

# **ADescent**

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<b>COLLABORATORS</b>
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# Chapter 1

## ADescent

### 1.1 Welcome to ADescent

Hello and Welcome to the 0.6 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
  - 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
- ADescent Mini-FAQ

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## Frequently asked questions

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 ADescent Mini-FAQ

Here, we want to give answers to some questions and solutions to some problems that we know of. ←

I try to run ADescent, but it won't work:

You may want to try with a clean system, e.g. break into startup-sequence and run all drivers you must have (e.g. Monitors, p96/cgx stuff, ahi). Then try it. You may also try the `-noicon` switch, or check which options are reported after starting (You may have FPU enabled even though you don't have one). Also, check if you've got the latest `ixemul.library`. If you still don't get it to run, contact us.

When will you make a PPC version:

I don't have a PPC. There will possibly be a PPC version, but not from us. Steffen Haeuser has agreed to do one, but it won't be possible until the normal version is finished, due to the amount of assembler in it. Plus, Steffen is busy right now...

What's this not enough strings message:

If you get this message when you start up ADescent, it means that you have a pre-1.5 `.HOG` file. The newer versions all had some more messages in the game, and these are missing from the 1.0 version. The only solution to this is to upgrade your 1.0 files to 1.5. This is normally done on a PC. There are reports that it can be done on a PC emulator.

I get a "Couldn't open descent.sng", but my `.HOG` is 1.5:

You've probably got a Macintosh version of the `.HOG`. The Mac had no MIDI sounds, it played it's music directly from CD. The only possible solution is to try the `-nosongs` switch, and proceed with fingers crossed. Another possibility is to touch `descent.sng` in your ADescent directory (or somehow create an empty file).

I get no sound when playing ADescent:

There are several possibilities: First, make sure that you have the newest version of AHI installed. You may also check if you've installed sound drivers for soundcards you do not have. Another possibility is to check your volume level in the options menu. For more information, look in Hints'n'Tips.

I can't save, or some keys do not seem to work:

You may have a commodity that eats up keystrokes. Try to remove that.

---

I run ADescent, but it's too slow, even on my 060:

On an 060, you may want to try the `-fpu` switch. The integer math functions all use instructions that are not available on the 060, so they are implemented with illegal instruction exceptions. This makes it around two to three times slower on the 060. For reference: When starting the first level, I get 17 fps, on an 060 with CyberVision3d, `-fpu` and `-vdirect`. Your figures may vary, but it should be around this.

Ok, but what about the 040:

We've got reports from users who tried with and without the `-fpu` switch on the 040, with different results. For some, it was faster, others said it was slower. Just try for yourself.

I got Picasso96, and `-vdirect` doesn't seem to work:

Yup. It doesn't. I don't know why. We are working on it. As some sort of consolidation, the `-wbmode` switch does not work on CyberGraphX, only on Picasso96, due to a bug in CyberGraphX's `WriteLUTPixelArray`. Expect both of these bugs to be fixed in later version.

Is ADescent faster on CyberGraphX:

Yes, we've got some reports about this. It seems that it's sometimes faster on CyberGraphX than on Picasso96. I can't confirm this yet, but it has been reported.

## 1.3 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.

## 1.4 What's new

(For older news, look in the  
History  
section.)

New for release 0.6 is the ability to use ExtraHalfBrite mode. Now, all you ECS owners with upgraded 2000 and 500 can play, too.

Another new feature is the workbench mode. You can now (theoretically) play ADescent in a window on the Workbench. Your Workbench must be in direct color mode (15/16/24 bit). Unfortunately, this option doesn't work yet on CyberGraphX, due to a possible bug. On Picasso96, it should work, although we have not yet tested it.

Always important, the new version features yet more speed. Some more math is now done in assembler. You should now get from 15 to 25 fps on an 060. The highest rate I ever got was 39 fps (in an empty room, facing a wall ;)

Another thing that's new is the keyboard configuration. I changed the default keyboard configuration to that mentioned in the manual (the original keymap). Back before version 0.0, we changed this because we thought the original was broken (it was, in fact, an endian problem).

The debugging stuff (fps counter, memory and mission time) are now off by default. The frame counter can still be toggled with DEL+f.

Last not least, a bug in mission loading was fixed. In older versions, \*.MSN files were not detected, only \*.msn. So, if you just unzipped a DOS archive, the level and mission file were called BLAH.MSN and BLAH.HOG. These were not found by ADescent. Now, they are...

## 1.5 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, ECS 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

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work with VMM, but will obviously slow if it does.

## 1.6 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...

## 1.7 Features

ADescent supports the following features:

- o Variable graphics modes, including AGA/ECS 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). You may even play in a window on the workbench (well, sort of, at least).
  - 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 requires (see our web page). With FlighStick, 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 040, and much inline assembly now. The texture mapper is assembly now, too. No perspective correction yet, expect this for 0.6^H^H^H0.7
- 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.

## 1.8 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

## 1.9 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.

WBMode

Do not open a new screen, open ADescent's window on the workbench screen. This option is only available in direct color modes, i.e. 16/24 bit. Please note that at the moment, this option only works on Picasso96, not on CyberGraphX.

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 useful, 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 useful 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

Intended 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.

## 1.10 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.

## 1.11 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

.

## 1.12 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

## 1.13 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.
-

## 1.14 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 ...

## 1.15 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. ←

## 1.16 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...

## 1.17 Known bugs

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

- The `-wbmode` switch doesn't work on CyberGraphX. It's not our fault, though, but CyberGraphX`.
  - Mouse and Keyboard used together result in jerky movements.
  - 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

## 1.18 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 fligh 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,

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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.

### Faster Loading

For faster loading, increase buffers of the partition ADescent is on. For example, I always do an "AddBuffers Work2: 4000" before starting ADescent for the first time, and this dramatically decreases loading times.

## 1.19 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 Assmber 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.
- 0.6 05-Apr.98 ECS support  
Workbench mode  
Original keymap  
Speed

## 1.20 Future features

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

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

## 1.21 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
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```

```
ADescent
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:
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```

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Visit our web site at http://www.informatik.uni-trier.de/CIP/tfrieden/
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Thank you, and good night.
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