

Introduction

The IECHost GUI Client is a multi-threaded software that operates in conjunction with the IECHost hardware.

IECHost is (C) 2017-2026 Luigi Di Fraia. All Rights Reserved.

This manual is (C) 2020-2026 Luigi Di Fraia. No parts of it can be quoted without the author's written permission.

Table of Contents

Introduction.....	1
Installation.....	4
Configuration persistence.....	4
Executing the IECHost GUI Client.....	5
Background color chooser.....	6
Sector content explorer.....	6
Sector navigation buttons.....	6
PETSCII mode.....	7
The Disk Imaging page.....	8
Warpsave to D64.....	8
Legend of overlay symbols and colors.....	8
Operational considerations.....	9
Pre-initialize disk.....	9
Auto naming.....	9
Offset.....	9
Side.....	9
Max errors.....	9
Read retries.....	10
Outermost track.....	10
Accessible errors.....	10
Warpsave to disk.....	10
Operational considerations.....	10
The Files / Directory page.....	11
Directory.....	11
Export PRG.....	12
Format disk.....	12
Validate disk.....	12
Scratch file.....	12
Import PRG.....	12
The Logging page.....	13
The Menubar.....	14
File menu.....	14
Select working folder.....	14
Quit.....	14
Configuration menu.....	15
Connection settings.....	15
Device port.....	15
Bootloader port.....	15
Format parameters.....	16
Disk name.....	16
Disk ID.....	16
Application settings.....	16
File extensions.....	16
Disk side letters.....	17
Special flags.....	17

Append disk name to image name.....	17
Confirm disk image overwrites.....	17
If tracks beyond 35 appear to be in use.....	17
If side B of a 1571 disk is detected.....	17
Retry sectors once per pass.....	17
Include SCR files in generated directory.....	17
Double size of PNG directory listing.....	17
Create MD5 digest files.....	18
Fonts.....	18
Zoom.....	18
View menu.....	19
Firmware menu.....	20
Tools menu.....	21
Initialize disk.....	21
Query error channel.....	21
Export sector grid to PNG.....	21
Disk directory.....	21
Export directory to PNG.....	21
Reset drive (soft).....	22
Reset the IEC bus (hard).....	22
Format II.....	22
Operational considerations.....	22
Dump 1541 drive ROM.....	22
Dump 1571 drive ROM.....	22
Special menu.....	23
Warpsave the whole disk.....	23
Dump dir track only.....	23
Dump dir track and first sector.....	23
Dump based on BAM contents.....	23
Load D64 file for re-reads.....	24
Re-read all sectors with errors.....	24
Re-read sectors with errors in dir track.....	24
Re-read dir track and first sector (alpha).....	24
Re-read sectors with errors in track range.....	24
Shifted track data and re-reads.....	25

Installation

The IECHost GUI Client doesn't include an installer. For manual installation, the contents of the distribution archive need to be extracted in a location of the file system that is convenient to the user.

Note: Under Windows the IECHost GUI Client requires the installation of the GTK+ 2.24.31 runtime, unless the portable archive is used. Under Linux the GTK+ 2.x.y runtime is usually already available, depending on the desktop engine in use, however version 2.24.31 is the minimum required.

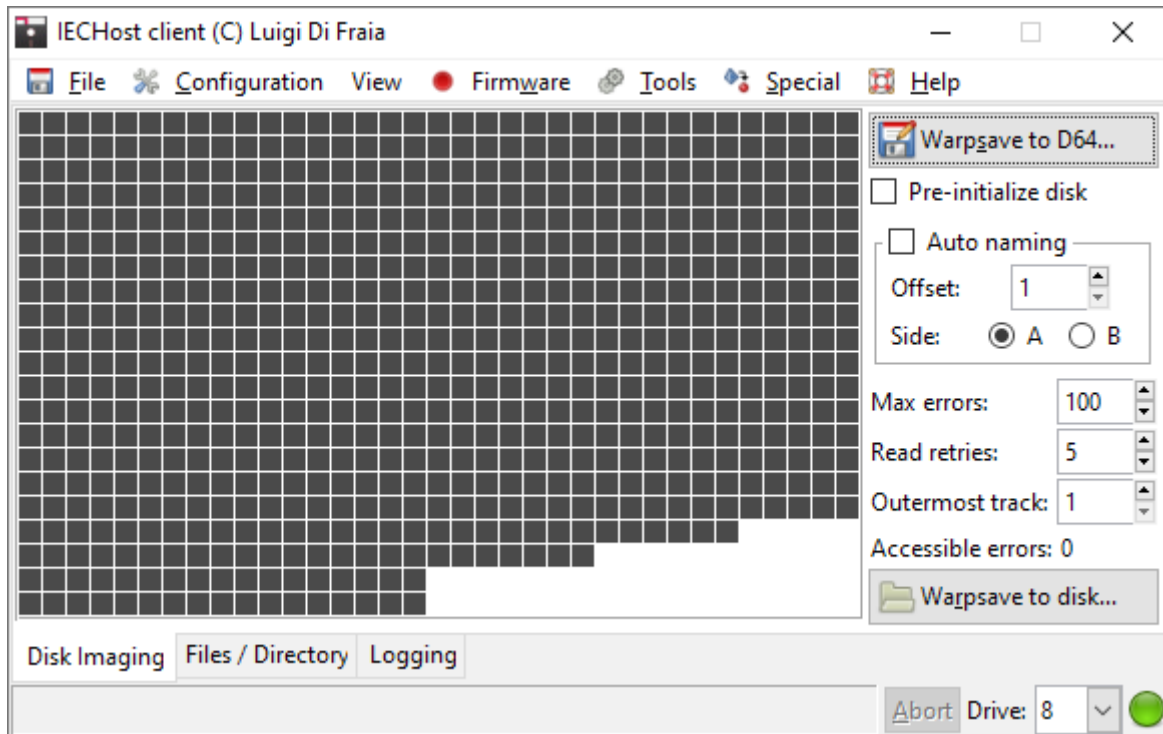
Configuration persistence

A number of user-configurable options and settings are persisted to file so that they can be restored when the application is restarted. Those settings that are not persisted aren't by design, in order to avoid their propagation between sessions.

The location of such file depends on the operating system in use and is displayed in the "Logging" page when the application is started. As an example, under Windows 10 the location is `%LOCALAPPDATA%\iechost-client\user.ini`.

Executing the IECHost GUI Client

Upon starting the IECHost GUI Client, its main window is displayed.

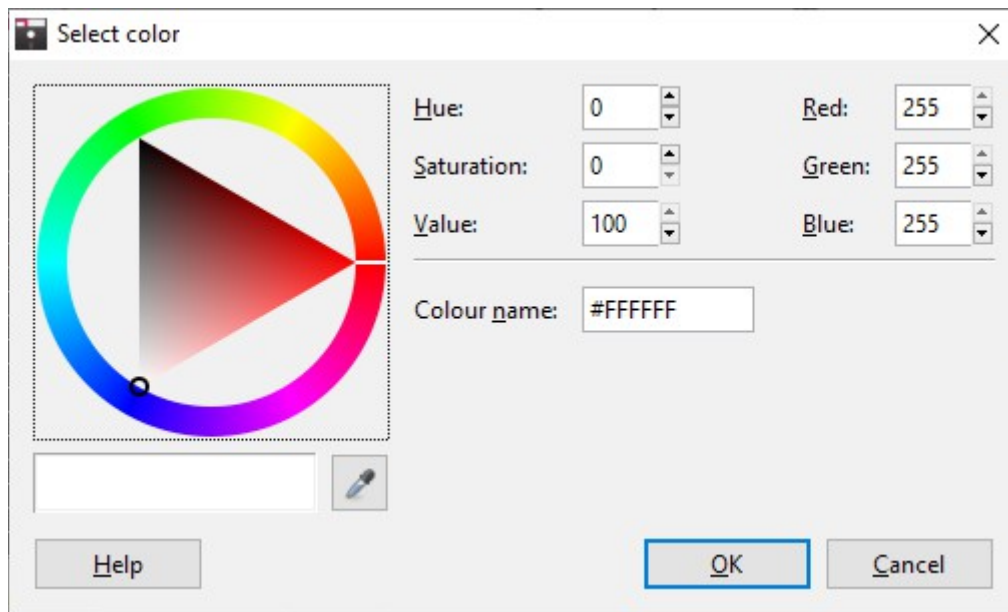


In the bottom right corner of the main window there's the "Drive" selection widget that allows users to switch between drive 8, 9, 10, and 11.

The "Abort" button becomes active when an operation is in progress. Furthermore the status icon turns from green to red when a drive operation is in progress, which is handy in noisy environments such as demo parties.

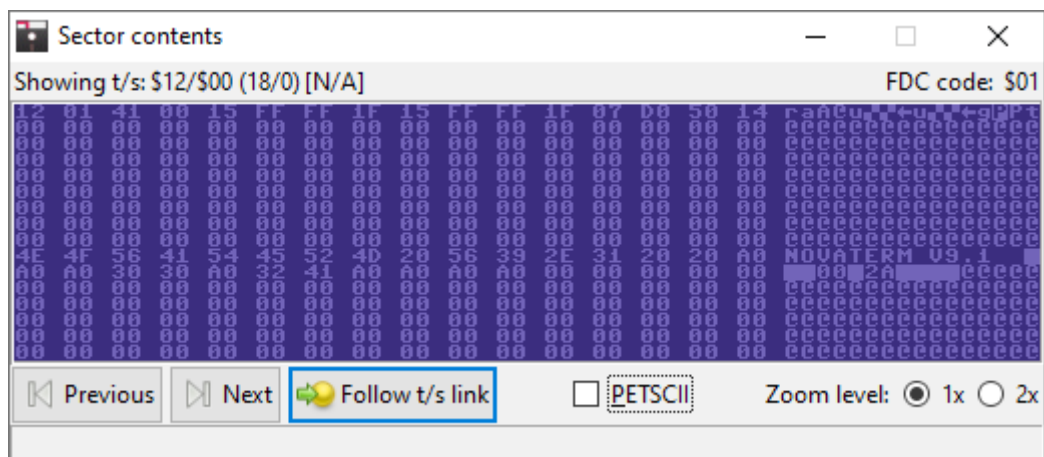
Background color chooser

If the left mouse button is clicked on the blank area of the sector grid while holding down the Ctrl key, then users are presented with the following dialog in order to choose the background color of the grid itself.



Sector content explorer

If the left mouse button is clicked on a sector cell while holding down the Ctrl key, then users are presented with the following window in order to explore sector contents:



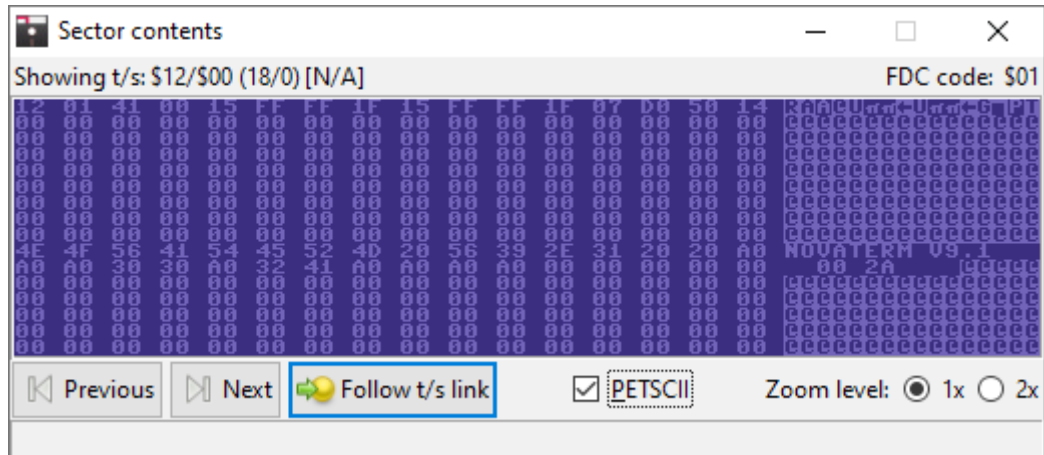
Sector navigation buttons

The "Previous" and "Next" buttons jump to the previous and next sector, if applicable.

The "Follow t/s link" button jumps to the sector pointed by the t/s link within the current sector, if applicable.

PETSCII mode

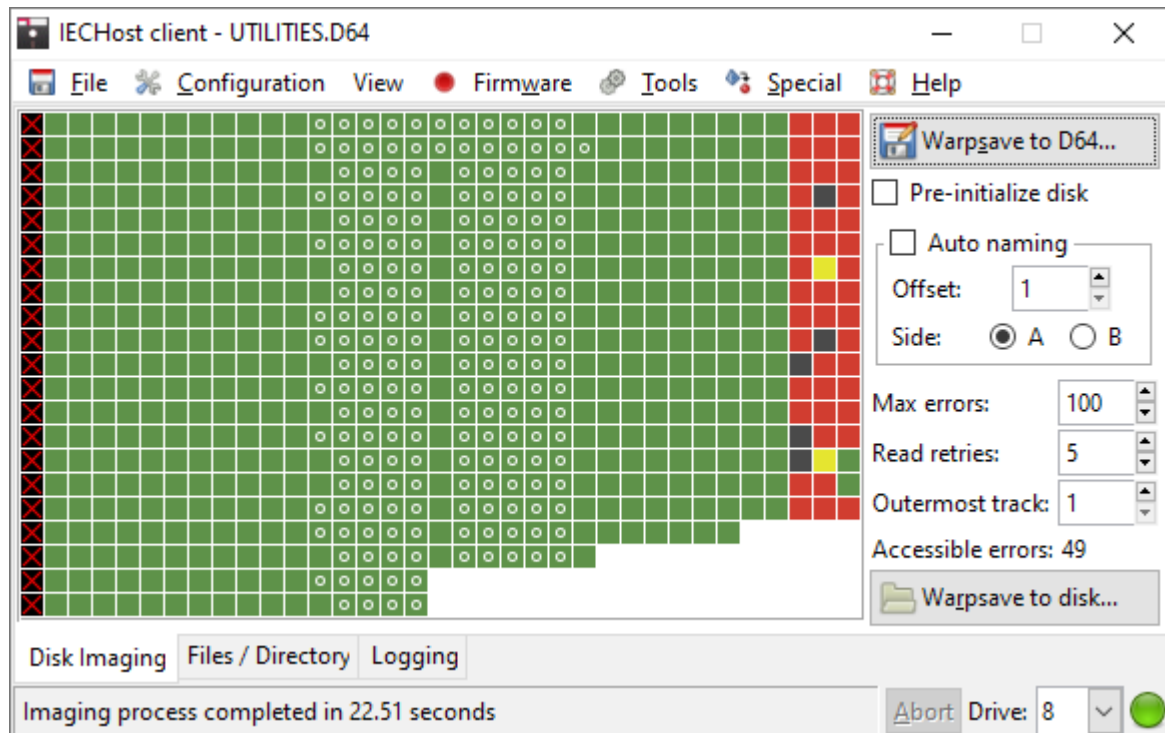
If this option is enabled, then the data display mode is switched from using screen codes to the PETSCII set. As an example:



The Disk Imaging page

WarpSave to D64...

This button is used to warpSave a disk image from the selected drive to a D64 file, using Graham's "WarpCopy64" drive code.



Legend of overlay symbols and colors

- Overlay symbols:
 - A white circle on a sector means that the sector is allocated (contains file data), according to the information stored within the BAM sector (only displayed if the latter is error free);
 - A red X on a sector means that the sector is in an inaccessible track (this results into status code 0x0F stored in the block error info);
- Sector colors:
 - Green: GCR decoded OK and data check byte check succeeded (status code 0x01);
 - Yellow: GCR decoded OK but data check byte check failed (status code 0x05);
 - Red: GCR decoding failed, due to an illegal GCR sequence being found (status code 0x09 is used in this scenario for the lack of a better one);
 - Black: the sector's sync pattern has not been found (status code 0x03).

Operational considerations

For 35-track floppy disks, it takes roughly 23 seconds to warpsave a disk image to D64.

Once the imaging process completes, the IECHost GUI Client goes through the following steps:

- Check if there are any block errors so that retries can be made, if applicable;
- Check if the disk image requires shifting inwards due to the presence of inaccessible tracks at the disk's edge (refer to the "Outermost track" option below for more details);
- Check if the disk image requires shifting outwards due to the fact that the imaging process didn't start from actual track 1 but from a pre-existing track at the disk's outer edge;
- Check if the disk is unformatted;
- Decode the BAM sector and, if it is error free, mark allocated sectors with a white circle;
- Check if tracks beyond 35 are used by looking at sector contents after the disk ID;
- Check if an image was made out of a 1571 disk's side B;
- Save the disk image (which includes the block error info if and only if there are block errors).

Pre-initialize disk

If this option is enabled, a disk is initialized ahead of being dumped, thus creating a strong reference for track navigation. Refer to the "Initialize disk" menu item below for additional details.

Auto naming

If this option is enabled, when dumping a disk, D64 filenames are automatically generated and the save dialog is not used. This is particularly useful for mass dumping scenarios.

Offset

Numeric prefix for auto-generated filenames.

Side

Select to flag the next disk dump as either side A or B.

Max errors

When dumping or re-reading a disk, sectors are re-read only if the number of accessible sectors with errors is lower than or equal to this value.

Read retries

Number of additional times a sector is read from a physical disk if it contains errors just after being dumped or when re-read.

Outermost track

If a disk was written by a drive whose head stop had been tinkered with, a few tracks might be inaccessible on a stock drive. In this scenario, setting the index of the outermost accessible track accordingly prevents the drive head from bumping and prevents the dumping process from waiting for non existing sectors at the edge of each speed area.

Accessible errors

When dumping or re-reading a disk, this is the count of sectors with errors that are accessible and can therefore be re-read.

Warpsave to disk...

This button is used to warpsave a disk image from a D64 file to a floppy disk in the selected drive, using Graham's "WarpCopy64" drive code.

Operational considerations

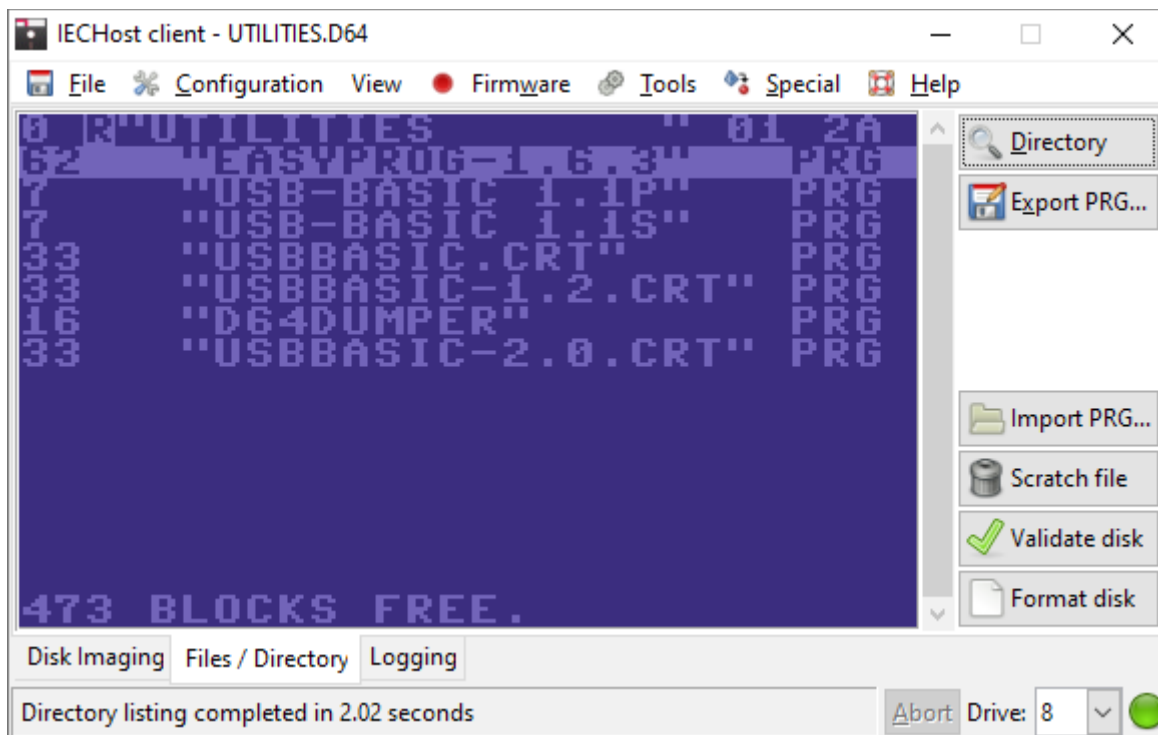
It should be noted that the destination floppy disk has to be DOS formatted at least once before warpsaving to it. In the case of 40-track D64 files, the destination floppy disk must have been formatted as a 40-track disk at some point in time.

For 35-track floppy disks, it takes roughly 36 seconds to warpsave a disk image to disk.

The Files / Directory page

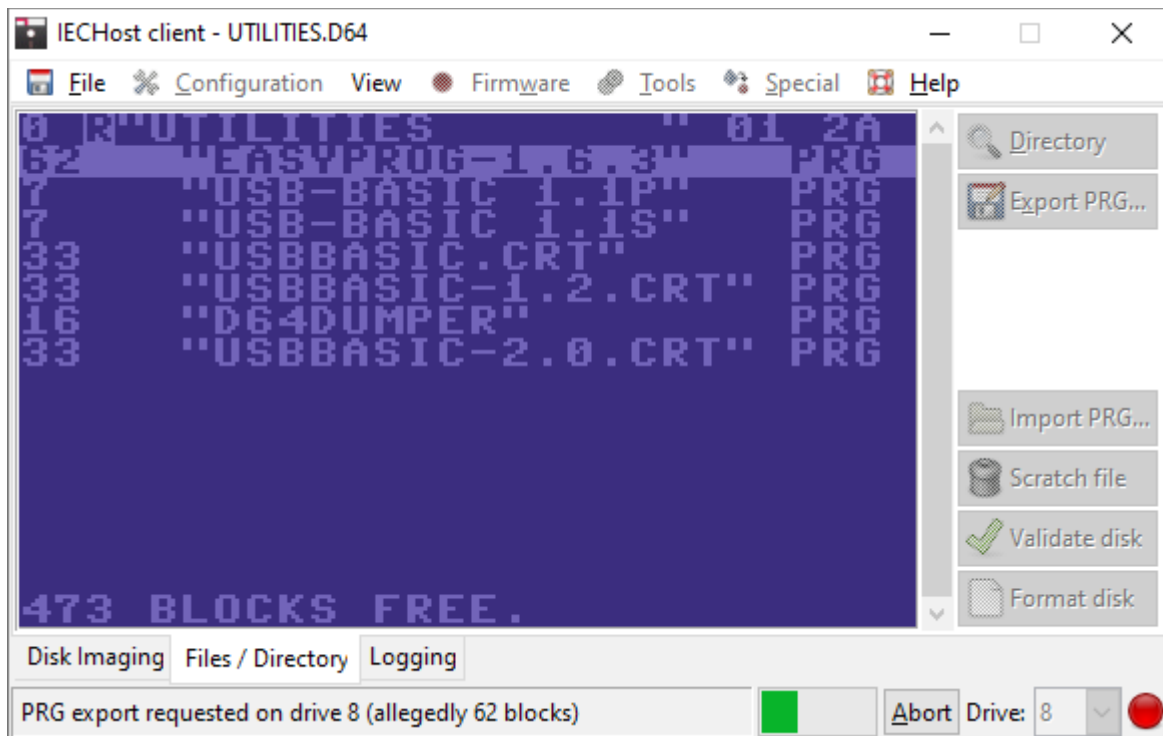
Directory

This button is used to list directory contents from the disk currently in use.



Export PRG...

This button is used to export the selected PRG file. A progress bar appears next to the "Abort" button until the export is over.



Format disk

This button is used to format a disk using (slow) DOS routines.

Validate disk

This button is used to validate a disk. This process deletes any file that was not properly closed, in which case the * char is printed before the file format in a directory listing.

Scratch file

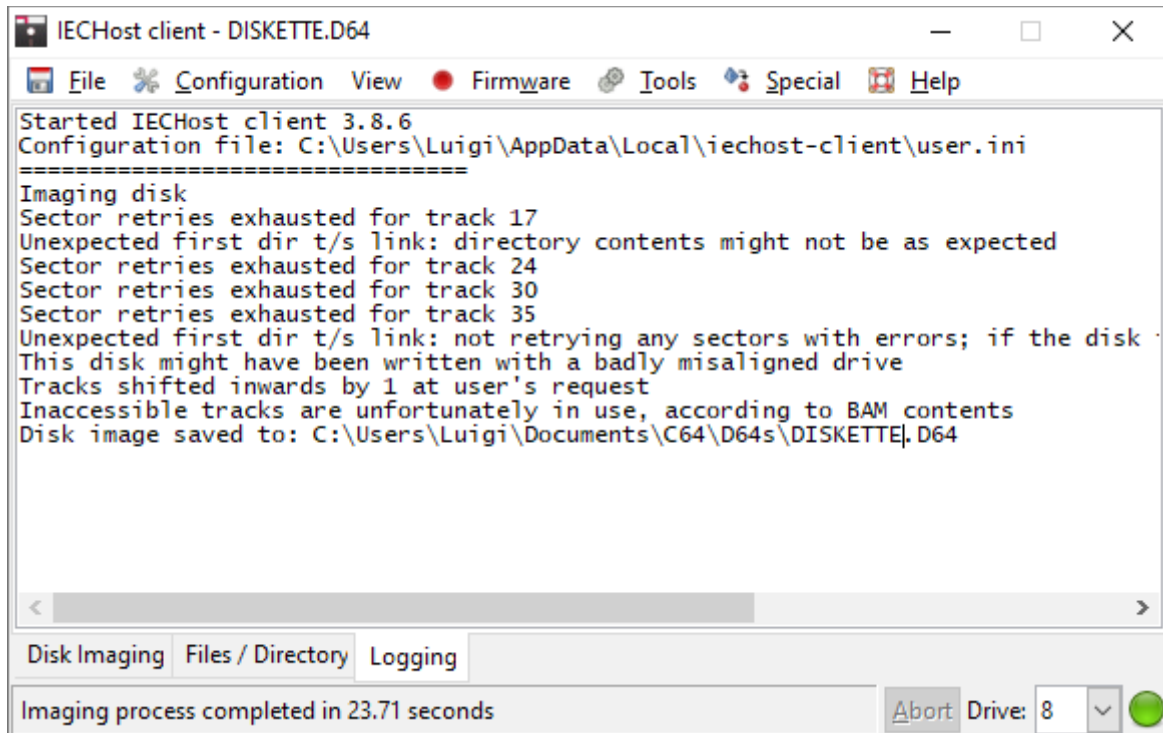
This button is used to delete the selected file.

Import PRG...

This button is used to import a PRG file into the floppy disk currently in use. A progress bar appears next to the "Abort" button until the import is over.

The Logging page

This is the last page available in the main window. It tracks commands and provides feedback on their execution.

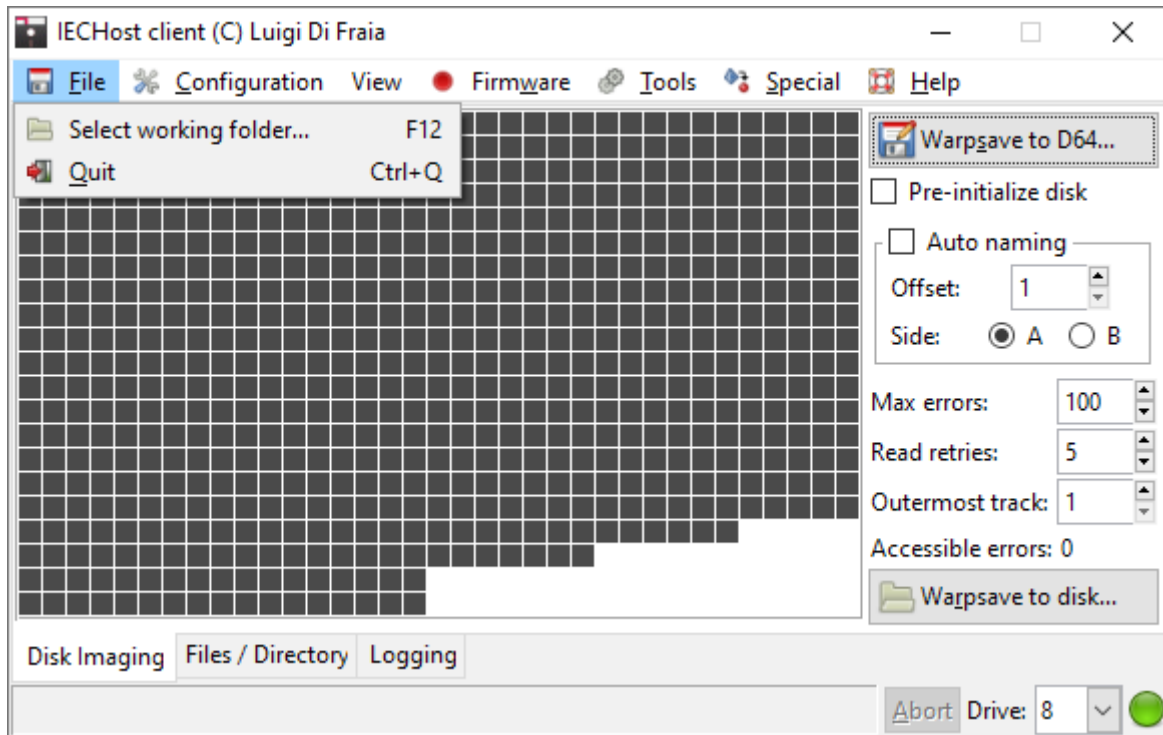


It should be noted that this area is editable: users can add comments and remove content. It may be handy to copy and save the contents of this area after each session.

The Menubar

The menubar comprises 7 menu groups, all of which are initially enabled.

File menu



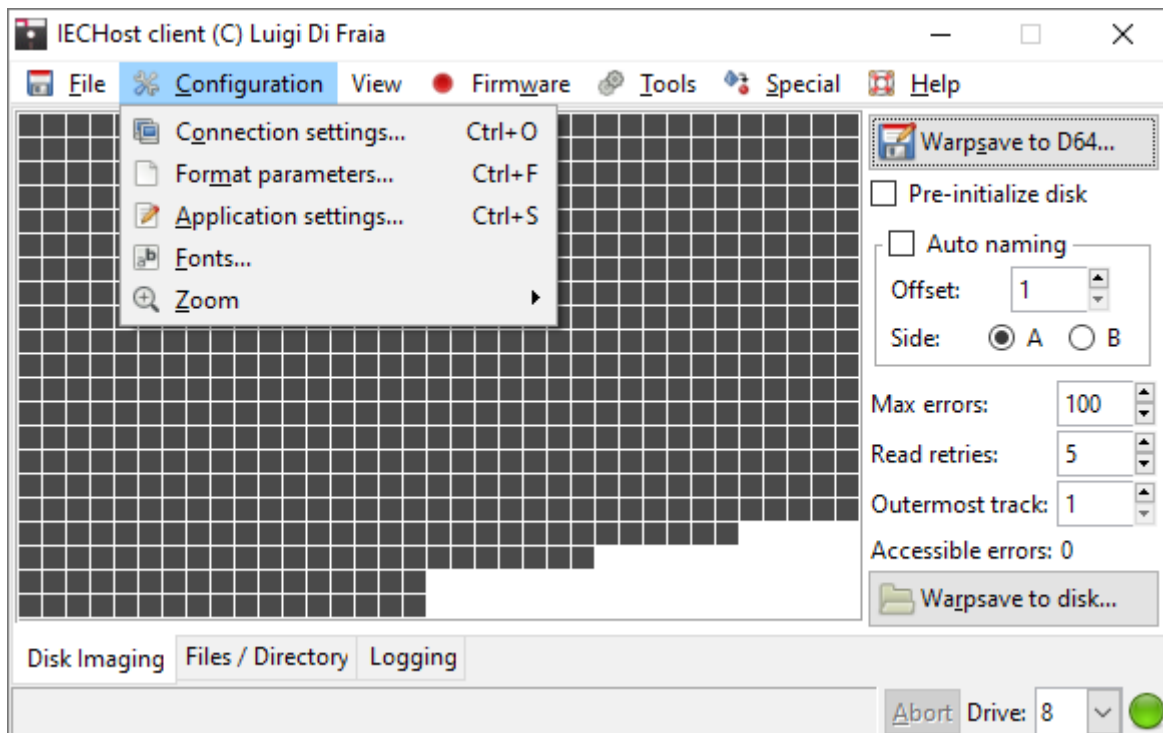
Select working folder...

This menu item is used to select the folder where disk images are saved to and loaded from.

Quit

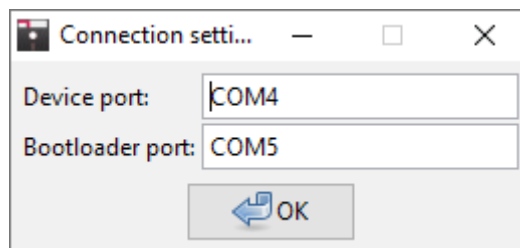
This menu item is used to quit the program.

Configuration menu



Connection settings...

This menu item is used to configure the ports to connect to the IECHost hardware. In order to do so, users are presented with the following dialog.



Device port

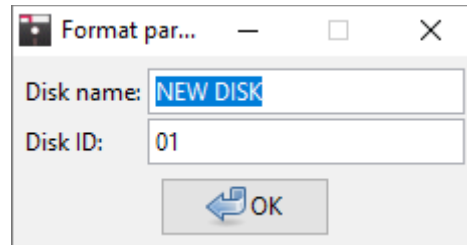
This is the USB serial port to use for connecting to the IECHost firmware. Refer to the hardware manual for more information.

Bootloader port

This is the USB serial port to use for connecting to the AVR bootloader. Refer to the hardware manual for more information.

Format parameters...

This menu item is used to configure parameters required to format disks. In order to do so, users are presented with the following dialog.



Disk name

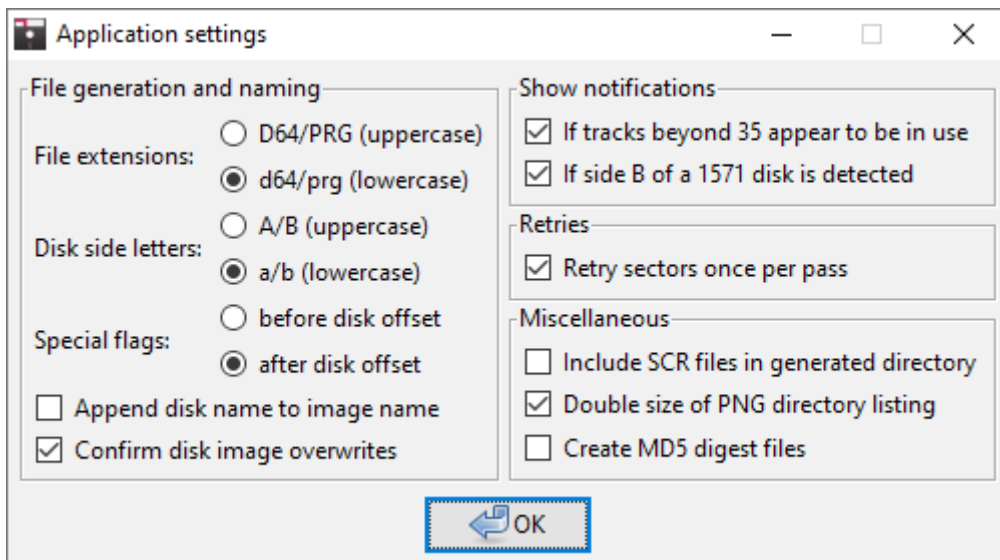
Name to use when formatting disks. Bear in mind that this text entry does not support PETSCII characters.

Disk ID

ID to use when formatting disks. Bear in mind that this text entry does not support PETSCII characters.

Application settings...

This menu item is used to configure miscellaneous application settings. In order to do so, users are presented with the following dialog.



File extensions

This option selects whether to use uppercase or lowercase file extensions when creating output files.

Disk side letters

When auto naming is enabled, this option selects whether to use uppercase or lowercase characters for the disk side identifier.

Special flags

For partial disk dumping, one of the following flags is inserted in the output filename:

- T18: Dump track 18 only (dir track);
- T18+: Dump track 18 and the first sector of each PRG only;
- BAM: Dump sectors that show as allocated within the BAM sector;

Users can use this option to prepend or append each flag to the output filename.

Append disk name to image name

When auto naming is enabled, this option selects whether or not the disk name (as it appears in T/S 18/0) should be added to the output filename when dumping a disk.

Confirm disk image overwrites

When auto naming is enabled, this option selects whether or not the user is prompted to overwrite existing disk images.

If tracks beyond 35 appear to be in use

This option selects whether or not to show a notification when extra data appears in the BAM block after the disk ID.

If side B of a 1571 disk is detected

This option selects whether or not to show a notification when a disk image appears to be side B of a 1571 disk.

Retry sectors once per pass

This option selects whether to retry a sector once per pass or exhaust all retries for a single sector before retrying the next one. Note that this is not always possible, so there are exceptions.

Include SCR files in generated directory

This option selects whether or not to include SCRatched files in the directory listing of D64 files.

Double size of PNG directory listing

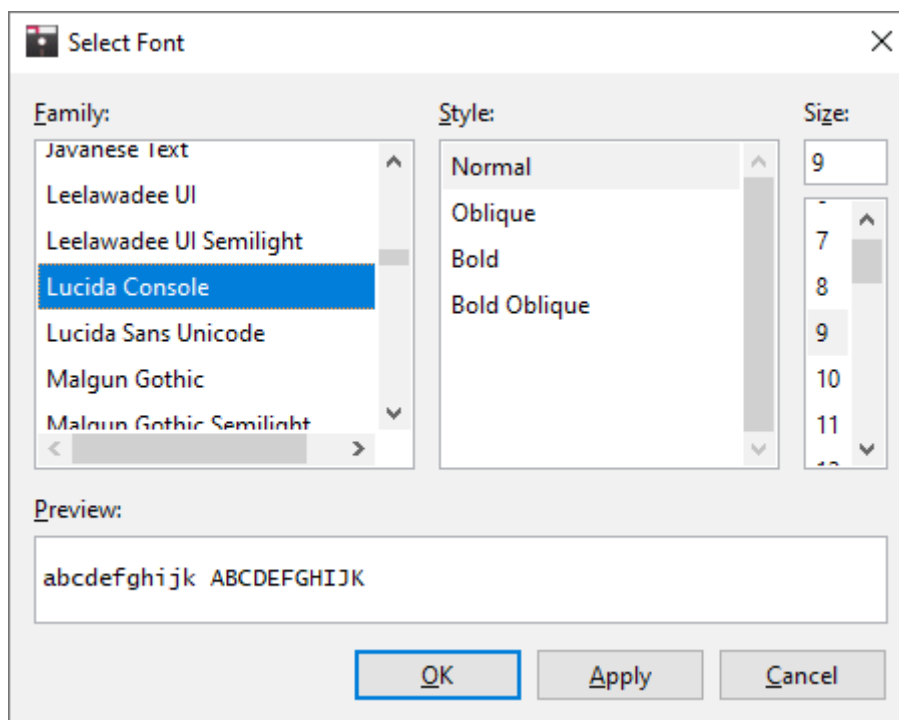
This option selects whether to double the image size when exporting the directory listing to PNG.

Create MD5 digest files

This option selects whether to also create MD5 digest files when saving disk images.

Fonts...

This menu item is used to set the font of text areas, through the following dialog.

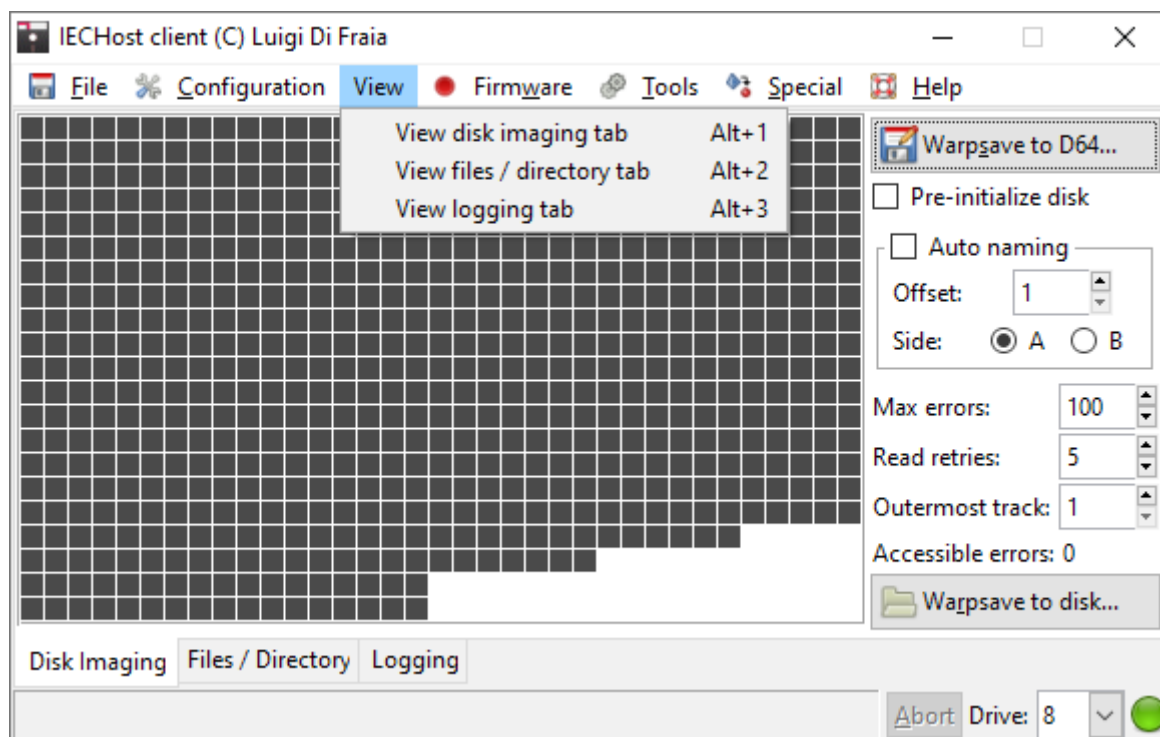


Zoom

Menu items in this group are used to set the zoom level of drawing areas in the main window.

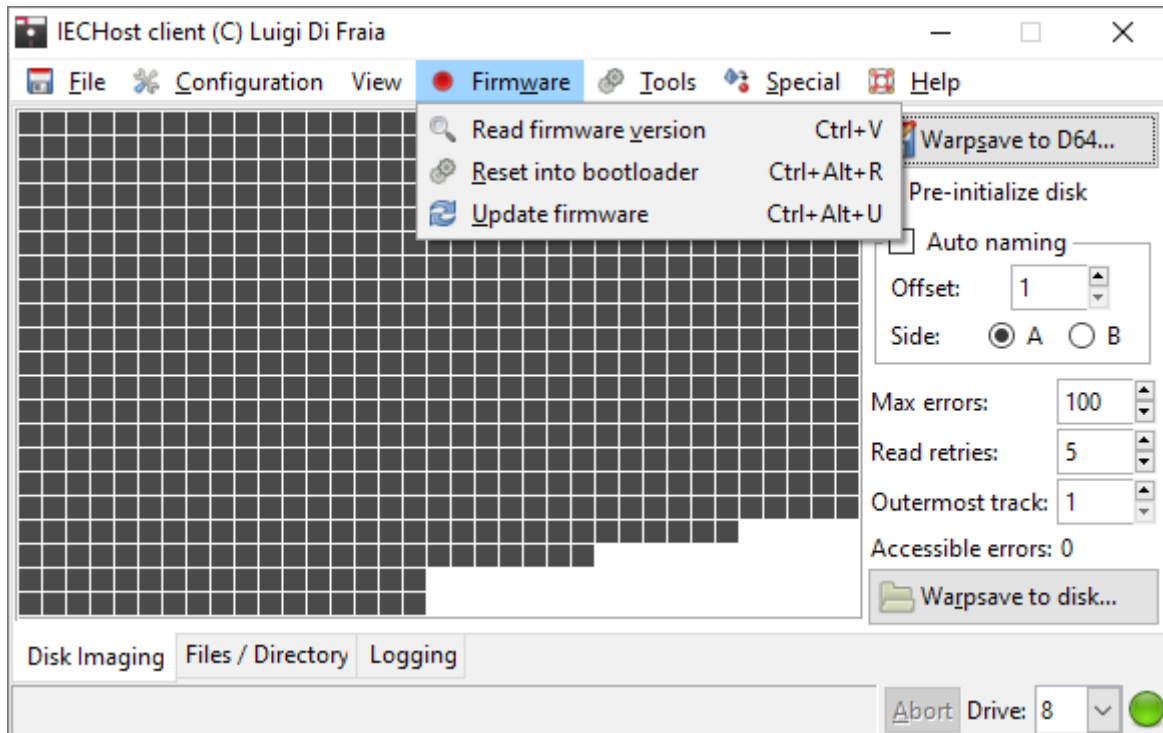
View menu

This menu is used to switch between the main notebook pages.



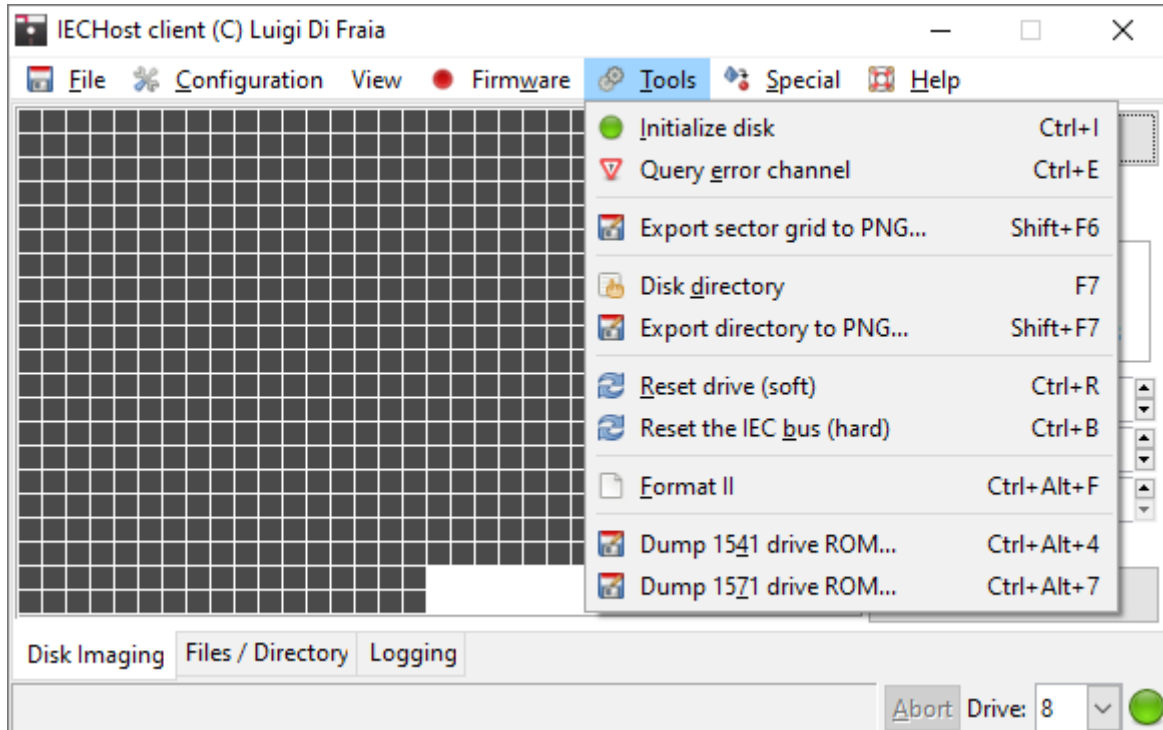
Firmware menu

This menu is used to perform low level operations, including reading the firmware version from the IECHost hardware and updating it to the latest version. Furthermore the ability to reset the hardware is provided in order to facilitate the discovery of the AVR bootloader port to use within the "Connection settings" dialog.



Tools menu

This menu is used to perform miscellaneous operations.



Initialize disk

This menu item is used to clear the error channel and force the DOS to read the disk ID and the contents of the BAM, storing these in the drive's RAM.

Query error channel

This menu item is used to query the error channel of the selected drive.

Export sector grid to PNG...

This menu item is used to export sector grid contents to a PNG image.

Disk directory

This menu item is used to list directory contents from the disk currently in use.

Export directory to PNG...

This menu item is used to export in-memory directory contents to a PNG image.

Reset drive (soft)

This menu item is used to soft reset the selected drive (through the "UJ:" command).

Reset the IEC bus (hard)

This menu item is used to hard reset the IEC bus by pulling the reset line down for 20 ms.

Format II

This menu item is used to fast format a disk in the selected drive, using Daniel Kahlin's "Format II" code.

Operational considerations

For 35-track floppy disks, it takes roughly 19 seconds to complete the format process.

Dump 1541 drive ROM...

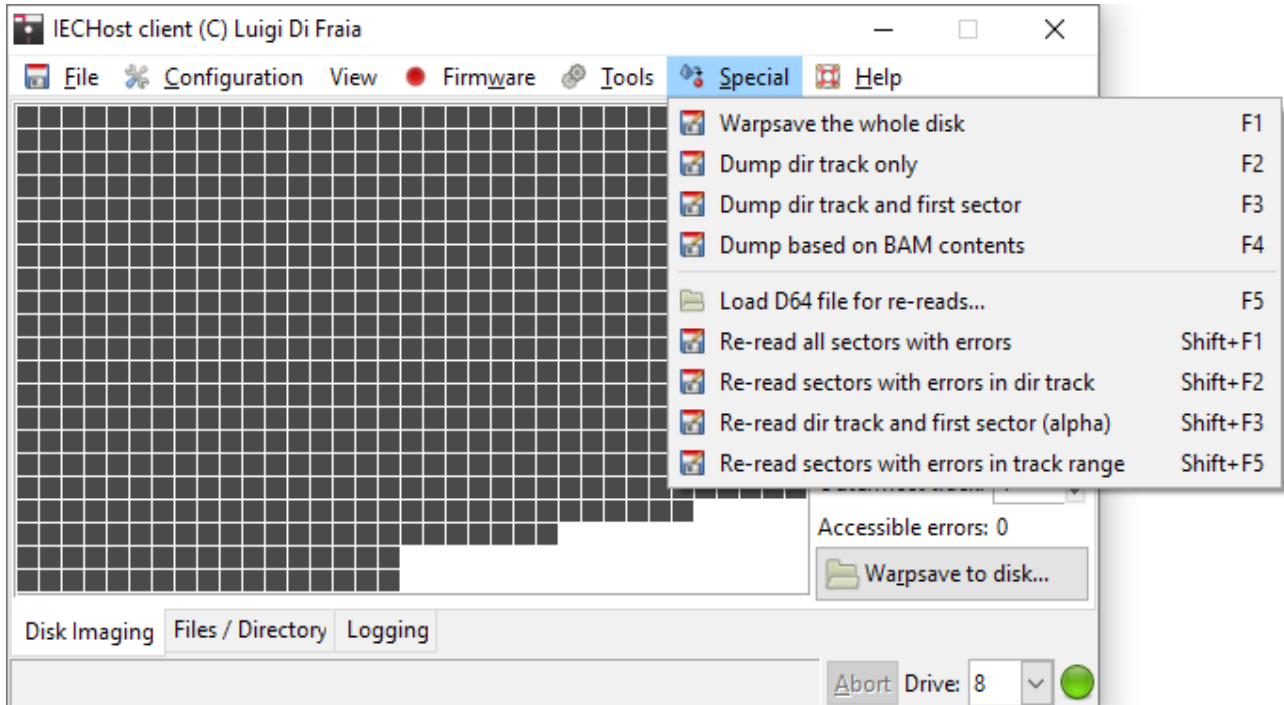
This menu item is used to dump a 1541 drive's ROM (\$C000-\$FFFF) to file.

Dump 1571 drive ROM...

This menu item is used to dump a 1571 drive's ROM (\$8000-\$FFFF) to file.

Special menu

This menu is used to perform specialized operations.



WARNING: Before re-reading any sector using one of the available specialised operations, users have to make sure that the directory listing of the destination D64 file is readable and, more specifically, that sector data is not shifted either inwards or outwards. Failure to do so will result in re-read sectors being written in the wrong position within the D64 file.

Warpsave the whole disk

This menu item is used to warpsave a disk image from the selected drive to a D64 file.

Dump dir track only

This menu item is used to dump sectors in track 18 (dir track) only.

Dump dir track and first sector

This menu item is used to dump sectors in track 18 (dir track) and the first sector of each PRG file that's part of the directory listing.

Dump based on BAM contents

This menu item is used to dump only sectors that are allocated, according to BAM contents.

Load D64 file for re-reads...

This menu item is used to select a disk image for re-reading sectors with errors.

Re-read all sectors with errors

This menu item is used to re-read all accessible sectors with errors.

Re-read sectors with errors in dir track

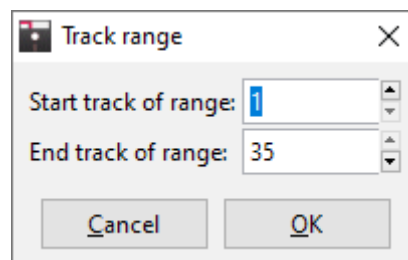
This menu item is used to re-read all sectors with errors in track 18 (dir track).

Re-read dir track and first sector (alpha)

This menu item is used to re-read all sectors with errors in track 18 (dir track) and the first sector of each PRG file that's part of the directory listing.

Re-read sectors with errors in track range

This menu item is used to re-read all sectors with errors in a track range. This is useful when several errors occur on tracks away from the directory track, particularly in sectors that contain no data and should therefore be skipped. Users are then presented with the following dialog.

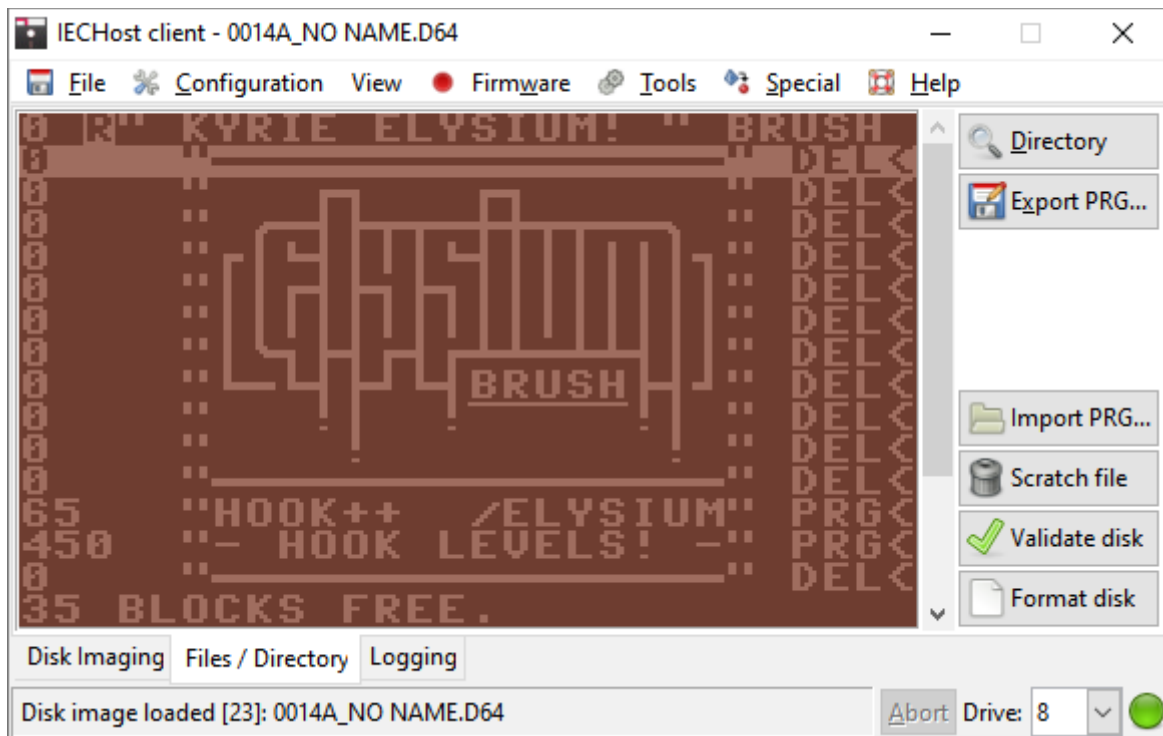


Note that:

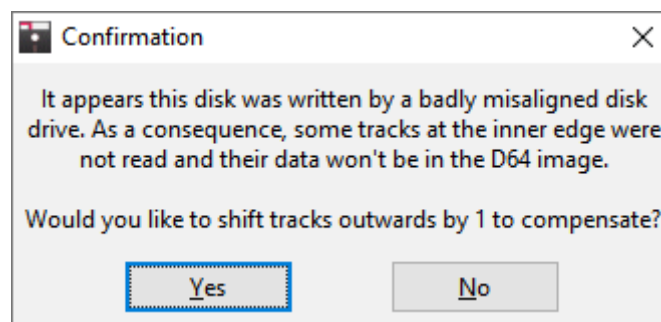
- The start track cannot be set to a value lower than the "Outermost track" value;
- The end track value is limited to either 35 or 40, depending on the build in use;
- The "Max errors" value is checked against the number of sectors with errors in the selected track range, instead of the whole disk.

Shifted track data and re-reads

The IECHost GUI Client can detect track data that is shifted either inwards or outwards. This check is performed when a disk is first dumped and when a D64 file is loaded for re-reading faulty sectors. When a shift is detected, should the directory listing be readable it will be shown in red colors.

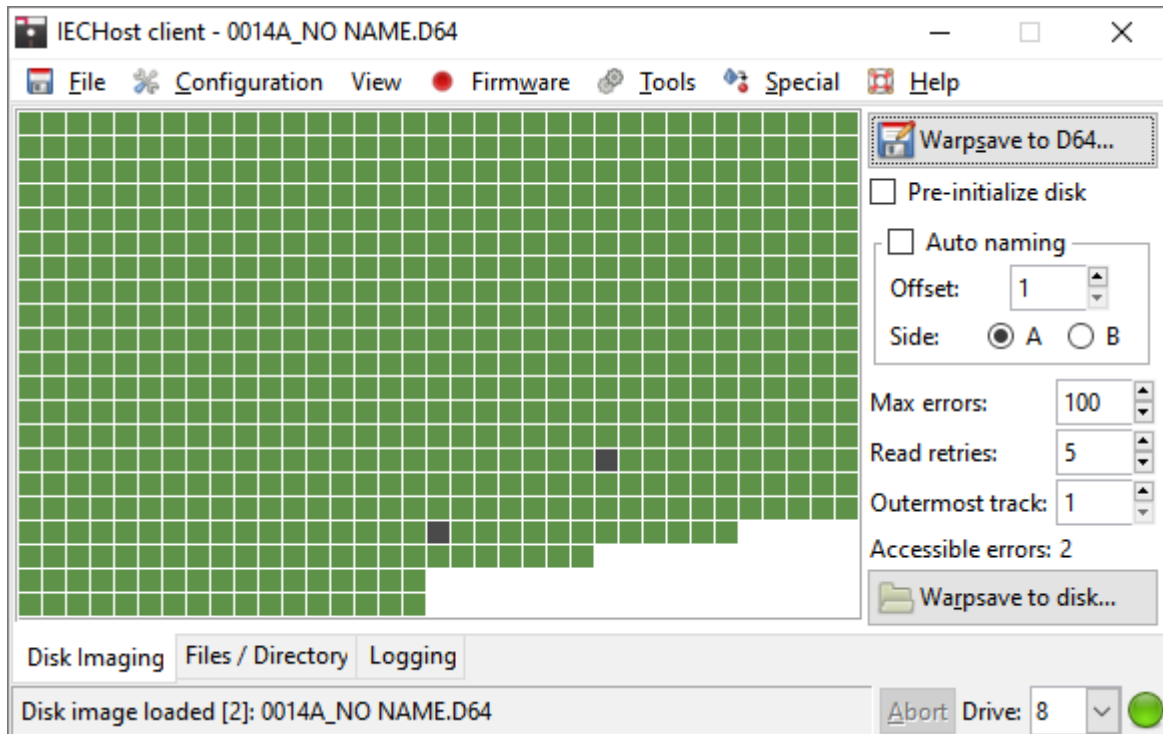


In these scenarios, the IECHost GUI Client will offer to shift tracks.

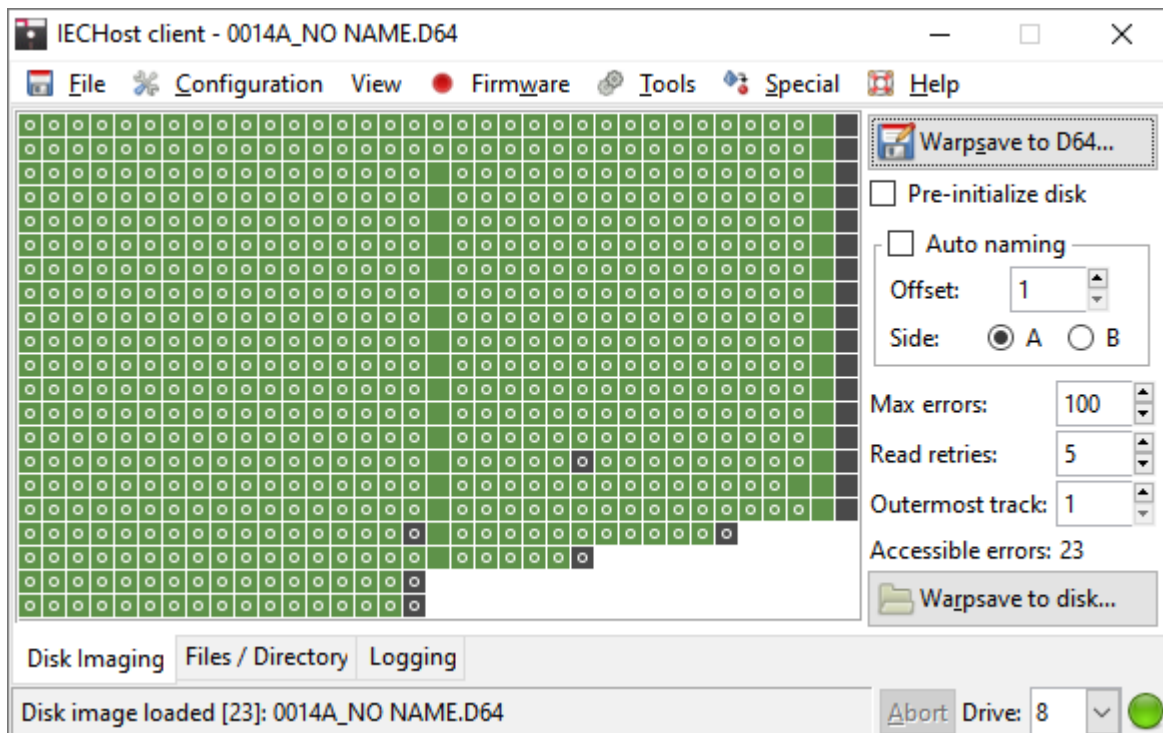


If disk contents are not shifted and faulty sectors are re-read, the latter will overwrite the wrong locations in the D64 file written to disk.

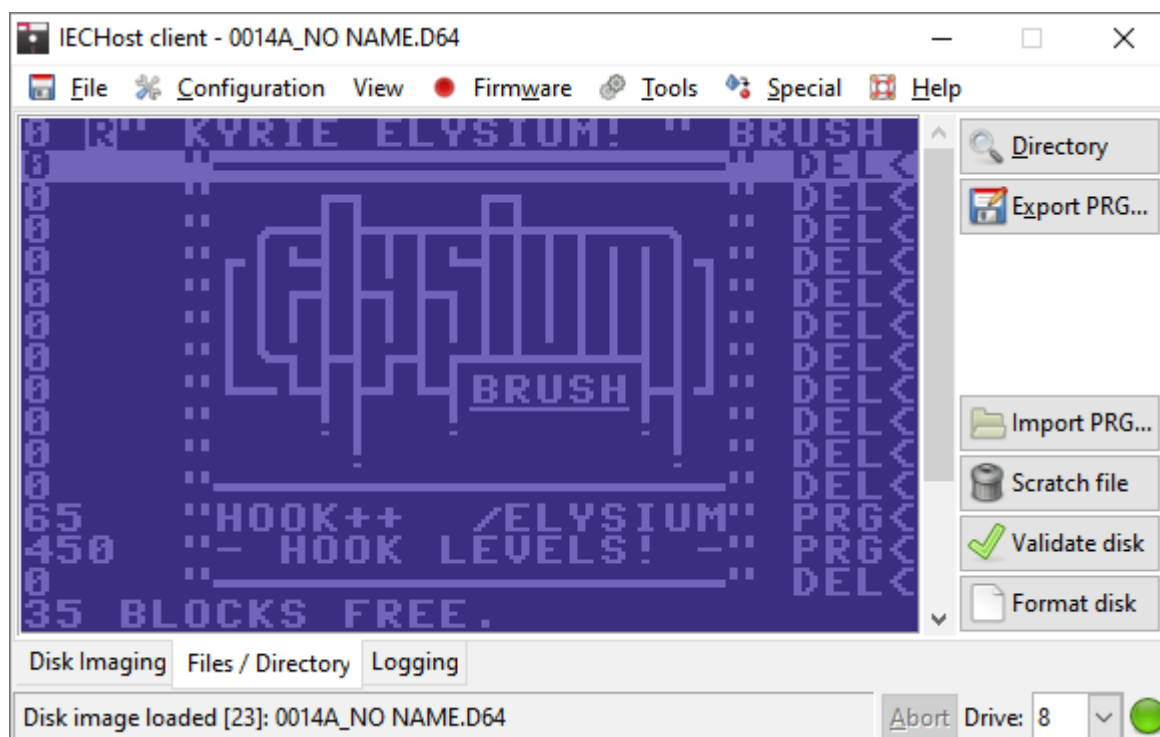
For the disk in the above example, this is the situation without a shift:



With a correct shift applied, this is the situation (note how the sector allocation information is now displaying correctly):



Furthermore, the directory listing will show in the usual blue colors after a shift is correctly applied.



Re-reading sectors after a shift has been correctly applied ensures that the final disk image is a correct copy of the disk being dumped.