

PNGdt

Gunther Nikl

COLLABORATORS

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WRITTEN BY	Gunther Nikl	July 31, 2024	

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Chapter 1

PNGdt

1.1 PNG picture datatype

PNG Picture DataType for Workbench 3.0 or above
Written by Gunther Nikl in 1998-2001

GiftWare

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Final note: Use at your own risk!

1.2 copyright

This PNG package is Copyright © 1998-2001 by Gunther Nikl. This software package may be used freely for non-commercial purposes. Distribution of this software package is allowed as long as it remains unaltered.

Hereby permission is granted to distribute this software package on the "Meeting Pearls" CD-ROM series. Distribution on other CD-ROMs, disks series or cover disks requires a permission of the Author.

If you use this datatype you should consider to send the author a small gift.

This software is based in part on the png reference library.

libpng:

libpng version 1.0.12 - June 8, 2001
Copyright (c) 1998-2001 Glenn Randers-Pehrson
(Version 0.96 Copyright (c) 1996, 1997 Andreas Dilger)
(Version 0.88 Copyright (c) 1995, 1996 Guy Eric Schalnat, Group 42, Inc.)

zlib:

zlib 1.1.3 - July 9, 1998
(C) 1995-1998 Jean-loup Gailly and Mark Adler

1.3 disclaimer

The author takes no responsibility for any results of the use of this program. This software is provided "AS IS" and there is no warranty of any kind, so that you use this software at your own risk.

1.4 introduction

Starting with OS Release 3 the Amiga has the concept of 'datatypes', which allow reading and viewing files of different types and formats. MultiView is an application that utilizes these datatypes and handles any file for which you have a data types class installed.

This png.datatype can be used with either an old V42 style picture.datatype or with a new V43 one. It adapts itself to the underlying version of the picture.datatype.

I wrote this datatype because I wasn't satisfied with the ones available ;-)

This datatype was tested on an A4000/060 with a PicassoIV running OS3.5 + P96.

1.5 features

- supports normal and interlaced PNGs
- supports HAM output (HAM6 as well as HAM8)
- switches to V43 mode if a new picture.datatype V43 is found
- asynchronous file I/O to speedup image loading and decoding
- utilizes WritePixelLine8() for chunky-to-planar in V42 mode
- can be configured to suit personal preferences
- OS 3.5 support (disables dithering for hi/true colour screens)
- FBlit support (affects V42 mode only)
- uses memory pools
- based on libpng 1.0.12 and zlib 1.1.3

1.6 installation

This "PNG" datatype distribution should consist of the following files:

- Classes/DataTypes/680x0/png.datatype
- Devs/DataTypes/PNG
- Devs/DataTypes/PNG.info
- PNGdt.guide
- PNGdt.guide.info
- Source code

Copy an appropriate "png.datatype" into the "SYS:Classes/DataTypes" drawer. The file "PNG" and its info file should be placed in the "DEVS:DataTypes" drawer. In order to use the datatype doubleclick on "PNG.info" (or reboot the machine). If there was another png.datatype installed its descriptor has to be removed from the "DEVS:Datatypes" drawer. A reboot is required in this case to get the new datatype activated.

Note: All versions compiled for ≥ 68020 do *require* a FPU!

1.7 preferences

The datatype can be configured by placing desired options in an environment variable. The name of this variable is "classes/datatypes/png44.prefs". Please use Setenv (or Echo if you prefer) to create **global** or Set to create **local** preference settings. Local settings do override global ones.

Note: You have to copy the variable from ENV: to ENVARC: if you want to keep global settings permanently!

The preference template is:

```
V42MODE/S,GRAY/S,HAM/K/N,UNSAFE/S,GAMMA/K/N,BACKGND/K,FLIPX/S,FLIPY/S,
VERBOSE/S
```

```
V42MODE
```

```
-----
```

Forces the datatype to work in the old V42 mode even if a new V43 picture datatype is installed. The datatype switches automatically into this mode if no V43 aware picture.datatype is found.

```
GRAY
```

```
----
```

If specified the datatype emits grayscale images (this is the default for displaying true-colour images in V42MODE!)

```
HAM
```

```
---
```

Request the conversion of true-colour data into HAM. A value of 6 invokes HAM6 and a value of 8 invokes HAM8 mode.

Note: This option is silently ignored when working in grayscale mode or if

the supplied argument is invalid.

UNSAFE

When working in V42 mode this option enables a FBlit related optimization provided FBlit is installed.

GAMMA

This option specifies the gamma of the screen. If present a picture will be adjusted according to this value for proper display. If the gamma conversion isn't done a picture may appear either too dark or too light.

The gamma value has to be given as an INTEGER >= 1000. Thus a gamma value of 1.7 would be specified as 1700. The default value is 2.2 (int: 2200).

BACKGND

With this option the image background colour can be specified as RGB value in hex notation beginning with either '\$' or '0x' as argument prefix (the prefix is *required*), eg. BACKGND=0xRRGGBB.

Note: If this option isn't present or the supplied argument is invalid the default value is 0 (black). Furthermore, this value is only used if an image doesn't specify a background colour itself and if it's not a paletted image with transparency information.

FLIPX,FLIPY

If specified the switches cause the image to be mirrored in X direction (horizontally) and/or Y direction (vertically). Although this is only a datatype these options may be quite useful.

VERBOSE

This switch (currently) affects the behaviour of error messages. By default no error message is displayed in case something goes wrong. When this png datatype is in "verbose" mode there might be a requester to show the error message since the requester will be suppressed if the calling process does not want a message displayed. The message should appear on the callers preferred screen (if there is one) rather than on the default public screen.

1.8 faq

Q: Why is the datatype so slow with the P96 picture.datatype V43?

A: The picture.datatype coming with P96 dithers 24bit data even for 15/16 bit screens. Either use only 24bit screens or disable dithering globally this way (posted on the PML by Olaf "Olsen" Barthel):

```
setenv classes/datatypes/picture/dither 2
```

and then following it up with

```
copy env:classes envarc:classes all
```

Note: it may be necessary to create the picture drawer manually to get the

Setenv command succeed!

Q: Can I speedup decoding?

A: The datatype uses the OS function CopyMem() to copy data between buffers. A patch for this function *might* decrease the decoding time in V42/V43 mode.

Q: Can I speedup decoding in V42 mode?

A: Since the OS function graphics.library/WritePixelLine8() utilized for c2p conversation when working in V42 mode is not the fastest one possible you should consider installing a patch for this function. Highly recommended is NewWP8 from Michael van Elst available on AmiNet.

Note: This probably affects native graphic chip-sets only!

1.9 acknowledgments

This "PNG" datatype was written from scratch using GNU CC 2.7.2.1 and 2.95.2 (ADE/GG) for 020/040/060+FPU versions and SAS/C 6.58 for the non-FPU version (using FFP math). All required information how to create a datatype were obtained from sample source code by David N. Junod found in the 3.1 NDK.

This datatype is based on the png reference library. Without this library the datatype wouldn't exist at all.

The asynchronous file I/O functions used are taken from an example file of the original picture.datatype V43. It was written by Matthias Scheler who allowed me to use his 'ffr.c'. I made some changes to adapt it to my needs, to add save capabilities and to get it compile with GNU CC cleanly.

The transparency problem in the first version of this datatype was reported by Francis Labrie and Allan Odgaard. With their help (and patience :-) I was able to add working transparency support.

I have to thank Frank Wille for pointing out a problem I was unaware of. Since the original IPrefs has very little stackspace available a datatype should not require much stackspace. Because my IPrefs was patched long ago increasing its stack size significantly I wouldn't have noticed this problem.

The class init code is loosely based on the class initialization from the AIFF datatype 1.16 by Olaf 'Olsen' Barthel. The HAM6 and HAM8 conversion functions are derived from assembler functions written by Olaf.

Futhermore, a thanks must go to Roland Mainz who pushed further datatypes development in the past and supplied useful example codes.

Finally, I have to thank all people who sent a gift thus supporting my work.

1.10 history

44.6 (09/09/2001) - disabled own save handling to make Multiview happy
 (Luca 'Hexaae' Longone)
 - upgraded to libpng 1.0.12

- 44.5 (03/03/2001) - modified library initialization to fix some holes according to hints from Thomas 'Thor' Richter
 - slightly improved decoding speed :-)
 - added FBlit support for V42 mode (Luca 'Hexaae' Longone)
 - upgraded to libpng 1.0.9
- 44.4 (17/09/2000) - added (probably) missing WaitBlit()s in V42 mode
 - changed method handling in V43 datatype mode (switched from vararg to "normal" method call)
 - disables dithering on hi/truecolour screens if picture.datatype V44 is detected (-> OS 3.5+)
 - added color icons ;-)
 - recompiled with gcc 2.95.2
 - added a scoptions file
 - (05/08/2000) - upgraded to libpng 1.0.8
 - (07/07/2000) - upgraded to libpng 1.0.7
 - (01/04/2000) - upgraded to libpng 1.0.6
 - (18/02/2000) - adaptations for V44 includes
 - (24/10/1999) - upgraded to libpng 1.0.5
- 44.3 (14/02/1999) - removed unnecessary bits from libpng
 - removed all references to AbsExecBase (should improve performance a lot!)
 - plain version compiled with SAS/C now (avoids IEEE math by using FFP libs!)
 - fixed minor bug in hex2long()
 - upgraded to libpng 1.0.3
- 44.2 (08/11/1998) - added background colour selection through prefs
 - added transparency handling
- 44.1 (21/09/1998) - initial release

1.11 future

Things that might be added in a future release:

- adding an encoder
- a PPC version
- ...

The future of this program depends on YOU!

1.12 author

IMPORTANT, my current email can be found in: AmiNet:/docs/anno/munk.lha

email: gnikl@informatik.uni-rostock.de

or

www: <http://home.pages.de/~munk/>

or

irc: munk on #amigager

or

snail: Gunther Nikl
Ziegendorfer Chaussee 96
Parchim
19370
GERMANY