How to add a savestate feature to a Super Metroid romhack

coding by tewtal – guide by goop.Q

Hi. It looks like you decided to speedrun a romhack of Super Metroid. Here is a simple guide how you can upgrade your practice experience by adding the possibility of savestates.

What you need:
-The files/software that comes with this guide
-an sd2snes cartridge (for further information please use google)
-NO SPECIAL SKILLS!

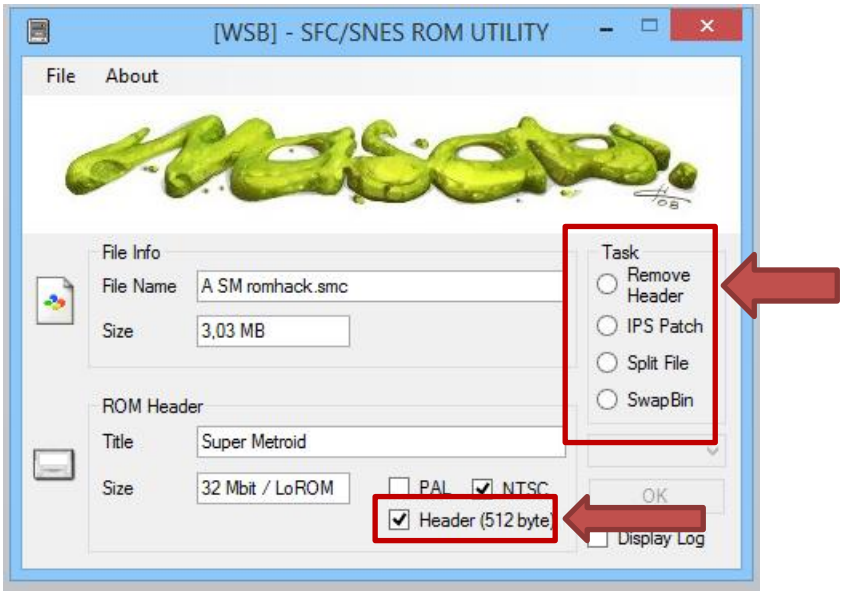
Step 1: make sure all the files contained in the "SM_savestate_feature.zip" sit in one folder

build.bat	15.03.2016 22:19	Windows-Batchda...	1 KB
HEXedit602.exe	26.05.2004 23:55	Anwendung	874 KB
Lunar_Address.exe	16.03.2016 22:06	Anwendung	112 KB
macros.asm	20.12.2015 15:30	ASM-Datei	1 KB
main.asm	15.03.2016 22:18	ASM-Datei	1 KB
save.asm	31.12.2015 17:56	ASM-Datei	10 KB
save_cfg.asm	17.03.2016 15:36	ASM-Datei	2 KB
snesROMUtil.exe	01.02.2009 16:10	Anwendung	60 KB
xkas.exe	20.12.2015 15:28	Anwendung	92 KB

Step 2: run the "**HEXedit602.exe**" and install HEXedit. Doesn't matter where.

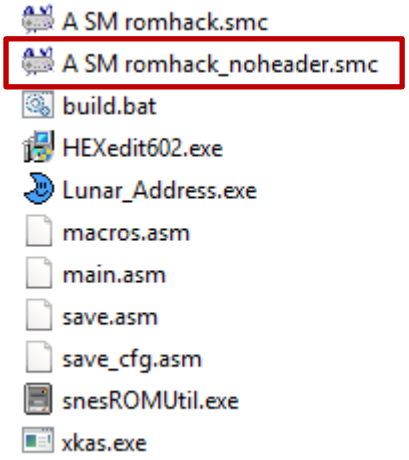
Step 3: copy your favorite romhack into the same folder. Make sure the file type is "***.smc**"! If your romhack happens to be "*.sfc" just rename it to "*.smc"

Step 4: run the "**snesROMUtil.exe**". Open the romhack: File -> Open



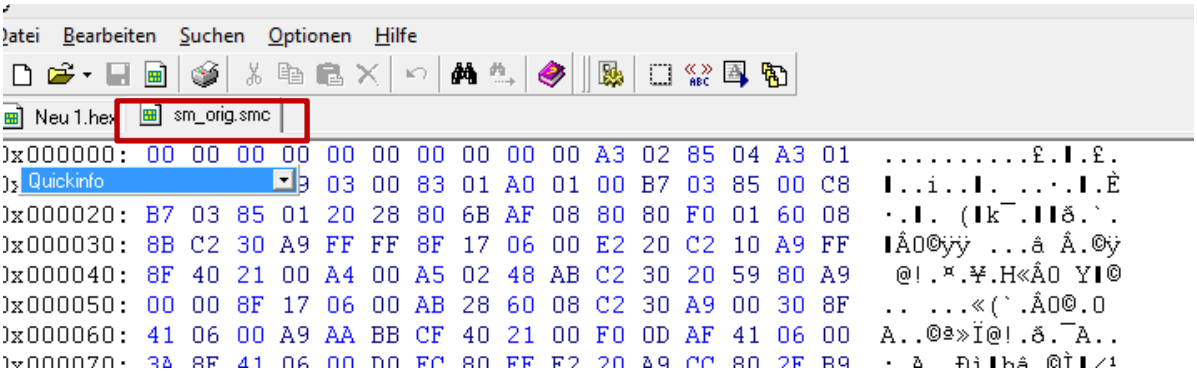
Step 5: check if the romhack is headerd, like in this case. This is shown by the little checked box that says "**Header**" :)
If it's unchecked skip this step and continue with step 7. Otherwise continue with step 6.

Step 6: we need to remove the header. Mark "**Remove Header**" in the Task frame and click OK. This will create a new file with the addon "**noheader**" in the file name. Close snesROMUtil.

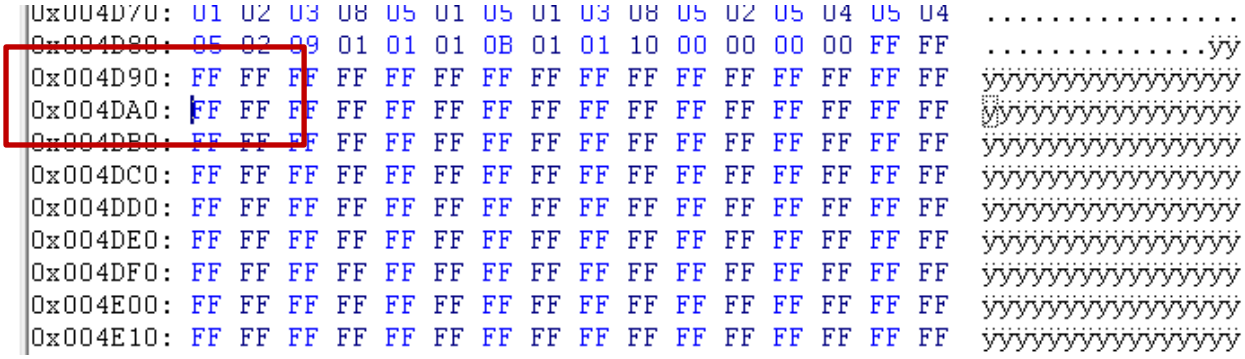


Step 7: close snesROMUtil and rename the romhack (mark the file and press F2) to "**sm_orig.smc**"

Step 8: now run HEXedit and drag & drop the romhack file into HEXedit. A tab will open in HEXedit:

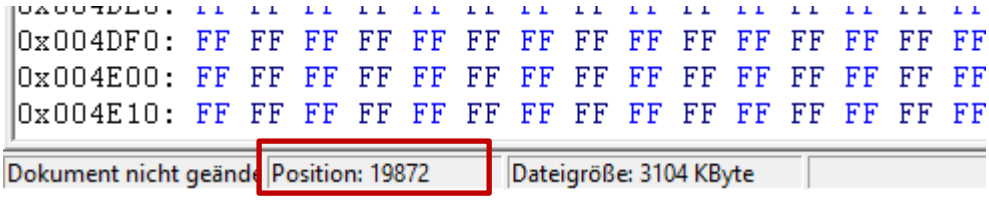


Step 9: now we need to look for free space in the romhack. Free space is shown as lots of F's. We need enough space to fit around 710 bytes (the size of the savestate code) into the romhack.
So click into the code once and use page down on your keyboard or the arrow keys to scroll down until you find a block with lots of F's.



In this case I found a nice big block starting at 0x004D90.

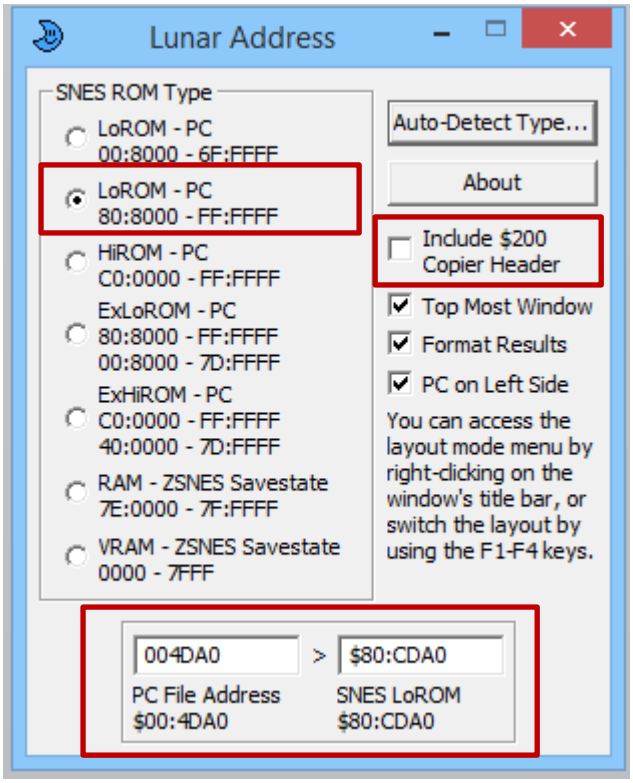
Step 10: we need to check if it's actually enough free space. Each pair of F's represents 1 byte. So we need 710 F pairs. Since we have 16 pairs per row, we need 45 rows of F's (710/16 = 44,37 = 45). We can check this by moving the cursor to the beginning of a row (here it's 0x004DA0). On the bottom of HEXedit is a status bar:



We see that the current position is 19872. If we move the cursor to the next pair (byte) that number increases by one. So just add 710 to that number and move the cursor to the new position. If there are still lots of F's and **nothing else inbetween**, you have found your free space. Otherwise look through the code to find more free space.

Step 11: now we take the "name" of the first row of our free space, in this case i take **0x004DA0** (one row further down just to be safe) and write it down somewhere (or memorize it). You can close HEXedit now!

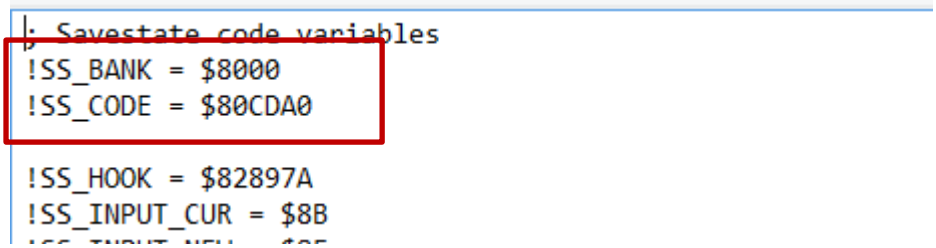
Step 12: run the "**Lunar_Address.exe**". A window should open and look like this:



Step 13: make sure "**LoROM PC 80:8000 – FF:FFFF**" is marked and "**Include $200 Copier Header**" is unchecked.

Step 14: type the row name you just wrote down into the "**PC File Address**" field. You can **ignore the "0x"** of the row name! The tool will convert the name while you type it in. Now write down the **SNES LoROM** name. Here it is "**$80:CDA0**". Close the Lunar Address tool.

Step 15: Open the "**save_cfg.asm**" (contained in our folder) with notepad or similar, by right clicking the file and then "Open with…"



Step 16: now we need to change two things. The **SS_BANK** value and the **SS_CODE** value. Take the first to numbers/letters of your converted row name add two ZEROS to it and overwrite the SS_BANK value. In this example SS_BANK is "**$8000**", because the first two positions of my converted row name are "**80***:CDA0*".
Do the same with SS_CODE but use the whole row name. Here it is "**80CDA0**" without the ":".
Now save it.
This whole part is to tell the script where to write the savestate code in the romhack. Close notepad.

Step 17: you are close to the finish line.

Step 18: run the "**build.bat**". This will create a new rom called "**sm.smc**".

Step 19: you did it!

Step 20: take the new rom (rename it if you want), copy it to your sd2snes and enjoy your favorite romhack with savestates.

SAVE = SELECT + R + Y
LOAD = SELECT + L + Y

I hope this guide was helpful and not too difficult to follow.
I know I didn't use the correct technical terms in this guide, but for the sake of better understanding I think you don't mind.
A big thanks to tewtal for providing his code and knowledge as well as explaining all the necessary changes to me.

Have a great speedrun. May the splits be with you!
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