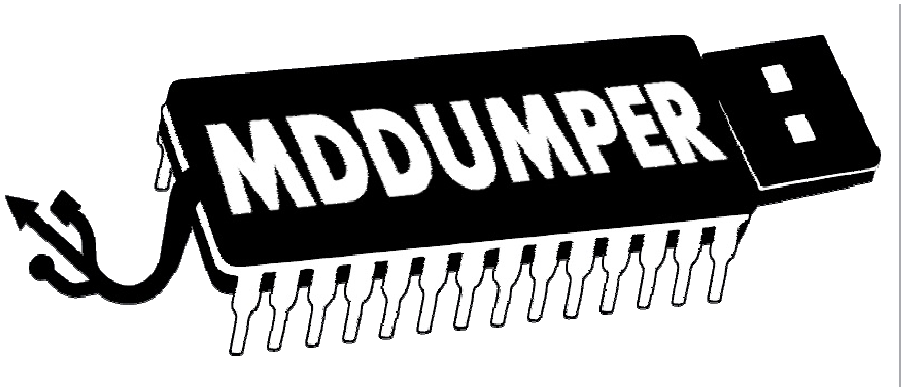
Version

1.0

# MD DUMPER

## USB Reader-Flasher for Sega Genesis/Megadrive




FIRST PUBLIC RELEASE 12/2019

Chapter

0

# Table of Contents

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# Product Feature

- Read Sega Megadrive cartridge up to 64 Meg
- Support Bankswitch for ROM & Saves
- Manage / Backup / Restore your own saves
- Reflash Third-Party Cartridges
-Read Master System / Mark III Games
-Universal Serial Bus USB2 Power & Use
-Multi OS compatibility Windows/Linux/Mac
-Open Source Software

-

Chapter 2

# Installation

## Microsoft Windows :

-Download MD_Dumper_Windows.zip and extract it in a new or any folder

-Plug the USB Cable

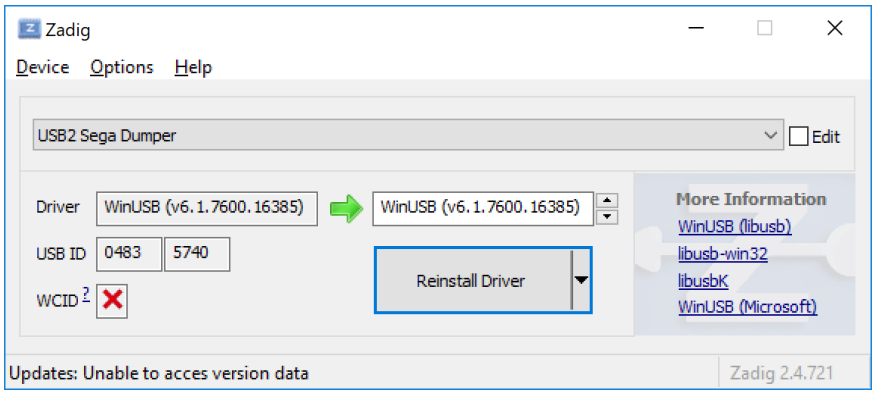
-Wait for Windows automatic hardware installation

-Launch USB View ( in the tools folder)

if everything is ok you should see USB2 Sega Dumper and it's informations

if you see a yellow warning that's mean no driver is currently attached to Sega Dumper so you must use Zadig to force WinUSB driver to Sega Dumper.

https://zadig.akeo.ie/




-After first installation process just do a simple reset by pressing reset button on the board.

-You can launch & use MD Dumper

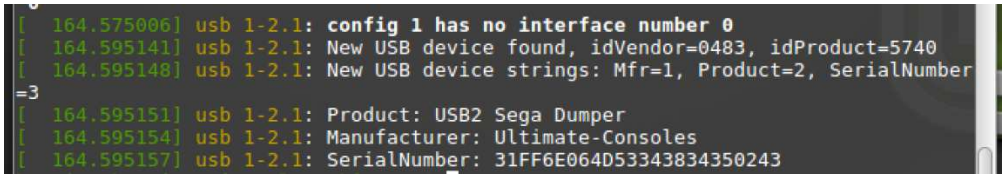
## GNU Linux :

-Download MD_Dumper_Linux.zip and extract it in a new or any folder

-Plug the USB Cable

-You could open a terminal and enter dmesg command for checking installation

if everything is ok you must see these lines




-Enter sudo ./Sega_Dumper for Launch & Use.

Chapter

3

# How to Dump your games

Insert your cartridge on the edge slot the stickers must be on the front of the PCB.

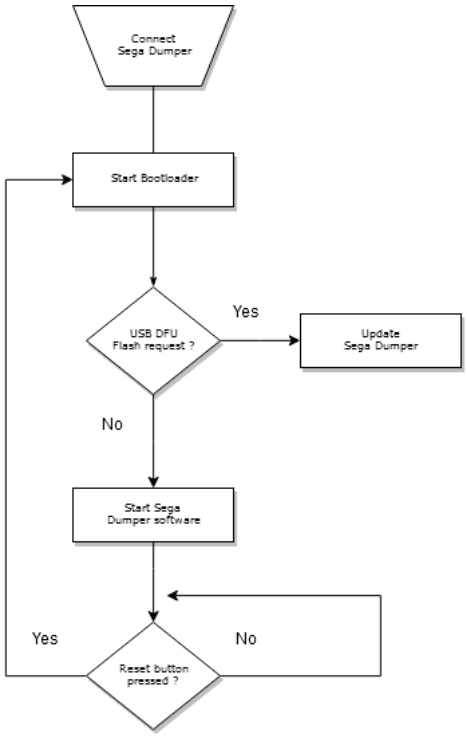
Plug the micro USB to USB cable in the connector and on your PC.

The status led must be following this order :

-Flashing for 3 seconds ( MD Dumper in Bootloader Mode)

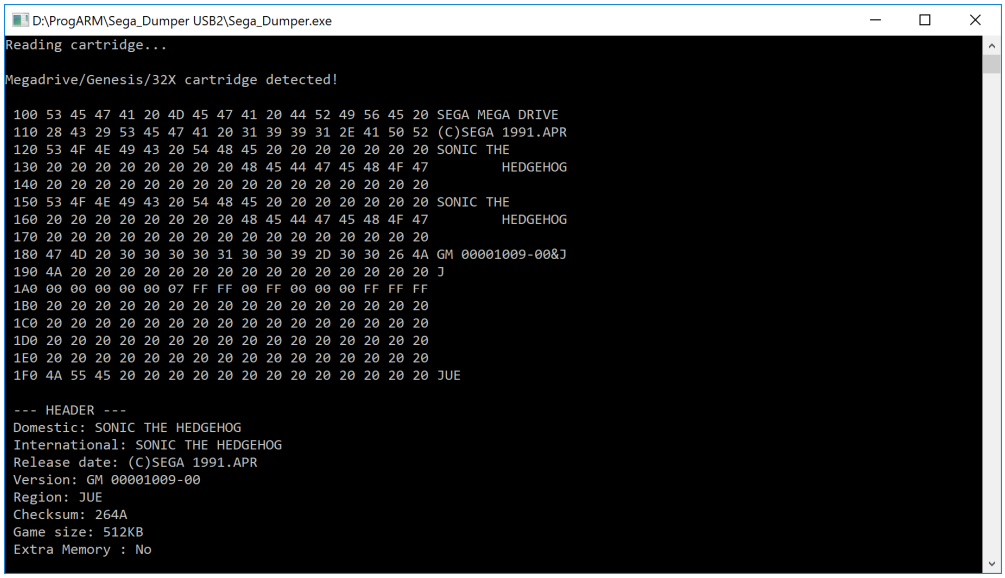
-Turned ON for 2 seconds ( MD Dumper in USB bulk mode and currently on initialization)

-Turned OFF Initialization complete wait for correct USB command, you can now launch software



# Games Meta-Informations

The software will start by checking Sega security code and displaying some cartridge informations stored in the beginning of the romchip.




If you cartridge is dirty or damaged Sega security code may not be readed and an error message will be displayed.

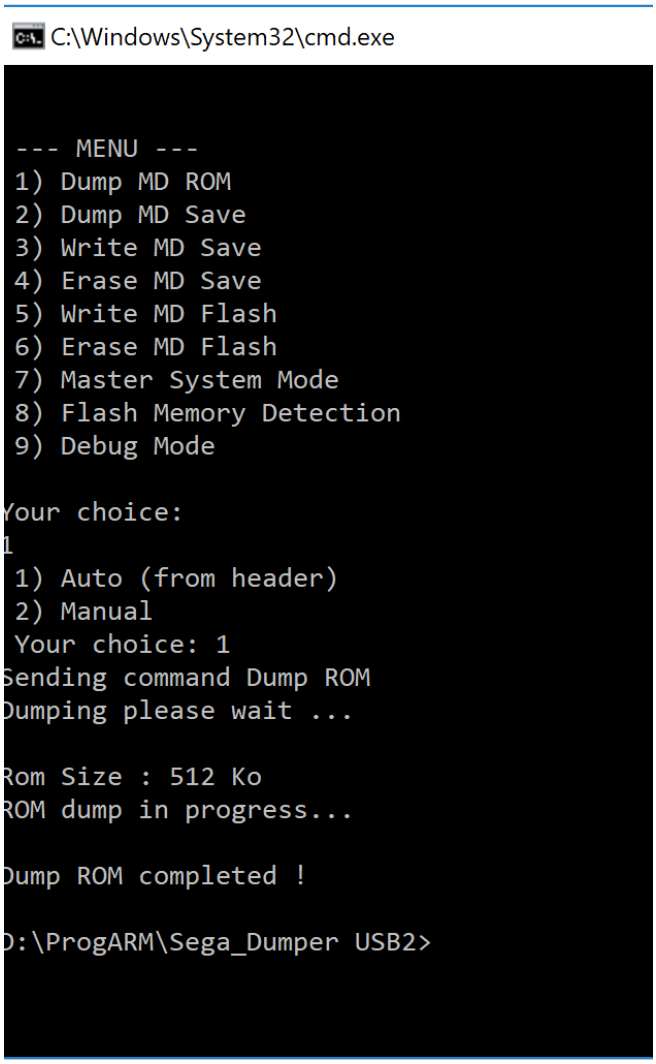
The same error message is displayed for a formatted flash cartridge.

In the header parts you can read a summary of all the useful information.
The game and ram size are automatically registered in software so you can use these later for automatic dump mode.
if the game have no backup ram ( like sonic 1 ) you will not see ram info

You can now use the first option of the menu for start a ROM Dump

If you want to read some unofffical games witch don't use correct information on Metadata you can use the manual dumping mode and specifiy the size of the output dumped file.

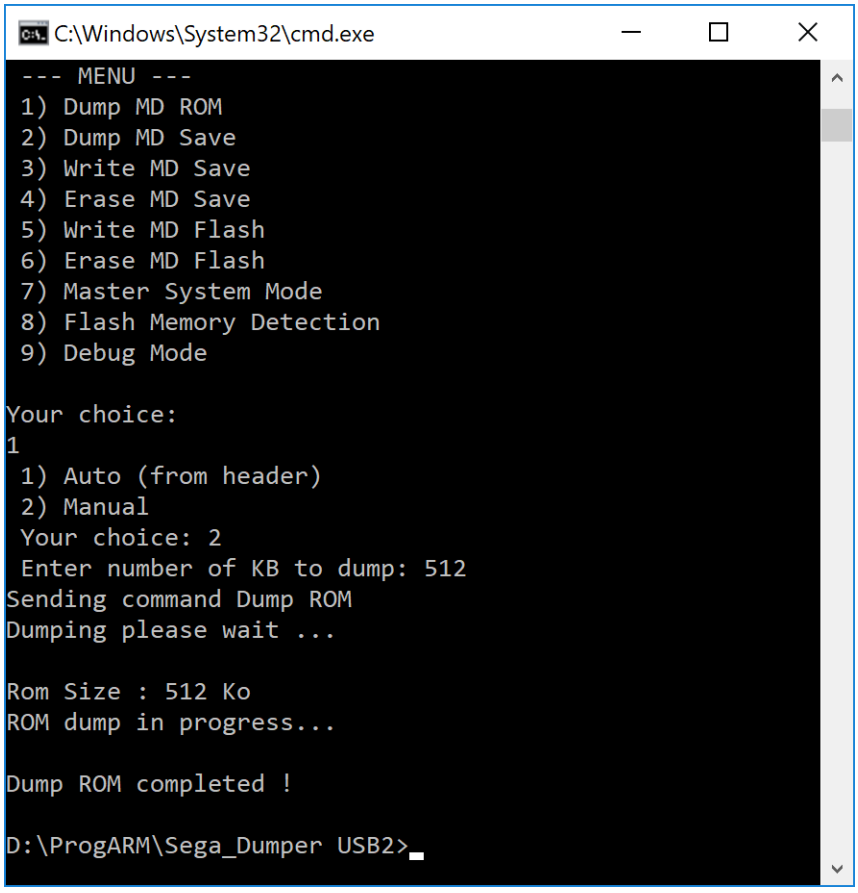
## Dump ( Automatic Mode )




Automatic mode will directly dump the game.
The size of the output file is taken from game meta information.
After dump is completed a file called dump_smd.bin is created.
The created file is generated in an emulator friendly format ( Endianness is reversed )
You can directly launch it in your emulator.

You must reset the board by pressing the push button( reset button) near USB connector for doing another dump ( or unplug – plug the USB )

## Dump ( Manual Mode )




Manual mode will dump the game at the specified size.
If the game is smaller than specified size it will be mirrored.
If the game is bigger than specified size you will miss data.
After dump is completed a file called dump_smd.bin is created.

Every official game has correct Meta information so you should only use this mode for homebrew.

MD Dumper support Bankswitch mode so if the game size is more than 16 MEG and have backup ram it will be correctly dumped even in Automatic mode.

Chapter

4

# SaveManagement

## Emulator Compatibility

The supported emulator is Genesis Plus GX .this emulator has accurate emulation and 100% compatibility even for unofficial games.


You could use your favorite emulator for launch dumped games but the save format used by MD dumper is same as Genesis Plus GX format ( raw 16 bits).

You can start a game in your console , dump the save with MD Dumper and continue your adventure in emulator or reflash your progress in the cartrigde.

Some games use serial EEPROM as backup ram.
You can find a list here :
https://krikzz.com/pub/support/everdrive-md/v2/gen_eeprom.pdf

Reading backup ram for these games has not currently supported.
Maybe in a future software upgrade :)

MD Dumper support Bankswitch mode for save too.
Bankswitch ram games will be correctly dumped without modification.

## Backup a save from Cartridge to PC

Insert your cartridge on the edge slot the stickers must be on the front of the PCB.

Start MD Dumper , you will see some save information extracted from header.

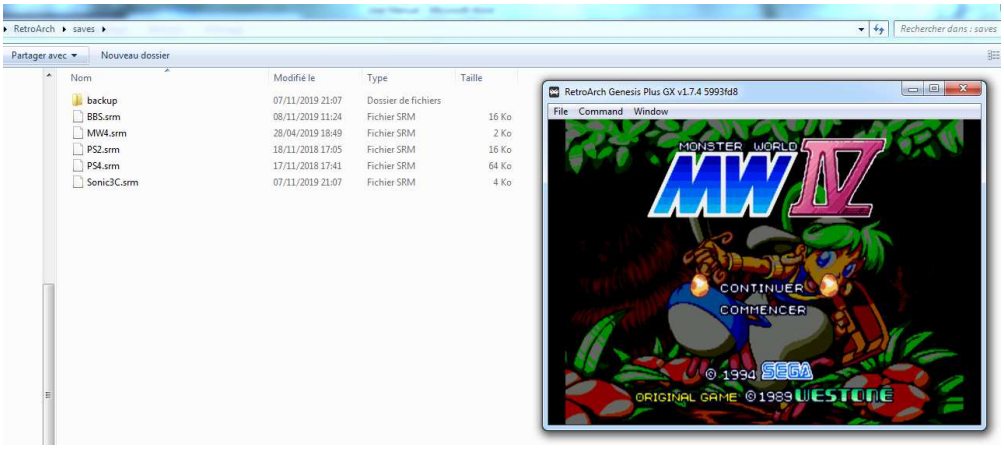
```
--- HEADER ---
Domestic: Monster World 4
International: Wonderboy 6
Release date: (C)WSTN 1994.APR
Version: GM G-5519  -01
Region: UE
Checksum: 8EAF
Game size: 2048KB
Extra Memory : Yes  8bit backup SRAM (odd addressing)
Save size: 1Kb
Save address: 200001
```

Choose the second menu option : Dump MD Save
like the dump rom option you have multiple dumping mode:

Header information of every official games is correct so you could use automatic mode.
Other mode is for manual mode for specific extra ram size on homebrew PCB.
Two files is created :

-dump_smd.srm is the save data in Genesis Plus GX compatible format
-raw.srm is an exact dump of the ram chip with no modification.

you just need to copy the dump_smd.srm in the save data of Genesis Plus GX and rename it with the same name of your dumped game.
Forexemple :
MW4.bin for Monster World IV and MW4.srm for save.



## Restore a save from PC to Cartridge

Restore or send a save from PC to cartridge is easily as the previous step.

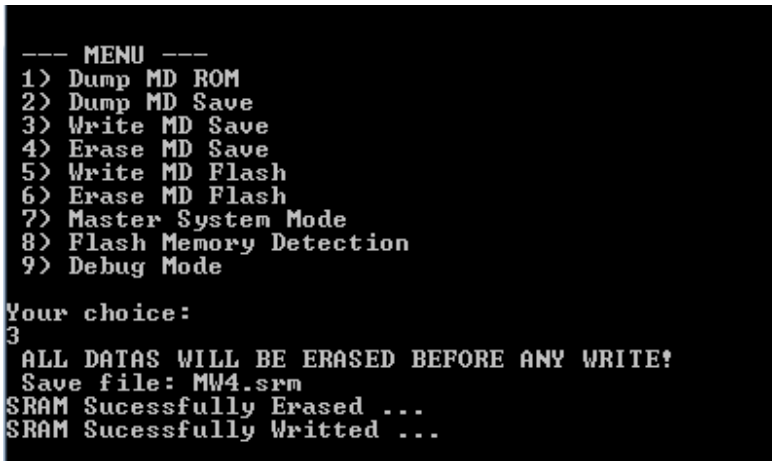
You just need to copy your save file intoMD Dumper folder.

Start MD dumper and choose third option : Write MD Save

write the name of the file with the extension.

for my exemple MW4.srm

ram chip on the cartridge will be fully erased before flash.




When this step is over you can remove USB cable and plug the cartridge in your console to continue your progress.

Chapter

5

# Flashing an home-made cartridge

## Flash Memory Detection

MD-Dumper support Write Mode for home-made flash based cartridge.

It use the /LWR signal ( pin B28 of the cartridge slot) as /WE signal of flash memory.

First things you could do is try to detect the Manufacturer ID and Chip ID.

Result with Microchip SST39SF020 Flash :

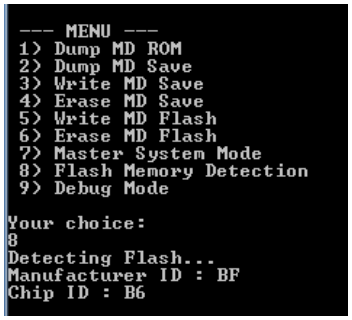



**Table 2:** Product Identification

| | Address | Data |
|---|---|---|
| Manufacturer's ID | 0000H | BFH |
| Device ID | | |
| SST39SF010A | 0001H | B5H |
| SST39SF020A | 0001H | B6H |
| SST39SF040 | 0001H | B7H |

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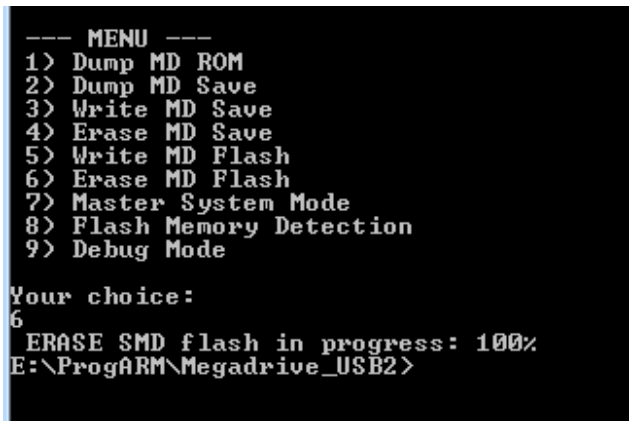
# Flash Memory Erase

Choose option 6 for perform a manually full flash chip Erase.

End of erase will be automatically detected by toggling chip pin.

Time for a complete Erase of Microchip SST39SF Flash is < 1 s.

On board Led will be turned "On" when Erase is finished.




If you dump the flash after an erase you will see only 0xFF bytes/word

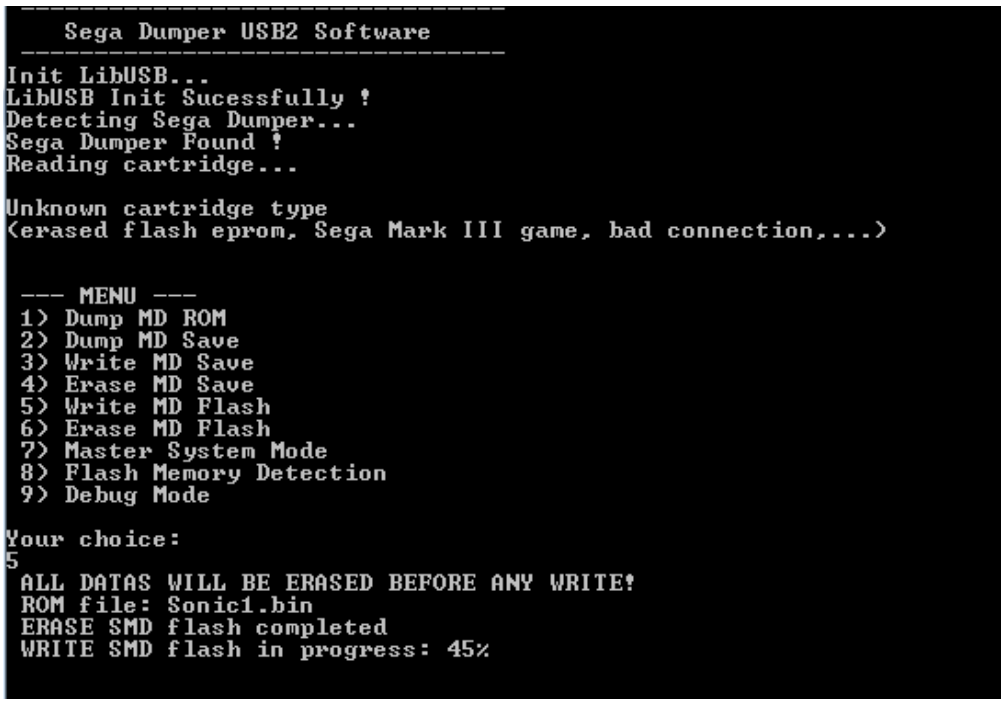
dump_smd.bin

| Offset | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00000000 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 00000010 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 00000020 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 00000030 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 00000040 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 00000050 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 00000060 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 00000070 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 00000080 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 00000090 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 000000A0 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 000000B0 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 000000C0 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 000000D0 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 000000E0 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |
| 000000F0 | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF | FF |

## Flash Memory Write

For sending your game/homebrew copy your file in the same folder of Md dumper

Select option 5 " Write MD Flash " and enter complete name with extension :




Speed progress depend of the game size and flash type but average speed is 120 Ko/s.

# Master System Compatibility

MD Dumper is also compatible with your Master System / Mark III cartridge.

You can use the Tototek or any compatible Adaptater/Converter.


Just plug the adapter + SMS cartridge and launch MD Dumper you cartridge will be detected directly :

```
 ---------------------------------
    Sega Dumper USB2 Software
 ---------------------------------
Init LibUSB...
LibUSB Init Sucessfully !
Detecting Sega Dumper...
Sega Dumper Found !
Reading cartridge type ...

Master System/Mark3 cartridge detected !
Region : USA / EUR
Game Size : 256 Ko

 --- MENU ---
 1) Dump MD ROM
 2) Dump MD Save
 3) Write MD Save
 4) Erase MD Save
 5) Write MD Flash
 6) Erase MD Flash
 7) Master System Mode
 8) Flash Memory Detection
 9) Debug Mode

Your choice:
7
 1) Auto (from header)
 2) Manual
 Your choice: 4
Sending command Dump ROM
Dumping please wait ...

Rom Size : 256 Ko
 ROM dump in progress: 100%
```

Select option 7 " Master System Mode " and press enter.

After dump is completed a file called dump_sms.sms is created.

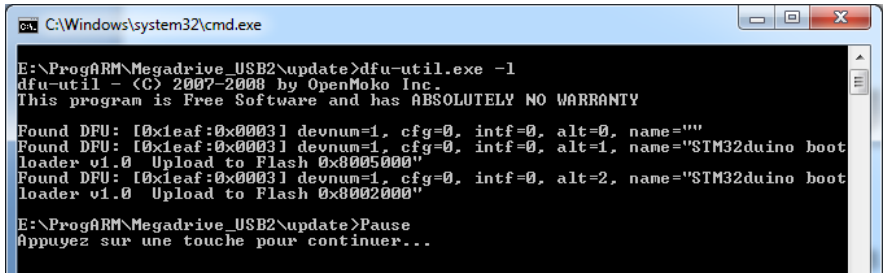
# Firmware Upgrade

Firmware Upgrade use the USB DFU Mode.

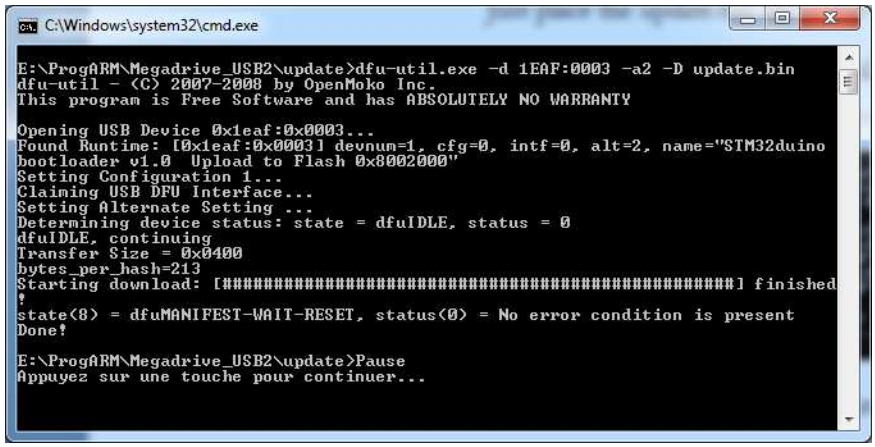
Be sure to install https://sourceforge.net/projects/dfu-util/

Just place the update.bin file in the same folder of the update script.

Press Reset and directly launch dfuList.bat you should see the STM32 Loader.




Press Reset and directly launch dfuwrite.bat you should see this result :




STM32 MD-Dumper code is now successfully updated.

# Notes

29/12/2019 : First Public Release