

MESSERSCHMITT Me 262 *Described Part 1*

KENNETH A. MERRICK



KOOKABURRA TECHNICAL PUBLICATIONS

\$1⁹⁵ USA

£0.50 UK & EUROPE

\$1²⁵ AUSTR

Series 1 No.6

TECHNICAL MANUAL

PUBLISHED BY

KOOKABURRA TECHNICAL PUBLICATIONS

DANDENONG, VICTORIA, AUSTRALIA

© CONTENTS COPYRIGHT
KOOKABURRA TECHNICAL PUBLICATIONS 1970

ISBN
0000-0000-0000-0000
0000-0000-0000-0000

U.K. AND EUROPEAN DISTRIBUTORS
ALMARK PUBLISHING CO LTD
270 BUNNINGTON RD,
NEW MALDEN, SURREY, KT3 4NL, UK

ALL OTHER PLACES
THE PUBLISHERS
KOOKABURRA TECHNICAL PUBLICATIONS
61 POTTER ST, DANDENONG 3175, VIC, AUSTRALIA

Cover: An Me 262-1a interceptor of JRG 01 34 makes a pass at a USAAF B-26 Marauder during a daylight attack over Germany in April 1945. Painting by Australian artist Norman Clifford.

MESSERSCHMITT Me 262

Described PART I

Kenneth A. Merrick



C. G. GARDNER

Above and below: The Me 262V (PC+UA) fitted with the same piston engine and the B.M.W. turboprop. Policy of invasion are the two-bladed airscrews, guide rails for the ejector seat and the cropped fin and rudder.

On April 26th, 1945, a formation of Mustang bombers was passing over Nuremberg on the Danube when it was intercepted by a formation of Me 262 fighters which came in for an almost head on attack. The Mustangs' engines opened fire immediately, putting up a strong defensive fire. In the leading Me 262 the pilot retained the safety catch on the gun and rocket switches and lining up carefully on one of the Mustangs he pressed the firing button. The four 30 mm. cannons in the nose burst into life, but the rockets remained on their racks beneath the wings. He had forgotten to release the second safety catch for the rockets. However, the Mustang hit by the cannon shells burst into flames and exploded. Turning his attention to another bomber further back in the formation, he raked it with a long burst of cannon fire as he swept past, and at the same time felt his own aircraft hit several times by the defensive fire, but this was ineffective.

The whole action had taken but a few seconds and the German pilot had not had sufficient time to see definitely what had happened to the second Mustang. Pulling up above the rest of the formation he banked sharply to the left—and in that second it happened. The Me 262 shuddered as a hail of .50 machine gun bullets tore into it. The instruments panel disintegrated and the pilot felt a sharp pain in his right knee. At the same time the starboard engine was hit, the cooling brake hose and was partially torn away by the airplanes. Another burst and the port engine was hit; the Me 262 was literally staggering. Diving through the protective layer of cloud beneath, he managed to shake off the tormented fighter escort Mustang.

Immediately beneath him was an autobahn. Experienced eyes picked out the landmarks, ahead was Munich and to the left Berlin. A few careful adjustments and he found that he still had a moderate degree of control over the battered aircraft. Moments later he was over the airfield and banking carefully he began his approach. One of the engines had had the throttle linkage shot away, leaving him no choice

but to cut both engines just before the edge of the field. Only when he had cut the engines did he notice the Thunderbolt slowing up the airfield. Now it was too late to do anything about it.

Touching down at 150 m.p.h. he heard the runway rattle violently—the tyre was flat. Banking as hard as possible, the aircraft tumbled on down the small landing strip till finally it ground to a halt and the pilot leapt out and took cover in the nearest bushy area. Later he learned that his formation had shot down five of the bombers without loss, and the rest of the pilots either being directed to neighbouring airfields or returning to bases after the Thunderbolt attack had ceased.

This was to be the last operational sortie for General Adolf Galland. It was apparently fitting that he should be flying an Me 262 fighter for no other senior Luftwaffe officer had risked so much politically or tried so desperately for so long to bring this radically advanced aircraft into full operational service. Finally, in Germany's metaphysical dawn hour, his efforts had reached partial fruition and the type of results that he had produced were proven. But his year of victory was drowned in the bitterness of the impending defeat.





The Me 262 (PC-UB) with early model Junkers turbojets, single piece airframe with external main balance and observer fixed with jump seats balance. Note sharply raked mainwheel fairing doors and lack of main balance on the rubber and wire sub.

The Me 262 had its genesis seven years before, in the autumn of 1935, when the *Kristallkabinenbauvereinigung* (K.L.K.) requested the Messerschmitt A.G. to design an airplane suitable for the utilization of a radically advanced powerplant. This new powerplant was the axial flow turbojet currently under development at both the Junkers Flugzeug und Motorenwerke and the R.M.W. Flugmotoren G.M.B.H.

Alotted the title of "Projekt 2000", the preliminary design studies were completed, along with wind tunnel tests of models, and by the following June orders were issued to proceed with the construction of a full scale mock-up of the proposed aircraft. This was inspected by the R.L.M. officials on December 19th and on March 1st, 1940, an order was placed for three Prototype airplanes. Power was to be provided by a pair of R.M.W. P.2000 turbojets (later redesignated R.M.W. 109-003A.) which were anticipated to be ready for installation during the coming summer. However, the first of many delays to be suffered was encountered with these engines.

Early experimental work at the Experimental Institute of Aerodynamics at Göttingen had resulted in a model compressor which showed the rather remarkable average efficiency figure of 80%. Using this as a basis the R.M.W. engineers designed a six stage axial flow compressor and although this proved capable of 80% efficiencies over a wide range of loads its capacity was insufficient to meet the demands of the R.L.M. specification. A solution was undertaken to increase the capacity by 30%, this being achieved by increasing the number of compressor stages to seven while the diameter remained unchanged. However, the results were still far from satisfactory despite an improvement in the average air velocity and an increase in the rated r.p.m. from 9,800 to 9,900. The only alternative turbojet engine, the Junkers Jumo 109-004A, could not be utilized as it was in an even worse state, having run into serious development troubles following its initial bench tests in November, 1935.

Undaunted by these disappointing results Messerschmitt proceeded with the construction of the three experimental airplanes, which had been allotted the type number Me 262, and these were completed by April, 1941. Meanwhile, changing policy at the R.L.M. had brought about a review of existing priorities for the aircraft industry and this resulted in the re-evaluation of a very low priority to both the airplane and the turbojet development programmes. Despite this

official apathy, enthusiasm remained high at Messerschmitt's and work went right ahead. Realizing that there was no chance of obtaining suitable turbojet engines for the next six months at least, the decision was made to begin preliminary flight investigation tests with a piston engine. A Junkers Jumo 210G engine of 700 h.p. driving a two-bladed propeller was installed in the nose and though seriously underpowered (the aircraft had a loaded weight of 9,270 lbs.) the Me 262V1 made its first flight on April 26th, 1941. In all seven flights were successfully undertaken with this configuration.

The programme received a fillip when a further five prototypes were ordered on July 19th. However, the turbojets were still not available and it was not till mid-November that the first pair arrived for installation, these being R.M.W. 109-003A units, each developing 1,000 hp. static thrust. These engines were far from satisfactory because failure in the first compressor stage was still a common fault and usually resulted in the complete destruction of the compressor. Because of the unreliability of these early engines, the piston engine was retained when they were installed in the Me 262V1 and as events turned out it proved a wise decision.

The first test flight was undertaken by Messerschmitt's chief test pilot Flugkapitän Fritz Wendel. Wendel was a fine apprehensive of the short runway, there being only 1,400 yards available and this was only grass. However, the aircraft succeeded in getting airborne if only just clearing the boundary fence. Just after completing the first circuit trouble struck. Both tailwheels ran and the aircraft sank rapidly on to the airfield only the piston engine preventing a really serious crash. When the engines were dismantled it was found that the turbine blades had been overstrained by the take-off surge, and had succumbed to vibration failure. Despite the accident the Messerschmitt team was satisfied with the main results and eagerly awaited the delivery of the more powerful Jumo 004 engines (rated at some 1,850 hp. static thrust). Meanwhile, Wendel proceeded to familiarize himself with the turbojet at the R.M.W. plant in Berlin and the Junkers works at Dessau. There he flew a Bf 110 with a Jumo 004 engine slung underneath the fuselage.

Almost eight months were to pass before the new engines could be delivered and installed in the Me 262V1. This resulted in a redesign of the original nacelles, the Jumo units having a greater overall length and diameter. The rubber

and the ailerons were also enlarged by the addition of tip plates to increase the lateral stability. Finally on July 18th, 1942, the aircraft was ready at Lockheed airfield and Muroc climbed into the Me 262V for what was to be the first flight of the aircraft on purely turbojet power. Lacking the brakes, he coasted both throttles open for thirty seconds and then released the brakes, catapulting forward. At 800 yards the tail still had not lifted and he pushed the control column forward in an attempt to modify this, but with negative results. The situation was decidedly critical either he get the aircraft off the fast descending runway immediately or he would have to brake as hard as possible in an attempt to pull up before hitting the trees that surrounded the boundary. He decided on the latter and braked hard. Much to his surprise and relief the tail came up as he. A split second decision and he had released the brakes again and with full throttle on the aircraft just cleared the tops of the surrounding trees. Once airborne the aircraft behaved well and proved to have good landing qualities.

The R.L.M.'s interest warmed considerably after the success of this initial flight and the Me 262V was transferred to the Luftwaffe test center at Rechlin for further tests. This enthusiasm was to be short lived, for while taking off on his second flight on August 11th, the chief test pilot crashed the Me 262V. The resulting confusion and lack of response to the programme by the R.L.M. shocked the Messerschmitt team, who knew that without official backing and the necessary increase in priority it would be impossible to establish adequate production facilities or even undertake the necessary comprehensive development programme. Despite this apathy and their already extensive commitments, Messerschmitt continued to derive every available means to stepping up the development of the Me 262 programme. Subsequently, the Me 262V2 was fitted with Junker turbojets and flew for the first time on October 2nd, 1942. The R.L.M. once more showed signs of enthusiasm and ordered Heinkel jet-production machines, this order later being amended to forty-five machines.

On December 2nd, the R.L.M. held a conference in Berlin in which it was decided to establish a production rate of 20 machines a month.

The Me 262V1 (PC+UC) being prepared for flight trials. Fairing areas panel has been temporarily removed and distinctly shows its lower more forward position when compared to the "A" series production aircraft. Wire frames over the intake were to prevent ingestion of foreign matter during ground taxiing of the engines.

Despite the strong protests from the Messerschmitt officials, who pointed out the utter inadequacy of such a programme, the R.L.M. remained adamant, pointing out that there was no real need for such an aircraft! The scheduled production rate was considered sufficient for operational needs.

The Me 262V1 received the test programme on March 2nd, 1943, having been acquired after the damage it suffered while testing the R.L.M. engines. It was flown to the company test center at Rechlin where the Me 262V4 joined it the following month. The failure of the Me 262 was further substantiated at an R.L.M. conference on January 22nd, 1943, at which various doubts were raised as to the value of continuing with development of complex advanced designs. It was felt that the emphasis should be placed on simplification in view of the increasing production difficulties. Messerschmitt was asked to provide a design proposal utilizing the maximum number of existing components from the Me 109 production coupled with the Junker 004-B1 turbojet engines.

The resulting proposal stipulated the use of either the fuselage of the existing Me 109 or its derivative the Me 100 along with the complete wing assembly of the latter plus the non-braked assembly of the Me 109. This limited the design of new components to the fairing nose section which was to contain two Me 109 Mk. 100 cannons with 800 r.p.m. and one MG 131 cannon with 178 r.p.m. the tail assembly, and the main undercarriage members. Estimated performance figures were extremely promising, maximum speed being 323 m.p.h. at sea level, 309 m.p.h. at 15,750 ft. and a service ceiling of 37,415 ft. Overall dimensions included a wingspan of 40 ft. 2 in., length 50 ft. 2 in., height 9 ft. 40 in. and a wing area of 299.68 sq. ft. Estimated weight was 6,748 lbs. with basic equipment and a loaded weight of 12,472 lbs. which gave a wing loading of 49.9 lbs. per sq. ft. at the latter figure.

These investigations were carried out over a period of two months by which time it was realized that much of the preliminary test work already completed on the Me 262 would have to be duplicated if the project was to come to fruition. In addition, the number of basic common compo-





The Me 262 (PC-412) after modification as the prototype underwing layout. The underwing engine doors were locked shut and the main air intakes remained in order the drag as much as possible. Two Borep systems are visible beneath the fuselage. The original shape of the doors.

tests that could be obtained were said of such insufficient numbers as to make the composite aircraft project of dubious value. Work had already begun on the initial pre-production batch of Me 262 and it was quite apparent that nothing was to be gained by the abandonment of the Me 262 programme in favour of the He 129 T1 project which then remained a very interesting proposal on paper.

In May, Prof. Messerschmitt informed General Galland that the testing programme had progressed satisfactorily and urged him to test fly one of the aircraft and judge its worth for himself. Galland, who was General in charge of the fighters at the time was a popular and energetic leader with an open mind where technical advancement was concerned. He was also in a position to bring political pressure to bear in favour of the Me 262 programme if he considered it worthwhile.

Early on the morning of May 12th, Galland drove out to the company test airfield, Rechfeld, where he met Prof. Messerschmitt and a party of officials and engineers. Among them was the commander of the Luftwaffe testing section at Rechlin, his chief test pilot Behrens, and the Junkers jet engine experts. Galland was introduced to the assembly and a short conference was held during which each of the attending experts outlined on his own pertinent point. Behind them on the runway stood two Me 262s. Finally, Messitt climbed into one of the machines and took off giving a preliminary demonstration for Galland. After landing, the aircraft was unloaded and Galland took his place in the cockpit. The mechanics engaged the starter for the first engine and it started quite easily. The starter for the second engine was engaged but this time the engine caught fire, the flare spreading rapidly over the entire engine. Galland viewed the cockpit with considerable anxiety. Undeterred he climbed into the second aircraft, the T4, and a few minutes later the procedure was repeated, only this time both engines functioned correctly. Moments later he was diving down the runway and at a little over 120 mph. he was airborne. This followed a brief but thorough examination of the aircraft's flying and handling qualities.

By the time he landed Galland was convinced beyond all doubt that the Me 262 was a marvel. Its enormous technical potential was abundantly clear. Here at last was part of the answer to the decline in the quality of the German aircraft industry. During the first three years of the war the Allies had gradually caught up in the field of technical development and finally surpassed Germany. Thus by early 1943 Germany found herself in an inenviable position. Clearly it was not sufficient to just re-establish a par with the Allies, she must make a rapid and decisive advancement in the shortest possible time. In the Me 262 the technical advancement had been achieved, all that remained was to institute mass production of it. Accordingly, Galland sent a telegram to Feldmarschall Milch immediately after his flight in the Me 262, expressing the utmost praise for the aircraft and the tremendous tactical potential it held.

A conference was held by the group who had been present at the demonstration flight and a concentrated effort was made to reach a workable solution which would bring the Me 262 into front line service with the least possible delay. Due to the seriousness of the war situation, it was decided to short-circuit the usual test procedures, and it was accordingly suggested that an immediate start should be made on a batch of one hundred aircraft. These would then be put through their technical and technical trials simultaneously. While these were being built and tested preparations could be made for the final mass production, and any changes found necessary could then be applied directly to the first production series.

A copy of this proposal, complete with Galland's report on his flight was sent to Milch while Galland took the original direct to Goering the same day. Goering read the document with open enthusiasm and immediately telephoned Milch who was in full agreement with the proposal. All that remained was to get Hitler's personal sanction. Goering went to see Hitler the next morning, while Galland and the Messerschmitt team waited for the final decision. When it came it drove one more nail into the coffin of Germany's impending defeat.

Hitler's increasing distrust of Goering and the Luftwaffe's long list of technical disappointments had taken their toll. Nothing was to be done until Hitler had assessed himself personally of all the facts. The extent of his distrust was amply demonstrated at the evening conference of experts at which not a single member of the Luftwaffe was allowed to participate. Hitler dominated the conference and demanded impossible guarantees which were beyond the means of those present to give. As a result of this one-sided argument, Hitler expressly forbade any kind of preparation for mass production. Technical tests would be allowed to continue with a few prototypes. Undeterred, Messerschmitt on July 21st, demonstrated the Me 262A to Goering who was highly enthusiastic about its performance. He reported his findings direct to Hitler, but the latter still refused to alter his former decision; the priority would remain the same.

Meanwhile, Messerschmitt continued to push the testing programme ahead as rapidly as possible. It had been obvious from the outset that the tailwheel layout was not very satisfactory, providing as it did very restricted visibility during the critical stages of the take-off as well as causing damage to the runways with the jet efflux. On top of this, as has already been recorded, it required the use of full brakes to bring the tail up for take-off. The obvious solution was to fit a nosewheel layout which, periodically, had been avoided originally as it was feared that this would provide too many complications. An order was also received from the R.L.M. stating that production aircraft and all subsequent prototypes were to be fitted with this type of undercarriage layout.

The Me 262A was chosen for the initial installation of the nosewheel layout, trials having already been carried out with a standard Me 109F-1 (Work No. 5603) fitted with a fixed nosewheel. In addition two Boeing tailrotor units, each delivering 1,100 lbs. static thrust, were fitted to the aircraft to shorten the take-off run. The flight tests were begun on June 24th and proved highly successful, and in consequence, the Me 262A was fitted with a nosewheel undercarriage, this being the first fully retractable installation. In addition to receiving the first Jumo 004B turbojets scheduled for installation in the production series aircraft, the prototype four cannon installation was also fitted, flight tests beginning in October.

Several other external changes were also apparent. The new engines were enclosed in revised cowlings of improved aerodynamic shape, the leading panels from the trailing edge of the wing being carried down to streamline the rear of the engine cowling in order to improve the airflow characteristics. Some cooling problems had been encountered during earlier tests and it had been found necessary to increase the flow of air over the rear section of the engine. This was achieved by introducing a series of slots radially in the external section of the ducts draining the metal in front of each slot being slightly depressed to form a shallow scoop.

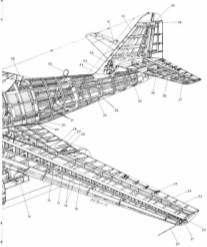
The control surfaces had also undergone a series of refinements. The original mass balanced ailerons with conventional internal linkage had proved to be inefficient at high speeds, becoming excessively heavy, a fault common to the earlier Me 109. In order to alleviate this problem the ailerons had been redesigned with a control external linkage to provide sufficient mechanical advantage to overcome the loads imposed at high speeds. Although a fully blown canopy had already been tested on the Me 262A, this being a rubber sealed unit fitted for cabin pressure tests, the original braced type of canopy was retained on this aircraft. The programme had, however, suffered a serious setback due to the first American daylight raid on the Regensburg plant on August 17th, which caused the destruction of a major portion of the assembly fixtures. This prompted the transfer of the development programme from Augsburg to Oberammergau which seriously disrupted production.

The November 2nd Goering visited the Messerschmitt works to see how the programme was progressing. During the course of the conversation with Prof. Messerschmitt he asked if the aircraft was capable of carrying one or two bombs in the role of fighter bomber, adding that this was the general trend of Hitler's thoughts. Messerschmitt was evasive at first, but finally replied that it was possible to adapt the aircraft for this role, though the performance would certainly suffer accordingly.

Early in December a demonstration of the latest Luftwaffe technical developments was held at the airbase centre at Indersdorf in east Prussia. Hitler, Goering, Gellard and Prof. Messerschmitt were all present on this occasion.

Another view of the Me 262A showing the prototype nosewheel installation.







The Me 262A (V1 + 44) with the late model James ballast of the production series aircraft showing the revised cowling panel. Both rudder and trim tab have mass balancers. Note canopy pins and the experimental hydraulic filler point.

The Me 262A was demonstrated and made a definite impression on Hitler. Turning to Goering he asked if the aircraft could carry bombs. Goering replied that it would, adding that it might even be possible to carry up to a 500 kg bomb load. Hitler immediately delivered a short but devastating speech to his companions. Here at last was what he had been demanding from the Luftwaffe for years, a high speed Blitz-bomber! With it he would destroy the coming Allied invasion in its first and weakest phase, on the beaches. Hitler had spoken—the Me 262 was to be a bomber!

These promises were summed the whole idea was ludicrous. The aircraft was capable of carrying bombs but it had no means of delivering them accurately. Level bombing attacks would be extremely difficult since there was no provision for firing a suitable bomb sight on the aircraft, and at the type the pilots would be lucky to hit a moderate-sized town from high altitudes under these conditions. Low level attacks were also out of the question since fuel consumption was excessively high at low altitudes and the effective range would be critically reduced. Diving or steep gliding attacks were equally impractical due to the extreme speed built up, the aircraft's controls becoming "wild" at speeds over 600 mph. Despite this the long ordered order for mass production was at last joined, but the factoring of the R.L.M. remained unimpaired, for no effort was made to streamline production of any of the other existing types to provide the necessary resources for the Me 262 production. However, Programme 121 was initiated which called for an initial production run of sixty aircraft per month from May, 1944, increasing to mass production at once as looking raw materials and labour became available.

In the meantime several other prototypes had been completed. The Me 262V, fitted with two streamlined bomb racks and two Berezin units, first flying in November, 1943. The Me 262V8 was used for further ammunition tests while the Me 262V9 which first flew in January, 1944, was

used to test radio and navigation aids including FuG 25A (L.F.F.-1) and FuG 24 (R/T), the latter being replaced by FuG 16 on the production aircraft. The Me 262V10, first flown on May 1st, 1944, was initially used to test methods of reducing shock losses at high speeds but was eventually fitted with two streamlined racks beneath the forward fuselage and used to test the aircraft's suitability for the ground attack role. Additional experiments with cabin pressurization and the development of a suitable oxygen unit were also carried out with the Me 262 during 1944.

The first thirteen pre-production Me 262A3 fighters for service were completed and test flown during the period from March to April, 1944. The close grouping of the armaments in the nose was tactically ideal but initially some firing difficulties were experienced during high speed turns due to the large centrifugal forces present. This was rectified by an alteration to the fuel system. These aircraft exhibited several external differences from the prototypes. The canopy canopy was of a revised aerodynamic shape. It is believed that the Me 262V7 was first used to test this improved canopy. Despite the use of ground adjustable internal mass balancers on the control balancers for the elevators and rudder, additional mass balancers were found to be necessary due to the loads imposed at high speeds. The elevators were already equipped with a small external mass balancer in the form of a weight suspended between two metal arms but this was replaced by a more refined type of mass balancer. A similar type was also fitted to the rudder, being inset into the fin, whilst the one fitted to the rudder trim tab was re-positioned at the top of the trim tab. The Luftwaffe factory also prepared a specially cleaned up high speed version, the Me 262V12 (Werk.Nr. 138 087) which was first flown on July 26th, 1944. This aircraft attained a level speed of 824 mph, the highest speed ever recorded for an Me 262.

Despite Hitler's bombing order, the existing programme for production and testing of the aircraft in the fighter configuration continued unchanged except for the bomb trials with the Me

262V10. Galland in the meantime had formed a special flight from experienced fighter pilots to test the Me 262 in action.

The initial deliveries of Me 262s had been made to two test units, one at Lechfeld and the other at Rechlin Experimental Station (*E-Stelle Rechlin*) north of Berlin. Each detachment had approximately fifteen aircraft on its charge but as far as is known the one at Rechlin did not undertake any operational sorties, being engaged purely in technical testing. However, the Lechfeld detachment, designated *Erprobungskommando 262*, under *Hauptmann* Thierfelder was used primarily against the high flying Mosquito daylight reconnaissance aircraft which had hitherto proved to be almost invulnerable due to their speed. Before long the first kills were achieved by the Me 262 flight, and Thierfelder progressed to attacking bomber formations single handed. After some initial success he was eventually shot down. The tactical and technical trials continued to progress most satisfactorily during this period, and the collaboration between the military and industrial departments developed quickly and favourably.

However the presence of German jet and rocket propelled aircraft had naturally not gone unnoticed by the Allies, and in February, 1944, their bomber forces were directed against the entire German aircraft industry. This caused serious damage to the Me 262 production programme, Messerschmitt's plants being so badly damaged that the initial order of 100 aircraft could not be delivered. Increasing difficulties with material and personnel further retarded the final production phase until the end of March, 1944. When the initial batch was finally ready to leave the assembly works at Leipheim four weeks later, they were caught by an American daylight raid of April 24th, and in the event only eighteen reached the *Luftwaffe*. A further seven aircraft were taken on charge in May.

During the same month Galland attended an armament conference at which he emphasised the fact that the *Luftwaffe*'s increasing losses could only be stemmed by the rapid service introduction of the technically superior jet and rocket propelled aircraft. He finished off his resumé with the statement that he would sooner have one Me 262 than five Bf 109s. The armament depart-

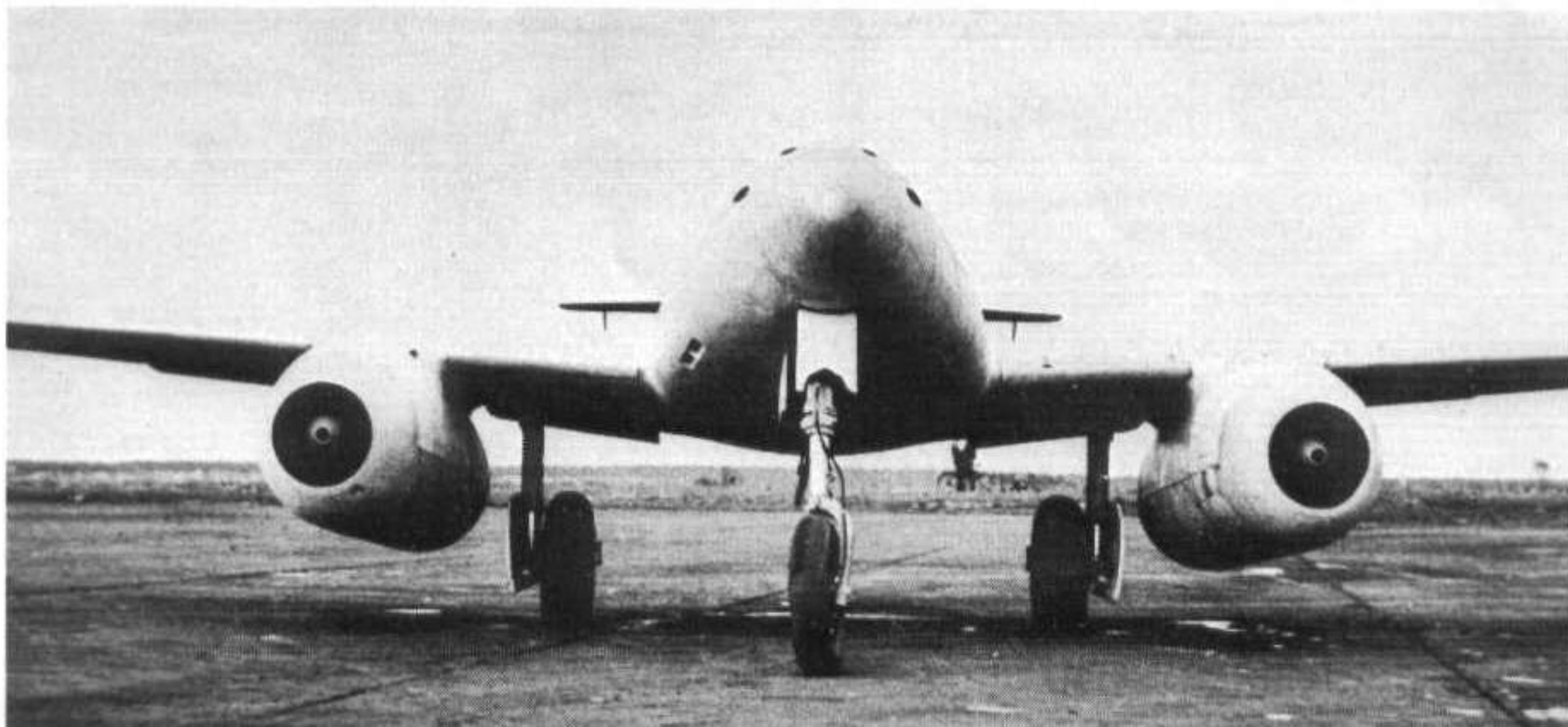
ment accepted his views and steps were taken to increase the Me 262 production tempo. It was decided that within three months of the inauguration of the proposed speed up programme production would exceed 1,000 aircraft per month. But once more Hitler intervened and rejected the programme. He still could not rationalise the necessity for increasing the air defences of Germany.

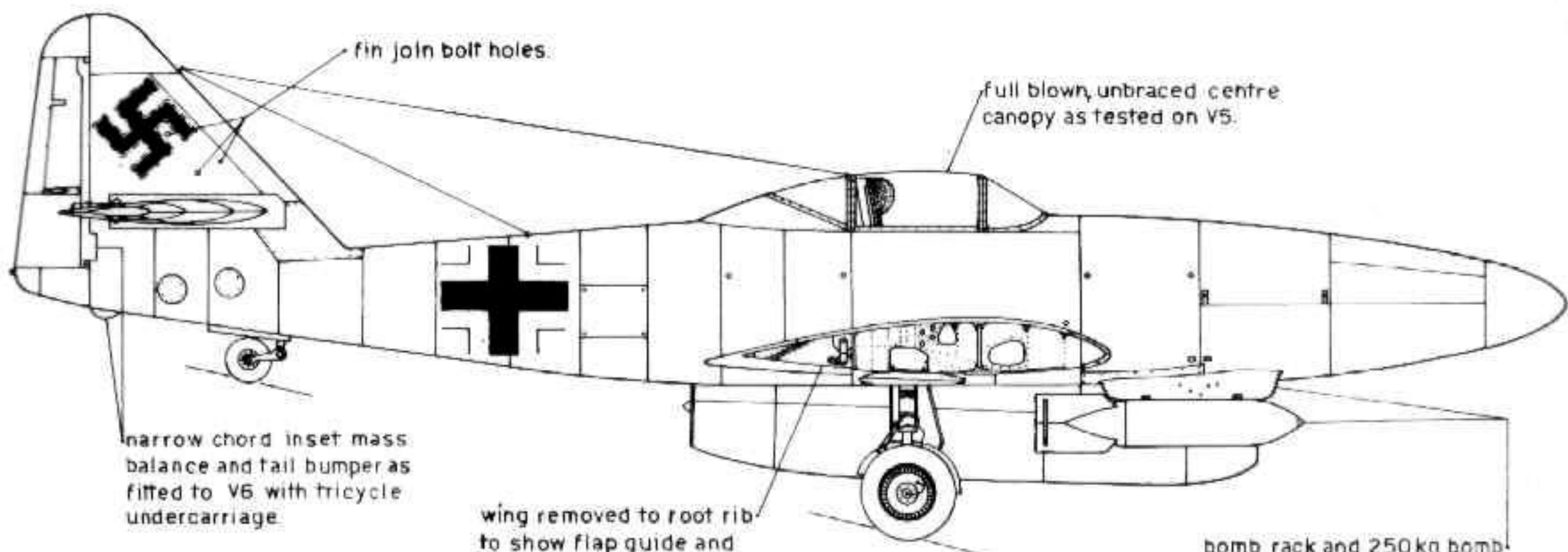
The initial production version was the Me 262A-1a *Schwalbe* which carried a fixed armament of four 30 m.m. MK 108 cannon in the nose. The two upper cannon were each provided with 100 rounds per gun, while the lower two had 80 rounds per gun. Radio equipment included FuG 16ZY with ZVG and FuG 25a. Several sub-variants stemmed from this basic design. The Me 262A-1a/U1 varied only in the type of armament fitted, six cannon being installed, two 20 m.m. MG 151 with 146 rounds per gun, two 30 m.m. MK 108 with 66 rounds per gun and two 30 m.m. MK 103 with 72 rounds per gun.

To meet the pressing need for a bad weather interceptor a specialized version with additional radio navigational aids was built under the designation Me 262A-1a/U2. A photographic reconnaissance version materialized under the designation Me 262A-1a/U3. This mark was unarmed, carrying two RB 50/30 cameras installed in the position normally occupied by the four cannon, the size and angular positioning of these units requiring the addition of a bulged fairing on each side of the fuselage. Despite this specialization the standard nose panelling was still retained, the cannon ports being covered with doped fabric patches.

The final blow came at a discussion of an emergency programme when Hitler suddenly asked how many of the finished Me 262s had been converted to carry bombs. Milch, who had not been present at Insterburg and thus had not heard Hitler's bomber order, replied that none had been converted as the aircraft was being produced exclusively as a fighter. Hitler flew into a rage, the severity of which had not been witnessed before. A few hours later orders were issued detailing the refitting of the entire Me 262 production output as bomber aircraft. As a final touch, the aircraft was in future only to be referred to as a bomber. Both Galland and

This nose on view of the Me 262V6 shows the shell ejector chutes in their original form. The lines projecting downwards from the underside of the tailplane are the hoop frames of the elevator mass balances.





narrow chord inset mass balance and tail bumper as fitted to V6 with tricycle undercarriage.

fin join bolt holes.

full blown, unbraced centre canopy as tested on V5.

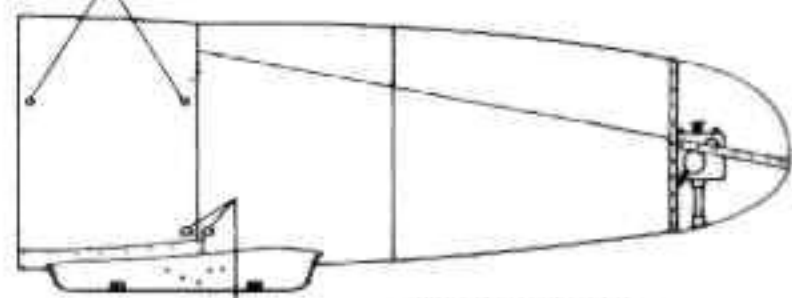
wing removed to root rib to show flap guide and toggle.

single bolt fastening for wing tip.

bomb rack and 250 kg bomb as fitted to V7 and production Me 262A-2a.

mass balances.

pick up points for main fuel tank covered with fabric patches but still visible.

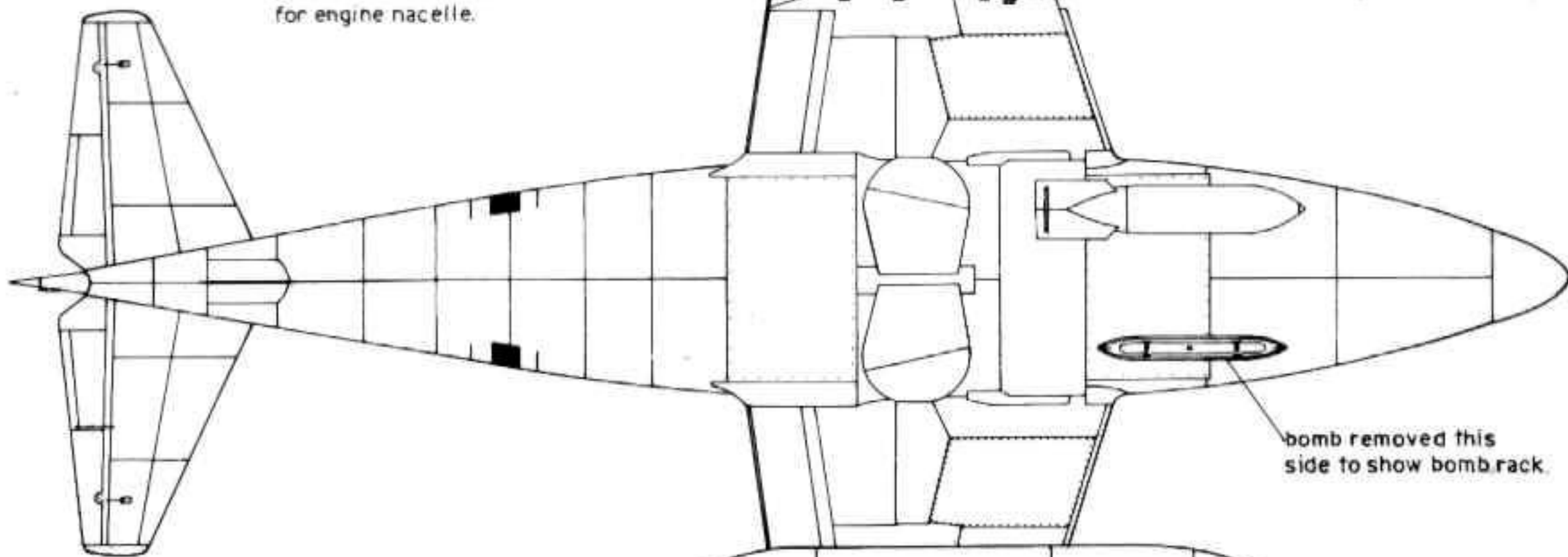


Me 262A-2a/U2

access holes for lower nose attachment bolt covered with fabric patches afterwards.

engine removed to show undersurface of wing, outlets for engine controls, electrical, fuel and hydraulic services plus skin stiffeners and brackets for engine nacelle.

pressure instrument connections.
hydraulic connections.
throttle rod.
electrical connections.

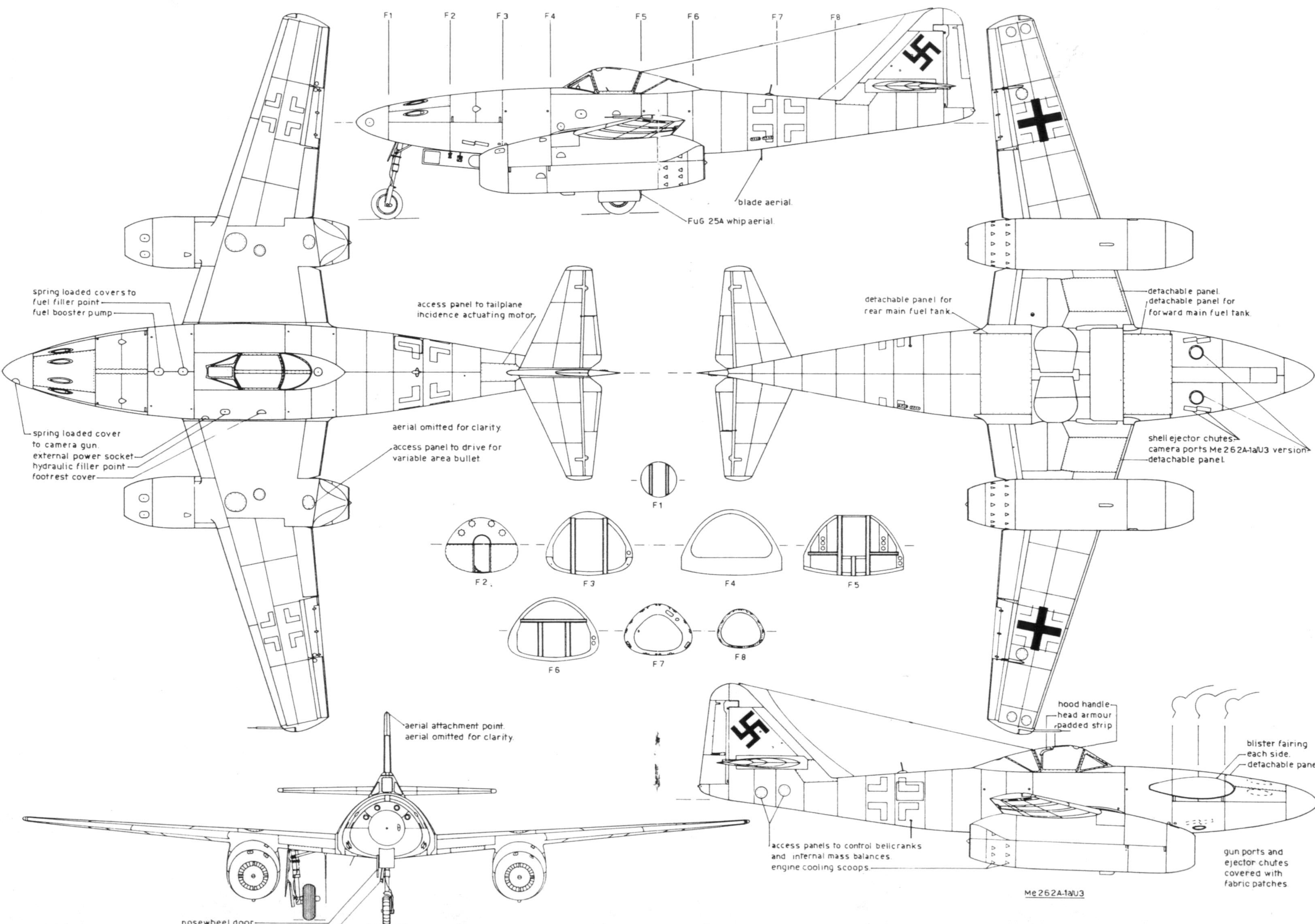


bomb removed this side to show bomb rack.

access panels.

1 2 3 4 5 6

FT.





An Me 262A-2a Werk.Nr.III711 in natural metal finish. Despite the lack of bomb racks this WAS a bomber variant and details of its capture will be found in Part II of this work.

Messerschmitt tried desperately to get the order revoked but it was useless. The entire programme of testing, training of personnel and preparation for action was transferred from Galland to Pelz, *General* of the bombers. This conversion, which resulted in further delays resulted in the Me 262A-2a *Sturmvogel*, two bomb racks in streamlined fairings being mounted beneath the nose on either side of the wheel well. These were usually ETC 504s or the type known as *Wikingschiff*. A multitude of stores including a guided torpedo were projected for use with this variant but in practice only four types were used. These were the SC 500 500 kg. light case bomb, the SD 500 500 kg. semi-armour piercing bomb, the SC 250 250 kg. light case bomb or the SD 250 250 kg. semi-armour piercing bomb. The resulting speed penalty was as much as 120 m.p.h. which made the aircraft vulnerable to interception by standard piston engined fighters. The usual four cannon installation was retained although a few aircraft had the upper pair of cannons removed. Initial deliveries of this version began in June 1944, twenty-eight being taken on charge by the *Luftwaffe*.

The next variant to appear was the Me 262A-2a/U1 in which the lower pair of cannon were removed to provide space for a T.S.A. bomb aiming device. The Me 262A-2a/U2 was a further attempt to improve the bomb aiming facilities by fitting a bulged semi-glazed wooden nose section, housing a second crew member in prone position similar to the P-38J Lightning (see Series 1, No. 3) and which resulted in an increase of approximately 8½ in. in the overall length of the fuselage. A standard *Loft 7H* bomb sight was fitted. Only one prototype of this version was completed.

A specialized ground support and interceptor model materialized in the Me 262A-3a which featured additional armour for the fuel tanks and cockpit but was otherwise externally indistinguishable from the standard Me 262A-1a. The characteristic German propensity for multiplicity of operational role produced a compromise between the pure photographic reconnaissance version and the fighter interceptor; the Me 262A-5a. While still retaining the two RB 50/30 cameras in their original position the relatively small size of the MK 108 cannon made it possible to fit two of these in the next forward fuselage bay, one each side of the nosewheel well, with the barrel pro-

truding through to the nose cone. External pylons beneath the nose permitted the fitting of either two 65.9 Imp. gal. or 131.8 Imp. gal. auxiliary fuel tanks for increased operational range.

During the following weeks, while German towns and industry succumbed to the softening up attacks of the Allied bomber forces, Pelz continued to attempt to retrain his bomber pilots to fly the Me 262. Problem after problem arose, and while they were still in the process of being solved the long anticipated Allied invasion began. Not a single one of the blitz bombers was ready for operations and even during the following critical weeks of the bridgehead, few if any went into action. Their greatest opportunity had been lost.

CONSTRUCTION DETAILS

Fuselage: The fuselage was a semi-monocoque construction employing a mixture of triangular hoop frames and formers. No longerons were used, only hat section stringers, one along the top centre line aft of the cockpit, six along the sides with one terminating at former 14, and five along the bottom, the two outermost terminating at former 15. Except where specifically noted, stressed aluminium alloy skinning was used to cover the airframe.

Immediately aft of the nose cone was a solid web bulkhead which served as a jacking point. This was followed by a section 14½ in. long terminating in a flush riveted, channel shaped former, the whole being screwed to the next section which contained the armament bay. Steel sheet .080 in. thick was used to cover this section. The entire nose section was joined to the mid-fuselage by two high tension steel bolts, one in each of the lower corners, fastening it to a solid web bulkhead. At the top two 1½ in. steel tubes, attached to the mid-section bulkhead by forged fittings, extended forward to the bulkhead at the front end of the gun access bay. Both tubes incorporate turnbuckles for alignment adjustments. Immediately behind the gun access bay was the forward fuel tank bay. The bottom panel of this section was of a waffle grid, double stressed skin construction and formed a detachable access panel. Attachment was by flush screws and captive nuts.

The horizontal semi-cylindrical cockpit fairing was supported between two solid web aluminum alloy bulkheads interspaced with three hoop frames and one channel shaped former. The rear bulkhead began the aft fuselage section and also formed the front panel of the rear fuel tank bay. The bulkhead forming the aft end of this fuel tank bay was also of solid web construction but utilized sheet steel 3/8 in. thick.

The skinning of the rear fuselage was of unusual construction, the sheets being perforated to the fuselage contour and then the aft 1 in. joggled to the thickness of the metal and bent inward to form a "J" channel section. The next skin was then lap-jointed and flush riveted.

The tail cone was attached to the rear fuselage by a ring of bolts which were afterwards covered with filler and dope'd fabric strip in order to preserve the flush finish. The former immediately aft of this joint comprised a built up ring riveted to a steel "I" beam section which slanted aft at 45 deg. from the vertical and extended upwards for approximately 2 ft. above the fuselage to form the lower portion of the front fin spar. At the end of the tail cone was a stamped flanged aluminum channel member which acted as the bottom half of the rear fin spar and the rudder post. A horizontal stamped flanged channel member connected the tops of these two spars and formed the attachment for the tailplane.

Tailplane: The adjustable, all metal, cantilever tailplane was built up in two sections split horizontally and bolted together through access holes which were afterwards fabric covered. A built up "I" beam spar carrying stamped flanged ribs was attached to the fuselage by bolts to two forged fittings set in ball bearings at the axis of the angle of adjustment. The one piece, pressed aluminum alloy tailplane fillets were held in place by a leading edge pin which secured reciprocally between ground strips just above the adjusting jack. The rear attachment was by two screws, one above and one below, aft of the spar.

Elevators: The mass balanced elevators were of conventional construction utilizing a stamped flange spar, rounded metal leading edge attached into the tailplane trailing edge, and stamped flanged ribs. The trailing edge was formed by

crimping the aluminum alloy skin directly together and crating it with plain rivets. Hinges were of the self-lubricating ball-bearing type. Both elevators had insect Fluonite-type trim tabs. Although originally intended to be interchangeable with each other and servo operated, in practice they were generally ground adjustable only. The trailing edges of these tabs were flush riveted.

Adjustment of the tailplane incidence was facilitated by means of an electric motor driven screw jack bolted to the front face of the slanting fin spar. Two guide rails, immediately above the jack, were provided with slots to take the retaining pins in the leading edge of the tailplane. A single piece drawn aluminum fairing attached by screws enclosed this unit and lifted the leading edge of the fin into the top of the fuselage. The tailplane had to be installed before the fin was bolted in place.

Fin: The fin was built up in two sections split vertically along the center line and bolted together through access holes which were covered with fabric patches afterwards. The assembly consisted of four main ribs built up on one flanged spar which were bolted at their lower end to the steel "I" beam section in the rear fuselage and the flanged channel steel post member. Between these two spars was a channel shaped stringer. The front of the fin was finished off with a flat sheet to which were attached a series of small fabric nose ribs. A single piece, pre-formed plywood nose skin was attached to them. Two small metal plates were riveted to the top ribs and supported a small fabric rib to which the fin tip was attached.

Rudder: The mass balanced rudder was built up from seven stamped flanged aluminum ribs attached to the leading edge "I" shaped spar, the curved portion of which fitted closely inside the trailing edge of the fin. The trailing edge was formed by crimping the aluminum alloy skin together and crating with 1 in. round headed rivets. The front portion of the lower member was built up from two pre-formed aluminum sheets flush riveted to the spar and the lower rib. Two small pre-formed sheets containing the horizon light were attached to the lower aft portion of the fin by flat screws.

This rear view shows well the exceptionally clean lines of the Air 242.





The dorsal triangular shape of the fuselage is well shown in this view. The port engine is a replacement, hence the difference in coloring.

The top of the fuselage was completed by a small lip secured into place just above the main balcony. A mass balanced combined servo-trim tab, attached by four hinges, was set into the trailing edge of the rudder. The trailing edge was formed by crimping together the aluminum alloy skin around which an aluminum strip was folded and flush riveted.

Mainplanes The mainplanes were built up on two spars, the main spar being a composite "I" beam with steel booms and built up dorsal web, tapering in depth from 14 1/2 in. at the approach center line to 7 in. at the tip attachment fitting. The spar boom caps were 1/2 in. thick at the center line, 3/4 in. wide at the top and 1/2 in. at the bottom.

The spar was built up in two sections and spliced at the aircraft center line where the webs were flanged and bolted. 1/2 in. thick by 8 in. long steel splice plates were attached to both the top and bottom of the boom caps by six through bolts on each side of the web. Small steel wedges were used as packing between the lower spar caps and the splice plates at the taper on their surface begins at the center line. Six heavy steel flat shaped stiffeners were riveted to the front face of the spar, three each side between the center line and the fuselage skin at which point the spar sweepback began. The shaped aluminum stiffeners replaced the steel ones along the rest of the spar.

Since the main spar occurred at approximately 15% of the Mean Aerodynamic Chord, the main ribs were longer than normal and were consequently of mixed construction. The compression ribs had flat shaped vertical stiffeners, while the remainder were of the crimped flanged type with curved stiffeners. Three large "L" section span-wise stringers were fitted, two in front of the main spar and one between it and the auxiliary spar. The auxiliary spar was aluminum, being channel shaped with flat shaped stiffeners. Set 1/2 in. behind the main spar at the aircraft center line, it extended out to the wingtip attachment point and carried the flaps and ailerons.

The wingtip stressed skin covering was flush riveted except at the base of the leading edge where it was flanged out and riveted to the bottom surface skin. It varied in thickness from .085 in. at the leading edge to .080 in. at the trailing edge. A rolled 317 in. thick sheet steel section was riveted in place at the lower surface to preserve the true aerofold shape behind the skin.

The skin was constructed from a .040 in. thick steel sheet and extended from the fuselage to the wingtips being divided into two sections by the power plants. The outboard section was further divided into two sections and connected by a 1/2 in. steel pin. Each section was bolted to two curved steel guide tracks which in turn slid over ball bearing rollers bolted to the wing ribs.

The wingtip, with integral formation light, was built in two halves, both riveted to an inboard rib and spar and welded together around the outer edge. The tip was attached by means of an inboard three way fitting using a single bolt.

The all metal Frise-type ailerons were constructed from a channel section aluminum leading edge and stamped flanged ribs. The two skin surfaces were crimped together at the trailing edge and riveted to a flat 1/2 in. strip with normal round headed rivets. The ailerons were built in two sections and connected via a control bracket. A self slipping ball bearing hinge assembly as a connecting point for the two sections and similar bearings were bolted to the ribs all of the auxiliary spar at each end. The main metal trim tabs were originally intended as servo tabs but were eventually built as ground adjustable units only, the control arm being actuated by a turnbuckle and rod to the aileron operating bracket. The trailing edges of the skins were crimped together and flush riveted to a metal strip.

The all metal flaps were of similar construction to the ailerons and were divided into two sections by the rear of the engine nacelle. Both sections were connected to the wings by roller bearing arms which fitted into angled tracks. Operation was via toggle arms which moved the flaps backwards by approximately 5/8 in. while the angled tracks transferred the movement downwards. In the fully extended position the flaps were stretched by 1 1/2 in. of the top wing surface. A set screw in the toggle arm could be adjusted for the "up stop" position. A single hydraulic jack located in the outboard wing operated the entire flap system via a series of bellows and rods. The port inboard flap was usually marked with a series of red lines denoting the degree of extension, i.e., 10 deg, 20 deg, etc., to the maximum of 30 deg.

The wing attachment to the fuselage was as simple as it was unorthodox. 9 in. aft of the leading edge, near the base of the root rib, a 1 in. bolt passed through a two sided forged



Another My 282A-1a minus bomb racks and showing the upper gear deleted, the recess being covered by dipole fabric.

"backh" fitting which was in turn bolted to the aft face of the bulkhead immediately behind the forward fuel tank bay. A similar bolt and fitting was used on the root rib aft of the auxiliary spar. Finally, rivets to the top wing surface at the hinge line was a 1 $\frac{1}{2}$ in. x 1 $\frac{1}{2}$ in. steel angle member which was attached directly by T bolts and self locking nuts to the fuselage skin. The wing rib was held in place by a cable attached to an angle bracket at the leading edge and passing under seven bolts riveted to the attaching angle members with a nut/buckle at the front. The leading edge rib was a drawn light aluminum alloy section attached by eight flush screws.

Undercarriage The main wheel units consisted of two forged steel-pneumatic shock absorber units which retracted upwards into the bottom of the fuselage to meet on the aircraft's center line. The right unit operated an actuating valve at the end of its act. which closed the landing doors. These doors also served as the landing gear uplock. Fitting plates for these wheels were built in two sections, both of which were of double skinned, grid type structures. The top section was hinged to the torque box and the lower one bolted to a bracket welded to the steel plates just below the ribs.

The steel pneumatic retractor retracted backwards and upwards into a well beneath the armor.

A production My 282A-1a before delivery. Letters on the fuselage side are not unit identification markings but the radio call sign allocated for factory test flights.

ruet bay. A transverse tube, which was operated by the wheel striking it at the top of its arc, pulled the double skin landing door closed. Spring loaded pins moving into the plates spread to up and down locks. Originally fitted with conventional torque linkages, leg production aircraft had built in shock dampers. Down locks for the three undercarriage members were incorporated in the hydraulic actuating cylinder, preventing the cylinder holding the undercarriage locked.

Navis.

The nose wheel could be selected to permit ground steering by means of a "T" shaped yoke during towing operations.

Cockpit Controls The main instrument panel was divided into two sections with the flight instruments to port and the engine instruments to starboard. Immediately below this panel was a control board with panel, on the bomber version, marked for level or dive bombing, plus instantaneous or delayed action for the flaps. An auxiliary clearing panel on the port side carried the valves for the emergency operation of the flaps and landing gear, plus the oxygen flow indicators, oxygen gauges and oxygen valves. Two horizontal auxiliary panels ran along each side of the cockpit and carried the rest of the instrumentation. A Revv 148 gun-sight was mounted above the main instrument panel and could be swung to starboard for take off and landing.





An operational *Av 282B-1a* of *AC 7* taxis out preparatory to intercepting a bomber stream over Germany in 1945.

The pilot's seat was adjustable only for height via a parallel-gram frame, being locked into position by a lever underneath the front of the seat. The upholstered back of the seat was held in place by two spring clips and could be retracted to give access to the battery behind the seat frame.

The control scheme was mounted in a hull and socket joint in the bottom of the cockpit floor, providing elevator and aileron control via a system of 1 in. push-pull tubes. Universal joints were used on the aileron controls at the fuselage side to compensate for the wing sweep-back. The rudder pedals were similar to those of the *Focke Wulf Fw 190* (see Series 1, Pts. 5) and incorporated the main wheel brake pedals as integral units, toe pressure being used to activate the system. A single vacuum tube extending from the marked pedal connected with the push-pull tube to the rudder via a series of bellows. All the control push-pull tubes ran along the port side of the fuselage.

Armour plating was attached to the front and aft bulkheads and a single piece of 18 mm. head and shoulder aluminium armour was attached directly to the canopy. However, most aircraft did not use this last item.

Propulsion: Two Junkers Jumo 109-004B-1, -2 or -3 eight stage axial flow turbojets with six straight through combustion chambers, and a single stage turbine leading to a variable area of the nozzle. Each was rated at 3,000 lbs. static thrust at 5,700 r.p.m. at sea level. A Koellid four cylinder, two stroke, starter motor was housed in the intermediate cover fairing of the intake of each engine.

The variable area efflux nozzle was obtained by the use of a longitudinally movable "butter" operated via a rack and pinion by a motor motor controlled, initially, from the throttle lever. During starting the "butter" was in the full forward position being gradually moved aft with increase in speed. In flight the control of the "butter" was automatic, the unit being locked to a pressure sensitive capsule exposed to the ram pressure due to the aircraft's forward speed.

Cooling air was bled off between the fourth and fifth compressor stages via a double skin non-leaking the combustion chamber assembly. A small portion of this air was allowed to pass into the space between the combustion chamber and the inner wall. The remainder passed into the "butter" fairing through a tubular strut and dis-

charged through small holes to cool the rear face of the turbine disc. Some of the air then passed into the double skin surrounding the rear portion of the jet efflux nozzle.

Similarly, air was bled internally from the last compressor stage and transferred through tunnels into two of the cooling ribs, to cool the front face of the turbine disc. Additional air was taken through three passages in the central casing and fed into the space between the two plain diaphragms in front of the turbine. Most of this air then passed into the hollow turbine nozzle guide vanes, to be discharged through slots in the trailing edges of the vanes.

Fuel System: All internal fuel tanks were installed in the fuselage, the two main tanks, each with a capacity of 1,174 Imp. gal., were installed immediately ahead of and behind the cockpit. A reserve 37.4 Imp. gal. tank was situated just in front of the main tank beneath the cockpit. An additional auxiliary tank of 111.2 Imp. gal. capacity was attached on some aircraft, being situated immediately aft of the rear main fuel tank. This installation necessitated moving the radio further aft. In most cases all these tanks were of the self-sealing variety although a few machines were fitted with non-sealing type reserve tanks.

The main fuel tanks were fitted with two booster pumps and the spare with one, the system being so arranged that the fuel could be pumped from any tank to either engine or transferred from the rear tank to the forward one.

Additional external fuel tankage was available in the form of either two 337 Imp. gal. or one 111.2 Imp. gal. fuel tanks which were attached to the under nose pylons. These tanks contained 2-2 diesel oil which was produced from kerosene used. Fuel carried in the lower portion of the pylon tank set in the nose of the engine cowling was used for starting, being delivered to the main engine by an electrically driven fuel pump operating at 20 p.s.i. which cut off automatically at 3,000 r.p.m. Two stroke cylinders for the Koellid starter motor was housed in the top portion of this pylon tank. Diesel fuel from the main tank was delivered by a single stage electrically driven gear type pump operating at 1,000 p.s.i.

Oil System: An annular shaped oil tank of 2.99 Imp. gal. capacity was attached by a flange to the aluminium alloy intake casing of the engine. Two gear pumps circulated the oil to the front



An Avia BZ-534 in its normal combat mode and with the upper cannon retracted.

compressor bearing assembly, the necessary drive gears and the necessary gears. Another pump supplied oil to the main compressor and back turbine bearings.

Pneumatic System: Gun firing and cocking mechanisms were pneumatically operated. Compressed air for charging the guns was carried in eight bottles, four each side beneath the armament bay.

Hydraulic System: Raising and lowering of the undercarriage and flaps was effected hydraulically, pressure being supplied by a pump mounted in the port engine. The hydraulic reservoir was located between the cockpit floor and the port wing root. During retraction and lowering of the undercarriage, the nose wheel retracted and extended after the main wheels had been locked in position. A safety device was incorporated in the system so that the flaps could not be lowered until the undercarriage was locked down. Both the undercarriage and the flaps were interconnected with compressed air bottles for emergency operation of the two systems. Hydraulic

expanding band type brakes were fitted to all three wheels, those on the main wheels being actuated from the rudder pedals while the nose wheel was applied by means of a hand brake lever on the port side of the cockpit.

Gun Controls: The cannons were fired electro-pneumatically by depressing a switch on the control column.

Rocket Projectile Controls: The projectiles were fired electro-pneumatically in a single salvo.

Bank Controls: Selection and timing switches were provided on a control panel beneath the main instrument panel. The bombs were released by pulling back a control lever on the starboard side of the cockpit. Pulling this lever back beyond the bomb release stop prepared the bomb rails.

View Camera Glass: The camera was mounted in the nose cone and automatically synchronized to the cannons or rocket projectiles. Access to it was gained via a quickly detachable plate on the port side of the nose cone.

An Avia BZ-534 in its full war load of two 150 kg. bombs and carrying the full complement of four cannons.



PILOT'S HANDLING NOTES

All figures left in the original metric form for accuracy.

Operating Instructions

Switch on main battery, port and starboard generators, instruments and stabilizer trim motor. Close throttle and fuel selector are in the closed position and press starter handle to down position for three to five seconds to prime starter engine. Pull starter handle up and at same time push down on tachometer button to engage low stage side. When 700 r.p.m. is indicated on the tachometer press ignition button on the right hand side of the throttle lever and hold it till a deep rattle is heard. This is the high octane aviation fuel being injected and igniting. Keep starter handle, tachometer and ignition on until 2,000 r.p.m. is indicated and then release the starter handle and tachometer button. Switch fuel selector to the desired tank, usually the front tank for the port engine and the rear tank for the starboard engine, then engage the fuel pump. Open the throttle slowly to the idle position, approximately 1,000 r.p.m., being careful to ensure that the engine temperature does not reach 700 deg. Centigrade for more than 30 seconds. If temperature exceeds 700 deg. throttle back immediately and release the ignition button. Open throttle slowly to maximum rpm holding the aircraft on the main wheel brakes and check that the variable area holes are fully extended for each engine. (These can easily be observed from the cockpit.) Check fuel pump pressure gauges to see that the pressure remains between 50 and 80 kg/cm².

Set tail trim indicator at plus 1 deg., the rudder trim to 0 deg., when 20 deg. of flap and check instruments. Hold the aircraft on the main wheel brakes, open the throttle slowly until 1,000 r.p.m. is indicated and then release the brakes and open the throttle fully. (The throttle can be quite safely advanced above 1,000 r.p.m.) After covering a distance of approximately 200 metres ease back on the control column to gently raise the nosewheel and hold in this attitude until the airspeed builds up to 200-230 km.p.h., then lift the aircraft off.

Shutting Down

The engine shut down technique is critical

and should be carefully adhered to. Retard the throttle to the idle position and wait for the engine to idle at a constant r.p.m. Shut down only one engine at a time. Switch the fuel pump off and close the fuel selector. Release the safety catch on the throttle and close the throttle completely, pressing the ignition button and holding it in the on position for five seconds as the r.p.m. drops below 2,000. This burns out any remaining fuel and fills the fuel lines with high octane fuel for restarting. If after stopping, an engine smokes, or flames are visible, re-engage the starter motor and restart engine before repeating the shut down procedure. Leave the oilpressure trim indicator and close all switches.

In Flight Checks

Apply brakes to stop wheel spin and retract undercarriage, raise flaps, close throttle to desired climb setting and retine aircraft. Check lateral trim as aircraft should not be more than 10 mm. out when control column is in the neutral position. Check fuel pump pressures to ensure that they are equal for both engines. On climb landing oops slips will open if speed drops below 450 km.p.h. (275 m.p.h.).

Landing Checks

Reduce speed to 400 km.p.h., and trim aircraft into straight and level attitude then lower undercarriage maximum permissible speed 300 km.p.h. As the nosewheel is lowered there is a slight air change and it is necessary to hold forward stick to counteract the sharp nose up trim. Once the nosewheel is fully extended the aircraft will assume its original level trim attitude. Lower the flaps 20 degrees and retine aircraft. It is advisable to keep engine r.p.m. at 1,800 during landing pattern to allow the throttles to be opened rapidly in the event of an emergency. Full flap of 30 deg. should be selected as the aircraft is turned on to final approach. The recommended speeds during the landing pattern are 170 km.p.h. on the base leg reducing to 100 km.p.h. on the turn on to final and further reducing to 120 km.p.h. on the final approach. The touchdown should be made between 140 and 200 km.p.h. on the main wheels letting the nosewheel down gently, but care should be taken to ensure that all three wheels are on the ground before applying the brakes.



DIMENSIONS, WEIGHTS & PERFORMANCE DATA

Figures in brackets refer to the 360 200A2s.

Fuselage

Overall length	36 ft. 9½ in.
Maximum width	3 ft. 6 in.

Wings

Span	66 ft. 10½ in.
Chord at root	8 ft. 4 in.
Chord at tip	2 ft. 9½ in.
Aspect ratio	7.5
Maximum thickness	15% M.A.C.
Maximum permissible C _d of fl.	10% M.A.C.
Dihedral	6 deg.

Weight overall

Static, clean free	12 ft. 4 in.
Static, clean compressed	11 ft. 4 in.

Tailplane

Span	12 ft. 5½ in.
Dihedral	6 deg.

Undercarriage

Main wheel track	7 ft. 9 in.
Tyre max. reinforced	640 mm. x 300 mm.
Tyre max. unreinforced	600 mm. x 280 mm.

Area

Wingplanform (gross)	234 sq. ft.
Ailerons (gross)	12.9 sq. ft.
Tails (gross)	1.6 sq. ft.
Flyers (gross)	22.4 sq. ft.
Tailplane with elevators and tabs	34.9 sq. ft.
Elevators (gross)	9.3 sq. ft.
Tabs (gross)	1 sq. ft.
Roller with tab	6.4 sq. ft.
Tab	1.3 sq. ft.

Wing loading

At maximum all up weight	68.3 lb./sq. ft. (61.6 lb./sq. ft.)
--------------------------	--

Weights

Tare	9,740 lb. (9,000 lb.)
Fuel and oil	3,150 lb.
Loaded	13,000 lb. (12,250 lb.)
Maximum	14,000 lb. (13,520 lb.)

Tyre pressure

11,000 lb. and below	58.8 p.s.i.
----------------------	-------------

11,000 lb. to 14,000 lb.	56 p.s.i.
14,000 lb. and above	70 p.s.i.

Range of movements of controls

Ailerons	20 deg. (±2 deg.)
Elevators	25 deg. (±2 deg.)
Director trim	25 deg. (±2 deg.)
Roller	20 deg. (±2 deg.)
Roller trim at 50 deg. deflection of roller	18 deg. (±2 deg.)
Roller trim at 0 deg. deflection of roller	20 deg. (±2 deg.)
Flaps, maximum	20 deg.

Power plant

Weight	1,660 lb.
Wing area	1,271 sq. ft.
Static thrust	1,970-2,060 lb.
Pressure ratio	1.3
Fuel consumption	2,700-2,780 lb./hr.
Maximum rpm	8,500
Idle rpm	1,000
Idle speed fuel consumption	64 lb./hr.
Frontal area	6.4 sq. ft.
Overall length	12 ft. 2 in.
Maximum external diameter	2 ft. 10 in.

Performance

Maximum speed	150 mph. at 20,500 ft. (140 m.p.h. at 21,000 ft.) 200 mph. at sea level
---------------	---

Rate of climb

Initial	3,817 ft./min.
	2,145 ft./min. at 10,000 ft.
	1,082 ft./min. at 20,500 ft.

Service ceiling	37,565 ft. (37,800 ft.)
-----------------	-------------------------

Stall	100 mph.
Range	700 mi. at sea level 550 mi. at 10,000 ft. 650 mi. at 20,500 ft.

Take off to clear a 50 ft.

obstacle	1,097 yds. (1,000 yds.)
----------	-------------------------

NOTES

Performance figures and even weights varied from individual aircraft to individual aircraft and the above information refers in general to all aircraft of that particular type but only specifically to the machine tested to obtain these figures.

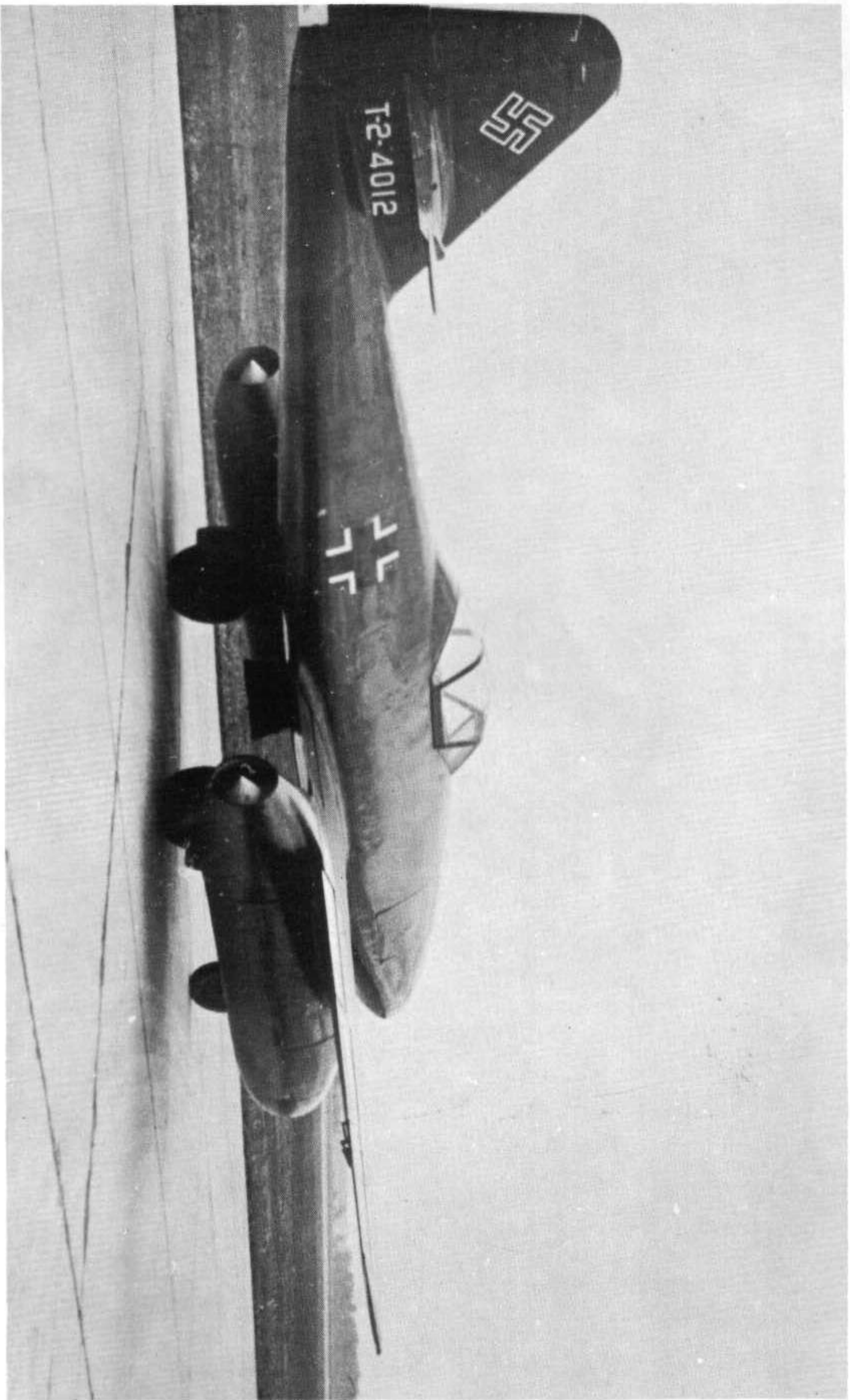
Left: Flyer side of cockpit showing flapless with starting function and immediately behind them the tailplane trim wheel.

Center: Main instrument panel with the blind flying instruments grouped together at top left and engine instruments at lower right.

Right: Starboard side of cockpit. The curved handle behind the non-standard microphone is the boom release. Pulling it back beyond the stop positioned the boom mics themselves.

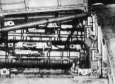


The extremely pleasing lines of the Me 262 are shown to advantage despite the incorrect camouflage and markings.



Mark	Radios/Radar	Armament/P.R. Equip.	Internal Fuel Capacity	Duty
A-1a	FuG 142 or FuG 142Y with ZNG (V.H.F., R/T, D/F, and communication facilities for G.C. stations) and FuG 21a (I.F.F.).	4 x 20 mm. MK108 cannon. Upper pair 100 r.p.g. Lower pair 80 r.p.g.	104.7 Imp. gal.	Fighter.
A-1a/U1	As for A-1a.	2 x 20 mm. MG131/20 with 140 r.p.g. 2 x 30 mm. MK131 with 55 r.p.g. 2 x 30 mm. MK103 with 72 r.p.g.	As for A-1a.	Fighter.
A-1a/U2	As for A-1a plus FuG 123.	As for A-1a.	As for A-1a.	Bad weather fighter.
A-1a/U3	As for A-1a.	2 x RB 30/30 cannons.	As for A-1a.	Flare-rocket.
A-1b	As for A-1a.	As for A-1a plus 24 RgM 30 mm rockets.	As for A-1a.	Fighter.
A-2a	As for A-1a.	As for A-1a plus either 1 x 200 Kg. bomb, or 2 x 100 Kg. bomb.	As for A-1a.	Fighter bomber.
A-2a/U1	As for A-1a.	2 x 30 mm. MG108 with 80 r.p.g. Bomb load as for A-2a.	As for A-1a.	Fighter bomber.
A-2a/U2	As for A-1a.	1 x 500 Kg. bomb, or 2 x 250 Kg. bomb.	As for A-1a.	Bomber.
A-3a	As for A-1a.	As for A-1a.	As for A-1a.	Ground attack fighter.
A-3b	As for A-1a.	2 x 30 mm. MG108 with 55 r.p.g. plus 2 x RB 30/30 cannons.	As for A-1a*.	Fighter-rocket.
B-1a	As for A-1a.	As for A-1a.	100.2 Imp. gal.*	Two-seat trainer.
B-1a/U1	FuG 142Y with AFN 2 (remote ranging) Evi 7 intercept, FuG 21a, FuG 113 (auxiliary to FuG 14 for beam approach), FuG 120a (automatic bearings), FuG 214 A2 (D/F indicator) and range measurement up to five miles), FuG 1002a (H/G bombing) and FStG-3 (dual approach).	2 x 20 mm. MG131/20 with 140 r.p.g. or 2 x 30 mm. MG108.	As for B-1a.*	Two-seat night fighter.
B-2a	As for B-1a/U1.	As for A-1a plus 2 x 30 mm. MK108 in a Schräge Attack installation.	617.4 Imp. gal.*	Two-seat night fighter.
C-1a	As for A-1a.	As for A-1a.	200.2 Imp. gal. of J-2 dual oil. 190.8 Imp. gal. of T-Seed. 110.8 Imp. gal. of C-Seed.	Rocket boosted fighter.
C-2b	As for A-1a.	As for A-1a.	As for C-1a.	Rocket boosted fighter.
—	As for A-1a.	1 x 30 mm. BK-3 cannon.	As for A-1a.	Bomber destroyer.

*Additional external tankage available by using either 2 x 65.9 Imp. gal. or 1 x 131.8 Imp. gal. auxiliary fuel tanks.



The ammunition bay showing the rear part of MK 108 cannon.



The starboard main undercarriage member showing the opening ram in the left of the photo graph.

Left:

The starboard airframe linkage with auxiliary linkage to the main link.



Left: Access panel removed showing the door face of the magazine. Cocking bar is visible through the wheel well. Right: The compact size of the MK 108 30 mm. cannon is readily apparent from this photograph.



ACKNOWLEDGMENT

The author and publisher gratefully acknowledge the generous assistance given in the preparation of this work by the following personnel, companies and institutions alphabetically: Capt. B. Bark, J. Conroy, J. Hill, J. Nippon, R. C. Jones, G. King, N. Nussara, G. Poulson, R. Rumber, P. Ryan, C. Schaefer, A. Sherman, M. Taylor, Hughes Tool Company Aircraft Division, Stevens, Massachusetts A.C., East Photo Limited, Imperial War Museum, United States Air Force and last but by no means least the officers and men of Wright Patterson Air Force Base and Willow Grove Naval Air Station.



The full story of the Me 262 operational history back as a fighter and a bomber and its ultimate development into a highly refined day and night fighter is dealt with in Part II of this work. A comprehensive five page coverage of the multiple camouflage schemes used by this aircraft, with accompanying tone illustrations and a complete breakdown of the various sub-variants and their equipment is also contained in the second volume.



The captured Me 262-1a currently on display at the Australian War Memorial, Canberra. Colour scheme is dark green and pale blue.



The Kommando Nowotny was the Luftwaffe's first complete Me 262 interceptive unit, and its main duties were to break up daylight attacks by USAAF bomber formations. This example, Me 262-1a, Werk-Nr 179873 is interesting in that it was camouflaged in the late-war years 81 and 82 with RLM-paint 76 under-schemes, the latter given during a distinct brownish cast. The pattern shown was fairly common for the Me 262 but the dark and lighter colors were often swapped.