dMagnetic

A Magnetic Scrolls Interpreter

Release 0.24

Thomas Dettbarn   dettus@dettus.net

July 26, 2020

dMagnetic has been released under the BSD-2-clause license

Magnetic Scrolls was an interactive fiction developer, based in London UK, active between 1984 and 1990 and pioneer of audio-visually elaborate text adventures.

Contents

Chapter 1

Introduction

"I am having great trouble in finding someone to perform an extremely simple task and I wonder if you would help me out. If you deliver this sealed letter to King Erik of Kerovnia, you will be well rewarded when I next meet you on your travels and I would be forever indebted to you."
— Kronos the magician

Hello, and thank you for your interest. `dMagnetic` is a Magnetic Scrolls interpreter. It can be used to play the following classics:

- The Pawn

- The Guild of Thieves

- Jinxter

- Fish!

- Corruption

- Myth

- Wonderland

Those games were Text adventures, a popular genre during the 1980s. They were telling a story in written form, and to advance, players had to type in instructions. Since players were presented with a story, one with which they could interact, those were also affectionally called "interactive fiction".

To explore the environment, for example, one would type in `GO NORTH`, `GO UP` or `NW`. `OPEN DOOR` would open a door, and to talk to other characters was started by something like `SAY HELLO`. Players also had so solve puzzles, rescue a princess (or not), which was a big part of the

gameplay. Magnetic Scrolls took great pride in its advanced parser, which was famous for being able to understand instructions such as `PLANT THE POT PLANT IN THE PLANT POT WITH THE TROWEL.`

Some games used graphics to illustrate the story, and Magnetic Scrolls' games were particularly famous for the beauty of the images they used.

The 1980s were also a decade in which several home computer systems were fighting for dominance. Software, and games, had to be written for as many of those platforms as possible, to reach a wider audience. For developers, this meant writing in assembler for several processors. Finding an error in one system, or even a small rewrite to the story would have caused a a painstakingly tedious process, where the software for all the other systems had to be checked and modified as well.

Magnetic Scrolls' solution to this was to create a virtual machine, one that was greatly inspired by the popular 68000 processor, and to develop the games for this. This machine was ported to different platforms, and the story, the puzzles, and the images had to be designed only once.

By itself, `dMagnetic` is not a game. It is an implementation of the virtual machine. It requires the original game binaries to run. In theory, it could run other software as well, but it has not been designed for that.

The purpose of this document is to explain the usage of `dMagnetic`, to allow users on modern computers to play the classics.

Thank you Hugh. Thank you Stefan. Thank you Niclas and David for your pioneering work on reverse engineering.
And finally: Thank you Magnetic Scrolls for being one of the reasons that have gotten me into computer science.

Chapter 2

Getting started

"The Guild and I have surveyed this region and know exactly how much of value is to be obtained. Jump to the jetty and begin your work. Return here when you have completed your business. And remember, I and my associates will be keeping an eye on you."
— The master thief

2.1 Downloading and compiling dMagnetic

`dMagnetic` can be downloaded from its homepage(2). Since it has been developed on OpenBSD and was later ported to Linux, it can be downloaded within a terminal window by typing

```
% wget https://dettus.net/dMagnetic/  \
                      dMagnetic_0.24.tar.bz2
% tar xvfj dMagnetic_0.24.tar.bz2
% cd dMagnetic_0.24
% make
```

This should result in an executable file called "dMagnetic". Typing

```
% ./dMagnetic --help
```

should print out the most important command line parameters.

2.2 The game binaries

`dMagnetic` by itself is not a game. It is an interpreter for game binaries, offering two possibilities to play them. The first is by owning the original files from the MS-DOS release of the games. The second, a more robust way, is using .mag and .gfx container files.

2.2.1   .mag and .gfx

The container format has been developed by Niclas Karlsson and David Kinder; it allowed for a uniform way of combining the necessary game binaries from different platforms into two files: One for the story and the interpreter (.mag), and one for the BEAUTIFUL graphics (.gfx). Magnetic Scrolls is especially known for the latter.

Several of those containers can be downloaded from the Magnetic Scrolls Memorial's Website(1). Afterwards, "The Pawn" can be played by typing

```
% ./dMagnetic -mag pawn.mag -gfx pawn.gfx
```

This should start the game in the same terminal window. It is now possible to play, or to close `dMagnetic` by typing QUIT.

By default, the size of the terminal is expected to be at least 125 columns wide and 50 rows high. Running `dMagnetic` in a smaller window might result in distorted output. Changing the window size helps, but if this is not possible, please see chapter 3.1.

2.2.2   MS DOS binaries

In case somebody is lucky enough to own an original copy of "The Pawn", and has installed it in the directory /C/GAMES/PAWN, typing

```
% ./dMagnetic -msdosdir /C/GAMES/PAWN -vmode high_ansi2
```

will read the binaries and load them into the virtual machine. This version also provides a beautiful title screen, which is shown before the actual game can be played in the terminal window.
As with the .mag and .gfx files, the terminal window's size is expected to have at least 125 columns and 50 rows. Additionally, the graphics are in a slightly different format. Chapter 3.7 explains how to view them with a richer amount of colours.

2.2.3   Magnetic Windows resource files

"Wonderland" and "The Magnetic Scrolls Collection" were released using a framework called "Magnetic Windows". This one used several resource file at its core. `dMagnetic` is able to read those. To provide the location, the prefix and possible capitalization of those, the name of the file ending in "TWO.RSC" needs to be provided:

```
% ./dMagnetic -tworsc /C/GAMES/WONDER/TWO.RSC
% ./dMagnetic -tworsc /C/GAMES/MSC/CTWO.RSC
% ./dMagnetic -tworsc /C/GAMES/MSC/FTWO.RSC
% ./dMagnetic -tworsc /C/GAMES/MSC/GTWO.RSC
```

The names of the other resource files (like ONE.RSC, THREE.RSC, FFOUR.RSC...) is being calculated from this.

It should also be noted that this release saw the addition of some bonus graphics, which, of course, are being shown in `dMagnetic` as well.

This collection also offers alternative pictures for the EGA graphics. To play with those pictures, it is recommended to try

```
% ./dMagnetic -tworsc MSC/GTWO.RSC -ega -vmode sixel
```

For games from this framework, however, graphics only become visible after typing `GRAPHICS` on the prompt.
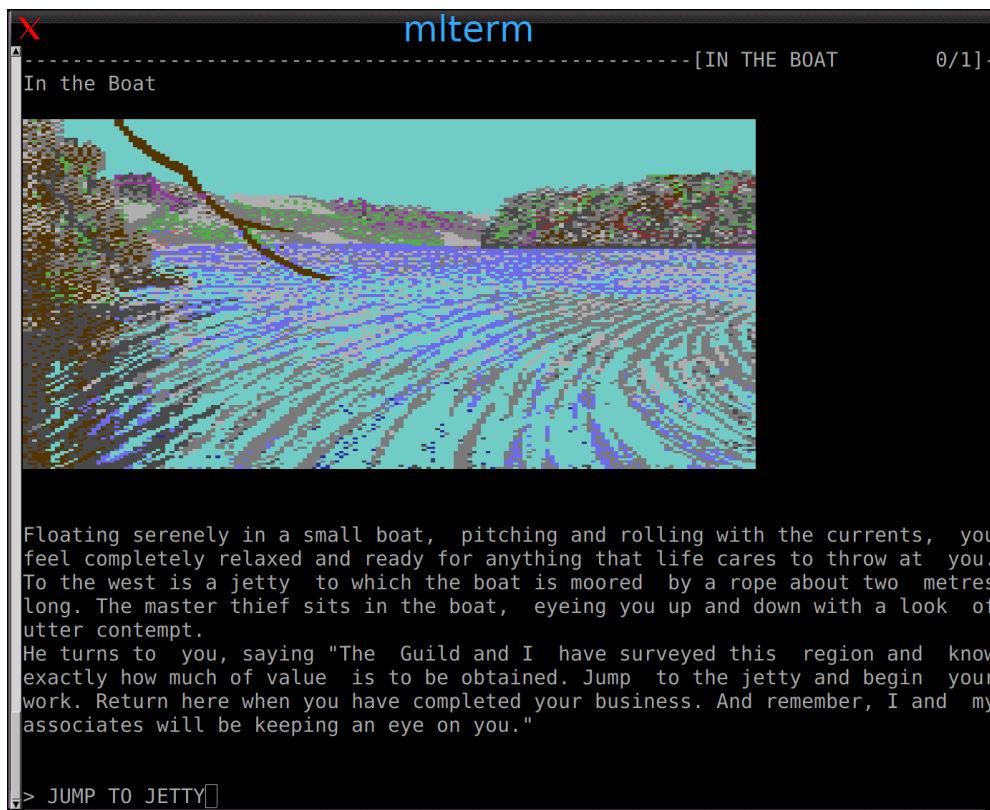
Figure 2.1: *"The Guild ot Thieves", with Commodore C64 graphics, running in* `dMagnetic` *0.24.*

2.2.4   D64 image files

`dMagnetic` is also capable of reading .d64 images of the original games. There are a couple of corrupted images floating around the internet, which were taken from deteriorated floppies. It is not advised to used those. If the image is healthy, however, it can be loaded with the following instruction:

```
% ./dMagnetic -d64 guild1.d64,guild2.d64
```

Please note, that the d64 images come in pairs, since the C64 floppies had a front- and a backside. Both of them have to provided by ading a komma.

2.3   Taking the first steps

Once `dMagnetic` has been started to play "The Pawn" by either one of

```
% ./dMagnetic -mag pawn.mag -gfx pawn.gfx
% ./dMagnetic -msdosdir /C/GAMES/PAWN
```

the game is running. The player is greeted with a screen, consisting of four elements, as seen in Figure 2.2. On the top, there is a header, giving away the room the player is currently in, as well as the score and the number of steps already taken. Below that comes the story in the form of text. (It IS a text adventure afterall). Occasionally, the rooms have some illustrative images. Which will be, by default, rendered in ANSI Art. (Chapter 3.4 elaborates on the `-vmode low_ansi` option).

The last element is the input prompt, starting with `>`. To advance in the game, and the story, text adventures require the player to type in instructions. Going north three times from the starting point in "The Pawn", for example, will lead the player to a larger boulder.

```
> GO NORTH
> GO NORTH
> GO NORTH
```

From here, going back to the starting point, and east afterwards will lead to the first enocunter with Kronos the magician.

```
> GO SOUTH. GO SOUTH. GO SOUTH.
> GO EAST
```

As it turns out, he is pretty hard to kill.

```
>  KILL KRONOS
Kronos waves his wand and you are knocked to the ground.
"That should teach you", he says with conviction.
```

The game can be left anytime by typing QUIT.

To store the game's status before can be done by typing

```
> SAVE
Please enter filename: WHATNOW.GAM
Are you sure (y/n)? y
```

and later be restored with

```
> LOAD
Please enter filename: WHATNOW.GAM
Are you sure (y/n)? y
> LOOK
```

And **yes**: When playing with the MS DOS binaries, old savegames work.
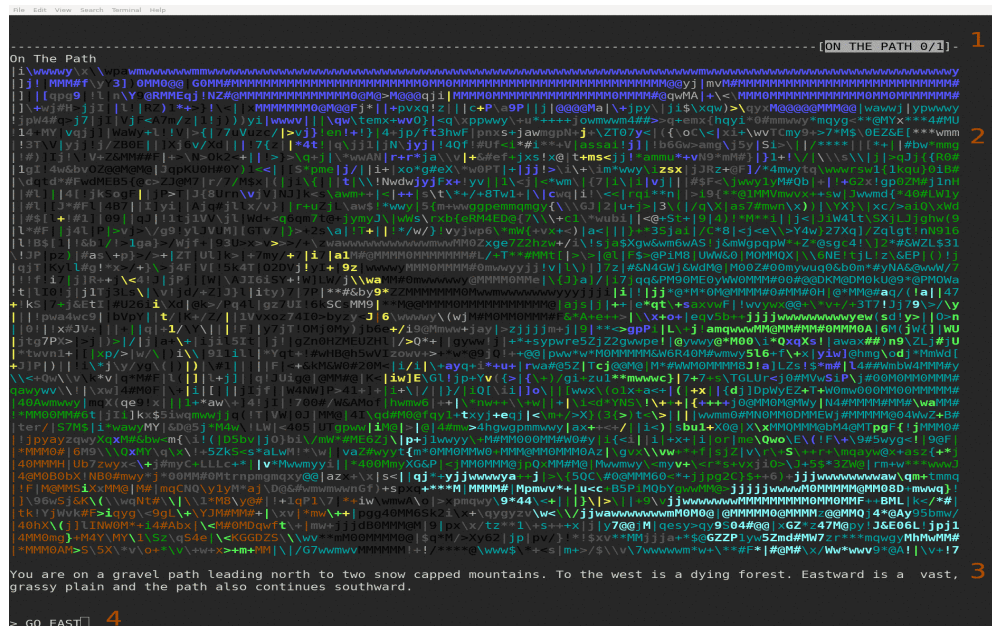
Figure 2.2: *"The Pawn", running in* `dMagnetic` *0.19. Visible elements when playing "The Pawn" are: The header (1), the image (2) (in this case rendered in ANSI art), the text (3) and the input prompt (4).*

2.4   Saving the configuration in an .ini-file

In case the user is getting more inclined to run any of the games more often, typing in full pathnames before being able to run the game might become a tedious chore. Instead, it is possible to create a dMagnetic.ini file in the home directory. This allows for a shortcut.

```
% echo "[FILES]" >~/dMagnetic.ini
% echo "pawnmag="`pwd`"/pawn.mag" >>~/dMagnetic.ini
% echo "pawnmag="`pwd`"/pawn.gfx" >>~/dMagnetic.ini
```

This way, a single command line option is required to select "The Pawn" for playing

```
% ./dMagnetic pawn
```

A more comprehensive dMagnetic.ini file can be produced by typing

```
% ./dMagnetic -helpini >~/dMagnetic.ini
```

This file needs to be edited.

It is possible to use several dMagnetic.ini files. To distinguish between them, the -ini parameter can be used on the command line

```
% ./dMagnetic -ini dMagnetic.test.ini pawn
```

Chapter 3

Graphics

*"We knew you'd stop the Seven Deadly Fins.
Good show! It's a shame they got away again.
But now I suggest you take a vacation. You've
earned it, old boy."*
— Sir Playfair Panchax

Magnetic Scrolls' games were famous for the beautiful images with which
they enriched their stories. `dMagnetic` has been designed to run in a
terminal, but it offers various ways of displaying them, by means of the
`-vmode` commandline parameter. To make the selection permanently,
the entry `mode=` in the `[DEFAULTGUI]` section of the dMagnetic.ini file
can be changed. An illustration about the different options for playing
the games can be seen in figure 3.1.

If the user wishes to try out the monochrome mode, for example, the
command line used would be

```
% dMagnetic -vmode monochrome pawn
```

In case this mode is satisfactory, the entry in the `[DEFAULTGUI]` section
would then be changed to

```
mode=monochrome
```

This way, the extra parameter can then be skipped the next time `dMagnetic`
is being started

```
% dMagnetic pawn
```
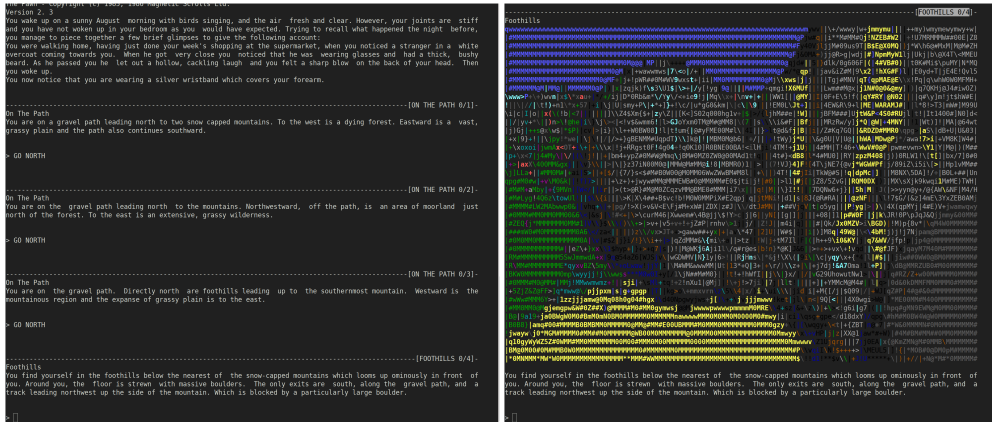
low_ansi
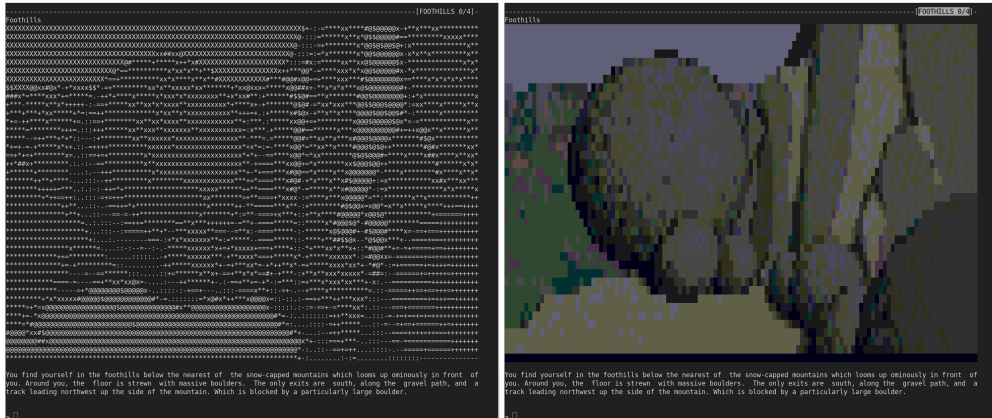
monochrome

high_ansi
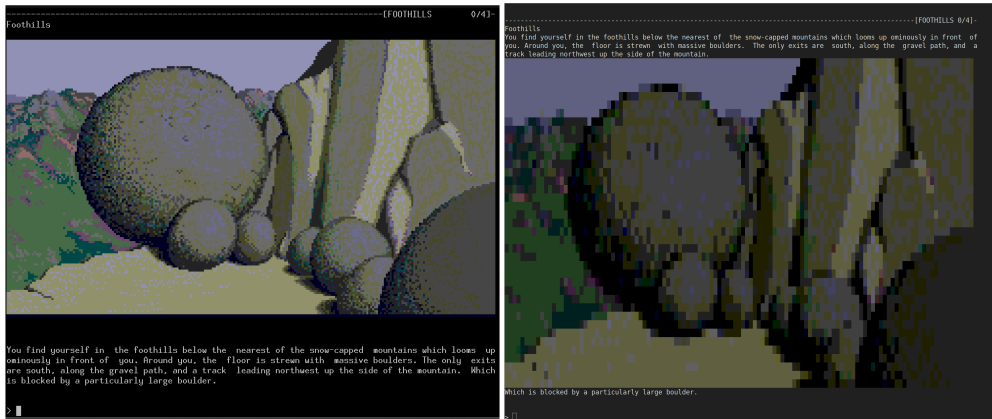
sixel

high_ansi2

Figure 3.1: *The options for the* `-vmode` *command line parameter offer a wide range of possibilities to experience "The Pawn" in a terminal window. The actual choice does not only depend on the user's preference, but also on the capabilities of the terminal window. The "sixel" mode, for example, offers the highest resolution, but only works in certain variants of xterm.*

3.1 Size of the graphics

The size of the graphics, its height and its width, are configurable within the .ini file or via command line paramters. In the .ini file, the entries are `rows` and `columns` within the `[DEFAULTGUI]` section.

```
[DEFAULTGUI]
rows=40
columns=120
```

The same values can be passed to `dMagnetic` with the `vrows` and `vcols` parameter

```
% ./dMagnetic -vcols 120 -vrows 40 pawn
```

By default, a UNIX terminal offers only 80x25 characters. If a user wishes to play within this confined space, it is possible to restrict the graphics to 15 lines.

```
% ./dMagnetic -vcols 80 -vrows 15 pawn
```

Which is 60% of the available space. An example can be seen in the top half of figure 3.2.

Alternatively, the images can be rendered in a higher resolution. This requires nothing more than a resize of the terminal window. However, with this technique, a pixel is exactly as wide as a character in the textual output. Meaning, that when the pixels get smaller, the texts get smaller. This can be seen in the bottom half of figure 3.2.

Choosing the actual size of the images should thus be up to the user's personal preferences.

3.2 Text only

Adding the paramter `-vmode none` to the commandline allows the user to play the games as pure text adventures.

```
% dMagnetic -vmode none -vcols 50 pawn
------------------------------[ON THE PATH 0/1]-
On The Path
You are  on a  gravel path  leading north  to  two
snow capped  mountains. To  the  west is  a  dying
forest. Eastward is a  vast, grassy plain and  the
path also continues southward.
>
```

It should be noted that this case also requires the addition of the `-vcols` parameter, to show the text with proper line wraps.
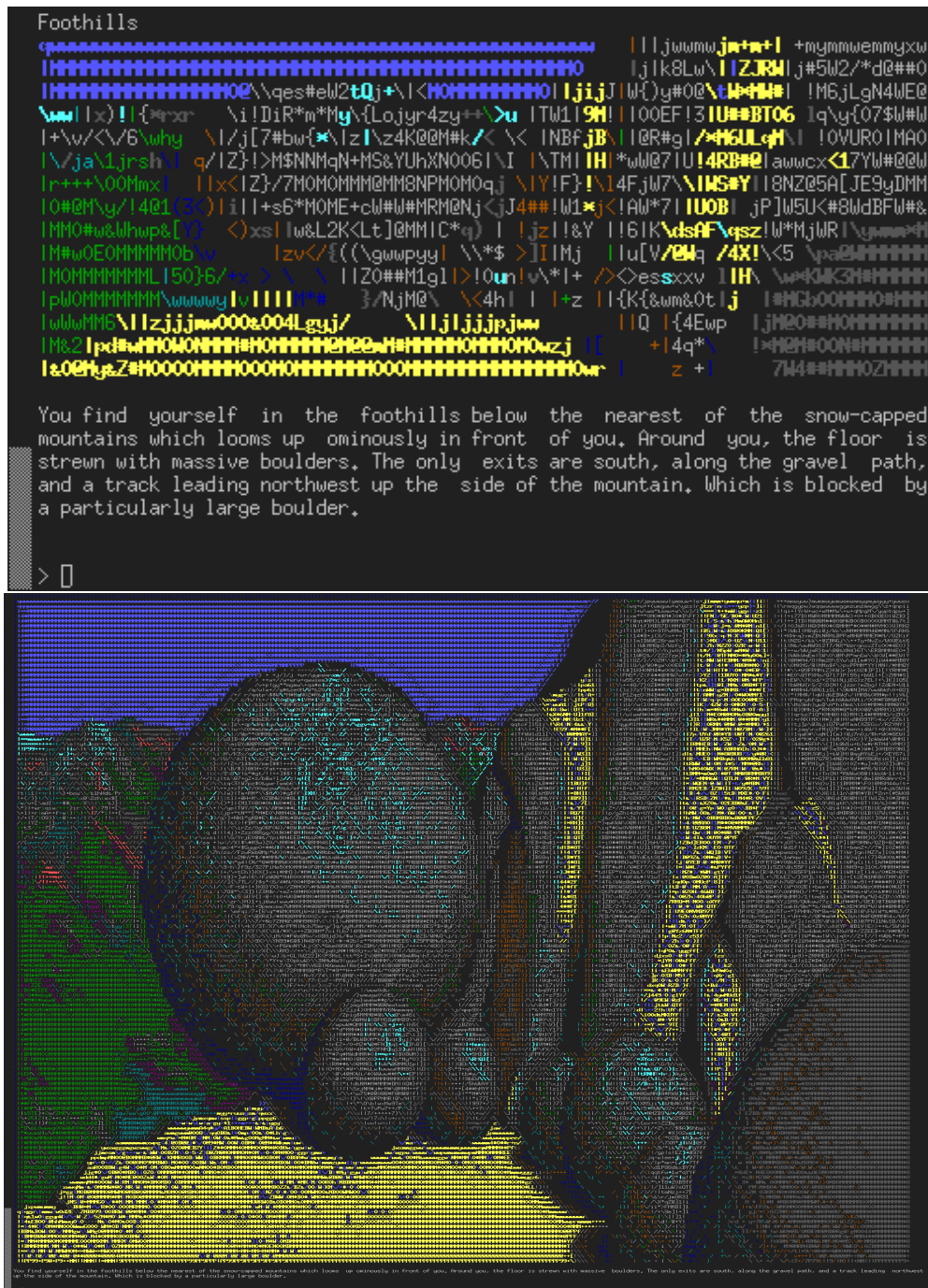
Figure 3.2: *Top: "The Pawn", running in xterm, with* `-vcols 80 -vrows 15`*. The graphics are scaled down to fit within a terminal window with 80 columns and 25 rows. Bottom: "The Pawn", running in xterm, with* `-vcols 260 -vrows 150`*. The image takes up most of the screen and shows the highest amount of detail. However, the text becomes smaller.*

To make the text-only output the default, the entry `mode=none` in the `[DEFAULTGUI]` section of the dMagnetic.ini file needs to be set.

The standard alignment for the text is block aligned (`-valign block`). This can be changed with the commandline option `-valign left` or `-valign right`.

```
% dMagnetic -vmode none -vcols 50 -valign left pawn
-----------------------------[ON THE PATH 0/1]-
On The Path
You are on a gravel path leading north to two
snow capped mountains. To the west is a dying
forest. Eastward is a vast, grassy plain and the
path also continues southward.
>
```

Currently, the right alignment is considered broken.

```
% dMagnetic -vmode none -vcols 50 -valign right pawn
-----------------------------[ON THE PATH 0/1]-
                                    On The Path
    You are on a gravel path leading north to two
     snow capped mountains. To the west is a dying
   forest. Eastward is a vast, grassy plain and the
                 path also continues southward.
                                                >
```

The preferred alignment option can be set within the `[DEFAULTGUI]` section with the `align` entry.

3.3 Monochrome

The `-vmode monochrome` and `-vmode monochrome_inv` parameters offer the possibility to play the game with images, even if the terminal does not have any colour-capability.

The effect is acquired by calculating the intensity, or brightness, of each pixel, which is then translated into a character. The characters can be configured by changing the `monochrome_characters` entry of the `[DEFAULTGUI]` section in the dMagnetic.ini file. Said entry defines a ramp, from left to right, of increasing intensity.

It should be noted that the background of the terminal window factors into the appearance of the image, as seen in figure 3.3.

One a white background, this technique works as followed: Small characters, such as a dot `.`, will be perceived as light. On the other hand, larger characters, such as `@` cover more of the white background and are being perceived as dark.

```
--------------------------------------------[FOOTHILLS 0/4]-
Foothills
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX#-:*****x@@@#=*********
XXXXXXXXXXXXXXXXXXX@@@$XXXXXXXXXXXXX#::-*****x@@@@=*********
XXXXXXXXXXXX$x*********xx$XXXXXXX$*=*x-*****#@@@@+*********
$XX@#@#*#@@@*+******x*x*****#x#@@#**x@#*=*****@@@@*+********
**+*****+**=-+*******x**xxxx****=***#@*+****x@@@@@x-********
*+++**x***=:=+*******xx*xxxxx*=+-+**x@+*****#@@@@@*-********
**+++***+=:=*****x*xxxxxxxxx=*x-**##=*****#@@@@x+*#@******
++=+*x**-:-++****xxxxxxxxxxx**-=**#x+*****@@@@+****#x*****
+**+****..:-+****xxxxxxxxxx**=====**#*+****x@@@**********
****+++*:.:-=+***********xxxx***+*==**@+*****@@@*-*****xx****
*******+=+.:::-=+***************=**xx-****x@@*************+++
*******+-.:---=++*************+=+==***:****@@#*@@*****+====++
**********=..:---=+==**xxx*-=*x-==*x+:***x@@*+@@x**=====++++
*******++****:..::-:;**xxx*+**x*=+*x+=+**xxx=-##*=======++++
*******+-++++=:...:;=****x-=*x=**xxxX=**:====++=+++
******x=---+**###@*..:-=*x+-.-=++=-+-=*****x=:-=====+=+++
**+*x*####@@@@@@@@@#**+=+*x#x**x@@+::..:==*+**x*::-=====+=+++
**=x#@@@@@@@@@@@@@@@@@@@@@@@@@@x+..::=*x*:::======+=+++
@@####@@@@@@@@@@@@@@@@@@@@@@@@@#*-:-=+*..::-=======+++
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX=..::--:.::::-----=-===
You find yourself in the foothills below the nearest of  the
snow-capped mountains which looms  up ominously in front   of
you. Around you, the floor is strewn with massive  boulders.
The only  exits are   south,  along the  gravel path,  and  a
track leading northwest up the  side of the mountain.  Which
is blocked by a particularly large boulder.
>
--------------------------------------------[FOOTHILLS 0/4]-
Foothills
.................................=#$*++++=----=x+++++++++
.................---:...........=$$#*++++=----x+++++++++
:..-=--=+----.;=++*x*++*+==:.......:+x*=#++++++=----x+++++++++
:..-=--+=----*x*+++++=+++++==+==-=+x+++++-----*x+++++++++
++x++++x**x#x*+++++++=++====+*x*++x+++=--*x++++=-----=#+++++++
*xx*=*+*x$xx*++++++==+=====*xx#x++=-x*++++=------+#*++++++
*+xx***xx$$x*+++++=+==========x+*#++==x+++++=----=x*=-++++++
xxxx***+#$#xx*++++=============**#x++==x+++++----x++++==+++++
x++x****XX$#x*+++++==========+*xxx*+=*x++++=---*+++++++=+++++
****xxx*$X$#xx*+++++++++====+++x*xx*+-x*++++---*#++++++++==++++
*****xxxX$$#xx**+++++++++++*x*xx*==#*++++=--++*++++++++*xxx
********x*#X$###xxx****++*x*xx*xxx++*$*+++--=*--++++*xxxxxxx
**********xXX$###xxxx+===*#x*+#xx+x$*++=--*x--=+*xxxxxxxx
*******xx****$XX$$#$$*++===+x*+=+xx++xxx++===x#==*xxxxxxxxx
*******x#xxxxxx$XXX$x*++++++#x+++*x+*x*++===x++$xxxxxxxxxx
*+**+*+x####x*+===-*XX$#x**x#X#xxxxx#x##*++++++*x$#xxxxxxxxxx
**x*x*====---------=+*xxx*===++=--x$$X$xx*x*+=*$$#xxxxxxxxxx
**x*==------------------------=xXX$$$x*++$$$xxxxxxxxxxxx
-=====----------------------------=+#$#xx**X$$#xxxxxxxxxx
==================================xXX$$##$XX$$$#####x#xxx
You find yourself in the foothills below the nearest of  the
snow-capped mountains which looms  up ominously in front   of
you. Around you, the floor is strewn with massive  boulders.
The only  exits are   south,  along the  gravel path,  and   a
track leading northwest up the  side of the mountain.  Which
is blocked by a particularly large boulder.
>
```

Figure 3.3: *The monochrome output with different characters configured in the dMagnetic.ini file. Top:* vmode monochrome, *optimized for black backgrounds. Bottom:* vmode monochrome_inv, *optimized for white backgrounds.*
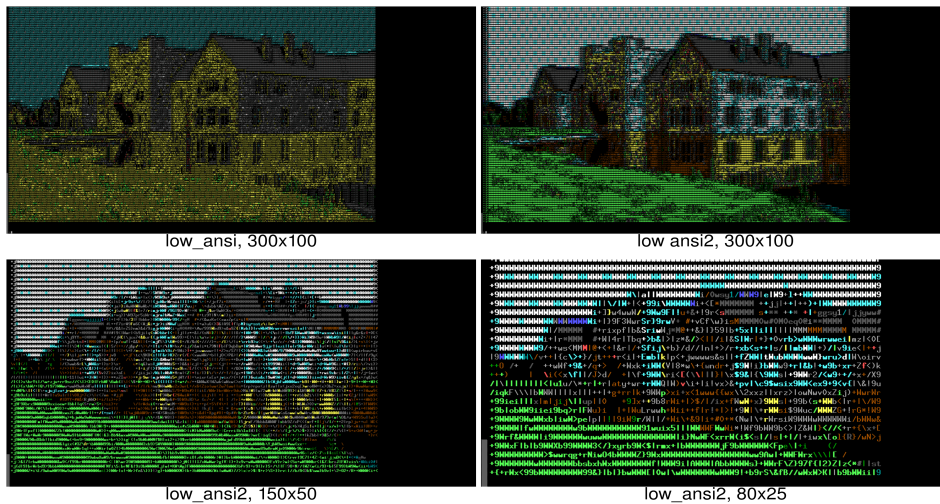
Figure 3.4: *Playing "The Guild of Thieves" from the MS DOS binaries in* `dMagnetic` *0.24 with different low ANSI options. Top left:* `vmode low_ansi` *does not offer many colours. Top right:* `vmode low_ansi2` *chooses the colours based on averaging pixels and offers more nuances. Buttom: Examples of the* `vmode low_ansi2` *with more realistic resolutions.*

3.4 Low Ansi

Using `-vmode low_ansi` will render the images in ANSI art. The colours are first projected into a limited colour palette. Afterwards, from a selection of characters, the ones representing the image best are being chosen.
It is possible to configure the characters used for rendering, by changing the entry `low_ansi_characters` in the `[DEFAULTGUI]` section of the dMagnetic.ini file.

This mode works best in terminal windows which offer the VGA ANSI RGB palette in appendix D.

3.5 Low Ansi 2

The MS-DOS releases of the games had a different format to store the images. Here, a higher resolution was used, albeit with only 2 instead of 3 bits per RGB-channel. Hence the introduction of the `-vmode low_ansi2`: It uses an alternative algorithm to choose the colours before rendering them by averaging over several pixels. The resulting picture has more nuances, as can be seen in figure 3.4. The experience for the player is a much more satisfying one.

3.6   High Ansi

Using `-vmode high_ansi` is rendering the images with the real RGB values. It requires a terminal window with the capability to do so, otherwise the image will be invisible.
This mode provides a rich amount of colours, however, one pixel is as large as a single character. The output will look blocky and pixelated.

3.7   High Ansi 2

As with the High Ansi mode, this mode requires a terminal window with the capability of showing real RGB values.
As figure 3.5 shows, the images from the MS-DOS version of the games can create some issues on modern monitors. Thus, the command line parameter `-vmode high_ansi2` can be used to average over several pixels.

3.8   Sixel

Sixels is a technique that offers the possibility of rendering high-resolution images within certain terminal emulators.
One such terminal emulator would be xterm, but only when invoked via

```
% xterm -ti vt340
```

the sixel mode becomes available. Another terminal emulator knwon to offer this mode is mlterm. When `dMagnetic` is running in Eterm, or gnome-terminal, for example, the images will be skipped. Others, such as Linux command lines in text-mode, might start flooding the output with command-codes.
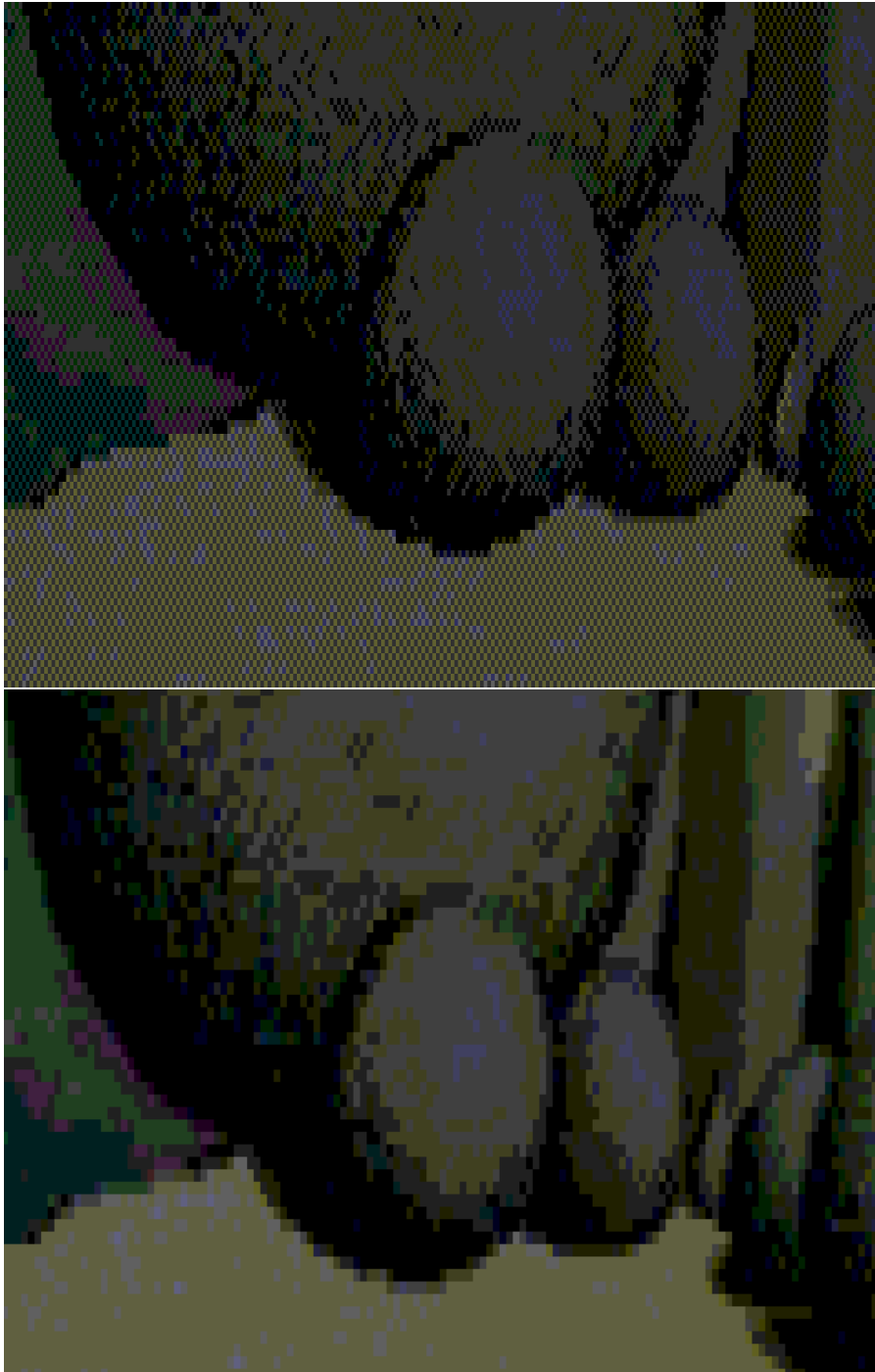
Figure 3.5: *The MS DOS version of "The Pawn" used half-tone graphics for the image.* dMagnetic *offers two possibilities of rendering those. Top:* -vmode high_ansi. *Bottom:* -vmode high_ansi2.

3.8.1 Resolution

For technical reasons, `dMagnetic` does not detect the size of the terminal window itself. To scale the images in sixel mode, the maximum resultion has to be passed on with the `-sres` commandline option. Alternatively, the `sixel_resolution` entry within the `[DEFAULTGUI]` section of the dMagnetic.ini file can be set as well.

As can be seen in figure 3.6, the images are in fact being scaled up from their orignial size, whilst the appropriate aspect ratio is being preserved.
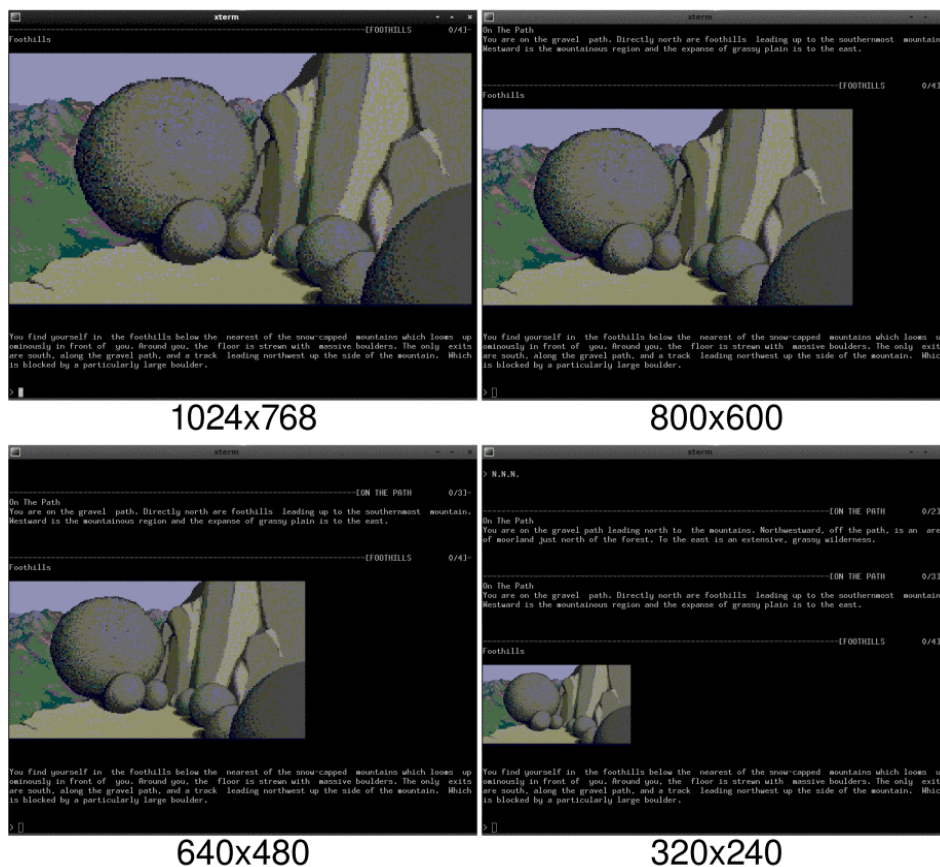
Figure 3.6: *Different options for the* `-sres` *commandline parameter whilst running the* `-vmode sixel` *mode. The original images are being scaled up, their aspect ratio is being preserved. It is up to the user to decide which one should be preferred.*

Chapter 4

Random events

"We play a variation on the game of Blackjack."
— Charon

Certain elements of the games rely on chance, to make playing through them more challenging. Those elements require a random number generator. `dMagnetic` offers the possibilities to generate the numbers internally, or externally, from the operating system. They can be chosen with the command line parameter `-rmode pseudo` or `-rmode real`, and further configured with the parameter `-rseed 12345`.

Within the dmagnetic.ini file, the `[RANDOM]` section can be used to make the choice permanent.

```
[RANDOM]
mode=pseudo
;mode=real
seed=12345
```

4.1 Pseudo random

The pseudo random generator offers some sort of determinism when playing through the game. This is necessary for scripted playthroughs (See chapter 5). Basically, the numbers advance with each command that has been typed in. So after the same amount of instructions, the same event happens.

Using `-rseed 12345` gives the random number generator the start value of 12345. Using a different value will, obviously, result in a different timing of events, and sometimes a different outcome of the game.

4.2   External random generator

A different experience whilst playing can be achieved with the option `-rmode real`. This is using the random number generator of the operating system. The option given by the `-rseed` parameter is used as additional salt.
The random numbers generated here are more sophisticated, even used for cryptographic purposes. Thus, the events happening in the game become much less predictable.

This mode is recommended for a repeated playthrough.

Chapter 5

Advanced logging

"Derek, that Scott Electronics deal did brilliantly."
— David Rogers

`dMagnetic` is reading from standard input and writing to standard output. It is thus easy to do some logging in the form of

```
% dMagnetic pawn | tee pawn.log
```

However, this is does not work for walkthroughs, since it would only write the story and the images into a file, but not the commands being typed in.

5.1   A walkthrough script

A better way to store the commands, and nothing else, comes with the `-vlog` parameter.

```
% dMagnetic pawn -vlog pawncmds.log -rmode pseudo -rseed 1
> NORTH. NORTH. NORTH.
> quit
> q
> y
% cat pawncmds.log
NORTH. NORTH. NORTH.
quit
q
y
```

Since `-rmode pseudo` has been chosen, the random events are deterministic (See chapter 4.1). Thus, the inputs can be played back easily with the same result as before:

```
% cat pawncmds.log | dMagnetic pawn -rmode pseudo -rseed 1
```

They can also be copied from the .log file and pasted into a new session of `dMagnetic`, to get back to the same point as before.

25

5.2   Turning a walkthrough into a story

To retrace the steps where something went wrong, it is better to have
the story along with the commands. To log the inputs as well as the
output, the parameter `-vecho` repeats whatever the user has typed in.
This makes `dMagnetic` work together with the `tee` command.

```
% dMagnetic pawn -vecho | tee pawn.txt
```

When trying to write a walkthrough script, it is thus recommended to use
the following commandline

```
% dMagnetic pawn -vlog pawncmds.log -vecho \
  -rmode pseudo -rseed 12345 | tee pawn.txt
```

Once the walkthrough is finished, it can be turned into a book EASILY by
typing

```
% cat pawncmds.log \
    | dMagnetic pawn -vmode monochrome \
      -rmode pseudo -rseed 12345 \
      -vcols 80 -vrows 40 -vecho >pawn.txt
% a2ps -o- pawn.txt >pawn.ps
% ps2pdf pawn.ps
```

(Even though pawn.txt should be edited so that the images are not
spread out over several pages...)

Appendix A

Command line parameters

Configuration		
`-ini`	dMagnetic.ini	Location and name of the .ini file.
Loading the game		
`-mag`	pawn.mag	Location and name of the .mag container
`-gfx`	pawn.gfx	Location and name of the .gfx container
`-msdosdir`	/C/GAMES/PAWN	Location and name of the directory containing the MSDOS binaries.
`-tworsc`	wonder/TWO.RSC	Primary resource file for Magnetic Windows
`-d64`	/8/fish1.d64,/8/fish2.d64	Commodore 64 images (both sides)

	`pawn`
	`guild`
	`jinxter`
	`fish`
	`corruption`
	`myth`
	`wonderland`
		Read the location of the .mag and .gfx containers from the dMagnetic.ini file.

Graphic output		
`-vcols`	120	Maximum number of columns for the image
`-vrows`	40	Maximum number of rows for the image

`-vmode`	`none`
	`monochrome`
	`monochrome_inv`
	`low_ansi`
	`low_ansi2`
	`high_ansi`
	`high_ansi2`
	`sixel`
		Graphic output mode
		
		Inverted monochrome
		
		Different algorithm
		
		Special mode for the MS DOS images.
		Requires `xterm -ti vt340.`

`-sres`	1024x768	Resolution for the sixel mode
Text alignment		

`-valign`	`block`
	`left`
	`right`
		
		Currently broken

Logging		
`-vlog`	pawncmds.log	Write the commands into a file
`-vecho`		Repeat the commands on the output console
Random events		
`-rmode`	`pseudo`	Deterministic random events
	`real`	Real random
`-rseed`	12345	Seed/salt for the random number generator
Others		
`--help`		Prints out the most important parameters
`--helpini`		Prints out an example of the .ini file.
`--version`		Prints out the version of `dMagnetic`.
`-ega`		Prefers the EGA images (Version 4 games).
`-bsd`		Prints out the license.

Appendix B

dMagnetic.ini file

Section `[FILES]` configures the location of the game binaries.		

`pawnmag`
`pawngfx`
`guildmag`
`guildgfx`
`jinxtermag`
`jinxtergfx`
`corruptionmag`
`corruptiongfx`
`fishmag`
`fishgfx`
`mythmag`
`mythgfx`
`wonderlandmag`
`wonderlandgfx`
	/usr/local/games/pawn.mag
	/usr/local/games/pawn.gfx
	/usr/local/games/guild.mag
	/usr/local/games/guild.gfx
	/usr/local/games/jinxter.mag
	/usr/local/games/jinxter.gfx
	/usr/local/games/ccorrupt.mag
	/usr/local/games/ccorrupt.gfx
	/usr/local/games/fish.mag
	/usr/local/games/fish.gfx
	/usr/local/games/myth.mag
	/usr/local/games/myth.gfx
	/usr/local/games/wonder.mag
	/usr/local/games/wonder.gfx
		Container format by (1).

`pawnmsdos`
`guildmsdos`
`jinxtermsdos`
`fishmsdos`
`mythmsdos`
`corruptionmsdos`
	/C/GAMES/PAWN
	/C/GAMES/GUILD
	/C/GAMES/JINXTER
	/C/GAMES/FISH
	/C/GAMES/MYTH
	/C/GAMES/CORRUPT
		Alternative:
		MS DOS binaries

`guildtworsc`
`corruptiontworsc`
`fishtworsc`
`wonderlandtworsc`
	/C/GAMES/MSC/GTWO.RSC
	/C/GAMES/MSC/CTWO.RSC
	/C/GAMES/MSC/FTWO.RSC
	/C/GAMES/WONDER/TWO.RSC
		Alternative:
		Resource files from the
		Magnetic Windows
		System

`pawnd64`
`guildd64`
`jinxterd64`
`corruptiond64`
`fishd64`
`mythd64`
	/d64/pawn1.d64,/d64/pawn2.d64
	/d64/guild1.d64,/d64/guild2.d64
	/d64/jinxter1.d64,/d64/jinxter2.d64
	/d64/corrupt1.d64,/d64/corrupt2.d64
	/d64/fish1.d64,/d64/fish2.d64
	/d64/myth.d64
		Alternative:
		Floppy images from
		the Commodore 64
		releases. This para-
		meter requires both sides.

Section [RANDOM] configures the random events		
mode	pseudo	Deterministic
	real	Real random
seed	12345	Seed/salt
Section [DEFAULTGUI] configures the output		
rows	40	Number of rows
columns	120	Number of columns
align	left	
	block	
	right	Currently broken
mode	none	
	monochrome	
	monochrome_inv	Inverted monochrome
	low_ansi	
	low_ansi2	Different algorithm
	high_ansi	May not work in very terminal
	high_ansi2	Mode for the MS DOS pictures
	sixel	Requires xterm -ti vt340
sixel_resolution	1024x768	Maximum resolution
low_ansi_characters	/\\IMS	Characters with which the
		Low ansi output is being rendered
monochrome_characters	.:-=*x$X	Characters with which the mono-
		chrome output is being rendered. It
		is aramp of increasing intensity:
		Left is dark, right is bright.
Special characters		
\		Escape sequence
;		Comment
\;		Escaped ; (Not a comment)
\\		Escaped \

B.1 Example

```
% dMagnetic --helpini
[FILES]
pawnmag=/usr/local/share/games/magneticscrolls/pawn.mag
pawngfx=/usr/local/share/games/magneticscrolls/pawn.gfx
;pawnmsdos=/usr/local/share/games/magneticscrolls/msdos/PAWN
;pawnd64=/d64/PAWN1.d64,/d64/PAWN2.d64
guildmag=/usr/local/share/games/magneticscrolls/guild.mag
guildgfx=/usr/local/share/games/magneticscrolls/guild.gfx
;guildmsdos=/usr/local/share/games/magneticscrolls/msdos/GUILD
;guildtworsc=/usr/local/share/games/magneticscrolls/MSC/GTWO.RSC
;guild64=/d64/GUILD1.d64,/d64/GUILD2.d64
jinxtermag=/usr/local/share/games/magneticscrolls/jinxter.mag
jinxtergfx=/usr/local/share/games/magneticscrolls/jinxter.gfx
;jinxtermsdos=/usr/local/share/games/magneticscrolls/msdos/JINXTER
;jinxterd64=/d64/JINXTER1.d64,/d64/JINXTER2.d64
corruptionmag=/usr/local/share/games/magneticscrolls/ccorrupt.mag
corruptiongfx=/usr/local/share/games/magneticscrolls/ccorrupt.gfx
;corruptionmsdos=/usr/local/share/games/magneticscrolls/msdos/CORRUPT
;corruptiontworsc=/usr/local/share/games/magneticscrolls/MSC/CTWO.RSC
;corruptiond64=/d64/CORRUPT1.d64,/d64/CORRUPT2.d64
fishmag=/usr/local/share/games/magneticscrolls/fish.mag
fishgfx=/usr/local/share/games/magneticscrolls/fish.gfx
;fishmsdos=/usr/local/share/games/magneticscrolls/msdos/FISH
;fishtworsc=/usr/local/share/games/magneticscrolls/MSC/FTWO.RSC
;fishd64=/d64/FISH1.d64,/d64/FISH2.d64
mythmag=/usr/local/share/games/magneticscrolls/myth.mag
mythgfx=/usr/local/share/games/magneticscrolls/myth.gfx
;mythmsdos=/usr/local/share/games/magneticscrolls/msdos/MYTH
;mythd64=/usr/local/share/games/magneticscrolls/MYTH.d64
wonderlandmag=/usr/local/share/games/magneticscrolls/wonder.mag
wonderlandgfx=/usr/local/share/games/magneticscrolls/wonder.gfx
;wonderlandtworsc=/usr/local/share/games/magneticscrolls/WONDER/TWO.RSC
[RANDOM]
mode=pseudo
;mode=real
seed=12345
[DEFAULTGUI]
rows=40
columns=120
;align=left
align=block
;align=right
;mode=none
;mode=monochrome
;mode=monochrome_inv
;mode=low_ansi
mode=low_ansi2
;mode=high_ansi
;mode=high_ansi2
;mode=sixel
low_ansi_characters=\\/|=0123456789abcdef
monochrome_characters= .-=+*x#@$X
sixel_resolution=800x600
;--------------------------------------------------------------------------------
```

Appendix C

Priorities

C.1 Location of .ini files

Highest priority: `-ini` parameter.
                  `˜/dMagnetic.ini` (Home directory)
                  `/etc/dMagnetic.ini`
                  `/usr/local/share/dMagnetic.ini`
                  `/usr/local/share/games/dMagnetic.ini`
                  `/usr/local/games/dMagnetic.ini`
                  `/usr/share/dMagnetic.ini`
                  `/usr/share/games/dMagnetic.ini`
                  `/usr/share/dMagnetic/dMagnetic.ini`
                  `/usr/games/dMagnetic.ini`
                  `/usr/games/dMagnetic/dMagnetic.ini`
                  `/usr/share/doc/dmagnetic/dMagnetic.ini`
                  `/usr/pkg/share/doc/dMagnetic/dMagnetic.ini`
Lowest priority: `./dMagnetic.ini` (current directory)

C.2 Configuration

Highest priority: Command line parameters.
Medium priority: Read from the ini file.
Lowest priority: Pre-compiled values

Appendix D

ANSI RGB values

Colours for the low ansi mode are being chosen from this palette

Black		#000000
Red		#AA0000
Green		#00AA00
Brown		#AA5500
Blue		#0000AA
Magenta		#AA00AA
Cyan		#00AAAA
Grey		#AAAAAA
Dark Grey		#555555
Bright red		#FF5555
Bright Green		#55FF55
Yellow		#FFFF55
Bright blue		#5555FF
Bright Magenta		#FF55FF
Bright Cyan		#55FFFF
White		#FFFFFF

Bibliography

(1) The magnetic scrolls memorial.
    https://msmemorial.if-legends.org/

(2) dMagnetic home.
    https://www.dettus.net/dMagnetic