

Aviation service and maintenance

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The Travel-Air 2,000, 3,000 and 4,000

By James G. Thompson

MANY Travel-Air models have been built during the long history of this airplane. The models considered herein are the 2000, 3000 and 4000. All are three-place open land biplanes, powered with a variety of engines; ranging from OX-5's in the early 2000 ships to Wright J-6-300 in the late 4000.

Those interested in the general characteristics of these airplanes are referred to *Western Flying's* Annual Aircraft Directories. The following information applies with equal emphasis to all three models unless otherwise specified.

Rigging

Actual rigging specifications vary with different models and are given in the rigging chart, elsewhere in this article. The center section stagger is fixed by adjusting its diagonal brace struts to the pin center distances given in the rigging chart. After installing the center section and landing gear the fuselage is brought into flying position, with the top longerons level both fore-and-aft and across. Both right and left side wings are rigged at the same time.

Bolt the interplane struts to the upper wings, raise them into place and bolt them to the center section, inserting the wing bolts from the top. Raise the lower wing into position, being careful to avoid tearing the wing fabric when guiding the struts into position.

Connect the landing and flying wires and tighten up the landing wires first, until the proper dihedral is obtained. The dihedral may be checked by stretching a taut cord or wire along the top of the upper wings, from tip to tip, and measuring the dihedral at the center section. When properly adjusted, the landing wires should be exactly the same length from pin center to pin

center, and wings should have equal dihedral.

Take up slack in the flying wires and check wings for sweepback. This can be done by sighting along the leading edge of the upper wing. If sweepback is noticeable, it should be removed by tightening the front flying wires and loosening the rear landing wire equally until wings are straight. Measure the distance from the lower pin center of the rear interplane strut to the center of the front fin fitting. This distance should be equal, on both sides to insure wings being square with fuselage after removing sweepback.

Incidence is fixed by the position of the wing fittings, but care must be used to avoid warping or distorting the wings while rigging. Check by sighting along the wings, from front and rear of plane. Wash-out the right wing about one turn of its diagonal interplane strut adjustment to compensate for engine torque. Take all slack out of the flying wires, but do not put them in tension.

Stagger can be checked by dropping a plumb line from the leading edge of the upper wing and measuring horizontally between plumb line and lower wing leading edge.

Make certain that the streamline tie rods (often referred to as "wires") are screwed into their forks the same number of turns on each end. After the rods are taken up to the desired tension the threaded ends must be screwed in far enough to close the small inspection holes in the end forks. Check this by attempting to insert a length of wire through the inspection holes. Do not tighten the tie rod lock nuts to excess.

Whenever it is necessary to dismantling the ship, the tie rods should all be slacked off exactly the same number of turns and locked there. This makes re-assembly and re-rigging much simpler.

The fin is off-set $\frac{5}{8}$ inch from left side of its adjustable front fitting for torque compensation. Lock securely in place after adjusting. The stabilizer brace wires are adjusted to align the fin with the tail post; and the wire pin center distances on both sides should be equal after alignment.

All bolts and pins used in the assembly are nickle steel, and are identified as such by an X stamped in the head. Do not use other bolts and nuts under any conditions.

The aileron hinge pins should be kept well lubricated and checked frequently for excess wear.

Landing gear

When the landing gear shock cord becomes badly oil soaked, it is liable to fail without warning and should be replaced. When replacing shock cord, slip one loop end over lower tube of shock cord rack and wind around upper and lower tubes of rack, stretching the shock cord to give seven turns around each of the four sections of the rack. Slip end loop over upper rack tube and equalize the tension in each section of the shock cord. Secure the cord from slipping off by bolting the figure eight anchor plates into place.

The axle slides in the landing gear are provided with Alemite connections and should be kept well lubricated. Oil the axle hinge bearings daily with engine oil, being careful to avoid oil on the shock cord.

Keep the tail skid bearing well lubricated, and shock cord in good condition. Excessive wear must not be permitted in the skid hinge bearing. The tail skid is easily damaged in a hard landing, and the skid and fuselage members adjacent to the skid should be carefully checked after a hard landing.

Ordinary adjustment for brake wear can be made with the turn-buckle in the brake cable. Keep

all slack out of the brake cables.

Service

Certain parts of the airplane are heat treated and cannot be used safely after welding, without re-heat treating. These parts are the control stick assembly, tail skid, and axles.

Keep all bearings and parts where friction occurs well lubricated. Use grease where pressure type lubrication fittings are provided, and use engine oil in other joints. Keep the leather cable guards well lubricated with vaseline. Wash all bearing surfaces thoroughly with gasoline and check for wear at intervals of about 100 hours.

Lubricate the wheel bearings of ships equipped with wire wheels with grease. Bendix wheels are fitted with graphite-bronze axle bushings, and must not be greased.

During periodic inspection give particular attention to the following items:

1. Inspect aileron hinge pins for excess wear. Check balance of con-

trol hinges, as well.

2. Inspect shock cord on landing gear and tail skid for fraying, oil soaked, etc. Replace if cord shows evidence of disintegrating.

3. Check tail skid assembly for excess wear in tail skid bearing, and for distortion, or cracking of skid, or adjacent fuselage members.

Propeller

When steel propellers are used the following pitch settings are recommended:

B-9-4000 Wright R-975-A 14 deg.
B-4000 Wright J-5 15½ deg.
W-4000 Warner Scarab. 14 deg.
3000 Hispano 150 h.p. 14½ deg.
2000 Curtiss OX-5
and OXX-6 ... 13½ deg.

The pitch can be accurately adjusted by the pitch graduations on the hub and blade shanks, when the propeller is new. After the propeller has been serviced, and the blades dressed down, the blade centerlines have been slightly altered, and the pitch graduations are no longer ac-

curate. The propeller must then be taken to an approved repair station when it is necessary to alter the pitch setting, where equipment is available for pitch adjustment without reference to the blade markings.

When mounting steel propellers make certain that the propeller splines are clean and coated with a thin film of oil to prevent rust.

Lap non-splined propeller hubs to the engine shaft to insure proper fit. Remove key from the crankshaft and using valve grinding compound, lap hub on the shaft until all low spots are gone. Check with bearing blue. Clean the grinding compound thoroughly from hub and shaft, and coat both with a film of oil. Avoid unnecessary lapping of propeller hub. Many engines have little excess metal in the propeller hub, and excess lapping will result in bottoming of the hub nut, or fouling the prop hub against the thrust bearing cover. Make certain that the hub nut of wooden propeller hubs actually clamps against the hub proper, and not against its flange nut.

MEMBERS AIRCRAFT

Travel Air 4000:
This model 4000 is owned and was restored by Travel Air Club member Harry V. Somers, 5722 Red River Drive, San Diego, California 92120.



Canadian Travel Airs
Continued

Travel Air BM-4000, CF-AKU, first owner Continental Aero Corp.

Travel Air, BM-4000, CF-AKV, first owner Continental Aero Corp.

Travel Air, E-4000, CF-AME, first owner Continental Aero Corp.

Travel Air B-4000, CF-AMF, first owner Continental Aero Corp.

Travel Air 6-B, CF-BPV, Airtech assembled was NC-14974. Purchased in 1939 by the British Yukon Navigation Co. Ltd. Lost at Fox Lake Yukon Territory in a forced landing on July 3, 1941.

Travel Air 6000 CF-AIB, owned by J. H. Maher and flown by R. M. Stirling. Was part of the 1931 Trans-

Canada Air Pageant starting on July 1 at the Hamilton Ontario Airport. During a fast low level pass fabric came off one wing and the crash that followed killed five. From the Canadian Travel Air registrations gleaned it would appear that most Travel Airs were imported by the Continental Aero Corporation as Travel Air distributors.

While this listing is not offered as the total number of Canadian Travel Airs it indicates this make of aircraft was in the minority. Canadian aviation history is loaded with Fairchilds, Fleets, Fokkers, Junkers and Bellancas among others. We welcome news of surviving Travel Airs in Canada and also photos of any Travel Airs in Canadian registration.

