



Sherlock Consulting Limited

OmniFlop Floppy Disk Driver & Wizard

User Guide

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1. Introduction

1.1 Product Overview

OmniFlop is a utility suite for accessing non-standard floppy disk formats in a standard PC. This is useful for archiving and resurrecting ancient data formats and floppy disks.

1.2 Purpose

This document is the User Guide for the OmniFlop utility suite.

1.3 Scope

This guide covers installation of the OmniFlop floppy disk driver and use of the OmniFlop Wizard application.

1.4 Readership

This document is targeted at any person involved in using the OmniFlop utility.

1.5 References

Ref	Title	Author	Description

1.6 Acknowledgements

This document is a first edition.

The product and this document owe credit to:

Jason Watton for authorship.
 Chris Richardson (<http://www.8bs.com>) for testing, encouragement, and support.
 Jonathan Graham Harston for extensive and unique information about alien disk formats.
 The Stairway To Hell website (<http://www.starwaytohell.com>).
 Robert Schmidt and "The BBC Lives!" (<http://bbc.nvg.org>).
 The BBC Micro community via the BBC Micro Mailing List.
 Peter Edwards for offering me a beer (or was it Sam?).
 Paulo Gomes for telling me about compatibility with Shima Seiki sewing machines.
 Others who have tried, tested, and used previous versions of OmniDisk and OmniFlop.
 Those rightly disgruntled by being missed off this list - tell me (I'm sorry).

All of the above have the right to be identified where appropriate as authors of their respective works.

1.7 Glossary

Definitions in the text are shown ***italicized and bold***. Use of terms recently defined elsewhere or a direct quote from elsewhere in the text are shown *italicized*. Bold and underlining are used for emphasis.

API	Application Programmer's Interface, a set of functions and declarations which provide the programmer of an application to use an object.
BIT	Built-In Test
CAN	Controller Area Network
Hex	Hexadecimal

RESIO	Red Earth Systems I/O system - a range of simple modules for developers to control electronic I/O from a PC.
Rx	Receiver/Reception
Tx	Transmitter/Transmission
μC	Micro-controller.
μP	Microprocessor.
USB	Universal Serial Bus - an electrical and signaling standard plus protocol for device communications.

1.8 History

The following versions of OmniFlop have been released:

Date	Version	Details
31st Dec 2004	v0.01	<p>Beta Release: Supports:</p> <ul style="list-style-type: none"> • 5¼" 360kB drive: Standard DOS formats only • 3½" 720kB drive: Standard DOS formats only • 5¼" 1.2MB drive: Extended formats (see below) • 3½" 1.44MB drive: Extended formats (see below) • 3½" 2.88MB drive: Standard DOS formats only • Standard x86 system architecture: Extended formats (see below) • NEC 98 system architecture: DOS formats only • 5¼" 360kB drive: DOS 160kB • 5¼" 360kB drive: DOS 180kB • 5¼" 360kB drive: DOS 320kB • 5¼" 360kB drive: DOS 320kB x1024 • 5¼" 360kB drive: DOS 360kB • 3½" 720kB drive: DOS 720kB • 5¼" 1.2MB drive: DOS 160kB • 5¼" 1.2MB drive: DOS 180kB • 5¼" 1.2MB drive: DOS 320kB • 5¼" 1.2MB drive: DOS 320kB x1024 • 5¼" 1.2MB drive: DOS 360kB • 5¼" 1.2MB drive: DOS 720kB • 5¼" 1.2MB drive: DOS 1.2MB • 5¼" 1.2MB drive: (Extended) BBC DFS 40 (100kB/200kB) • 5¼" 1.2MB drive: (Extended) BBC DFS 80 (200kB/400kB) • 5¼" 1.2MB drive: (Extended) BBC DDOS 360kB (1-side) • 5¼" 1.2MB drive: (Extended) BBC DDOS 720kB • 3½" 1.44MB drive: (Extended) BBC DFS 40 (100kB/200kB) • 3½" 1.44MB drive: (Extended) BBC DFS 80 (200kB/400kB) • 3½" 1.44MB drive: (Extended) BBC DDOS 360kB (1-side) • 3½" 1.44MB drive: (Extended) BBC DDOS 720kB • 3½" 1.44MB drive: DOS 720kB • 3½" 1.44MB drive: DOS 1.44MB • 3½" 2.88MB drive: DOS 720kB • 3½" 2.88MB drive: DOS 1.44MB • 3½" 2.88MB drive: DOS 2.88MB
2nd Jan 2005	v0.02	<ul style="list-style-type: none"> • Extended formats disabled by default
2nd Jan 2005	v0.03	<p>Beta Release:</p> <ul style="list-style-type: none"> • Simple Analysis (Test) support added for all drive types. • Enhanced error reporting in Wizard.
11th Jan 2005	v0.04	<p>Beta Release:</p> <ul style="list-style-type: none"> • Enhanced Analysis algorithm - changed to distinguish between formats and sub-formats (e.g. 720kB/640kB) and check tracking. • Analysis support for NEC98 x86 system architecture (all drive types).

		<ul style="list-style-type: none"> • All drive types: Custom format added for readable unrecognised formats. • Read/Write of custom (unrecognized) formats added. • 'Test' function tries to match format & advises of type of read/write to use. • Format option added but <u>not implemented</u>. • Pre-defined formats extended - now covers: <ul style="list-style-type: none"> • (Extended) BBC DFS 40 (100kB single sided/200kB double sided) • DOS 160kB • DOS 180kB • (Extended) BBC DFS 80 (200kB single sided/400kB double sided) • DOS 320kB • DOS 320kB (1024 bytes/sector) • (Extended) BBC DDOS 360kB (single sided) • DOS 360kB • (Extended) BBC ADFS L 640kB • (Extended) CP/M-80 / PDOS 640kB • (Extended) BBC DDOS 720kB • Spectrum +3 CP/M 720kB • Atari ST DSDD 720kB • Amstrad CP/M 720kB • DOS 720kB • (Extended) BBC ADFS D, D+, E, E+ 800kB • (Extended) Spectrum Miles Gordon Tech +D/Disciple 800kB • (Extended) DOS 800kB • DOS 1.2MB • (Extended) BBC ADFS F, F+ 1600kB • DOS 1.44MB • DOS 2.88MB • User Guide updated to include Windows 2000 installation.
12th Feb 2005	v1.00	<p>Release:</p> <ul style="list-style-type: none"> • Format option implemented for all pre-defined formats. • Pre-defined formats amended for GPL (format) and GSL (read/write). • Licensing added (levels All, Format, BBC, Other, Custom). • User selections stored between runs for use as default. • Added to pre-defined formats: <ul style="list-style-type: none"> • (Extended) BBC ADFS S 160kB • (Extended) BBC ADFS M 320kB • (Extended) BBC Master 512 DOS Plus 800kB • (Extended) BBC Z80 CP/M Acorn 400kB • Corrected pre-defined formats: <ul style="list-style-type: none"> • DOS 360kB (3.5" 1.44MB FDD)

1.9 Disclaimer of Warranty

THIS SOFTWARE IS DISTRIBUTED "AS IS" AND WITHOUT WARRANTIES AS TO PERFORMANCE OF MERCHANTABILITY OR ANY OTHER WARRANTIES WHETHER EXPRESSED OR IMPLIED. BECAUSE OF THE VARIOUS HARDWARE AND SOFTWARE ENVIRONMENTS INTO WHICH THIS PROGRAM MAY BE PUT, NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS OFFERED. GOOD DATA PROCESSING PROCEDURE DICTATES THAT ANY PROGRAM BE THOROUGHLY TESTED WITH NON-CRITICAL DATA BEFORE RELYING ON IT. THE USER MUST ASSUME THE ENTIRE RISK OF USING THE PROGRAM. ANY LIABILITY OF THE SELLER WILL BE LIMITED EXCLUSIVELY TO PRODUCT REPLACEMENT OR REFUND OF PURCHASE PRICE.

2. Installation

2.1 System Requirements

- a) An IBM-PC compatible 386 or better with a **built-in NEC-compatible floppy disk controller**.
- b) Windows 2000 SR1 or later, or Windows XP.

Windows 95, Windows 98, and Windows Me users should use **OmniDisk** at <http://www.shlock.co.uk/Utils/OmniDisk> instead of OmniFlop.

2.1.1 External Floppy Drives

The OmniFlop driver is unlikely to work with external drives, e.g. USB external floppy drives. These do not afford the access to the floppy disk controller that the OmniFlop driver requires.

USB has a rigidly-defined protocol for floppies. To read/write strange formats requires an NEC μ PD765-compatible FDC (Floppy Disk Controller) *plus* access to it - a floppy drive at the end of a USB cable rarely provides the necessary functions. However, it could if the manufacturer of the drive made it so...

The tweakable parameters offered by the USB drives simply aren't enough to read/write/format alien formats - for example, there's no command to select 'double density' (MFM) or 'single density' (FM)... As an aside, the Microsoft floppy driver didn't support MFM/FM switching either, which is probably why 'new' USB floppy drives simply don't offer this option.

Basically, USB floppy drives were made to allow you to access 'standard' DOS-format disks with limited 'customisation'. Get an internal floppy drive - they're also lot cheaper!

2.2 Components

The distribution of OmniFlop (<http://www.shlock.co.uk/Utils/OmniFlop>) consists of 4 files:

<i>OmniFlop.inf</i> <i>OmniFlop.sys</i>	The OmniFlop floppy disk driver. This replaces the standard Microsoft-supplied generic floppy disk driver, and extends its capabilities (accessing FAT12/FAT16/DOS/Windows floppy disks is still possible).
<i>OmniFlop.exe</i>	The OmniFlop Wizard. This application provides access to the enhanced services of the driver.
<i>OmniFlop.pdf</i>	This user guide in Adobe pdf format.

The package is distributed as a WinZip archive containing all 4 files.

External registration is sometimes required - see 2.5.

2.3 Installation

The files in 2.2 must be extracted from their archive and copied to a directory, preferably on a hard disk. Then installation must be performed in the order described below.

To re-install or update the driver, it is recommended that you first 'Roll-back' the driver to the Microsoft default, to avoid leaving a trail of versions behind. See section 2.4 first, before you follow the installation sequence below.

2.3.1 Driver

The driver is a fully-compliant WDM driver for Windows NT, 2000, and XP.

You do not have to install the driver. Without the driver installed, the OmniFlop wizard will read and write the (standard) DOS formats that Windows knows natively. With the driver installed, the OmniFlop wizard will read and write an extended list of formats not usually accessible from within Windows. If you only want to access standard DOS-format floppies, skip this section and proceed with 2.3.2.

Note that Windows will usually opt for using the Microsoft driver. Worse, **Windows XP will strenuously resist installing the driver.** This is because it has not been authorised by Microsoft: no money has been paid for them to 'rubber stamp' it as 'Windows Compliant'. **Do not worry** about the number of warnings or cautions encountered when installing the driver – it's because Microsoft hasn't been paid.

However, at the same time, it would be remiss not to warn of the danger of changing this system component of Windows (part of the reason Windows complains so much). This software, as is usual with all software, comes with a disclaimer of warranty (see 1.9). Both Windows 2000 and Windows XP are capable of reverting to the Microsoft driver, if you wish – the installation is not permanent! There are currently no reported faults known to exist in this software.

2.3.1.1 Windows 2000

Right-click the 'My Computer' icon on the desktop and select 'Properties'. Alternatively, navigate to the Control Panel (click the 'Start' button and select 'Settings' and 'Control Panel') then select 'System' to give the System Properties.

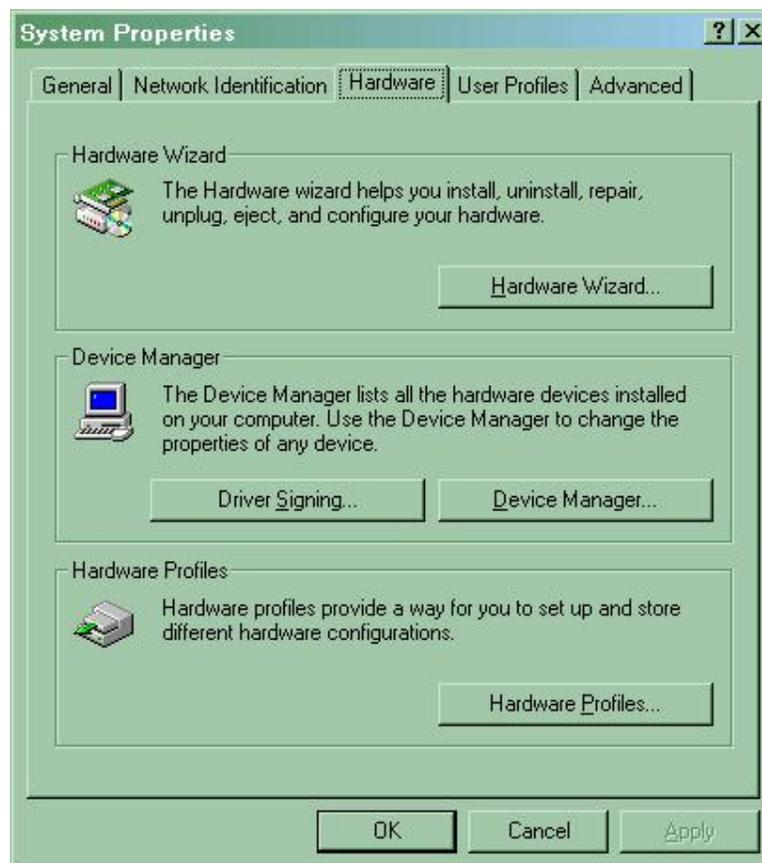


Figure 1. Win2000: System Properties

Select the 'Hardware' tab and click on 'Device Manager'.

In Device Manager, click the '+' by 'Floppy disk drives' and double-click the 'Floppy disk drive':

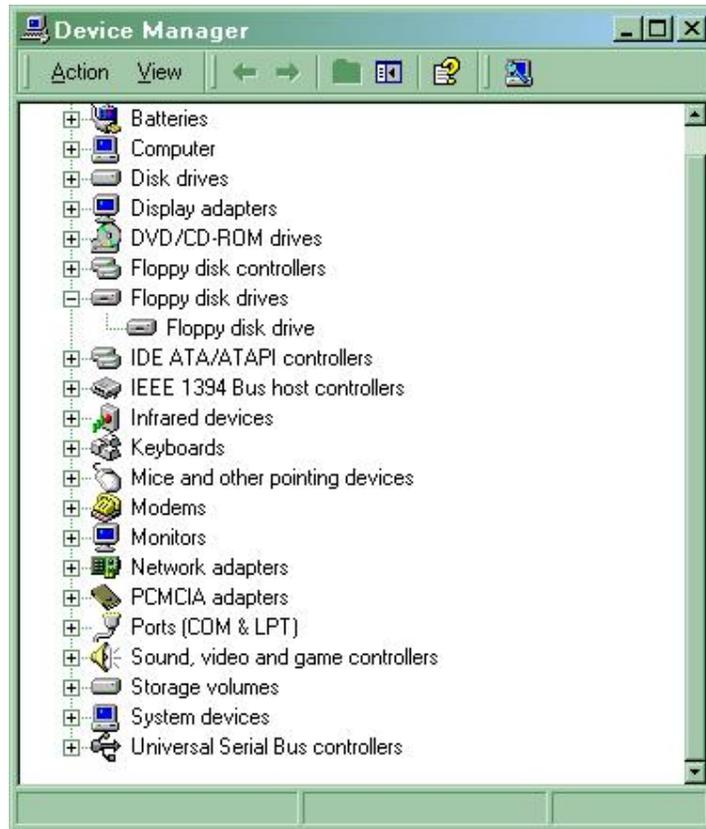


Figure 2. Win2000: Device Manager

Click the 'Driver' tab:

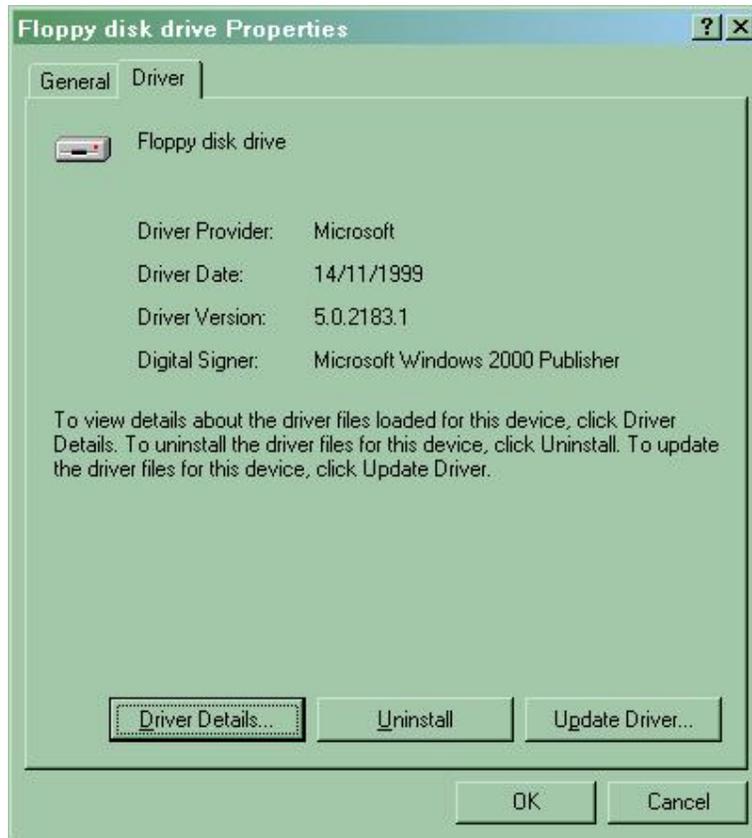


Figure 3. Win2000: Floppy Disk Drive Properties

Click 'Update Driver'. The Upgrade Device Driver Wizard starts:



Figure 4. Win2000: Upgrade Device Driver Wizard

Click 'Next'.

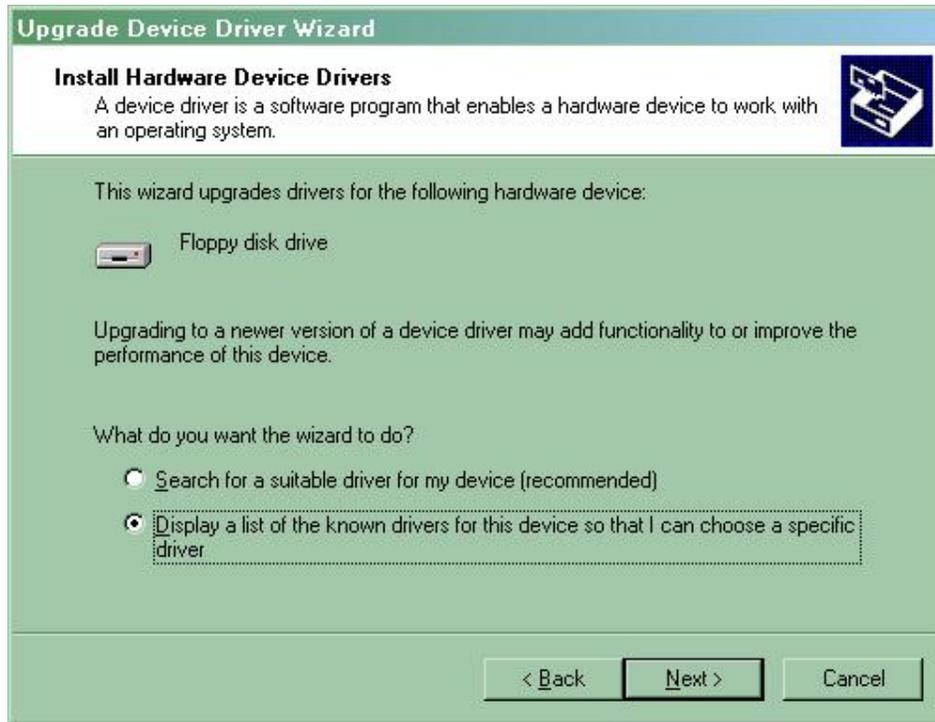


Figure 5. Win2000: Auto/Manual Driver Search

Select 'Display a list of the known drivers', and click 'Next'.

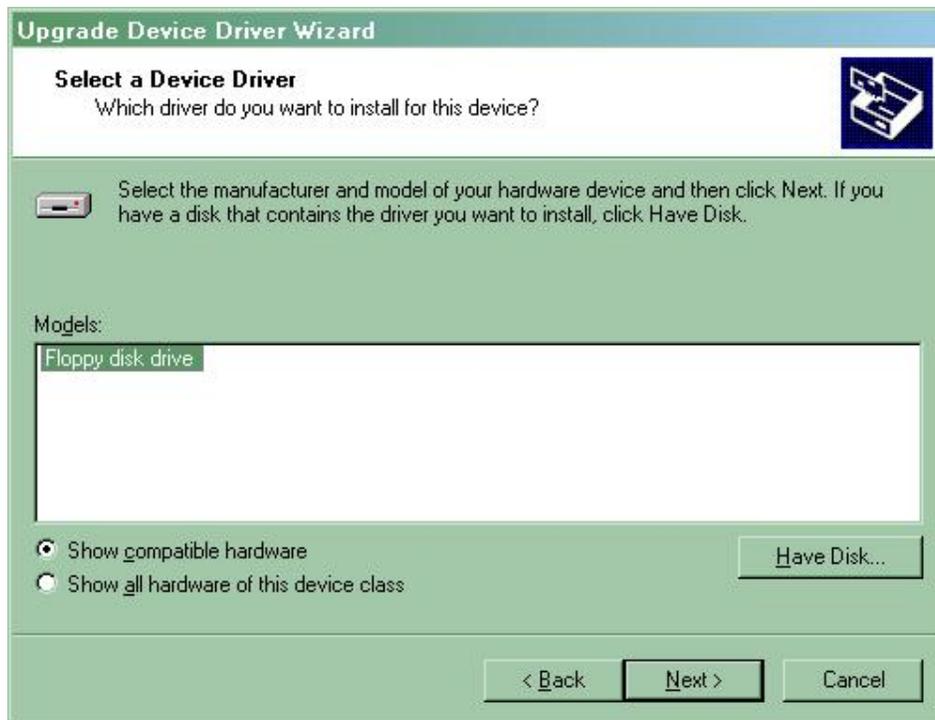


Figure 6. Win2000: Driver Selection(1)

Note: If the "OmniFlop Enhanced Floppy Disk Drive" is listed, a previous version already exists on your machine. If you choose this, the last installed version will be re-installed. If you want to use an *updated* version, do not be tempted to select the previously installed version shown here.

Click 'Have Disk' and 'Browse' to where OmniFlop has been installed. OK the selection and you will get an updated display:

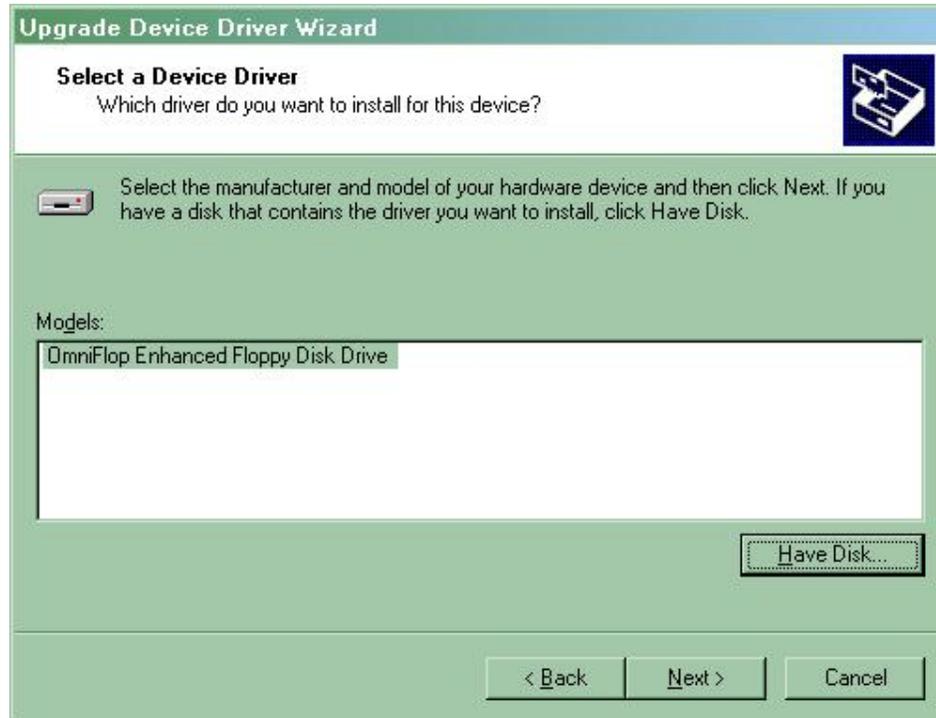


Figure 7. Win2000: Driver Selection(2)

Click 'Next'.



Figure 8. Win2000: Ready To Install

Click 'Next'.

You should get (after a brief delay):



Figure 9. Win2000: Success

'Finish' the wizard, and the properties for the Floppy disk drive should now show:

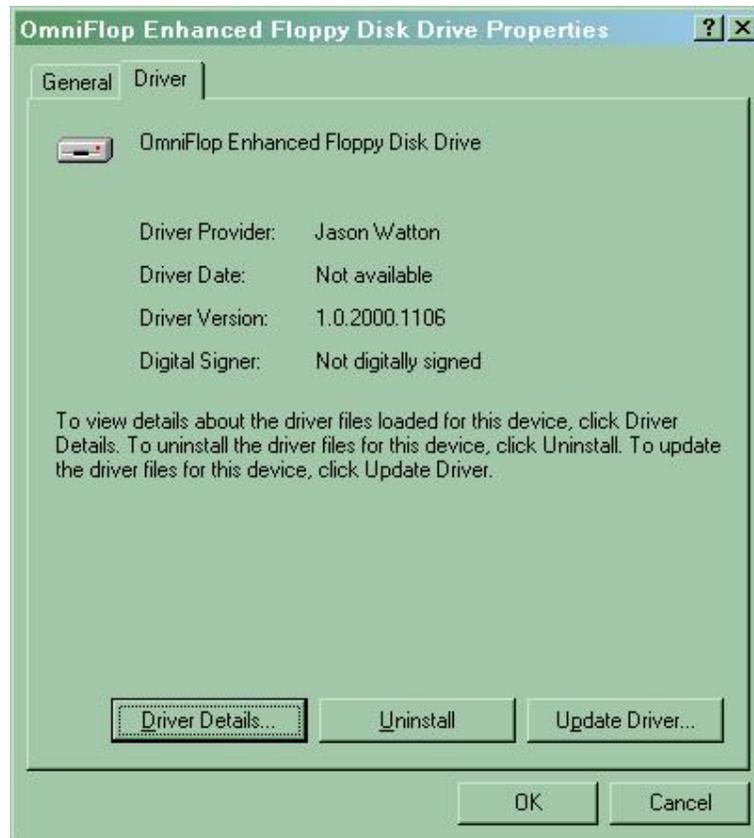


Figure 10. Win2000: Floppy Disk Drive Properties – Using OmniFlop

The driver is now installed.

2.3.1.2 Windows XP

Right-click the 'My Computer' icon on the desktop and select 'Properties'. Alternatively, navigate to the Control Panel (click the 'Start' button and select 'Settings' and 'Control Panel') then select 'System' to give the System Properties.



Figure 11. System Properties (XP)

Select the 'Hardware' tab and click on 'Device Manager'.

In Device Manager, click the '+' by 'Floppy disk drives' and double-click the 'Floppy disk drive':

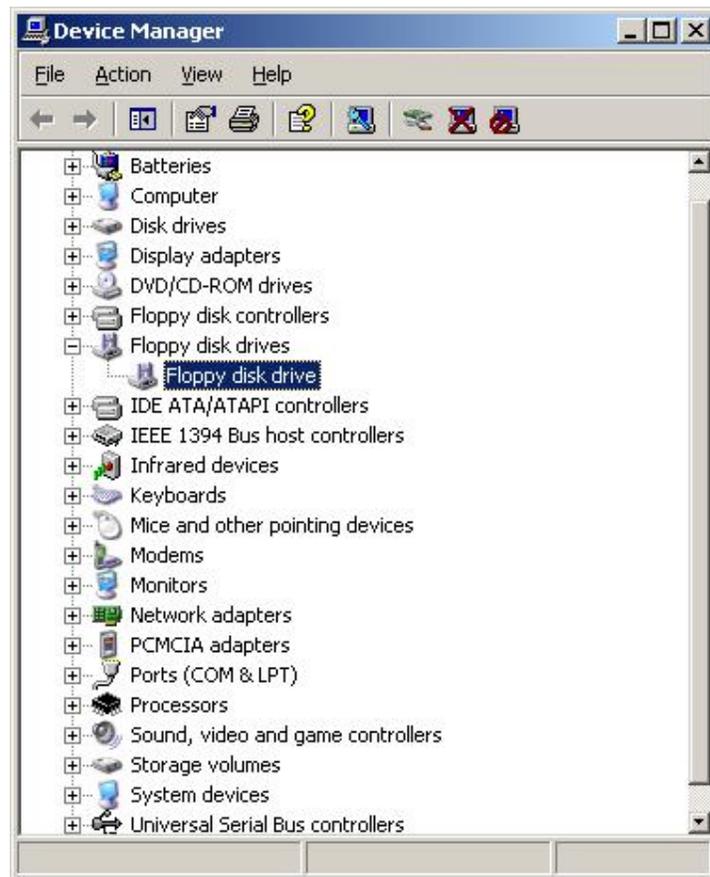


Figure 12. Device Manager

Click the 'Driver' tab:



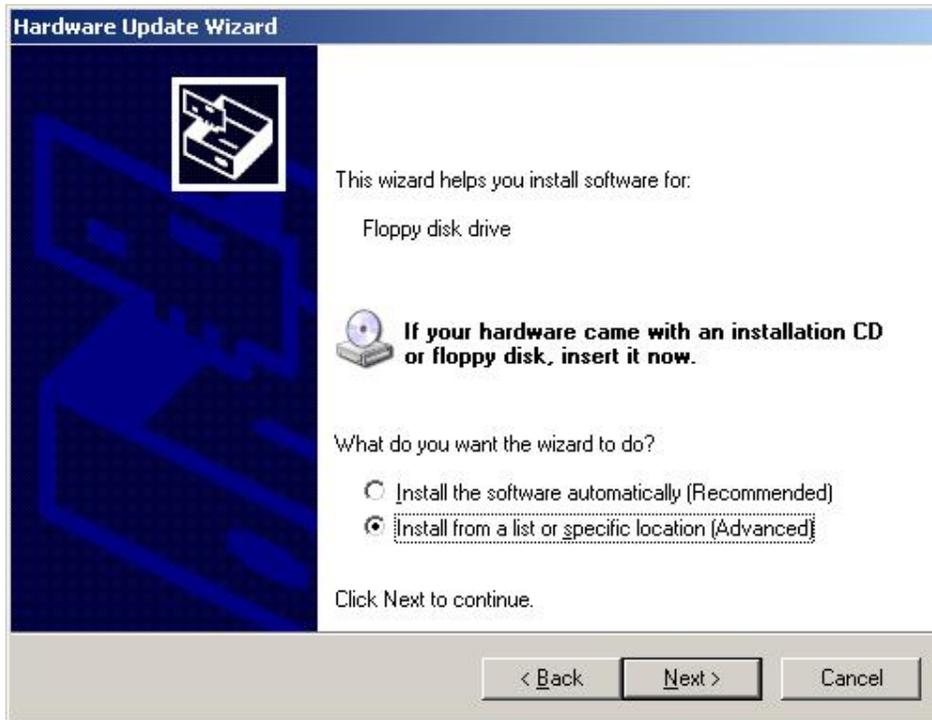
Figure 13. Floppy Disk Drive Properties

Click 'Update Driver'. The Hardware Update Wizard starts, and may produce as a first screen:



Figure 14. Hardware Update Wizard – Talk to Microsoft

Select 'No'. The driver is not published nor vetted by Microsoft (another money-making scheme by the big, bad Corporation). Click 'Next'.

**Figure 15. Hardware Update Wizard – Auto/Manual**

Select 'Install from a specific location', and click 'Next'.

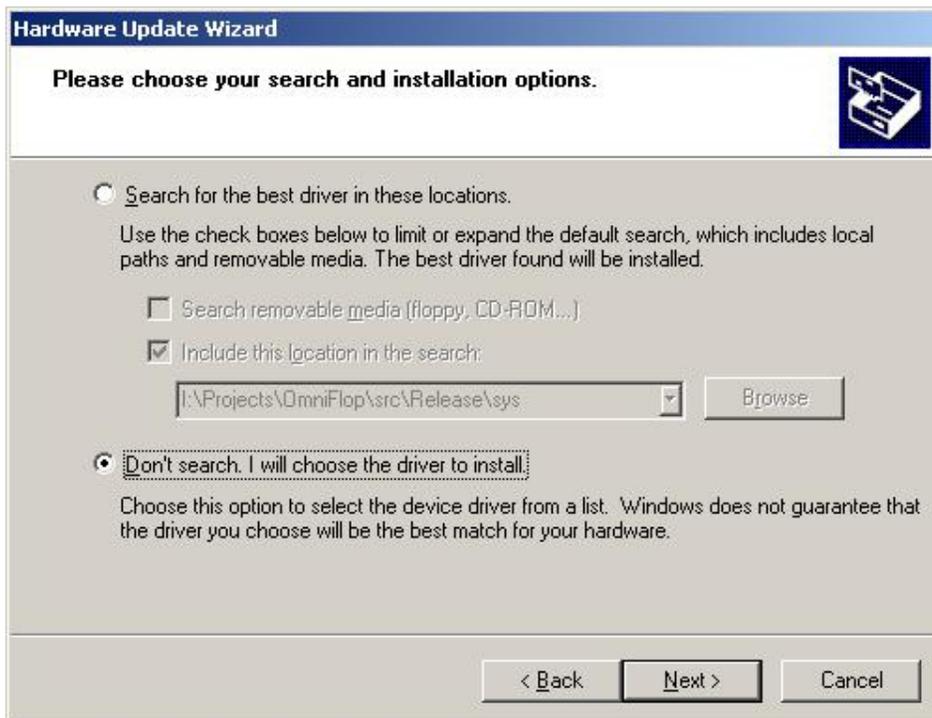


Figure 16. Hardware Update Wizard – Search Options

Select 'I will choose the driver to install', and click 'Next'.

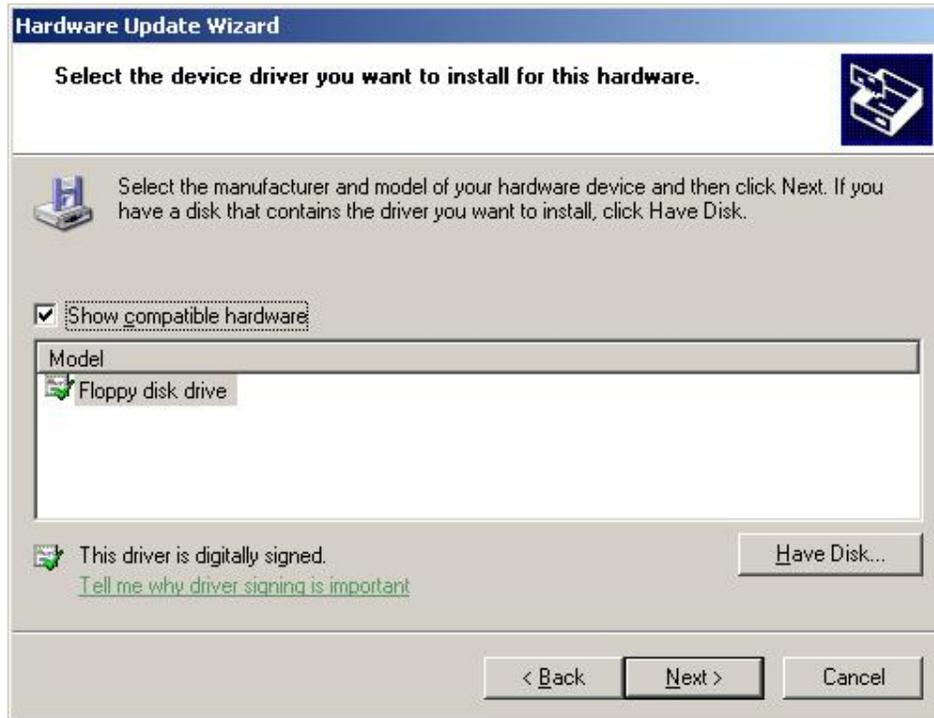


Figure 17. Hardware Update Wizard – Initial Options

Click 'Have Disk' and 'Browse' to where OmniFlop has been installed. OK the selection and you will get the display with a little warning:



Figure 18. Hardware Update Wizard – New Driver

Don't worry about the warning – this is an indication that Micro\$oft has not been paid to rubber-stamp the driver.

Click 'Next' and things get worse:



Figure 19. Hardware Update Wizard – Scare Tactics

This is blatant harassment of the end user to scare them away from installing drivers which haven't earned Micro\$oft any money. Alarming though this is, ignore the bold text and severe warnings of gloom and anarchy and click 'Continue Anyway' – unless you want to pay the money for getting Micro\$oft to rubber-stamp it, that is.

You should get (after a brief delay):



Figure 20. Hardware Update Wizard – Success

'Finish' the wizard, and the properties for the Floppy disk drive should now show:



Figure 21. Floppy Disk Drive Properties – Using OmniFlop

The driver is now installed.

2.3.2 Application

The application may be run directly from floppy disk or copied to the hard disk of the host PC. No other installation is required.

2.4 Removal

2.4.1 Driver

2.4.1.1 Windows 2000

Follow the actions in section 2.3.1.1 up to Figure 6. There should be two driver options currently available to choose from: "Floppy disk drive" and "OmniFlop Enhanced Floppy Disk Drive". Choose "Floppy disk drive" , click 'Next', and continue from Figure 8.

2.4.1.2 Windows XP

Follow the actions in section 2.3.1.2 up to Figure 13 to get the Floppy Disk Drive properties – it should actually look like Figure 21. Then press 'Roll Back Driver' and accept the roll-back. When the disk activity stops, the display should look like Figure 13, i.e. Microsoft all the way.

2.4.2 Application

Simply delete the folder containing the executable file. No further removal is required.

2.5 Registration and Licensing

Certain formats and functions of OmniFlop require you to get a licence from the author.

Licences are free and do not require any enrolment or subscriptions.

Any information supplied for registration will only be used for registration and to aid in the support and development of the product.

Licenses can be obtained using e-mail (jason.watton@lycos.co.uk) or using the contacts at the download web site (<http://www.shlock.co.uk>).

2.5.1 Justification

The decision to enforce licences was taken for the following reasons:

- To halt and prevent unlawful commercial exploitation of the utility.
- To halt and prevent impersonation of authorship.
- To provide feedback to the author. Free unrestrained distribution has provided no feedback on the number of users, what it was being used for, how successful it was, or how unsuccessful it was. The only feedback has been via those requiring support in using it (thanks be to them). Feedback is especially important for formats that were theoretical but unproven (and remain so without feedback).

2.5.2 Licensing Strategy

Licensing is applied as follows (as of v1.00):

1. Testing Disks requires no licence.
2. Reading and Writing the Microsoft-supported (DOS) formats requires no licence.

3. Reading and Writing the (established) BBC Acorn DFS and DDOS formats requires no licence.
4. Reading and Writing the BBC Acorn ADFS formats requires a 'BBC' licence. No feedback has confirmed these formats.
5. Reading and Writing non-BBC and non-Microsoft formats requires an 'Other' licence. No feedback has confirmed these formats.
6. Formatting disks requires a 'Format' licence. Feedback on the success of formats is essential, since the process is unproven and many of the parameters are theoretical.
7. Reading and Writing unknown (custom) formats requires a 'Custom' licence. This is to restrain commercial exploitation.

To get a licence you should attempt the function you require a licence for. The program will prompt with instructions. The program name (OmniFlop) and version (currently v1.00) are always required. If you require multiple licences it saves time and effort if you note down all the details for those you require before asking for the licences.

The right to refuse licences is reserved.

3. User Guide

This section describes use of the OmniFlop Wizard.

3.1 Supported Formats & Discoverers

The OmniFlop driver recognises formats in two different ways:

1. From a list of pre-defined 'known' formats. These can be physically read, written, and formatted.
2. By physically analysing a pre-formatted floppy disk. This results in an 'unknown' format which can still be read or written. **This means OmniFlop can read and write formats even if it doesn't know them.**

The driver must be installed to read, write, and format extended and unknown formats. If an analysis finds a format on a disk which is already known then OmniFlop switches to using the parameters of that format.

The formats known to be recognised by OmniFlop are currently (discoverers credited in brackets):

- (Extended) BBC Acorn DFS 40 (100kB single sided/200kB double sided) [Rob Nicholds]
- DOS 160kB
- DOS 180kB
- (Extended) BBC Acorn DFS 80 (200kB single sided/400kB double sided)
- (Extended) BBC Acorn Z80 CP/M 400kB [Chris Richardson]
- DOS 320kB
- DOS 320kB (1024 bytes/sector)
- (Extended) BBC Opus DDOS 360kB (single sided)
- DOS 360kB
- IBM Torch Graduate 360kB [Chris Richardson]
- Master 512 DOS 360kB [Chris Richardson]
- (Extended) BBC Acorn ADFS L 640kB [Jon Ripley]
- (Extended) BBC Acorn ADFS M 320kB [Jonathan G Harston]
- (Extended) BBC Acorn ADFS S 160kB [Jonathan G Harston]
- (Extended) CP/M-80 / PDOS 640kB
- (Extended) BBC Opus DDOS 720kB
- Spectrum +3 CP/M 720kB [Andy J Davis, Thomas Heck]
- Atari ST DSDD 720kB [Jon Ripley]
- Amstrad CP/M 720kB
- Master 512 DOS 720kB [Chris Richardson]
- DOS 720kB
- (Extended) BBC Acorn ADFS D, D+, E, E+ 800kB [Jon Ripley]
- (Extended) BBC Master 512 DOS Plus 800kB [Chris Richardson]
- (Extended) Spectrum Miles Gordon Tech +D/Disciple 800kB [Andy J Davis, Thomas Heck]
- (Extended) DOS 800kB
- DOS 1.2MB
- (Extended) BBC Acorn ADFS F, F+ 1600kB [Jon Ripley]
- DOS 1.44MB
- Apple Macintosh 1.44MB high-density, HFS Volume [Jon Ripley]
- DOS 2.88MB
- (Extended) **Any format readable by the NEC μ PD765/7265/72065/72066 floppy disk controller** – this includes formats from the Intel 8271 and WDC1770 floppy disk controllers.

Formats marked "Extended" require use of the OmniFlop driver. Other formats can be used without installing the OmniFlop driver.

If you try OmniDisk with a format not listed above and send the 'Test' results to the contact in 'About' then you will get a credit for the format in future releases, as shown in some cases ([]) above.

Note: The OmniFlop analysis means the format does not need to be known for it to be read or written. (The OmniFlop driver must be installed for this facility).

3.2 Formatting Disks

As of v1.00 of OmniFlop, the utility (with the driver installed) is capable of physically formatting the pre-defined formats listed above. However, the disks produced will have no data structure (logical format) written to them - to be used, they must still have a disk image of the correct format written to them.

OmniFlop does not format 'blank disks' of the correct format, just disks to the correct physical format, so that images (blank or otherwise) may be written to them.

You must sort out the logical format (catalogue/file system/FAT/bad sector area/data content), usually by writing to the disk (after formatting) a disk image of the correct format.

3.3 Running OmniFlop

Double-click the 'OmniFlop.exe' application from Windows Explorer.

A shortcut icon to the application may be placed on the desktop or Start menu if desired.

The Wizard is designed to be as self-explanatory as possible, and leads you through the process of using an alien format disk step-by-step. However, some notes and further explanation are offered below.

3.4 Welcome Page



Use 'About' to see details of the version of the application.

Use 'Test installation' to see if the OmniFlop driver is installed and providing extended format support. You do not need this driver if you are simply using standard DOS formats supported natively by Windows.

'Cancel' at any time will exit the wizard.

3.5 Function Selection



If the format of the disk has been registered with OmniFlop (see 'Supported Formats' in 3.1) then use 'Read', 'Write', or 'Format' to read, write, or format a disk. **This only works with known formats.**

If you are unsure of the format of the disk, or whether OmniFlop 'knows' it, select 'Test' and follow the wizard through. If the result is an "Unknown custom" format, then you must use the 'Read unknown' or 'Write unknown' options to read or write the floppy disk (a separate licence is required - see 2.5).