

# Contents

► Issue 80 ► April 2019

## Cover Feature

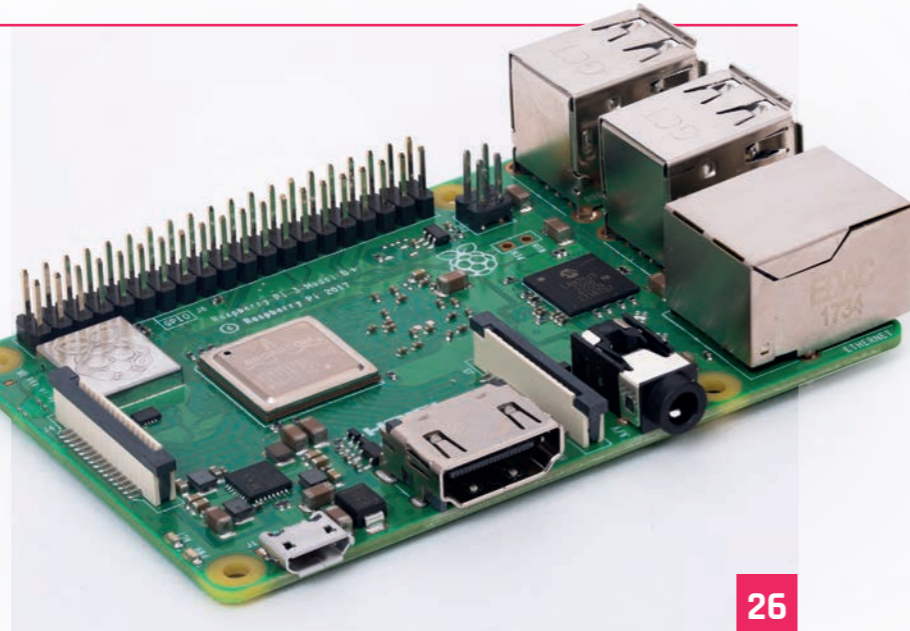
26 Tips & tricks

## Regulars

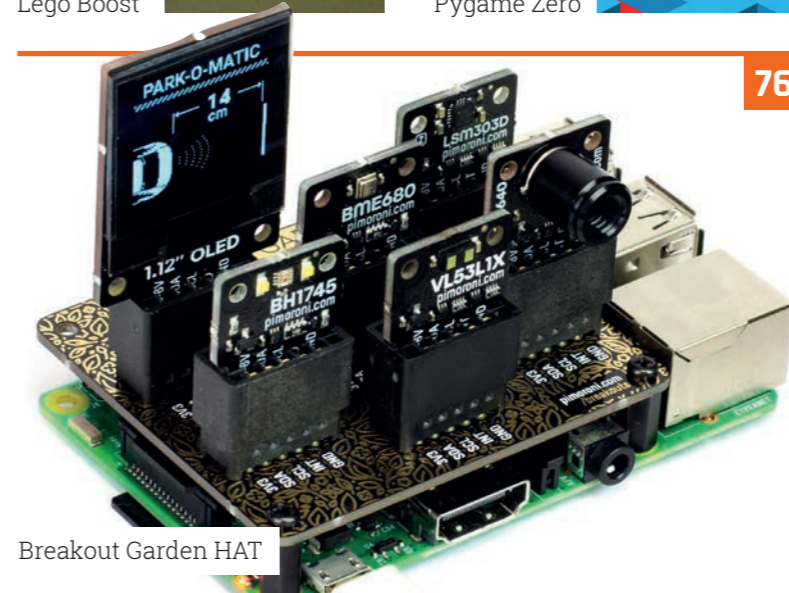
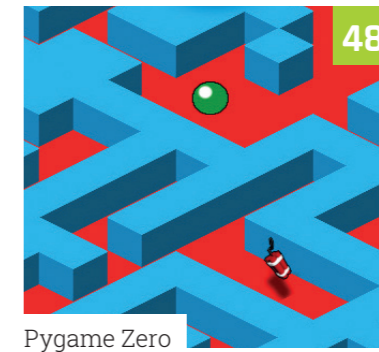
- 06 The world of Pi
- 92 Your letters
- 97 Next month
- 98 Final word

## Project Showcases

- 12 A Whisper of Moths
- 16 E-ink Calendar
- 18 Underwater Drone
- 20 YogAI
- 22 Clapper



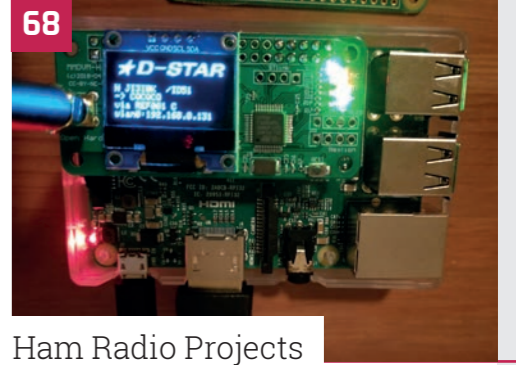
**DISCLAIMER:** Some of the tools and techniques shown in The MagPi magazine are dangerous unless used with skill, experience, and appropriate personal protection equipment. While we attempt to guide the reader, ultimately you are responsible for your own safety and understanding the limits of yourself and your equipment. Children should be supervised. Raspberry Pi (Trading) Ltd does not accept responsibility for any injuries, damage to equipment, or costs incurred from projects, tutorials or suggestions in The MagPi magazine. Laws and regulations covering many of the topics in The MagPi 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 The MagPi magazine may go beyond. It is your responsibility to understand the manufacturer's limits.



## Tutorials

- 38 Lego Boost – Pi Bakery
- 44 Samba file server
- 48 Pygame Zero: AmazeBalls pt 3
- 54 Comic creator
- 58 Karaoke machine
- 62 Pictures from space

## The Big Feature



## Reviews

- 76 Breakout Garden HAT
- 78 Zero Dongle
- 80 Top 10 HATs
- 82 Learn the command line

## Community

- 84 Claire Pollard interview
- 86 This month in Raspberry Pi
- 90 Events

**WIN ONE OF FIVE KEYBOW Mechanical keyboards** 95