

Bending by Design: reconfigured and combined DIY circuits for collaborative music-making

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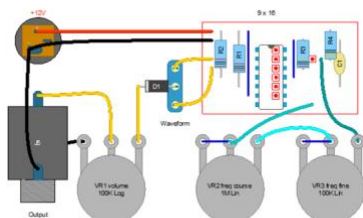
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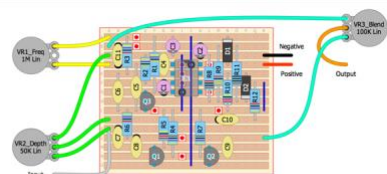
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Abstract

Currently, there are many electronic circuits available as resources for maker-musicians. These 'off-the-shelf' technologies are available to assist in solving music-making problems in the design of novel performance systems. We are particularly interested in reconfiguring and combining existing musical circuits with the aim of creating sonic diversity and a certain degree of unpredictability in our systems, a process which can be described as bending by design [1]. In the context of improvisation, such systems are desirable as they can enable the emergence of new performance strategies and techniques.

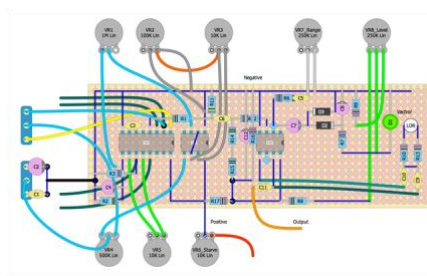


The instrument reconfigures existing circuits; a fixed system comprising of three modules: Noise Siren, Quad Sine, and Flub Filter. The design process involved modifying existing equipment: circuit bending [2][3] (naïve play) and hardware hacking [4] (informed intervention).



Noise Siren: tone generator

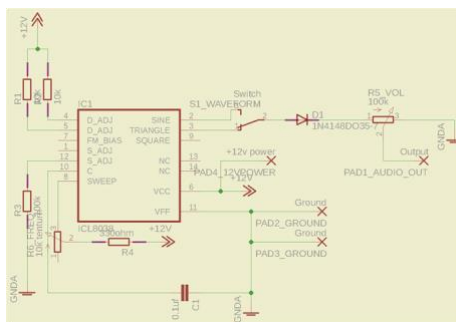
The design was extended with the addition of a circuit based the DOD 440 envelope filter². The reconfigured circuit design in a format that is easy to replicate by novice hackers.



Quad/Tri Sine: tone generator

A bank of four/three oscillators with frequency and amplitude controls. We used the 8038 function generator³.

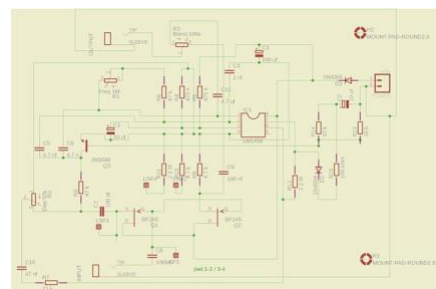
The use of ten-turn potentiometers inform how the instrument is played: lending itself to slower changes of parameters.



Flub Filter: envelope filter effect

Based on the Seamoon Funk Machine⁴, a circuit that tracks amplitude changes at its input to change tone. It has controls for the depth, frequency and blend of the effect.

This tone-shaping stage was applied after combining the signals from the tone generators using a simple mixer. Depending on the settings; a range of effects can be created, including phasing and amplitude modulation.



Acknowledgements and References

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[1] R. Hordijk. The Blippoo Box: A Chaotic Electronic Music Instrument, Bent by Design. Leonardo Music Journal, 19:35–43, 2009.

[2] Q. R. Ghazala. The Folk Music of Chance Electronics: Circuit-Bending the Modern Coconut. Leonardo Music Journal, --97–104, 2004.

[3] S. J. Norman, J. Ryan, and M. Waisvisz. Touchstone. Touch, 1998.

[4] N. Collins. Composing Inside Electronics. Music in Art, (September):1988 – 2007, 2007.

¹ <http://dub-siren.com/>

² <https://digitech.com/en/products/envelope-filter-440-2014>

³ <https://www.intersil.com/content/dam/Intersil/documents/an01/an013.pdf>

⁴ http://www.geofex.com/FX_images/seamoon.gif