EVALUATION OF THE ME-262

(Project No. NAD-29)

Roy W. Adams

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HEADQUARTERS AIR MATERIEL COMMAND
WRIGHT FIELD, DAYTON, OHIO

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AIR MATERIEL COMMAND
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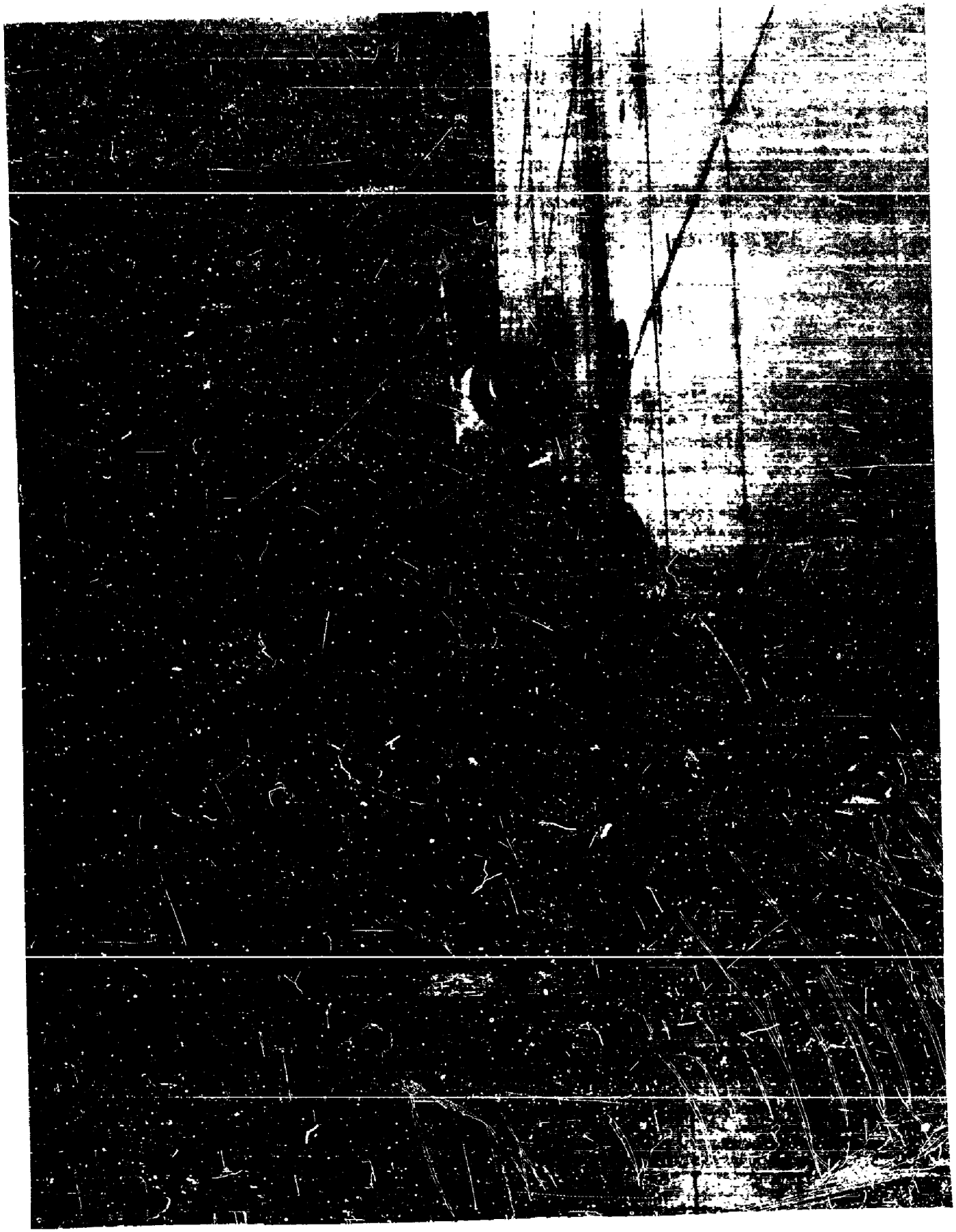

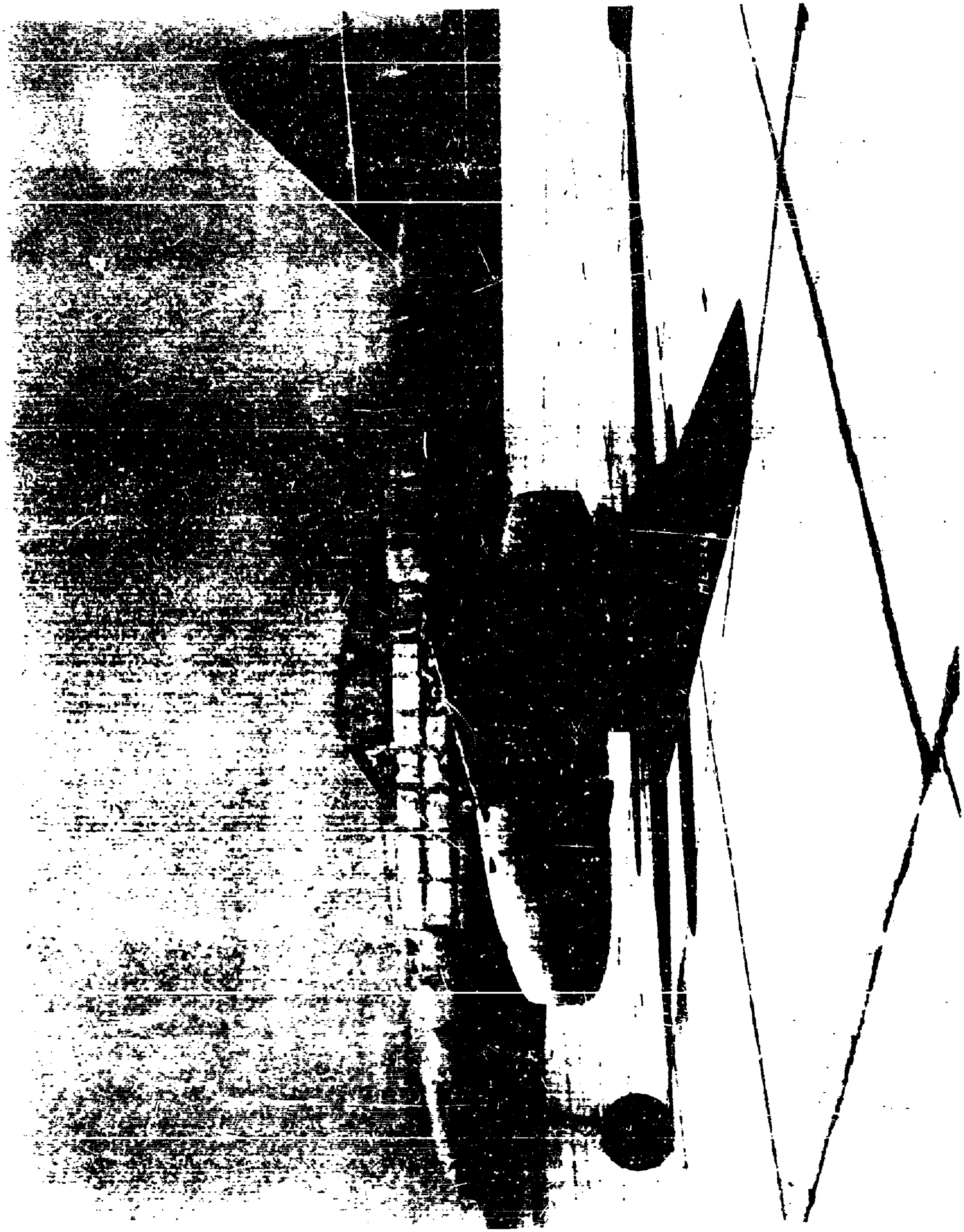

EVALUATION OF THE ME-262

INTRODUCTION

A considerable amount of research and experimental work has been carried out during the war on jet propulsion in general. This method of propulsion has the advantages of potentially higher speeds, greater rate of climb, and higher ceiling, but is inefficient at moderate speeds, and does not, at least in its present state of development, have an endurance comparable with that of a conventionally engined aircraft of similar structural characteristics and fuel capacity. At high speeds, the efficiency of a jet-propulsion unit is increased and a greater range will therefore be obtained, but the already low endurance is then further reduced. This inherent lack of endurance is the principal disadvantage of the jet-propelled aircraft when used as an interceptor fighter, as obviously, to be successful, the airplane must have sufficient time in the air to intercept formations of enemy aircraft traveling at high speeds and frequently changing course.

An attempt to overcome this disadvantage while still maintaining the high speeds required was undertaken by Germany, and the culmination of their efforts resulted in the Messerschmitt Me-262.

This airplane was the first German jet-propelled aircraft to go into production, and was used in operations on a small scale beginning in the summer of 1944 until the termination of the European war.

DESCRIPTION

General

The Me-262 is a twin-jet, single-place, low-wing monoplane. It can be used as a fighter, a fighter bomber, or a reconnaissance-type airplane.

Fuselage

The fuselage is slim and pointed with a flat belly, and for a single-place aircraft is exceptionally roomy; the large stowage capacity has been dictated by the heavy fuel requirements of the two jet-propulsion units. It is of semimonocoque construction, and steel is employed in the fabrication of the pointed nose portion including the thin outer skin. The rear portion of the fuselage is made from duralumin. The entire fuselage is of substantially triangular cross section, approaching a circular section at the nose. The tail is very slim, the maximum width at a point 18 in. forward of the horizontal stabilizer leading edge being only 2 ft 1 in.

Wing

The thin single-spar wing has a span of 41 ft, with the leading edge swept back approximately 12°. The trailing edge, outboard of the power units, is also slightly swept back; inboard of the power units, the trailing edge is swept forward.

Automatic slots extend along the entire leading edge of the wing, both inboard and outboard of the power units. They are of steel construction throughout and are mounted on steel brackets.

Flaps of modified Handley-Page type are incorporated inboard and outboard of the power units.

Tail Unit

For ease of construction, the fin is made in two halves and bolted together.

The narrow-chord rudder has an over-all height of 6 ft 11 in. It extends from the top of the fin to the bottom of the fuselage.

The 12 ft 4 in.-span tail plane is set fairly high and has pronounced sweepback on the leading edge.

Cockpit

The cockpit is enclosed in a streamlined canopy that is hinged on one side and held in place by a lever-operated bolt on the other. In emergency the entire cover can be jettisoned mechanically.

Landing Gear

The landing gear is of the tricycle type, the main wheels retracting inward into the bottom of the fuselage immediately behind the main spar. The nose wheel retracts in a vertical position into the space beneath the armament installation in the nose. Hydraulic retraction is employed for the nose wheel as well as for the main wheels. All three wheels are equipped with hydraulic brakes, the nose-wheel brake being hand-operated and the main-wheel brakes foot-operated.

Fuel Capacity

There is a fuel tank forward of the cockpit with a capacity of 198 gal, and one behind the cockpit having the same capacity. Beneath the pilot there is a reserve tank of approximately 50 gal. Oil capacity is two gallons. Fuel is pumped by electric immersion pumps. All fuel tanks are self-sealing.

Armament

The standard armament of the Me-262 was four MK 108/30 mm cannon firing simultaneously and converging at 500 yards. These guns are grouped in the nose of the fuselage and as their over-all length is only 3 ft 6 in., a very compact installation was achieved with no external projections. For flight testing, the cannon were removed and the ports left open.

There are two external bomb racks faired into the underside of the fuselage, the forward end of the racks located at a point approximately in line

with the leading edge of the power units. They have a maximum carrying capacity of 500 lb each.

The pilot's armor protection consists of a 16 mm bulkhead in front and rear of the cockpit. Also for frontal protection there is a wind shield 3-1/2 in. in thickness.

Communication and Radio Equipment

The radio used in the Me-262 conformed to the usual type of equipment for German aircraft fulfilling similar functions. A few two-place trainer versions were modified with radar and adapted as experimental night fighters.

FACTUAL DATA

Dimensions

Span	41 ft
Length	34 ft 9 in.
Height	11 ft 4 in.
Chord of wing at root	8 ft 4 in.
Chord of wing at tip	2 ft 10 in.

Weights

Basic weight	8514 lb
Maximum take-off	15,620 lb

Power Plants

The Me-262 is powered by two Jumo 004 turbojet propulsion units. This unit has a sea level (15°C) static thrust at 8700 rpm of 1980 lb. It is of the axial-flow type with an eight-stage compressor at the leading end. The weight of each unit is approximately 1500 lb.

The units are located low beneath the wing so that there is no interruption of the main spar.

Performance

Normal take-off	111 - 124 mph
Normal cruising	465 mph
Normal stall	112 - 125 mph
Final approach	155 mph

Maximum flight duration at low altitudes is 45 to 50 min; at high altitudes it ranges from 60 to 90 min.

Pressure Altitude Feet	Still Air Temperature °C	rpm	Tail Pipe Temperature °C	True Air Speed	Weight 13,100 lb ft/min
4,000	11	8400	595	524	
20,200	-12	8230	600	516	2900
20,200	-12	8650	735	568	
35,300	-45	8220	610	509	1500
35,300	-45	8670	700	546	

PILOT'S OBSERVATIONS

Purpose

To forward pilot's comments on handling characteristics of Me-262.

Factual Data

1. Introduction

The Me-262 is a German jet fighter bomber powered by two Jumo 004 axial-flow jet engines rated at 1980 lb thrust (each) at 8700 rpm.

Two airplanes, Nos. T-2-711 and T-2-4012, were used in this test program. General maintenance was very difficult on both airplanes. Number T-2-711 was flown 12 flights for a total of 10 hr and 40 min, and No. T-2-4012 was flown eight times for a total of 4 hr and 40 min. Four engine changes were necessary on No. T-2-4012 and five on No. T-2-711. Power failure in flight resulted in abandonment of the airplane and complete destruction of No. T-2-711. Tests were discontinued on No. T-2-4012 after two single-engine landings resulting from engine failure in flight, because the value of further flights was not believed to be worth the risk and trouble of maintaining the airplane.

2. Weight and Center of Gravity Information

Flights were made with a take-off gross weight of 13,500 lb at 22.3% M. A. C. (full main tanks only, 474 gal).

3. Flight Characteristics

a. Cockpit layout

The cockpit is somewhat cramped and it is difficult to turn in the seat to obtain vision to the rear. The location of the instruments and controls is satisfactory except that the throttles and starting controls are located too far aft for easy manipulation.

b. Brakes and ground handling

The brakes were very poor, which made ground handling difficult.

c. Take-off and initial climb

All take-offs were running take-offs, due to the poor brakes. The ground roll was slightly longer than ordinarily required. The nose wheel could be lifted off at about 100 mph IAS, and the take-off was made at about 120 mph in a nose-high attitude.

d. Climb

No unusual characteristics were noted in the climbs.

e. Handling and control at various speeds

The handling characteristics were poor at all speeds above 350 mph. The airplane would not make a very satisfactory gun platform because of a tendency to hunt directionally, which resulted in snaking at speeds above 400 mph IAS.

f. Trim and stability

Changes in trim due to operation of the landing gear and flaps were excessive. The relatively large trim changes with changes in power were also objectionable. Longitudinal trim was accomplished by changing the angle of incidence of the stabilizer, which was somewhat slower in operation than the usual trim tab.

No tests were made to check the asymmetric power handling characteristics, but several engine failures resulted in single-engine landings being made without difficulty. The minimum control speed for operation on one engine appeared to be 160 mph, and above 180 mph; the single-engine performance was quite good.

g. Stalls and stall warning

Several straight-ahead power stalls were made. The stalls were clean and straight with no tendency to drop a wing. A stall warning, consisting of buffeting of the airplane and controls, occurred at a speed approximately 5 mph above the stall. Indicated stalling speed in the clean configuration was 130 mph, and in the landing configuration approximately 120 mph.

h. Noise and vibration

The noise level was higher than that of a P-80, although still not objectionable. Wind noise around the canopy contributed greatly to the noise level.

i. Vision

Vision was rather poor, due to the design of the canopy. Many braces obstructed the line of vision and distortion was apparent when looking upward. Vision to the rear was poor because of the difficulty of turning in the seat to look aft.

j. Approach and landing

Preparations for landing required some care because of the large trim changes encountered when lowering the flaps and landing gear. Approach was normal at 150 mph IAS, with good forward visibility. The landing occurred at approximately 120 mph in a very nose-high attitude (because of the slots). The resulting ground roll was straight with no tendency to swing. The ground roll was long because of the poor brakes.

4. General Functioning

a. Power plant and associated equipment

Except for excessive trouble which developed [illegible] brakes and engines, maintenance by a trained crew with all necessary spares readily available might be considered comparable to that required on the P-80A. However, the engines appeared most unreliable and required frequent replacements. The brakes never functioned satisfactorily, as compared to those installed on our own aircraft, and required excessive maintenance.

b. Hydraulic, pneumatic, and electrical systems

No trouble with the operation of the hydraulic or electrical systems was experienced. With the lift unit inoperative, there is no hydraulic pressure and the landing gear and flaps must be lowered by use of a pneumatic emergency system. This unit was used successfully although considerable time was required to bleed the hydraulic lines before another flight could be made. The jettisonable canopy also worked perfectly, in the instance in which it was used, although it would have been better if the release were located on the floor instead of at shoulder level, so that the pilot could lower his head when releasing the canopy. When leaving the plane the pilot jumped, at a speed of approximately 150 mph, from the right side - apparently just clearing the lower surface of the stabilizer.

CONCLUSIONS

Despite a difference in gross weight of nearly 2000 lb, the Me-262 No. T-2-711 was superior to the average P-80A in acceleration and speed, and approximately the same in climb performance.

The handling characteristics of the Me-262 airplanes tested were very poor. However, it is believed that, with the exception of the directional hunting or yawing, they would have been considerably improved if the aileron and

elevator servo tabs had been connected.

The Me-262 apparently has a higher critical Mach number, from a drag standpoint, than any current AAF fighters.

APPENDIX

Reference should be made to the following documents:

"Me-262 Pilot's Handbook" (Report No. F-SU-1111-ND)
"Me-262 Maintenance Handbook (Report No. F-TK-1121-ND)

DEPARTMENT OF DEFENSE
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW
1155 DEFENSE PENTAGON
WASHINGTON, DC 20301-1155

03 APR 1998

Ref: 98-F-1139/M

MEMORANDUM FOR DEFENSE TECHNICAL INFORMATION CENTER
ATTN: KELLY AKERS (DTIC-RSM)
8725 JOHN J. KINGMAN ROAD
SUITE 0944
FORT BELVOIR, VA 22060-6218

SUBJECT: Freedom of Information Act Request - [redacted]
(DTIC FOIA 98-92)

This responds to your March 24, 1994 memorandum which forwarded the subject Freedom of Information Act Request on behalf of [redacted]

This is to inform you that the documents were cleared for release to the general public. A copy of your memorandum, our response to [redacted] and the covers of the three documents are attached for your information.

Our action officer is Lt Col Jordan, (703)697-8120.

A. H. Passarella
Director

Attachments:
As stated

DOCUMENTS

1. Number: ATI 96444
   Title: Improvement of the Performance of the ME-262 Fighter Bomber and Attack Airplane
   Report Date: 23 Feb 45
   Classification: Unclassified

2. Number: ATI 123468
   Title: Evaluation of the ME-262
   Report Date: Feb 1947
   Classification: Unclassified

3. Number: ATI 152169
   Title: Messerschmitt Assembly Plant
   Report Date: 8 June 1945
   Classification: Unclassified

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