WarpPNG

Oliver Roberts

COLLABORATORS			
	TITLE : WarpPNG		
ACTION	*NAME*	*DATE*	*SIGNATURE*
WRITTEN BY	Oliver Roberts	February 14, 2023	

REVISION HISTORY			
NUMBER	DATE	DESCRIPTION	NAME

Contents

Chapter 1

WarpPNG

1.1   WarpPNG.datatype 44.3

```
            WarpPNG.datatype 44.3 - the
      fastest
       24-bit PNG picture datatype!
                        (for WarpUp PPC systems only)


    Copyright © 1999-2000
          Oliver Roberts
          , All Rights Reserved.


       Description
       what is this datatype for?

       System requirements
       what you need to use this software

       Installation
       installing this software

       Speed
       information regarding speed issues


       Distribution
       distribution conditions

       Disclaimer
       important notices


       Acknowledgements
       thankyous and credits

       About the author
       how to contact the author

       Future
       improvements I intend to make
```

1.2   Description

As you've probably guessed, WarpPNG.datatype is a yet another PNG
datatype. The difference is that this is for owners of PPC cards, and it
has been targetted specifically at WarpUp (not PowerUp). Even better, it
is compact, clean, free and well behaved – a true plug'n'play PPC
datatype.

I decided to write this datatype because no other decent WarpOS native PNG
datatype exists for the PPC, and it is was relatively easy to implement
being based on the same engine that WarpJPEG.datatype uses.

1.3   System Requirements

This datatype needs the following in order to work:

 – PPC accelerator card + 68040/060
 – WarpUp Release 4 (powerpc.library V15) or higher
 – picture.datatype v43 or higher
   (i.e. either of the ones supplied with AmigaOS 3.5, P96 or CGraphX)
 – Kickstart 3.0 or higher

Note that a graphics card is not necessary – the P96 or OS 3.5
picture.datatype will automatically dither images down to your display
requirements.

1.4   Installation

                To install this datatype, simply run the provided installer script ←
                  by
double-clicking the icon.

Alternatively, the datatype can be installed manually (be sure to
understand the
                requirements
                 first though) by typing the following shell
commands:

```
   Copy "Devs/Datatypes/PNG#?" DEVS:Datatypes
   Copy Classes/Datatypes/WarpPNG.datatype SYS:Classes/Datatypes
   AddDataTypes REFRESH
```

You'll probably want to make a backup of your existing PNG descriptor (the
file in DEVS:Datatypes) first. You will also need to ensure there are no
other PNG datatypes in DEVS:Datatypes. Finally, a reboot may be
needed for the changes to take effect.

1.5 Speed

The fastest PNG datatype?

WarpPNG is currently the fastest PNG datatype available. The table below
shows the time (in seconds) it took to decode 14 different images on my
A1200 603e/240MHz 060/50MHz, with BVision and CGX picture.datatype, with
other tested datatypes configured as close as possible to WarpPNG's
internal settings:

	PowerPC		M68K	
	WarpPNG	akPNG 44.65	PNGdt	
	44.3	WarpUp / 68K	G.Nikl	
1024x768 24-bit, 833721 bytes	1.36	1.94	5.01	3.75
1024x768 24-bit int, 1037008 bytes	2.05	2.71	10.02	6.22
779x767 24-bit, 946564 bytes	1.19	1.76	4.83	3.33
473x639 24-bit, 377518 bytes	0.57	0.89	2.02	1.49
473x639 24-bit int, 459869 bytes	0.82	1.19	4.08	2.52
368x463 24-bit, 279896 bytes	0.38	0.65	1.61	1.02
251x400 24-bit, 136856 bytes	0.25	0.46	0.97	0.59
718x425 grey, 157890 bytes	0.27	0.53	1.27	0.71
718x425 grey int, 182522 bytes	0.38	0.75	3.33	1.39
1024x768 256 col, 324599 bytes	0.43	0.76	1.62	0.93
779x767 256 col, 404245 bytes	0.42	0.77	1.96	0.95
473x639 256 col, 163397 bytes	0.24	0.49	0.98	0.49
368x463 256 col, 115942 bytes	0.16	0.31	0.64	0.33
251x400 256 col, 57056 bytes	0.11	0.38	0.46	0.20

  (int = interlaced image)

These figures are provided for comparison purposes only, but they speak for
themselves... WarpPNG is at least 50% faster than the native WarpOS
version of akPNG in most cases (80-300% faster with palette based and/or
smaller files), and around 3 times faster than 68k datatypes on a 060 (the
speed difference will be even greater on 040 systems with a fast PPC). All
this and no loss in image quality!

All tests were performed, multiple times, using Visage, with the following
command line: "visage test.png nopng time test".

Still too slow!

Despite these facts, I'm still disappointed with the relatively slow
performance advantage offered by my 603e over my 060 (approximately only 3
times faster). The main problem is that PPC datatypes still have to use the
68k for reading the data from disk and for creating / writing to the bitmap
time lost for file i/o is negligable as WarpPNG uses double buffered
asynchronous i/o (supports DMA controllers).

The largest bottleneck is that the DTM_WRITEPIXELARRAY method of the
picture.datatype has to be used to write the image data from WarpPNG into
the image bitmap. As this process is done via picture.datatype, it can
only currently be performed by the 68k. To give you some idea of how much

of a problem this is for WarpPNG, typically, half of the overall decode
time is used by the PPC to decode the whole image, and the other half is
used by DTM_WRITEPIXELARRAY on the 68k. And that's on a graphics card -
the time used by DTM_WRITEPIXELARRAY will probably be even greater on
systems using native Amiga graphics. It doesn't take a genius to see that
this is slowing the datatype down, and is the main reason why WarpPNG will
still be faster on a 060 than a 040.

How to make the datatype faster

Is there anything that can be done about this? Well, yes, there are a few
patches that you can install which should make things faster:

 - NewWPA8 (util/boot/NewWPA8.lha on Aminet) should provide a notable
   speed increase on native Amiga graphics - probably won't make any
   difference if you use a graphics card.

 - If you use a graphics card and CyberGraphX, you may want to make
   sure you are using the supplied v43 picture.datatype, as this will
   be faster than the P96 and OS3.5 picture.datatype on your system.

Of course, any other general speed-up patches should help too.

1.6 Distribution Conditions

              WarpPNG.datatype is public domain with the copyright remaining ←
                 with the

              author
               and may be freely distributed legally providing:

  (1) None of the distributed files are changed in any way
  (2) It is not sold for profit and it is not included on any disks
      that are sold solely for profit (includes magazine coverdisks)
  (3) The distribution contents remain complete (see list below)

If this software is to be sold for profit, permission must be obtained from
me, the
              author
              .

Aminet, Amiga Format and Amigactive have been granted permission to
distribute WarpPNG.datatype on their CDs.

The following files must be present in their original and unchanged form in
any copies of this software:

   Classes/Datatypes/WarpPNG.datatype
   Devs/Datatypes/PNG
   Devs/Datatypes/PNG.info
   WarpPNG.guide
   WarpPNGG.guide.info
   Install_WarpPNG
   Install_WarpPNG.info

1.7 Disclaimer

This software is provided "as is", without warranty of any kind, either
expressed or implied, statutory or otherwise. By using the archive and its
contents, you accept the entire risk as to its quality and performance.

Neither Oliver Roberts nor any other party involved in the creation,
production or delivery of the archive and its contents shall be liable for
any direct, indirect, special, consequential or incidental damages,
including without limitation damages for loss of profits, loss of use or
loss of anticipated costs, expenses or damages, and any data or information
which may be lost or rendered inaccurate, even if Oliver Roberts is advised
of the possibility of such damages.

Do not attempt to tamper with the supplied files. Doing so will cause
problems and you may find things start going wrong!

1.8 Acknowledgements

PNG support provided by the libpng link library by the PNG Development
Group, and the zlib link libary by Jean-loup Gailly and Mark Adler (both
compiled for WarpOS, of course).

It was made possible by VBCC, which was used to build and compile the
datatype. Thanks to Volker Barthelmann and the other authors involved.

Thanks also to Sam Jordan for WarpOS and helping me out with various
queries regarding it.

Finally, thanks to the OS 3.5 development team - now everyone has access to
a 24-bit picture.datatype, I don't need to bother messing about adding
dithering routines :)

1.9 About the author

If you have any problems with this software, or if you have any
suggestions/queries, please contact me and I will do my best to sort any
bugs out as soon as possible:

e-mail: oliver.roberts@iname.com
   www: http://www.nanunanu.org/~oliver/
   icq: 34640231

1.10 Future

                  Some things that may appear in the future:

- If I can squeeze any more speed out of the datatype, I'll do so :)

If you have any other suggestions, please
let me know
.

Future releases of WarpPNG.datatype will be available from either Aminet
(util/dtype/WarpPNGdt.lha) or its webpage:

  http://www.nanunanu.org/~oliver/warppng.html

1.11 Program History

44.3 (22.1.2000)

 – Fixed possible deadlock case (caused everything to freeze/lock-up)
   which usually only occurred when lots of images were being decoded
   simultaneously.

44.2 (9.1.2000)

 – When the OS3.5 picture.datatype is in use, dithering is now switched
   off (only) if the image is to be rendered to a hi/true colour screen,
   resulting in much higher performance, with negligable quality loss.
 – Dispatcher now performs some extra functions, which should quash
   possible stability problems.
 – Corrected akPNG WarpUp
                benchmarks
                .

44.1 (3.1.2000)

 – Initial release.