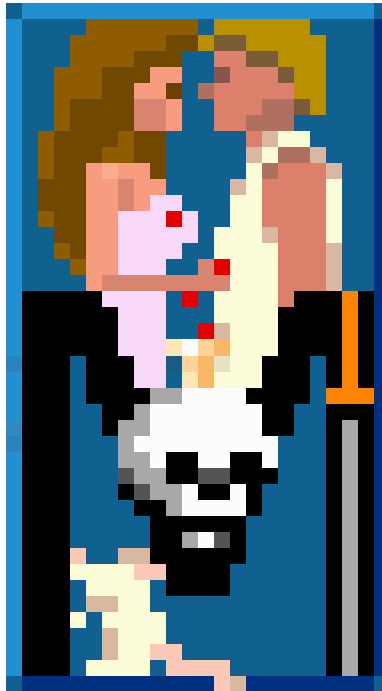


MININIM 0.9.1

The Advanced Prince of Persia Engine (a childhood dream)



Bruno Félix Rezende Ribeiro <oitofelix@gnu.org>

MININIM is the Advanced Prince of Persia Engine — a childhood dream, the free software engine for Jordan Mechner’s masterpiece, developed from scratch by Bruno Félix Rezende Ribeiro ([oitofelix](#)).

This manual is for MININIM version 0.9.1 (February 10, 2016).

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Preface

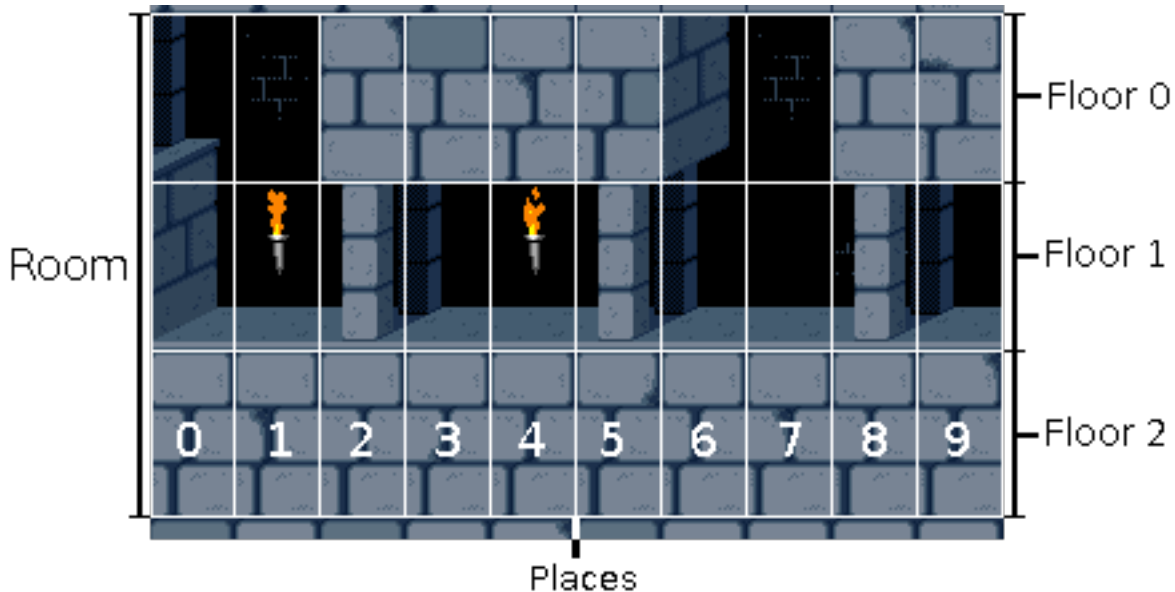
Menininho is the Brazilian Portuguese word for *male kid*, and *mininim* is how it's informally pronounced throughout the country. *Kid* is the term used by *Jordan Mechner*¹ when referring to the main character of his most famous game — **Prince of Persia** — in its source code and documentation, because the character's movements were derived from rotoscoping footage of Mechner's little brother. **MININIM** is the *Advanced Prince of Persia Engine*, written from scratch by computer programmer and free software activist *Bruno Félix Rezende Ribeiro* (*oitofelix*). Bruno had a childhood dream of deciphering the secrets of his favorite game that introduced him to computing — a dream dreamt when he was just a kid, a dream realized now that he's still a *mininim* deep in his heart.²

¹ Jordan Mechner (born June 4, 1964) is an American video game designer, author, screenwriter, and filmmaker, best known for creating the Prince of Persia video game franchise and the 8-bit computer game *Karateka*.

² Of course, none of this is reason enough to name a game engine “MININIM”, if not by the fact that it's a really cool palindrome!

1 Constructions

Each *level* is comprised of *rooms*¹. Each room is comprised of three *floors*. Each floor is comprised of 10 *places*. Each place holds a *construction* (or *con* for short).² The following figure illustrates this arrangement.



Therefore, any given construction is uniquely identified within a level by the coordinates of its place³, which are defined as the triplet *room*, *floor* and *place*: (r, f, p) .

Constructions are comprised of three elements: *foreground*, *background* and *extension*. A *construction foreground* is the physical part the kid interacts with. Physical properties determined by it are collision, hang and fall conditions, to name a few. On the other hand, a *construction background* is the part that yet visible, doesn't affect the kid in any way — its sole purpose is ornamental; torches and windows are examples of this. A *construction extension* is a modifier which tells how the con looks or behaves. For example, items and door opening states are both expressed by them. Any given construction can have only one extension. The valid extensions are:

- Item* This is a code indicating which item should be put on the construction. Used by FLOOR.
- Can't fall* This is a boolean indicating whether the construction should ignore fall conditions. Used by LOOSE_FLOOR.
- Event* This is an integer indicating which door event the construction triggers. Used by OPENER_FLOOR and CLOSER_FLOOR.

¹ The terminology used for *rooms* in the original game is *screens*.

² The terminology used for *constructions* in the original game is *tiles*.

³ The term *place* is used throughout the text to describe both the last coordinate of the triplet and the world space the triplet refers to. Also, often the term *place* is omitted and the text refers just to the construction itself, implying a reference to its place, as in “the left construction”, meaning “the construction one place to the left”. Hopefully, these shouldn't be a source of ambiguity.

<i>Step</i>	This is a integer indicating in which state, of a progressive set of configurations, a construction is in. Used by dynamic constructions that don't use other extension.
<i>Design</i>	This is a code indicating which alternative graphical design should be used to render the construction. Used by carpet constructions.

1.1 Non-directed relative positioning

In order to easily talk about the relations between constructions it's necessary to define the *non-directed relative positioning* of a given place to its adjacent ones. Consider the place C , which has the coordinates (r, f, p) , and its 8 adjacent places, as shown in the following figure.

TL	T	TR
L	C	R
BL	B	BR

TL (top left) T (top) TR (top right) L (left) C (center)
R (right) BL (bottom left), B (bottom) BR (bottom right)

Then we define the following mapping between names and coordinates:

Name	Coordinates
TL	$(r, f - 1, p - 1)$
T	$(r, f - 1, p)$
TR	$(r, f - 1, p + 1)$
L	$(r, f, p - 1)$
C	(r, f, p)
R	$(r, f, p + 1)$
BL	$(r, f + 1, p - 1)$
B	$(r, f + 1, p)$
BR	$(r, f + 1, p + 1)$

1.2 Foregrounds

Construction foregrounds have physical properties that determine how they behave in certain events and also how the kid is affected by the interaction with them.

Strictly traversable

This property means that the construction can't support the kid vertically at its bottom, thus he falls immediately when trying to rest on it. Notice that cons having this property can't be *hangable*.

Traversable

This property means that the construction can't *indefinitely* support the kid vertically at its bottom, thus he *eventually* falls when trying to rest on it. Notice that *strictly traversable* is a particular case of this.

Collidable This property means that the construction prevents the kid from passing through it horizontally, thus he collides (often recoiling from the impact) when trying to do so.

Semi-collidable

This property means that the construction is *collidable* only under certain circumstances.

Hangable This property means that the kid can hang on the construction's bottom, in case there is an *strictly traversable* one at its side.

Depressible

This property means that the construction is sensible to pressure at its top, thus some reaction is triggered when the kid exerts such pressure.

Trap This property means that the construction might harm the kid.



Rigid This property means that the construction can't be smashed by a falling one, thus that which falls stops at the rigid con's top.

Dynamic This property means that the construction has a set of distinct states in which it can be in. Such states matter for how the construction looks and behaves.

It's possible that some of these properties may apply only under certain conditions of the construction and/or the kid.

1.2.1 Floors

Floors make the ground above constructions the kid stands on. All of them are *hangable*, except for NO_FLOOR.

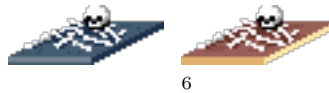
Code	Dungeon	Palace	Notes
NO_FLOOR ⁴			This is an empty space. This is <i>strictly traversable</i> and uses no extension.
FLOOR			This is a normal floor. This uses the <i>item</i> extension.

⁴ The *no floor* con is called *empty* in the original game.

BROKEN_FLOOR⁵

As soon as a falling LOOSE_FLOOR encounters a *rigid* construction, it disappears replacing the rigid con's top by a BROKEN_FLOOR. In contrast, if it encounters a *non-rigid* and *non-traversable* construction, it disappears replacing that very con by a BROKEN_FLOOR. Finally, if it encounters a *non-rigid* but *traversable* construction, it pass through, breaking over the con in case that is not *strictly traversable*. This uses no extension.

SKELETON_FLOOR



This behaves like FLOOR but uses no extension.

LOOSE_FLOOR⁷

This is rendered as FLOOR, but shakes as the kid hits the ground, by falling (from above), or vertically jumping (from below). If the kid hits near enough it's released and falls. It might harm the kid when falling over him. This is *traversable*, *depressible*, a *trap*, *dynamic* and uses the *can't fall* extension.

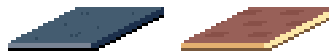
SPIKES_FLOOR



Spikes come out of it, killing the kid if he falls or steps too fast over it. This is a *trap*, *dynamic* and uses the *step* extension (ranging from 0 to 9). This gets activated as soon as the kid is in the same room and place column, and in the same or higher floor without a wall in between. Guards can activate this as well.

OPENER_FLOOR⁸

This opens one or more doors. This is *depressible*, *dynamic* and uses the *event* extension.

CLOSER_FLOOR⁹

This closes one or more doors. This is *depressible*, *dynamic* and uses the *event* extension.


⁵ The *broken floor* is called *debris* in the original game.

⁶ The original game has no palace version of the skeleton floor.

⁷ The *loose floor* is called *loose board* in the original game.

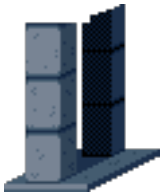

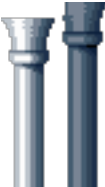

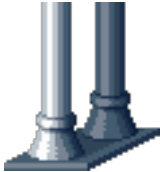
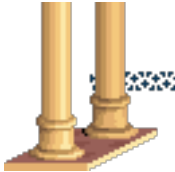


⁸ The *opener floor* is called *raise button* in the original game.

⁹ The *closer floor* is called *drop button* in the original game.

STUCK_FLOOR ¹⁰		This is rendered like a pressed CLOSER_FLOOR, but it can't be unpressed. This uses no extension.
HIDDEN_FLOOR ¹¹		This is rendered as NO_FLOOR, but as soon as the kid presses it, it's replaced by FLOOR. This is <i>depressible</i> and uses no extension.

1.2.2 Pillars



Pillars are aesthetic supports for the constructions on the floor above them. All of them are *hangable*, except for BIG_PILLAR_TOP. Pillars use no extension.

Code	Dungeon	Palace	Notes
PILLAR			This is <i>rigid</i> .
BIG_PILLAR_TOP			This should be placed above a BIG_PILLAR_BOTTOM. This is <i>strictly traversable</i> and <i>rigid</i> .
BIG_PILLAR_BOTTOM			This should be placed below a BIG_PILLAR_TOP.
ARCH_BOTTOM			This should be placed below an ARCH_TOP_MID.

¹⁰ The *stuck floor* is called *stuck button* in the original game.
¹¹ The original game doesn't have a HIDDEN_FLOOR construction by itself.

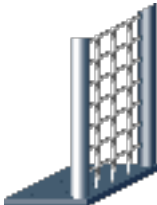
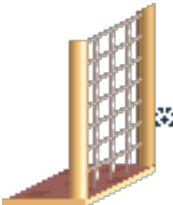
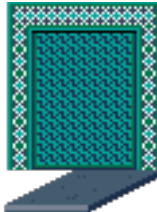
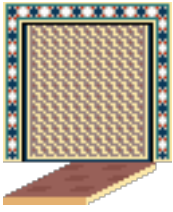
1.2.3 Wall

The *wall* is a solid constructs that separates sections of the level. It's *collidable*, *rigid* and uses no extension.

Code	Dungeon	Palace
WALL		

1.2.4 Doors

Doors are constructions that conditionally separate levels and in-level sections. Both door types are *hangable*, *dynamic* and use the *step* extension. The extension determines the door opening level, ranging from fully open (0) to fully closed.

Code	Dungeon	Palace	Notes
DOOR ¹²			This is <i>semi-collidable</i> at right, as the kid might pass or not through it depending on the difference of the grid tip height and kid's movement height. This is <i>rigid</i> and its <i>step</i> extension range from 0 to 47.
LEVEL_DOOR ¹³			Often the kid progress through levels entering these. This can only be entered when fully open. Its <i>step</i> extension range from 0 to 43.

1.2.5 Chopper

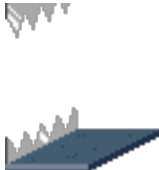
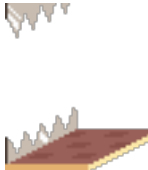
The *chopper*¹⁴ can leave the kid in half. It's a *trap*, *hangable at right*, *rigid* and *dynamic*. It uses the *step* extension which range from 0 to 4 and 128 to 132 (bloody counterpart).

¹² The *door* is called *gate* in the original game.

¹³ The *level door* is called simply *exit* in the original game. There it's divided into two constructions: *exit left* and *exit right*.



¹⁴ The *chopper* is called *chomper* in the original game.

It gets activated as soon as the kid is in the same room and floor and there is no wall in between. It doesn't get activated by guards, but can kill them as well. The chopper nullifies the *hangable at left* property of its top construction.

Code	Dungeon	Palace
CHOPPER		

1.2.6 Mirror

The *mirror* reflects the kid's image and prevents him from passing through, except if he is able to perform a running jump, whatever the side. It's *semi-collidable* at left, *hangable at right*, *rigid* and uses no extension. The mirror nullifies the *hangable at left* property of its top construction.

Code	Dungeon	Palace
MIRROR		

1.2.7 Carpets

*Carpets*¹⁵ are ornamental constructions often placed over DOOR cons. They come in two flavors: CARPET and TCARPET; the watershed difference being the *traversable* property, which the latter has but the former lacks. Both are *collidable* at right, *rigid* and make use of the *design* extension. The CARPET construction is also *hangable at left*. Also, carpets nullify the *hangable at left* property of their *right* and *top right* constructions.

Code	Dungeon	Palace	Notes
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¹⁵ Carpets are called *tapestry* in the original game.

TCARPET



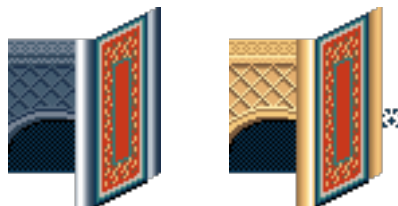
These graphics are drawn for the *design* CARPET_00.

TCARPET



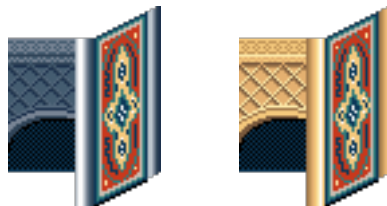
These graphics are drawn for the *design* CARPET_01.

TCARPET



These graphics are drawn for the *design* ARCH_CARPET_RIGHT_00. This is intended to end an arch. This should be placed at right of an ARCH_TOP_MID.

TCARPET



These graphics are drawn for the *design* ARCH_CARPET_RIGHT_01. This is intended to end an arch. This should be placed at right of an ARCH_TOP_MID.

TCARPET



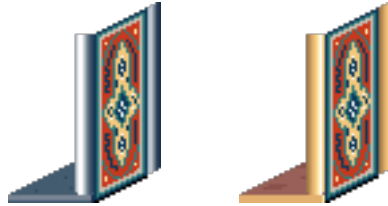
These graphics are drawn for the *design* ARCH_CARPET_LEFT. This is intended to end an arch. This should be placed two places to the left of an ARCH_TOP_MID.

CARPET



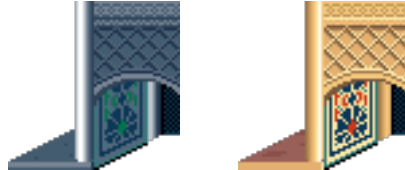
These graphics are drawn for the *design* CARPET_00.

CARPET



These graphics are drawn for the *design* CARPET_01.







CARPET



These graphics are drawn for the design ARCH_CARPET_LEFT. This is intended to end an arch. This should be placed two places to the left of an ARCH_TOP_MID.

1.2.8 Arches

*Arches*¹⁶ are ornamental constructions that can be indefinitely chained together to make a structure that spans several rooms across. They are *strictly traversable*, *rigid* and use no extension.

Code	Dungeon ¹⁷	Palace	Notes
ARCH_TOP_MID			This should be placed above an ARCH_BOTTOM and at left of an ARCH_TOP_LEFT, at right of an ARCH_TOP_RIGHT, or next to an ARCH_TOP_SMALL.
ARCH_TOP_SMALL			This should be placed in between two ARCH_TOP_MID.
ARCH_TOP_LEFT			This should be placed at left of an ARCH_TOP_RIGHT.

¹⁶ *Arches* are called *lattices* in the original game.

¹⁷ In the original game there is no dungeon version of arches.











ARCH_TOP_RIGHT



This should be placed at right of an ARCH_TOP_LEFT.

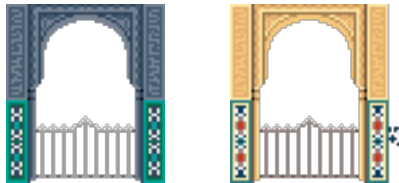
1.3 Backgrounds

Any combination of construction background and foreground is allowed, but be aware that some may simply not look right, or even not make a difference at all (like a torch behind a wall).

Code	Dungeon	Palace	Notes
NO_BRICKS			For the dungeon and palace this results in no graphics at all.
NO_BG			For the dungeon this results in no graphics. For the palace this results in the same graphics as BRICKS_02.
BRICKS_00			For the palace this results in no graphics.
BRICKS_01			For the palace this results in the same graphics as BRICKS_03
BRICKS_02			For the palace this results in the same graphics as NO_BG.
BRICKS_03			For the palace this results in the same graphics as BRICKS_01.
TORCH ¹⁸			

¹⁸ The fire sprites are mirrored horizontally depending on the level coordinates the torch has. This is not so in the original game.

WINDOW

BALCONY¹⁹

1.4 Items

The item extension is used only by **FLOOR**. Items are placed over the floor construction they belong to and animated. They can be caught by the kid by pressing the shift key.

Code	Graphics	Notes
NO_ITEM		This results in no graphics at all.
EMPTY_POTION		This potion has no bubbles and no effect.
SMALL_LIFE_POTION		This potion has red bubbles and recovers one life point.
BIG_LIFE_POTION		This potion has red bubbles, adds one life point container and recover all life points.
SMALL_POISON_POTION		This potion has blue bubbles and takes one life point. It has the same graphics as ACTIVATION_POTION .
BIG_POISON_POTION ²⁰		This potion has blue bubbles and takes all life point, effectively killing the kid.

¹⁹ The background stars are randomly positioned and animated. In the original game, all balconies have non-animated white stars in fixed positions.

²⁰ The big poison potion is not available in the original game.

FLOAT_POTION



This potion has green bubbles and allows the kid to levitate, effectively making long falls harmless.

FLIP_POTION



This potion has yellow bubbles and flips the screen horizontally, vertically or both, depending on its level coordinates.²¹ Drinking another one undo this effect.

ACTIVATION_POTION



This potion has the same graphics as `SMALL_POISON_POTION` and is used to activate a construction.²²

SWORD²³

This allows the kid to enter fight mode. The sword blinks from time to time.

²¹ In the original game, flip potions only invert the screen vertically and are drawn as `FLOAT_POTION`, that is, with green bubbles.

²² In the original game the *activation potion* is designed to be used in the potion level, a copy protection mechanism employed to stop people from sharing. **MININIM is free software**, and we repudiate this kind of measure. Thus here *activation potions* may be used to handicap the kid, but certainly won't be used to do so to you nor to your friends.

²³ The sword graphics is mirrored horizontally depending on its level coordinates. This is not so in the original game.

2 Movements

In his journey to save the princess, the kid has to endure several levels full of challenging traps and skilled opponents. Run, walk, turn, crouch, jump, hang, climb, take the sword, attack and defend are some of the kid's movements at your disposal to make the way to the princess tower. Although, this is a relatively large set of movements, basically all these are accomplished by some combination of the directional and shift keys, often conditioned to the current kid's state. This chapter explains in detail all possible movements of the kid.

There are six modes of movement: *normal*, *crouch*, *run*, *hang*, *fall* and *fight*. The mode the kid is in is the foremost element determining how the input is translated into kid's movements.

Notice that (whenever it makes sense) for any move, holding its triggering keys continues or repeats the movement.¹ Often, when transitioning from a movement to another that share some keys, you can keep the common keys pressed, as well as any other keys ignored by an intermediate movement, and the kid will just do the right thing. It's also worth noting that the kid responds to the input in real time, that is, in the next animation cycle.²

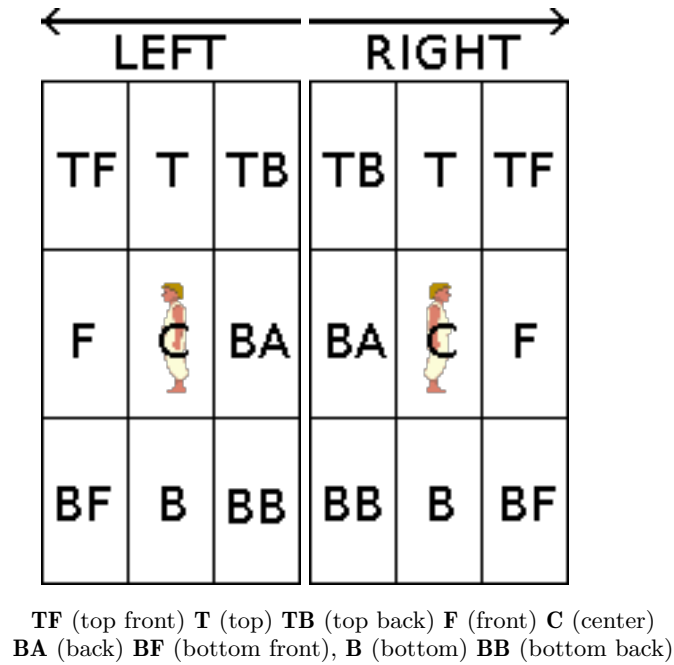
FRONT and *BACK* are meta-keys used to refer to *LEFT* and *RIGHT* conditionally subject to kid's facing direction. The *UP* and *DOWN* directional keys are simply referred as such.

¹ That's not so for the original game, in which for many situations you have to release and press the keys again to have the movement repeated.

² That's not so for the original game, in which the kid delays one cycle to respond.

2.1 Directed relative positioning

The concept of *directed relative positioning*, necessary to easily describe the relations between constructions and the kid is analogous to the already defined concept of *non-directed relative positioning*, used to describe relations between constructions. Consider the kid's place C , which has the coordinates (r, f, p) , its 8 adjacent places and the direction the kid is facing, as shown in the following two figures.



Then we define the following mapping between names and coordinates:

Left	Right	Coordinates
TF	TB	$(r, f - 1, p - 1)$
T	T	$(r, f - 1, p)$
TB	TF	$(r, f - 1, p + 1)$
F	BA	$(r, f, p - 1)$
C	C	(r, f, p)
BA	F	$(r, f, p + 1)$
BF	BB	$(r, f + 1, p - 1)$
B	B	$(r, f + 1, p)$
BB	BF	$(r, f + 1, p + 1)$

2.2 Hangable place

Quite a few movements might culminate in the kid hanging on a construction. In order to describe the conditions in which that may happen, it's necessary to define the concept of *hangable place*.

Hangable place: we say the kid's place is *hangable*, if (and only if) its top construction is *strictly traversable* and its top front one is *hangable* in the opposite direction.

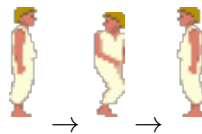
2.3 Normal

The movement mode at the beginning of each level is *normal*. While in it the kid is standing still.



2.3.1 Turn

If you press *BACK*, the kid turns and then faces the opposite direction likewise.

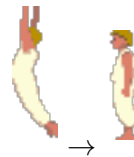


2.3.2 Vertical jump

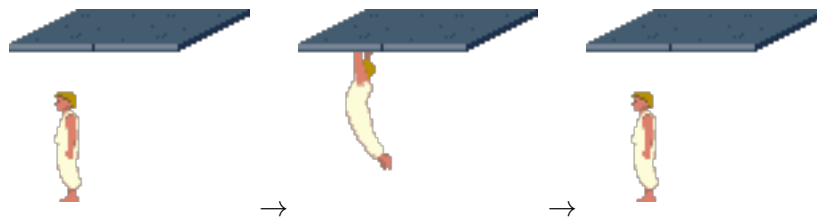
Pressing *UP*, makes the kid perform a vertical jump.



In case his *top construction* is *strictly traversable* but he isn't in a *hangable place*, he performs a long vertical jump and comes back to the **exact** same position he was before the jump.¹

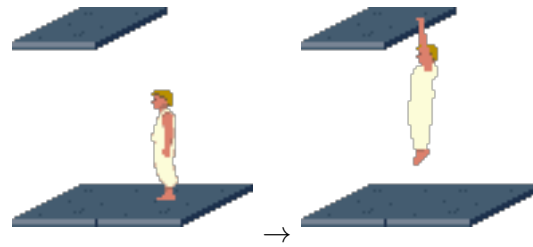


In case his *top construction* is not *strictly traversable* and his *back place* is not *hangable*, he performs a short vertical jump and then comes back to the exact same position he was before the jump.

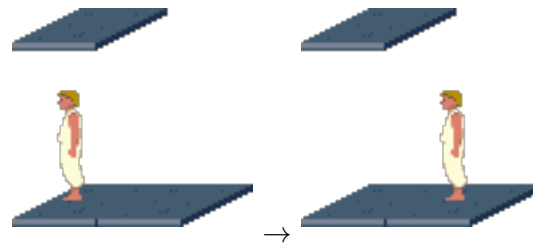


¹ This is not so in the original game, where he moves a little bit forward at each vertical jump.

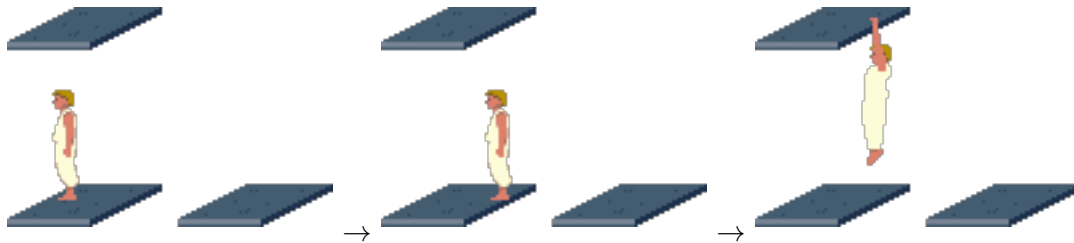
In case he's in a *hangable place*, he performs a long vertical jump (after coming close enough to the edge if he isn't already) and hangs for a brief period of time.



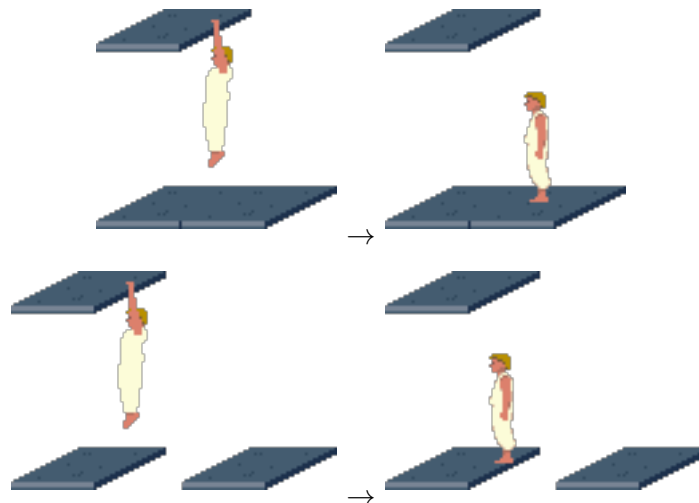
In case his *back place* is *hangable* and *non-strictly traversable*, he backs off so the situation fits the previous paragraph description.



In case his *back place* is *hangable* but *strictly traversable*, he backs off just enough, without entering the *strictly traversable* place, to perform a very vertical jump, and then hangs as described.

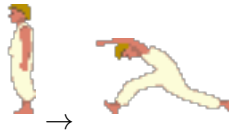


If holding *SHIFT*, the kid enters *hang mode*, otherwise he just drops back to the ground.

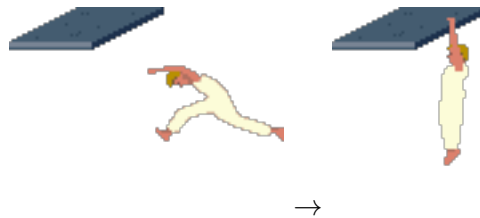


2.3.3 Normal jump

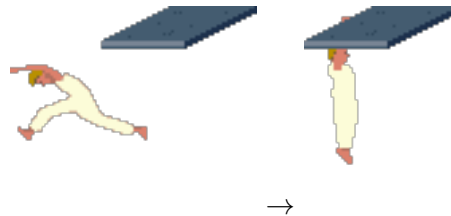
Pressing *UP* and *FRONT* at once makes the kid jump forward. He can jump over (up to) two *places* across without falling.



In midair, if he's in a *hangable place*, holding *SHIFT* and pressing *FRONT* makes him hang on the construction and enter *hang mode*.²

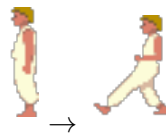


If he's in a *hangable place* for the opposite direction, holding *SHIFT* and pressing *BACK* makes him turn in midair, hang on the construction and enter *hang mode*.³

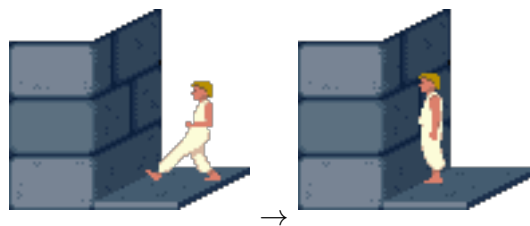


2.3.4 Walk

Pressing *FRONT* while holding *SHIFT*, makes the kid walk carefully.

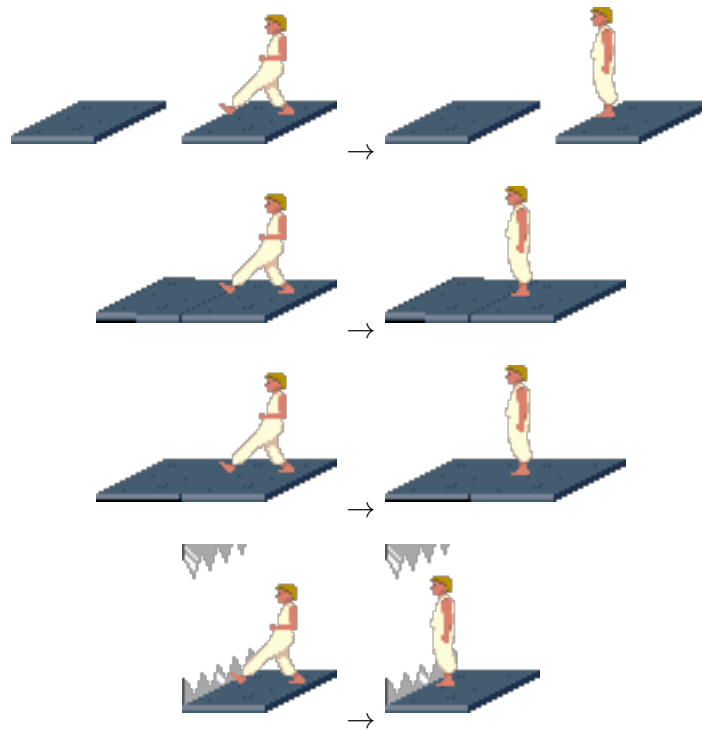


He always safely stops before a collision, fall, loose floor, closer floor and chopper blade.

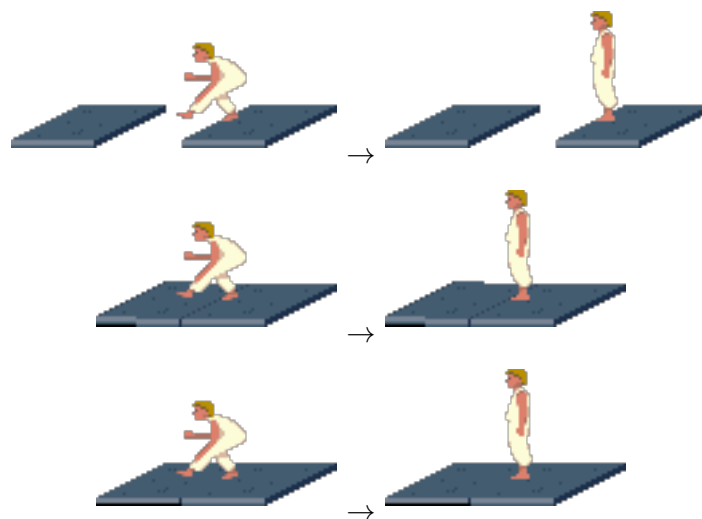


² The original game has no such movement.

³ The original game has no such movement.



If the kid is just before a *traversable* construction or a closer floor⁴, he misstep and gets back to his original position, as a warning of the eminent danger.

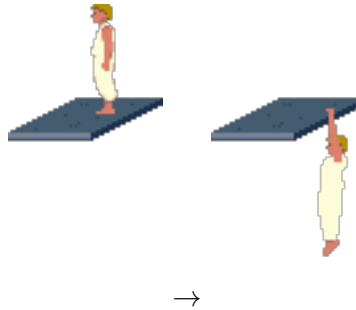


If you insist, he'll obey and suffer the consequences — so, be careful!

2.3.5 Descend

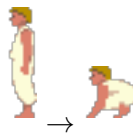
If you press *DOWN* and the kid's *bottom back place* is *hangable* and he's near enough to it, he descends, then hangs briefly — entering *hang mode* if *SHIFT* is kept pressed, or dropping off otherwise.

⁴ The kid doesn't misstep for a closer floor in the original game.

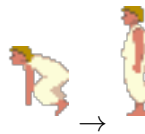


2.4 Crouch

If you press *DOWN* and the kid's *bottom back place* is *non-hangable*, or the kid is not near enough to it, he crouches.

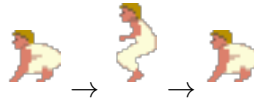


The kid stays crouched as long as you keep *DOWN* pressed. Releasing it makes him stand up again.



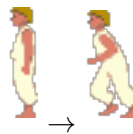
2.4.1 Crouching jump

If you press *FRONT* without releasing *DOWN*, the kid performs little crouching jumps forward.

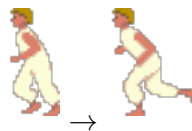


2.5 Run

Pressing *FRONT*, makes the kid start to run.⁵

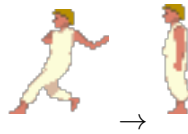


He runs as long as you keep *FRONT* pressed.



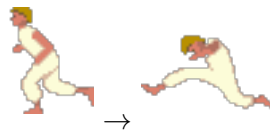
⁵ Unless he is facing a *collidable* construction with at most one place of distance, in which case he performs a *walk*. Notice that in the original game the threshold is lower.

Releasing it makes him stop, and go back to the normal stage.



2.5.1 Running jump

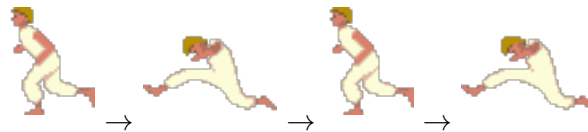
In case you press *UP* while running, the kid performs a running jump. The running jump has a reach greater than the *normal jump*. The kid can jump over (up to) three *places* across without falling.



When the kid lands on ground, he continues to run if you keep *FRONT* pressed.



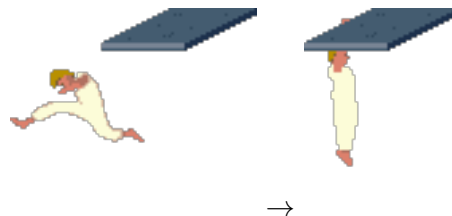
This implies that, if you keep both keys pressed the movement repeats indefinitely.



In midair, if he's in a *hangable place*, holding *SHIFT* and pressing *FRONT* makes him hang on the construction and enter *hang mode*.⁶



If he's in a *hangable place* for the opposite direction, holding *SHIFT* and pressing *BACK* makes him turn in midair, hang on the construction and enter *hang mode*.⁷

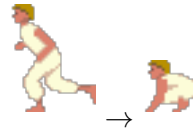


⁶ The original game has no such movement.

⁷ The original game has no such movement.

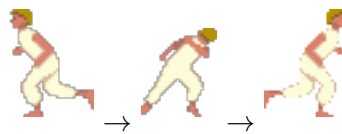
2.5.2 Running crouch

If you press *DOWN* while running, he crouches, slipping with some momentum, and then he enters *crouch mode*.



2.5.3 Running turn

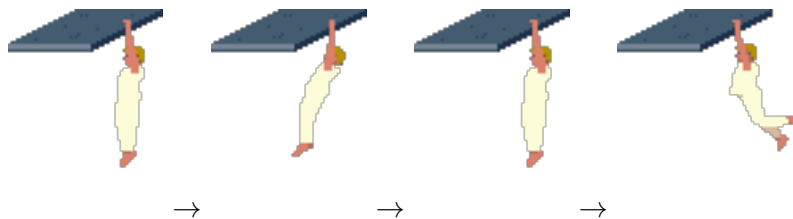
If you press *BACK* while running, the kid turns without stopping and continues to run in the opposite direction if you keep it pressed.



2.6 Hang

There are two modes of hanging: *free* and *non-free*. The kid *hangs free* when his *front construction* is not collidable in the direction of hanging. Otherwise he *hangs non-free*.

While *hanging free* the kid swings back and forth like a pendulum.



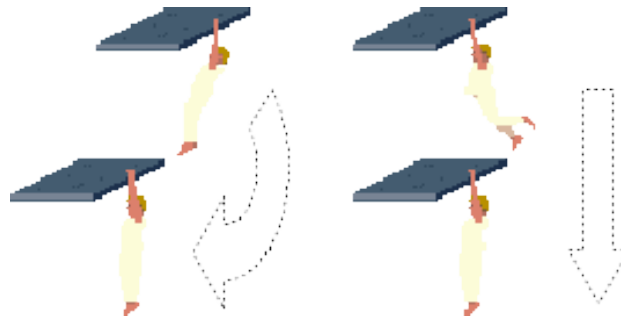
By contrast, when *hanging non-free* the kid keeps himself static.



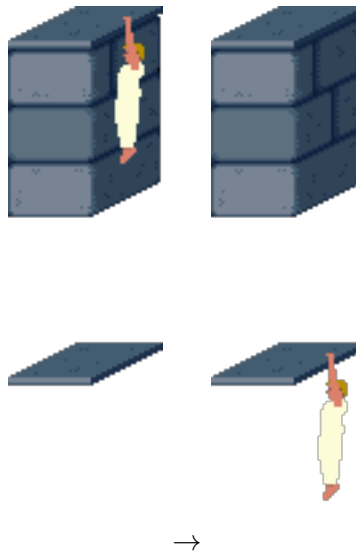
2.6.1 Hanging fall

When *hanging free*, there is a limit for how much time the kid can support his own weight, after which he drops from the construction. Releasing *SHIFT* in the meantime has the same effect. The kid will fall either aligned with the *hangable place's column* or with the *hangable place's front column*, depending upon which his feet are in when he leaves the hanged construction.⁸

⁸ It's not possible to perform such movements in the original game, because there the kid always falls over a *non-strictly traversable* construction, in case there is one.

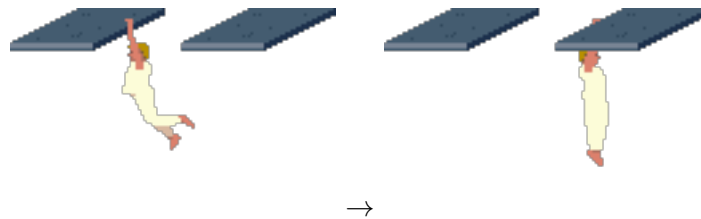


The kid can sustain himself indefinitely when *hanging non-free*, thus the only way to make him drop is by releasing *SHIFT*. As one would expect, the kid always falls aligned to the *hangable place's* column.



2.6.2 Hanging turn

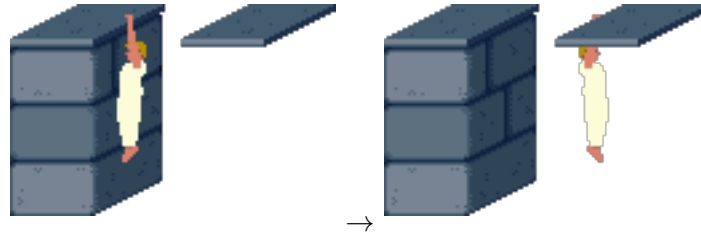
When the kid is *hanging free* in a place that is *hangable* in both directions and his feet are in the *hangable place*, pressing *BACK* while holding *SHIFT*, makes him turn in midair and hang on the con at his back.⁹



Naturally, if *hanging non-free* in a place that is *hangable* in both directions, there is no need to observe the kid's body inclination, just pressing *BACK*, will do the job (granted *SHIFT* is kept pressed).¹⁰

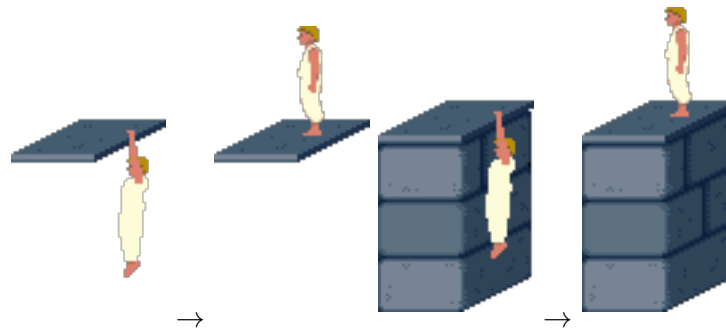
⁹ This movement is not present in the original game.

¹⁰ This movement is not present in the original game.



2.6.3 Climb

Pressing *UP* while hanging makes the kid climb the construction for both modes.



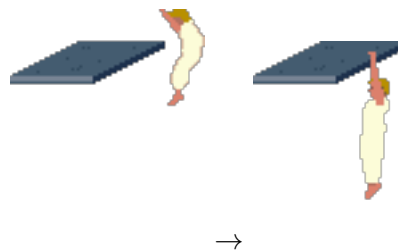
2.7 Fall

This mode is not really related to a key combination, but instead to a circumstance: the kid trying to support his own weight on an *strictly traversable* construction. When this happens he accelerates downwards (eventually reaching terminal velocity), until he encounters a *non-strictly traversable* construction or hangs at a *hangable place* which might appear in his way down.

If the kid hits a *non-traversable* construction with sufficient speed, he is harmed or can even die. Falling from a height of one floor inflicts no damage on him. Two floors takes one life point. Three or more kills him instantly.

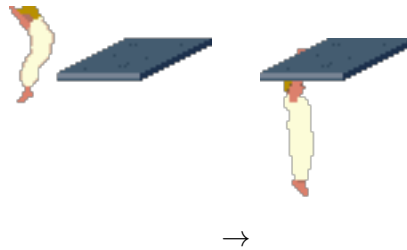
2.7.1 Falling hang

When falling if the kid is passing through a *hangable place* and his vertical velocity is low enough, and he's near enough to the *hangable construction*, he is able to hang there and enter *hang mode* if you hold *SHIFT* down.



2.7.2 Falling turn

If instead the place is *hangable* at the opposite direction, holding *SHIFT* and pressing *BACK* makes the kid turn in mid air, hang there and enter *hang mode*.¹¹



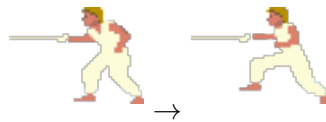
2.8 Fight

If the kid has got the sword, *RETURN* takes the sword and puts him in *fight mode*.¹²



2.8.1 Fight walk forward

Pressing *FRONT*, makes the kid walk forward.



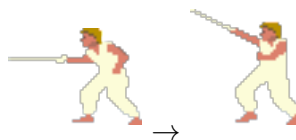
2.8.2 Fight walk backward

If you press *BACK*, the kid goes backward.



2.8.3 Defense

If you press *UP*, the kid makes the defense movement.

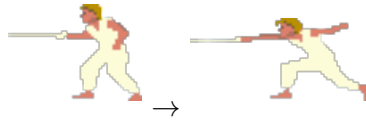


2.8.4 Attack

Pressing *SHIFT* makes the kid attack.

¹¹ This movement is not available in the original game.

¹² In the original game, the kid enters fight mode automatically in the eminence of an enemy threat.



2.8.5 Counter attack and counter defense

Holding *SHIFT* and *UP* puts the kid in counter attack and counter defense mode. At first, there is no immediate noticeable difference from standing still in fight mode, but as an enemy attacks¹³, the kid defends for certain. Then, depending upon probability whose likelihood is given by the KCA (Kid's Counter Attack skill), he may counter attack.

If he does, depending on the enemy's skills, they may counter defend and then counter attack. In that case, depending upon probability whose likelihood is given by the KCD (Kid's Counter Defense skill), the kid may counter defend and the process restarts at the kid's counter attack stage, making for a chain of counter attacks and counter defenses whose length is determined only by the fighters' skills (and a little bit of luck). Every counter attack that is not responded with a counter defense by the opponent, makes him lose a life point.

When standing still in this mode, releasing *UP* initiates an attack (but at the same time makes the kid briefly vulnerable to the enemy's attacks). In this case the same counter attack and counter defense chain logic described above is symmetrically applied.

Pressing *FRONT* and *BACK* (while holding *SHIFT* and *UP*) makes the kid walk forward and backward, respectively, without leaving this mode. However, although walking backward doesn't make him lower his guard, walking forward makes him vulnerable until he puts himself on guard again.

The kid's skills are built up by defeating enemies.¹⁴ The more advanced the defeated enemy's skills, the more the kid's skills improve. Both skills —KCA and KCD— are given by a number between 0 and 100, interpreted as percentages, indicating the likelihood of counter attacking and counter defending, respectively.

2.8.6 Keep sword

Finally you can make the kid keep his sword and return to *normal mode* by pressing *DOWN*.



¹³ In the original game the terminology for “attack” is “striking”, for “counter attack” is “re-striking after block”, for “defense” is “blocking strike” and for “counter defense” is “improper blocking”.

¹⁴ In the original game there is no such skills scheme. There, if you don't get tired of pressing *SHIFT* and *UP*, the kid's counter attack and counter defense are infallible.

3 Key bindings

The engine has several key bindings that control an wide range of settings and perform useful functions. Many key bindings work anytime, in the title screen, cut scenes and levels, while others work only in the latter. The key bindings are designed to mimic those of the original game when started with the option `megahit` (improved in latter revisions), however they can implement a super-set of the functions available there and MININIM implements quite a few more. Also, many key bindings have a configuration option counterpart. [Chapter 4 \[Configuration\]](#), page 30.

3.1 Game flow

<i>SHIFT+L</i>	Warp to next level. Related to option <code>--start-level</code> .
<i>CTRL+A</i>	Restart level.
<i>CTRL+R</i>	Restart the game.
<i>CTRL+Q</i>	Quit the game.

3.2 Graphical rendering

These key bindings modify how the engine graphically renders the game world objects.

<i>F10</i>	Select guard mode. This circulates around the modes: “ORIGINAL”, “GUARD”, “FAT GUARD”, “VIZIER”, “SKELETON” and “SHADOW”. The “ORIGINAL” mode gives level modules autonomy in this choice for each particular guard. This is the default. Related to option <code>--guard-mode</code> .
<i>F11</i>	Select environment mode. This circulates around the modes: “ORIGINAL”, “DUNGEON” and “PALACE”. The “ORIGINAL” value gives level modules autonomy in this choice for each particular level. This is the default. Related to option <code>--environment-mode</code> .
<i>F12</i>	Select video mode. This circulates around the modes: “VGA”, “EGA”, “CGA” and “HGC”. The default is VGA. Related to option <code>--video-mode</code> .
<i>SHIFT+B</i>	Toggle blind mode. In blind mode background and non-animated sprites are not drawn. The default is to draw everything. Related to option <code>--blind-mode</code> .

3.3 Life and death

<i>K</i>	Kill enemy. ¹
<i>R</i>	Resurrect kid.
<i>I</i>	Toggle immortal mode. In immortal mode the kid can’t be harmed. The default mode is mortal. Related to option <code>--immortal-mode</code> .
<i>SHIFT+S</i>	Increment kid’s current life points.
<i>SHIFT+T</i>	Increment kid’s total life points. Related to option <code>--total-lives</code> .

¹ This only works for the enemy currently associated with the kid. In the original game this works for the enemy in the room at view, as it can only handle one guard per room. There is no such limit in MININIM.

3.4 Kid special

These key bindings give or trigger special kid's abilities.

- A** Alternate between kid and its shadows. This is intended for level modules that make use of such feature. That's not the legacy module case.
- SHIFT+W** Float kid. This is equivalent to drinking a float potion.

3.5 Time

These key bindings allow you to control the remaining time available to end the game. They are related to options `--time-limit` and `--start-time`.

- SPACE** Display remaining time. Notice that the remaining time is displayed automatically when it reaches multiples of 5 minutes, and it's constantly shown when remains less than a minute to its end.
- +** Increment and display remaining time. If the remaining time is greater than 1 minute, increment remaining time by 1 minute, otherwise by 1 second.
- Decrement and display remaining time. If the remaining time is greater than 1 minute, decrement remaining time by 1 minute, otherwise by 1 second.

3.6 Skills

These key bindings allow you to set the kid skills. They are related to options `--kca` and `--kcd`.

- TAB** Display skills. If the kid is associated with an enemy, it shows both fighters' skills, otherwise it only shows the kid's.
- CTRL+=** Increment KCA skill.
- CTRL+-** Decrement KCA skill.
- ALT+=** Increment KCD skill.
- ALT+-** Decrement KCD skill.

3.7 Level navigation

These key bindings allow you to move the camera around the level, making it possible to view any room linked to the current one without having to move the kid there. Notice that if the kid enters the room the camera is on, it starts following him again. There is also a couple of key bindings intended to show room coordinates, which is useful when building levels.

- H** Move the camera to the room at left (right if the screen is flipped horizontally).
- J** Move the camera to the room at right (left if the screen is flipped horizontally).
- U** Move the camera to the room above (below if the screen is flipped vertically).
- N** Move the camera to the room below (above if the screen is flipped vertically).
- HOME** Move the camera back to the kid's room.
- C** Show direct coordinates.
- SHIFT+C** Show indirect coordinates.

3.8 Files

These key bindings are used to save and load configuration files. They open a platform-dependent file choosing dialog. Notice that save files are a particular case of configuration files and should be loaded the same way. When loaded in-game, configuration files take effect immediately, however some effects only become visible under certain conditions. For instance save files show their effect only on game (re)start.

CTRL+L Load configuration. Related to option `--load-config`.

CTRL+G Save game.

3.9 Peripherals

These key bindings allow you to tune hardware peripherals that work with the game.

F Toggle fullscreen mode. In fullscreen mode the window spans the entire screen. The default is to have a window of 640x400 resolution. Related to option `--fullscreen`.

SHIFT+I Select display flip mode. This circulates around the modes: “NONE”, “VERTICAL”, “HORIZONTAL” and “VERTICAL + HORIZONTAL”. The default is “NONE”. Related to option `--display-flip-mode`.

SHIFT+K Select keyboard flip mode. This circulates around the modes: “NONE”, “VERTICAL”, “HORIZONTAL” and “VERTICAL + HORIZONTAL”. The default is “NONE”. Related to option `--keyboard-flip-mode`.

CTRL+S Toggle sound. The default is to have sound enabled. Related to option `--sound`.

3.10 Miscellaneous

These are key bindings that don't fit in any other category.

CTRL+V Show engine name and version. Related to option `--version`.

4 Configuration

MININIM can be easily setup to match user's preferences regarding the way the game looks and behaves. It features an integrated configuration system which offers three distinct interfaces: *command line options*, *environment variables* and *configuration files*.

The configuration system uses the command line options parser as the central interpreter for the configuration process. Providing a single options parsing routine allows for easy maintenance, equivalence between methods and a canonical interface for integrating future methods.

For that end, each configuration option backend implements a translator between its specifics of option representation and access, to a normal command line array. Then the resulting options are roughly processed as if they were given at the engine invocation command line.

As the options are the same for all three current methods of configuration, and all of them are in essence processed as command line options, it's unnecessary to describe all options for each separately. Therefore, we provide systematic rules for converting between method option names and their command line equivalents, and then describe only the latter.

The rule for option naming conversion is very simple: for every command line option of the form `x-y` there is an equivalent environment variable option `MININIM_X_Y` and an equivalent configuration file option `'x y'`.

The multiple methods of configuration are cumulative but command line options override any other, while environment variables override the main configuration file. In any method applicable later options override earlier ones. The option `--print-paths` shows, among other things, the expected file name of the main configuration file. Configuration files have INI format without any sections, like this:

```
option 0 = value 0
...
option n = value n
```

Notice that many options can be changed on the fly by key binding counterparts. See [Chapter 3 \[Key bindings\], page 27](#).

The following remarks apply to the options list in this chapter:

- Long option names are case sensitive.
- Option values are case insensitive.
- Both can be partially specified as long as they are kept unambiguous.
- *boolean* is an integer equating to '0', or any sub-string (including the null string) of 'FALSE', 'OFF' or 'NO' to disable the respective feature, and any other value (even no string at all) to enable it.
- For any non-specified option the documented default applies.
- Integers can be specified in any of the formats defined by the C language.
- Key bindings references are based on the default mapping.

4.1 Configuration options

`--ignore-environment`

Ignore environment variables. The default is to parse them after the main configuration file.

`--ignore-main-config`

Ignore main configuration file. The default is to parse it at the very beginning of each run.

`--load-config=FILE`

Load configuration file *file*. The options set in *file* have the same precedence as the equivalent command line options given at its place of occurrence. This can be done in-game by the **CTRL+L** key binding.

4.2 Level options

`--level-module=LEVEL-MODULE`

Select level module. A level module determines a way to generate consecutive levels for use by the engine. Valid values for *level-module* are: ‘LEGACY’ and ‘CONSISTENCY’. ‘LEGACY’ is the module designed to read the original unarchived PoP (Prince of Persia) 1 DOS level files. ‘CONSISTENCY’ is the module designed to generate random-corrected levels for accessing the engine robustness. The default is ‘LEGACY’.

`--start-level=N`

Make the kid start at level *n*. The default is ‘1’. Valid integers range from ‘1’ to INT_MAX. This can be changed in-game by the **SHIFT+L** key binding.

4.3 Time options

`--start-time=N`

Set the play time counter to *n* seconds. The default is ‘0’. Valid integers range from ‘0’ to INT_MAX.

`--time-limit=N`

Set the time limit to complete the game to *n* seconds. The default is ‘3600’ (1 hour). Valid integers range from ‘1’ to INT_MAX. This can be changed in-game by the **+** and **-** key bindings.

4.4 Skills options

`--immortal-mode[=BOOLEAN]`

Enable/disable immortal mode. In immortal mode the kid can’t be harmed. The default is ‘FALSE’. This can be changed in-game by the **I** key binding.

`--kca=N` Set kid’s counter attack skill to *n*. The default is ‘0’. Valid integers range from ‘0’ to ‘100’. This can be changed in-game by the **CTRL+=** and **CTRL+-** key bindings.

- `--kcd=N` Set kid's counter defense skill to *n*. The default is '0'. Valid integers range from '0' to '100'. This can be changed in-game by the *ALT+=* and *ALT+-* key bindings.
- `--total-lives=N` Make the kid start with *n* total lives. The default is '3'. Valid integers range from '1' to '10'. This can be changed in-game by the *SHIFT+T* key binding.

4.5 Rendering options

- `--blind-mode[=BOOLEAN]`
Enable/disable blind mode. In blind mode background and non-animated sprites are not drawn. The default is 'FALSE'. This can be changed in-game by the *SHIFT+B* key binding.
- `--display-flip-mode=DISPLAY-FLIP-MODE`
Select display flip mode. Valid values for *display-flip-mode* are: 'NONE', 'VERTICAL', 'HORIZONTAL' and 'VERTICAL-HORIZONTAL'. The default is 'NONE'. This can be changed in-game by the *SHIFT+I* key binding.
- `--environment-mode=ENVIRONMENT-MODE`
Select environment mode. Valid values for *environment-mode* are: 'ORIGINAL', 'DUNGEON' and 'PALACE'. The 'ORIGINAL' value gives level modules autonomy in this choice for each particular level. This is the default. This can be changed in-game by the *F11* key binding.
- `--guard-mode=GUARD-MODE`
Select guard mode. Valid values for *guard-mode* are: 'ORIGINAL', 'GUARD', 'FAT-GUARD', 'VIZIER', 'SKELETON' and 'SHADOW'. The 'ORIGINAL' value gives level modules autonomy in this choice for each particular guard. This is the default. This can be changed in-game by the *F10* key binding.
- `--mirror-mode[=BOOLEAN]`
Enable/disable mirror mode. In mirror mode the screen and the keyboard are flipped horizontally. This is equivalent of specifying both the options `--display-flip-mode=HORIZONTAL` and `--keyboard-flip-mode=HORIZONTAL`. The default is 'FALSE'. This can be changed in-game by the *SHIFT+I* and *SHIFT+K* key bindings for the display and keyboard, respectively.
- `--video-mode=VIDEO-MODE`
Select video mode. Valid values for *video-mode* are: 'VGA', 'EGA', 'CGA' and 'HGC'. The default is 'VGA'. This can be changed in-game by the *F12* key binding.

4.6 Window options

- `--fullscreen[=BOOLEAN]`
Enable/disable fullscreen mode. In fullscreen mode the window spans the entire screen. The default is 'FALSE'. This can be changed in-game by the *F* key binding.

`--window-dimensions=WxH`

Set window width and height to *w* and *h*, respectively. The default is '640x400'. The values *w* and *h* are strictly positive integers and must be separated by an 'x'.

`--window-position=X,Y`

Place the window at screen coordinates *x,y*. The default is to let this choice to the window manager. The values *x* and *y* are integers and must be separated by a comma.

4.7 Paths options

`--data-path=PATH`

Set data path to *path*. Normally, the data files are looked for in the current working directory, then in the user data directory, then in the resources directory, and finally in the system data directory. If this option is given, before looking there the data files are looked for in *path*.

`--print-paths`

Print paths and exit.

4.8 Other options

`--inhibit-screensaver[=BOOLEAN]`

Prevent the system screensaver from starting up. The default is 'FALSE'.

`--keyboard-flip-mode=KEYBOARD-FLIP-MODE`

Select keyboard flip mode. Valid values for *keyboard-flip-mode* are: 'NONE', 'VERTICAL', 'HORIZONTAL' and 'VERTICAL-HORIZONTAL'. The default is 'NONE'. This can be changed in-game by the *SHIFT+K* key binding.

`--skip-title[=BOOLEAN]`

Skip title screen. The default is 'FALSE'.

`--sound[=BOOLEAN]`

Enable/disable sound. The default is 'TRUE'. This can be changed in-game by the *CTRL+S* key binding.

4.9 Help options

`-?`

`--help` Print options list and exit

`--usage` Print a short usage message and exit

`-V`

`--version`

Print program name and version and exit

5 Software package

This chapter briefly discuss matters relevant to MININIM while a software package: build, installation, distribution and contribution are some of the covered topics. Bear in mind that instructions in this chapter are package-specific; for general and in-depth configuration, build and installation instructions refer to the `INSTALL` file present in the top-level directory of the source distribution. If you have checked out the source tree from the VCS repository see [Section 5.8 \[Hacking\]](#), page 36.

For more information about this program you can visit its home page at <https://oitofelix.freeshell.org/mininim/>. If you want to receive notifications about new releases of this program or important issues related to it, subscribe to its mailing list, as described in [Section 5.4 \[Contact\]](#), page 35, or subscribe to the package atom feed <https://forge.oitofelix.freeshell.org/news/atom.php?group=mininim>.

5.1 Description

MININIM is the Advanced Prince of Persia Engine — a childhood dream, the free software engine for Jordan Mechner’s masterpiece, developed from scratch by Bruno Félix Rezende Ribeiro ([oitofelix](#)).

MININIM aims to have detailed documentation on all matters concerning the original 1989 Prince of Persia world, ranging from its design concepts to the engine’s practical use and development.

5.2 Distribution

This program is *free software*; this means that everyone is free to use it and free to redistribute it under certain conditions. This program is not in the public domain; it is copyrighted and there are restrictions on its distribution, but these restrictions are designed to permit everything that a good cooperating citizen would want to do. What is not allowed is to try to prevent others from further sharing any version of this program that they might get from you. The precise conditions are found in the GNU [GPL](#) (General Public Licence). The program manual is covered by the GNU Free Documentation License ([Appendix A \[GNU FDL\]](#), page 41). This license is similar in spirit to the GNU General Public License, but is more suitable for documentation.

5.3 Getting a copy

One way to get a copy of this program is from someone else who has it. You need not ask for our permission to do so, or tell any one else; just copy it. You may also receive this program when you buy a computer. Computer manufacturers are free to distribute copies on the same terms that apply to everyone else. These terms require them to give you the full sources, including whatever changes they may have made, and to permit you to redistribute the program received from them under the usual terms of the GNU General Public License. In other words, the program must be free for you when you get it, not just free for the manufacturer.

If you have access to the Internet, you can get the latest distribution version of this program at <https://ftp.oitofelix.freeshell.org/gnu/mininim/>. Please,

use a mirror if possible; you will be automatically redirected to the nearest mirror at <http://ftpmirror.oitofelix.freeshell.org/mininim/>.

A VCS repository, where the development takes place, is also available. It maintains the full history of modifications of every single source file. You can checkout any given revision of any file or get a snapshot of the entire source tree in a particular desired state. Special build tools, as described in [Section 5.8 \[Hacking\], page 36](#), are required to build from those checkouts, though. Notably, to stay up to date with the latest developments in the source tree, you can anonymously checkout the repository with the following command:

```
git clone git://git.forge.oitofelix.freeshell.org/mininim.git
```

5.4 Contact

You can get in touch with other users and the developers of this program by subscribing to its mailing list. Anyone is welcome to join the list; to do so, visit [MININIM help and support mailing list web interface](#). To post a message to all the list members, send email to mininim@oitofelix.freeshell.org. To see the collection of prior postings to the list, visit [its archive](#). You can use this list for all discussion, including asking for help and bug reporting, although the preferred method for reporting bugs is sending a mail to bug-mininim@oitofelix.freeshell.org, the MININIM bug reporting mailing list. See [Section 5.5 \[Bug reporting\], page 35](#).

If you feel somewhat chatty, eager for a somewhat more instantaneous response from community, you can join us on our friendly IRC channel: `'irc://irc.freenode.net/mininim'`.

5.5 Bug reporting

If you came across some problem and need help you can contact the community as described in [Section 5.4 \[Contact\], page 35](#). If you think you found a bug, but is not quite sure about it, you can ask for support sending a mail to mininim@oitofelix.freeshell.org. We will revise your post, advise you and take the appropriate measures. If you are confident you have found a bug, you can submit a bug report directly to bug-mininim@oitofelix.freeshell.org. You can subscribe to this MININIM bug reporting mailing list at [its web interface](#). To see the collection of prior reported bugs, visit [its archive](#). Please, when reporting a bug include enough information for the maintainers to reproduce the problem. Generally speaking, that means:

- The contents of any input files necessary to reproduce the bug and command line invocations of the program(s) involved (crucial!).
- A description of the problem and any samples of the erroneous output.
- The version number of the program(s) involved (use `--version`).
- Hardware, operating system, and compiler versions (`uname -a`).
- Unusual options you gave to configure, if any (see `config.status`).
- Anything else that you think would be helpful.

5.6 Contributing

This program is a collaborative effort and we encourage contributions from anyone and everyone — your help is very much appreciated. You can help in many ways:

- Donate to developers in order to support their work. See [Section 5.7 \[Donating\]](#), [page 36](#).
- Write documentation.
- Help users in the mailing list and IRC channel.
- Find and report bugs. See [Section 5.5 \[Bug reporting\]](#), [page 35](#).
- Fix reported bugs.
- Implement new feature ideas.
- Write test cases.
- Check the documentation against the implementation.
- Translate the program strings to other languages.

You can join the development team to contribute code and documentation at the [development page](#). Patches are most welcome, but contributed code should follow the *GNU Coding Standards*. If it doesn't, we'll need to find someone to fix the code before we can use it. It is also necessary that the contributor be willing to assign their copyright to the FSF, since the developers plan to make it officially part of the GNU operating system and they want FSF to enforce the program's license. To get started hacking see [Section 5.8 \[Hacking\]](#), [page 36](#).

5.7 Donating

If you find this program useful, please **send a donation** to its developers to support their work. If you use this program at your workplace, please suggest that the company make a donation. We appreciate contributions of any size – donations enable us to spend more time working on this package, and help cover our infrastructure expenses.

If you'd like to make a donation of any value, please send it to the following Bitcoin address:

16atTwmYogSunTeaxEofjrBdLAdCn9EuCa

Since we aren't a tax-exempt organization, we can't offer you a tax deduction, but for all donations over 0.05 BTC, we'd be happy to recognize your contribution on the [donors page](#) and on DONORS file for the next release.

We are also happy to consider making particular improvements or changes, or giving specific technical assistance, in return for a substantial donation over 0.5 BTC. If you would like to discuss this possibility, write to me at oitofelix@gnu.org.

Another possibility is to pay a software maintenance fee. Again, write to me about this at oitofelix@gnu.org to discuss how much you want to pay and how much maintenance we can offer in return.

Thanks for your support!

5.8 Hacking

The development sources are available through VCS:

<https://forge.oitofelix.freeshell.org/git/?group=mininim>

If you are getting the sources from a VCS (or change `configure.ac`), you'll need to have Automake, Autoconf and Gettext installed to (re)build. You'll also need help2man. All of these programs are available from <https://ftp.oitofelix.freeshell.org/gnu/>.

After getting the VCS sources, and installing the tools above, you can run `./bootstrap && ./configure && make` to do a fresh build. After that first time, running `make` should suffice to rebuild the program with your changes. See file `INSTALL`.

When modifying the sources, or making a distribution, more is needed, as follows:

- This distribution also uses **Gnulib** to share common files, stored as a submodule in git.
- When updating gettext, besides the normal installation on the system, it is necessary to run `gettextize -f` in this hierarchy to update the `po/` infrastructure. After doing so, rerun `gnulib-tool --import` since otherwise older files will have been imported. See *Gnulib Manual*, for more information.

When committing changes to the repository always create an entry in the `doc/release/latest-news.texi` file for any user-visible changes or additions made. This file is intended to provide the latest release news for the `NEWS.texi` and `ANNOUNCEMENT.texi` files to avoid duplication of information and syncing work. After a release is made the news items should be moved to the `NEWS.texi` file and another news list should be built from scratch in the `ANNOUNCEMENT.texi` file.

5.9 MinGW

These are the steps to build using MinGW, in a machine running Microsoft Windows.

- Download and install git: <https://git-scm.com/download/win>.
- Clone the gnulib repository: `git clone git://git.savannah.gnu.org/gnulib.git` and add the gnulib root to your `PATH`.
- Download MinGW: <http://downloads.sourceforge.net/project/mingw/Installer/mingw-get-setup.exe>
- Install the packages: ‘mingw32-base’, ‘mingw32-gcc-g++’, ‘msys-base’, ‘mingw32-autoconf’, ‘mingw32-automake’.
- Rename the file `C:/MinGW/msys/1.0/etc/fstab.sample` to `fstab`.
- Download Allegro: <http://cdn.allegro.cc/file/library/allegro/5.0.10/allegro-5.0.10-mingw-4.7.0.zip> and extract its root folder’s contents to `C:\MinGW`.
- Run `msys`: `C:\MinGW\msys\1.0\msys.bat`
- Clone the repository: `git clone https://github.com/oitofelix/mininim.git`
- Build: `cd mininim && ./bootstrap && ./configure && make`
- Distribute the resulting binary `mininim.exe` along with the following dlls: `C:\MinGW\bin\libstdc++-6.dll` and `C:\MinGW\bin\libgcc_s_dw2-1.dll`.

6 Release

In this chapter one can find information that are specific to the current release or subject to change between releases. It presents the features this package acquired over time, problems that affect its overall usage and what possibly could happen to it by our wishes. Last but not least, people whose contribution for this package are noteworthy are acknowledged.

6.1 Announcement

MININIM is the Advanced Prince of Persia Engine — a childhood dream, the free software engine for Jordan Mechner’s masterpiece, developed from scratch by Bruno Félix Rezende Ribeiro ([oitofelix](#)).

MININIM aims to have detailed documentation on all matters concerning the original 1989 Prince of Persia world, ranging from its design concepts to the engine’s practical use and development.

News

- First release

Download

Here are the compressed sources and a GPG detached signature:

```
https://ftp.oitofelix.freeshell.org/gnu/mininim/mininim-0.9.1.tar.gz
https://ftp.oitofelix.freeshell.org/gnu/mininim/mininim-0.9.1.tar.gz.sig
```

Use a mirror for higher download bandwidth:

```
http://ftpmirror.oitofelix.freeshell.org/mininim/mininim-0.9.1.tar.gz
http://ftpmirror.oitofelix.freeshell.org/mininim/mininim-0.9.1.tar.gz.sig
```

Use a `.sig` file to verify that the corresponding file (without the `.sig` suffix) is intact. First, be sure to download both the `.sig` file and the corresponding tarball. Then, run a command like this:

```
gpg --verify mininim-0.9.1.tar.gz.sig
```

If that command fails because you don’t have the required public key, then run this command to import it:

```
gpg --recv-keys 0x28D618AF --keyserver hkps://keys.gnupg.net
```

and rerun the `gpg --verify` command.

This release is signed by *Bruno Félix Rezende Ribeiro*. His key fingerprint is 7CB1 208C 7336 56B7 5962 2500 27B9 C6FD 28D6 18AF.

This release was bootstrapped with the following tools:

- GNU Autoconf 2.69
- GNU Automake 1.14.1
- GNU Texinfo 5.2

Links

Homepage <https://oitofelix.freeshell.org/mininim/>

Atom feed <https://forge.oitofelix.freeshell.org/news/atom.php?group=mininim>

Help and support mailing list
mininim@oitofelix.freeshell.org

Bug reporting mailing list
bug-mininim@oitofelix.freeshell.org

IRC channel
<irc://irc.freenode.net/mininim>

Support Tracker
<https://forge.oitofelix.freeshell.org/support/?group=mininim>

Bug Tracker
<https://forge.oitofelix.freeshell.org/bugs/?group=mininim>

Development page
<https://forge.oitofelix.freeshell.org/projects/mininim/>

6.2 News

This document contains a list of user-visible changes worth mentioning. The changes are split and ordered by version in reverse chronological order. If you want to receive notifications about new releases of this program or important issues related to it, subscribe to the mailing list, as described in [Section 5.4 \[Contact\]](#), page 35, or subscribe to the package atom feed <https://forge.oitofelix.freeshell.org/news/atom.php?group=mininim>.

0.9.1

- First release

6.3 To do

This section contains a list of ideas and features which would be nice to see implemented some day. If you are ready to start working on any of these TODO items, we appreciate your help; please write to bug-mininim@oitofelix.freeshell.org so we can be aware that the problem is being addressed, and talk with you how to do it best. It is best to consult the latest version of this file in the program source code repository. See [Section 5.3 \[Getting a copy\]](#), page 34 and [Section 5.8 \[Hacking\]](#), page 36 for instruction on how to access it.

Since the developers of this program are willing to assign the copyright of this package to FSF, please be prepared to sign legal papers to transfer the copyright on your work to the FSF too. For more details on this and some more practical details about getting involved, see [Section 5.6 \[Contributing\]](#), page 35.

As well as the issues listed here, there are bug reports, which are effectively to-do that can use your help at the [bug tracker web interface](#). See [Section 5.5 \[Bug reporting\]](#), page 35 for more information.

Here are the major features we want to implement for futures versions of this package:

- Joystick support
- Native level format
- Level editor
- Level generator module
- Guile scripting
- Network play

6.4 Authors

This section contains a list of people that made sufficiently large contributions to development that they can be regarded as truly authors of the program. The names are listed in chronological order of contribution.

For contributions that does not matter for copyright purposes, e.g., minor or non-source code contributions, see [Section 6.5 \[Thanks\]](#), page 40. If you would appreciate your own name listed here, **please contribute!** See [Section 5.6 \[Contributing\]](#), page 35.

Bruno Félix Rezende Ribeiro (oitofelix) oitofelix@gnu.org

He is the original and only author so far.

6.5 Thanks

This section contains a list of people that reported problems, suggested improvements or submitted relatively small portions of actual code. The names are listed in chronological order of contribution.

For contributions that does matter for copyright purposes, e.g., major source code contributions, see [Section 6.4 \[Authors\]](#), page 40. If you would appreciate your own name listed here, **please contribute!** See [Section 5.6 \[Contributing\]](#), page 35.

—

6.6 Donors

This section contains a list of people that supported development by means of donation. This program would not be what it is today without the invaluable help of these people, to whom we would like to say:

THANK YOU VERY MUCH!

If you would appreciate your own name listed here, **please donate!** See [Section 5.7 \[Donating\]](#), page 36.

Name	Email	\$
—	—	—

Appendix A GNU FDL

Version 1.3, 3 November 2008

FSF (Free Software Foundation) (<http://fsf.org/>)
51 Franklin St., Floor 5
Boston, MA 02110-1335
USA

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Appendix B Linux and the GNU system

The original version of this essay was published as the file `etc/LINUX-GNU` in the GNU Emacs distribution.

This document is part of GNU philosophy, the GNU Project’s exhaustive collection of articles and essays about free software and related matters.

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The GNU project started in 1984 with the goal of developing a complete free Unix-like operating system: GNU. “Free” refers to freedom, not price; it means you are free to run, copy, distribute, study, change, and improve the software.

A Unix-like system consists of many different programs. We found some components already available as free software—for example, X Windows and \TeX . We obtained other components by helping to convince their developers to make them free—for example, the Berkeley network utilities. This left many missing components that we had to write in order to produce GNU—for example, GNU Emacs, the GNU C compiler, the GNU C library, Bash, and Ghostscript. The GNU system consists of all these components together.

The GNU project is not just about developing and distributing some useful free software. The heart of the GNU project is an idea: that software should be free, that software users should have freedom to participate in a community. To run your computer, you need an operating system; if it is not free, your freedom has been denied. To have freedom, you need a free operating system. We therefore set out to write one.

In the long run, though, we cannot expect to keep the free operating system free unless the users are aware of the freedom it gives them, and value that freedom. People who do not appreciate their freedom will not keep it long. If we want to make freedom last, we need to spread awareness of the freedoms they have in free software.

The GNU project’s method is that free software and the idea of users’ freedom support each other. We develop GNU software, and as people encounter GNU programs or the GNU system and start to use them, they also think about the GNU idea. The software shows that the idea can work in practice. Some of these people come to agree with the idea, and then they are more likely to write additional free software. Thus, the software embodies the idea, spreads the idea, and grows from the idea.

Early on in the development of GNU, various parts of it became popular even though users needed proprietary systems to run them on. Porting the system to many systems and maintaining them required a lot of work. After that work, most GNU software is easily configured for a variety of different platforms.

By 1991, we had found or written all of the essential major components of the system except the kernel, which we were writing.¹

That was the situation when Linux came into being. Linux is a kernel, like the kernel of Unix; it was written by Linus Torvalds, who released it under the GNU General Public

¹ This kernel consists of the Mach microkernel plus the GNU HURD. The first test release was made in 1996. Now, in 2002, it is running well, and Hurd-based GNU systems are starting to be used.

License. He did not write this kernel for GNU, but it fit into the gap in GNU. The combination of GNU and Linux included all the major essential components of a Unix-compatible operating system. Other people, with some work made the combination into a usable system. The principal use of Linux, the kernel, is as part of this combination.

The popularity of the GNU/Linux combination is success, in the sense of popularity, for GNU. Ironically, the popularity of GNU/Linux undermines our method of communicating the ideas of GNU to people who use GNU.

When GNU programs were only usable individually on top of another operating system, installing and using them meant knowing and appreciating these programs, and thus being aware of GNU, which led people to think about the philosophical base of GNU. Now users can install a unified operating system which is basically GNU, but they usually think these are “Linux systems”. At first impression, a “Linux system” sounds like something completely distinct from the “GNU system,” and that is what most users think.

This leads many users to identify themselves as a separate community of “Linux users”, distinct from the GNU user community. They use more than just some GNU programs, they use almost all of the GNU system, but they don’t think of themselves as GNU users. Often they never hear about the GNU idea; if they do, they may not think it relates to them.

Most introductions to the “Linux system” acknowledge that GNU software components play a role in it, but they don’t say that the system as a whole is a modified version of the GNU system that the GNU project has been developing and compiling since Linus Torvalds was in junior high school. They don’t say that the main reason this free operating exists is that the GNU Project worked persistently to achieve its goal of freedom.

As a result, most users don’t know these things. They believe that the “Linux system” was developed by Linus Torvalds “just for fun”, and that their freedom is a matter of good fortune rather than the dedicated pursuit of freedom. This creates a danger that they will leave the survival of free software to fortune as well.

Since human beings tend to correct their first impressions less than called for by additional information they learn later, these users will tend to continue to underestimate their connection to GNU even if they do learn the facts.

When we began trying to support the GNU/Linux system, we found this widespread misinformation led to a practical problem—it hampered cooperation on software maintenance. Normally when users change a GNU program to make it work better on a particular system, they send the change to the maintainer of that program; then they work with the maintainer, explaining the change, arguing for it, and sometimes rewriting it for the sake of the overall coherence and maintainability of the package, to get the patch installed. But people who thought of themselves as “Linux users” showed a tendency to release a forked “Linux-only” version of the GNU program and consider the job done. In some cases we had to redo their work in order to make GNU programs run as released in GNU/Linux systems.

How should the GNU project encourage its users to cooperate? How should we spread the idea that freedom for computer users is important?

We must continue to talk about the freedom to share and change software—and to teach other users to value these freedoms. If we value having a free operating system, it makes sense to think about preserving those freedoms for the long term. If we value having a

variety of free software, it makes sense to think about encouraging others to write free software, instead of proprietary software.

However, it is not enough just to talk about freedom; we must also make sure people know the reasons it is worth listening to what we say.

Long explanations such as our philosophical articles are one way of informing the public, but you may not want to spend so much time on the matter. The most effective way you can help with a small amount of work is simply by using the terms “Linux-based GNU system” or “GNU/Linux system”, instead of “Linux system,” when you write about or mention such a system. Seeing these terms will show many people the reason to pay attention to our philosophical articles.

The system as a whole is more GNU than Linux; the name “GNU/Linux” is fair. When you are choosing the name of a distribution or a user group, a name with “GNU/Linux” will reflect both roots of the combined system, and will bring users into connection with both—including the spirit of freedom and community that is the basis and purpose of GNU.

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