Adding New Sounds to SM64 (Decomp Setup)

*Disclaimer: This document is based on a guide that was created by **Cheezepin** on Discord, however, I decided to put it into a proper document so that anyone can easily understand how to add sounds into SM64 without needing to search for this on Discord.*

#1 Add new sound .aiff file:
Add a new .aiff file to whatever bank you wanna use in *"/sound/samples"* (Let's use *sfx_5*, so the next ID is *1D.aiff* I believe).

#2 Add new instrument in soundbank:
In the sfx_5 file (05.json in sound/sound_banks), create a new instrument with that ID.

```
},
    "inst16": {
        "release_rate": 208,
        "envelope": "envelope0",
        "sound": "1D"
    }
}
```

#3 Add said new instrument to the instrument list:
Add it to the instrument list in the same file.

```
"instrument_list": [
    "inst0",
    "inst1",
    "inst2",
    "inst3",
    "inst4",
    "inst5",
    "inst6",
    "inst7",
    "inst8",
    "inst9",
    "inst10",
    "inst11",
    "inst12",
    "inst13",
    "inst14",
    "inst15",
    "inst16"
]
```

#4 Add .sound and respective note in 00_sound_player.s:
In *"/sound/sequences/00_sound_player.s"*, create a new.sound and a respective note.
The layer_note1 params represent the sound's pitch, duration, and velocity respectively.
  - **Pitch:** Represents the number of semitones above an A0. A value of 39 reflects a C4 on the piano, and will also have no pitch impact on the source instrument (sound effects are always assumed to be a C4 by default).
  - **Duration:** Represents how long the sample playback should last. This can be calculated by the number of seconds in the sample, multiplied by 96 (rounded up to the nearest integer). For example, a sound effect that is exactly 1.5 seconds long should use a value of 0x90. Note this assumes the sample's pitch is set to 39, as pitch changes will also alter the duration of the sample.
  - **Velocity:** Represents how loud the sample should play back. Acceptable values range from 0-127.

The _setbank should match the sound bank (so sfx_5 is 5)
The _setinstr should be the *index* of the new instrument defined in instrument_list

```
.sound_general_gem:
chan_setbank 5
chan_setinstr 16
chan_setlayer 0, .layer_1337
chan_end


.layer_1337:
layer_note1 39, 0x7f, 127
layer_end
```

#5 SFX Table:
In the same file, look for the sfx table you want to assign the inst to (channel 3/channel 8 is general/general2 sounds so that's your best bet)

```
.channel38_table:
sound_ref .sound_general_activate_cap_switch
sound_ref .sound_menu_enter_hole
sound_ref .sound_menu_enter_hole
sound_ref .sound_general_flame_out
```

Add a sound_ref for your sound at the bottom (can't do it above or else it will push all the other sounds down and mess up the ids)

Also your repo will probably have some extra stuff in between vanish_sfx and the end of the list, would recommending deleting these because they're unused duplicates

#6 Adding new SFX to sounds.h:
In *"/include/sounds.h"*, set up your sound (**sound_bank_general** and **sound_bank_general2** point to channel_38, so use those. The *0x77* is the offset within the channel_38 table. 0x80 is the priority; higher priority values take precedent over lower ones whenever a sample bank conflict occurs)

```
#define SOUND_GENERAL_VANISH_SFX        /* 0x30762080 */ SOUND_ARG_LOAD(SOUND_BANK_GENERAL,  0x76, 0x20, SOUND_DISCRETE) // unverified
#define SOUND_GENERAL_GEM                               SOUND_ARG_LOAD(SOUND_BANK_GENERAL,  0x77, 0x80, SOUND_CONSTANT_FREQUENCY | SOUND_DISCRETE)
```

(Transcribed below)

```
#define SOUND_GENERAL_VANISH_SFX
SOUND_ARG_LOAD(SOUNDBANK_GENERAL, 0x76, 0x20, SOUND_DISCRETE)
```

```
#define SOUND_GENERAL_GEM
SOUND_ARG_LOAD(SOUNDBANK_GENERAL, 0x77, 0x80,
SOUND_CONSTANT_FREQUENCY | SOUND_DISCRETE)
```

#7 Call sound in code:
Call your new sound with play_sound. 🙂