The history of the RasPi

- Early 2006 concept based on Atmel ATmega644
- Designed for educational use
- Intended for Python (but of course is friendly to all)
Pop quiz!
The BBC Microcomputer Is Here!

A WONDER FOR THE MONEY. Even before its introduction in the U.S., the BBC microcomputer was acclaimed as a "no-nonsense computer" (BYTE magazine); "a remarkably friendly machine" the "will set the standard for home computers for quite some time" (POPULAR COMPUTING); and "the most versatile, small general-purpose computer I've seen... a wonder for the money" (COMPUTERS & ELECTRONICS).

EDUCATIONAL USES. The BBC micro was designed as part of a national computer literacy project, one portion of which is "The Computer Programme" TV series being shown in the U.S. on more than 220 PBS stations. BBC micros now account for more than 75% of the computers being ordered by British schools under a government plan to put a computer into every primary and secondary school.

THE SYSTEM. The BBC micro is based on a 2MHz 6502 main microprocessor with a combined RAM/ROM address capability of 64K.

HIGH RESOLUTION GRAPHICS. The system features very high resolution color graphics in modes up to 640 x 256 (163,840 pixels). Text display can be 80, 40 or 20 characters by 32 or 25 lines.

EXPANDABILITY. The computer includes built-in serial and parallel interfaces, a floppy disc interface, a 1MHz expansion bus, analog/digital interfaces, and a network interface which allows schools and businesses to link economically up to 254 computers in a low cost local area network, and a unique high-speed data channel called the Tube® for adding a second processor.

SECOND PROCESSORS. An additional 6502 microprocessor provides increased processing speed and an extra 64K of RAM. Alternatively, a Z-80B Second Processor can be joined to add 64K of RAM and allow running of CP/M programs, which are extensively used for business applications. A third choice is a UNIX based 16032 16-bit processor with 32-bit architecture that provides 256K RAM.

CONTACT
FOURTH DIMENSION SYSTEMS
for details and name of your local dealer.
Dealer inquiries invited.

FOURTH DIMENSION SYSTEMS
1101 South Grand Ave., Suite A
Santa Ana, California 92705
(714) 835-6202

*Circuit board trademark of Digital Research, Inc.
Slicing up the Pi
Find your Pi

cat /proc/cpuinfo

Processor : ARMv6-compatible processor rev 7 (v6l)
CPU architecture: 7

[...]  
Hardware : BCM2708  
Revision : 000e  
Serial : 0000000011185abc
Buying parts

- Element14 (newark.com)
- Adafruit.com
- MakerShed.com
- DX.com
- Sparkfun.com (for parts)
- Amazon
- And in a pinch... Radio Shack
Getting started

1. Get the right SD card
2. Get the right distro
3. Don't break off C6
4. ???
5. Profit!
1. Get the right SD card

- Most quality cards are OK
- Micro with adapter?
- elinux.org/RPI_SD_cards
Display options

- HDMI 1.3 and 1.4 supported; audio and video output, does not support HDMI input
- PAL and NTSC supported through RCA with audio through 3.5 mm to red/white RCA connector
- DSI
- No VGA
Fun display alternatives

- Atrix Lapdock
- Kindleberry Pi

www.ponnuki.net
2012/09/
kindleberry-pi/
Touchscreens

- Ooh, look! DSI connector!
- Mimo 720
  - USB DisplayLink Framebuffer Driver
    CONFIG_FB_UDL/udlfb.ko
  - USB DisplayLink Kernel Mode Setting (KMS) driver
    CONFIG_DRM_UDL/udl.ko
- Won't work with OpenELEC without rebuilding the kernel
Couture kernel

- rpi-3.2.27
- rpi-3.6.y (.11)
- rpi-3.8.y, rpi-3.9.y, rpi-3.10.y, rpi-3.11.y

$ git clone
git://github.com/raspberrypi/linux.git

$ tar xvfz rpi-3.6.y.tar.gz

$ make mrproper
2. Get the right distro

- Pidora (of course)
- Raspbian
  - Moebius
- RaspBMC
- Occidentalis
2.14 Or get brave

Android      Arch ARM     AROS
Chromium OS   Debian Squeeze
Firefox OS    FreeBSD     Gentoo
Haiku IPFire  NetBSD      PiBang
Plan 9 from Bell Labs QtonPi
RISC          Slackware ARM Squeezed
ARM Puppy     WebOS
Pidora

- Graphical firstboot configuration (with additional modules specifically made for the Raspberry Pi)
- Compact initial image size (for fast downloads) and auto-resize (for max storage afterwards)
- Auto swap creation available to allow for larger memory usage
- C, Python, & Perl included in the SD card image
- Includes libraries capable of supporting external hardware such as motors and robotics (via GPIO, I2C, SPI)
- For graphical operation, Gedit text editor can be used with plugins (python console, file manager, syntax highlighting) to serve as a mini-graphical IDE
NOOBS

New Out Of Box Software
Android on your Pi

http://androidpi.wikia.com
Installing it

- Fedora ARM installer
  - fedoraproject.org/wiki/Fedora_ARM_Installer
  - `yum install fedora-arm-installer`
Installing it

- Fedora ARM installer
  - fedoraproject.org/wiki/Fedora_ARM_Installer
  - `yum install fedora-arm-installer`
- On a Mac, Rpi-sd card builder or RasPiWrite
  - Google “Rpi-sd builder”
  - github.com/exaviorn/RasPiWrite
1 + 2 - worrying = Buy pre-loaded
Power

- 5V. 5V. 5V.
- Why you shouldn't use iPhones
- Your laptop's USB port is not the droid you're looking for
- Put a power brick on your shopping list
- Did I mention C6?
Write down these words

220 uF 16v electrolytic capacitor
Add an off switch
Johnny Five alive!
Test your might! (In volts)
Test your might! (In volts)
Decoding the LEDs

- D5 OK (Rev 1.0) ACT (Rev 2.0) Green SD card access, connected to GPIO 16
- D6 PWR Red  3.3 V Power, connected to 3V3
- D7 FDX Green Full Duplex LAN
- D8 LNK Green Link/Activity LAN
- D9 10M (Rev 1.0) 100 (Rev 2.0) Yellow 10/100Mbit LAN
Why didn't it start?

- Red light off = No power
- Red light on, green light off = The Pi can't read the image on the card. The voltage is below 5V.
- Green light blinks 3 times = start.elf was not found
- Green light blinks 4 times = start.elf did not launch
- Green light blinks 7 times = kernel.img was not found
GPIO

- http://elinux.org/RPi_Low-level_peripherals
Raspberry Leaf

http://www.doctormonk.com/2013/02/raspberry-pi-and-breadboard-raspberry.html
Building a cross-compiler

- You *could* use an existing one... or you could DIY with crosstool-ng (crosstool-ng.org)
- Get kernel source: github.com/raspberrypi/linux
Blah blah blah. Stop saying words and show us pretty pictures of cool things people made.
Case closed.

- Make one
- 3D print one
- Buy one
- (or use the one it comes in)
Not bigger on the inside.
Temple of Pi
Lego my Pi-go...?
Brian Gillespie
Or just buy it.

http://www.thedailybrick.co.uk/lego-sets/custom/lego-custom-raspberry-pi-case.html
Aren't you a little small for an HTPC?

- RaspBMC/XBMC
  - 1080p
  - Share over NFS, SMB, FTP, HTTP, USB, XYZ, and other acronyms
  - Install to SD, USB, or run off NFS Embedded Samba TVHeadend FTP SSH
Can you do it?

**Anton Hvornum** - 5 months ago

Within 3 minutes, I've:

* Opened a package containing a Raspberry Pi
* Found a SD card in a drawer
* Googled "Raspberry pi xbmc"
* Installed Raspbmc onto the SD card
* Booted it and it works...

I haven't even figured out who's behind Raspbmc or anything, but whoever you are... I love you!

72 ‼️ ‼️ ‼️ Reply Share ›
PiBoy
PIP-Boy 3000
RIP Pi-PIP-Boy

http://blog.ryangrieve.com/the-raspberry-pipboy/
Emulating your childhood
Teeny arcade!
Hack Attack

Chapter Focus
Learn to control sprites with the mouse, program objects to bounce back, and start a game by pressing the spacebar.

The Game
Hob Scratchy attack flying viruses and stop them from touching the server at the bottom of the screen. If you successfully block 30 viruses, you win the game!

First, go to the Stage and import a sparkly nighttime picture of Hong Kong!

Did you know you can add programs to the Stage, too? We can add this program to make our city glow!

Super Scratch Programming Adventure!

©2012, The Lead Project

Mission Completed!
Fabu's Free Again!
Sniff Foiled Again...
Aww... Don't be upset! I just think that arts meant to be shared!

Do you think the Cosmic Defenders would take me back, or just forgive me if I apologized?

Probably but be careful now, news has it that the Dark Wizard is planning to launch a virus attack on Hong Kong!

Oh no! But if that happens, the whole digital world could be destroyed!

Fabu's right! We have to destroy the virus right away!

Hong Kong

Stand back. I know Kung Fu!

Here it comes!
Googler Coder

 CODER

 Eyeball

 Gadgetoid!

 Hello Coder
// Try changing the variables below
SpaceRocks.projectileColor = "#FF4444";
SpaceRocks.projectileSpeed = 40;
SpaceRocks.enemyColors = ["#FF4444", "#00CDAC"];
SpaceRocks.shipColor = "#00CDAC";
SpaceRocks.lineThickness = 2;
SpaceRocks.outlineShapes = true;
SpaceRocks.fillShapes = true;

// The 3 letter name for your ship
SpaceRocks.ship.name = "You";

// Ship properties
SpaceRocks.ship.speed = 3;
SpaceRocks.ship.size = 1;
SpaceRocks.ship.drag = 0;
Raspberry Pi Hacks

Coder helps you learn how to make web pages.
PiLorean

fortoffee.org.uk/raspberry-pi-d lorean/
PiLorean

http://www.youtube.com/watch?v=ncXxBmbuFII
LCARS Home Automation

http://www.youtube.com/watch?v=176YaM5jta4
Ice cream with your Pi
Ice cream with your Pi
Coffee ordering

http://www.youtube.com/watch?v=BQBOPGSfFwY
Control Christmas lights
Best Valentine EVER
Geiger Counter - Radiation Sensor Board for Raspberry Pi tutorial
www.cooking-hacks.com/..geiger-counter-raspberry.pi-radiation-sensor...
Manifesto. The main functionality of the Radiation Sensor Board for Raspberry Pi is to help people in Japan to measure the levels of radiation in their everyday life ...
Manifesto - The Board - The Geiger Tube - Types of radiation

RPI Geiger Counter | MAKE
makezine.com/2013/06/12/pi-geiger-counter/
by John Baichtal - in 725 Google+ circles
Jun 12, 2013 - The Raspberry Pi is a perfect platform to be a cheap but very versatile geiger counter. It can be connected to a TV/Monitor to display a nice ...

Raspberry Pi • View topic - My Raspberry Pi Geiger Counter
Dec 28, 2012 - 1 post - 1 author
I got a Mighty Ohm Geiger counter for Christmas and made it into a Random Number Generator. Luckily you can mute the counter so I won't be ...

Geiger Counter Kit - Radiation Sensor ID: 483 - $99.95 : Adafruit ...
www.adafruit.com/products/483
Adafruit Industries, Unique & fun DIY electronics and kits Geiger Counter Kit - Radiation Sensor ID: 483 - Detect particles and/or make a cool ... Raspberry Pi (96).

Nuclear Emergency Tracking Center
www.netc.com/Radiation%20Equipment%20Compatible.html
Special Deal - Complete Radiation Monitoring Site - for $199.00 - Sold Out 1. Raspberry Pi Model B, case and power supply 2. GMC-200 Geiger counter 3.

Apollo-NG - PiGI - Raspberry Pi Geiger-Müller Interface
More ideas

- Samba
- Remote print server
- LEGO robot
- Temperature sensor
- Light sensor
- Listen to aircraft transponders
- Spotify (Pi MusicBox)
- Control 3D printer
Resources

- learn.adafruit.com
- elinux.org
- instructables.com
- Beginner's Guide to Raspberry Pi
- Raspberry Pi Hacks

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