



KLAXON

July 2026

Newsletter of the International Research Group Orford Ness

This edition of KLAXON details the development of drones, a technology that current wars have suddenly accelerated to unimaginable levels of performance and precision. When peace returns, we will find a changed world where drones define the military strength of armed forces and likely also become omnipresent in civilian life. Drones are a paradigm shift in how we observe, communicate and deliver items cheaply to the most remote and inaccessible places.

A similar “technology explosion” occurred during World War 1, when in four short years aircraft evolved from often ridiculed, barely controllable and dangerous contraptions to powerful and efficient weapons of war, a technology that eventually came to define how we travel.

Orford Ness was at the centre of British aviation development in World War 1. In our archives, IRGON have dozens of fascinating stories about aircraft development, spanning many decades of the 20th century, that are just waiting to be discovered and published. Join us if you're interested!

Olaf Kirchner, Chairman

The Iranian Shahed 136 Drone and the WW2 V1 Flying Bomb

1. Introduction

The previous issue of our newsletter (Klaxon 8) concentrated on the part played by anti-aircraft batteries on Orford Ness in confronting the menace of V1 flying bombs in 1944 and 1945. This is a subject of ongoing interest given the advancement of drone technology in current conflicts.

2. Background

We were on holiday in Dubai at the end of February 2026 and had our holiday interrupted by drone attacks from Iran. Having experienced Shahed 136 drones at close range flying over our hotel I thought it might be of interest to produce an article on the weapon and compare it to its WW2 V1 predecessor which crossed the skies over Orford Ness in 1944/5.

3. Comparison with the WW2 V1 Flying Bomb

1. The V1 was the first of the Vergeltungswaffen V weapons deployed for the terror bombing of London (and Antwerp). Development started in 1941 and the first V1 was fired at London in June 1944. The V1 was a cruise missile that used an



V1 Flying Bomb

© Smithsonian National Air & Space Museum

innovative pulsejet motor capable of propelling the sheet steel and plywood weapon at a speed of 640km/hr (400mph) It carried a 850kg high-explosive warhead. The V1 was launched using a 48m long steam catapult, alternatively it could be launched from a converted Heinkel He111 bomber.

4. Specification

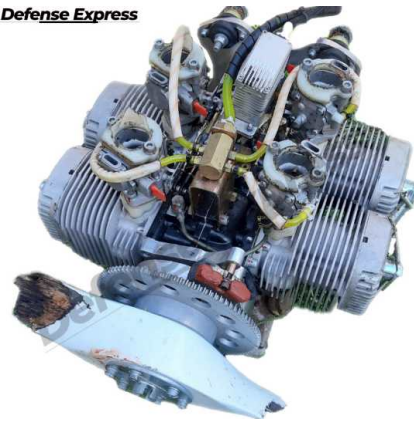
Wingspan	5.4m
Length	8.3m
Engine	Argus Pulsejet running on 80 octane petrol.
Navigation	Pneumatically powered mechanical autopilot system with target accuracy of about 31km @ 250km range.
Warhead	850kg
Overall weight	2150kg
Speed	640 km/hr (400mph)
Range	250km (160m)
Altitude	600 – 900m (2000-3000 feet)
Radar profile	Sheet steel fuselage - so quite high.

5. The V1 had several electrical systems including the fusing system and electrical precession coils for the gyros. The drive system for the gyros was pneumatic, using 2 compressed air storage tanks to drive two pitch and yaw control gyros linked to a mechanical autopilot. The system used inputs from a magnetic compass, a barometric altitude unit and a small propellor air log to measure distance travelled. The V1 was not a precision weapon but could land within a 31km diameter circle at a maximum range of about 250km (160miles).

6.Shahed 136: Description

The Iranian Shahed 136 weapon is a 'suicide drone' that has been widely used by the Islamic Revolutionary Guard Corps (IRGC) in the ongoing conflict in the Gulf. Its design origins go back to the 1980's in Germany. NATO commissioned Dornier Flugzeugwerke to design a loitering munition intended to destroy radar systems during the cold war and was known as the DAR (Drohne-Anti-Radar) It used a delta wing design, a petrol engine driving a 68cm 2 bladed 'pusher' propellor and a rocket assisted launching system. The DAR used a flat 4-cylinder 550cc 2 stroke engine designed by Limbach of Germany.

Defense Express



*Shahed 136
Engine*

NATO did not pursue the volume production of the DAR.

However, it is understood that Iran managed to acquire details of its design in 2006 and set about reverse engineering the DAR design for its own use. The Shaded 136 is heavily reliant on western made commercially available microelectronics. Iran produced their own copy of the engine known as the MADO-550 and their own composite delta wing fuselage.

The drone is designed for high precision long range strikes to pre-programmed co-ordinates.

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Dates for your calendar



- Sunday, 26th July:
BBC Countryfile, featuring Orford Ness and IRGON. Scheduled for transmission on BBC1 at 7 p.m. It will be available later on BBC iPlayer.
- Sunday 13th September 2026:
"MHAS Showcase Event 2026"
11:00am — 4:30pm

IRGON will be on site with our gazebo.

The Iranian Shahed 136 Drone and the WW2 V1 Flying Bomb - continued

7. Specification

Wingspan	2.5m
Length	3.5m
Engine	550cc flat 4 cylinder 2 stroke petrol engine producing 50hp @ 7000 rpm
Navigation	Commercial grade GPS, GLONASS (Russia) and Inertial Nav system made in Iran, flight computer (autopilot) Anti Jamming GPS anti jamming antennas and interference suppression is incorporated. Very accurate target location capability.
Cost to produce	Estimated to be in the order of \$50,000 but could be significantly lower than this estimate.
Warhead	Up to 50kg
Overall weight	200kg
Speed	185km/hr (114mph)
Range	2,500 km (1500miles)
Altitude	60 – 4,000m (200 – 13,000 feet)
Radar profile	Fibreglass construction - so profile quite low.



Shahed 136 Drone © Wikipedia

8. Launching system

The drone is launched using a solid fuel rocket located under the drone that burns for about 3 seconds and is discarded. The petrol engine is running prior to launch and the propellor is engaged when the weapon leaves the launcher. Drones may be fired in salvos of up to 5 from the back of a specially adapted lorry or trailer and must be pre-programmed with their target destination co-ordinates.



Shahed 136 Drone Mobile Launching Truck © Wikipedia

9. Developments

Russia has produced their own version of the Shahed 136 with the co-operation of Iran known as the Geran-2. Some sources indicate that it has a larger payload of 90kg but engine reliability is regarded as questionable.

The US have also designed a similar delta wing drone slightly smaller than the Shahed 136 known as FLM-136/LUCAS. It is more sophisticated using composite construction and has a remote-control capability by means of an integrated Starlink communication terminal. It is also said to have an autonomous AI swarm capability. The Iranian Shahad 136 can also have a similar remote-control capability by using mobile phone technology that can take over control from the autopilot mid-flight.

Conclusions

The two weapons although very different in design shared a number of common operational characteristics.

1. Relatively low cost to manufacture. (The V1 was manufactured using slave labour being forced to work under appalling conditions)
2. Both required an assisted launching system.
3. Both weapons can be used in 'swarms' to overwhelm defensive measures.
4. Both are intended to be asymmetric where defensive measures tend to be significantly more costly than the weapon itself.

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5. The low radar profile of the Shahed 136 makes it quite difficult to track and very expensive to destroy with conventional defensive missiles.
6. The Shahed 136 is relatively slow but can be very accurate. It continues to be a significant threat in the Gulf and Ukraine.

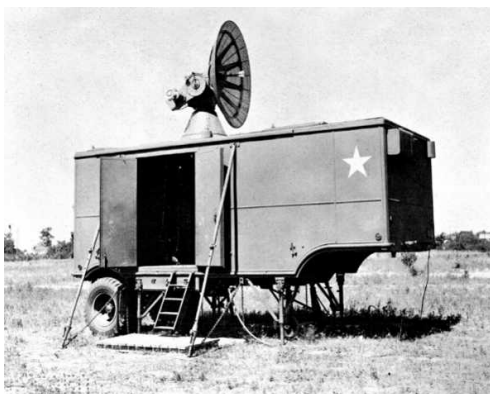
Ukraine however is rapidly developing nimble cost-effective anti-drone-drones that are proving effective in dealing with the Shahed 136/Geran-2 threat and other targets.

The relatively high radar profile of the V1 ended up being its greatest weakness.

In 1944 sophisticated Heavy Anti-Aircraft (HAA) gun batteries were deployed along the south eastern corner of England known in what was known as Operation Diver (See March 2026 KLAXON article written by John Ogden detailing the Orford Ness installation)

The Diver guns used an integrated American SCR-584 μ -wave radar, a M9 Gun Director analogue computer, shells fitted with active radio proximity fuses and a Remote Power Control System that automatically adjusted and fired the 3.7inch (94mm) AA gun.

This setup resulted in a remarkable 82% success rate when engaging V1's.



SCR-584 Radar © MIT Lincoln Laboratory

The V1 was highly effective as a weapon of terror and psychological warfare but largely ineffective as a strategic military weapon. It caused significant casualties and damage in London and Antwerp but its low accuracy and effective counter measures resulted in only about 25% reaching their intended targets.

Barry Searle
IRGON
May 2026

Mystery object found on the Ness



A few weeks ago, one of our IRGON volunteers discovered an interesting find on Orford Ness.

A piece of metal, triangular in form, with various holes and engraved inscriptions like "INTERIOR LIGHTS PANEL" and "SCI EMISSION SWITCH".

We are able to tell that it originates from a large aircraft (there are references to "corridor lighting"), that it had a tail wheel, "TAIL WHEEL IND ", and it was probably a bomber aircraft which could have a mid-upper turret fitted "AMID GUN CONTACTOR - REMOVE LINK WHEN TURRET IS FITTED".

IRGON suspects this panel may have originated from a bomber fuselage used on the Ness for lethality and vulnerability trials (we know for example that the German R4M air-to-air rocket was tested against Halifax and Warwick fuselages). We have submitted photos to various forums, and several members are of the opinion that this may be a fuse panel.

Please let us know if you recognise this piece of Orford Ness history!

IRGON featuring on BBC Countryfile



Anita Rani with BBC production crew with WE177a bomb

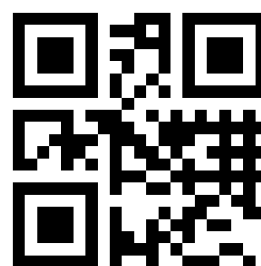
Earlier this year one of our volunteers Bill, spent the morning filming on Orford Ness for BBC Countryfile highlighting the work of IRGON. He guided presenter Anita Rani around many of the historic military sites on the Ness. There was particular interest in the Chinese Wall, especially as it is believed to be the only monument in the UK to 96,000 Chinese labourers working for the British during WW1 (more on this in a future Klaxon), the recent research and discoveries by IRGON into the R-System and the mysteries of the 50m ring and Anita was astounded by seeing and touching the WE177a nuclear bomb, inert versions of which were tested on Orford Ness. Neither the presenter nor any of the BBC team had visited the site before and they were amazed by the historical significance of the 70 years of research on Orford Ness.

The programme will be broadcast on BBC1 on Sunday 26th July and will be subsequently available on BBC iPlayer. Bill assures everyone he won't be watching!

Want to know more or join us? – If you have an interest in military history, if you have a personal or family connection to the work carried out on Orford Ness or access to information that may help us further document this history, you will find our contact details on www.IRGON.org.

Thank you!

Website – Our updated website now has new articles, visit us to find the most up-to-date information and discoveries made by IRGON.



www.IRGON.org