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ARSENAL UPGRADES

MANPADS, the RSF, and the War in Sudan

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A QW-pattern launch tube and gripstock seized from the RSF and displayed by the Sudanese military at a base in Omdurman. Source: Katharine Houreld

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Overview

This Briefing Paper analyses the illicit acquisition and use of man-portable air defence systems (MANPADS) by the Rapid Support Forces (RSF) as revealed in media reporting and social media posts, including posts by the RSF itself, since the outbreak of the Sudanese civil war in April 2023. Data collected for this paper indicates that the RSF has acquired at least eight different models of MANPADS, including five advanced models—more than any other armed group in the Middle East and North Africa (MENA) region. The RSF is also the first non-state armed group to obtain recent-generation Chinese FN-16 MANPADS. These findings highlight two important proliferation trends: the gradual supplanting of Soviet-/Russian-designed MANPADS with recent Chinese-designed systems, and the continued proliferation of advanced MANPADS despite international counter-MANPADS initiatives and norms.

Key findings

- Since the outbreak of the Sudanese civil war in April 2023, the Survey has identified at least eight different models of MANPADS in the possession of the RSF, including five advanced (third- and fourth-generation) systems. This is the first publicly documented case of an armed group in the MENA region armed with eight models of MANPADS.
- The RSF is also the first group in the MENA region known to have acquired four different models of Chinese-designed MANPADS, as well as the first to have acquired FN-16 MANPADS. Prior to their appearance in Sudan, FN-16s had not been documented outside of government control in Africa or elsewhere. Since known distribution of the FN-16 is extremely limited, it is highly likely that the missiles came from—or were acquired with the assistance of—a state actor.
- The RSF's inventory of MANPADS reflects two region-wide proliferation trends: the gradual supplanting of Soviet/Russian systems with Chinese-designed models in armed groups' arsenals, and the continued illicit proliferation of advanced MANPADS despite international counter-MANPADS efforts.

Introduction

MANPADS are short-range surface-to-air missiles that are intended for use against low-flying aircraft and launched from a tube that rests on the operator's shoulder. Designed specifically for use by dismounted infantry, MANPADS are lightweight, portable, and easy to assemble and operate. These characteristics, which are essential for successfully engaging fast-moving aircraft in combat conditions, also make MANPADS attractive to non-state actors. For instance, an armed group intending to attack a military or commercial airliner can easily conceal a MANPADS in the back seat of a car and drive it to a military base or commercial airport. Once the attacker is in position and the target identified, the missile system can be assembled and launched in less than a minute. The 'fire and forget' missile then guides itself to the target, allowing the attacker to leave the area before the passengers on the aircraft even realize they are under attack.

Recognizing the serious threat posed by the illicit acquisition and use of MANPADS, the United States and like-minded states took several steps to minimize acquisition of these systems by unauthorized end users as part of a global counter-MANPADS initiative that started in the early 2000s (Schroeder, 2013, pp. 21–22). These steps include the negotiation of multiple multilateral agreements on export controls and stockpile security that have been endorsed—directly or indirectly—by nearly every government in the world. Yet despite these efforts, the illicit proliferation of MANPADS continues, especially in the MENA region.[1] Nowhere is this proliferation more evident than in Sudan, where imagery posted online since April 2023 shows members of the RSF with at least eight models of MANPADS, including recent-generation systems not previously seen outside of government control. This Briefing Paper examines the illicit possession of MANPADS by the RSF and assesses the implications of this proliferation for conventional weapons threat mitigation efforts. The Survey chose to focus solely on the RSF rather than on all parties to the current conflict because of resource and space constraints, and because of the unprecedented nature of the RSF's inventory of MANPADS.

Illicit possession and use of MANPADS in Sudan

The illicit possession and use of MANPADS by armed groups in Sudan dates back at least to the 1980s, when the Sudan

Table 1 MANPADS models identified in RSF possession, 2023–26

Model	Generation	Country of origin*	Year(s) documented Complete system (c), incomplete (i), unclear (u)**
HN-5	1	China	2023 (c)
Strela-2M/Strela-2 pattern	1	Unclear	2023 (u), 2024 (i), 2025 (c), 2026 (c)
Igla-1	2	USSR/Russian Federation	2025 (i)
Igla	3	USSR/Russian Federation	2023 (c)
Igla-S	3	USSR/Russian Federation	2023 (i), 2025 (i)
QW pattern***	3	China	2025 (i)
FN-6 pattern	Unclear (3/4)	China	2023 (c), 2024 (i), 2025 (i)
FN-16	Unclear (3/4)	China	2023 (i), 2024 (c), 2025 (i)

Notes:

* The countries listed below are either the country of design, manufacture, or both.

** 'c' = complete system: all four main components required to launch the missile are present (missile, launch tube, gripstock, battery unit); 'i' = incomplete system: one or more main components are not visible in available imagery; 'u' = unclear: one or more main components may not be present (this often applies when the cap is on the launch tube in available imagery, making it impossible to tell whether the missile is still in the tube).

*** Publicly available imagery does not allow for the identification of the specific model of QW-pattern MANPADS in this case.

Source: Small Arms Survey (n.d.)

People's Liberation Army (SPLA) shot down multiple civilian planes with first-generation Soviet-designed SA-7-pattern missiles during the second Sudanese Civil War (1983–2005). The attacks killed 77 people, including the 60 passengers and crew on board a twin-engine Fokker F-27 prop aircraft shot down shortly after departing from Malakal (now in South Sudan's Upper Nile state) in August 1986 (US DoS, 1994, p. 77; US TSA, 2011).

The last successful (documented) missile attack on civilian aircraft in Sudan occurred in 1989 (US TSA, 2011), after which the threat posed by illicit MANPADS receded from the headlines. Publicly available information suggests that the MANPADS in the inventories of armed groups in the 2000s and 2010s were few in number and primarily older systems, some of which had been circulating in Sudan for years. That changed in May 2023 when a video showing RSF members holding multiple Chinese-designed FN-6 MANPADS outside of the Republican Palace in Khartoum was posted on social media (see Image 1). The RSF's acquisition of MANPADS reflects a strategic need to mitigate aerial threat from the Sudanese Armed Forces (SAF), including from fighter aircraft, combat helicopters, and unmanned aerial vehicles (UAVs).

Since then, photos and videos of RSF fighters have revealed the presence of at least seven additional models of MANPADS in its arsenal. These systems, which include both Chinese- and Soviet-/Russian-designed models, are listed in Table 1. Only one other armed group in

Images 1–5 RSF fighters displaying FN-6 MANPADS and components, 2023

Notes: Members of the RSF displaying a mix of complete FN-6 MANPADS and launch tubes outside of the Republican Palace, Khartoum, May 2023 (1); RSF members holding empty FN-6 tubes, 2023 (2); an RSF member holding an FN-6 missile and a gripstock (no battery), 2023 (3); former SAF air force captain Sufyan Muhammad Zayn posing with an FN-6 missile and gripstock, 2023 (Sufyan appears in several social media posts with different MANPADS) (4); RSF fighters with a mix of unused and expended FN-6 launch tubes, 2023 (5).

Sources: War Noir (2023a; 2023h; 2023f) (1–3); RSF (2023a) (4); War Noir (2023j) (5)

the MENA region, Lebanese Hezbollah,[2] has a documented MANPADS inventory of more than four systems.

Types and models of illicit MANPADS held by the RSF

Chinese-designed MANPADS

Publicly available imagery reveals that the RSF has acquired at least four different models of Chinese-designed MANPADS, three of which are considered advanced systems (FN-6, FN-16, and a QW-pattern system). The fourth model is the HN-5, which is a Chinese variant of the first-generation Soviet Strela-2M.

The FN-6 is a recent-generation system developed in the late 1990s. It has a longer range and is faster and more resistant to aircraft counter-measures than older MANPADS (Jane's Group, 2024). Illicit FN-6s have been circulating in the MENA region since at least 2013, when the first images of systems smuggled to Syrian rebels appeared online. Since then, the Survey has identified FN-6s in the arsenals of 12 armed groups in five MENA states (Small Arms Survey, n.d.).[3] As noted above, the first images of RSF members with FN-6s were posted online in May 2023.[4] Over the next year, imagery of RSF fighters holding or using FN-6s was posted online on at least nine separate occasions. The images show a mix of complete systems,[5] partial systems, and empty launch tubes (see Images 1–5).

The RSF has also acquired at least a limited number of FN-16 MANPADS, an updated version of the FN-6 that had not been identified outside of government control prior to its appearance in Sudan. The FN-16 has a more advanced seeker and a longer range than its predecessor.[6] Existing evidence indicates that the global distribution of the FN-16 is limited to just a handful of importing states.[7] This fact, combined with the absence of documented acquisition of FN-16s by armed groups, strongly suggests that the units acquired by the RSF came directly from a state sponsor or one of its agents.

The first sighting of an FN-16 in Sudan was in a video—posted on the RSF's X account in October 2023—of the downing of a government plane in the Nyala area of South Darfur state (RSF, 2023d). After showing a missile striking the plane, the video cuts to an RSF fighter holding a clear plastic bag containing a MANPADS launch tube. The UN Panel of Experts referred to the MANPADS as 'likely a SA-7 type', but a visual inspection of a photo of the tube reveals that it is actually an FN-16 (UNSC, 2024, p. 14; see Image 7).

Over the next six months, two additional videos of missile launches appeared online, both of which show one or more of the distinctive physical characteristics of the FN-16, including the system's cylindrical battery unit; its short, rectangular gripstock; its launch tube markings; and the circular band around its launch tube opening (see Images 6–9).

Images of the FN-16 launches, along with an FN-6 launch, are provided below (see Images 10–15).

Images 6–9 Distinctive physical characteristics used to identify FN-16 MANPADS in Sudan

Notes: FN-16 MANPADS on display at a defence exhibition (6); markings on an FN-16 launch tube displayed by RSF members, 2023 (7); FN-16 gripstock attached to an expended launch tube after an attack on SAF aircraft, 2024 (8); FN-16 battery coolant unit attached to an expended launch tube after a night-time attack on SAF aircraft, 2024 (9).

Sources: Mike1979 Russia (2022) (6); RSF (2023d) (7); NzarW49480 (2024) (8); War Noir (2024) (9)

Images 10–15 Distinctive physical characteristics used to identify FN-16 MANPADS in Sudan

Notes: RSF fighter launching a MANPADS missile at an unseen aircraft over Khartoum, circa January 2024 (10); RSF fighter launching an FN-6 MANPADS at a Sudanese aircraft, 2023 (11); screenshots from a video of an RSF fighter firing an FN-16 MANPADS at an unidentified target, 2024 (12–15).

Sources: NzarW49480 (2024) (10); WarNoir (2023c; 2024) (11–15)

Images 16–17 Chinese HN-5 MANPADS displayed by RSF officer, 2023

Notes: Screenshots of former SAF captain Sufyan standing in front of the police headquarters in Khartoum with a Chinese-designed HN-5 MANPADS (16, 17). The markings on the (SK-5) gripstock and battery unit of Sufyan's HN-5 MANPADS indicate that they were manufactured in 1989 and 1987, respectively.

Sources: War Noir (2023e; 2023g) (16); RSF (2023b) (17)

The third Chinese-designed MANPADS identified in Sudan is the first-generation HN-5, one of which was displayed by former SAF air force captain Sufyan Muhammad Zayn at the Sudan Police Force headquarters in Khartoum in mid-2023. Markings on the components indicate that they were manufactured in 1987 and 1989, respectively (see Images 16–17). While MANPADS are capable of functioning at that age, the likelihood of key components malfunctioning during use increases over time, raising questions about the operational status of these systems (see Box 1).

The final and most recently identified Chinese-designed MANPADS component spotted in Sudan is a single QW-pattern launch tube and gripstock seized from the RSF in May 2025 (Houreld, 2025; see Images 18–19). QW-series MANPADS are recent-generation systems, the first of which—the QW-1—was fielded in the 1990s. Several additional models quickly followed, including the QW-18. Along with the QW-1, the QW-18 was exported to several countries, including known proliferators such as Iran, which later produced[8] the QW-1 and the QW-18 domestically as the Misagh-1 and Misagh-2. The Survey has identified QW-1- and QW-18-pattern MANPADS in the inventories of non-state actors in eight MENA states and territories,[9] and has linked some of these systems to Iran. The absence of legible imagery of the markings precludes the identification of the proximate source of the QW-pattern MANPADS seized by Sudanese authorities.

Soviet-/Russian-designed MANPADS

The Survey has identified four Soviet-/Russian-designed MANPADS models in the possession of the RSF: Strela-2M (first generation), Igla-1 (second generation), Igla (third generation), and Igla-S (third generation). The second-generation

Box 1 The unpredictable operational status of MANPADS acquired by armed groups

While the videos and reports of downed aircraft appear to confirm that at least some of the RSF's MANPADS are operational, it would be a mistake to assume that the same is true of all of the missiles in their inventories. In Syria, armed groups posted numerous videos of MANPADS launches, including successful strikes on the former (Bashar al-Assad) government's aircraft. Yet interviews with the rebels revealed that dozens of their MANPADS, including missiles from both looted stocks and foreign suppliers, were inoperable or malfunctioned during use (Chivers, 2013).

Images 18–19 A Chinese-designed QW-pattern MANPADS launch tube and gripstock seized by the Sudanese military from the RSF, May 2025

Notes: A QW-pattern launch tube and gripstock seized from the RSF and displayed by the Sudanese military at a base in Omdurman. No battery unit is visible in the photos and the launch tube covering appears to be cracked.

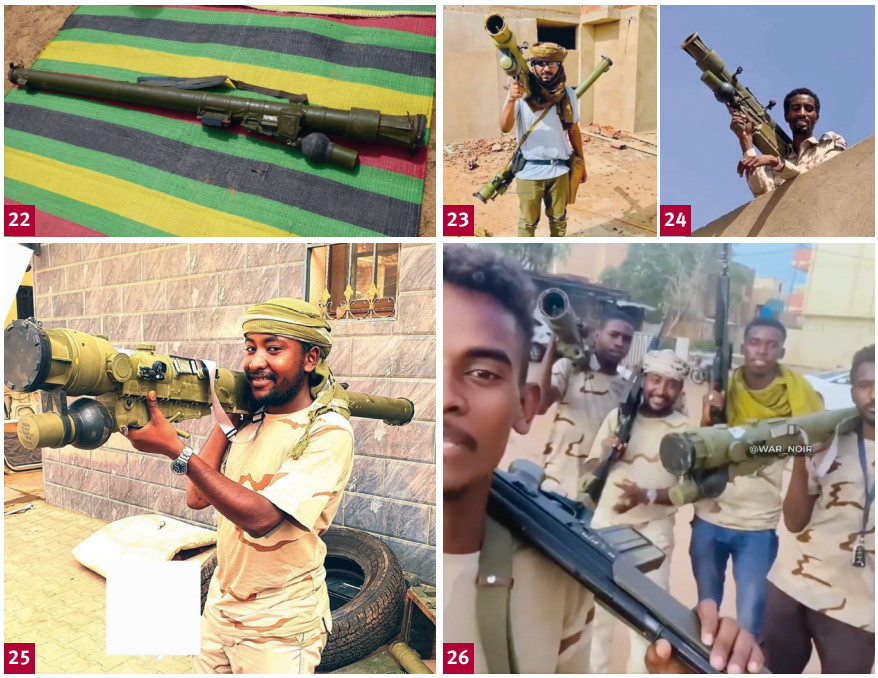
Sources: Houreld (2025) (18); RTArNewsRoom (2025) (19)

Images 20–21 Igla-1- and Strela-2-pattern MANPADS missile reportedly seized by the RSF, 2025

Notes: Imagery from a video of launch tubes for an Igla-1- and two Strela-2-pattern MANPADS (20–21) reportedly seized from the SAF by the RSF in late 2025. The video shows a man removing the cap from the Igla-1 tube, revealing the tri-cone nose of the missile. No gripstocks for Igla-1 MANPADS are visible in the video.

Source: War Noir (2025)

Images 22–26 Soviet-/Russian-designed MANPADS and components displayed by the RSF, 2023



Notes: Igla launch tube and battery coolant unit surrendered to the Sudanese government by a faction of the Justice and Equality Movement, 2018 (22); RSF fighter holding an Igla and an incomplete Strela-2-pattern MANPADS (no gripstock is visible), 2023 (23); RSF fighter holding an Igla MANPADS, 2023 (24); RSF fighter displaying an Igla-S launch tube and battery coolant unit, 2023 (no gripstock) (25); RSF fighters with Igla and Igla-S launch tubes (the Igla missile is visible), 2023 (26).

Sources: UNSC (2019) (22); War Noir (2023b) (23); RSFo7 (2023) (24); War Noir (2023i; 2023d) (25, 26)

Igla-1 was fielded in 1981 (Jane's Group, 2021) and has proliferated widely in the MENA region and elsewhere. The first (and only) report of Igla-1-pattern MANPADS concerns a missile seized from the SAF by the RSF in November 2025. A video of the missile shows a man removing the cap from the launch tube, revealing the distinctive tri-cone nose of the Igla-1 missile (War Noir, 2025; see Images 20–21).

Advanced Soviet-designed MANPADS identified in RSF stocks include the Igla and the Igla-S (see Images 22–26). The Igla was initially fielded in 1983[10] and, like the Igla-1, has proliferated widely, including to numerous armed groups in the MENA region.[11] The other third-generation Soviet-designed system is the Igla-S—an improved version of the Igla. While the Igla-S has not proliferated as widely, it has been acquired by groups in several MENA states.[12] Available imagery shows at least one complete Igla system in the RSF's possession. To date, none of the Igla-S launch tubes spotted in Sudan are attached to gripstocks.

The RSF has also acquired first-generation Strela-2M-pattern MANPADS, which are the most widely proliferated MANPADS in the world and among the least capable. The Survey located at least a dozen images of SA-7 pattern MANPADS in the possession of the RSF at some point between May 2023 and January 2026. The physical similarities between the Strela-2M and the HN-5, however, preclude a definitive identification of the model without clear imagery of the markings, which are only partially visible in photos from one case.

Sources of illicit MANPADS in Sudan

Information on the sources of the RSF's MANPADS is limited at best. Reports of looting from government storage facilities indicate that at least some of the group's MANPADS were sourced domestically. This is not surprising given the number and type of facilities reportedly overrun by the RSF and the Sudanese military's known stocks of MANPADS, which reportedly include Strela-2-pattern, Igla, and FN-6 systems (Jane's Group, n.d.). How many of the RSF's MANPADS were obtained domestically is less clear. Most reports describe the looted missiles as 'SAM-7' or 'SA-7' MANPADS[13] (Elmotazballah, 2023), which could be specific references to Strela-2-pattern systems or, especially in the case of the reference to 'SAM-7s', shorthand references to MANPADS more generally.

Imagery of the MANPADS seized from Sudanese military facilities is available for just one case, namely the seizure of several launch tubes found in a cave-like facility in Khartoum in or around July 2023. Video footage of the facility shows hundreds of crates of munitions, including at least two containing an FN-6 launch tube and multiple Strela-2-pattern tubes (either Strela-2/M or Chinese HN-5 missiles). The tubes are covered in dust, with no visible gripstocks or battery units (RSF, 2023c; see Images 27–29). None of the key identifying markings on the tubes are fully legible, precluding efforts to link them—and the facility—to MANPADS displayed by the RSF at other times and in different locations. Imagery of other MANPADS reportedly seized from Sudanese government stocks came from locations other than clearly identifiable storage facilities, making it difficult to confirm that the missiles were sourced from government inventories. Thus, the only MANPADS that the Survey was able to definitively trace to seized Sudanese government stocks are the ones shown in Images 27–29.

Armed groups in Sudan are also potential sources of illicit MANPADS, although the types and quantities appear to be limited. In 2018, for example, a faction of the Justice and Equality Movement surrendered large quantities of weapons to the Sudanese government as part of a peace initiative. These weapons included an Igla missile. This could be one of several Igla missiles delivered to Darfuri rebel groups by the SPLA who reportedly received them from an unidentified 'neighbouring country', which, in turn, had imported them from an unidentified Eastern European state (UNSC, 2019, pp. 33–35; see Image 22). According to UN investigators, the Iglas 'were of limited use to the Darfurian groups, because SPLA did not deliver them the associated training' (p. 35). It is therefore possible that the missiles received by the SPLA were still in Darfur in 2023. Whether the Iglas displayed by the RSF are those missiles is unknown because none of the markings are visible.

Claims of international transfers of MANPADS to the RSF are equally difficult to confirm. In its January 2024 report, the UN Panel of Experts on Sudan concluded that allegations of trafficking of weapons, including 'anti-aircraft missiles', supplied by the United Arab Emirates (UAE) and transported through Chad were 'credible' after they 'triangulated [information] from several military and intelligence sources, and local interlocutors in the Sudan and Chad' (UNSC, 2024, p. 15). A confidential February 2024 memo by the European Union Ambassador to Sudan reportedly contains similar allegations.[14] The UAE has repeatedly denied providing weapons to the RSF (Al Jazeera, 2025; Shah and Cornish, 2024).

The panel also claimed that the RSF had received two shipments of arms and ammunition from the Central African Republic (CAR) in April and May 2023, including an unspecified quantity of MANPADS (UNSC, 2024, pp. 16–17). This claim followed a statement made by the US Mission to the UN in May 2023, which accused the Russian military organization the Wagner Group of involvement in the trafficking. The statement read, 'We are increasingly alarmed by reports that MANPADs have been transported through CAR into Sudan by the Wagner Group' (US Mission to the UN, 2023).

Media reports from 2023 and 2024 reiterate and, in some cases, elaborate on these claims. A CNN article from April 2023 identified Libya as the staging area for the Wagner-led trafficking, noting that 'Russia' (not 'Wagner') airdropped MANPADS to RSF forces in north-west Sudan, citing unspecified 'regional and Sudanese sources' (Elbagir et al., 2023). The article implicitly links this delivery to suspicious flight patterns of a Russian transport plane in the days leading up to the reported airdrop. The plane reportedly flew from Khadim airbase in Libya to Latakia, Syria, 'where Russia has a major airbase', and then back to Khadim before flying to another Libyan airbase in Jufra. The article does not explicitly state that there were MANPADS on the plane when it returned from Syria, let alone how CNN concluded that the MANPADS in the plane were the same ones that were airdropped to the RSF a few days later. Former Wagner Group leader Yevgeny Prigozhin denied the allegations (Elbagir et al., 2023).

While the Survey has no reason to question the veracity of these claims, it is not possible to substantiate them without additional evidence. It is unclear how the various UN and government officials arrived at their conclusions, and none of the publications quoting them include imagery of the MANPADS or their crates, copies of shipping or storage documents, or detailed information about the MANPADS. Without this or comparable evidence, the Survey is unable to identify the proximate sources of the RSF's MANPADS.

Images 27–29 MANPADS launch tubes reportedly captured by the RSF from a government arms depot in Khartoum, 2023

Notes: Video footage taken at a storage facility showing an FN-6 and multiple Strela-2-pattern MANPADS launch tubes found in a government arms depot reportedly captured by the RSF, 2023 (27–29). No gripstocks or batteries are visible in the footage.

Source: RSF (2023c) (27–29)

Conclusion

The RSF's increasingly diverse inventory of MANPADS, including advanced missile systems, is the latest example of two worrisome region-wide trends. The first is the gradual supplanting of Soviet/Russian MANPADS by Chinese-designed systems in the inventories of armed groups. In a 2001 study, Jane's Group identified two models of Chinese MANPADS obtained by just three of the 27 armed groups worldwide reported or confirmed to have acquired MANPADS in the previous five years (Hunter, 2001).

Twenty years later, a similar analysis conducted by the Survey identified Chinese-designed MANPADS in the arsenals of 14 groups in the MENA region alone, 12 of which possessed advanced Chinese systems (Schroeder, 2024, p. 32). Existing evidence indicates that most of these MANPADS were acquired, directly or indirectly, from importing states—an indictment of Chinese end-use controls on their exported MANPADS.

The second trend is the continued proliferation of advanced MANPADS despite two decades of international counter-MANPADS initiatives. As noted above, the United States and other like-minded states have invested heavily in diplomatic efforts and foreign aid programmes aimed at strengthening export controls and securing government stockpiles of MANPADS. By the early 2010s, these efforts had eliminated tens of thousands of surplus and obsolete missiles; improved security in depots holding thousands more; and prompted notable (if inconsistently applied) changes to the export practices of key producer states. A precipitous decline in documented MANPADS attacks on civilian aircraft coincided with these efforts and has continued to this day.

These accomplishments are imperilled by vulnerable government stockpiles and covert transfers of imported MANPADS to state-sponsored proxy groups, especially in the MENA region. In a 2024 study, the Survey identified reports of illicit possession of MANPADS in half of the 26 states and territories in the region,[15] including advanced MANPADS in the inventories of armed groups in nine states (Schroeder, 2024, p. 50). Available data also indicates that this proliferation is not just the recirculation of MANPADS already in the illicit sphere prior to the counter-MANPADS campaign. At least five of the seven models of advanced MANPADS[16] identified in the region had not been publicly documented outside of government control before 2011. In that regard, Sudan stands out; the RSF is the first armed group in the MENA region identified by the Survey as having acquired five different models of advanced MANPADS. The longer this trend continues, the greater the likelihood that the 18-year streak of zero successful MANPADS attacks on civilian aircraft will abruptly end, with potentially catastrophic consequences for civil aviation.

Reducing the illicit proliferation of MANPADS, and particularly advanced models, is possible. Sources of illicit MANPADS remain relatively limited. Most non-state end users of illicit MANPADS are groups that either receive military aid from government sponsors or seize government facilities containing MANPADS. There is some secondary circulation due to losses from—or retransfers by—these groups, but beneficiaries of this recirculation tend to be relatively few in number and largely located in the same geographic region as the original recipients. Acquisition of MANPADS, and especially advanced MANPADS, by other unauthorized end users located outside of the MENA region is rare, even among those with significant resources, such as drug cartels. Securing vulnerable government stocks of MANPADS and curbing illicit proliferation by importing states would therefore almost certainly reduce the number of MANPADS (especially advanced MANPADS) available to armed groups and other violent non-state actors.

> “Strategies for preventing diversion of MANPADS are as old as the systems themselves, and are clearly laid out in a series of guidelines and best practices adopted by members of several key multilateral organizations in the 2000s.”

Strategies for preventing diversion of MANPADS are as old as the systems themselves, and are clearly laid out in a series of guidelines and best practices adopted by members of several key multilateral organizations in the 2000s. Most MANPADS-exporting states, including China, are members of these organizations. These control measures include:

- the adoption of robust pre-licence checks aimed at assessing the likelihood of diversion and ensuring that potential recipients are willing and able to prevent unauthorized retransfers, diversion, loss, or theft;
- the inclusion of detailed provisions regarding stockpile security requirements and retransfer restrictions in contracts and other documentation associated with MANPADS exports;
- the implementation of rigorous stockpile security measures by importing states, including strict record-keeping, restrictions on access to MANPADS and key components, and separate storage of missiles and gripstocks;
- the disposal of surplus and obsolete MANPADS held by importing states before exporters approve the transfer of new MANPADS; and
- the development and installation of ‘technical performance and/or launch control features’ in newly designed MANPADS that prevent unauthorized use of the systems, even when they are seized, lost, or stolen from state inventories (APEC, 2004; OSCE, 2008, para. 3.4; WA, 2007, para. 3.4).

Other key measures critical to preventing diversion, but not explicitly included in the guidelines and best practices, include annual on-site physical inventories by serial number of all exported MANPADS and the export of vehicle-mounted systems instead of man-portable systems to countries where armed conflict, political instability, or corruption significantly increase the likelihood of theft, seizure, or diversion. Full implementation of these controls would have prevented the diversion—or mitigated the threat from looted or diverted missiles—in most recent cases of illicit proliferation of MANPADS in the MENA region.

Convincing exporting and importing states to fully implement these controls and take other steps to prevent the illicit proliferation of MANPADS requires significant and sustained external pressure, little of which has been brought to bear in recent years. This is illustrated by the

relatively muted public response to the RSF's acquisition of advanced MANPADS, including systems not previously seen outside of government control. MANPADS are mentioned only briefly in statements by UN and government officials, often in passing, and usually as part of a list of other transferred weapons. There is little or no explicit recognition of the acute threat to civilian aviation posed by MANPADS, or the special status granted to them by the international community in response to this threat. While it is possible that governments are more active behind the scenes on this issue, a written response by the US Department of State to a query submitted by the Survey suggests otherwise. 'Beyond the UNSC [United Nations Security Council] extension of the UN arms embargo, we are unaware of any efforts by actors providing external support to warring factions in Sudan to stop the movement of MANPADS,' reads the response.[17] This inaction, combined with similarly tepid responses to increasingly blatant violations of international norms and guidelines in other MENA states, raises questions about the long-term viability of counter-MANPADS efforts. ●

Abbreviations and acronyms

CAR Central African Republic

MANPADS Man-portable air defence system(s)

MENA Middle East and North Africa

RSF Rapid Support Forces

SAF Sudanese Armed Forces

SPLA Sudan People's Liberation Army

UAE United Arab Emirates

USSR Union of Soviet Socialist Republics

Notes

1 The prominence of MANPADS proliferation in this region is due to several factors, including the number of recent and ongoing conflicts, the involvement of state-sponsored proxy groups in those conflicts, and the loss of state control of MANPADS stocks in Iraq, Libya, and, to a lesser extent, Syria (prior to former Syrian president Bashar al-Assad's fall in December 2024).

2 The models and patterns of MANPADS identified in open-source imagery of Hezbollah's weapons are Strela-2-, Strela-3-, Igla-1-, QW-1-, and QW-18-pattern systems. See Schroeder (2024) and IDF (2024). The inclusion of the Strela-3 is tentative, pending receipt of clearer imagery.

3 These states are Iraq, Lebanon, Libya, Sudan, and Syria.

4 Note that the Sudanese government has had FN-6s in their stocks at least since the mid-2000s (Jane's Group, 2024) and, consequently, it is possible that individuals or units within the RSF had access to FN-6s well before 2023.

5 A complete MANPADS consists of a missile in a launch tube, a gripstock (launcher), and a battery or battery coolant unit.

6 The FN-16 has a maximum range of 6 km versus 5.5 km for the FN-6, and a maximum altitude of 4 km for the FN-16 as compared to 3.8 km for the FN-6. See Jane's Group (2023; 2024).

7 As of August 2023, Jane's had identified just three importing states: Cambodia, Cameroon, and Pakistan (Jane's Group, 2023).

8 Existing evidence indicates that Iran did not produce all of the components for its versions of the QW-series MANPADS domestically, but rather imported them from China and assembled them in Iran. For more information, see Schroeder (2024).

9 These states and territories are Iraq, Israel, Lebanon, Libya, the Palestinian Territories, Sudan, Syria, and Yemen (Small Arms Survey, n.d.). Reports of QW-series MANPADS in Libya are limited to one unverifiable social media post.

10 See Jane's Group (2021).

11 The Survey has identified imagery of illicit Igla MANPADS in the following MENA states and territories: Iraq, the Palestinian Territories, Sudan, Syria, and Türkiye (Schroeder, 2024, pp. 51–56).

12 These states are Egypt, Sudan, and Syria. The Survey also found imagery of Igla-S MANPADS purportedly taken in Libya and Yemen but chose to exclude them because of questions about the provenance of the images (Schroeder, 2024, pp. 51–56, 60).

13 See, for example, Elmotazballah (2023).

14 According to the *New York Times*, the memo claimed that '"[t]he delivery of drones, howitzers, multiple rocket launchers and MANPADS to the RSF by the UAE has helped it neutralize the air superiority" of Sudan's military' (Walsh and Koettl, 2024).

15 These states and territories are Algeria, Chad, Egypt, Iraq, Lebanon, Libya, Niger, the Palestinian Territories, Sudan, Syria, Tunisia, Türkiye, and Yemen.

16 These models are Anza II, FN-6, FN-16, Igla, and Igla-S.

17 Written correspondence with the US Department of State, 27 November 2024.

References

Al Jazeera. 2025. 'UAE Denies Supplying Sudan Paramilitaries with Chinese Arms.' 9 May.

APEC (Asia-Pacific Economic Cooperation). 2004. *Guidelines on Controls and Security of Man-Portable Air Defense Systems (MANPADS)*. 2004/AMM/035. 17–18 November.

Chivers, C.J. 2013. 'The Risky Missile Systems That Syria's Rebels Believe They Need.' At War Blog. *New York Times*. 24 July.

Elbagir, Nima, et al. 2023. 'Exclusive: Evidence Emerges of Russia's Wagner Arming Militia Leader Battling Sudan's Army.' CNN. 21 April.

Elmotazballah, Mustafa Hassan. 2023. Facebook. 12 May.

Houreld, Katharine. 2025. 'Surface-to-Air Missiles and Deadly Drones Spread on Sudan's Battlefields.' *Washington Post*. 29 September.

Hunter, Thomas. 2001. 'The Proliferation of MANPADS.' *Jane's Intelligence Review*. 28 August.

IDF (Israeli Defense Forces). 2024. '769th Brigade Fighters Locate Weapons Depot in Southern Lebanon' [in Hebrew]. 23 December.

Jane's Group. 2021. 'Igla Family of MANPADS.' *Land Warfare Platforms: Artillery & Air Defence*. August.

—. 2023. 'FN-16; FY-16.' *Land Warfare Platforms: Artillery & Air Defence*. 20 November.

—. 2024. 'HY-6; FN-6; FY-6.' *Land Warfare Platforms: Artillery & Air Defence*. 25 July.

—. n.d. 'Sudan: Sudan—Army.'

Mike1979 Russia. 2022. 'Russian: Chinese MANPADS FN-16' [in Russian]. Wikimedia Commons. 20 August.

NzarW49480. 2024. X. 6 January.

OSCE (Organization for Security and Co-operation in Europe). 2008. 'Updating the OSCE Principles for Export Controls of Man-portable Air Defence Systems.' Decision No. 5/08. 26 May.

RSF (Rapid Support Forces). 2023a. Telegram. 17 June.

—. 2023b. Telegram. 26 June.

—. 2023c. Telegram. 6 July.

—. 2023d. X. 9 October.

RSFo7. 2023. Twitter [now known as X]. 24 May.

RTArNewsRoom. 2025. X. 28 May.

Schroeder, Matt. 2013. *The MANPADS Threat and International Efforts to Address It: Ten Years after Mombasa*. Washington, DC: Federation of American Scientists.

—. 2024. *Persistent Perils: Illicit MANPADS in the MENA Region*. Security Assessment in North Africa Report. Geneva: Small Arms Survey. April.

Shah, Gioia and Chloe Cornish. 2024. 'UAE Denies Sending Weapons to Paramilitary Group in Sudan War.' *Financial Times*. 24 January.

Small Arms Survey. n.d. Database of Illicit MANPADS. Unpublished restricted database.

UNSC (United Nations Security Council). 2019. *Final Report of the Panel of Experts on the Sudan Established Pursuant to Resolution 1591 (2005)*. S/2019/34 of 10 January.

—. 2024. *Final Report of the Panel of Experts on the Sudan*. S/2024/65 of 15 January.

US DoS (Department of State). 1994. *Terrorist Tactics and Security Practices*. February.

US Mission to the UN (United Nations). 2023. 'Explanation of Vote Following the Adoption of a UN Security Council Resolution Renewing Central African Republic Sanctions.' 27 July.

US TSA (Transportation Security Administration). 2011. 'MANPADS Attacks on Civilian Aircraft.'
WA (Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies). 2007. Elements for Export Controls of Man-Portable Air Defence Systems.
Walsh, Declan and Christoph Koettl. 2024. 'How a U.S. Ally Uses Aid as a Cover in War.' *New York Times.* Updated 25 September.
War Noir. 2023a. Twitter [now known as X]. 4 May.
—. 2023b. Twitter. 25 May.
—. 2023c. Twitter. 18 June.
—. 2023d. Twitter. 20 June.
—. 2023e. Twitter. 26 June.
—. 2023f. Twitter. 27 June.
—. 2023g. Twitter. 3 July.
—. 2023h. Twitter. 17 July.
—. 2023i. X. 24 July.
—. 2023j. X. 25 November.
—. 2024. X. 29 March.
—. 2025. X. 25 November.

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The **Human Security Baseline Assessment (HSBA) for Sudan and South Sudan** is a multiyear project administered by the Small Arms Survey since 2006. It was developed in cooperation with the Canadian government, the United Nations Mission in Sudan, the United Nations Development Programme, and a wide array of international and Sudanese partners. Through the active generation and dissemination of timely, empirical research, the project supports violence reduction initiatives, including disarmament, demobilization, and reintegration programmes and incentive schemes for civilian arms collection, as well as security sector reform and arms control interventions across Sudan and South Sudan. The HSBA also offers policy-relevant advice on the political and economic drivers of conflict and insecurity. Selected publications are available in Arabic and French at:

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