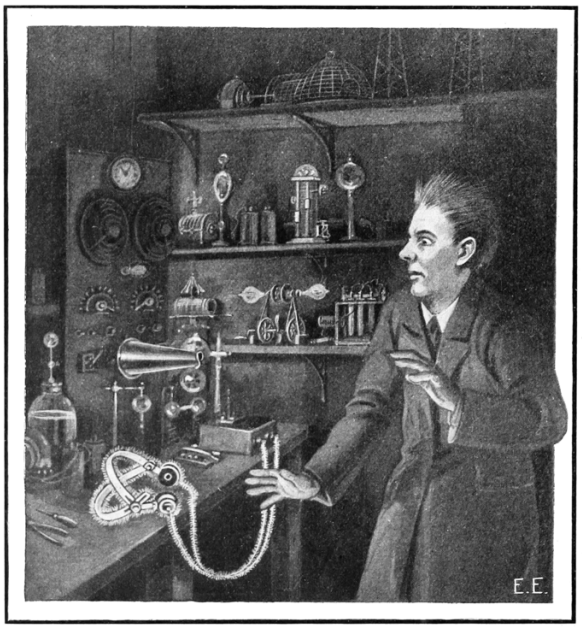
16:01 Every Man His Own Cigar Lighter

Neighbors, please join me in reading this seventeenth release of the International Journal of Proof of Concept or Get the Fuck Out, a friendly little collection of articles for ladies and gentlemen of distinguished ability and taste in the field of reverse engineering and the study of weird machines. This release is a gift to our fine neighbors in São Paulo, Budapest, and Philadelphia.

If you are missing the first sixteen issues, we suggest asking a neighbor who picked up a copy of the first in Vegas, the second in São Paulo, the third in Hamburg, the fourth in Heidelberg, the fifth in Montréal, the sixth in Las Vegas, the seventh from his parents' inkjet printer during the Thanksgiving holiday, the eighth in Heidelberg, the ninth in Montréal, the tenth in Novi Sad or Stockholm, the eleventh in Washington D.C., the twelfth in Heidelberg, the thirteenth in Montréal, the fourteenth in São Paulo, San Diego, or Budapest, the fifteenth in Canberra, Heidelberg, or Miami, or the sixteenth release in Montréal, New York, or Las Vegas.



After our paper release, and only when quality control has been passed, we will make an electronic release named `pocorgtfo16.pdf`. It is a valid PDF document and a ZIP file filled with fancy papers and source code. It is also a shell script that runs a Python script that starts webserver which serves a hex viewer IDE that will help you reverse engineer itself. Ain't that nifty?

Pastor Laphroaig has a sermon on intellectual tyranny dressed up in the name of science on page 5.

On page 7, Brandon Wilson shares his techniques for emulating the 68K electronic control unit (ECU) of his 1997 Chevy Cavalier. Even after 315 thousand miles, there are still things to learn from your daily driver.

As quick companion to Brandon's article, Deviant Ollam was so kind as to include an article describing why electronic defenses are needed, beyond just a strong lock. You'll find his explanation on page 17.

Page 18 features uses for useless bugs, fingerprinting proprietary forks of old codebases by long-lived unexploitable crashes, so that targets can be accurately identified before the hassle of making a functioning exploit for that particular version.

Page 21 holds Yannay Livneh's Adventure of the Fragmented Chunks, describing a modern heap based buffer overflow attack against a recent version of VLC.

On page 39, you will find Maribel Hearn's technique for dumping the protecting BIOS ROM of the Game Boy Advance. While there is some lovely prior work in this area, her solution involves the craziest of tricks. She executes code from *unmapped* parts of the address space, relying of *bus capacitance* to hold just one word of data without RAM, then letting the pre-fetcher trick the ROM into believing that it is being executed. Top notch work.

Cornelius Diekmann, on page 45, shows us a nifty trick for the naming of Ethernet devices on Linux. Rather than giving your device a name of `eth0` or `wwp0s20f0u3i12`, why not name it something classy in UTF8, like 🦄? (Not to be confused with 🐞, of course.)

On page 47, JBS introduces us to symbolic regression, a fancy technique for fitting functions to available data. Through this technique and a symbolic regression solver (like the one included in the feelies), he can craft absurdly opaque functions that, when called with the right parameters, produce a chosen output.

Given an un-annotated stack trace, with no knowledge of where frames begin and end, Matt Davis identifies stack return addresses by their proximity to high-entropy stack canaries. You'll find it on page 49.

Binary Ninja is quite good at identifying explicit function calls, but on embedded ARM it has no mechanism for identifying functions which are never directly called. On page 52, Travis Goodspeed walks us through a few simple rules which can be used to extend the auto-analyzer, first to identify unknown parents of known child functions and then to identify unknown children called by unknown parents. The result is a Binary Ninja plugin which can identify nearly all functions of a black box firmware image.

On page 58, Evan Sultanik explains how he integrated the hex viewer IDE from Kaitai Struct as a shell script that runs a Python webserver within this PDF polyglot.

On page 60, the last page, we pass around the collection plate. Our church has no interest in bitcoins or wooden nickels, but we'd love your donation of a nifty reverse engineering story. Please send one our way.