BurgerDisk Smartport Hard Disk for Apple II

User manual

Version 2.0
January 2026

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Introduction

BurgerDisk is a Smartport hard disk, with storage backed on a microSD card, for the Apple II line of computers running ProDOS.

It is compatible with the Smartport-enabled Apple II models:

- The Apple //c (apart from the ROM255 version, which can be upgraded)
- The Apple IIgs
- Slotted Apple II computers with a DiskII controller and a SoftSP card.

It is daisy-chainable, which lets you use other storage devices with it.

BurgerDisk storage configuration

Presenting disk images to the computer

Different image formats are supported:

- .po (in ProDOS-ordered format, unlike .dsk)
- .hdv
- .2mg (in ProDOS-ordered format)

These images can be either 140KB, 400KB, 800KB, or an arbitrary number of blocks up to 32MB (65535 blocks).

The BurgerDisk does **not** support .woz, .nib, .edf, .dsk, .do images.

BurgerDisk uses these disk images to present to ProDOS. They are stored as files on the MicroSD card, formatted as FAT.

By default, the firmware will search for four files: PART1.po, PART2.po, PART3.po, PART4.po, and present them if they exist.

You can also put images with arbitrary names, and reference at most four of them in the **config.txt** file at the root of the MicroSD's filesystem.

Table 1: Example config.txt

```
A2DeskTop-1.5-en_800k.2mg
Total Replay v5.2.hdv
Documents.po
```

Afterwards, you can insert the MicroSD card in its slot (face up, connector down), connect your device to your Apple II, and boot it.

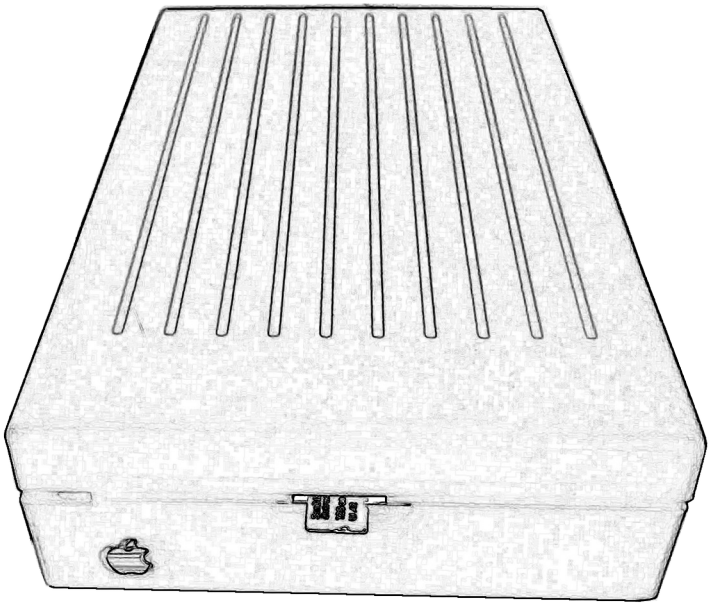

Figure 1: Inserting the MicroSD card

The MicroSD card slot is recessed, push the card with your nail or a small flat tool (like the handle side of a spoon) until it clicks in place.

Note: Do not replace the microSD card while the Apple II is running. This is not handled by the BurgerDisk firmware.

Debugging and hacking

If you would like to work on the BurgerDisk firmware, enabling debug messages on its serial port will be useful. You can do that by adding **debug=1** in the fifth line of *config.txt*. (Leave empty lines if you have configured less than four images).

BurgerDisk installation

You can now connect the BurgerDisk to your Apple II. It can either be plugged directly to the computer, or to another device in what is called a Daisy Chain. This allows you to have multiple storage devices connected to your computer.

If you are connecting multiple devices to your computer's DB19 port, there are some rules about the order:

- First "dumb" 3.5" floppy drives, like the Apple 3.5 Drive (A9M0106)
- then Smartport 3.5" floppy drives, like the Unidisk 3.5 (A2M2053)
- followed by the BurgerDisk and other Smartport hard disks
- followed by 5.25" floppy drives

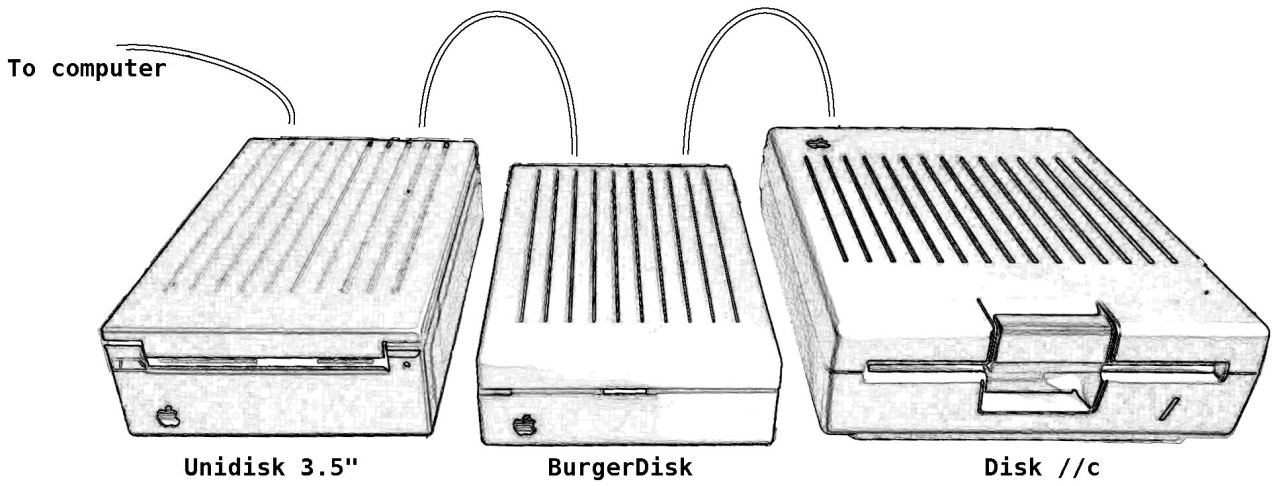

Figure 2: Example daisy-chain

Booting the computer

The Apple II can boot from the first device in a given slot. Smartport devices are usually in slot #5, and 5.25" drives in slot #6.

If you want to boot your Apple II from the BurgerDisk, use a bootable image, like A2Desktop, as first image; and connect the BurgerDisk first to the computer.

Note: this means that you cannot directly boot from the BurgerDisk if a 3.5" drive is present in your chain, even if no floppy is inserted into it.

Troubleshooting

Serial debug output

If you are investigating a problem or experimenting with your own modifications of the firmware, you might want to enable debug output on the Arduino's serial port.

This can be enabled with a **debug=1** line, inserted at line 5 of **config.txt** (leave empty lines between your last image and the fifth line if you have configured less than four images).

Afterwards, you can open the enclosure, locate the UART port, and connect an UART to USB adapter to it. Connect the UART's **GND** to the adapter's **GND**, and the UART's **TX** to the adapter's **RX**.

Blinking LED, no image mounted

If after booting the Apple II, a small delay happens, followed by the BurgerDisk's LED blinking 4 times per second, and none of its volumes are visible by ProDOS, this means that the MicroSD card initialization failed, or that zero valid images were found on the card. Verify its presence and contents.

Compatibility

So far, the BurgerDisk has been tested on:

- Apple //c ROM3, model A2S4000
- Apple //c ROM4x, model A2S4100
- Apple IIgs, ROM01
- Apple IIe, DiskII controller + SoftSP card

Various daisy chaining configurations have been tested:

- only the BurgerDisk on the Smartport bus
- Unidisk 3.5", then BurgerDisk
- BurgerDisk, then Disk //c
- Unidisk 3.5", then BurgerDisk, then Disk //c
- Unidisk 3.5", then BurgerDisk, then another BurgerDisk, then Disk //c

In case of problems in a daisy chain, verify that your chain respect Apple's rules, and that the chained devices are actually able to be chained.

Compatibility with the SPIISD, Fujinet, or other Smartport-based devices has not yet been tested.

It is expected that the SPIISD and Fujinet will not be seen behind a BurgerDisk (they do not advertise themselves as a Smartport device).