Contents









LENS

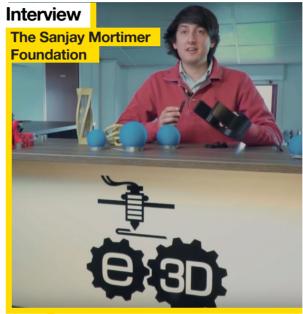
- 18 The Future of Making
 - Enhance your mind-machine connection
- 28 How we Made: BrailleRAP

 An open-source Braille printer for everyone
- 34 Interview: The Sanjay Mortimer Foundation
 We speak to CEO Teula Bradshaw about the man and the mission
- 48 Objet 3d'art
 - The most impressive maker business card we've seen
- 50 Letters

Robots, robots, robots, plus the wonder of Tiny Tapeout



Grow fresh, tasty herbs with a tiny bit of space and some 3D-printed planters



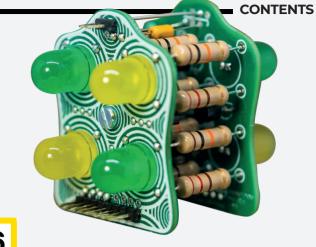
34

How one visionary's legacy is helping neurodivergent young people into engineering

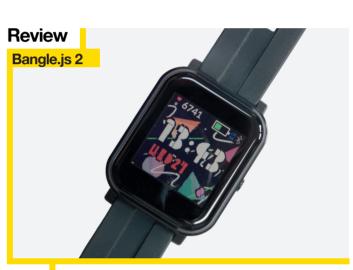


FORGE

- 54 SoM KiCad
 - Make an RP2040 temperature sensor
- 60 Tutorial Cash Register
 - Grab a Raspberry Pi Pico: we're going to save capitalism!
- **Tutorial** 3D-printed planters
 - Maximise limited space with a vertical herb garden
- 70 Tutorial Pico gamepad
 - Turn GPIOs into run, jump, and shoot buttons
- 74 Tutorial ROS: the Robot Operating System
 Control the way your robot moves
- 82 Tutorial Animatronic wings
 Take flight with a cardboard butterfly



86



94

Welcome to the cyborg age: monitor your life force with an open-source computer worn on your wrist



FIELD TEST

- 86 Best of Breed
 - Start your soldering iron for one of these great kits
- 92 Review Cardputer
 - We don't know why we love this tiny machine, but we do
- Review Bangle.js 2
 - A hackable smartwatch to measure all the things
- **Crowdfunding** Power Mole and Invisibility Shield A neat solution to getting power outdoors. Plus invisibility!

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 Pit td 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 magazine is published monthly by Raspberry Pittd, 194 Cambridge Science Park, Milton Road, Cambridge, England, CB4 QAB, United Kingdom. Publishers Service Associates, 2406 Reach Road, Williamsport, PA, 17701, is the mailing agent for copies distributed in the US and Canada. Application to mail at Periodicals prices is pending at Williamsport, PA. Postmaster please send address changes to HackSpace magazine c/o Publishers Service Associates, 2406 Reach Road, Williamsport, PA, 17701.

HackSpace