Ever wanted to build an Amiga with a solid state drive (SSD)? This document describes step by step to get the job done by using a CompactFlash card and an IDE-2-CF adapter. It also shows the common “traps” when using the CompactFlash solution on your Amiga.

The compact flash card (CF)

What is a CF card?

A compact flash card (CF) is a flash memory card which holds data even when the power is turned off (ehh.. I guess we all know this). The CF card is using the IDE protocol for communication, which comes in handy, because we don't need any logic to do conversions; “Just pass it through baby!”.

There are two types of cards; Type I 3.3 mm thick (CF) and Type II 5 mm thick (CF2). All the cards you buy in the shop are mostly CF Type I cards. In fact this whole document is about Type I cards.

CF write limitations

Keep in mind that a CF card has limitations on the amount of write (insertion/removal) cycles to a memory cell. For older cards it's unclear how many cycles this exactly is, but the new ones like the SanDisk Ultra II and Extreme III it should be at least 10000 write cycles. Solid state drives go far beyond this and go up to 4 million write cycles.

It is unclear what happens when the maximum number of write cycles passed. Will it stop writing? I guess so. I haven't seen it happen yet.

If you use applications that do a lot of write cycles to the hard drive, you might consider pushing it
to the RAM disk or don't use the solid state solution. Examples of these applications are 1) paint programs that use disk storage for editing pictures, 2) web browsers that use browser cache, 3) disk speed test tools (write tests) and 4) virtual memory.

If you use your Amiga on a daily basis and don't do much writes all the time at the same memory cell, the card will last over 30 years.

Variety of cards

There are a variety of CF cards nowadays. For this experiment I tried several brands Kingston, Sandisk, Kodak (also SanDisk), DaneElec. I've tried 2x 16MB Kodak (SanDisk), 512MB SanDisk Ultra II, 1GB Extreme III, 4GB SanDisk Ultra II, 1GB Kingston Elite Pro and 256MB DaneElec. The 1GB Kingston never worked properly. On the A1200 it never did anything and on the Amiga 4000 it was very unstable. 128MB DaneElec (Toshiba) gives an error "can't format cycle 0", is able to partition, ide led keeps lid up all the time.

The 16MB Kodak's (which are in fact Sandisk's hardware at the inside) worked on the A1200 but where somewhat unstable using a SCSI<->IDE Bridge on the Amiga 4000 (using WarpEngine040 SCSI controller). The best results so far are with all the Sandisks Ultra II and Extreme III on the IDE controller (A1200/A4000). Some benchmarks (using Nick Wilson's Sysinfo drive speed, using an A4000/040@40) **table** (not finished).

Traps when preparing the card

I've installed several machines with CF cards and had in some cases I had difficulties to let the system see the card. Most common thing is that HDToolbox doesn't show the proper card information i.e. wrong card size, no manufacturer information, wrong cylinders, etc. This happens on old IDE controllers on the A500 or when you use a SCSI to IDE bridge. Just try to enter some data here, try to be accurate, but it's not necessary to have the proper cylinders, heads, blocks per track. After the definition of the drive is done you are able to partition the drive. As you probably notice is that the proper card size is shown here in the partition menu. Just save your settings and reboot. Tip: try to use another boot device next to the card, this will give you less frustration.

Sometimes it might be useful to use another Amiga i.e. A4000 to do the preparation work. I assume that this is already a working environment. It is wise to format the CF card on the system what you are going to use, so you will use a proper file system belonging to that system i.e. 3.1. FFS.

PCMCIA with CF will not boot on Amiga

Some might think that there is a solution to use the PCMCIA slot of the A600/A1200 to boot from a CF card. This is not possible as the kickstart doesn't recognize this as a bootable IDE drive. It can only be used to transfer data once an OS started an proper PCMCIA drivers are loaded.
**Let’s go to work**

This installation explains a CF card installation on a plain A1200.

**1.> Recipe**
The recipe for this project:

<table>
<thead>
<tr>
<th>A proper Compact Flash card. Not bigger then 4GB. Only if you are sure that your controller can handle drives bigger then 4GB. Recommended SanDisk Ultra II/Extreme III series or better.</th>
</tr>
</thead>
</table>
| An Amiga with IDE controller (or SCSI<->IDE bridge)  
In this case we will use a plain A1200. |
| IDE2CF, IDE to Compact Flash adapter (2.5” used in this example). |
| Double sided tape for keeping it together.  
Tip: use sticky Velcro tape (klittenband). This is for easy removal of your CF card. |

**2.> Open up**
Open up the A1200 case. If needed remove the metal cage.

**3.> Install**
I used the 2.5" compact flash adapter which fits directly on the A1200 controller without using another converter / adapter.

Place the compact flash card adapter on the IDE controller of the A1200 (I used the 3cm 2.5" IDE cable which I got from AmigaKit). Then I placed the CF card into the adapter. Don't close the case yet before you know the card is working, you might consider preparing the card on another machine.
4.> Prepping, partitioning formatting
Once the card is installed you can try to see if your system recognizes the CF card using HDToolbox. You probably have to do the option “Install Drive” fist. This is the part where your drive is identified, when problems occur try to define a drive yourself (the accuracy of the data is not really important).
Now you are able to partition the drive and select the desired file system, boot priority etc. Save the settings and reboot. Then format the drive, in some cases you might do a forced format on a specific device as the icon “unknown” disk doesn't always appear on your desktop (I have no clue why that is).

Note:
You can do this process a lot easier if you have more Amiga's with IDE controllers (i.e. A4000). Then it's very convenient to first prepare the card in total on this machine as it already got an OS with all the tools you need to prepare the CF card.
Make sure you don't make your partitions too big. FFS supports drives up to a max of 4GB and a partition size of 2GB. (Source the cryptmag.com).

5.> Finish up...
In fact you are ready now.
You can use some double sided sticky tape or better Velcro tape on the IDE-2-CF adapter to keep it tight to the metal case. But do this when you think your really done i.e. OS is installed etc.

Some useful tips:
✔ PCMCIA-2-CF for data transfer (A1200 owners)
   Very convenient for transferring files between Amiga and PC.
   I ordered this at AmigaKit, but you can also use the files on AmiNet (fat95, etc).
✔ Gayle Chip Patch (A1200 owners)
   Eliminates spontaneous resets when using.
✔ SCSI 2 IDE bridge (test shows that this is pretty slow, mostly halve the speed).
Some Photo's

2.5” IDE-2-CF Adapter front.

2.5” IDE-2-CF Adapter back.

A1200 with build-in CF.

A1200 with build-in CF.

Double sided sticky tape.

Duct tape to cover the cradle opening.
PCMCIA-2-CF to use in A600/A1200 (from AmigaKit).

4MB extra RAM, Clock battery, Copro.

SCSI-2-IDE bridge.

CF extreme performance! Only for faaast IDE controllers.

Sources:
http://en.wikipedia.org/wiki/Compact_Flash
http://www.thecryptmag.com/Online/16/PowerFlyer.html
http://www.amigakit.com
http://povod.info/falcon.html

Keywords: Amiga 1200 SSD Solid State Drive Compact Flash CompactFlash CF Flash Ram Flashram Flash Drive Flashdrive Micro MicroDrive