



THE "BRISTOL" THREE-SEATER: Details of the tail skid and its mounting. On the right may be seen one of the horizontal "T" cranks of the tail-trimming gear. Inset shows the renewable shoe of the tail skid.

reduce the bending moment, owing to the compression in the top spar acting below the pin, and thus creating an opposite bending moment to that resulting from the loading of the spar as a beam. On the other hand, the compression has to be taken by the pins in shear, as the spar roots do not touch the ends of the centre-section spars. As, however, the pins are of fairly large diameter they are probably easily capable of withstanding the shear loads.

The Wing Bracing

The biplane wing structure is braced with Rafwire in duplicate, and the bracing is somewhat unusual in that there is but one set of duplicate anti-lift wires on each side. As the stagger is very considerable, the rear spar of the upper wing is vertically above the front spar of the lower wing, and it is in this plane that the anti-lift wires are running, from the rear spar of the top centre-section to the attachment of the front inter-plane strut to the lower wing. Thus there is no anti-lift wire running to the point where the rear inter-plane strut meets the lower rear spar.

The struts, inter-plane as well as centre-section, are streamline steel tubes, welded together to form a letter N. Each set of struts thus forms a unit, and there is consequently no incidence bracing requiring adjustment. The struts are attached to the spar fittings by longitudinal bolts.

The Tail

In shape the various tail surfaces are of usual type, the tail plane and elevators being built of steel tubes. As the weight of the passengers carried may vary considerably, the tail plane is of the trimming type, the details of which will be referred to later. The vertical fin is approximately a quadrant, to which the lobe-shaped rudder is hinged. It is of interest to note that all control cables to the tail run either through the fuselage, under the passengers' cockpit, or along the outside on the starboard side, so as to avoid getting in the way of the passengers' door. The elevator tube runs right across, and there is only one pair of cranks, placed on the starboard side.

The Controls

Reference has already been made to the somewhat unusual arrangement of the aileron controls. The departure from usual practice is chiefly one of using crank levers in place of pulleys. Thus from the control stick in the pilot's cockpit cables run to cranks in the lower wing. These cranks are housed in the leading edge, and as a matter of fact both the direct cable on the lower plane and the return cable on the top plane run along the outside of the leading edge, where they can be inspected along their whole length, while, owing to the fact that they lie close to the leading edge, they offer no extra resistance. On the same spindle, but just below the bottom plane, is another crank, at right angles to the one housed in the wing, and pointing outward. From the latter crank a cable runs to the aileron crank, which is simply a piece of sheet steel, 10 gauge or so. A wire runs from the trailing edge of the lower aileron to the trailing edge of the top aileron, while from the crank of the latter (which is, of course, placed above the aileron) a cable runs to a transverse crank secured to the same spindle as the longitudinal crank in the leading edge. From the latter crank the return cable runs straight across to the crank on the opposite side, following the leading edge.

The control column itself is a tube, terminating at the top in a handle shaped somewhat like an inverted V, not unlike those used on a number of German machines during the War. The control tube is hinged to a rocking shaft running across the floor of the fuselage. Thus the "stick" can be swung from side to side for aileron control (and owing to the width of the fuselage the amount of movement available is considerable), while a to-and-fro movement rocks the transverse shaft. The latter carries on one end, and mounted on the starboard side of the fuselage, a crank, from which a cable runs to the elevator. Concentric with and mounted on the same transverse tube as the elevator control crank is the crank for the tail trimming gear. This crank is operated by a lever on the right-hand side inside the pilot's cockpit. This lever works on a notched quadrant, and as there are six notches six tail plane positions are available. As the range of the tail plane setting is about 5 degrees, each notch corresponds approximately to one degree change in the incidence of the tail plane.

At the stern the tail trimming control cables are attached to horizontal T-cranks, the single limb of which is attached to a short tubular strut running to the trailing edge tube of the tail plane. Thus when the T-cranks are rocked the trailing edge of the tail plane is raised or lowered. This arrangement is not, perhaps, quite so refined an engineering job as is the usual worm gear, but it is more rapid in action, and for a small machine with a relatively low-power engine it is probably



THE "BRISTOL" THREE-SEATER: Three-quarter rear view.