

## **Rocketry projects at "Ort Ramat-Gan" technical high school, Israel, 1972-1973**

### **Abstract**

Another paper in a series describing Israeli made research rockets from the 1960's to the 1990's. In this paper a wealth of new information on a series of rockets built and launched by students from ORT technical school is described. The author was able to locate and buy one of the original rockets from 1973 and met with the instructor of the rocketry club operated by him, as well as the former students who built and launched the rockets. With the research on these rockets, the history of Israeli research rockets is not yet completed, but an important, and for years obscured part of the story is revealed with "behind the scenes" personal accounts from the actual people behind the rockets.

This is another paper in the series of papers by the author, on the history of research and student-built rockets in Israel from the 1960's onwards.

### **Introduction**

Since the 1960's, there were several rocketry projects in Israel, in which students – from high school to university were involved.<sup>1</sup> In many cases, the Israeli defense contractors helped with some advice from engineers and rocket motor provided to

the various groups. In that regard, the rocketry course described in this paper is different, and it could be described as a one man show, with no support from industry or academia. All the rockets built at the "Ort Ramat-Gan", at the time one of Israel's prestigious technical high schools, were the

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See the author's papers from IAC, portraying <sup>1</sup> the Technion rockets, with the assistant of RAFAEL, for example.

creation of one teacher, Oded Kirsh, and a very small team of selected students.



Figure 1: *The first Ort Rocket on the launcher, 1972. The launch took place at a beach in Northern Tel-Aviv*

### **The rocketry projects**

Oded Kirsh, the teacher at Ort Ramat-Gan, decided that a hands-on rocket project is a good idea, and started to assemble a selected group of students, who were at the time all 17 years old. The first rocket was built by only three students, and the whole process from design to flight took only two months.<sup>2</sup> With no academic or industrial support, the rocket was constructed from scrap metals at the school's machinery

workshop<sup>3</sup> while the solid rocket motor was developed with the help of the chemistry teacher at the school.<sup>4</sup> This was in sharp contrast to other student built rockets – at the Technion for example, the rocket motors were provided by Israel's military industries or RAFAEL, and a rocket project at the Israel Air Force technical cadet school used a ZOONY rocket as the basis for its project.<sup>5</sup>



Figure 2: *The first launcher at the Tel-Aviv beach, 1972.*<sup>6</sup>

Maariv (Israel daily newspaper), 20.2.1972<sup>2</sup>

Ibid<sup>3</sup>

Maariv, 21.6.1972<sup>4</sup>

A paper on this project will be presented by<sup>5</sup>  
the author on a future congress – recently

new information obtained after 40 years of  
research.

Image courtesy of Moshe Strauch, one of<sup>6</sup>  
the three students at the project.

### **Finding the sole remaining rocket**

By a lucky coincidence, the author was able to find the sole hardware remains from the rocketry activity at Ort – the FIRST rocket built at the school. In April 2021, at antique market in Tel-Aviv, a rocket on a decorative stand was on display on a table of one of the merchants, alongside some pictures of other rockets. After researching each rocket project for more than 30 years, I immediately understood what was on the table.<sup>7</sup>



Figure 3: *Rocket as was in an antique market in Tel Aviv, 2021*

The rocket bears the signature of Oded Kirsh, the teacher behind it, and a quote by him: "This is the first, original small rocket". After a short bargaining with the seller<sup>8</sup> it was purchased by the author, together with some pictures of

Consider the odds – it was the first time <sup>7</sup> since the beginning of COVID-19 pandemic that the market was opened...

other rockets and old newspaper clips on the launch.

The rocket was constructed out of steel, with an aluminum cone at the front. It is 55 centimeters long, with a diameter of 50 millimeters and an empty weight of 1500 grams. There is no parachute inside, or other mechanism for soft return of the rocket after a powered flight.



Figure 4: *The rocket in the author's collection*

Who runs an auction house, and his primary <sup>8</sup> intention was to offer the rocket on an auction.



Figure 5: *Oded Kirsh signs on the rocket*

The rocket is identical to the flown "Ort-1" of 1972, and it turns out that several rockets were built, in the sake of redundancy in case of a failed launch attempt. In the news it was reported that Ort-1 lifted off successfully to a height of 700 meters. The newspaper also stated (on February 20, 1972), that several more rockets will be launched "by the end of the year".<sup>9</sup>

Maariv, 20.2.1972. And the statement was <sup>9</sup> correct as more rockets were launched in June 1972.

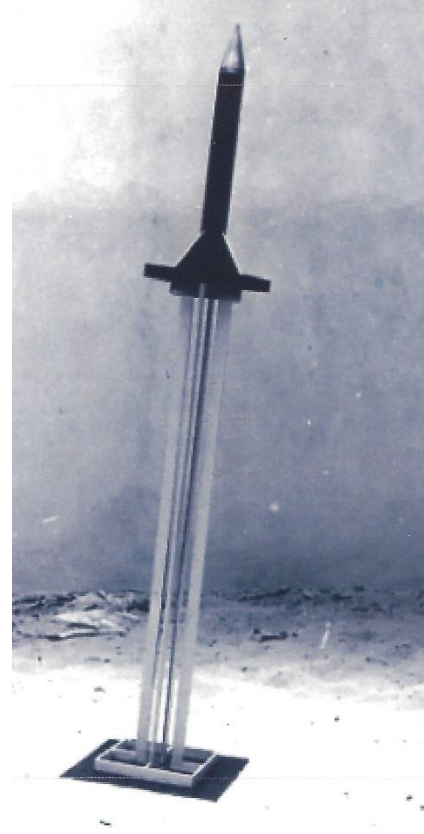


Figure 6: *"Ort-1" and its launcher – from the project's documentation<sup>10</sup>*

### **Follow-on rockets**

Several more rockets were built and launched by the small team of students<sup>11</sup> up until "Ort-5". On June 20, 1972, they launch a more powerful rocket. Three rockets were launch at the same day, the first was a small "test vehicle" flown to a height of 500 meters; the second exploded in flight and the third was able to reach an

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Courtesy of Oded Kirsh <sup>10</sup>  
The students were Moshe Strauch, Itzhak <sup>11</sup>  
Gutterman and Zevi Bareket



altitude of 3 kilometers, reaching an approximate speed of Mach 1.3.<sup>12</sup>



Figure 7: *More advanced launch pad. It is POSSIBLE that the launcher was on loan from the Technion.*

### Ort-5

The last "ort" rocket was Ort-5. It had 4 strap-on boosters, externally installed on the rocket. They were separated after the propellant was spent. The technical difficulties to cast a large diameter rocket motor with high enough reliability was the motivation to choose the cluster configuration of one main rocket motor plus 4 outside boosters.



Figure 8: *Ort-5 at the workshop- with the boosters attached.*

The rocket was again constructed out of steel and aluminum, with self-made rocket motors. It is still not clear what was the exact chemical compound used for the propellant.

The technical data of Ort five was confirmed by the author with one of the students who built it and it is: 1360 mm in length, 90 mm in diameter and a mass of 10 kilograms. According to a press report the rocket was launched to a height of 4.5 kilometers. According to media coverage of the launch, this rocket was involved (undisclosed) help

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Maariv, 21.6.1972 <sup>12</sup>

from RAFAEL<sup>13</sup>. The rocket was considered by the school as the student's final project (in mechanics) and part of their matriculation's exams.



Figure 9: *Ort-5 without the boosters*

This rocket marked the end of the rocketry project of Ort Ramat-Gan as the students were drafted to a military service. Soon after (October 1973) the Yom Kippur war broke out and the national morale was very low, so Mr. Kirsh at the school never embarked on a new rocketry activity at school.

After the discovery of the rocket by the author, it was published on social media and a dedicated group on Facebook, devoted to early Israeli research and student rockets. The publication made it

possible to connect with the 3 students that built the Ort rockets, AND their teacher. All of them contributed some insights, pictures and helped bring the story of the (short lived) rocket activities into daylight.

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Then – Weapon development authority, <sup>13</sup>  
now "Rafael advanced defense systems Ltd"