

CyberAVI

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CyberAVI

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## **Chapter 1**

# **CyberAVI**

## 1.1 main

CyberAVI 1.7

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CyberAVI is a fast AVI animation player for 020+ machines with AmigaOS 3.0 or higher and a graphic board with CyberGraphX or AGA.

Background

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Distribution

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Credits

Disclaimer

CyberAVI is Freeware. You don't need to send money or anything  $\ensuremath{\hookleftarrow}$  else (but if you

really want to I won't stop you from doing that :). But I would be glad if you send

me

an EMail if you like CyberAVI.

## 1.2 background

The main reason why CyberAVI was developed was because all existing animation players for AVI files were either far to slow or didn't support my graphic board in the way I wanted. All ports of XAnim supported only very few file formats and were "optimized" for the original Amiga graphic chipset.

So I planed to write such a piece of software myself. Because I own a CyberVision64 graphic board it was so easy to support the different file types with display depth >8 bits.

CyberAVI was developed on:

- A4000/030 (yes, just an MC68EC030 at 25MHz)
   now equipped with CyberStrom MK2 68060 at 50MHz
- AmigaOS 3.1
- 2MB ChipRAM
- 16MB FastRAM
- FastLaneZ3 SCSI host (disk capacity about 1.3GB)
- CyberVision64 with 4MB graphic memory
- Philips 17B 17" monitor

-graphic board with CyberGraphX

## 1.3 requirements

```
minimum hardware requirements:
-Amiga with AmigaOS 3.0 (V39)
-MC68020
-graphic board (eg. CyberVision64, Picasso II, Retina, etc) or AGA chipset
-2MB of FastRAM, 512K of ChipRAM

software requirements
-CyberGraphX 2.16 or higher if used with a graphic board
-asyncio.library V37 (included)

recommended hardware requirements:
-Amiga with AmigaOS 3.1 (V40)
-MC68040 at 25MHz minimum
```

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I recommend a registered version of CyberGraphX since the unregistered version doesn't support 24 bit screenmodes. So no screenmode requester will appear since there are no screenmodes to select!

Up from version 1.5 there is support for AGA, but I still recommend a graphic board with CyberGraphX, because OS3.x's graphics.library has some bugs and display on AGA is not just slow, it is DAMN slow! Please don't blame me for this...

## 1.4 install

Just use the supplied installer script.

If you are very experienced you can install CyberAVI "by hand". Just copy asyncio.library to LIBS: and copy CyberAVI to where ever you want to. I recommend to use the installer script.

## 1.5 encoding

Podlipec's

XAnim

program.

I will add more decoders as I need them and get any animations to test them.

Supported encodings until now:

#### Video:

Microsoft Video 1	l (CRAM)	8/16	bit
Radius CinePak	(CVID)	24	bit
Microsoft RGB	(RGB)	8/16/24/32	bit
Microsoft RLE8	(RLE8)	8	bit
IBM Ultimotion	(ULTI)	16	bit
Component Video	(YUV2)	24	bit
Intel Raw	(YUV9)	24	bit

#### Audio:

PCM 8 bit Mono/Stereo PCM 16 bit Mono/Stereo ADPCM 4 bit Mono

I am still looking for other encodings. Please

contact me

if you have an

animation with one of the following compressions:

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- Microsoft RGB with 4 bits
- RLE4 (Microsoft RLE4)
- JPEG (JFIF JPEG)
- MJPG (Motion JPEG)
- XMPG (Editable MPEG)
- IJPG (Intergraph JPEG)
- CYUV (Creative Technology CYUV)

You can send me any animation with one of the above compressions. Just compress it (with e.g. LhA) and send it uuencoded to one of my

EMail

addresses.

My worst problem is to support the

Intel Indeo

codec. Intel charges \$5000 (in

words: five thousand US-Dollars) for a licence to their source code. So it seems to be impossible that Indeo is ever supported :(

#### 1.6 shell

The command template for CyberAVI is...

FILES/M, DELAY/K/N, BUFFERSIZE=BUF/K/N, PUBSCREEN/K, SOUND/S, LOOP/S, SCREENMODEREQ=SMR/S, AGA/S, GRAY=GREY/S, FORCE24/S, MAXFPS/S, NOINDEX/S, SKIP/S, STATS/S, QUIET/S, DEBUG/S

FILES

One or more AVI files you want to view. If you don't specify a filename an ASL file requester will pop up to let you choose one or more animations. Wildcards, like ?, #? or  $\star$ , are allowed.

DELAY

CyberAVI will wait the given amount of seconds before displaying the first frame. This is very useful if you have a slow synchronizing monitor, so you don't miss a few frames at beginning of the animation. Default value is 1 second. The given value has to be between 0 and 10.

BUFFERSIZE

This option sets the buffersize for asynchronous reading. asyncio.library allocates two buffers of the given size! Default value is 64K per buffer. The given value has to be between 1 and 4096.

NOTE

This value is interpreted as the given amount of blocks of 1024 bytes. So a value of 50 means 51200 bytes and NOT 50 bytes!!

PUBSCREEN

This options forces playback to a window on a public screen. Both the screen and the animation must have at least a depth of

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> 16 bits. If this screen does not exist or if the screen's or animation's depth is lower than 16 bits or CyberAVI will use its own screen.

NOTE:

This option only works with CyberGraphX!

SOUND

Enables sound playback. If audio encoding is unknown sound playback will be switched off for the current animation. If sound listens bad you should try the SKIP (see below) option.

NOTE:

This option will have no effect on a DraCo, because this machine doesn't have the Amiga custom chips, and also no audio.device.

LOOP

Enables looping of the animation when it finishes. The default is to exit at the animation's end.

SCREENMODEREQ Enables screenmode requester. If the screen is to be opened for playback you can choose a screenmode here. This requester will appear everytime CyberAVI tries to open a screen.

AGA

Enables AGA support. This options doesn't need to be specified if you don't own a graphic board. CyberAVI will recognize itself if either AGA or CyberGraphX is available. It is just meant to force playback on AGA if you want. If this option is specified or only AGA chipset is available all frames will be reduced to 256 colors without doing any dithering, just color reduction.

#### NOTE:

Do not expect too much from AGA support. AGA chipset is damn slow compared to recent CyberGraphX compatible boards. And since there are still some bugs in OS3.x's graphics.library display may look corrupt on AGA screens.

GRAY or GREY

This switch will set a grayscale palette instead of the normal color palette.

FORCE24

Forces 16 bit animations to be displayed on a 24 bit screen. This may increase playback speed a bit.

NOTE:

If CyberAVI is running on a non-CyberGraphX system this option is totally useless and will be ignored. This option only works for 16 bit animations. For 8 bit animations this option will be ignored!! For 24 bit animations this option is (of course) senseless.

MAXFPS

Set playback speed to maximum possible. In fact a delay of 0

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seconds per frame is set, so there won't be any delay and playback will be as fast as your machine can do.

#### NOINDEX

This switch forces CyberAVI to read the file "as is". Every AVI file can have an optional index describing in which sequence the file has to be played. If you set this option the index will be ignored and the animation will be played in the sequence the frames appear in the file.

#### SKIP

This option enables skipping of video chunks if playback speed is to slow. SKIP will only work if the animation's index can be used (index available and NOINDEX ist NOT specified). Skipping will be done to the next available keyframe to avoid "humpling" of sound. If there is no "next" keyframe and your machine is too slow there is no way to play sound correctly.

#### STATS

This option causes some statistical information to be displayed after playback. This will include the number of frames, the number of displayed frames, expected playback speed and real playback speed.

#### QUIET

This options will switch off all message printing. This does not affect error messages!

#### DEBUG

Enables debug mode. When switching debug mode on CyberAVI will print much stuff to the output window describing the work being done.

#### Attention!

The FRAMESPERSEC switch doesn't exist anymore from V1.4 on since there was no real reason for its existance. Or does anybody view his AVIs with 2 fps??:)

The PRIORITY option doesn't exist anymore from V1.7 on, because all subtasks have been removed.

#### Examples:

#### CyberAVI blabla.avi

This will just show blabla.avi without sound. The index will be used if it is available.

#### CyberAVI blabla.avi sound noindex maxfps

This will show blabla.avi with sound (if available) and at maximum possible speed. No index will be used.

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CyberAVI blubb.avi screenmodereq buffersize=128

This will show blubb.avi, but before playback starts CyberAVI will ask you for a screenmode. A buffersize of 128K is used for reading.

CyberAVI brabbel.avi delay=5 loop stats

This will show brabbel.avi with a delay of 5 seconds before starting playback. The loop option causes CyberAVI to restart playback as soon as the animation's end is reached. Playback can be aborted by pressing a mousebutton, ESC or CTRL-C. After playback some statistical data will be shown.

CyberAVI veryslow.avi skip quiet gray

This will show veryslow.avi without printing any information. If your machine isn't fast enough then delayed frames will be skipped if possible. A grayscale palette will be used instead of the normal colors.

## 1.7 workbench

NOTE:

The following ToolTypes are available for CyberAVI's and any  $\leftrightarrow$ AVI animation's icon: This specifies the output window CyberAVI uses. "NIL:" is the WINDOW default value, so no text output will be visible. This option only exists if CyberAVI was started from Workbench DELAY BUFFERSIZE PUBSCREEN SOUND LOOP SCREENMODEREO AGA | These options are identical with the shell options GRAY or GREY FORCE24 | so please have a look there for further explanation. MAXFPS NOINDEX SKIP STATS QUIET **DEBUG** 

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The DEBUG option only makes sense in combination with the WINDOW option. So if you specify DEBUG but not WINDOW you won't see any debug information.

## 1.8 operation

CyberAVI will try to show the animation at the correct speed, but  $\hookleftarrow$  this mostly

depends on your machine. Faster processors (e.g. MC68040 or MC68060) and fast graphic board will result in more smooth playback.

If you did not specify the

NOINDEX

option CyberAVI will try to read the index

in every AVI file. This may take a few seconds and depends on how fast you machine is and how big the animation is.

To quit CyberAVI or stop playback you can do one of the following things:

- press either mousebutton or ESC

This will just terminate playing the current animation and is the only way to quit CyberAVI if the

LOOP

option has been specified.

- press CTRL-C

This will quit CyberAVI completely

send a Break to CyberAVI's task with tools like Scout or XOper
 This is the same as pressing CTRL-C

During playback you can use the function keys to adjust playback speed:

 ${\tt F1}$  - as fast as possible, same as

MAXFPS

option

F2 - 60 frames per second

F3 - 30 frames per second

F4 - 24 frames per second

F5 - 15 frames per second

F6 - 12 frames per second

F7 - 10 frames per second

F8 - 5 frames per second

F9 - 1 frame per second

F10 - speed specified in AVI file

The real speed you get may differ from the speed it should be, but this depends on you machine. The faster you machine is, the more exact playback speed will be.

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## 1.9 faq

encoding!

- A: Intel charges \$5000 (or more) for a non-disclosure agreement and the source to their Indeo technology. I am just a student and can't afford so much money. Now you can imagine?
- Q: Why is the ECS chipset not supported?
- A: There are some very simple reasons:

  CyberAVI was originally designed just to run on CyberGraphX systems only.

  From V1.5 on CyberAVI will also run on AGA machines and all graphics are reduced to 256 colors. AGA chipset is a lot faster than ECS chipset, but access to ChipRAM is still very slow. Thus playing AVIs on AGA machines is MUCH slower than on CyberGraphX machines, even if you have a fast CPU, like MC68040 or MC68060. Watching AVIs on AGA machines is really no fun. So, what would you expect from ECS?
- Q: Why does the sound sometimes listen very bad?
- A: Either your machine isn't fast enough to decode the video frames in time and so the sound can't be played correctly, or it is my fault. Sound support still is not perfect. You can try the SKIP

option to allow skipping of video frames if your machine is not fast enough.

- Q: After playing a huge animation with index it takes some time until my Shell's prompt appears again. Are there any bugs when playing such huge animations??
- A: Hey, please give Oberon's runtime system some time to free the memory occupied by the index :) This is definately NO bug and only appears with large indices.
- Q: CyberAVI doesn't display anything or crashes the machine!
- A: Please

contact me

! It seems you have found a bug in CyberAVI.

Q: CyberAVI refuses to work on my A500 with MC68000/7 bought back in 1988! Why?

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```
A: <sigh>!!

Q: CyberAVI refuses to work on my 200MHz Pentium with Win95? Should I buy a faster processor and more memory?

A: YOU DAMN IDIOT!!
```

## 1.10 contact

```
My adresses:

Snail mail:
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Entgelhof 11
D-32278 Kirchlengern Tel: +49-5744-1309 and +49-5744-1323
Germany

Thore Böckelmann
Stephanusstraße 82
D-33098 Paderborn Tel: +49-5251-730837
Germany

Electronic mail:
tboeckel@uni-paderborn.de
tboeckel@guardian.fido.de
```

## NOTE:

FidoNet: 2:2432/230.15 AmigaNet: 39:170/410.15

I prefer guardian.fido.de and my FidoNet account for "just talking" and bugreports. If you want to send any uuencoded stuff (like animations for testing) then PLEASE send them to tboeckel@uni-paderborn.de, because I have (nearly) unlimited mailquota at the university.

The most recent version of CyberAVI is always available by filerequest at Blind Guardian BBS. Just request "CyberAVI.lha" at one of the following lines:

```
Line 1: 38400 - 64000 Elink 310 +49-5742-920340 (2:2432/231.0)

Line 2: 2400 - 28800 Elsa TQV +49-5742-920341 (2:2432/230.0)

Line 3: 2400 - 19200 ZyXEL EG+ +49-5742-920342 (2:2432/232.0)
```

## 1.11 history

```
V1.0:
17-May-96 - first release on Aminet
```

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## V1.1: 19-May-96 - corrected version string now it should look like "CyberAVI Vx.x (date)" - timer checking implemented now playback speed should be the same on MC68030 and MC68060 - added user adjustable playback speed - added startup delay - added user adjustable buffersize for asynchronous I/O. 26-May-96 - added support for RGB and RLE compression - small speed improvements 28-May-96 - playback may now be aborted by pressing any mousebutton - reduced CVID memory usage a lot by decreasing maximum allowed strip count from 16 to 4. This may lead to incompatibiliy with some animations, but I never saw any animation with more than one strip. Please report your experiences with this. V1.2: 31-May-96 - fixed a bug that caused "memory header to located" gurus - again some small speed improvements 2-Jun-96 - added screenmode requester option - added file requester if CyberAVI is called without a filename a requester will pop up for selection V1.2a: 5-Jun-96 - fixed a bug that caused crashes, when CyberAVI was called with non-AVI-files V1.3: 10-Jun-96 - added support for 32bit RGB animations - raised default buffer size for asynchronous reading to 64K - many people complained that CyberAVI did not correctly open its screen. I hope this is fixed now. 14-Jun-96 - fixed a bug in RLE8 decoding. Thanks to Steve Cutting for his really BIG RLE8 animation to find this bug. 16-Jun-96 - seems I have found a bug in MainActors AVI saver. MA saves a buffersize of 0 instead of the correct value. This lead to crashes before. - improved sound support. I hope it listens better now. V1.4: 1-Jul-96 - started to rewrite CyberAVI completely rewrite is really necessary because the source code had become very confusing and weird :)

- why are 00xx chunks used for video data???? Very strange.

Much thanks to Maurizio Lotauro for the example animations

7-Jul-96

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(swing.avi and baseball.avi).

 $11 - J_{11}I - 96$ - rewrite is mostly done and playback should be much more stable - now a subtask is used to decode the video data. This sped up playback speed about 10% on my system. Its priority can be changed with the PRIORITY option - fixed a big bug when width or height of a video frame had to to be rounded to multiples of 4 or 8. Former versions did't allocate enough memory, so innocent memory could be overwritten while decoding data - many minor bugfixes - removed FRAMESPERSECOND option since there was no real reason for it (who would play anims at eg. 2 fps??) Therefore the switch MAXFPS was introduced. 12-Jul-96 - now AVIs will be played "by index". If an index chunk is found it will be used to determine the sequence in that the animation will be played. added NOINDEX switch to force ignorance of the index chunk 14-Jul-96 - added support for 8 bit RGB anims. Thanks to Joachim Greve for for the example animations. 17-Jul-96 - improved recognition of chunks. Unknown video chunks should not appear anymore (eq: 00xx, 00id, etc). Thanks to Ingo Jürgensmann for his animation with these strange chunks. - added support for startup from Workbench. All ToolTypes should work exactly the same way as the Shell options do. - added 18-Jul-96 SKIP switch. This allows skipping of video frames if necessary and possible 27-Jul-96 - fixed problem with shrug display of some animations. Thanks to Manuel Schlegel for his sample animations. - removed some MungWall hits - disabled audio subtask because of many problems while playback 1-Aug-96 - I hope all sound problems are fixed now. A big "Thank you" to Thomas Wenzel for his great advice. - Wow! I spent 4 weeks on rewriting and cleaning up!! I hope I

- put audio subtask back in, works fine now 4-Aug-96

did a good work :)

- again found some bugs that could lead to crashes : (

V1.5:

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```
- finally got my CyberStrom MK2 with an XC68060/50 :))))
                 GREAT speedup for the whole system :)
   16-Sep-96
               - started to support AGA :), but it's more difficult than I
                 thought. But the worst thing is: although I now own an
                 XC68060/50 displaying AVIs on AGA is slooooooooow:(
   18-Sep-96
               - added option
               AGA
                                 This forces use of color reduction routines used \leftarrow
                                      for AGA
                 chipset
               - support for 8 bit AVIs on AGA is almost finished
                 SetPatch 43.4 is needed for correct display, without it the
                 display will become screwed up due to bugs in graphics.library
   22-Sep-96
               - finished support for AGA :)
                 now it should be possible to show all supported encodings on
                 AGA machines
               - CyberAVI now doesn't depend on audio.device anymore, so it
                 should also run on Amiga's without audio hardware (e.g. DraCo)
   23-Sep-96
               - mouse pointer is now invisible during playback
               - functions keys can now be used to adjust playback speed
               - several bug fixes
   25-Sep-96
               - completely rewrote synchronization part. Skipping of frames
                 should be better now.
   26-Sep-96
               - added
               STATS
                option
   27-Sep-96
               - rewrote synchronization part again :)
                 now using EClock's instead of TimeVal's, thus timing is much
                 more exact. Now skipping of delayed frames works much better,
                 too. Pooohhhh :)
   29-Sep-96
               - removed audio subtask again :)
                 I had some spare time and worked on audio support and I think
                 it now works really good. Because audio data are very small
                 and simple there is no need for an asynchronous audio decoder
                 anymore.
               - when playing animations with palette changes in loop mode the
                 original palette was not restored. This fixed now.
               - added support for PCM 16 bit mono samples
               - fixed a bad bug with PCM 8 bit stereo samples. These were
                 played at half speed before.
               - all truecolor decoders have been splitted in a CyberGraphX
   30-Sep-96
                 part and an AGA part. This may improve speed a bit.
               - a colormap is allocated only if needed
V1.6:
```

2-Oct-96 - added support for ADPCM 4 bit mono samples

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```
- CyberAVI could hang if playback was aborted very very early.
                 This is fixed now.
               - again removed some problems with sound playback
               - SetPatch 43.x is not needed anymore, but it is supported if
    7-0ct-96
                 available. With SetPatch 43.x installed playback is slightly
                 faster, because no additional copy of video data is necessary
               - switching off mouse pointer during playback caused Enforcer
                hits. Thanks to Alexander Wild for reporting that bug.
               - fixed some bugs when pressing keys without function
    8-Oct-96
               WINDOW
               tooltype was not recognized if started from Workbench
               - finished Installer script
    9-Oct-96
               - when playing more than one animation with and without sound at
                 a time CyberAVI could do Wait() for non-existing signals which
                 lead to deadlocks. This is fixed now.
               - audio.device became very confused when stopping sound without
                 aborting pending requests. This lead to deadlocks before, too.
               - CyberAVI has now an
   15-Oct-96
               Arque
                interface. At least Argue V1.3 is
                 needed.
   16-Oct-96
               - again fixed some bad bugs when playing an animation with sound
                 and loop
   18-Oct-96
               - added
               GRAY
                option for doing playback with grayscale palette
   23-Oct-96
               - added some checking when reading the index with corrupted
                 offsets. Thanks to Chris Longmore for his "strange" animations
V1.7:
   29-Oct-96
               - AGA display routine now uses Peter Kunath's FastC2P algorithm
                 for chunky->planar conversion. This nearly doubled playback
                 speed with AGA!! :)
   13-Nov-96
               - again a rewrite became necessary :)
               - video subtask now completely removed, because overhead was too
                big. By doing this playback speed again raised a bit!
               - as there are no subtasks anymore the
               PRIORITY
                option is
                 obsolete now and has been removed.
   15-Nov-96
               - added support for Component Video (YUV2) compression. Thanks
                 to Chris Longmore for his sample animation.
   17-Nov-96
               - added support for Intel Raw (YUV9) compression. Note: this is
                 a "hacked" support. It took me nearly one complete day to
```

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disassemble the YUV9 part from XAnim's Indeo module. 18-Nov-96 - added support for PCM 16 bit stereo samples - improved skipping of delayed frames 19-Nov-96 - fixed a small display bug when rounded width or height was different from original value 20-Nov-96 - added PUBSCREEN option to display truecolor animations on truecolor screens 21-Nov-96 - removed a Mungwall-Hit that appeared when allocating odd size of memory for video buffer - the CVID decoding routine now uses the same YUV tables as YUV2 and YUV9. With this change CyberAVI should use the same CVID routine as the most recent version of XAnim. This is a "hacked" part, too. 22-Nov-96 - maximum possible buffersize decreased to 4096 (which means 4MB). I think this is enough.

## 1.12 bugs

27-Nov-96

Known bugs:

- Memory usage increases when playing more than one animation at a time. To avoid this just start CyberAVI with only one animation at a time.

If you should find any additional bugs or if you have any suggestions please

contact me
immediately.

If you should find some Enforcer hits, please report them to  $$\operatorname{\textsc{me}}$$ 

- some minor speed optimiziations

Please include a capture of CyberAVI's output when started with the  ${\tt DEBUG}$ 

option if there are any problems while playback (eg. black  $\,\,\hookrightarrow\,\,$  screen, immediate stop after start, crashes, etc).

## 1.13 todo

Very urgent things to to (maybe already finished in the next release):
 - better sound support (will this ever be finished?)

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- support AHI for sound playback. This package offers much easier access to different types of audio hardware.
- add option to save single frames as IFF-ILBM pictures

#### To do:

- support for more video and audio encodings
- use CyberGraphX's ability to use locked bitmaps and write directly to them (does anybody know how this exactly works?)
- support the Toccata audio board. I already have the developer files, but since audio support still isn't perfect there is no way to support this board. Thanks to Seuma McNally for the developer files.

## 1.14 **xanim**

The AVI encodings supported by CyberAVI are based on the source code to Mark Podlipec's XAnim program. XAnim supports a number of other AVI video encodings, as well as QuickTime files.

The key differences between CyberAVI and XAnim for AVI files are:

- XAnim is more powerful and more general than CyberAVI.
- CyberAVI requires either a CyberGraphX compatible graphic board or AGA chipset. ECS is not and will not be supported!

A gzip compressed archive of Mark Podlipec's XAnim can be obtained from:

http://www.portal.com/~podlipec/home.html "The XAnim Home Page"

```
* xanim.c

*
    Copyright (C) 1990,1991,1992,1993,1994,1995,1996 by Mark Podlipec.

* All rights reserved.

*
    This software may be freely copied, modified and redistributed without
    fee for non-commerical purposes provided that this copyright notice is
    preserved intact on all copies and modified copies.

*
    There is no warranty or other guarantee of fitness of this software.

* It is provided solely "as is". The author(s) disclaim(s) all
    responsibility and liability with respect to this software's usage
    or its effect upon hardware or computer systems.

*
*/
```

#### 1.15 argue

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It was around 1992 when Commodore released their new Amiga OS 2.0. With this, there were amazing changes for developers and users. All looked a bit more professional, and a lot of things were just easy and better to handle than in former times.

Earlier, developers had to write their own argument reading system. Often it was really unpractically and difficult to understand.

The guys at Commodore knew that and thought about a new standard for argument parsing to avoid confusion about all that. What they finally got was ReadArgs(), a system function that parses arguments automatically.

Developers now only had to write a template to specify, what arguments they would like to have. A template looks like this: FILE/A, SWITCH/S...

From now on, all the users could have a look at this template by adding a question mark to the program's name to execute.

But all in all, there was a problem. Folks still had to go "down" into a shell and type in all the arguments by hand.

So there are still a lot of people that write external interfaces for a specific tool. Some of them are even shareware!

This was really annoying as there was no tool that could manage ALL tools.

In early 1996 I developed a GUI layout system called NiceGUI. It was crap, but on this way I created the first version of Argue.

Argue's job was and is to read other tool's argument templates and prepare a nice user interface where the user can decide what he would like to have as arguments. Argue 0.3 was quite bad, but it was the first basis for further development.

Some months later I invented how to write MUI applications. It was very easy, and I implemented a new version of Argue with it. This was called Argue 0.6 and released to some BBSs here in Germany.

From then on Argue made giant steps towards user friendliness and efficiency. New features were added in masses, and now, at the time of Argue 1.0, there is a (near ;) complete interface creation system.

#### 1.16 distribution

CyberAVI is Copyright ©1996 by Thore Böckelmann.

CyberAVI may be freely distributed as long as the following conditions are met:

- all files have to be kept together
- no file my be modified or crunched/packed
- the only official way to distribute this program as archive is the original LhA archive

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### 1.17 credits

CyberAVI was written by Thore Böckelmann using Amiga Oberon 3.10  $\,\leftrightarrow$  and GCC 2.7.0

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The

XAnim

program is written by Mark Podlipec. XAnim6 on the Amiga is a  $\ensuremath{\hookleftarrow}$  port by

Terje Pedersen. XAnim is @1990-1996 by Mark Podlipec.

asyncio.library was written by Martin Taillefer, Magnus Holmgren and Olaf Barthel

Arque

is ©1996 by Thorsten Stocksmeier

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#### 1.18 disclaimer

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residing on a system attempting to run the programs.

The user of this program uses it at his or her own risk.