Contents



SPARK

Of Top Projects
The Prado of DIY projects

14 Objet 3d'art

Beautiful things made of hot plastic

16 C88 and C3232
A home-made FPGA-built computer

20 Columns

How to get started with hardware hacking

22 Meet the Maker

Jason Hotchkiss of Sixty-Four Pixels

26 Letters
Write to us!

28 Hackspace Unallocated Space Makers in Severn, Maryland, USA

33

LENS

34 Wearable Tech

Add circuits to clothing to produce unique geek garments

46 Pick the perfect single board computer
Find the best brains for your latest build

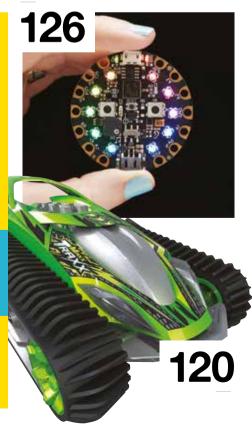
54 Innovation Camp
What came out of a retreat for hardware hackers

60 Interview Lucy Rogers
The Robot Wars judge tells all about the Guild of Makers

Improvisor's Toolbox Paper clips
Do more with these tiny bits of metal wire

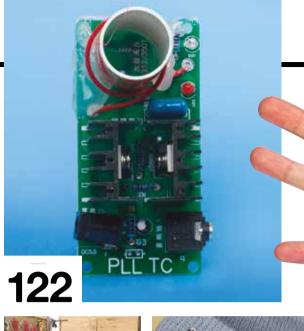
70 How I Made: Trump Time to Go Clock
Count down to big events with the aid of Nixie tubes





HackSpace

4









CONTENTS



FORGE

- 80 SoM Workshop basics

 Make besnoke hoves with your las
 - Make bespoke boxes with your laser cutter
- **82** SoM Coding For Arduino

 Deal with data using variables and constants
- Dear with data using variables and constants
- **86** SoM Sew LEDs into a hat Make your brain box more visible to traffic!
- **Tutorial** NFC door security

 Keep intruders out of your hackspace!
- **Tutorial** Build a hot water monitor
 Piping hot water all the time thanks to a Pi Zero
- **98** Tutorial Internet of Tea

 Email your kettle to make you a cuppa. Magic!
- **Tutorial** Make a terrarium

 Grow evergreens in a sealed environment
- **104 Tutorial** ESP8266 Web app

 Monitor a solar power setup in a browser
- **Tutorial Build a power supply**Turn an old laptop PSU into a bench power box



FIELD TEST

- 112 Best of Breed
 - Find the best display for your current project
- 120 Can I Hack It?
 - Our latest toy: a bright green remote-controlled car
- 122 Direct from Shenzhen Tesla Coil Speaker
 - Thunder and lightning in one cheap DIY kit
- **124** Review LilyPad ProtoSnap Plus
 - One PCB, several gadgets for Arduino-based playfulness
- 125 Review OKAY Synth DIY Kit
 - A retro blast of fun that you build yourself. And it's pink!
- 126 Review Adafruit Circuit Playground Express
 - All hail a brilliantly accessible way to create intelligent wearable circuits
- 128 Review Sonoff Basic WiFi Smart Switch
 - Control your mains electricity points over WiFi with an app
- 129 Book Review Much Ado About Almost Nothing

A history of electronic geekery

Some of the tools and techniques shown in HackSpace Magazine are dangerous unless used with skill, experience and appropriate personal protection equipment. While we attempt to guide the reader, ultimately you are responsible for your own safety and understanding the limits of yourself and your equipment. HackSpace Magazine is intended for an adult audience and some projects may be dangerous for children. Raspberry Pi (Trading) Ltd does not accept responsibility for any injuries, damage to equipment, or costs incurred from projects, tutorials or suggestions in HackSpace Magazine. Laws and regulations covering many of the topics in HackSpace Magazine are different between countries, and are always subject to change. You are responsible for understanding the requirements in your jurisdiction and ensuring that you comply with them. Some manufacturers place limits on the use of their hardware which some projects or suggestions in HackSpace Magazine may go beyond. It is your responsibility to understand the manufacturer's limits.

HackSpace 5