

# Using the SD HxC in an Emulator-I and Emulator-II

by *///E-Synthesist*

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## Important note

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## Log of Changes

Date	Version	Author(s)	Description
07 Jan 2012	1.0	///Esynthesist	Initial version.
16 June 2012	1.1	///Esynthesist	Correction Jean-Francois DEL NERO instead of Jean-Pierre

# Table of Contents

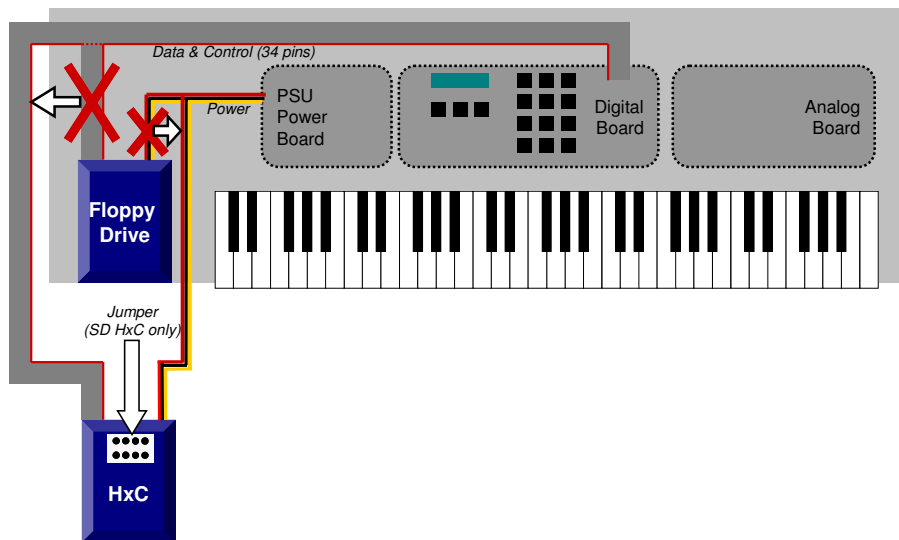
Important note .....	1
Copyright .....	1
Log of Changes .....	1
Table of Contents .....	2
1. Introduction.....	3
1.1 Origin and concept of the HxC.....	3
1.2 Two types of HxC devices: USB and SD.....	3
1.3 Internal or external SD HxC.....	5
1.4 The HxC's SD Card: a virtual box holding virtual floppy disks .....	6
1.5 Creating "virtual floppy disks" by generating HFE files.....	8
1.6 Don't be confused by the HXCSDFE.CFG file .....	9
2. Installing the SD HxC in the E-Mu Emulator .....	10
2.1 About Drive A and Drive B in the SD HxC.....	10
2.2 Ribbon cables, power cables and switches.....	10
2.3 Installing the SD HxC in the E-Mu Emulator-I .....	14
2.4 Installing the SD HxC in the E-Mu Emulator-II .....	18
2.5 Preparing the SD Card .....	27
3. Using the SD HxC in the E-Mu Emulator .....	29
3.1 Saving E-Mu Emulator files to the SD Card on a Windows PC.....	29
3.2 Booting the E-Mu Emulator from the SD Card .....	38
3.3 Loading sound banks from the SD Card on the E-Mu Emulator .....	39
3.4 Saving sound banks to the SD Card on the E-Mu Emulator .....	40
3.5 Loading E-Mu Emulator files from the SD Card on a Windows PC.....	41
3.6 Copying floppy disks to the SD Card on the E-Mu Emulator.....	44
3.7 Copying files from the SD Card to floppy disk on the E-Mu Emulator.....	47
GNU FREE DOCUMENTATION LICENSE .....	52

# 1. Introduction

## 1.1 Origin and concept of the HxC

The HxC is a device which is capable of emulating the floppy drive of many vintage computers and electronic musical instruments. It has been designed by the HxC2001 project, which is initiated and lead by Jean-Francois Del Nero <sup>1</sup>.

In order to use the HxC, the original floppy drive must be replaced by the HxC. In practice it means that the power and data cables in the computer or synthesizer/sampler should be connected to the HxC instead of to the original floppy drive.

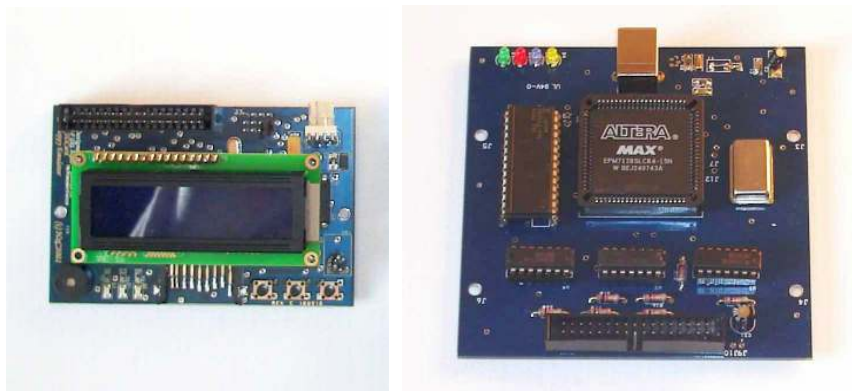


*Connecting the HxC to a sampler*

## 1.2 Two types of HxC devices: USB and SD

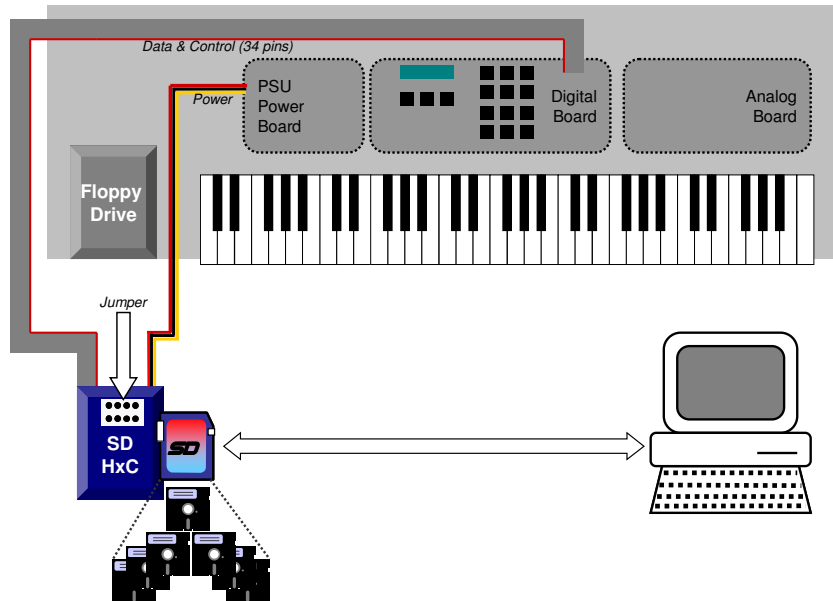
There are two types of HxC devices:

- SD HxC: a stand-alone device which uses SD Memory Cards for reading/writing data from/to the “virtual floppy disks” that are stored on the SD Card.
- USB HxC: a device which must be connected to a Windows PC (XP or higher) with a USB cable in order to read data from the “virtual floppy disks” that are stored on the PC’s hard disk. As opposed to the SD HxC, the USB HxC can not be used stand-alone because it doesn’t have on-board storage memory to hold the disk’s data. Writing data is also not supported by the USB HxC.

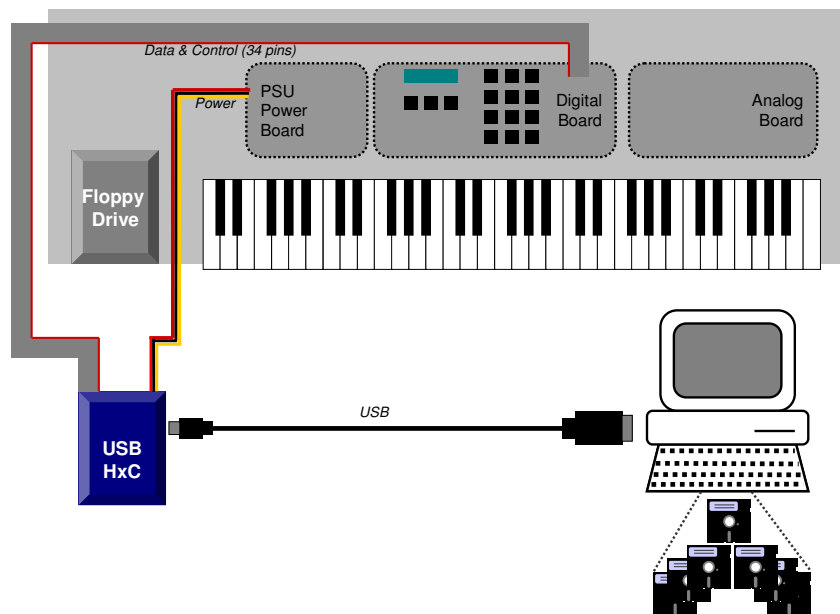


*SD HxC (left) and USB HxC (right)*

<sup>1</sup> For more information: [http://hxc2001.free.fr/floppy\\_drive\\_emulator/](http://hxc2001.free.fr/floppy_drive_emulator/)



*The stand-alone SD HxC uses an SD card which can contain hundreds of “virtual floppy disks”. During a performance, no computer is required – the “floppy disks” are instant available to the sampler.*



*The USB HxC must be connected to a Windows PC to get access to the “virtual floppy disks” which are stored on the computer’s drive. During a performance, the presence of the computer is required – the USB HxC can not operate in a stand-alone mode*

In this document the usage of the SD HxC is assumed, because it’s the most popular choice. The SD HxC supports the E-Mu Emulator-I and Emulator-II samplers since the end of 2010.<sup>2</sup>

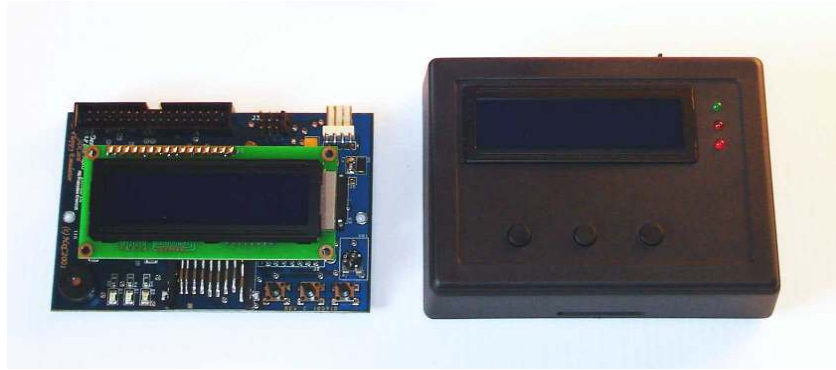
*Note: in the remainder of this document the term E-Mu Emulator refers to both the Emulator-I and the Emulator-II. When a specific reference is made to either the Emulator-I or Emulator-II, the specific terms E-Mu Emulator-I and E-Mu Emulator-II are used.*

<sup>2</sup> The E-Mu Emax, Emax-II and SP1200 are also supported by the HxC. These configurations are not discussed here, but the installation and usage is very similar.

### 1.3 Internal or external SD HxC

Ideally the HxC would have been mechanically designed in a way that it fits in an original floppy drive bay/space. Unfortunately it wasn't. As a result it's pretty to hard to install the SD HxC into the original floppy drive bay of the computer/sampler.

Perhaps the easiest and most aesthetic solution is to use an externally cased SD HxC which is also available at the time of writing<sup>3</sup> (see pictures below). In that way the vintage look of the E-Mu Emulator can be retained, while it's even possible to still use the original floppy drives if required (see next section).



*Internal SD HxC (left) and External SD HxC (right)*



*The external SD HxC used with the E-Mu Emulator-I*



*The external SD HxC used with the E-Mu Emulator-II*

<sup>3</sup> On Lotharek's web shop: <http://www.lotharek.pl>

## 1.4 The HxC's SD Card: a virtual box holding virtual floppy disks

The SD Card used in the SD HxC must have been formatted as FAT32. It also needs a configuration file called HXCSDFE.CFG which is independent from the computer or musical instrument on which you the SD HxC and the SD Card are used; this file only configures some generic behaviour of the SD HxC.

In order to be able to read data from or write data to the SD Card with an E-Mu Emulator, the SD Card must contain "virtual floppy disks":

- These are files which have the same structure and same size as real floppy disks;
- These files must *always* be created on a Windows PC using the HxCFloppyEmulator software<sup>4</sup>;
- These files have the .HFE file extension in their file name;

An SD Card containing .HFE files can be considered as a *box of floppy disks*. Nothing more, nothing less.

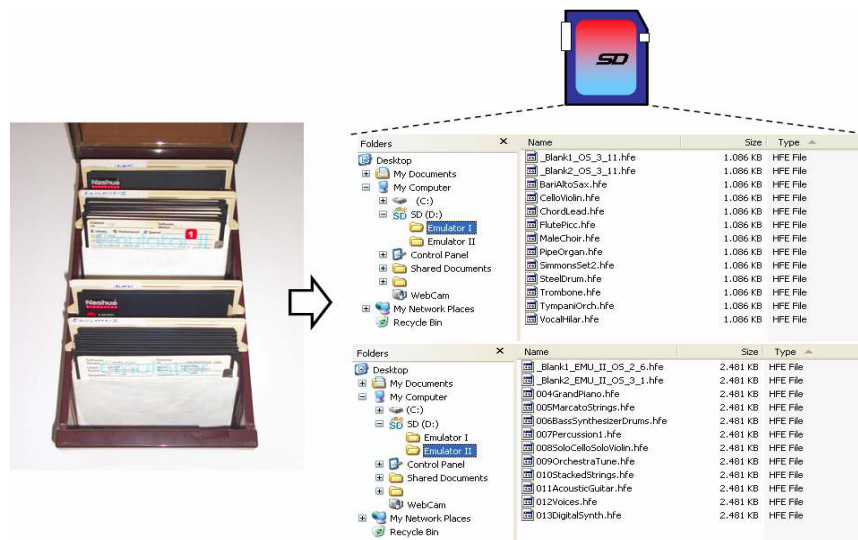
- Multiple .HFE files - even for different types of computers and samplers - can be put on the same SD Card.

*Just like multiple different floppy disks can be stored together in one box*



*A good old floppy storage case*

- The .HFE files on the SD Card can be organized in folders.  
*Just like you can group floppy disks in a box – floppy disk storage boxes even had dividers in them which helped you organizing the disks*



<sup>4</sup> The software can be downloaded from the HxC2001 website: [http://hxc2001.free.fr/floppy\\_drive\\_emulator/](http://hxc2001.free.fr/floppy_drive_emulator/)

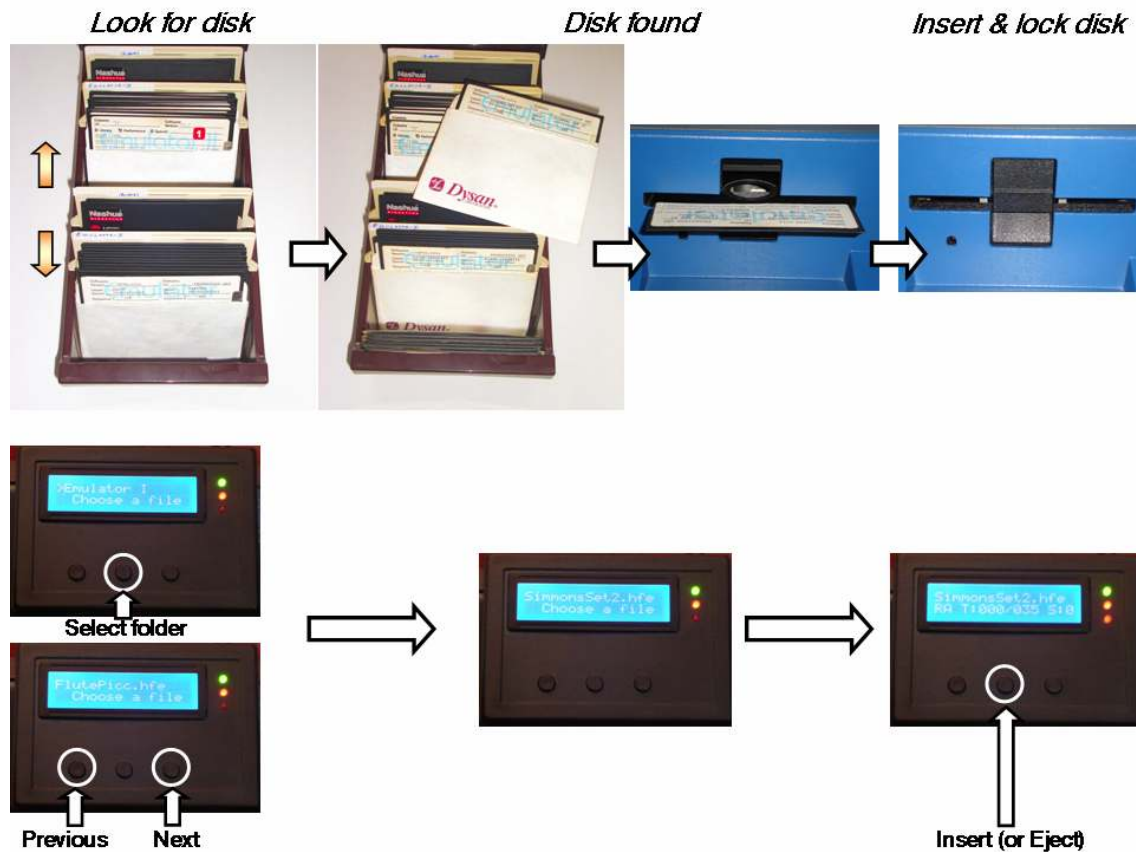
Creating folders on the SD Card is done in the same way as you create folders on your computer's hard disk (e.g. with Windows Explorer)

By inserting the SD Card in the SD HxC device, you have *not yet* inserted a "floppy disk" into the "floppy drive".

*You only have put a box of floppy disks next to your Emulator and have opened the box*

To actually insert a "floppy disk" into the "floppy drive", you have to select one of the .HFE files. This can be done with the buttons on the SD HxC device:

- The left and right buttons are used to navigate through the folders and files on the SD Card  
*Similar as doing a search through the floppy disks in your floppy disk box.*
- The middle button is used to actually select or de-select a folder or file on the SD Card  
*Similar as taking a floppy disk out of the floppy disk box, inserting it in the floppy drive, and (in case of a 5.25 drive) locking the drive. Pressing this button again is similar as unlocking the drive (in case of a 5.25 drive) and ejecting the disk.*



Just like on any computer, the three basic actions that you can do with a floppy disk in an E-Mu Emulator are:

- **Reading:** loading a sound bank, loading the operating system, ....
- **Writing:** saving a sound bank, saving the operating system, ...
- **Formatting:** formatting the disk to make sure it has the expected physical track & sector layout as required on the E-Mu Emulator.

As a consequence, these actions can also be done on your E-Mu Emulator with the .HFE files on the SD Card.



Formatting the .HFE files however is not required anymore, because the HxCFloppyEmulator software has already formatted the files when generating the .HFE files. Moreover the *Format Disk* function on the E-Mu Emulator-II does not work with the SD HxC, although it works fine on an E-Mu Emulator-I.

It's very important to understand that you *always have to select an existing .HFE file*, even if you are going to *write data* to the SD Card on the E-Mu Emulator.

*Indeed, you would also have to insert a [blank formatted] floppy disk in the E-Mu Emulator-'s floppy drive before you can save a sound bank to it.*

The SD HxC device will not generate a new .HFE file “on the fly” when it detects write-activity from the E-Mu Emulator.

## 1.5 Creating “virtual floppy disks” by generating HFE files

As mentioned already, .HFE files must be generated by the HxCFloppyEmulator Windows software. This software needs *raw floppy disk images* as input files to do this.

Raw floppy disk images are files containing exactly the same data as can be found on a real floppy disk. For the E-Mu Emulator this typically means the operating system and/or sound bank data.

There are three ways to obtain raw floppy disk images for the E-Mu Emulator-I or E-Mu Emulator-II:

- Download them from the internet  
E.g. some bootable images (containing the operating system only) can be downloaded from <http://www.emxp.net>
- Generate them with some software package  
E.g. EMXP can generate these files for both the E-Mu Emulator-I and the E-Mu Emulator-II.
- Make these images from real existing E-Mu Emulator floppy disks  
You will need a special floppy disk controller connected to your computer if you want to read true E-Mu Emulator-I or E-Mu Emulator-II floppy disks; standard floppy disk controllers in PCs and Macs can not read these floppy disks. The only disk controller supporting E-Mu Emulator floppy disks is KryoFlux<sup>5</sup>

When converting raw floppy disk images into .HFE files, the HxCFloppyEmulator software

- will add low level data which is specific for the type of floppy disk (e.g. some specific data regarding the E-Mu Emulator-II disk format and disk interface)
- will encode the data in a way that it can be understood by the SD HxC device

The HxCFloppyEmulator software needs two important inputs in order to generate correct .HFE files:

- a valid *raw floppy disk image file* with a valid file extension

Floppy disk type	Valid file extension	Valid file means...
E-Mu Emulator-I	.EMUFD	Size is 125440 bytes
E-Mu Emulator-II	.EMUIIFD	Size is 573440 bytes

Note: as an alternative, the software also accepts E-Mu Emulator-II Sound Designer files (.EII) as input. In that case it also needs a so-called *OS Overlay file* (called EMUIIOS.EMUIIFD), as explained later in this document.

- the *interface mode* used by the E-Mu Emulator's internal floppy disk controller, which can be set in the “SD Card Floppy Emulator Settings” window.

Floppy disk type	Interface mode	Automatic detection ?
E-Mu Emulator-I	Emu Shugart (or Generic Shugart)	Yes, based on file extension .EMUFD
E-Mu Emulator-II	Emu Shugart (or Amstrad CPC)	Yes, based on file extension .EMUIIFD

<sup>5</sup> See: <http://www.kryoflux.com/>



However, since the interface mode (here: Emu Shugart) can be *automatically detected* by the HxCFloppyEmulator software based on the file extension (.EMUFD and .EMUIFD), you don't have to explicitly define it anymore. Simply mark the HFE file interface mode's "Auto" flag in the "SD Card Floppy Emulator Settings" window.

### **1.6 Don't be confused by the HXCSDFE.CFG file**

As already mentioned the SD Card must contain an HXCSDFE.CFG configuration file in its root folder. This file can be defined and generated in the HxCFloppyEmulator software in the "SD Card Floppy Emulator Settings" window which can be accessed through the menu *Settings -> SD Card Floppy Emulator Settings* or by pushing the "SD Card Floppy Emulator Settings" button on the main window.

This HXCSDFE.CFG file configures the behaviour of the SD HxC with respect to:

- LCD display and sound on the SD HxC
- whether some .HFE file should be automatically chosen and booted at start-up time, and if so, which one

The HXCSDFE.CFG file can be generated by pressing the "Save Config file" button.

It's very important to understand that this configuration file does *not depend* on the kind of computer or sampler that you will use the SD HxC or SD Card on.

It doesn't contain any parameter which is specific for a particular floppy disk format/computer/sampler.

The "HFE file interface mode" – which *is* specific for a particular floppy disk format/computer/ sampler - is *not* saved in the HXCSDFE.CFG file ! It's only used to generate .HFE files.

In practice this means that the same SD Card with the same HXCSDFE.CFG file can contain .HFE files for many different computers and samplers at the same time, and can be swapped between these units without the need to replace the HXCSDFE.CFG all the time.

## 2. Installing the SD HxC in the E-Mu Emulator

This chapter explains the wiring schema and jumper settings for connecting the SD HxC to the E-Mu Emulator-I and E-Mu Emulator-II.

Many variants are discussed, e.g. with or without floppy drive, e.g. as first or second drive in the E-Mu Emulator-II, etc...

### 2.1 About Drive A and Drive B in the SD HxC

The SD HxC can emulate two floppy drives simultaneously.

This means that both floppy drives of the E-Mu Emulator-II can be emulated by a single SD HxC unit. The first floppy drive emulated by the SD HxC is called Drive A; the second drive emulated by the SD HxC (if any...) is called Drive B.

Whether at a certain point in time the SD HxC is behaving as Drive A or as Drive B must be selected on the SD HxC's in its disk drive selector menu (see instruction manual of the SD HxC for more information).

Defining which original floppy drive (Drive 1 or Drive 2 in the E-Mu Emulator-II) should be emulated by either Drive A or Drive B must be defined with the jumpers on the SD HxC.

In this document we assume that **only one floppy drive will be emulated by the SD HxC.**  
**The emulated drive on the SD HxC will always be Drive A.**

On the E-Mu Emulator-II this SD HxC Drive A can be either Drive 1 or Drive 2. See section 2.3.

The reason why we assume that only one drive will be emulated is that emulating both E-Mu Emulator-II drives does not add a lot of value. The main reason for installing two drives in the original E-Mu Emulator-II were:

- To be able to more easily format disks and make copies of disks  
*But it's easier now to copy files on the same SD Card with your Windows computer instead of using the SD HxC and E-Mu Emulator-II for this...*
- To be able to more easily use the double memory of the E-Mu Emulator-II+ by using Drive 1 for Bank A and Drive 2 for Bank B  
*But it's perfectly possible to also use a single drive for loading different banks into Bank A and Bank B*

### 2.2 Ribbon cables, power cables and switches

#### **Ribbon cable (34 wires)**

Both the E-Mu Emulator-I and E-Mu Emulator-II need pretty long ribbon cables (with 34 wires) for the disk interface connection between the floppy drive/SD HxC and the E-Mu Emulator's digital mother board.

Standard PC ribbon cables for floppy drives are typically not long enough.

So you will probably have to build them yourself.

You may try to re-use the original cable of your E-Mu Emulator and replace the 5.25" connector by a 3.5" connector, but in general the resulting cable will be too short too because:

- The internal version of the SD HxC is not as large as the 5.25" drive which it is replacing, so the "missing" length of the drive must be compensated by an extension of the ribbon cable.
- The external version of the SD HxC needs an even longer ribbon cable, because the cable must leave the E-Mu Emulator at the backside.

When constructing a ribbon cable, you will need – besides the ribbon cable itself – a few 3.5" [female] connectors. These are very easy to find on the market.



*34-pin female 3.5" connector*

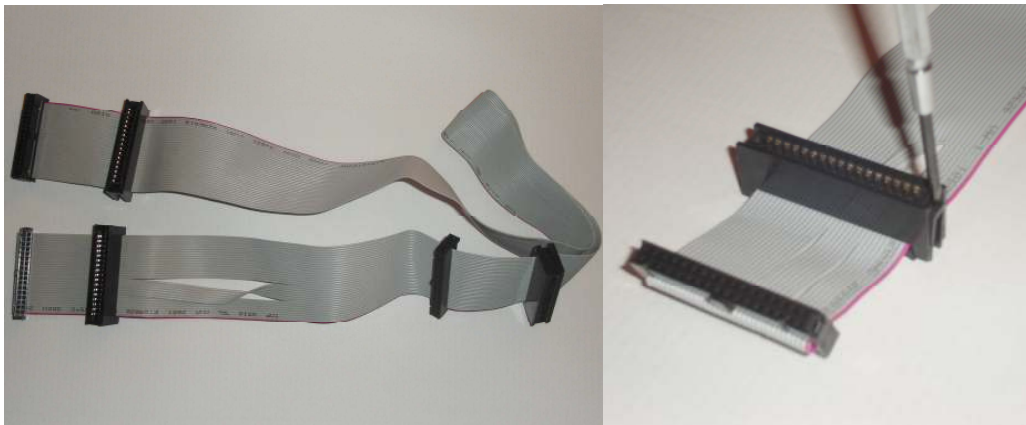
But you will also need one or two 5.25" [female] connectors if you want to keep one or two floppy drives connected. These connectors are much harder to find today...



*34-pin female 5.25" connector*

But they are typically available on standard PC floppy ribbon cables. And those cables are still easy to find in the retail computer stores.

You can carefully remove these connectors from an existing cable (even from the original E-Mu Emulator's cable) by using a small screwdriver to lift up the clips on both sides and remove the two parts of the connector.



*Removing a 5.25" connector from an existing standard floppy cable*

To install the connectors on a ribbon cable, you will need a lot of (human) power... A wooden block may help to put good pressure on the connectors when installing them on the cable.

If you will use an external SD HxC, it may be a good idea to use two ribbon cables:

- One cable inside the E-Mu Emulator which leaves the E-Mu Emulator at the backside and ends with a 3.5" [male] connector. This cable may also be used to internally connect the floppy drive(s).



*34-pin male 3.5" connector*

- One cable outside of the E-Mu Emulator which is used to connect the SD HxC to the 3.5" [male] connector of the first ribbon cable.
- This way, there's no long cable hanging out of the E-Mu Emulator if the SD HxC is not connected to it.



*Backside of an E-Mu Emulator-II*

*When using an external SD HxC it may be a good idea to make the ribbon (and power) cable leave the backside of the E-Mu Emulator and install a male connector (and female power connector) to it. The SD HxC can be connected to these connectors by using external cables.*



*External SD HxC with external ribbon and power cable which can be connected to the backside connectors of the E-Mu Emulator-I or E-Mu Emulator-II*

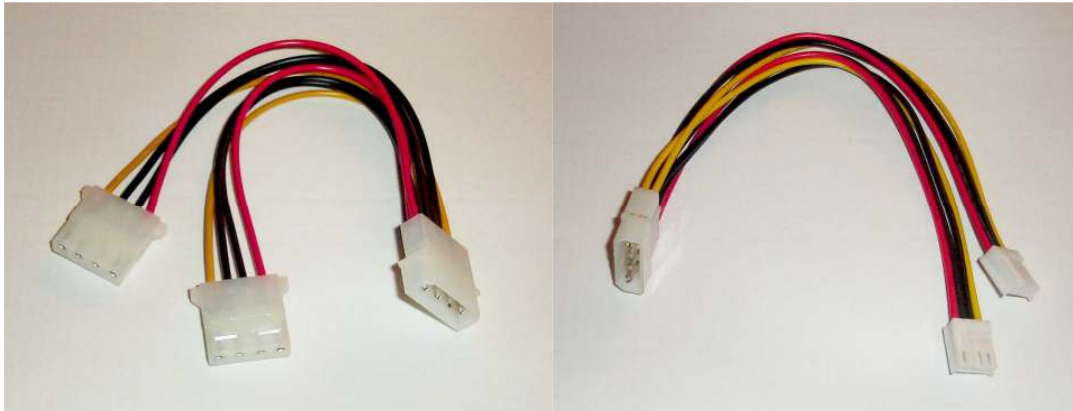
### **Power cable**

The SD HxC needs a power supply with +5V DC and GND level. A standard 3.5" [female] connector is required to plug a power cable in the SD HxC.

When using the *internal version* of the SD HxC in the E-Mu Emulator, you can simply use a standard power splitter cable (5.25" → 2x or 1x 3.5") combined with another standard power splitter cable (5.25" → 2x 5.25") if you want to keep the floppy drive connected:

- The 5.25 [male] connector of this 5.25" → 2x 5.25" power splitter should be connected to the power cable inside the E-Mu Emulator which originally was connected to the floppy drive.
- One of the 5.25 [female] connectors of this 5.25" → 2x 5.25" power splitter should be connected to the floppy drive inside the E-Mu Emulator.

- The other 5.25 [female] connector of this 5.25" → 2x 5.25" power splitter should be connected to the SD HxC's 5.25" → 3.5" power splitter cable.



5.25" → 2x 5.25" power splitter (left) and 5.25" → 2x 3.5" power splitter (right)

When using the *external version* of the SD HxC you will probably have to build a *longer* power cable with a 5.25" [male] connector on one side and a 3.5" [female] connector on the other side.

This cable must be combined with a standard power splitter (5.25" → 2x 5.25") inside the E-Mu Emulator if you want to keep a floppy drive connected:

- The 5.25 [male] connector of this 5.25" → 2x 5.25" power splitter should be connected to the power cable inside the E-Mu Emulator which originally was connected to the floppy drive.
- One of the 5.25 [female] connectors of this 5.25" → 2x 5.25" power splitter should be connected to the floppy drive inside the E-Mu Emulator.
- The other 5.25 [female] connector of this power splitter should leave the E-Mu Emulator at the backside. The SD HxC's (longer) power supply cable can be connected to this connector.

See picture shown before in this chapter.

To construct the longer power cable, you can cut a standard power splitter cable (5.25" → 2x or 1x 3.5") and solder / connect an extension cable in between. As an alternative, you can construct this cable from scratch: 4-wire cable and connectors are available on the market.



Components to construct an external power cable for the SD HxC

### Switch

The floppy drive which is replaced by the SD HxC can still be used instead of the SD HxC if you disconnect the ribbon cable from the SD HxC and connect it back to the floppy drive.

This can even be done:

- while the E-Mu Emulator is powered
- while both the SD HxC and the floppy drive are connected to the power supply of the E-Mu Emulator

Of course you should make sure that you don't swap the cable while the E-Mu Emulator is reading / writing one of these drives.

The advantage of being able to swap "online" between the floppy drive and the SD HxC is that it allows for copying floppy disks to the SD Card (or vice versa). This is especially handy on the E-Mu Emulator-I.

*Important note:* although this kind of configuration has successfully been tested on both the E-Mu Emulator-I and E-Mu Emulator-II, it is without any doubt an "unnatural" configuration which has rarely been used so far and which was also not common practice when using real floppy drives. As a result, we're not sure that this is a very reliable way of working, and hence can not guarantee that no side-effects (or even damage) will occur to the hardware.

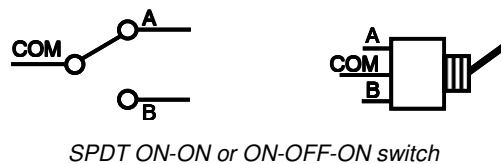
Disconnecting and reconnecting the ribbon cable all the time is not very comfortable and not reliable.

As an alternative you can connect both the floppy drive and SD HxC to the ribbon cable, and put a switch on the "Drive Select" wire of the ribbon cable between the two drives. This is explained in the next sections.

The switch that should be used for this purpose is

- either an ON-ON single pole double throw switch (SPDT ON-ON)
- or an ON-OFF-ON single pole double throw center-off switch (SPDT ON-OFF-ON)

Using a switch instead of reconnecting ribbon cables is preferable.



## 2.3 Installing the SD HxC in the E-Mu Emulator-I

Following configurations are explained. (*shaded configurations can be considered "default" choices*)

No	Floppy Drive installed in Emulator-I	Ribbon Cable towards SD HxC is...	External connectors ? (*) (for ext. SDHxC)	Switch between SD HxC and Floppy Drive ?
1	No	untwisted	No	-
2	No	untwisted	Yes	-
3	No	twisted	No	-
4	No	twisted	Yes	-
5	Yes	untwisted	Yes	No
6	Yes	untwisted	Yes	Yes
7	Yes	twisted	Yes	No
8	Yes	twisted	Yes	Yes

(\*) "External connectors" means that there will be a power connector and 34 pins connector at the backside of the E-Mu Emulator; in this set-up the SD HxC has its own power and ribbon cable which should be plugged into the connectors at the backside of the E-Mu Emulator. The usage of external connectors for the SD HxC is the standard assumption if the floppy drive will remain and/or when an externally cased SD HxC is being used.

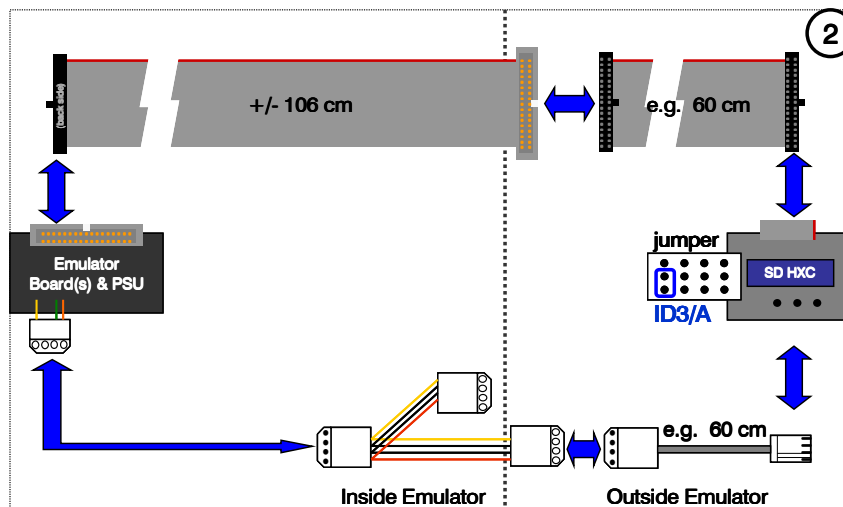
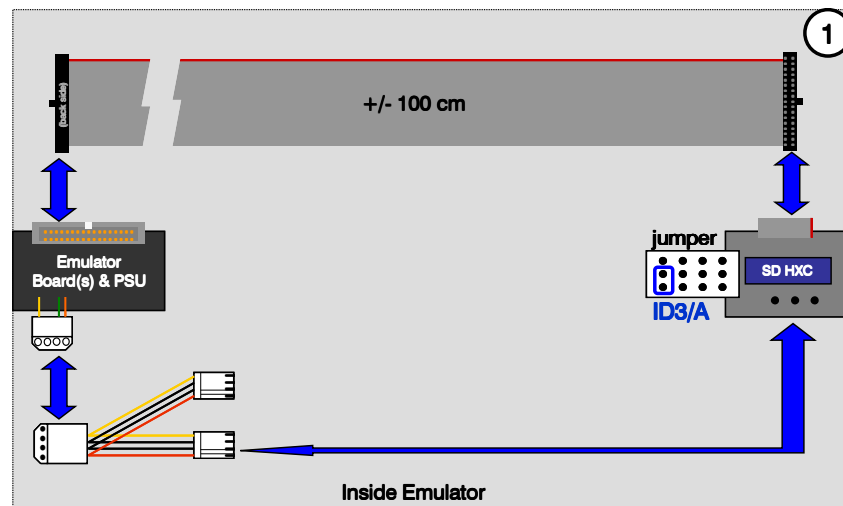
In *configurations 1 → 4*, the SD HxC will replace the original floppy drive. No floppy drive will be installed in the E-Mu Emulator-I anymore.

In *configurations 5 → 8*, both the SD HxC and original floppy drive can be used with the E-Mu Emulator-I. This can be useful for:

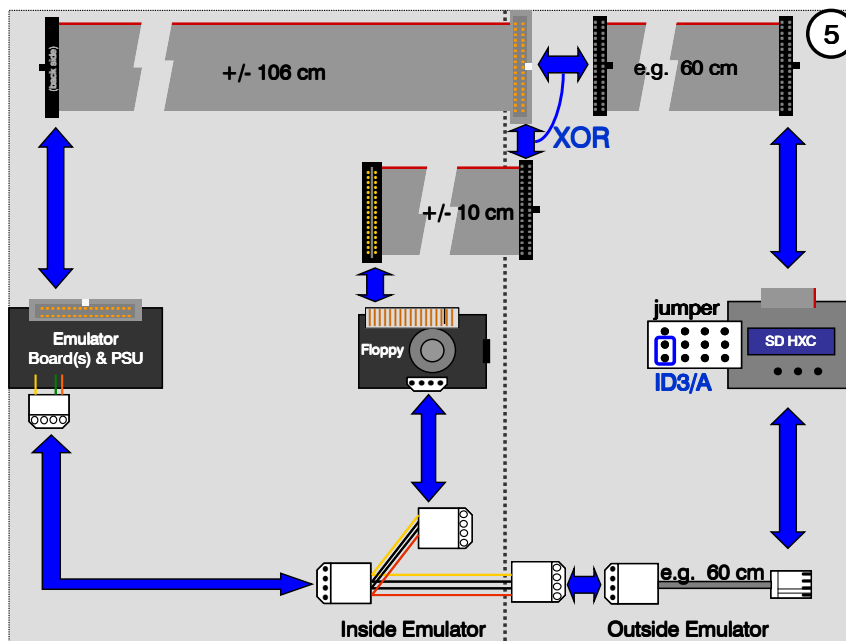
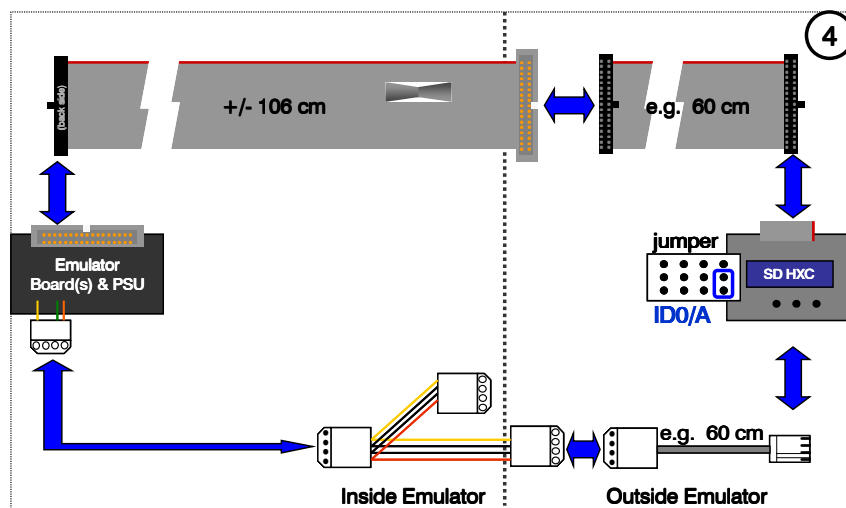
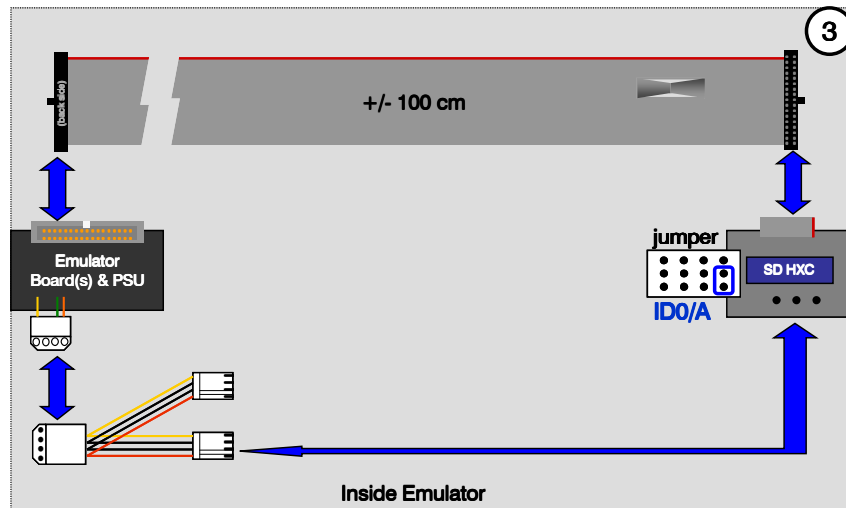
- being able to copy floppy disks to the SD Card or vice versa
- being able to use the SD HxC on other samplers/devices (esp. when using the external SD HxC), while still being able to use the E-Mu Emulator-I with its original drive

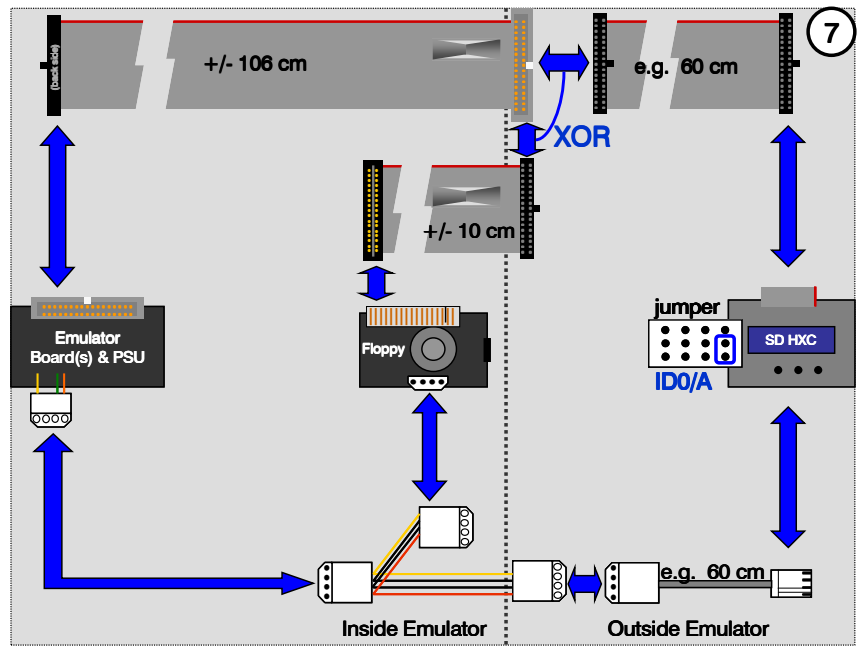
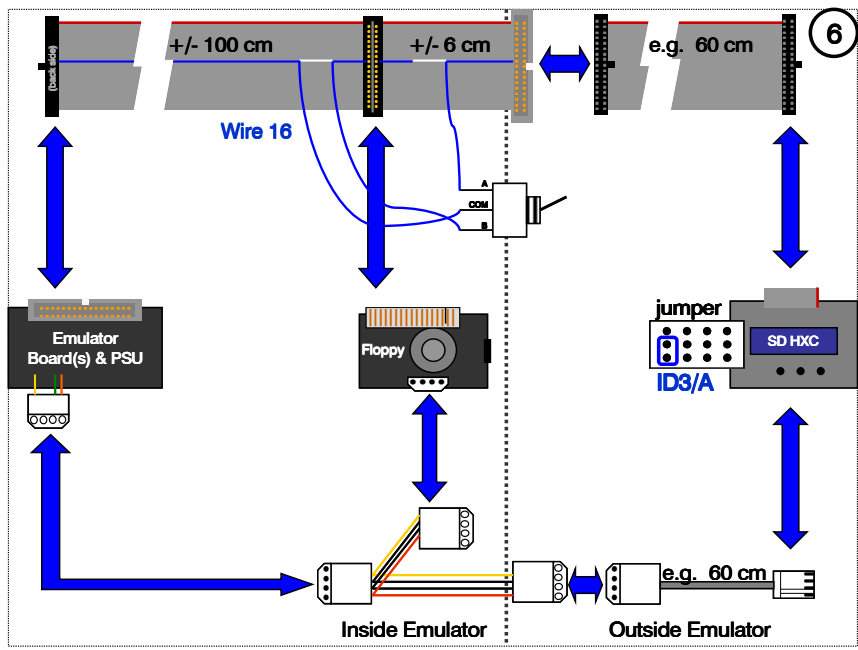
*Important note:* although this configuration has successfully been tested on the E-Mu Emulator-I, it is without any doubt an “unnatural” configuration which has rarely been used so far and which was also not common practice when using real floppy drives. As a result, we’re not sure that it is the most reliable way of working, and hence can not guarantee that no side-effects (or even damage) will occur to the hardware.

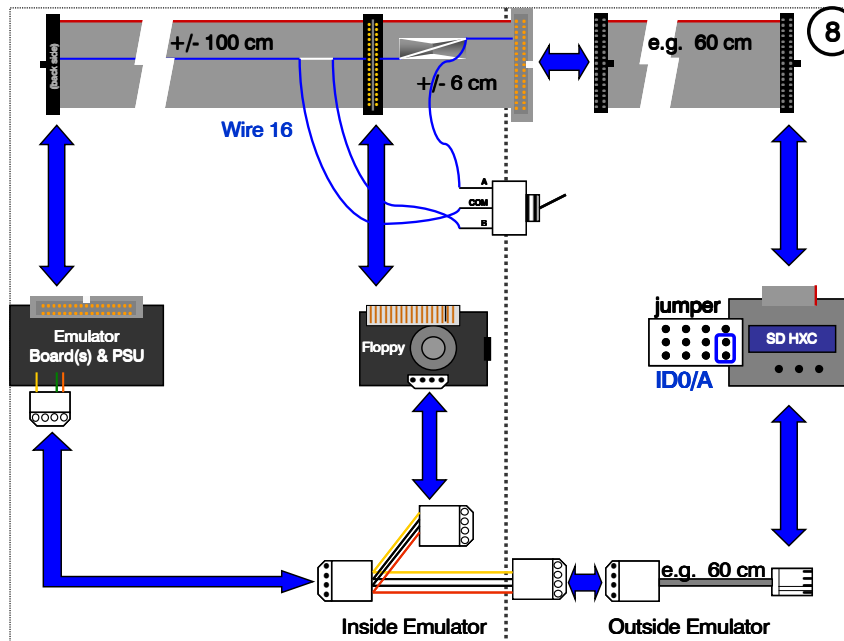
An untwisted ribbon cable can always be used, so there’s no reason to use a twisted cable. Nevertheless we also explain the configurations with a twisted cable. In those configurations it is assumed that the connector to the SD HxC is the one *succeeding the twist of the wires*.











## 2.4 Installing the SD HxC in the E-Mu Emulator-II

### Overview

Following configurations are explained. (shaded configurations can be considered “default” choices)

No	SD HxC as Emulator-II Drive...	Floppy Drive 1 installed in Emulator-II	Floppy Drive 2 installed in Emulator-II	Ribbon Cable towards SD HxC is...	External connectors ? (*) (for ext. SDHxC)	Switch between SD HxC and Floppy Drive ? (**)
1	Drive 1	No	Yes	untwisted	No	-
2	Drive 1	No	Yes	untwisted	Yes	-
3	Drive 1	No	Yes	twisted	No	-
4	Drive 1	No	Yes	twisted	Yes	-
5	Drive 2	Yes	No	untwisted	No	-
6	Drive 2	Yes	No	untwisted	Yes	-
7	Drive 2	Yes	No	twisted	No	-
8	Drive 2	Yes	No	twisted	Yes	-
9	Drive 1	Yes	Yes	untwisted	Yes	No
10	Drive 1	Yes	Yes	untwisted	Yes	Yes
11	Drive 2	Yes	Yes	untwisted	Yes	No
12	Drive 2	Yes	Yes	untwisted	Yes	Yes
13	Drive 1	Yes	No	untwisted	No	Yes
14	Drive 1	Yes	No	untwisted	Yes	No
15	Drive 1	Yes	No	untwisted	Yes	Yes
16	Drive 1	Yes	No	twisted	No	Yes
17	Drive 1	Yes	No	twisted	Yes	No
18	Drive 1	Yes	No	twisted	Yes	Yes

(\*) “External connectors” means that there will be a power connector and 34 pins connector at the backside of the E-Mu Emulator-II; in this set-up the SD HxC has its own power and ribbon cable which should be plugged into the connectors at the backside of the E-Mu Emulator-II. The usage of external connectors for the SD HxC is the standard assumption if the two floppy drives will remain and/or when an externally cased SD HxC is being used.

(\*\*) The use of a switch is only considered if the SD HxC and the floppy drive are defined as the same drive in the E-Mu Emulator-II (either Drive 1 or Drive 2)

We always assume that at least one floppy drive remains installed in the E-Mu Emulator-II.

If you won't keep any floppy drive in the E-Mu Emulator-II, you can start from configurations 1 → 4 and ignore the wiring/cabling for the floppy drive.

We also always assume that the E-Mu Emulator-II has two floppy drive power connectors available. If not, you will have to plug a power splitter cable (5.25" → 2x 5.25") into the original floppy drive connector.

In *configurations 1 → 8*, there's (only) one real floppy drive connected to the E-Mu Emulator-II while the SD HxC behaves as the second floppy drive.

- in configurations 1 → 4, the SD HxC behaves as E-Mu Emulator-II Drive 1
- in configurations 5 → 8, the SD HxC behaves as E-Mu Emulator-II Drive 2.

Different configurations are described, depending on whether you are using the SD HxC internally or externally, and whether you are using a twisted or untwisted ribbon cable.

In *configurations 13 → 18*, there's also (only) one real floppy drive connected to the E-Mu Emulator-II and the SD HxC behaves as a replacement for that drive instead of behaving as a second drive. In practice this means that you have to swap between the drives by re-connecting the ribbon cable or by using a switch on the ribbon cable.

Again, different configurations are described, depending on whether you are using the SD HxC internally or externally, and whether you are using a twisted or untwisted ribbon cable.

*Important note:* although this configuration has successfully been tested on the E-Mu Emulator-II, it is without any doubt an "unnatural" configuration which has rarely been used so far and which was also not common practice when using real floppy drives. As a result, we're not sure that it is the most reliable way of working, and hence can not guarantee that no side-effects (or even damage) will occur to the hardware.

In *configurations 9 → 12*, the *two* original floppy drives are still connected to the E-Mu Emulator-II. The SD HxC behaves as a replacement drive for either the first or the second floppy drive. The choice must be made by re-connecting the ribbon cable or by using a switch on the ribbon cable. (see *Important Note mentioned above*)

Since both floppy drives are still installed in the E-Mu Emulator-II, these configurations are only described assuming the external use of an SD HxC. Moreover the use of twisted cables is not taken into account, since ribbon cables with 2 untwisted connectors and one twisted connector are pretty rare...

Note that untwisted ribbon cables can always be used, so there's no reason to use a twisted cable. Nevertheless we also explain some configurations with a twisted cable. In those configurations it is assumed that the connector to the SD HxC is the one *succeeding the twist of the wires*.

### ***Choosing between Drive 1 or Drive 2 for the SD HxC***

The most obvious choice is to use the SD HxC as *Drive 1* on the E-Mu Emulator-II.

The E-Mu Emulator-II needs to access the floppy disk many times because it needs load pieces of the operating system all the time. To find the operating system, the sampler always tries Drive 1 first, so if the SD HxC is installed as Drive 1, this will be the fastest and most comfortable way of working.

There may however be a good reason to install the SD HxC as *Drive 2*.

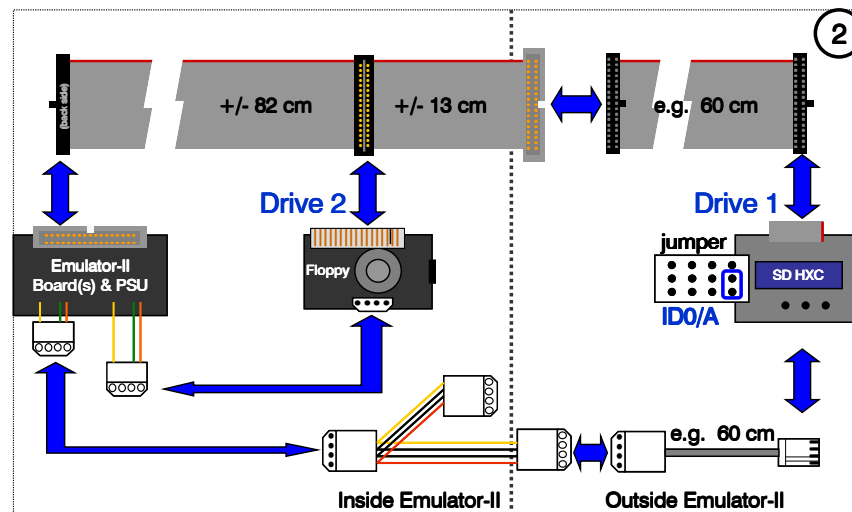
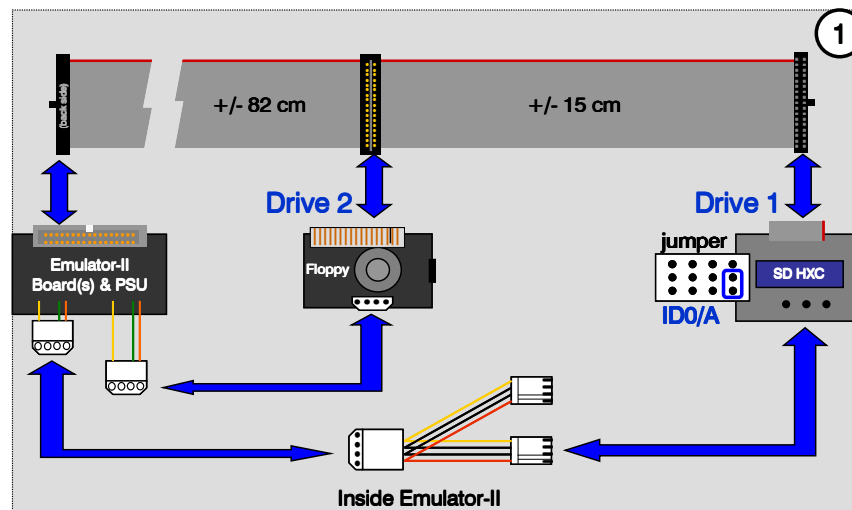
The dual floppy drive E-Mu Emulator-II's "*Copy Disk*" and "*Write Software*" functions require that the source drive is always Drive 1 and the destination drive is always Drive 2. If you are planning to use these functions for copying data *from floppy disks to the SD Card*, you'll have to install the floppy drive as Drive 1 and the SD HxC as Drive 2. [for using these functions to copy data *from SD Card to floppy disk*, the SD HxC should however be installed as Drive 1]

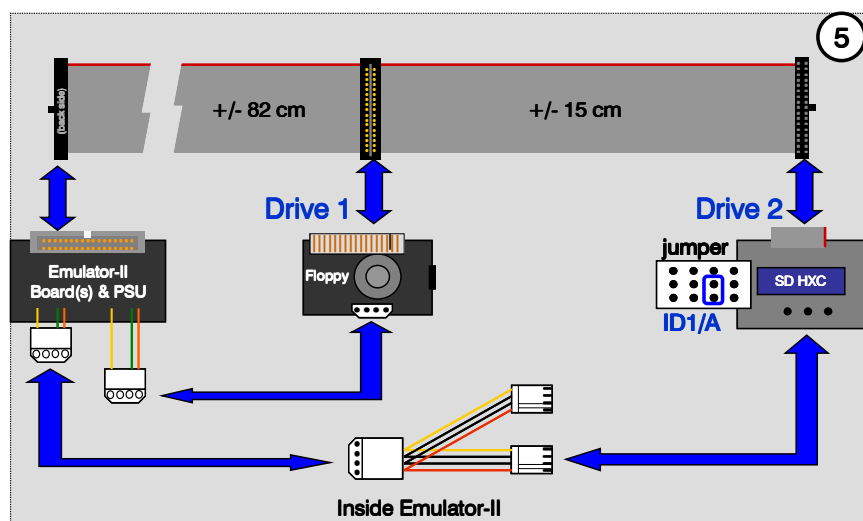
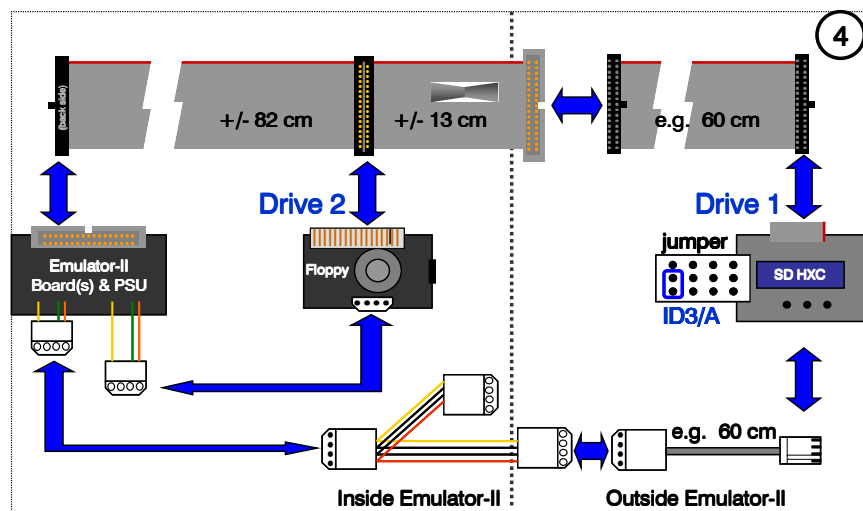
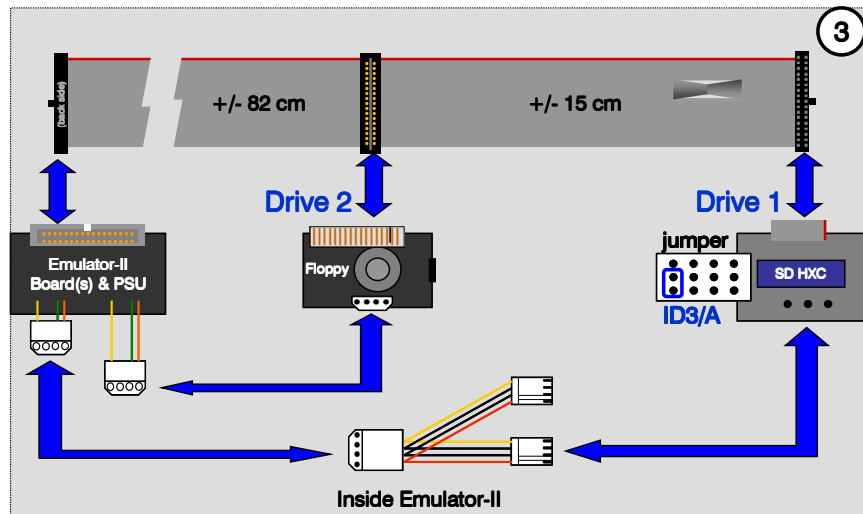
Note that copying sound banks from E-Mu Emulator-II (performance) floppy disks can also be done by simply loading and saving the bank. In that case, you don't need the "Copy Disk" function and the SD HxC can be installed as Drive 1.

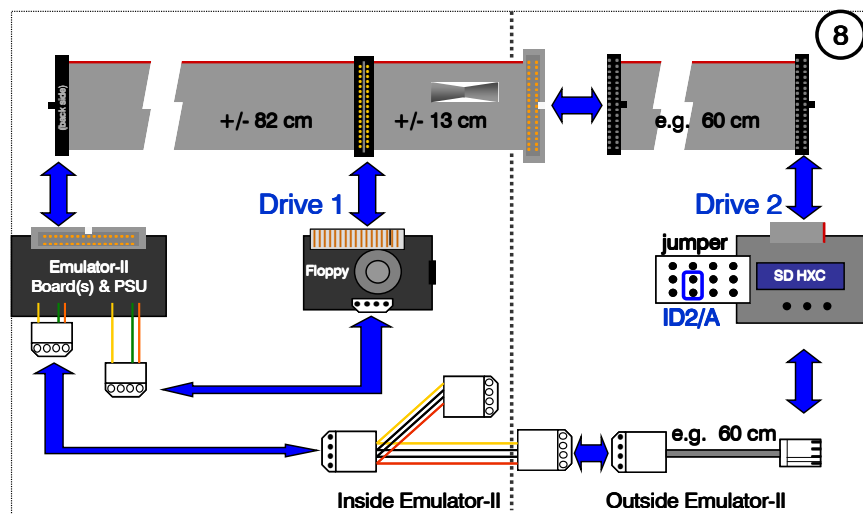
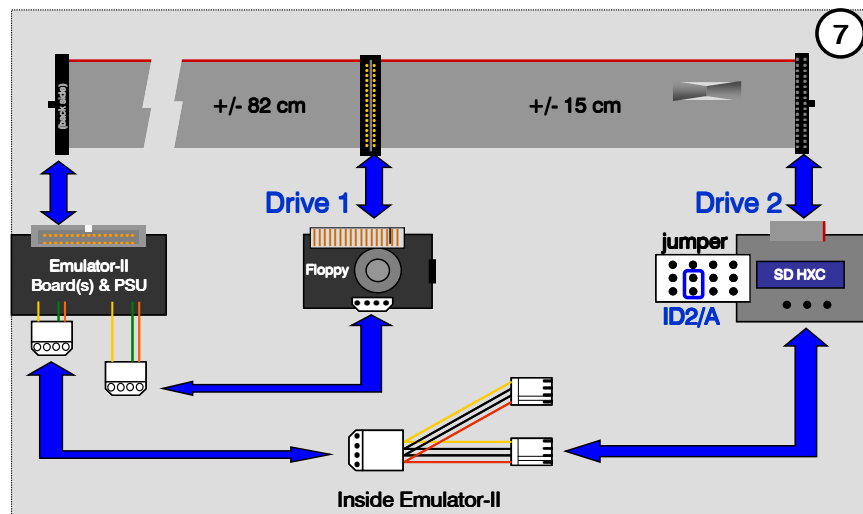
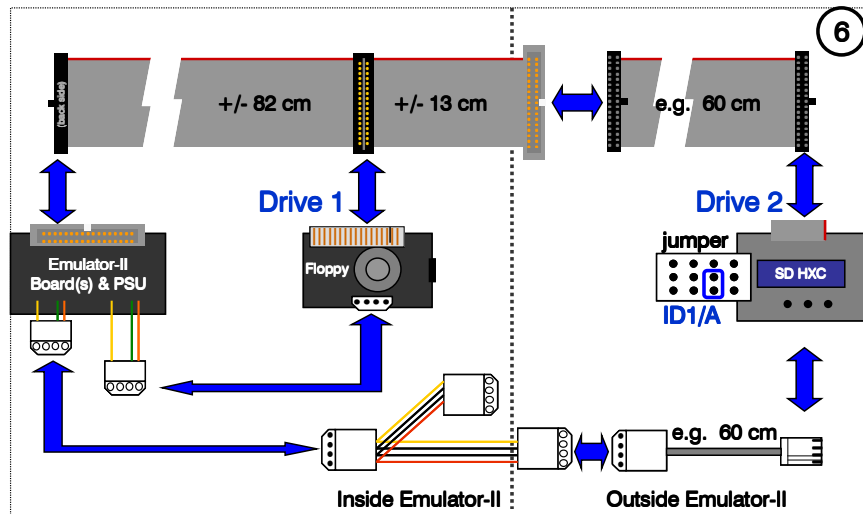
As a "meet in the middle" solution, you could also consider to install both the SD HxC and the floppy drive as Drive 1 and to use a switch or reconnect the ribbon cable if you want to swap between the SD HxC and the floppy drive.

This would turn the E-Mu Emulator-II into a *single drive* unit. The "Copy Disk" and "Write Software" functions on a single drive unit can handle the same drive as source and destination drive.

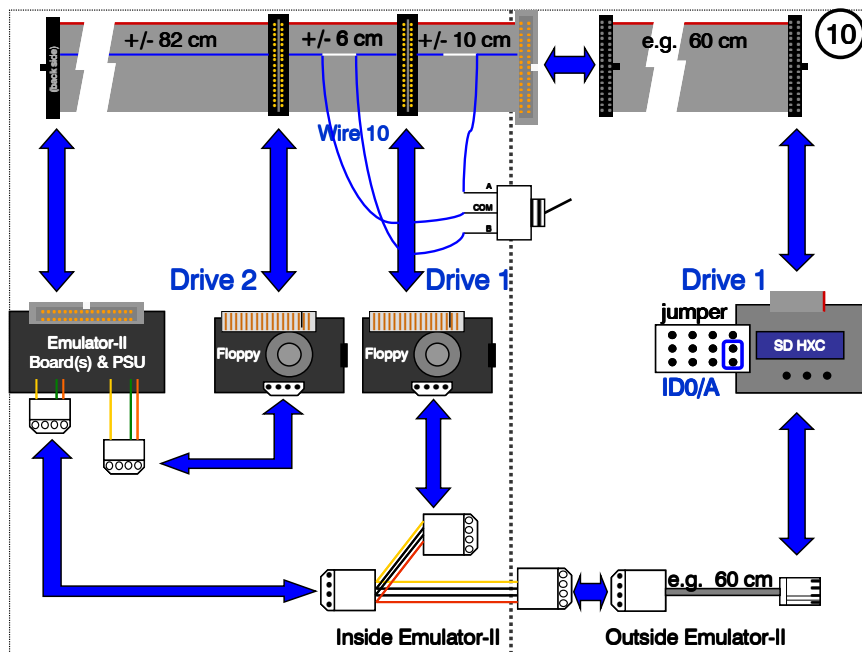
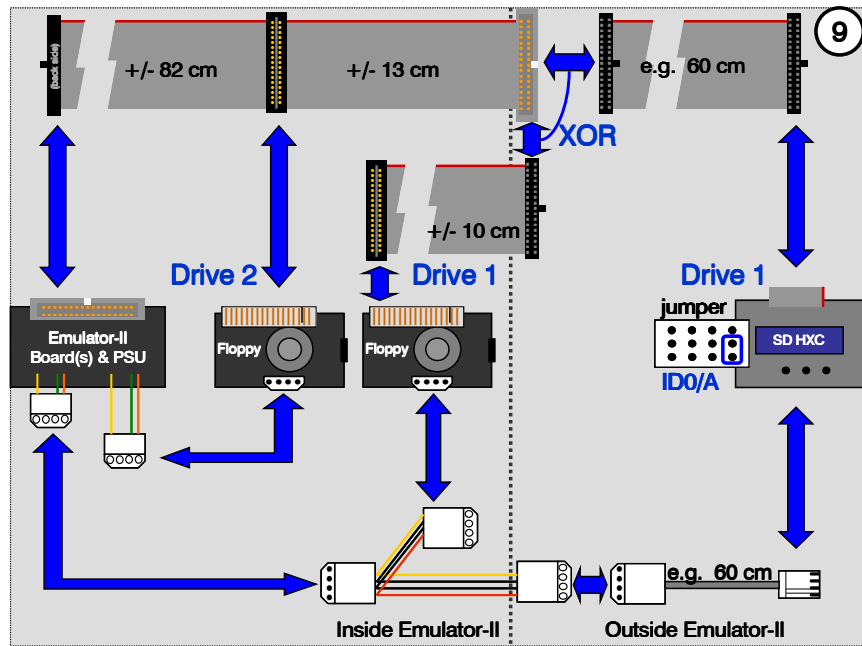
### Detailed schemas of the configurations

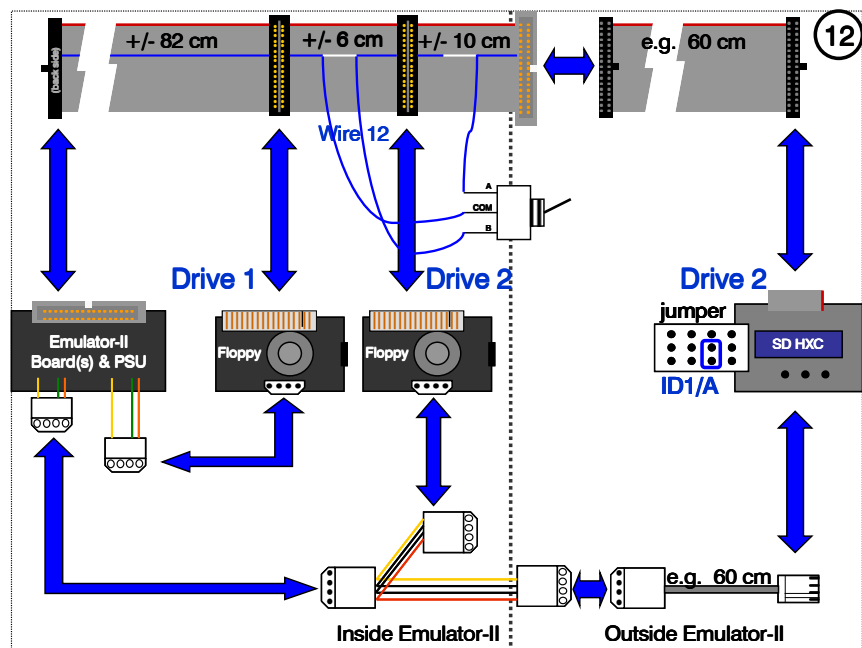
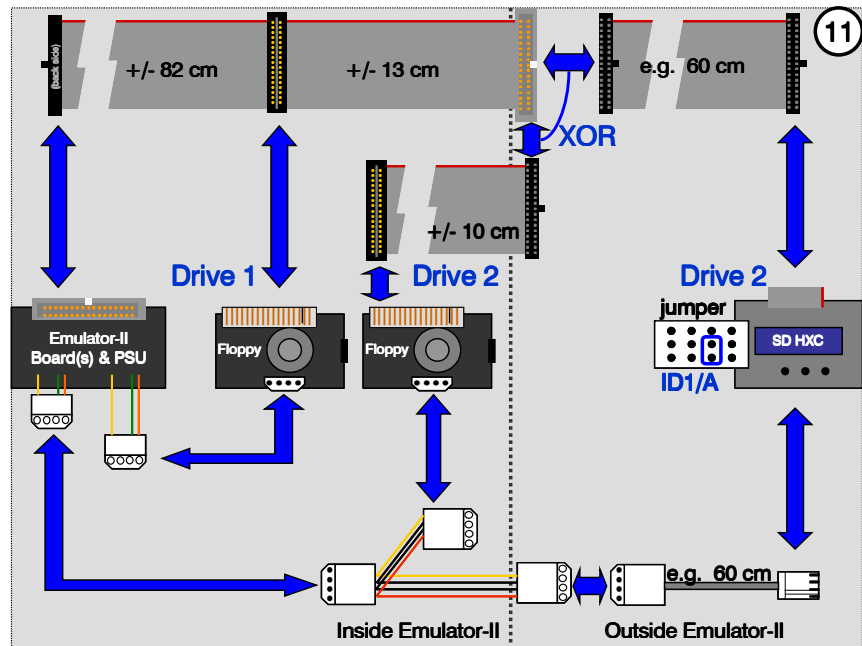


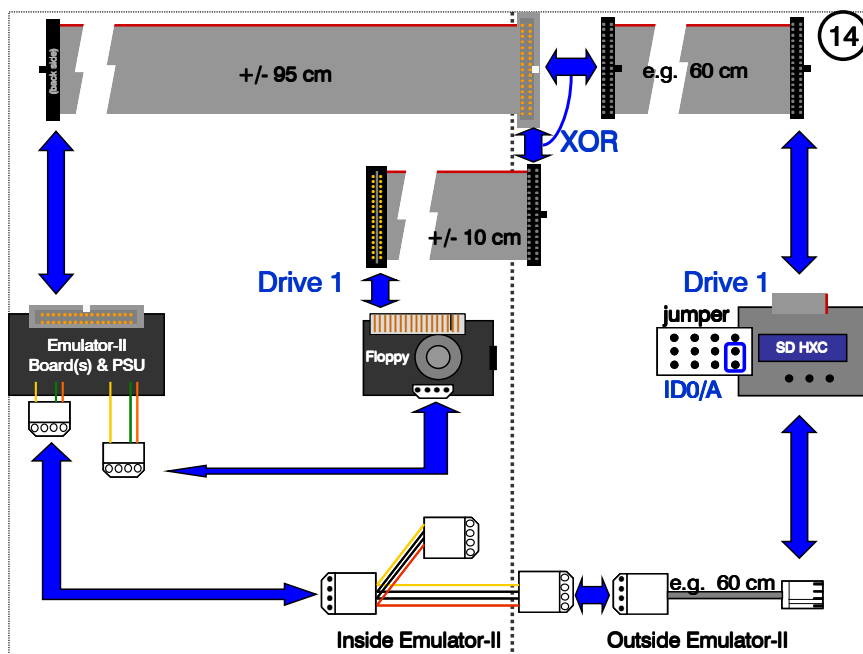
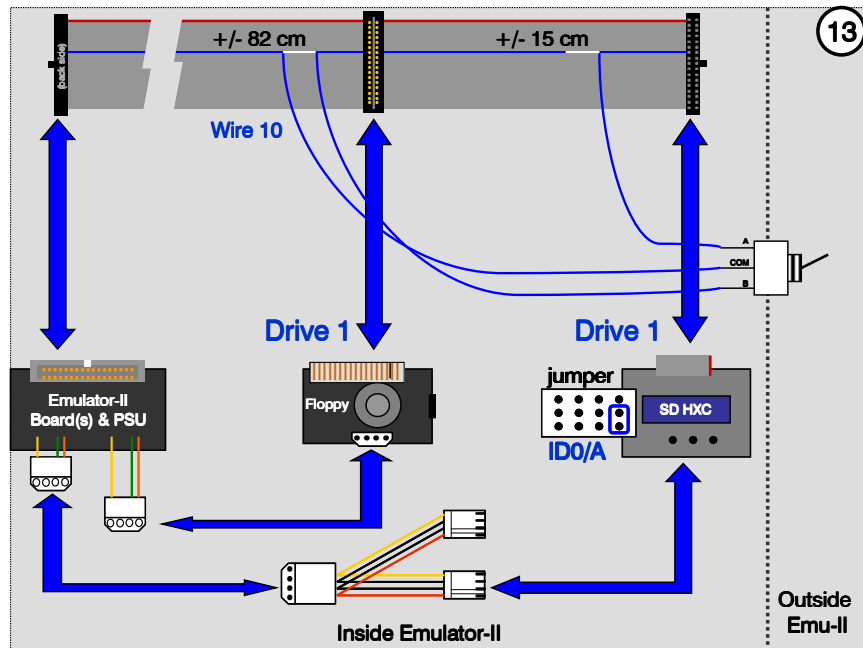


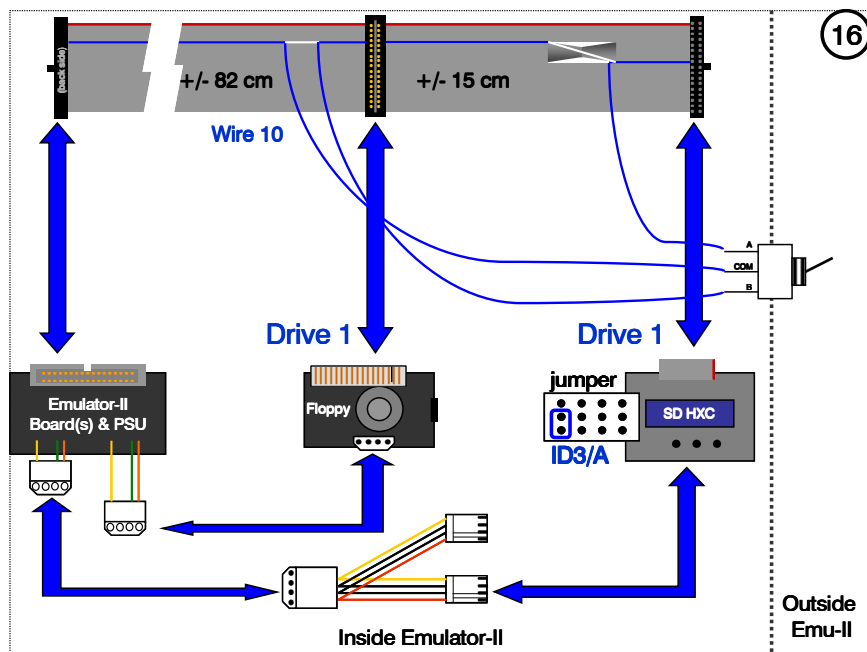
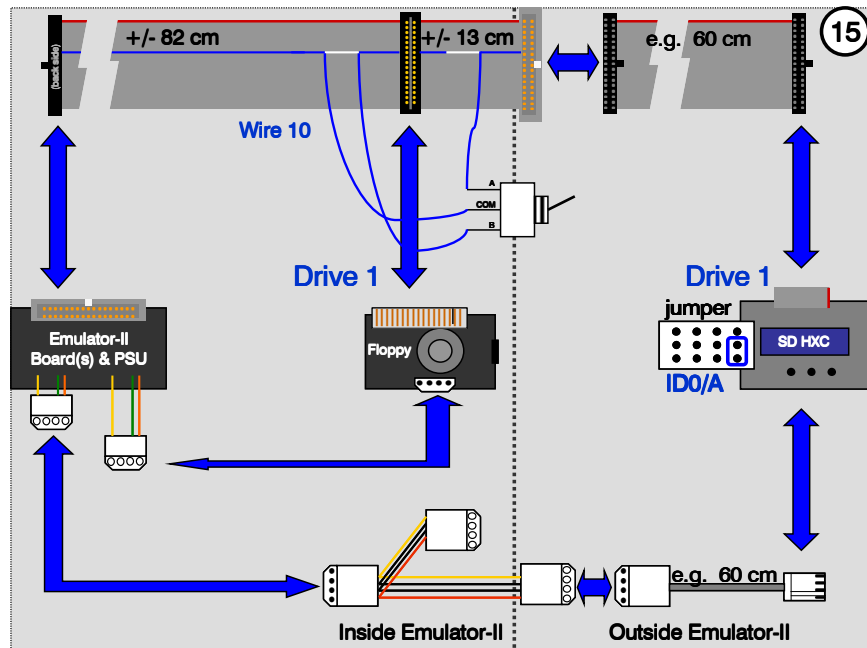


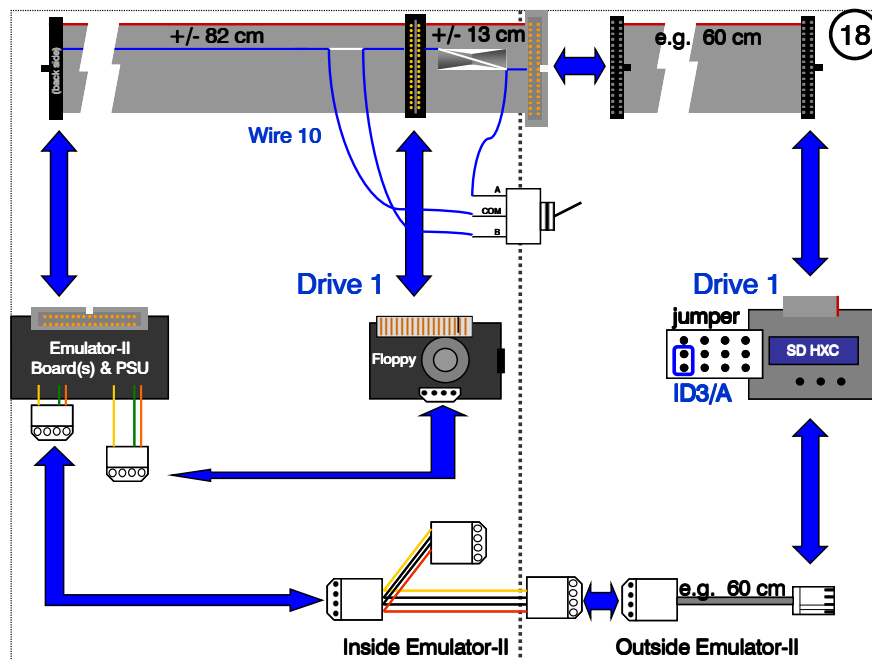
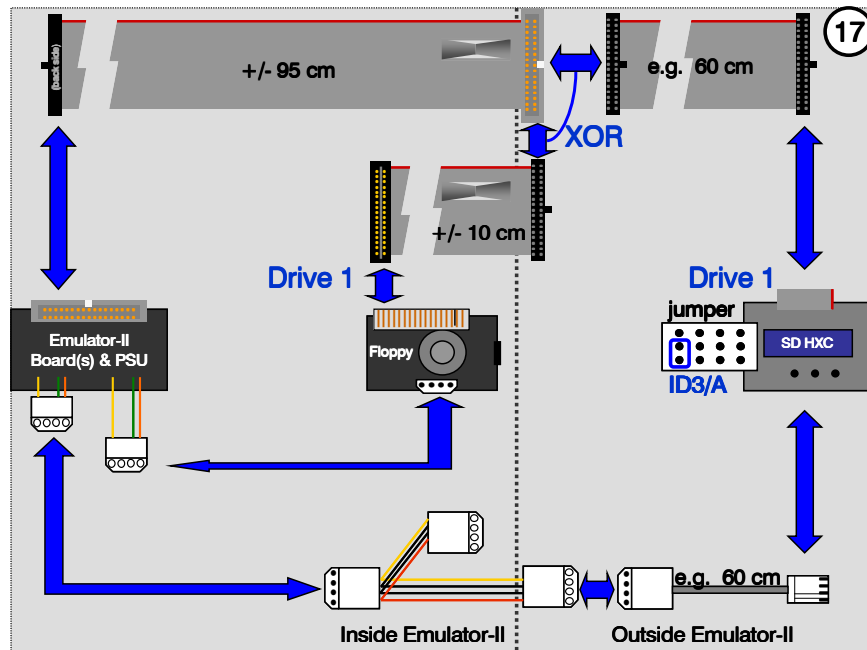












## 2.5 Preparing the SD Card

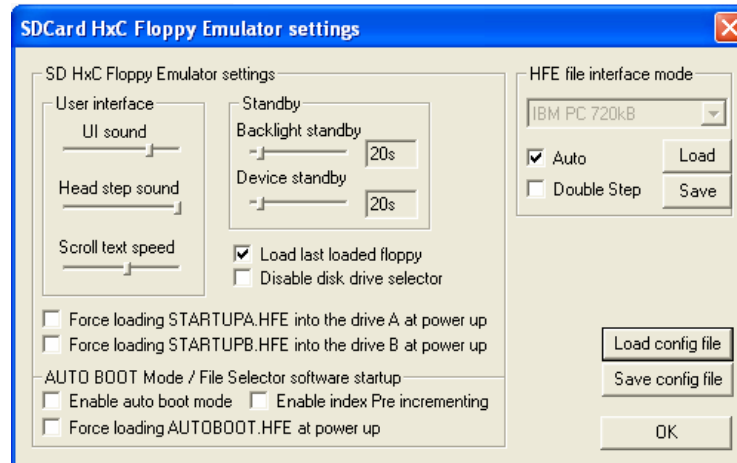
The SD Card that will be used in the SD HxC must have been formatted in FAT32 layout on a computer first.

You should also copy an HXCSDFE.CFG configuration file to the SD Card.

The HXCSDFE.CFG file must be generated in the “SD Card Floppy Emulator Settings” window of the HxCFloppyEmulator software.

1. Press the “SD Card Floppy Emulator Settings” button in the main HxCFloppyEmulator software window

2. Check whether you agree with the (default) settings in this window. Note: the HFE file interface mode settings are NOT saved in the configuration file.



*The default settings in the “SD HxC Floppy Emulator settings” section can be used. They must be saved into an HXCSDFE.CFG file by pressing the “Save config file” button.*

3. Press the “Save config file” button.
4. Copy the HXCSDFE.CFG file to the SD Card (if you haven’t saved it directly to the SD Card yet in step 3)

You should also save some .HFE files for the E-Mu Emulator-I or E-Mu Emulator-II to the SD Card now: without any .HFE file, the SD Card is useless in the SD HxC.

See section 3.1 for instructions how to create .HFE files.

### 3. Using the SD HxC in the E-Mu Emulator

In this section we assume that your SD HxC has been connected to the E-Mu Emulator. At the time of writing, the following software versions of the SD HxC were used (e.g. for screen shots)

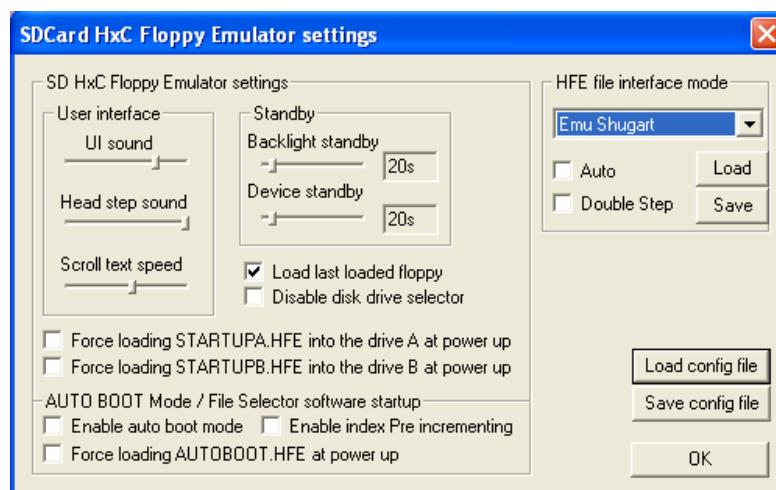
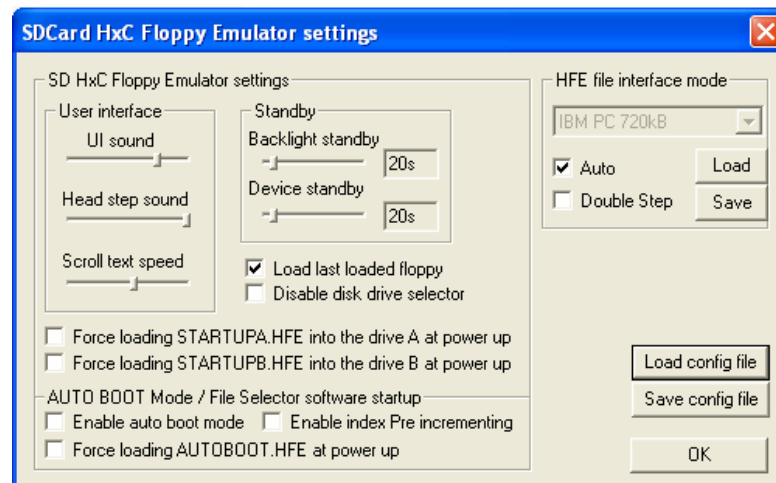
- SD HxC firmware: v1.6.0.0 (*check the HxC website for instructions how to upgrade the firmware*)
- HxCFloppyEmulator software for Windows: v1.6.11.15

#### 3.1 Saving E-Mu Emulator files to the SD Card on a Windows PC

All virtual floppy disk files stored on the SD Card must be .HFE files.

These .HFE files can only be created with the HxCFloppyEmulator software on the Windows platform.

1. Make sure the “HFE file interface mode” is either set to “Auto” or to “Emu Shugart”
  - Press the “SD HxC Floppy Emulator settings” button in the main HxC window
  - Either select the “Auto” flag or choose “Emu Shugart” from the drop down list in the “HFE file interface mode” section of the settings window.
  - Press “OK”



*Make sure that in the “HFE file interface mode” section of the SD HxC settings window either the “Auto” flag is set (top picture) or “Emu Shugart” has been selected (bottom picture)*



- Make sure you have files that can be converted to .HFE files for the SD HxC.  
As explained already, following files can be used as valid input files:

Sampler	File type	File extension	Size (bytes)
E-Mu Emulator-I	Emu-I Disk Image	.EMUFD	125440
E-Mu Emulator-II	Emu-II Bank Image (SoundDesigner for EII file)	.EII	485887
E-Mu Emulator-II	Emu-II Disk Image	.EMUIIFD	573440

All these files can be created by EMXP (version 2.11 or higher)

See the EMXP Manual for more information.

It's also possible to download bootable disk images for E-Mu Emulator-I (.EMUFD) and E-Mu Emulator-II (.EMUIIFD) from <http://www.emxp.net>.  
These files only contain an operating system and an empty preset / empty sounds. A variety of operating system versions is available.

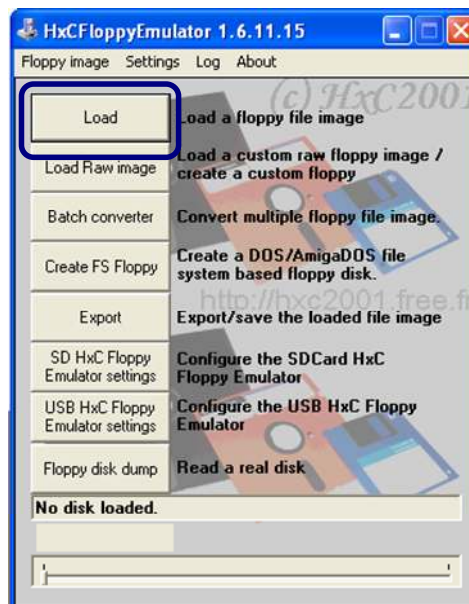
These files can be used:

- for booting the E-Mu Emulator
- as a target "template" file to which sound banks can be saved or floppy disks can be copied to on the E-Mu Emulator itself (see later).

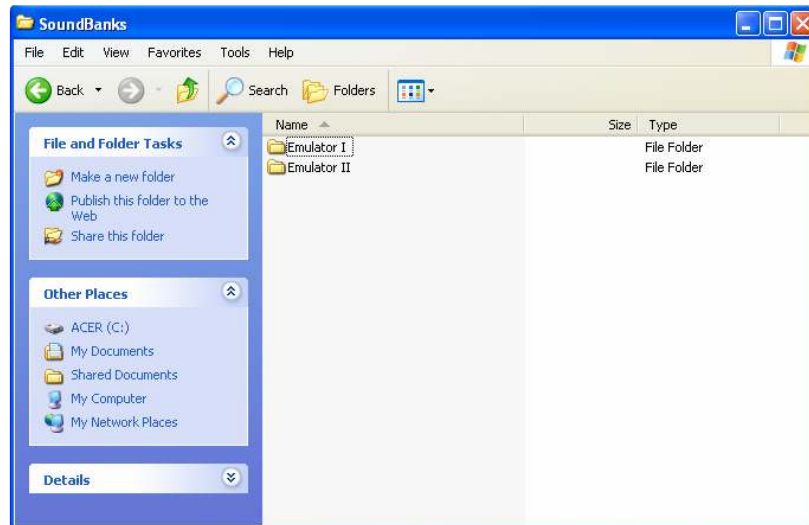
- Select the files and export them as .HFE files.

To convert files one by one:

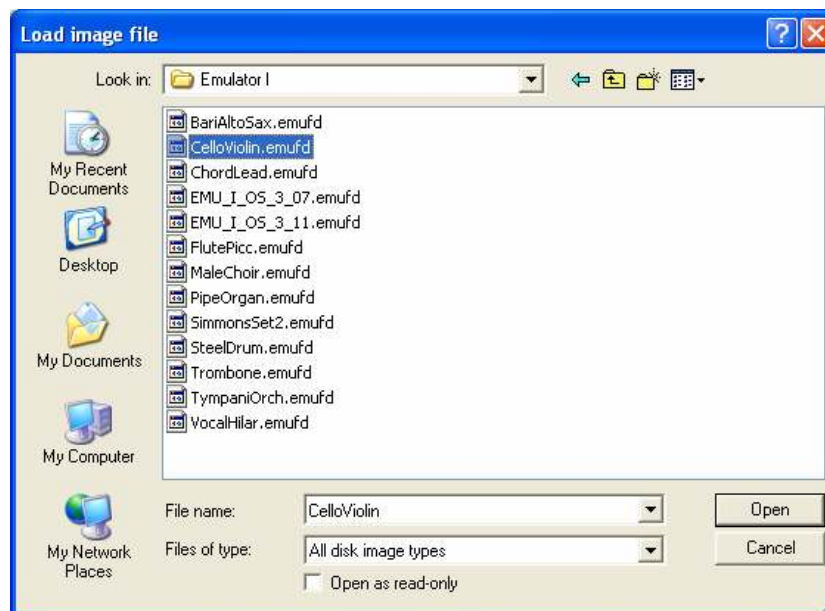
- Press the "Load" button in the main HxC window



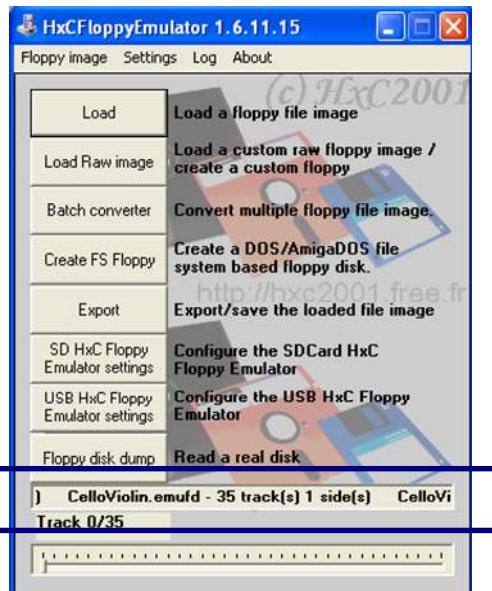
- Navigate to the folder on your computer's disk which contains the E-Mu Emulator files.  
In the example shown below, we have made separate folders for Emulator-I and Emulator-II files. *Note: these folders are not the ones on the SD Card.*



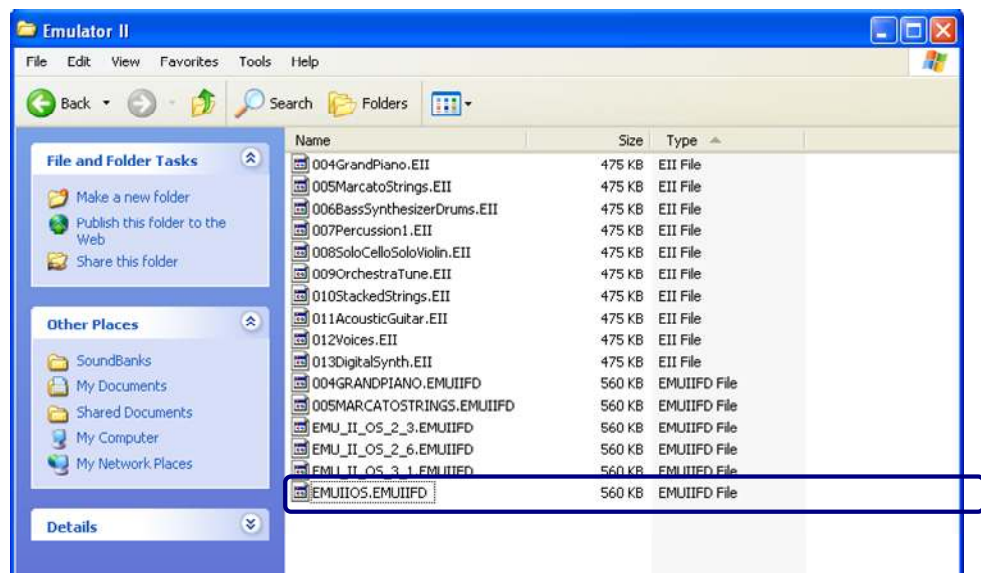
- In case of *E-Mu Emulator-I*:
  - Select an .EMUFD Disk Image file (here: CelloViolin.emufd) and press “Open”



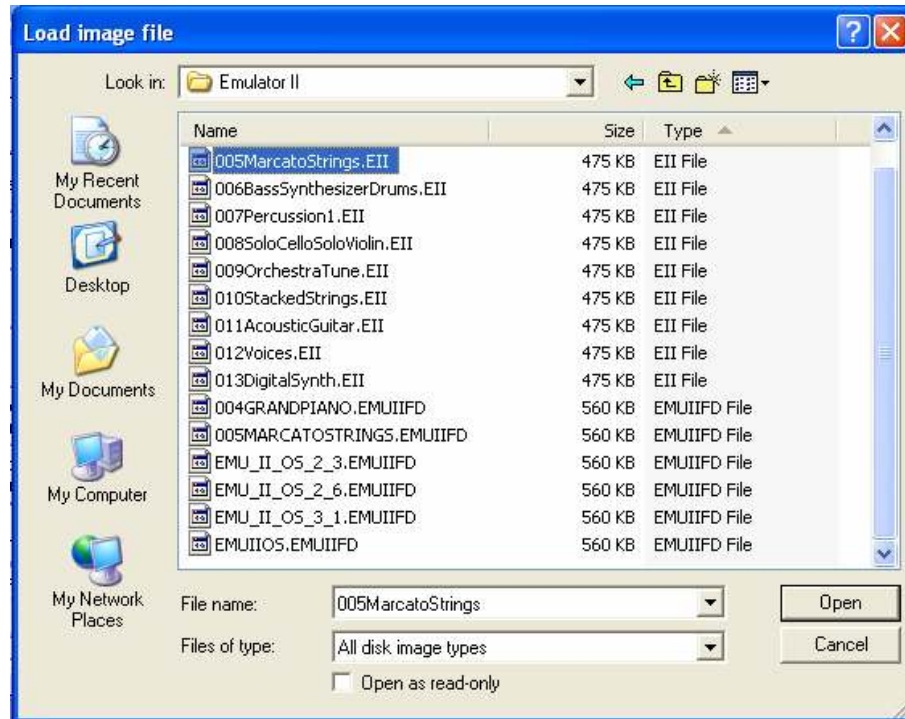
- Note: you can also select an Operating System-only .EMUFD Disk Image, not containing any sound bank. The resulting .HFE file can be used to boot the E-Mu Emulator-I or to write sounds to it on the E-Mu Emulator-I.
- If the selected file is valid, the scroll bar in the main window will show the file name and number of tracks (35 tracks, 1 side)



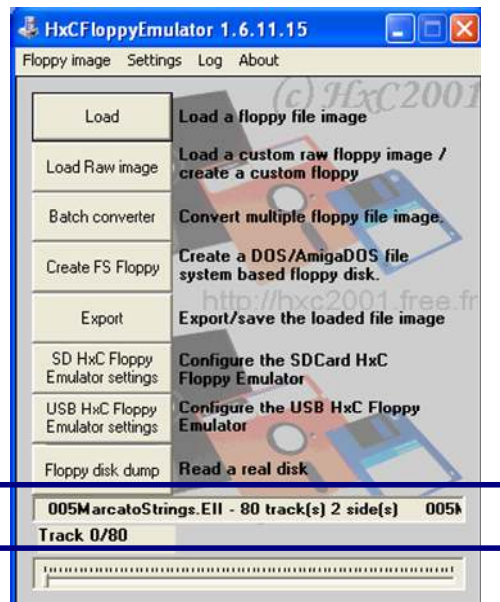
- In case of *E-Mu Emulator-II*:  
There are two options:  
Option 1: using .EII Bank Images (aka SoundDesigner for EII files)
  - Make sure that an .EMUIFD Disk Image containing at least an E-Mu Emulator-II operating system is available in the very same folder as the one containing the .EII Bank Image. Moreover make sure that this .EMUIFD Disk Image is called "EMUIIOS.EMUIFD".
    - The HxCFloppyEmulator will merge this file (in-memory) with the selected .EII Bank Image when you start the export/conversion
    - It is allowed that the EMUIIOS.EMUIFD file also contains a sound bank besides the operating system; HxCFloppyEmulator will ignore this sound bank.



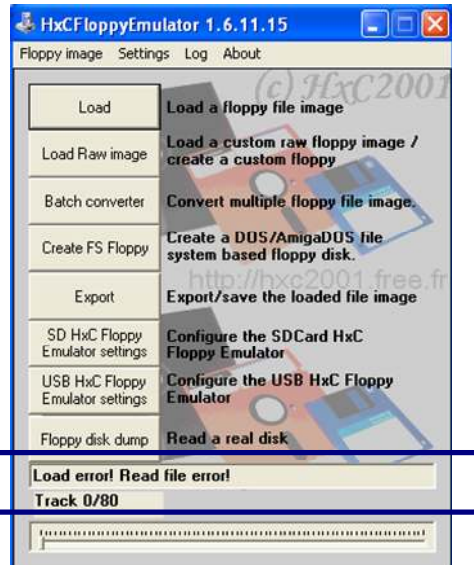
- Select an .EII Disk Image file (here: 005MarcatoStrings.EII) and press "Open"



- If the selected file is valid *and* a valid EMUIIOS.EMUIFD file is present in the same folder, the scroll bar in the main window will show the file name and number of tracks (80 tracks, 2 sides)



Note: if the EMUIIOS.EMUIFD file is not present or not valid, the scroll bar will display an error message, as shown below.



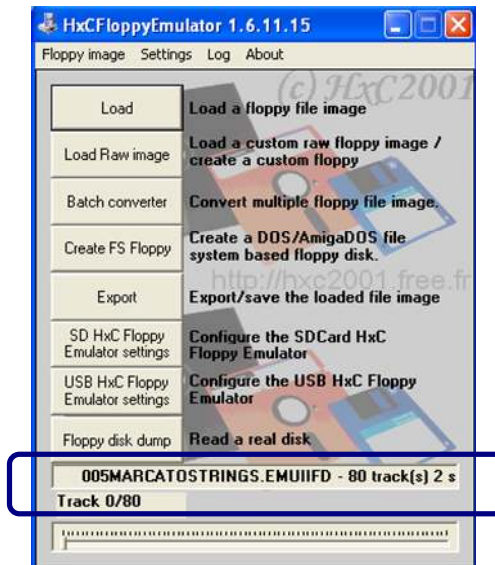
Option 2: using .EMUIFD Disk Images

- Select an .EMUIFD Disk Image file (here: 005MarcatoStrings.emufid) and press "Open"

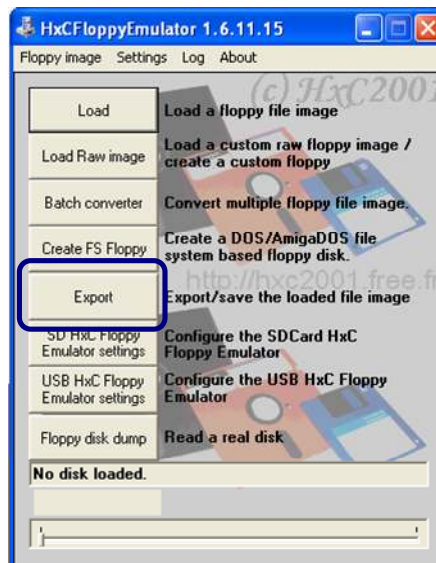


- Note: you can also select an Operating System-only .EMUIFD Disk Image, not containing any sound bank. The resulting .HFE file can be used to boot the E-Mu Emulator-II or to write sound banks, another operating system or any kind of E-Mu Emulator-II software (like the memory or scanner test software) to it on the E-Mu Emulator-II.
- If the selected file is valid, the scroll bar in the main window will show the file name and number of tracks (80 tracks, 2 sides)

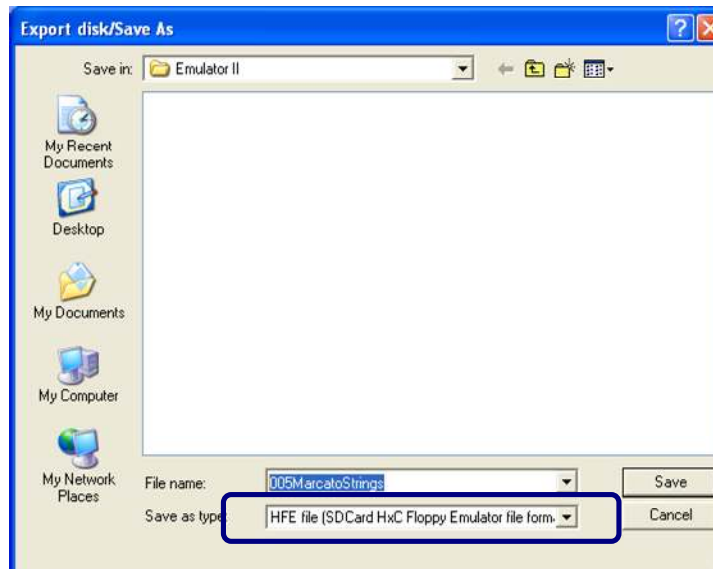




- Press the “Export” button on the main HxC window



- Make sure the “Save As Type” is set to “HFE file (SD Card HxC Floppy Emulator file format)”



- Select a folder in which the .HFE file must be saved, and provide a name for this .HFE file. In our example we use the same folder as the one containing the input files.

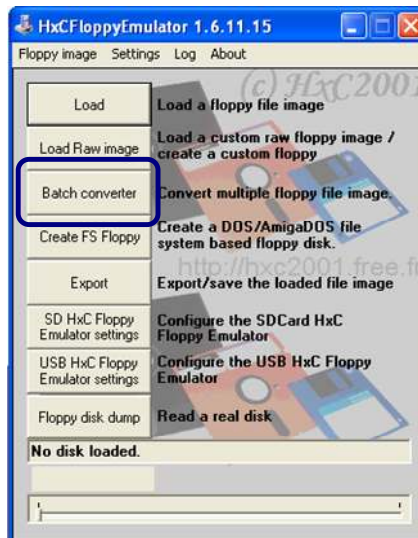
Note: HxCFloppyEmulator will suggest a file name, which is the concatenation of the input file name and the input file extension (e.g. 005MarcatoStrings\_emuiifd).

We recommend to replace this suggestion with a *shorter file name*, because the LCD display of the SD HxC is pretty small. The SD HxC will scroll names of .HFE files that don't fit in the display, which is quite annoying, especially if the file name is very long !

- Press the "Save" button.

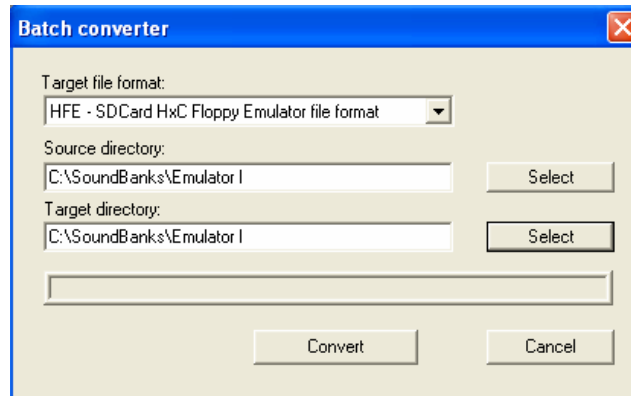
To convert files in a batch run:

- Press the "Batch converter" button in the main HxC window

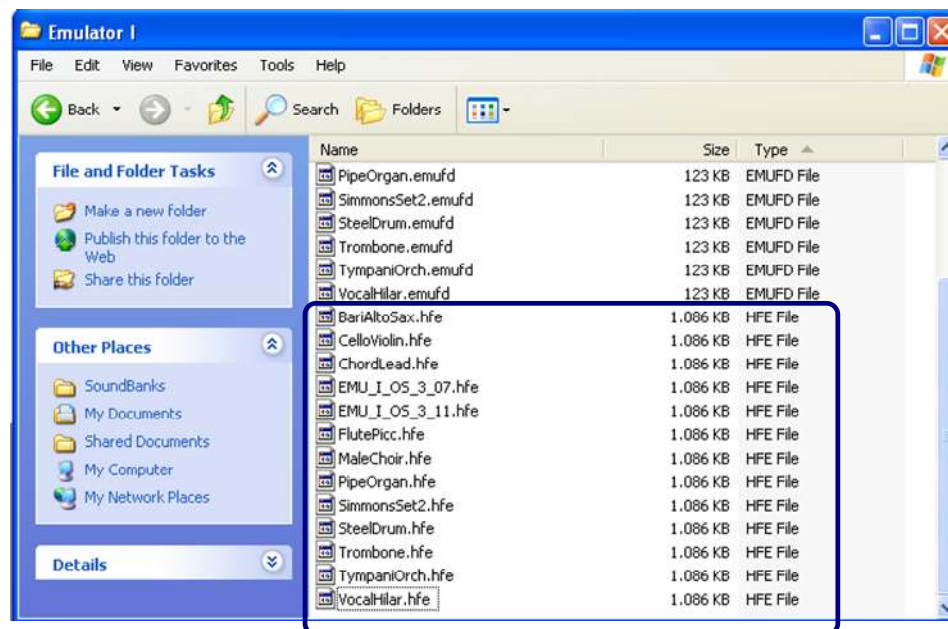
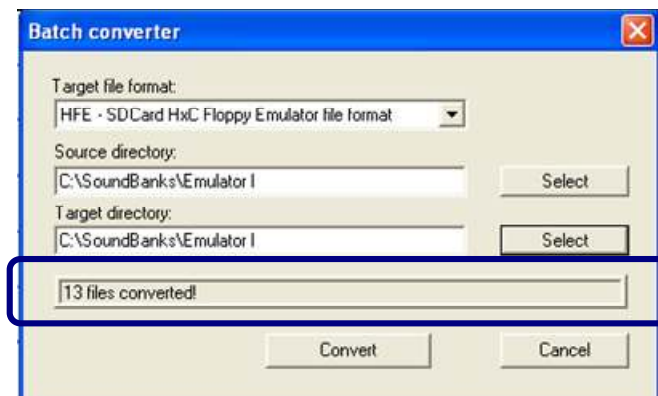


- Make sure the "Target file format" is set to "HFE file (SD Card HxC Floppy Emulator file format)"
- Define the source folder and target folder for the conversion. The source folder is the folder containing the .EMUFD, .EII or .EMUIFD files. The target folder is where the converted .HFE files will be stored.  
Again, if you are creating E-Mu Emulator-II .HFE files based on .EII Bank Images, make sure that a valid EMUIIOS.EMUIFD file is stored in the source folder. See explanation in the previous section.





- Press the “Convert” button: all files in the source folder will be converted into .HFE files in the target folder. The file name of the .HFE files is the concatenation of the input file name and the input file extension (e.g. CelloViolin\_emufd.HFE). As already mentioned, it may be wise to remove at least the “\_emufd”, “\_emuifd” or “\_eii” part of the name to make it more compact.



*All .EMUFD files have been converted into .HFE files – the names have already been made shorter*

#### 4. Copy the .HFE files to the SD Card

As explained in the first section, the SD Card must be made ready for use in the SD HxC:

- Make sure the SD Card has been formatted in FAT32 format

- Make sure the SD Card contains the HxC configuration file (HXCSDFE.CFG).
- [Optional: ] Create a folder structure on the SD Card which allow for organizing the .HFE files on the SD Card. You can navigate through these folders on the SD HxC with the left and right buttons.  
In our example, the SD Card contains separate folders for Emulator-I and Emulator-II files.

Copy the .HFE files from the previous step to the SD Card.  
This can simply be done with Windows Explorer.

Folders	Name	Size	Type
Desktop	_Blank1_OS_3_11.hfe	1.086 KB	HFE File
My Documents	_Blank2_OS_3_11.hfe	1.086 KB	HFE File
My Computer	BariAltoSax.hfe	1.086 KB	HFE File
(C:)	CelloViolin.hfe	1.086 KB	HFE File
SD (D:)	ChordLead.hfe	1.086 KB	HFE File
Emulator I	FlutePicc.hfe	1.086 KB	HFE File
Emulator II	MaleChoir.hfe	1.086 KB	HFE File
Control Panel	PipeOrgan.hfe	1.086 KB	HFE File
Shared Documents	SimmonsSet2.hfe	1.086 KB	HFE File
WebCam	SteelDrum.hfe	1.086 KB	HFE File
My Network Places	Trombone.hfe	1.086 KB	HFE File
Recycle Bin	TympaniOrch.hfe	1.086 KB	HFE File
	VocalHilar.hfe	1.086 KB	HFE File

Folders	Name	Size	Type
Desktop	_Blank1_EMU_II_OS_2_6.hfe	2.481 KB	HFE File
My Documents	_Blank2_EMU_II_OS_3_1.hfe	2.481 KB	HFE File
My Computer	004GrandPiano.hfe	2.481 KB	HFE File
(C:)	005MarcatoStrings.hfe	2.481 KB	HFE File
SD (D:)	006BassSynthesizerDrums.hfe	2.481 KB	HFE File
Emulator I	007Percussion1.hfe	2.481 KB	HFE File
Emulator II	008SoloCelloSoloViolin.hfe	2.481 KB	HFE File
Control Panel	009OrchestraTune.hfe	2.481 KB	HFE File
Shared Documents	010StackedStrings.hfe	2.481 KB	HFE File
WebCam	011AcousticGuitar.hfe	2.481 KB	HFE File
My Network Places	012Voices.hfe	2.481 KB	HFE File
Recycle Bin	013DigitalSynth.hfe	2.481 KB	HFE File

5. The SD Card is ready now; the sound banks stored on it can be loaded into the Emulator-I or Emulator-II.

### 3.2 Booting the E-Mu Emulator from the SD Card

The E-Mu Emulator-I and E-Mu Emulator-II can be booted from an .HFE file on the SD Card. The only thing you need is an .HFE file on the SD Card containing an operating system for the Emulator-I or Emulator-II.

1. Copy an .HFE file to the SD Card containing an operating system for the E-Mu Emulator-I or E-Mu Emulator-II

This .HFE file can also contain a sound bank – in that case the sound bank will automatically be loaded after booting (exactly the same way as with real floppy disks).

See section 3.1 for instructions how to create .HFE files.

2. Don't power the E-Mu Emulator yet.
3. Insert the SD Card into the SD HxC
4. Power the E-Mu Emulator.
5. Select the .HFE file containing the operating system on the SD HxC

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

Note: as long as the .HFE file has not been selected,

- The E-Mu Emulator-I will remain in "Not Ready " status, i.e. all LEDs are ON. Don't panic... in the meanwhile the E-Mu Emulator-I keeps scanning the SD HxC and it will leave this "Not Ready" status as soon as a valid bootable .HFE file has been selected.
- The E-Mu Emulator-II will keep scanning the SD HxC and the floppy drive(s) (if any floppy drive is connected to the E-Mu Emulator-II too), until you have selected a valid bootable .HFE file.

6. The E-Mu Emulator will boot, and will also load the sound bank if any is present in the .HFE file

On the E-Mu Emulator-II, the SD HxC *might* not start loading the .HFE file after you have selected it the first time after powering the E-Mu Emulator-II.

The E-Mu Emulator-II may report a "Disk Format Error" instead.

In that case, simply press the Select/Eject button on the SD HxC another two times, i.e. eject the virtual floppy disk for a short a while and then insert it again.

Normally, the E-Mu Emulator-II should then start loading the .HFE file.

This is a known problem which is not resolved yet.

#### *Note about automatic booting from last loaded floppy*

If you have set the "Load last loaded floppy" flag in the "SD HxC Floppy Emulator settings" window before generating the HXCSDFE.CFG file for the SD Card, the E-Mu Emulator will try to boot from the .HFE file that you have loaded the last time when you have used the SD Card with your E-Mu Emulator.

So, if you shut down the E-Mu Emulator after step 6, and power it up again, it will automatically try to boot from the very same .HFE file that you had selected previously in step 5.

Note however that this doesn't work on an E-Mu Emulator-II. This problem has not been resolved yet. On an E-Mu Emulator-II, the SD HxC will automatically select the last used .HFE file, *but the E-Mu Emulator-II does not succeed in loading this .HFE file*. In other words - for the time being - you always have to go through steps 1 → 6 on an Emulator-II.

### **3.3 Loading sound banks from the SD Card on the E-Mu Emulator**

1. We assume that the SD HxC is connected to the E-Mu Emulator and that the E-Mu Emulator is booted already.
2. Make sure that the SD Card in the SD HxC contains valid .HFE files for the E-Mu Emulator-I or E-Mu Emulator-II

See section 3.1 for instructions how to create .HFE files.

3. Select the .HFE file containing the sound bank that you want to load into the E-Mu Emulator.

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

4. Instruct the E-Mu Emulator to load the bank.

This is done in exactly the same way as you would do with a normal floppy disk.

*In case of E-Mu Emulator-I:*

- Press the “*Get Lower*” and/or “*Get Upper*” button and/or “*Get Seq*” button
- The E-Mu Emulator-I will start loading the sound(s) from the selected .HFE file

*In case of E-Mu Emulator-II:*

- Press the “*Disk*” button
- Press “*1*” if the SD HxC replaces the first or only floppy drive of the E-Mu Emulator-II, or press “*2*” if the SD HxC replaces the second floppy drive of the E-Mu Emulator-II.
- The E-Mu Emulator-II will start loading the sound bank from the selected .HFE file.

*Note: the SD Card in the SD HxC is hot swappable*

This means that you can eject and insert it whenever you want without having to shut down the E-Mu Emulator. Of course you can or should not do this while the E-Mu Emulator is reading or writing the SD Card.

### **3.4 Saving sound banks to the SD Card on the E-Mu Emulator**

The SD HxC supports write activity from the E-Mu Emulator-I and E-Mu Emulator-II to its SD Card. This means that you can perfectly save banks, copy disks and copy system software to the SD Card on the E-Mu Emulator-I and E-Mu Emulator-II.

As explained in the “1. Introduction” chapter, you have to save data to an *existing* .HFE file on the SD Card; the SD HxC will not create on-the-fly a brand new .HFE file for you when it detects that you want to write something to it from the E-Mu Emulator.

For this section we assume that a sound bank is already loaded in the memory of the E-Mu Emulator:

- by having loaded it from a floppy disk in a floppy drive which is still connected to the E-Mu Emulator
- by having loaded it from (another) .HFE file on the SD Card
- by having transmitted it to the E-Mu Emulator-II through RS422 (Emulator-II only)

We also assume that the SD HxC is connected to the E-Mu Emulator.

1. Make sure that the SD Card in the SD HxC contains valid .HFE files for the E-Mu Emulator-I or E-Mu Emulator-II, which *are allowed to be overwritten*.

These can be either empty .HFE files (e.g. only containing the operating system), or used .HFE files (i.e. containing a sound bank but which can be overwritten by another sound bank)

See section 3.1 for instructions how to create .HFE files.

2. Select the .HFE file on the SD HxC to which you want to save the sound bank which is currently in memory of the E-Mu Emulator.

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

3. Instruct the E-Mu Emulator to save the bank.

This is done in exactly the same way as you would do with a normal floppy disk

*In case of E-Mu Emulator-I:*

- Press the “Save” button.
- The E-Mu Emulator-I will start saving the sounds and sequences to the selected .HFE file

*In case of E-Mu Emulator-II:*

- Press the “Disk” button
- Press “7” (Save Bank)
- Conform that the SD HxC is OK as suggested destination drive by pressing “Y”; this suggestion is only made by the E-Mu Emulator-II if it does not detect a floppy disk in the remaining floppy drive

or

Press “1” if the SD HxC replaces the first or only floppy drive of the E-Mu Emulator-II, or press “2” if the SD HxC replaces the second floppy drive of the E-Mu Emulator-II. This must be done if both the floppy drive and the SD HxC contain a disk.

- The E-Mu Emulator-II will start saving the sound bank to the selected .HFE file.

### **3.5 Loading E-Mu Emulator files from the SD Card on a Windows PC**

.HFE files on the SD Card can be translated back to E-Mu Emulator-I and E-Mu Emulator-II Disk Image files.

This means that after you have saved a sound bank to an .HFE file in the E-Mu Emulator, you can insert the SD Card in your Windows PC and use the HxCFloppyEmulator software to transform it into a Disk Image.

This Disk Image can then be used in other software packages such as EMXP.

1. Make sure the SD Card in the SD HxC contains valid .HFE files for the E-Mu Emulator-I or E-Mu Emulator-II.

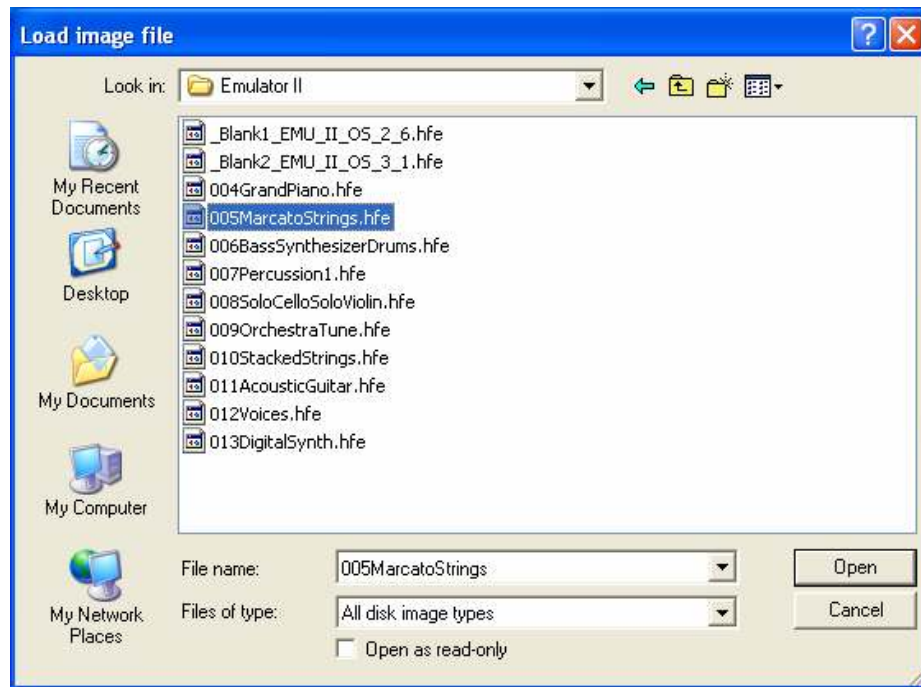
See section 3.1 for instructions how to create .HFE files with the Windows HxCFloppyEmulator software.

See section 3.4 for instructions how to save banks to .HFE files on the E-Mu Emulator.

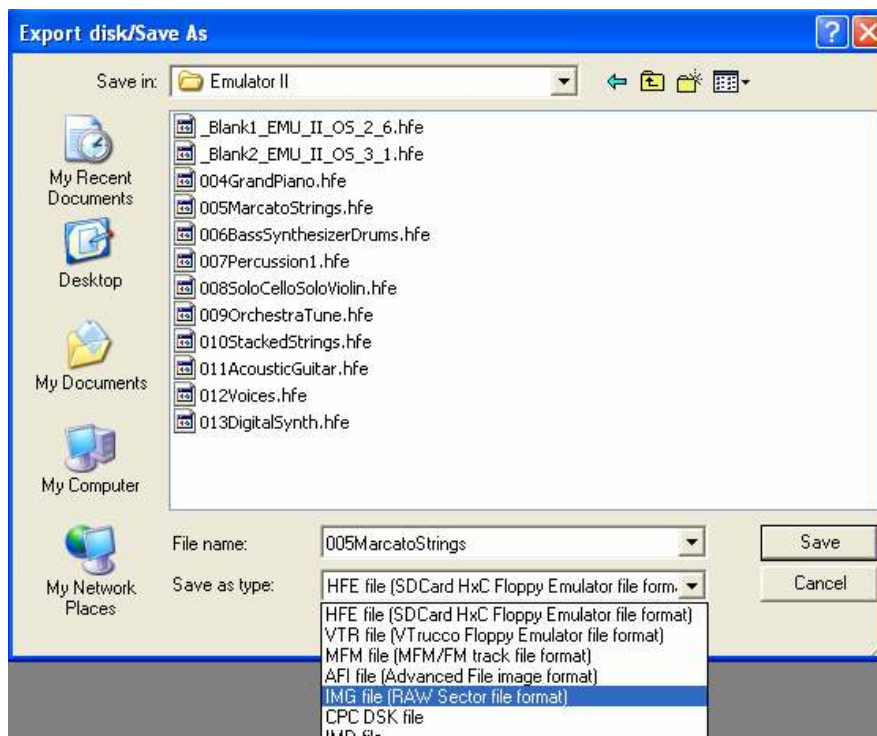
2. Start the HxCFloppyEmulator software
3. Select the .HFE files and export them as Disk Image files.  
*The procedure is similar with the one explained in section 3.1. Since section 3.1 is fully illustrated with screen shots of the HxCFloppyEmulator software, we have kept the number of pictures in section 3.5 to a minimum.*

To convert files one by one:

- Press the “Load” button in the main HxC window
- Navigate to the folder containing the E-Mu Emulator .HFE files on the SD Card (or to the folder on your computer’s disk if you have copied the .HFE files to your computer first)  
In the example shown below, we access the SD Card’s folders for Emulator-I and Emulator-II .HFE files directly.
- In case of E-Mu Emulator-I:
  - Select an .HFE file and press “Open”
  - If the selected file is a valid E-Mu Emulator-I file, the scroll bar in the main window will show the file name and correct number of tracks (35 tracks, 1 side)
- In case of E-Mu Emulator-II:
  - Select an .HFE file (here: 005MarcatoStrings.hfe) and press “Open”



- If the selected file is a valid E-Mu Emulator-II file, the scroll bar in the main window will show the file name and correct number of tracks (80 tracks, 2 sides)
- Press the “Export” button on the main HxC window
- Set the “Save As Type” to “IMG file (RAW Sector file format)”



- Select a folder in which the .IMG file must be saved, and provide a name for this .IMG file. In our example we use the folder Emulator-II on the computer's hard disk

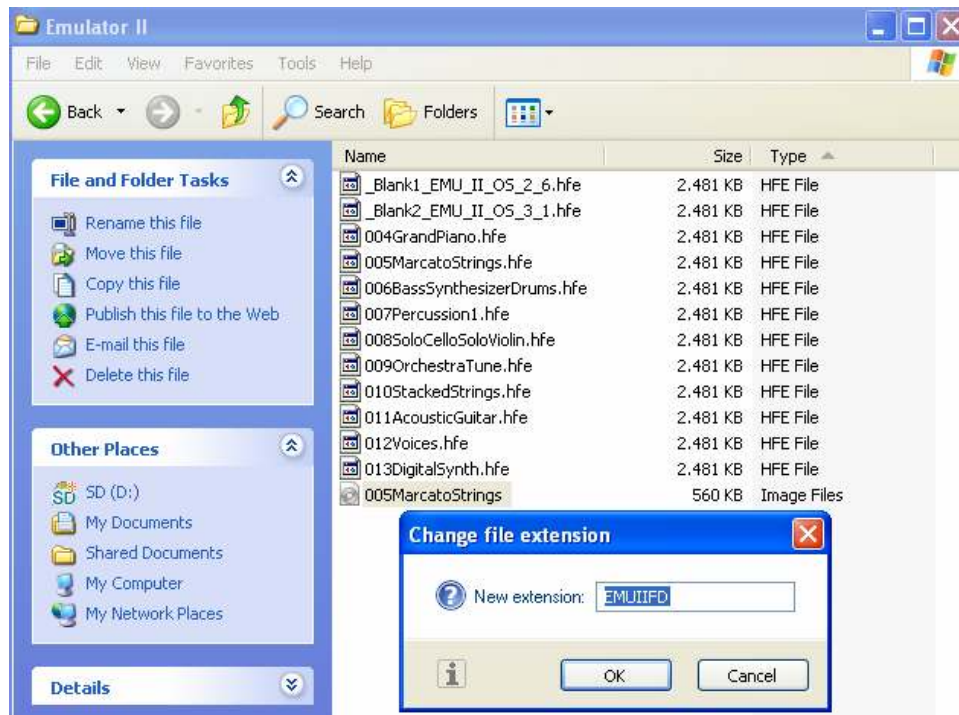
Note: HxCFloppyEmulator will suggest a file name, which is the concatenation of the input file name and the input file extension (e.g. 005MarcatoStrings.hfe).

In our example we have replaced this suggested name by 005MarcatoStrings

- Press the “Save” button.

- Replace the file extension of the generated .IMG file by
  - .EMUFD for E-Mu Emulator-I Disk Images
  - .EMUIFD for E-Mu Emulator-II Disk Images

This can be done with the RENAME command in a DOS Window, or (preferably) with one of the free softwares for changing file extensions<sup>6</sup>



To convert files in a batch run:

- Press the “Batch converter” button in the main HxC window
- Set the “Target file format” to “IMG file (RAW Sector file format)”
- Define the source folder and target folder for the conversion. The source folder is the folder containing the .HFE files. The target folder is where the converted .IMG files will be stored.
- Press the “Convert” button: all files in the source folder will be converted into .IMG files in the target folder. The file name of the .IMG files is the concatenation of the input file name and the input file extension (e.g. 005MarcatoStrings\_emuiifd.IMG).
- Replace the file extension of the generated .IMG files by
  - .EMUFD for E-Mu Emulator-I Disk Images
  - .EMUIFD for E-Mu Emulator-II Disk Images

This can be done with the RENAME command in a DOS Window, or (preferably) with one of the free softwares for changing file extensions<sup>6</sup>

*Note: .EII Bank Images can not be generated by the HxCFloppyEmulator software.*

Although the HxCFloppyEmulator software is capable of using .EII Bank Image files as input files for conversion to .HFE files, the other way around is not supported. The software can only generate Disk Image files (.EMUIFD) for the E-Mu Emulator-II.

To convert the .EMUIFD files to .EII Bank Image files, you can use EMXP.

- First copy the .EMUIFD file(s) to the \Images folder of EMXP and start EMXP.
- Then select “3. Manage Emu Emulator II Images” → “2. Manage Emulator II Disk Images” → (select one or more .EMUIFD files) → “1. Convert to Emulator II Bank Image” → (define destination Bank Image file [new or existing] for each of the selected .EMUIFD Disk Images)

<sup>6</sup> Example: the free Change File Extension Shell Menu from T800 Productions, which adds the file extension changing option to the Windows Explorer’s file right click menu

### 3.6 Copying floppy disks to the SD Card on the E-Mu Emulator

It is possible to copy floppy disks to the SD Card on the E-Mu Emulator-I and E-Mu Emulator-II.

As an alternative, you can also use a 5.25 floppy disk drive and a Kryoflux disk controller and copy the disks on your computer.

As explained before, the SD Card must contain a valid E-Mu Emulator .HFE file in order to copy or write data to it. See also section 3.4.

#### E-Mu Emulator-I

The E-Mu Emulator-I sampler is a single drive device. This means that the SD HxC and the floppy drive can not be used simultaneously.

However, as explained in section “2. Installing the HxC...”, there are possibilities to swap between the E-Mu Emulator-I floppy drive and the SD HxC:

- Both drives – SD HxC and floppy drive – must be connected to the E-Mu Emulator-I's power supply
- You can swap between the SD HxC and floppy drive while the E-Mu Emulator-I is powered:
  - Either by using a switch which routes wire 16 of the 34 pins ribbon cable to either the SD HxC or the floppy drive [recommended]
  - or by unplugging the 34 pins connector from one drive and plugging it into the other drive [not recommended]

*Important note:* although this configuration has successfully been tested on the E-Mu Emulator-I, it is without any doubt an “unnatural” configuration which has rarely been used so far and which was also not common practice when using real floppy drives. As a result, we're not sure that it is the most reliable way of working, and hence can not guarantee that no side-effects (or even damage) will occur to the hardware.

#### Copying sounds and sequences

We assume that the E-Mu Emulator-I is booted already and that the configuration of floppy drive and SD HxC as explained above has been installed.

1. Make sure the SD Card in the SD HxC contains a valid .HFE file for the E-Mu Emulator-I which *is allowed to be overwritten*.

See section 3.1 for instructions how to create .HFE files.

2. Make sure the floppy drive is connected to the E-Mu Emulator-I with the 34 pins cable; if a switch has been installed [recommended], this means you should set it to “floppy drive”.
3. Load the sounds and sequences from the floppy drive into the memory of the E-Mu Emulator-I
  - Press the “Get Lower”, “Get Upper” and “Get Seq” button
  - The E-Mu Emulator-I will start loading the sound(s) and sequence(s) from the floppy disk
4. Switch the 34 pins cable from the E-Mu Emulator-I to the SD HxC instead of to the floppy drive; if a switch has been installed [recommended], this means you should change it to “SD HxC”.
5. Select the .HFE file on the SD HxC to which you want to copy the floppy disk.

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

6. Save the sounds and sequences to the selected .HFE file on the SD Card:
  - Press the “Save” button.
  - The E-Mu Emulator-I will start saving the sounds and sequences to the selected .HFE file



### *Copying the operating system and other system software*

1. Don't power the E-Mu Emulator-I yet.
2. Make sure the SD Card in the SD HxC contains a valid .HFE file for the E-Mu Emulator-I of which the system software *is allowed to be overwritten*.

See section 3.1 for instructions how to create .HFE files.

3. Make sure the floppy drive is connected to the E-Mu Emulator-I with the 34 pins cable; if a switch has been installed [recommended], this means you should set it to "floppy drive".
4. Enter the floppy disk containing the system software that you want to copy, e.g.:
  - Floppy disk containing the operating system
  - Floppy disk containing the User Format software
  - Floppy disk containing the Multi Sampling software
  - ...
5. Power the E-Mu Emulator-I.  
The system software is being loaded.
6. Select the .HFE file on the SD Card to which you want to copy the system software.

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

7. Switch the 34 pins cable from the E-Mu Emulator-I to the SD HxC instead of to the floppy drive; if a switch has been installed [recommended], this means you should change it to "SD HxC".
8. Save the system software by following the appropriate "software replication" instructions as described in the E-Mu Emulator-I user manual. Examples:

*To copy the Operating System, the Multi Sampling software, etc...:*

- Press the "B" button on the Sequencer panel
- Press the "8 [Stop]" button on the Sequencer panel
- The software is being copied.

*To copy the User Format software:*

- Press the "Dynamic" button on the main panel
- The software is being copied.

### **E-Mu Emulator-II**

The E-Mu Emulator-II sampler can be used as a dual drive device. This means that the SD HxC and the floppy drive can be used simultaneously.

As explained in section "2. Installing the HxC..." the SD HxC must be installed as either Drive 1 or Drive 2.

- If the SD HxC has been installed as Drive 1 and the floppy drive as Drive 2, copying disks with the "Disk" → "4. Copy Disk" and "Special" → "14. Write Software" functions is not possible because these functions can only copy from Drive 1 to Drive 2.  
You can however copy the presets, voices, samples and sequences of *performance disks* by loading the sound bank from Drive 2 ("Disk" → "2. Get Bank Disk 2") and saving it to the SD Card in Drive 1 ("Disk" → "7. Save Bank" → "1").  
See section 3.4 for instructions how to save banks to the SD Card.  
Copying *library disks* is not possible.
- If the SD HxC has been installed as Drive 2 and the floppy drive as Drive 1, copying disks with the "Disk" → "4. Copy Disk" and "Special" → "14. Write Software" functions is possible. See instructions below.
- If both SD HxC and floppy drive are installed as Drive 1, copying disks with the "Disk" → "4. Copy Disk" and "Special" → "14. Write Software" functions is also possible. In that case, the E-Mu Emulator-II is behaving as a single drive unit. For switching between floppy drive and

SD HxC, you will have to swap the 34 pins ribbon cable from the E-Mu Emulator-II between the two drives (preferably with a switch) while both drives and the E-Mu Emulator-II are powered.

*Important note:* although this configuration has successfully been tested on the E-Mu Emulator-II, it is without any doubt an “unnatural” configuration which has rarely been used so far and which was also not common practice when using real floppy drives. As a result, we’re not sure that it is the most reliable way of working, and hence can not guarantee that no side-effects (or even damage) will occur to the hardware.

### *Copying presets, voices, samples and sequences*

We assume that the E-Mu Emulator-II is booted already and that the 2<sup>nd</sup> or 3<sup>th</sup> configuration of floppy drive and SD HxC has been installed (as explained above).

We also assume that the “Disk → Copy Disk” function of the E-Mu Emulator-II is used.

1. Make sure the SD Card in the SD HxC contains a valid .HFE file for the E-Mu Emulator-II which is *allowed to be overwritten*.

See section 3.1 for instructions how to create .HFE files.

2. Select the .HFE file to which you want to copy the floppy disk.

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

3. *Only if both SD HxC and floppy drive are installed as Drive 1:* Make sure the floppy drive is connected to the E-Mu Emulator-II with the 34 pins cable; if a switch has been installed [recommended], this means you should set it to “floppy drive”.

4. Copy the disk:
  - Press the “Disk” button
  - Press “4” for starting the Copy Disk function
  - Answer “Y” when the E-Mu Emulator-II asks if memory can be erased

*If the floppy drive is installed as Drive 1 and the SD HxC as Drive 2:*

- Confirm that the source floppy disk is in Drive 1 and the destination disk is in Drive 2 (= .HFE file has been selected) by pressing “ENTER”
- The E-Mu Emulator-II will start copying the floppy disk to the SD Card

*If both the floppy drive and the SD HxC are installed as Drive 1:*

- Confirm that the source floppy disk is in the drive (= floppy disk in Drive 1) by pressing “ENTER”.
- The E-Mu Emulator-II starts loading the floppy disk into memory
- When the E-Mu Emulator-II requests to put the destination disk in the drive, switch the 34 pins cable from the E-Mu Emulator-II to the SD HxC instead of to the floppy drive. If a switch has been installed [recommended], this means you should change it to “SD HxC”.
- Confirm that the destination disk is in the drive (= .HFE file selected on SD Card in Drive 1) by pressing “ENTER”.
- The E-Mu Emulator-II starts saving the memory to the SD Card.

Note that the Copy Disk function does not copy the operating system.

### *Copying the operating system and other system software*

For copying E-Mu Emulator-II system software the “Special → Write Software” function of the E-Mu Emulator-II is used.

1. Make sure the SD Card in the SD HxC contains a valid .HFE file for the E-Mu Emulator-II of which the system software *is allowed to be overwritten*.

See section 3.1 for instructions how to create .HFE files.

2. Select the .HFE file to which you want to copy the system software floppy disk.

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

3. *Only if both SD HxC and floppy drive are installed as Drive 1:* Make sure the floppy drive is connected to the E-Mu Emulator-II with the 34 pins cable; if a switch has been installed [recommended], this means you should set it to “floppy drive”.
4. Load the software to be copied:
  - Press the “*Special*” button.
  - Type “14” to select the “Write Software” function.
  - Insert the floppy disk containing the software that you want to copy, e.g.:
    - A floppy disk containing an operating system
    - A floppy disk containing the scanner test software
    - A floppy disk containing the memory test software
    - ...
  - Confirm that the E-Mu Emulator-II’s memory can be erased by pressing “Y”.
  - The E-Mu Emulator-II is loading the system software into its memory
5. *Only if both SD HxC and floppy drive are installed as Drive 1:* switch the 34 pins cable from the E-Mu Emulator-II to the SD HxC instead of to the floppy drive. If a switch has been installed [recommended], this means you should change it to “SD HxC”.
6. Confirm that the destination disk is in Drive 1 (= selected .HFE file on the SD Card) by pressing “ENTER”.
7. The E-Mu Emulator-II is now saving the system software to the .HFE file on the SD Card.

### **3.7 Copying files from the SD Card to floppy disk on the E-Mu Emulator**

This is the opposite action as the one described in section 3.6.

#### ***E-Mu Emulator-I***

The E-Mu Emulator-I sampler is a single drive device. This means that the SD HxC and the floppy drive can not be used simultaneously.

However, as explained in section “2. *Installing the HxC...*”, there are possibilities to swap between the E-Mu Emulator-I floppy drive and the SD HxC:

- Both drives – SD HxC and floppy drive – must be connected to the E-Mu Emulator-I’s power supply
- You can swap between the SD HxC and floppy drive while the E-Mu Emulator-I is powered:
  - Either by using a switch which routes wire 16 of the 34 pins ribbon cable to either the SD HxC or the floppy drive [recommended]
  - or by unplugging the 34 pins connector from one drive and plugging it into the other drive [not recommended]

*Important note:* although this configuration has successfully been tested on the E-Mu Emulator-I, it is without any doubt an “unnatural” configuration which has rarely been used so far and which was also not common practice when using real floppy drives. As a result, we’re not sure that it is the most reliable way of working, and hence can not guarantee that no side-effects (or even damage) will occur to the hardware.

#### ***Copying sounds and sequences***

1. Make sure the floppy drive of the E-Mu Emulator-I contains a floppy disk which has been formatted for E-Mu Emulator-I and which can be overwritten.

2. Select the .HFE file on the SD Card which contains the sounds and sequences that you want to copy to the floppy disk.  
  
(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)  
  
See section 3.1 for instructions how to create .HFE files.
3. Make sure the SD HxC is connected to the E-Mu Emulator-I with the 34 pins cable; if a switch has been installed [recommended], this means you should set it to "SD HxC".
4. Load the sounds and sequences from the selected .HFE file on the SD Card into the memory of the E-Mu Emulator-I
  - Press the "Get Lower", "Get Upper" and "Get Seq" button
  - The E-Mu Emulator-I will start loading the sound(s) and sequence(s) from the SD Card
5. Switch the 34 pins cable from the E-Mu Emulator-I to the floppy drive instead of to the SD HxC; if a switch has been installed [recommended], this means you should change it to "Floppy Drive".
6. Save the sounds and sequences to the floppy disk in the E-Mu Emulator-I's floppy drive:
  - Press the "Save" button.
  - The E-Mu Emulator-I will start saving the sounds and sequences to the floppy disk.

#### *Copying the operating system and other system software*

1. Don't power the E-Mu Emulator-I yet.
2. Make sure the floppy drive of the E-Mu Emulator-I contains a floppy disk which has been formatted for E-Mu Emulator-I and which can be overwritten.
3. Make sure the SD HxC is connected to the E-Mu Emulator-I with the 34 pins cable; if a switch has been installed [recommended], this means you should set it to "SD HxC".
4. Power the E-Mu Emulator-I.  
If the E-Mu Emulator-I starts booting immediately from the last used .HFE file, and this .HFE file is NOT the file containing the system software that you want to copy:
  - Select the .HFE file on the SD Card which contains the system software that you want to copy to the floppy disk.  
  
(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)  
  
This can be an .HFE file containing e.g.:
    - the operating system
    - the User Format software
    - the Multi Sampling software
    - ...
  - Re-boot the E-Mu Emulator-I.
  - The E-Mu Emulator-I will now load the system software that you want to copy.
5. Verify that the floppy drive contains the formatted floppy disk to which the system software can be written.
6. Switch the 34 pins cable from the E-Mu Emulator-I to the floppy drive instead of to the SD HxC; if a switch has been installed [recommended], this means you should change it to "Floppy Drive".
7. Save the system software by following the appropriate "software replication" instructions as described in the E-Mu Emulator-I user manual. Examples:

#### *To copy the Operating System, the Multi Sampling software, etc...:*

- Press the "B" button on the Sequencer panel
- Press the "8 [Stop]" button on the Sequencer panel
- The software is being copied.

To copy the User Format software:

- Press the “Dynamic” button on the main panel
- The software is being copied.

## **E-Mu Emulator-II**

The E-Mu Emulator-II sampler can be used as a dual drive device. This means that the SD HxC and the floppy drive can be used simultaneously.

As explained in section “2. Installing the HxC...”, the SD HxC must be installed as either Drive 1 or Drive 2.

- If the SD HxC has been installed as Drive 1 and the floppy drive as Drive 2, copying “disks” from SD Card to floppy disk with the “Disk” → “4. Copy Disk” and “Special” → “14. Write Software” functions is possible. See instructions below.
- If the SD HxC has been installed as Drive 2 and the floppy drive as Drive 1, copying “disks” from SD Card to floppy disk with the “Disk” → “4. Copy Disk” and “Special” → “14. Write Software” functions is not possible because these functions can only copy from Drive 1 to Drive 2.

You can however copy the presets, voices, samples and sequences of *performance disk .HFE files* by loading the sound bank from the SD Card in Drive 2 (“Disk” → “2. Get Bank Disk 2”) and saving it to the floppy disk in Drive 1 (“Disk” → “7. Save Bank” → “1”).

See section 3.4 for instructions how to load banks from the SD Card.

Copying *library disk .HFE files* is not possible.

- If both SD HxC and floppy drive are installed as Drive 1, copying “disks” from SD Card to floppy disk with the “Disk” → “4. Copy Disk” and “Special” → “14. Write Software” functions is also possible. In that case, the E-Mu Emulator-II is behaving as a single drive unit. For switching between floppy drive and SD HxC, you will have to swap the 34 pins ribbon cable from the E-Mu Emulator-II between the two drives (preferably with a switch) while both drives and the E-Mu Emulator-II are powered.

*Important note:* although this configuration has successfully been tested on the E-Mu Emulator-II, it is without any doubt an “unnatural” configuration which has rarely been used so far and which was also not common practice when using real floppy drives. As a result, we’re not sure that it is the most reliable way of working, and hence can not guarantee that no side-effects (or even damage) will occur to the hardware.

### *Copying presets, voices, samples and sequences*

We assume that the E-Mu Emulator-II is booted already and that the 1<sup>st</sup> or 3<sup>rd</sup> configuration of floppy drive and SD HxC has been installed (as explained above).

We also assume that the “Disk → Copy Disk” function of the E-Mu Emulator-II is used.

1. Make sure the floppy drive of the E-Mu Emulator-II contains a floppy disk which has been formatted for E-Mu Emulator-II and which can be overwritten.

See section 3.1 for instructions how to create .HFE files.

2. Select the .HFE file on the SD Card which contains the sound bank that you want to copy to the floppy disk.

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

See section 3.1 for instructions how to create .HFE files

3. *Only if both SD HxC and floppy drive are installed as Drive 1:* Make sure the SD HxC is connected to the E-Mu Emulator-II with the 34 pins cable; if a switch has been installed [recommended], this means you should set it to “SD HxC”.
4. Copy the disk:

- Press the “Disk” button
- Press “4” for starting the Copy Disk function
- Answer “Y” when the E-Mu Emulator-II asks if memory can be erased

*If the SD HxC is installed as Drive 1 and the floppy drive as Drive 2:*

- Confirm that the source disk is in Drive 1 (= .HFE file that has been selected) and the destination floppy disk is in Drive 2 by pressing “ENTER”
- The E-Mu Emulator-II will start copying the sound bank from the SD Card’s .HFE file to the floppy disk

*If both the floppy drive and the SD HxC are installed as Drive 1:*

- Confirm that the source disk is in the drive (= .HFE file that has been selected on the SD Card in Drive 1) by pressing “ENTER”.
- The E-Mu Emulator-II starts loading the .HFE file’s sound bank or library into memory
- When the E-Mu Emulator-II requests to put the destination disk in the drive, switch the 34 pins cable from the E-Mu Emulator-II to the floppy drive instead of to SD HxC. If a switch has been installed [recommended], this means you should change it to “Floppy Drive”.
- Confirm that the destination floppy disk is in the drive by pressing “ENTER”.
- The E-Mu Emulator-II starts saving the sound bank or library to the floppy disk.

Note that the Copy Disk function does not copy the operating system.

### *Copying the operating system and other system software*

For copying E-Mu Emulator-II system software the “Special → Write Software” function of the E-Mu Emulator-II is used.

1. Make sure the floppy drive of the E-Mu Emulator-II contains a floppy disk which has been formatted for E-Mu Emulator-II and which can be overwritten.

See section 3.1 for instructions how to create .HFE files.

2. Select the .HFE file to which you want to copy the system software floppy disk.

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

3. Load the software to be copied:
  - Press the “Special” button.
  - Type “14” to select the “Write Software” function.
  - *Only if both SD HxC and floppy drive are installed as Drive 1:* Make sure the SD HxC is connected to the E-Mu Emulator-II with the 34 pins cable; if a switch has been installed [recommended], this means you should set it to “SD HxC”.
  - Select the .HFE file on the SD Card which contains the system software that you want to copy to the floppy disk.

(use the previous/next buttons to navigate through the folders and files on the SD Card, use the select/eject button to select folders and to finally select the .HFE file you need)

This can be an .HFE file containing e.g.:

- an operating system
- the scanner test software
- the memory test software
- ...
- Confirm that the E-Mu Emulator-II’s memory can be erased by pressing “Y”.
- The E-Mu Emulator-II is loading the system software from the .HFE file into its memory

4. *Only if both SD HxC and floppy drive are installed as Drive 1:* switch the 34 pins cable from the E-Mu Emulator-II to the floppy drive instead of to the SD HxC. If a switch has been installed [recommended], this means you should change it to “Floppy Drive”.

5. Confirm that the destination floppy disk is in Drive 1 by pressing *"ENTER"*.

The E-Mu Emulator-II is now saving the system software to the floppy disk.

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