SOUND CANVAS COMPARISON PROJECT (SCCP)
(version 0.3: March 22nd, 2022)

INTRODUCTION

This project is designed to investigate, document and record the differences in sound between three main categories of Sound Canvas and GS compatible devices:
1. The SC-55 and its variants (and SC-55 modes of items in the next category).
2. All other Sound Canvases ("SC-88 +"): SC-88, SC-88Pro, SC-8820/50 and their variants.
3. Roland brand Edirol's Studio Canvas line: SD-20, SD-80, SD-90 and the more recent SD-50. (AFAIK, there are no SD variants, as in the sound maps in another product. If you know of any, please contact me – see the end of the document!)

The distinction is made between SC-55 and later Sound Canvases because the SC-55 waveforms used changed between the SC-55 and SC-88, with the result that the SC-88 and later devices inaccurately emulate the SC-55 (such problems do not exist for SC-88 and Pro emulation on later devices due to reused waveforms).
Anything recorded via "SC-55 map" is therefore a later device with (somewhat inaccurate) SC-55 emulation, including the contemporary Sound Canvas VA software emulation.

AIMS/PROCESS

1. The primary purpose is to get quality recordings of Sound Canvas and related units for comparison and decision-making purposes (i.e., which synth to get for accurate SC-55 gaming, which to get for high quality recording, which keyboard to get, which to get for fun, personal or other projects).

2. The secondary purpose is to provide information in the database about the units themselves and the DAC hardware they use, so information is available in one place.
E.g., a JV-50 is like a SC-50 hardware unit with a keyboard. It uses the same NEC DAC, although has some upgraded components. It also has an expansion slot.

3. The primary focus is to be on Sound Canvas variants with a close relationship to the SC-55, 88, 88Pro and 8820/50. However, all appropriate submissions are welcome.

4. Both GM and GS official MIDI files from Roland will be used to test the synth's capabilities (GM only units such as the SC-7 will obviously not be tested in GS, with an appropriate disclaimer). This will allow comparison between Roland synths and, once the future GM comparison project is launched, comparison with other GM synths.
MIDI files to be announced soon.

5. Due to differences in recording setups, each contributor will be asked to record all the SC devices they have. This will allow multiple recordings of synths, to separate differences from Roland hardware and circuitry with differences with participant's audio interface/sound card hardware and circuitry. While not possible to completely rule out, the more recordings we

have the less of a factor it will be. (This will apply less in the future GM project.)
All recordings will be therefore labelled both in terms of the Roland synth hardware (e.g., Roland SC-55) and recording hardware (e.g., Focusrite Scarlett 2i2).

6. Recordings will be made at 24-bit/96kHz by participants, including a 5 second intro of silence for noise sampling purposes. If either of these requests are not feasible for you, please get in touch with me for potential alternative arrangements.
Recordings will be downmixed and released as 16-bit/48kHz high quality MP3 files, with the aim for lossless tracks to be available as well.
Please **try to avoid** submitting recordings that are not of acceptable quality or have clipping (clipping = excess volume above 0dB resulting in distortion/lost waveform).

7. Recorded tracks will be edited by me in my studio, and for one set of recordings, noise will be sampled and removed to avoid a noisy interface/recording setup colouring the sound. This will allow for accurate sound comparison without the distraction of noise/hiss. However, to provide accurate information including noise levels of the units themselves, a second set of recordings will be presented raw (unedited except for length, no noise removal). Both sets of tracks will have the same runtime and volume levels, one will have noise removed.

If there is any flaws or potential issues with the above methodology, please let me know your thoughts (see contact details at the end). Feedback has helped revise it to what it is now.

THE FUTURE – GM PROJECT?

Currently, the focus is on the Sound Canvas GM set, but if things go well, I will likely be launching a full GM synth project as a different project.
This current project looks at all SC's and their DAC's, the GM project would be a full GM recording database. DAC's not relevant, only as many recordings of different devices as we can get!
Suggestions for GM files welcome, as I'm mostly familiar with Sierra games. Descent and Doom I know would be popular choices. Under 3 minutes please!

The current plan will be a public launch, as well as private launch on Patreon as well as I will try to fund to get some more and rare GM devices to further the "library", or database, or whatever it ends up being called. To show how serious I am, I have probably 30 or so GM synths currently, many with multiple GM modes. I have invested a lot of time and money already into wanting to do something like this!

SPECIAL THANKS

Thanks go out to everyone who has supported the project thus far, particularly the VOGONS

retro gaming/sound community.

GUIDE TO THE PROJECT

In the project, there are multiple categories, representing the three broad types of Sound and Studio Canvas (see: the **Introduction** to this document).

Inside a category, an entry looks like the following (without the numbers on the left):

1. **Roland SC-55**
2. DAC: NEC UPD6376, 16-bit.
3. Sound set: SC-55 map.
4/5. Optional categories (Digital output, Other)

1. The first line is the synth title. In the case of brackets after the synth name, such as:

Roland SC-D70 (SC-55 map)

Brackets denote the map to be used in the device for the recording, for any synth that contains multiple maps.

2. The second line refers to the DAC (digital-to-analog converter) used in the synth in the audio output process, often related to output quality.
For example, a SC-55 has the NEC UPD6379 DAC, which is about the same as the 6376 in the MT-200, but less good than the SC-55mkII's 63200.
Note that in the project:
- **TBD** denotes missing information about DAC
- ***** denotes uncertain information about a DAC's bitrate
If you have information on these unknown parts/specs, please contact me.
For more information about DAC's, see the Appendix.

3. The third line is the sound set. This is used to explain what patches they contain (and synths they are equivalent to) if not a "regular" SC-55, 88, 88Pro or 8820/50.
For example, a SC-50 has most of the SC-55mkII's map but lacks the MT-32 tones.
For more information about sound sets, see the Appendix.

4/5. The fourth and fifth lines refer to two optional categories:

4. Digital output: what digital output options they have in addition to standard analog outputs. Recordings will be obtained in both digital and analog methods to provide both a comparable analog comparison and showcase the synth's potentially "highest quality" output. Note that USB audio is these days considered a digital output if present.

5. Other: misc. notes including comparable hardware, and any other relevant information.

THE SCCP (SO FAR):

SC-55

Roland SC-55
DAC: NEC UPD6376, 16-bit.
Sound set: SC-55 map.

Roland SC-55mkII
DAC: NEC UPD63200, 18-bit.
Sound set: SC-55mkII map.

Roland SC-33
DAC: NEC UPD6376 16-bit.
Sound set: SC-50 map.

Roland SC-55ST

Roland SCC-1
DAC: NEC UPD6376, 16-bit.
Sound set: SC-55 map.
Other: ISA sound card.

Roland CM-500
DAC: BurrBrown PCM61, 18-bit*.
Sound set: SC-55 map.
Other: this synth is the same as the CM-300 (SC-55 with no screen) plus the older CM-64 (CM-32L [MT-32 with SFX] + CM-32P [U-110]).

Roland MT-200
DAC: NEC UPD6376, 16-bit.
Sound set: SC-55 map.
Other: this synth is the same as the MT-120 plus effects and extra MIDI ports, and minus mix inputs.

Roland JV-50
DAC: NEC UPD63200, 18-bit.
Sound set: SC-50 map.
Other: this synth is the same as the JV-35 (with a floppy drive added). The SC-50 sound set is also replicated on the optional expansion VE-GS1 for JV/other keyboards, but the expansion may vary in output quality depending on which keyboard (and hardware) it's used to expand. The VE board can also be used in one of these synths to effectively give 2 independent SC-50's in one keyboard, each with 28-note polyphony, their own effects, and

output. Finally, the other optional expansion VE-JV1/VE-JV1E can be used to add a full JV-1000 synth to the board, also with its own 28-note polyphony and effects.

Roland PMA-5
DAC: NEC UPD6379*, 16-bit*.
Sound set: SC-50 map plus 80 of the 300 extra GS patches from the SC-88, and 7 extra drumkits.
Other: Handheld portable Sound Canvas with touch screen.

Roland SC-D70 (SC-55 map)
DAC: BurrBrown PCM1716, 24-bit.
Sound set: SC-55mkII map (emulated).
Digital output: SPDIF (coaxial/optical), USB.

Roland SD-50 (SC-55 map)
DAC: N/A
Sound set: SC-50 map, called “Classic”.
Digital output: USB.

Roland INTEGRA-7 (SC-55 map)
DAC: N/A
Sound set: SC-7 map, undocumented.
Digital output: SPDIF (coaxial), USB.

SC-88 +

Roland SC-88Pro (SC-88 and 88Pro maps)
DAC: BurrBrown PCM69, 18-bit.
Sound set: SC-88Pro (SC-88Pro, SC-88, 55 maps) plus 128 patches with built in EFX.

Roland SC-880 (SC-88 and 88Pro maps)
DAC: AKM AK4324, 20-bit*.
Sound set: SC-88Pro (SC-88Pro, SC-88, 55 maps) plus 256 patches with built in EFX.
Other: 1RU version of the SC-88Pro with different DAC and extra sounds.

Roland SC-8820 (SC-88, 88Pro and 8820 maps)
DAC: BurrBrown PCM1716, 20-bit.
Sound set: SC-8820 (SC-8820, SC-88Pro, SC-88, 55 maps).

Roland SC-8850 (SC-88, 88Pro and 8850 maps)
DAC: AKM AK4324, 20-bit.
Sound set: SC-8850 (SC-8850, SC-88Pro, SC-88, 55 maps).
Other: Has slightly more sounds than the SC-8820 and some sounds which are not the same between the two modules (e.g., GM Clarinet).

Roland SC-D70 (SC-88, 88Pro and 8820 maps)
DAC: BurrBrown PCM1716, 24-bit.
Sound set: SC-8820 (SC-8820, SC-88Pro, SC-88, 55 maps).
Digital output: SPDIF (coaxial/optical), USB.

APPENDIX

This section will provide extra and background information regarding sound sets and DAC's.

Sound set guide (best to worst):

SC-55
SC-55mkII map = 354 patches, 9 drumkits.
SC-55 map = 317 patches.
SC-50 map = SC-55mkII minus MT-32 tones, 226 patches.
SC-7 map (GM only) = SC-55 minus MT-32 and GS tones, 128 patches.

SC-88+
SC-8850 (SC-8850, SC-88Pro, SC-88, 55 maps) = 1640 patches.
SC-8820 (SC-8820, SC-88Pro, SC-88, 55 maps) = 1608 patches.
SC-88Pro (SC-88Pro, SC-88, 55 maps) = 1117 patches (plus 128 User patches).
SC-88 (SC-88, SC-55 map) = 654 patches.

SD*
SD-50**, *** = 1125 patches, 32 drumkits.
SD-80/90 = 1050 patches, 30 drumkits.
SD-20 = 660 patches, 23 drumkits.
* The GS mode in all SD's is equivalent to a SC-50 map.
** GS mode in the SD-50 is only accessible via GS reset.
*** Patches in the SD-50 are different to the other SD modules (not a superset of).

Some minor variances on these sound sets may exist out there too (e.g., SC-880 vs 88Pro).

DAC guide (best to worst): [in progress and subject to change]
SC-55
BurrBrown PCM61 (18-bit)
NEC UPD63200 (18-bit)
=NEC UPD6379 (16-bit)
=NEC UPD6376 (16-bit)

SC-88+
BurrBrown PCM1716 (24-bit)
=BurrBrown PCM1716 (20-bit)
=AKM AK4324 (20-bit)
BurrBrown PCM69 (18-bit)
NEC UPD63200 (18-bit)

Notes:
- an = sign denotes roughly equivalent to the item below/above with another = sign.
- despite being "inferior", many have cited the NEC UPD63200 as warmer/better sounding

than the BurrBrown PCM69 (e.g., Roland JV-1080 [NEC] vs JV-2080 [BurrBrown] discussion). This could also apply to the UPD63200 vs PCM61.

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