

# **ADescent**

Hans-Joerg Frieden

<b>COLLABORATORS</b>
----------------------

	<i>TITLE :</i> ADescent		
<i>ACTION</i>	<i>NAME</i>	<i>DATE</i>	<i>SIGNATURE</i>
WRITTEN BY	Hans-Joerg Frieden	April 18, 2022	

<b>REVISION HISTORY</b>
-------------------------

NUMBER	DATE	DESCRIPTION	NAME

# Contents

<b>1</b>	<b>ADescent</b>	<b>1</b>
1.1	Welcome to ADescent	1
1.2	A Short Introduction	2
1.3	What's new	2
1.4	Requirements	3
1.5	Obtaining the data files	3
1.6	Features	3
1.7	Starting ADescent	4
1.8	Command line options	5
1.9	Configuration file	7
1.10	Installation	8
1.11	The ViRGE version	8
1.12	Special Requirements	8
1.13	Overview of Features	9
1.14	Speed of the ViRGE version	10
1.15	Bugs in the ViRGE version	10
1.16	Known bugs	11
1.17	Hints'n'Tips	11
1.18	History	12
1.19	Future features	12
1.20	Authors and Copyrights	13

---

# Chapter 1

## ADescent

### 1.1 Welcome to ADescent

Hello and Welcome to the 0.5 Release of ADescent.  
Here's a list of what is available in this database:

- A short Introduction
  - The essential reading
- What's New
  - For those that can't wait
- Requirements
  - What you'll need
- Features
  - What it offers
- Starting ADescent
  - How to get it going
- The ViRGE Version
  - Notes about the CV64/3D version
- Bugs
  - What is broken
- Hints'n'Tips
  - Things you might try
- History
  - What has been done before
- Future
  - What might be done
- Author and Copyright
  - Who's done this

Just a quick note: I tend to say "I did" and "I added" and stuff all over

---

this document. This is because I am typing this right now. But that is really wrong, ADescent is and was a team effort. So please forgive me, brother ;-)

## 1.2 A Short Introduction

In the beginning there was Doom. Next came Descent. Parallax has finally released the source code to their great game that was in the top ten of the most frequently downloaded games of all times. As soon as the source code became available, we started our port. It is based on the linux source code as done by Patrik McCarthy. This version had all assembly removed, and compiled without too much work with GCC. To get it to actually do something was a completely different story. At present we compile with EGCS. This gives much better code.

For those that never played the game, you take the role of the Material Defender, a person responsible for cleaning up the solar system mines of the PTMC corporation ↵  
. For  
this purpose, you are equipped with a small one-man spacecraft small enough to ↵  
navigate  
through the narrow corridors of the mine.

In each mine, you'll have to gain access and destroy the main reactor core of the ↵  
mine.  
To make things a bit more tasty, there's someone there that is trying to stop you.

## 1.3 What's new

For those of you that can't wait...

The game should be much faster now. Parts of the engine and parts of the math have ↵  
been  
replaced with custom assembler code. Normally, the 030-optimized code is active, ↵  
but  
you can override this with the -fpu option. Additionally, the texture mapper  
is now assembler, too.

Some of you might have noticed that the game notably slowed down when you left the first level. This is now fixed, the problem was that the level-end sequence set ↵  
the  
texture mapper to perspective mode.

The automapper should now work without errors. The new command line option - ↵  
largemap  
gives you a 640x480 automapper.

A few minor bugs are fixed. The game should no longer crash at exit.

Last not least, there's now a ViRGE version for that much neglected 3D part of the CyberVision 64/3D.

---

## 1.4 Requirements

Descent is not the game for the weak processor. You should at least have a 030/50, but a 040 or 060 would be better. PowerPC is currently not supported, but you'll never know...

ADescent supports AGA or CyberGraphX. Picasso96 should also work, but we have reports that the `-vdirect` option (see [Starting ADescent](#)) might not work with Picasso96. We are currently investigating.

You'll also need a commercial Descent I HOG and PIG file, which should be at least version 1.5 (1.4 might also work), and it should be a PC version. If you have a MAC version, try the `-nosongs` command line switch. See [Obtaining the files for infos](#) on how to obtain these files.

You must have AHI V4 installed, ADescent won't work without.

Your OS version must be 3.0 or better.

You will need about 10 MB of memory, slightly more for the ViRGE version. Might work with VMM, but will obviously slow if it does.

## 1.5 Obtaining the data files

There are numerous ways for obtaining the HOG and PIG files. The most obvious (and the only legal way) is buying the game. It is still available on collections, and might have been on some cover CD from a magazine.

In Germany, there's the possibility to buy it on the blackmarket label.

You might also convince a PC friend to part with the CD/disks, since there's [Descent II](#) and [Forsaken](#) available there...

## 1.6 Features

ADescent supports the following features:

- o Variable graphics modes, including AGA and CyberGraphX/P96 cards. To get a screen mode requester, start with `-smr`. Custom C2P code for AGA. Correct aspect even on non-square screen mode (320x400).

- o Digital Sound Effects, with full volume and stereo panning. Music isn't yet in it, as I have problems finding info about the HMP/HMQ music format. Also see the Hints'n'Tips section on how to configure ADescent for AHI.
  - o Fully multitasking.
  - o Support for Analog Joysticks. This includes normal two-button sticks, four-button sticks and CH FlightStick compatible devices. For the latter two, a special adaptor is required (see our web page). With FlightStick, ADescent supports all four buttons as well as the "hat", but no thrust lever (might come in the future).
  - o Mouse support (not available in the ViRGE version, sorry). All three buttons are supported.
  - o Amiga'ized Keyboard. Knows almost all keys, including Amiga keys. Pause key is mapped to HELP. Pressing CTRL-ALT-PAD\* makes a screen shot (screenxx.pcx). 'PAD\*' means that this is the star on the numerical pad (sorry, A600 users).
  - o Fully customizable controls. Controls are saved with your pilot record.
  - o FPU support, 64 bit arithmetics for 030, and much inline assembly now. The texture mapper is assembly now, too. No perspective correction yet, expect this for 0.6
  - o Workbench startup and icon tooltype parsing. ToolTypes are specified like the command line options without the leading dash, for example -verbose becomes VERBOSE. Options like -option <n> become OPTION=<n>. Icon tooltypes are parsed even when started from shell (ADescent prints the options in effect), using -noicon as the very first argument inhibits tooltype parsing. Tooltypes may be commented out with '\*', '(', '<' or '<<', i.e the entries (VERBOSE), \*VERBOSE, <VERBOSE> or <<NewIcon by... are not parsed.
- NOTE: IMG1 and IMG2 from the NewIcon system are also not parsed. This caused EMT Trap errors on the first release of the ViRGE version.
- o Hardware-Accelerated automapper in the ViRGE version. Hardware-assisted texture mapping on CyberVision/3D cards via the ViRGE chip (available in a special archive).
  - o Experimental IPX support, using AmIPX library. This is in no way tested, and might or might not work. We'd like to hear if someone got this to work correctly.

## 1.7 Starting ADescent

---

ADescent might be started either from the Shell or from its icon. ↔

In either case,

Command line options are parsed first, then icon tooltypes. ToolTypes are always parsed, even when started from Shell...

Arguments on the shell command line are specified with a leading dash character, like "-verbose", and if they have an optional parameter, this is specified as "-texcache 50".

The same options in the icon would look like:

```
VERBOSE
TEXCACHE=50
```

Capitalization does not really matter, and is done purely for Amiga conventions. Tool types might be commented with '\*', '(', '<' or '«'.

Installation

Command line Options

Configuration file

## 1.8 Command line options

The following options are supported:

noicon

Ignore settings from the icon. This must appear as the first argument after the program name on the command line, or it has no effect.

320x400

640x480

Select a different screen size for the game. Not really recommended on the native version, but 320x400 is playable on the ViRGE version.

AutoDemo

Directly goes into demo mode and plays every available demo in the current directory.

FPU

Use FPU for math functions. Normally, ADescent uses 64 bit operations suitable for 68030 use as a default. The -fpu switch replaces those with optimized version for 68040/68060 CPU's

LargeMap

Opens the automapper in 640x480-Mode. This will result in a bigger display, but will be slower. Useful for those that don't have, or don't want to define, a 320x400 screenmode.

NOTE: When the game asks you for a 320x400-Mode, you should still select this. Using LargeMap specifically requests a 640x480 mode.

Network

Enables experimental IPX support. This used to be the NoNetwork options, but we



changed this, since the code is still experimental.

#### NoConfig

Do not save the config file at the end of the game. Not really usefull, but might be if/when other Descent ports start adding own config items.

#### NoMouse

Disables the mouse support. This is the default on the ViRGE version.

#### NoScreens

Disables the briefing screens

#### NoSongs

Experimental. If ADescent exits with "can't open SONGS.SNG", you might try this option. Untested, so might not help...

#### NoSound

Disables digital sound effects (and would disable music, too, if this was already implemented :-)

#### NoTitles

Do not show the title screens (Interplay&Parallax Logo)

NOTE: Credit where credit's due

This option was originally intended as debugging aid only, and should be removed in the final release. This option might go away in the final release of ADescent too.

#### Piggy

Use an alternative PIG file. Not very usefull if you don't have one...

#### Shareware

Highly Experimental!!!

Try to use the shareware .hog/.pig file. This is still untested, as we could not find a 1.4 or 1.5 shareware hog, if such a thing even exists.

#### SMR

Open a screen mode requester for the in-game screen modes. This option is disabled if there are valid screen mode entries in the config file, otherwise it defaults to on.

#### TexCache <n>

Raises the internal cache size for mixed textures to <n>. This normally defaults to 10, and may go up to 50.

The use of this option is not so obvious. Internally, Descent generates temporary textures like the monitors on the walls by mixing a monitor and a wall :-) Those are stored in a cache for later retrieval. The TexCache option increases the size of this cache, making the game a bit faster. It is mainly used for the ViRGE version of ADescent, where this can make a dramatic speedup.

#### VDirect

Only usable with CyberGraphX/Picasso96. Makes direct access to the video ram. Depending on your system, this might or might not be faster than offscreen

---

rendering. Try it out and see for yourself.

NOTE: Reports have it that this does not work with Picasso96. Should be fixed...

#### Verbose

Inteded for testing use. Makes ADescent a bit more talkative. When you send bug reports, it would be a good idea to redirect this output to a file and send it along with your report.

## 1.9 Configuration file

We have added a few custom items to the configuration file DESCENT ↔  
.CFG.

This file is saved when you leave the game, unless you specify the NoConfig option. Besides the standard entries, ADescent supports the following:

Mode320x200

Mode320x400

Mode640x480

These store the (decimal) ModeID's of the appropriate screen modes. There should not be any need to edit them by hand, since they are set when you first start ↔ the game, and reset when you start using the SMR option

AHIAudioMode

Part of the Audio subsystem. This is the (hexadecimal) Audio ModeID to use. If left at zero, or not specified, it will use the default AudioMode from the AHI Prefs program.

See

Hints'n'Tips  
for configuration hints.

AHIMixFreq

Part of the Audio subsystem. Specifies the Mixing frequency used by the AHI mode. No sanity check is made on this. If zero, uses the default frequency.

See

Hints'n'Tips  
for configuration hints.

AHIMaxChannels

Part of the (you guessed it) Audio subsystem. Specifies how many channels the audio system should allocate.

See

Hints'n'Tips  
for configuration hints.

AHIVolumeBoost

Part of the... Audio subsystem (!). Specifies a boost factor for the audio ↔ volume.

Some people have reported that the volume was too low. 1 is the default setting. Setting this too high distorts the sound and causes ugly noises...

See

Hints'n'Tips  
for configuration hints.

---

## VirgeNumTextures

Only available/sensible in the ViRGE version. Specifies how many textures you want to allocate on the CV64/3D. The number depends on the Bus system you are using. See

the notes on the Virge version  
for a description of this.

## 1.10 Installation

Really simple, this one. Create a directory somewhere on your ↔  
harddisk  
and copy everything there, including the HOG and PIG files. Now start the game by either entering "ADescent" from the shell (without the quotes - yes, you must say things like that) or double-click the icon. If there is no configuration file, the game will ask for screen modes for 320x200, 320x400 and 640x480. If you don't need or have one of those mode, choose anyone you want.

After the main menu appears, select QUIT. Back in AmigaOS, load the configuration file into a text editor and edit the appropriate fields.

For more info on that one, see  
Hints'n'Tips  
.

## 1.11 The ViRGE version

This part is only for the ViRGE version. Please read through all ↔  
this before  
trying to run it, or you might have a really bad day...

### Requirements

What you need for the ViRGE

### Overview

Features and stuff

### Speed

Speed's what matters, not size

### ViRGE bugs

ViRGE-Specific bugs

## 1.12 Special Requirements

---

In addition to the stuff mentioned in the normal requirements section, you will need

the following:

- o A ViRGE chip. It would be a bonus if this chip is connected to a CyberVision64/3 D, which in turn should be active in your Amiga :-)
- o CyberGraphX V3. Picasso96 will not work with the current release, this might change later, but if it does, this day is still a while off...
- o cgx3dvirgin.library V2.10 must be installed on your system. It will be included in later releases, but currently you'll have to get it elsewhere (for example, the ViRGE page on [www.vgr.com](http://www.vgr.com), in the V1.3 ViRGE demos).
- o 320x240, 320x400 and 640x480 15 bpp screen modes. Create them with CGXMode.

## 1.13 Overview of Features

### Features

- o Hardware-accelerated texture mapping in 15 bpp.
- o Hardware-Gouraud-Shading.
- o Everything looks much better than the original 8 bit version
- o AND IT'S FASTER... :-)

The new entry in the config file, `VirgeNumTextures`, is used to tell the program how many textures to allocate on the graphics board. Currently this is limited to 64 on the Zorro II version of the CV64/3D, and 128 on the Zorro III version. You should, however, use only 60 and 124 respectively for safety. I should really build some detection code for this and adjust the value...

Each texture map needs 8192 bytes of memory on the card. Each pixel has 16 bits, 1 bit alpha channel (transparency), and 5 bits of red, green and blue each. It would have been easy to add colored light if Descent supported it (there's some stuff in the source, but it is not used).

By default, textures are filtered (Bilinear filtering, mode 4TPP, for the pro's). This can be toggled with ALT-F1 during the game... Go ahead and position your ship directly in front of a wall or grate, and press ALT-F1... Filtering is so fast that it can be left on, it does not make it notably slower (in 320x400/640x480, the difference is bigger).

The Automapper is drawn with accelerated 3D-Line routines from the chip, resulting in a major speedup here. I also changed the layout a bit, hope you like it.

No MIPMapping. The memory is a bit too low for this, especially on the ZII boards.

---

Might show up later, but don't hold your breath.

No perspective mapping yet, either. The virgin library does not support this ↔ directly, so I will have to use the Blit functions to program the Chip directly. I have ↔ already figured out how to do this, so the perspective mapping should be ready in the next release.

Fogging is off-limits, sorry. Alpha Blending and Fogging does not work ↔ simultaneously on the ViRGE, but I need alpha blending for the transparency of grates and doors ↔ ...

## 1.14 Speed of the ViRGE version

I guess this is what all of you want to read...

The speed is higher than on the normal version, although it might not be what you expected. It does an honest 15-20 FPS on my Z2-Blizzard 2060 machine. Sometimes it is faster (peaks at around 44 FPS when close to a wall), sometimes slower. The speedups of the main version will almost all have impact on the ViRGE version...

- The ViRGE chip does not accelerate 3D Calculations. This means that although texture mapping is faster, the underlying math is still as slow as ever. This ↔ means that to get the most out of this version, you still need a fast processor.
- The game's 15 bpp now. More stuff has to be moved to the display for things that ↔ are not handled by the chip, like text, and explosions etc. Especially the bitmap scaler is quite slow, and will be replaced with assembler functions later.
- I have not figured out everything the game draws, and some stuff might still go on in the background. Given some time, I will eventually remove this...

Textures are cached on the card using and LRU (least recently used) strategy. This works reasonably well, and it currently gives hit rates of 98% and higher. For ↔ optimal performance, set the TexCache option to 50. When the game exits, it prints cache hit statistics.

## 1.15 Bugs in the ViRGE version

Most hangups can be cured by sending a break signal...

Bugs currently known:

- Textures distort. This is because the texture mapper is linear, but the U/V correction is perspective. Since the ViRGE version draws triangles and not scanlines, the problem is much more obvious in this version than in the normal version.

This will be fixed with perspective correct mapping

- Powerups, explosions and Headup-Display stuff might occasionally vanish. This is because I directly write into the ViRGE display buffer while the chip is still texture mapping (it can do this in parallel to the processor).

This will vanish as soon as I have a fix for it, hopefully soon...

## 1.16 Known bugs

There's probably quite a lot left. Here are the bugs we know of:

- Sometimes the game hangs. This is because the object sorter sometimes keeps swapping two adjacent objects in an endless loop. Send a break to quit. Sorry 'bout this. Might be fixed soon.

Should you discover more, please send them to us. See the section about

contacting  
us for addresses and email

## 1.17 Hints'n'Tips

Debug Keys

There are a few debugging keys active in the game. If you want to play in earnest, don't use them. Debugging Keys must be pressed together with DEL.

- a - Get all weapons
- c - The WIMP menu
- f - FPS counter toggle
- y - Explode the reactor
- L - Toggle headlights.

And others... Play a bit...

Pressing Right Shift zooms the view...

Audio

There's currently no AudioMode requester in the game (I know we should add one). To get an AudioMode, use the GetAudioID program from the AHI distribution to get an audio mode and mixing frequency.

A word about the volume boost: AHI volume gets lower with each channel you add. So if the sound is too soft, you can either

- o Reduce the number of channels
  - o Use AHIVolumeBoost
-

The AHIVolumeBoost level should not be too high, you'll have to experiment. With 16 channels, you should use 2 or 3.

### Joystick

ADescent supports all analog joysticks and Flightsticks. Support for digital joystick will come soon. You can get cheap flight sticks in almost all computer stores. For those living in Germany, I recently bought a Medion Erazer at ALDI for 30 german marks, and this stick works great. You'll need a special adaptor for Analog joysticks, see our web page for that.

### Using other Descent ports

As you probably know, there's another excellent Descent port on Aminet, by Christian Sauer. You might run into problems with this one if you use your pilot files, since it might not correctly write joystick configuration. So it's best to use a different pilot. Also, the keyboard layout is different.

## 1.18 History

- 0.0 First release. First ever Descent port on Amiga!!!
- 0.1 AHI Support added
- 0.2 26-Feb-98 Mouse Support added.  
Preliminary AGA support.
- 0.3 Custom C2P added.  
Cleaned up CyberGraphX code to use WritePixelFormat.  
CV64 should now display correctly.  
Added '-smr' switch  
Added '-nosongs' switch  
Added Analog Joystick support.  
'-numaxis' switch added, but still broken. Do not use
- 0.4 26-Mar-98 Added various stuff.  
including FPU, some speedups and bug fixes.  
First ever Amiga game to use the ViRGE chip on the CV64/3D...
- 0.5 30-Mar-98 Assmbler speedups, including texture mapper.  
"Not enough strings" message extended to warn about wrong  
version, to prevent further usenet postings ;-)  
Automapper now works correctly, alas no background  
ViRGE fixes.  
ViRGE automapper speed up.  
Various bug fixes.  
Minor additions.

## 1.19 Future features

---

Those might be implemented/will be implemented in the future:

- o Networking is high on our list: TCP and serial/Modem
- o ECS support
- o More speedups
- o Digital Joysticks and Pads
- ...

## 1.20 Authors and Copyrights

This game was done by Parallax Software, and published by Interplay. This is the original copyright notice:

```
THE COMPUTER CODE CONTAINED HEREIN IS THE SOLE PROPERTY OF PARALLAX
SOFTWARE CORPORATION ("PARALLAX"). PARALLAX, IN DISTRIBUTING THE CODE TO
END-USERS, AND SUBJECT TO ALL OF THE TERMS AND CONDITIONS HEREIN, GRANTS A
ROYALTY-FREE, PERPETUAL LICENSE TO SUCH END-USERS FOR USE BY SUCH END-USERS
IN USING, DISPLAYING, AND CREATING DERIVATIVE WORKS THEREOF, SO LONG AS
SUCH USE, DISPLAY OR CREATION IS FOR NON-COMMERCIAL, ROYALTY OR REVENUE
FREE PURPOSES. IN NO EVENT SHALL THE END-USER USE THE COMPUTER CODE
CONTAINED HEREIN FOR REVENUE-BEARING PURPOSES. THE END-USER UNDERSTANDS
AND AGREES TO THE TERMS HEREIN AND ACCEPTS THE SAME BY USE OF THIS FILE.
COPYRIGHT 1993-1998 PARALLAX SOFTWARE CORPORATION. ALL RIGHTS RESERVED.
```

ADescent 0.5  
Amiga Port by  
Thomas Frieden  
Hans-Jörg Frieden

C2P code by  
Peter McGavin, based on James McCoull's work  
IPX stuff by  
Philip Grossviler, based on AmIPX  
Joystick code by  
David Kinzer, with slight modifications

ADescent uses the AHI Audio System by Martin Blom.  
ADescent\_ViRGE uses the cgx3dvirgin.library by Frank Mariak. Many thanks to you, ←  
Frank,  
for the help with the virge stuff and for the library.

ADescent uses CyberGraphX and Picasso96 in selected Cinemas.

Many thanks to Mike and Matt at Parallax for releasing the source code and for funny comments in the source code...

This port is freeware. We cannot be held responsible for any damage that arises from the use or abuse of this port.

To contact us:

Thomas Frieden                      Hans-Joerg Frieden  
tfrieden@uni-trier.de              hfrieden@uni-trier.de



Schloßstraße 176  
54293 Trier  
Germany  
0651/66410

Visit our web site at <http://www.informatik.uni-trier.de/CIP/tfrieden/>

Thank you, and good night.

---