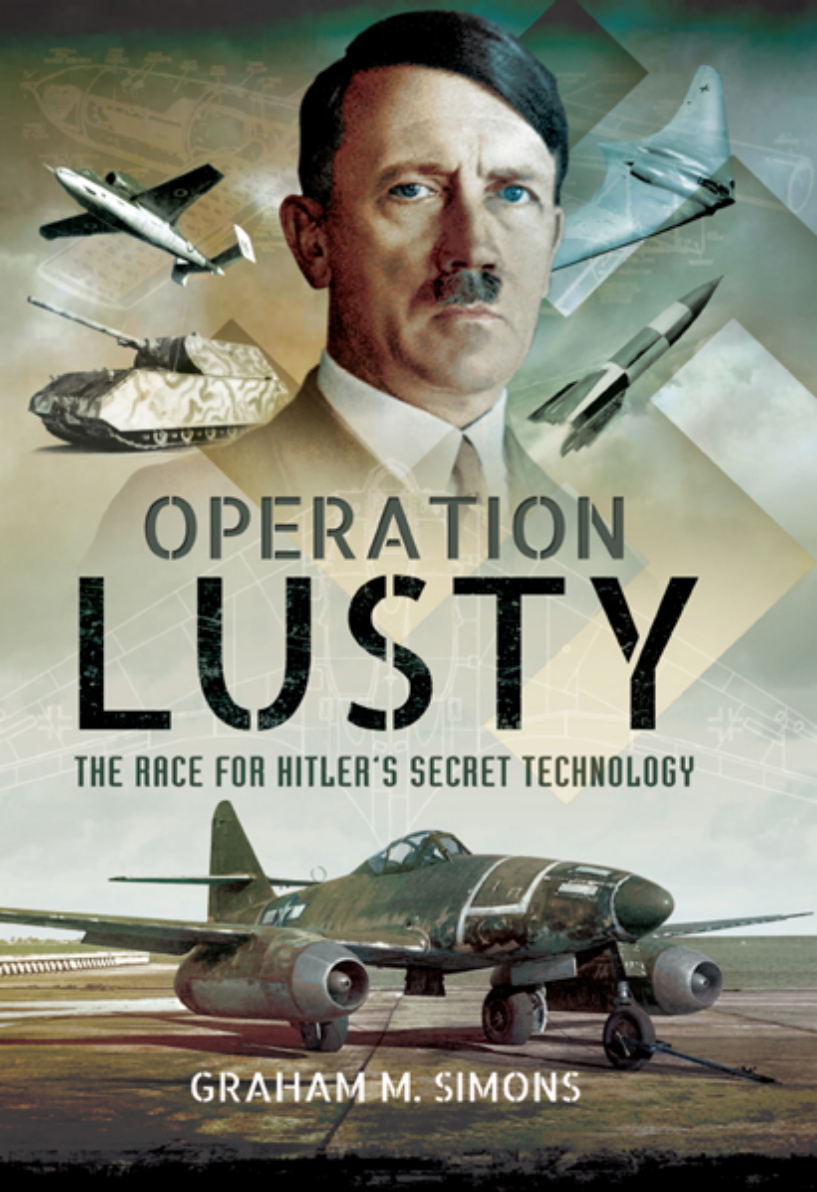
OPERATION
LUSTY
THE RACE FOR HITLER'S SECRET TECHNOLOGY
GRAHAM M. SIMONS

Operation Lusty:

the race for Hitler's secret technology

Graham M Simons

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A great amount of background material to the operations and the projects can be found in published and unpublished primary source research material in the form of memoranda, policy statements and other documents from the Army Air Corps, the USAF as provided by Lynn Gamma and all in the U.S. Air Force Historical Research Center at Maxwell Air Force Base, Montgomery, Ala. The same applies to the valuable services provided by the History Office of the Air Technical Service Command, Wright Field, Dayton, Ohio and the Public Affairs Office, Edwards Air Force Base. Much other primary source documentation is also located in the National Archives and Records Administration at College Park, Maryland.

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The author is indebted to many people and organisations for providing photographs for this book, many of which are in the public domain. In some cases it has not been possible to identify the original photographer and so credits are given in the appropriate places to the immediate supplier. If any of the pictures have not been correctly credited, the author apologises.

Introduction

Over the years numerous books have been written about captured German aircraft - *'War Prizes'* by Phil Butler and Kenneth S West's *'The Captive Luftwaffe'* being two excellent examples. Like many other works they look in depth at the machines - but little has been written about why the Allies studied the equipment, interrogated those who worked with it, and in many cases shipped men and machines halfway across the world to the USA.

Throughout almost the entire Second World War the Allies made use of captured Axis aircraft and equipment – either for propaganda and war-bond selling, for evaluation as to what they were flying against, or for testing to discover if and where the enemy had any advantages. From as early as 1939 the Royal Air Force and the Royal Aircraft Establishment pioneered the re-building and testing of captured enemy aircraft – flying them against their own men and machines in order to arrive at the best tactical methods of defeating the enemy. However, this could at best be only piecemeal, for all they could ever do was test what came their way.

With the entry of the United States of America into the conflict in late 1941, it fell to the British to provide the US Army Air Force with technical information as to what they were up against in the European Theatre of Operations (ETO). In the Pacific Theatre it was even harder for the Americans to evaluate the enemy because of the series of defeats they initally suffered.

In the run-up to Operation Overlord in June 1944 there were rumours of a whole range of so-called *'wunderwaffen'* - super-high-tech weapons that were far in advance of anything the Allies had which would miraculously save the Third Reich from defeat. These rumours were continually strengthened by the activities of Dr Joseph Goebbels and his Propaganda Ministry who were regularly making claims about items of equipment that were just about to be used that would force the Allies to sue for peace with the Germans.

Even to this day, it has never been revealed just how much the Allies actually believed Goebbels and his Propaganda Ministry, but nevertheless, the politicians and military men alike did take notice of all that was said, and even before the war was finally over, the Allies sent teams into both Germany and Japan hard on the heels of the front line troops in something of a mad scramble to discover and make use of the enemies' secrets. It was also clear that despite a series of political promises for sharing 'the spoils of war' - both hardware and retrieved data - with each other, there was certainly no desire or intention to actually do it!

The Allied forces had faced a whole set of frightening new German secret equipment - firstly there was the V-weapons, known in the original German as Vergeltungswaffen, meaning retaliatory or reprisal weapons. These were a particular set of long-range artillery weapons designed for strategic bombing - particularly terror bombing of cities.They comprised the V-1, a pulsejet-powered cruise missile, the V-2, a liquid-fuelled ballistic missile, and the V-3 cannon. Then there were the first jet aircraft and even rocket-powered fighters – with the imminent defeat of Germany, now the Allies could really discover what had been going on. Not only could they study the hardware, but also the plethora of ancillary equipment, items and technological achievements that went with them.

Elements within the US political and military establishment harboured resentment towards British technological advances and strong anti-British feelings that went back to the American War of Independence. Most

Americans were also at complete ideological odds with Joseph Stalin and the Soviet Union. So it should not have been surprising that when Hitler's war machine began to collapse, as far as the Americans were concerned, the race was now on to snatch as much and as many of these secrets before the other Allies – and especially the Soviet Red Army - found them.

Thus the last great battle of World War Two was fought, not for military victory but fought over and for the technology of the Third Reich. This took the form of a number of interlinked operations, including 'Operation Alsos' and its subsidiary 'Operation Big' created following the Allied invasion of Italy in September 1943 to investigate and capture or destroy what they thought could be the German nuclear energy project, 'Operation Lusty', the hunt for Nazi technologies and 'Operation Paperclip' the hunt for the German scientists.

In April 1945 American armies were on the brink of winning their greatest military victory, yet America's technological backwardness was becoming increasingly shocking when measured against that of the retreating enemy. Senior officers, including the Commanding General of the Army Air Forces, Henry Harley 'Hap' Arnold, knew all too well the seemingly overwhelming victory was, in fact, much less than it appeared. There was just too much luck involved in its outcome. Two American Army Air Force teams set out to regain America's technological edge and then exploit it for America's own ends. One went after the German technology; the other went after the Nazis' intellectual capital - their world-class scientists.

This is that story.

The thousands of reports generated in the mad dash to get as much German technology into the Allies hands as possible and used as the basis for this book resulted in a complete mis-mash of dimensions, weights, distances and speeds appearing in these documents. Feet and inches mingle with metres and centimetres. Litres mix with gallons - both Imperial and American! Distances appear in miles and kilometres, and speeds are recorded in both miles and kilometres per hour! To convert one into the other for consistency results in sets of ridiculous looking figures no matter what convention or conversion is used - therefore all dimensions that appear in this book are exactly as they appear in the primary source documentation - what was good enough for the original reports is good enough for me!

Graham M Simons
Peterborough, England
July 2015.

Chapter One

Wunderwaffen

Wunderwaffen is German for 'wonder-weapons' and was a term assigned by the Third Reich propaganda ministry to a number of revolutionary 'superweapons'.

The Reichsministerium für Volksaufklärung und Propaganda - RMVP or Propagandaministerium - known as the Reichs Ministry of Public Enlightenment and Propaganda - was a Nazi government agency to enforce Nazism ideology.

Founded upon the 1933 Machtergreifung - or seizing of power - by Adolf Hitler's National Socialist government, it was headed by Reich Minister Joseph Goebbels and was responsible for controlling the German news media, literature, visual arts, filmmaking, theatre, music, and broadcasting. As the central office of Nazi propaganda, it supervised and regulated the culture and mass media of Nazi Germany.

The English-language propaganda radio programme *Germany Calling* was broadcast to audiences in the UK on the medium wave station Reichssender Hamburg and by shortwave to the USA. The programme started on 18 September 1939 and continued until 30 April 1945, when Hamburg was finally overrun by the British Army.

Through such broadcasts, the RMVP attempted to discourage and demoralize British, Canadian, Australian and American troops and the British population within radio listening range, to suppress the effectiveness of the Allied war effort through propaganda, and to motivate the Allies to agree to peace terms leaving the Nazi regime intact and in power. Among the techniques used, the Nazi broadcasts reported on the shooting down of Allied aircraft and the sinking of Allied ships, presenting discouraging reports of high losses and casualties among Allied forces at the same time constantly broadcasting the scientific achievements of their scientists and technicians to create a soon-to-be-launched threat of the new German wonder weapons.

Paul Joseph Goebbels (*b.* 29 October 1897 – *d.* May 1945) was a German politician and Reich Minister of Propaganda in National Socialist Germany from 1933 to 1945.

With the benefit of hindsight most of these weapons remained just feasible prototypes, or reached the combat theatre too late and in too insignificant numbers to have any great military effect. At the time however, those in power on the Allied side did not know that – nor could they take the risk of letting such super-weaponry fall into other hands.

This was particularly true of the USA, who not only did not trust their allies in the slightest, many of the political elite were harbouring ambitions of being the world's only super-power at the cost of the British Empire!

With the passing of time it became increasingly difficult to decipher what was fact, what was fiction and what was pure fantasy in the context of the wunderwaffen. Instead of clarification coming from the removal of the Iron Curtain and declassification of secret documents, all that has happened is that the water has become increasingly muddied by conspiracy theorists and Unidentified Flying Object fantasists.

That said, the list of known or alleged *wunderwaffen* was huge, and could be split into numerous sections, but please remember, this is just a partial list!

Naval vessels

Graf Zeppelin – a 33,550 ton aircraft carrier that was the lead ship in a class of four carriers ordered by the Kriegsmarine, planned in the mid-1930s by Grand Admiral Erich Raeder as part of the Plan Z rearmament programme after Germany and Great Britain signed the Anglo-German Naval Agreement. The carrier would have had a complement of forty two fighters and dive bombers.

A combination of political infighting between the Kriegsmarine and the Luftwaffe, disputes within the ranks of the Kriegsmarine itself and Adolf Hitler's waning interest all conspired against the carriers. A shortage of workers and materials slowed construction still further and, in 1939, Raeder reduced the number of ships from four to two. Even so, the Luftwaffe trained its first unit of pilots for carrier service and readied it for flight operations. With the advent of the war, priorities shifted to U-boat construction; one carrier, *Flugzeugträger B*, said by some sources to have been named *Peter Strasser*, - the chief commander of German Imperial Navy Zeppelins during World War I - was broken up on the slipway while work on the other, *Flugzeugträger A* (christened *Graf Zeppelin*) was continued tentatively but suspended in 1940. The air unit scheduled for her was disbanded at that time.

German Aircraft Carrier I– This was a planned conversion of the transport ship *Europa* during World War Two. The loss of the battleship *Bismarck* and near torpedoing of her sistership *Tirpitz* in May 1941 and March 1942, respectively spurred the Kriegsmarine to acquire aircraft carriers. *Europa* was one of several vessels selected for conversion into auxiliary aircraft carriers. As designed, the ship would have had an air complement of 24 Bf.109T fighters and 18 Ju.87C Stuka dive-bombers.

Somewhat ironically, the *Graf Zeppelin* was captured by the Russians at the end of the war at Swinemünde and used as a Headquarters for the Commission analysing captured German equipment.

H-class battleship – a series of proposals for battleships surpassing both the US Navy's Montana-class battleships and the Imperial Japanese Navy's Yamato-class battleships in armament, culminating in the H-44, a 140,000 ton battleship with eight 20 inch guns. Two only laid down; both were scrapped on slipways.

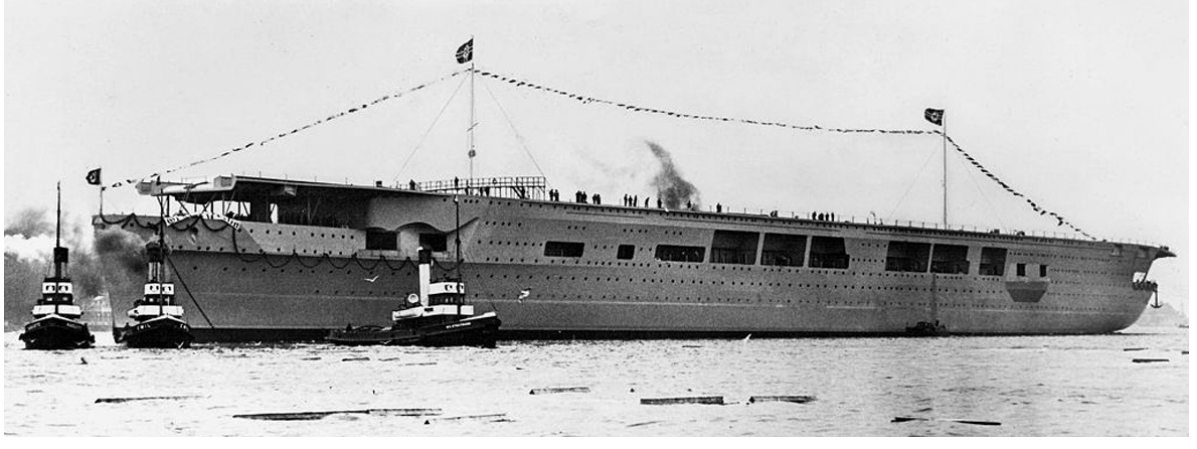
U-boats

Rocket U-boat – a planned ballistic missile submarine; project abandoned.

Type XVIII U-boat – a U-boat designed to use air-independent propulsion; several were under construction when the war ended

Type XXI U-boat 'Elektroboot' (Electric boat) – the first U-boat designed to operate completely submerged. 118 were built

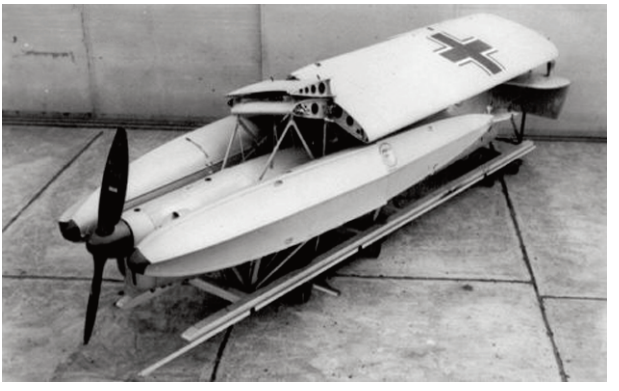
The German aircraft carrier *Graf Zeppelin* after its launch in December 1938.



Type XXIV U-boat – a planned U-boat designed to use air-independent propulsion
Type XXVI U-boat – designed to use air-independent propulsion.
Type XXII U-boat – designed to use air-independent propulsion.
Type XXIII U-boat ('Elektroboot') – a U-boat designed for coastal missions; 67 were built
Type XXV U-boat – a planned all-electric U-Boat designed for coastal missions
Type XI U-boat – designed to carry the Arado Ar 231 collapsible floatplane; four were laid down but cancelled at the outbreak of World War Two

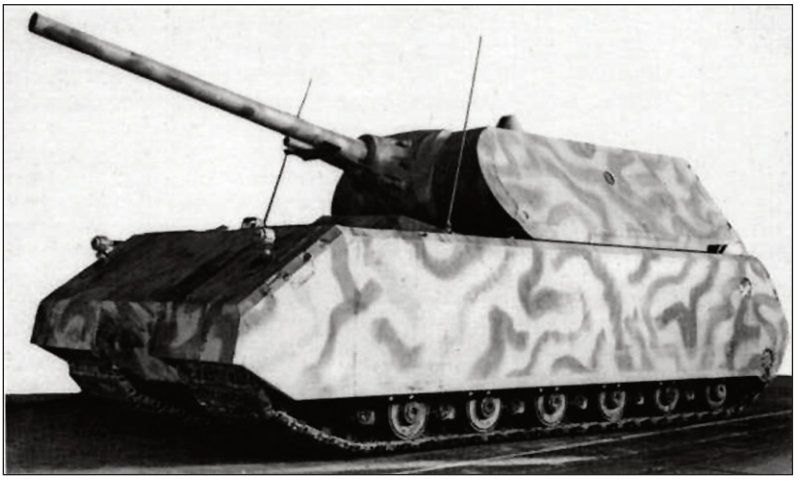
Armoured vehicles
Flakpanzer 'Kugelblitz' (Ball Lightning) – a self-propelled anti-aircraft gun.
Sturer Emil – an experimental tank destroyer.
Landkreuzer P. 1000 'Ratte' (Rat) – a planned super-heavy tank, weighing 1000 metric tons and armed with two 280mm cannons, 128mm anti-tank gun, eight 20mm flak guns and two 15mm heavy machine guns.
Landkreuzer P. 1500 'Monster' – a proposed super-heavy self-propelled gun, weighing 1500 metric tons and armed with the 800mm Schwerer Gustav / Dora gun
Panzer VII 'Löwe' (Lion) – a planned super-heavy tank, weighing 90 metric tons and armed with a 105mm cannon.
Panzer VIII 'Maus' (Mouse) – a super-heavy tank, weighing 180 metric tons and armed with two cannons of 128mm and 75mm calibre, two operable prototypes completed.
Panzerkampfwagen E-100 – a planned super-heavy tank, weighing 140 metric tons and armed with either 128, 149 or 170mm cannon.

Aircraft
Junkers Ju.322 'Mammut' (Mammoth) – a flying wing heavy transport glider.



Focke-Achgelis Fa.269 – a planned tilt-rotor VTOL fighter.
Focke-Wulf Ta.152 – a high-altitude interceptor.
Focke-Wulf Ta.400 – a planned Amerika Bomber candidate with six radial engines and two jet engines with a range of 13,000 km in bomber configuration
Heinkel He.111Z – a five engined Zwilling (twin fuselage) aircraft created by combining two He.111s and designed to tow large gliders
Heinkel He.274 – a high altitude heavy bomber with four in-line engines with a range of 3,440 km, two completed by France after the war
Heinkel He.277 – a planned, advanced long range bomber design, never built as a

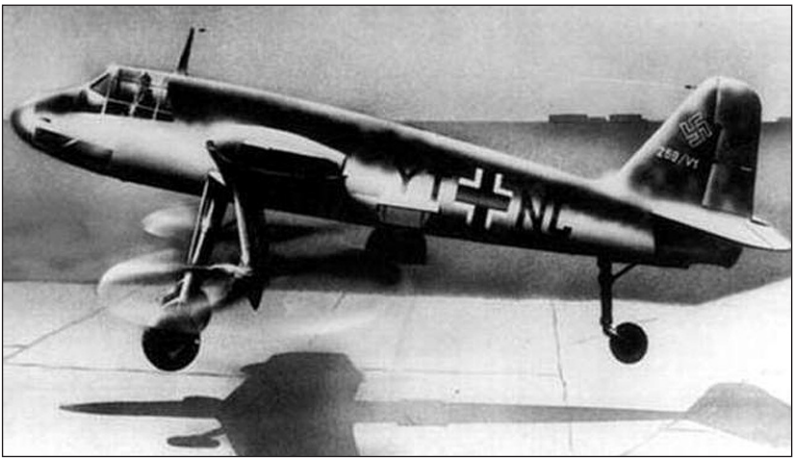
Designed for use on U-boat 'cruisers', like the Type XI B, the Arado Ar 231 was a light parasol-wing aircraft. It was powered by a 160 hp Hirth HM 501 inline engine, weighed around 1,000 kg, and had a 10 metre wingspan. The design led to a simple and compact aircraft that could be fitted into a storage cylinder only two metres in diameter. One unusual feature was an offset wing design, with the right wing root attaching to the wing's tilted centre section and lower than the left wing root, to allow the wings to be quickly folded up.



Panzerkampfwagen VIII Maus ('Mouse') was a German super-heavy tank completed in late 1944. It is the heaviest fully enclosed armoured fighting vehicle ever built. Only two hulls and one turret were completed before the testing grounds were captured by the advancing Soviet forces.

complete aircraft, evolved to be an Amerika Bomber candidate, to be powered with four BMW 801 radial engines and up to 11,000 km range.
Junkers Ju.390 – an Amerika Bomber candidate with six radial engines with a range of 9,700 km. Two airworthy prototypes built and flown.
Junkers Ju.488 – a heavy bomber with four radial engines with a range of 3,395 km.
Messerschmitt Me.264 – an Amerika Bomber candidate with four inline or radial engines and a range of 15,000 km, three airworthy prototypes built and flown.
Messerschmitt Me.323 'Gigant' (Giant) – a heavy transport with six engines.
Arado Ar.234 – the first operational turbojet bomber and reconnaissance aircraft.
Arado E.555 – a planned jet-powered Amerika bomber.
Arado E.560 – a series of tactical bomber projects.
Bachem Ba.349 'Natter' (Adder) – a rocket-powered vertical takeoff interceptor.
Blohm & Voss P.178 – a turbojet dive bomber.
DFS.194 – a rocket-powered experimental aircraft.
DFS.228 – a rocket-powered high altitude reconnaissance aircraft.
DFS.346 – a rocket-powered research aircraft.

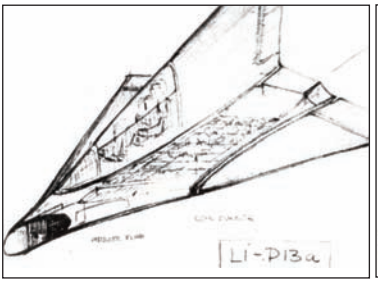
A model of the Messerschmitt P.1106 swept wing jet fighter

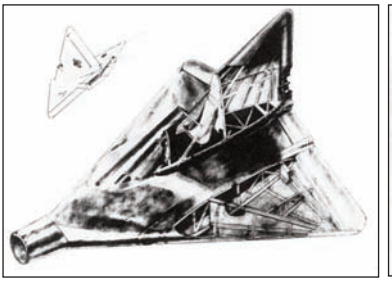


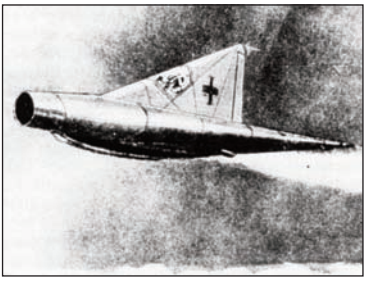
The Fa.269 was a tiltrotor VTOL single seat fighter. The machine did not make it into production since the war ended before it could be produced. It went through extensive wind tunnel testing and a full scale prototype was supposedly built, but was destroyed by bombing, so it did not survive the war.

Fieseler Fi.103R 'Reichenberg' – a manned version of the V-1 flying bomb.
Focke-Wulf 'Triebflügel' (Powered Wings) – a tip jet rotorcraft, tailsitter interceptor.
Focke-Wulf Ta.183 'Huckebein' – a planned swept wing turbojet fighter.
Focke-Wulf Ta.283 – a planned swept wing ramjet and rocket-powered fighter.
Heinkel He.162 'Volksjäger' (People's Fighter) – a turbojet fighter.
Heinkel He.176 – the world's first liquid-fuelled rocket-powered experimental aircraft
Heinkel He.178 – the world's first experimental turbojet aircraft to fly.
Heinkel He.280 – the first turbojet fighter design, prototypes only.
Heinkel He.343 – a four engined jet bomber based on the Arado Ar 234.
Henschel Hs.132 – a planned turbojet dive bomber and interceptor.
Horten Ho.229 – a turbojet flying wing jet fighter/bomber.
Horten H.XVIII – a planned flying wing jet bomber based on the Horten Ho 229.
Junkers EF.128 – a planned turbojet fighter.
Junkers EF.132 – a planned turbojet bomber.
Junkers Ju.287 – a forward-swept wing turbojet bomber.
Lippisch P.13a – a planned supersonic ramjet delta wing interceptor.
Lippisch P.13b – a ramjet delta wing interceptor developed from the Lippisch P.13a.
Messerschmitt Me.109TL – a turbojet fighter designed as an alternative to the Me.262.
Messerschmitt Me.163 'Komet' (Comet) – a rocket-powered fighter.
Messerschmitt Me.262 'Schwalbe' (Swallow)- a turbojet fighter/bomber.
Messerschmitt Me.263 – a rocket-powered fighter developed from the Me 163.
Messerschmitt P.1101 – a variable-sweep wing turbojet fighter.
Messerschmitt P.1106 – a jet fighter based on the Messerschmitt Me P.1101.
Skoda-Kauba Sk P.14 - a ramjet-powered emergency fighter.

Three views of the little-known Lippisch P.13b. This appears to be one of the most controversial aircraft of World War Two - not due to any special paper project design discovered apart from the others, but due to the claims that the United States deliberately kept classified documents that may prove that the aircraft was actually built in 1945 and was the first to break the sound barrier.

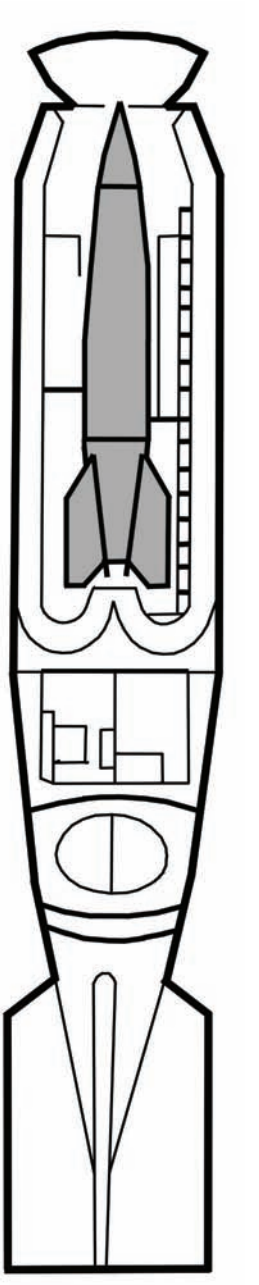






In late 1943 Deutsche Arbeitsfront Director, Otto Lafferenz, proposed a towable watertight container which could hold an A4 rocket. The design was a container of 500 tons displacement to be towed behind a U-boat. Un-manned and unpowered, it was towed to within range of its target, flooded into an upright position, and the missle then launched. Three of these vessels were ordered in late 1944, but only one was built. The project was dubbed Projekt Schwimmweste and the containers themselves referred to by the codename Prüfstand XII. Work on the containers was carried out by the Vulkanwerft, and a single example was completed by the end of the war, but never tested with a rocket launch. The design looks remarkably like a maritime version of the underground missile silos used both by the Americans and the Soviets during the Cold War.

Sombold So.344 - a rocket-powered plane with a detachable explosive nose.
Silbervogel (Silverbird) – planned sub-orbital antipodal bomber.
Zeppelin Fliegende Panzerfaust – a rocket-powered very-short-range interceptor.
Zeppelin Rammer – a rocket-powered ramming interceptor.



Helicopters
Flettner Fl.184 – a night reconnaissance and anti-submarine autogyro.
Flettner Fl.185 – an experimental helicopter.
Flettner Fl.265 – an experimental helicopter.
Flettner Fl.282 'Kolibri' (Hummingbird) – a reconnaissance helicopter
Focke-Achgelis Fa.223 'Drache' (Dragon) – an anti-submarine, search and rescue, reconnaissance, and freight helicopter, based on the pre-war Fw 61.
Focke-Wulf Fw.61 – an experimental helicopter.

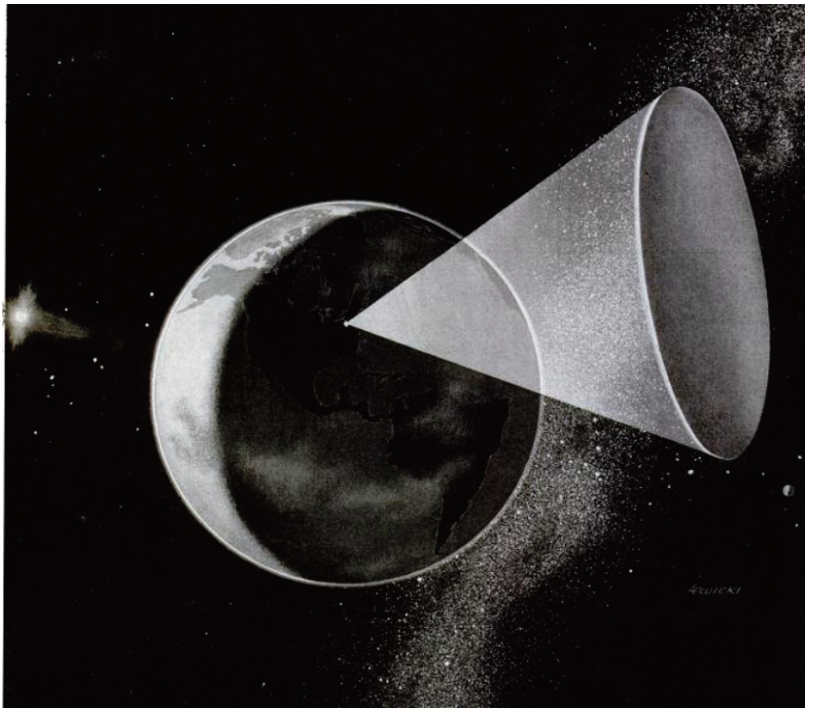
Bombs, rockets and explosives
German nuclear energy project
Schwerer Gustav (Heavy Gustav) – an 800mm railway gun
V-3 cannon 'Hochdruckpumpe' – 'High Pressure Pump'; a supergun
A1 – the first German experimental rocket
A2 – an experimental rocket, gyroscopically stabilised
A3 – an experimental rocket with an inertial guidance system.
A4/V-2 – a ballistic missile.
A4-SLBM – a planned submarine-launched ballistic missile.
A4b - Longer range version of the A4 rocket.
A5 – an experimental reusable rocket.
A6 – an improved A4b rocket.
A7 – an improved A4 rocket.
A8 – a planned submarine-launched ballistic missile.
A9 Amerikarakete – an intermediate-range ballistic missile to be used to strike the eastern United States.
A10 – a lower stage for the A9 to upgrade it to an intercontinental ballistic missile.
A11 – a planned satellite launcher.
A12 – a rocket, capable of putting 10 metric tons into low Earth orbit.
Enzian – a surface-to-air missile with infrared guidance.
Feuerlilie F-25 'Fire Lilly' – a surface-to-air missile.
Feuerlilie F-55 'Fire Lilly' – a two-stage, supersonic surface-to-air missile.
V-1 flying bomb/Fieseler Fi 103/Vergeltungswaffe 1 – the first cruise missile.
Fliegerfaust 'Pilot Fist' or 'Plane Fist'/*Luftfaust* 'Air Fist' – the first man-portable air-defence system (MANPADS).
Fritz X – an unpowered air-launched, manual command to line of sight-guided anti-ship missile.
Henschel Hs.117 Schmetterling 'Butterfly' – a manually guided surface-to-air missile.
Henschel Hs.117H – a manually guided air-to-air missile.
Henschel Hs.293 – a manual command to line of sight guided air-to-ship missile.

Henschel Hs.294 – a manual command to line of sight guided air-to-ship missile/torpedo.
Henschel Hs.298 – an air-to-air missile.
R4M Orkan 'Hurricane' – an unguided air-to-air rocket.
Rheinbote 'Rhine Messenger"- the first short-range ballistic missile.
Rheintochter 'Rhinedaughter' – a manually guided surface-to-air missile.
Ruhrstahl X-4 – a wire-guided air-to-air missile designed for the Ta 183.
Taifun 'Typhoon' – a planned unguided surface-to-air missile.
Wasserfall Ferngelenkte Flakrakete – a supersonic surface-to-air missile.
Werfer-Granate 21 – a heavy-calibre unguided air-to-air rocket.
G7es/Zaunkönig T-5 – acoustic homing torpedo used by U-boats.

Orbital
Sun gun – a parabolic mirror in orbit designed to focus sunlight onto specific locations on the Earth's surface.

Guns
Jagdfaust – an automatic airborne anti-bomber recoilless rifle for use on the Me 163.
Mauser MG 213 – a 20 mm aircraft mounted revolver cannon.
Mauser MG 213C – a 30 mm aircraft mounted revolver cannon.
Sturmgewehr 44 – the first assault rifle.
Krummlauf – a curved barrel for the StG44.
Sturmgewehr 45 – prototype.

The Heavy Gustav railway gun.



In 1929, the German physicist Hermann Oberth developed plans for a space station from which a 100 metre-wide concave mirror could be used to reflect sunlight onto a point on the earth.

During World War Two, a group of German scientists at a research centre in Hillersleben began to expand on Oberth's idea of creating a superweapon that could utilize the sun's energy. This 'sun gun' would be part of a space station 5,100 miles above Earth. The scientists calculated that a huge reflector, made of metallic sodium and with an area of 3.5 square miles, could produce enough focused heat to make an ocean boil or burn a city. After being questioned by Allied officers, the Germans claimed that the sun gun could be completed within 50 or 100 years.

Directed-energy weapons

Rheotron/betatron - Among the directed-energy weapons the Nazis investigated was the X-ray beam developed under Heinz Schmellenmeier, Richard Gans and Fritz Houtermans. They built an electron accelerator called Rheotron (invented by Max Steenbeck at Siemens-Schuckert in the 1930s, these were later called betatrons by the Americans) to generate hard x-ray synchrotron beams for the RLM. The machine worked by interrupting the magnetos of engines in Allied bombers and brought aircraft down to lower altitudes into the reach of flak batteries.

Norwegian born Dr Rolf Wideroe wrote in his autobiography that he worked on a particle accelerator X-Ray transformer for this project at Hamburg in 1943. The Philips subsidiary Valvo also participated and much of the engineering was performed by CHF Muller & Co. Wideroe later rescued the device from the rubble of Dresden and delivered it to General Patton's 3rd Army at Burggrub on 14 April 1945.

Röntgenkanone - another approach was from Ernst Schiebold who developed this from 1943 at Großostheim. This employed a particle accelerator cupped from beneath by a Beryllium parabolic mirror with a bundle of nine beryllium rods as an anode at its core. The entire device was steerable at Allied bomber formations. The Company Richert Seifert & Co was largely responsible for its manufacture.

Given the scale and scope of projects and technology suspected of either being already in the hands of the Germans, or being actively worked on and close to fruition, it is not surprising that the Allied military machine did all they could as the war drew to its conclusion to get their hands on it all.

But investigations had started at least four years earlier.

Chapter Two

Making Use Of What Arrived

On many occasions during the Second World War German aircraft literally fell upon the United Kingdom, and they subsequently arrived at experimental establishments in various stages of wreckage or disrepair. It was by no means unusual for them to be very much the worse for wear, but sometimes good fortune provided specimens in complete working order, or suffering only minor damage.

Other Axis aircraft were also captured and evaluated. The testing and evaluation of captured aircraft and equipment in the United Kingdom was undertaken at various research establishments and specialist Service units, but came under the overall control of a department within the Air Ministry. Termed 'AI-2', this Air Ministry intelligence branch was responsible for the analysis of enemy aircraft production.

Factors in securing a good flow of enemy machines were, firstly, as shoot-downs from the fighter and anti-aircraft defences, but from the scientific viewpoint machines obtained in this manner were not over popular since they tended to have been inflicted with rather drastic damage; the second, and much better source was primarily due to bad navigation, fuel shortage, engine failure, and defection.

Naturally, the Royal Aircraft Establishment (RAE) at Farnborough came in the first category and was engaged in this function from 1939 to 1946. Farnborough was the premier centre for flight testing in the United Kingdom, with a reputation of being one of the world leaders in its field.

It's origins date back to the spring of 1906, when the Army Balloon Factory, which was part of the Army School of Ballooning relocated, from Aldershot to

The remains of a Messerschmitt Me.110 shot down by British fighters over Essex are removed by a squad of British soldiers on 3 September 1940. *(Peter H T Green Collection)*

Members of the British Home Guard pose in front of this downed Junkers Ju.87 'Stuka' that bears the numbers 5167 on its rudder. The aircraft appears to be undamaged. *(Peter H T Green Collection)*

the edge of Farnborough Common in order to have enough space for experimental work. Superintendent of the Balloon Factory was Colonel John E Capper, Royal Engineers.

In the winter of 1907 American Samuel F Cody, who had been making balloons and man-carrying kites as the 'Chief Instructor of Kiting' at the Factory - came to build his 'Army Aeroplane No.1'. In September 1908 Cody made the first aeroplane flight in Britain at Farnborough when his machine made a free flight of two hundred and ten feet.

In December 1909, His Majesty's Balloon Factory and its associated 'Balloon Section, Royal Engineers' was split in two. Colonel Capper was appointed as Commander of the Balloon Section, which became the embryo of the later Royal Flying Corps (RFC), and his job as Superintendent of the Factory was taken by Mervyn O'Gorman, a consulting engineer.

By 1911, the Factory became the Army Aircraft Factory, although its main pre-occupation was initially the production of Army airships. At this time Assistant Engineers of Design, Physics and Machine Shops were appointed, laying the foundations for the later work of the Establishment. In 1912 it was further renamed as the Royal Aircraft Factory and was charged, amongst other duties, with *'…tests with British and foreign engines and aeroplanes; experimental work'*.

Among its designers was Geoffrey de Havilland, who later founded his own company, John Kenworthy who became chief engineer and designer at the

Troops inspect the burnt out remains of Heinkel He.111 of KG27 (1G+L), which came down on the south-east coast on England on 13 July 1940.

Wrecked enemy aircraft, such as this Messerschmitt Bf.109, were littered across the countryside and the beaches of England...

...where they became a centre of attention. Specialist units removed the wreckage - such as this Heinkel He.111 - for further study. *(Peter H T Green Collection)*

Austin Motor Company in 1918 and who went on to found the Redwing Aircraft Co in 1930, and Henry Folland – later chief designer at Gloster Aircraft Company, and founder of his own company, Folland Aircraft. One of the designers in the engine department was Samuel Heron, who later went on to invent the sodium-filled poppet valve, instrumental in achieving greater powers from piston engines. While at the RAF, Heron designed a radial engine that he was not able to build during his time there, but upon leaving the RAF he went to Siddeley-Deasy where the design, the RAF.8, was developed as the Jaguar. Heron later moved to the United States, where he worked on the design of the Wright Whirlwind.

Other engineers included Major F.M. Green, G.S. Wilkinson, James E. 'Jimmy' Ellor, Prof. A.H. Gibson, and A.A. Griffith. Both Ellor and Griffith would later go on to work for Rolls-Royce Limited.

During the early years of the First World War, the Royal Aircraft Factory was in almost a monopoly situation with regard to the design of aircraft for the RFC, such that it produced not only prototype aircraft designs but also supervised the production of those designs which were accepted for military service. This involved setting up production by a large number of privately-owned aircraft industry sub-contractors to the government, to the exclusion of aircraft designed by the private aircraft industry. The Factory also became involved in the production of its own aircraft and engine designs.

Activities extended not only to aircraft design and production, but also

The cockpit section of Ju.88A-1 7A+FM under examination ar the RAE. The aircraft made a wheels up landing at RAF Oakington on 19 September 1940. *(John Hamlin Collection)*

to the use of wind-tunnels and to the development of materials, instruments, propellers, and stressing methods that included the testing of aircraft to destruction.

The monopoly held by the Factory was criticised and in 1916 an official enquiry was set up which eventually ruled that the Factory should no longer be concerned with the design and construction of aircraft, but instead concentrate on the theoretical and consultative aspects.

With the creation of the Royal Air Force (RAF) on 1 April 1918, the Royal Aircraft Factory was renamed as the Royal Aircraft Establishment.

In 1924 a further official Committee was set up to report on the organisation of the Establishment, and this - the Halahan Committee - confirmed the primary function of the RAE as providing 'a full-scale aeronautical laboratory for the Air Ministry' and defined its main activities as:

- development work on experimental aeroplanes and engines .
- testing of experimental instruments and accessories .
- development of special flying instruments for which there is little commercial demand .
- investigations of failures; liaison with contractors' research.
- technical supervision of the construction of experimental machines.
- stressing of new types of machine, approval of designs and the issue of airworthiness certificates.
- the issue of certain technical publications.

In the inter-war period, subject to the severe financial restraints of the time, much work was done in the field of aero engine development, especially

This Junkers Ju.88 crash-landed during the Battle of Britain and is seen here guarded by members of the British Army. From the condition of the propellers the machines must have slid backwards during its final landing. *(Peter H T Green Collection)*

A police constable and Army private investigate this downed Heinkel He.111. *(Peter H T Green Collection)*

with regard to engine superchargers and automatic engine controls. Other areas included aircraft fire extinguishing research, a comprehensive programme of work on aerofoils and wind-tunnel testing of models for general aerodynamic research, catapult launching and pilotless aircraft developments, and pioneering work on Gas Turbine development for aircraft applications. The whole of the RAF radio communications network was reconstructed under RAE supervision. These tasks were undertaken with a technical staff of about 150 people, until the numbers began to build up from 1934 with the prospect of a European war looming.

With the outbreak of the Second World War, the technical staff of the RAE became increasingly involved in the investigation of crashed enemy aircraft and captured equipment. The investigation work drew on the experience of all departments of the Establishment. This experience had been built up during the formative years of peace.

These activities resulted in the issue of the 'Enemy Aircraft' (EA) series of special technical reports. From June 1940, when the Experimental Flying Department became involved in flight tests of a captured Messerschmitt Bf.109E fighter, these reports included flight test results, engineering appraisals and descriptions of complete aircraft received at the Establishment or examined 'on site' at other experimental units or at the locations where they had been shot down. The main appraisal work was co-ordinated by Mr W. Sutcliffe, who was put in charge of an Enemy Aircraft and Engine Section of the Mechanical Test

Local newspapers carried reports of enemy aircraft being put on display. This Heinkel 111, coded 4H+FM and bearing signs of battle-damage, was escorted by police through Peterborough. It was common to sheet over the cockpit area, especially if it showed signs that the crew had been killed. *(author's collection)*

Two views of this badly damaged Junkers Ju.88 from 7th Staffel, KG30 that was put on display in the grounds of Kings School, Park Road Peterborough. It had been shot down near Driffield in Yorkshire on 15 August and was displayed for 'War Week' in late 1940. Local legend has it that members of the public, including King's School pupils, could climb into the aircraft for a closer look, once they had made their 15 shilling purchase! *[both author's Collection]*

Department of the Establishment. Staff from this Section were available at short notice to carry out on-site examinations of enemy aircraft which had crashed or been shot down in the United Kingdom.

The majority of complete German and Italian aircraft captured after force-landing (or landing in error) in England were brought to Farnborough for examination and test. Later in the war examples of aircraft types or variants which had already been assessed at the RAE were sometimes sent to 1426 Flight or other units without being moved to Farnborough, although even in these cases technical specialists from the RAE often examined them and wrote reports describing any new features or equipment found.

The main flight test work was carried out by the Aerodynamics Flight of the Experimental Flying Department, although the Wireless & Electrical Flight also flew many hours, especially with investigations of radar-equipped aircraft later in the war.

With the coming of World War Two, the first few enemy aircraft shot down over Britain were objects of the greatest interest and a team of experts was detailed for the sole task of examining the wrecks. The supply soon became more plentiful and it was possible, in some instances, to repair different types

One of a number of official air-to-air photographs of He.111 H-1 AW177 - formerly 1H+EN of IIKG26. The Lion Geschwader emblem is seen below the pilot's side window. *(Peter H T Green Collection)*

and put them through flight tests to determine their capabilities. After the Battle of Britain and the subsequent bombing raids, the RAE in fact possessed a not insignificant set of Luftwaffe machines, and it was a common enough event to see mock dog-fights between British and German aircraft over Farnborough.

The responsibility for flying captured aircraft rested on the shoulders of such distinguished test pilots as Group Captain H. J. Wilson, among others.

Known as 'Willie' Wilson (*b.* 28 May 1908 – *d.* 5 September 1990) Hugh John Wilson was a senior Royal Air Force officer. He served as the RAF's main chief test pilot for captured enemy aircraft.

On 13 September 1929, Wilson joined the RAF within the General Duties Branch on a short service commission. He trained at 5 Flying Training School and was later posted to 111 Squadron. Exactly five years after joining the RAF in 1934, he was placed on the Reserve of Air Force Officers. Whilst on this reserve list he passed a conversion course on flying boats and also as a flying instructor.

In the mid-1930s he worked as a test pilot for Blackburn Aircraft and was, in 1938, the first to fly the Blackburn Roc. He later worked at the Royal Aircraft Establishment at Farnborough as a civil test pilot.

Recalled to active service with the RAF in 1939, Wilson was the Commanding Officer of the Aerodynamic Flight of the RAE at RAF Farnborough.

An Italian Arrival.

A little known fact about the Battle of Britain was that the UK was attacked by the Italian Regia Aeronautica. This occurred when a group of FIAT CR.42 biplane fighters - suggested by some records as being around sixty - from 95ª Squadriglia Caccia Terrestre of the 18° Gruppo, 56° Stormo attached to the Corpo Aereo Italiano (Italian Air Corps) under the command of the Luftwaffe's Luftflotte 2 escorted between fifteen and twenty Caproni bombers who attacked the south east of England. This unit, based at Maldegen in Belgium, had at least one machine – MM5701 coded 13-95 - shot down by RAF Hurricanes from Martlesham Heath on 11 November 1940. The aircraft made a force-landing

Ju.88 G-6 'AM 3' was delivered by road to 6 MU on 23rd July 1945 for preparation for display in Hyde Park London. It returned to the MU until 11 December, when it was returned to RAE Farnborough. Its subsequent fate is unknown. *(Peter H T Green Collection)*

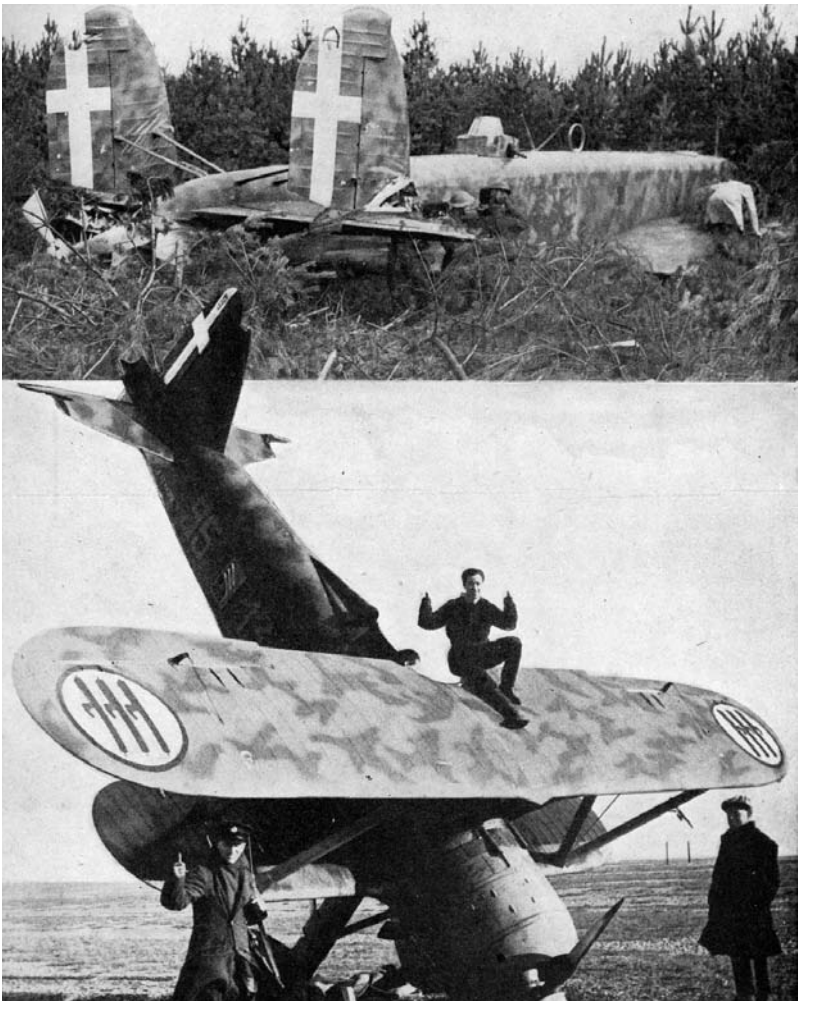
near Orfordness with a fractured oil-pipe but was otherwise undamaged. Contemporary reports suggest that the Hurricanes shot down eight bombers and five fighters.

The CR.42 was taken by road to Martlesham Heath and then, on 27 November, to Farnborough. The fighter was subsequently allotted the RAF serial BT474. Only limited flights were made at RAE by Squadron Leader L. D. Wilson before it was flown to the AFDU at Duxford by Wing Commander I. R. Campbell-Orde on 28 April 1941, to enable that unit to develop tactics against the type, which was the standard Italian fighter in use in the Middle East theatre, by mock combat with various types of fighter in service with the RAF.

During 1943 the AFDU lost interest in the type because of its obsolescence and the aircraft was selected for storage as potential museum material.

Between 1941 and the end of the war Wilson was the RAF's main test pilot on all captured enemy aircraft. Flying these aircraft from RAF Farnborough (they had been repainted with RAF roundels), Wilson would evaluate their handling and performance.

One such 'acquisition' was the capture of a Focke-Wulf Fw.190A-3 of III/JG 2. The story behind its arrival is most intriguing. Luftwaffe pilot Oberleutnant Armin Faber mistook the Bristol Channel for the English



Two of the downed Italian aircraft: a twin-tailed Caproni bomber and a biplane FIAT CR.42 fighter.

FIAT CR.42 MM5701 95ª Squadriglia Caccia Terrestre of the 18° Gruppo, 56° Stormo attached to the Corpo Aereo Italiano seen on a test flight in RAF markings as BT474.

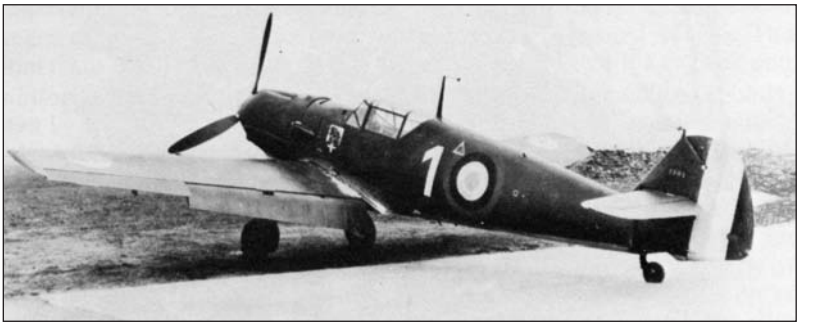
Heinkel He.115B-1 BV186. This machine had a somewhat varied career, having been captured from the Luftwaffe by the Norwegians during the fighting for Norway and taken over by the *Marinens Flyvevaesens.* It was operated by the Royal Norwegien Navy as '64' until evacuated to the UK in June 1940, being flown then by British Overseas Airways Corporation. It was then flown to Malta on October 1941, being destroyed at Kalifrana by strafing early in 1942. *(John Hamlin Collection)*

Channel and landed his Focke-Wulf 190 intact at RAF Pembrey in south Wales, thinking he was in France! This machine was the first Fw-190 to be captured by the Allies and was tested to reveal any weaknesses that could be exploited.

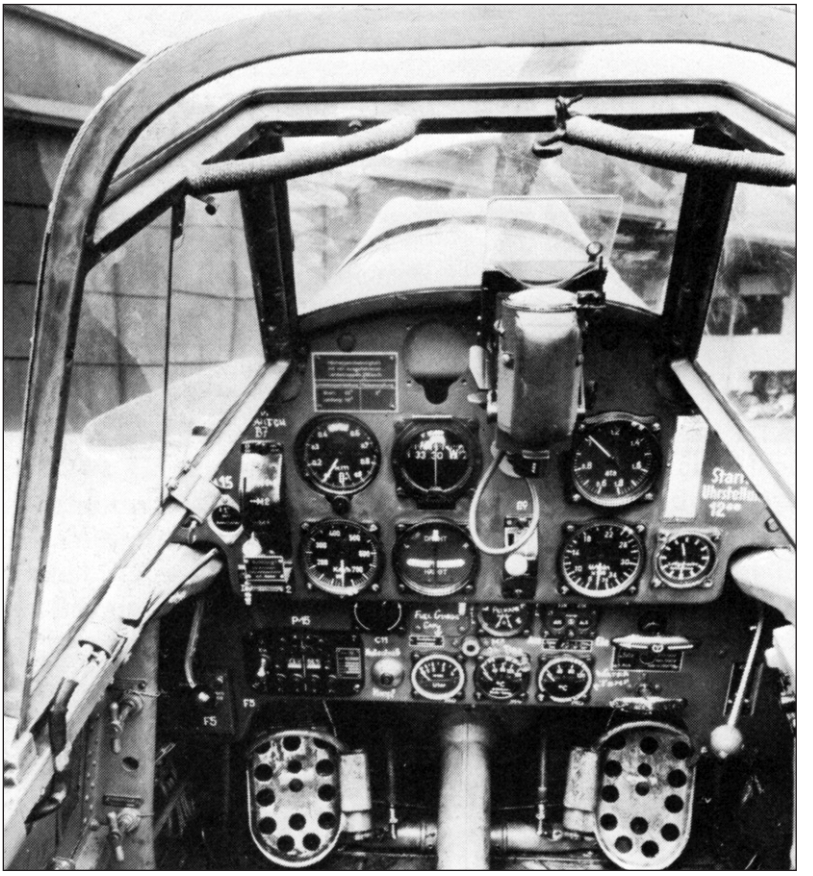
It all began when in June 1942 Oberstleutnant Armin Faber was Gruppen-Adjutant to the commander of the III fighter Gruppe of *Jagdgeschwader 2* (JG 2) based in Morlaix in Brittany. On 23 June, he was given special permission to fly a combat mission with 7th Staffel.

The Fw.190 had only recently arrived with front line units and its superior performance had caused the Allies so many problems that they were considering mounting a commando raid on a French airfield to capture one for evaluation.

7 Staffel was scrambled to intercept a force of twelve Bostons on their way back from a bombing mission; the Bostons were escorted by three Czech-manned RAF squadrons, 310, 312 and 313. A fight developed over the English Channel with the escorting Spitfires, during which Faber was attacked by Czechosolvakian Sergeant František Trejtnar of 310 Squadron. In his efforts to shake off the Spitfire, Faber flew north over Exeter in Devon.



Messerschmitt Bf.109E-3 landed in error due to fog in an orchard at Woerth, in Bass-Rhin in France. It was transferred to the CEV (or *Centre d'Essais en Vol* - flight test centre) at Bricy and painted in French colours, but retained its 1/JG76 insignia, construction number and 'White 1'. The aircraft was handed over to the RAF at Amiens on 2 May 1940 and was flown to A&AEE Boscombe Down via Chartres and Tangmere the next day and allocated the RAF serial AE479.



The cockpit of the aircraft. Translations have been painted on some of the instruments. *[both Hugh Jampton Collection]*

After much high-speed manoeuvring, Faber, with only one cannon working, pulled an Immelmann turn into the sun and shot down his pursuer in a head-on attack.

Trejtnar bailed out safely, although he had a shrapnel wound in his arm and sustained a broken leg on landing; his Spitfire crashed near the village of Black Dog, Devon. Meanwhile, the disorientated Faber now mistook the Bristol Channel for the English Channel and flew north instead of south. He turned towards the nearest airfield - RAF Pembrey. Observers on the ground could not believe their eyes as Faber waggled his wings in a victory celebration, lowered the Focke-Wulf's undercarriage and landed.

The Pembrey Duty Pilot, Sergeant Jeffreys, immediately grabbed a signal

Faber's Focke-Wulf Fw.190A-3 of III/JG 2 at RAF Pembrey, June 1942.

pistol and ran from the control tower and jumped onto the wing of Faber's aircraft as it taxied in. Faber was apprehended and later taken to RAF Fairwood Common by Group Captain David Atcherley for interrogation.

Faber's aircraft was a Fw.190A-3 with the Werknummer 313. It was the only fighter configuration to be captured intact by the Allies during the war. All other captured aircraft were either of the long range bomber or fighter bomber configuration.

Group Captain Hugh Wilson, the pilot mainly responsible for test flying captured enemy aircraft, was asked to fly 313 from RAF Pembrey to RAF Farnborough under the guarantee that he would not crash. This was an impossible guarantee to give, so the aircraft was dismantled and transported via lorry instead.

At Farnborough, the Fw-190 was repainted in RAF colours and given the RAF serial number MP499 and a 'P' for prototype. Testing and evaluation commenced on 3 July 1942 at the RAE. Roughly nine flying hours were recorded, providing the Allies with extremely valuable intelligence.

Faber's captured Focke Wulf Fw.190A-3 at the Royal Aircraft Establishment, Farnborough, with the RAE's chief test pilot, Wing Commander Hugh J 'Willie' Wilson at the controls, August 1942. The machine would later have a yellow 'P' in a circle painted behind the roundel denoting 'prototype'.

After ten days it was transferred to the Air Fighting Development Unit at RAF Duxford for further tactical assessment, where it was flown in mock combat trials against the new Spitfire Mk.IX, providing the RAF with methods to best combat the Fw.190A with their new fighter.

The Fw-190 was flown 29 times between 3 July 1942 and 29 January 1943. It was then partially dismantled and tests done on engine performance at Farnborough. It was struck off charge and scrapped in September 1943.

Faber meanwhile was a prisoner of war in Canada, where he managed to successfully convince British authorities that he suffered from epilepsy. Remarkably, it appears the authorities were taken in by his ruse and in 1944 they allowed his repatriation. Shortly after his return, he was again flying in front-line fighter operations.

After a short period working in America as a test pilot, Wilson joined 616

NN644, a Messerschmitt Bf.109F-4 still wearing it's 'White II' and falling bomb symbols going back to its time in service with JG26.

Squadron in 1944 to train pilots on Britain's first jet fighter, the Gloster Meteor. He subsequently became Officer Commanding of the Empire Test Pilots' School at RAF Cranfield.

On 7 November 1945, flying the Gloster Meteor Britannia (EE454) over a 1.86 miles course at Herne Bay in Kent, Wilson averaged a new world air speed record for a jet fighter of 606.38 miles per hour.

After leaving the RAF with the rank of Group Captain, Wilson worked as an engine salesman for Blackburn Aircraft and Rolls-Royce.

Publishing the information

Remarkably – and somewhat surprisingly – throughout the entire period of the Second World War there appeared regular articles in the Allied aeronautical press regarding the activities of the Axis industry and air forces. Often this was very 'up-to-date'.

During the course of the war a number of the aircraft examined at the RAE were subsequently passed to various local and national authorities for exhibition purposes, to raise money for War Bonds and Savings, Spitfire Funds, and other causes.

At the request of the Ministry of Economic Warfare, an extensive and intensive study was undertaken of the construction methods of the German aircraft industry, in order to seek out any weaknesses in the economic and production centres. Therefore, in addition to flying aircraft on test, evaluation of equipment was a primary function, various departments within the RAE being responsible for close study of specific items. These departments comprised Aerodynamics, Armaments, Chemistry, Electrical Engineering, Engines, Instruments, Materials/Metals, Mechanical Test, Photographic, Radio/Wireless and Structures/Airworthiness Standards. As part of this latter item, particular attention was paid to build quality.

Bf.109G-2/Trop RN228 once 'Black 6' on III/JG77. It was captured at LG139/Gambut Main in Libya on 13 November 1942 and made airworthy by members of 3 Squadron, Royal Australian Air Force. At the controls is Flying Officer G D M Gough.

BEHIND THE LINES

Service and Industrial News from the Inside of Axis and Enemy-occupied Countries

Honours for Dornier

CLAUDIUS DORNIER, founder and managing director of the Dornier Aircraft Works, has been elevated by Hitler's order to the rank of Professor.

Ladies for Regia

ABOUT 700 women, members of the Fascist Party, have been recruited for service with the Italian Air Force. One hundred of them are reported to be engaged in wireless communications from airfields, while the rest are undergoing training as ground wireless operators.

Hispano Suiza

AT their works in Bois-Colombes, near Paris, and at Tarbes, in Unoccupied France, this firm has completed the development of a new 12-cylinder liquid-cooled engine, designated 12Z. The new type differs from the 12Y by the doubling of its valves, and its power output is about 1,400 h.p. It is reported, however, that this will soon be brought up to 1,600 h.p.

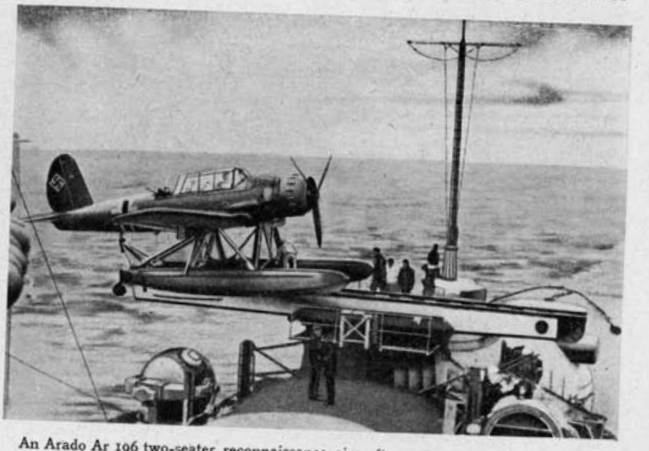
The development of a 24-cylinder type demonstrated at the Paris Aircraft Show of 1938 continues under the direction of M. Birkigt. The four 6-cylinder banks in an "H" arrangement and driving two crankshafts are now to be replaced by those of the new 12Z. The new 24 H engine is to have a power output of about 3,000 h.p. A further report suggests that the company is planning the development of a high-performance engine, composed of two tandem arranged 24 H types and developing 6,000 h.p.

V.G.50

THE Vichy Government Aircraft Works at Lyons-Villeurbanne are engaged on the construction of a twin-engine all-metal high-speed aircraft, "V.G.50." The designers are Vernisse and Galtier, who for many years were engaged on the design of wooden aircraft. Of particular interest is the power plant arrangement, which is composed of two Hispano Suiza 12Z engines of about 1,500 take-off h.p. and which drive contra-rotating airscrews. One engine is mounted in front of the pilot's cockpit, the other in its rear and below it. The extension shaft of the rear engine passes between the legs of the pilot and contains also the pressure oil lines for the operation of the c.p. airscrew.

Two prototypes are now in construction, one with a conventional, the other with a nose-wheel landing gear. The gross weight of the aircraft is about 16,500 lb., wing loading about 41 lb./sq. ft., and wing area between 365 sq. ft. and 387 sq. ft.

It is reported that the designs for a four-engined Atlantic flying boat have been completed by the same firm. The flying boat is to have engines mounted in tandem. (According to "Interavia" a similar arrangement is to be found on the Heinkel He 177.) The aircraft is to be fitted with a pressure cabin; its gross weight is to be about 27 metric tons, span about 138ft., and its speed 310 m.p.h. at 29,500ft.



An Arado Ar 196 two-seater reconnaissance aircraft on the retracted catapult of a German cruiser The Ar 196 is powered with a Bramo Fafnir 323 air-cooled radial of 830 h.p. It will be remembered that they were employed by the *Bismarck* during its historic engagement with the Royal Navy.

The Italian Caproni Reggiane 2001 single-seater fighter. It is powered by a Mercedes-Benz DB601N engine of 1,150 h.p. and has a maximum speed of 348 m.p.h. at 22,000 ft.

Nazi Munition Council

FLIGHT, July 9th ("Behind the Lines"), reported the formation of a German Munition Council. As mentioned then, this Council is to co-ordinate military and production requirements. In addition to the military members mentioned in our previous report, the following representatives of the industry have been called by Professor A. Speer, Nazi Munition Minister, to serve on the Council: H. Bucher, managing director of the A.E.G.; P. H. Kessler, chairman of the Bergmann Electrical Works and former director of the Siemens firm, well known for his experience in Japan; P. Pleiger, chairman of the Iron Mining and Smelting Section of the Hermann Goering Works; Dr. E. Poensgen, chairman and managing director of the Vereinigte Stahlwerke (United Steel Works); W. Zangen, chairman and managing director of the Mannesmann Tube Works; H. Roehnert, chairman and man. director of the Rheinmetall-Borsig and chairman of the holding company of the H. Goering Works; Dr. A. Voegler, president of the Kaiser Wilhelm Society.

The above representatives of the munition industry are known as "Leaders of Economy" (Wirtschaftsfuehrer).

In addition to this Council, a number of central industrial committees has been formed for the different branches of war production. These committees are composed of engineers and production experts who work in close contact with technical branches of the armed forces and have full authority over the mass production of different war equipment.

A page from *Flight* dated 30 July 1942, showing the latest aeronautical developments in the Axis countries. Clearly there were ways of getting information across the conflict lines and into the public domain!