

AIRCRAFT CIRCULARS

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

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No. 55

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"TRAVEL AIR" COMMERCIAL AIRPLANE -- TYPE 5000

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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

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"TRAVEL AIR" COMMERCIAL AIRPLANE - TYPE 5000.\*

This airplane is a semicantilever monoplane, closed cabin type, with pilot about in line with the leading edge of the wing and with the four passengers immediately behind him. This type was developed to meet the growing demand for an efficient and high-speed airplane for combination mail and passenger carrying with both day and night flying and to give constant service through inclement weather.

Visibility

As can be seen from the figures, good visibility for the pilot has been very successfully obtained. In his elevated position, the line of sight over the engine strikes the ground at about 75 feet ahead of the airplane when at rest. In flight, forward and sideward vision is excellent while downward sight is through the door windows (from which the wheels are visible) and through the sloping windows at the side of the rudder pedals. The cupola over the pilot's head is a V-shaped metal frame rigidly attached to a point just back of the pilot's head, and a removable pyrolin streamline from thence rearward. The V holds two sliding glass windows which, when opened, afford

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\*Prepared by Travel Air Manufacturing Company.

unobstructed vision forward with little or no air inflow. This is especially desirable for fog, rain, or snow flying when a stationary windshield would cloud vision.

The rear of the cupola is so shaped that the air flow tends to suck it off at all times. A single pin and ring holds this part to the V and when the ring is pulled, the resulting opening is ample for quick egress by the pilot if a jump is necessary.

The height and position of the cupola is such that a large range of vision directly to the rear and below the horizontal is obtained. This has been found very desirable for night flying where beacons are used as a sight on the line of beacons to the rear aids navigation. Also opportunity is afforded to see an airplane approaching from the rear - a feature which is not present in most cabin-type airplanes when the pilot is low.

### Propeller

Standard steel propellers have been used and the adjustable pitch feature is desirable where varying loads, climbs and speeds are required for various sections of an express or mail route.

### Power Plant

The Wright Whirlwind engine is mounted on a steel tube ring and the supporting frame or mount is held to the longeron terminals by four bolts. Mounted on this is the oil tank and a

section of the instrument panel carrying the engine gauges, tachometer, primer and engine controls. This section remains with the mount when the engine is removed (see Fig. 2). It is only necessary to remove four bolts, unscrew the gasoline line connection and unclamp the heater tube, to swing off the power unit completely. Over a series of tests by average mechanics, it was found that a complete engine-propeller unit could be changed in fifteen minutes. The present operations of these airplanes keep assembled power units ready at their main and intermediate fields, and it is found that the changing of engines is as quickly done as the shifting of passengers or cargo from one airplane to another. Obviously, the number of airplanes required and the attendant investment is enormously diminished.

The power unit, when removed, completely exposes the rear of the engine, which can be worked on without further disassembly.

#### Pilot's Cockpit

The pilot's cockpit is roomy and comfortable; stick and rudder pedal control is employed and, as mentioned above, the throttle and mixture control levers extend from the removable part of the instrument board. The instruments, in addition to those mentioned, are an altimeter, air-speed meter, bank and turn indicator, magnetic compass, clock and light switches.

The pilot's seat is cushioned and upholstered and adjustable both in height and angle of inclination. Brake-control

pedals swing just above the rudder's pedals and are engaged by raising the feet, yet still maintaining rudder control. Each brake can be separately operated, a feature much needed for taxiing.

At the left of the pilot's seat, two levers with spring-catch stops are mounted. Separate cables run from there through the nose of the wing out to the landing light supporting brackets. The frames supporting the lights are hinged at their rear edge and a bracket and shock cord holds the front edge up against the bottom of the wing. Pulling down the control levers in the cockpit swings the lights down to the desired angle where they are rigidly held. (See Fig. 3, showing one light down.)

#### Passenger Cabin

A metal partition with a sliding window separates the passengers and pilot. Wicker chairs are used and are held rigidly to the floor by slide catches. Plywood forms the sides of the cabin from the floor to the window sill, and sound-proofing velour completes the upholstery. The door and window positions are shown.

The rear wall of the cabin has a small door at the bottom allowing removal of the storage battery which is carried just off of the cabin. A suction waste tube is also incorporated in the rear of the cabin for the convenience of passengers adversely affected by air travel.

### Landing Gear

Wire wheels with laced-in brake drums and metal streamliners are used. The split axle type landing gear is of heat-treated steel tubing throughout. The compression leg is of the trombone type with rubber shock cords in tension. A rubber disc absorbs the rebound shocks.

### Struts

The flying struts, which are of hollow steel tubing, are enclosed in metal streamliners, the whole being covered with fabric. The rear strut is adjustable for rigging.

### Wings

Wooden box spars and wooden ribs are used. These are conventional and need no description. Double drag bracing is employed from root to tip. The fuel tanks are located at the wing roots and held between the spars by metal straps and stiffening beams. The bottom and top of this compartment is plywood rigidly attached to the spars and ribs and takes the drag loads through this section. A metal leading edge runs around the nose from top to bottom of spar. Overhanging balanced ailerons are employed.

### Fuselage

The fuselage is of welded steel tubing throughout with diagonal brace tubes from the engine mount to the rear of the cabin

and wire bracing from there to the tail

### Empennage

Rudder and fin need no description. Adjustment of the stabilizer is obtained through a screw attachment at the rear spar of the stabilizer. A torque tube mounted to the operating gear runs directly to the pilot's cockpit.

Rubber shock cords are attached to the upper end of the tail skid, which is of the beam type.

### General

Besides the landing lights, a complete set of navigation lights are built into the wing tips and the trailing edge of the rudder.

The exhaust ring is the type developed by Travel Air and is very successful in its dual purpose of discharging the exhaust gases under the fuselage and also muffling the noise.

### Characteristics

This airplane has exceptional stability in flight both with power on and off. It has been flown for very long distances without touching the controls and yet handles well.

Following are the dimensions of the airplane and the performance as obtained by flight tests:

T R A V E L   A I R  
SPECIFICATIONS, CABIN TYPE MONOPLANE 5000

Capacity - Pilot and four passengers and 50 pounds of baggage, or pilot and 750 pounds of mail, express, etc.

Performance with Normal Full Load:

High speed at sea level . . . . .	123 M.P.H.
Cruising speed at sea level at 1650 R.P.M. . . . .	108 "
High speed at 10,000 feet . . . . .	111 "
Rate of climb at sea level . . . . .	750 ft./min.
Rate of climb at 10,000 feet . . . . .	270 "
Service ceiling (climb of 100 ft./min.) . . . . .	13,600 ft.
Absolute ceiling . . . . .	15,600 "
Landing speed . . . . .	55 M.P.H.
Normal cruising range (with 75 gal. fuel) . . . . .	675-725 miles.

Dimensions:

Over-all span (tip to tip) . . . . .	51 ft. 7 in.
Over-all height . . . . .	8 " 9 "
Over-all length . . . . .	30 " 5 "
Wing chord . . . . .	6 " 9 "
Wing area . . . . .	312 sq.ft.
Wing section . . . . .	M-6
Wing loading . . . . .	11.5 lb./sq.ft.
Power loading . . . . .	15.65 lb./HP.

Power Plant:

Wright Whirlwind J-5-C, 230 HP. at 1900 R.P.M.

Fuel consumption at cruising speed  
(1650 R.P.M.) . . . . . 12 gal. per hr.

Standard steel propeller

Weights:

Gross weight, fully loaded . . . . . 3600 lb.

Weight empty, fully equipped . . . . . 2160 "

Pay load . . . . . 750 "

Useful load (pilot, passengers - or express -  
fuel and oil) . . . . . 1440 "

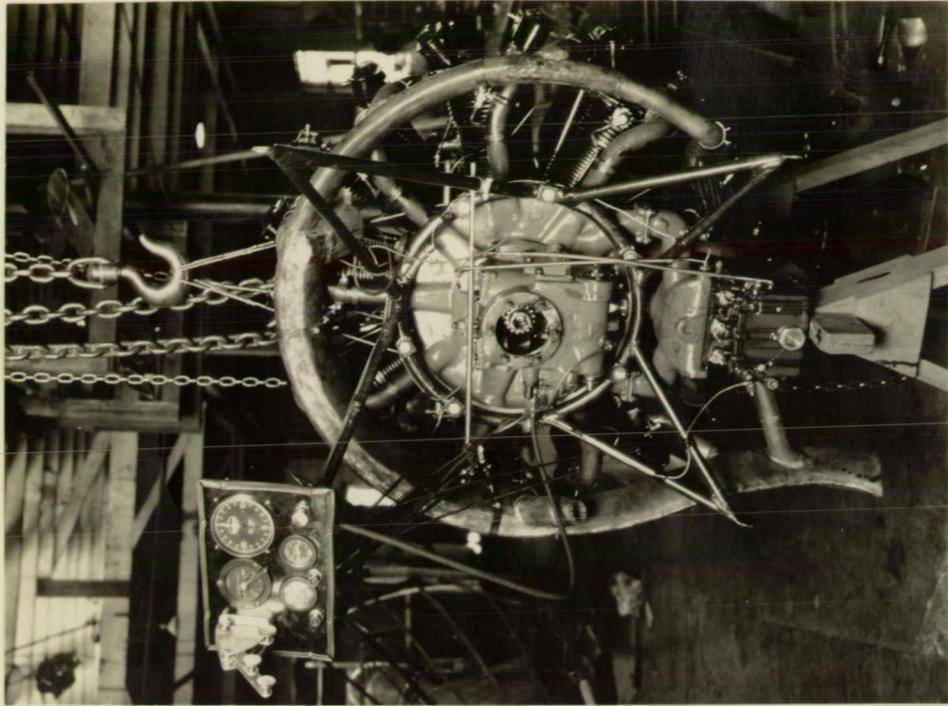


FIG. 3



FIG. 1



FIG. 2

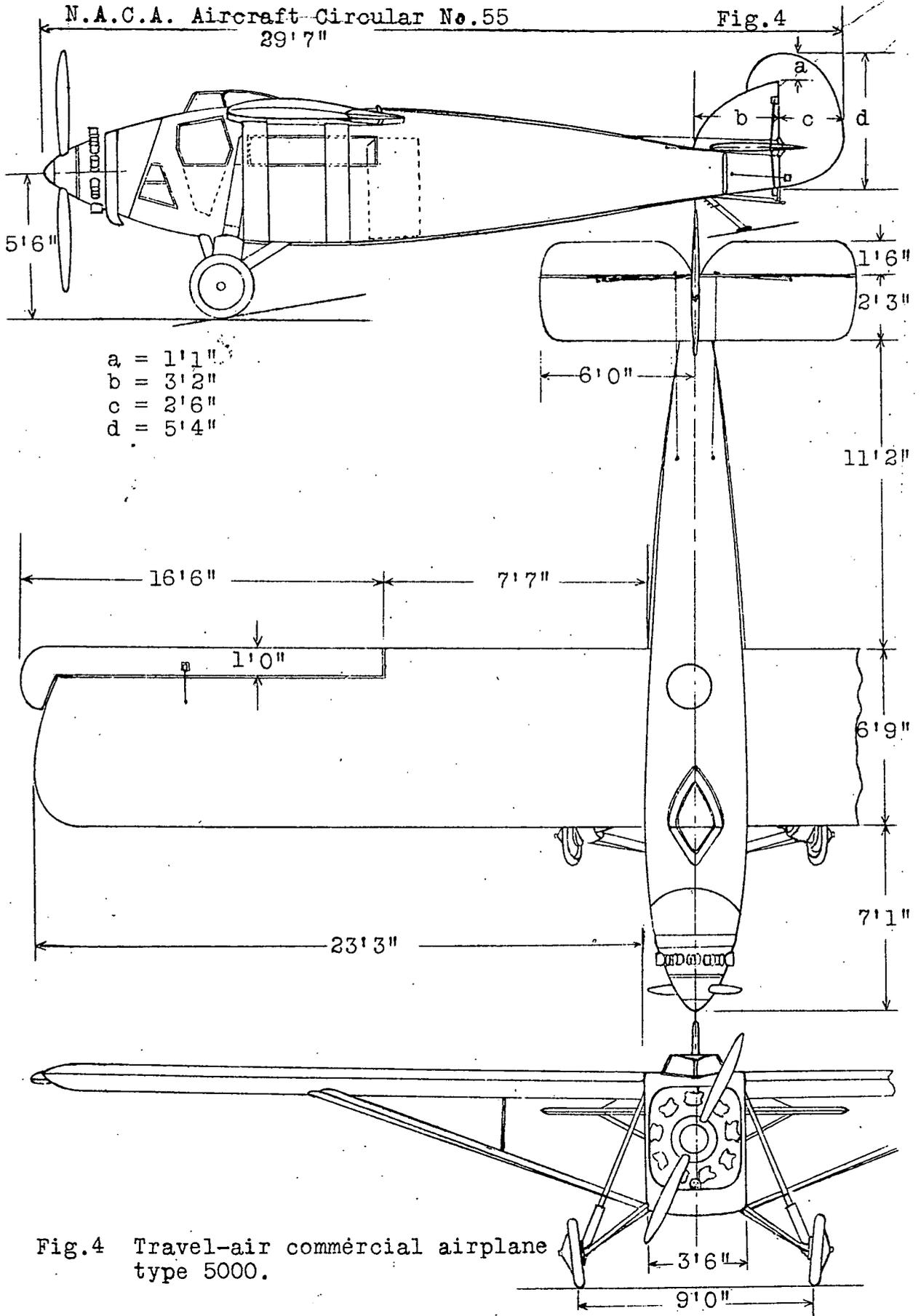


Fig. 4 Travel-air commercial airplane type 5000.