

dt2ps

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Chapter 1

dt2ps

1.1 dt2ps - Manual

```
dt2ps
(Picture)Datatype to Postscript

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Manual for dt2ps V1.0

Freeware
It is free what you give me for :)
```

Contents

Introduction	What dt2ps can do for you
Features	and how good
Liability	Legal stuff
Installation	quite easy
Requirements	please read
Usage	how to ...
Options	the real stuff
Prefsfiles	set it up
About Datatypes	dt2ps and the different picture.datatypes
Notes	maybe interesting
History	the story so far
Author	me

dt2ps uses ReadArgs extended help feature, "dt2ps ?" shows the template and another "?" shows a brief description of any option.

1.2 dt2ps: Introduction

Introduction

dt2ps is a shelltool that reads any picture you have a datatype for and produces a PostScript file that is suitable for printing directly or placing (with EPS on) in a program such as PageStream3.

It is mainly written to print pictures directly to a PostScript printer without the need to start any other programs and fiddle around with picture imports.

Since no other Amiga program (AFAIK) produces such small output files. Printing is normally faster than with any other program, because the parallel port of Amiga (and even most I/O-Cards) is slow and the main bottleneck for any recent printer

1.3 dt2ps: Features

Features

- AFAIK the first program for Amiga that uses RunLength- and the efficient ASCII85Encoding to reduce the size of the PostScript file
- Output can be made for printing directly or placing in e.g. PageStream3
- works with any picture.datatype
- Support for HAM8/HAM6/EHB Input
- Truecolor if v43 picture.datatype is found
- Gammacorrection for pictures
- Interpolation to smooth pictures can be switched on
- Setting frequency and angle and spotfunction for output raster by user or
- Automatic calculation of optimal rasterfrequency
- 12 different spotfunctions included
- specifying of output size by DPI
- Output can be color or gray (with two different color-to-gray conversions)
- Output can go to file or stdout
- It is a lot faster than I expected :)

1.4 dt2ps: Liability

Liability

With the usage of dt2ps you agree to the following announcement-declaration:

THERE IS NO LIABILITY TO THIS PROGRAM-PACKAGE, IN REFERENCE TO THE ASSERTED LAWS. THE COPYRIGHT OWNERS, AND/OR A THIRD PARTY, PLACE THIS PROGRAM PACKAGE AT YOUR DISPOSAL "AS IS" (EXCEPT WHERE THIS IS FIXED ANYWHERE ELSE IN A WRITTEN WAY) WITHOUT ANY GUARANTEE IN ANY FORM (INDIRECT OR DIRECT FORM). THE FULL RISK OF QUALITY AND FUNCTIONALITY OF THIS PROGRAM IS AT YOUR OWN. IF THE PROGRAM HAS A BUG, YOU HAVE TO PAY ALL COSTS OF THE NECESSARY SERVICE-WORKS AND REPAIRS FOR YOURSELF.

UNDER NO CIRCUMSTANCES, THE COPYRIGHT OWNERS OR A THIRD PARTY DISTRIBUTING THIS PROGRAM PACKAGE, AS ALLOWED, JUST BEFORE, CAN NOT BE HELD RESPONSIBLE FOR ANY DAMAGE CAUSED IN ANY USUAL, SPECIAL, OR ACCIDENTAL WAY OR BY THE PROGRAM PACKAGE (SURROUNDING BUT NOT RESTRICTED ARE THE LOSS OF DATA OR NOTCORRECTLY DISPLAYED DATA OR LOSSES CAUSED BY YOU OR A THIRD PARTY OR BY A FAULTY WORK OF THIS PROGRAM PACKAGE WITH OTHER PROGRAMS), ALSO IF THE OWNER OR A THIRD PARTY HAS BEEN POINTED AT SUCH POSSIBILITIES OF DAMAGE.

1.5 dt2ps: Installation

Installation

- Read Requirements
- rename the suitable executable to dt2ps and copy it anywhere in your path, even 040-060 version doesn't use a FPU.
- copy dt2ps.guide wherever you can retrieve it.
- Create a preferences file if needed

1.6 dt2ps: Requirements

Requirements

- needed by the picture.datatype is enough memory to keep at least the whole picture in memory. dt2ps itself needs only a few kb.
 - PostScript output is using Level 2 operators and will probably not print on Level 1 implementations. See Notes
 - any kind of need for a Picture to PostScript converter :)
 - please read the About Datatypes section
-

1.7 dt2ps: Usage

Usage

dt2ps has some groups of options to specify pagesize, imagesize, placing, rastering, gamma and the rest.

Usage can be as easy as this:

```
dt2ps anypicture mywonderfulpsfile.ps
```

or

```
dt2ps anypicture par:      (if there is your psprinter)
```

or even

```
dt2ps anypicture | more   (if you have a proper pipesetup)
```

If there is no preferences file, in this cases the internal defaults are used and these are:

- Pagesize is DIN A4 with an unimaginable border of 0.5 cm each side.
- Picture is scaled (aspect ratio 1:1) to maximum fit
- Output is gray with luminance conversion
- Runlengthcompression is on
- Image is centered on page
- No gamma
- No change of raster
- No interpolation

See Options

1.8 dt2ps:Options - Main

Measurement System is metric, input in cm.

All Numbers except LOSSY are floats.

All inputs except ANGLE, LOSSY and PAGEBORDER have to be greater than 0 to be useful

PAGEBORDER can even be a negativ number for "special effects" e.g. posters

Optiongroups

Pagesize	What is your paper?
Imagesize	How do you want your picture
Imageplacement	and where?
Imagemanipulation	Is it to dark or jaggy?
Halftone	You want it better?

Special

The ungroupables

1.9 dt2ps: Options - Pagesize

Pagesize

PH=PAGEHEIGHT : The height of the output page

PW=PAGEWIDTH : The width of the output page

PB=PAGEBORDER : The border around the page your printer can't reach

SPS=STANDARDPAGE SIZE : Due to a special request, dt2ps has a small number of pagesize presets:

They can be specified either by name or number:

1=A4	210	mm	x	297	mm
2=A3	297	mm	x	420	mm
3=A5	148.5	mm	x	210	mm
4=USLetter	215.9	mm	x	279.4	mm
5=USLegal	215.9	mm	x	355.6	mm

1.10 dt2ps: Options - Imagesize

Imagesize

IDPI=IMAGEDPI : Picture will be scaled to match the given DotsPerInch, if IMAGEDPI are given any other imagesizeoption is ignored

IH=IMAGEHEIGHT : Desired height of the image

IW=IMAGEWIDTH : Desired width of the image

If none of these options are given, the picture is scaled (with aspect ratio 1:1) to its maximum possible size.

If only one of IH or IW is given, dt2ps calculates the missing parameter (aspect ratio 1:1)

1.11 dt2ps: Options - Imageplacement

Imageplacement

By default the image is centered on page

This behavior can be changed with these options:

T=TOP : Image is aligned to the top of the page

B=BOTTOM : Image is aligned to the bottom of the page

L=LEFT : Image is aligned to the left of the page

R=RIGHT : Image is aligned to the right of the page

These switches can be combined to e.g. top left or bottom right

C=CENTER : Centering is default and this switch only make sense in conjunction with a preferences file.

Autorientate (decision portrait or landscape) is always on.

Landscape is chosen if image doesn't fit on page in portrait.

1.12 dt2ps: Options - Imagemanipulation

Imagemanipulation

COLOR : Output is in color instead of grayscale

IP=INTERPOLATE : Sets the interpolation switch in PostScript. The interpolation is completely done in your printer, it needs really a lot of time and probably some memory.

G=GAMMA : lighten or darken of image. The calculation is done by the PostScript interpreter of your printer, so it could longer printing time a little, unremarkable for me.
GAMMA=1, changes nothing and is default

1 > GAMMA, lighten, try 1.25

0 < GAMMA < 1, darken

The resulting transferfunction is concatenated with any already established (by default, importing program, whoever)
Due to this, the correction should always be relative to the usual output.

MG=MATHGRAY : Switches to "mathematical gray", color to gray conversion is then done by summing up the third of every color gun. Otherwise the weights are chosen to match the human kind of viewing, that should lead to better results and is default.

M=MIRROR : The picture is mirrored

1.13 dt2ps: Options - Halftone

Halftone -----

There is no special support for color output yet, color is always done with the default settings of the printer.

In grayscale you have the choice between 12 different spotfunctions, the spotfunction describes the shape of every single rasterspots used for halftoning.

They can be selected by:

SF=SPOTFUNCTION : The spotfunction can be specified by name or number.

The following spotfunctions are available:

1=PSDot : The standard spotfunctions normally used in printers. The Shape is a dot for light and dark grays and is mutating to a square for grays of 50% black.

2=Dot : Every spot is a real dot.

3=AntiDot : The negativ version of dot, every spot is a white dot

4=Line : Lines

5=Square : Squares only

6=Diamonds : Look like little pyramids

7=UFO : space invasion

8=Ring : Just married

9=AntiRing : divorced ?

10=ThickRing : 25 Years later

11=Cross : a lot of little crossroads

12=Triangle : Triangles, not so straight as Diamond

All of these (except the first) are mostly (had a little glimp at PageStream's spotfunctions) invented by me and if there are some standardspotfunctions anywhere with the same names is it done by accident.

At least, PSDot is the only one mentioned in Adobe's Postscript Reference Manual.

For high resolution spotfuntions don't make such big differences, a little

darker, a little lighter. Dot has more contrast than PSDot, that's nice.

Additional one can choose frequency and angle of the raster either by hand:

FR=FREQUENCY : Frequency of raster in lpi. If not changed explicit, the angle stays at the printers default.

A=ANGLE : Angle of raster, If not changed explicit, the frequency stays at the printers default.

Useful range of ANGLE is $0^\circ \leq \text{ANGLE} < 360^\circ$

or you can let dt2ps calculate settings for the printer like that:

PDPI=PRINTERDPI : The DPI of your printer for internal calculation.

PDPI DOES NOT CHANGE THE RESOLUTION OF YOUR PRINTER
IT IS ONLY USED FOR INTERNAL CALCULATIONS

WG=WANTEDNUMBEROFGRAYS : The number of grays you want to have in your output, don't be too greedy or you will have quite big points.

Important !!

To get so the called optimal screens let the number WG be a number which square root is an integer N, $WG = N^2$ (N: integer)

e.g. 4, 16, 25, 36, 49, 64, 81, 100, 121, 144, ... aso.

And the result of $PDPI/N$ should be an integer, too.

The angle should be 45° , but other angles are allowed.

If these both terms are fulfilled, this calculation matches to the PPDs I had a look at. But different can also look quite good.

HINT: If you lower WG the raster lpi will increase.

For most laserprinters it is true that higher lpi-values are leading to darker printouts. Maybe you should use GAMMA to compensate.

I thought about doing this automatically, but the effect is probably too device dependend.

If you have one of the newer printers, you should think about not changing the default halftoning, because they often use more sophisticated raster functions with varying pointsizes and other tricks and it depends on your printer if it keeps going on like this if a parameter of the raster is changed. Maybe it fall back to standard function, maybe not.

I suggest, you just play around a little with this.

1.14 dt2ps: Options - Special

Special

EPS : If you switch this on, you will get an EPSfile.
- any given pagesize is ingnored
- if no imagesize is given the output is scaled to 300 DPI
- output is always portrait

- output can not be printed directly ... well you can add a showpage just before %%EOF and it will do
- Default is normal PS

NORLE : Switches off runlengthcompression. Default is on

Due to the nature of runlength compression and the chunky pixel format I use in PostScript only grays are crunchable, so color output would not benefit much of it (only if there is a white background or something like that) from it.

However, LOSSY can help here too.

Maybe I will do something to change this, but not until I know of at least one user of dt2ps using it on a Color-PostScript-Printer :)

LOSSY : Allow lossy crunching of the image ... this option is strange :)

Runlengthcompression only crunches equal bytes. A sequence of n times byte x will result in two bytes telling that byte x has to be repeated n times. That's easy.

Lossy allows bytes, which are not the same as its predecessor, to equalize to it within the given range.

So if next byte is in the range of lastbyte \pm lossy it is equaled to the preceding byte. \leftrightarrow

In other words, lossy is a kind of color reduction. It is meant to use with low values to equalize e.g. unicolored backgrounds of scanned images. Scanned images often show very little dissimilarities between pixels of the same (original) color.

Sequences are restarting at every new line of the image. So it does not reduce the colors in a predictable way over the complete picture.

At least, for most printers out there it save to say that a lossy=1 can not result in any visible change. In the very worst case (that is a line with a smooth gradient from one side to the other) this will reduce the possible shades of gray to 128. Printers that are capable of producing more than 128 shades of gray are very rare.

For natural, scanned pictures and a 600 dpi laserprinter lossy=5 should be invisible, I guess :)

This option was implemented for me to play a little, now you can play too :)

This option is a natural number and its default is 0, it is meaningless if NORLE is on.

V=VERBOSE : dt2ps is telling you a lot of interesting things:

- Input, Output Formats

- All values, given, default or calculated.
- The efficiency of RLE
- An ugly progress information

The "progressdisplay" can be switched off, but only via preferences. Add the line "noprogess" to your prefsfile.

It is possible to redirect (> or |) stdout and still have this output in the shell.

PF=PREFSFILE : As default, dt2ps searches for dt2ps.prefs
The given filename is searched in the following directories:

1. Relativ to the current directory
2. In ENV:
3. In ENVARC:
4. In the directory dt2ps where is living

I suggest ENVARC: is a good place for the different preffiles

See section about the Preferences Files.

"NONE" disables any search for a prefsfile. This is made for scripting purposes, where you may wish to work on the same presets on any system.

1.15 dt2ps: The Preferences File

The Preferences Files

PF=PREFSFILE : As default, dt2ps searches for dt2ps.prefs
The given filename is searched in the following directories:

1. Relativ to the current directory
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I suggest ENVARC: is a good place for the different preffiles

"NONE" disables any search for a prefsfile. This is made for scripting purposes, where you may wish to work on the same presets on any system.

The Preferences File is just a collection of all possible cli-parameters, it contains them line by line without an particular order the settings you wish to have as default. All sensible cli-parameters are supported, but only in its long form. Abbreviations are not supported!

It can look as easy as this:

--- schnipp ----

```

printerdpi = 1200
pagewidth  = 21
pageheight = 29.7
imagedpi   = 150
verbose
interpolate
--- schnapp ----

```

You can easily set up several prefsfiles for the different kinds of use.

Spaces and TABs are filtered and can be used to make the file more readable.

Unknown tokens are ignored but reported, so there is no way to get comments in the file without being disturbed by warnings.

There are two special prefsfileonly parameters:

NOPROGRESS/S : Switch, disables "progressdisplay" in verbose-mode

EPSPDI=DPI_as_Float: This is used to change the preset of 300 dpi in eps-mode

All settings in prefsfiles can be overridden by cli-parameters, that's logical...

If you want to disable a setting and not replacing it with another, you have to set it to 0.

e.g. You have specified IMAGEDPI=150 in the preferencesfile, because you are mostly printing at this resolution. But now you want to have the biggest possible printout and use dt2ps's autosize feature. Here simply setting another IMAGEDPI wouldn't help, you have to disable it by setting IDPI=0 in cli.

Another thing are these switches ... all switches except the alining ones are toggling. e.g. If you have set VERBOSE in the preferences file, giving VERBOSE in the cli will switch it off, same for MIRROR, INTERPOLATE, NORLE, EPS, MATHGRAY and COLOR. This may be a little confusing, but I didn't want to have a bunch of NO... options.

Alining is little different, TOP overrides BOTTOM, RIGHT overrides LEFT and vice versa. CENTER overrides all of them.

CENTER can be followed by another alining, so one can say CENTER LEFT and be sure to have the picture in the middle of the left side no matter what the prefsfile said.

1.16 dt2ps: About Datatypes

Overview and Behavior of possible Datatype Setups

with an eye on the hardwaredependent special amigamodes
multiview as example

1. Original AmigaOS 3 Setup:

Original Commodore picture.datatype, original ilbm.datatype:

multiview: normal use but no Truecolor

dt2ps: normal use but no Truecolor

One can print near Truecolor if using HAM8. Quality depends on where the HAM8 is coming from. E.g. the HAM8 output of akJFIF.datatype is quite bad.

2. Suggested Setup for ECS/AGA-Users:

Picasso96 picture.datatype and ilbm.datatype out of the v43-PicDT-Package ((ECS)/AGA, CGFX, P96, behaving just the same here)

multiview: normal use including Truecolor, but screens are opened for HAM8/HAM6/EHB in HiresInterlace (at least here)

dt2ps: Everything works.

3. Enhanced Setup for CGFX and Picasso96 (Probably ProDev's MerlinEmu, too)

CGFX/Picasso96 picture.datatype and Stephan Rupprecht's ilbm.datatype v44 which converts HAM6/HAM8 to Truecolor and EHB to 6 Bit Palette

multiview: normal use, one can even see HAM8 aso. in a Window as Truecolor

dt2ps: Everything works.

Setup 1 Notes:

I really would upgrade to Setup 2 or even 3 if possible :)

Setup 2 Notes:

To install, you should get the original v43-datatype-package and install it. Then replace the picture.datatype with the one in the Picasso96 archive.

There are a lot more v43-compliant datatypes and programs available.

To Setup 3:

Picasso PicDT works also with AGA (ECS) and CGFX

The original CGFX-v43-PicDT doesn't work with P96 or native Amigamodes

Stephan Rupprecht's ilbmDT ilbmDT (v44.7+ works with any setup) is the only one reading Softlogik's BW and Grayscale ILBMs!

On my system the CGFX-PicDT is faster and needs less memory*, there are users of the P96-PicDT stating the same for it :)

* if I'm talking about less memory here I mean something like that:
if using dt2ps with 1024x1401 24 Bit IFF (Rawimagesize ~4 MB) the

CGFX-PicDT uses ~7.5 MB and the P96-PicDT for a short moment ~11.5 MB

1.17 dt2ps: Notes

Notes

- dt2ps can be breaked by pressing control-c if the PSoutput is running.
The scanning of the picture is done by the datatype and unbreakable AFAIS
- dt2ps was written on an Amiga 4000 with Cyberstorm MK1 060 and compiled with SAS/C 6.58. My machine has enough RAM and HD-Space to make me fun.
- The PostScript output has been prooved:

Mainly with:

GhostScript
Lexmark Optra S1250, 1200dpi Laserprinter with PS-Emulation

some files with:

Adobe Acrobat Distiller

It was interesting to see, that Adobe's Distiller behaves less conform to the PostScript Reference Manual than Lexmark's Emulation :)

- POST.LIBRARY wether old or new (HWGPost) IS INCAPABLE of displaying the files produced by dt2ps.
- There are version for every processor because they perform quite different on my 68060. Feedback about speed differences would be welcome.
- Even the 040-060 version doesn't need a FPU, floating point calulations are not used in the main loops.

1.18 dt2ps: History

History

third release, Version 1.0

- added: Extended Help, shown by a second ?
 - added: mirror switch see Options - Imagemanipulation
 - added: support for preferences files
 - added: some pagesize-presets see Options - Papersize
-

- added: 12 different spotfunctions for halftoning
- changed: now different angles than 45° are allowed for the autolpi- ← feature
- some cosmetics
- changed: Pageborder can now be a negativ number, so it's quite easy to print e.g. posters at your own. Give a border outside the paper and align the image e.g. left, than just the same and align right.
- fixed: encodingerror if end of encoding met linefeed, encoding should be perfect now.
- fixed: encodingerror if RLE was switched off.
- changed: About Datatypes section, to reflect the latest changes of Stephan Rupprecht's ilbmDT (44.7)

second release, Version 0.5

- changed: About Datatypes section
- added: Verbose now tells input format as well
- added: Support for HAM6, HAM8 and EHB
- fixed: Description of the optimal raster calculation parameter WG Image, it has been completely wrong before.
- added: About Datatypes section and the history
- added: support for the good old commodore picture.datatype, no need for v43-DT anymore, please see About Datatypes section
- fixed: now Picasso96's v43 picture.datatype works, too
- removed: stupid bug if no v43 Datatype was found, now would tell you that a v43-Datatype is needed, at least if it still would :)
- changed: Gammacorrection now corresponds to the "official" Gamma used everywhere. The function has not change, but the parameter is used different. If you have already found a perfect match for your printer, you now have to use $1/(\text{perfect-matching-gamma-in-dt2ps}0.3)$

first release, Version 0.3

1.19 dt2ps: Me

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Please report any bugs you came across
and
feel free to ask for new features

Gimme feedback and if it only is to say: "I use it."