

Contents

► Issue 89 ► January 2019

Cover Feature

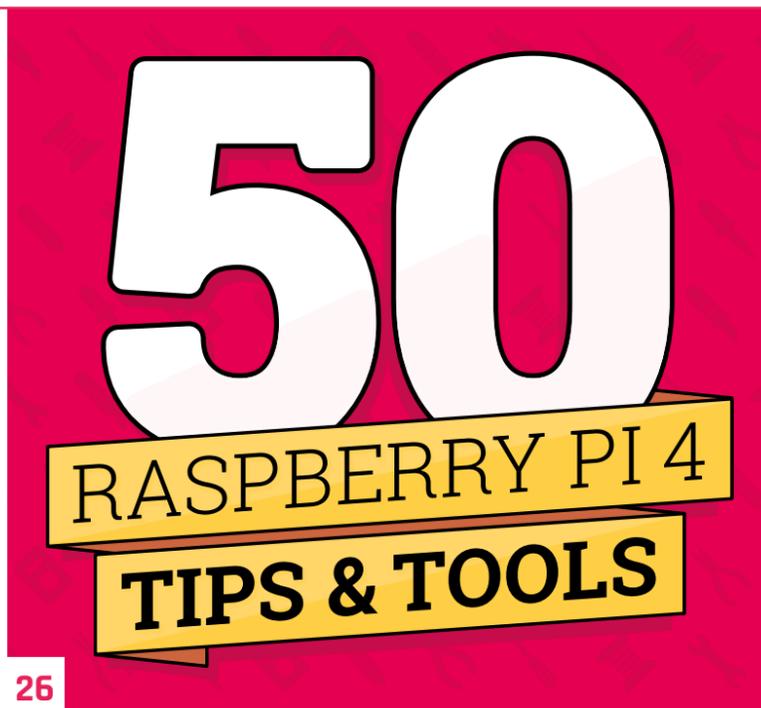
26 Tips & Tools

Regulars

- 06 World of Raspberry Pi
- 92 Your letters
- 97 Next Month
- 98 The Final Word

Project Showcases

- 08 AMOS sailboat
- 12 Organnery pipe organ
- 14 Airdrum
- 16 Cheeseborg
- 20 CutiePi
- 22 Bit Time Rotary Dial Phone



Aquatic Mini Observation System



Cheeseborg

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.



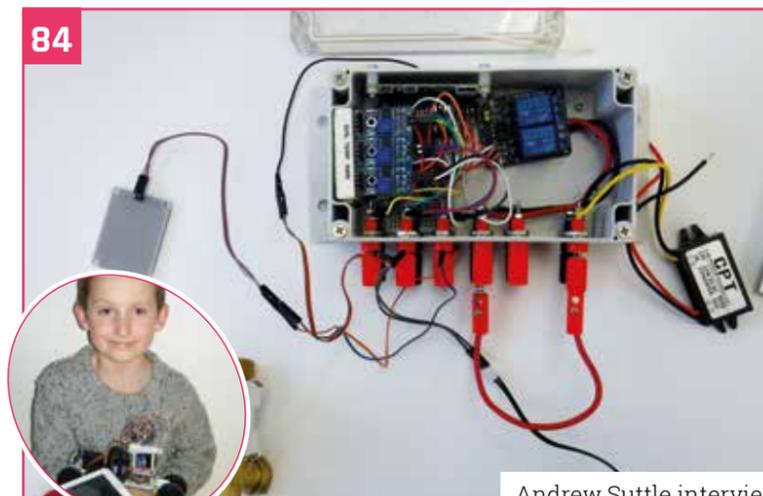
Add navigation to a robot



Design a 3D printer pendant



Add internet to a vintage computer



Andrew Suttle interview

**WIN
ONE OF
FIVE**

**RASPBERRY PI 4
& CASE BUNDLES**



95

Tutorials

- 38 Add navigation to a robot
- 44 Smart classroom assistant
- 48 Vintage computer internet
- 52 Hack GraviTrax – part 3
- 60 C and GTK custom widgets
- 64 Design a 3D printer pendant

The Big Feature



Raspberry Pi kit & gadget guide

Reviews

- 76 Enviro
- 78 SmartiPi Touch 2
- 80 Top 10 advanced projects
- 82 Learn R with Raspberry Pi

Community

- 84 Andrew Suttle interview
- 86 This month in Raspberry Pi
- 90 Events calendar