SPECIAL REPORT:

Advanced UAVs Identified at RSF-Controlled Nyala Airport

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Yale SCHOOL OF PUBLIC HEALTH
Humanitarian Research Lab

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I. Key Findings

The Yale School of Public Health's Humanitarian Research Lab (HRL) has observed three unmanned aerial vehicles (UAVs) at RSF-controlled Nyala Airport between 9 December 2024 and as recently as 14 January 2025. Yale HRL assesses that these UAVs are most consistent with FH-95s (see typing section). The FH-95 has significant electronic surveillance and warfare capabilities and can be equipped with air-to-ground munitions. The FH-95 is manufactured by the Chinese company Aerospace Times Feihong Technology Company (Feihong). It is not yet known which countries have purchased these airframes to date, nor is it known who supplied these specific airframes to the RSF. Feihong reported that FH-95s were first purchased by an unnamed customer in 2019; a large order was placed in 2021 by another unnamed customer.[1] Chinese open sources have claimed that Serbia purchased a large order of FH-95s, however Serbian state videos posted on Chinese media from that time instead shows a purchase order for CH-95s.[2] It is unknown whether Serbia has purchased FH-95s.

The arrival of the two UAVs by 28 December 2024 occurred during the period in which White House Coordinator for the Middle East and North Africa Brett McGurk, in a letter to Senator Chris Van Hollen (D-MD), stated that the United Arab Emirates (UAE) is not now supplying weapons to the RSF.[3] Although it is not known who supplied these UAVs, it is likely that a foreign actor has transferred lethal UAVs to the RSF that appeared in the field following the US government's claim that the UAE is not transferring weapons. The UAE is a known sponsor of RSF armed activity since the outbreak of war in October 2023.[4] On 17 January 2025 the White House is expected to provide the US Congress with its determination about whether UAE arms transfers are continuing. It is not known whether these UAVs first entered RSF's service in Nyala at this time and place, or if they had been under RSF control preceding either the McGurk letter or the UAVs' presence in Nyala.

The arrival of these UAVs, which are advanced weapons systems, at an RSF-controlled airport within the past 4-6 weeks indicates recent transfers of sophisticated military technology likely from an outside foreign actor to the RSF. Yale HRL has observed 43 shipping containers appearing at the Nyala Airport between 14 December 2024 and 12 January 2025 which corroborates that cargo transport flights have occurred. This corroborates multiple reports of repeated flights into Nyala airport allegedly supplying RSF.

Reported Air Operations at Nyala Airport

Ongoing reports across local and social media claim that cargo flights have landed at least ten times at RSF-controlled Nyala Airport since September 2024. According to these reports, flights typically land between 10 pm (2200) CAT and depart by 6 am (0600) CAT. Open sources report that these flights may provide weapons, munitions, and other supplies to RSF.[5] Open sources have reported flights on 1 September, 25 September, 13 October, 31 October, 6 November, 9 November, 14 November, 22

November, and 28 December 2024, as well as on 1 January, 3 January, 10 January 2025.[6] Yale HRL is not currently able to verify these individual reports due to insufficient data during the reported flight times.

SAF airstrikes on Nyala have followed these reported flights multiple times. Some munition impacts from these airstrikes have damaged the tarmac or areas near the airport; other airstrikes have targeted neighborhoods kilometers away from the Nyala Airport.[7]

Analysis of UAVs at Nyala Airport

Yale HRL has identified three objects consistent with fixed-wing UAVs present in satellite imagery at the Nyala Airport as of 12 January 2025. A UAV was first visible at Nyala airport on 9 December 2024 and no longer present on 14 December 2024. By 28 December 2024, two UAVs were visible; between 3-8 January 2025, three UAVs are visible in satellite imagery at the airport. Only two UAVs were visible at the airport on 12 and 14 January 2025.

These UAVs have a wingspan of approximately 12.2 meters, a length of approximately 8 meters, winglets (flared edges) at the ends of the wings and a twin boom tail. The configuration and dimensions of these UAVs are not commonly found in fixed-wing UAVs. Yale HRL has not yet identified a ground control station for these UAVs and the location where these UAVs are controlled from is currently unknown.

FH-95 Assessment

The FH-95 is manufactured by the Aerospace Times Feihong Technology Company (Feihong), a subsidiary of the state-owned China Aerospace Science and Technology Corporation.[8] The FH-95 is a multifunctional UAV, characterized by a twin-boom tail and winglets on its body. This UAV's capabilities include electronic warfare, reconnaissance, and attack roles.[9] There is little publicly available data on the specifications of the FH-95 UAV and its buyers. The FH-95 was advertised to be present at the Zhuhai Airshow in November 2024 and the DIMDEX trade show in Qatar in March 2024.

Yale HRL has identified a UAV at a test site in Baotou, Inner Mongolia, consistent with the shape, color and body dimensions of the suspected FH-95 UAVs identified at Nyala Airport between December 2024 and January 2025. The UAVs in Baotou have a wingspan that measures 12m and share similar color and body configurations as the UAVs identified in Nyala. The UAVs identified at Baotou are consistent with what is known about FH-95s. Feihong is reported to have a UAV test site in Baotou, and FH-95s demonstrated at the 2024 Zhuhai airshow were reportedly controlled by a ground station in Inner Mongolia.[10] The Baotou test site is near the office of the Northern Heavy Industry Group, which is a subsidiary of Norinco, a Chinese state-owned company, in Inner Mongolia.[11] Yale HRL previously identified four artillery pieces

consistent with AH-4s, manufactured by Norinco, in El-Fasher starting in November 2024.[12]

These UAVs are assessed to be consistent with the FH-95 based on available dimensions, the configuration of the tail, the wing configurations, and the position of the dome *(see Table 1)*. Yale HRL analyzed a range of alternatives from the known inventories of potential UAVs with similar configurations. These candidates of UAVs include the Forpost-R, the FH-91, the FH-92A, the FH-96, the Wing Loong I, the Wing Loong II, the Mohajer-6, the TAI Anka-S, the TAI Aksungur, the Striking Hawk TW312, the Twin Tailed Scorpion TW328, the BZK-500E, the CH-95, the CR500, and the Turkish Bayraktar TB-2. All other potential candidates other than the FH-95 were rejected based on a combination of the following: (a) dimensions, including wingspan, length (nose-to-tail), and length ratio (wingspan: body length); (b) wingspan configuration; (c) tail configuration; and the (d) dome.

Table 1: UAV Assessment Components

Assessment Components	Nyala UAVs*	Baotou Test Site UAVs*	FH-95	UAVs Consistent with Criteria	UAVs Inconsistent with Criteria
Wingspan (m)	**~12 m**	~12.2 m		CR500, Bayraktar TB-2	Forpost R, Wing Loong I, Wing Loong II, Mohajer-6, TAI Anka-S (Variations include Anka+A, Anka-B, Anka-I), TAI Aksungur (Anka 2), FH-96, FH-91, Striking Hawk TW312, Twin Tailed Scorpion TW328, CH-95, BZK-500E, CR500, Bayraktar TB-2
Length (nose - tail)	**~8m**	~7.5 -8 m		Mohajer-6, Striking Hawk TW312	Forpost R, Wing Loong I, Wing Loong II, TAI Anka-S (Variations include Anka+A, Anka-B, Anka-I), TAI Aksungur (Anka 2), FH-96, FH-91, Twin Tailed Scorpion TW328, CH-95, BZK-500E, CR500, Bayraktar TB-2
Ratio of Wingspan : Length	**~3:2**	~3:2	~3:2†	Wing Loong I, Forpost R, FH-95	Mohajer-6, TAI Anka, TAI Aksungur, FH-91, Striking Hawk TW312, Twin Tailed Scorpion TW328, CH-95, BZK-500E,
Tail configuration	**Twin boom tail**	Twin boom tail	Twin Boom tail	Forpost R, Mohajer 6, TAI Aksungur, FH-96, FH-91, CH-95, BZK-500E, FH-95	Wing Loong I, TAI Anka-S, Striking Hawk TW312, Twin Tailed Scorpion TW328, Bayraktar TB-2
Wing Configurations	**Winglets (flared ends)**	Winglets (flared ends)	Winglets (flared ends)	FH-92A, FH-96, CH-95, FH-95	Wing Loong I, Mohajer-6, TAI Aksungur (Anka 2), Striking Hawk TW312, BZK-500E, Bayraktar TB-2
Assessment	**FH-95**	FH-95 Consistent with Nyala UAVs	Consistent with Nyala UAVs and Baotou Test Site UAVs	FH-95 is the only assessed UAV without disqualifying criteria	Inconsistent UAVs: *Forpost R, Wing Loong I, Wing Loong II, Mohajer-6, TAI Anka, TAI Aksungur (Anka 2), FH-96, FH-91, Striking Hawk TW312, Twin Tailed Scorpion TW328, CH-95, BZK-500E, CR500, Bayraktar TB-2*

Note: Yale HRL was not able to identify each component for all assessed UAVs. However, all UAVs were deemed inconsistent based on available characteristics

* This assessment is based on measurements conducted using satellite imagery analysis tools and are therefore approximate.

† This assessment is derived from photo analysis of pixel ratios from photos and videos of FH-95's.

This is not the first time that a UAV with electronic surveillance and warfare capabilities associated with RSF has been identified in this area. Sudan Armed Forces (SAF) and Joint Forces (JF) captured an UAV from RSF that Yale HRL has identified as a CH-95 outside Nyala in December 2024.[13] The UAVs at Nyala Airport in this report differ from the UAVs captured by Joint Forces in the following ways: the wingspan of the UAVs in Nyala are approximately 12m in width. The photos and videos of the UAV allegedly captured from RSF had a wingspan that may be consistent with either 12 m or 20 m; accordingly, the UAV present in the ground photos of the vehicle captured by JF could be consistent with CH-95 or FH-95. Yale HRL cannot reach a high confidence typing based on the photos alone.

Cargo Assessment

Between 14 December 2024 and 12 January 2024 Yale HRL identified approximately 43 containers measuring approximately 6 m x 2.5 m at Nyala Airport. These containers are consistent with 2.44 m x 6.10 m ISO-standard intermodal containers (also known as "shipping containers," "cargo containers," "freight containers," and colloquially as "CONEX [Boxes]").[14]

They have accumulated in phases: twelve of these containers were first visible stacked in two parallel rows in satellite imagery from 28 December 2024, the same day that two of the UAVs featured in this report were first visible in satellite imagery. An additional nine containers were first visible at the eastern edge of the apron in satellite imagery from 8 January 2025, the same day that three UAVs were first visible at the Nyala airport. By 12 January 2024 an additional 22 containers were then present at the location and the first twelve containers appeared to be under construction and being used to create the walls of a new structure. The presence of this cargo corroborates multiple reports of large cargo planes landing at Nyala Airport between 28 December 2024 – 10 January 2025.[15]

These containers are consistent with the external length and width dimensions of 20-foot ISO Series 1 freight containers (length 6.058m, width 2.438m, height varies from 2.438 – 2.896m).[16] These containers are typically transported by container ship, truck, or freight train. They can also be transported by planes, although there are very few planes that can accommodate the size of this cargo.[17]

Operational Significance

The UAVs consistent with FH-95s have great operational significance for the RSF. As a multi-functional UAV, the FH-95 has both surveillance and reconnaissance capabilities, strike capacity, electronic warfare capabilities, and can assist with long-range targeting. This enhances the RSF's known capacities. The FH-95 is reported to have a

250km (line of sight) combat radius and an endurance of 24 hours.[18] Its maximum payload is reportedly 250 kg.[19] The FH-95 has a cruising altitude ranging between 3,000-6,000 meters (approximately 10,000-20,000 feet) and a service ceiling of 7,000 m (approximately 23,000 feet). It can be equipped to carry air-to-ground munitions. Although the individuals or entities who transferred the FH-95 to the RSF are unknown, this is likely evidence of recent and ongoing external support to the RSF.

II. Methodology

Yale HRL utilizes data fusion methodologies of open source and remote sensing data analysis. Yale HRL produced this report through the cross-corroboration of open source data, including social media, local news reporting, multimedia, and other reports, and remote sensing data, including satellite imagery and thermal sensor data. Researchers analyzed open source data across social media, news reports, and other publicly available sources to identify, chrono- and geolocate, and verify incidents. Analysts assess the credibility and reliability of open source data based on a source's level of detail, past credibility, and the corroboration of other independent sources. Remote sensing and satellite imagery analysis relies on multi-temporal change detection, which involves the comparison of two or more satellite images of the same area captured at different times to detect differences in coloration, visual properties, and presence, absence, or positional change of objects across the images. Artillery assessment involves comparing and considering a range of dimensions and characteristics of various known artillery in comparison to each other.

Place names were identified using UN P-codes obtained via the United Nations Humanitarian Data Exchange (HDX) and International Organization for Migration (IOM)'s Displacement Tracking Matrix (DTM) Sudan. This baseline was then verified and informed through open source analysis by Yale HRL's analysts with relevant cultural and linguistic skills.

Limitations

There are significant limitations to the data fusion methodology. The information environment in Sudan does not have the breadth of data available in other locations and there is likely a significant reporting bias for those who provide open source reporting. The tools and techniques present significant challenges to assess activities such as extrajudicial detention, conflict-related sexual violence (CRSV), and conflict-related casualties, particularly in environments with limited data. Satellite imagery analysis is limited by available imagery over time and space. Available nadir angles of satellite imagery can produce challenges to assess structural damage, until multiple angles and ground-level photographic and video materials emerge to help inform the analysis. Image resolution level can also limit the analyst's ability to perceive the full extent of damage present.

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[2] China Aerospace, "飞鸿 95 无人机获批量海外订单，具备电子战能力免费试用," 12 March 2023, https://www.chinaerospace.com/article/show/152b1dcc082d1af10fb14003afa68606, archived at https://archive.ph/wip/ZZafe ; Bilibili "塞尔维亚装备的中国飞鸿-95（CH-95）无人机," 11 February 2024, https://www.bilibili.com/video/BV1tt4218717/, archived at https://perma.cc/R4QJ-EDK9; @China3army on Telegram, "Сообщается, что китайская компания Aerospace Times Feihong Technology Co получила заказ на продажу за границу БЛА средней дальности FH-95," March 7 2023, https://t.me/china3army/19413, archived at https://perma.cc/SU2H-5GKP

[3] National Security Council, *December 18 Letter to Senator Van Hollen*, December 18, 2024, https://www.vanhollen.senate.gov/imo/media/doc/mcgurk_letter_to_cvh_signed.pdf , archived at https://perma.cc/2CTF-A33G

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[5] https://www.darfur24.com/2024/09/26/%D9%87%D8%A8%D9%88%D8%B7-%D8%B7%D8%A7%D8%A6%D8%B1%D8%A9-%D9%85%D8%AC%D9%87%D9%88%D9%84%D8%A9-%D9%84%D9%84%D9%85%D8%B1%D8%A9-%D8%A7%D9%84%D8%AB%D8%A7%D9%86%D9%8A%D8%A9-%D9%81%D9%8A-%D9%85%D8%B7%D8%A7/, archived at https://perma.cc/UV6U-CM4P Darfur24, "هبوط طائرة مجهولة في مطار "نيالا" للمرة الثانية خلال اسبوع" September 26, 2024, https://www.darfur24.com/2024/09/26/%D9%87%D8%A8%D9%88%D8%B7-%D8%B7%D8%A7%D8%A6%D8%B1%D8%A9-%D9%85%D8%AC%D9%87%D9%88%D9%84%D8%A9-%D9%84%D9%84%D9%85%D8%B1%D8%A9-%D8%A7%D9%84%D8%AB%D8%A7%D9%86%D9%8A%D8%A9-%D9%81%D9%8A-%D9%85%D8%B7%D8%A7/, archived at https://perma.cc/UV6U-CM4P; Mohamed Haj Nour, " مقتل وإصابة عدد من المواطنين بواسطة طيران الجيش بنيالا" Sudan War Monitor, https://sudanwarmonitor.com/p/a7d, archived at https://perma.cc/5S7H-26Y2; Mohamed Haj Nour, "مقتل أربعة أشخاص في غارة جوية للجيش على مدينة نيالا" Sudan War Monitor, https://sudanwarmonitor.com/p/b5f, archived at https://perma.cc/7CRS-BGTG

[6] Note: some sources report that as many as six individual flights occurred sequentially each day ending through approximately 3 January, Yale HRL was not able to corroborate each of those flights individually. Sudan War Monitor, "Intense fighting in

central El Fasher," September 21, 2024, https://sudanwarmonitor.com/p/intense-fighting-in-central-el-fasher, archived at https://perma.cc/P5XN-M35A; Darfur24, "هبوط طائرة مجهولة في مطار "نيالا" للمرة الثانية خلال اسبوع" September 26, 2024, https://www.darfur24.com/2024/09/26/%D9%87%D8%A8%D9%88%D8%B7-%D8%B7%D8%A7%D8%A6%D8%B1%D8%A9-%D9%85%D8%AC%D9%87%D9%88%D9%84%D8%A9-%D9%84%D9%84%D9%85%D8%B1%D8%A9-%D8%A7%D9%84%D8%AB%D8%A7%D9%86%D9%8A%D8%A9-%D9%81%D9%8A-%D9%85%D8%B7%D8%A7/, archived at https://perma.cc/UV6U-CM4P; Radio Dabanga, "هبوط طائرة مجهولة في مطار نيالا بجنوب دارفور" October 14, 2024, https://www.dabangasudan.org/ar/all-news/article/%D9%87%D8%A8%D9%88%D8%B7-%D8%B7%D8%A7%D8%A6%D8%B1%D8%A9-%D9%85%D8%AC%D9%87%D9%88%D9%84%D8%A9-%D9%81%D9%8A-%D9%85%D8%B7%D8%A7%D8%B1-%D9%86%D9%8A%D8%A7%D9%84%D8%A7-%D8%A8%D8%AC%D9%86%D9%88%D8%A8-%D8%AF, archived at https://perma.cc/V8SQ-SDSX; Radio Dabanga, "ليلة مرعبة في نيالا بسبب القصف الجوي" October 15, 2024, https://www.dabangasudan.org/ar/all-news/article/%D9%84%D9%8A%D9%84%D8%A9-%D9%85%D8%B1%D8%B9%D8%A8%D8%A9-%D9%81%D9%8A-%D9%86%D9%8A%D8%A7%D9%84%D8%A7-%D8%A8%D8%B3%D8%A8%D8%A8-%D8%A7%D9%84%D9%82%D8%B5%D9%81-%D8%A7%D9%84%D8%AC%D9%88%D9%8A, archived at https://perma.cc/4FSV-9EG7; Mohamed Haj Nour, "مقتل وإصابة عدد من المواطنين بواسطة طيران الجيش بنيالا" Sudan War Monitor, https://sudanwarmonitor.com/p/a7d, archived at https://perma.cc/5S7H-26Y2; HRL_MMC_064; Darfur24, ""الدعم السريع" تعيد تشغيل مطار نيالا الدولي في دارفور" November 22, 2024, https://www.darfur24.com/2024/11/22/%D8%A7%D9%84%D8%AF%D8%B9%D9%85-%D8%A7%D9%84%D8%B3%D8%B1%D9%8A%D8%B9-%D8%AA%D8%B9%D9%8A%D8%AF-%D8%AA%D8%B4%D8%BA%D9%8A%D9%84-%D9%85%D8%B7%D8%A7%D8%B1-%D9%86%D9%8A%D8%A7%D9%84%D8%A7-%D8%A7%D9%84/, archived at https://perma.cc/B7Z5-LHCE; HRL_MMC_065; HRL_MMC_066; Sudan Tribune, " الجيش يعلن قصف طائرة شحن إماراتية في مطار نيالا" December 30, 2024, https://sudantribune.net/article295286/, archived at https://perma.cc/52LJ-Z5J3; Mohamed Haj Nour, " مقتل أربعة أشخاص في غارة جوية للجيش على مدينة نيالا" Sudan War Monitor, https://sudanwarmonitor.com/p/b5f, archived at https://perma.cc/7CRS-BGTG

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Nyala Airport, Nyala, South Darfur

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A Two UAVs are observed at the airstrip on 14 January 2025. Previously analyzed imagery shows that the first UAV arrived between 19 November and 09 December 2024, with the second UAV observed on 28 December 2024. A third UAV has been observed at this site on both 08 and 12 January 2025.

B A corrugated metal-roofed structure consisting of cargo container walls was constructed between 08 and 13 January 2025. The containers that comprise the walls first arrived between 18 and 28 December 2024.

C At least 30 containers arrived at the airstrip between 03 and 12 January 2025.

Nyala Airport, Nyala, South Darfur

PRESENCE OF 3 UAVS OBSERVED ON 12 JANUARY

Analysis of satellite imagery collected on 12 January 2025 shows the new presence of three UAVs in satellite imagery observed at the airstrip of Nyala Airport

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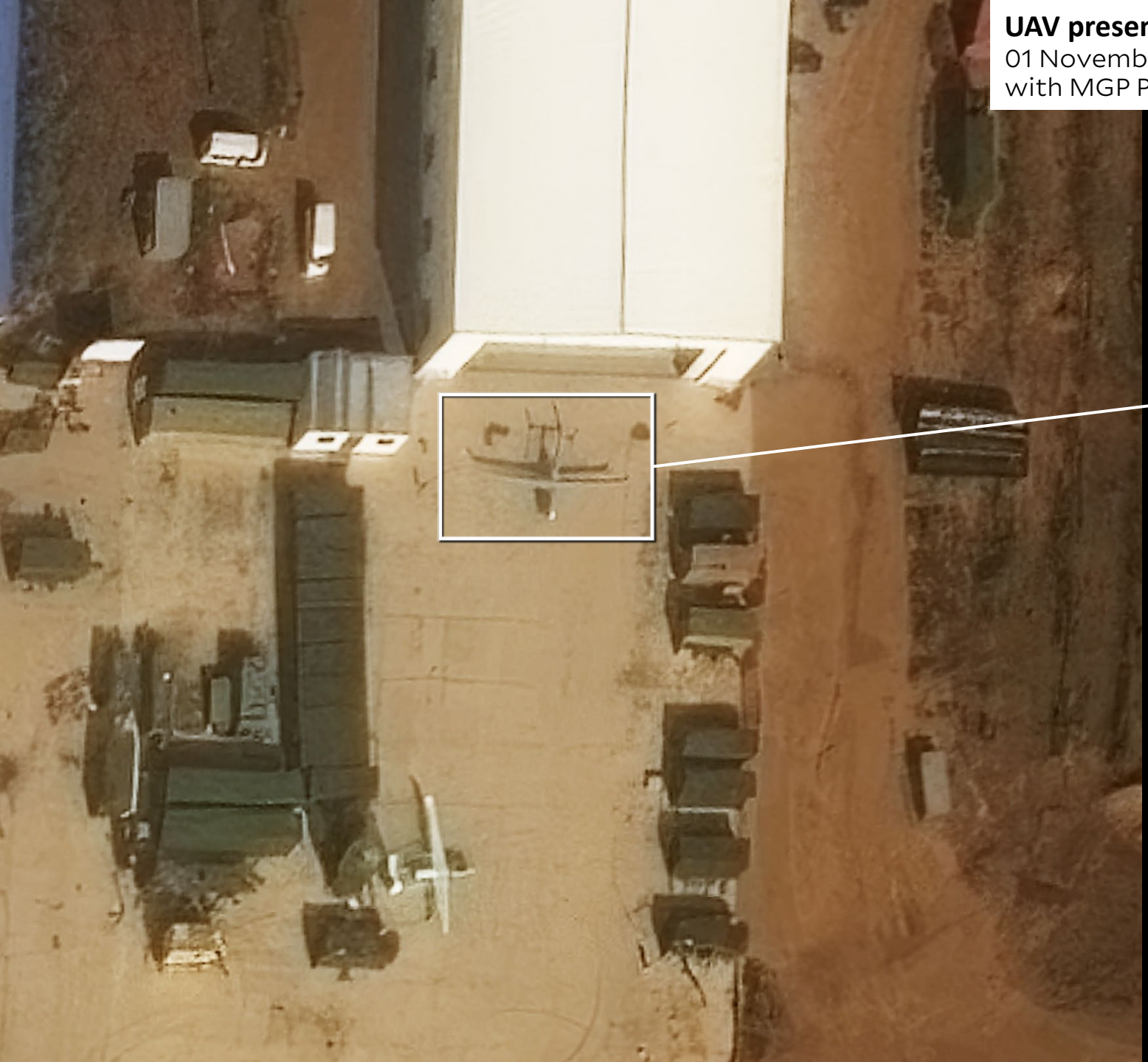
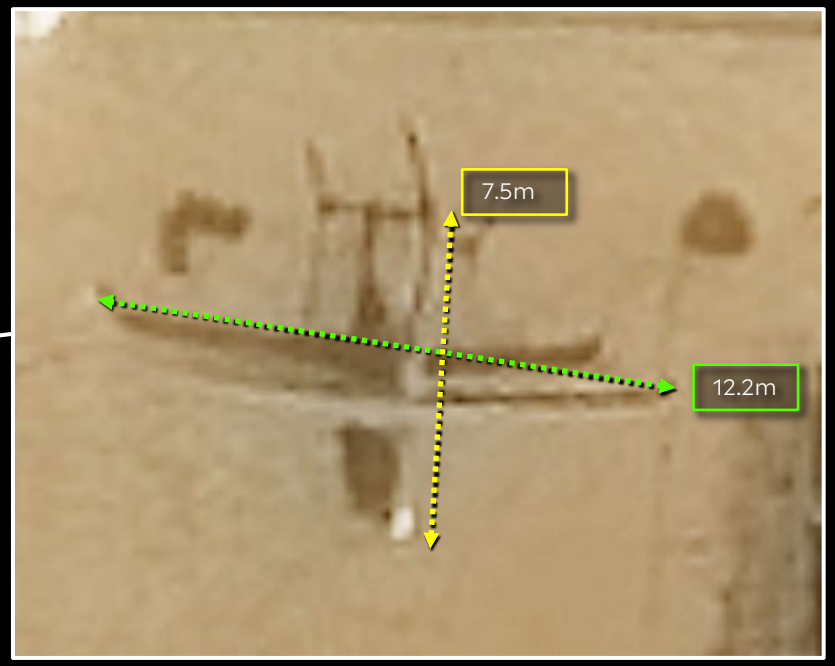
UAV present at test site in Baotou, Inner Mongolia

01 November 2024 © 2025 Maxar Technologies | Image enhanced with MGP Pro image enhancement





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Analysis of footage from a FH-95 training video shows that the UAV's wingspan to length ratio is approximately 3:2 (155 pixels : 100 pixels).

Image Source | https://x.com/globaltimesnews/status/1855438778909045146, archived at https://perma.cc/MCM7-4H3C

Nyala Airport, Nyala, South Darfur

ARRIVAL OF CARGO CONTAINERS OBSERVED BETWEEN 03-11 JANUARY

Analysis of satellite imagery collected between 03 and 13 January shows the new presence of at least 30 storage containers, measuring approximately 6 x 2.5m, observed at the apron of Nyala airport.

03 January 2025 © 2025 Planet Labs

13 January 2025 © 2025 Maxar Technologies

Image enhanced with MGP Pro HD image enhancement

Nyala Airport, Nyala, South Darfur

NEW CONSTRUCTION OBSERVED BETWEEN 08-13 JANUARY 2025

Analysis of satellite imagery collected over Nyala Airport shows a corrugated metal roof being constructed over two stacks over storage containers between 08 and 12 January 2025.

Imagery collected on 13 January 2025 shows that roof construction has been completed.

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