

CDXL

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WRITTEN BY		February 12, 2023	

REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME

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Chapter 1

CDXL

1.1 CDXL-Format

C D X L · A N I M A T I O N E N

CDXL I N F O S

CDXL F O R M A T

CDXL L O A D E R

CDXL S A V E R

CDXL P L A Y E R

1.2 CDXL-Format Infos

CDXL I N F O S

CDXL-Auflösungs-Kombinationen für unterschiedliche Laufwerkstypen...
...jeweils mit 4096 Farben und 12 bis 15 Bildern pro Sekunde.

1fach-Speed Laufwerk (150 kB)	-	160x100 in HAM6 mit 12 FPS und 8 Bit Mono in	↔
11.025 kH			
2fach-Speed Laufwerk (300 kB)	-	224x146 in HAM6 mit 12 FPS und 8 Bit Mono in	↔
11.025 kH			

3fach-Speed Laufwerk (450 kB) - 272x170 in HAM6 mit 12 FPS und 8 Bit Mono in ↔
 22.05 kHz
 4fach-Speed Laufwerk (600 kB) - 320x200 in HAM6 mit 12 FPS und 8 Bit Mono in ↔
 22.05 kHz
 6fach-Speed Laufwerk (900 kB) - 384x240 in HAM6 mit 12 FPS und 8 Bit Stereo in ↔
 22.05 kHz
 8fach-Speed Laufwerk (1200 kB) - 384x274 in HAM6 mit 15 FPS und 8 Bit Stereo in ↔
 22.05 kHz
 10fach-Speed Laufwerk (1500 kB) - 384x274 in HAM6 mit 20 FPS und 8 Bit Stereo in ↔
 22.05 kHz

BEISPIEL für eine Animation mit Sound, die auf jedem Doublespeed
 Cd-Rom-Laufwerk und jedem Amiga flüssig abgespielt werden soll...

ABSPIELGESCHWINDIGKEIT: 12 Bilder pro Sekunde

CHUNKHEADER: CXHD=32 bytes
 32*12=384 bytes

ABMESSUNGEN DER BILDER: 224x146 in HAM6

BERECHNUNGSFORMELN: 224*146=32704 bits
 32704\$/div\$8=4088 bytes
 4088*6=24528 bytes
 24528*12=294336 bytes

BILDPALLETTE: CMAP=32 bytes
 32*12=384 bytes

SAMPLERATE DES SOUNDS: 8 bit Mono mit 11025 Hertz

BERECHNUNGSFORMELN: 11025*8=88200 bits
 88200\$/div\$8=11025 bytes

CHUNKGRÖßE: 25512 bytes
 BERECHNUNGSFORMEL: 24528+32+32+920=25512 bytes

OPTIMIZED: FALSE
 BERECHNUNGSFORMEL: 25512\$/div\$2048=12.46 Blocks

DATENDURCHSATZ HEADER: 384 bytes pro Sekunde
 DATENDURCHSATZ CMAP: 384 bytes pro Sekunde
 DATENDURCHSATZ GRAFIK: 294336 bytes pro Sekunde
 DATENDURCHSATZ SOUND: 11025 bytes pro Sekunde
 DATENDURCHSATZ PAD: 0 bytes pro Sekunde

DATENDURCHSATZ GESAMT: 306129 bytes pro Sekunde
 ~ 299 Kb pro Sekunde

Zur Optimierung des Lesestromes sollte die Chunkgröße möglichst durch 2048 teilbar
 sein und eine ganze Zahl ergeben, da CDXL auf die Blockgröße der ISO-CD-Rom ausge-
 richtet wurde. Darum noch ein BEISPIEL für eine Animation mit Sound, die auf jedem
 Doublespeed Cd-Rom-Laufwerk und jedem Amiga flüssig abgespielt werden kann...
 ...jetzt aber in einer optimierten Form.

ABSPIELGESCHWINDIGKEIT: 12 Bilder pro Sekunde

```

CHUNKHEADER:      CXHD=32 bytes
                  32*12=384 bytes

ABMESSUNGEN DER BILDER: 224x140 in HAM6

BERECHNUNGSFORMELN: 224*140=31360 bits
                   31360$\div$8=3920 bytes
                   3920*6=23520 bytes
                   23520*12=282240 bytes
BILDPALLETTE:     CMAP=32 bytes
                   32*12=384 bytes

SAMPLERATE DES SOUNDS: 8 bit Mono mit 11025 Hertz

BERECHNUNGSFORMELN: 11025*8=88200 bits
                   88200$\div$8=11025 bytes
                   11025$\div$12=919 bytes

                   CHUNKGRÖßE: 24576 bytes
                   BERECHNUNGSFORMEL: 23520+32+32+919+73=24576 bytes

                   OPTIMIZED: TRUE
                   BERECHNUNGSFORMEL: 24576$\div$2048=12 Blocks

DATENDURCHSATZ  HEADER:      384 bytes pro Sekunde
DATENDURCHSATZ   CMAP:       384 bytes pro Sekunde
DATENDURCHSATZ  GRAFIK:     282240 bytes pro Sekunde
DATENDURCHSATZ   SOUND:     11028 bytes pro Sekunde
DATENDURCHSATZ   PAD:       876 bytes pro Sekunde
                   -----
DATENDURCHSATZ  GESAMT:     294912 bytes pro Sekunde
                   ~ 288 Kb pro Sekunde

```

In dieser Qualität würden ungefähr 38 Minuten Animation auf eine ISO CD-Rom [640 ← Mb] passen, was ungefähr der Hälfte der Video-CD [MPEG-1 ~ 70 min. in 384x280x24] ← entspricht. Bei einer Abmessung von 320x200 und 22.05 kHz Sound, würde man ein 4fach Speed- ← Laufwerk benötigen und eine CD-Rom hätte für circa 18 Minuten Animation Platz.

1.3 CDXL-Format Beschreibung

CDXL F O R M A T

Typenbedeutung:

```

BYTE   8 Bit vorzeichenlose ganze Zahl
WORD   16 Bit vorzeichenlose ganze Zahl im 'Motorola'-Byte-Sex
LONG   32 Bit vorzeichenlose ganze Zahl im 'Motorola'-Byte-Sex

```

CDXL-Format Beschreibung [CHUNK]

```

#01 BYTE: $00 {0}          [CUSTOM CDXL]
or BYTE: $01 {1}          [STANDARD CDXL]

```

or BYTE: \$02 {2} [SPECIAL CDXL]

Das CDXL-Info-Byte entsteht durch Addition dreier Beschreibungsgruppen:

```
#02 BYTE: $00 {0} [RGB] ...VIDEO ENCODING
or BYTE: $01 {1} [HAM]
or BYTE: $02 {2} [YUV]
or BYTE: $03 {3} [AVM & DCTV]
```

plus

```
#02 BYTE: $00 {0} [BIT PLANAR] ...PIXEL ORIENTATION
or BYTE: $20 {32} [BYTE PLANAR]
or BYTE: $40 {64} [CHUNKY]
or BYTE: $80 {128} [BIT LINE]
or BYTE: $C0 {192} [BYTE LINE]
```

plus

```
#02 BYTE: $00 {0} [MONO] ...AUDIO VALUES
or BYTE: $10 {16} [STEREO]
```

```
#03 LONG: $0000295C {10588} [CURRENT CHUNKSIZE]
#04 LONG: $0000295C {10588} [PREVIOUS CHUNKSIZE]
#05 WORD: $0000 {0} [RESERVED]
#06 WORD: $0001 {1} [CURRENT FRAMENUMBER]
#07 WORD: $00CB {203} [BITMAPWIDTH]
#08 WORD: $005E {94} [BITMAPHEIGHT]
#09 WORD: $0004 {4} [NUMBEROFBITPLANES]
#10 WORD: $0020 {32} [COLORMAPSIZE]
#11 WORD: $02EC {748} [RAWSOUND SIZE]
#12 LONG: $00000000 {0} [RESERVED]
#13 LONG: $00000000 {0} [RESERVED]
```

BYTE #32 - #64 [COLORMAP] ; die Pens sind immer WORT-kodiert mit führenden Nullen
d. h. die Palette ist immer 12 Bit (4096 Farben).

```
z.B. 0FFF oder 0E9A
   |||_15   |||_10   ; RGB_Blau_Anteil (0-15)
   ||__15   ||__09   ; RGB_Grün_Anteil (0-15)
   |__15   |__14    ; RGB_Rot_Anteil (0-15)
```

Alle nachfolgenden Daten Sind immer in der Reihenfolge:

```
#3 BITMAPDATA [UNCOMPRESSED BODY]
#4 SOUND DATA [UNCOMPRESSED BODY]
```

```
#1 HEADER
#2 COLORMAPDATA
#3 BITMAPDATA
#4 SOUND DATA
```

u.s.w. angeordnet.

1.4 CDXL-Format Loader

CDXL L O A D E R

CDXL(TM) LOADER
FOR ASDG'S
ART DEPARTMENT PROFESSIONAL(TM)

THE ART DEPARTMENT PROFESSIONAL MODULES DESCRIBED IN THIS DOCUMENT (AS WELL AS THIS DOCUMENT ITSELF) ARE PROPRIETARY AND ARE SUBJECT TO PROVISIONS OF THE (1) CDTV(TM) DEVELOPER LICENSE AND (2) THE ART DEPARTMENT PROFESSIONAL END-USER SOFTWARE LICENSE AGREEMENT.

NOTE: USE OF THESE MODULES REQUIRES ADPRO 2.1.X OR LATER.

The Loader

THE LOADER REQUIRES "adpro.library" TO BE LOADED IN THE LIBS: DIRECTORY.
THIS IS PERFORMED BY THE INSTALL PROGRAM

The ADPRO CDXL loader can load most of the image types that the CDXL format supports. Specifically it supports 1-8 bit rendered data, HAM and EHB. It also supports 8 bit gray and 24 bit color chunky image data. It allows you to load (preserve) audio and pad data from existing CDXL files which include such information.

The CDXL loader is special in that it stays resident after its first use. And, when used from ARExx, it can also keep open the last file used. This allows the loader to process animations extremely quickly.

The CDXL Loader main window gives you the number of frames in the CDXL file, and the number of bytes per frame of audio and pad data. It allows you to select which frame to load.

Along the bottom of the window, "Accept" loads the selected frame. "Quit", closes the file and quits the loader (meaning that the loader will be removed from memory). Finally, "Cancel", cancels the load but leaves the loader resident and the last used CDXL file open.

If the pre-existing CDXL file contains pad and/or audio data, you can choose to load that data or not. If loaded, this information will be saved with the frame during the next CDXL save provided that the CDXL file being saved has made provisions for audio and pad data of the same size as the source CDXL file.

From AREXX, you interface to the CDXL loader in the following way:

The general format of the CDXL loader ARExx interface
is as follows:
LOAD "filename" "framenum" n [CMD] [standard ADPRO C_OPTS]

where CMD is 0 or more of the following:

SKIPPAD	do not load pad data
SKIPAUDIO	do not load audio data

SKIPVIDEO	do not load video (audio or pad only)
KEEPOPEN	keep the file open. SEE NOTE!!!
CLOSE	close the file, and do nothing else
QUIT	close the file, and quit (unresident the loader), do nothing else
NOPAD	do not convert rendered data to 8 bit or 24 bit raw

If you do not specify SKIPPAD or SKIPAUDIO, pad and audio will be loaded, if present.

NOTE: WHEN YOUR THROUGH WITH A FILE WHICH YOU EXPLICITLY ASKED TO ``KEEPOPEN``, YOU MUST REMEMBER TO ISSUE A ``CLOSE``, OR RISK THE FILE STILL BEING OPEN WHEN YOU REBOOT WITH POTENTIALLY HAZARDOUS RESULTS

1.5 CDXL-Format Saver

CDXL S A V E R

CDXL(TM) SAVER
FOR ASDG'S
ART DEPARTMENT PROFESSIONAL(TM)

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NOTE: USE OF THESE MODULES REQUIRES ADPRO 2.1.X OR LATER.

The SAVER

The ADPro CDXL Saver allows you to create, modify and extend CDXL files. It allows you to specify the amount of space to leave for audio and padding. It, in conjunction with the CDXL loader, can even be used to copy audio and pad data from other CDXL files.

The saver may be used with 1-8 bit rendered data, HAM and EHB. It also supports 8 bit gray and 24 bit color chunky image data.

The CDXL saver is special in that it stays resident after its first use. When used from ARexx, it can keep open the last file used. This allows the saver to process animations extremely quickly.

The CDXL Saver main window shows the number of frames (if any) currently in the CDXL file, the amount of pad and audio space, and the type of image.

If you are creating a new CDXL file, you are allowed to enter the amount of pad and audio space, and well as the type of image - either raw or rendered.

There are two buttons which allow you to select how to handle audio and pad space in the file. Each button has 3 settings. "Skip Audio" leaves the audio data in the file intact, "Zero Audio" clears the audio space, "Keep Audio" saves the audio data that the CDXL loader may have loaded previously. The "Keep Audio" selection will not appear unless you have loaded Audio data, and it appropriately sized. The other button, with values of "Zero Pad", "Skip Pad" and "Keep Pad" serves the same functions for pad data.

Below the audio and pad buttons in the Interleaved/Non-Interleaved image button (this button is only enabled if you are creating a new CDXL file). Beneath this button is the button which allows you to pick rendered or raw data.

If you choose interleaved, and you choose rendered data, then the planes of rendered data are interleaved in the file.

If you choose interleaved, and you choose raw data, then the format of the data is interleaved lines of of the three colors, red green blue.

If you choose non-interleaved, and you choose rendered data, then the planes of rendered data are saved one at a time.

If you choose non-interleaved, and you choose raw data, then the format of the data is as triples of red,green,blue bytes in a matrix of size width*height.

The three buttons along the bottom of the window, "Accept", "Quit", "Cancel", respectively saves the selected frame, closes the file and quits the saver, cancels the save but leaves the saver resident and the file open.

You are allowed to enter a frame number one larger than the number of frames in the file, thus extending the file by one frame.

From AREXX, you interface to the CDXL saver in the following way:

The general format of the CDXL saver ARexx interface is as follows:

```
SAVE "filename" TYPE framenum n [CMD]
```

Where TYPE may be one of

```
RAW          save "raw" image data
IMAGE       save "rendered" image data
```

where CMD is 0 or more of the following:

```
FRAMENUM nn  -1 means append, else must be
              1..#of frames+1 in the file

PADSPACE nn  allows you to pick pad space. If not
              creating a file, this number must agree with
```

the existing padspace in the file.

You must also specify SAVEPAD for PADSPACE to perform its work

AUDIOSPACE nn	allows you to pick audio space. If not creating a file, this number must agree with the existing audiospace in the file
	You must also specify SAVEAUDIO for AUDIOSPACE to perform its work
SKIPPAD	do not save pad data - leave this frames pad intact
SAVEPAD	save the loaded pad data into this frame (sizes must match)
ZEROPAD	clear the pad space of this frame to zeros
SKIPAUDIO	do not save audio data - leave this frames audio intact
SAVEAUDIO	save the loaded audio data into this frame (sizes must match)
ZEROAUDIO	clear the audio space of this frame to zeros
KEEPOPEN	keep the file open SEE NOTE!!!
CLOSE	close the file and do nothing else
QUIT	close the file, and quit (unresident) the saver and do nothing else
INTERLEAVED	use "interleaved" format. If this word is not present then save noninterleaved.

NOTE: WHEN YOUR THROUGH WITH A FILE WHICH YOU EXPLICITLY ASKED TO ``KEEPOPEN``, YOU MUST REMEMBER TO ISSUE A ``CLOSE``, OR RISK THE FILE STILL BEING OPEN WHEN YOU REBOOT WITH POTENTIALLY HAZARDOUS RESULTS

1.6 CDXL-Format Player

CDXL P L A Y E R

cdgsxl FROM/A,X/K/N,Y/K/N,VOL/K/N,VIEW/S,BLIT/S,BACK/K,MULTIPAL/S,XLSPEED/K/N, ↔
 NOXLEEC/S,
 XLPAL/S,LACE/S,NONLACE/S,HIRES/S,LORES/S,BOXIT/S,SDBL/S,NTSC/S,PAL/S,DEFMON/S, ↔
 NOPOINTER/S,
 XLMODEID/S,ENDDELAY/K/N,LOOP/K/N,CDXL/S,DOSXL/S,NOPROMOTE/S,LMBABORT/S,RMBABORT/S, ↔
 FIREABORT/S,
 MSGPORTNAME/K,HAM/S,NONHAM/S,EHB/S,NONEHB/S,PATCHOPENWB/S

Introduction:

FROM/A ~ CDXL-File [Path- and/or FileName]
 X/K/N ~ LeftEdge in Pixel (Default is CENTER)
 Y/K/N ~ TopEdge in Pixel (Default is CENTER)
 VOL/K/N ~ SoundVolume [0-64] (Default is 64)
 VIEW/S ~ Open on View is ON (Default is SCREEN)
 BLIT/S ~ Blit to Display is ON (Default is NON BLIT)
 BACK/K ~ BackdropILBM [Path- and/or FileName] (Implies BLIT ON)
 MULTIPAL/S ~ MultiPalette is ON (Default is FIXED PALETTE)
 XLSPEED/K/N ~ PlaybackSpeed [1-1000] (Default is 75) {Blocks per Sec. (2048 ←
 Bytes) }
 NOXLEEC/S ~ ErrorCorrection is OFF (Default is ON)
 XLPAL/S ~ Use CDXLPALLETTE (Default is BACKDROPIBMPALLETTE if BACK is ON)
 LACE/S ~ Interlace Display is ON (Default is CDXL- or ILBMSETTING)
 NONLACE/S ~ NonInterlace Display is ON (Default is CDXL- or ILBMSETTING)
 HIRES/S ~ Hires Display is ON (Default is CDXL- or ILBMSETTING)
 LORES/S ~ Lores Display is ON (Default is CDXL- or ILBMSETTING)
 BOXIT/S ~ Draw a Box in Color 0 around Image (Default is OFF)
 SDBL/S ~ ScanDoubled Display is USED (Default is CDXL- or ILBMSETTING)
 or SizeDoubled... Don't woory it did not work!
 NTSC/S ~ NTSC MonitorID is USED (Default is CDXL- or ILBMSETTING)
 PAL/S ~ PAL MonitorID is USED (Default is CDXL- or ILBMSETTING)
 DEFMON/S ~ DEFAULT MonitorID is USED (Default is CDXL- or ILBMSETTING)
 NOPOINTER/S ~ MousePointer is OFF (Default is ON)
 XLMODEID/S ~ Use CDXLMODEID (Default is BACKDROPIBMMODEID if BACK is ON)
 ENDDelay/K/N ~ In Frames [n] per Second (PAL Default 50 FPS, NTSC Default 60 ←
 FPS)
 LOOP/K/N ~ Number of PlayLoops [1-???|-1~Infinite] (Default is 1)
 CDXL/S ~ cd.device or cdtv.device is USED (Default is ON)
 DOSXL/S ~ Current DOSdevice is USED (Default is OFF)
 NOPROMOTE/S ~ NOPROMOTION of ModeID is ON (Default is OFF)
 LMBABORT/S ~ LeftMouseButtonAbort is ON (Default is OFF)
 RMBABORT/S ~ RightMouseButtonAbort is ON (Default is OFF)
 FIREABORT/S ~ JoystickFireButtonAbort is ON (Default is OFF)
 MSGPORTNAME/K ~ MessagePort is ON [Name] (Default is OFF)
 HAM/S ~ HAM Display is ON (Default is CDXL- or ILBMSETTING)
 NONHAM/S ~ NONHAM Display is ON (Default is CDXL- or ILBMSETTING)
 EHB/S ~ EHB Display is ON (Default is CDXL- or ILBMSETTING)
 NONEHB/S ~ NONEHB Display is ON (Default is CDXL- or ILBMSETTING)
 PATCHOPENWB/S ~ Force OpenWorkbench() is OFF (Default is ON)