

CoCo3 Digital Video Player

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Who am I?



What is this?

A digital video player for the Color Computer 3!

- Start with “off the shelf” videos (e.g. YouTube)
- Process them to match CoCo3 capabilities
- Display them with recognizable audio/video

What is it not?

Not what you might think...

- Not “page flipping”
- Not tethered to a PC
- Not pre-loading data
- Not using MMU

Why did you do this?

Because I can?

- Started as simple curiosity
- Continued out of irritation
- Surprisingly educational

But really, why not?

Specifications

Video

- 16-color resolutions — 128x96, 128x192, 256x192
- 256-color resolutions — 128x96, 128x192
- Frame “rate” — 15fps, 30fps

Audio

- 11kHz 8-bit PCM
- Internal 6-bit DAC
- Orchestra-90 hardware

Dataflow

After initial program load, program runs on “bare metal” ...

- No filesystem, no OS hardware driver
- Video data is written straight to active video memory
- Audio data is “double-buffered”

Data format

“On-disk” file format is customized for application...

- Interleaved video and audio data
- Video data is a segmented bitmap
 - Segment begins w/ a “jump” to video frame offset
 - Segments can have “flat” data and/or RLE sequences
 - “Magic” jump offset indicates EndOfFrame or EndOfVideo
- Audio data is simply an 8-bit PCM sequence

Synchronization

A/V is a “real time” application!

- “High-resolution” timer used for writing audio data
- Vertical sync interrupt used for frame stepping

After reading EndOfFrame, player fills the next audio buffer and waits for next video frame to start.

How do you process the videos?

Videos are heavily processed offline!

- Converted to a sequence of still images...
- Each still image converted to a “raw” bitmap format...
- Next frame compared to “current” frame, unchanged portions dropped...
- Remaining video data segments ranked...
 - Amount of change in color
 - Output length of sequence data
 - Input length of sequence data
- Each segment gets a “score” based on time to process data...
- Segments emitted until quota is met...
- Each frame’s data is used to update “current” video frame.

Let's use it!

Interested in this technology? Maybe I can help?

- “Laser disc”-style game
- Transition sequences in games
- DVD “emulator”
- ????

Questions?



Demonstrations

Come to my corner!

- Movies
- Documentaries
- Interviews
- Music videos

Contact

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