15:01 There's no excuse for not knowing.

Neighbors, please join me in reading this sixteenth 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 Montréal and Las Vegas.

If you are missing the first fifteen 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, or the fifteenth release in Canberra, Heidelberg, or Miami.

What a lovely dinner! But oh dear! how I hate to wash the dishes!
My hands are a perfect fright! They are just as rough and red as they can be all the time from the horrid dish water.

The Faultless Quaker
DISH WASHER

Not only prevents such remarks as the above but it ——

WASHES DISHES
TO PERFECTION

and does not chip or break them.
It's a novel invention and *WE WANT YOU TO KNOW MORE ABOUT IT.*
Write the

QUAKER NOVELTY CO.
SALEM, OHIO,

for one of their Free Circulars or ask your dealer for a Quaker. If he doesn't keep them, write us. Take no other.

SEE A QUAKER.

After our paper release, and only when quality control has been passed, we will make an electronic release named `pocorgtfo15.pdf`. It is a valid PDF document and a ZIP file of the relevant source code. Those of you who have laser projection equipment supporting the ILDA standard will find that this issue can be handily projected by your laser beams.

At BSides Knoxville in 2015, Brandon Wilson gave one hell of a talk on how he dumped the cartridge of Pier Solar, a modern game for the Sega Genesis; the lost lecture was not recorded and the slides were never published. After others failed with traditional cartridge dumping techniques, Brandon jumped in to find that the cartridge only provides the first 32 kB until an unlock sequence is executed, and that it will revert to the first 32 KB if it ever detects that the CPU is not executing from ROM. On page 5, Brandon will explain his nifty tricks for avoiding these protection mechanisms, armed with only the right revision of Sega CD, a serial cable, and a few cheat codes for the Game Genie.

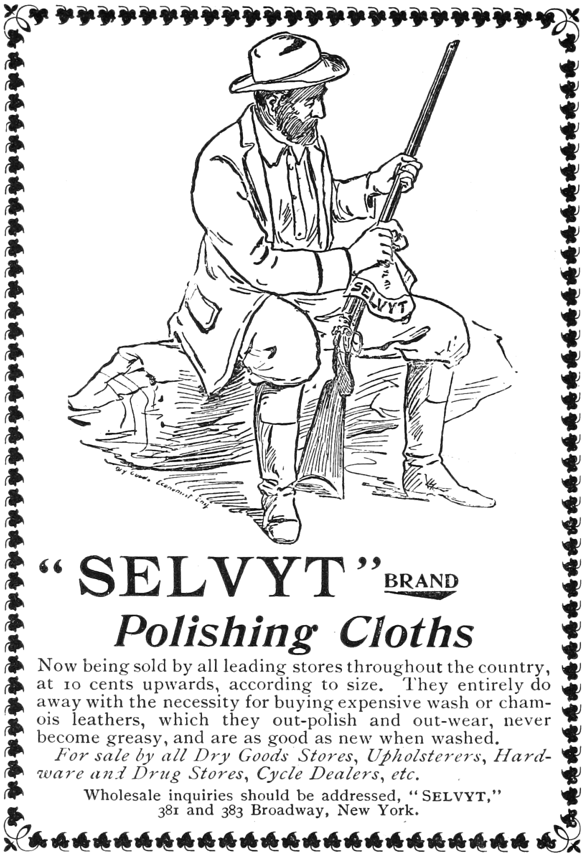
Pastor Laphroaig is back on page 13 with a sermon on alternators, Studebakers, and bug hunting in general. This allegory of a broken Ford might teach you a thing or two about debugging, and why all the book learning in the world won't match the experience of repairing your own car.

Page 16 by Saumil Shah reminds us of those fine days when magazines would include type-in code. This particular example is one that Saumil authored twenty-five years ago, a stub that produces a self-printing COM file for DOS.

Don A. Bailey presents on page 17 an introduction to writing shellcode for the new RISC-V architecture, a modern RISC design which might not yet have the popularity of ARM but has much finer prospects than MIPS.

Our longest article for this issue, page 25 presents the monumental task of cracking Gumball for the Apple][. Neighbors 4am and Peter Ferrie spent untold hours investigating every nook and cranny of this game, and their documentation might help you to preserve a protected Apple game of your own, or to craft some deviously clever 6502 code to stump the finest of reverse engineers.

Evan Sultanik has been playing around with the internals of Git, and on page 60 he presents a PDF which is also a Git repository containing its own source code.



Rob Graham is our most elusive author, having promised an article for PoC||GTFO 0x04 that finally arrived this week. On page 66 he will teach you how to write Ethernet card drivers in userland that never switch back to the kernel when sending or receiving packets. This allows for incredible improvements to speed and drastically reduced memory requirements, allowing him to portscan all of /0 in a single sweep.

Ryan Speers and Travis Goodspeed have been toying around with MIPS anti-emulation techniques, which this journal last covered in PoC||GTFO 6:6 by Craig Heffner. This new technique, found on page 76, involves abusing the real behavior of a branch-delay slot, which is a bit more complicated than what you might remember from your Hennessy and Patterson textbook.

Page 82 describes how BSDaemon and NadavCH reproduced the results of the Gynvael Coldwind's and jur00's Pwnie-winning 2013 paper on race conditions, using Intel's SAE tracer to not just verify the results, but also to provide new insights into how they might be applied to other problems.

Chris Domas, who the clever among you remember from his Movfuscator, returns on page 87 to demonstrate that X86 is Turing-complete without data fetches.

Tobias Ospelt shares with us a nifty little tale on page 89 about the Java Key Store (JKS) file format, which is the default key storage method for both Java and Android. Not content with a simple proof of concept, Tobias includes a fully functional patch against Hashcat to properly crack these files in a jiffy.

There's a trick that you might have fallen prey to: sometimes there's a perfectly innocent thumbnail of an image, but when you click on it to view the full image, you are hit with different graphics entirely. On page 97, Hector Martin presents one technique for generating these false thumbnail images with `gAMA` chunks of a PNG file.

On page 100, the last page, we pass around the collection plate. Our church has no interest in cash or wooden nickels, but we'd love your donation of a nifty reverse engineering story. Please send one our way.