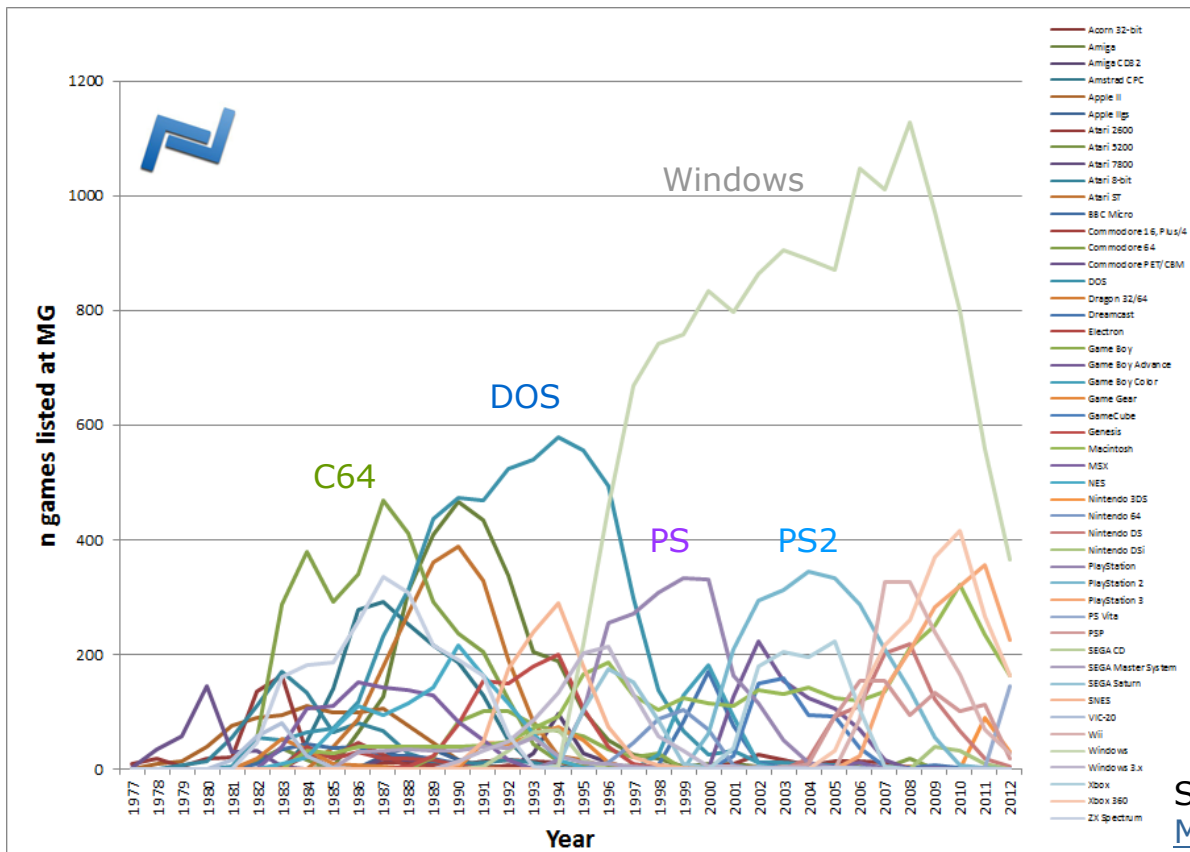


Porting Contemporary Games to a Vintage Platform

Paul Koller

Game Developer, Independent

Number of Games released per Platform per Year



Source: [MobyGames](http://MobyGames.com): Quantify Me 2012

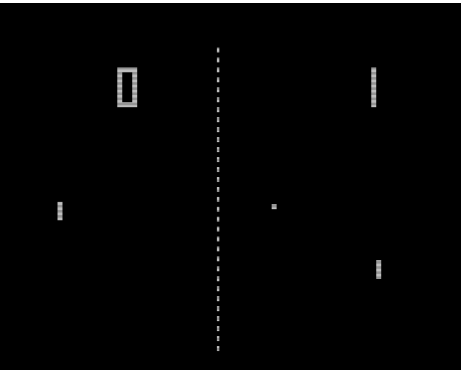
Mainstream Gaming: Technology Push

New technology →

New gaming platforms →

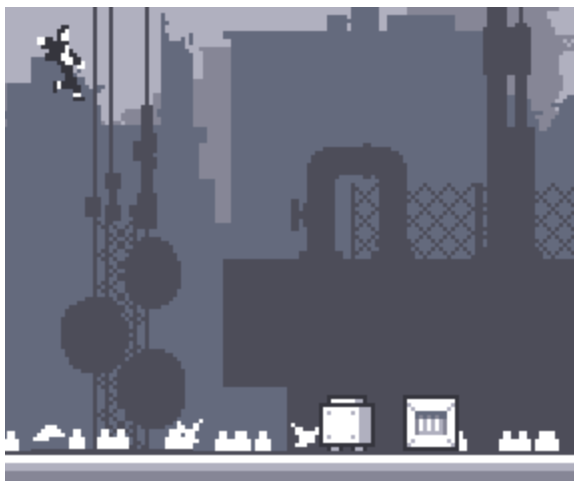
More gaming possibilities →

Older platforms become obsolete



Indiegaming

- “Smaller” Games
- More Innovative
- Do not necessarily require latest next-gen technology



Demakes

- Not new technology, but new gameplay is key in the succes of new indiegames
- This now makes it possible to port these contemporary games to obsolete platforms
- Such vintage platforms continue to have an enthusiastic following, most dominantly the...

The Commodore 64



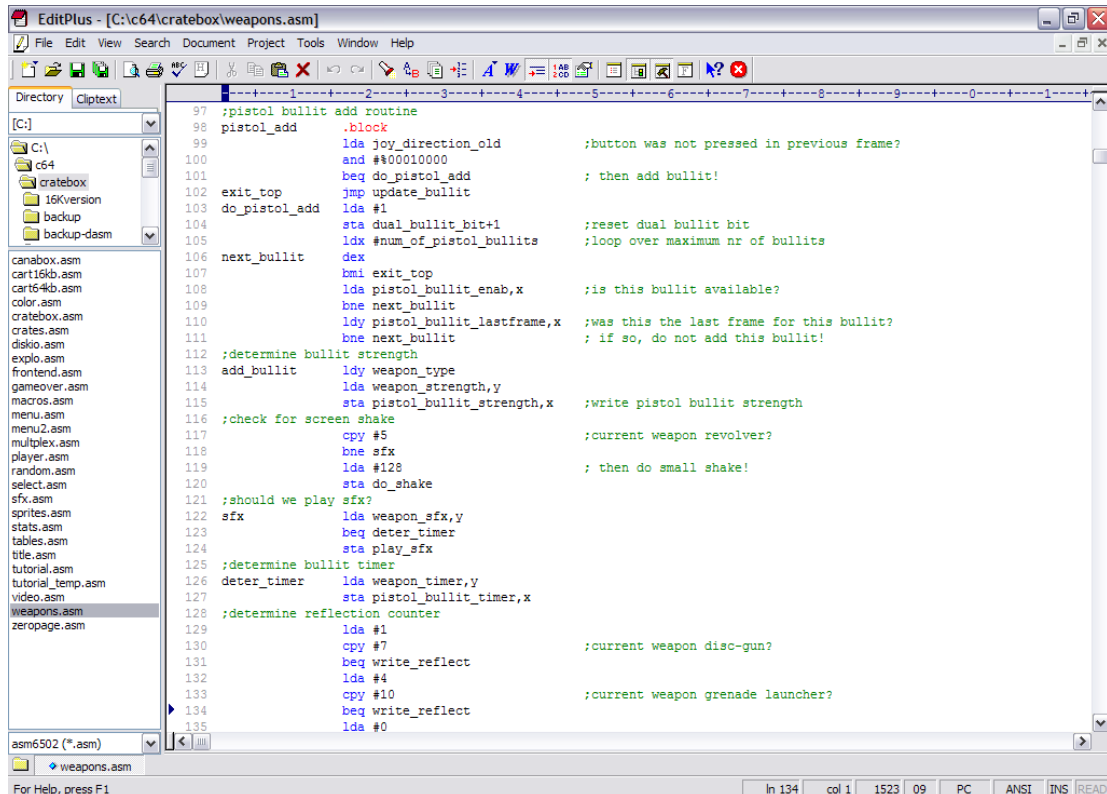
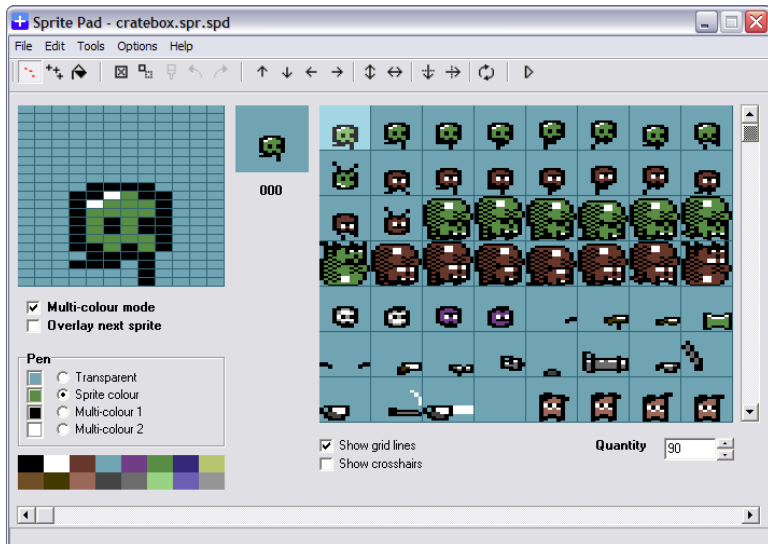
- The dominant gaming platform in the early 80s!
- It had the best compromise between performance and price at that time
- Between 1982 and 1994 ~17 million units were sold
- Today most people in the gaming or IT business grew up with one.

Technical constraints

- 1 MHz CPU
- 64KB RAM
- 16 colors
- 320x200 resolution
- 8 sprites
- 3 voice sound chip

This presentation:
How to work within
these constraints in
porting games

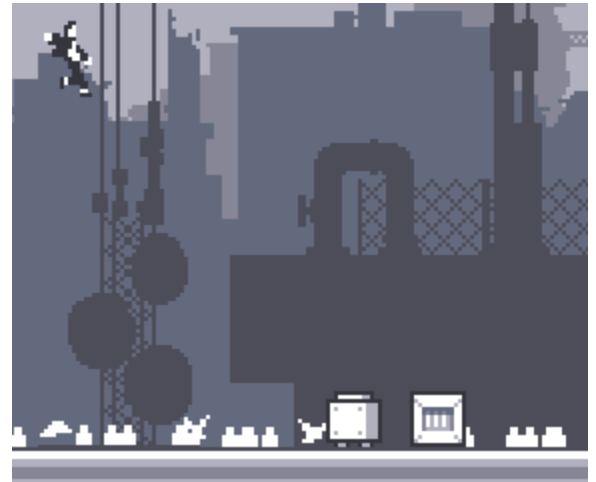
C64 game development in 2013



Canabalt (2009 SemiSecret SW)

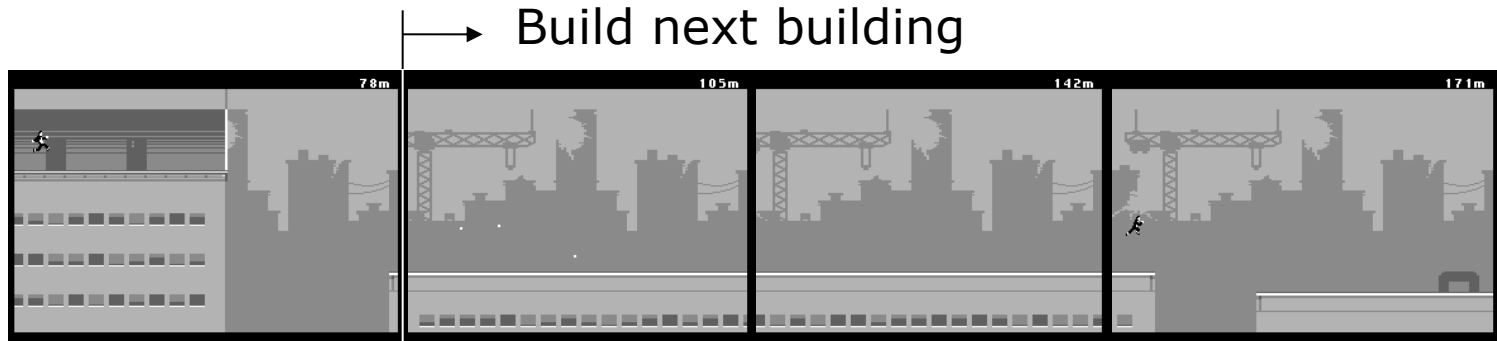
Technical features:

- Procedural level generation
- Fast scrolling
- Parallax background



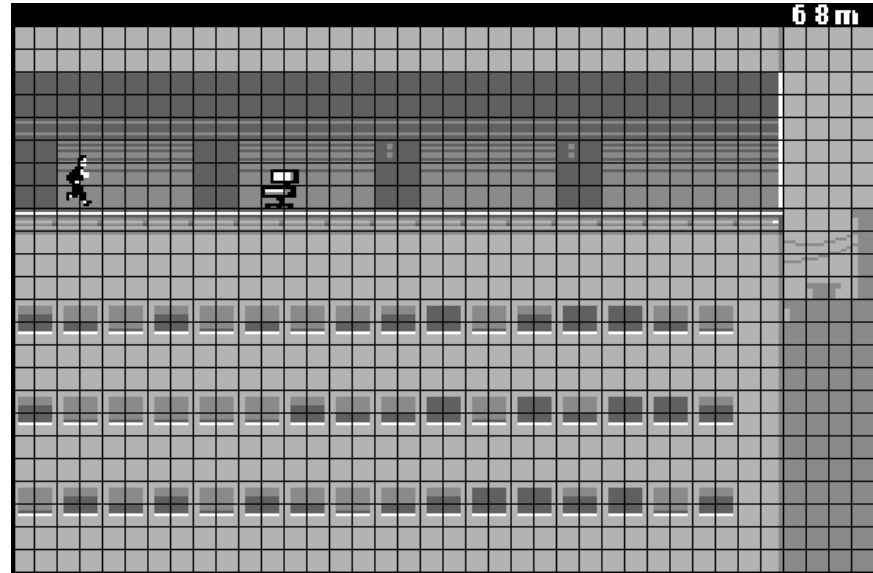
C64anabalt – Procedural levels

- Height and length of building depends on player speed and screen width
- Constructing next building while scrolling the previous building → spread CPU load over multiple frames



C64anabalt – Fast scrolling

- C64 only supports HW scrolling up to 7 pixels
→ SW based scrolling routine needed
- 40x25 “tile” based screenmode available → still 1000 bytes need to be copied



- Trade memory against speed → Unroll copy loop to reduce overhead

```
FOR row=2:25
  FOR column=2:40
    tile(row,column-1)=
      tile(row,column)
  END
END
```

Duration: 17.5 ms

Size: 38 bytes

```
tile(2,1)=tile(2,2)
tile(2,1)=tile(2,2)
...
...
tile(25,39)=tile(25,40)
tile(25,39)=tile(25,40)
```

Duration: 7.5 ms

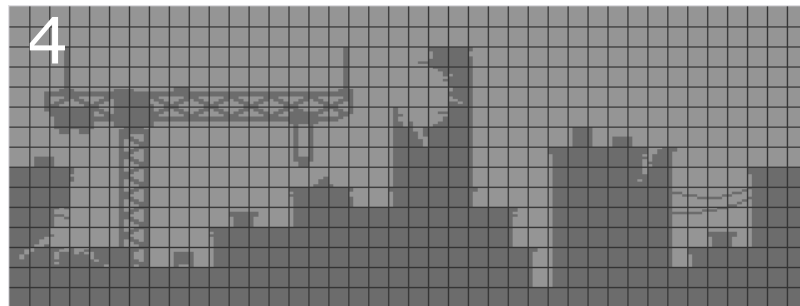
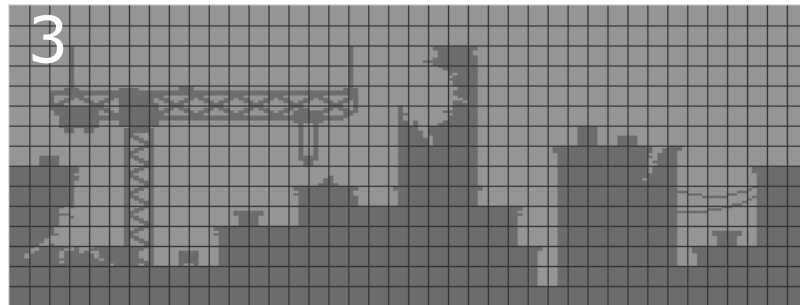
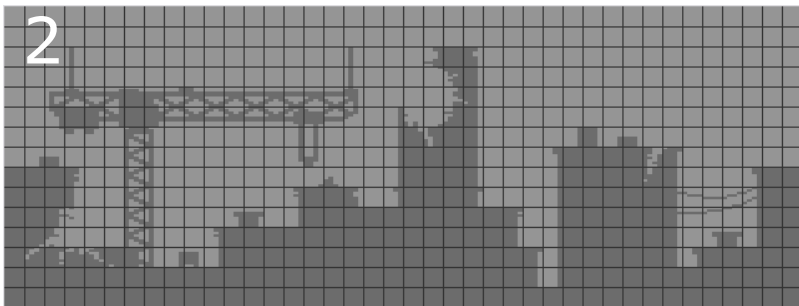
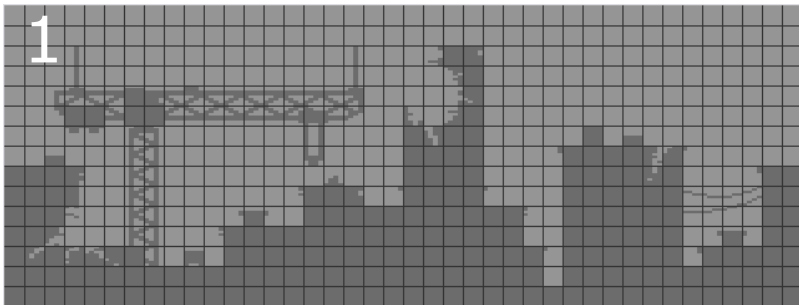
Size: 5616 bytes

C64anabalt – Parallax background

- C64 only supports single playfield → implement parallax background in SW
- Copying background realtime takes WAY too much time → trade memory against speed



- Keep 4 shifted background images in memory and switch between them depending on scroll value → illusion of a static background



C64anabalt

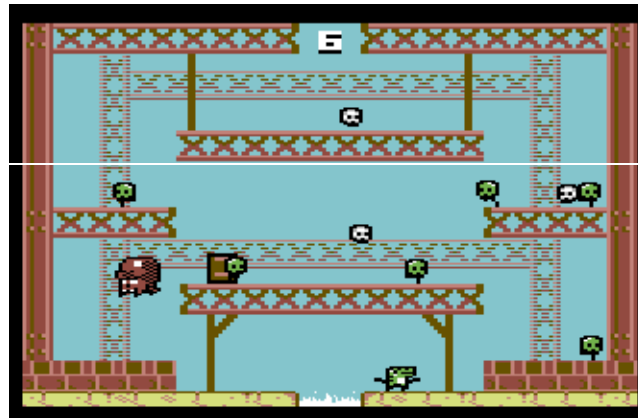
Super Crate Box (2010 Vlambeer)

- Technical features:
 - Lots of sprites on screen
 - Lots of bullet effects
 - Online highscores



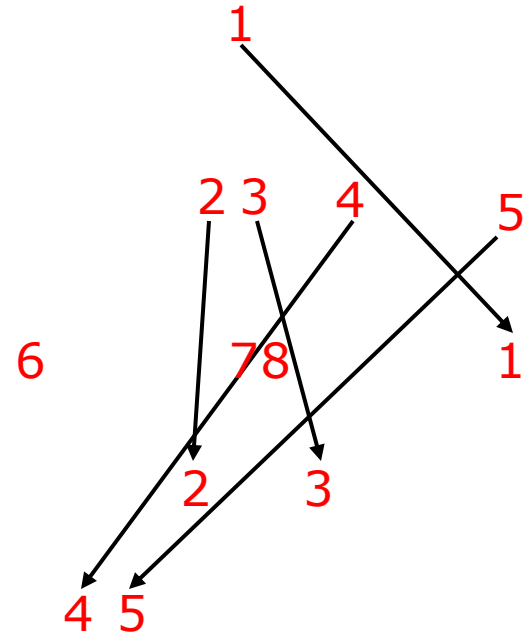
SuperBreadBox – lots of sprites

- C64 only supports 8 HW sprites
- Screen is build up from top to bottom → current raster location available in SW



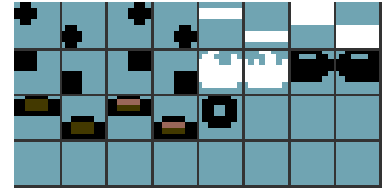
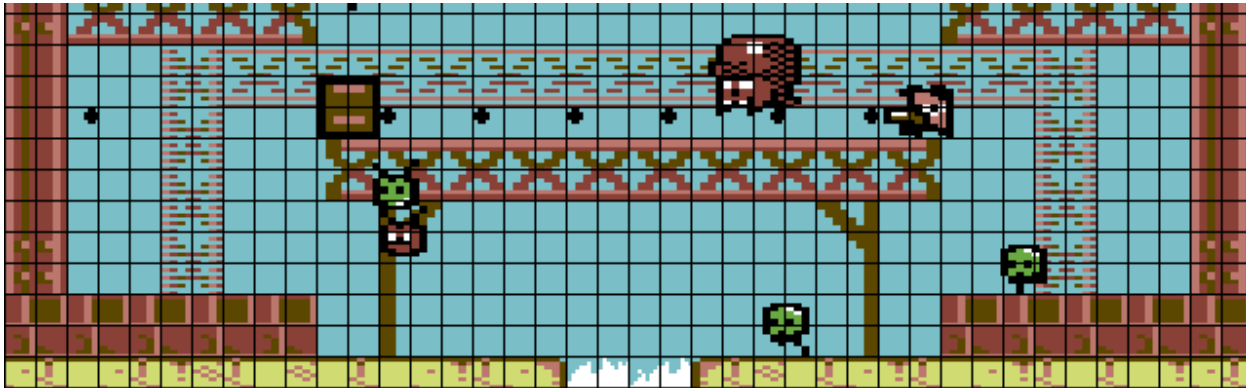
Current
rasterline

- Change sprite location and image when raster location is below sprite → sprite multiplexing



SuperBreadBox – lots of bullits

- HW sprites already used for enemies → need some SW routine
- Bullits move fast → Use the 25x40 "tile" based screenmode



SuperBreadBox – Online highscores

- C64 has no build-in ethernet capability
- Use score encryption method to generate a 25 digit code → upload to a dedicated website

ENTER CODE

o35pe

30hbn

0t45x

e70cg

Go

HIGHScores

Construction Yard		
1.	ENCORE	199
2.	PKOLLER	76
3.	JHOWARD	52
4.	TESTTEST	20
5.	PAULKO	15
6.	NEILBURT	13
7.	JAMIE	12
8.	JMONKMAN	11
9.	JAMES	10
10.	TEST	5

Rocket Silo		
1.	PKOLLER	71
2.	PAULKO	54
3.	JHOWARD	27
4.	ENCORE	20
5.	JMONKMAN	15
6.	JAMES	10
7.	NEILBURT	9
8.	TEST	5
9.	VLAMBEER	2
10.	TESTT	1

Moon Temple		
1.	PKOLLER	22
2.	TESTTEST	20
3.	ENCORE	12
4.	JHOWARD	11
5.	JMONKMAN	10
6.	TEST	5
7.	VLAMBEER	3
8.	TESTT	1
9.		
10.		

SuperBreadBox

Distribution methods

- Digital
- Tape and Floppy disk
- Cartridges



www.rgcd.co.uk

Original author involvement

- Helps in gamellogic & playtesting
- Generates (renewed) interest for the original
- Awareness of your port is much higher



Adam Atomic
@ADAMATOMIC



IMPORTANT ANNOUNCEMENT: Canabalt is now available as a C64 Cartridge!! rgcd.co.uk Get em while they last!

6:58 PM - 9 Jan 2012

34 RETWEETS 7 FAVORITES



Vlambeer
@Vlambeer



Super in-depth post about the technical challenges behind bringing Super Crate Box to the Commodore 64. rgcd.co.uk/2012/10/super-...

11:49 PM - 30 Oct 2012

14 RETWEETS 5 FAVORITES



Acknowledgments

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Paulko64@gmail.com
rgcd.co.uk