INSTRUCTIONS

How to build Model Aeroplanes with Meccano Aeroplane Constructor Outfit No. O

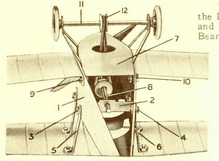


Fig. A

To build up a model, first take the Fuselage Section 1 (see Fig. A) and secure the Propeller Shaft Bearing 2 in place by means of Bolts 3 and 4 fitted with Nuts. The model shown is a biplane, and the Bolts 3 and 4 also hold the rear pair of Short Wing Struts 5 and 6 in position. Before going further, the front pair of Bolts holding the lower Wing in position must be secured in place by means of Nuts. Next place the Rubber Band around the groove in the pulley on the Propeller Shaft 8 and screw a nut on to the screwed end of the Shaft. Pass the screwed end of the Propeller Shaft through the hole in the bent-up portion of the Undercarriage 7 and thread a second Nut on to the end of the Shaft 8. Lower the Undercarriage 7 into position, and at the same time slip the plain end of the Propeller Shaft 8 through the hole in the Propeller Shaft Bearing 2.

Now secure the Undercarriage rigidly in position by screwing the Bolts 9 and 10 into the threaded holes in the Undercarriage. Two Bolts are also passed through the Fuselage near the nose and screwed into threaded holes in the Undercarriage.

Pass one end of the Wheel Axle 11 through one of the Vee struts of the Undercarriage 7. Draw the Rubber Band through the circular opening in the Undercarriage 7, and pass the Band over the Axle 11 and round the pulley 12 that is fixed to the Axle. Be sure to arrange the Band so that the Propeller Shaft rotates in a clockwise direction when the model is pushed forward along the ground. Next push the end of the Axle 11 through the remaining Vee strut and screw a Nut on to each end of the Axle. Finally screw the Landing Wheels into position against the Nuts and lock them together by turning each Wheel and Nut in opposite directions by means of a Spanner and the fingers.

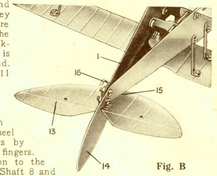


Fig. B

The Propeller is screwed on to the projecting end of the Propeller Shaft 8 and is locked in position by turning the Nut placed behind it in an anti-clockwise direction by means of the Spanner, while the Propeller itself is rotated in a clockwise direction by the fingers.

To assemble the Tail Unit (see Fig. B) push the Tail Plane into the slot in the Rudder. Place the projecting end of the Rudder into the centre slot in the top of the Fuselage 1, and gently prise the edges 15 of the Tail Plane into the slots at each side of the Fuselage. Next push the Tail Skid 16 in between the sides of the Fuselage and the lug of the Rudder, and secure by means of two Bolts and two Nuts. A short length of Cord is then passed through the holes in the Tail Plane and Rudder to brace the complete unit. The Cord is knotted at each end to keep it in place.

MECCANO

AEROPLANE CONSTRUCTOR OUTFITS

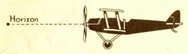
The aeroplane is rapidly taking its place as a regular means of high speed transport, and the time is not far distant when we shall use it as readily as to-day we employ the train, the steamship, and the motor car. Now is the time for every boy to learn how aeroplanes are designed and constructed, and to recognise at a glance the different types. The best way of doing this is to build aeroplanes for himself, and the Meccano Aeroplane Constructor Outfits have been designed specially for this purpose. This folder shows how to construct six different types of aeroplanes, but other fine models may be built by varying the positions of the parts.

How an Aeroplane Flies

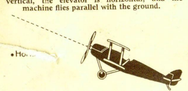
The fun of building with Meccano Aeroplane Constructor Outfits is greatly increased if you know something of the way in which a real aeroplane is controlled in flight. What strikes anyone examining an aeroplane for the first time is the simplicity of the manœuvring mechanism, everything being done by two levers. The first of these, the control column or "joy-stick," is not unlike the gear lever of a motor car, and is connected to two controls, the ailerons and the elevators. The ailerons are small movable flaps arranged along the trailing or rear edge of the wings, and the elevators form one of the two main parts of the tail unit. The other lever, the rudder bar, is near the floor of the cockpit and operated by the feet. This bar controls the rudder, which is the second main portion of the tail unit.

Joy-Stick and Rudder

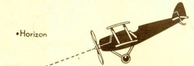
The joy-stick is the most fascinating factor in the control of an aeroplane. If you wish to fly level, you keep the stick in a central and vertical position. If you move it forward, the elevators are depressed and the machine promptly puts down its nose and tries to dive. If you pull the stick backward, the elevators are raised and the nose of the machine rises. Movement of the stick to left or right brings the ailerons into action. If you move it to the left, the left wings will go down; if you move it to the right, the right wings will drop. This raising and lowering of the wings is termed "banking."



When the control column or "joy-stick" is vertical, the elevator is horizontal, and the machine flies parallel with the ground.



When the stick is pulled back, the elevator is raised and the machine climbs.



Pushing the stick forward causes the machine to put down its nose and dive.

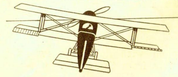
If you find that the aeroplane is veering to the left, you put on right rudder by moving the right foot gently forward; and similarly veering to the right is corrected by applying left rudder. If you wish to turn the aeroplane round, however, you must not attempt to do it by rudder alone, because in that case the machine would skid in a similar manner to a motor car racing round a bend on an unbanked road. You cannot bank the air, so you bank the aeroplane. That is to say, you apply rudder and bank together in the direction in which you wish to turn.

When a pilot has entered the cockpit of his machine, and ascertained that his engine is running well, the chocks are removed from under the wheels, and the machine is taxied into the wind. It is kept pointing in the correct direction by means of the rudder, and the pilot prevents the tail from rising and the machine going on to its nose by keeping the joy-stick a little back from the neutral position. As the speed increases, the stick is slowly moved to the point at which all controls are neutral, and when the correct speed has been attained the machine almost imperceptibly becomes air borne. In alighting, these operations are reversed, the machine gliding to land with the engine cut out.

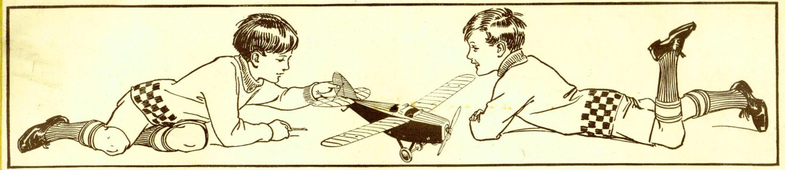
The aeroplanes used for training purposes have two cockpits, one in front of the other, the controls in each being exactly the same, and connected together. This arrangement enables the instructor, who sits in the front cockpit, to see exactly what manipulations are being made by the pupil behind, and to correct them accordingly. Communication between instructor and pupil is maintained by means of ear tubes attached to the helmets.

When the joy-stick is vertical the machine flies on an even keel, the wings being parallel with the horizon.

When the stick is moved over to the left, the ailerons on that side are raised and the wings drop, producing left bank.



A right bank is brought about by moving the stick to the right.



MECCANO

AEROPLANE CONSTRUCTOR

INSTRUCTIONS

FOR OUTFIT

No. O

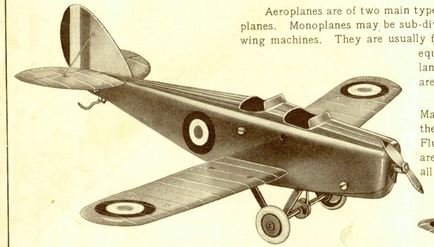
Price 2d.

No. 32-O AC

1/632/40

All these Splendid Models can be built with Meccano Aeroplane Constructor Outfit No. 0

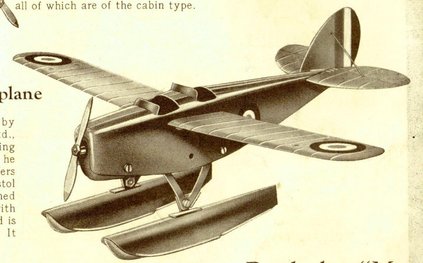
Model No. 0.1 Low Wing Monoplane



Aeroplanes are of two main types, monoplanes having only one plane, and biplanes having two planes. Monoplanes may be sub-divided into two types known respectively as low wing and high wing machines. They are usually faster than biplanes of similar weight equipped with engines of equal power, and a better view is obtained from them. The landing speed of monoplanes is higher, however, and biplanes are more stable in the air.

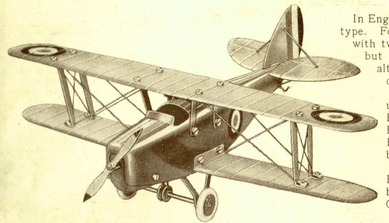
Meccano Model No. 0.1 is a monoplane of the low wing type. Machines of this type are often regarded as the best for speed and they are specialised in by many German firms, such as the Junkers Flugzeugwerke A.-G. Examples of British low wing monoplanes are the Blackburn "Segrave," the Hendy 302 and the Monospar, all of which are of the cabin type.

Model No. 0.2 High Wing Monoplane Seaplane



The distinction of building the world's largest seaplane is held by the famous British firm of Short Brothers (Rochester & Bedford) Ltd., the constructors of the Short "Valetta," which is of the high wing monoplane type. Sir Alan Cobham used this Short seaplane when he made his last famous survey flight in Africa. The "Valetta" differs somewhat from Model No. 0.2, being equipped with three Bristol "Jupiter" engines, whereas the Meccano model is of the single-engined type. The D.H. "Puss Moth" seaplane, however, is only fitted with one engine. This machine has a maximum speed of 122 m.p.h. and is capable of cruising at speeds varying between 95 and 105 m.p.h. It can climb to an absolute ceiling of 16,000 ft.

Model No. 0.3 Light Biplane

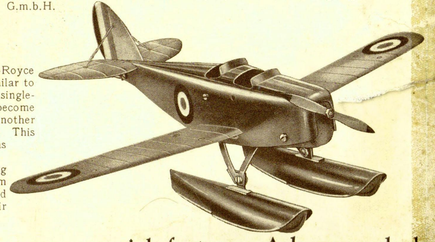


In England, biplanes are still more numerous than aeroplanes of the monoplane type. For many purposes it is almost essential that a machine should be fitted with two planes. A Service aeroplane, for instance, must not only be fast, but must also be capable of carrying a good load at both high and low altitudes. The great wing area of a biplane, although it involves a slight decrease in speed, gives the machine a greater carrying capacity.

Model No. 0.3 is a biplane of the light type. These machines are used mostly for civilian work, although they are also employed in the R.A.F. It was on light aeroplanes that the wonderful flights from England to Australia were made by Mr. Bert Hinkler, Air Commodore Kingsford Smith and Mr. C. W. A. Scott, and in the reverse direction by Mr. J. A. Mollison.

One of the most widely known light aircraft is the British de Havilland "Gipsy Moth," while a number of single and two-seater biplanes are constructed in Germany by the Albatros-Flugzeugwerke G.m.b.H.

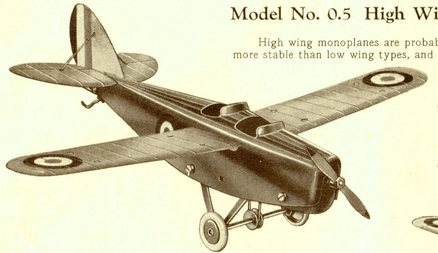
Model No. 0.4 Racing Seaplane



Of all the world's aircraft, the Vickers-Supermarine Rolls-Royce S.6B is probably the most widely known. This aeroplane is similar to Model No. 0.4 except that the Supermarine machine is only a single-seater. In recent years the low wing monoplane seaplane has become the accepted type where very high speeds are required, and another particularly interesting machine is the Italian Macchi M-67. This machine, which is fitted with a Isotta-Fraschini engine, was produced for the Schneider Trophy Contest in 1929.

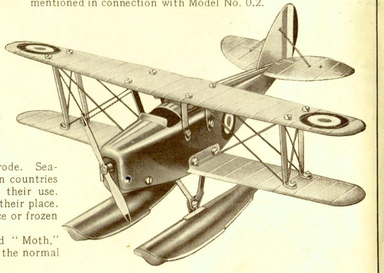
In addition to purely racing machines, many light low wing monoplanes such as the Junkers "Junior" made by the firm mentioned in connection with Model No. 0.1, may be obtained equipped with floats by owners who desire to operate their machines from the water.

Model No. 0.5 High Wing Monoplane



High wing monoplanes are probably the most popular monoplane aircraft. They are usually more stable than low wing types, and the view downward from them is much better, being practically unobstructed. Aeroplanes of this type, similar to Model No. 0.5, are used in all parts of the world and they range from small single-seater machines to huge aircraft seating as many as 30 people. One of the smallest aeroplanes in the world, the Comper "Swift" single-seater, is a high wing monoplane, while other particularly famous ones are made by the French Bordelaise firm and the German Focke-Wulf Flugzeugbau A.-G. Another British example is the de Havilland "Puss Moth," the seaplane version of which was mentioned in connection with Model No. 0.2.

Model No. 0.6 Light Seaplane



Most light aircraft may be obtained either as landplanes or fitted with floats for operation from water. The fitting of floats to a light aeroplane appreciably reduces the maximum speed and makes the machine more difficult to fly. The floats are usually made of duralumin, an aluminium alloy that is exceedingly light and does not readily corrode. Seaplanes are not frequently seen in Europe, but they are very popular in countries such as Canada, where there are numberless waterways suitable for their use. In the winter the seaplanes have their floats removed and skis fitted in their place. The aeroplane is then able to take off from, or alight on, stretches of ice or frozen snow with perfect safety.

Model No. 0.6 shows a light aeroplane such as a de Havilland "Moth," Blackburn "Bluebird" or Avro "Avian," fitted with floats in place of the normal land undercarriage.

Read the "Meccano Magazine." The "Air News" pages are a special feature. Ask your dealer for full particulars