



CDVDBurn 3...and more



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A bit of structuring

Agenda

Part I
Promotion

Part II
The interesting stuff

Why optical discs?

- Archiving and backup
 - M-Disc or “Archival Grade” discs for longevity
 - Easy to store – just keep the discs dry and in the dark
 - Read-only-ness by design
 - Cheap per GiB
 - Endless supply of drives
 - Every OS can read it
- Data transfer to classic computers
 - No network card? Floppy too small? Serial too slow?
- Audio CDs for classic stereo equipment

CDVDBurn 3 – What's New (1)

- Supports all RISC OS 5 machines
 - ARMv5 to ARMv8 – RPi 1 to 4(00), ARMX6, Titanium, IYONIX...
 - Also Risc PC/A7000, but currently no drive support
- Supports USB and S-ATA (and IYONIX IDE)
- Supports many modern drives
 - Asus, LG, Lite-On – and one Samsung
- Supports all media types
 - Audio CD-R(W) and Data CD-R(W)
 - Data DVD-R(W), DVD+R(W), DVD-RAM
 - Data BD-R(E)

CDVDBurn 3 – What's New (2)

- Disc Extractor
 - Alternative to CDFS/CDFaker
 - Look at content of CDs/DVDs/BDs/image files
 - Extract files and directories, filer-like UI
 - ISO9660, Joliet extensions, Rockridge Naming extensions
 - Avoid CDFS annoyances (“Ambiguous Disc Name”)
- Verify Disc
 - Compare what was written to what should have been written
- Many small UI improvements
- ...and a lower price!

CDVDBurn 3 – Audio Features

- Audio CD database
- Extract audio tracks as WAV
- Combine extracted tracks to new collections
- Write in Track-At-Once or Disc-At-Once mode
- Support CD-Extra – Data and Audio on one CD

CDVDBurn 3 – Data Features

- ISO9660 compliant (Level 1, Level 2)
 - But flexible character conversion to optimize for old CDFS
 - Allows case-preserving naming for old patched CDFS
- Joliet extensions
 - Long filenames, full ISO8859/1 character set
 - Unlimited directory depth
- CDFS extensions
 - Filetype, Access Rights, Timestamp or Load/Exec
- Create Image via Drag&Drop in a filer-like way

CDVDBurn 3 – Keep in mind

- Speed
 - USB speed is limited! (micro)SD-card speed is limited!
 - ...and RISC OS speed is limited...
 - Multitasking writing is better with slower writing speeds!
 - Guideline: DVD writing is OK at 8x on RPi and 16x on ARMX6/Titanium
 - BD writing speed is more problematic (1x means 4.5 MB/s!)
- Drive compatibility
 - Please only use tested drives
- Media selection
 - Use quality media!

Live Demo CDVDBurn 3

CDVDBurn 3 - How To Buy

- Online ordering only, digital delivery
 - <https://www.hubersn-software.com/buy.html>
- CDVDBurn 3 “Full” – 50 GBP, 60 EUR
- Upgrade from CDVDBurn – 25 GBP, 30 EUR
- Upgrade from CDBurn – 40 GBP, 48 EUR
- ...sorry, no price-reduced upgrade from CDBurn Lite

CDVDDBurn 3 - TODO

- Hopefully USB 3 gives a speed boost!
- Support more drives?
- Add back Risc PC IDE/IDE podules/SCSI podules support?
- FreeDB support?
- More audio source formats?
- Direct MP3 et al creation?
- Rockridge Extensions for ISO creation?
- UDF support for Disc Extractor?
- Media Quality Scan? (aka C1/C2 error scan)

CD(VD)Burn History (1)

- Development start: 1997
- Prototype in BASIC to try out the Philips CDD2000
 - I bought the only drive with publicly available command set docs!
 - ...you might remember...Risc PC, SCSI drive, Power-tec podule
- Can write simple data tracks and audio tracks
- Only RISC OS CD writer software: EESOX CDscribe
 - Always bundled with a drive, north of 1500 DM (drive cost: 800 DM)
- RiscBSD mailing list question leads to contact with Robin Watts
- Robin/WSS want to sell a CD writing software
 - Availability: ASAP of course 😊

CD(VD)Burn History (2)

- BASIC doesn't cut it – proper data structures wanted for ISO9660
- Programming languages experience to date:
 - Locomotive BASIC
 - Z80 Assembler
 - Turbo Pascal
 - BBC BASIC
 - ARM Assembler
 - Modula 2
 - LISP
 - HP-PA Assembler
 - Ada 83, Ada 95

CD(VD)Burn History (3)

- Acorn World 1997 as release date
 - “it must fit onto an 800 KiB floppy disc!”
- Time is in short supply
- GNAT is available – thank you Peter Burwood!
 - Can I easily call SWIs?
 - OK -> write CDBurn in Ada 95!
- First version is straight port from BBC BASIC
 - ...including a bare-bone WIMP helper lib
- CDBurn V0.99 released at Acorn World 1997
 - ISO images created externally by mkisofs port – thank you Peter Burwood!

CD(VD)Burn History (4)

- 1997: ISO9660 creation
- 1998: CD-RW, Multisession, Joliet (for CDRMFS)
- 1999: Risc PC IDE
- 2000: Simtec IDE, APDL/Baildon IDE
- 2002: 32bitting...thanks Martin Würthner!
- 2003: CDBurn 32bit, CDBurn Lite for IYONIX bundling, IYONIX IDE
- 2004: hubersn Software
- 2005: CDVDBurn
- 2006: 2.02b – last public beta for a long while...
- 2007: CD/DVD extractor
- 2008: BD-R and BD-RE development
- 2010: BeagleBoard and USB
- 2017: Titanium S-ATA, ARMv8
- 2020: CDVDBurn 3 released!

CD(VD)Burn History (5)

- 14 years? Really?
 - A lot of drive compatibility frustration
 - USB on RISC OS 5 was flaky for optical drives
 - IDE on IYONIX was too slow
 - PSU in Risc PCs not good enough for modern drives
 - Most drives did not work with CDFSSoftATAPI
 - Cannot get DVD-R to work
 - GNAT buggy on 32bit for several cool features
 - GNAT runtime not compatible with ARMv8 (RPi 3 and later)

More about Ada

- Multi-paradigm language
 - Procedural at heart, but with good OO extensions
- Strong typing and rich type system
- Good support for modularity, fine-grained visibility
- Tasking provides cool abstraction for concurrency
- Record layout definable to the bit
- Compiler catches many many errors
- Strong runtime checking
- Unicode string types
- Exceptions, Generics, operator overloading...
- Low-level and high-level interoperability

Ada/GNAT on RISC OS

- Don't use it!
- Really! Don't!
- Only use it if you know what works
- Based on GCC 2.7.2 (1995!), but can produce ARMv8 code
- Compiler is slow and memory hungry
- ...but you don't need Makefiles! Just do "gnatmake code.adb" and everything is compiled automatically
- Only runs reliably on 26bit systems -> use RPCEmu with RISC OS 4.xx

Beyond optical discs

- Likely no new optical disc format after BD-R(E) XL
- New drives arrive less frequently
- Users have less interest because of cheap USB sticks and (micro)SD cards
- Buying and testing new drives is expensive and time consuming

so...what comes next???

Deliberations

- Do I want to continue with bare-bone dev tools?
- Do I ever want to touch hardware again?
- Is there a need for cross-platform tools?
- Is there a need for emulator-specific tools?
- Can I profit from knowledge gained in my “real” job?

A New Idea

- Write software in Java
- Write UIs in Java Swing
- Write software for my own needs (again)
 - ...hopefully those needs are not too esoteric!
- Write software “for” RISC OS, even if it does not run “on” RISC OS

Four Live Demos!

ArchiveReader, BBCBASICDetokenizer, SpriteViewer,
FilecoreImageReader

FilecoreImageReader – Technical Details

- Clean-room Java implementation
- Compatible down to Java 7 (Windows XP), up to Java 16
- Runs on Windows, Linux, MacOS
- Pluggable content view handler
- Java Swing UI – Look&Feel neutral, use what you like
 - `-Dswing.defaultlaf=javax.swing.plaf.nimbus.NimbusLookAndFeel`
- Full i18n and l10n support
 - `-Duser.language=en -Duser.country=GB`

FilecoreImageReader – when?

- Integrate ArchiveReader
 - Thank you James Woodcock for riscosarc!
- Big Disc support
- Support for partitioning schemes
 - EADFS already on the way
- Fix known bugs (D format...)
- Better error handling
- Decide on feature set of two editions “Free” and “Pro” (and price)

FilecoreImageReader – Future Ideas

- ISO image creation for arbitrary directory paths
- ZIP creation for arbitrary directory paths
- More content views – Templates, Drawfiles, Artworks, Disassembler...
- Extend as “RISC OS HostFS browser”
- Allow natively opening known filetypes
 - PDF, video, audio, graphics...
- True Acorn Latin codepage support
- RISC OS Look&Feel for Java Swing
- Pseudo-execute Obey files to simulate RISC OS behaviour better
- ???Direct Disc/Device access???



Questions/comments?