

wfmhcybergfx_r3d.library v40.1

Miloslaw Smyk

COLLABORATORS

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REVISION HISTORY

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Chapter 1

wfmhcybergfx_r3d.library v40.1

1.1 wfmhcybergfx_r3d.library v40.1

wfmhcybergfx_r3d.library v40.1

Render library for Real3Dv3.11 and CyberGraphX supported boards.
©1995-1996 Miloslaw Smyk
© 1995-1996 World Federation of Mad Hackers

Copyrights

- as usually - boring

Disclaimer

- not that this one is interesting :(

Introduction

- what's inside

Features

- there is a lot

Registration

- yep, it's not free!

Requirements

- IMPORTANT!! READ THIS!!!

Installation

- child's play

Usage

- that's easy, too

Limitations

- what are limitations of unregistered version

Technical info

- for techies among you

Known bugs

- read before you send bug-report!

Credits

- and who did all this?

History

- quite short for the moment

To do

- what you can expect in the future

Support sites

- where to get the updates

Thanks

- you pay \$100 to get here. :)

Other releases

- worth a closer look...

Note for language purists

Please bear in mind that English is not author's native language, thus this documentation can contain some grammar and spelling errors. Please be overlooking with them, or even better -

send me a mail

, so I can fix them

ASAP. Thank you.

1.2 Copyrights

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wfmhcybergfx_r3d.library

© 1995-1996 Miloslaw Smyk

© 1995-1996 World Federation of Mad Hackers
Real3D is © realsoft ky

1.3 Disclaimer

This software is subject to the "Standard Amiga FD-Software Copyright Note"
It is SHAREWARE as defined in paragraph 4s.
If you like it and use it regularly please send \$20 or 30DM to author.
For more information please read AFD-COPYRIGHT (Version 1 or higher).

1.4 Introduction

Introduction

Real3D is great rendering and animation software, that can only be rivaled by high-end products available on expensive workstations. Unfortunately its Amiga version is only capable of using max. 8-bit screens, thus limiting on-screen work to 256 colors or shades of gray. Although Real3D can of course render 24-bit data to files, most gfx-card owners find it inconvenient to render picture to disk just to view it with some external software. This problem is somewhat cured by the so called "external screens" - a display library interface that allows programmers to redirect rendering engine output to graphics card's framebuffer. Still, it is a far cry from what PC users can do - render 15/16/24-bit data directly to the same windows they model in. This allows for faster work, as there are no hassles associated with switching screens, different resolutions, etc. Not-so-good design of Real3D's Display Driver Interface doesn't allow for such extravagance on Amiga...

...or does it? My fascination with CyberVision64 graphics board (and its great software) made me sit and think about the matter carefully - the result is library capable of everything the PC can do, plus a lot more!
See

features
for complete listing. Using Real3D with this library and
gfx-board is a whole new ball game, but remember - this is
shareware
!

1.5 Registration

Registration

Vast amount of work went into making this library possible. Many hours with the debugger and Real3D were necessary to find out all the required information that Display Driver Interface failed to supply. Some were present on the stack, some in data areas of certain Real3D's tasks and processes - if you are a programmer you can probably realize that it wasn't easy job - in fact it was more a struggle between me and brain-deadness of DDI combined with unsuitable (from my point of view) data handling inside Real3D.

I would like to ask for a small amount of money in reward for my work, namely \$20 or 30DM, if you use this library and find it useful. Considering the fact that you have already bought an Amiga with Zorro slot (A3000 or A4000), graphics board and (perhaps) Real3D, it should not be a big expense for you. I am sure the speed-up gained with this library will quickly justify this one-time cost.

Just print out included registration form, fill-in the necessary details, and send it together with money (cash only, please) to the following address:

Miloslaw Smyk
ul. Orawska 22/34
70-131 Szczecin
POLAND

When I receive it I will send you a keyfile, that allows you to use all features disabled in the public release. If the "e-mail" field in your registration form won't be empty, I will personally notify you about any updates available.

1.6 Fill-in and send out

Send this form and fee to
Miloslaw Smyk
ul. Orawska 22/34
70-131 Szczecin
Poland
#####
##
##
##
##
#####
##

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#####      ##  ##  ##      ##
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##  ##  #####  #####  #####
```

YES, I WOULD LIKE TO BECOME REGISTERED USER AND RECEIVE A KEYFILE

Name: -----

Address: -----

E-mail: ----- Phone: -----

Config: -----

Real3D v.: -----

Notes and suggestions: -----

I would like to receive my personal keyfile:

- on diskette - by E-mail

I enclose a shareware fee in CASH together with this form:

- US\$ 20 - DM30

I HEREWITH DECLARE TO KEEP RECEIVED KEYFILE TO MYSELF AND NOT DISTRIBUTE IT BY ANY MEANS.

Date: _____ Signature: _____

1.7 What's in store

Features

- * rendering on 15/16/24-bit deep screens directly to windows you use for modelling,
- * simultaneous rendering to several windows at once,
- * two optional dithering modes - Floyd-Steinberg and ordered 4x4 - for high quality 15- and 16-bit deep renderings,
- * contents of any window can be saved as IFF file,
- * small preferences editor that lets you change dithering modes and save your preferred settings to disk,
- * you can have more than one copy of Real3D using this library at the same time.

1.8 What do you need to run this - Cray 2?

Requirements

- * Real3D v3.11 - the most powerful rendering package for Amiga.
- * graphics board with CyberGraphX software from Vision Factory Development.
- * 68020+ and OS 3.0 or better - but you already have these, as CyberGraphX requires them too.

IMPORTANT!

This library is only able to work with Real3D v3.11. Any other version of Real most likely won't render at all but rather crash/whatever, when used with this library. For more on that look into

Technical info
section of the documentation.

1.9 Installation

Installation

Installation can be effortlessly performed by included Installer script. Simply double click "Install" icon and follow the instructions that will be shown.

If you are one of these do-it-yourselfers, you may just copy file wfmhcybergfx_r3d.library to LIBS: or R3D3: (standard assignment made by Real3Dv3), wfmhcybergfx_r3d.prefs to ENVARC:, and wfmhcybergfx_r3d.guide to R3D3:Help/ . Sample project file and image can be copied (or not) wherever you want. That's it.

If you have received the keyfile with this release and want to install it manually, see

here

.

IMPORTANT!

In case you dislike library's name and want to change it - FORGET IT! The library with changed name will not work - in fact Real3D won't be even able to open it.

1.10 Keyfile

Keyfile

The keyfile is provided to registered users only. It has a form of short library, that should be put in either LIBS: or Real3D's main directory (usually R3D3:). The third possible location is the place pointed to by environmental variable KEYPATH. This allows you to have keyfile stored on e.g. partition protected with MuFS, readable only by you.

IMPORTANT!

Please remember that your name and address are stored inside the keyfile. If you try to distribute it, sooner or later I will get to know about this fact, because even if you think only your closest friends have it, experience teaches us that it won't be long before it can be found on some pirate ftp or BBS.

If I will notice that copies of your keyfile are spread around, you won't be able to register any other program from W.F.M.H., no matter how believable your explanation will be. Period.

1.11 Usage

Usage

As it was previously mentioned, this library uses slightly enhanced Display Driver Interface to do its job. Because of that, in order to use it you have to configure Real3D first:

- start Real3D,
- select "Project/External Screen/Settings" from the menu and type "wfmhcybergfx_r3d.library" in the string gadget, then click OK,
- select "Project/Environment/Open Screen", choose one of your gfx-board's "deep" screen-modes (e.g. "CVision: 16Bit 800x600"), and change the "depth" slider's value to eight. This is very important, as Real3D will probably crash if it's left at its maximum setting (it's a bug in Real3D),
- now, as you have screen open, you can set up your usual working environment (view, select, tool and other windows), and save it for later use. View windows that you would like to render in full-color, should have their output mode set to "External". At this stage, you may also try out ("Project/Project/Insert") example project file I included in the archive. Note that 15-/16-/24-bit screen has already to be open, as ModeIDs change between different setups, and thus I couldn't store it in the project file.

Real3D is now ready to work, and you just have to activate the render library ("Project/External Screen/Open"). All functions related to external libraries are located in "Project/External Screen" menu, and here is what they mean for wfmhcybergfx_r3d.library.

Open

Close

Set Modes

Save

When everything is set up properly, you can work as usually, ↔ rendering

in current window using Amiga-R (or corresponding menu item). One thing to remember is that windows rendering in full-color MUST have output mode set to "External".

1.12 Project/External Screen/Open

Open

The library is loaded to memory and initialized. Requester is shown,

displaying information about me and you - naturally if you are registered. From this moment you can render in full-color.

1.13 Project/External Screen/Close

Close

The library is closed. You won't be able to render in full-color from now on. Not much use for this function. ;)

1.14 Project/External Screen/Set Modes

Set Modes

The preferences window opens, allowing you to modify the kind of dithering used by the library. If you are using unregistered version, your only choice is "NONE" (see Limitations).

You can save, use or cancel your choice. Saving means storing your settings in ENVARC: and ENV: so that they will be valid even if you restart your machine. Using - storing only in ENV: - after reset you will have your previous settings. Along with dithering method, the position of preferences window is kept in settings file.

In case you wanted to modify settings file manually, it's called wfmhcybergfx_r3d.prefs, and its first line is parsed according to the following template: "DITHER/K,PO SX/N,PO SY/N", where possible dither types are: NONE, ORDERED and FS.

1.15 Dithering

Dithering

On the 16-bit screen you have choice of 65535 colors. 32 shades of blue and red, and 64 of green. In 15-bit mode matters get even worse, number of colors shrinks to 32768, 32 shades per color gun. This makes many pictures look poor. Images containing a lot of smooth color gradients are simply tragic. But on the other hand, 15/16-bit screens take only a half of 24-bit screen's memory, and they are faster to work with (due to

smaller amount of data to shift around).

In order to help non-24-bit screens look acceptable I decided to implement dithering. The result is so good, that there is hardly a reason to use full 24-bit with Real3D anymore (I mean, for screen output). There's a picture included in the archive to let you compare the difference visually.

Two dithering modes are available:

Ordered - classical and very fast, using 4x4 dispersed dot ordered dither pattern. Produces good results, but under some circumstances aliasing can be observed, due to the simple ("mechanical") nature of this method.

Floyd-Steinberg - more accurate and just a bit slower. Minding the fact that the huge percentage of render time is taken by Real3D itself, it is unlikely that you notice any difference in speed. Little digression (techies only): I replaced original error-diffusion values with ones that look better when quantizing from 24 to 16 bits. In result, 16-bit output is nearly indistinguishable from 24-bit original, even on good monitor (tested on 20' Sony Black Trinitron).

All algorithms have been tested visually and statistically, Floyd-Steinberg having both visual perception and mean square error per color gun notably better for sample images I rendered. Not that I was surprised. :)

1.16 Project/External Screen/Save

Save

This function saves contents of currently selected window to a file. It doesn't have to be view-type window - in fact it doesn't have to be Real3D's window at all. :)

1.17 Limitations of unregistered version

Limitations

The unregistered version is only intended to give you overall feeling of how software works and to let you find out if it is usable on your system. The following features are not present in the public release:

*

dithering

- the only supported dithering type is NONE, and that

shows in 15- or 16-bit pictures with smooth color gradients. ;-)

* rendering to screens bigger than 640x512 - which is generally insufficient for professional work

Additionally, the library lets you make only 50 renders in one session and then it will deactivate itself, showing a requester reminding you about

what you should do
to get full, uncrippled version.

1.18 Technical information

Technical information

Well, Display Driver Interface (DDI from now on) developer documentation says that it is impossible to render to several external screens at once. This library proves it wrong, but unfortunately - at a cost. To make DDI render to several resizeable windows simultaneously I had to fiddle with values on the Real3D's stack and in its A5 data area. Yes, I know it is a heavy hack, but this was the only way, of course apart from modifying Real3D's source code. :) Quite understandable side-effect of this behavior is the library's inability to cooperate with any other version of Real3D than 3.11 - the one I had handy.

If I will gain access to any other binaries than 3.11 I will certainly make this library compatible with them, so stay tuned...

And the last thought - there IS some probability that internal structure of Real3D has changed so little, that this library will work with other binaries than 3.11. So if you are using Real3D v3.3 you can give it a try - in the worst case it will just crash and you will have to reboot. In the best - it will work. I will be grateful if you

notify me
about

your results.

1.19 Known bugs

IMPORTANT!

Before you fill out bug report form please ensure that you are using this software with Real3D v3.11 and CyberGraphX supported board capable of non-CLUT (i.e. 15/16/24-bit deep) screen modes. Also check if the problem you would like to report isn't mentioned on the list below.

Known bug (or rather limitation):

- at the start of rendering the library looks for an active window to find out where to draw the render engine output. As a result of this fact, you can't use auto-redrawing windows in "External" (i.e. "deep") mode. This is also the reason why "Extras/ Refresh All/ Raytrace" won't work if there is more than one view-type window open. The rule of thumb: window have to be an active one when rendering starts. This is not as big limitation as it may seem at the first glance, because color output is very seldom used in auto-redrawing windows.

If all of above applies to you and the thing that bothers you is not on the list, please

send me a mail
, specifying your full hardware
configuration (ShowConfig output), programs in WBStartup and user-startup,
as well as CyberGraphX software version/revision numbers (preferably output
from "Versions" script included with CyberGraphX distribution). I may be
able to help you.

To date this software has been tested on the following equipment:

A3000/030/25, 1.3GB HD, 8MB RAM, CyberVision 64 2MB, Kickstart 3.0
A4000/040/25, 1.3GB HD, 18MB RAM, CyberVision 64 2MB, Kickstart 3.0
A4000/040/40, 5.6GB HD, 22MB RAM, GVP Spectrum 2MB, Kickstart 3.0
A4000/040/40, 1.3GB HD, 26MB RAM, Piccolo II 2MB, Kickstart 3.0
A4000/040/40, 2.6GB HD, 74MB RAM, CyberVision 64 4MB, Kickstart 3.1

all running CyberGraphX v2.16

1.20 Credits

Author

I am the computer-science undergraduate at the Technical University of Szczecin, Poland. My specialization is computer graphics, hence my interest in Real3D, but I am generally computer freak and Amiga enthusiast. I use A4000/040 and eagerly await PowerAmigas. I tend to bite and laugh hysterically when confronted with this marvel of software MS-Windows is.

I can be contacted by e-mail:

smykm@felix.univ.szczecin.pl

WWW:

<http://dedal.man.szczecin.pl/~thorgal/milek.html>

or snail-mail:

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ul. Orawska 22/34
70-131 Szczecin
POLAND

I sometimes cruise as Thorgal on irc #amiga and #amigapl

1.21 History

History:

v40.1 - Initial release

1.22 Things I plan in next releases

To do:

Support for versions of Real other than 3.11, and perhaps some additions suggested by you - the users.

1.23 Support sites

The official wfmhcybergfx_r3d.library WWW page is:

<http://dedal.man.szczecin.pl/~thorgal/R3D/main.html>

where you can always download the newest version.

** ** *

This archive is also available from any Aminet site, e.g.

wuarchive.wustl.edu

ftp.luth.se

aminet.org

where it can be found in gfx/board directory.

** ** *

Modem traders may try our support BBS - newest version is always placed in section "Files/W.F.M.H. Support", which is available even for guests.

- Wasted Time
