may need to modify how Control Panel handles 3rd party installation of printer drivers.

1.5.7 New Control Panel Icons

Priority: 2 Development Est: external

Along with all the new icons in groups, the control panel will use new color-3d-icons.

1.5.8 Promote "Remove" botton for printers (put it net to "Install")

Priority: 2 Development Est: ?

Users have a hard time figuring out how to delete a printer, so the button will be promoted one "level" up so it's by the "Install" button.

2.0 Setup

2.1 Upgrade Windows from 3.0 to 3.1

Priority: 1 Development Est: ?

Setup will need to fully upgrade from 3.0 to 3.1, as well as from 2.x. This includes expanding the DDE with Program Manager, replacing files, and updating the win.ini and system.ini files. We are also researching how to make the Win 3.0 to Win 3.1 update Windows based.

2.2 Device detection

Priority: 1 Development Est: ?

Improve how setup detects hardware, especially networks.

2.3 Code cleanup

Priority: 2 Development Est: ?

There are several tasks that need to be done to make the process of building Windows easier. This includes improving the copy procedures to allow more flexibility in the disk layouts, and redesigning the machine section of setup.inf, and making Setup more configurable from the setup.inf file. In addition, we need to improve our verification tool: infchk.exe.

2.4 Compatibility issues with sw configurations

Priority: 2 Development Est: ?

Remove append when found--Windows is not compatible with DOS append, so Setup should disable it.
Better CONFIG.SYS handling--Setup needs a better way of finding the CONFIG.SYS when modifying it. Specifically, it needs to better detect an OS/2 system and not update the OS/2 Config; and allow for updating an alternate Config.sys. We need market feedback on whether this is worth a lot of effort.
Force the user to reboot after net setup--allows for client software during net setup.

2.5 Add installation options

Priority: 2 Development Est: ?

2.5.2 Add switch to disable DOS mouse driver installation--this is needed for OEMs who don't have permission to install our mouse drivers.

2.5.1 Add batch file installation--Corporate accounts want a way to install Windows entirely from the command line, answering all queries on the initial command line.

2.5.3 Add setup.inf switch to force network installation--Corporate accounts want to force their users to set up using the network installation method.

2.5.4 Possibly add a partial installation option for users with insufficient disk space--Will evaluate from market feedback.

2.6 Make 3rd party installation easier

Priority: 1 Development Est: ?

Setup needs to handle 3rd party installations better. Specifically, Setup should not install the VDD twice, and the user should be allowed to install 3rd party drivers under Windows maintenance mode.

2.7 Rename compressed files

Priority: 1 Development Est: ?

In 3.1, all compressed files will have a different name than the uncompressed form of the file. Setup will need to rename compressed files as it copies them to the user's hard disk. In addition, our compress and expand utilities need to be updated to handle differing file names.

2.8 Improve PIF file creation

Priority: 3 Development Est: ?

Setup should set up all PIF file settings. In addition, we could add an option in setup.inf to specify the icon file to use for the application. We will continue to improve the non-Windows application recognition by adding more applications.

2.9 General user interface improvements

Priority: 3 Development Est: ?

There are some minor enhancements could be made to the user interface. We could differentiate changed lines when viewing config.sys and autoexec.bat, we could show progress under DOS Setup with a bar similar to under Windows Setup.

2.10 User verification at install time: name and company

Priority: 3 Development Est: ?

We will do this as required by the User Verification Spec as defined by International.

3.0 Applets

3.0.1 File.Printer Setup changes for all applets

Priority: 1 Development Est: ?

All applets that support printing need to show the default printer in Printer Setup, and have an internationally aware Page Setup.

3.0.2 Support Associative Actions in all applets

Priority: 1 Development Est: 6 man days

Win 3.1, all the applets need to support associated actions/class registration as defined in the shell portion of this spec.

3.1 Calendar

Priority: 2 Development Est: ?

Fix annoying bugs, specifically the alarm + 1 day bug reported by Compaq.

3.2 An International Clock

Priority: 3 Development Est: ?

Internationalize the font used by Clock (add time separators other than the colon).

3.3 Notepad Fixes

Priority: 2 Development Est: ?

3.3.1 Notepad needs to be fixed to handle larger files (current maximum size is about 30K).

3.3.2 Improve error messages.

3.3.3 Fix annoying bugs, specifically that Time/Date only displays the date.

3.4 Paintbrush Fixes

3.4.1 Performance improvements

Priority: 1 Development Est: ?

There are a number of performance issues which need to be addressed, including; Plug memory leaks, Handle low memory better, Improve file I/O performance.

3.4.1 Address usability problems

Priority: 2 Development Est: 17 man days

There are a number of items which would make paintbrush more usable; Allow editing in Zoom in mode; Add 256 color support; Add a character dialog box; add more intuitive foreground/background color selection; Have Opaque/Transparent handled from menu item; Add shrink to fit rubber bands.

3.5 Write Fixes

Priority: 2 Development Est: ?

Write needs to handle low memory much better. Improve the support for pasted in graphics.

3.6 New Game?

Priority: 2 Development Est: external

We are exploring the possibility of acquiring a new game for Windows; Tetris, and Taipai are among the games we are looking at.

4. Core

4.1.Kernel

4.1.1 Kernel will run all Windows applications at Ring 3

Priority:1 Development Est: done

This needs to be done before applications begin coding in dependencies upon the current behavior. Allows us to install protected subsystems in future Windows versions.

4.1.2 Kernel Modifications needed by MMsys

Priority:1 Development Est: ?

Kernel enhancements include: Allow WinExec from within the LibInit of a DLL; Support FreeLibrary and FreeModule from DLL WEP func; Have the WEP function unload DLLs in a sensible order.

4.1.3 Cache WIN.INI and private INI files

Priority: 2 Development Est: done

Just as the title says.

4.2.User

4.2.1. Screen Saver

Priority:1 Development Est: done

After a specified time period with no keystrokes or mouse movements, the system will automatically invoke a specified program, which may then display any type of screen-saver on the screen.

Open Issue: Do we put in user interface in Control Panel, or just leave it for experienced users who fiddle with win.ini?

4.2.2. Improve User's "System Resources" usage

Priority:1 Development Est: 10 man days

Move menu structures out of users local heap. This should help alleviate the annoying tendency to get out-of-memory messages when you have huge amounts of global memory free. The largest use of User's local heap is for menu structures, so these will be removed to another data segment.

4.3.Protected Mode

4.3.1. DOS Extender will run under VCPI

Priority:1 Development Est: 25 man days

Being VCPI compliant allows Windows run in Standard mode under a VCPI server such as QEMM or 386-to-the-Max. This will allow the Loadhi feature of 386max and qemm to work with standard mode. Setup will be modified to no longer automatically remove these utilities.

4.3.2. Speed and Size Improvements in 386 Enhanced mode

Priority:1 Development Est: ?

Many improvements are planned. Examples: ship virtual devices in compressed form, thus both saving disk space and speeding up load time by several seconds; optimize the page table searching methods.

4.3.3. Support machines with more than 16MB of memory

Priority:1 Development Est: done

This will allow standard and 386 enhanced mode to work on MCA and EISA machines without having to first disable all super extended memory.

4.3.4 FastDisk technology

Priority:1 Development Est: 45 man days

This will let us have specific virtual devices to directly access the secondary storage devices. This will not only speed up virtual memory, but also allow us to demand-page running non-Windows applications, thus dramatically increasing our capacity on low-memory configurations. We will include components for as many popular storage devices as possible. The mechanism will be designed to leverage work already being done for OS/2 devices.

4.3.5. Support for additional hardware

Priority:1 Development Est: 5 man days

We will be adding support for new hardware devices in 386 enhanced mode, most importantly additional displays. Currently planned video include extended mode for ATI video adapters, Paradise 600x800, Genius full-screen display, and NEC 1024x1024 black-and-white monitor. Additionally we will include support for the Microsoft Ballpoint mouse, and possibly other handwriting or joystick devices.

4.4. Non-Windows Applications

4.4.1. Directed hotkeys for all applications

Priority: 2 Development Est: 7 man days

Currently directed hotkeys exist only for non-Windows applications in 386 enhanced mode. This change would enable them for all applications (and would also be in the DOS5 switcher). The hotkeys would be defined as item properties in the Program Manager.

4.4.2. Improve size and speed of non-Windows app support

Priority: 1 Development Est: ?

We will decrease the size of the WinOldAp stub, freeing up more memory for non-Windows applications. Also be smarter about only swapping used memory to disk, thus saving disk space and decreasing switch time. Finally, speed up response to ALT+TAB key.

Questionable

4.4.3. Allows applications to be run in real mode (super exclusive mode)

Priority: 3 Development Est: 20 man days

Enhanced mode Windows will support a flag specifying that an application should be run in real mode, rather than in virtual 8086 mode. This will allow ANY dos application to be run without terminating your other tasks. Examples would incompatible extended dos applications and high-performance applications (such as popular games). We would use the standard-mode Winoldap to support these applications.

Questionable

4.4.4. Allow graphics applications to run in the background

Priority: 3 Development Est: 30 man days

Currently, enhanced mode Windows on a VGA cannot run any hi-res graphics applications in the background or in a window. The Virtual Display Device will be rearchitected to allow this.

5. Networks

5.1. Network DDE

Priority: 1 Development Est: external

This consists of a new applet (the "agent") which redirects DDE messages over the network to other DDE agents running on OS/2 and Windows workstations. It works on any network supporting NETBIOS, and can be modified to support other protocols. The risk here is relying on work still to be done by Midland Bank

5.2. Improved Network Support

Priority: 2 Development Est: ?

5.2.1 Task Switch API. Adding a new API to allowing networks to prevent a task switch during critical sections. This will allow network vendors to support any asynchronous API in real and standard modes (the current product only supports NETBIOS).

5.2.2 Network specific connect dialog box. Allow network drivers to put up customized connection dialog boxes, where today the user has to step through a generic dialog box to get to network-specific enhancements. This would apply to printer and disk connections in Control Panel and File Manager.

5.2.3 UNC print connections. Support automatic connection to network printers. This would allow many workstations to use the same network printer, because they are only connected to it when actually printing.

5.2.4 Other network-related enhancements are listed under their respective areas of the product, such as Setup.

5.3. Support additional networks

Priority: 1 Development Est: external

Several network vendors are developing new or improved components to support their networks. These include Banyan, DCA/10net, DEC, LAN Manager, Novell and Ungermann-Bass. Some of these will be available earlier on the Supplemental Driver Disk. Both TOPS and SUN PC-NFS are working on supporting Windows 3.0 as well, but availability at this time is not known.

In addition, we may choose to provide support for 802.2 (DLC), which is the most commonly requested LAN protocol after NETBIOS. However, by the 3.1 timeframe all major ISVs may have implemented it on their own, removing the need for us to include it.

5.4. Support Load-Hi Software

Priority: 1 Development Est: done

We will support the upper-memory-block mechanisms defined for XMS. This will allow software such as EMM386, 386-to-the-Max and QEMM to load networks and other software devices between 640K and 1MB. This capability is also being included in DOS5. Obviously this is not a network specific feature.

6. Imaging

6.1 Fonts

6.1.1 TrueType Fonts

Priority:1 Development Est: 30 man days minimum

New outline TrueType fonts will be provided with Windows 3.1 in addition to the existing raster fonts. This will require changes to Setup so that the TrueType fonts are copied over. It will also require changes to GDI so that it calls the TrueType rasterizer to generate bitmap fonts as needed. Additional APIs will be added which may need to be added to the SDK. With the exception of dot matrix printers, printer drivers will need to be updated to download TrueType fonts. The DDK will need to be updated to describe how to update printer drivers for TrueType and to provide sample printer driver sources. Note that the majority of this work will be done for the TrueType kit in Sept 1990.

Open Issue: While we will ship at a minimum the base 13 fonts (4 styles of Times, Helvetica, Courier and 1 style of Symbol), it is not yet determined which other fonts we may ship. The Lucida is also a likely set.

6.2 Printing Enhancements

6.2.1 Ability to Print Landscape and Portrait within One Document

Priority: 2 Development Est: 9 man days

Modifications to gdi to provide a way to "merge" output from two DC's into a single print job. This approach is probably the easiest to implement and could possibly be done without modifying printer drivers (in general, an impossible proposition). This solution requires printer drivers with ExtDeviceMode() support (in order to request an orientation change). Currently, PCL4, PCL5 (for the LJIII) and PSCRIPT do have this support. New APIs may need to be added to the SDK.

6.2.2 Improve Printing Throughput Via Parallel Port

Priority: 1 Development Est: 5 man days

Modifications to gdi and comm driver to allow more data to be passed through the parallel port to improve overall printing performance.

6.3 GDI

6.3.1 DIB Driver

Priority: 2 Development Est: 40 man days

Modifications to gdi to incorporate the new DIB driver. This feature will make it easier for applications to use the Device-Independent Bitmap(DIB) format for creating graphics. Several new APIs will be added. Device drivers with DIB support are able to BLT the DIB bitmap directly onto the device which should allow for better performance.

API
? => do we really need it.

3.0 Win 3.1
This would make display specific display. cards.

7.0 Drivers

7.0.1 True Type support in the DDK

Priority: 1 Development Est: none

A special update packet will be provided with the DDK which will include a new booklet on incorporating TrueType support in printer drivers as well as diskettes with sample printer driver sources.

7.0.2 Generic Printer Driver

Priority: 2 Development Est: external

The goal is to replace our existing dot-matrix drivers with the generic printer driver from the PBU. Each printer model will require a separate "mini-driver" which describes the special features of the printer.

7.0.3 Improved Display drivers from MMsys

Priority: 2 Development Est: external

MMsys has improved the performance in the manstream display drivers, we may want these.

7.1 PCL4 and PCL5 Printer Drivers

(Note that We now have modification rights to the PCL 5 driver, but HP still maintains. HP now has modification rights to the PCL 4 driver, we still maintain it.)

7.1.1 Performance Enhancements

Priority: 1 Development Est: mostly done

Several performance enhancements will be done including variable banding. These have already been done for PCL4 and need to be incorporated into PCL5.

7.1.2 Imaging Enhancements

Priority: 1 Development Est: 1 man day

The drivers will add support for greyscaling by supporting the SetDIBitstoDevice function. They will also add other support for DIBs. The drivers will add support for downloading TrueType fonts.

7.1.3 Implement PCL5 Features

Priority: 2 Development Est: external

These include downloading CG outline fonts, implementing Mode III compression, and implementing HP/GL II graphics. HP Boise has "control" of this driver, but we do have modification rights.

7.2 PostScript Driver

7.2.1 Requested Enhancements From Aldus

Priority: 2 Development Est: 5 man days

Aldus as joint owner of this driver has asked for two enhancements: 1) Add Adobe structuring conventions and color separation enhancements to support color separable PostScript output for a Print Pre-Processing program. 2) Support Transverse rotation for printers using paper rolls.

7.2.2 TrueType Support

Priority: 1 Development Est: ?

The driver will add support for downloading TrueType fonts. The exact method we use is still to be determined.

7.3 Other Printer Drivers

7.3.1 TrueType Support

Priority: 1 Development Est: external

The most important goal for external printer drivers for Windows 3.1 is for as many to support TrueType fonts as possible. All non dot-matrix printer drivers will need to be updated eventually so they can download TrueType fonts.

There will also be new printer drivers available during the Windows 3.1 timeframe. See the attached list of display driver candidates for the Supplemental Driver Disk, Appendix A. Marketing will have to determine whether any of these are important enough to add to the retail product. Disk space in the retail product is very tight.

8.0 SDK

8.1 SDK Debugging

8.1.1 Support Debugging in a Window

Priority:1 Development Est: 15 man days

Enable debugging in a window so that a true GUI debugger can be implemented for Sequoia, the Quick products, and Borland's compiler/debugger for Windows.

This debugger interface is a Windows implementation of a similar debugger interface in Presentation Manager. Most of the work is in User, to provide for "soft" mode debugging in which the debugger responds to messages on behalf of the debuggee application. The debugger interface is basically the same windebug.dll employed by CVW 3.0, but there is new debugging-in-a-window support provided by User. The new User support needs to documented so that third parties like Borland can take advantage of it.

Open Issues: Support for a new debugger interface needs to be implemented in User. Should we also implement a second, cleaner debugger interface for Sequoia, in which debugging is done in a second VM? Note, the second VM debugger interface can't be our only solution, because it requires 386 hardware that Borland and Quick customers can't be expected to have.

8.1.2 Better Failure Mode Diagnostic Messages

Priority: 2 Development Est: 15 man days?

Windows functions typically provide a NULL return value, or similar value, to indicate failure of the call, but no additional information is provided. New support should be added to send diagnostic information to the debugger or COM port. The diagnostic information explains the reason for the NULL return. The message should include the segment/offset location of the calling code, so that the debugger can parse the message and display the symbolic location (module/function) of the failed call.

8.1.3 Debugging APIs to Query Windows Internal Data

Priority: 2 Development Est: external

These APIs give a developer visibility into Windows internal data without compromising undocumented internal formats. For example, there would be an API to query the internal structure elements of a window.

Open Issues: Which internal data structures should we provide query capabilities for? Can these debugging APIs used by tools other than debuggers? Can these APIs be called directly by applications for debugging purposes (kind of like doing printf's to display program data)?

8.1.4 Improve Useability and Performance of CVW

Priority: 2 Development Est: ?

Areas of improvement include:

(1) Decrease debuggee load time.
(2) Improve CVW's ability to trace back from a GP fault.
(3) Provide an expensive alternative to the required 8514/VGA dual monitor configuration for PS/2 customers.
(4) Utilize 386 debug registers.
(5) Display Windows-specific data (see 8.1.3, "Debugging APIs to Query Windows Internal Data" above)
(6) Provide means of alt-tabbing between CVW and Windows rather than having CVW be system modal.
(7) Provide a Restart option.

Areas Effected: windebug.dll (owned by win386 group) and CVW (owned by Languages)

Open Issues: Languages may not have an expert developer staffed for CVW. What inexpensive hardware solution should we offer to PS/2 customers– single monitor screen swapping, or COM port terminal?

8.2 SDK Resource Editing

8.2.1 Specify Integrated Resource Editor

Priority: 1 Development Est: ?

The integrated resource editor itself won't be implemented for 3.1, but the resource editing interface library (RC.DLL) will. We need to understand the requirements of the integrated resource editor sufficiently to specify RC.DLL.

8.2.2 SDK Resource Editing Interface Library (RC.DLL)

Priority: 1 Development Est: ?

RC.DLL enables a resource editor to compile resources from an intermediate binary representation into Windows internal resource format. This library also provides for reverse compiling from Windows internal resource format into an intermediate binary format known by the resource editor.

RC.DLL provides for attaching resources to Windows executables, and for also reading and removing resources from Windows executables. This will enable resource editors to copy resources from one Windows application to another. This will also eliminate a separate resource compilation step in the process of developing Windows applications. The RC.DLL interface needs to be documented so that third parties can take advantage of it.

Open Issues: Does RC.DLL have to support compiling of resource script (.RC files)?

Other SDK Additions

8.3 Dynamic Data Exchange DLL

Priority: 1 Development Est: external

This significantly reduces effort required by Windows developers to implement DDE in their applications. Provide source code compatibility with Presentation Manager DDE. The plan is to port the Presentation Manager 1.1 DDE DLL to Windows. Aldus is already doing the port. Our work is to make sure this DDE DLL works.

Open Issues: The implementation of this DDE DLL assumes protected mode. Do we want to deliver a Windows/SDK feature that requires 286/386 hardware?

8.4 Common Dialog APIs

Priority: 1 Development Est: ?

Standardize frequently used dialogs. Borrow and productize standard dialog code in the form of a DLL so it can be fitted to Windows 3.0:

(1) File Open
(2) File Save As
(3) Printer setup
(4) Color picker

8.5 Advanced SDK Documentation

Priority: 1 Development Est: ?

Windows Development will provide source materials to User Ed in the form of white papers, which can be delivered to customers before 3.1 is out. Provide new chapters in SDK Guide to Programming on:

(1) Debugging techniques, particularly using CVW and WDEB.
(2) Application tuning techniques, particularly using the profiler and swap tools.

8.6 OS/2 Box for Language Tools

Priority: 1 Development Est: 20 man days more

Enables Windows SDK user to run OS/2 versions of C, Link, and other Languages tools in protected mode while in Windows. Breaks 640K barrier for MS compilers and linkers running under Windows (in a special OS/2 box). This makes Windows a more attractive development environment.

Open Issues: Should the OS/2 box be distributed with MS compilers instead of or in addition to the SDK?

9. Other

9.1. Add Right-to-Left (BiDi) support

Priority: ? Development Est: ?

This is a very large amount of work, and more importantly needs much definition. It is considered unlikely in the 3.1 timeframe.

9.2. Double Byte Character Support

Priority: 1 Development Est: ?

Windows 3.1 will be built in both single-byte and double-byte versions. The latter will serve as the basis for far-east versions of the product. This will be the first version to be developed with DBCS support inherent in the base code, greatly speeding up far-east product development.

9.3. Improve floating-point math performance

Priority: 1 Development Est: ?

Floating point performance is currently unacceptable and will be greatly improved.

9.4. Support Windows in ROM

Priority: 1 (?) Development Est: 20 man weeks

Windows 3.1 will be built in both normal and ROMable form.

9.5. Handicapped Access devices

Priority: 2 Development Est: external

Modified mouse and keyboard drivers will be included to provide handicapped access. Features include sticky-keys, slow-keys, mouse-keys, and simulated mouse and keyboard input from a alternative serial input devices (such as puff-and-sip). A small control application will be provided for adjusting the special functions provided by these drivers. They will be recommended for all Windows machines in public space or accessed by multiple users, since all special support is off until requested. The drivers are being developed by the University of Wisconsin.

9.6. Support joystick input

Priority: 2 Development Est: 3 man days

Second, support for joystick input, requested by multimedia group. Affects User and a driver.

Preliminary Windows 3.1 Features/Work Items

Feature	Cat	Area	Task	Priority	Status	Dev	Progmun	IntDays	ExtDays
	APIs	App Int	Public Drag/Drop API	4			LisaCr		
Shell Drag/Drop	APIs	App Int	Write up/spec Assoc. Actions (class registration) API	2		CraigC	LisaCr	4	
Applet Improvement	Apps	Calendar	Fix alarm + 1 day bug	2			MelissMo		
Applet Improvement	Apps	Clock	internationalize digital.fon	2		fernando	MelissMo		
Applet Improvement	Apps	general	Show default printer in Printer Setup	1			MelissMo		
Applet Improvement	Apps	general	internationalize Page Setup	2			MelissMo		
Shell Drag/Drop	Apps	general	Support for assoc. actions (class registration)	2		CraigC	MelissMo	6	
Applet Improvement	Apps	Notepad	Edit larger files.	1			MelissMo		
Applet Improvement	Apps	Notepad	Fix Time/date bug	2			MelissMo		
Better Error Messages	Apps	Notepad	Improve error messages	3			MelissMo		
Applet Improvement	Apps	Pbrush	Bug fixes	1		GeorgeP	MelissMo		
Applet Improvement	Apps	Pbrush	Performance enhancements	1	None kn	GeorgeP	MelissMo		
Applet Improvement	Apps	Pbrush	Plug memory leaks	1	None kn	GeorgeP	MelissMo		
Applet Improvement	Apps	Pbrush	256 color bitmap support	2		GeorgeP	MelissMo		
Applet Improvement	Apps	Pbrush	Edit in Zoom in mode	2		GeorgeP	MelissMo	10	
Applet Improvement	Apps	Pbrush	improve file IO	2		GeorgeP	MelissMo		
Applet Improvement	Apps	Pbrush	add character dialog box	3	Mostly d	GeorgeP	MelissMo	3	
Applet Improvement	Apps	Pbrush	more intuitive foreground/background color selection	3		GeorgeP	MelissMo	2	
Applet Improvement	Apps	Pbrush	Opaque/Transparent handled from menu	3		GeorgeP	MelissMo	2	
Applet Improvement	Apps	Pbrush	replace curve tool	3	done, do	GeorgeP	MelissMo	0	
Applet Improvement	Apps	Pbrush	shrink to fit rubber bands	3		GeorgeP	MelissMo		
Applet Improvement	Apps	Terminal	evaluate VT-100 and VT-52 compatibility	2			MelissMo		
Applet Improvement	Apps	Write	Handle low memory better	2			MelissMo		
Applet Improvement	Apps	Write	Handle pasted in graphics better	2			MelissMo		
DOSX Compatibility	Core	DosX	ChargeCard support	1		EarleH	GregLo	2	
DOSX Compatibility	Core	DosX	DPMI 0.9 Compliant	1		EarleH	GregLo	25	
~~Single stack (a bug fix)~~	~~Core~~	~~DosX~~	~~Single stack (a bug fix)~~	~~1~~		~~EarleH~~	~~GregLo~~		
>16meg Compatibility	Core	DosX	Compatibility for EISA mahines with more than 16 megs	1		EarleH	GregLo	2	
DOSX Compatibility	Core	DosX	VCPI client	2	in progr	EarleH	GregLo	25	
TrueType	Core	GDI	On the fly TrueType fonts, screen and printers	1				20	
Portrait/Landscape in same DOC	Core	GDI	Print Portrait and Landscape in the same document	2				1	
SDK Diagnostic Messages	Core	GDI	Better failure mode diagnostic messages - debug only. SDK issue.	2					
Better Error Messages	Core	GDI	Detailed error messages for printing errors.	2		CraigC		2	
	Core	GDI	UNC connections/Auto connect when printing (GDI Issue?)	3		BobGu	GregLo		
MMSys Requirements	Core	GDI	DIB driver (from multimedia)		in progress			40	
MMSys Requirements	Core	GDI	Lockable GDI objects, new pagelock API						
	Core	Kernel	Move from Ring 1 to Ring 3 (everything get's moved)	1	done	TonyG	GregLo	3	
SDK Diagnostic Messages	Core	Kernel	Better failure mode diagnostic messages - debug only. SDK issue.	2		TonyG	GregLo		
MMSys Requirements	Core	Kernel	Allow WinExec from within the LibInit of a DLL	2		TonyG	GregLo		
MMSys Requirements	Core	Kernel	Support FreeLibrary and FreeModule from DLL WEP func	2		TonyG	GregLo		
Performance/Size	Core	Kernel	Cache WIN.INI and private initialization files	2	done	TonyG	GregLo	5	
MMSys Requirements	Core	Kernel	Have the WEP function unload DLLs in a sensible order	2		TonyG	GregLo		

Feature	Cat	Area	Task	Priority	Status	Dev	Progman	IntDays	ExtDays
Performance/Size	Core	Loader	Compress VxDs	2			GregLo		
TrueType	Core	New DLL	TrueType Rasterizer	1		jeanp	timmce		
Application Services/Color	Core	New DLL	CIE-Lab Color Model Support	2		DavidW	LisaCr	15	180
Performance/Size	Core	User	Squeeze USER's ds down - move menus out	1		bobgu	GregLo	10	
Windows-H Support	Core	User	Support for a stylist, Windows-H	1		bobgu	GregLo	5	
3rd party SDK Support	Core	User	Message queue hack debugging in a window	1		davidds	GregLo	15	
	Core	User	Bug Fixes	1		bobgu	GregLo	13	
Improved Printing Throughput	Core	User	Improve parallel port throughput	1		CraigC	GregLo	1	
SDK Diagnostic Messages	Core	User	Better failure mode diagnostic messages - debug only. SDK issue.	2		bobgu	GregLo	5	
SDK Support	Core	User	Drag handle frame style - needed for future SDK	2		bobgu	GregLo	5	
SDK Support	Core	User	Installable drivers - support in user. Needed for SDK.	2		davidds	GregLo	5	
SDK Support	Core	User	Private export of certain dialog functions - for SDK	2		bobgu	GregLo	1	
Win App hot keys	Core	User	Activate Win app when assigned hot key pressed	3		davidds	GregLo	2	
	Core	User	Screensaver in USER	3	done	davidds	GregLo	1	
MMSys Requirements	Core	User	Support for a joystick, single input queue support	1		bobgu	GregLo	3	
MMSys Requirements	Core	User	Transparent window background (bobgu to investigate)	3					
General Performance	Core	Win87em	Performance improvements for WIN87EM.DLL	1			GregLo		
TrueType	DDK	Doc	Printer driver modifications for TrueType outlines	1					
	DDK	Drivers	Include new versions of all drivers						
	Drivers	All Printer	Take printer lists out of the drivers						
Improved Printing Throughput	Drivers	Comm	Improve parallel port throughput	1		CraigC	GregLo	2	
	Drivers	DDK	Need to provide updated printer and display drivers, plus fonts doc	1					
Complete and enhnace visuals	Drivers	Display	Update resources in display drivers (3D control/gray arrows)	2		BobGu	LisaCr	2	
Performance/Size	Drivers	Display	Take improved drivers from MMSys	2					
Loadhi UMB Support	Drivers	DOS	EMM386 work (Support UMBs)	1		JimMat	GregLo		
	Drivers	Generic	Additional mini-drivers to support more printers	1			Timmce		
>16meg Compatibility	Drivers	himem	Compatibility for EISA mahines with more than 16 megs	1			GregLo		
Handicap support	Drivers	keyboard	Handicapped access keyboard driver	1			GregLo		
Handicap support	Drivers	mouse	Handicapped access mouse	1			GregLo		
	Drivers	Mouse	Ballpoint mouse driver						
Portrait/Landscape in same DOC	Drivers	PCL 4	Support Portrait and Landscape in same document	1			Timmce	4	
Performance/Size	Drivers	PCL 4	Variable Banding		done		Timmce		
TrueType	Drivers	PCL 4	TrueType download support				Timmce	5	
Performance/Size	Drivers	PCL 4	Performance Improvements		done		Timmce		
	Drivers	PCL 4	SetDIBitstoDevice support for PCL greyscale, DIB support				Timmce	1	
	Drivers	PCL 5	Download CG outlines	1			Timmce		
Portrait/Landscape in same DOC	Drivers	PCL 5	Support Portrait and Landscape in same document	1			Timmce	4	
	Drivers	PCL 5	Implement HP-GL graphics	3			Timmce		
	Drivers	PCL 5	Mode III compression	3			Timmce		
Performance/Size	Drivers	PCL 5	Variable Banding				Timmce		
TrueType	Drivers	PCL 5	TrueType download support				Timmce		
Performance/Size	Drivers	PCL 5	Performance Improvements				Timmce		

Feature	Cat	Area	Task	Priority	Status	Dev	Progman	IntDays	ExtDays
	Drivers	PCL 5	SetDIBitstoDevice support for PCL greyscale, DIB support				Timmee		
	Drivers	PSCRIPT	Document structuring conventions for Aldus				Timmee	5	
TrueType	Drivers	PSCRIPT	TrueType download support				Timmee		
Portrait/Landscape in same DOC	Drivers	PSCRIPT	Support Portrait and Landscape in same document					4	
Handicap support	Drivers	Special	Handicapped access controller (mouse control panel)	1			GregLo		
MMSys Requirements	Drivers	System	Incorporate MMsys Timer APIs	2					
	Nets	DDE	Net DDE from Midland Bank	1			GregLo		20
	Nets	Novell	Support fForce on CancelConnection	2			GregLo		2
	Nets	Print	Support UNC print connections	3		CraigC	GregLo		
Application Services	Nets	Win3270	Evangilize HLLAPI.DLL from 3rd party	2			GregLo		
	Nets	Winnet	Provide network specific connect dialog	3					
Better Error Messages	Nets	Winnet	Improved error messages. (listen to the market)				GregLo		
	Nets	Winnet	Support performance improvements in FileMan				GregLo		
Application Services	SDK	API	Standard file open/save as/print dialogs (.DLL or code)	2		BobGu	LisaCr		
Application Services	SDK	API	Evaluate adding the Multimedia WINCOM.DLL						
Application Services	SDK	API	Standard library or DLL for getting the Custom Color Picker	2		BobGu	LisaCr		
Application Services	SDK	DDE	DLL for DDE API, Aldus is suppose to do this work	1					
Improved SDK	SDK	Debug	Support comm terminal in CVW	2					
Improved SDK	SDK	Debug	WDEB386 (don't use INT 68) and other debugging work					3	
Improved SDK	SDK	Doc	Document patterns .ini	2					
Improved SDK	SDK	SDK	OS/2 base calls - "Looking Glass" ✓	1					
Improved SDK	SDK	SDK	Function to display path in space	3					
Application Services	SDK	Setup	Setup sources for Windows portion of Setup for ISVs				MelissMo		
3rd party SDK Support	SDK	Tool	RC.DLL for 3rd party resource editors/compilers						
Improved SDK	SDK	Tool	Resource Editor for EXE editing						
	Setup	configs	Improve detection, esp. network	1			MelissMo		
	Setup	configs	Make 3rd party install easier; OEM setup, VxD install	1			MelissMo		
	Setup	configs	find and remove append from sys files	2			MelissMo		
	Setup	configs	improve OS/2 sys file updating	2			MelissMo		
	Setup	configs	support 3rd party drivers under Win Setup maintenence	2			MelissMo		
	Setup	DDE	DDE with progman for installing groups	1			Melissmo		
	Setup	dos apps	Allow spficying icon and file to get the icon from in setup.inf	2			MelissMo		
	Setup	dos apps	Improve nwa recognition	2			MelissMo		
TrueType	Setup	Fonts	Install TrueType Fonts	1					
	Setup	Inf	Break .inf file into setup.inf and printers.inf	2			MelissMo		
	Setup	Intl	Enhance code page support				MelissMo		
	Setup	Nets	Install Net DDE	1			Melissmo		
	Setup	OEM	INF switch for not updating DOS mouse drivers (OEM need)	1			MelissMo		
	Setup	Setup	Change filename of compressed files	1			MelissMo		
	Setup	Setup	expand ProgMan DDE	1			MelissMo		
	Setup	Setup	Improve copy procedures to eliminate potential disk swapping prob	1			MelissMo		
	Setup	Setup	INF switch to force net setup	1			MelissMo		

Preliminary Windows 3.1 Features/Work Items

Feature	Cat	Area	Task	Priority	Status	Dev	Progman	IntDays	ExtDays
	Setup	Setup	Make sys file munger more configurable from .inf file	2			MelissMo		
	Setup	Setup	Setup minimal/partial setup	3			MelissMo		
	Setup	Setup	User verification at install time; name and company						
LAN Client Install	Setup	Setup	Install LAN client from Win Setup				MelissMo		
	Setup	Setup.inf	Allow setting more PIF items	2			MelissMo		
	Setup	ui	Improve UI on compress/expand utilities	1			MelissMo		
	Setup	ui	differentiate changed line in config/autoexec	2			MelissMo		
	Setup	ui	Redesign machine section	2			MelissMo		
	Setup	ui	show progress under DOS setup	3			MelissMo		
	Setup	update	Remove VPICD hack from a Win 3.0 installation	1			MelissMo		
	Setup	update	Update 3.0 to 3.1	1			MelissMo		
TrueType	Shell	Control	Install and Delete TrueType Fonts	1					
	Shell	Control	Create LCD/Plasma color schemes	1			MelissMo	0	
	Shell	Control	Fix keyboard repeat delay	1		ClarkC	MelissMo	1	
	Shell	Control	Handle 3rd party install better (printers?)	1		ClarkC	MelissMo		
	Shell	Control	Modify Screen Font Installer to add Truetype fonts	1		ClarkC	MelissMo		
	Shell	Control	Provide settings for all color elements	1		ClarkC	MelissMo	1	
	Shell	Control	Interface to NetDDE agent	2			Melissmo		
	Shell	Control	Read from printers.inf	2		ClarkC	MelissMo		
	Shell	Control	Move "Remove" button to first dialog	2			Melissmo		
	Shell	Control	~~New 3D icons~~	3			MelissMo	1	
	Shell	Control	Interface to Screen saver feature	3			MelissMo		
	Shell	Control	Provide network specific connect dialog	3			MelissMo		
	Shell	Control	Option to set wrapping icon titles length and # of lines	3			MelissMo	1	
Improved Printing Throughput	Shell	PrintMan	Improve parallel port throughput (gdi, user too)	1		CraigC		1	
Shell Drag/Drop	Shell	PrintMan	New Drag/Drop messages	2		CraigC	LisaCr	1	
Auto network connect	Shell	PrintMan	UNC connections/Auto connect when printing	3		CraigC	LisaCr		
Setting default data directory	Shell	ProgMan	Add "default directory" property for group items	1	Done	CraigC	LisaCr	0	
Setup requirement	Shell	ProgMan	Enhance DDE for creating groups (for 3.1 setup and apps)	1		ChrisG	LisaCr	3	
Shell Performance	Shell	ProgMan	Fix ProgMan's use of DS (system resource space)	1	Done	CraigC	LisaCr	0	
Shell Performance	Shell	ProgMan	Back to front screen painting	1	Done	CraigC	LisaCr	0	
Remove Annoyance	Shell	ProgMan	Include *.com, *.pif, and *.bat as assumed executables (file.run)	1	Done	CraigC	LisaCr	0	
Compatibility with win 3.0	Shell	ProgMan	Make 3.0 .grp files compatible to 3.1 ProgMan	1	Done	CraigC	LisaCr	0	
Remove Annoyance	Shell	ProgMan	Don't search path when path is given and the file's not found	1	Done	CraigC	LisaCr	0	
Remove Annoyance	Shell	ProgMan	Ability to save changes other than on exit	2	Done	CraigC	LisaCr	0	
Remove Annoyance	Shell	ProgMan	Reword the exit dialog	2		CraigC	LisaCr	1	
Shell Drag/Drop	Shell	ProgMan	New Drag/Drop messages	2		CraigC	LisaCr	3	
Win App hot keys	Shell	ProgMan	Property for user assigned hot keys in Win apps	2		CraigC	LisaCr	1	
Startup settings	Shell	ProgMan	Ability to set which programs "run" or "load" at boot time	2		CraigC	LisaCr	2	
Remove Annoyance	Shell	ProgMan	Save menu settings automatically	2		CraigC	LisaCr	1	
Remove Annoyance	Shell	ProgMan	Press first letter of item title selects item (groups like listboxes)	3		CraigC	LisaCr	4	
Remove Annoyance	Shell	ProgMan	Make Auto Arrange work for group icons (not just item icons)	3		CraigC	LisaCr	2	

Feature	Cat	Area	Task	Priority	Status	Dev	Progmun	IntDays	ExtDays
Remove Annoyance	Shell	Shell	Other annoying usability problems (listen to the market)	1			LisaCr	10	
Better Error Messages	Shell	Shell	Better error messages and dialog text (listen to the market)	2			LisaCr	2	
Better network support	Shell	Shell	Auto reconnect net drives and printer ports	2		CraigC	LisaCr	3	
Remove Annoyance	Shell	Shell	Option to wrap icon titles	3		DavidDs	LisaCr	4	
Remove Annoyance	Shell	UI	Multiple-Line Entry fields deviate from CUA	2	Done	DavidDs	LisaCr	0	
Consistency with OS/2/SDM	Shell	UI	~~Make scroll bars like OS/2~~	2		DavidDs	LisaCr	2	
Complete and enhnace visuals	Shell	UI	~~Complete the 3D look with new buttons and controls~~	3		BobGu	LisaCr	18	
Complete and enhnace visuals	Shell	UI	~~New 3D icons~~	3			LisaCr	1	
Remove Annoyance	Shell	UI	Standardize accelerators	3			LisaCr	1	
Shell Performance	Shell	WinFile	Option to turn "+" and "-" on or off for net and hard drives	1	Done	ChrisG	LisaCr	0	
Remove Annoyance	Shell	WinFile	Include *.com, *.pif, and *.bat as assumed executables (file.run)	1	Done	CraigC	LisaCr	0	
Shell Performance	Shell	WinFile	Massive performance improvements	1	80% do	ChrisG	LisaCr	5	
Shell Performance	Shell	WinFile	Perform refresh after complete copy/delete/move action	1	Done	CraigC	LisaCr	0	
Remove Annoyance	Shell	WinFile	Don't allow deleteing parent dir ([..]) from child dir window	1	Done	CraigC	LisaCr	0	
Shell Performance	Shell	WinFile	Allow ESC to interupt drive search	1	Done	ChrisG	LisaCr	0	
Shell Performance	Shell	WinFile	Clicking on a drive should interupt a drive search	1	Done	ChrisG	LisaCr	0	
Drag/drop	Shell	WinFile	New Drag/Drop messages	2		CraigC	LisaCr	5	
Remove Annoyance	Shell	WinFile	Allow more than one disk directory tree (lots of work)	2		ChrisG	LisaCr	15	
Remove Annoyance	Shell	WinFile	Bring up WinFile icon if second instance is run (like CP and Print	2	Done	ChrisG	LisaCr	0	
Better Error Messages	Shell	WinFile	Call winnet for more detailed network error messages	2		CraigC	LisaCr	2	
Remove Annoyance	Shell	WinFile	Make file attribute check boxes tri-state	2		ChrisG	LisaCr	1	
Remove Annoyance	Shell	WinFile	Net connection labels on net drives	2		ChrisG	LisaCr	1	
Remove Annoyance	Shell	WinFile	Show Net connection labels when disconnecting net drive	2		CraigC	LisaCr	1	
Remove Annoyance	Shell	WinFile	Place focus on file following the last deleted file (not top of list)	2		ChrisG	LisaCr	1	
Startup Settings	Shell	WinFile	Save directory windows and positions	2	Done	ChrisG	LisaCr	0	
Shell Performance	Shell	WinFile	Background drive search	2	Done	ChrisG	LisaCr	0	
Startup Settings	Shell	WinFile	Ability to save changes other than exit	2		ChrisG	LisaCr	1	
Startup Settings	Shell	WinFile	Reword or remove the exit dialog (accept if main shell)	2		ChrisG	LisaCr	1	
Remove Annoyance	Shell	WinFile	Save menu settings automatically	2		ChrisG	LisaCr	2	
Better network support	Shell	WinFile	Check for open files before disconnecting	3		CraigC	LisaCr	1	
Remove Annoyance	Shell	WinFile	Remove dialog for confirming net disconnect (redundant)	3		ChrisG	LisaCr	1	
Remove Annoyance	Shell	WinFile	Add ability to arrange icons to Window menu	3		ChrisG	LisaCr	1	
Auto expand tree option	Shell	WinFile	Add option to expand tree automatically	3	Done	ChrisG	LisaCr	0	
Shell Performance	Shell	WinFile	Don't discard directory tree when you collapse	3		ChrisG	LisaCr	4	
Better network support	Shell	WinFile	Provide network specific connect dialog	3		ChrisG	LisaCr	1	
Shell Performance	Shell	WinFile	FileSysChange refresh after completed action (set a timer)	3		ChrisG	LisaCr	3	
Remove Annoyance	Shell	WinFile	Insert selected item name into the Run command dialog box	3		ChrisG	LisaCr	1	
Remove Annoyance	Shell	WinFile	Position directory tree win below disk drive icons in drive tree	3		ChrisG	LisaCr	2	
Remove Annoyance	Shell	WinFile	File.search should list individual drives or all to choose from	3		ChrisG	LisaCr	3	
~~DOS 5.0 Undelete command~~	~~Shell~~	~~WinFile~~	~~Support DOS 5 undelete command~~	~~3~~		~~ChrisG~~	~~LisaCr~~		
Better network support	Shell	WinFile	Support mixed-case volume labels	3		ChrisG	LisaCr	1	
Remove Annoyance	Shell	WinFile	Better initial window placement for directory tree, vertical	3		ChrisG	LisaCr	2	

Preliminary Windows 3.1 Features/Work Items

Feature	Cat	Area	Task	Priority	Status	Dev	Progman	IntDays	ExtDays
Intl Releases	Special	Intl	Maintain DBCS code						
Intl Releases	Special	Intl	Right to Left Windows						
Performance/Size	Special	Perform	Complete performance analysis, improvements.				Davidcol		
	Special	Release	ROM Windows						
	User Ed	WUG	Additional book for power users, advanced materials						
	User Ed	WUG	Update booklet for 3.1						
	Win386	Nets/3270	Provide 802.2 support in vnetbios	1		AmitC	GregLo	10	
FastDisk	Win386	OEM	FastDisk VxDs, will need one for each HD controller	1			GregLo		
	Win386	v86mmgr	Page Granular EMMEXCLUDE, IE on 4K boundries	2	done	AaronR	GregLo	0	
	Win386	VDD	Support other misc video adapters	1			GregLo	5	
	Win386	VDD	Background/windowed Hi-Res graphics apps on VGA	1			GregLo	30	
	Win386	VDD	Extended Modes for ATI video boards	2			GregLo	3	
	Win386	VDD	Paradise 600x800 VGA driver for NEC	2			GregLo	?	
	Win386	VDD	Support for NEC 1024X1024 B&W monitor	2			GregLo	?	
	Win386	VDD	Support for Genius full page monitor	3			GregLo	?	
	Win386	vdmad	Better DMA handing	1			GregLo	5	
	Win386	vmda	Super exclusive mode, IE real mode	2			GregLo	20	
	Win386	vmda	Activate Win app when assigned hot key pressed	3			GregLo		
	Win386	vmm	Rewrite timeslicer	2		W-Micheal	GregLo	25	
FastDisk	Win386	vmm	Fast Disk for 386 enhanced mode (v2store)	1		RalphL	GregLo	20	
	Win386	vmm	Pull out system dependent code into a new VxD	1		RalphL	GregLo	5	
MMSys Requirements	Win386	VTD	VTD that uses timer mode 4	2		RalphL	GregLo		
MMSys Requirements	Win386	VxD	Lock on demand VxDs						
FastDisk	Win386	VxD	FastDisk VxD for IBM AT	2		TonyG	GregLo	10	
FastDisk	Win386	VxD	FastDisk VxD for IBM SCSI	2		TonyG	GregLo	15	
MMSys Requirements	Win386	Win386	Multiple threads in Enhanced mode	3		RalphL	GregLo	10	
MMSys Requirements	Win386	Win386	Power-On Services (POS) for accessing SCSI on MCA	3					
>16meg Compatibility	Win386	Win386	Compatibility for EISA mahines with more than 16 megs	1	done	AaronR	GregLo		
	Win386	Win386	Enable Loadhi in 386MAX, EMM386, and QEMM (v86mmgr, v	2	done	AaronR	GregLo		
	Win386	Win386	Optimizations/speed	2			GregLo		
	Win386	Win386	Debugging in a VM (likely a 4.0 item)	3			GregLo	20	
	Win386	WOA	Intense and underline text attributes	2		AaronR	GregLo	3	
	WOA	WOA	COMSPEC support	1		AmitC	GregLo	1	
	WOA	WOA	Reduce disk size of saved files	1		AmitC	GregLo		
	WOA	WOA	Task switch API for nets	1		AmitC	GregLo	2	
	WOA	WOA	Reduce amount of convention memory WOA takes	1	done	AmitC	GregLo		
Win App hot keys	WOA	WOA	Support Windows application hotkeys	3		AmitC	GregLo	7	
	WOA	WOA	Win 286 WOA - Potential Problem with Copy/Paste			AmitC	GregLo		
	WOA	WOA	Installable API mapping layer	2		AmitC	GregLo	25	
	WOA	WOA	802.2 support	3		AmitC	GregLo	5	
	WOA	WOA	Improved support for asynchronous network API	2		AmitC	GregLo	5	

F. Windows 4.0 Objectives

As stated in the planned release section of this document, Windows 4.0 is a major release of Windows and we are not bound by short term marketing constraints outlined earlier in this document. Although detailed planning has not begun, it's worth stating some of the objectives:

Product Goals

- Identical shell with OS/2 2.0 where it makes sense.
- Start the transition toward Object Oriented look and feel in the shell
- Begin merging Win and OS/2 APIs, all new APIs must match OS/2s.
- Retain 1 megabyte design goal
- Scalable memory/performance (ie get's better with more RAM)
- Consistent Personal Metaphor (new shell, enhance UI)
- Robust Application Integration services
- Continue to be sexy
- Complete Environment (with DOS) from power on to power off
  - DOS integration (utilities in Windows)
  - Network
  - 3270
- Improved developer environment
- Improved end-user control of environment (configurable)
- Portable/Laptop support (ROM-able, power management)
- Continue to extend support hardware (printers, displays, computers)
- Win 3.0 app/net/3270 compatibility
- 32 bit API for Win apps/devices
- Threads
- Improve graphical/color services

Sources for Feedback

Now that Windows 3.0 has shipped we will embark on gathering feedback from the "world" and defining the next versions of Windows. Feedback, product requests, and strategic direction will be incorporated into the Windows 4.0 (and Windows 3.1) product plan as appropriate. Just for clarification, here's a list of sources we get information and direction from:

<u>Sources of Feedback/direction</u>

- Customer feedback on Win 3.0
  - PSS
  - Letters
  - Customer visits
  - End user, Corp, ISV, IHV, OEM, Edue, Govt, Retailers
  - Press
- Formal research
  - Questionnaire/Telephone
  - Focus Groups
- Competitive Analysis
- Influencers
- OS2 Consistency/Compatibility
- BillG, SteveB "Company Direction"
- Technology Trends

<u>Specific Groups</u>

- MS OO Group, MMsys, OS/2, Apps, Network, Languages, Help, Intl, OEM group, User Ed, TandyTr, Handwriting, Porthole, PSS/MSU, SEs, Sales Force, PBU, IBM and other OEMs, and the DOS group.

G. Supplemental Drivers Program - Appendix A

The following section shows a list of drivers targeted for the Supplemental drivers disk, scheduled to be released August 10, 1990.

Device Support for Supplemental Drivers Disk - August 1990

Schedule	
Date	Task
DONE	Updated 3.0 SDK/DDK is distributed
DONE	Deadline for final commitment on drivers
DONE	Final retail, SDK, & DDK software distributed
DONE	Deadline for delivery of all Beta drivers
6/12/90-7/5/90	Verification cycle
7/6/90	Deadline for delivery of all final drivers
7/9/90-8/6/90	Certification cycle
8/7/90	Product Freeze
8/10/90	Disks/materials delivered to manufacturing

Printers	Drv Name	Vendor	HW	Status
New NEC 24 Pin	NECPNSER.DRV, NECPNS	GCA/NEC	Y	DONE, received on 6/8
HP PCL 5	HPPCL5a.DRV	HPBD	Y	Haven't received yet, special arrangement
PCL / HP LaserJet	HPPCL.DRV	Win group	Y	DONE
PostScript	PSCRIPT.DRV	Win group	Y	DONE
New Fujitsu dot matrix	FUJDLSER.DRV, FUJDLSE	GCA/Fujitsu	Y	DONE, received on 6/8
HP GL/2 (Plotter driver)		HPSD	Y	Will send driver and cartridge on 6/12
Okidata OL-400		Okidata	Y	DONE, received on 6/8, printer borrowed
Okidata OL-800		Okidata	Y	DONE, received on 6/8, printer borrowed
Okidata 380 - 24 pin	OKI24.DRV	Okidata	Y	DONE, received on 6/8, printer borrowed
Okidata ML-390 Plus	OKI24PLS.DRV	Okidata	Y	DONE, received on 6/8, printer borrowed
Okidata ML-391 Plus	OKI24PLS.DRV	Okidata	Y	DONE, received on 6/8
Okidata ML-393 Plus	OKI24PLS.DRV	Okidata	Y	DONE, received on 6/8
Okidata ML-393 C Plus	OKI24PLS.DRV	Okidata	Y	DONE, received on 6/8, printer borrowed
Xerox 4045	XER4045.DRV	Xerox	N	DONE, we have it
Xerox 4046	XER4046.DRV	Xerox	N	DONE, we have it
Xerox 4020	XER4020.DRV	Xerox	N	DONE, we have it
AMT Accel-500 24 pin color	ACCEL.DRV	Hoolko	N	DONE, we received on 6/6
Bitstream FLEX	FLEX.DRV, SFFLEX	Hoolko	N	DONE, received on 6/8
IBM Quickwriter	IBM5204.DRV	Hoolko	Y	DONE, received on 6/8
JDL-850/950 24 pin color	JDL850.DRV	Hoolko	N	DONE, we received driver on 5/11
Olivetti DM-309	DM309.DRV	Hoolko	Y	DONE, we received on 6/6
Okidata OL-820	OL820.DRV	Hoolko	Y	DONE, we received on 6/6, printer borrowed
Canon LBP-8 III/4	LPBIII.DRV	Hoolko/PBU	Y	DONE, at PBU to test, we received on 5/11
Seiko CH-5500	CH5500.DRV	Hoolko/PBU	N	DONE, at PBU to test, we received on 5/11
Kodak Diconix 150 12 jet ink jet	DCNX150.DRV	Hoolko/PBU	N	DONE, at PBU to test, we received on 5/11
Kodak Diconix 150 Plus 12 jet ink jet	DCNX150P.DRV	Hoolko/PBU	N	DONE, at PBU to test, we received on 5/11
Kodak Diconix color 4 12 jet color in	DICONDX4.DRV	Hoolko/PBU	N	DONE, at PBU to test, we received on 5/11
Brother M series		PBU		In PBU testing
Canon BJ-130e		PBU		In PBU testing
Canon BJ-10e		PBU		In PBU testing
Star NX-1000		PBU		In PBU testing
Star XB-2410		PBU		In PBU testing
Star XB-2415		PBU		In PBU testing

PostScript WPD Files		Vendor	Status
Apple LaserWriter v23.0	APPLE230.WPD	Adobe	DONE, received on 5/10
Apple LaserWriter Plus v38.0	APPLE380.WPD	Adobe	DONE, received on 5/10
Apple LaserWriter Plus v42.2	APPLE422.WPD	Adobe	DONE, received on 5/10
AST TurboLaser/PS v47.0	AST_470.WPD	Adobe	DONE, received on 5/10
Agfa-Compugraphic 9400P v49.3	CG94_493.WPD	Adobe	DONE, received on 5/10
Dataproducts LZR-2665 v47.0	DATAP462.WPD	Adobe	DONE, received on 5/10
Dataproducts LZR 1260 v47.0	DP_US470.WPD	Adobe	DONE, received on 5/10

IBM 4019 v52.1 (17 Fonts)	IBM17521.WPD	Adobe	DONE, received on 6/6
IBM 4216-020 v47.0	IBM20470.WPD	Adobe	DONE, received on 5/10
IBM 4216-030 v50.5	IBM30505.WPD	Adobe	DONE, received on 5/10
IBM 4019 v52.1 (39 Fonts)	IBM39521.WPD	Adobe	DONE, received on 6/6
Linotronic 100 v42.5	L100_425.WPD	Adobe	DONE, received on 5/10
Linotronic 200 v47.1	L200_471.WPD	Adobe	DONE, received on 5/10
Linotronic200 v49.3	L200_493.WPD	Adobe	DONE, received on 5/10
Linotronic 300 v47.1	L300_493.WPD	Adobe	DONE, received on 5/10
Linotronic 300 v49.3	L300_493.WPD	Adobe	DONE, received on 5/10
Linotronic 500 v49.3	L500_493.WPD	Adobe	DONE, received on 5/10
Apple LaserWrite II NTX v47.0	LWNTX470.WPD	Adobe	DONE, received on 5/10
Apple LaserWriter II NT v47.0	LWNT_470.WPD	Adobe	DONE, received on 5/10
OceColor Pscript v50.3	O5241503.WPD	Adobe	DONE, received on 6/6
Oki OL840/PS v51.8	OL840518.WPD	Adobe	DONE, received on 5/10
QMS PS 2200 v51.0	Q2200510.WPD	Adobe	DONE, received on 6/6
QMS PS 2210 v51.0	Q2210510.WPD	Adobe	DONE, received on 6/6
QMS PS 2220 v51.0	Q2220510.WPD	Adobe	DONE, received on 6/6
QMS PS 810 Turbo	Q810T517.WPD	Adobe	DONE, received on 6/6
QMS PS 820 Turbo	Q820_517.WPD	Adobe	DONE, received on 6/6
QMS PS 820	Q820T517.WPD	Adobe	DONE, received on 6/6
QMS-PS 810 v47.0	QMS81470.WPD	Adobe	DONE, received on 5/10
QMS-PS 800 Plus v46.1	QMS8P461.WPD	Adobe	DONE, received on 5/10
QMS-PS 800 v46.1	QMS8_461.WPD	Adobe	DONE, received on 5/10
QMS ColorScript 100 v49.3	QMSCS494.WPD	Adobe	DONE, received on 5/10
Qume ScripTEN v47.0	QUME_470.WPD	Adobe	DONE, received on 5/10
Ricoh PC Laser 6000/PS v50.5	R6000505.WPD	Adobe	DONE, received on 5/10
Schlumberger 5232 Color v50.3	S5232503.WPD	Adobe	DONE, received on 5/10
TI OmniLaser 2108 v45.0	TI08_450.WPD	Adobe	DONE, received on 5/10
TI OmniLaser 2115 v47.0	TI15_470.WPD	Adobe	DONE, received on 5/10
TI MicroLaser PS17 v52.1	TIM17521.WPD	Adobe	DONE, received on 6/6
TI MicroLaser PS35 v52.1	TIM35521.WPD	Adobe	DONE, received on 6/6
Unisys AP9415 v47.0	U9415470.WPD	Adobe	DONE, received on 6/6
Varityper Series 4000/5330	V5334522.WPD	Adobe	DONE, received on 5/10
Varityper 4200B-P	VT42P522.WPD	Adobe	DONE, received on 5/10
Varityper 4300P	VT43P522.WPD	Adobe	DONE, received on 5/10
Varityper Series 4000/5300	VT530522.WPD	Adobe	DONE, received on 5/10
Varityper Series 4000/5500 v52.2	VT550522.WPD	Adobe	DONE, received on 5/10
Varityper VT-600P v48.0	VT60P480.WPD	Adobe	DONE, received on 5/10
Autologic APS-PS PIP with APS-6/10	APS08522.WPD	Adobe	DONE, received on 6/11
Autologic APS-PS PIP with LZR 120	APS12522.WPD	Adobe	DONE, received on 6/11
Autologic APS-PS PIP with LZR 260	APS26522.WPD	Adobe	DONE, received on 6/11
Autologic APS-PS PIP with APS-6/80	APS80522.WPD	Adobe	DONE, received on 6/11
Monotype Imagesetter v52.2	MONO_522.WPD	Adobe	DONE, received on 6/11
Canon LBP-8 Mark IIIR	CLB8R512.WPD	Adobe	DONE, received on 6/11
Canon LBP-8 Mark IIIT	CLB8T514.WPD	Adobe	DONE, received on 6/11
Canon LBP-8 Mark III	CLB8_514.WPD	Adobe	DONE, received on 6/11
Fujitsu RX7100PS	F71RX503.WPD	Adobe	DONE, received on 6/11
NEC Silentwriter2 Mod. 90 v52.2	N2090522.WPD	Adobe	DONE, received on 6/11
NEC Silentwriter2 290 v52.0	N2290520.WPD	Adobe	DONE, received on 6/11
NEC Silentwriter LC 890 XL v50.5	N89X505.WPD	Adobe	DONE, received on 6/11
NEC Silentwriter LC 890 v47.0	N890_470.WPD	Adobe	DONE, received on 6/11
NEC Colormate PS v51.9	NCOL_519.WPD	Adobe	DONE, received on 6/11
QMS PS Jet Plus v46.1	QMSJP461.WPD	Adobe	DONE, received on 6/6
QMS PS Jet v46.1	QMSJ_461.WPD	Adobe	DONE, received on 6/6
QMS ColorScript 100 Model 10	QCS10503.WPD	Adobe	DONE, received on 6/6
QMS ColorScript 100 Model 20/30	QCS23503.WPD	Adobe	DONE, received on 6/6
Scantext 2030/51	SCG20522.WPD	Adobe	DONE, received on 5/10
Varityper VT-600W v48.0	VT60W480.WPD	Adobe	DONE, received on 5/10

HP LaserJet IID v.52.2	HPIID522.WPD	Adobe	DONE, received on 6/11
HP LaserJet III v.52.2	HPIII522.WPD	Adobe	DONE, received on 6/11
HP LaserJet IIP v.52.2	HPIIP522.WPD	Adobe	DONE, received on 6/11
Tektronics Phaser PX	PX.WPD	Tektronics	DONE. we have it

Others		Vendor	Status
mouse for disabled	AP-MOU.DRV	Trace	DONE, received on 6/11
keyboard for disabled	AP-KBD.DRV, AP-KBDHP.	Trace	DONE, received on 6/11

Network		Vendor		Status
Banyan Vines	VINES.DRV	Banyan	Y	DONE, received on 6/11
Novell	NETWARE.DRV	Novell	Y	DONE, received on 6/12
10 Net	WTNET.DRV	DCA/10net	Y	DONE, received on 6/11
Ungerman Bass		Ungerman	Y	driver will be here on 6/13

Displays *	Drv Name	Vendor		Status
Compaq VGA	CPQIVGS.DRV	Compaq	Y	DONE, received on 6/11
Video Seven VGA	V7VGA.DRV	MS	Y	DONE, Speed enhanements
DGIS	S3HI.DRV, S3LO.DRV	GSS	Y	DONE, received on 6/7
TIGA	TIGA.DRV	TI		DONE, received on 6/12
1024 x 768, 16 col	V776816.DRV	Headland/Video Seven		DONE, received on 6/7
800x600, 16 col	V760016.DRV	Headland/Video Seven		DONE, received on 6/7
720x540, 16 col	V754016.DRV	Headland/Video Seven		DONE, received on 6/7
640x480, 16 col	V748016.DRV	Headland/Video Seven		DONE, received on 6/7
720x512, 256 col	V7512256.DRV	Headland/Video Seven		DONE, received on 6/7
VGA 1024x768 16 col	VGA1024.DRV	Western Digital		DONE, received on 6/12
VGA 800x600 16 col	VGA800.DRV	Western Digital		DONE, received on 6/12
VGA 640x480 256 col	PVGA480.DRV	Western Digital		DONE, received on 6/12
VGAWonder (800x600 16 col)	WIN3-54B.DRV	ATI		DONE, received on 6/6
VGAWonder (1024x763 16 col)	WIN3-55B.DRV	ATI		DONE, received on 6/6

* includes .DRV, VDD, GR2, and GR3

H. Windows TrueType ISV Kit - Appendix B

The following section describes in detail the TrueType kit we plan to release to ISVs in Sept 90.

The Truetype Font Kit

for

Windows 3.0

Product Specification
For The Add-on Product That
Provides Truetype Outline Fonts
Capability to Windows 3.0

1. Overview

The Truetype Font Kit For Windows is an add-on product that the end-user can install after having installed Windows 3.0. The kit, targeted for September 1990, includes Truetype outline fonts for the base 13 PostScript fonts which consist of the normal, italic, bold, and bold italic styles of Times, Helvetica, and Courier and one style only of Symbol. The actual font names used will depend on the font vendor used. Additionally, the kit will include12 Lucida fonts. Getting final high quality versions of these Truetype fonts by September is believed to be our critical path for this project.

The kit will provide a Setup program that will update the Windows graphic engine (GDI) and Control Panel, add the Truetype rasterizer, and provide updated printer drivers with Truetype support. With the kit installed, the user will be able to generate screen fonts using these Truetype outlines and scale them to the desired point size. Additionally, the user will be able to print these screen fonts which will provide the much desired WYSIWYG capability. All existing fixed size Windows raster fonts and variable size Windows vector "stick" fonts will still be available for use. The user will also have the option of purchasing and installing additional Truetype fonts for use within Windows as they become commercially available from the font vendor community. The kit will include two 5.25" disks (three 3.5" format) and a saddle-stitch booklet describing the Setup process and a brief overview of what Truetype Outline fonts are, how they differ from the current Windows fonts, and deliver on the promise of providing WYSIWYG capability within Windows. The approximate cost for the kit will be about $15 to cover materials and shipping costs. We will encourage ISVs to bundle this kit with their product.

2. Schedule

July 1, 1990	First Beta Version of Windows With Truetype Available
August 1 1990	Code Complete including all scheduled printer drivers
September 1, 1990	Final Truetype Fonts Received
October 1, 1990	Release to Manufacturing

3. Software Deliverables

Truetype Font Kit Setup Program (New) **Man Weeks Effort: 2**

A new Windows-based Setup program will be written which will check to see if the person is running Windows 3.0 and if the user has at least 1 megabyte (approx.) of free disk space. It will then update GDI, the Screen Font Installer, and copy over the Truetype Rasterizer as well as the 13 Truetype Outline fonts. It will automatically update all existing printer drivers in use and will prompt the user to re-setup the desired printer drivers. New on-line help will also be provide with this Setup program.

Update Control Panel To Install TrueType Fonts **Man Weeks Effort: 1**

The existing Windows Screen Font Installer will need to be updated so that it can install Truetype Outline fonts in addition to installing Windows format raster fonts. The Truetype font is displayed at a nominal size just as vector/stroke fonts are today. Control panel's on-line help will also need to be updated.

Windows Graphics Engine (GDI) **Man Weeks Effort: 8**

The Windows graphics engine will be updated so that it calls the Truetype rasterizer as needed to generate glyphs for the screen and printer.

Windows Truetype Rasterizer **Man Weeks Effort: 6**

The Windows version of the Truetype rasterizer will need to be optimized for performance and size under Windows.

Printer Driver Strategy
While our ultimate strategy will be to eventually support Truetype fonts across all of the Windows supported printers, we will only be able to incorporate Truetype support into a subset of the printer drivers for the first release due to time constraints. All Page Printer type drivers need to be modified in order to print Truetype fonts. At a minimum, we plan to ship updated PCL4 (LaserJet II), PCL5 (LaserJet III) and Postcript printer drivers. If time permits, we will to try to get support for the two Canon printer models, Canon LBPII and LBPIII since they are important for the European market. and will also try to include the popular HP DeskJet . The remaining HP Paintjet and IBM 4019 will be targeted for the Windows 3.1 release. Dot matrix printer drivers should not require any modification to the driver to successfully print with Truetype fonts. It is unclear at this time how we will implement Truetype support into plotter device drivers. Please see the attached worksheet which lists currently shipping Windows printer drivers.

Impact On Printer Drivers That Are Not Updated In Time
They will not have the extra font engine calls within them to enumerate the fonts available from the Truetype rasterizer and will print the closest matching device/soft font available.

The Truetype Fonts
The Truetype fonts are being acquired through the Printer Business Unit (PBU). The goal is to get the 13 base Postscript fonts as well as 12 Lucida fonts. The absolute minimum font requirements for this kit are the Postscript 13 fonts. The 12 Lucida fonts are scheduled to be finished in time for this release but are not viewed as a critical component. Getting the base 13 fonts in final form by September 1st is seen to be our critical path for this project.

Documentation **Man Weeks: 2**
A saddle-stitch booklet will be provided with the Truetype Font Kit which has a section on running the Setup Program included with the Kit. It will also have a section discussing what Truetype Outline Fonts are. This section will provide information on which Truetype fonts are included with the kit and describe the scaling capabilities of Truetype fonts and how they compare to the previous Windows raster fonts. It will also note that additional Truetype fonts will soon be available from all leading Type vendors. It will briefly explain how they provide a WYSIWYG capability since these same fonts are used when printing. A marketing blurb will also make note of the fact that Truetype is the same font technology that is to be provided within the new Macintosh System 7 computer and Microsoft's OS/2 Operating System which will allow for document portability between these systems.

4. Product Ramifications

Impact on the SDK
This will impact the SDK for Win 3.1 in that several new APIs will be made available and some additional information will need to be added to the Fonts Chapter. Need to meet with ISVs to review our proposed APIs to see if they are adequate.

Impact on the DDK **Man Weeks: 2**
The Printers and Fonts Kit will need to be updated with a chapter on how to update printer drivers to incorporate Truetype support.

The sources for the Postscript, PCL4 and PCL5 sources with Truetype support will be provided.

Impact On Windows User Guide (WUG)

No short term impact on the WUG. For Win 3.1, we may want to consider including the information in the Kit's Saddle-stitch booklet. It could be added in a New Features in Windows 3.1 section at the beginning of the WUG.

Size Enumeration

The Truetype outline fonts should be handled as our current vector/stroke fonts are. These are also scalable. It is up to the application to specify the list of proposed point sizes as well as allow the user to specify a custom size.

Testing Requirements

Performance

We will need to create a series of scripts which tests the performance of TrueType under Windows and then compare it against Windows without Truetype, ATM for Windows and ATM for the Macintosh.

Quality

We will need to create a mechanism for comparing Truetype fonts created under Windows with those created on the Macintosh to ensure that they are identical.

Beta Test

We need to get beta testers who really care about fonts to be included in this test. We will try to leverage off of ISVs who plan to bundle the kit to conduct beta tests with their users as well. We hope to work closely with Aldus on PM 4.0. beta sites if they adopt Truetype.

Projection of Disk Space Requirements:

File	Current	Projected
GDI.EXE	134k	150k
T2.DLL	100k	100k
13 base PS fonts x 50k		650k
12 Lucida Fonts x 50k		600k
CONTROL.HLP	71k	80k
CONTROL.EXE	161	180k
SETUP.EXE		100k
SETUP.HLP		50k
HPPCL.DRV	271k	300k
HPPCL.HLP	12k	20k
PSSCRIPT.DRV	261k	300k
PSSCRIPT.HLP	21k	30k
HPPCL5A.DRV	206k	250k
DESKJET.DRV	151k	170k
DESKJET.HLP	13k	20k
	Approximately:	3 Mb
	After Compression:	2 Mb

We will use a compression scheme which will reduce disk usage by about a third so the total disk usage should be approximately 2 Megabytes. The Setup program will not be compressed and from our knowledge fonts do not compress well.

Requirements: TWO 1.2 Mb (5.25") diskettes
or THREE 720k (3.5") diskettes.

Priority	Driver Filename	Printer Models
	Page Printers(8)	
1	HPPCL.DRV	All LaserJet I and II Compatible Printers
2	hppcl5a.drv	All LaserJet III Compatible Printers
3	PSCRIPT.DRV	All PostScript Compatible Printers
4	LBP8II.DRV	Canon LBP-8II
4	CANONIII.DRV	Canon LBP-8III/LBP-4
4	DESKJET.DRV	HP DeskJet Family
5	ibm4019.drv	IBM Laser Printer 4019
6	PAINTJET.DRV	HP PaintJet Series
	Plotters (1)	
	HPPLOT.DRV	ALL HP Plotter Models and Compatibles
	Dot Matrix Printers (21)	
	TTY.DRV	Generic / Text Only
	EPSON24.DRV	All Epson 24 Pin Compatibles
	EPSON9.DRV	All Epson 9 Pin Compatibles
	FUJIMTRX.DRV	All Fuji Dot Matrix Printers
	NEC24pin.DRV	All Nec 24 Pin Dot Matrix Printers
	OKI24.DRV	All Okidata 24 Pin Printers
	OKI9.DRV	All Okidata 9 Pin Printers
	OKI9IBM.DRV	All Okidata 9 Pin IBM Printers
	OLIPRIN2.DRV	Olivetti DM 250, DM 400, PR 24
	OLIPRINT.DRV	Remaining Olivetti DM and PR Series
	proprint.DRV	IBM ProPrinters
	propm24.DRV	All IBM 24 Pin ProPrinters
	DM600.DRV	Olivetti DM 600
	CITOH.DRV	AT&T 470/475 and C-Itoh 8510
	QWIII.DRV	IBM QuietWriter III
	TH760.DRV	Hermes 820 and Olivetti TH 760
	THINKJET.DRV	HP ThinkJet (2225 C-D)
	TI850.DRV	TI 850/855
	TOSHIBA.DRV	Toshiba P1351 and P351
	IBMGRX.DRV	AT&T 473/478, IBM Graphics, and Okidata 92/93-IBM
	IBMCOLOR.DRV	IBM Color Printer