Sherlock Consulting Limited

OmniFlop Floppy Disk Driver & OmniFlop Wizard

User Guide

Document Type	User Guide - Uncontrolled
Document Version	3.0b
Document Reference	User Guide.doc
Date	12 January 2012
Author	Jason Watton
Status	Release
Total Number of Pages	66

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Contents

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

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.stairwaytohell.com).
alchresearch on The Stairway To Hell forum, and at http://www.alchemistresearch.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.
Paulo Gomes for telling me about compatibility with Shima Seiki sewing machines.
Tim Felgate, Darren Atkinson, and Markus Dimdal for reporting the vital format statistics.
Garth Hjelte for incredible patience dealing with DD Ensoniq disks.
Paolo Bagnaresi for extensive TI-99/4A testing, development, and the screen shots of Vista and Windows 7 Ultiimate.
Martyn Lovell for testing and manifest advice for Vista and Windows 7.
Christof Kauer of ipcas GmbH for feeding me formats and feedback for their *USB Floppy Emulator* (http://www.ipcas.com/products/usb-floppy-emulator-fdd-to-udd.html), and providing me with a prototype.
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
Hex	Hexadecimal
_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	Details
31st Dec 2004	**v0.01 Beta Release:** Supports: • 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) [Chris Richardson] • 5¼" 1.2MB drive: (Extended) BBC DFS 80 (200kB/400kB) [Chris Richardson] • 5¼" 1.2MB drive: (Extended) BBC DDOS 360kB (1-side) [Chris Richardson] • 5¼" 1.2MB drive: (Extended) BBC DDOS 720kB [Chris Richardson] • 3½" 1.44MB drive: (Extended) BBC DFS 40 (100kB/200kB) [Chris Richardson] • 3½" 1.44MB drive: (Extended) BBC DFS 80 (200kB/400kB) [Chris Richardson] • 3½" 1.44MB drive: (Extended) BBC DDOS 360kB (1-side) [Chris Richardson] • 3½" 1.44MB drive: (Extended) BBC DDOS 720kB [Chris Richardson] • 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:** • Extended formats disabled by default
2nd Jan 2005	**v0.03 Beta Release:** • Simple Analysis (Test) support added for all drive types. • Enhanced error reporting in Wizard.

11th Jan 2005	**v0.04 Beta Release:**
	• 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).
	• 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:
	    • (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 [Chris Richardson]
	    • (Extended) Spectrum Miles Gordon Tech +D/Disciple 800kB [Andy J.Davis, Thomas Heck]
	    • (Extended) DOS 800kB
	    • DOS 1.2MB
	    • (Extended) BBC ADFS F, F+ 1600kB [Chris Richardson]
	    • DOS 1.44MB
	    • DOS 2.88MB
	• User Guide updated to include Windows 2000 installation.

12th Feb 2005	**v1.00 Release:**
	• 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:
	    • (Extended) BBC ADFS S 160kB [Chris Richardson]
	    • (Extended) BBC ADFS M 320kB [Chris Richardson]
	    • (Extended) BBC Master 512 DOS Plus 800kB [Chris Richardson]
	    • (Extended) BBC Z80 CP/M Acorn 400kB [Chris Richardson]
	    • (Extended) ZX Spectrum TR-DOS 640kB [Art]
	• Corrected pre-defined formats:
	    • DOS 360kB (3.5" 1.44MB FDD)

27th Mar 2005	**v1.01 Limited release:** • Over-sampling added (to cope with 82-track formats). • Under-tracked format detection corrected (e.g. 35-track).
4th Apr 2005	**v1.02 Release:** • Deflect attempts to mount drive when non-standard format is present. • Added/changed pre-defined formats:

	• (Extended) 3.5" BBC ADFS L 640kB [Chris Richardson] • (Extended) 5.25" BBC ADFS L 640kB [Tim Felgate, Mark Ferns] • (Extended) Tandy CoCo RSDOS single-sided 157.5kB [Darren Atkinson] • (Extended) Tandy CoCo RSDOS double-sided 315kB [Darren Atkinson]
22nd Apr 2005	**v1.03 Release:** • Remove licensing from all confirmed formats and functions (i.e. Format) to date.

9th Sep 2005	**v2.00a Release:**
	• Redesign of user interface to reduce errors.
	• Reading/writing formats first always tries pre-defined formats, as per v0.03.
	• User chooses from all possible matching formats before reading/writing the disk.
	• Addition of Diagnostics Page.
	• Addition of Licensing Page.
	• Added formats:
	    • SJ Research MDFS [Mark Ferns]
	    • Akai S900 DD [Markus Dimdal]
	    • DEC Rainbow [Paul Hughes]
	    • Akai MPC 60 MK II [Dale Henriques]
	    • Master 512 DOS [Chris Richardson]
	    • Sinclair QL QDOS [Ali Booker]
	    • Philips P2000C CP/M [Jason Watton]
	    • Stride PDOS [Jason Watton]
	    • ZEISS Spectrophotometer Specord M400 [Milan Kubasek]
	    • Shima Seiki knitting machine DS DD [Paulo Gomes, Kathy Newey]
	    • ABB/Asea Robot [Daniel C. Hayden]
	    • BBC Master 512 DOS [Chris Richardson]
	    • IBM 360kB Torch Graduate [Chris Richardson]
	    • Akai MPC 60 MK II [Dale Henriques]
	    • Akai S1000 HD [Markus Dimdal]
	    • Akai S3000 HD [Markus Dimdal]
	    • Akai S950 HD [Markus Dimdal]
	    • Ensoniq ASR-10 HD [Markus Dimdal]
	    • Ensoniq EPS 16+ [Matt Savard]
	    • Spectrum 128 Beta 128 [Walter G Hertlein]
	    • NEC PC9801 UV, NEC FC9801 V DMF HD [Christopher J.M. Robertson]

14th Sep 2005	**v2.00b Release:** • Added further diagnostic options.
14th Sep 2005	**v2.00c Release:** • Added 'Disk map' diagnostic option.
20th Sep 2005	**v2.00d Release:** • Added 'Test BIOS drive types'. • Enhanced 'Get disk map' and 'Test disk'.
26th Sep 2005	**v2.01a Release:** • Enhancements in preparation for use with external 3rd-party programs. • Added version check on driver. • Added support for SFManager.
27th Sep 2005	**v2.01a Release (documentation update):** • Format naming standardised. • Format lists updated in Wizard and documentation. • Minor GUI changes to Wizard. • Added support for Awave Studio.
30th Sep 2005	**v2.01b Release:** • Added 1.722MB DOS format. • Added Electroglas Wafer Probers CP/M format. • Added support for 3rd-party Electroglas format. • Corrected e-mail use of '?' in automated e-mailing. • Enhanced OmniFlop Disk Map (*.ofm) format.
17th Oct 2005	**v2.01c Release:**

	• Further enhancements to disk mapping. • Head settle time corrected on some seeks.
19th Oct 2005	**v2.01d Release:** • Further enhancements to disk mapping. • Head settle time corrected on some seeks. • Added ZX Spectrum BetaDisk 40S format [Roberto Jose] • Added ZX Spectrum BetaDisk 40D format [Roberto Jose] • Added ZX Spectrum BetaDisk 80S format [Roberto Jose] • Added ZX Spectrum BetaDisk 80D format [Roberto Jose] • Added DOS 1.232MB format [pstaszkow] • Split current Tandy CoCo RS-DOS format into separate 48TPI and 96TPI formats. • Amended Tandy CoCo RSDOS single-sided 48TPI 157.5kB [Darren Atkinson] • Amended Tandy CoCo RSDOS double-sided 48TPI 315kB [Darren Atkinson] • Added Tandy CoCo RSDOS single-sided 96TPI 157.5kB [Darren Atkinson, Benoit Bleau] • Added Tandy CoCo RSDOS double-sided 96TPI 315kB [Darren Atkinson, Benoit Bleau] • RadioShack CoCo OS9/Nitros9 single-sided 40-track 48TPI (180kB) [Benoit Bleau] • RadioShack CoCo OS9/Nitros9 double-sided 40-track 48TPI (180kB) [Benoit Bleau] • RadioShack CoCo OS9/Nitros9 single-sided 40-track 96TPI (180kB) [Benoit Bleau] • RadioShack CoCo OS9/Nitros9 double-sided 40-track 96TPI (180kB) [Benoit Bleau] • RadioShack CoCo OS9/Nitros9 single-sided 80-track (360kB) [Benoit Bleau] • RadioShack CoCo OS9/Nitros9 double-sided 80-track (360kB) [Benoit Bleau] • Reset default File Format if format changes. • Refresh the list of File Formats with those most commonly used. • Correct the File Formats offered for a generic single-sided format. • Added support for 3rd-party CoCo format.
1st Dec 2005	**v2.01e Release:** • Added support for Rubber Chicken Software Co. software (Ensoniq MID-Disk Tools, Ensoniq Disk Tools, Ensoniq ASR-X Tools, Translator). • Added warning to 'Get a license' to use the program first. • Added file format '*.adf' for single-sided Acorn ADFS. • Added initial warning about disabling anti-virus software.
10th Jan 2006	**v2.01f Release:** • Added E-mu Emax 800kB [Garth Hjelte] • Added E-mu EOS 1440kB [Garth Hjelte] • Added E-mu ESi [Garth Hjelte] • Added Oberheim DPX [Garth Hjelte] • Added Prophet 2002 [Garth Hjelte] • Added Ensoniq Mirage [Claude Climer] • Added Korg DSS-1 [Claude Climer] • Added Spectrum Opus Discovery [Simon Owen] • Added Korg T-series (T1, T2, T2EX, T3, T3EX) format [Dominic Guss] • Added Atari ST 820kB format [David Williams]
29th Jan 2006	**v2.01g Release:** • Added Dynacord [Garth Hjelte] • Improved 'skip bad sectors' • Added HP-2100 8" [Dave White] • Added Mori Seiki DS DD 648kB [Thean Low]
20th Feb 2006	**v2.01h Release:** • Added support of .D81 file format [JackLT] • Added Amstrad System (SS/DS) [Karl Kopeszki] • Added Amstrad Data (SS/DS) [Karl Kopeszki] • Added Amstrad System/Data DS and Data/System DS [Karl Kopeszki]
30th May 2006	**v2.01i Release:** • Added Thomson TO9 3.5" 640k format • Added support for ensDT (Ensoniq Disk Tools) • Added Korg 01/W format. • Altered E-mu EMAX format for compatibility with EMAX-I [Kris VC]

	• Added RadioShack CoCo NitrOS9 80trk DS (720kB) variant [Bob Devries] • Added on-line licensing
27th Jul 2006 3rd Sep 2006 4th Oct 2006	**v2.01j Release:** • Added support for EMXP/EMXPN • Added CoCo (truly) double-sided 40-track formats, 48TPI and 96TPI. Changed names of previous double-sided CoCo formats to "SSx2". • Added support for ensDT. • Added Balzer Metal Evaporator format [Richard Scott, Dynex Semiconductors] • Added Alesis Datadisk [Donal Ryan] • Added DOS 640kB format [Malcolm Sargent] • Added DOS 1.743MB format [kalman]
3rd Nov 2006 4th Nov 2006 15th Nov 2006	**v2.01k Release:** • Added 3.5" HP-2100 format [Patrice Leonard] • Added Atari ST SSDD format [Mark "alfspanners"] • Added support for EnsoniqFS. • Added Slow Step Rate option.
2nd Sep 2007	**v2.01m Release:** • Formatting reliability improved. • Added DOS 729kB format [Gutbrod András] • Added Beli disk format [Igor Živanović] • Changed names of CoCo formats from 96TPI/48TPI to sng step/dbl step. • Enabled support for Rubber Chicken Software Co. software. • Added Applix 1616 800kB, 810kB, 820kB [Bob Devries] • Added Sanyo X68000 1248kB format [Charles Doty] • Added Atari 8-bit 90kB [Charles Doty] • Added unnamed 180kB format [Shawn Howell] (unproven) • Added Tatung Einstein TC01 Xtal Dos 1.31 40-track DS 400kB & 40-track SS 200kB [Chris Coxall] • Added unnamed 144kB format [Brian "Briza" Palmer] • Added OS-9/68K 3.5" DD 38W7 format [Andrey Gritzenko] • Added Spectrum DISCiPLUS 40-track [Dario Ruellan] • Added unnamed 360kB format [Ralph Hänsel] • Added LIF 1232kB disk format [Bruce] • Added ABB/Asea Robot IRB L6/0293 41-track format [Toon Lettink] • Added Atari ST SS 320kB format [Bob Devries] • Added HP 9121 format [Chuck Magee] • Added COMX DOS formats [Dennis Heijmans, Marcel van Tongeren] • Added file type Roland S50/550/W30/S7xx image • Added file type Roland S50 image • Added HP-9000 Series 310 616kB format [Jason Watton] • Added missed 5.25" 360kB DOS-compatible formats.
26th Feb 2008	**v2.01n Release:** • Added Panasonic KX-W940 Word Processor Typewriter format [Richard Holdaway] • Removed licensing for EMXP/EMXPN • Removed licensing for Rubber Chicken Software • Fixed failed auto-detect on some PCs of the format *after* an 'over-tracked' format, e.g. ASR-10 fails to be recognised.
N/A	**v2.01o Release:** • Added beta Computer Automation LSI-2 mini-computer format [Lars Hamren] (Wizard only)
14th May 2008	**v2.01p Release:** • Fixed Ensoniq Mirage format • Fixed Ensoniq SQ80 format • Fixed Oberheim DPX format • Fixed Prophet 2002 format • Changed all references of 'EMu' to 'E-mu'. • Added Tandy TRS-80 Model 1 NEWDOS/80 v2.0 40-track 100kB format

	• Added GravoGraph VX format [Norman Bruggner] • Added Atari Power Up Plus format [Norman Bruggner] • Added support for RSX2MS program. • Added support for AkaiS20 program. • Added ABB/Asea IRB2000 format [Rob Bos] • Added Korg DSM-1 [Doug Skinner]
9th Sep 2008 4th Oct 2008 21st Oct 2008 25th Oct 2008 1st Nov 2008	**v2.01q Release:** • Added Sequential Studio 440 [Dazzer] • Added TRS-80 Model 1 NEWDOS/80 v2.0 77-track 385kB [Terry Stewart] • Added Tandy RSDOS 2.3 87.5kB [Terry Stewart] • Added CP/M 2.2 80/10x1024 800kB [Dave Timmins] • Added HP-9121 DS 664kB format [Ian & Jo Andrews] • Fixed ABB/Asea IRB2000 format [Rob Bos] • Added Mecmor Variatex 2500 1280kB [Anton Sinovitch] • Fixed Gravograph VX [Norman Bruggner] • Added BBC DFS 83-track DS format [Electronic Workshop, University of Sheffield] • Added RCA Micro Floppy System 315kB [Berni Meier] • Added CNI NC481 720kB [Kamil Murin] • Added DOS 1.701MB DTMF format [Lindsay Hargreaves] • Added Automatix RobotControl RAIL 400kB [Johan M Lundstrom] • Added unknown Media400x1024_0 400kB format [Taking the 5th!] • Added ABB/Asea Robot IRB L6/0293 3½" conversion [Leotta Domenico] • Changed interleave on Automatix RobotControl RAIL 400kB [Johan M Lundstrom] • Added TRS-80 Model 1 NEWDOS/80 v2.0 68-track 340kB [Terry Stewart] • Added HP-1000 format [Lawrence Uchida] • Added E-mu EIII 800kB format [Alexander Burgwedel] • Added Ensoniq SD-1 800kB format [Danyel Gloser] • Added Heath H-89 HDOS 600kB partial format [Rich Lentz] • Added Heath H-89 HDOS 640kB format [Rich Lentz] • Added TV3102 Controller Programmer [Ian Sharpe] • Added Exelvision [Fabien Neck]
18 Nov 2008	**v2.01r Release:** • Interleave checked for matching formats - perfect match returned if possible, otherwise first (1:1) used. • Improved Exelvision format (gaps) • Removed duplicate Exelvision format (leaving only interleave 7:1) • Added independent Heath H-89 CP/M 2.2 I3 800kB [Rich Lentz] • Added FM77L4 320kB format [Eginer (Tecnoginer S.L.)] • Added Hector CP/M 200kB format [Yves Fontanes] • Added Hector CP/M 720kB format [Yves Fontanes] • Added Hector CP/M 800kB format [Yves Fontanes] • Added Timex 2048 FDD3000 single-sided (160kB) format [Michal Tarasiejski] • Added Timex 2048 FDD3000 double-sided (320kB) format [Michal Tarasiejski]
19 Nov 2008 2 Dec 2008	**v2.2a Release:** • Added OmniFDC driver. • Tandy TRSDOS 2.3 (87.5kB) modified to accommodate the curious track 17. • Reg Codes and License Keys presented in Courier New for easier transposition if necessary (withdrawn).
12 Feb 2009 04 Mar 2009	**v2.2b Release:** • 4th year anniversary of v1.00 release. • Added universal license to cover all others. • Added HP-9000 Model 362 1540kB format [Kelvin Lee] • Added Thomson T08-T09 series 320kB format [Norman Bruggner] • Added Osbourne 1 (O1) SSSD 100kB format [Theodore (Alex) Evans] • Added Osbourne 1 (O1) SSDD 200kB format [Theodore (Alex) Evans] • Added Osbourne Vixen (O4) DSDD 400kB format [Theodore (Alex) Evans] • Removed licensing on **all** but the following formats:

	• Custom/Unknown • Formats listed as 'New' on web page (i.e. those added for v2.2a and v2.2b only). • Added GEM S2/S3 synthesizer 1600kB format [Alexander Burgwedel]

12 May 2009
27 Jun 2009
31 Jul 2009
26 Aug 2009
24 Oct 2009
25 Nov 2009
	v2.2c Release:
	• Added TI-99/4A formats:
	    • TI-99/4A SS/SD 40T SngStep 90kB [Paolo Bagnaresi]
	    • TI-99/4A SS/SD 40T DblStep 90kB [Paolo Bagnaresi]
	    • TI-99/4A DS/SD 40T SngStep 180kB [Paolo Bagnaresi]
	    • TI-99/4A DS/SD 40T DblStep 180kB [Paolo Bagnaresi]
	    • TI-99/4A SS/DD 40T SngStep 180kB [Paolo Bagnaresi]
	    • TI-99/4A SS/DD 40T DblStep 180kB [Paolo Bagnaresi]
	    • TI-99/4A DS/DD 40T SngStep 360kB [Paolo Bagnaresi]
	    • TI-99/4A DS/DD 40T DblStep 360kB [Paolo Bagnaresi]
	    • TI-99/4A SS/HD 40T SngStep 360kB [Paolo Bagnaresi] - *needs OmniFDC driver*
	    • TI-99/4A SS/HD 40T DblStep 360kB [Paolo Bagnaresi] - *needs OmniFDC driver*
	    • TI-99/4A DS/HD 40T SngStep 720kB [Paolo Bagnaresi] - *needs OmniFDC driver*
	    • TI-99/4A DS/HD 40T DblStep 720kB [Paolo Bagnaresi] - *needs OmniFDC driver*
	    • TI-99/4A SS/SD 80T 180kB [Paolo Bagnaresi]
	    • TI-99/4A DS/SD 80T 360kB [Paolo Bagnaresi]
	    • TI-99/4A SS/DD 80T 360kB [Paolo Bagnaresi]
	    • TI-99/4A DS/DD 80T 720kB [Paolo Bagnaresi, Bill R Sullivan]
	    • TI-99/4A SS/HD 80T 720kB [Paolo Bagnaresi] - *needs OmniFDC driver*
	    • TI-99/4A DS/HD 80T 1440kB [Paolo Bagnaresi, Bill R Sullivan] - *needs OmniFDC driver*
	    • TI-99/4A SS/DD 40T SngStep 160kB [Paolo Bagnaresi]
	    • TI-99/4A SS/DD 40T DblStep 160kB [Paolo Bagnaresi]
	    • TI-99/4A DS/DD 40T SngStep 320kB [Paolo Bagnaresi]
	    • TI-99/4A DS/DD 40T DblStep 320kB [Paolo Bagnaresi]
	    • TI-99/4A SS/DD 80T 320kB [Paolo Bagnaresi]
	    • TI-99/4A DS/DD 80T 640kB [Paolo Bagnaresi]
	• Automated audit performed - inconsistencies found:
	    • Changed GSL on FX_OSBRN1_200 (all but 5.25" 1.2MB drive)
	    • Changed GSL on FX_OSBRN4_400
	    • Changed GSL on FX_HP1000
	    • Changed GPL on FX_IBM_DOS1232 (all but 3.5" 1.44MB drive)
	    • Changed GPL on FX_RCA_MFS on 1.2MB 5.25"
	    • Changed GPL on FX_HEC_CPM_200
	    • Changed GPL on FX_APPL1616_810 (3.5" 1.44MB)
	    • Changed GPL on FX_APPL1616_820 (3.5" 1.44MB)
	    • Changed GSL on FX_AMS_SYS_SS
	    • Changed GSL on FX_AMS_SYS_DS
	    • Changed GSL on FX_AMS_DATA_SS
	    • Changed GSL on FX_AMS_DATA_DS
	    • Changed GSL on FX_AMS_DATA_SYS
	    • Changed GSL on FX_AMS_SYS_DATA
	    • Changed GSL on FX_IBM_DOS180
	    • Changed GSL on FX_IBM_DOS360
	    • Changed GSL on FX_HANSEL
	    • Changed GSL on FX_AKAI_S950_HD for 5.25" 1.2MB
	    • Changed GSL and skew on FX_BALZER as per 3.5" 1.44MB
	    • Changed GPL on FX_BBC_DOS_PLUS (except 5.25" 1.2MB)
	    • Corrected PAD on FX_SPEC_BETA40S
	    • Corrected number of heads on FX_THOMSON_T08T09 for 1.2MB 5.25"
	    • Corrected number of heads on FX_SPEC_BETA80S for 1.2MB 5.25"
	    • Changed GSL on FX_SPEC_DiP_40 on 5.25" 360kB
	    • GPL for 5.25" 1.2MB FX_DYNACORD, FX_ENS_COMP_HD, FX_ENS_ASR10, FX_ENS_ASR10_SP, FX_ENS_TS12 corrected.

	• Corrected GSL & GPL for FX_CPM22_CTS_800
	        • Pad character for NEC98 architecture all but 5.25" 360kB drive changed from e5 to f6 (all formats) as per standard architecture
	        • FX_SPEC_BETA80D interleave corrected to 1:1
	• Added Slogger DDCPM format [Dave Moore] plus file formats with and without padding
	• Completed Computer Automation LSI-2 mini-computer format [Lars Hamren] (100% driver-based) plus added file formats with and without padding
	• Added FLEX formats [Ron Bihler, Ian Blythe, Michael Evenson, Dell W. Setzer] plus FLEX .dsk file format
	• Added DEC RX02 1001kB format [Nikolay Degtev]
	• Added Didaktik D40 360kB & D80 720kB formats [Pavel Chromy] plus .d80 file format
	• Added Zenith ZDS ZDOS 360kB and CP/M-86 (320kB) formats [Steven White]
	• Added Balzer Ophthalmic Lens Machine (250.25kB) format [Carlos Sánchez]
	• Added IMS MM/1 (1280kB) format [Bob Devries]
	• Added Gravograph ISIS 640kB format [Patrick Poncet]
	• Added Data General/1 199.5kB format [Josef Havlik]
	• Added 4th Dimension 799.75kB format [Wocki]
	• Added OS-9 1010.75kB format [Georg Woltersdorf]
	• Added OS-9 Universal 632kB format [Bob Devries]
	• Added SATIM 560kB format [Florian Peth]
	• Recording of default user choices simplified (no separate R/W and Format choices)
	• Drive/Media locking improved for faster forced formats
	• File format choice recorded as string so it can be used with more than one disk format
	• Added filter to disk format selection to reduce number of formats offered
	• Added Stäubli/Unimation Puma 560c Robot Arm Controller 640kB format [Mike Ward-Theatronics]
	• Removed Toshiba Libretto support from FDC driver.
	• Added support for Paolo's TI-99/4A program.
	• Removed all format-specific 3rd-party licensing
	• Tested on Vista32 and Windows 7 Ultimate OK [Paolo Bagnaresi]
	• Added installation section for Vista and Windows 7 Ultimate [Paolo Bagnaresi]
	• Added HP110 portable 693kB format [Tom Szolyga]
	• Added manifest for Vista and Windows 7 Ultimate [Martyn Lovell]
	• Added Oric Jasmin/Jasmin II (340kB, 348.5kB, 357kB) formats [Wilfrid Avrillon]
	• Added Dynacord ADD-one 840kB format [Roland Weihmayer]
	• Added full list of possible formats to a successful Diagnostic/Test Disk
	• Added Prophet 2000 420kB and 840kB formats [Kris ///E-Synthesist]
	• Added Casio FZ-20M (1280kB) format [Chris Strellis, Dr. Georg Müller, Rainer Buchty]
	• Added Tavernier 6809 (90kB, 170kB) formats [Thierry Hennuyer]

06 Dec 2009	**v2.2d Release:** • Fixes to Prophet 2000 format. • Fixes to Tavernier 6809 DD (170kB) format
07 Apr 2010	• Added Simmons SDX (1280kB) format [Garth Hjelte]
10 Jun 2010	• Changed interleave for Computer Automation LSI-2 format to 2 • Added NEC FC9801 997.75kB format [Chris Paice] • Added Tatung Einstein TC01 Xtal System 5 80-track 800kB [Phil Simmons]
04 Oct 2010	• Removed licensing from Computer Automation LSI-2 for Chris Paice • Added Hitachi Bio-chemical Analyzer 1040kB format [M. Heidari] • Added Sharp X68000 77-track 1232kB format [Papa November] • Enhanced strength of 'Skip Bad Sectors' to cover all possible errors • Added 'Ignore DDAMs' option
26 Oct 2010	• Added IGM 6012 DD and HD formats (800kB)
16 Nov 2010	**v2.3a Release:** • Upgraded from legacy DDK (2600.1106) to latest (7600.16385.1) • Resolved all problems with 64-bit use • Added file format '.TRD' for TR-DOS to selection • TR-DOS 640kB format interleave adjusted

23 Mar 2011	**v2.3b:** • Cosmetic release to help support TR-DOS changes • Changed interleave for Stride PDOS • Added Stride p-System (640kB) • Added Stäubli JC3 JC4 JC5 (Jacquard Control) 1.44MB format [Christof Kauer, ipcas GmbH] • Added NEC PC8801 359.5kB format [Víctor Jiménez Pérez] • Enhanced auto-ID algorithm for non-uniform formats • Added Nestal Synergy 800-110 690.5kB format [Christof Kauer, ipcas GmbH] • Added ZX Spectrum TR-DOS 1-head 640kB format [Micky Elima] • Added Okuma OSP 1458kB format [Christof Kauer, ipcas GmbH]
13 Jul 2011β 18 Sep 2011	**v3.0a:** • Rationalised database into one coherent list covering all drive types • Added Cloos Rotrol 16 720kB format [Christof Kauer, ipcas GmbH] • Added IBM OS/2 XDF 1840kB format [Robert McMurray] • Added ASM Epsilon 2000 Epi Reaktor 1440kB format [Christof Kauer, ipcas GmbH] • Added Schiess-Nassovia Optimat 505 520kB format [Christof Kauer, ipcas GmbH] Withdrawn 22 Nov 2011 in favour of v3.0b - ASM Epsilon format often confused with DOS 1.44MB format.
31 Oct 2011β 21 Nov 2011β 22 Nov 2011β 23 Nov 2011β 12 Han 2012	**v3.0b:** • Added Greco Systems EZ-FILE 41-track 410kB and Greco Systems EZ-FILE 81-track 810kB formats [Robert M. Woodruff] • Added Hashima Model HSQ-88NC 720kB format [Yurij Usoltsev] • Added Tracer/ST 0-based and 1-based 1.44MB format [Jerry L. Hallett] • Fixed mistaking 1.44MB DOS HD format for ASM Epsilon 2000 Epi (introduced in v3.0a) due to BPB on interpreted disk data - only affects DOS/BPB formats other than 720kB. • Added Format-Write combined function. • Added option to repeat operation at end for mass production. • Added 18x128, 9x256 and 5x512 test formats [Cosimo Oliboni].

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.
b) Either:
      i. (for OmniFlop) a **built-in NEC-compatible floppy disk controller**. You can use the Diagnostic options of OmniFlop to see if this holds for your system.
      ii. (for OmniFlopUSB) a USB-connected external floppy disk drive.
c) Windows 2000 SR1 or later, Windows XP, Windows Vista, or Windows 7 Ultimate.

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 (USB) Floppy Drives

The OmniFlop driver is unlikely to work with external drives, e.g. USB external floppy drives. These usually work in a different way to internal floppy disk drives.

Note: A USB floppy drive usually determines the format itself. The testing on the disk is not extensive - it can be as unreliable as merely looking at the density of the floppy disk inserted! For example, a double-density floppy inserted will usually return the 720kB 80/2/9x512 DOS format regardless of the format of the floppy.

USB has a rigidly-defined protocol for floppies. To read/write strange formats requires an NEC µPD765-compatible FDC (Floppy Disk Controller) *plus* access to it - a floppy drive at the end of a 4-wire 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). USB floppy drives are designed only to support "standard" PC DOS formats; there is no need for them to support formats from the 1980s, for example, so they don't.

Basically, USB floppy drives were made to allow you to access 'standard' DOS-format disks with limited 'customisation'. For the moment I can only recommend an internal floppy drive.

2.1.2 Disk Drive Calibration & Compatibility

If you are trying to read, write, or format a disk made on another system (especially a non-PC system), then by all accounts the odds are stacked against you. However, with OmniFlop, the odds are reduced from 'impossible' to 'possible'.

<p align="center">No two floppy disk drives are identical.</p>

Floppy disk drives are mechanical. They are created, then calibrated, then used. Over time and with wear-and-tear their calibration may wander and their tolerance to disks formatted on other drives will vary.

<p align="center">Just because you've got a drive of the correct size for your disk doesn't mean that drive can read or write it.</p>

To test the function of OmniFlop with your drive and machine you should:

- Make sure your floppy drive can format, read, and write disks using the Windows 'format' function and Windows Explorer.
- Get hold of a known, reliable floppy disk of the correct density. 3.5" HD disks have two holes in the top edge (one for write-protect); 3.5" DD disks have only one hole (the write-protect).

- Format the disk to the correct format using OmniFlop.
- Write an image onto the disk using 'Write disk'. The image does not need to be of the correct format - just an image of known data content.
- Read the disk back in using 'Read disk'. Check the data read in matches the data written.

If this sequence works, then OmniFlop and your hardware are compatible for the format you have selected. If you then have problems reading a disk from another system then this is almost always down to physical tolerances in the hardware of the floppy disk drives - see http://www.accurite.com/FloppyPrimer.html. I cannot fix your hardware problems with software.

Note that it took the author three 5.25" drives to find a drive capable of reliably reading an (aging) format of 5.25" disks. 5.25" drives are far less tolerant of each other than 3.5" drives.

2.2 Components

The distribution of OmniFlop (http://www.shlock.co.uk/Utils/OmniFlop) consists of 6 files:

OmniFlop.inf *OmniFlop.sys*	The OmniFlop **floppy disk drive** 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). *Usually, this is required, and should be installed.*
OmniFDC.inf *OmniFDC.sys*	The OmniFlop **floppy disk controller** driver. This replaces the standard Microsoft-supplied generic floppy disk controller driver, and extends its capabilities (accessing FAT12/FAT16/DOS/Windows floppy disks is still possible). *You do not normally need to upgrade this driver - see 2.3.1.*
OmniFlop.exe	The OmniFlop Wizard. This application provides access to the enhanced services of the driver.
OmniFlop.pdf	This user guide in Adobe pdf format.

The package is distributed as a WinZip archive of the above files.

External registration is rarely 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.

You must install the latest OmniFlop driver (OmniFlop.sys) that came with the Wizard if you want to use non-DOS formats**.** Inconsistencies will cause problems. From version 2.01 a check is made that the driver is compatible.

You only have to install the OmniFDC driver if you want to use the formats listed in 2.3.1.

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

There are **two** drivers:

- The ***OmniFlop*** driver, **OmniFlop.sys**. You should always install this driver. It replaces the ***Floppy disk drive*** driver.
- The ***OmniFDC*** driver, **OmniFDC.sys**. This replaces the ***Floppy disk controller*** driver. You do not need to install this driver unless you are using any of the following formats:
  - **Tandy TRSDOS 2.3**

o   **All HD (High-Density) TI-99/4A formats**

The procedure for installing both drivers is almost identical. **The procedure for installing <u>one</u> driver is given below** - you must do this <u>twice</u> if you are installing <u>both</u> drivers (once for **OmniFlop**, then again for **OmniFDC**).

Both drivers are fully-compliant WDM driver for Windows 2000, XP, Vista and 7.

You do not <u>have to</u> install any drivers. Without the **OmniFlop** driver installed, the OmniFlop wizard will read and write the (standard) DOS formats that Windows knows natively. With the **OmniFlop** 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, or re-installing the existing one. 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.
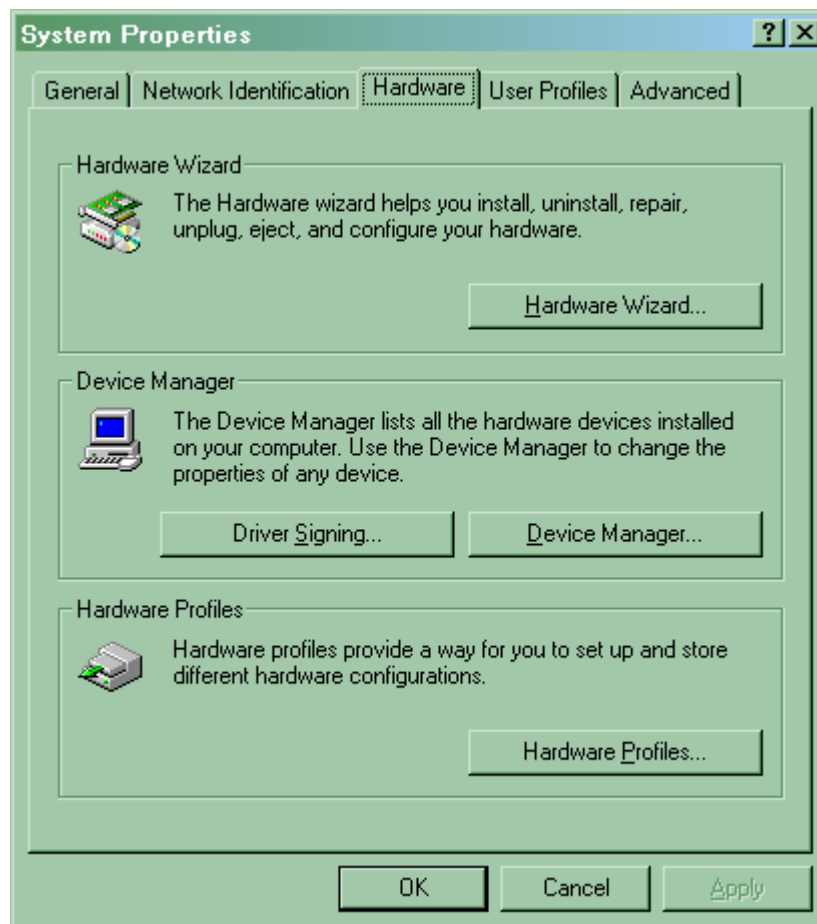
Figure 1.   Win2000: System Properties

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

In Device Manager:
- To install the **OmniFlop** driver, click the '+' by '**Floppy disk drives**' and double-click the 'Floppy disk drive':
- To install the **OmniFDC** driver, click the '+' by '**Floppy disk controllers**' and double-click the 'Standard floppy disk controller':

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'.
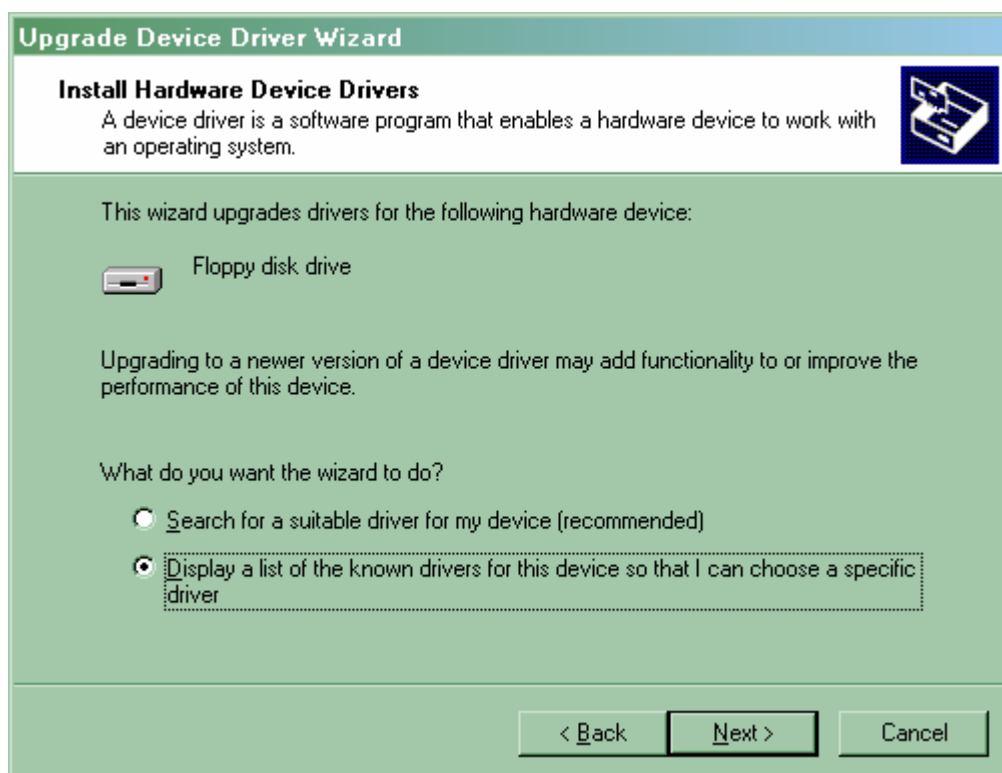
Figure 5.   Win2000: Auto/Manual Driver Search

Select 'Display a list of the known drivers', and click 'Next'.
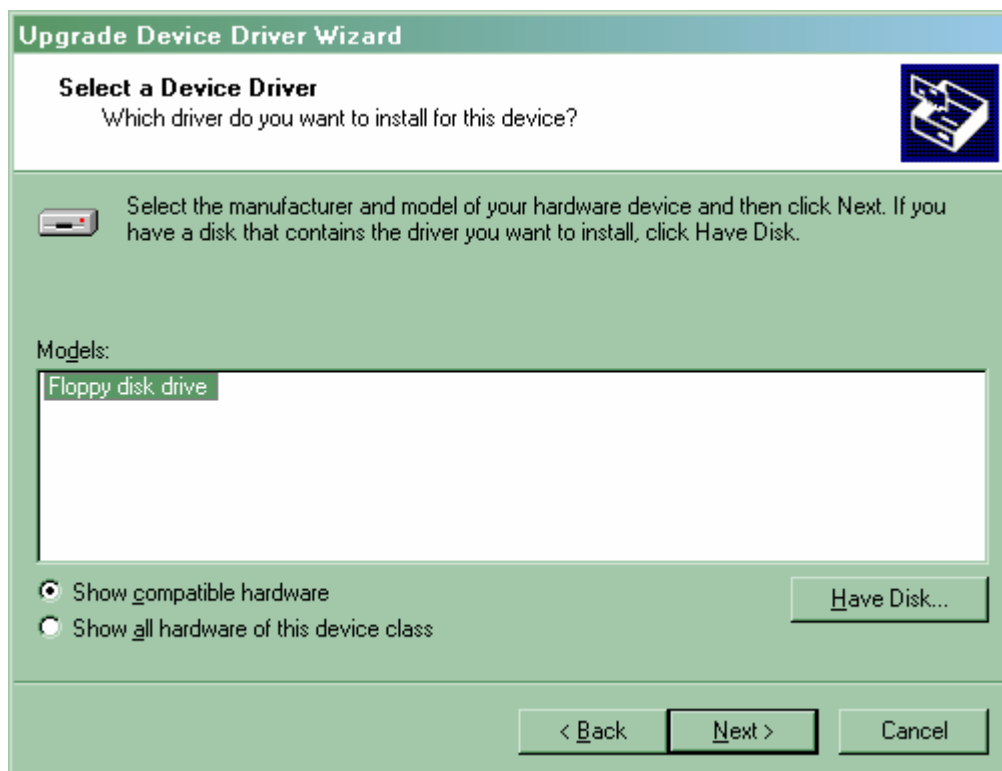
Figure 6.   Win2000: Driver Selection(1)

Note: If the "OmniFlop Enhanced Floppy Disk Drive" (or "OmniFDC Enhanced Floppy Disk Controller") 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:
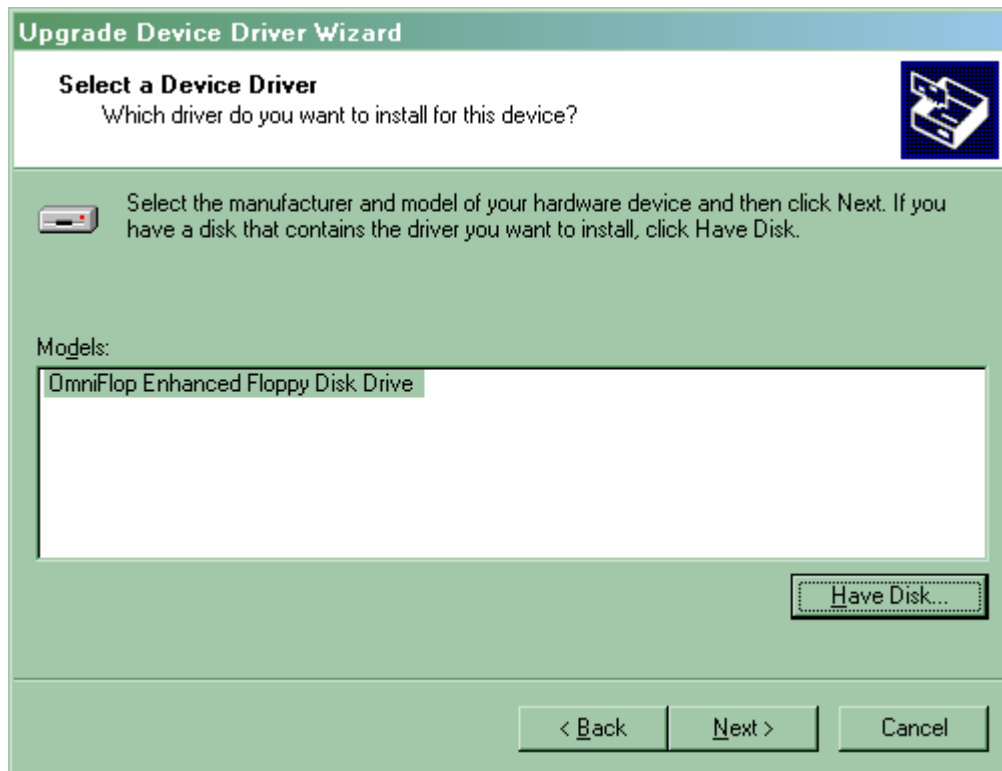
Figure 7.   Win2000: Driver Selection(2)

Click 'Next'.
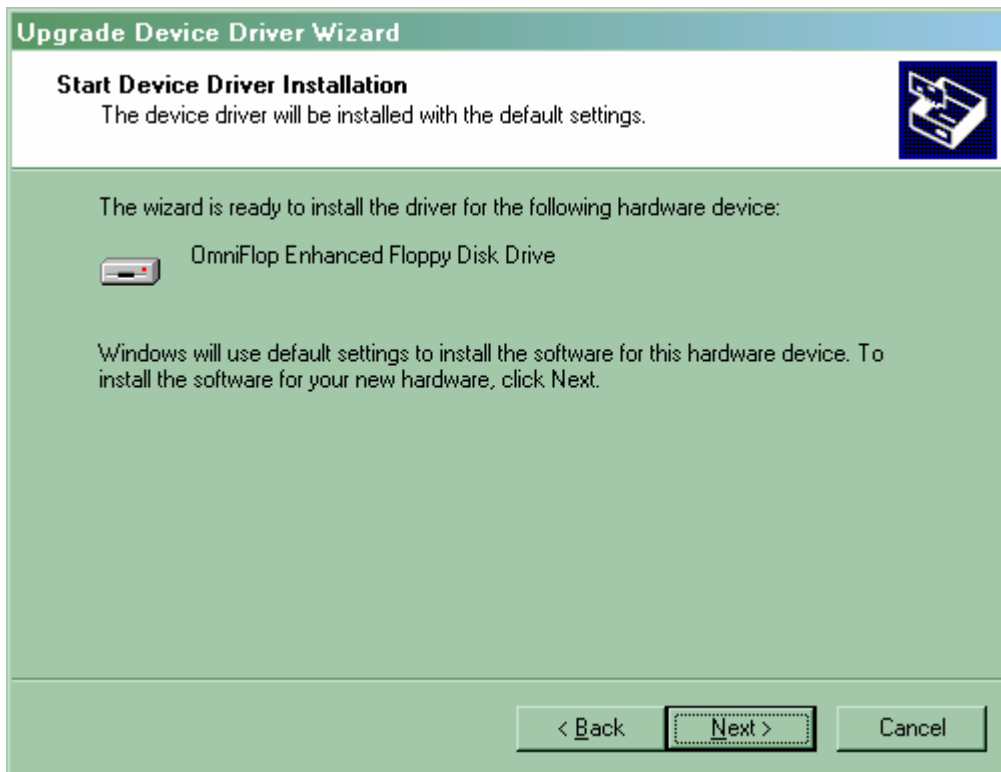
Figure 8.   Win2000: Ready To Install

Click 'Next'.

You should get (after a brief delay):

Figure 9.   Win2000: Success

'Finish' the wizard, and the properties for the Floppy disk drive (or Flpppy disk controller) should now show something similar to:

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

Note: The version may be later than shown here. **Make sure you are using the version of the driver supplied with the Wizard you want to use.**

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:

- To install the **OmniFlop** driver, click the '+' by **'Floppy disk drives'** and double-click the 'Floppy disk drive':
- To install the **OmniFDC** driver, click the '+' by **'Floppy disk controllers'** and double-click the 'Standard floppy disk controller':
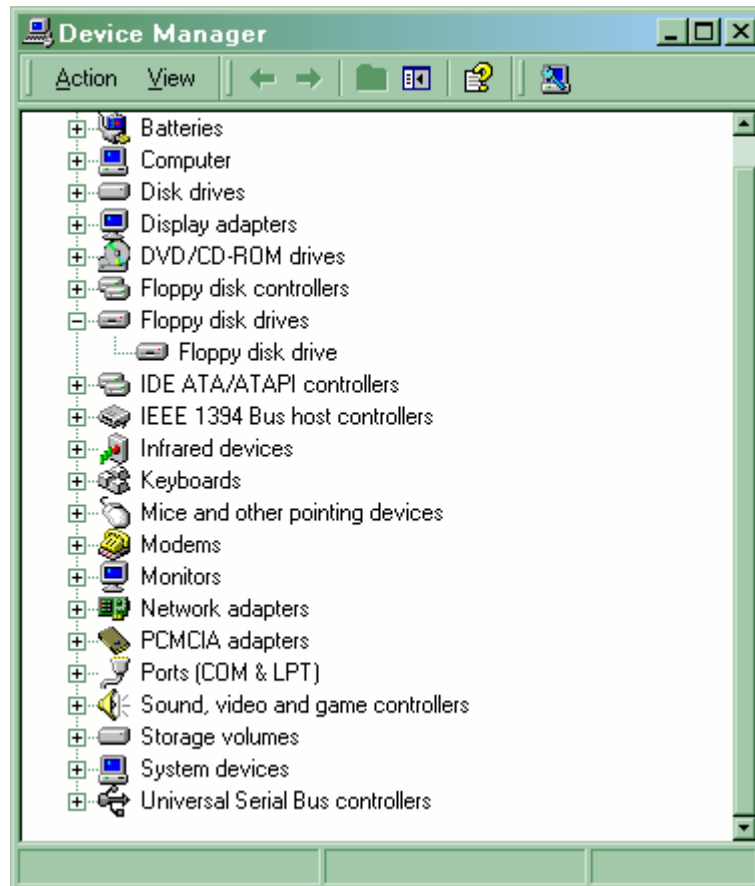

Figure 12. Device Manager

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 Micro$oft (another money-making scheme by the big, bad Corporation). Click 'Next'.
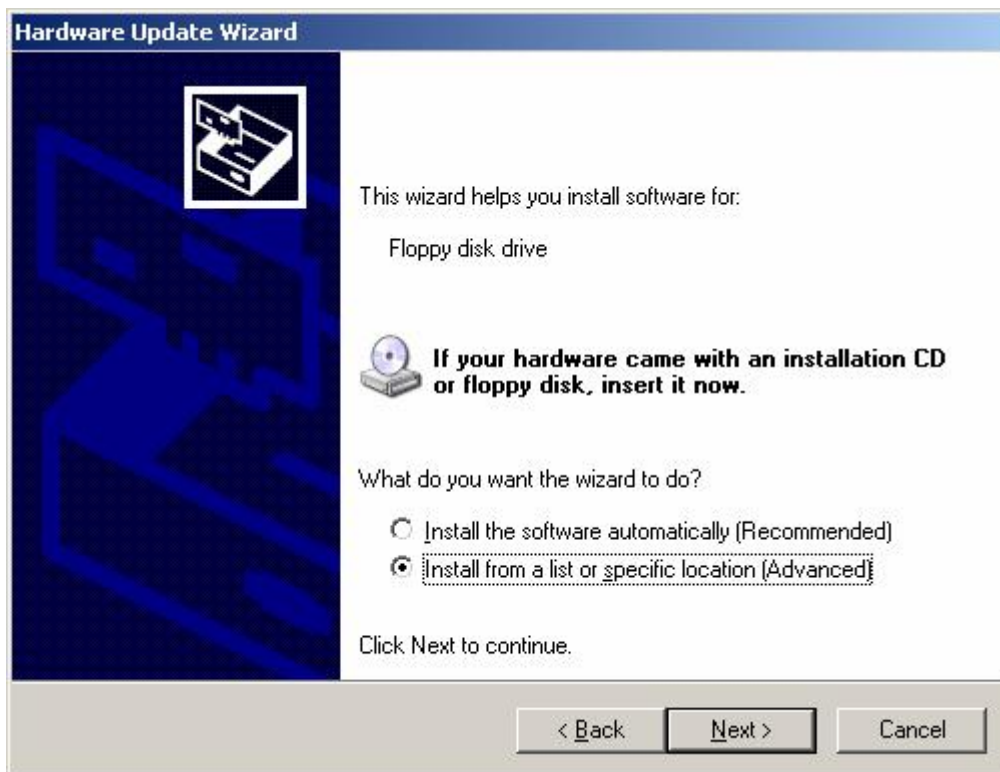
Figure 15. Hardware Update Wizard – Auto/Manual

Select 'Install from a specific location', and click 'Next'.
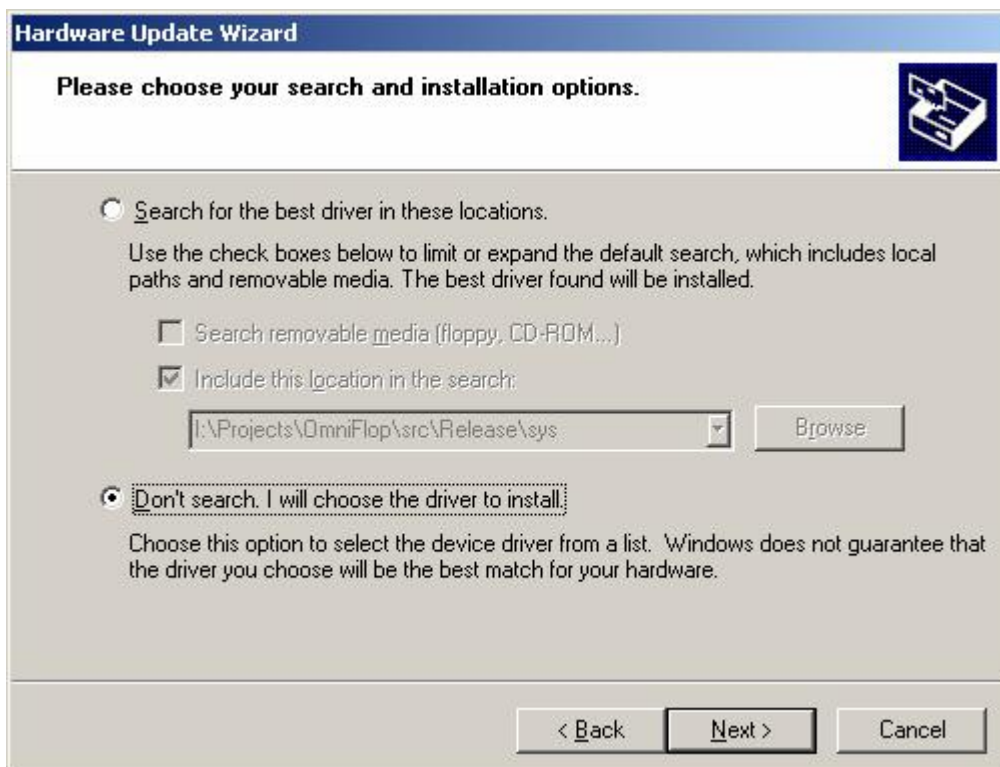
Figure 16. Hardware Update Wizard – Search Options

Select 'I will choose the driver to install', and click 'Next'.
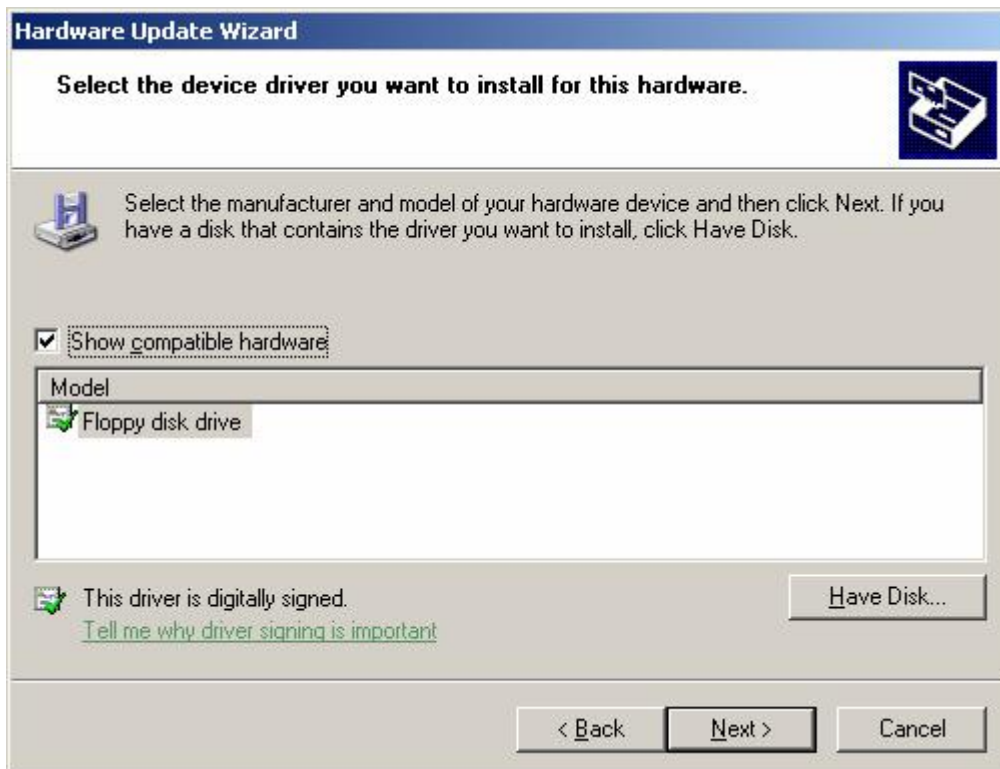
Figure 17. Hardware Update Wizard – Initial Options

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 earnt 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) something like:

Figure 20. Hardware Update Wizard – Success

'Finish' the wizard, and the properties for the Floppy disk drive (or controller) should now show something similar to:

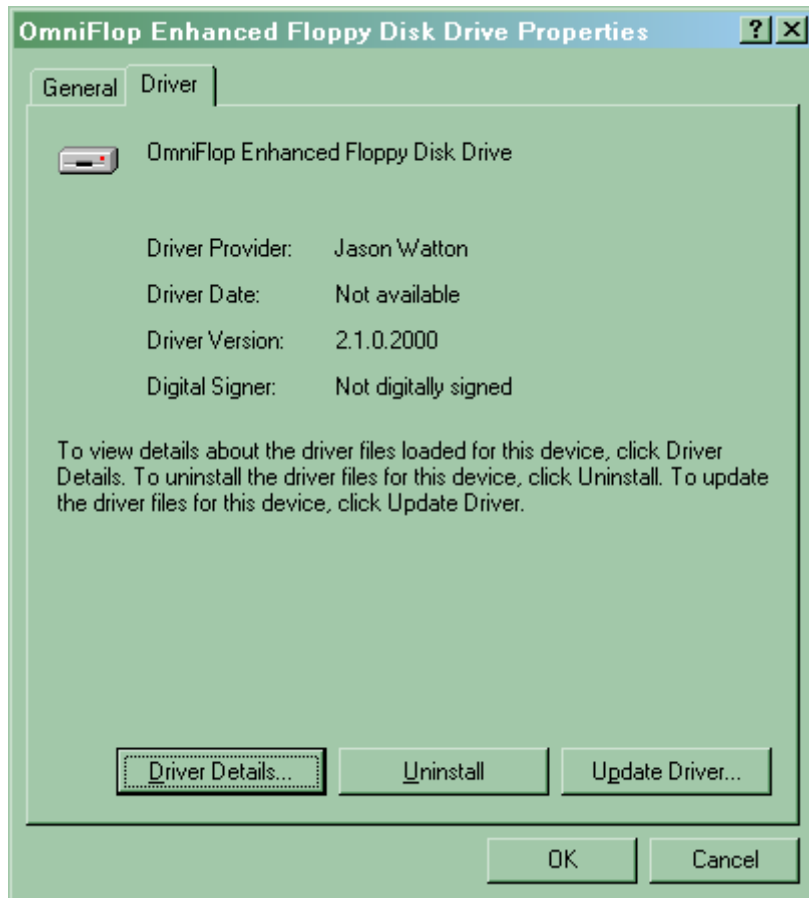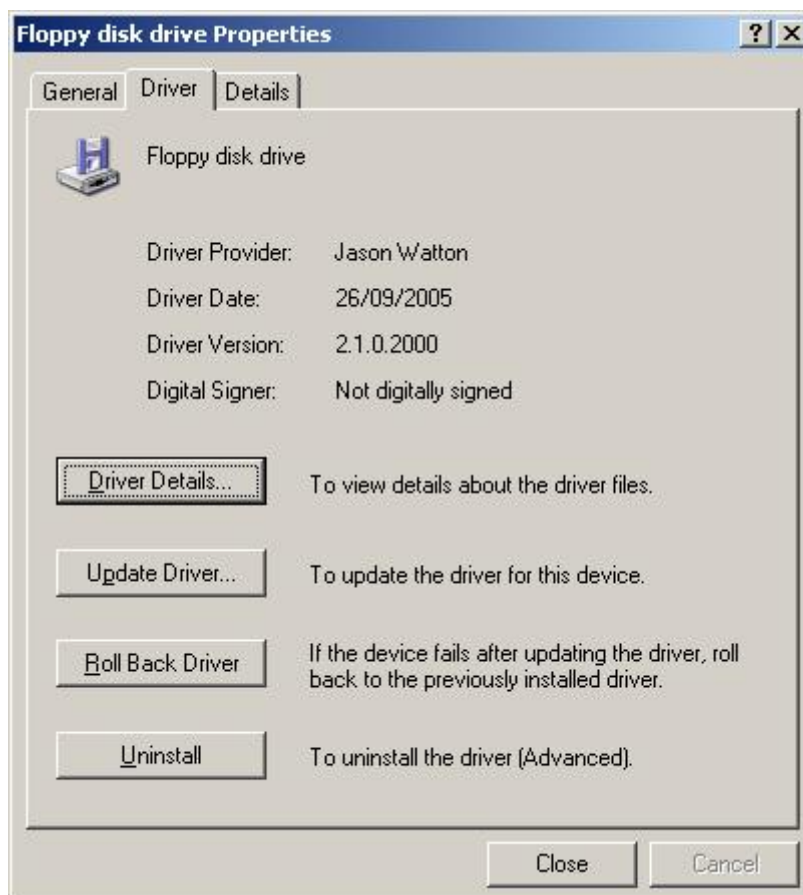**Figure 21. Floppy Disk Drive Properties – Using OmniFlop**

Note: The version may be later than shown here. **Check the date,** and make sure you are using the version of the driver supplied with the Wizard you want to use.

The driver is now installed.

2.3.1.3 Windows Vista

The installation follows a similar path to XP. The following screen shots are provided for guidance.
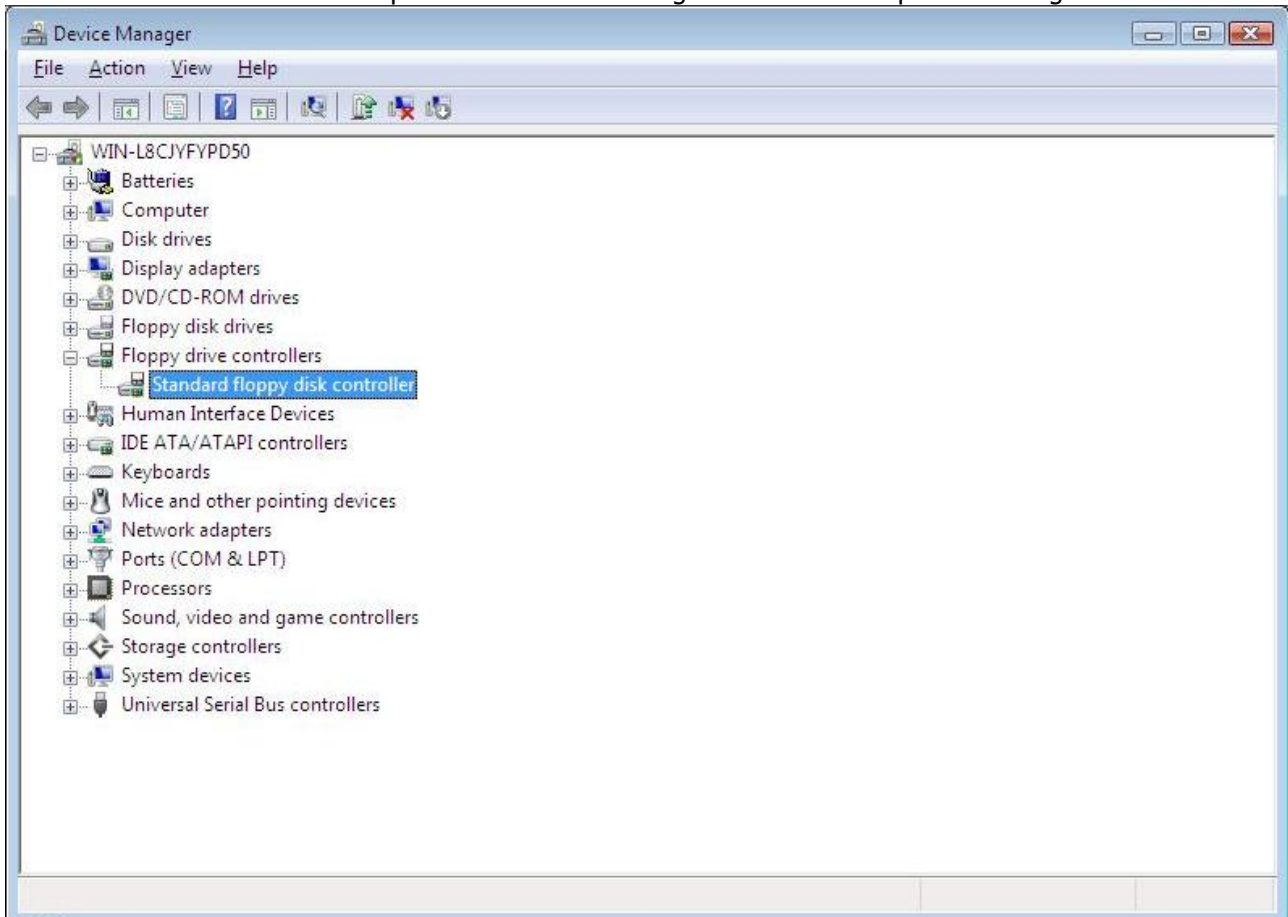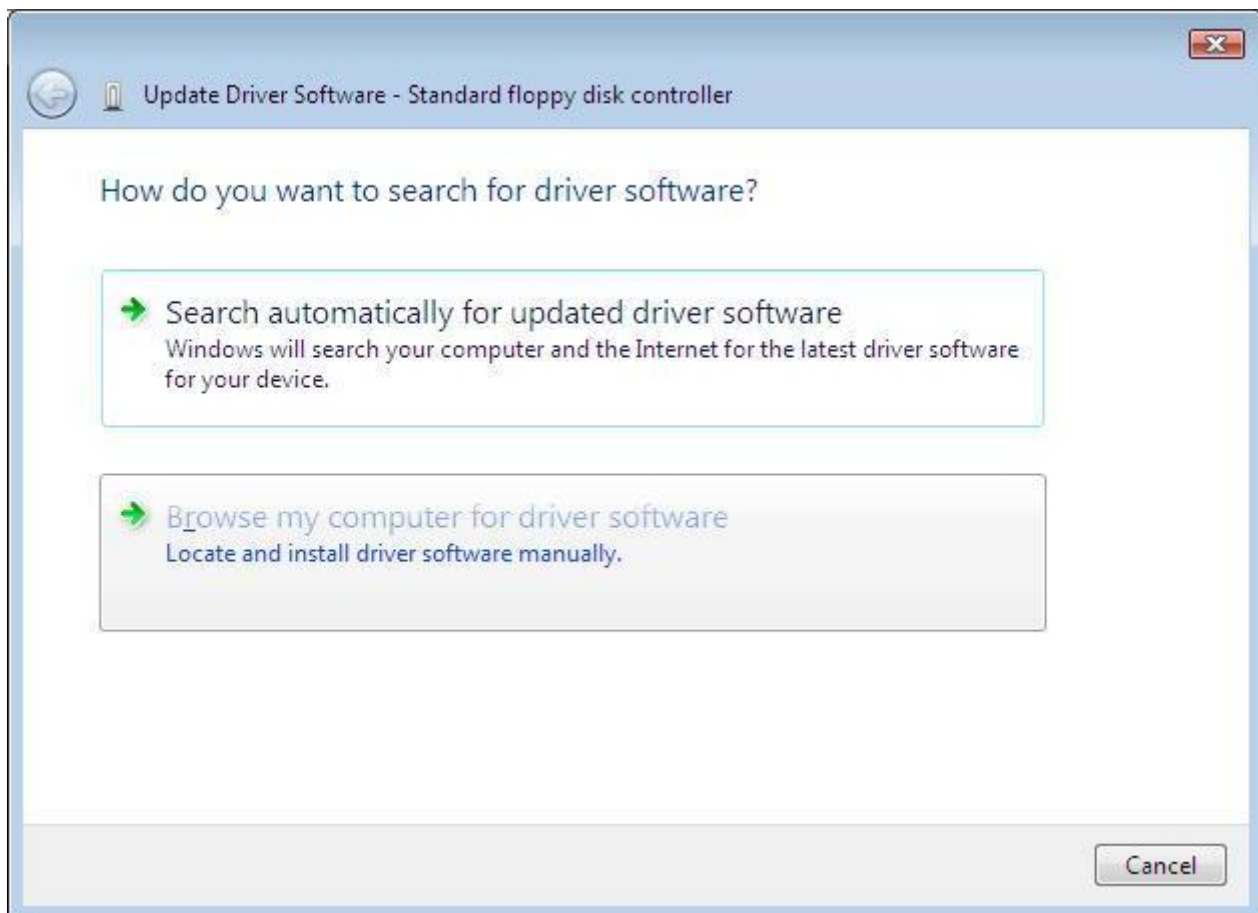
Choose 'Browse...'.

Choose 'Have Disk...'.
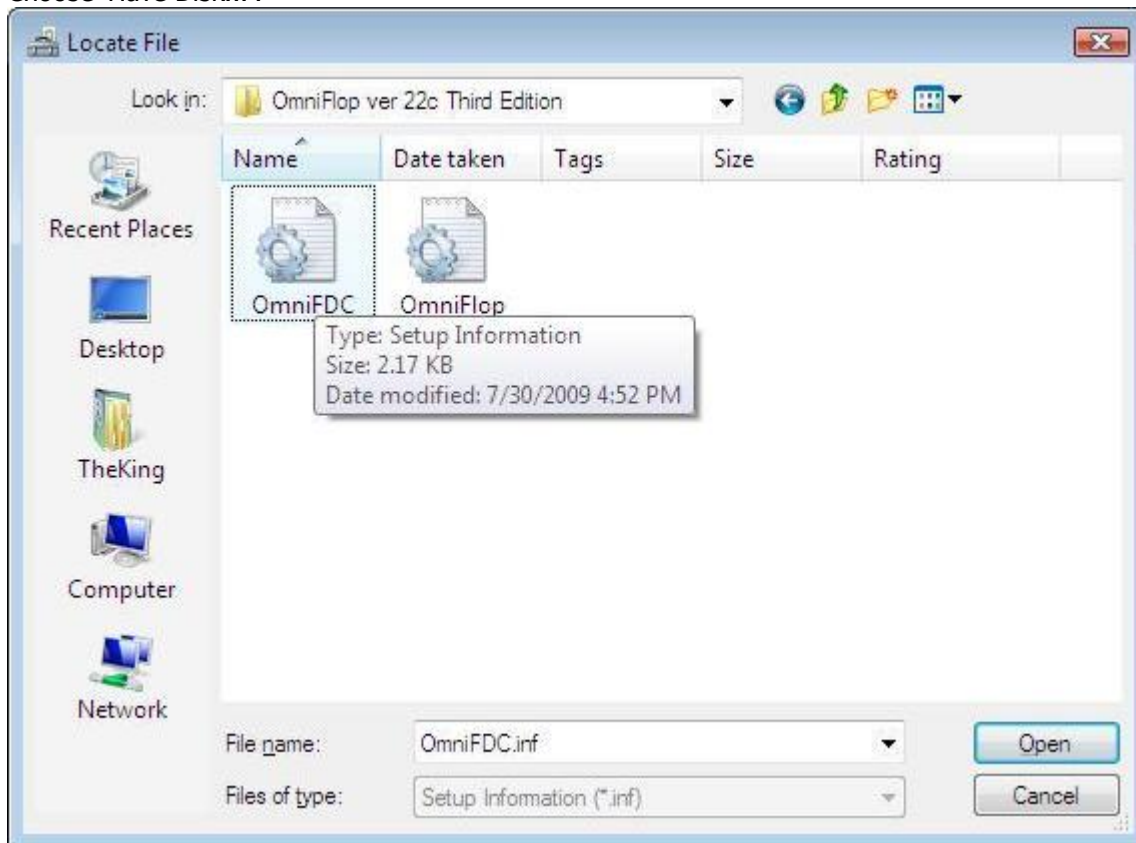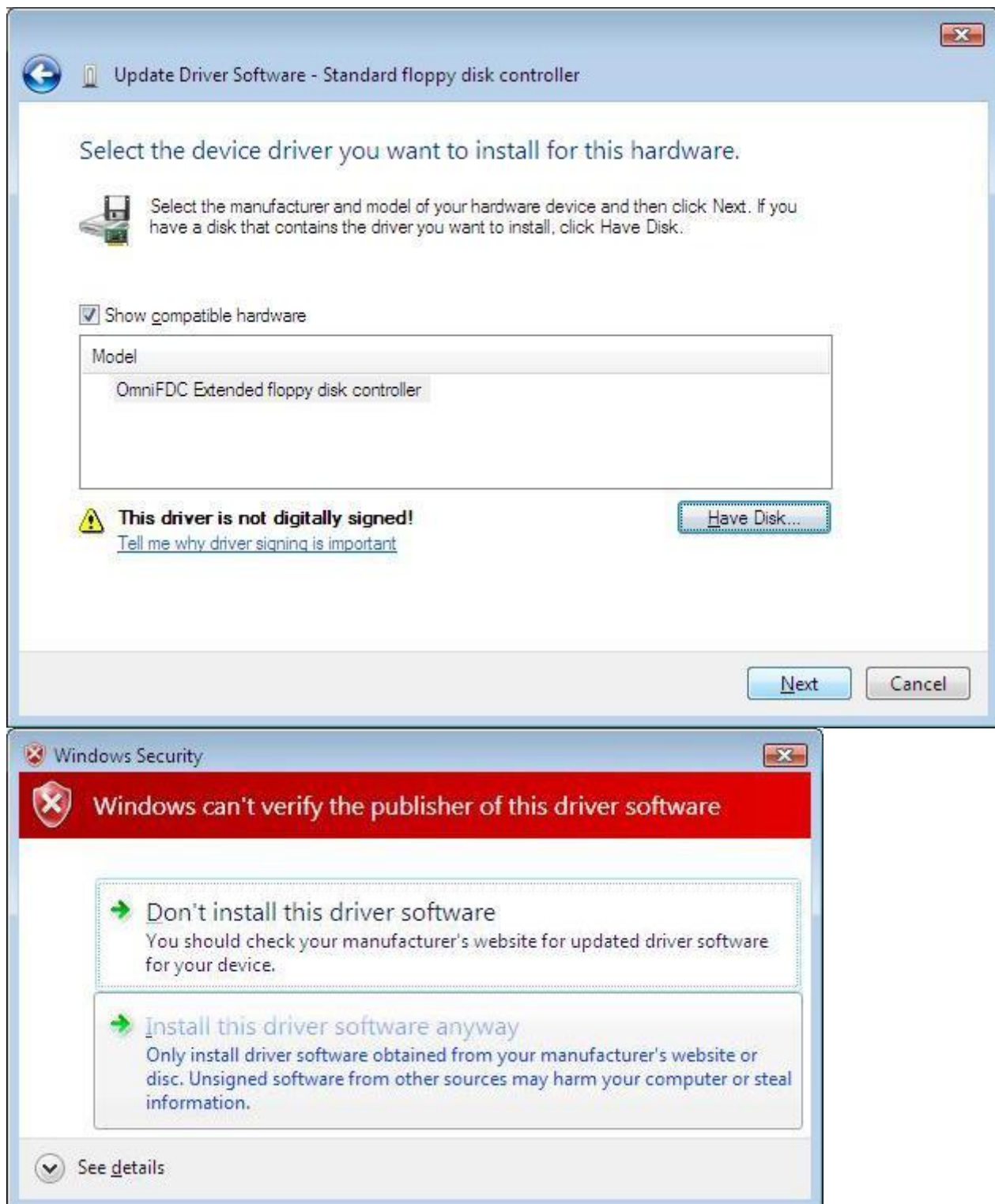
Repeat the above sequence for the Floppy Disk Drive:
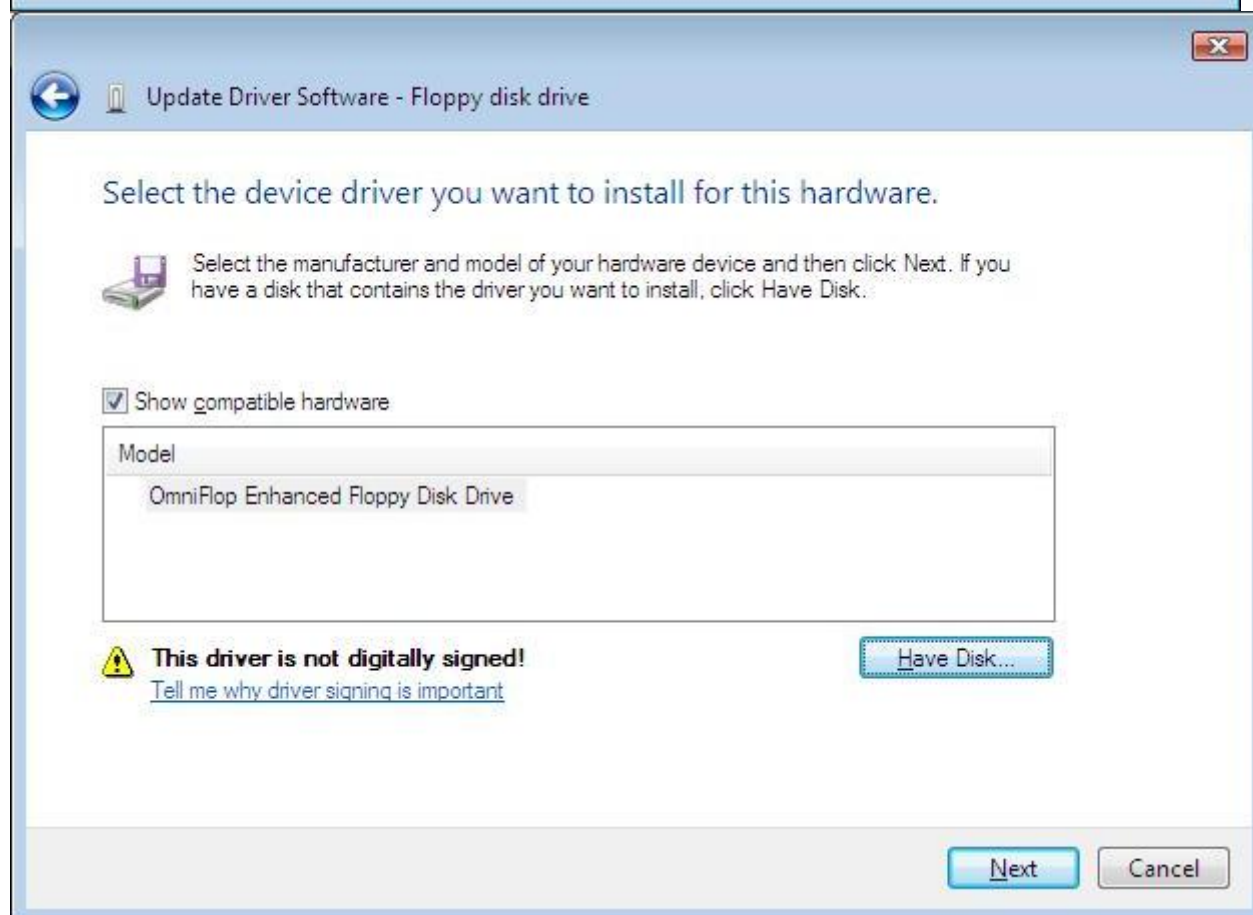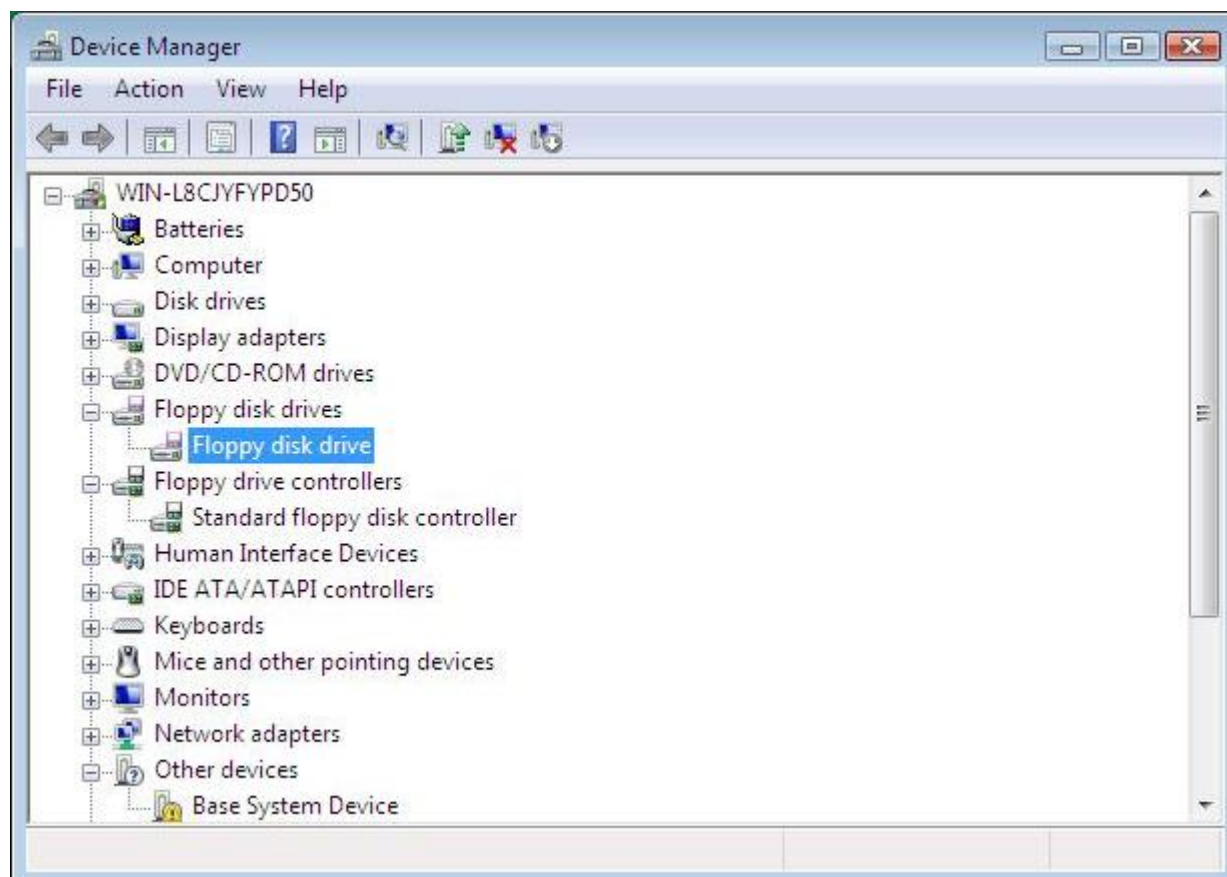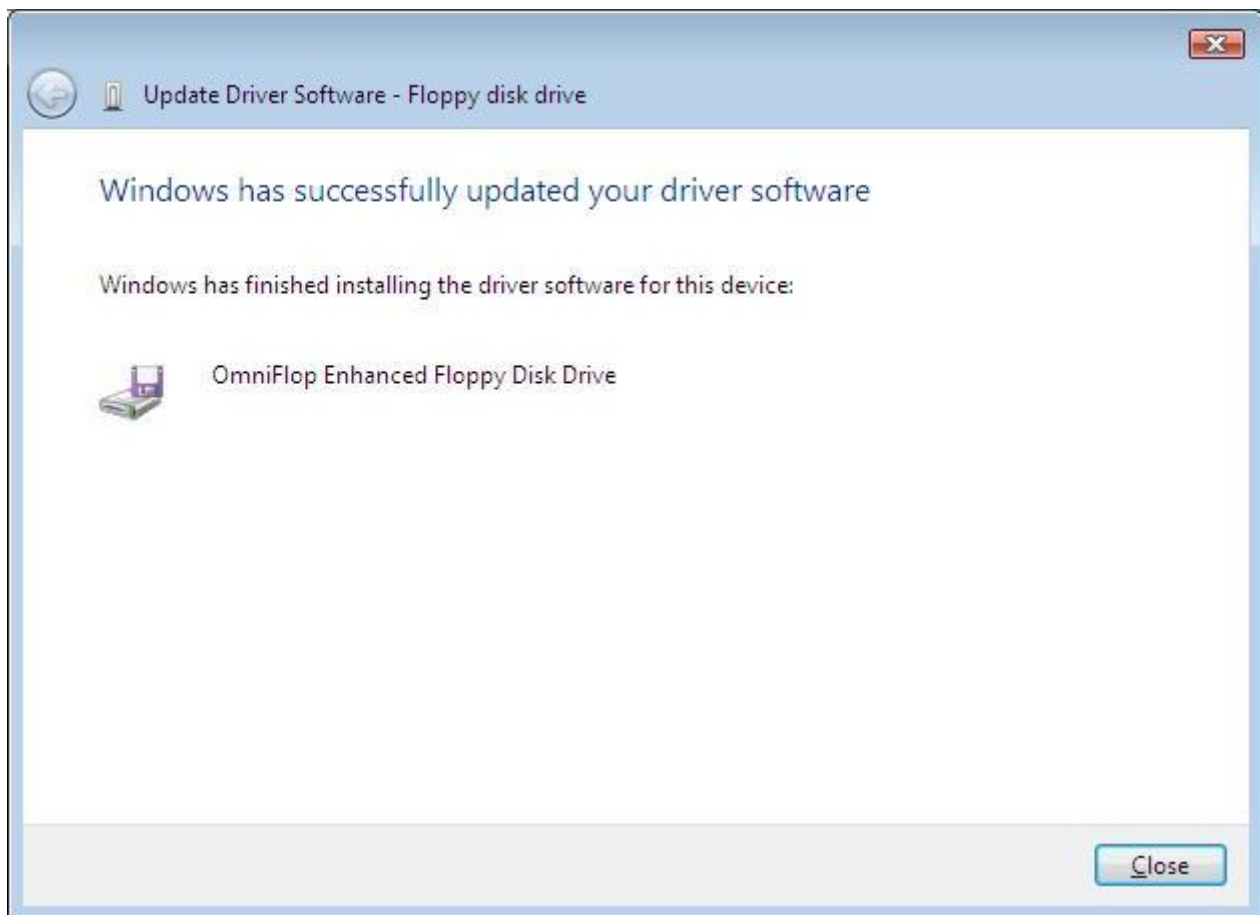
2.3.1.4 Windows 7 Ultimate

The installation follows a similar path to XP and Vista. The following screen shots are provided for guidance.
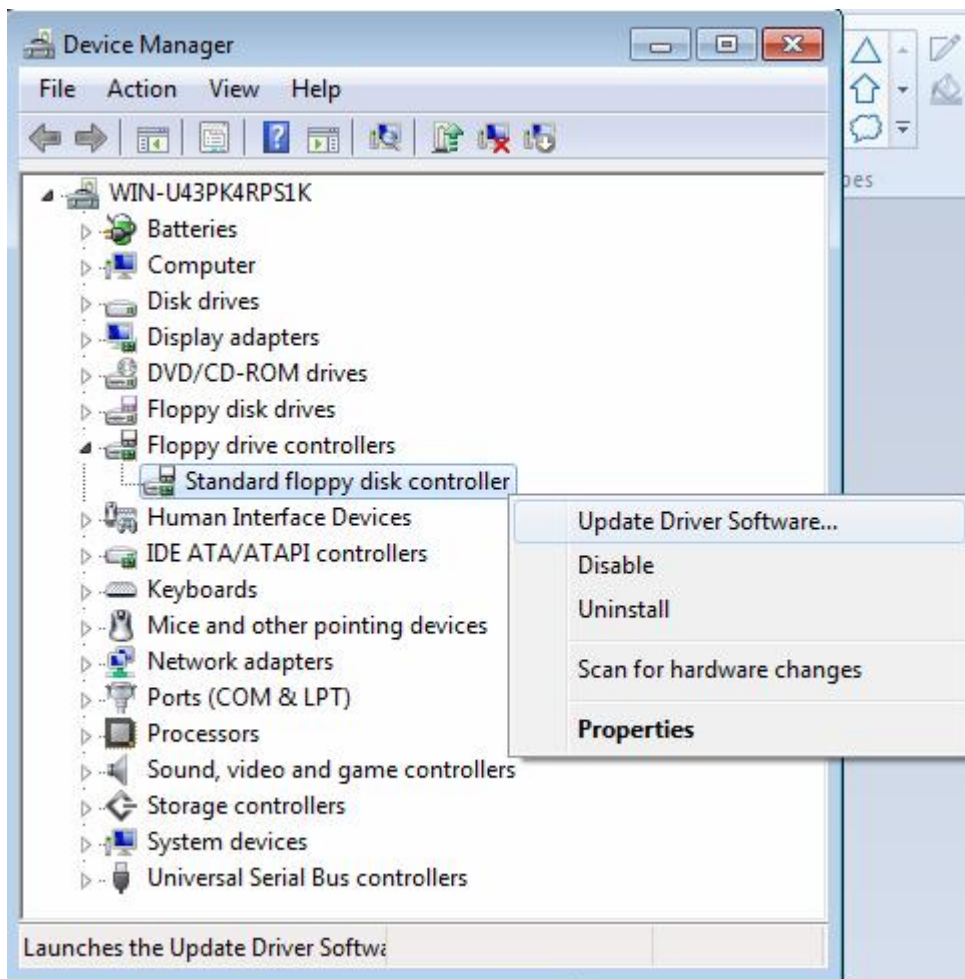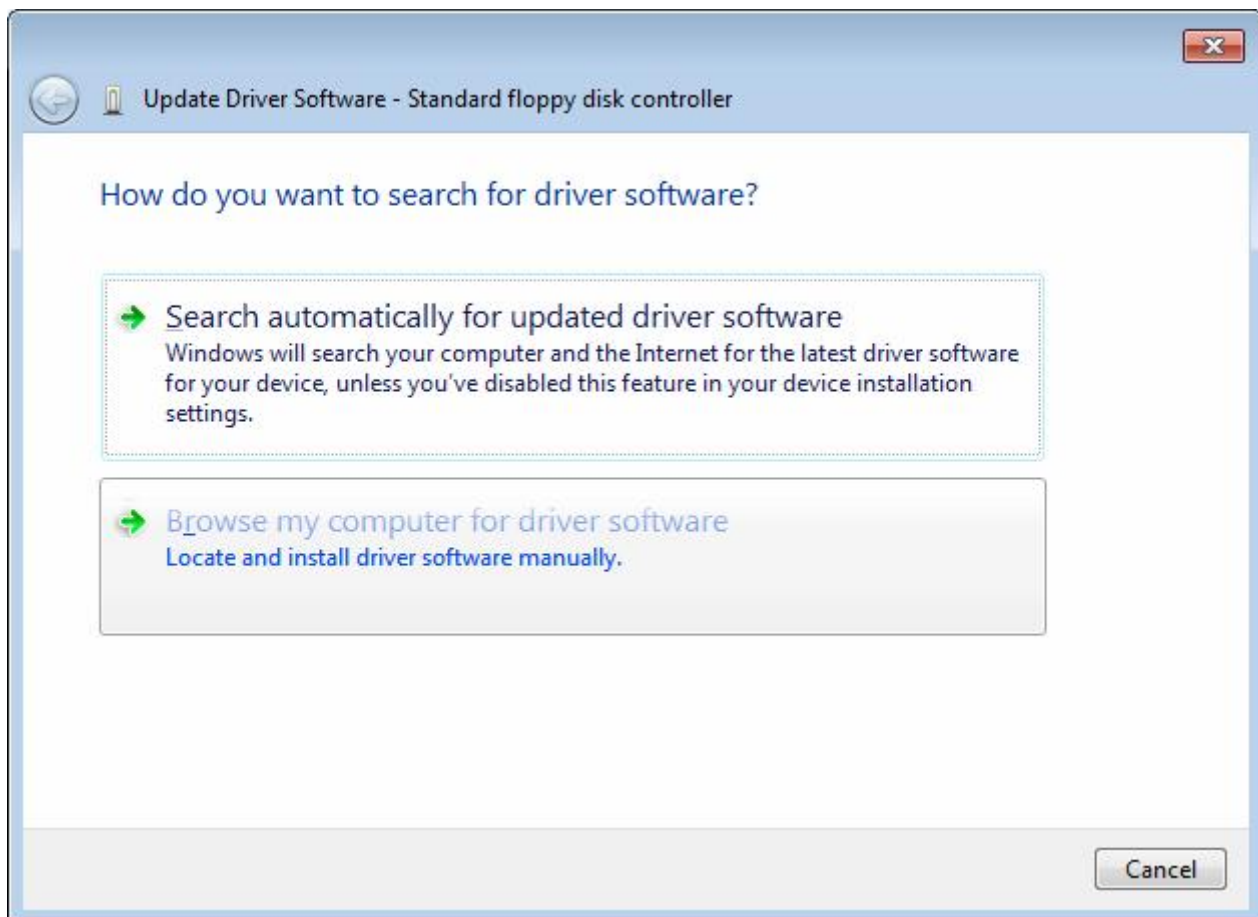
Choose 'Browse...'.
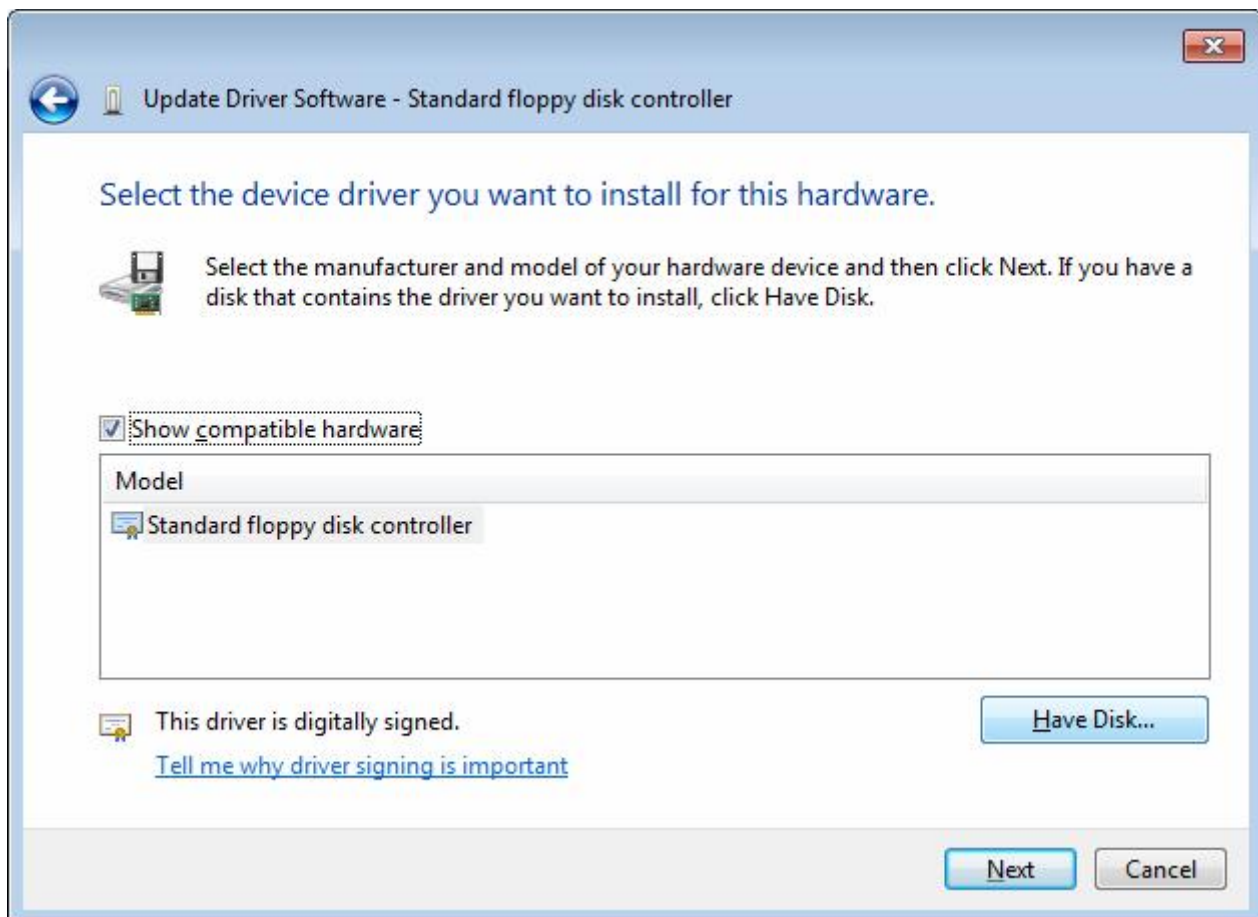
Click 'Have Disk...' and browse to the folder where you extracted OmniFlop.
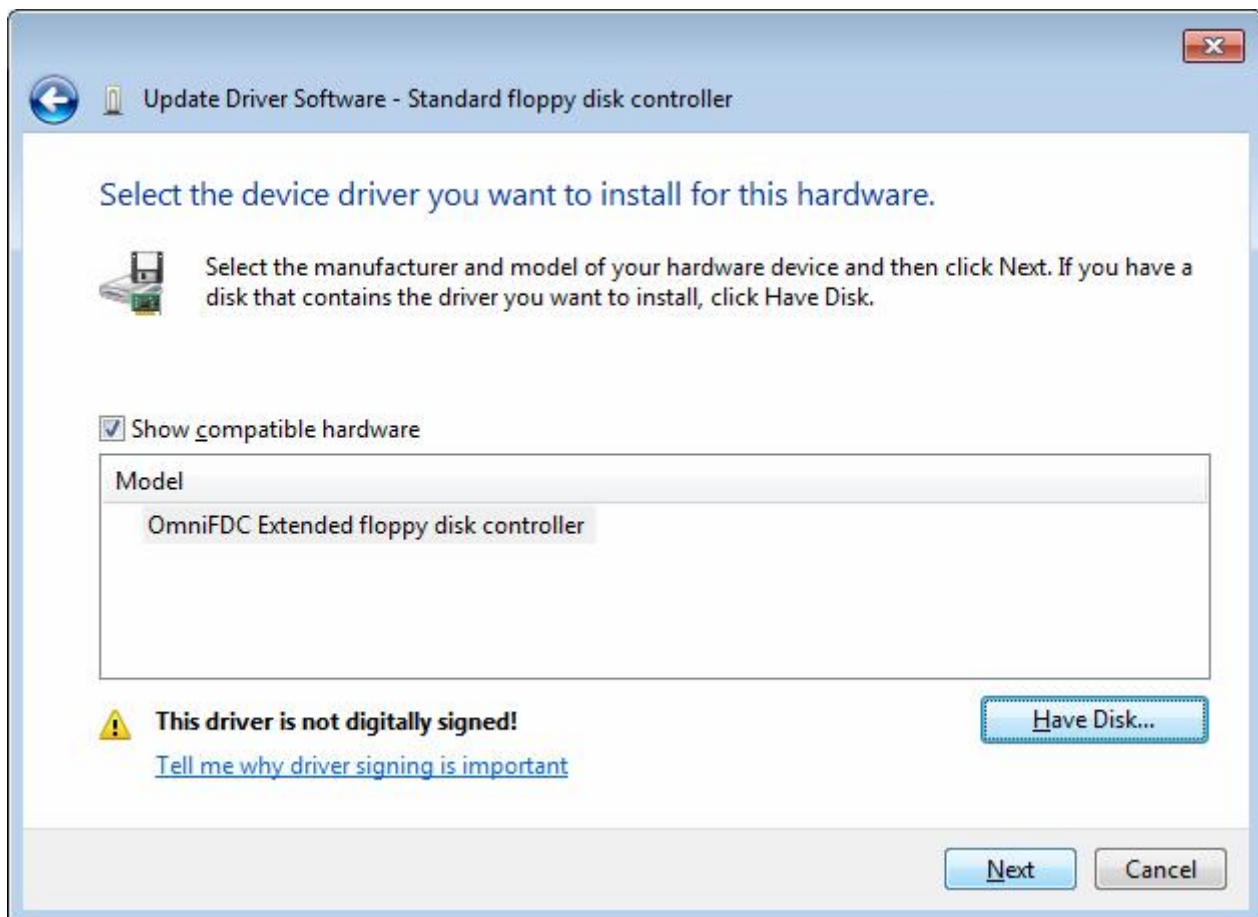
Repeat for the Floppy disk drive:
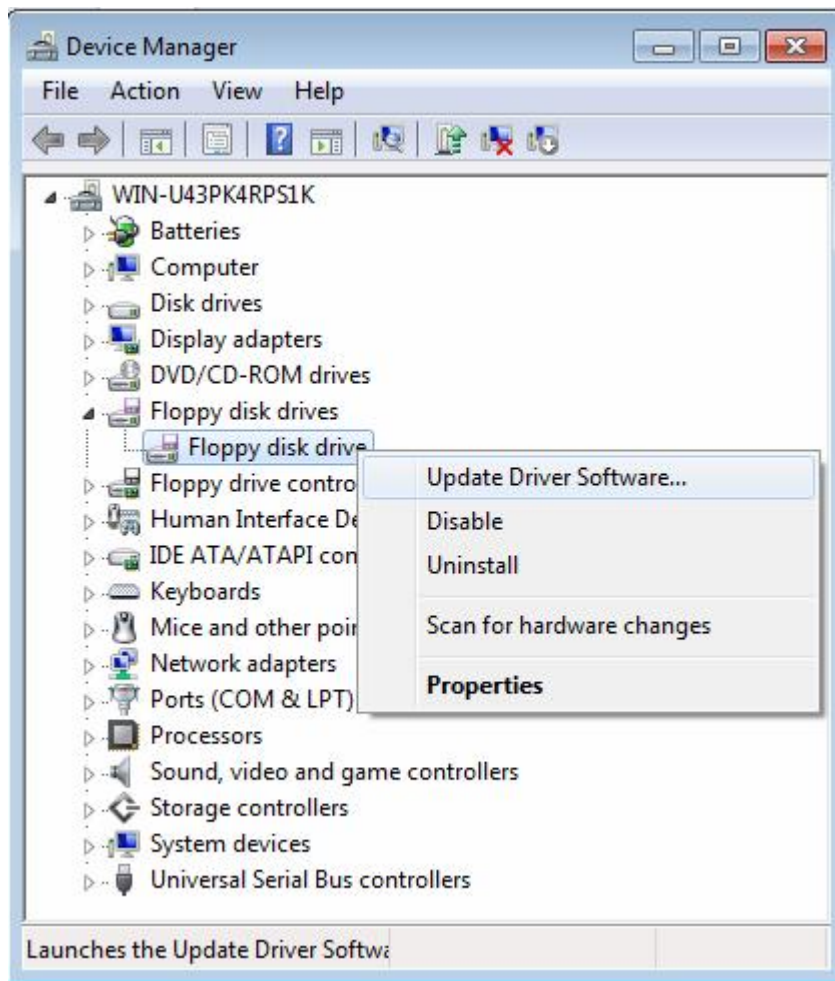
2.3.2 Application

The application (OmniFlop.exe, a wizard) may be run directly by double-clicking the program icon. 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.

2.4.1.3 Windows Vista

After 'Browse my computer for driver software' choose the offered 'Standard floppy disk controller' or 'Floppy disk drive' driver.

2.4.1.4 Windows 7 Ultimate

After 'Browse my computer for driver software' choose the offered 'Standard floppy disk controller' or 'Floppy disk drive' driver.

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 license from the author. Since v2.2b almost all licensing has been removed.

Licenses 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 (click 'Register by e-mail') or, preferably, on-line (click 'Register on-line'). Registering on-line is automated and fast, whereas e-mails have to be manually processed, so are considerably slower.

If there are problems obtaining a license, check http://www.shlock.co.uk/Utils/OmniFlop for details of service. There are times when licensing is unavailable, especially using e-mail.

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:

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 *Double-Density* DDOS and ADFS formats requires no licence.
4. Reading and Writing *any* Single Density format now requires a license. This has been introduced to gather information on PCs which are able to support FM encoding (see 4.1.2). There is considerably widespread opinion on what "most" PCs can, and cannot, do, but very little objective evidence.
5. Reading and Writing non-BBC and non-Microsoft formats sometimes requires an 'Other' licence. This happens if there has been insufficient feedback to confirm their effectiveness. Some formats (e.g. Tandy CoCo) do not require a license as they have been confirmed as correct.
6. Reading and Writing unknown (custom) formats requires a 'Custom' licence. This is to restrain commercial exploitation.
7. Licenses are available to allow use of the OmniFlop driver with external (3rd party) programs. The licensing is used to monitor the support liability for external programs.

The right to refuse licences is reserved.

2.5.3 Getting a License

Using the program does not normally require a license. If you need a license, you will be told.
To get a license you should simply attempt the function you wish to use.

However, there are situations where you want to obtain a license up-front, i.e. before attempting the function. This includes licensing other software to use the OmniFlop driver - a license is used to enable other software to access the driver directly. To get a license in this case use the 'Get a License' option from the front screen. The program will prompt with instructions, but when you ask for the license **you must specify**:

- The program name, i.e. OmniFlop
- The version number, e.g. v2.01a
- The Registration Code, e.g. BBCgT51x£@3. This is <u>unique to you</u> and a license cannot be issued without it. The code may contain codes which are normally untypeable or characters that you cannot easily recognise - e.g. 'I' and 'l', '0' and 'O' - so you should <u>cut & paste the code</u> directly into an e-mail. From v2.01 onwards an e-mail will automatically be generated for this purpose.
- The format you are trying to use. *This is point of the license* - to provide support for as many formats as possible. Your help in testing - and using - them is crucial.
- The hardware you are using (i.e. machine type or motherboard). This is to help with support and highlight PCs which are known to work, or known not to.

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.

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 (with discoverers):

OmniFlop driver required?	EXTENDED_MEDIA_ TYPE	Format Name	Discoverer
NO	F8_256_128	8" DOS 256kB	
NO	F5_160_512 FX_IBM_DOS160	5¼" DOS 160kB	
NO	F5_180_512 FX_IBM_DOS180	5¼" DOS 180kB	
NO	F5_320_512 FX_IBM_DOS320	5¼" DOS 320kB	
NO	F5_320_1024	5¼" DOS 320kB (1024-byte sectors)	
NO	F5_360_512 FX_IBM_DOS360	5¼" DOS 360kB	
YES	F5_640_512 FX_IBM_DOS640	5¼" DOS 640kB	Malcolm Sargent
NO	F5_720_512 FX_IBM_DOS720	5¼" DOS 720kB	
NO	F5_1Pt2_512 FX_IBM_DOS1200	5¼" DOS 1.2MB	
NO	F5_1Pt23_1024 FX_IBM_DOS320_1024	5¼" DOS 1.23MB (1024-byte sectors)	
YES	FX_IBM_DOS160	3½" DOS 160kB	
YES	FX_IBM_DOS180	3½" DOS 180kB	
YES	FX_IBM_DOS320	3½" DOS 320kB	
YES	FX_IBM_DOS320_1024	3½" DOS 320kB (1024-byte sectors)	
YES	FX_IBM_DOS360	3½" DOS 360kB	
YES	F3_640_512 FX_IBM_DOS640	3½" DOS 640kB	Malcolm Sargent
NO	F3_720_512 FX_IBM_DOS720	3½" DOS 720kB	
NO	F3_1Pt2_512 FX_IBM_DOS1200	3½" DOS 1.2MB	
NO	F3_1Pt23_1024	3½" DOS 1.23MB (1024-byte sectors)	
NO	F3_1Pt44_512 FX_IBM_DOS1440	3½" DOS 1.44MB	
NO	F3_2Pt88_512 FX_IBM_DOS2880	3½" DOS 2.88MB	
NO	F3_20Pt8_512	3½" DOS 20.8MB	
NO	F3_120M_512	3½" DOS 120MB	
NO	F3_128Mb_512	3½" DOS 128MB	
NO	F3_230Mb_512	3½" DOS 230MB	

YES	FX_IBM_DOS729	DOS 729kB	Gutbrod András
YES	FX_IBM_DOS800	DOS 800kB	
YES	FX_IBM_DOS1215	DOS 1.215MB	Vitaliy Vorobyov
YES	FX_IBM_DOS1232	DOS 1.232MB	pstaszkow
YES	FX_IBM_DOS1230	DOS 1.230MB	Vitaliy Vorobyov
YES	FX_IBM_DOS1245	DOS 1.245MB	Vitaliy Vorobyov
YES	FX_IBM_DOS1458	DOS 1.458MB	Vitaliy Vorobyov
YES	FX_IBM_DOS1476	DOS 1.476MB	Vitaliy Vorobyov
YES	FX_IBM_DOS1494	DOS 1.494MB	Vitaliy Vorobyov
YES	FX_IBM_DOS1701	DOS 1.701MB	Lindsay Hargreaves
YES	FX_IBM_DOS1722	DOS 1.722MB	Stephane Roth
YES	FX_IBM_DOS1743	DOS 1.743MB	kalman
YES	FX_4THDIM_800	4th Dimension 799.75kB	Wocki
YES	FX_ABB_IRB2000	ABB/Asea Robot IRB2000 S3 Type: PS 130/6 -45-P. 3084 80-track	Rob Bos
YES	FX_ABB_ROBOT	ABB/Asea Robot	Daniel C Hayden
YES	FX_ABB_ROBOT41	ABB/Asea Robot IRB L6/0293 41-track	Toon Lettink
YES	F3_ABB_ROBOT41	ABB/Asea Robot IRB L6/0293 3½" conversion	Leotta Domenico
YES	FX_IBM_DOS360	3½" Acorn BBC Master 512 DOS 360kB	Chris Richardson
NO	F3_720_512	3½" Acorn BBC Master 512 DOS 720kB	Chris Richardson
NO	F5_720_512	5¼" Acorn BBC Master 512 DOS 720kB	Chris Richardson
YES	F3_BBC_ADFS_L	3½" Acorn ADFS L 640kB	Chris Richardson
YES	F5_BBC_ADFS_L	5¼" Acorn ADFS L 640kB	Tim Felgate, Jon Ripley, Mark Ferns
YES	FX_BBC_ADFS_M	Acorn ADFS M 320kB	Jonathan G Harston, Chris Richardson
YES	FX_BBC_ADFS_S	Acorn ADFS S 160kB	Jonathan G Harston, Chris Richardson
YES	FX_BBC_ADFS_DE	Acorn ADFS D, D+, E, E+ 800kB	Jon Ripley, Chris Richardson
YES	FX_BBC_ADFS_F	Acorn ADFS F, F+ 1600kB	Jon Ripley, Chris Richardson
YES	FX_BBC_SJ_MDFS	Acorn BBC SJ Research MDFS	Mark Ferns
YES	FX_BBC_DFS40	Acorn BBC DFS 40-track single-sided (100kB)	Chris Richardson, Rob Nicholds
YES	FX_BBC_DFS40x2	Acorn BBC DFS 40-track double-sided (200kB)	Chris Richardson
YES	FX_BBC_DFS80	Acorn BBC DFS 80-track single-sided (200kB)	Chris Richardson, Rob Nicholds
YES	FX_BBC_DFS80x2	Acorn BBC DFS 80-track double-sided (400kB)	Chris Richardson
YES	FX_BBC_DFS415	Acorn BBC DFS 83-track double-sided (415kB)	Electronic Workshop, University of Sheffield
YES	FX_BBC_Z80_CPM	Acorn BBC Z80 CP/M 400kB	Chris Richardson
YES	F5_BBC_MAST_DOS_4 0T FX_BBC_MAST_DOS_4 0T	Acorn BBC Master 512 DOS 360kB	Chris Richardson
NO	F3_BBC_MAST_DOS	3½" Acorn BBC Master 512 DOS Plus 720kB	Chris Richardson
NO	F5_BBC_MAST_DOS	5¼" Acorn BBC Master 512 DOS Plus 720kB	Chris Richardson
YES	FX_BBC_DOS_PLUS	Acorn BBC Master 512 DOS Plus 800kB	Chris Richardson
YES	FX_BBC_DDOS80	Acorn BBC DDOS 80-track single-sided 360kB	Jason Watton

YES	FX_BBC_DDOS80x2	Acorn BBC DDOS 80-track double-sided 720kB	Jason Watton
YES	FX_AKAI_MPC_60	AKAI MPC 60 MK II	Dale Henriques
YES	FX_AKAI_S900	AKAI S-900 800kB	Markus Dimdal
YES	FX_AKAI_S950_HD	AKAI S-900 1440kB	Markus Dimdal
YES	FX_AKAI_S_DD	AKAI S-950 800kB	Markus Dimdal
YES	FX_AKAI_S950_HD	AKAI S-950 1440kB	Markus Dimdal
YES	FX_AKAI_S_HD	AKAI S-950 1600kB	Markus Dimdal
YES	FX_AKAI_S1000_DD	Akai S-1000 800kB	Markus Dimdal
YES	FX_AKAI_S1000_HD	Akai S-1000 1600kB	Markus Dimdal
YES	FX_AKAI_S3000_DD	Akai S-3000 800kB	Markus Dimdal
YES	FX_AKAI_S3000_HD	Akai S-3000 1600kB	Markus Dimdal
YES	FX_ALESIS_DATA	Alesis Datadisk (800kB)	Donal Ryan
YES	FX_APPL1616_800	Applix 1616 (800kB)	Bob Devries
YES	FX_APPL1616_810	Applix 1616 (810kB)	Bob Devries
YES	FX_APPL1616_820	Applix 1616 (820kB)	Bob Devries
YES	FX_AMS_DATA_SS FX_AMS_DATA_DS	Amstrad Data (SS/DS)	Karl Kopeszki
NO	F5_AMS_IBM FX_AMS_IBM	5¼" Amstrad IBM 160kB	
NO	F5_AMS_CPM	5¼" Amstrad CP/M 720kB	Andy J Davis, Thomas Heck
NO	F3_AMS_CPM	3½" Amstrad CP/M 720kB	Andy J Davis, Thomas Heck
YES	FX_AMS_SYS_SS FX_AMS_SYS_DS	Amstrad System (SS/DS)	Karl Kopeszki
YES	FX_AMS_SYS_DATA FX_AMS_DATA_SYS	Amstrad System/Data DS and Data/System DS	Karl Kopeszki
NO	FX_APPLE_MAC_HD_HFS	3½" Apple Macintosh 1.44MB high-density, HFS Volume	Jon Ripley
YES	FX_ASM_2000_1440	ASM Epsilon 2000 Epi Reaktor	Christof Kauer, ipcas GmbH
YES	FX_ATRI_8BIT_90	Atari 8-bit 90kB	Charles Doty
NO	F5_ATRIST_DSDD	5¼" Atari ST DSDD 720kB	Jon Ripley
NO	F3_ATRIST_DSDD	3½" Atari ST DSDD 720kB	Jon Ripley
YES	FX_ATRIST_320	Atari ST SS 320kB	Bob Devries
YES	FX_ATRIST_SSDD	Atari ST SS 360kB	Mark "alfspanners"
YES	FX_ATRISTE_738	Atari STE 738kB	John Davis
YES	FX_ATRISTE_800	Atari STE 800kB	John Davis
YES	FX_ATRISTE_810	Atari STE 810kB	John Davis
YES	FX_ATRISTE_820	Atari ST 820kB	David Williams
YES	FX_ATRI_PUP	Atari ST(e) Power Up Plus 913kB - **Note:** Writing disks of this format may require retries - keep pressing 'Retry'!	Norman Bruggner
YES	FX_AUTOMX_RAIL	Automatix RobotControl RAIL 400kB	Johan M Lundstrom
YES	FX_AUTOMX_RAIL_0	Media400x1024_0 400kB	Taking the 5th!
YES	FX_BALZER	Balzer Metal Evaporator Balzer Ophthalmic Lens Machine	Richard Scott Carlos Sánchez
YES	FX_BELI	Beli 640kB	Igor Živanović
YES	FX_BMI3030A	BMI3030A	Edward Winterberger
YES	FX_CASIO_FZ20M	Casio FZ-20M **Note:** This format may require a modification to your PC floppy drive for use with the Casio FZ-20M - see here.	Dr. Georg Müller, Chris Strellis
YES	FX_CASIO_FZ20M_HD	Casio FZ-20M HD	Rainer Buchty
YES	FX_CBM1581	cbm1581	Wolfgang Moser
YES	FX_CMDFD1M	cmdfd1m	Wolfgang Moser
YES	FX_CMDFD2M	cmdfd2m	Wolfgang Moser
YES	FX_CMDFD4M	cmdfd4m	Wolfgang Moser

NO	FX_CNI_NC481_HD	CNI NC481 HD 1440kB	Senad Gluhacevic
NO	F5_CNI_NC481_DD	5¼" CNI NC481 DD 720kB	Kamil Murin
NO	F3_CNI_NC481_DD	3½" CNI NC481 DD 720kB	Kamil Murin
YES	FX_ROTROL_720	Cloos Rotrol 16 720kB	Christof Kauer
YES	FX_COMP_AUTO_LSI2	Computer Automation LSI-2 Mini	Lars Hamren
YES	FX_COMX_35_SS	COMX DOS 35-track single sided	Dennis Heijmans
YES	FX_COMX_35_DS	COMX DOS 35-track double sided	Dennis Heijmans
YES	FX_COMX_70_SS	COMX DOS 70-track single sided	Marcel van Tongeren
YES	FX_CPM_640	CP/M-80 640kB (various machines, e.g. P2000C)	Jason Watton
YES	FX_CPM22_CTS_800	CP/M 2.2 80/10x1024 800kB	Dave Timmins
YES	FX_DG1_200	Data General/1	Josef Havlik
YES	FX_DEC_RAINBOW	DEC Rainbow 100	Paul Hughes
YES	FX_DEC_RX02_1001	DEC RX02 1001kB	Nikolay Degtev
YES	F3_DIDAKTIK_D40	Didaktik D40 3.5" 360kB	Pavel Chromy
YES	F5_DIDAKTIK_D40	Didaktik D40 5.25" 360kB	Pavel Chromy
YES	F3_DIDAKTIK_D80	Didaktik D80 3.5" 720kB	Pavel Chromy
YES	F5_DIDAKTIK_D80	Didaktik D80 5.25" 720kB	Pavel Chromy
YES	FX_DYNACORD	Dynacord	Garth Hjelte
YES	FX_DYNACORD_ADD1	Dynacord ADD-one	Roland Weihmayer
YES	FX_ELG_WP_CPM	Electroglas Wafer Probers CP/M	Phil Wiens
YES	FX_EMU_EIII_DD	E-mu EIII DD-disk 800kB	Alexander Burgwedel
YES	FX_EMU_EIII_HD	E-mu EIII HD-disk 800kB	Alexander Burgwedel
YES	FX_EMU_EMAX_DOS FX_EMU_EMAX	E-mu Emax 800kB	Garth Hjelte
NO	FX_EMU_EOS	E-mu EOS 1440kB	Garth Hjelte
NO	FX_EMU_ESI	E-mu ESi 1440kB	Garth Hjelte
NO	F5_720_512	5¼" Ensoniq ASR-10 Computer Format DD	Markus Dimdal
NO	F3_720_512	3½" Ensoniq ASR-10 Computer Format DD	Markus Dimdal
NO	F3_ENS_720 F5_ENS_720	Ensoniq ASR-10, EPS, KS32, KT, SQ1, SQ2, SQ80, VFX-SD 720kB	Markus Dimdal
YES	FX_ENS_800	Ensoniq ASR-10, EPS, EPS 16+, KS32, KT, SQ1, SQ2, SQ80, VFX-SD, SD-1 800kB	Markus Dimdal
YES	FX_ENS_820	Ensoniq ASR-10, EPS, KS32, KT, SQ1, SQ2, SQ80, VFX-SD 820kB	Markus Dimdal
YES	FX_ENS_1600	Ensoniq ASR-10, EPS, KS32, KT, SQ1, SQ2, SQ80, VFX-SD 1600kB	Markus Dimdal
YES	FX_ENS_1640	Ensoniq ASR-10, EPS, KS32, KT, SQ1, SQ2, SQ80, VFX-SD 1640kB	Markus Dimdal
NO	FX_ENS_COMP_1440	3½" Ensoniq ASR-10 Computer Format HD 1.44MB	Markus Dimdal
YES	FX_ENS_COMP_800	Ensoniq EPS 16+/Classic DD Ensoniq ASR-10 [Computer Format] DD Ensoniq VFX-SD Ensoniq SD-1	Matt Savard, Markus Dimdal, H Mandingo Gary Giebler Gary Giebler
YES	FX_ENS_COMP_1600	Ensoniq Computer Format HD 1600kB	Markus Dimdal
NO	FX_ENS_COMP_1440	Ensoniq ASR-10, EPS, KS32, KT, SQ1, SQ2, SQ80, VFX-SD 1440kB	Markus Dimdal
YES	FX_ENS_MIRAGE	Ensoniq Mirage 440kB	Claude Climer, Kris ///E-Synthesist
YES	FX_ENS_SD1_HD	Ensoniq SD-1 (HD-disk) 800kB	Danyel Gloser
YES	FX_ENS_SQ80	Ensoniq SQ80 880kB	Eric Nevarez, Gary Giebler

YES	FX_ENS_TS12	Ensoniq TS12 1540kB	Dominic
YES	FX_EXEL_640	Exelvision 640kB	Fabien Neck
YES	FX_FLEX_SSSD40T	FLEX SSSD 40T 100kB	Ron Bihler, Ian Blythe, Michael Evenson, Dell W. Setzer
YES	FX_FLEX_DSSD40T	FLEX DSSD 40T 200kB	Ron Bihler, Ian Blythe, Michael Evenson, Dell W. Setzer
YES	FX_FLEX_SSDD40T	FLEX SSDD 40T 178kB	Ron Bihler, Ian Blythe, Michael Evenson, Dell W. Setzer
YES	FX_FLEX_DSDD40T	FLEX DSDD 40T 356kB	Ron Bihler, Ian Blythe, Michael Evenson, Dell W. Setzer
YES	FX_FLEX_SSSD80T	FLEX SSSD 80T 200kB	Ron Bihler, Ian Blythe, Michael Evenson, Dell W. Setzer
YES	FX_FLEX_DSSD80T	FLEX DSSD 80T 400kB	Ron Bihler, Ian Blythe, Michael Evenson, Dell W. Setzer
YES	FX_FLEX_SSDD80T	FLEX SSDD 80T 358kB	Ron Bihler, Ian Blythe, Michael Evenson, Dell W. Setzer
YES	FX_FLEX_DSDD80T	FLEX DSDD 80T 716kB	Ron Bihler, Ian Blythe, Michael Evenson, Dell W. Setzer
YES	FX_GEM_S2S3	GEM S2/S3 synthesizer 1600kB	Alexander Burgwedel
YES	FX_GRAVO_ISIS	Gravograph ISIS 640kB	Patrick Poncet
YES	FX_GRAVO_VX	Gravograph VX 320kB	Norman Bruggner
YES	FX_GREC_EZ_410	Greco Systems EZ-FILE 41-track	Robert M. Woodruff
YES	FX_GREC_EZ_810	Greco Systems EZ-FILE 81-track	Robert M. Woodruff
YES	FX_CPM22_800_I3	Heath H-89 CP/M 2.2 I3 800kB	Rich Lentz
YES	FX_H89_HDOS600	Heath H-89 HDOS 600kB - partial format	Rich Lentz
YES	FX_H89_HDOS640	Heath H-89 HDOS 640kB	Rich Lentz
YES	FX_HEC_CPM_200	Hector CP/M 200kB	Yves Fontanes
YES	FX_HEC_CPM_720	Hector CP/M 720kB	Yves Fontanes
YES	FX_HEC_CPM_800	Hector CP/M 800kB	Yves Fontanes
YES	FX_HIT_BIO_1040	Hitachi Bio-chemical Analyzer 1040kB	M. Heidari
YES	FX_HP110_693	HP110 Portable (693kB)	Tom Szolyga
YES	FX_HP1000	HP-1000 (770kB)	Lawrence Uchida
YES	FX_HP2100	8" HP-2100 (125kB)	Dave White
YES	F3_HP2100	3½" HP-2100 (616kB)	Patrice Leonard
YES	F3_HP2100	3½" HP-9000 Series 310 (616kB)	Jason Watton
YES	FX_HP9000_362	HP-9000 Model 362 (1540kB)	Kelvin Lee
YES	FX_HP9121	HP-9121 (270kB)	Chuck Magee
YES	FX_HP9121_664	HP-9121 DS (664kB)	Ian & Jo Andrews
YES	FX_IBM_XDF_1836	IBM OS/2 XDF (1836kB)	Robert McMurray
YES	FX_IGM_6012_DD	IGM 6012 DD-disk 800kB	Sebastien 'PetiteAnnonceDu71'
YES	FX_IGM_6012_HD	IGM 6012 HD-disk 800kB	Sebastien 'PetiteAnnonceDu71'
YES	FX_IBM_TORCH_GRAD	3½" IBM 360kB Torch Graduate	Chris Richardson
YES	FX_IMS_MM1_1280	IMS MM/1 1280kB	Bob Devries
NO	F3_KORG_01W	3½" Korg 01/W	bblueth123_HIRATA
NO	F5_KORG_01W	5¼" Korg 01/W	bblueth123_HIRATA
YES	FX_KORG_DSS1	Korg DSS-1	Claude Climer
YES	FX_KORG_DSM1	Korg DSM-1	Doug Skinner
YES	FX_KORG_T	Korg T-series (T1, T2, T2EX, T3, T3EX)	Dominic Guss
YES	FX_LIF_1232	LIF 1232kB	Bruce
YES	FX_LYNXDOS_800	LynxDOS 800kB	Pete Todd
YES	FX_MECMOR_1280	Mecmor Variatex 2500 1280kB	Anton Sinovitch
YES	FX_MOOG_TMC_BLOW MOULD	Moog TMC Blowmould control	Richard Koppack
YES	FX_MORI_SEIKI	Mori Seiki DS DD 648kB	Thean Low

YES	FX_NEC_PC8801	NEC PC8801 359.5kB	Víctor Jiménez Pérez
YES	FX_NEC_PC9801	NEC PC9801 UV DMF HD	Christopher J M Robertson
YES	FX_NEC_FC9801	NEC FC9801 V DMF HD	Christopher J M Robertson
YES	FX_NEC_FC9801_FM	NEC FC9801 997.75kB (with FM leading track)	Chris Paice
YES	FX_NEST_SYN_690p5	Nestal Synergy 800-110 690.5kB	Christof Kauer, ipcas GmbH
YES	FX_OBERHEIM_DPX	Oberheim DPX	Garth Hjelte, Kris ///E-Synthesist
YES	FX_OKUMA_OSP	Okuma OSP	Christof Kauer, ipcas GmbH
YES	FX_JASMIN_340	Oric Jasmin 40x17 340kB	Wilfrid Avrillon
YES	FX_JASMIN_349	Oric Jasmin 41x17 348.5kB	Wilfrid Avrillon
YES	FX_JASMIN_357	Oric Jasmin 42x17 357kB	Wilfrid Avrillon
YES	FX_RSOS9_1010	OS-9 (1010.75kB)	Georg Woltersdorf
YES	FX_RSOS9_640_R1	OS-9/68K 3.5" DD 38W7 (640kB)	Andrey Gritzenko
YES	FX_RSOS9_UNIV_632	OS-9 Universal (632kB)	Bob Devries
YES	FX_OSBRN1_100	Osbourne 1 (O1) SSSD 100kB	Theodore (Alex) Evans
YES	FX_OSBRN1_200	Osbourne 1 (O1) SSDD 200kB	Theodore (Alex) Evans
YES	FX_OSBRN4_400	Osbourne Vixen (O4) DSDD 400kB	Theodore (Alex) Evans
YES	FX_PANA_KXW940_WP	Panasonic KX-W940 Word Processor Typewriter	Richard Holdaway
NO	FX_PEAVEY_SP	Peavey SP	Chris Short, Scott Peer, Garth Hjelte
YES	FX_PROPHET_2000SS	Prophet 2000 SS 420kB	Kris ///E-Synthesist
YES	FX_PROPHET_2000DS	Prophet 2000 DS 840kB	Kris ///E-Synthesist
YES	FX_PROPHET_2002	Prophet 2002	Garth Hjelte, Kris ///E-Synthesist
YES	FX_RSOS9_40_48	RadioShack CoCo OS9/Nitros9 single-sided 40-track 48TPI (180kB)	Benoit Bleau
YES	FX_RSOS9_40_48x2	RadioShack CoCo OS9/Nitros9 2 x single-sided 40-track 48TPI (360kB)	Benoit Bleau
YES	FX_RSOS9_40_48DS	RadioShack CoCo OS9/Nitros9 double-sided 40-track 48TPI (360kB)	Carey
YES	FX_RSOS9_40_96	RadioShack CoCo OS9/Nitros9 single-sided 40-track 96TPI (180kB)	Benoit Bleau
YES	FX_RSOS9_40_96x2	RadioShack CoCo OS9/Nitros9 2 x single-sided 40-track 96TPI (360kB)	Benoit Bleau
YES	FX_RSOS9_40_96DS	RadioShack CoCo OS9/Nitros9 double-sided 40-track 96TPI (360kB)	Carey
YES	FX_RSOS9_80	RadioShack CoCo OS9/Nitros9 single-sided 80-track (360kB)	Benoit Bleau
YES	FX_RSOS9_80x2	RadioShack CoCo NitrOS9 80trk SSx2 (720kB)	Benoit Bleau
YES	FX_RSOS9_80DS	RadioShack CoCo NitrOS9 80trk DS (720kB)	Bob Devries
YES	FX_RCA_MFS	RCA Micro Floppy System (315kB)	Berni Meier
NO	F5_ROLAND_S5S7_DD	5¼" Roland S-5XX series 720kB	Markus Dimdal
NO	F3_ROLAND_S5S7_DD	3½" Roland S-5XX series 720kB	Markus Dimdal
NO	FX_ROLAND_S7_HD	3½" Roland S-7XX series 1.44MB	Markus Dimdal
YES	FX_SANX68k_1248	Sanyo X68000 1248kB	Charles Doty
YES	FX_SATIM_560	SATIM 560kB	Florian Peth
YES	FX_OPTIMA_505	Schiess-Nassovia Optimat 505 520kB	Christof Kauer, ipcas GmbH
YES	FX_SEQ_STUD_440	Sequential Studio 440	Dazzer
YES	FX_SHIMA_SEIKI_DSDD	Shima Seiki DS DD	Paulo Gomes, Kathy Newey
YES	FX_SIMMONS_SDX	Simmons SDX	Garth Hjelte
YES	FX_SLOG_DDCPM	Slogger DDCPM	Dave Moore

YES	FX_SPEC_BETA40S	Sinclair ZX Spectrum BetaDisk 40S 160kB	Roberto Jose
YES	FX_SPEC_BETA40D	Sinclair ZX Spectrum BetaDisk 40D 320kB	Walter G Hertlein, Roberto Jose
YES	FX_SPEC_BETA80S	Sinclair ZX Spectrum BetaDisk 80S 320kB	Roberto Jose
YES	FX_SPEC_BETA80D	Sinclair ZX Spectrum BetaDisk 80D 640kB	Roberto Jose
YES	FX_SPEC_DiP_40	Sinclair Spectrum DISCiPLUS 40-track 400kB	Dario Ruellan
YES	FX_TRDOS_640	Sinclair ZX Spectrum TR-DOS	Art
YES	FX_TRDOS_640_1	Sinclair ZX Spectrum TR-DOS 1-head	Micky Elima
NO	F5_SPEC_CPM	5¼" Sinclair Spectrum +3 CP/M 720kB	Andy J Davis, Thomas Heck
NO	F3_SPEC_CPM	3½" Sinclair Spectrum +3 CP/M 720kB	Andy J Davis, Thomas Heck
YES	FX_SPEC_MGT	Sinclair Spectrum Miles Gordon Tech +D/Disciple 800kB	Andy J Davis, Thomas Heck
YES	FX_SPEC_OPUSDISC	Sinclair Spectrum Opus Discovery 180kB	Simon Owen
YES	FX_QL_QDOS	Sinclair QL QDOS	Ali Booker
YES	FX_PUMA560C_640	Stäubli/Unimation Puma 560c Robot Arm Controller 640kB	Mike Ward-Theatronics
YES	FX_STAUBLI_JC345	Stäubli JC3 JC4 JC5 (Jacquard Control)	Christof Kauer, ipcas GmbH
YES	FX_STRIDE_PDOS	Stride PDOS 640kB	Jason Watton
YES	FX_STRIDE_PSYS	Stride p-System 640kB	Jason Watton
YES	FX_RSDOS48	Tandy CoCo RSDOS single-sided double-stepped (157.5kB)	Darren Atkinson
YES	FX_RSDOS48x2	Tandy CoCo RSDOS double-sided double-stepped (315kB)	Darren Atkinson
YES	FX_RSDOS96	Tandy CoCo RSDOS single-sided single-stepped (157.5kB)	Darren Atkinson, Benoit Bleau
YES	FX_RSDOS96x2	Tandy CoCo RSDOS double-sided single-stepped (315kB)	Darren Atkinson, Benoit Bleau
YES	FX_TRS80_NEWDOS	Tandy TRS-80 Model 1 NEWDOS/80 v2.0 40-track 100kB	Terry Stewart
YES	FX_TRS80_NEW340	Tandy TRS-80 Model 1 NEWDOS/80 v2.0 68-track DS 340kB	Terry Stewart
YES	FX_TRS80_NEW385	Tandy TRS-80 Model 1 NEWDOS/80 v2.0 77-track DS 384kB	Terry Stewart
YES	FX_TRSDOS_87k5	Tandy TRSDOS 2.3 87.5kB	Terry Stewart
YES	FX_TAT_EINS_SS40	Tatung Einstein TC01 Xtal Dos 1.31 40-track SS 200kB	Chris Coxall
YES	FX_TAT_EINS_DS40	Tatung Einstein TC01 Xtal Dos 1.31 40-track DS 400kB	Chris Coxall
YES	FX_TAT_EINS_XS5	Tatung Einstein TC01 Xtal System 5 80-track 800kB	Phil Simmons
YES	FX_TAVERN_6809_SD	Tavernier 6809 SD 90kB	Thierry Hennuyer
YES	FX_TAVERN_6809_DD	Tavernier 6809 DD 170kB	Thierry Hennuyer
YES	F3_THOMSON_MOTO_DS	Thomson MO/TO double-sided 3½" 640kB	Daniel Coulom/Yoann Riou/Jean Rech
YES	FX_THOMSON_TO8TO9	Thomson TO8-TO9 single-sided 3½" 320kB	Norman Bruggner
YES	FX_TI994A_SSSD40S_90	TI-99/4A SS/SD 40T SngStep 90kB	Paolo Bagnaresi
YES	FX_TI994A_SSSD40D_90	TI-99/4A SS/SD 40T DblStep 90kB	Paolo Bagnaresi
YES	FX_TI994A_DSSD40S_180	TI-99/4A DS/SD 40T SngStep 180kB	Paolo Bagnaresi

YES	FX_TI994A_DSSD40D_180	TI-99/4A DS/SD 40T DblStep 180kB	Paolo Bagnaresi
YES	FX_TI994A_SSDD40S_180	TI-99/4A SS/DD 40T SngStep 180kB	Paolo Bagnaresi
YES	FX_TI994A_SSDD40D_180	TI-99/4A SS/DD 40T DblStep 180kB	Paolo Bagnaresi
YES	FX_TI994A_DSDD40S_360	TI-99/4A DS/DD 40T SngStep 360kB	Paolo Bagnaresi
YES	FX_TI994A_DSDD40D_360	TI-99/4A DS/DD 40T DblStep 360kB	Paolo Bagnaresi
YES	FX_TI994A_SSHD40S_360	TI-99/4A SS/HD 40T SngStep 360kB	Paolo Bagnaresi
YES	FX_TI994A_SSHD40D_360	TI-99/4A SS/HD 40T DblStep 360kB	Paolo Bagnaresi
YES	FX_TI994A_DSHD40S_720	TI-99/4A DS/HD 40T SngStep 720kB	Paolo Bagnaresi
YES	FX_TI994A_DSHD40D_720	TI-99/4A DS/HD 40T DblStep 720kB	Paolo Bagnaresi
YES	FX_TI994A_SSSD80_180	TI-99/4A SS/SD 80T 180kB	Paolo Bagnaresi
YES	FX_TI994A_DSSD80_360	TI-99/4A DS/SD 80T 360kB	Paolo Bagnaresi
YES	FX_TI994A_SSDD80_360	TI-99/4A SS/DD 80T 360kB	Paolo Bagnaresi
YES	FX_TI994A_DSDD80_720	TI-99/4A DS/DD 80T 720kB	Paolo Bagnaresi, Bill R Sullivan
YES	FX_TI994A_SSHD80_720	TI-99/4A SS/HD 80T 720kB	Paolo Bagnaresi
YES	FX_TI994A_DSHD80_1440	TI-99/4A DS/HD 80T 1440kB	Paolo Bagnaresi, Bill R Sullivan
YES	FX_TI994A_SSDD40S_160	TI-99/4A SS/DD 40T SngStep 160kB	Paolo Bagnaresi
YES	FX_TI994A_SSDD40D_160	TI-99/4A SS/DD 40T DblStep 160kB	Paolo Bagnaresi
YES	FX_TI994A_DSDD40S_320	TI-99/4A DS/DD 40T SngStep 320kB	Paolo Bagnaresi
YES	FX_TI994A_DSDD40D_320	TI-99/4A DS/DD 40T DblStep 320kB	Paolo Bagnaresi
YES	FX_TI994A_SSDD80_320	TI-99/4A SS/DD 80T 320kB	Paolo Bagnaresi
YES	FX_TI994A_DSDD80_640	TI-99/4A DS/DD 80T 640kB	Paolo Bagnaresi
YES	FX_TMX_2048_DS	Timex 2048 FDD3000 double-sided 320kB	Michal Tarasiejski
YES	FX_TMX_2048_SS	Timex 2048 FDD3000 single-sided 160kB	Michal Tarasiejski
YES	FX_ASM_2000_1440	Tracer/ST 0-based 1.44MB	Jerry L. Hallett
YES	F3_1Pt44_512	Tracer/ST 1-based 1.44MB	Jerry L. Hallett
YES	FX_TV3102	TV3102 Controller Programmer	Ian Sharpe
YES	FX_WATFORD_DDFS	Watford Electronics DDFS 720kB	Herman Klaassen
YES	FX_HOWELL	Unnamed 180kB	Shawn Howell
YES	FX_BRIZA	Unnamed 144kB	Brian "Briza" Palmer
YES	FX_HANSEL	Unnamed 360kB	Ralph Hänsel
YES	FX_ZEISS_M400	ZEISS Spectrophotometer Specord M400	Milan Kubasek
YES	FX_ZDS_CPM86_320	Zenith CP/M-86 320kB	Steven White
YES	F5_ZDS_ZDOS_40T FX_ZDS_ZDOS_40T	Zenith ZDS ZDOS 360kB	Steven White
YES		**Any uniform format readable by the NEC µPD765/7265/72065/72066 floppy disk controller** – this includes formats from the Intel 8271 and WDC1770 floppy disk controllers.	

Note that some formats do not require the installation of the OmniFlop driver. Installation of the OmniFlop driver adds <u>all</u> formats listed above. Variable (copy-protected) formats are not yet available.

If you try OmniFlop 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 <u>does not need to be known</u> for it to be read or written. (The OmniFlop driver must be installed for this facility).

3.2 Formatting Disks

People use the term 'formatting' for two things:

- Physically formatting tracks and sectors on a disk.
- Physically formatting tracks and sectors on a disk and <u>then</u> writing a filing system, including catalogue data, lists of free sectors, lists of bad sectors etc.

In ancient times the term 'format' meant the former - the latter process was called 'initializing' a disk. In such systems you usually had to 'format' and 'initialize' in two stages, using two different programs. However, as time went on the two steps were merged into one, which became known simply as 'formatting'.

OmniFlop uses 'formatting' for the <u>former</u> - i.e. just drawing the lines for sectors and tracks onto a disk. After an OmniFlop 'format' there is **no data <u>at all</u> on the disk**. The disks produced will have no **filing system** (logical format) written to them - to be used, they must still have a disk <u>image</u> <u>of the correct format</u> 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. That is:

> **To create a 'blank disk' for use with your ancient system,** you will need OmniFlop <u>plus an image of a blank disk</u> (get hold of a blank disk first and 'Read' it to a file). Use OmniFlop to '<u>Format</u>' the disk to the correct physical format, then use OmniFlop to '<u>Write</u>' the image of the blank disk to it. The resulting disk should then be acceptable as a blank disk to the original system.

In v3.0b an extra option, "Format-Write" was added to simplify this process. A 'Format-Write' first formats the disk to the correct physical format, then writes the disk image which you have chosen to the disk. The result? A disk that should work in your original equipment. So from v3.0b, to 'format a blank disk' for your old system:

> **To create a 'blank disk' for use with your ancient system using v3.0b onwards,** get hold of an original blank disk and use '<u>Read</u>' to read the disk to an image file. You need only ever do this once - keep the image. Then use OmniFlop to '<u>Format-Write</u>' the disk to the correct physical format <u>and</u> write the disk image of the blank disk to your new disk. The resulting disk should then be acceptable as a blank disk to the original system.

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.
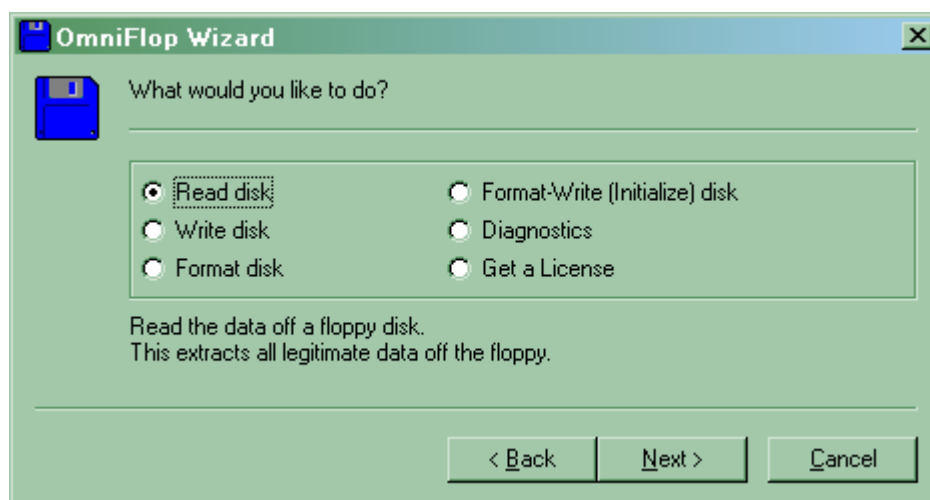
3.4 Welcome Page

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', 'Format', or 'Format-Write' to read, write, format, or format and write a disk.

If you are unsure of the format of the disk, or whether OmniFlop 'knows' it, select 'Diagnostics' and choose 'Test disk'. If the result is an "Unknown custom" format, then you should register it for full support by OmniFlop. While support is being added, though, you can still read or write the format using the 'Read disk' or 'Write disk' options although you will need a special license - see 2.5.

The 'Get a License' option is **rarely needed**. You do not normally need a license to use OmniFlop; it will prompt you if you do. Getting a license is so that I know a format that is currently untested has worked - if you tell me about this then I can remove the license and you will not need to get one in future. Licenses are free and are only there to provide feedback to the author.

4. Support

OmniFlop is designed to work with the majority of PCs using a 'standard' Floppy Disk Controller and in most cases works immediately without any changes to the host system. However, floppy disks are physical media using magnetism to store binary data - trying to read that 20-year old floppy in a modern PC with an unrelated drive from 10 years ago is fraught with opportunities for things to go wrong. **Start with a floppy disk and drive that works** - i.e. a 1.44MB or 1.2MB DOS-formatted floppy.

Generally, if you have a problem, **make sure you've got the <u>latest</u> version of the driver <u>and</u> wizard installed.**

4.1 Things to Check

4.1.1 Hardware

If your hardware does not work properly then OmniFlop won't work properly. Make sure your hardware works - under Windows, you should be able to format disks (to Windows'/DOS' FAT12), write them, fill them up, read them, and delete files off them - this must all work **<u>without error</u>**. Then try this disk with OmniFlop. Make sure you have a decent floppy drive, and disk, that actually <u>works</u> before trying to get support for one that doesn't.

Your hardware includes the **<u>media</u>** - i.e. the floppy disk. If the disk is old, damaged, dirty, or losing its magnetic coating, then the disk will be at best unreliable, at worst unreadable. **<u>Use decent, known good, media</u>**, at least initially for testing. Once you know the system works, you can <u>then</u> try those disks from 20 years ago.

4.1.2 Single Density Support

Note that there <u>are</u> cases of PCs with chipsets that do not support **<u>Single Density</u>** operation. However, it is not as common as portrayed out on the Internet - those who it didn't work for are vocal about it, while those it did work for remain silent ("How can you say it works for *most* PCs when it doesn't work on *mine*...?"). The PCs known about so far that do **<u>not</u>** support Single Density are:

- Dell Latitude XPi P133ST laptop - no Single-Density support **<u>at all</u>**.
- Dell Dimension XPS T500 - possibly **<u>read only</u>** 5¼" Single Density. [Paul Jenkinson]
- Olivetti PCs - no Single-Density support **<u>at all</u>**. [Mark Ferns]
- Advansys card - reported to **<u>read only</u>** Single Density. [Mark Ferns]
- Platinum PackardBell P3 500MHz - **<u>read-only</u>** Single Density. [Colin McDougall]

If you find more, or wish to clarify which particular machines are afflicted, please contact support.

4.1.3 Software

If your hardware works properly then under Windows there is an added complication: **other software**. Other software running at the same time as OmniFlop may interfere with OmniFlop's operation; OmniFlop needs exclusive access to the floppy disk while it runs. As a first step, check:

- There is no Anti-Virus software running or enabled. If you are not willing to turn it off completely while you try OmniFlop, make sure you at least '**Disable scanning of removable media**'.
- Windows Explorer is not open. A refresh/update of Windows Explorer can cause it to access the floppy disk.
- No other software that accesses the floppy drive is running.

If none of these help, <u>reboot Windows into Safe Mode</u>. To do this, as your PC reboots, before it starts Windows, press 'F8' many, many times, like a lunatic, even if the PC starts beeping at you. This should give

you the Windows Options Menu - select "Safe Mode" and hit 'Enter'. Try OmniFlop once Safe Mode is up and running.

If you want to prove that your hardware is OK then reboot your PC into DOS and use a DOS-based program such as OmniDisk (http://www.shlock.co.uk/Utils/OmniDisk) to SAMPLE a disk. If this does not detect anything, then your hardware (PC) and the disk you are trying to read simply aren't compatible. Try another PC, or disk, or both.

4.2 The Ideal Test Environment

The best environment, at least for testing OmniFlop, is:

- Windows 2000 SP4.
- 3½" 1.44MB High-Density internal Floppy Disk Drive.
- BIOS set up for 3½" 1.44MB High-Density Floppy Disk Drive.
- 3½" 1.44MB [2.0MB unformatted] High-Density floppy disk (for High-Density formats). <u>Not</u> a double-density floppy disk!
- 3½" 720kB [1.0MB unformatted] Double-Density floppy disk (for double or single-density formats). <u>Not</u> a high-density floppy disk! It doesn't have the HD hole in the top, and it doesn't have tape over it!
- OmniFlop v2.01 or later downloaded.
- Windows running in Safe Mode.
- **<u>All Anti-Virus software disabled or not installed.</u>**
- Re-install Floppy Disk <u>Controller</u>.
- Install OmniFlop in place of Microsoft Floppy Disk <u>Drive</u>.
- Try 'Test installation', then 'Test disk' (Diagnostics), then 'Read disk'.
- If all else fails, try 'Get disk map' (Diagnostics) and send it to support.

To steal a sound-bite from *TextPad* [http://www.textpad.com]: OmniFlop is designed to work *with* Windows, not *against* Anti-Virus software.

If the above setup works, then you have a basic level of functionality to work from.

If you use a 5¼" drive then be prepared for a struggle. It is especially hard to get the PC to accept the format from an alien system on 5¼" disks, <u>but it is possible</u>.

4.3 The driver "does not contain any information about your hardware"

You are trying to install the driver as a Floppy Disk **<u>Controller</u>**. The driver is a replacement for the Floppy Disk **<u>Drive</u>**.

4.4 The media in the drive cannot be read

OmniFlop requires <u>exclusive</u> access to the floppy disk drive to work. If another application retains access to the floppy disk drive then OmniFlop cannot access the drive. Usually this is symptomatic of an anti-virus program.

Check none of the following are running at the same time as OmniFlop:

- Anti-virus software with 'removable media scanning' enabled.
- Windows Explorer
- Any other software, especially any likely to be 'watching' or 'using' the floppy disk drive.

Also check "Nothing was found" below.

4.5 It won't work with my [external USB] floppy disk drive

Correct - it won't. See 2.1.1.

4.6 How do I install a 5¼" [internal] floppy disk drive?

1. You <u>may</u> need conversion cables from a 34-way IDC (3.5" floppy drive) plug to a 34-way edge connector (5.25" floppy drive) socket. Less probably you may also need a 5.25" power plug to 3.5" power socket for the power cable, but this is extremely unlikely. This allows the 5.25" drive to offer the same physical connectors as a 3.5" drive.
2. Follow the same procedure as for a 3.5" drive (see 4.7) but set the BIOS to the appropriate type of drive - usually 5.25" 1.2MB (for a high-density drive) or 5.25" 360kB (40-track double-density), or 5.25" 720kB (80-track double-density). **If the appropriate type of drive isn't available**, there is no harm in trying a 3.5" equivalent - e.g. 3.5" 1.44MB for a 5.25" 1.2MB, 3.5" 720kB for a 5.25" 720kB.

4.7 How do I install a 3½" [internal] floppy disk drive?

1. Open up the PC case and plug it in. A power cable needs to be connected plus the data cable, which is a 34-way flat IDC (grey) cable, similar to, but not the same as, the two hard disk drive (50-way) cables. One side may be marked with a red stripe - this indicates pin 1, and should be matched with the markings on the floppy disk drive.
2. Turn on the PC and as it reboots go into the BIOS. This is usually by pressing 'Del', 'F1', or 'F2' <u>as the PC boots</u>. Be quick about it - once Windows starts booting, you've missed your opportunity.
3. Search through the pages of configuration for 'Floppy disk drive'. Change the setting from 'Not installed' to the appropriate type of drive you've got - usually 3.5" 1.44MB.
4. Reboot the PC into Windows.
5. Get hold of two floppy disks: one pre-formatted by another PC, the other a spare simply for reformatting.
6. Reformat the spare floppy disk using Windows and check you can put files on it and read them back. This checks your BIOS is set up OK and the drive works.
7. Try the pre-formatted floppy disk and make sure you can read files off it, and, if possible, write files to it and read them back. This checks the calibration of the drive is reasonable.

4.8 How do use a 3" [single-sided] floppy disk drive?

1. You'll need a custom-built cable. There are people who've already done this as part of the Spectrum Disk Preservation Project at http://www.worldofspectrum.org/sdp/.
2. Install the drive like a 5¼" floppy drive - see 4.6.
3. Set the drive type in the BIOS to 5¼" 360kB.

4.9 Nothing was found

1. Has the disk been "over-formatted"? Imation, for example, pre-format disks with 81 tracks. OmniFlop will detect the 81st track and try and accommodate it into the format (**this changed in v2.00**). If your format on tracks 0 to 79 is not the same as the one laid down on track 80 then OmniFlop will detect that the format is not consistent and you will get "Nothing was found". Try another disk. OmniFlop v2.00 and later give more options for this scenario.
2. Check the <u>latest</u> driver is installed correctly. From the OmniFlop first screen, click 'Test installation'. For any drives you have installed, a long list of supported formats should be displayed, followed by a summary saying for each installed drive "Extended formats supported". From v2.01 of the wizard, a check is made on the driver version, but for versions previous to this you may be using an old driver which doesn't have all facilities.
3. Check no other applications (e.g. anti-virus software) are running.
4. Try another floppy disk drive.
5. Try another PC. If it works there then you need to "spot the difference".
6. Go to 'Diagnostics' and choose 'Get Disk map'. Send the file produced to support.

4.10 The formatting works and it works in my old equipment but OmniFlop cannot read it

1. The media density is incorrect. You are using an HD disk in the PC with a format that is Double Density then using the disk on a Double-Density system (which does not recognise High Density).
2. Tape up the second hole on the (High Density) floppy disk - that is, <u>not</u> the write-protect hole - and retry reading the format with OmniFlop - it should now recognise the disk.

5. Using OmniFlop With Your Software

You can use the normal windows *CreateFile, ReadFile, WriteFile* functions along with the OmniFlop driver to access disks of formats you want to use in your own programs. This chapter describes how.

5.1 List The Formats You Need To Use

The formats you need to access must be pre-defined in the OmniFlop driver. In the OmniFlop wizard, a 'Test disk' must return a recognised format for all formats you need to access.

If the formats you want to access aren't yet recognised by OmniFlop, use the Wizard to send an e-mail to register the formats. A new driver will be created for you to test with the original disk. Once the OmniFlop Wizard confirms the format is correct, you can proceed.

You need a list of the formats you need to access <u>as reported by the OmniFlop Wizard</u> before you continue. To do this, you must list all the EXTENDED_MEDIA_TYPEs from the table in 3.1 that you want to use. This list must be sent to support with the request for a new driver.

Any format with an EXTENDED_MEDIA_TYPE of FX_CUSTOM cannot be used by your own software. This is because these formats are modelled by the OmniFlop Wizard rather than the OmniFlop driver. These formats cannot be used with *CreateFile, ReadFile, WriteFile* alone. You have to use the Wizard to handle these formats.

Note that if you use single-sided formats you should consider <u>all possible combinations</u> of formats for <u>each side</u> of the disk. Remember that both heads of the PC's floppy drive are accessed via drive A: (or B:), so you must yourself sort out the head handling in your code (see 5.5.1) – the disk is served as one contiguous platter.

5.2 Contact The Author

You will need to supply:

- the list of formats you want access **as EXTENDED_MEDIA_TYPEs from 3.1** (do **not** invent your own descriptions!),
- the name of your program, and
- a contact address (e-mail or web address).

At the same time you can also specify:

- If you want a reference to your program to be included in the OmniFlop documentation and web site.
- If you want a link to your website included.

In response you will receive:

- An access string to allow you to enable and disable your selected formats.
- A new driver with the formats you have chosen available to use with your access string.
- A new Wizard with your application listed under 'Get a License'. From v2.2b of OmniFlop licenses are **not usually needed**, either by you or your users. However, if your program causes support problems for OmniFlop then licenses can be enabled for tracing. This function is added in case this happens.
- Two header files (OmniFlop.h, OmniFlopFmtIDs.h) with constants (IOCTLs and media types) defined for use with your program.

5.3 Install The New Driver

When you receive a new driver with your formats added you will also get a new version of the OmniFlop Wizard.

1. Install the new driver.
2. Check the driver still works as you expect with the Wizard and your chosen formats.

5.4 Enable The Formats

Note that while your chosen formats are enabled, Windows will still try to mount floppy disks and interpret them as DOS (FAT12) format. Even worse, an anti-virus program may try to interpret the data on the alien-format disk and check it doesn't look like a virus - which it might. For this reason you should claim exclusive access to the floppy drive while your extended formats are enabled. You may also need to prompt the user at some point to turn off removable media checking in their anti-virus software.

Do not share the drive while you have enabled the formats!

Include the headers supplied then use IOCTL_OMNIFLOP_ENABLE_EXTENDED_FORMATS like this:

```
bool EnableExtendedFormats(const char *szDrive, bool bEnable)
{
    DWORD nBytesReturned;

    // We need to enable the Extended formats without prompting the driver
    // to test the media (first) - so we have to open it with Query access
    // only before opening it for 'read' or write seperately.

    HANDLE hMedia = CreateFile(
        szDrive,
        0,          /* NO SHARING */
        0,          /* QUERY ACCESS ONLY */
        NULL,
        OPEN_EXISTING,
        FILE_ATTRIBUTE_NORMAL | FILE_FLAG_SEQUENTIAL_SCAN,
        0           /* No template file */ );

    bool status = !!
        DeviceIoControl(
            hMedia,
            bEnable ?
                IOCTL_OMNIFLOP_ENABLE_EXTENDED_FORMATS :
                IOCTL_OMNIFLOP_DISABLE_EXTENDED_FORMATS,
            bEnable ? "XXX" : NULL, /* CHANGE THIS STRING to your access string */
            bEnable ? 4 : 0, /* Length of previous parameter - DO NOT CHANGE */
            NULL, 0,
            &nBytesReturned,
            NULL);

    // Returns status == 0 and GetLastError == 0x00000005 (ERROR_ACCESS_DENIED)
    // if not registered or invalid code
    if (!status)
    {
        DWORD nError = GetLastError();
        char szError[256];

        ExplainError(szError, sizeof(szError));
    }

    CloseHandle(hMedia);

    return status;
}
```

Your program should call **EnableExtendedFormats("\\\\.\\A:", true)**, for example, to enable your chosen formats.

Note that GetLastError in the above code can return the following codes:

ERROR_INVALID_FUNCTION	The driver is not present or an old version (pre-v2.01).
ERROR_ACCESS_DENIED	The highlighted string is incorrect or there is no license for these formats.
Other	Another Windows error has occurred.

The value for the highlighted string ("XXX") will be supplied with the driver and headers. The additions to the driver for use with your program will be included in the <u>next public release</u> of the OmniFlop driver - you do not need to keep a 'special' version of the driver for use with your program. You should specify to your users that the version of the driver must be at least that supplied back to you (e.g. v2.01m). You can also check this in code using IOCTL_OMNIFLOP_GET_DRIVER_VER - the returned value must be greater than or equal to the value OMNIFLOP_DRIVER_VER in the header file supplied. The string code (highlighted) sets up the driver for the needs of your particular program.

5.5 Access The Floppy Disk

To read, for example:

```
HANDLE hMedia = CreateFile(
    szDrive,
    GENERIC_READ,              /* Read access */
    0, // No sharing
    NULL,
    OPEN_EXISTING,
    FILE_ATTRIBUTE_NORMAL,
    0                          /* No template file */ );
```

To write, for example:

```
HANDLE hMedia = CreateFile(
    szDrive,
    GENERIC_WRITE,
    0, // No sharing
    NULL,
    OPEN_EXISTING,
    FILE_ATTRIBUTE_NORMAL | FILE_FLAG_NO_BUFFERING | FILE_FLAG_RANDOM_ACCESS,
    0);
```

Note that in both cases the drive is opened for exclusive access to prevent Windows trying to access the disk.

5.5.1 Disk Order

<u>All</u> floppy disk access using the OmniFlop driver is in **CYLINDER/HEAD/SECTOR (interleaved) order**. Head 0 on the first cylinder is accessed, followed by head 1 on the same cylinder, followed by the next cylinder in the same way, and so on up to the number of cylinders. That is:

- All sectors, in order, on cylinder 0, head 0, followed by…
- All sectors, in order, on cylinder 0, head 1, followed by…
- All sectors, in order, on cylinder 1, head 0, followed by…
- All sectors, in order, on cylinder 1, head 1, and so on until…
- All sectors, in order, on cylinder 79, head 1.

Note that these numbers can vary depending on the physical format - e.g. 40-track formats only go up to track 39. The dimensions of the disk are available using IOCTL_DISK_GET_DRIVE_GEOMETRY. Extended media types are provided in the header file you get when registering with the author.

No attempt is made to change the scheme depending on the format - the OmniFlop driver does not handle logical disk formats (filing system). If this is not the ordering by which you wish to access the disk your software must translate your order into a file offset and use this on the handle returned from the floppy disk. For this, you have almost all the standard Windows tools available, but particularly:

- **IOCTL_DISK_GET_DRIVE_GEOMETRY** will work.
- **SetFilePointer** will access the disk randomly and therefore allows you to access the disk in another order.

Note that the OmniFlop driver includes certain non-uniform formats which are described below.

5.5.2 Ensoniq SQ80 Format

The geometry of the format is specified in 512-byte sectors although the underlying format uses 1024-byte sectors for all but the last sector on each track. The driver must be used with the the correct sector size - part-sectors cannot be read nor written.

5.5.3 Slogger DDCPM Format

In tracks where FM is used rather than MFM the physical sector size is halved. To maintain the larger sector size for these tracks each individual sector has an equal amount of 0xFF bytes appended to it.

5.5.4 Computer Automation LSI-2 Format

This follows the same scheme as 5.5.3.

5.5.5 FLEX Double-Density Formats

These reduce the number of sectors in the smaller FM tracks. The sector size remains the same, however. The driver appends padding sectors (of 0xFF) to those returned for each track (i.e. each cylinder/head combination). A double-sided FM track therefore has the data from head 0, followed by padding, followed by the data from head 1, followed by more padding, so that each head always delivers the same amount of data. In this way the cylinder/head/sector ratios are maintained.

5.6 Close all Access to the Floppy Disk

Close all handles to the floppy disk using **CloseHandle**.

5.7 Disable The Formats

Disable the formats by opening the floppy disk drive with Query access only and use IOCTL_OMNIFLOP_DISABLE_EXTENDED_FORMATS. This is achieved (for example) by calling **EnableExtendedFormats("\\\\.\\A:", false)** using the function defined in 5.3.

If you do not do this then Windows will have access to your formats and the system may become unstable. The author accepts no responsibility for programs which leave their formats 'open'. If you leave the formats open and generate unnecessary support for the author then licensing for your program to access the formats may be enabled, which is inconvenient for both users and I.

5.8 Formatting a Disk

Formatting a disk is more complex than simply reading or writing the data on it. Because Windows is a multi-tasking operating system, and designed to use its own formats of floppy disks, the floppy disk must be protected from Windows while the alien disk formatting is taking place.

You will need to know:

- The MEDIA_TYPE of the format you wish to use. **This may not be named the same as your format**, since many different filing systems used the same physical format. The alien formats are listed in the header *OmniFlop.h*; note that other formats are Windows-supplied in the enumeration type MEDIA_TYPE (see the Microsoft documentation, or MSDN on-line). **The extended formats declared under type EXTENDED_MEDIA_TYPE by OmniFlop.h must be cast to MEDIA_TYPE to be used wherever a MEDIA_TYPE is expected.**

The sequence is:

1. Enable your format(s). See 5.4.
2. Open the disk drive for formatting (see 5.12). This includes:
   a. Lock the Media Type to your chosen format. See 5.9.
   b. Disable all other reading and writing from the disk while you format it. See 5.11.
   c. Lock the volume.
   d. Dismount the volume.
3. Format the tracks. See 5.13
4. Close the disk drive (see). **This must include:**
   a. Unlock the volume. See 5.12.
   b. Re-enable read/write access to the drive for Windows. See 5.11.
   c. Unlock the Media Type. See 5.10.
5. Disable your format(s). See 5.4.

Note that the code below is C++, but not object-oriented.

5.9 Locking The Media Type

```
bool LockMediaType(const char *szDrive, MEDIA_TYPE MediaType)
{
   DWORD nBytesReturned;
   bool status;

   // We need to do this without prompting the driver to
   // test the media (first) - so we have to open it with Query access only
   // before opening it for 'read' or write seperately.

   HANDLE hMedia = CreateFile(
        szDrive,
        0,           /* Read access / Query access only */
        0,           /* Read sharing / No sharing */
        NULL,
        OPEN_EXISTING,
        FILE_ATTRIBUTE_NORMAL | FILE_FLAG_SEQUENTIAL_SCAN,
        0                            /* No template file */ );

   status = !!
        DeviceIoControl(
             hMedia,
             IOCTL_OMNIFLOP_SELECT_MEDIA_TYPE,
             &MediaType, sizeof(MediaType),
             NULL, 0,
             &nBytesReturned,
             NULL);

   if (!status)
   {
        DWORD nError = GetLastError();
        char szError[256];

        nError;
        ExplainError(szError, sizeof(szError));
   }

   status = !!
        DeviceIoControl(
             hMedia,
             IOCTL_OMNIFLOP_LOCK_MEDIA_TYPE,
             NULL, 0,
             NULL, 0,
             &nBytesReturned,
             NULL);

   if (!status)
   {
        DWORD nError = GetLastError();
        char szError[256];
```

```
            nError;
            ExplainError(szError, sizeof(szError));
    }

    CloseHandle(hMedia);

    return !!status;
}
```

5.10 Unlocking The Media Type

```
bool UnlockMediaType(const char *szDrive)
{
    DWORD nBytesReturned;
    bool status;

    // We need to do this without prompting the driver to
    // test the media (first) - so we have to open it with Query access only
    // before opening it for 'read' or write seperately.

    HANDLE hMedia = CreateFile(
        szDrive,
        0,          /* Read access / Query access only */
        0,          /* Read sharing / No sharing */
        NULL,
        OPEN_EXISTING,
        FILE_ATTRIBUTE_NORMAL | FILE_FLAG_SEQUENTIAL_SCAN,
        0                           /* No template file */ );

    status = !!
        DeviceIoControl(
            hMedia,
            IOCTL_OMNIFLOP_UNLOCK_MEDIA_TYPE,
            NULL, 0,
            NULL, 0,
            &nBytesReturned,
            NULL);

    if (!status)
    {
        DWORD nError = GetLastError();
        char szError[256];

        nError;
        ExplainError(szError, sizeof(szError));
    }

    CloseHandle(hMedia);

    return !!status;
}
```

5.11 Disabling/Enabling Read/Write Access

Note: The function returns the previous setting rather than 'success' or 'failure'.

```
bool EnableReadWrite(const char *szDrive, UCHAR bEnable)
{
    DWORD nBytesReturned;
    UCHAR bPrevious = 1; // Default to ON

    // We need to enable without prompting the driver to
    // test the media (first) - so we have to open it with Query access only
    // before opening it for 'read' or write seperately.

    HANDLE hMedia = CreateFile(
        szDrive,
        0,          /* Read access / Query access only */
        0,          /* Read sharing / No sharing */
        NULL,
        OPEN_EXISTING,
        FILE_ATTRIBUTE_NORMAL | FILE_FLAG_SEQUENTIAL_SCAN,
        0                           /* No template file */ );
```

```
bool status = !!
      DeviceIoControl(
            hMedia,
            IOCTL_OMNIFLOP_ENABLE_READ_WRITE,
            &bEnable, sizeof(UCHAR),
            &bPrevious, sizeof(UCHAR),
            &nBytesReturned,
            NULL);

if (!status)
{
      DWORD nError = GetLastError();
      char szError[256];

      nError;
      ExplainError(szError, sizeof(szError));
}

CloseHandle(hMedia);

return !!bPrevious;
}
```

5.12 Opening For Formatting

This sequence provides access to the (unformatted) floppy disk in `m_hMedia`.

```
HANDLE m_hMedia = INVALID_HANDLE_VALUE;

bool OpenForFormat(const char *m_szDrive, MEDIA_TYPE MediaType)
{
   LockMediaType(m_szDrive, MediaType);
   EnableReadWrite(m_szDrive, false);

   DWORD nBytesReturned;

   m_hMedia = CreateFile(
         m_szDrive,
         GENERIC_READ | GENERIC_WRITE, // Both flags mandatory - otherwise Access denied
         0, // No sharing
         NULL,
         OPEN_EXISTING,
         FILE_ATTRIBUTE_SYSTEM | FILE_FLAG_NO_BUFFERING,
         0);

   if ((m_hMedia == INVALID_HANDLE_VALUE))
   {
         Close();
         return false;
   }

   // Exclusive access required
   if (!DeviceIoControl(
               m_hMedia,
               FSCTL_LOCK_VOLUME,
               NULL, 0,
               NULL, 0,
               &nBytesReturned,
               NULL)
         )
   {
         Close();
         return false;
   }

   // Dismount
   if (!DeviceIoControl(
               m_hMedia,
               FSCTL_DISMOUNT_VOLUME,
               NULL, 0,
               NULL, 0,
               &nBytesReturned,
               NULL)
         )
```

```
        {
                Close();
                return false;
        }

        return true;
}
```

5.13 Closing The Format

The handle to the open disk drive is in `m_hMedia`.

```
        void DriveMedia::Close()
        {
        if (m_hMedia != INVALID_HANDLE_VALUE)
        {
                DWORD nBytesReturned;

                // Revoke exclusive access
                DeviceIoControl(
                        m_hMedia,
                        FSCTL_UNLOCK_VOLUME,
                        NULL, 0,
                        NULL, 0,
                        &nBytesReturned,
                        NULL);
                CloseHandle(m_hMedia);
        }
        m_hMedia = INVALID_HANDLE_VALUE;

        // Make sure we always explicitly re-enable read/write access to the disk
        EnableReadWrite(m_szDrive, true);

        // Release any locked format
        UnlockMediaType(m_szDrive);
        }
```

5.14 Formatting Tracks

This should be performed **once for every track required on the disk**, i.e. every cylinder and head combination. It uses the standard Windows IOCTL, IOCTL_FORMAT_TRACKS. See the Microsoft documentation for more information. You may alter the parameters of the IOCTL_DISK_FORMAT_TRACKS at your own risk if you wish to alter its behaviour.

If you need the parameters of the format (number of cylinder, number of heads etc.) then these are available from the standard IOCTL_DISK_GET_DRIVE_GEOMETRY.

Note that this does not verify the format has been written correctly, and will blindly place an incompatible format onto media without checking. To verify the format, read it back in once written, and if it reads the track (as data) without error then the format has been successful. This is as per the standard Windows API.

```
        bool FormatTrack(MEDIA_TYPE MediaType, DWORD nCylinder, DWORD nHead)
        {
        FORMAT_PARAMETERS FormatParameters;
        DWORD nBytesReturned;

        FormatParameters.MediaType = MediaType;
        FormatParameters.StartCylinderNumber = nCylinder;
        FormatParameters.EndCylinderNumber = nCylinder;
        FormatParameters.StartHeadNumber = nHead;
        FormatParameters.EndHeadNumber = nHead;

        if (DeviceIoControl(
                m_hMedia,
                IOCTL_DISK_FORMAT_TRACKS,
                &FormatParameters, sizeof(FormatParameters),
                NULL, 0,
                &nBytesReturned,
```

```
              NULL))
      {
              return true;
      }
      else
      {
              DWORD nError = GetLastError();

              if (nError == ERROR_NOT_READY)
              {
                      strcpy(m_szError,
                              "The device is not ready.\n\n"
                              "This usually means the drive door is open,\n"
                              "the media is invalid (e.g. wrong density),\n"
                              "or the media is damaged.");
              }
              else
                      ExplainError(m_szError, sizeof(m_szError));

              return false;
      }
}
```