



# USER MANUAL PAULINE

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### WHAT IS PAULINE?

#### What is Pauline?

Pauline is a tool developed by Jean François Del Nero, also author of the very famous HxC tool, within the association La Ludothèque Française, in partnership with the associations Game Preservation Society located in Japan, and MO5.COM located in France.

Pauline is a totally open-source, powerful, universal and simple to use tool that will allow you to scan with precision the content of the magnetic disks you want to archive, regardless of their format.

Pauline, finally, is based on a commercially available hardware solution, a DE10-Nano FPGA board and a daughter board whose plans and BOMs are given on the SourceForge site, as well as a software solution that is also open-source and still available on Pauline's SourceForge.



Pauline Rev A mounted on her DE10-Nano and OLED display (August 2020)

Pauline, whose name of use stipulates the set consisting of a DE10-Nano card with its daughter card "Pauline", will interface with your floppy disk drives, whatever their format (3, 3.5, 5.25, 8 inches or other) and will allow you in just a few clicks to scan their content and archive it.

#### WHAT IS PAULINE?



Connection diagram of a Pauline card

Your Pauline will therefore interface with several floppy disk drives of various formats. It is important to note here that, as shown in the diagram above, we recommend that Pauline and the floppy disk drives share the same power supply (by default, a modern ATX-type PC power supply), in order to limit possible problems of differences in electrical voltage (common ground).

In order to be able to easily connect all these components to an ATX power supply (choose quality over power, of course), here is a small device available on the market that allows to link all floppy drives and Pauline to the same power supply easily :



A standard ATX power supply unit with 20/24Pin ATX Benchtop PC Power Adapter Board

# WHAT ARE THE COMPONENTS OF PAULINE ?

#### What are the components of Pauline?

Pauline is a set of several technical and software elements that will allow you to scan with precision your magnetic disks, whatever their format.

Pauline uses a technical platform known as DE10-Nano in order to be efficient and to be able to work in an autonomous way, out of sync with a conventional computer, which we briefly present :

#### THE DE10-NANO

It is an electronic board built around a high-performance fifth-generation FPGA chip, and two ARM cores capable of running one OS (Linux, other). It is also equipped with an HDMI output (not yet used at this stage of the project), an RJ45 Gigabit network socket, USB connectors and GPIO (General Purpose Input/Output) connectors capable of receiving different electronic boards and dialoguing with the outside world.



A DE10-Nano card (July 2020)

This card is available for around  $\leq$ 130 according to commercial sites (public prices as of July 2020), for example at Digi-Key : <u>https://www.digikey.fr/fr/product-highlight/t/terasic-tech/de10-nano</u>

### WHAT ARE THE COMPONENTS OF PAULINE ?

Pauline is therefore, as you will have understood, a daughter board that will be grafted on the DE10-Nano board, directly on the GPIO connectors, located at the top and bottom on the picture above.

#### THE PAULINE CARD

This one is composed of several connectors that will allow to control floppy disk drives in Shugart data format (up to 4 drives). A 4-pin connector located in the center of Pauline allows the use of a small 0.96 inch OLED screen which will help to make an immediate diagnosis of Pauline and the operations in progress. Finally, three buttons will in the future also allow to interact quickly with Pauline's functionalities.



Pauline revision A (July 2020)

#### Pauline's assembly

Now that you have received all the materials necessary for Pauline's functioning, we will see together how to arrange them in order to start Pauline. Don't hesitate to ask for help again on the Discord of La Ludothèque Française or MO5.COM if you encounter any difficulty (see last chapter of this document).

#### PREPARATION OF ALL COMPONENTS

Measure the thickness of the document using a micrometer...

First check that you have received a complete DE10-Nano card, including the card, power supply, manuals and necessary cables, as shown here :



Contents of the box of a complete DE10-Nano card in July 2020

Then, take out its power supply, taking care to add an adapter for French electrical plugs. Note that you can use any 5V USB power supply but with a minimum capacity of 2 amps.



Original power supply of the DE10-Nano card and its adapter for French plugs



The DE10-Nao card is presented in this form once extracted from its protective packaging:

The additional OLED screen that we offer you to purchase is in this form. Note this reference and seller if you wish.



#### ASSEMBLY OF THE PAULINE CARD ON THE DE10-NANO

Take delicately between two fingers the daughter card Pauline, and present it above the DE10-Nano card as follows :



Then, make sure that the connectors of the daughter board are facing the connectors of the DE10-Nano board :



You should get the following setup :



#### ASSEMBLY OF THE OLED SCREEN

The optional OLED display is very simple to set up, and works only with 4 pins to be placed in Pauline.







Congratulations, your Pauline is now complete !



#### PREPARING THE FIRMWARE'S MICROSD CARD

#### Preparing the Firmware's MicroSD card

The DE10-Nano card comes with an 8GB MicroSD card. This capacity is more than enough for Pauline's work. However, it needs to be formatted with the Linux work environment prepared for Pauline and her operating tools.

First of all, get the latest Pauline's firmware from Jean-François Del Nero's website : <u>https://hxc2001.com/pauline/</u>

Unzip the file into a directory, which should give you access to the following file :

C:\Users\philippe.du	ubois\Desktop\Pauline\pauline_sdcard_14July2020				- 0	×
FiFer Accueil Partage Af	ffichage					~ <b>e</b>
Volet de visualisation	Très grandes icônes Grandes icônes	■ [   • • ∎ •	Cases à cocher d	des éléments oms de fichiers	2	¥=
Volet de Tolet des détails navigation 👻	Eliste	Trier par ▼ 📅	🗹 Éléments masqu	i <b>és</b> Sé	ier les éléments lectionnés	Options •
Volets	Disposition	Affichage ac		Afficher/Masquer		
← → × ↑ 📑 > Pauline > p	pauline_sdcard_14July2020		ٽ ~	Rechercher dans : pa	uline_sdcard_14J	ul ,0
^	Nom	Modifié le	Туре	Taille		
Acces rapide	pauline_sdcard.img	14/07/2020 12:23	Fichier d'imag	e di 524 288 Ko		
Téléchargements *			-			
💻 Ce PC 🛛 🖈						
ocuments 🖈						
Eureau Bureau						
host						
output						
Scripts						
💻 Ce PC						
Eureau Bureau						
ocuments 🎯						
📰 Images						
🁌 Musique 🗸 🗸						
1 élément						III 📰

Then, if you are in a Windows environment, download the free Win32DiskImager tool :

https://sourceforge.net/projects/win32diskimager/

Proceed with the installation and then launch the tool. The following window should appear :

👒 Win32 Disk	lmager - 1.0			—		×					
Fichier image	Périphéri	ique T									
Hash None 🔻	Generate	Сору									
Read Only A Progression	Read Only Allocated Partitions Progression										
Annuler Waiting for a tas	Lire sk.	Ecrire	Verify Only		Ferm	er					

# PREPARING THE FIRMWARE'S MICROSD CARD

Insert the MicroSD card into your computer, and if you don't have a special slot for this, you can use for example this MicroSD to SD adaptor :



Then, select Pauline's firmware file unzipped just beforehand

📚 Win32 Disk Imager - 1.0	-		×
Fichier image		Périphér	ique
bois/Desktop/Pauline/pauline_sdcard_14July2020/pauline_sdcard.img	, 2	[E:\]	•
Hash			
None  Generate Copy			
Read Only Allocated Partitions			
Progression			
Annuler Lire Ecrire Verify Only		Ferm	ner
Ecrire les données du 'fichier image' sur le 'Périphérique'			

Press the "Write" button and wait until the end of the operation, where you should receive a "Write successful" message.

# PREPARING THE FIRMWARE'S MICROSD CARD

📙   🛃 🚽 🕴 H:\Tools\pc_hxc_t	tool								_		×
Fichier Accueil Partage	Affichage										^ 🕐
Épingler dans Copier Coller Accès rapide	uper pier le chemin d'accès Iler le raccourci	Déplacer Copier vers * vers *	Supprimer Renomm	er Nouveau dossier	¶∎• 1•	Propriét	és <table-cell></table-cell>	Ouvrir ~ Modifier Historique	Sélection Bandaria Sélection Aucun Bandaria Inverse	onner tout r la sélectio	on
Presse-papiers		Orga	aniser	Nouv	reau		Ouvri	r	Sélec	tionner	
← → × ↑ 🔤 × Lecteur US	B(H:) > Tools > pc	_hxc_tool				√ <sup>©</sup>	Reche	ercher dans :	pc_hxc_too	1	Ą
🕂 Téléchargements	^ Nom	^	Modif	é le	Туре			Taille			
Vidéos	hxcfe.exe		22/05/	2020 21:33	Appli	cation		27 K	0		
🛣 Windows (C:)	🚸 HxCFloppyE	mulator.exe	22/05/	2020 21:35	Appli	cation		1 095 K	0		
👝 Données (D:)	libhxcfe.dll		22/05/	2020 21:33	Exten	sion de l'	app	1 551 K	0		
SDHC (E:)	libusbhxcfe.	dll	22/05/	2020 21:33	Exten	sion de l'	app	31 K	0		
Lecteur USB (F:)											
👝 Lecteur USB (G:)											
👝 Lecteur USB (H:)											
🛖 Sante (S:)											
Lecteur USB (F:)											
🚘 Lecteur USB (G:)											
👝 Lecteur USB (H:)											
Disks_Captures	<b>&gt;</b>										
4 élément(s)											

Then insert the updated MicroSD card into the DE10-Nano card as follows :



Push in MicroSD card until you feel a click, with the tip of a fingernail, for example, into its holder.

# FIRST LAUNCH OF PAULINE

### First launch of Pauline

The assembly of your Pauline is finished ! It's time to turn it on and allow it to wake up for the first time. Make sure you have inserted the MicroSD card updated with Pauline's firmware, then insert the power supply of the DE10-Nano card.

After a few seconds, you should get a small beep and the following screen :



Your Pauline is ready and functional, congratulations !

We will now configure it to work on your network and with your floppy drives.

#### Test procedure « Pauline – Test – Interface »

Before you start using Pauline, it is important to check that everything is correctly installed on the card.

For this we will use the internal test procedure of the card. To implement it we will need to go through the command line with a communication software : « Putty »

https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html

If you do not wish to install all the software that make up the Putty package with "Windows installer", a version without installation is available : https://the.earth.li/~sgtatham/putty/latest/w64/putty.zip

You can also download only « Putty.exe », which is only used for this procedure.

https://the.earth.li/~sgtatham/putty/latest/w64/putty.exe

Connect a straight floppy cable between the 2 connectors J3 (host) and J4 (drives).

See the <u>appendices</u> for some information on ribbon cables.

Plug a network cable for Pauline to get an IP address.



Turn on Pauline, the IP address is displayed on the OLED screen. Example: 192.168.1.28



Launch Putty

In Putty, fill in the IP address and Port fields.

Example :

IP address : 192.168.1.28

Port:22

Tick « SSH »

As a reminder, here are the default username and password used to connect to Pauline:



Session	Basic options for your PuT	TY session			
E Terminal Keyboard	Specify the destination you want to Host Name (or IP address) 192.168.1.28	Port 22			
Features	Connection type:				
Behaviour     Translation     Selection     Colours     Connection     Data	Saved Sessions Default Settings	Load			
···· Proxy ···· Telnet ···· Rlogin		Delete			
SSH Serial	Close window on exit: Always Never  Only on clean exit				

- SSH (Login/pwd : pauline/pauline, Login/pwd : root/root)

- FTP (Login/pwd : pauline/pauline, Login/pwd : root/root)

- Samba / Windows shares (Login/pwd : pauline/pauline)

Click on the button « Open »

A terminal windows opens: login as :

Enter « root » and « root » for password



Password is not displayed while typing





#### **FIRST TEST**

Enter « pauline -test\_interface »

The test will test the floppy interfaces, the leds, the buzzer, the additional IO port.

~ # pauline -test\_interface HxC Floppy Emulator : Pauline floppy drive simulator / floppy drive dumper control software v1.0.0.0 Copyright (C) 2006-2020 Jean-Francois DEL NERO This program comes with ABSOLUTELY NO WARRANTY This is free software, and you are welcome to redistribute it under certain conditions; Host -> Floppy test (00) OK ! (03) OK ! (13) OK ! (14) OK ! (15) OK ! (17) OK ! (22) OK ! (26) OK ! (27) OK ! (28) OK ! Floppy -> Host test (01) OK ! (02) OK ! (04) OK ! (05) OK ! (06) OK ! (07) OK ! (08) OK ! (09) OK ! (10) OK ! (11) OK ! (12) OK ! (16) OK ! (18) OK ! (19) OK ! (20) OK ! (21) OK ! (23) OK ! (24) OK ! (25) OK ! (00) (0x1) 0x1 (0x1|)0x1 (0x2|)0x3 (0x4|)0x5 (0x8|)0x9 0xF (01) (0x2) 0x2 (0x1|)0x3 (0x2|)0x2 (0x4|)0x6 (0x8|)0xA ØxF (02) (0x4) 0x4 (0x1|)0x5 (0x2|)0x6 (0x4|)0x4 (0x8|)0xC 0xF (03) (0x8) 0x8 (0x1|)0x9 (0x2|)0xA (0x4|)0xC (0x8|)0x8 0xF 1 -> 1 0 -> 0 PB1:1 PB2:1 PB3:1 INT:1 At the end there are a few seconds to test the buttons :

Then press the buttons to switch the PBx to zero.

The LEDs should flash during the first part of the test, and the buzzer should « beep ».

Check that the IO part gives this :

(00)	(0x1)	0x1	(0x1 )0x1	(0x2 )0x3	(0x4 )0x5	(0x8 )0x9	0xF
(01)	(0x2)	0x2	(0x1 )0x3	(0x2 )0x2	(0x4 )0x6	(0x8 )0xA	0xF
(02)	(0x4)	0x4	(0x1 )0x5	(0x2 )0x6	(0x4 )0x4	(0x8 )0xC	0xF
(03)	(0x8)	0x8	(0x1 )0x9	(0x2 )0xA	(0x4 )0xC	(0x8 )0x8	0xF

#### SECOND TEST (OPTIONAL)

If everything is Ok, you have the possibility to check one last point on your card

This test is optional as it requires a little hardware and some electronic skills - see the <u>appendix for the</u> <u>procedure</u>.

Everything is OK, let's move on to the next step : the configuration of Pauline's interfaces.

### SETTING PAULINE TO FLOPPY DISK DRIVES CONNECTED

#### Setting Pauline to floppy disk drives connected

Depending on the type of drives connected to Pauline (Shugart or PC Drive), the "MOTOR\_LINE" and "SELECT\_LINE" commands must be set.

See <u>the appendices</u> for the assignments of the connectors according to their positions on the 34-pin floppy cable.

Access the content of the SD CARD in an external port, via FTP or SAMBA network share.

(see <u>page 15</u> for username and password)

In the folder \pauline\Settings

Edit the file « drives.script »

If you are using « Shugart » drive

This technology can have 4 differents select lines and 1 motor line.

The motor-on is common to all floppy drive on the same bus.

If you are using « PC Floppy disk drives »

Pauline allows to control 2 drives.

Drive A and Drive B

Example with the use of a 3.5 inch PC drive

set DRIVE\_0\_DESCRIPTION "3.5-inch Floppy drive"
set DRIVE\_0\_SELECT\_LINE DRIVES\_PORT\_DRVSA
set DRIVE\_0\_MOTOR\_LINE DRIVES\_PORT\_MOTEA
set DRIVE\_0\_MAX\_STEPS 82

See the "drives\_script\_base.txt" file in the \pauline\Settings folder on the SD card for more information.

# SETTING « HXCFLOPPYEMULATOR »

# Setting « HxCFloppyEmulator »

Several possibilities to control Pauline.

#### WEB INTERFACE

By using Pauline's IP address in a web browser, you can connect to the http service.

Home Status Configuration	Floppy disks dump	Drives simulator	Contacts
Floppy disk dump			
Floppy disk identification			
Name : untitled			
Comments : Additional comments :			
Drive informations :			
Index : 1 2 Auto index			
Drive Selection			
Track / Side selection			
Track: 0			
Head: 0	FLAF		
Head move			
	PZULIHE		
Settings			
Side 0 ØSide 1 □Double Step □ Ignore Index □50Mhz dump □Alternate RPM			
Min track : 0 Max track : 00			
Track dump lenght (ms) : 000 Index to dump delay (us) : 0			
Operations			
Read Disk Read Track Step I Eject			
Real time viewer decoders selection			
ØISO MFM    ØISO FM    ØAmiga MFM □ APPLE     □FJFmu    □TVCOM    □MFMIRRAIN □ Arburn			
AED 6200P NORTHSTAR HEATHKIT DEC RX02			
1200			
<b>PZI IILINF</b>			
X Graph time: 000 ms			
X Graph Graph			
Y Graph time: 16 us ⊠High contrast ⊡Eat dots			
Command : Sand			
Connection opened			
h.			

(C) 2020

### SETTING « HXCFLOPPYEMULATOR »

#### WITH « HXCFLOPPYEMULATOR »

Download HxCFloppyEmulator

https://hxc2001.com/download/floppy\_drive\_emulator/HxCFloppyEmulator\_soft\_beta.zip

Unzip the ZIP archive, find and edit the file "config.script".

Change the default IP address to your IP address displayed on Pauline's screen.

In our example Pauline's IP is 192.168.1.28, the line is modified :

set PAULINE\_DEFAULT\_IP\_ADDRESS "192.168.1.28"

Save the file.

2<sup>nd</sup> Method in HxCFloppyEmulator

Launch HxCFloppyEmulator.exe.

Go to « Settings », « Internal Parameters »

Edit line « pauline\_default\_ip\_address » => 192.168.1.28

HxCFloppyEmu	lator v2.5.6.2	2	-		×	
Eloppy image	Settings	Look	Log	About		
Load	SD HxC F USB HxC	ioppy E Floppy	imulato Emula	or setting tor settir	gs Alt ngs Alt	+L +S
Load Raw image	Internal p Execute s	aramete cript	ers		Alt Alt	+P +E
Batch converter	Convert n	nultiple f	oppy fil	es image	s	Γ
Disk Browser	Create / E	lrowse a	DOS fl	oppy disk		
Export	Export/sa	ve the lo	aded fil	e image		
SD HxC Floppy Emulator settings	Configure	the SD	HxC Flo	oppy Emu	lator	
USB HxC Floppy Emulator settings	Configure	the USI	B HXC F	loppy Em	ulator	
Floppy disk dump	Read a re	al disk				
Track Analyzer	Low level	tracks v	iewer			
No disk loaded.						

🗞 Parameters	_	×
		<b>^</b>
BMPEXPORT_ENABLE_HEATHKIT_HS_FM_ENCODING 0		
BMPEXPORT_ENABLE_DEC_RX02_M2FM_ENCODING 0		
BMPEXPORT_ENABLE_QD_MO5_ENCODING 0		
BMPEXPORT_ENABLE_C64_GCR_ENCODING 1		
SCPEXPORT_NUMBER_OF_REVOLUTIONS 3		
KFRAWEXPORT_NUMBER_OF_REVOLUTIONS 3		
LOADER_IPF_CAPS_DI_LOCK_INDEX 0		
CPCDSK_WRITER_LIMIT_SECTOR_SIZE 1		
CPCDSK_WRITER_DISCARD_UNFORMATTED_SIDE 1		
ORICDSK_LOADER_REGENERATE_TRACK 1		
USB_HXCFLOPPYEMULATOR_DEFAULT_PACKET_SIZE 1664		
PAULINE_DEFAULT_IP_ADDRESS 192.168.1.28		
SECTORBYSECTORCOPY_SECTOR_ERROR_TAG -1		
SPSCAPS_LIB_NAME_CAPSImg.dll		
FLUXSTREAM NOPLLPRESYNC 0		1
FLUXSTREAM PHASE CORRECTION DIVISOR 8		
FLUXSTREAM INITIAL BITRATE		-
Close Advanced parameters to tweak the libhxcfe behavior.		

### YOUR FIRST "DUMP" UNDER HXCFLOPPYEMULATOR

#### Your first "dump" under HxCFloppyEmulator

#### Launch HxCFloppyEmulator.exe

Launch Ludo Floppy Disk Toolkit => « Floppy image » then « Pauline control interface » or shortcut keys « ALT + P »



Check the displayed IP address, click on « Connect »,

« Connected » is displayed in the « Status » section

« User connection » should appear on Pauline's oled screen



Choose the « Disk drive » number adapted to your connection configuration of the drive(s).

Click on « recal », if all is well the floppy disk drive, must do a reset operation of the reading head (Heads recalibrate).

Using the « Track/Side selection » slider and the « move » button you can move the head to the desired location.

Don't forget "Double step" tick button option, moving the head to the next track or half track, as you wish.

(double step to create 48tpi 40 track diskettes on 5.25 inch drives)

Be careful not to exceed the physical capabilities of your player.

### YOUR FIRST "DUMP" UNDER HXCFLOPPYEMULATOR

Finally the stream dump ...

Fill in the descriptive information on the diskette (Name, Comment and No.).

Insert a floppy disk in the drive.

Press the « recal » button to be sure to start on side 0 / track 0.

Choose the « track analysis format » adapted to the format of your floppy disk to have a real-time visualization of the integrity of the data read.

Start the stream dump by pressing the "Read Disk" button, playback starts.

Ludo Floppy Disk Toolist	201.27 RPM / 199.15 Hs	- C X
		MAUTO Clear Eloppy image Settings Look Log About
		Load Load a floppy file image
8.3 % 60 20 20 20 20 20 20 20 20 20 20 20 20 20		Load Raw image Load a custom raw floppy Image / create a custom floppy
		Batch converter Convert multiple Roppy files images
		Disk Browser Create / Browse a DOS floppy disk
3 0 <b>126</b> - 20 20 20 20 20 20 20 20 20 20 20 20 20	20 20 20 20 20 20 20 20 20 20 20 20 20 2	In the section of the
890 <b>5</b> -		ISO IN     INORTHISTAR     SO HILD REPAIR     INORTHISTAR     SO HILD REPAIR     INORTHISTAR     SO HILD REPAIR     INORTHISTAR     SO HILD REPAIR     SO HILD R
9845-		tsk drive USB HxC Floppy Emulator settings
9745-	Dr	Prive D Prive
96 us-		0 Track Analyzer Low level tracks viewer
95v5-		Track number No disk loaded.
9945 <u>-</u>		Side number
		nove Read Disk Read Track Spy bus
		ecal STOP! Eject
Ri (ds-		ter vale 2 Side 7 CAR PM
as col		[ High contrast ] [ Fait dots
x offset (% of the tracklen) full x	xāme scale tul yāme scale (us)	Pase 192.168.1.28 Connect

Green ... all is well ...

In the folder \pauline\Disks\_Captures

A folder has been created corresponding to the name indicated in the « Name » section.

One file per track and per head (side) has been created in this folder Example : track00.0.hxcstream = track 0 side 0 / track00.1.hxcstream = track 0 side 1

By drag and drop the first file on the HxCFloppyEmulator.exe application, an analysis of the files starts, after a few seconds or more depending on the amount of tracks read and the power of your computer.

whier Accuell Partage A	thhapt						~ (		
	🕷 Très grandes islères 🕷 Gra	ndes kalves 🔛 kalves m	yennes -	Grouper par -	Caper à come	r des éléments 🖂		HxCPloppyErrol	tor v2.5.5.1 - X
	Pettes ichnes III Lat	e El Détais		Ayouter des colonnes *	Ditensions de	nomi de fichieri	12	Eloppy image	settings Look Log About
wigation *	St Mosalques SE Cor	utetu	×	par * Ayuster la taille de toutes les colonnes	Déments mas	qués selectionnés	- openers	1455	I cad a forey fie image
Valets		Dispesition		Attichage actuel		Attiches Masquer			I and a maken and Ream Import
🗁 🗠 🛧 🔂 > Réseau >	192.168.128 > pauline > Disks_0	Captures > Documentation P	valine > Doo	umentation Pauline-0002	v o J	Rechercher dans : Documentation P	aufine-0002	Load Raw image	create a custom Boppy
Non	Modifie In	Ine	alle .					· Batch converter	Convert multiple floppy files images
No. of the local sector of		441	244.00					Cran Company	County (Descent of COL Research of C
Discouncemen								CASA BETWEET	Cital I treate a DOD Hoppy date
hark(1.6.hardman	16/06/0000 25:58	Fahire HICS WEIM						Export	Exporting the loaded life image
track(1.1.h.comman	13/09/2020 23:58	Fichier HOCSTREAM	211 Kg						C2001
track12.0.hs cebram	15/09/2020 23:55	Fichier HOCSTREAM	218 Ko						COODY EMONION
track02.1.hr.cohream	13/06/2020 23:58	Fichier HICSTREAM	225 Ko					Distance Contractor	Comps riddoy Emulate
track[] fitecepteen	13/09/2020 23:58	Fichier HOCSTREAM	208 Ko					Envelor settings	
back03.1.hs obrem	13/09/2020 23:58	Fichier HICSTREAM	230 Ko					Floppy disk dump	Read a real disk
tracid4.0.hucmvam	12/09/2020 22:58	Fichier HOLCSTREAM	214 Ko					Tank Instance	https://hxc2001.com
track(4.1.hrcstream	15/09/2020 25:58	Fichier HOCSTREAM	230 Ko					mack receptor	
back25.0.hr colvean	13/09/2020 23:58	Fishier HICSTREAM	214 Ko					81 Mack(s) 2 6ide(	<li>s) track00.0 hycotream - 81 track(s) 2</li>
track05.1.hxcdtwam	15/09/2020 23:58	Fichier HICSTREAM	228 Ko					Track 0/81	
back06.8.harcsbream	13/09/2020 23:58	Fichier HICSINEAM	220 Ko					-	
track06.1.hvcdtwam	13/09/2020 22:58	Fichier HOCSTREAM	221 Ko					Long Street	
trackIT.0.hxcdream	15/09/2020 23:58	Fichier HOCSTREAM	212 Ko					1 . A.	
track07.1.hs colvean	13/09/2020 23:58	Fishier HICSTREAM	225 Ko						
track06.0 hx cetream	13/09/2020 23:59	Fichier HOCSTREAM	219 Ko						
back08.1.hxcstream	13/09/2020 23:59	Fichier HICSINEAM	221 Ko					100 C	
track09.0.hxcdtwam	13/09/2020 23:59	Fichier HOCSTREAM	205 Ko						
track99.1.hxcstream	15/09/2020 23:55	Fichier HICSTREAM	221 Ko						
track10.0.hacstream	13/09/2020 23:59	Fichier HOCSTREAM	174 Ko						
track10.1.hxcdream	15/09/2020 23:50	Fichier HOCSTREAM	191 Ko						
back11.8.hrcsbram	13/08/2020 23:59	Fichier HOCSIREAM	175 Ko					1. 1. 1. 1.	
track11.1.hxcdtwam	13/09/2020 22:59	Fichier HOCSTREAM	191 Ko						
back12@hscotream	15/09/2020 23:99	Fichier HICSTREAM	177 Ko						
track Q.1.ha cotream	13/09/2020 23:59	Fichier HOCSTREAM	191 Ko						
track13.0.hv cetream	15/09/2020 25:59	Fichier HOCSTREAM	177 Ko					1	
back13.1.hroßrem	13/09/2020 23:59	Fichier HUCSIREAM	193 Ko						
track14.0.hxcmvam	13/09/2020 23:59	Fichier HOCSTREAM	178 Ko						
track14.1.hscotream	13/09/2020 23:99	Fichier HICSTREAM	194 Ko						
Character Strengton								×	



By clicking on « Track Analyzer » button, the result appears.

#### ABOUT US

#### About us

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### APPENDICES

### Appendices

#### ASSIGNMENT OF CONNECTORS ACCORDING TO THEIR POSITION ON THE RIBBON CABLE



Sources

https://old.pinouts.ru/HD/InternalDisk\_pinout.shtml

http://www.nullmodem.com/Floppy.htm

### APPENDICES

#### 2<sup>ND</sup> TEST

If everything is Ok, during the first test, you can check one last point :

Turn off the power, remove the sdcard from the DE10 motherboard, and turn on Pauline.

All IOs of floppy ports must be in high state.

Otherwise there is a defect with a pull-down. It is important to check this to avoid false writings and other undesirable tricks during the first 200ms after powering up the card (fpga initialization time).

To do this, equip yourself with a multimeter (VOM), check the output voltage of your power supply then test the presence of 5V on the pins of ports J3 (host) and J4 (drives).



The voltage measured at the ports must be more or less the same as the power supply voltage (+/- 0.3V). Everything is OK, let's <u>go to the next step</u> ...