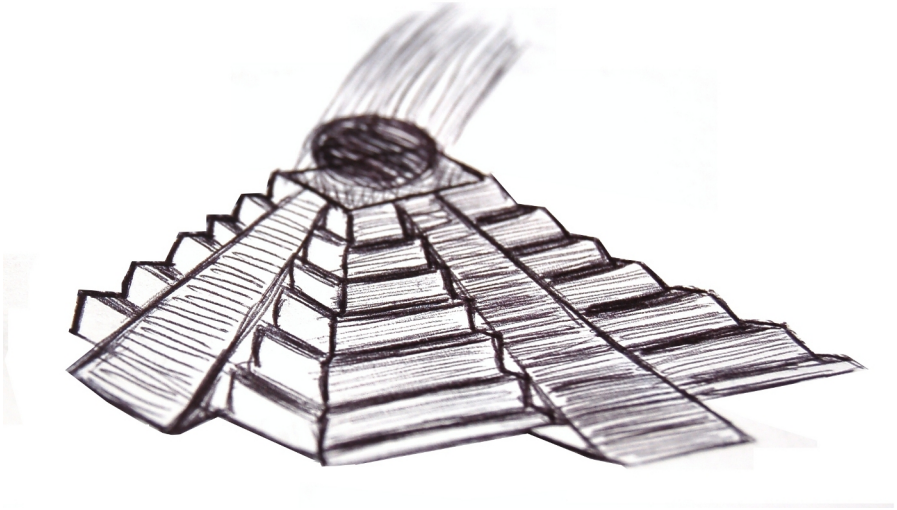

URO
Unidentified Rolling Objects

Stefan Wanger
Zygmunt Malecki
Francesco Andriani
Liana Manukyanl

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1 Game Story

Long long time ago, thousands years Before Christ, on the edge of our beautiful Earth where small but outstanding Maya people were living peacefully and happily, strange phenomena began to happen. The amount of messages about missing people increased over a short period of time and people started telling horror stories about Unidentified Rolling Object (URO) which were observed in a neighborhood. After a few months the whole area was abandoned by the natives.

The URO were actually transport devices of aliens, which came to earth in order to study the inhabitants. One of the tests included a multi-task evaluation of physical and mental properties of individual subjects. For this purpose an alien cought a human into an carefully prepared hunting ground.

2 Game Description

Game action is taking place in/on a Maya pyramids and/or in the surrounding area. The interior of the pyramids looks like catacombs, full of hidden traps and secret rooms. The outer is just a natural environment, with some hills, vegetation, typical Maya buildings, maybe lakes.

2.1 Players

Two players drive a Rolling Object(RO):

- one of the players takes the role of the Alien hunter and is trying to capture the native Maya;
- the second player controls the latter, and tries to escape form its pursuer.

2.2 Objectives

The game consists of one or more rounds, which lasts a predefined amount of time or until the Maya is captured. In the beginning of the game players may choose the duration of each round as well as number of overall rounds. In order to win one round, alien has to enclose the Maya in a sort of a small energy field. On the other side, the Maya has to evade any contact with the energy field as long as possible. Possibly, there will be a score system based on how the player behaves in the rounds (how much damage the RO has suffered, how many objects have been collected/used, how much damage is caused to the opponent, etc). After each round the roles of the two players are switched and the final winner is determined after all rounds have been played.

2.3 Round Rules

1. The Maya enters the arena in advance to have a privileges of escaping player.
2. Each player has limited amount of fuel, that allows RO to accelerate and spin themselves.
3. The engine of the RO can suffer only some amount of damage until it starts to break.
4. The hunter can produce a short range energy field to capture the Maya, but cannot accelerate at the same time.
5. The ROs have some built-in orientation systems, different for each player.
6. The ROs can gather and use Power Ups / Power Downs, which influence gameplay and can generate additional points.

2.4 Resources

Fuel:

The fuel is used for acceleration and this implies a heavy use of inertia and a careful arena design. If the RO runs out of fuel, it won't be able to accelerate. Fuel also is used to generate the energy shield. Players might be able to choose between different game strategies:

- with limited amount of fuel and fuel can not be picked up as power-up during the round
- with limited amount of fuel, but fuel resources can be filled up during the round
- with infinite amount of fuel

Engine / Damage Points:

The Engine has a certain amount of resistance, expressed by Damage Points, that is lowered by crashes and possibly by the shield generated by the hunting opponent. The state of the engine is coupled with the ability to control the RO, in a way that the influence of damage on vehicle control increases exponentially. The player might be able to customize his/her RO, by choosing RO's material. Heavier materials have higher resistance (more available Damage Points), but also they need more fuel to accelerate.

Energy Field:

The Alien can use some of its fuel to generate an Energy Field, with the purpose of capturing the Maya. If the alien builds up the field, he is not able to accelerate. The field can either:

- slow down both ROs
- steal/burn the fuel of the other RO
- damage the engine of the other player

Fig1 illustrates energy field concept

Orientation System:

Additional to the first-person view, each player has some small navigation help. The Alien has a short range Radar, that shows the relative position of the Maya, but no environmental details. The Maya, due to his knowledge of the environment, gets a detailed Minimap.

Power Ups / Power Downs:

Each power up/ power down can be applied to the player who has picked it up, or to his opponent. Below is a list of possible power ups/power downs:

- Cubify (turns the player or the opponent into a cube, modifying all the physical properties of the vehicle)
- Super Acceleration
- Invisibility
- Radar/Map (that is, each player can additionally use the same type of orientation aid of the opponent)
- Mines (placed on the field, causes damage to the vehicle if stepped on) - Fig2. illustrates mine blow up.
- Smoke Granade
- Rocket Jump (a long distance jump)

3 Development Schedule

3.1 Functional Minimal

- No game settings:
  - One round, which lasts hard-coded amount of time
  - One game strategy: Aliens win if the Maya is captured / the Maya wins if he avoids the capture
  - Infinite amount of fuel
  - One RO material
- Minimal amount of visual effects
- No sound
- No score

3.2 Low Target

- HUD for the Alien and the Maya
- Lighting/shading
- Limited handling of Rigid Bodies physics
- Background music
- Fuel management
- Some Power ups (cubify, invisibility)

3.3 Desired Target

- Full set of game settings
- More Power ups: Mines, Rocket Jumps, Smoke Granades
- More Visual Effects: es. particle systems, shadows.
- Complete and correct handling of RB physics, for calculation of damage, speed and jumps
- Visually enriched ROs and Arena(s)
- In-game sound effects (throttling, breaking, crashes, jumps, etc)

3.4 High Target

- AI for single-player game
- Fog/smoke rendering
- Trails of escaping RO in fog
- Water simulation for lakes/puddles

3.5 Extras

- Different types of characters for RO - for example humans
- Animation of characters (consequence of previous point)
- More insights into the whole story behind the game, and/or making the game evolve with the story
- Add different levels/arenas with peculiar features
- Multilayer many-to-many online game.

3.6 Task Assignment

#	Task	Estimate	Member	Description
1	Framework	20 hours	Stefan, Zygmunt	Basic framework + basic gamepad control
2	HUD for alien	10 hours	Stefan, Zygmunt	Screen setup (radar, score display, health/fuel display, power-up's panel)
3	HUD for Maya	10 hours	Stefan, Zygmunt	The same as for alien, but with map instead of radar
4	Energy field display	10 hours	Stefan, Zygmunt	Visualization of energy shield
5	Fuel concept	20 hours	Stefan, Zygmunt	Fuel acceleration + inertia concept
6	Camera control	20 hours	Stefan, Zygmunt	Advanced camera effects
7	Arena design	100 hours	Francesco	Map design, random height field
8	Basic Rigid bodies	50 hours	Liana	Basic rigid bodies physics and occlusion handling
9	Damage Handling	20 hours	Liana	Row estimation of damage, caused by occlusions
10	Shield effects	20 hours	Liana	Effects, caused by energy field: slow down, fuel burn, engine damage
11	Bugfixing	80 hours	All	Testing, bugfixing, improving, testing , ...

Table 1: Functional Minimum and Low Target

#	Task	Estimate	Member	Description
1	Team discussion	20 hours	All	Evaluating remaining work, refining rules, etc
2	Advanced game menus	20 hours	Stefan	Game setting menus, more visually pleasant menus
3	Rocket jump	20 hours	Stefan	Implementing one of the power-ups - blow-up and jump
4	Advanced physics	50 hours	Stefan	Physics improvements
5	Power-ups	20 hours	Zygmunt	Power-up interface, power-ups appearance design
6	Basic cubify	20 hours	Zygmunt	Implement one of the power-ups, turns sphere into cube, but without precise cube dynamics
7	RO materials	40 hours	Zygmunt	Add ability to change RO material, including modelling of fine texture
8	Arena refinements	40 hours	Francesco	More complex obstacles and richer landscape
9	Sound	40 hours	Francesco	Background sound + in-game sound effects
10	Minimaps	10 hours	Liana	Improvements to the map in Maya HUD
11	Power-ups	10 hours	Liana	Implementing several power-ups: invisibility, radar/map, etc
12	Physics improvements	20 hours	Liana	Work with Stefan on physics improvements
13	Lighting, Visual Effects	40 hours	Liana	Improving visual appearance of the environment
14	Bugfixing	80 hours	All	Testing, bugfixing, improving, testing , ...

Table 2: Desired Target

#	Task	Estimate	Member	Description
1	Team discussion	20 hours	All	Evaluating remaining work, refining rules, etc
2	AI	120 hours	Zygmunt	Artificial Intellect for single-player game
3	Mines	40 hours	Liana	Implementing mines blow-ups and effects
4	Advanced Visual Effects	80 hours	Liana	Improving visual appearance of the environment
5	Advanced cubify	60 hours	Francesco	Precise physics calculation
6	Advanced rigid bodies	60 hours	Francesco	Interaction with dynamic obstacles
7	Smoke granades	60 hours	Stefan	power-up with smoke rendering
8	Water effects	60 hours	Stefan	Water obstacles, which RO can cross
9	Bugfixing	open	All	Testing, bugfixing, improving, testing , ...

Table 3: High Target

4 Assessment

The main difficult part of the game would be making it fun - i.e. first of all creating the challenge.First of all, we would like to encourage a fast-paced, but not completely crazy gameplay. The fuel system will be engineered to invite the players push the throttle to obtain higher and higher speeds, while keeping an eye on the remaining resources and avoiding the destruction of the ROs against the arena walls. To make the game more enjoyable, we will have to carefully build a system of power ups: they will make the gameplay more varied, and, in our vision, should give the players the possibility of a more strategic play, developing simple but effective tactics.Secondly we'll concentrate on Visual Effects. Initially the main feature of the game was smoke simulation, and we really hope we will have time to implement this feature. In any case, the overall appearance of the ROs and the Arena (or Arenas) will be attended, as it influences the mood to the whole game. We will most probably employ heightmaps for the exterior areas and, if time permits, directly model and texture some interior scenes.The game also requires a solid physics engine; the behaviour of all the objects on the scene must be coherent, somehow physically reasonable but, most of all, fun-driven.At the end, this game will have a strong racing component, together with a platform attitude and, possibly, a certain tactical depth. Therefore, we suppose it would have a very broad audience, both in terms of age range and player preferences.

5 Drawings

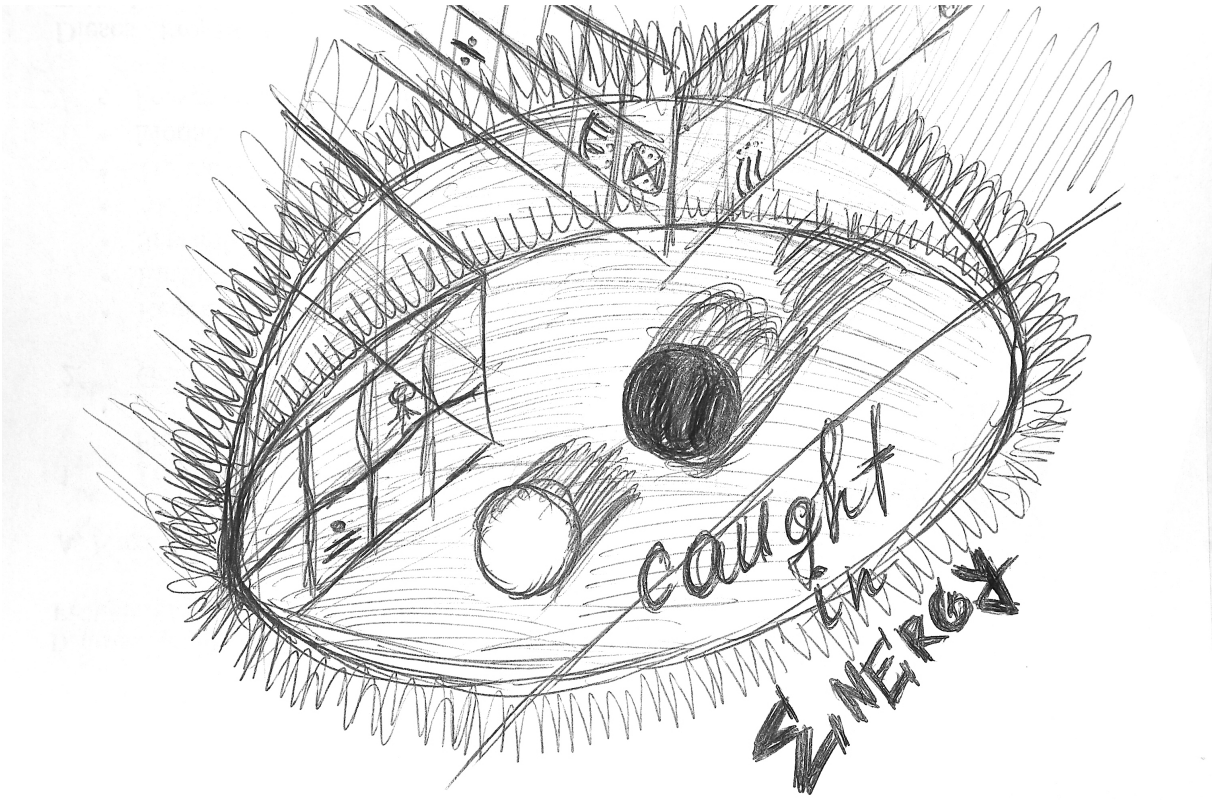

Figure 1: Energy Field

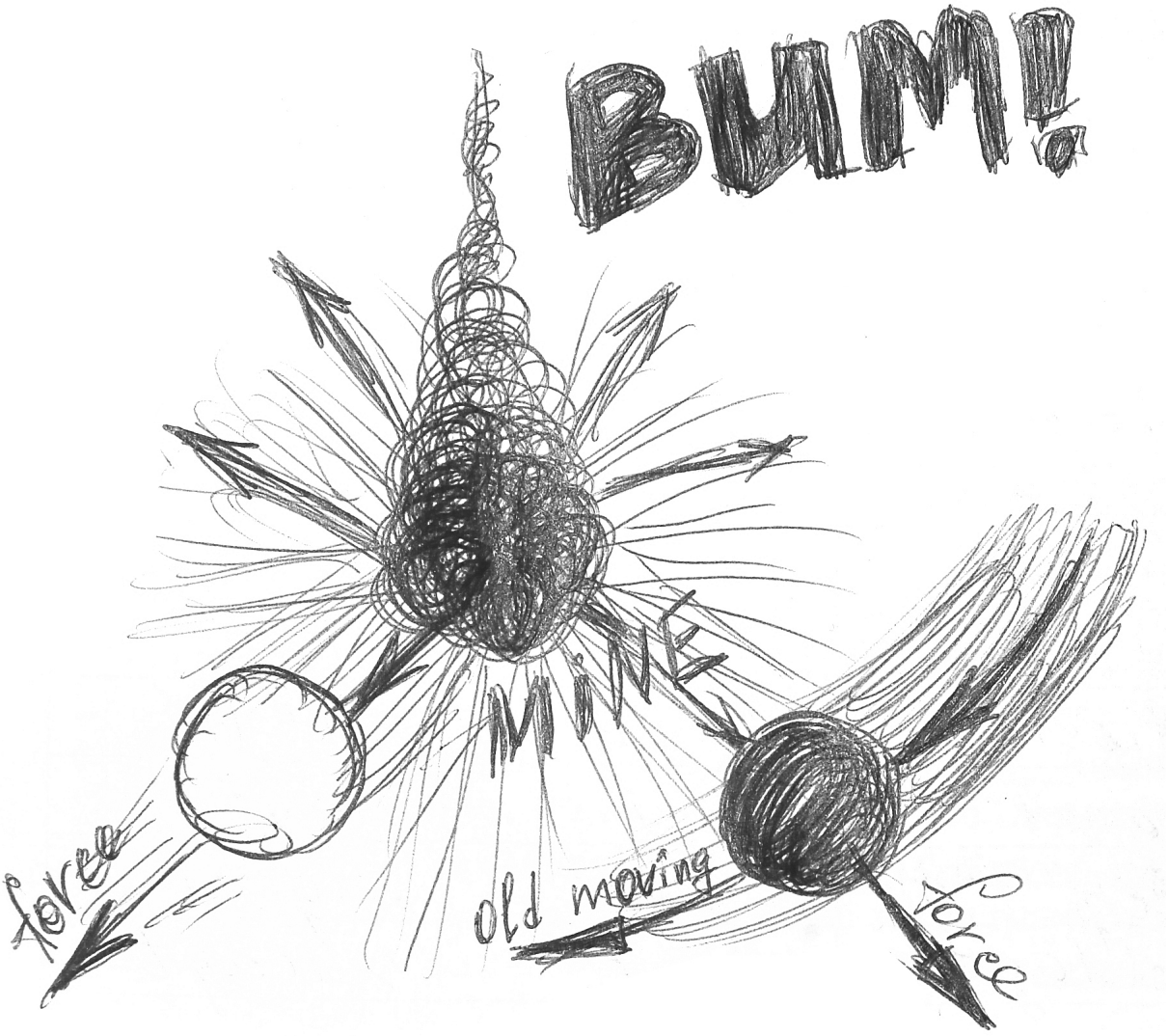

Figure 2: Mine Blow-up

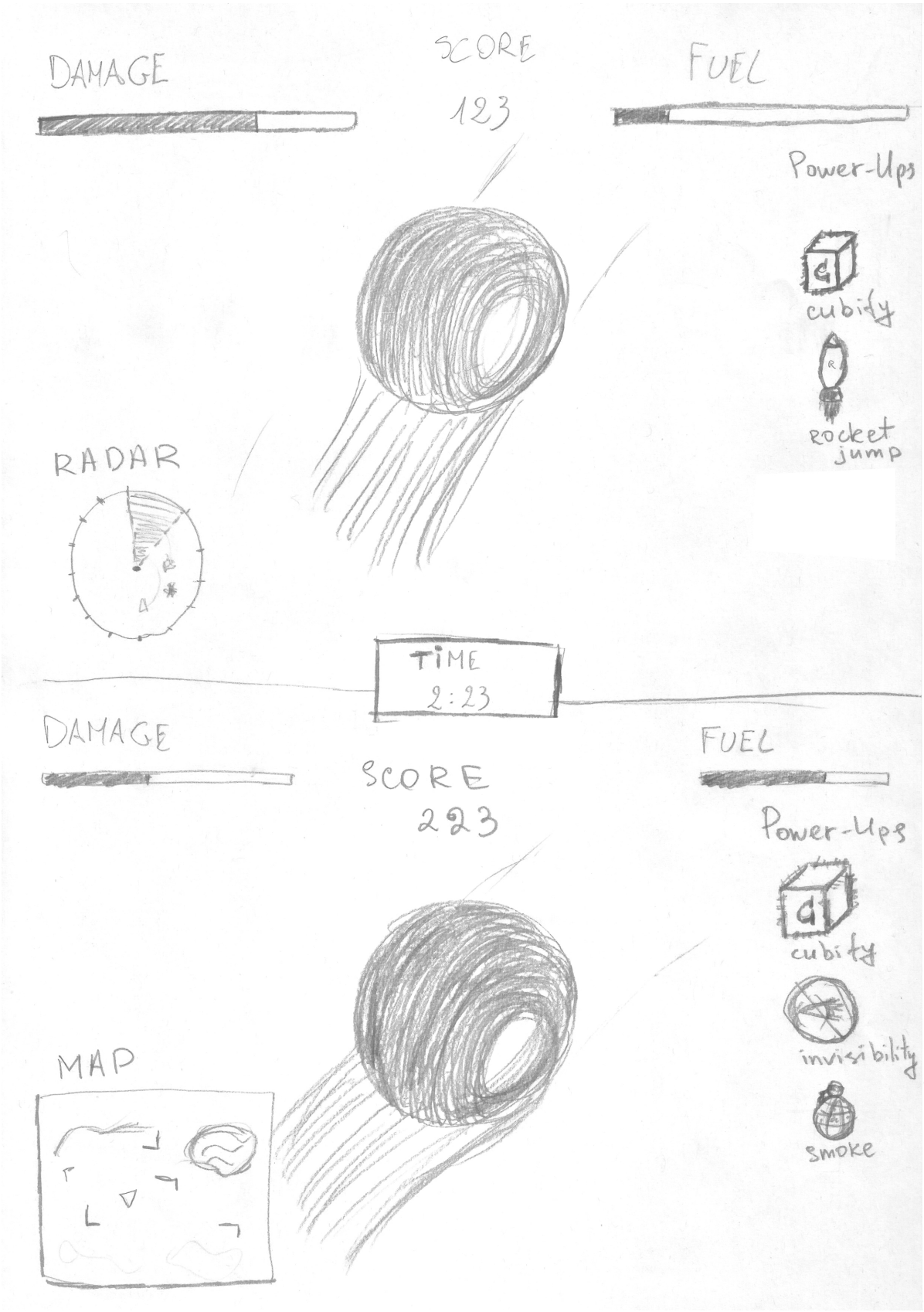

Figure 3: Screen layout