APPENDIX IV. REPORT NO.6.

DESCRIPTION AND DRAWINGS

OF

Ki 94 and Ki 106 AIRCRAFT

A descriptive Manual of the Ki 106 and a complete design analysis of the Ki 94 aircraft were obtained from the Tachikawa Company and translations have been made by the Language School, Directorate of Intelligence, R.A.A.F.; the writer gratifully acknowledges this assistance.

Copies of the translations have not been circulated, due to their bulk and the difficulty of editing for reproduction; a general review of the two aircraft has, however, been made, setting out any interesting or unique points noted in their construction. The originals and translations may be viewed at any time, by contacting the writer.

(1) Ki 94 AIRCRAFT

This aircraft was designed for high altitude interception, no doubt against the B29 Superfortress. Attached are a G.A. drawing of the aircraft and drawings of the turbo supercharger installation, undercarriage, engine mount and pressure cabin.

A general description of the aircraft, noting points of interest is set out hereunder -

(a) FUSELAGE

A feature of the design of the fuselage is the use of a separate pressure cabin installation consisting of a structure and canopy. The canopy is sealed by a large diameter rubber tube, maintained at pressure by connection to the Supercharger. The fitment of armour plate has been confined to immediately forward to the pilot.

(b) MAIN PLANES

A laminar flow wing section has been employed and to gain full advantage of the section characteristics, thicker skins have been used; stringers have been dispensed with, and spot welding has been used extensively. Because of the thickness of skinning the torsional rigidity of the wing is high thus improving dive performance.

To house the various items of the equipment in the main planes, special attention has been paid to the design of the spars. In the case of the cannon installation, cutouts in the auxiliary spars have been made, whilst the centre section of main spar is discontinuous to permit the installation of the intermediate radiator.

(c) MATERIALS

Substitutes for the materials in short supply have had to be made.

The use of extruded sections, except where unavoidable, has been abandoned. As far as possible the use of machined parts has been discouraged and for production aircraft the extensive use of forgings had been planned.

(1) Ki 94 AIRCRAFT (Cont'd.)

(d) ENGINE INSTALLATION

The engine is a double row 18 cylinder air cooled radial fitted with a single stage two speed compressor, coupled to an exhaust turbine-driven compressor. The engine is equipped with a low pressure methanol injection system.

In the attachment of the engine mounting to the fuselage, a ball and socket joint, claimed to facilitate engine replacement, has been used, this is similar to the joints used on some German aircraft.

Maximum power figures for various heights are shown hereunder - (Maximum r.p.m. is 2,800.)

ALTITUDE	HORSEPOWER
Sea Level	2400
39300	2100
46000	1750

(e) AIRCRAFT PERFORMANCE

Maximum speed - 467 m.p.h. at 37,800 ft.

Cruising Speed - 291 m.p.h.
Service Ceiling - 45000 ft.

Attached to the report is a series of drawings of the aircraft, which may be of interest.

(2) Ki 106 AIRCRAFT

This aircraft is a wooden version of a previous aircraft of metal construction, the Ki 48. As stated in section 5-11 only one aircraft was constructed and this had been destroyed at the time of interogation.

Fuselage and mainplane were entirely constructed of wood, strengthened and improved wood being employed in the primary structure. The main undercarriage retracted inwards and was hydraulically operated. Four cannon were carried, two 20 mm. cannon, with 300 rounds, in the wings and two 12.7 mm. cannon, with 700 rounds in the fuselage, these being electro magnetically fired, but hydraulically loaded.

The engine, an 18 cylinder twin row radial, employing methonal injection, was assembled as a power egg; the power output at various altitudes is shown hereunder -

HEIGHT - Metres	POWER - B.H.P.
Take-off and initial climb	1990
1750	1860
6100	1625

The fuel, oil and methonal tanks were fitted with

(2) K1 106 AIRCRAFT (Cont'd.)

bullet proof covering, similar to the "Cima" type covering and as a precaution against vapour lock, at high altitudes, the fuel tanks were pressurised.