

Curtiss XBTC-1,-2

1945

The XBTC-1 and -2 were experimental shipboard torpedo attack aircraft which primarily investigated a “duplex” wing (advanced flap system) and the use of contra-rotating propellers from both Aero products and Curtiss-Electric. Two prototypes were built but weapons trials were never conducted.

Wingspan: 50 feet Weight (max): 18,000 lbs. lbs.
First flight: January, 1945

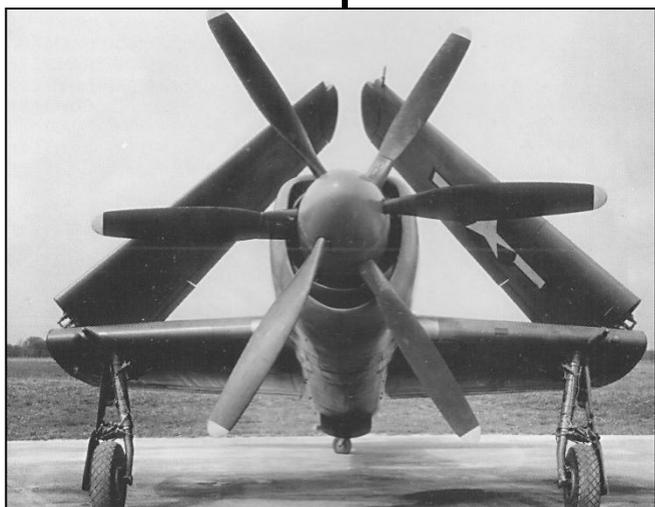
Engine: Pratt & Whitney R-4360-8a, 3,000 HP
Props: Curtiss-Electric hollow steel blades of 14 ft 2 inch diameter, or Aero products AD7562 X14 of 13.5 feet dia.



XBTC-1, Curtiss Electric props



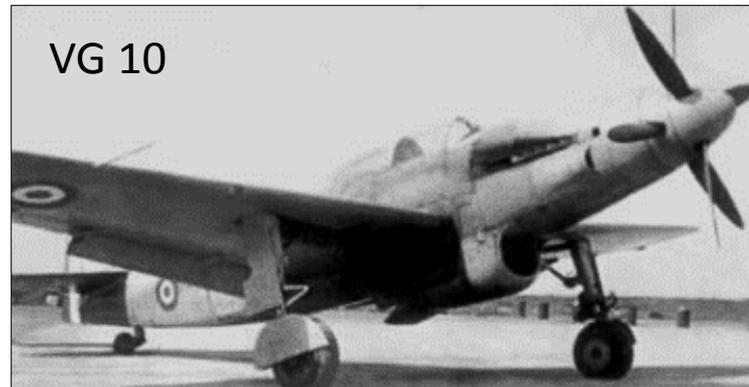
XBTC-2, Duplex wing, Aero props



Arsenal VG 10, VB 10

1945

French experimental tandem, twin-engine heavy fighter. First prototype (VG 10) evaluated by Vichy French and occupying Germans. Two VG-10's and four post-war VB 10's were built. The VB 10 packed 4 x 20 mm cannon however production was halted September 21, 1948.



Wingspan: 51 feet, 10 inches

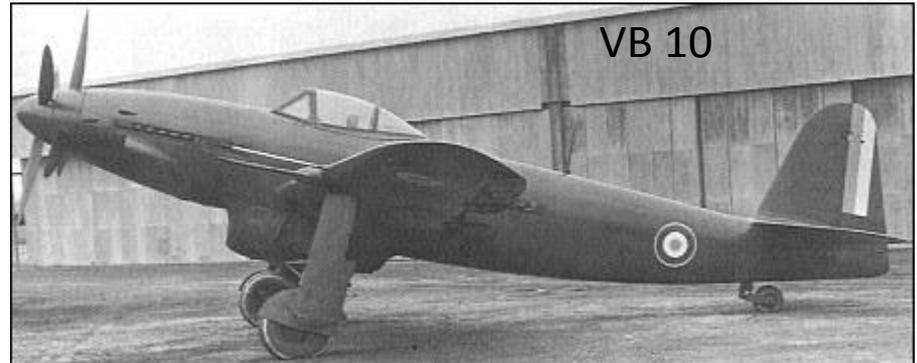
Weight (takeoff): 19,533 lbs.

First flight: VG 10: July 7, 1945 VB 10: Sept. 21, 1946

Engines: Ship #1: Hispano-Suiza 12Y31 v-12, 860 HP, x2

Prototype #2: Hispano-Suiza 12Z/12/131 v-12, 1,150 HP x2

Props: Variable pitch, approx. 11 feet 10 inches diameter



Sud Ouest Dewoitine SE.580

1945

The design of this heavy fighter began in early WWII but final design and construction began after France was liberated. A massive engine, empennage, and wing root thickness are apparent from the pictures. The two prototypes were never completed due to the coming age of the jet.

Wingspan: 52 feet, 0.5 inches

Weight (max.): 11,205 lbs.

First flight: Never flown

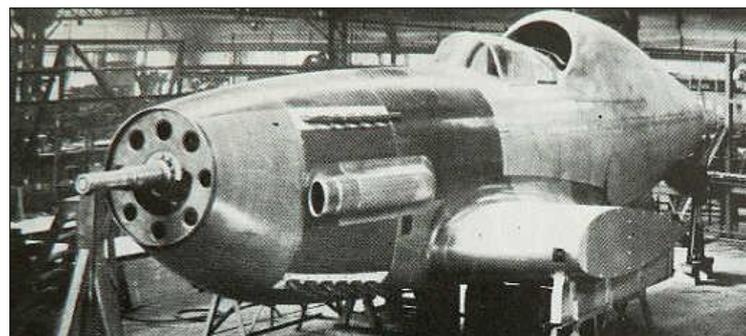
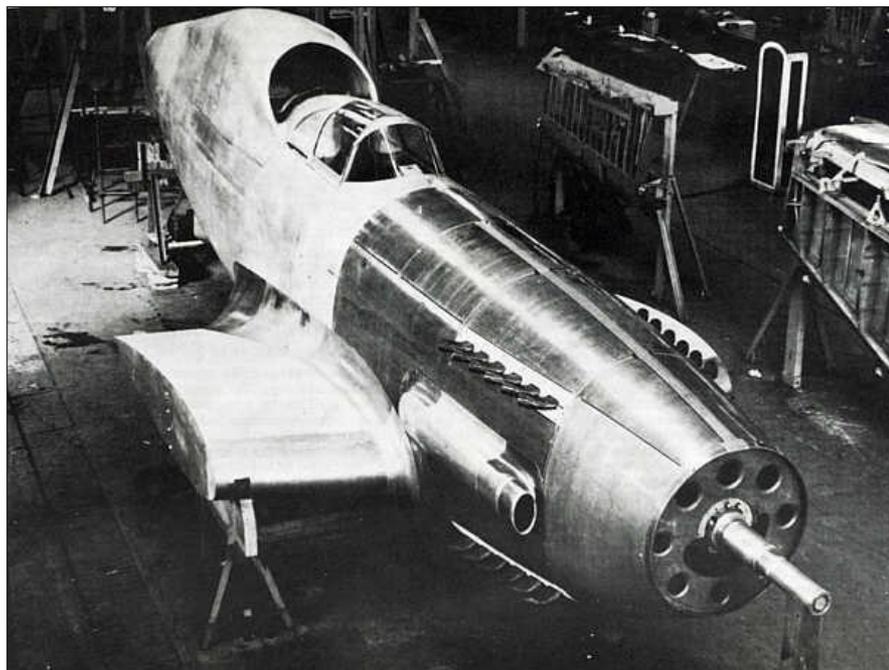
Engine: Early design: Hispano-Suiza 24Z (2,000 HP)

Late Design: Arsenal 24H (3,400 HP)

Props: Unknown, 12 feet 1.2 inch diameter



Arsenal 24H



Northrop XB-35

1946

Jack Northrop's flying wing dream for bomber efficiency and speed used four buried R-4360's, long drive shafts, and a remote gearbox to power the aircraft. The initial version flew with the H-S Super Hydromatic propellers (full feathering and reversing) which were fraught with vibration, gearbox, and propeller control failures. Subsequent version used single-rotation props with a loss of efficiency. Each remote reduction gearbox had its own oil cooler and 3 gallon supply of oil.

Wingspan: 172 feet

Weight (max): 180,000 lbs.

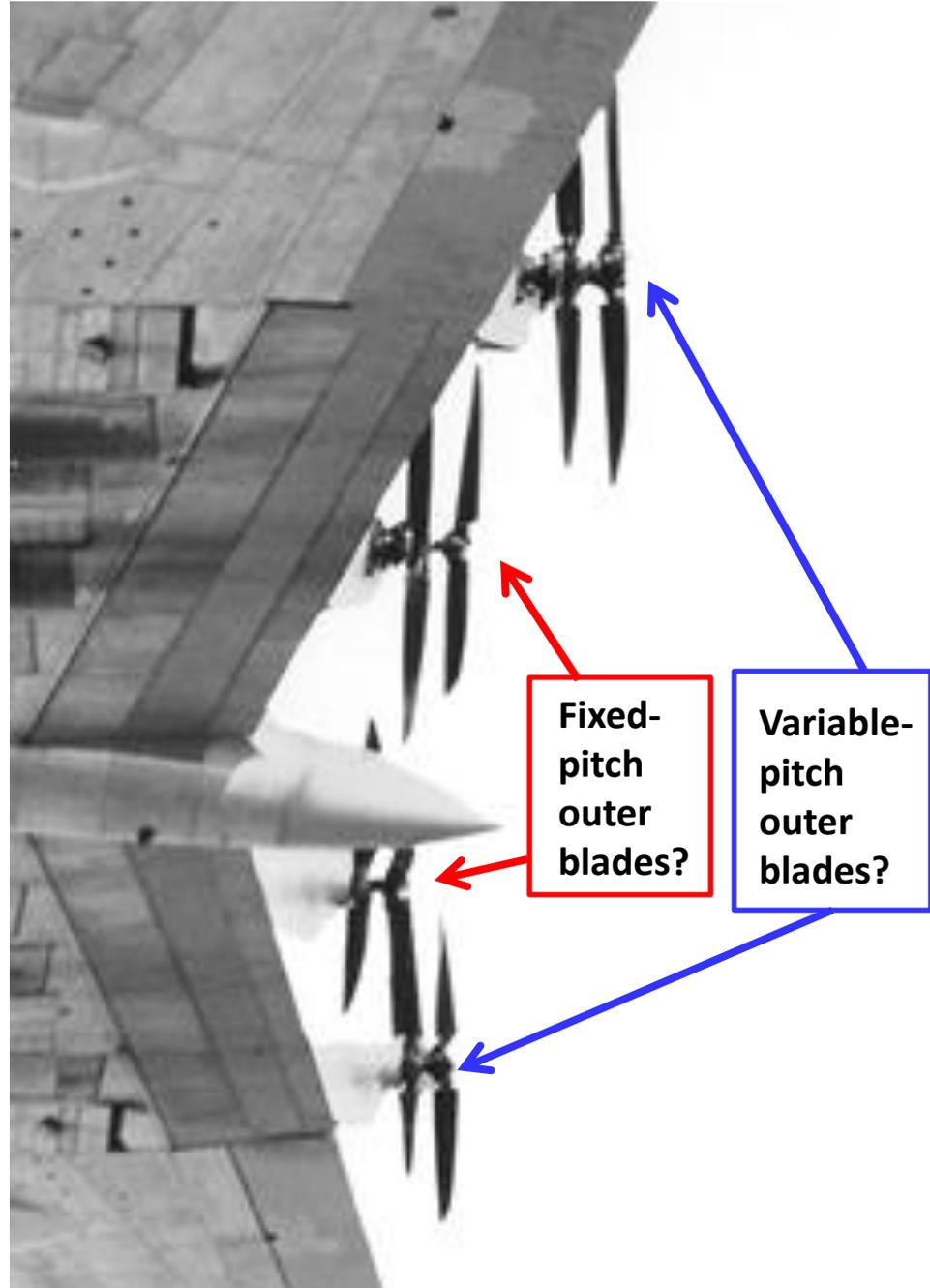
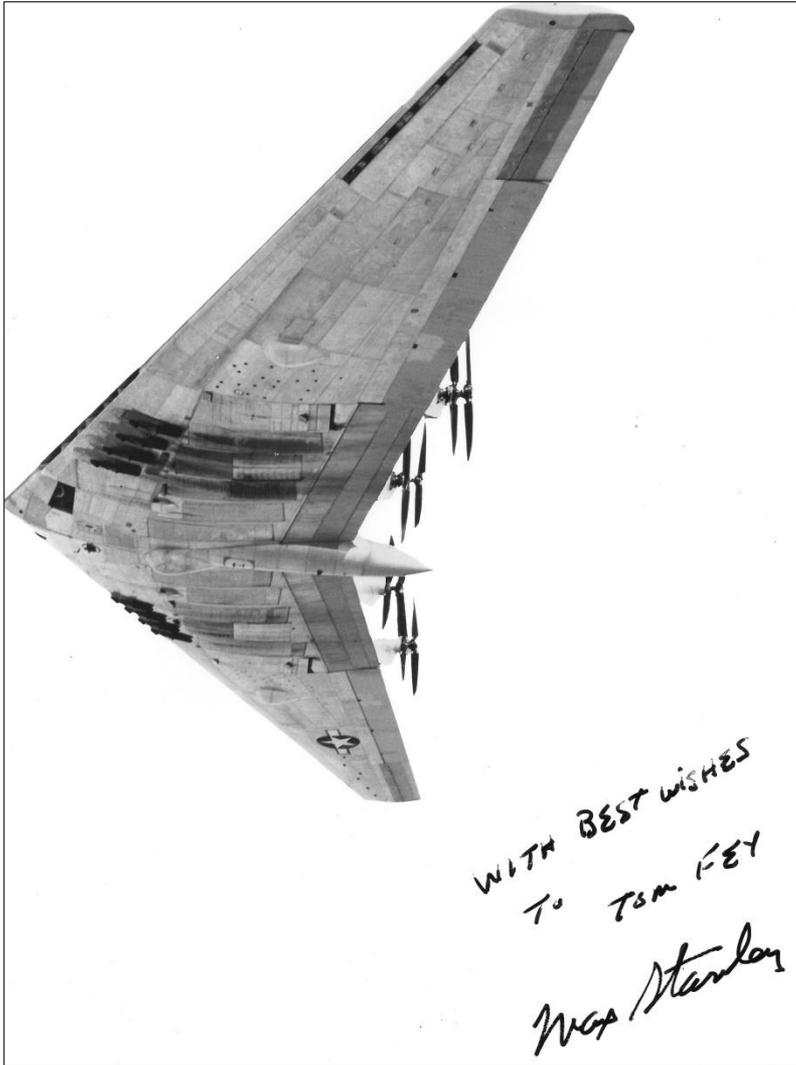
First flight: June 25, 1946

Engines: Four P&W R-4360-17 and -21, 3,000 HP, each with dual GE BH-1 turbochargers

Propellers: Hamilton-Standard Super Hydromatic propellers, Hub #828060 (80 and 60 spline);

Fore prop: blades 2C15-B2-Oa7 of 15 ft. 3 inch. Aft prop blades: 2C15-B2-Oa8 of 15 foot 1 inch diameter.





Short S-38, S-39 Sturgeon

1946

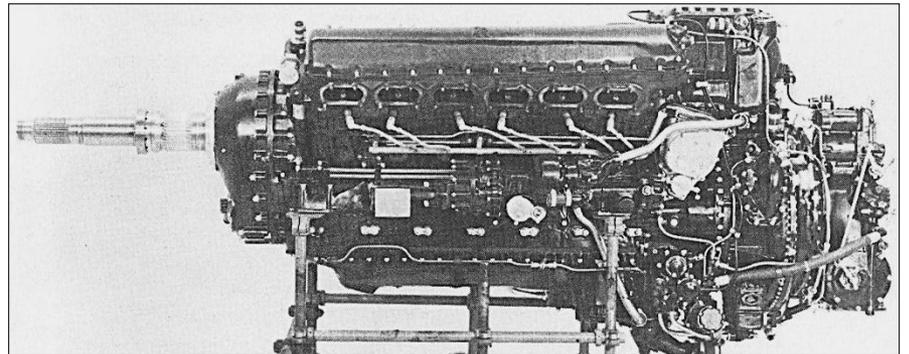
The Irish aircraft firm built 25 twin engine, two man aircraft intended as torpedo bombers but were relegated into a predominantly target tug / anti-submarine role. The Merlin 140 driving contra-props placed the small diameter props as close as possible to the aircraft centerline to allow wing folding into a mandated 20 foot width, and secondarily, to try to minimize engine-out asymmetry for carrier landings.

Wingspan: 59 feet 11 inches Weight (max): 18,126 lbs.

First flight: June 7, 1946

Engines: Rolls-Royce Merlin V-1650-140, 2,080 HP

Props: Rotol, full feathering,
10 ft. diameter



Supermarine Seafang Mk XXXII Type 382 / 396 1946

Along with the land-based Spiteful, the Seafang was the end of the line for the prop driven Supermarine fighters. With laminar flow wings, an inward retracting, wide track landing gear, and numerous other improvements, the airframe was no longer a Spitfire. Nine production Seafangs were delivered. Note the minimal propeller clearance. A single rotation propeller and engine prototype (Mk XXXI) was also evaluated.

Wingspan: 35 feet

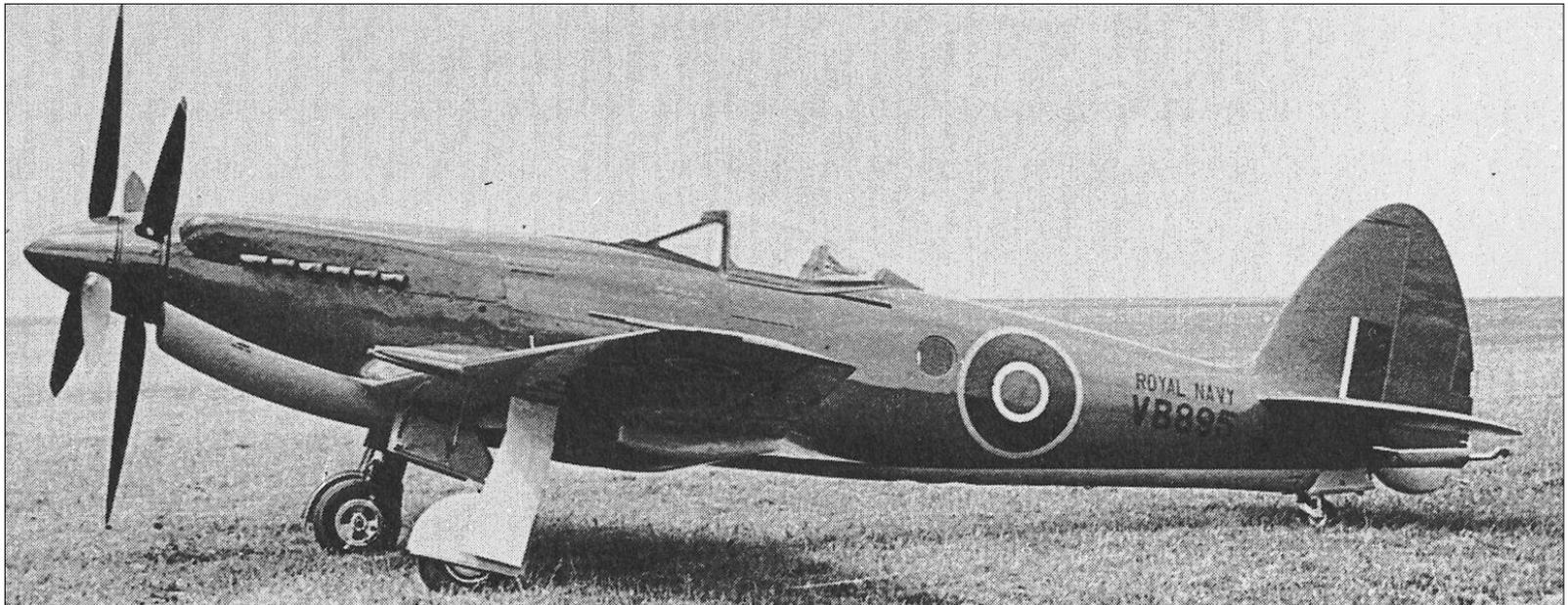
Weight (max; armed): 9,030 lbs.

First flight: June 1946

Engines: Rolls-Royce Griffon

98/130, V-2240, 2,350 HP

Props: Rotol, approx. 10 foot 4 inch diameter, Jablo wooden blades



Supermarine Seafire F.46 / F.47

1946

The desire for Spitfire fighter performance in a piston-powered carrier fighter aircraft led to the Seafire F. 47. Contra-rotating props eliminated the dangerous torque on take-off and wave-off, provided a manageable prop diameter for deck landing, and sufficient blade area to accept the power of the Griffon engine. The Seafire had a wider landing gear and boasted the largest tail area of the breed due to the destabilizing effects of the contra-props. Ninety F.47 aircraft were built.

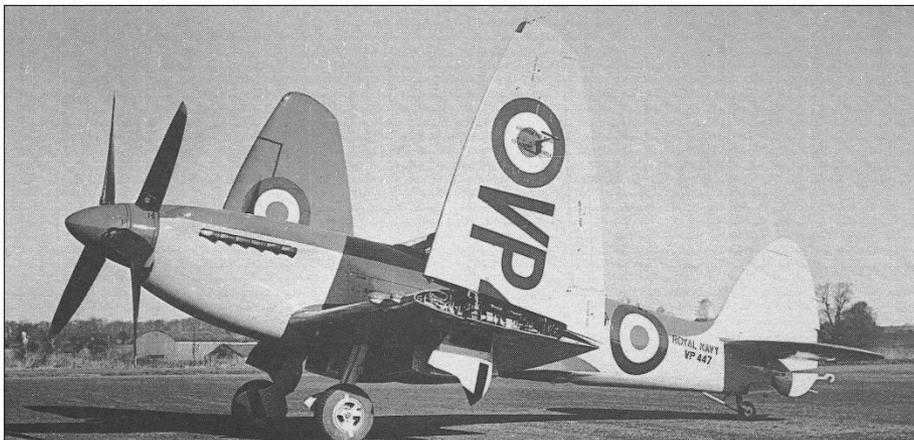
Wingspan: 35 feet (17 feet folded)

Weight (max; armed): 10,760 to 12,600 lbs.

First flight: June 7, 1946

Engines: Rolls-Royce Griffon 85, V-2240, V-12 cylinder engine of 2,375 HP

Props: Rotol 10 foot 4 inch diameter; often used laminated wooden blades (Jablo) to spare engine, deck, and crew on prop strikes



Hughes XF-11

1946

The Hughes XF-11 was a pressurized, high performance photo recon prototype aircraft powered by turbo-supercharged R-4360's for high speed, high altitude work. The first prototype used experimental Hamilton-Standard Super Hydromatic contra-rotating props which failed on the maiden flight. A second prototype used Curtiss Electric single rotation units of 14 feet 8 inches diameter.

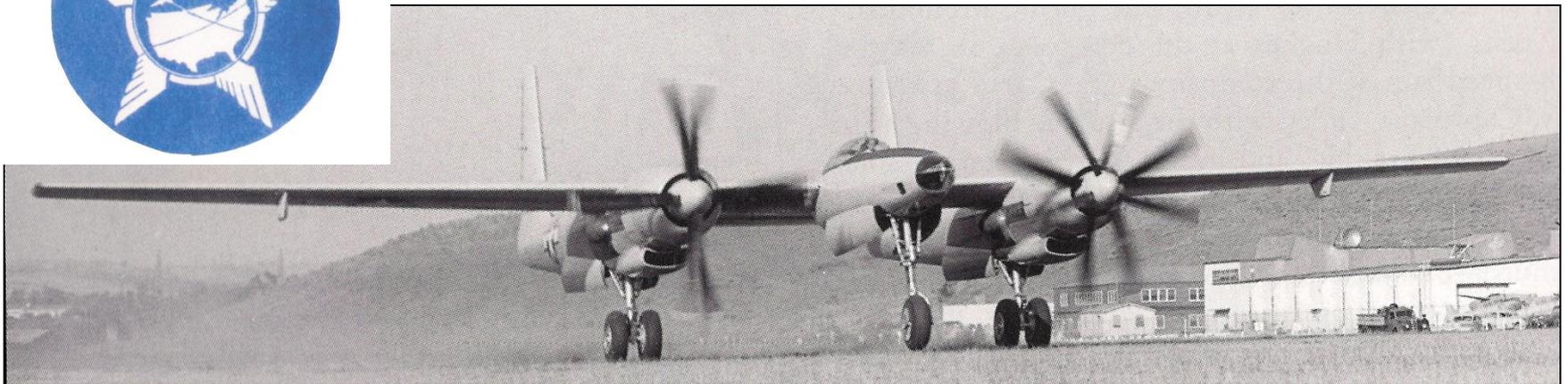
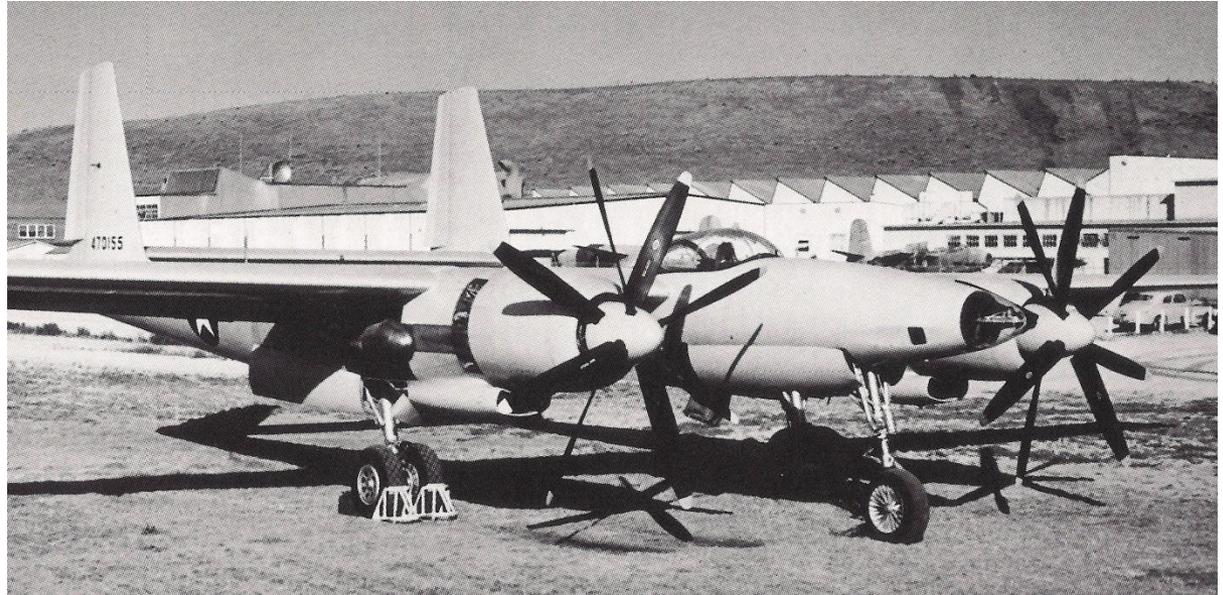
Wingspan: 101 feet, 4 inches

Weight (max): 58,000 lbs.

First flight: July 7, 1946

Engine: Dual P&W R-4360- 31,
3,000 HP each, with dual GE
BH-1 turbochargers

Props: Hamilton-Standard Super
Hydromatic; 15 feet 1 inch fore
prop, 15 feet 3 inches aft prop.



Westland Wyvern Mk. 1 (Eagle 22)

1946

The Wyvern was a single seat naval attack aircraft which suffered a protracted development for both aerodynamic and propulsion reasons. It first flew in the Mk.1 form (6 were manufactured) with the Eagle 22 piston engine as a precedent to upgrading with turboprop power.

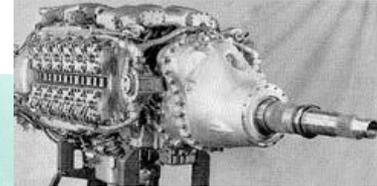
Wingspan: 44 feet

Weight (max.): 24,450 lbs.

First flight: December 12, 1946

Engine: Rolls Royce Eagle 22; 3,200 HP.

Props: Rotol 5½ / 7½, 2 x 4 blade, 13 feet dia.



Fairey Firefly 4

1947

The Firefly was a WWII naval single or dual seat fighter/attack/recon aircraft normally fitted with a Rolls-Royce Griffon and single rotation propeller. The substitution of a dual rotation Griffon and propeller set was likely not too demanding as the airframe was Griffon-compatible and the prop assemblies from at least two British manufacturers already existed. The contra-prop Firefly never entered service and all Fireflies were retired from British service in 1955.

Wingspan: 41 feet 2 inches

Weight (max): 16,096 lbs

First flight: December 22, 1941 (original prototype); c-prop: 1947

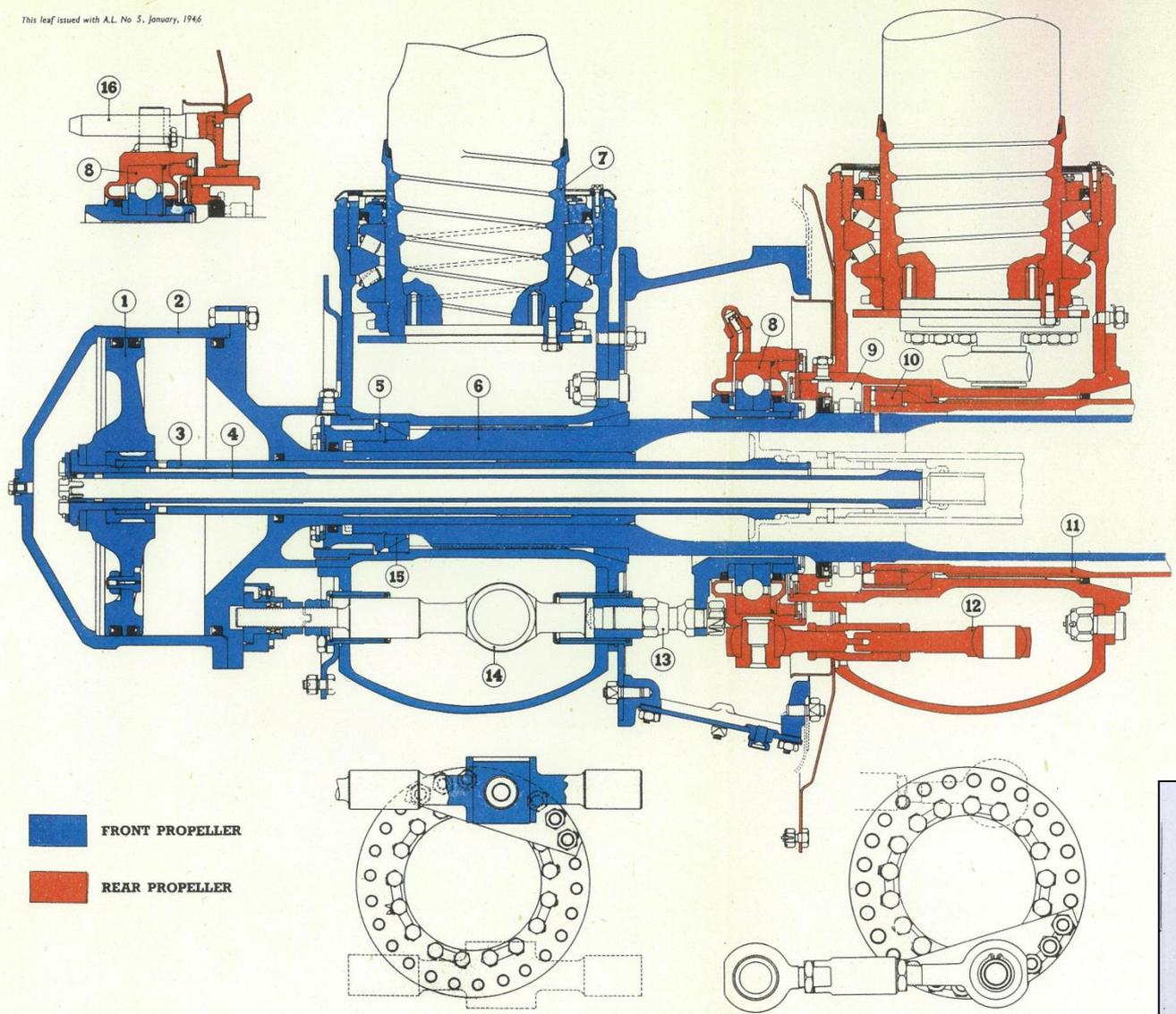
Engine: Rolls-Royce Griffon 74 (single rotation), V-2240, 2,330 HP.

Props: Rotol or de Havilland



Rotol 35 Degree Contra-Prop: Slaved linkage between fore and aft prop sets

This leaf issued with A.L. No 5, January, 1946



- 1 Piston (Stationary)
- 2 Cylinder (Translates)
- 3 Outer oil tube
- 4 Inner oil tube
- 5 Hub retaining nut (Front propeller)
- 6 Engine propeller shaft (inner)
- 7 Blade assembly
- 8 Transfer bearing
- 9 Roller bearing (Engine component)
- 10 Hub retaining nut (Rear propeller)
- 11 Engine propeller shaft (outer)
- 12 Operating link (Rear propeller)
- 13 Connecting link (Front propeller to transfer bearing)
- 14 Operating link (Front propeller)
- 15 Front cone
- 16 Driving pin

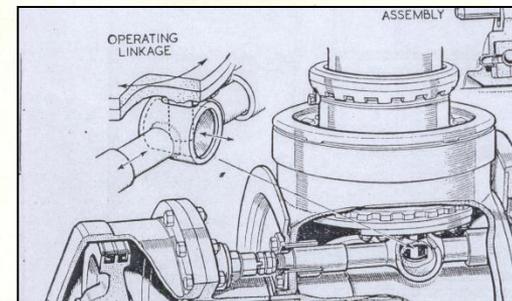


FIG. 5. RELATIVE MOTIONS OF COUNTER-ROTATING PROPELLER

Supermarine Seagull ASR.1

1948

The Seagull was an attempt to update the air-sea rescue capability performed by the Walrus. It had a variable incidence wing, slats, and drooping, double slotted ailerons which provided a 57 mph landing speed. The lack of torque on a powerful engine mounted far from the center of gravity greatly improved water handling while the generous tail wheel fairing acted as the water rudder. The Seagull housed a crew of three and set an amphibian air speed record of 241.9 mph in 1950. The maturing of the helicopter made the Seagull obsolete, and the two flown and one partially-completed airframe were sold for scrap in 1950.

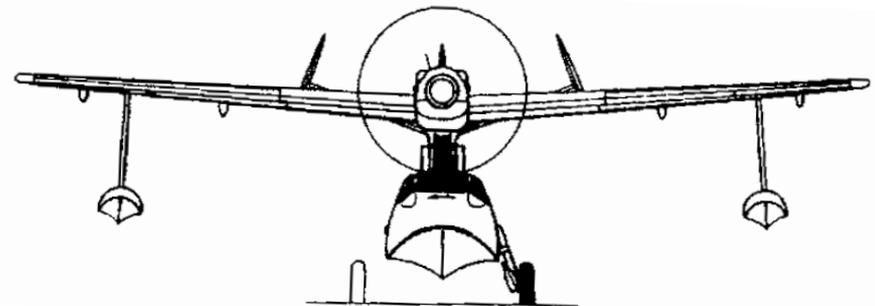
Wingspan: 52 feet 6 inches

Weight (max.): 14,500 lbs.

First flight: July 14, 1948

Engines: Rolls-Royce Griffon 29, V-2240, 12 cylinder engine of 1,815 HP

Props: Rotol, approx. 9 feet 10 inches dia.



Atlas H-10 Mono-Twin

1948

Light 4 place aircraft designed by Max Harlow, based on his PJC-2 but using parts from the uncompleted PJC-4, and built by the Pasadena Junior College. The first iteration used a 190 HP Lycoming O-435 flat six, then dual Continental GO-300 opposed, flat 6 cylinder engines, one on top of the other, driving contra-rotating propellers. The plane was soon converted to a 215 HP Franklin 6AB, and then to a 400 HP IO-720.

Wingspan: 35 feet, 9 inches

Weight (takeoff): unknown

First flight: Jan. 1, 1948 (O-435)

Engine (C-Prop): Dual Continental O-300 air cooled flat 6 engines, 145 HP each

Props: Fixed pitch.



Avro Shackleton

1949

British long range maritime patrol, anti-submarine, and airborne early warning patrol aircraft built in at least three different versions. The propeller translation bearing is lubricated in flight after every 5 hours by three rounds of setting the engines to 2,400 rpm for at least 10 seconds, then 1,240 rpm for 5 seconds, which introduces oil into the translation bearing. Because of prop limitations, presumably resonance vibration, continuous engine speeds between 1,350 and 1,550 rpm, or 2,200 to 2,400 rpm, were forbidden.

Wingspan: (M.R.3) 120.5 feet

Weight (takeoff): (M.R.3.) 99,817 lbs. (max)

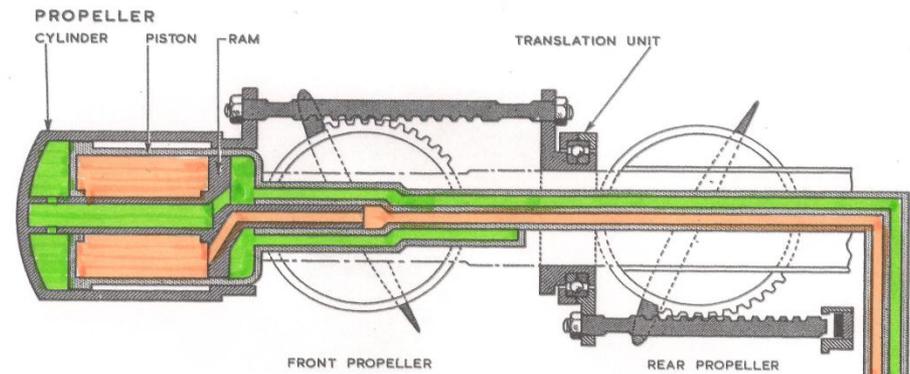
First flight: (M.R.1) March 9, 1949

Engine: (M.R.3) Rolls-Royce Griffon 57A, V-2240, V-12, 2,500 HP wet, x4

Props: M.R.3: Constant speed, full feathering, de Havilland CR.No. 3+3/3000/4-6 with blades XPB.31250. Fore prop diameter 13 feet. Aft prop diameter 12 foot 9 inches



de Havilland contra-prop assembly; fixed piston, translating cylinder



Sud Ouest S.N.C.A.S.O SO.8000 Narval

1949

The Narval was a protracted French attempt at a swept-wing, high performance naval fighter with the ultimate intention for jet propulsion. Two prototypes were constructed, with the maiden flight made by Ship #2 which ultimately logged 43 flights. Ship #1 flew only once. The jet age had arrived, and the last flight of the Narval occurred within 9 months of the maiden flight.

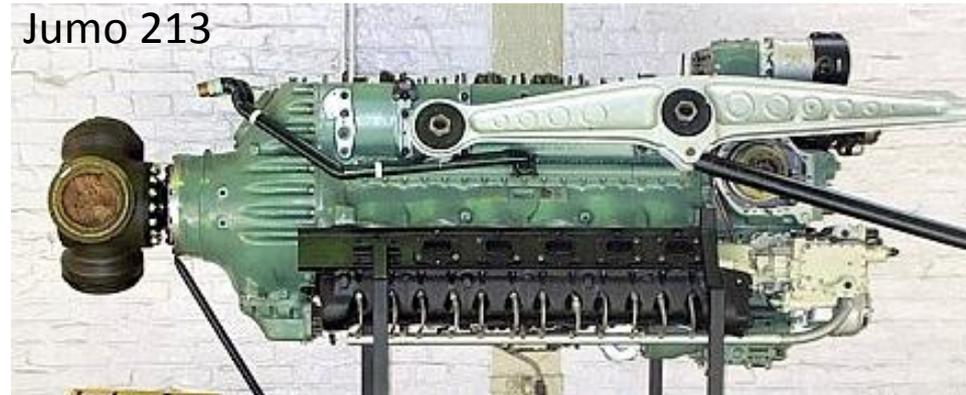
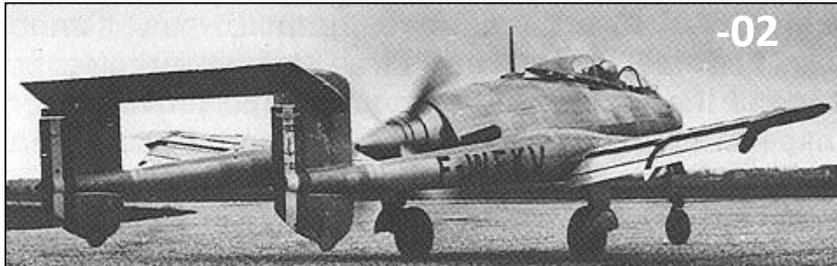
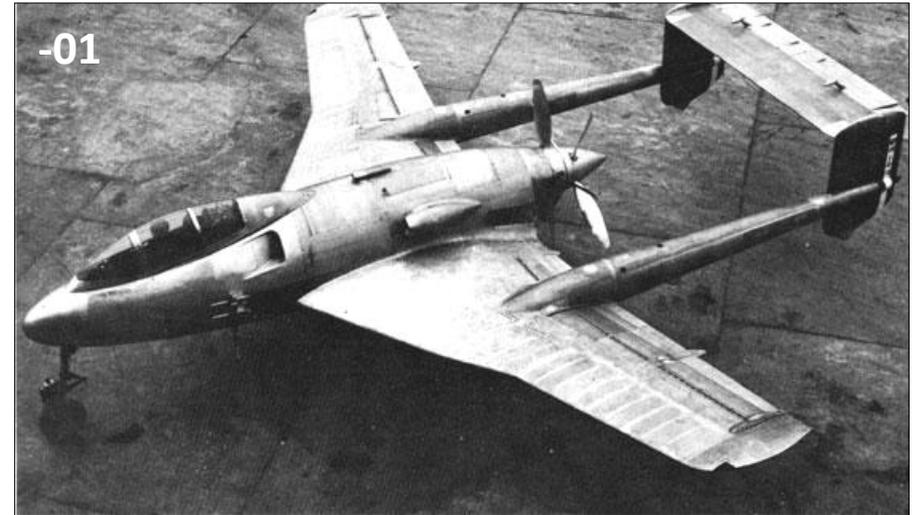
Wingspan: 39 feet 7 inches

Weight (max;): 14,564 lbs.

First flight: April 1, 1949

Engine: Arsenal 12H-O2 (utilized Jumo 213 parts and technology) of 2,250 HP

Props: Chauviere initially; switched to Rotol later



Westland Wyvern (Clyde and Python)

1949

The Wyvern single seat naval attack aircraft was prototyped with a Rolls-Royce Clyde (W.35) as well as the A-S Python (W.34) turboprop engine. The reverse-flow, constant-speed (7,800 rpm) Python utilized a complex fuel management and prop control system, when combined with airframe aerodynamic issues, devoured considerable development time. The Wyvern participated in the Suez Crisis of November of 1956, however the rapid advancement of jet aircraft led to the withdrawal of the Wyvern in early 1958 after 124 aircraft had been produced.

Wingspan: 44 feet

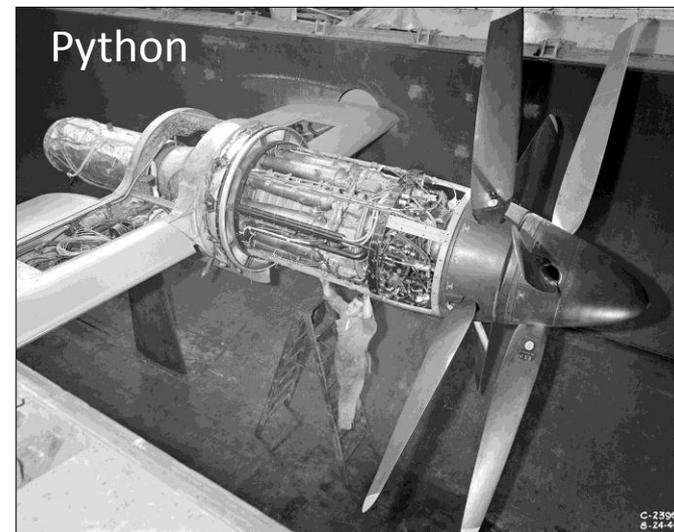
Weight (max.): 24,450 lbs.

First flight: March 22, 1949 (Mk.2)

Engines: MK. 2,3,4: Armstrong-Siddeley

Python (5,000 HP + 1,340 lbs. jet thrust)

Props: Rotol 5½ / 7½, 13 feet diameter



Bristol Brabazon (Type 167)

1949

British prototype 100 passenger trans Atlantic airliner. Flew a total of 382 hrs., but was found to be underpowered and soon to be overtaken by the jet age.

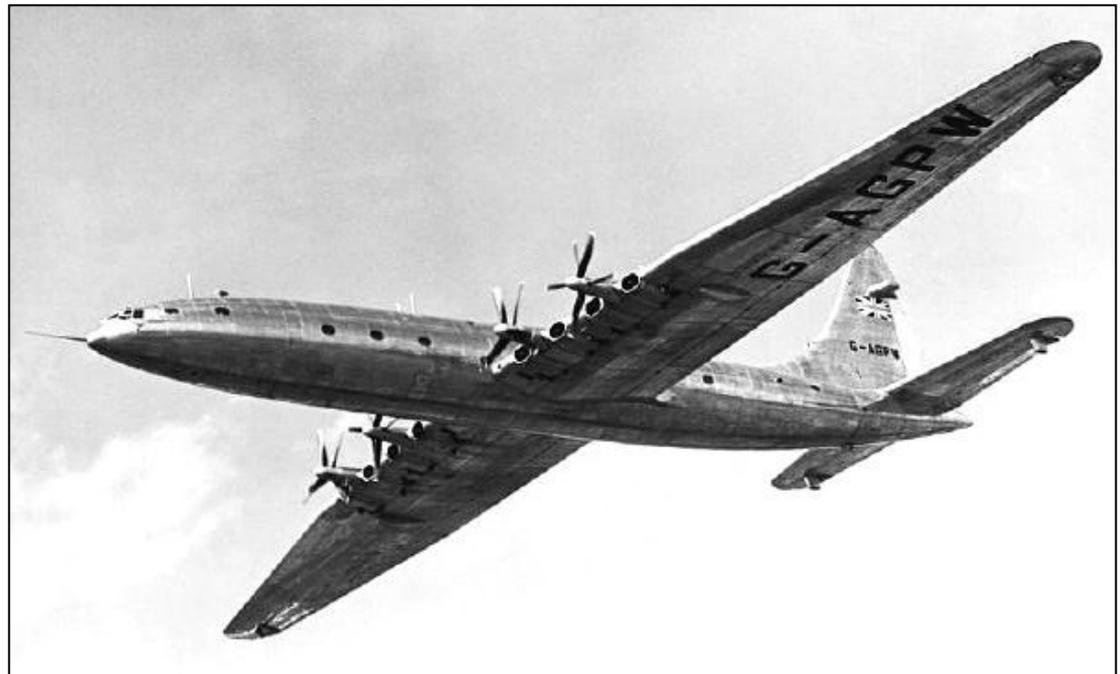
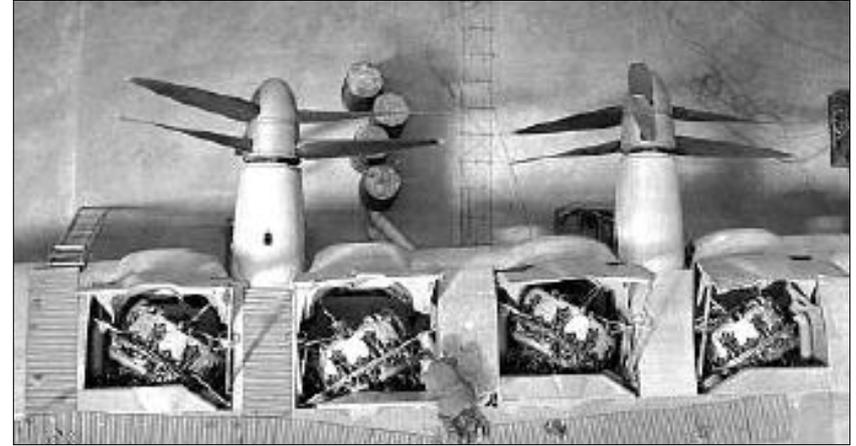
Wingspan: 230 feet

Weight (takeoff): 290,000 lbs. (max)

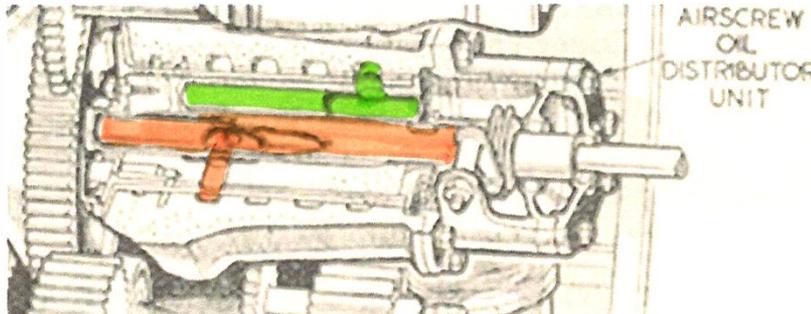
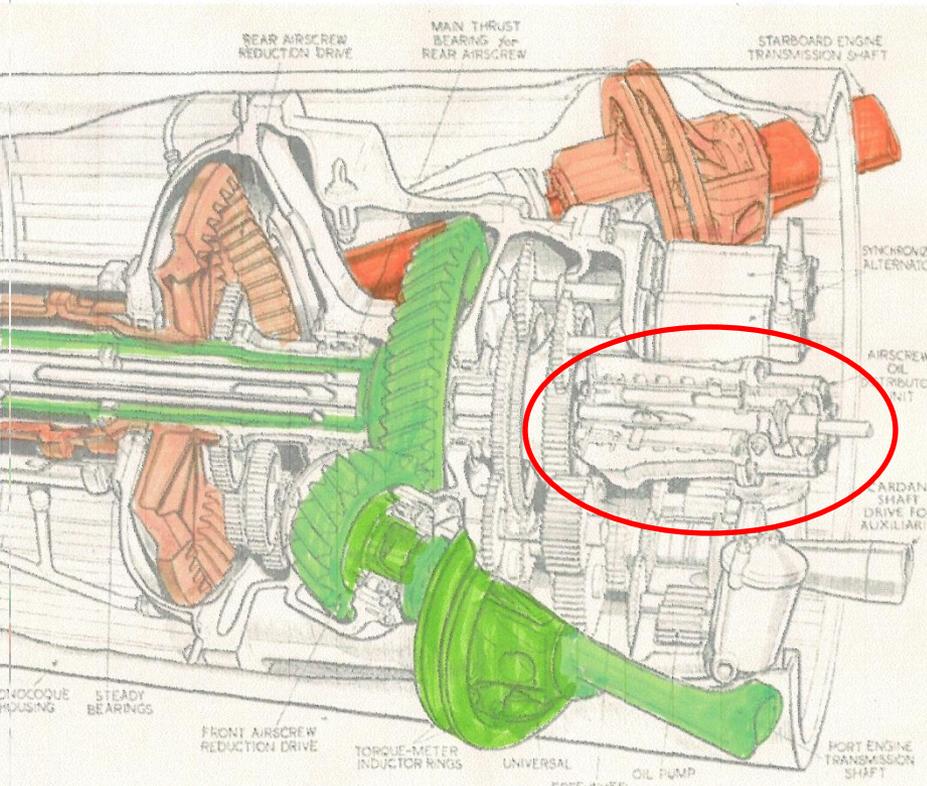
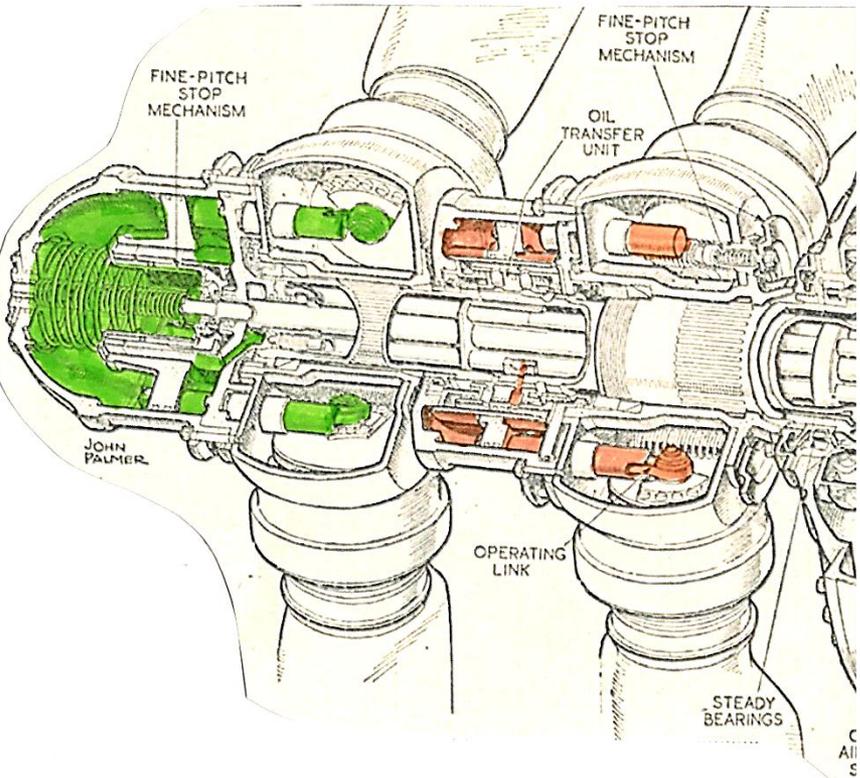
First flight: Sept. 4, 1949

Engine: Bristol Centaurus radial, 2,650 HP, x8; each engine driving own propeller

Props: Rotol constant speed, full feathering, reversible, braking, 16 foot dia., independently-controlled contra props.



Rotol Independently-Controlled, Co-Axial, Contra-Rotating Propeller



Fore prop drive, cylinder, and linkages

Aft prop drive, cylinder, and linkages

The reduction gears were so large and complex that specialized tooling and equipment had to be built to construct them. Cooling/lubrication flow was 5.5 gal/minute in the gearboxes.

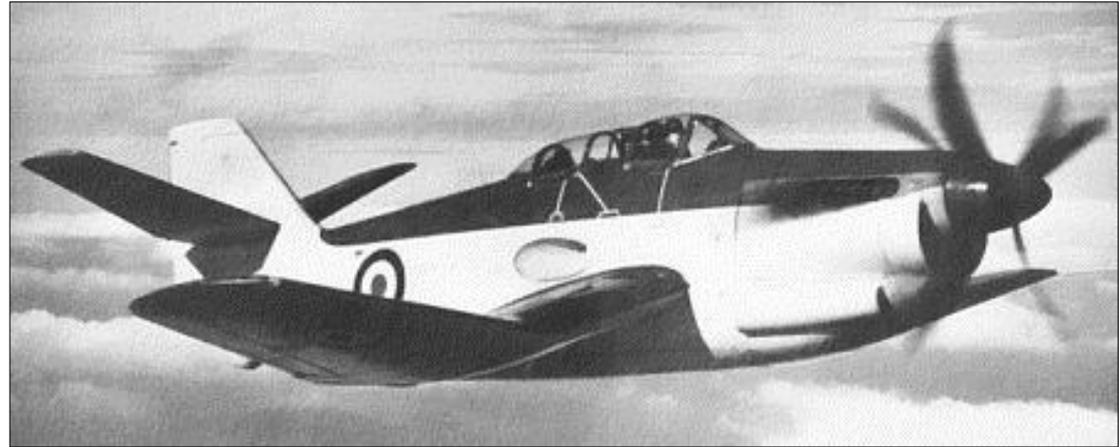
Four lane oil tubes for control of props runs in the bore of the inner prop shaft

Blackburn B-54 (Y.A.5)

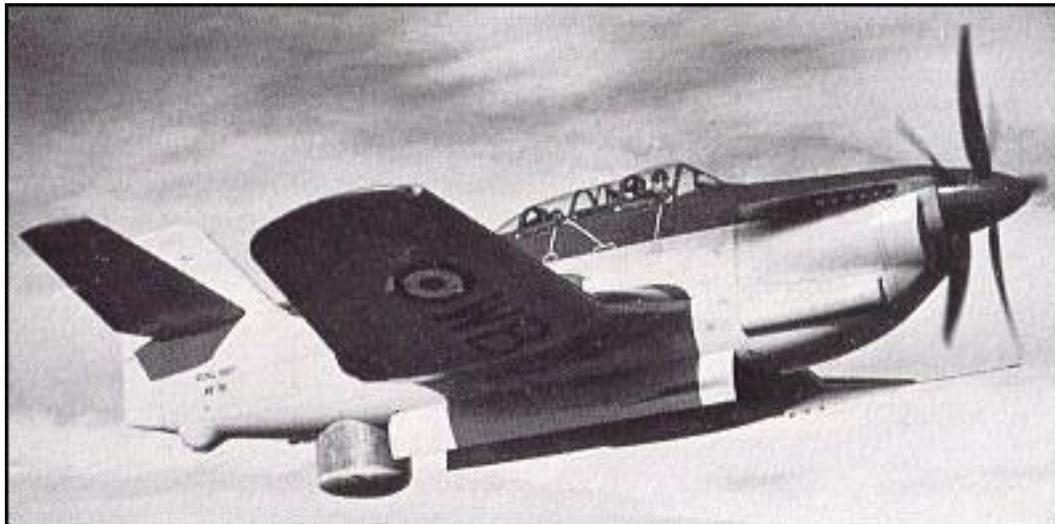
1949

British prototype carrier based anti-submarine warfare aircraft. Initial prototype flew with Griffon piston engine as the Armstrong-Siddeley Double Mamba turboprop engine was not yet ready for flight. Dihedral in horizontal stab moves surfaces out of turbine exhaust and adds vertical surface area to tail.

Wingspan: 44 feet, 2 inches
Weight (max.): approx. 13,091 lbs.
First flight: Sept. 20, 1949
Engine: Rolls-Royce Griffon 56 or 57,
V-2240, V-12, 2,000 HP
Props: Rotol, constant speed, full
feathering, 13 foot diameter



Note exhaust shroud over wing root for the yet-to-be installed turboprop engine. Might be used coolant for exhaust



Note open bomb bay and extended radome in aft fuselage

Fairey Gannet

1949

The Gannet was a remarkable 3 place anti-submarine/AEW aircraft providing twin engine power with the safety of centerline thrust for carrier operations. The propeller pitch was independently controlled for each prop, and alternate engines would be shut down and prop feathered for one hour at a time to extend loiter time. Early engine/props (101's) did not have a fine pitch stop, resulting in a number of "disc-ing" incidents and crashes. It served four naval forces for 25 years.

Wingspan: 54 feet, 4 inches

Weight (max): 25,000 lbs.

First flight: Sept. 19, 1949

Engine: Armstrong-Siddeley Double Mamba turboshaft,
2,950 to 3,875 HP plus 150 - 810 lbs. jet thrust

Props: Rotol 4/6, 11 to approx. 16 foot diameter,
constant speed, full feathering, braking, neg. torque
system, independently controlled. (11 ft. dia.: 582 lbs
total; 278 lbs. fore, 304 lbs. aft, NACA 16 series airfoil)

A.S. Mk 4



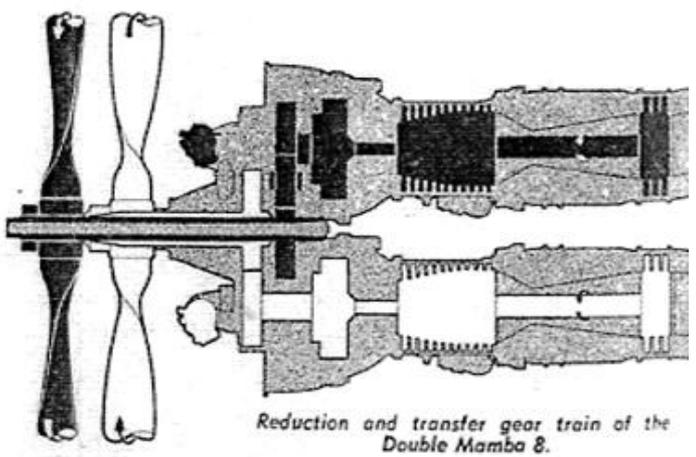
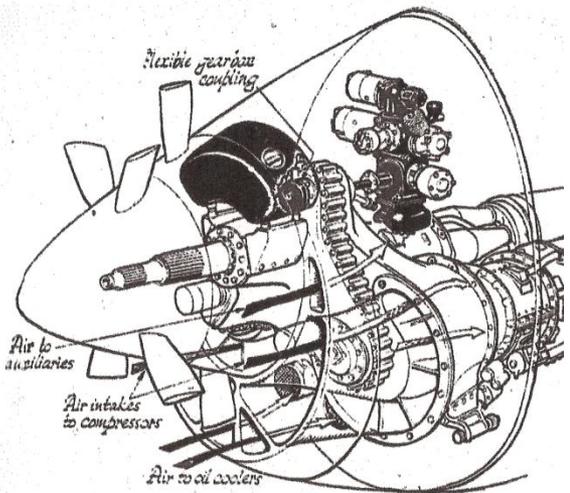
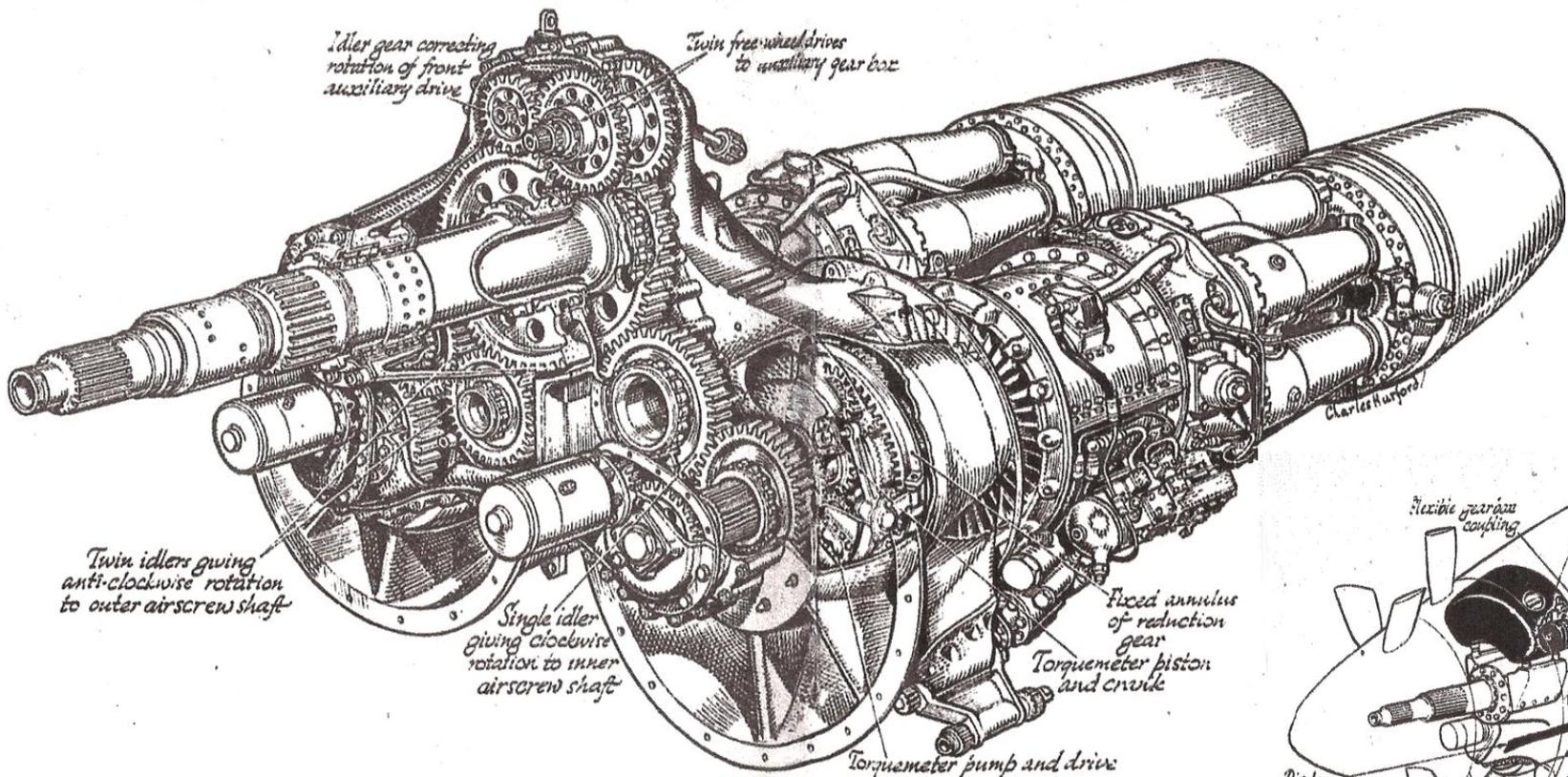
T Mk 2



A.E.W. Mk 3



A.E.W. Mk 3



Reduction and transfer gear train of the Double Mamba 8.

Double Mamba:

Reduction Ratio: 10.36 to 1 = prop speed 1500 rpm

Oil Flow: 8.3 gal./minute each engine

Fuel flow: Max cruise (400 mph) 249 gph

Cruise sfc: 0.85

Pressure ratio: 5.2 to 1

Cartridge (later electric) starting to attain 4,500 rpm for start

Gannet flight endurance: 3.5 to 6 hrs.

Convair XP5Y-1, R3Y-1, R3Y-2 Tradewind

1950, 1954

The prototype XP5Y-1 first flew in 1950, but production versions of this pressurized flying boat turboprop transport (R3Y-1), beaching-capable assault transport (Bowloader R3Y-2) and aerial refueler R3Y-2 didn't fly until 1954. The Tradewind became operational in 1956, but was withdrawn in April 1958 due to chronic engine and propeller problems after 3,302 total hours on a fleet of 11 aircraft.

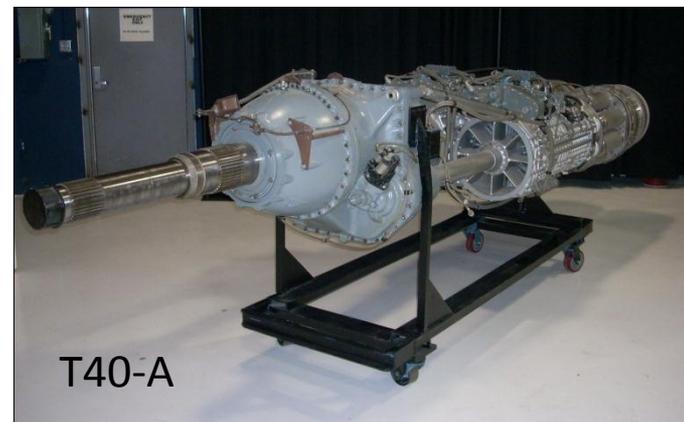
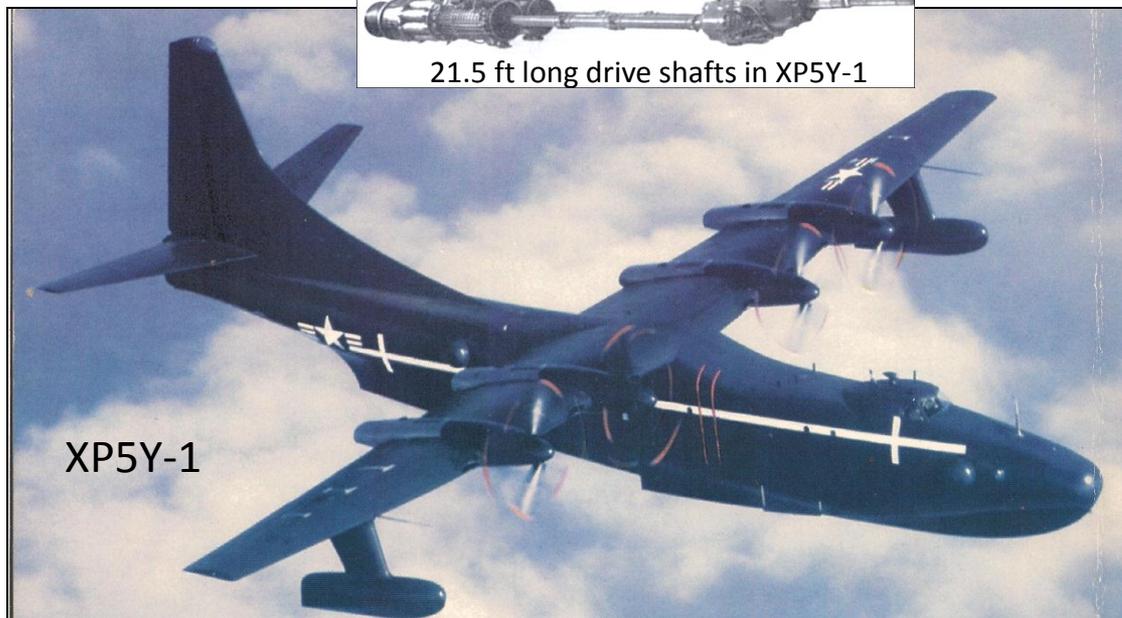
Wingspan: 145 feet, 7.7 inches

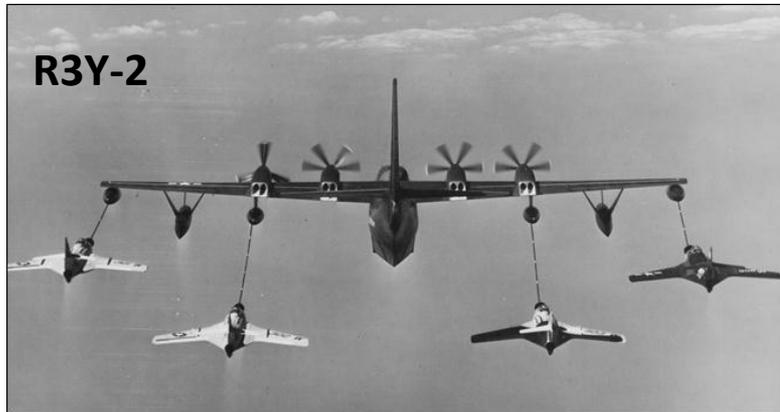
Weight (takeoff): 165,000 lbs. (max.)

First flight: XP5Y-1: Apr. 18, 1950. R3Y-1: Feb. 25, 1954. R3Y-2: Oct. 22, 1954.

Engine: Allison XT40-A or T40-A-10 engines, 5,100 to 5,332 SHP + 1,240 to 1,296 lbs. jet thrust each, x4

Props: Aero products AD8664FN-44 full feathering, reversing, 15 foot diameter propellers





Blackburn B-88 (YB.1)

1950

Prototype British carrier based anti-submarine warfare aircraft. This single prototype was dropped in favor of the similarly-powered Fairey Gannet. Like the Gannet, each power unit of the Double Mamba driving one propeller, and the propellers, like the Brabazon and Gannet, were independently controlled.

Wingspan: 44 feet, 2 inches

Weight (max): approx. 13,091 lbs.

First flight: July 19, 1950

Engine: Armstrong-Siddeley Double Mamba,
2,540 HP, + 770 lbs. thrust

Props: Rotol constant speed, full feathering



Douglas A2D Skyshark

1950

The A2D was an attempt to update the successful carrier-based attack aircraft Skyraider concept with turboprop power. Two prototypes and 6 production aircraft were produced before recurrent problems with the engines, propellers, and gearboxes halted the program in the Spring of 1955.

Wingspan: 50 feet

Weight (max): 24,780 lbs.

First flight: May 26, 1950

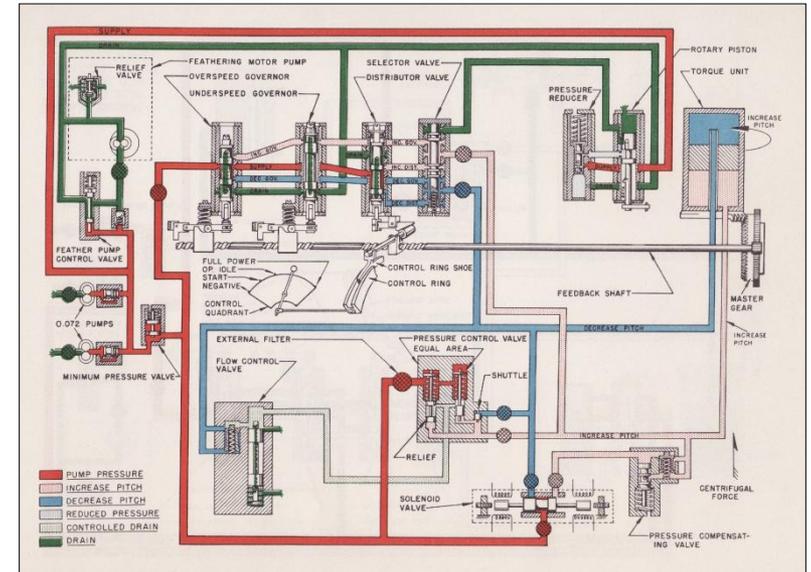
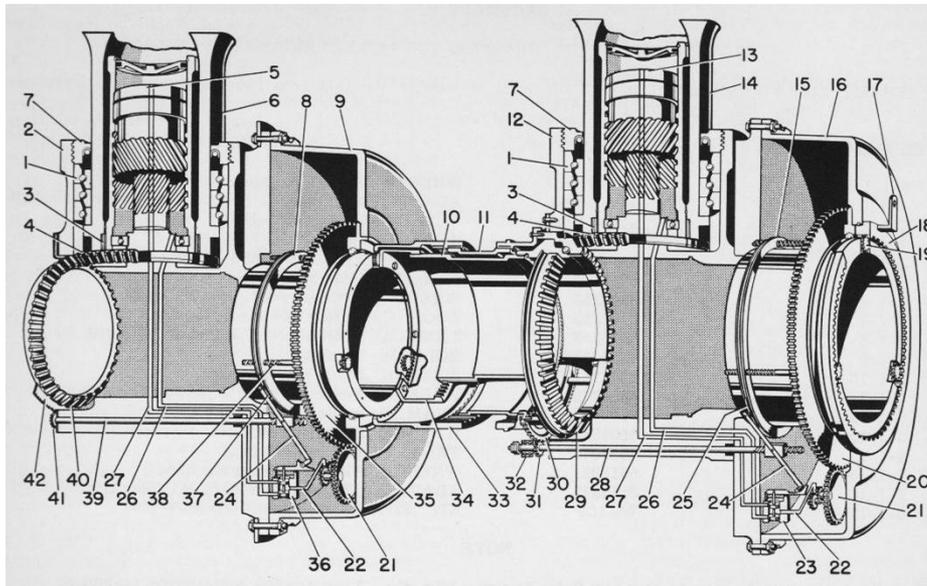
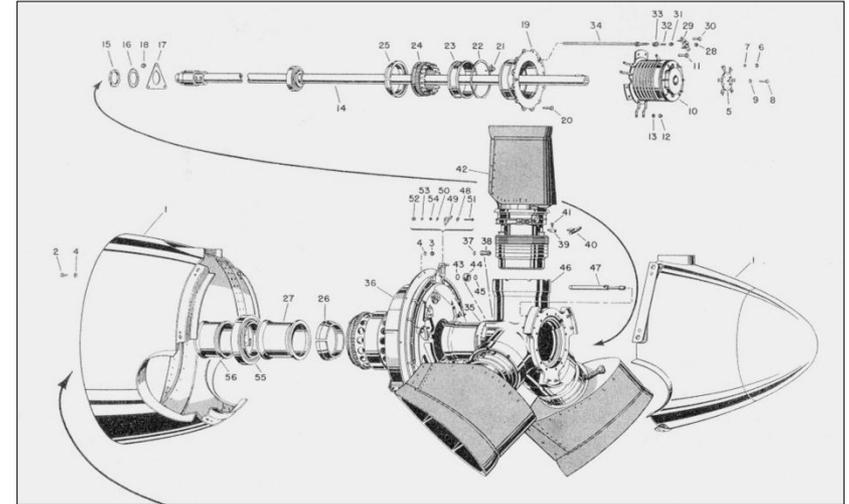
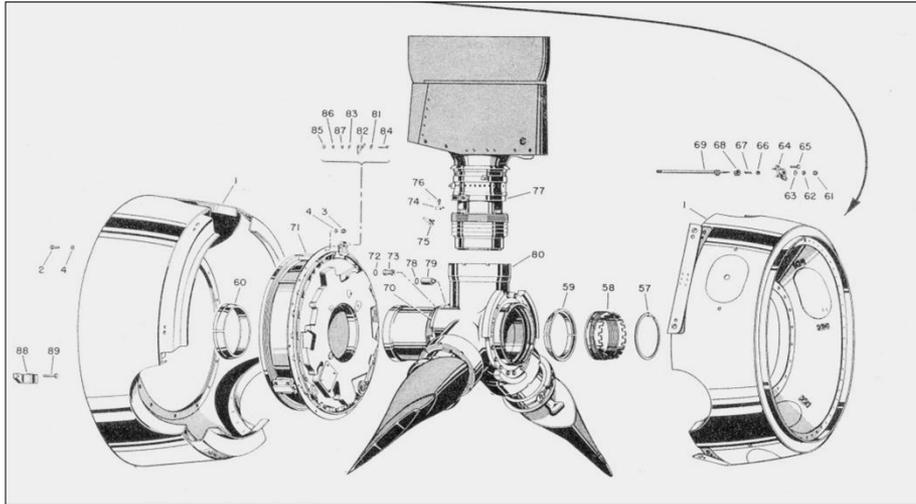
Engine: Allison XT-40-A, 5,100 SHP + 860 lbs. jet thrust

Props: Aero products AD8664 FN-47, 14 foot diameter, 1,516 lbs. installed weight.



Aeroproducts AD8664FN Dual Rotation Turbopropeller

Electro-mechanical-hydraulic control, constant speed (+/- 7 rpm), feathering, reversing, de-icing, negative torque control



North American XA2J-1 Super Savage

1952

The XA2J-1 was an effort to produce a carrier based heavy attack / nuclear bomber with increased range and payload over the piston powered AJ1 by using Allison T40 turboprop engines. Delays, mechanical problems with the propulsion system, and the advancing jet age doomed the aircraft to an early retirement after 5 flights.

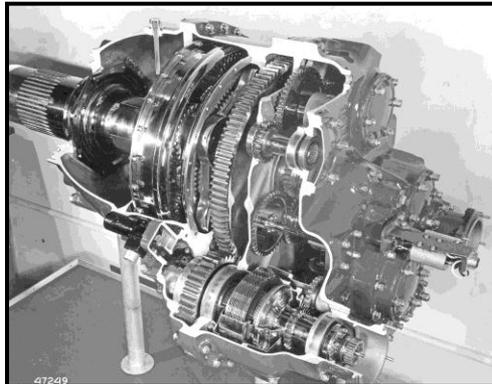
Wingspan: 71 feet, 6 inches

Weight (max): 61,200 lbs.

First flight: January 4, 1952

Engines: Dual Allison T40-A-6; 5,332 SHP + 1,296 lbs. jet thrust each

Propellers: Aeroproducts AD-8664FN-B1, 15 foot diameter, 1,446 lbs. dry, electric deicing



Gearbox:
15.7 to 1
reduction
ratio

