SMARTDISK][

I Introduction

Thanks for using the SmartDisk II drive to replace your existing DISKII and SmartPort drive for Apple II+ // IIe // IIc & IIGS. This drive is the result of the opensource efforts to bring the best retro-device experience. This drive will continue to evolve as new firmware will be release with new features, capabilities and issues fixing.
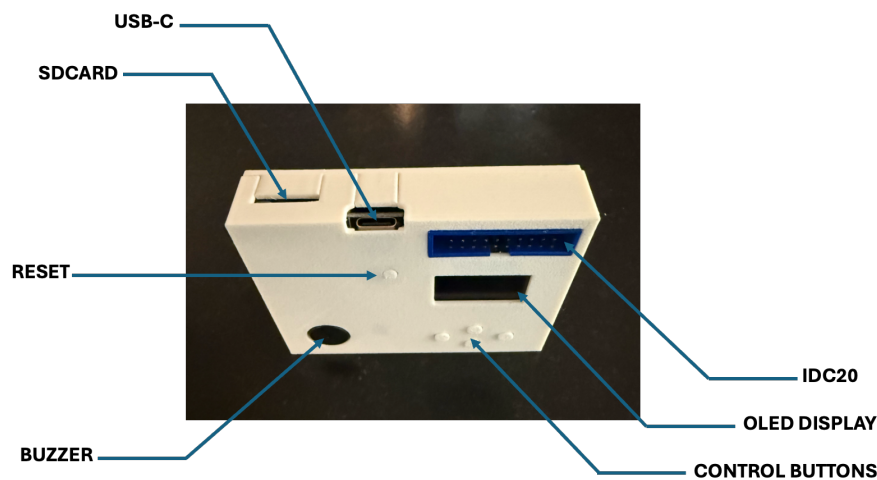
Progresses are available at: https://github.com/vibr77/AppleIIDiskIIStm32F411

This drive supports image files from various formats such as: DSK, WOZ 1.0, WOZ 2.0, NIB, PO.

II Usage precautions

For best usage experience and to keep your SmartDisk II functioning, some precautions need to be followed:

- Never plug in/out your SmartDisk II while your Apple II is powered on, it may damage the SmartDisk II circuit,
- Never insert or eject the SDCard while the SmartDisk II is powered,
- Do not plug in USB with your SmartDisk II connected to the Apple II,
- Always check the IDC connection on the Apple Disk controller before turning the Apple II power on,
- SmartDisk II before rev 3 is not compatible with IIc & IIGS, a modification is needed on the PCB.
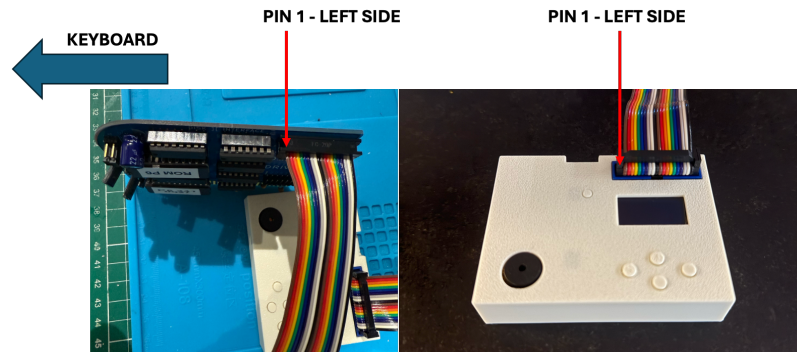
III SmartDisk Hardware description

IV Connecting your SmartDisk II to your Apple

A/ Apple II + / Apple IIe

You will need a Disk II controller that should be connected to your DISK II drive. It is very important to check the side of the 20 pins ribbon before connecting the SmartDisk II.

KEYBOARD

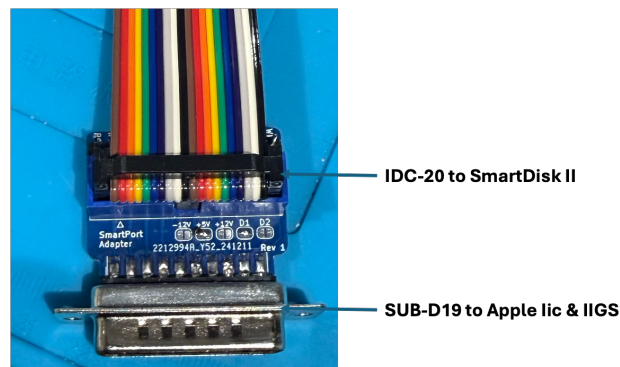**PIN 1 - LEFT SIDE**   **PIN 1 - LEFT SIDE**

Check the color of the ribbon cable to make sure the left side of the DISKII Controller is connected to the left side of the SmartDisk II.

B/ IIc & IIGS

To connect the SmartDisk II to your IIc and IIGS, and adapter will be needed to convert SmartPort (SUB-D19) to IDC20. It is very hard to find a SUB-D19 as no-one is now using it.

This online shop have SUB-D19: http://iec.net/product/d-style-male-solder-type-connector/

An adapter to convert SUB-D19 and IDC20 is available on github: https://github.com/vibr77/SmartPortAdapter

IDC-20 to SmartDisk II

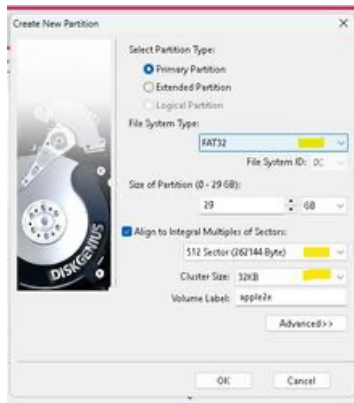**SUB-D19 to Apple IIc & IIGS**

V Preparing the SDCard

The SDCard needs to be formatted using FAT32 with a specific sector size: 64 sectors of 512 Bytes per cluster. This is needed to ensure an optimal access to comply with Apple II timing requirement.

If SDCard formatting is not done with the right sector size (512 Bytes) then, reading image file on Apple II will give unpredictable behaviours.

On Linux: formatting can be done on a terminal: mkfs.fat –F 32 –s64 [SDCARD /dev/sde as exemple]

On Windows: Tools like DiskGenius can perform the required formatting with cluster size 32Kb and 512 sectors

On Mac using a terminal: `sudo newfs_msdos –F 32 –c 64` [diskXsY]

There is also an option in the configuration menu on the SmartDisk II to rightfully format the SDCard

UI Update

Each SmartDisk II has a bootloader that enable easy firmware update. To enter the Bootloader mode, double click on the RESET button.
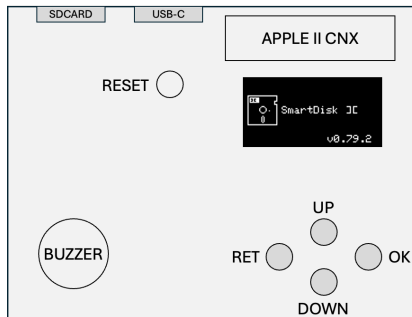
Process:

1. Disconnect the SmartDisk from the Apple II
2. Remove the SDCard
3. Connect the SmartDisk on your PC using a USB Cable (be careful some cable are only Powercable and do not enable data transfer)
4. DoubleClick on the Reset button on the SmartDisk II
5. On the computer a new drive should have appeared
6. Copy & Paste UF2 firmware update file available on github release

Warning: before updating to USB, unplug the SmartDisk II from the Apple II otherwise it may be damaged.

VI Using the SmartDisk II

A/ User Interface

The User interface is composed of:

- 4 Navigation buttons
  - o RET: Return
  - o OK: execute selection
  - o UP: move selection up
  - o DOWN: move selection down
- 1 System reset button: perform a system reboot when a single click is done or activate DFU mode for firmware update when a double click is done.
- 1 OLED Screen
- 1 Buzzer

B/ SCREEN NAVIGATION

The overall screen navigation path from the splash Screen to mounted image is:

Current firmware version

When the system boot up, the first screen to be displayed is the splash Screen, it provides at the bottom right the current firmware version. The current firmware version changes according to the firmware update (see upgrade).

After 2 seconds the Splash screen is replaced by either:

- The SMARTPORTHD screen if the emulation type in the config is Smartport HD,
- The last mounted image if boot last image option is selected from the config
- The File manager screen if boot last folder option is selected
- The Main Menu at the first boot or if no image has been previously mounted

B.2 Main Menu

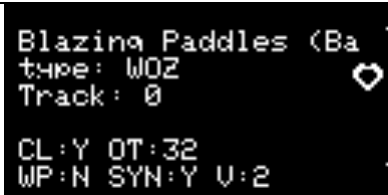|	
	The Main Menu is the root screen of the SmartDisk II. It can be reached by pressing the [RET] button from any other screen. The current firmware version is displayed at the bottom left.
Navigation	[UP] & [DOWN] Buttons are used to change the current selection highlighted on the screen [OK] Button is used to move to the selected option on the screen
Options	Favorites: list the image file added to favorites (only in DISK II emulation) File Manager: navigate within the directory tree of the SDCard Mounted Image: display the current Mounted image if any Config: navigate to the configuration screen

B.3 SmartPort HD

	If the emulation type selected in the config is Smartport HD then the SmartDisk II can load up to 4 PO disk image.
	The mounted image is displayed on the screen. The first image to boot is marked with a star instead of the left number.
	
	To change the boot order, change the boot image index in the configuration.
	Each PO files needs to be stored at the root of the SDCard with a specific naming:
	    - Image 1: vol01_[xxx].PO
	    - Image 2: vol02_[xxx].PO
	    - …
	    - Image 4:vol04_[xxx].PO
	
	[xxx] being the title to be displayed on the screen.
	
	Each read request a Harvey Ball is changing on the screen.
	
	Note: to use the Smartport HD emulation, the following is needed:

	– Apple II+ / IIe: a softSp card like the grappler minus,
	– Apple IIc: a DB19 to IDC20 interface and a ROM 4.X
	– Apple IIGS: a DB19 to IDC20
Navigation	[RET] to return to the main menu

B.4 File manager:

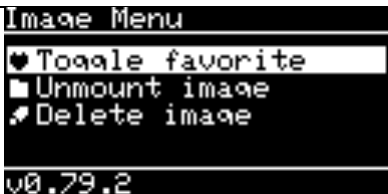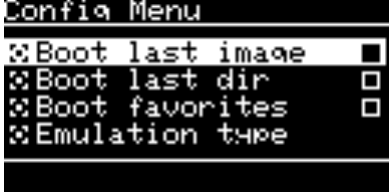|	
File listing ■ GAMES ■ NIC ■ TOOLS ■ WOZ 1.0 01/17	The file manager accesses the SD Card and list all the folder and image files available and with the right extension (DSK, NIC, WOZ, PO). Folders available appears at the beginning of the listing and then image files. At the bottom right, number of items in the current directory is displayed.
Navigation	[RET] to return to the main menu or up in the directory tree [UP] move up the selection highlighted [DOWN] move down the selection highlighted [OK] enter the directory or mount the image file.

B.5 Mounted image

Blazing Paddles (Ba
type: WOZ
Track: 0   ♡
CL:Y OT:32
WP:N SYN:Y V:2
	After mounting an image file from the file manager, the image screen is displayed with the following information:
	    – Title of the image
	    – Image file type (WOZ, DSK, PO, NIC)
	    – Current Track 0/35
	    – Heart Full means image is added to favorite
	    – CL Weak bit cleared, Y/N
	    – OT Optimal timing 32 x 0.125 ns
	    – WP Write protected
	    – SYN Synchronized track
	    – V Version 1 / 2

Navigation	[RET] to return to the main menu [OK] enter the image option screen

B.6 Image option

Image Menu
♥ Toggle favorite
■ Unmount image
✎ Delete image
v0.79.2
	The image option lets the user to execute simple action as:
	    – Add / Remove the image from/to favorite
	    – Unmount the image
	    – Permanently delete the image from the SD Card

Navigation	[RET] to return to the mounted image screen [UP] move highlighted option UP [DOWN] move highlighted option DOWN [OK] execute selected option

B.7 Config

| ```
Config Menu
☒Boot last image  ■
☒Boot last dir    □
☒Boot favorites   □
☒Emulation type
``` | The config screen lets the user change the configuration of the SmartDisk II with the following entries:<br>– **Boot last image**: after Boot up process, the SmartDisk will auto mount the last mounted image (if any)<br>– **Boot last dir**: after booting process, the SmartDisk will display the file manager with the last browsed directory (if exists)<br>– **Boot favorites**: after booting up process, the SmartDisk will display the list of favorites image<br>– **Emulation type**: let the user chose the SmartDisk emulation between:<br>    ○ DISK II : regular Apple II+ / IIe drive<br>    ○ DISK 3.5: not release yet<br>    ○ Smartport HD: to read 32 MB files like Total replay or IIGS GS OS<br>– **Boot Img Index**: defines for the emulation SmartportHD the image to be the first to boot<br>– **Sound Effect**: activate the Buzzer<br>– **Clear prefs**: clear the configuration<br>– **Clear favorites**: clear the list of favorites<br>– **Make filesystem**: wipe out the SDCard with a new FAT32 partition |
| **Navigation** | [RET] to return to the main menu screen
[UP] move highlighted option UP
[DOWN] move highlighted option DOWN
[OK] execute selected option |