Descent Documentation

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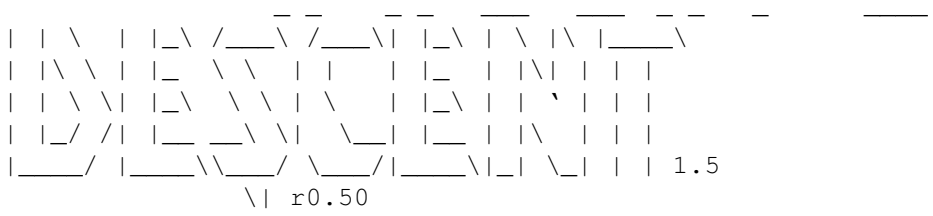
Chapter 1

Descent Documentation

1.1 Welcome to Descent I V1.5 r0.50



Port by Christian 'Ville9' Sauer

1.2 Some words from PARALLAX

Legal Stuff:

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About the Source Code:

Included is almost all the source code to Descent 1, ver. 1.5. We removed all code to which we did not own the copyright. This mainly involved low-level sound and modem code.

Kevin Bentley, maintainer of the Descent Developer Resources and author of Kahn, has agreed to support this code base through his website at www.ladder.org/ddr. If you have questions or comments about the code, please go there. Please do not contact Parallax Software, its employees or its affiliates.

The following tools were used in the development of Descent:
Watcom C/C++, version 9.5
Microsoft Macro Assembler, version 6.1x
Opus Make, version 6.01

Have fun with the code!
Parallax Software Corporation
Jan. 12, 1998

Kevin Bentley's notes:

As included in this zip file, the source should compile and run with the following:

Watcom 10.6
Miscrosoft Macro Assembler 6.11
GNU (or compatible, such as Microsoft, or Borland) Make utility

To build the executable, you should be able to just run maked1.bat.
Descentr.exe should be built in the main subdirectory.

When you unzip the archive, make sure you use the -d option to expand ↩
subdirectories, or it will not
compile.

The compiled code will run fine with no sound, and no serial port functionality (This means no VR equipment that uses serial interfaces, and no modem or serial play games.)

If you port this to another platform, please drop me a note kevinb@stargatenetworks.com , I would be happy to post a copy of your port on the web site. *PLEASE* make an attempt to keep the existing code compilable (ie. use #IFDEFS)), so other people can benefit from your work.

To build the editor, change the CCFLAGS variable in all the makefiles to "CCFLAGS = /dNETWORK /dEDITOR" and rebuild all files. You will need the files in editdata.zip (included in this archive) to run the editor. Also, I was only able to get the editor to run using the -nobm command line arguement.

Interview with Matt Toschlog and Mike Kulas regarding the release of the Descent source code:

Q: Why are you releasing the source code?

Mike: The main reason is we figured a lot of people aspiring to work in the game industry would like to see production "quality" code. There are two reasons for this. One, you can learn a lot by looking at working code. Two, people will see that you can write a decent game without writing beautiful code.

Matt: That’s a good thing?

Mike: Not really, except that it might make people think writing production quality code isn’t that hard.

Matt: That’s a good thing?

Mike: Well, not really, unless they learn that they have to focus on designing a brilliant game, rather than writing brilliant code.

Matt: Ah, that’s a good thing.

Mike: Yeah, I don’t think I understood that until we started working on Descent. At first all I cared about was writing technically good code.

Matt: Then we ran out of money and all we cared about was finishing our game.

Mike: Right. Our code got ugly, but our game got done.

Matt: Writing code is easy. Finishing is hard.

Q: Is there any code you're particularly proud of?

Matt: No.

Mike: No.

Matt: I'm most ashamed of the vector intersection code.

Mike: Yeah, that's pretty bad.

Matt: Mike's AI code is the worst I've ever seen.

Mike: Only because you program with your eyes closed.

Matt: I'm proud we managed to finish without going bankrupt.

Mike: Yeah, finishing is all. Who said that?

Q: Seriously, what should people look at?

Matt: I really don't know. It's not like there's a lot of reusable code in there. Some low level stuff could probably be used. The vector-matrix library is probably fairly instructive.

Mike: The AI is an example of how not to write an AI system.

Matt: You're doing it the same way in FreeSpace, right?

Mike: Yeah.

Matt: The texture mapper is worth looking at, not that you'll be needing a software texture mapper much longer.

Q: You're including the editor, right?

Mike: Yeah, people will be able to use our editor. On the whole, I doubt it's any better than DMB2. And it doesn't run under Windows.

Q: What enhancements do you hope to see people make?

Matt: If an aftermarket sprouts for it, we'd be very happy. People ask for lots of little features that we just don't have the time to add.

Mike: People could probably roll in some of the D2 multiplayer features without too much difficulty.

Matt: I don't think we can guess what people will do. We had no idea how much would be done with third party levels.

Q: The license states that people can't use the code for commercial gain. What if some kid develops something and wants to recoup some of the cost through shareware?

Mike: We're not opposed to that in principle. They need to get written permission from us, though. And, it would have to be after the thing is done so we know what we're permitting to be commercialized, if you want to call it that.

Q: Any plans to release the D2 source code?

Matt: No definite plans. Though, I guess I don't see why all our source code wouldn't eventually get released.

Mike: Me, too. It loses commercial value in just a few years. And, releasing it brings us closer to our customers, which is a very good thing to do.

Q: Any final comments?

Mike: Yeah, have fun with the code.

1.3 What you need to run Descent

You'll need the following to be able to start Descent:

· 68020+ (68040+ recommended)

· AGA, CyberGraphX or Picasso96

· AmigaOS 3.0

· about 8MB FastRAM or 2MB FastRAM & VMM

· Descent I PC V1.5 REGISTERED ".pig" and ".hog" files

That's it.

1.4 What you can do with it

The current features include:

· Fully multitasks
· AGA support with fast C2P
· Support for CyberGraphX/Picasso96 direct video access
· Support for different screen modes including I-glasses!
· 16 channel stereo sound
· Support for soundcards with AHI
· Virtual Memory support
· Keyboard/Mouse support
· Tooltypes

See also
Future

1.5 How to install and use

First, get a copy of Descent I V1.5 for the PC. The CD-ROM Bundle "DESCENT I and II - THE DEFINITIVE COLLECTION"
is still available in computer game stores.

Copy the descent drawer on Disc one onto your HD and install the DescentAmiga executable over it.

That's all - fairly simple, isn't it?

1.6 How to use Descent

Descent can be started via Icon from Workbench or from Shell. Make sure, that the stack is set large enough,
as I haven't compiled in any stack extension code. An amount of 60KB should be large enough (if the game crashes,
try to increase the stack).

One word about the used key mapping:

F11 is mapped to the DEL key and F12 is HELP. That's because all Keypad keys are used by the game and I wanted to
have F11/F12 near F10... I hope, you can live with it.

Some of the key commands are:

<AMIGA><F>	Enable the frame counter
<AMIGA><C>	Show the cheat menu

The currently added/tested commandline arguments are:
(You can specify them as tooltypes as well)

-verbose	Show initialization steps
-fpu	Enable FPU routines The default is off with a 68020-40 and on with a 68060
-smgame <screenmode>	Screenmode to use for the game
-smmenu <screenmode>	Screenmode to use for the menu
-smautomap <screenmode>	Screenmode to use for the automap
-amsound <audiomode>	AHI audiomode to use for the sound A requester will pop up, if no mode is given If this option is omitted, audio.device will be used
-directgfx	Make use of direct accessing the videomem on a AGA/CyberGraphX/Picasso96 screen If not enabled, WritePixel#?() will be used
-iglasses	Enable display for I-glasses!

```
        The NTSC monitor must be loaded for this.

-volume <percentage>            The maximum sound volume from 0 to 100

-lowmem                         Lower the animation detail for better performance ↩
   with low memory

-nolowmem                       Never lower animation detail

-nosound                        Disable sound

-nomemcheck                     Disable memory checking

-nomouse                        Disable the mouse handler (maybe a bit faster)

-notitles                       Skip the title screens

-noscreens                      Skip the briefing screens

-autodemo                       autoload the demo at start
```

1.7 What has changed

```
I started on 30th January 1998 with porting directly the PC source, as I don't ↩
   want to make
a port of a port ...

0.00 - 0.05     12/02/98

· rewritten Makefiles for GNU make and changed directory structure a bit
· replaced all DOS/conio stuff with dos.library function calls
· moved x86-Assembly into C by peeking into the Mac-Source
· named every unnamed struct/union
· packed nearly every structure as this is the way Watcom C/C++ handles them per ↩
   default
· added TONS of byteswappes, inlined them and turned to assembly
· removed byteswap of ID-Strings in IFF-loader code ;-)
· ported error handling routines
· ported debug mini-system (disabled the exec.library/Debug() call for Int3() in ↩
   this release)
· ported timer interrupt code via lowlevel.library/TimerInt
· ported keyboard interrupt routines via lowlevel.library/KBInt
· ported compressed file IO routines and changed some other places to use asyncio. ↩
   library
· quickported graphic setup code, it's nasty right now and I'm blitting directly ↩
   into videomem
· inlined fixmul(), fixdiv(), fixmuldiv() and sqrt() for better performance
· replaced all rand()'s and RAND_MAX's with own routines returning short instead ↩
   of int
· cleaned up code a bit and added a few missing prototypes
· a lot more changes in nearly every file, mainly cosmetic changes ...
· made an icon and created this documentation

0.06 - 0.07     17/02/98
```

· rewritten loader code and got rid of all __attribute__((packed))s
· ported critical error handling stuff
· ported main() program entry point
· added support for different screen modes (no AGA though)
· ported graphic setup code and fixed automap bug

0.08 - 0.10 20/02/98

· rewritten and ported most of the canvas/bitmap stuff to support AGA ;-)
· introduced new automap bug (please don't use it right now) :-(
· disabled temporarly direct Cybergfx

0.11 - 0.15 27/02/98

· replaced FPU instructions with fast 32Bit integer routines
· fixed some gfx bugs
· fixed an Enforcer hit caused by fix_fastsincos()
· added support for direct video on CyberGraphX/Picasso96 screens
· finally ported the ModeX stuff in automap mode
· made some small optimizations

0.16 - 0.20 06/03/98

· fixed a small accuracy bug in the palette code
· fixed a bug in the demo playback code
· made automap autoscrolling when no 320x400 mode is available
· added a switch to disable the mousepointer
· turned fixedpoint library to assembly, using 64Bit integer math on
  68020-40 and FPU instructions on 68060

0.21 - 0.25 12/03/98

· oops, direct video access was never used during game - fixed
· fixed a hashtable bug in the automapper and changed the algorithm to the faster
  one used in the Mac port
· PC keyboards don't create scancode zero, but so do AMIGA keyboards. Thus, taking ↩
    zero
  as an error code isn't such a good thing - fixed
· added c2p routines by Aki Laukkanen, modified for being able to c2p at odd ↩
   addresses
· changed the window shrinking stepsize to 32, for better chipmem-alignment
· turned the vector/matrix library to assembly, again using 64Bit integer math on ↩
   68020-40
  and FPU instructions on 68060
· added extra lores mode
· lots of other small things I've forgotten

0.26 - 0.30 22/03/98

· changed position of framecounter a bit
· set interpolation method after each level back to linear
· fixed some nasty bugs in the assembly version of vector/matrix-library
· simplified the c2p-routines for masked writes
· reenabled the screenmode-requesters
· bitmaps are now always locked under CyberGfx/P96 when accessed directly
· fixed some canvas bugs in the original sources
· some 2d routines turned to assembly

· recompiled with EGCS
· disabled doublebuffering - it isn't needed on an Amiga
· added tooltypes
· added sound (sort of...)

0.31 - 0.34 04/04/98

· debugged sound and switched from function API to device API of AHI as it isn't possible
  to access the sound hardware with different tasks at the same time
· written fast sound mixing routines for up to 16 different stereo FX
· fixed some bugs in the loader/save-code for config-files

0.35 - 0.39 23/04/98

· completey rewritten sound system once again - but now I'm satisfied: ;)
  · again using lowlevel API of AHI (it's simply MUCH faster)
  · now using audio interrupts with -directsfx
  · improved soundquality a lot with -directsfx (nearly no mixing dependent distortion)
  · added switch for disabling the lowpass filter
· removed asyncio (increasing the buffer size of the partition does the same job)
· fixed a whole bunch of load/save bugs
· PCX loading was still non-linear at some places
· fixed rearview with -directgfx
· removed timer interrupt - it isn't needed anymore
· now using timer.device for timing instead of lowlevel.library
· ...

0.40 - 0.43 11/05/98

· removed keyboard interrupt, now uses IDCMP and doesn't require lowlevel.library anymore
· changed the VR-devices code as it was a little f*cked up in V1.5 imho
· I-glasses! mode now always opens a NTSC mode
· game crashed if no screenmodes were available - fixed
· pattern matching now uses #? instead of *
· optimized the sound system and increased DMA buffer size
· removed a lot of unused PC code
· bitmaps aren't locked anymore with directgfx - it's simply faster and shorter
  also custom C2P now requires directgfx to be specified
· added mouse support
· changed default keyboard settings a bit to be the same as in the original code
· removed OS version check as I'm using the auto library opening feature of libnix now
· no shell window anymore when started from workbench
· disabled <CTRL>-<C> handling and added version string

0.44 - 0.50 28/05/98

· oops, screen saving didn't work anymore - fixed
· removed the 640x480 screen size limitation (nice slideshow in 1600x1200 ;))
· made the game to use perspective texturemapping instead of linear
· converted texturemapping library inner loops to assembly
· fixed all bugs that I've found in the C versions of the mapper
· fixed a small bug in vector/matrix library

```
· fine-tuned fixedpoint library and vector/matrix library to avoid pipeline stalls ↩
    on 68060
· removed -directsfx as it's obsolete: just don't specify -amsound
· removed -nofilter because I only allocate two channels and felt like this was a  ↩
   hack
· removed -nopointer, you'll soon know why...
· Added NewIcons by Luca 'Hexaä' Longone
```

1.8 What time will bring

```
· make a 3d accelerated version for Virge (already in the work, no high priority  ↩
   though)
· joystick support
· support for ECS and Graffiti
· music
· networking and modem support
· turn 3D engine back to assembly (partially done already)
· port the editor
· make a version for PowerPC (sorry, this will have to wait as I don't have the  ↩
   money right now)
· localize it
· many other things that might be implemented, like Descent in a WB-Window,  ↩
   Overlay ...

"Where's the source?" you might ask. Well, I might include it in one of the  ↩
   following versions,
as soon as it is in a bit better state (mainly remove all the terrible warnings  ↩
   when compiling and
remove all the unused PC-stuff...).
```

1.9 What, How, When...?

```
Q: Descent exits with "Not enough strings in text file" or something like that!
A: You're using pre-V1.5 .pig/.hog-files or the shareware-files which currently  ↩
   don't work with Descent.

Q: Why do the walls look so curious when I fly near them? Am I stoned?
A: This one is fixed with r0.50!

Q: The screenmode requesters don't show up, what's wrong?
A: Descent needs 8-bit screenmodes in 320x200 and 320x400. Be sure you have such  ↩
   screenmodes
   (There's a monitor preset in the Goodies-directory for use with CVision3D and  ↩
      M1764).

Q: When will there be a PPC-version?
A: As soon as I have enough money to buy a PowerUP board. But I'll release my  ↩
   sources with r1.00,
   so there may be other people who want to do this.

Q: Why is the sound that low?
A: That's the nature of sound mixing, and there are 16 stereo channels to be mixed ↩
    together.
```

```
   Sound boosting would be possible, but it would lead to distortion in larger  ↩
      battles...
```

1.10 Thank you for the flowers

I wish to thank the following persons & companies (in no particular order):

- Parallax Software for releasing the source of such a great game
- Phase 5 for sending me valuable information about Virge
- Paul Bartlett for his nice 'Amiga Porting Resource' at http://homepages.which. ↩ net/~bartlett
- Andreas Kürzinger for the drawer icon and the Descent-Logo at the top of this ↩ guide
- Aki Laukkanen for the fastest C2P routines
- Jan Britsch for his help to set up a homepage :-)
- Martin Jeppesen for the File_Id.Diz and providing me with the shareware files
- Nigel Milnes for making a mirror at http://www.southcom.com.au/~nigelm/descent/ ↩ index.html
- Luca 'Hexaä' Longone for sending me some NewIcons

and many other Amiga users who sent their ideas.

1.11 About myself

If you find any bugs (for sure ... :-)), have new ideas or something else,
you can send an e-mail to

  sauer@informatik.uni-wuerzburg.de

For the newest version of Descent for Amiga, check out my Descent-Homepage:

  http://www.geocities.com/SiliconValley/Haven/7398/

Alternatively, you can use the Australian mirror:

  http://www.southcom.com.au/~nigelm/descent/index.html