

# Open Source Hardware

## On *CircuitousRoot*

### An Introduction

# By Way of Introduction

Since you might have stumbled across this material outside of its original context, it is probably important for you to understand where it came from, what it is and, more importantly, what it is not..

By way of introduction, I (Dr. David M. MacMillan) am a retired computer programmer and technical writer.<sup>1</sup> I'm a second-generation programmer; my father started programming in 1958.<sup>2</sup> I started in the late 1970s, but for most of my career I was primarily a technical writer and instructor for a small company that I helped to start.

There are two things I am not. First, I'm not the kind of guy who started welding in grade school and rebuilt his first car before getting a driver's license. Those kinds of people have truly impressive skill sets; I don't. I came to machinery much later than that. Second, I have no background or training in real engineering. None at all. The important "take-away" from this is:

**These designs/projects are not the work of a trained, qualified, or even skilled professional. DO NOT assume that anything in them is correct.**

These are the works of an amateur. As such, I love my subject,<sup>3</sup> but I'm just a tinkerer and dilettante.

## About CircuitousRoot

I think the things I'm interested in are so much fun that everyone should be interested in them.<sup>4</sup> So I self-publish my research, and to the extent that time and restrictions allow I reprint original literature in my fields. This research and publishing activity occurs under the rubric "CircuitousRoot." My late wife, Rollande Krandall, first came up with this name in the 1990s. I've always felt that it conveyed the right impression for what I'm doing: taking the long way 'round to get to the bottom of things. The vehicle for most of this publication is my hobby website:

<http://www.CircuitousRoot.com>

Almost all of the subjects that interest me have to do with "antiquarian technology." If it's old, complicated, and probably heavy then I find it irresistible.

The largest area of my interest has to do with the making of metal type for letterpress printing: typesetting, "hot metal" composition, and punch/patrix/matrix making. This started out as nothing more than the collection of cool machinery. It has evolved into a desire

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1 The "Dr." indicates a Ph.D. in English and American Literature (Univ. of California,, San Diego, 1992). Half of my undergraduate degree was in Computer & Information Science (Univ. of California, Santa Cruz, 1984).

2 His Master's thesis at Columbia University was a program in IBM 650 machine language (they didn't have an assembler yet). When he began work at IBM in 1960 they sent him through their own programming training class. I still have his class photograph, with the class serial number shown in it. That number was '3'.

3 "Amateur" comes from the Latin "amator," one who loves.

4 Funny thing - most people aren't. I really don't understand why.

to document, completely and correctly, this important area of our technological and cultural history. Necessarily, in my approach, this involves a great deal of hands-on machine work.

I'm interested as well in several other fields: the elaborate early machine tool work which began with "rose engines" and evolved into "ornamental turning"; technical horology (especially watchmaking); steam engines and "model engineering"; machine shop work generally.

## About My Open Source Hardware

I'm pretty good at research and, in a verbose way, writing. I'm much less good at actually making things in the shop. But, still, it is not possible to understand these subjects completely and accurately without hands-on work. Also, most of this machinery is old and wearing out. These machines require parts, and these parts are not always available. So I end up reverse-engineering old parts, re-creating old devices, and designing new devices in these older traditions. Often this goes no further than the design stage, but sometimes I manage to make these in my home machine shop.

Since this is a hobby for me, and since all of this equipment is from the past, I wish to share these designs as freely as we all should share the public domain knowledge and literature of these fields.

"Open Source Hardware" is the extension of the highly successful "free and open-source" ("FOSS") software/writing/media movements into the world of hardware. The basic idea is that the original maker (myself in this case) wishes to share a physical, made, item in such a way that anyone else may make it too. The only restriction necessary for this is to insist that you cannot deny anyone else the right to make it. The legal details to support this are complicated and are not as cleanly defined as they are for writing, software, and other media subject to the laws of copyright, but a workable approach is still possible.

The document 1ZZ0 "Licensing Terms" which should accompany any release of any of these open-source hardware designs discusses this further. It may also be obtained on the CircuitousRoot Notebook "Open Source Hardware On CircuitousRoot" at:

<http://www.CircuitousRoot.com/oshw.html>

## About The Singing Lemur LLC

My late wife, Rollande Krandall, was a musician and jeweler. She sold her jewelry through her business, Singing Lemur Jewelry LLC. I have inherited this business, and renamed it The Singing Lemur LLC.

It is a hobby/retirement business for me. It's just for the fun of it. It gives me the opportunity to make and sell some of the CircuitousRoot hardware projects. This may be useful because not everyone has a fully equipped machine shop and most commercial machine shops don't really want one-off and highly specialized orders.

But when I do make and sell an item through The Singing Lemur LLC, I'm just another maker. The item itself remains free and open-source hardware.

The Singing Lemur lives on the web at:

<http://www.Lemur.com>

# Licensing

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For a discussion of the issues of Open-Source Hardware and the use of Creative Commons licenses to ensure its freedom via documentation licensing, see the Notebook “Open-Source Hardware on CircuitousRoot” at:

<http://www.CircuitousRoot.com/oshw/index.html>

See also the printed/printable CircuitousRoot document 1ZZ0, “Licensing Terms,” which is available with the distribution of these hardware designs.

# Contact

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I prefer not to receive telephone calls. Thank you.

# Revision

- 2 2017-12-31. Minor fix.
- 1 2017-12-30. Initial version.