



Teaching Old Micros New Tricks

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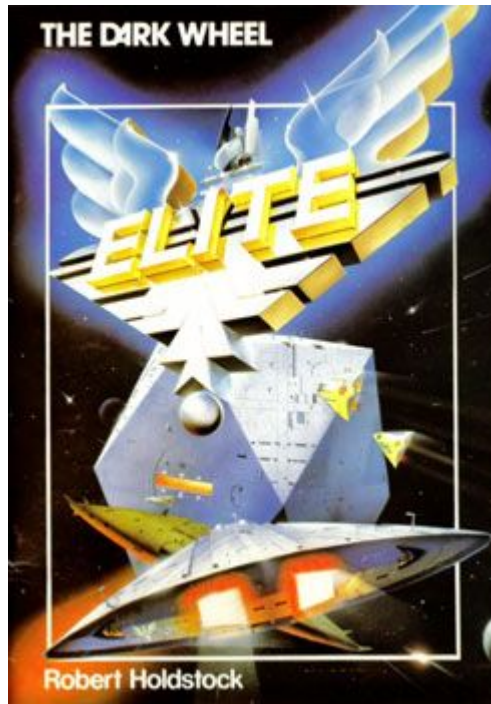
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Acorn BBC Micro





Why?! Nostalgia of course!





Practicalities



- The Beeb is almost 30 years old
- Disks die and oxidise
- Poor supply of 'original' 5.25" floppies
- Some Y2k issues

... do we need any more excuses?!



Part 1: Overcoming Problems Of Age



The Y2k Issue

- Affects BBC Master real-time clock
- Millennium wrapped clock to 1900
- Or if you're lucky, corruption...

- Most stuff doesn't use it

Domesday ROM

- Several on the market
- Rob Sprowson's is most flexible
- Costs £10, fixes Y2k
- Adds in timezones too!
- Simple ROM
- No new technology



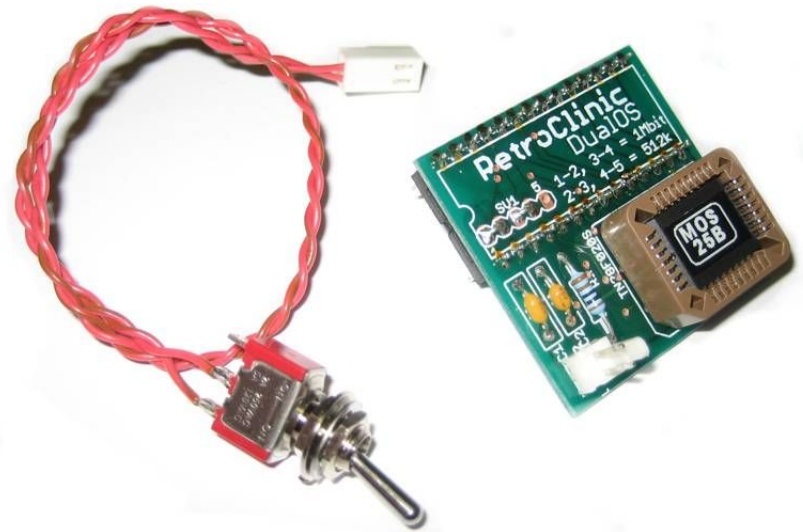


MOS Bugs

- Y2k is just one example
- Disk access, weird bugs, oddness
- Different versions of MOS
- Usually 3.20 or 3.50

Retroclinic Switchable MOS

- Replacement Master 128 MOS
- Both MOS versions in one chip
- Plus *lots* of fixes
- Custom builds
- BBC OS1.0/1.2 too!





Part 2: When Your Memory Fails...



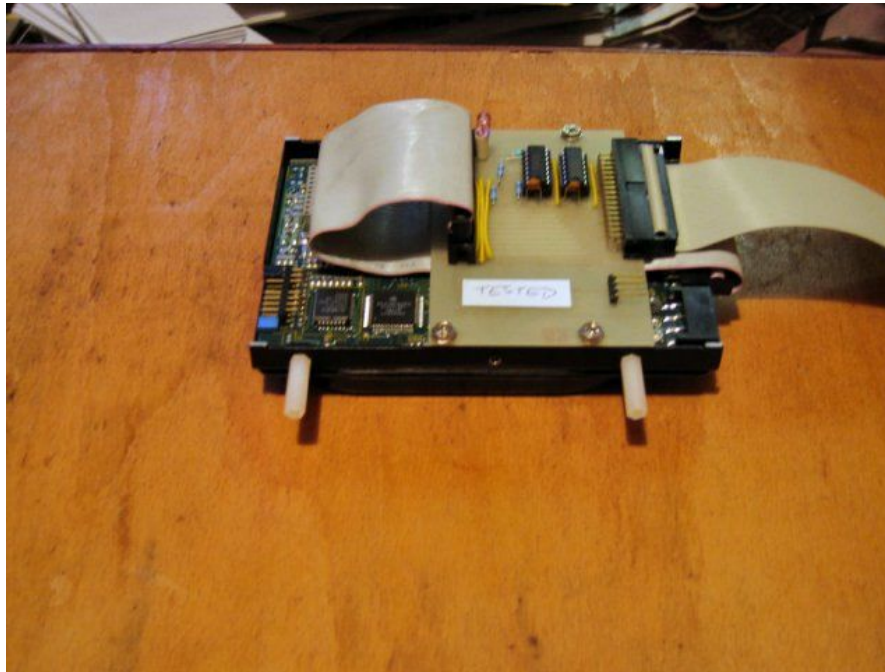
Storage

- Floppies are history
- BBC hard drives are scarce
- Econets are unwieldy (and tedious)
- Why not use newer technology?

- IDE, flash cards, USB... oh my!

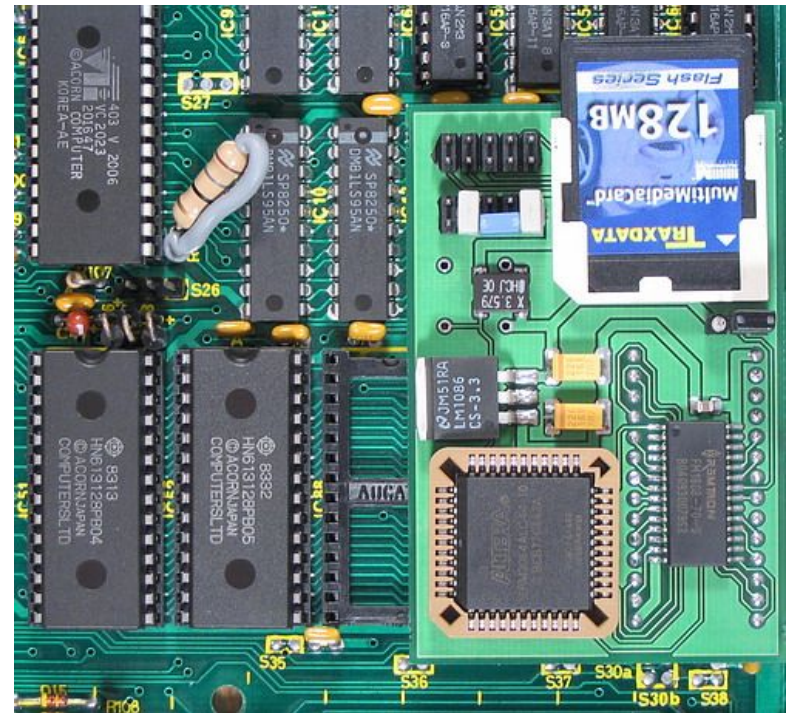
1: JGH IDE Interface

- 1MHz bus, very simple, 8-bit



2: John Kortinck's GoMMC

- MMC internal interface
- Can be picky
- Can be unreliable
- MMC hard to find

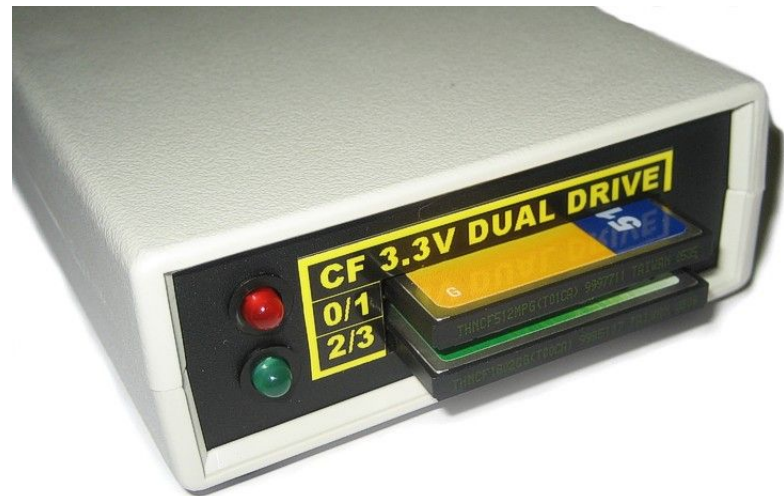


3: Retroclinic CF Reader

- Cheap, well supported
- Plugs into 1MHz bus
- Still 8-bit

Very standardised

And...

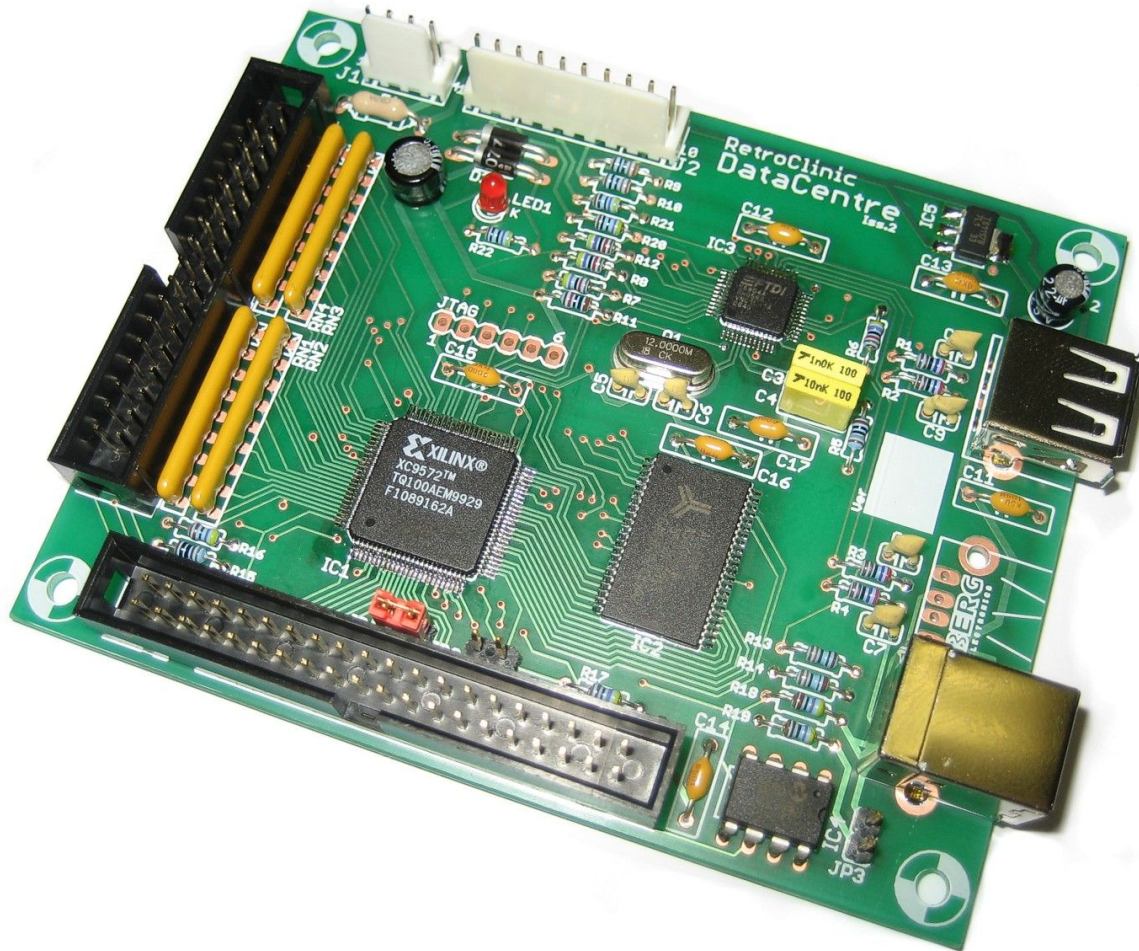


3: Retroclinic CF Reader



It works on Econet Level 3!

4: Retroclinic Datacentre





4: Retroclinic Datacentre

- IDE understands disks, CF cards
- USB-A for host FAT32 filesystems
- USB-B for slave serial port
- Plugs into 1MHz bus

- Now comes the interesting bit...



A Parenthesis... (

- BBC Micro files have load/save addresses
- Required to execute/load files
- No way of storing on modern filesystems

- How do we transfer Internet files to BBC?

SSD/DSD File Formats

- Disk image files
- .SSD is single-sided DFS disk
- .DSD is double-sided DFS disk
- .ADF is ADFS

- You can get 'ELITE.DSD' from Ian Bell!

) ...end parenthesis.



Datacentre Understands!

- Download and use *quickly*
- Put the DSD/SSD file on your USB stick
- Mount the file using *IMPORT
- Archive old disks using *EXPORT
- Save your old data – very very useful

Datacentre Understands!

```
RetroClinic RamFS
```

```
BASIC
```

```
>*.5
```

```
NO NAME
```

```
<4291-7CBA> USB
```

```
Drive 5
```

GAMES	<DIR>	GAMES1	.DSD
ELITE	.IMG	ELITE	.SSD
FRAMES1		FRAMES2	
GARFIEL		LOADER	
MARK	.SSD	PHILQ	.SSD
REPTON÷1	.SSD	SNAPPER	.SSD
SPHINX	.SSD	SPORT	
SUPERI÷1	.SSD	SUPERI÷2	.SSD
TRANSP1		JGHO	.DSD
TRANSP2		DC	.SSD
Z1	.SSD	DC2	.SSD
Z2	.SSD	NVRAM	.SSD
ZZTEST	.SSD	G2	.SSD
HDINIT		ALBERT	.SSD

```
27 files, 1 directory
```

```
>_
```

Datacentre Understands!

```
>*.5
NO NAME          <1412-84AA> USB
Drive 5

FILES            <DIR>
JCBDIG           .SSD
POLEPOS          .SSD
ELITE            .IMG
STARWARS         .SSD
SDSNOOK          .SSD
ELITE            .SSD
```

```
6 files, 1 directory
```

```
>*→IDDE
```

```
USB VID = $058F
```

```
USB PID = $6387
```

```
Vendor Id = Generic
```

```
Product Id = Flash Disk
```

```
Revision Level = 8.07
```

```
I/F = SCSI
```

```
FAT32
```

```
Bytes/Sector = $0200
```

```
Bytes/Cluster = $004000
```

```
Capacity = $0007D4250000 Bytes
```

```
Free Space = $0007D4148000 Bytes
```

```
>_
```



The Caveat

- Hacked ADFS required
 - Removes SCSI code and slots in IDE
 - Interfaces usually include it
 - Switchable MOS has it
-
- No simultaneous ST506 drives, sorry



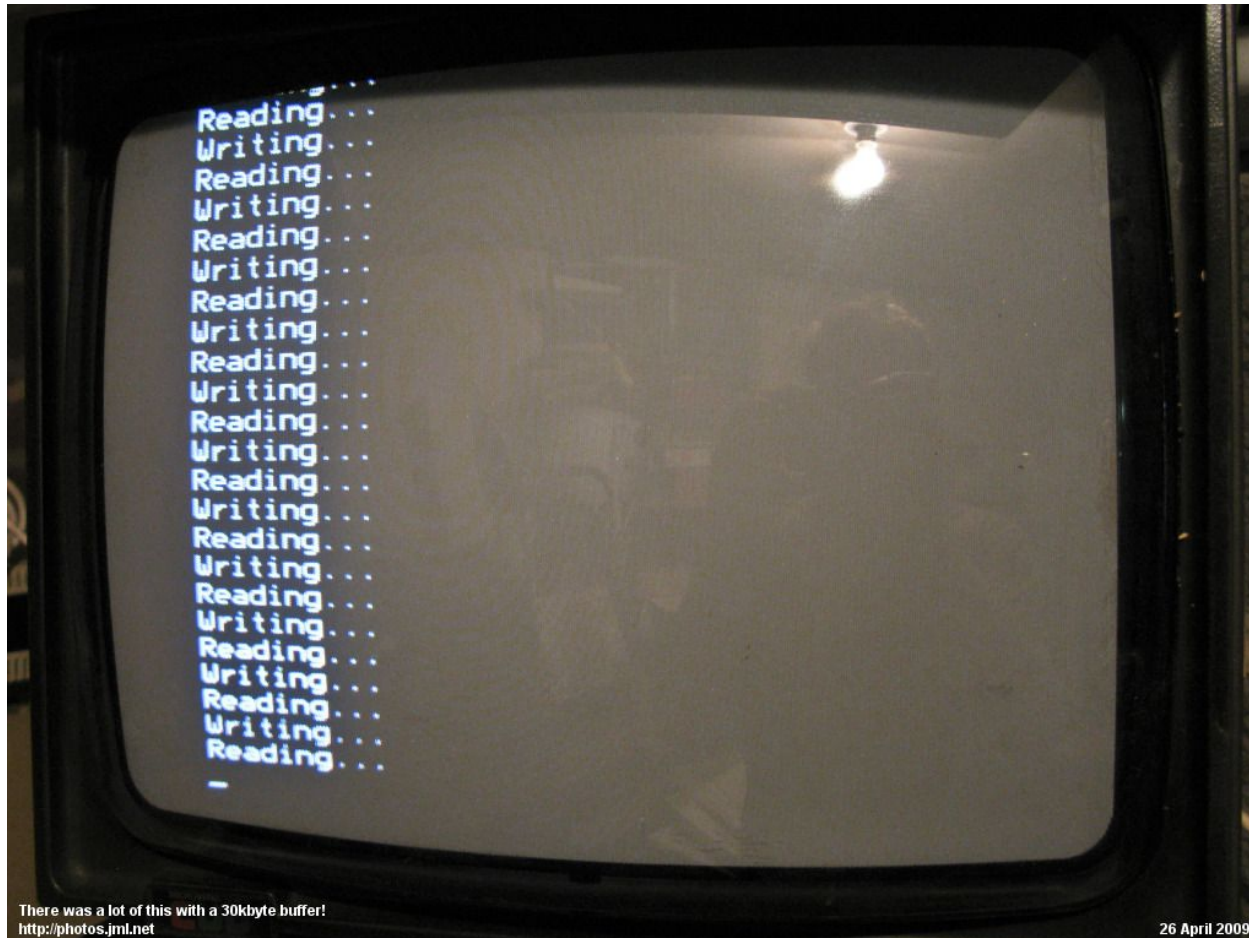
Part 3:
32k will be enough for anyone...



BBC Micro 32k...

- ...isn't 32k.
- It's more like 20k if you're lucky.
- Larger files, buffering lots.
- Get a bit more on a Master.

BBC Micro 32k



There was a lot of this with a 30kbyte buffer!
<http://photos.jml.net>

26 April 2009

More RAM, Vicar?

- Traditional route via a coprocessor
- Host/parasite arrangement
- I/O in Beeb, CPU in copro

- 6502, Z80, ARM1, 68000
- Usually in 'cheese wedges'



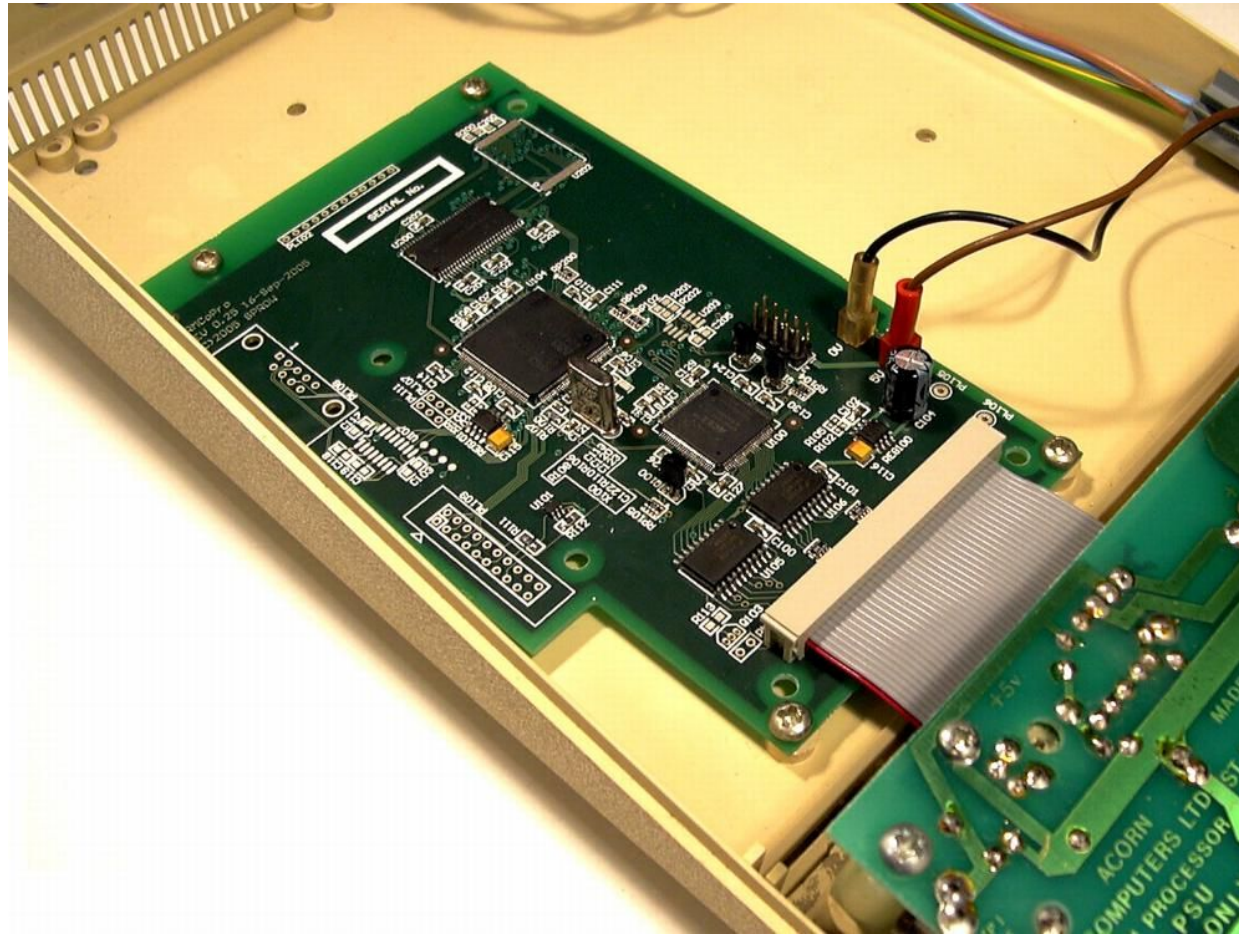


1: ARM7TDMI

- Clocked at 64MHz
- 16MB RAM as standard
- Run ARM code, relocatable modules
- BASIC V

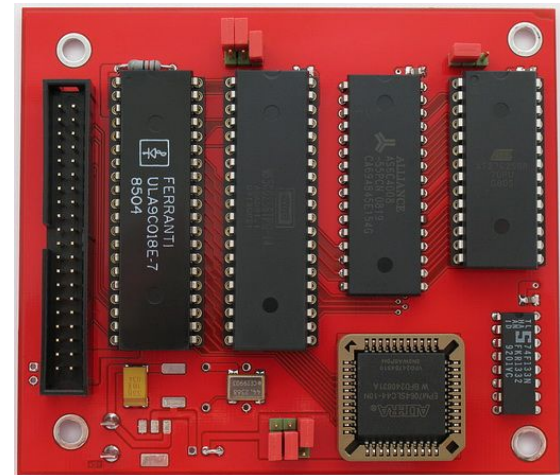
- ...and emulate other CPUs!

1: ARM7TDMI



2: John Kortinck's ReCo6502

- 65C02 replacement coprocessor
- 'Classic' 3MHz, or contemporary 14MHz
- Or 65C816 at full speed
- Bad news:
Needs Tube ULA





Part 4: The Outside World



The Outside World

- Network your BBC Micro
- Econet's a pain
- Not enough memory for TCP/IP stack

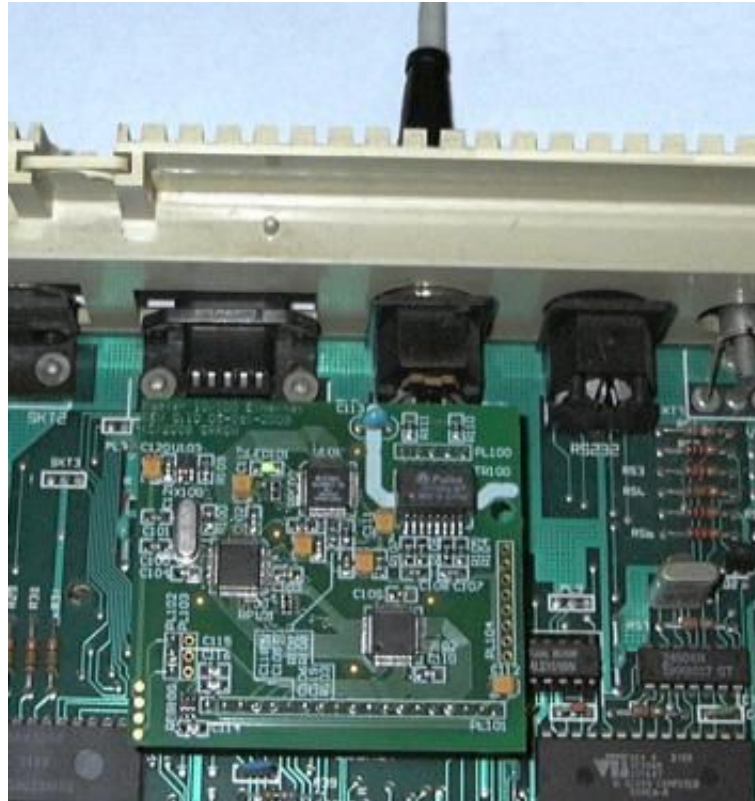


Still...

- It'd be nicer through modern cabling...
- ...using newer protocols...
- ...perhaps...

- ...uh oh, one of 'those' ideas again.

Spro's Ethernet Interface





Spro's Ethernet Interface

- Master 128 / Compact *only*
- Fits in Econet module space
- All software in ROM
- Flying-lead breaks out to RJ45
- No hack inside, no mucking around
- Talks SAMBA to Windows shares



Spro's Ethernet Interface

So just

***MOUNT**

the Windows share you want to use!



The Tricky Bit: Getting It Past The Wife

Costs Very Reasonable!

- Pretty much all peripherals under £70
- Get them from eBay or from websites
- www.retroclinic.com (ebay **retroclinic**)
- www.sproy.co.uk



To The Extreme...

- 16MB BBC Micro
- 100M ethernet interface
- USB2.0 filesystem
- 2GB hard disk

- Who needs a RiscPC anyway?!



Epilogue: Hackers Of A Feather



The Retro Scene

- Many popular places to research
- **Stairway To Hell** web forum
- **BBC Micro Mailing List**

- Lots online: Chris's Acorns, BBC Documentation Project, etc.etc.etc.

Meet Other Nutters!

- Lots of shows – next one in Leicester



The Retro Scene

- **SOME** software still under copyright
- Lots of idiots on eBay **R@RE! LOOK!**
- Buy from established folks
- Floppies and manuals (mostly) worthless

- But still have fun 😊



Thanks!

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