

Hamas' Weapons

Yiftah S. Shapir

General

Since 2001, the most important weapon possessed by the Palestinian organizations in Gaza, and particularly Hamas, has been rocket weaponry. Rockets offer these organizations clear advantages: the weapons are easy to use and cause damage to the other side from a great distance with a minimum of risk to the operators. The rockets are launched from the simplest rails (or, in the case of standard rockets like the Grad, from launching pipes) and they can be launched, after installation and setup, from a distance – which thereby further reduces the risk to the operators. In addition, it seems that it is relatively simple to manufacture primitive and inaccurate rockets by domestic means, without sophisticated industrial facilities.

Eight years' experience of manufacturing "homemade" rockets has shown that self-made weapons entail serious limitations and therefore, alongside efforts to enhance these primitive rockets, the Palestinians tried to acquire standard rockets made at specialized facilities. Indeed, in the recent campaign extensive use was made of standard rockets. In addition, in contrast with Hizbollah in 2006, Hamas also used mortars, most of which were probably standard.

All told, according to credible data, during Operation Cast Lead (December 27, 2008-January 18, 2009) 640 rockets were fired, (202 Grads and 438 Qassams) as well as another 224 mortar shells, an average of about 29 rockets a day. (In comparison, Hizbollah managed to fire a daily average of around 120 rockets a day throughout the Second Lebanon War).¹

Yiftah S. Shapir, senior research associate at INSS

Non-Standard Rockets

The various Palestinian organizations in Gaza manufacture rockets at a large number of workshops, some in people's homes. These rockets appeared in a variety of models and under many names, with each organization boasting its own model under a particular name (see table). Despite the differences, however, the basic design was identical for all rocket types:

- a. A metal pipe used to house the motor, generally with a diameter of 90-115 mm. This pipe is filled with propulsion material, generally primitive explosives made of agricultural fertilizers (potassium nitrate) and sugar.
- b. The rear end of the engine housing – 4 stabilizer wings.
- c. The front section of the rocket contains the warhead, which is also made of piping with an identical diameter and is filled with high explosives (any explosives the manufacturers could obtain, sometimes plastic explosives extracted from Israeli weapons that had landed there).
- d. The head of the rocket is cone shaped topped with a fuse at the top.
- e. Sometimes a metal stick is added to the rocket head, which is designed to push out the fuse when the rocket reaches a certain height in order to ensure a greater spread of shrapnel.

Since the first models of Hamas' Qassam rockets were used in 2001, Palestinian organizations have made efforts to improve the rocket in terms of accuracy and range. The first rockets reached a range of about 4 km, but since 2007 Qassam rockets have had ranges of 10 -12 km.

Self-produced rockets have other problems, some of which the Palestinians have not yet managed to overcome:

- a. They are highly inaccurate.
- b. There is a great difference between individual rockets from the same production line.
- c. Their trajectory is irregular.
- d. There is a large percentage of duds.
- e. The production is not safe (there are multiple "work accidents").
- f. They are not safe to operate (there have been cases of rockets falling within the Gaza Strip shortly after being launched).
- g. They have a short shelf life (no more than a few weeks).

Standard Rockets

Standard rockets do not have these disadvantages. They are more accurate than self-made rockets, are designed to have a long shelf life, are safe to use, have modern propulsion materials (whose casting requires technical skills that the Palestinians do not have), and have different types of modern explosives in the head.

Since the 2005 disengagement from Gaza, the Palestinians have endeavored to obtain various types of weapons from outside sources and import them through a system of tunnels dug underneath the Philadelphi route between the Gaza Strip and the Egyptian side of Rafah. It was suspected that even before the last confrontation, Iran was Hamas' chief arms supplier, including for rocket weapons. The latter were smuggled in to the Sinai Peninsula by sea, either from Lebanon or from Sudan, or overland through Egypt, and from there via the tunnels into the Strip. During Operation Cast Lead the Palestinians fired standard rockets of the Grad family of rockets, some of which had a range of close to 40 km.

This rocket is the most common in the global arms markets. It has a diameter of 122 mm, and originally comes from the Soviet Grad system. Many types of launchers and many types of rockets were developed for this system. The Grad technology spread among countries that purchased Soviet weapons, and various Grad models are manufactured today in Russia, as well as other countries, like Romania, Iran, and China. Each manufacturer adds its own modifications. The standard Grad rocket is capable of ranges of up to 20 km, although enhanced models, developed in Russia and elsewhere, are capable of reaching distances of up to 40 km.

One rocket, with a range of approximately 40 km, bore markings that indicated it was made in China. Yet in contrast with previous assessments, no signs of Iranian-made rockets were found. This, however, does not provide conclusive findings as to the sources of the rockets used by Hamas. Arms may have come from Iran and the markings were intentionally disguised, or perhaps Iran gave Hamas arms not made in Iran. They may also have had rockets from different sources. There was no use or sign of Fadjr 3 and Fadjr 5 rockets made in Iran (models used by Hizbollah during the Second Lebanon War).

Standard Artillery Rockets

Rocket	Caliber	Length	Weight	Warhead weight	Minimum-maximum range	Type of warhead	Make	Notes
9M22U	122 mm	322.6 cm	66.2 kg	19.4 kg	1.5-20.4 km		USSR	This is the original basic Grad rocket
9M22M	122 mm	287 cm	66 kg	18.4 kg	1.5-20 km		USSR	
9M2B	122 mm	190.5 cm	45.8 kg	19.4 kg	2.5-10.8 km		USSR	Used by special forces
9M217	122 mm		70 kg	25 kg	30 km		Russia	New Russian models
9M218	122 mm		70 kg	25 kg	40 km		Russia	New Russian models
9M521	122 mm		70 kg	21 kg	37.5 km		Russia	New Russian models
Type 81	122 mm	287 cm	66.8 kg	18.3 kg	20 km		China	The name comes from the launcher, not the rocket. This is the Chinese version of the Russian BM-21, used by the Chinese army.
Type 90	122 mm	287 cm 275 cm	67 kg 61 kg	18.4 kg	20 km 30 km		China	The name comes from the launcher. Designed to replace type 81, new development. 2 rocket models for 2 different ranges.
PHZ-89	122 mm	287 cm 275 cm	67 kg 61 kg	18.4 kg	20 km 30 km		China	The name comes from the launcher on a tank – armored version of type 90, with rockets identical to type 90.
Type 90	122 mm						China	The name comes from the launcher. Designed to replace type 81, new development. Rockets identical to the PHZ-89.
WS-1E	122 mm	296.4 cm	74 kg	18-22 kg	20-40 km		China	Rocket developed by SCAIC, as a rival to the models used by the Chinese army (made by NORINCO). Nothing is known of manufacture of orders but this is the only 122 mm rocket made by China with a reported range of 40 km.

Mortars

Mortars, light and easy-to-use artillery, were used during the war. It is known that Hamas had 120 mm mortars armed with standard bombs that were apparently manufactured in Iran (a copy of the Israeli model from the 1970s). Some of the bombs were fitted with an auxiliary engine that added 10 km to their range. Video clips posted on the internet showed Hamas operating smaller mortars, probably with a diameter of 81 or 82 mm. The range of these mortars does not generally exceed 5 km, so their ability to hit Israeli towns is limited.

Antitank Weapons

In light of the Second Lebanon War, where Hizbollah used a large quantity of antitank missiles, particularly Russian-made Konkurs and Kornet missiles, there was much concern that Hamas might also make extensive use of these missiles against the IDF. Reports prior to the outbreak of the conflict indicated the possibility that Konkurs missiles as well as older Sagger missiles had been smuggled into the Gaza Strip. In practice, as far as is known, no use was made of standard antitank missiles during the campaign. On the other hand, the Palestinians used self-made antitank "missiles." Despite their impressive names the Palestinian organizations do not have the ability to manufacture guided antitank missiles. The "missiles" they have are Palestinians copies of unguided antitank missiles like the old RPG-7, which is a standard infantry weapon used by most armies that operate Soviet arms.

Antiaircraft Weapons

In the wake of the lessons of the Second Lebanon War, there was much concern in Israel that the Palestinians would make every effort to bring down Israeli aircraft. Such a strike could be considered by them a major success and a considerable propaganda achievement. In particular there was concern that as part of its arms smuggling efforts, Hamas would obtain portable antiaircraft weapons such as the Soviet Strela and Igla missiles or the American Stinger missile. In practice no attempt to use such arms was identified.

Whether antitank and antiaircraft missiles were not used because the Palestinians did not have them or the weapons they did have were unusable for some reason, or because the Palestinian military leadership decided not to use the missiles it had remains an open question.

Notes

- 1 Various sources offered different figures for the number of rockets fired. According to Israel Police's southern district, 708 rocket launches and 269 rockets landings as well as 151 launches of mortar shells and 20 mortar shells landings were counted. Hamas itself reported 345 Qassam rocket launches, 213 Grad rocket launches, and 422 mortar shell launches. Clearly these figures do not include launches by other organizations, such as Islamic Jihad. The difference between the figures is a result of the different sources of information: many rockets and shells landed in uninhabited locations, and were not necessarily handled by the police. There were also many landings in the sea, and some that occurred within the Gaza Strip itself. On the other hand, it is possible that some of the launch alarms were false alarms.