

Floppy Drive Replacement

Introduction

Dear Wave User,

due to the fact that floppy disks become hard to find more and more and the same is fact for a potential replacement of the floppy drive, I started to search for a replacement of the floppy drive.

This document gives you an introduction to what I found. It describes the handling and the installation. These pages can be printed out and added to your manual if you like. *Note:* Please do not care about the dust on my Wave - nevertheless it often is used ☺.

So, I wish you a lot of fun with the Wave and to speak in the words of Till Kopper "keep on turning these knobs".

Werner Schönenberger, August, 2009
(werner.schoenenberger@gmx.ch)



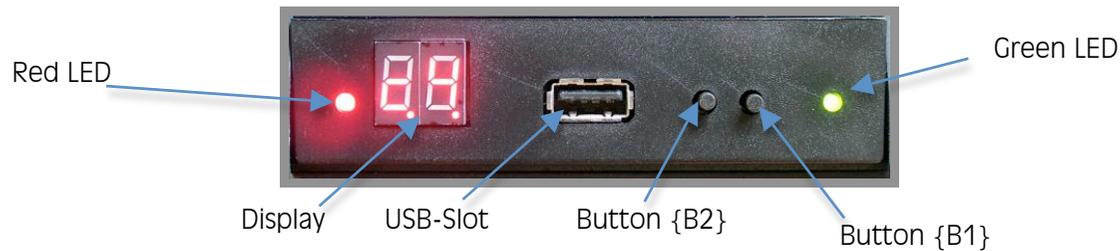
Features

The following picture shows the Floppy-Emulator installed in the Wave.

It offers the use of prepared USB sticks, which can hold the content of up to 100 floppies (1.44MB) on the stick. These floppies are represented by simple folders with a pre-defined folder name. Please note that it is not possible to address more than 100 floppies per stick. Therefore any USB stick with 144 MB and more can be used to emulate the floppies. Please also note that remaining memory on the stick can be used for your personal purpose without limitation.

The USB stick can be prepared on any PC or Mac to work with the Floppy-Emulator.

The following picture shows the front of the Floppy-Emulator and its components.



The buttons {B1} and {B2} are used to select the different emulated floppies by increments and decrements. The current floppy id is shown in the display. Any number between **00** and **99** is valid.

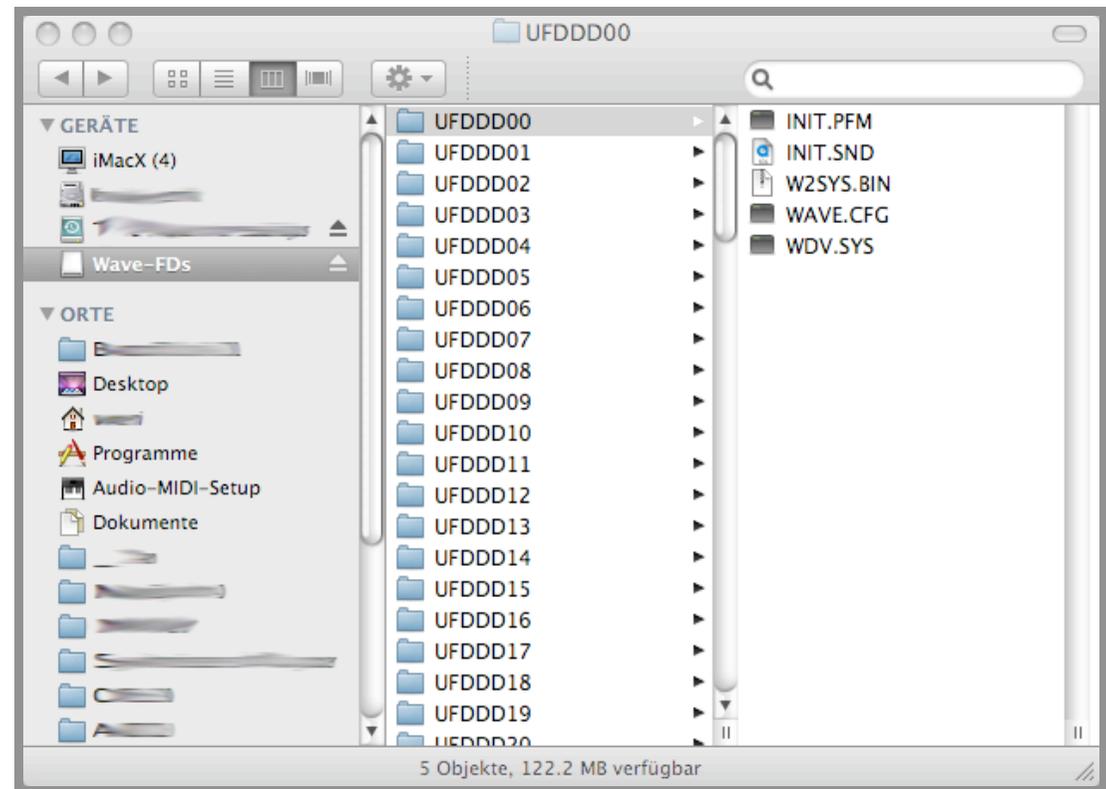
The green LED on the right indicates the power state. The red LED on the left shows an activity of the Floppy-Emulator as the indicator in the original floppy drive does. This means access to the file system.

Note: Please note that as long as the LED is switched on or the two dots in the display are switched on, the USB stick may not be removed, otherwise data might be lost.

Stick Preparation

To use an USB stick with a Wave, it has to be prepared by a PC or Mac. The preparation happens in two steps:

1. The USB stick needs a well-defined folder structure that allows the Floppy-Emulator to access the different floppies. The names of the folders have the following format: *UFDDDnn*, where *nn* represents the floppy number in a range from *00* to *99*. E.g. *UFDDD00* represents "floppy #0". The following picture shows the floppy structure displayed on a Mac where the first 20 floppies are displayed.



Note: in the Appendix you will find the code for an MS-DOS batch file that can be run on Windows systems that will prepare the folder structure on a PC. Also an applescript for Mac is attached which prepares the USB stick.

- "floppy #0" (**F#00**) has to contain the Wave OS. Unfortunately on a cold start, the Wave only can read from **F#00**. Therefore make sure that **UFDDDD00** contains the files: W2SYS.BIN, WDV.SYS, INIT.PFM & INIT.SND (see picture above). You have to copy these files from a floppy or from your hard disk.

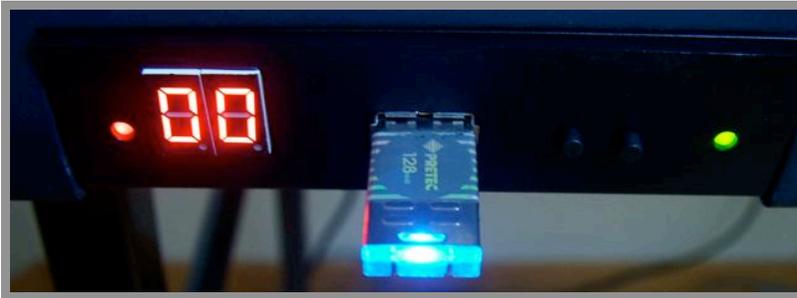
Note: Copying the Wave OS can be done by the batch file and the applescript that are described in the appendix.

After these steps, the USB stick is ready to be used with your Wave equipped by the Floppy-Emulator.

Operation

When powering on the Wave, the Floppy-Emulator initializes and then displays **C4**. The green and the red LED is on and the Wave displays ****** No System Disk ******.

Inserting a prepared stick will change to first to **00**, with the red and green LED still on. During this phase data is copied from the stick to the Floppy-Emulator. After a short time, the display will switch to **00**, then the red LED will be switched off and the Wave will start to boot. The red LED will go on during the second phase to load additional files.



Note: Please note that you also can power on the Wave with the stick already inserted. In this case the Wave will start booting from **F#00**.

To change a "floppy" simply press the button {B1} to increase the floppy number. E.g. if **F#02** is active, the display shows **02**. Pressing {B1} will change the display to **02**, with the red LED switched on. After short time it will change to **03**, with the red LED switched off. Now **F#03** is "inserted". Please do not forget to select [DiskChange] at the Wave if you are already in the Disk menu to notify the instrument the change of a

"floppy". This is necessary since the Floppy-Emulator simply replaces the original floppy drive and acts independently.

In the same way, pressing button {B2} will decrease the floppy number.

Note: Whenever the red LED on the left side as well as the two dots in the display are switched off, the USB stick can be safely removed.

Remarks

If you are in the disk menu and switch the floppy by pressing the buttons {B1} and {B2}, the display shows e.g. to **0.2**, as mentioned above. If you press [DiskChange] before the two dots in the display are switched of, you might get the following message.



You have to press <Cancel> and restart the process. The error just indicates that the Floppy Emulator was not ready.

Keep in mind that

- the red LED on the left side indicates activity (access) of the Floppy-Emulator by the Wave
- the two dots in the display indicate activity (access) of the USB stick by the Floppy-Emulator.

Installation

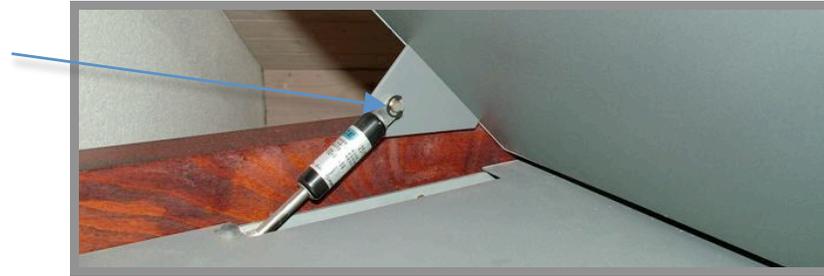
General comment: During production time of the Wave a couple of changes were made to some details in the housing. Therefore the installation might differ in some details from the description below. Whenever those differences are known, they will be noted below.



To install the floppy, the wheel and floppy module of the housing of Wave has to be removed.

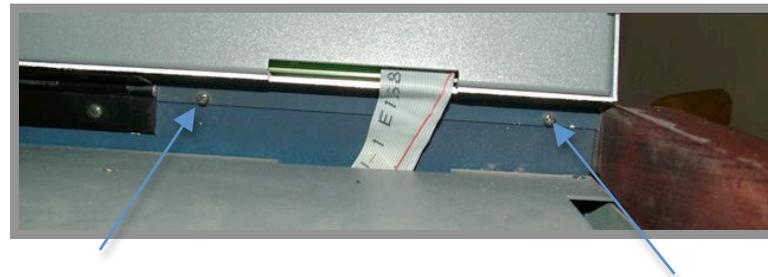
Note: The headphones connector might be mounted in different ways. In this example the headphones connector is mounted on the bottom plate. In other examples, the headphones connector is mounted to the wheel and floppy module housing.

To remove the housing, first the front panel has to be lifted. This is done the easiest with the help of a second person. First remove the lockers at the gas springs. This can be carefully be done by the use of a screwdriver or by strong fingernails. Do not lose the lockers. After this step you can pull out both gas springs.



Hint to remove the lockers: Place the tip of the screwdriver inside one of the two inside grooves of the locker and while pushing the locker away from the centre shaft, press the locker/shock tip between your thumb/index finger - the locker won't fly and will end up between thumb and index finger.

The gas springs will plunge into the housing and the panel can be turned upright. Please take care not to turn the panel more than to vertical direction; otherwise it might damage the paint. As a next step you have to remove two screws of the wheel module at the back on the right side. Use a Philips screwdriver. Then lay down the panel to the back.



Next remove the two screws at the bottom of the housing, which held the wheel housing. Again use the Philips screwdriver.



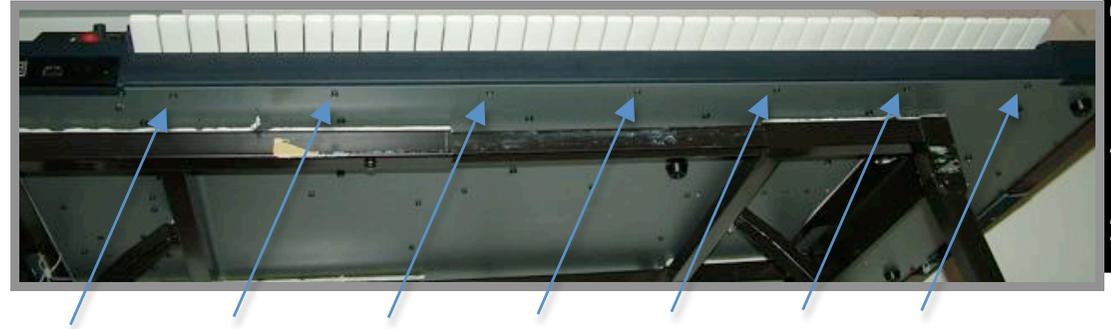
Now it should be possible to remove the wheel housing. Be careful to not harm the wooden side panels or the housing itself.

Note: Some of the Waves have three screws instead of two, which have to be removed. Please note also the two screws in the picture, which held the headphone connector to the base plate.

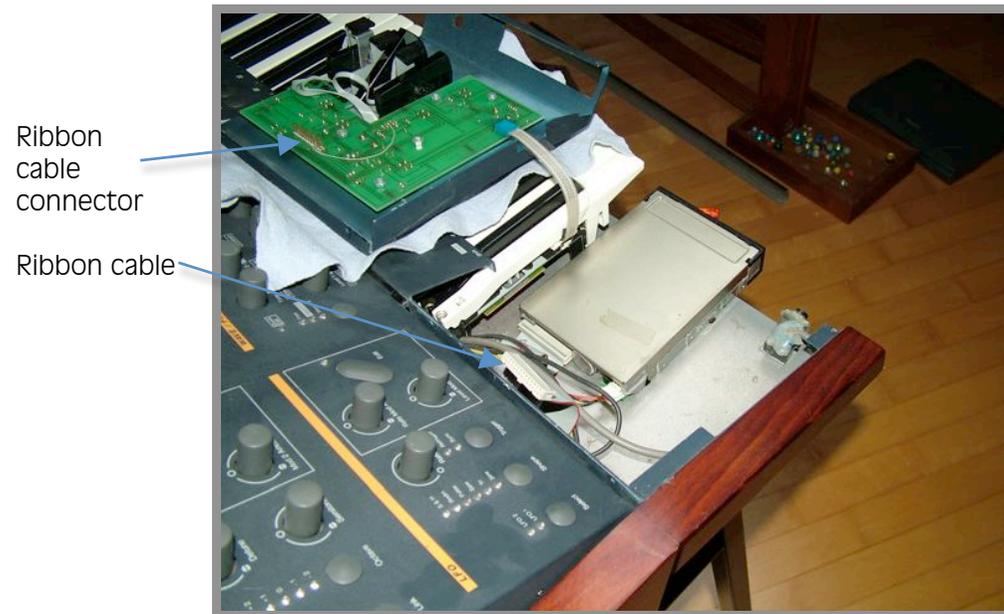


Note: If the housing is tight fit to the instrument, the easiest way to open is by keeping the front panel upright, then pushing from behind the wall supporting the wheel housing while at the same time pushing upward to detach the wheel housing.

If this does not work due to the mechanical shape of the wheel housing, then you should remove the strip below the keyboard. Removing the seven screws from the bottom front side is necessary to do this.



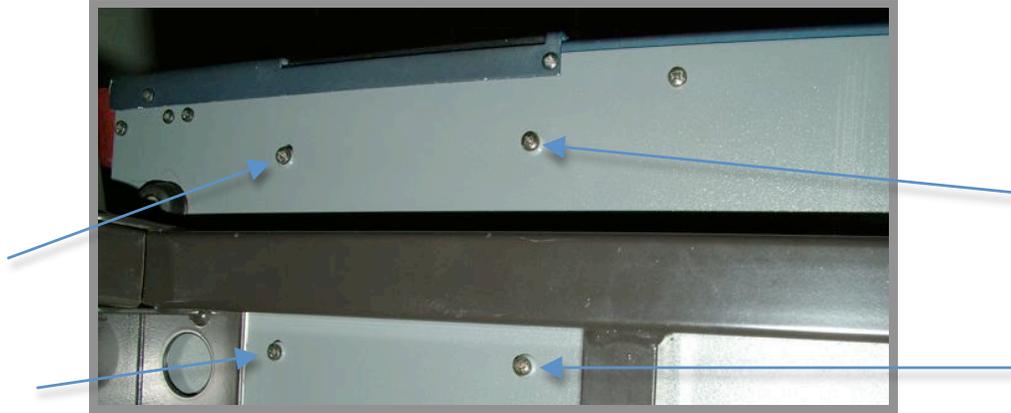
The strip can be moved to the right and then be removed. Carefully move now the wheel housing onto the keyboard. The ribbon cable that leads to the wheels electronic has to be carefully removed. Take care to no scratch the keyboard.



On the picture, please note the front strip at the floor as well as the ball path ©.

Also it might be easier to remove the connector to the after touch strip, if this is not locked by glue to the PCB.

Now it is time to remove the four screws that fix the floppy drive.



Then the floppy drive can be lifted and the ribbon cable as well as the power cable can be carefully removed. Attach now the ribbon cable and the power cable to the Floppy-Emulator.



Note: The power cable is located on the opposite side and the ribbon cable has to be turned upside down.

Note: Some of the Waves have a different floppy drive that already had twisted the ribbon cable so no turn upside down is necessary. Please compare the position of the dent in the middle of the ribbon cable. It has to match to the connector at the floppy emulator.

Please make sure that the ribbon cable is well seated to the floppy emulator to avoid disconnection when mounting the emulator to the base plate.

Touch sensor
ribbon
connector



Please also take care about the connector to the after touch sensor. This connection is difficult. You can carefully fix the Floppy-Emulator by use of the four screws for the former floppy drive at the same position. Due to the fact that the housing of the Floppy-Emulator does not contain any metal, take care to not overwind the screws.

After this step you can re-insert the wheel housing and fix it with the four screws. Then insert the front strip if you had removed it. Finally turn the front panel upright and catch the gas springs. Best is to use a screwdriver or tweezers to grab them out of the housing. Do not forget to insert the lockers. Switch on the Wave and it should show you the green LED for powered.

Hint to attach the lockers: To attach the locker, line up the locker against the shock shaft groove, rotate the locker so that the hump of the locker is against the shock end, press the locker against the shock end with your thumb/index finger, then use a pair of closed needle nose pliers to push the locker in - locker won't fly anywhere and will go into the groove.



DONE !

Appendix

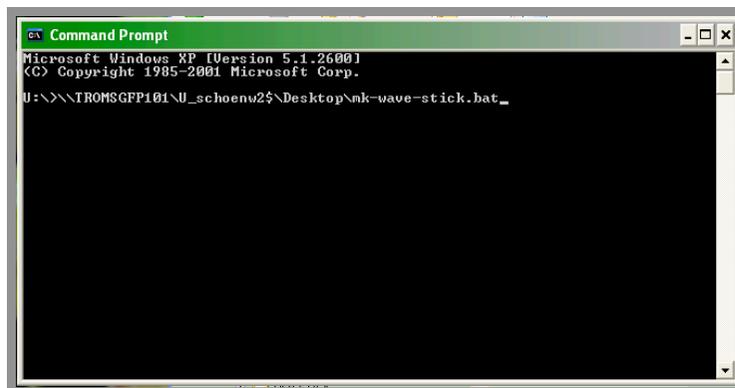
The Appendix contains the source code for a batch file that creates the 100 "floppy drives" in a Windows environment and an applescript for use with Macs. On request the executables can be provided.

- *Windows Batch File "MK-Wave-Stick.BAT"*

The simple batch file has to be started in the command prompt and needs at least one or two command line parameters. The first parameter defines the drive letter of the USB stick. The optional second parameter defines the location of the Wave OS that has to be copied to **F#00**. If no second parameter is defined, no files are copied. To execute the command prompt in XP select "start→run...→command" then a command line window is displayed.



Then drag and drop the "MK-Wave-Stick.BAT" file to the window. It will display something similar to the following picture.



Now you just have to enter the drive letter of the USB-Stick. If you have it inserted as drive "E:", enter "e". The display should read in the example above

```
U:>\\TROMSGFP101\U_schoenw2$\Desktop\mk-wave-stick.bat e
```

If you also intend to copy the Wave OS that e.g. can be found in the directory "C:\Wave\OS 1.8 Boot\", enter it with parenthesis due to the spaces in the directory name. E.g.

```
U:>\\TROMSGFP101\U_schoenw2$\Desktop\mk-wave-stick.bat e
"C:\Wave\OS 1.8 Boot\"
```

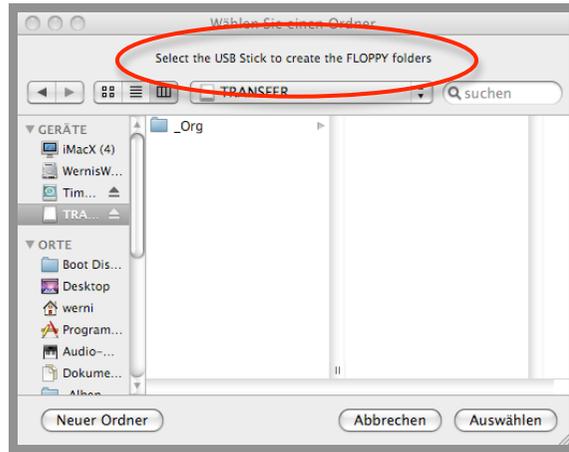
Then press <enter> and the Batch file will create the 100 folders and copy the OS files to the first floppy.

Finally the code:

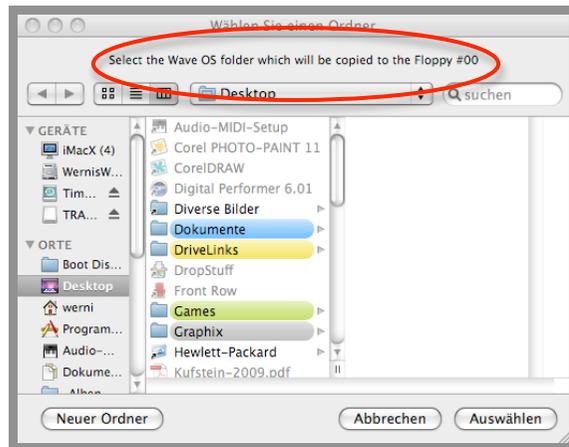
```
@echo off
IF "%1"==" " goto exit
echo --- please wait ---
for %%X in (0 1 2 3 4 5 6 7 8 9) do for %%Y in (0 1 2 3 4 5 6 7 8 9) do MD
%1:\UFDDD%%X%%Y
IF 1%21==11 goto exit
copy %2\*. * %1:\UFDDD00\*. *
:exit
```

Note: Directories only will be created if they do not already exist. But if there are OS files already installed in **F#00** and parameter two is set, the files will be overwritten.

- *Mac Applescript "MK-Wave-Stick"*
This script first asks for the stick location, then creates the 100 "floppies"



Then it asks for the folder with the Wave OS and finally copies the content of this folder.



Pressing <cancel> (or "abbrechen" ☺) will cancel the second step.

Finally the code:

```

set i to 99

tell application "Finder"
    activate
    set the destination_folder to choose folder with prompt "Select the USB Stick to create the
        FLOPPY folders"
end tell

repeat while i ≥ 0
    set txt to i as text
    if i ≤ 9 then
        set foldername to "UFDDDD0" & txt
    else
        set foldername to "UFDDDD" & txt
    end if
    set i to i - 1

    tell application "Finder"
        try
            make new folder at destination_folder with properties {name:foldername}
        end try
    end tell
end repeat

tell application "Finder"
    activate
    set the source_folder to choose folder with prompt "Select the Wave OS folder which will be
        copied to the Floppy #00" default location desktop as alias
    set df to destination_folder & foldername & ":" as text
    set destination_folder to df as alias
    try
        copy files of folder source_folder to (folder destination_folder)
    end try
end tell

```

Note: Directories only will be created if they do not already exist. If there are OS files already installed in **F#00** and a directory with files is selected, the OS files will **not** be overwritten.

Floppy Content

#	Content	#	Content
00		25	
01		26	
02		27	
03		28	
04		29	
05		30	
06		31	
07		32	
08		33	
09		34	
10		35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	

#	Content	#	Content
50		75	
51		76	
52		77	
53		78	
54		79	
55		80	
56		81	
57		82	
58		83	
59		84	
60		85	
61		86	
62		87	
63		88	
64		89	
65		90	
66		91	
67		92	
68		93	
69		94	
70		95	
71		96	
72		97	
73		98	
74		99	