



KAKAMIGAHARA 2006

IDEA WATER ROCKET CONTEST



Overview

- ◆ Contest started in 1996 by YAC chapter in Kakamigahara near Gifu
- ◆ Contest held outside the Aerospace Museum
- ◆ Contest is for design/idea: no performance targeted
- ◆ One constraint: bottles must be filled using a manual pump
- ◆ 1 day contest:
 - installation and presentations in the morning
 - launchings in the afternoon
- ◆ Public event with a family atmosphere
- ◆ No limit of age although adults are encouraged to work with kids
- ◆ Jury members are from JAXA, CNES, YAC (and maybe more)
- ◆ Lots of prizes:
 - 1st=50'000 Yens, 2nd=30'000 Yens (330/ 200 Euros)
 - 1 grand prize, 2 encouragement prizes



Overview



Organization

- ♦ End of registration: begin of September
- ♦ Contest held in late October. Was on October 22nd in 2006
- ♦ No limit of age nor nationality
- ♦ 32 contestants for this 10th edition of the event
- ♦ About 15 people in the organization team
- ♦ Teams (most of them families) are staying under open tents
- ♦ They present their project to the public and the jury
- ♦ At 12:30 is the opening ceremony
- ♦ Groups of 6/7 projects are installed at the same time with a total of 4/5 series
- ♦ Time for preparation is 15 minutes
- ♦ A speaker interviews the teams before/after the launch.
- ♦ A recorded countdown with sounds from 50-60's Sci-Fi movies creates a dramatic (but funny) atmosphere.
- ♦ At 16:30 is the awards ceremony (almost every contestant receives a prize, offered by organizers and jury members)

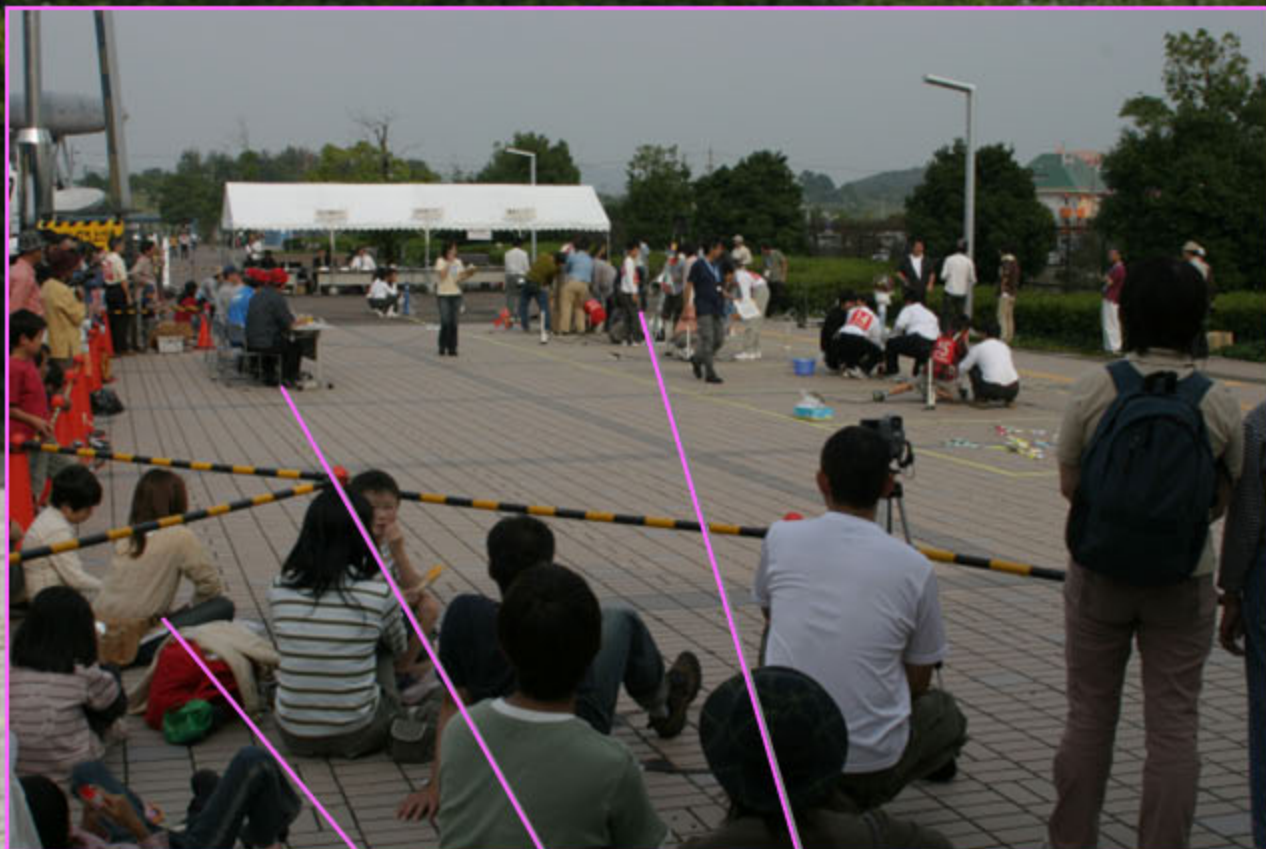
Organization



Safety

- ♦ Launch pads standard inclination $< 60^\circ$: no altitude performance to reach
 - Although several projects are launched at wider angle and even 90° for one
- ♦ Safety areas:
 - Almost none for the teams, standing 1 meter behind the rocket
 - About 3 meters for the jury, that receives drops quite often :)
 - About 4 meters for the public, standing behind low plastic barriers
 - Public stands up or sits during the launches depending on where they stay
 - Rockets are landing in a restricted area behind a fence
- ♦ Overall feeling: caution is of course a matter for contestants and organizers but by nature this is a safe activity: no need for more safety rules, especially for a contest with no performance target.

Safety



Clubs

Jury

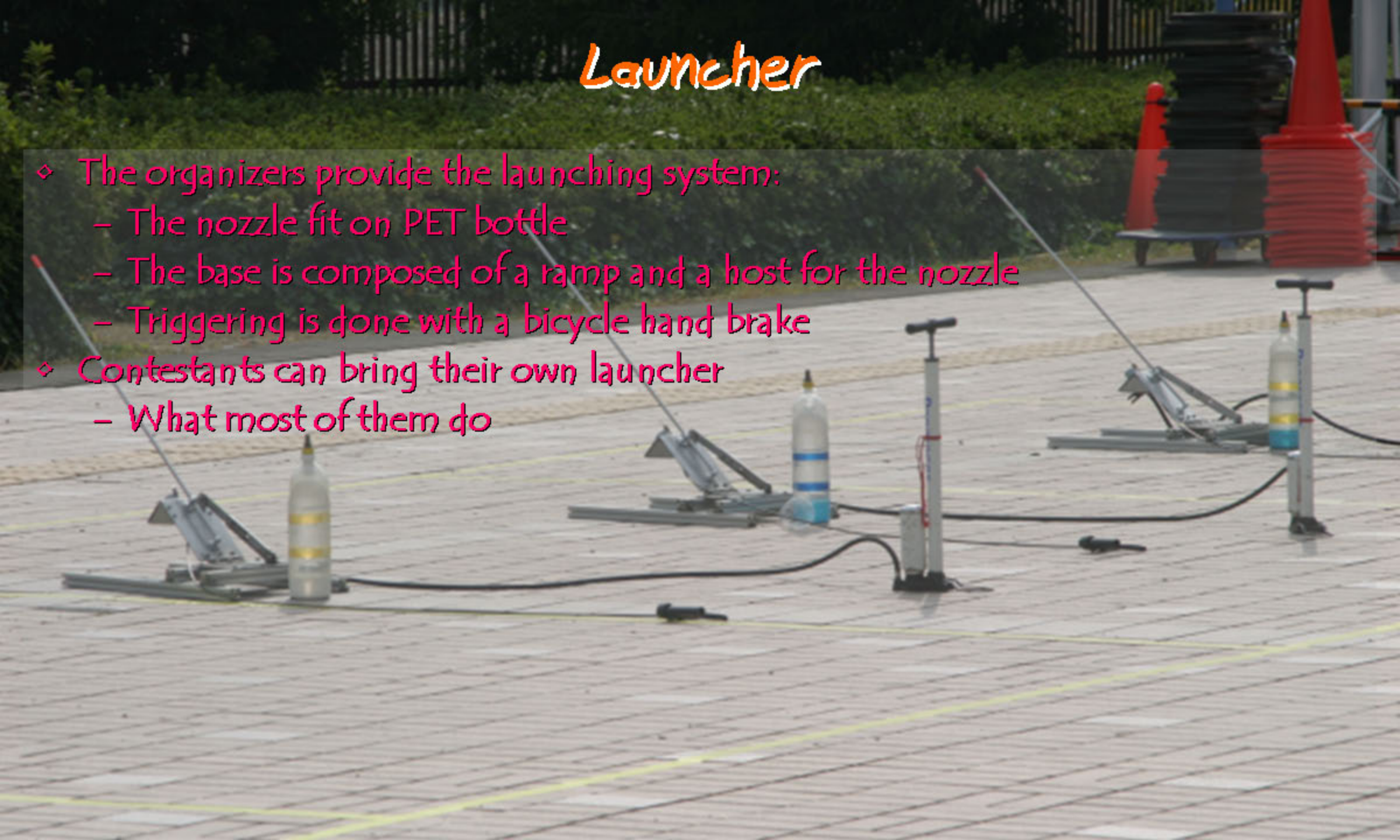
Public

Safety



Launcher

- ♦ The organizers provide the launching system:
 - The nozzle fit on PET bottle
 - The base is composed of a ramp and a host for the nozzle
 - Triggering is done with a bicycle hand brake
- ♦ Contestants can bring their own launcher
 - What most of them do



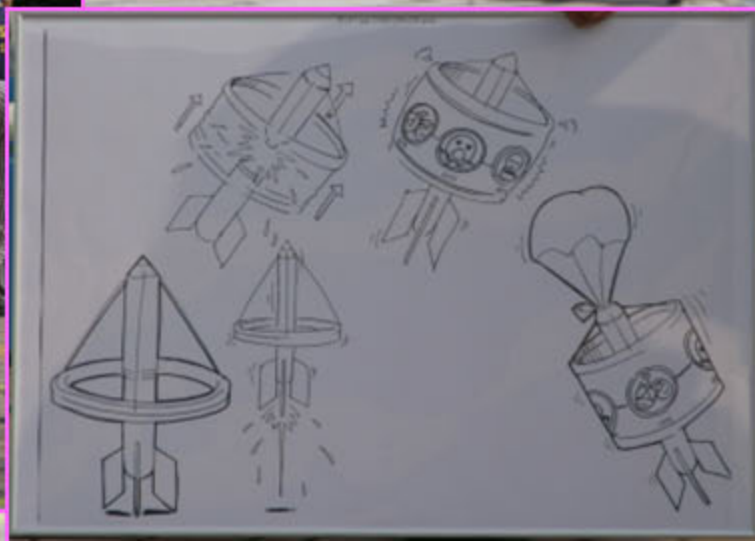
Launcher



Design & techniques

- ♦ It's a design idea contest, could it be for the shape, the purpose of the rocket, or the mechanisms it contains
- ♦ 1, 2, 3 stages, multiple bottles, very various sizes and volumes
- ♦ Almost no electronics onboard
- ♦ Mechanisms are based on gravity and pressure triggering pins, hooks...
- ♦ Recovery with parachute, helicopter, wings...
- ♦ Modules are released, as well as streamers or confetti.
- ♦ Originality and decoration are very important
- ♦ Fin are carefully attached to the body; some are ready-made.
- ♦ People come to have fun with their family, with the public. They're not afraid to be ridiculous. A cultural fact.

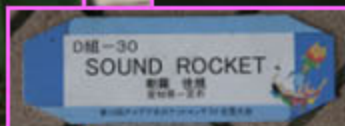
Design & techniques



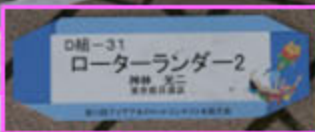
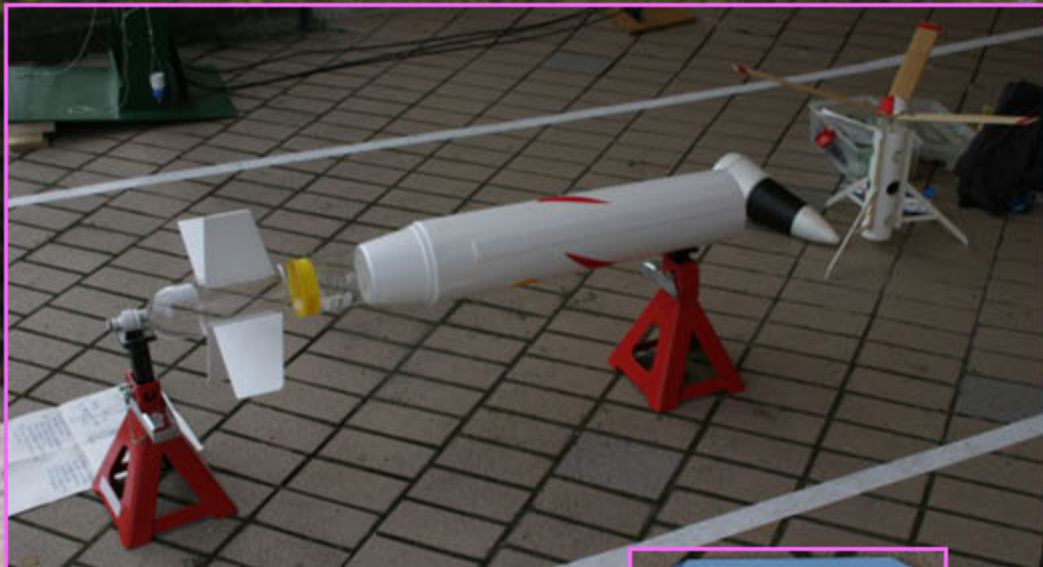
Design & techniques



Design & techniques



Design & techniques



Atmosphere



Atmosphere



Famous Japanese



Famous traveler

What about 2007 ?

- ♦ In the perspective of strengthening our relations with space clubs and organizations in Japan, why not considering a French team to participate to the contest in 2007 ?
 - Kakamigahara's contest is not restricted to Japanese contestants though none has ever registered.
 - Basically, at first, it could be French students based in Japan (lycée Français or university students)
- ♦ JAXA's Space education center has released a comprehensive Water Rocket Educator's manual with a video on DVD, all in English. It intends to broadcast the manufacturing techniques and the science of water rocket so that more children experience the same excitement that rocket engineers do.
 - This document completes perfectly this report of the 2006 Idea Water Rocket Contest
 - Mathieu Grialou will send a copy to CNES France.

Thanks to Mathieu for the pictures

Thanks to Minoru Sasaki and Noriaki Nakano for their great help

Mulder – Feb 2007

Almost on time!