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COUNTRY Soviet Zone of Germany REPORT 25X1

TOPIC Soviet Development on EF-126 "Elli" GA Plane

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REFERENCES

PAGES 5 ENCLOSURES (NO. & TYPE)

REMARKS

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25X1 1. a. By order of the Soviets, the EF-126 ground attack plane equipped with a Jumo-226 power plant was further developed in the Special Designs Office No. 1 (Junkers) in DESSAU (M 52/E 17).

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2. Ground Attack Aircraft of EF-126 "Elli" Type

a. Project engineer: "OLF III, Designer: BONIN. The ground attack aircraft of type EF-126 represents a modification of the EF-126 ground attack plane developed in the last months of "W II.

b. In placing the order for the construction of this type ground attack plane the Soviets were motivated by the following reasons:

(1) The plane has the simplest possible structural design and is easy to produce. It was, above all, the simplicity of the power plant (Jumo-226) that convinced the Soviets and overruled a number of objections.

(2) The smallness of the aircraft made it possible to build the airfoil as one unit, which considerably facilitated the assembly of the plane. By means of a simple device it was feasible to load two of these planes on one conventional truck.

(3) The plane could not take off by its own power and had to be catapulted by means of a cable winch. This point, which was considered by the Germans a serious drawback of the first experimental model, did not constitute a fundamental weakness in the eyes of the Soviets. The original experimental German model was to be equipped with a detachable auxiliary landing gear which could be dropped after the take-off. The required [illegible]

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be supplied by two used power plants mounted underneath the wings. These power plants were also detachable.

(4) The Soviet engineer officers, however, considered the take-off by means of a winch a great advantage, as it enabled the plane to take off from a relatively small level strip. The easy means of transportation of both the plane and the starting winch made it possible to change to take-off strip quickly and to launch the plane from areas very close to the point of commitment.

3. Structural Design of the Plane

The plane is a single-seat semi-high-wing monoplane of composite construction. The landing gear has been replaced by a retractable skid. Retractable bow frames mounted at the wing tips are provided for take-offs and landings. The power plant is located above the rear section of the fuselage. The plane was not equipped with any automatic devices; all required service operations were performed by hand or mechanically.

4. Airfoil Make-Up

Wing area is eight square meters, span 7 meters; all-wood monocoque construction. The main through-prop was set about one third of the wing chord from the leading edge. An auxiliary prop is provided for in the area of the aileron. The wing was to be constructed as a tank wing with a capacity of about 200 liters. By the end of the reported period a solution for an absolute leak-proof wing had not been found. The wing profile was a NACA high-speed profile of from 10 to 12 percent thickness. Between the fuselage and the split aileron there were two flaps with a depth of 30 percent of the wing chord.

5. Tail Unit

As the airfoil, the tail unit was a monocoque construction. Due to the proximity of the power plant, the rudder assembly was of metal. The tail unit had a conventional design. Only the rudder assembly, on account of its setting between fuselage and power plant, had an unusually small side ratio. Later on, the rudder assembly area actually proved to be too small and had to be enlarged by end disks attached to the elevator assembly.

6. Fuselage

The fuselage was all-metal construction. The front section shows the conventional belt frame and stringer make-up, the aft section behind the pilot's seat is in monocoque with installed fuel tanks.

7. Landing Gear

Instead of a landing gear, the plane was given a retractable skid, operated mechanically by means of a lever from the pilot's seat. Two bow frames mounted at the wing tips for take-offs and landings, also retractable, were likewise operated mechanically.

8. Power Plant

The Jumo-226 engine, which has been described in detail before.

9. Fuel System

The plane was equipped with one 800-liter tank installed in the fuselage and one spherical 100-liter container located behind the first tank. The fuel feed was performed by two fuel pumps which were operated by a propeller drive mounted in the nose. For take-offs, when the propeller drive was not yet in operation, the fuel was fed from the spherical container by means of carbon dioxide stored in three flasks. The original primitive design, which envisaged an automatic switch over to the fuel pump system only after consumption of the fuel contained in the spherical tank, was later on modified in such a way that the spherical container was automatically cut off as soon as a sufficient fuel pressure was reached by the pumps. In case the fuel pumps failed there was a reserve of carbon dioxide left sufficient for about three flight minutes.

10. Instrumentation

The equipment with instruments was as simple as possible, the following instruments being available:

1 magnetic compass
1 altimeter
1 timepiece
1 speedometer.

The work of the power plant was solely controlled by a fuel pressure gauge and a thrust indicator. Since the plane was almost always flying at full throttle, the gas lever was set at maximum thrust. This made all automatic fuel governors, one of the weak points of the V-1, dispensable. The electrical equipment consisted of a 2,000-watt generator, which fed the buzzer of the ignition system and the only radio set of type FuG-16. Special high altitude equipment was not required since the absolute ceiling was between 16,500 and 20,000 feet.

11. Armament

Two automatic cannons of 20 mm caliber installed in the nose.

12. Weights

Empty weight, about 1,4 tons; gross weight, 2.5 tons. As additional load, only 900 liters of fuel and the required ammunition were provided for.

13. Performance

The performance data on the EF-126 are shown in the attached diagrams. Maximum ground speed is about 435 mph, it decreases only little with higher altitudes since both the thrust performance and the required thrust change with the prevailing air pressure. In the attached graphs, the speed variation curve is drawn for a 75 percent utilization of the thrust performance. However, there is little sense in flying at such an engine performance, since the fuel consumption decreases only slightly. Annex 3 "Available and Required Thrust" shows the curve of the required thrust. It reveals that a slight variation of the thrust has very little influence on the maximum speed. Higher speeds are only attainable if the drag coefficient of the aircraft can be reduced at higher Mach numbers. The dependence of the surface of equivalent drag on the Mach number as shown in a special graph (see Annex 7) is still capable of improvement, at least to a certain extent. The rate of climb is surprisingly high, even with full take-off weight, and compares well with the rate of climb attained by propeller-driven fighters. Annex 6 (Range of the EF-126) shows that the range of the plane is satisfactory in spite of the unusually high fuel consumption of the power plant. The present gross weight of 2.5 tons allows a speed of about 155 mph at sea level and of almost 250 mph at an altitude of about 20,000 feet. With a gross weight of three tons, an increase which is being aimed at by providing for an additional 500 liters of fuel, the plane will have a range of upward of 390 miles when flying at an altitude of about 20,000 feet. Annex 5, representing the performance of the plane in relation to its weight, simultaneously shows that it is easily capable of further development. The initial experiments made for a reduction of the fuel consumption of the EF-126 are of particular importance for the range of the plane.

14. Construction and Trial Flights

A total of six experimental models of the EF-126 have been built. In the course of the reported period only some towed take-offs effected with the help of a Ju-88 have been performed. This was partly due to the unsatisfactory working of the used power plant. The take-offs performed shows that apart from a certain deficiency in its directional stability the plane proved satisfactory. In order to eliminate this deficiency two end disks functioning as a rudder were mounted at the elevator assembly. The lacking directional stability was the cause of a fatal accident, a cross wind leading to a crash landing. At the take-offs and landings, the spring system, the energy absorption, and the stability of the skid proved a satisfactory design. Only the supporting bow frames proved too weak and were regularly shorn off at landings. This deficiency required only minor modifications. The experiments made with the plane proved its serviceableness. Its very simple structural design made it particularly useful for Soviet purposes.

15. Comment:

a. The type designations EF-126 and EF-127 refer to the same ground attack plane of type "Elli".

b. The design of the EF-126 was submitted by the Junkers Firm to the Technical Division of the High Command of the German Air Force, in the winter of 1944/45. It was, however, not accepted by the General Staff of the Air Force for both technical and tactical reasons. This decision, which was taken in view of the existing deficiencies)speed inferior to that of the conventional fighters, too limited range, no possibility of moving again after landing, etc.) induced the Junkers Firm to eliminate the shortcomings of the first experimental model.

c. After the Soviets seized upon this project, it went by the name of EF-127, although essential improvements over the original EF-126 were not provided for. However, the new type designation was never officially approved so that both designations for the ground attack plane were used side by side in previous report.

d. There is no definite information available on the further development of this plane in the SU. But both reports received from IVANKOVO PODBERESHE and STAKHANOV (both located near MOSCOW) lead to the assumption that further experiments with this type are being conducted there.

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