

# Hezbollah's Missiles and Rockets

## An Overview

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### THE ISSUE

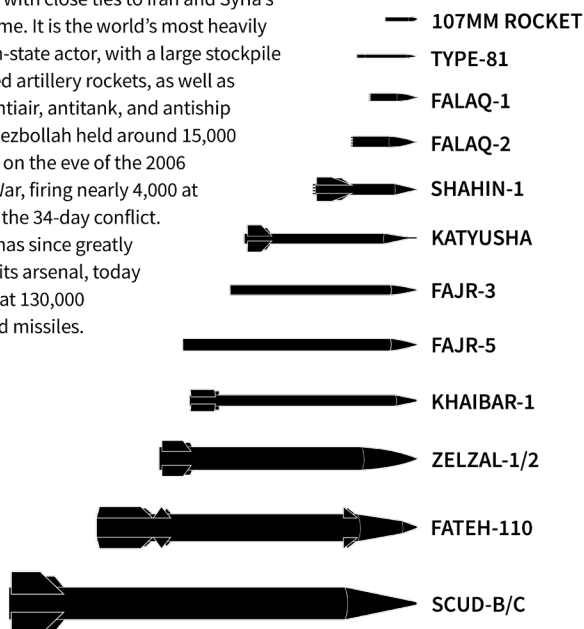
- Hezbollah is the world's most heavily armed non-state actor, with a large and diverse stockpile of unguided artillery rockets, as well as ballistic, antiair, antitank, and antiship missiles.
- Hezbollah views its rocket and missile arsenal as its primary deterrent against Israeli military action, while also useful for quick retaliatory strikes and longer military engagements.
- Hezbollah's unguided rocket arsenal has increased significantly since the 2006 Lebanon War, and the party's increased role in the Syrian conflict raises concerns about its acquisition of more sophisticated standoff and precision-guided missiles, whether from Syria, Iran, or Russia.
- This brief provides a summary of the acquisition history, capabilities, and use of these forces.



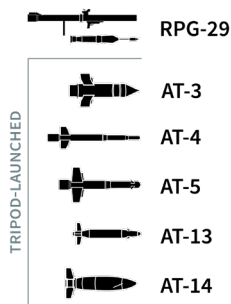
## MISSILES & ROCKETS OF HEZBOLLAH

Hezbollah is a Lebanese political party and militant group with close ties to Iran and Syria's Assad regime. It is the world's most heavily armed non-state actor, with a large stockpile of unguided artillery rockets, as well as ballistic, antiair, antitank, and antiship missiles. Hezbollah held around 15,000 projectiles on the eve of the 2006 Lebanon War, firing nearly 4,000 at Israel over the 34-day conflict. The party has since greatly expanded its arsenal, today estimated at 130,000 rockets and missiles.

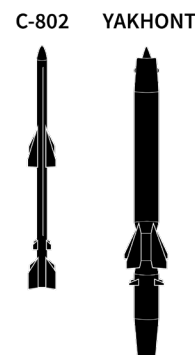
### LAND ATTACK



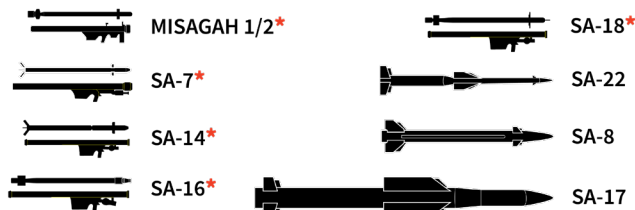
### ANTITANK\*



### ANTISHIP



### ANTIAIR\*



\*missiles scaled at 200% for clarity

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zbollah is a Lebanese political party and militant group with close ties to Iran and Syria's Assad regime. It is the world's most heavily armed non-state actor—aptly described as “a militia trained like an army and equipped like a state.”<sup>1</sup> This is especially true

with regard to its missile and rocket forces, which Hezbollah has arrayed against Israel in vast quantities.

The party's arsenal is comprised primarily of small, man-portable, unguided artillery rockets. Although these devices lack precision, their sheer number make them effective weapons of terror. According to Israeli sources, Hezbollah held around 15,000 rockets and missiles on the eve of the 2006 Lebanon War, firing nearly 4,000 at Israel over the 34-day conflict. Hezbollah has since expanded its rocket force, today estimated at 130,000 rounds.<sup>2</sup>

Hezbollah asserts that its rocket forces are primarily for deterrence—a means to retaliate against Israel in the event of conflict. In May 2006, Hezbollah's Secretary General Hassan Nasrallah explained “The purpose of our rockets is to deter Israel from attacking Lebanese civilians...The enemy fears that every time he confronts us, whenever there are victims in our ranks among Lebanese civilians, this will lead to a counter-barrage of our rockets, which he fears.”<sup>3</sup> Indiscriminate rocket fire, particularly from small, easily transportable launchers makes the suppression of fire with airpower more challenging. This forces Israel to rely more heavily on ground forces in a conflict. Lacking any air force of its own, Hezbollah prefers ground wars in its own territory to bombardment from the skies. As Human Rights Watch notes, however, none of these arguments justifies targeting civilians under international law.<sup>4</sup>

The continued growth of Hezbollah's missile and rocket forces is undesirable for several reasons. It may, for example, embolden the party to overstep Israeli red lines. Hezbollah's push to acquire longer-ranged and precision-guided munitions could likewise spur Israel into preemptive action.

Hezbollah's weapons acquisition also raises the prospects for the proliferation of missile technology and know-how. According to Saudi and UAE officials, Hezbollah militants have worked with their Houthi forces in rocket development and launch divisions in Yemen.<sup>5</sup> Hezbollah forces in Syria and Iraq similarly operate with various Shiite militias. Growing relations among these groups presents risks for the dissemination of missile technology and knowledge.

The following is a summary compilation of Hezbollah's missile and rocket arsenal. It is limited by the availability of

public source information and does not cover certain topics such as rocket strategies, evolution, or storage locations. This brief instead focuses on the acquisition history, capabilities, and use of these forces.

## LAND ATTACK MISSILES AND ROCKETS

### 107 AND 122 MM KATYUSHA ROCKETS



Photo: Marwan Naamani/AFP/Getty Images

The name Katyusha (Russian translation: “Little Katy”) was originally used by Soviet soldiers during World War II to refer to 82 mm and 132 mm rockets used by USSR forces. Today, however, reporters and analysts alike use the term for most of Hezbollah's unguided artillery rockets fired from or designed for multiple rocket launchers (MRLs).<sup>6</sup>

Hezbollah operates several Katyusha models, which are typically distinguished by their range (4-40 km), warhead (10-20 kg, high explosive (HE) or submunitions), and launch weight (45-75kg).<sup>7</sup> The 122 mm 9M22 Grad-type is one of the more popular Katyusha variants today. It was originally fitted for the Soviet BM-21 MRL, and has a range of approximately 20 km while carrying 6 kg of HE or submunitions, both dispersing antipersonnel fragments. The rocket may be fired through tripod launchers or from truck-based MRLs, and is accurate within a 336 m x 160 m space.<sup>8</sup>

Katyushas make up the majority of Hezbollah's rocket force and were the party's weapon of choice in the 2006 Lebanon War. According to a 2006 report, Hezbollah was estimated to hold between 7,000-8,000 107 mm and 122 mm Katyusha rockets; this number has since increased, but more recent estimates are unreliable.<sup>9</sup> Iran serves as Hezbollah's primary Katyusha supplier and, starting in 2001, has also transferred several truck-mounted, multi-barrel rocket launchers (MBRL). These assets enable Hezbollah to fire salvos of Katyushas into Israel, although the party largely continues to carry out single shot attacks to maximize media attention.<sup>10</sup> Nevertheless, whether launched individually or in salvos, Katyushas proved difficult to intercept prior

to Israel's deployment of Iron Dome in March 2011. The rockets' short flight time and low flight trajectory made it difficult and cost ineffective for higher-tier missile defenses like Patriot to intercept.<sup>11</sup>

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### **FAJR-1 / CHINESE 107 MM ROCKETS**



Photo: Israel Defense Forces (Flickr)

China developed 107 mm artillery rockets in the 1960s for its Type-63 MRL. It sold the 107 mm rockets to Syria and a reported 500-700 units to Iran. Iran subsequently developed indigenous copies of the rocket (renaming it Fajr-1) and the MRL (renaming it Haseb). Iran is reported to have supplied Hezbollah with approximately 144 Haseb-type launchers and an unknown number of accompanying rockets.<sup>12</sup>

These rockets have a range of 8-10 km and employ an 8 kg HE-fragmentation warhead. Different models vary between 0.841 m and 0.92 m in length and weigh nearly 19 kg. The rockets may be manually ground-launched or fired through the Haseb-type launchers acquired from Iran. The Haseb MRL holds 12 rounds (three rows of four cells) and weighs about 613 kg.<sup>13</sup>

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### **FALAQ-1 AND FALAQ-2**



Photo: Israel Defense Forces (Flickr)

Falaq is a family of unguided artillery rockets developed by Iran in the 1990s. They are sometimes identified as Falagh. The Falaq-1 has a range of 10-11 km while carrying a 50 kg HE warhead. The rocket has a length of 1.32 m, a body

diameter of 240 mm, and a total launch weight of 111 kg. A man-portable variant exists.<sup>14</sup>

The Falaq-2 also has a range of 10-11 km, but carries a 120 kg HE warhead. The rocket has a length of 1.82 m, a body diameter of 333 mm, and a launch weight of 255 kg. It has a fragmentation radius of around 300 m.<sup>15</sup>

The Falaq-1 and -2 are solid-fueled, spin-stabilized, and can be launched from trucks or boats. On August 25, 2005, Hezbollah reportedly fired a Falaq-1 into Israel by accident. Hezbollah subsequently launched several Falaq rockets against Israel during the 2006 Second Lebanon War.<sup>16</sup>

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### **333 MM SHAHIN-1**

The Shahin-1 is an unguided heavy artillery rocket developed by Iran. It has a range of 13 km while carrying a 190 kg HE warhead. The rocket has a length of 2.9 m, a body diameter of 333 mm, and a launch weight of 384 kg.<sup>17</sup>

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### **122 MM TYPE-81 ROCKET**

These Chinese cluster munition rockets are often subsumed under the Katyusha umbrella. It is not known how Hezbollah obtained them, but the party fired approximately 118 Type-81 rockets during the 2006 Lebanon War. Hezbollah's deployment of the 122 mm Type-81 was the first confirmed use of this weapon.<sup>18</sup>

The Type-81 rocket has a range of 20.5 km while fitted with an HE warhead, reportedly carrying 39 MZD-2 or Type-90 submunitions. The standard 122 mm rocket is 1.927 m long and weighs 45.3 kg.<sup>19</sup>

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### **FAJR-3 AND FAJR-5**



Photo: Mahmoud Zayyat/AFP/Getty Images

The Fajr is a family of Iranian-designed, unguided artillery rockets developed in the 1990s. One Israel Defense Forces (IDF) figure reported in 2011 estimated Hezbollah held a stockpile of several hundred of these projectiles. Iranian Air Force officers have furthermore

made repeated trips to Lebanon to train Hezbollah fighters to aim and fire Fajr rockets.<sup>20</sup>

The Fajr-3 has a range of 43 km while carrying a 45 kg HE warhead. The rocket has a length of 5.2 m, a body diameter of 240 mm, and a launch weight of 407 kg. Fajr-3 launchers used in 2006 carried up to 14 rockets each.<sup>21</sup>

The Fajr-5 has a range of 75 km while carrying a 90 kg HE warhead. The rocket has a length of 6.485 m, a body diameter of 333 mm, and a launch weight of 915 kg. The mobile Fajr-5 launchers used in 2006 carried up to four rockets each.<sup>22</sup>

Israeli intelligence learned that Fajr rockets had been distributed among core Hezbollah activists in the early 2000s. Hezbollah fighters fired a Fajr-5 rocket for the first time during the 2006 Lebanon War. The projectile struck the Northern Israeli town of Rosh Pina, but did not result in any casualties. Analysts also believe Hezbollah used Fajr-3 or Fajr-5 missiles to strike Israel's northern port city of Haifa.<sup>23</sup>

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### **RAAD-2 AND RAAD-3 / 220 MM URAGAN-TYPE ROCKETS**



Photo: Joseph Eid/AFP/Getty Images

The Soviet Union designed these artillery rockets in the 1970s for its BM-27 Uragan MRL. Renamed by Hezbollah the Raad-2 and Raad-3, these rockets have a range of 60-70 km with a 50 kg HE warhead, which is filled with 6 mm antipersonnel steel balls. The rockets measure approximately 4.8 m in length and 280 kg in weight.<sup>24</sup>

The Soviet Union sold Uragan rockets and launcher systems to Syria, which then transferred a number of these rockets to Hezbollah in the early 2000s. Hezbollah's launchers differ from the standard Soviet design, as one analysis explains: "[O]nly one layer of four tubes rather than the standard three layers, two with six tubes and one with four."<sup>25</sup> Hezbollah likely made this change to accommodate a lighter launch vehicle.

Hezbollah successfully fired a Raad rocket into Israel for the first time on July 16, 2006, four days into the Second Lebanon War.<sup>26</sup>

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### **302 MM KHAIBAR-1 / M-302 / B-302**

The Khaibar-1 rocket is an unguided artillery rocket, developed and manufactured by Syria. Reports suggest the Khaibar-1 is based heavily on the Chinese Wei Shi (WS-1) MRL system. The rocket is named after the 629 CE Battle of Khaibar, fought between early Muslims and resident Jews.<sup>27</sup>

The Khaibar-1 has a range of 100 km while carrying a 150 kg payload. It is typically equipped with large, antipersonnel warheads. The rocket has a length of 6.3 m, a body diameter of 0.302 m, and a launch weight of approximately 750 kg. The launcher features two layers of three firing tubes each. The Khaibar-1 is unguided but more accurate than most indigenous Hezbollah rockets and can be stored more easily due to increased durability. However, the rocket does not spin like the Fajr-5 and is therefore likely less accurate.<sup>28</sup>

The Khaibar-1 was first fired by Hezbollah on July 28, 2006, striking the city of Afula. Subsequent targets included Haifa, Hadera, and areas in the northern West Bank.

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### **ZELZAL-1 AND ZELZAL-2**



Photo: Behrouz Mehri/AFP/Getty Images

The Zelzal is an Iranian variant of the Soviet FROG 7 artillery ballistic missile. It has a substantially higher range and payload than Hezbollah's Katyusha and Fajr rockets, providing the group with the capability to target deep within Israel.<sup>29</sup>

The Zelzal-1 has a range of 125-160 km while carrying a 600 kg HE warhead. It has a length of 8.325 m, a body diameter of 610 mm, and a launch weight of 2,950 kg.<sup>30</sup>

The Zelzal-2 has a range of 210 km while carrying a 600 kg HE warhead. The solid-fuel rocket shares the same length

and diameter as its predecessor, but has an increased launch weight of 3,400 kg. It is also spin-stabilized.<sup>31</sup>

Iran reportedly began delivering the Zelzal-1 and -2 rockets to Hezbollah in the early 2000s. Iran used transport planes to carry sophisticated missiles—including the Zelzal—into Syria, which were then smuggled to Hezbollah. Zelzal rockets are fairly inaccurate, and require a large transporter-erector launcher (TEL) vehicle with a large target signature. Israeli officials, however, believe the rocket's considerable payload makes it a serious threat.<sup>32</sup> One 2006 report found that Hezbollah likely held “a few dozen” Zelzal rockets, while another cited as many as 200.<sup>33</sup> Updated numbers are unclear. Hezbollah's Zelzals went unused during the 2006 war, likely due to Iranian influence (seeking to prevent further escalation), Israeli airpower (which could easily strike larger targets like Zelzals), or a combination of the two.

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### **FATEH-110 / M-600**

The Fateh-110 is an Iranian short-range, road-mobile ballistic missile. It is likely a modified version of the unguided Zelzal-2, with the addition of control and guidance systems. The M-600, or “Tishreen,” is a Syrian copy of the Fateh-110 missile.

The Fateh-110 and M-600 have ranges of 250-300 km, making them among the longest-ranged weapons in Hezbollah's inventory. Both carry a 450-500 kg HE warhead and are satellite-guided, providing them with a CEP of 500 m. They are nearly 9 m in length and weigh approximately 3,450 kg at launch.<sup>34</sup>

Iran reportedly supplied Fateh-110s to Hezbollah as early as 2007, but Iranian and Lebanese sources only acknowledged the transfers in November 2014.<sup>35</sup> In 2010, Israeli defense officials announced that Syria had transferred a number of M-600 missiles to Hezbollah.<sup>36</sup>

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### **SCUD-B/C/D**

Unconfirmed reports indicate that Syria transferred an unknown number of Scud missiles (B, C, or D variants) to Hezbollah. These reports emerged in late 2009, and again in April 2010, although they have not yet been confirmed. Reports also conflict on whether Hezbollah is capable of firing Scuds without foreign assistance. Additionally, Scuds are often described as impractical weapons for Hezbollah in any conflict with a state actor like Israel. As one analyst explains, “Scuds are very bulky to transport and difficult to hide and manipulate,

requiring 45 minutes of preparation. They do not provide Hezbollah much advantage compared to the Fateh-110...”<sup>37</sup>

Scuds variants have ranges between 300-550 km while carrying a 600-985 kg payload. Standard versions measure 11.25-12.29 m in length, with a body diameter of 0.88 m and launch weight of around 5,400-6,500.<sup>38</sup> If Hezbollah does indeed have Scuds, it could use them to reach Israeli targets from party-controlled territory in northern Lebanon.

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## **ANTISHIP MISSILES (ASMS)**

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### **C-802 / YINGJI-2 / NOOR**



Photo: Fars News Agency

The C-802 is a medium-range antiship cruise missile (ASCM) developed by China in the 1970s-1980s. Iran began buying dozens from the Chinese during the 1990s until the United States pressured Beijing to cease sales. Iran then developed its own variant, the “Noor,” and transferred it to Hezbollah. Hezbollah's C-802s are likely maintained and operated by Iranian military personnel.<sup>39</sup>

The C-802 has a range of 120 km while carrying a 165 kg warhead. It has a length of 6.39 m, a body diameter of 360 mm, and a launch weight of 715-800 kg. The missile is turbo-jet powered, high-speed subsonic, and sea-skimming capable.<sup>40</sup>

On July 14, 2006, Hezbollah fired two C-802s were fired at the Israeli Saar-class corvette Hanit, which was enforcing a blockade along the Lebanese coast. One of the missiles successfully hit the vessel, killing four Israeli sailors. Until the strike, U.S. and Israeli intelligence agencies did not know Iran had transferred C-802 missiles to Hezbollah.<sup>41</sup> It is unclear how many C-802 ASCMs Hezbollah currently holds.

## YAKHONT



Photo: Wikipedia

The Yakhont is an antiship cruise missile (ASCM) developed by Russia in the 1990s. It can be air-, ground-, or sub-launched.

The Yakhont has a range of 300 km while carrying either a 200 kg HE or 250 kg semi-armor piercing (SAP) warhead. It measures 8.6 m in length, with a body diameter of 670 mm and a launch weight of 3,000 kg. It is supersonic, capable of sea-skimming flight, and employs inertial navigation-based guidance.<sup>42</sup>

Russia delivered 72 Yakhont coastal defense missiles to Syria in December 2011, along with 18 TEL vehicles. Additional shipments of more advanced, radar-equipped variants followed in May 2013. Syria transferred a number of these systems to Hezbollah. As of January 2016, the United States estimates that Hezbollah possesses up to 12 Yakhont ASCMs.<sup>43</sup> However, some analysts believe that Hezbollah does not have the means to launch the missile without Iranian or Syrian support.<sup>44</sup> Israel considers the Yakhont one of the more significant threats it faces from Hezbollah, as the missile threatens shipping along Israel's entire coastline and complicate any potential blockade of Lebanon.

## ANTITANK MISSILES (ATMS)

According to Israeli tank commanders at the front of the 2006 War, Hezbollah's antitank missiles damaged or destroyed Israeli vehicles on about 20% of their hits.<sup>45</sup> The party successfully struck nearly 50 Israeli Merkava tanks during the conflict, penetrating the armor of 21. Hezbollah used ATMs against buildings and Israeli troop bunkers as well. As Anthony Cordesman writes, "More [Israeli] infantry soldiers were killed by antitank weapons than in hand-to-hand combat."<sup>46</sup> While fighting ISIS in Syria and Iraq, Hezbollah has effectively used ATMs to counter suicide vehicle-borne improvised explosive devices (SVBIED) launched by the extremist group.<sup>47</sup>

## RPG-29 VAMPIR



Photo: Wikipedia

The RPG-29 is an unguided rocket-propelled grenade launcher (RPG) developed by the Soviet Union in the 1980s. It was designed to give mobile infantry units the ability to penetrate and destroy enemy tanks. The RPG-29 has an effective range of 450-500 meters while carrying a 4.5 kg antitank or antipersonnel grenade. The 105.2 mm rocket is equipped with a tandem-shaped warhead, which was designed to counter reactive armor like that used on many Israeli vehicles. Some versions are also equipped with thermal-imaging capability for night warfare and tracking heat signatures.<sup>48</sup>

Russia sold the RPG-29 to Syria between 1990-1999, which in turn provided the system to Hezbollah in the early 2000s.<sup>49</sup> Hezbollah first used the RPG-29 in November 2005 when the party launched an unsuccessful kidnapping attempt on the IDF position at Ghajar.<sup>50</sup> Israeli officials claim that the RPG-29 was a leading cause of IDF casualties during the 2006 Lebanon War, penetrating Merkava tank armor on multiple occasions.<sup>51</sup>

## 9M14 MALYUTKA (NATO: AT-3 SAGGER)



Photo: Israel Defense Forces (Flickr)

The AT-3 Sagger is a manual command to line of sight (MCLOS) wire-guided antitank guided missile (ATGM)

developed by the Soviet Union in the early 1960s. It has an effective range of up to 3 km while carrying a 2.6 or 3.5 kg warhead. The Iranian variant, known as Raad, carries a double tandem-type warhead, which was designed to counter reactive armor like that used on many Israeli vehicles. It can penetrate armor up to 400 mm thick.<sup>52</sup> Hezbollah is estimated to hold hundreds of Iran- and Syria-supplied AT-3s.<sup>53</sup>

Following training provided by Iran and Syria, Hezbollah used the AT-3 against Israeli forces during the 2006 Lebanon War to high effect. When Israel withdrew from southern Lebanon, it left behind about 40 armored vehicles—most destroyed by AT-3s. Hezbollah also used the AT-3 “like artillery” to hit houses and other soft targets holding IDF soldiers.<sup>54</sup>

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### **9K111 FAGOT (NATO: AT-4 SPIGOT)**



Photo: Thomas T. (Flickr)

The AT-4 Spigot is a semi-automatic command to line of sight (SACLOS) wire-guided ATGM developed by the Soviet Union in the 1960s. The second-generation ATGM has an effective range of up to 2.5 km and can penetrate armor up to 480 mm thick. Hezbollah is estimated to hold hundreds of Syria-supplied AT-4s.<sup>55</sup>

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### **9M113 KONKURS (NATO: AT-5 SPANDREL)**



Photo: Thomas T. (Flickr)

The AT-5 Spandrel is a SACLOS wire-guided ATGM developed by the Soviet Union in the late 1960s and early 1970s. The AT-5 has an effective range of 4 km and armor penetration of more than 750 mm.<sup>56</sup> An Israeli report suggests that Iran provided Hezbollah with domestic copies of the AT-5.

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### **9K115-2 METIS-M (NATO: AT-13 SAXHORN-2)**



Photo: Wikipedia

The AT-13 Saxhorn-2 is a wire-guided ATGM developed by Russia in the early 1990s. It has an effective range of 1.5 km, and can fire up to four rounds a minute. The rocket is equipped with a tandem-shaped warhead, which was designed to counter reactive armor like that used on many Israeli vehicles. It can penetrate armor up to 460 mm thick.<sup>57</sup> Russia sold the AT-13 to Syria, which then provided the weapons to Hezbollah in the early 2000s. Hezbollah is estimated to hold hundreds of AT-13s.<sup>58</sup>

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### **9M133 KORNET-E (NATO: AT-14 SPRIGGAN)**



Photo: Wikipedia

The AT-14 Kornet is a laser-guided ATGM developed by Russia in the 1990s. It is likely Hezbollah’s longest-range ATGM, with an effective range of about 5 km while carrying an anti-armor or bunker-busting thermobaric warhead. It can penetrate armor up to 1200 mm thick. The third-generation system also has thermal-

imaging capability for night warfare and tracking heat signatures.<sup>59</sup>

Russia sold the AT-14 to Syria between 1990-1999, which in turn provided hundreds to Hezbollah soon thereafter.<sup>60</sup> Hezbollah had the AT-14 during the 2006 Lebanon War, but only used it in limited numbers, likely waiting for Israeli forces to move farther into southern Lebanon and extend their supply lines. The AT-14 was demonstrably effective against Israeli Merkava tanks, and Israeli analysts worry that Russia-Hezbollah cooperation in Syria may result in the party receiving more AT-14s.<sup>61</sup>

## ANTI-AIR MISSILES (AAMS)

Most of Hezbollah's anti-air missile systems offer only a relatively small area of protection. They nevertheless force Israeli aircraft to fly at higher altitudes, reducing Israel's ability to accurately strike ground-based targets.<sup>62</sup> Israeli policymakers and military officers have consistently reiterated their concerns about Hezbollah acquiring more sophisticated air defenses from Bashar al-Assad's Syria.

### MISAGH-1/2



Photo: ISNA News Agency

The Misagh-1 is a second-generation, man-portable anti-air missile (MANPAD) developed by Iran in 1994. Iran subsequently developed the fourth-generation Misagh-2 in the early 2000s. These missiles are reportedly copies of the Chinese Qian Wei rockets (QW-1/-1M/2 'Vanguard').<sup>63</sup>

The Misagh-1 can engage targets between a 0.5 to 5 km range, at altitudes between 0.3 and 4 km. It employs a 1.42 kg HE fragmentation warhead. The rocket has a length of 1.477 m, a body diameter of 71 mm, and a launch weight of 10.86 kg. The total weight of the system is 16.9 kg.<sup>64</sup>

The Misagh-2 has an effective range of 5-6 km at a maximum altitude of 2.5 (for fighters) or 3.5 km (for

helicopters). Weighing 12.74 kg at launch, the rocket carries a 1.42 kg HE warhead and employs an infrared seeker for guidance.<sup>65</sup>

An improved variant known as the QW-1M has also proliferated in the region and is believed to be in Hezbollah's possession. According to one small arms analyst, this version is "more sophisticated than the first generation of SA-7s."<sup>66</sup>

### ZU-23



Photo: Wikipedia

The ZU-23 is a stationary unit with twin 23 mm anti-aircraft guns developed by the Soviet Union in the 1950s. It was designed to engage low-flying targets at a range of 2.5 km and a maximum altitude of 1.5 to 2 km. It can also target armored vehicles up to a 2 km range. The ZU-23 has a length of 4.57 m, a width of 1.83 m, a height of 1.87 m, and a barrel length of 2.01 m. Hezbollah air defense units reportedly station ZU-23 assets on flatbed trucks to add mobility.<sup>67</sup> ZU stands for "Zenitnaya Ustanovka," which translates to "anti-aircraft self-propelled system." The missile is alternatively known as the '2A14 ZU-23-2' and 'Sergey'.

### 9K32 STRELA-2 (NATO: SA-7 GRAIL)



Photo: Wikipedia



The SA-7 is a MANPAD developed by the Soviet Union in the 1960s. It is the first generation of Russian MANPADS. The SA-7 can engage targets between 0.8 and 3.4 km away, at a maximum altitude of 1.5-2.3 km. Its 9K32 interceptor employs a 1.17 kg HE fragmentation warhead and infrared guidance. The rocket has a length of 1.438 m, a body diameter of 0.72 m, and a launch weight of 9.15 kg. Several sources confirm that Hezbollah has SA-7s, which were supplied by Syria and Iran.<sup>68</sup>

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### **9K33 OSA (NATO: SA-8 GECKO)**



Photo: Wikipedia

The SA-8 is a tactical air defense system developed by the Soviet Union in 1972, and modified several times since. Its launcher holds multiple missile types, each able to engage targets between 1.5 to 10 km at a maximum altitude of 5 km.<sup>69</sup>

Russia provided Syria over 2,000 SA-8 interceptors between 1979 and 1988. It is likely that Hezbollah obtained the system from Syria thereafter. Israeli military officials reported that Hezbollah had first received the SA-8 in January 2012. In October 2013, Israeli airstrikes targeted shipments of SA-8 missiles en route to Hezbollah.<sup>70</sup>

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### **9K34 STRELA-3 (NATO: SA-14 GREMLIN)**

The SA-14 is a MANPAD developed by the Soviet Union in the 1960 and 1970s. It was largely based on the earlier Strela-2 and -2M. The SA-14 can engage targets between 0.5 to 4.5 km, at a maximum altitude of 1.5 to 3 km. It employs a 1.15 kg HE-blast fragmentation warhead and infrared guidance. The rocket measures 1.42 m in length, with a body diameter of 72 mm, and a launch weight of 10.3 kg. Unconfirmed reports suggest that Hezbollah has dozens of SA-14s, likely supplied by Iran.<sup>71</sup>

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### **9K310 IGLA-1 (NATO: SA-16 GIMLET) AND 9K38 IGLA (NATO: SA-18 GROUSE)**

The SA-16 and SA-18 are MANPADs developed by Russia. The SA-18 is an improved version of the SA-16. The

rockets have a range of about 0.5 km, a flight ceiling of 3.5 km, and employ a two-color infrared homing device for guidance. They were most likely supplied by Iran.<sup>72</sup>

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### **9K40 BUK-M2 (NATO: SA-17 GRIZZLY)**

The SA-17 is a medium-range air defense system developed by Russia in the early 1990s. It holds four ready-to-launch missiles, which can engage targets at a 50 km range at an altitude of 10 to 24 km. The SA-17 is designed to protect ground troops and can be moved by a collection of vehicles and trailers, making it difficult to target.<sup>73</sup>

Russia sold a battery of SA-17s to Syria in 2007 after Israel conducted an airstrike on an unfinished Syrian nuclear reactor.<sup>74</sup> Moscow again provided Damascus SA-17s in 2015, leading analysts to conclude that Syria was the most likely source of Hezbollah's current inventory. In January 2013, Israeli airstrikes targeted a convoy of SA-17 missiles en route from Syria to Lebanon. Israeli fighters are also believed to have carried out several strikes against SA-17 convoys in late 2015.<sup>75</sup> Israel considers the SA-17 one of the more significant threats it faces from Hezbollah.

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### **PANTSYR-S1 (NATO: SA-22 GREYHOUND)**

The SA-22 is a short- to medium-range air defense system developed by Russia in the 1990s to replace the older SA-19 Grison. The SA-22 was designed as a point defense weapon, with its 12 57E6 or 9M335 interceptors capable of engaging targets at ranges between 1.2 and 20 km, at a maximum altitude of 15 km. Both missile types are 3.2 m in length and employ a 20 kg HE-fragmentation warhead. The vehicle also carries a radar and two 30 mm anti-aircraft cannons.<sup>76</sup>

Iran or Syria likely supplied Hezbollah with the system. Russia sold Syria 850 Pantsyr-S1E units in 2008 and 36 units of the Pantsyr-S1E in 2009. Russia also sold Iran 10 units of the Pantsyr-S1 at an unknown time. At a United Nations meeting in 2015, Israeli Prime Minister Benjamin Netanyahu accused Iran of transferring SA-22s to Hezbollah, but did not provide confirmatory evidence.<sup>77</sup>

## **CONCLUSION**

Hezbollah has acquired a diverse and growing set of rocket and missile forces with which it can harass and threaten its adversaries. Despite Israeli interdiction efforts, the party has maintained an impressive and sizable force. This force presents one of the most dangerous flashpoints between Israel and Hezbollah, as well as a source for further rocket and missile

proliferation in the region. With an arsenal providing land attack, antiship, antitank, and anti-air applications, useful for quick retaliatory shots, general deterrence, and military operations, Hezbollah is unlikely to alter its investment strategy without a fight. ■

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