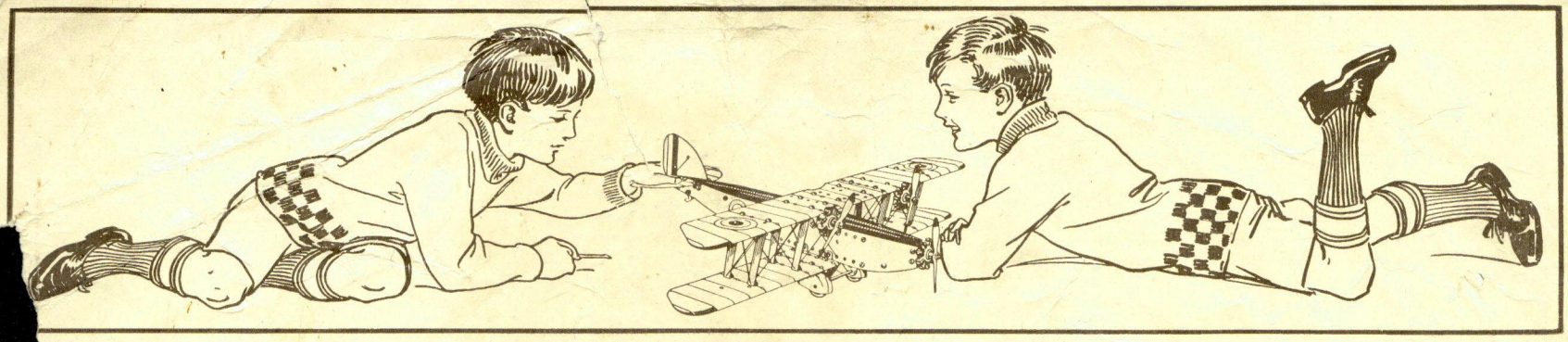


MECCANO

AEROPLANE CONSTRUCTOR

INSTRUCTIONS

FOR OUTFIT

No. 2

Price 6d.

No. 39-2AC

13/339/2.75 (IP)

MECCANO

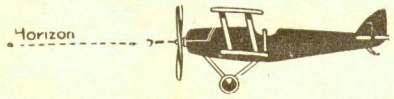
AEROPLANE CONSTRUCTOR

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 today we employ the train, the steamship, and the motor car. In future we shall cross the oceans in giant flying boats that will traverse well-marked routes. Overland routes will be even more numerous than those across the seas, and these will be thronged with aeroplanes carrying both passengers and goods.

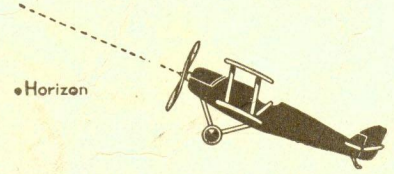
Now is the time for every boy to learn how aeroplanes are designed and constructed, and to recognise at a glance the different types. The best way of doing this is for a boy to build aeroplanes for himself, and the Meccano Aeroplane Constructor Outfits have been designed specially for this purpose. This Manual shows how to construct twenty different machines, but a large number of other splendid models may be built by varying the positions of the parts. These parts are all interchangeable on the Meccano principle and can be used in conjunction with the standard Meccano parts.

How an Aeroplane Flies

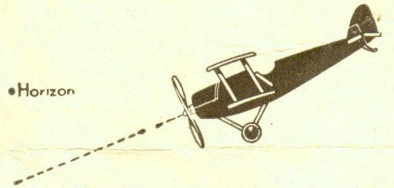
The fun of building with Meccano Aeroplane Constructor Outfits is greatly increased if you know something of the way in which a real aeroplane is controlled in flight. What strikes anyone examining an aeroplane for the first time is the simplicity of the manœuvring mechanism, everything being done by 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 edges 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 is operated by the feet. This bar controls the rudder, which is the second main portion of the tail unit.



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.



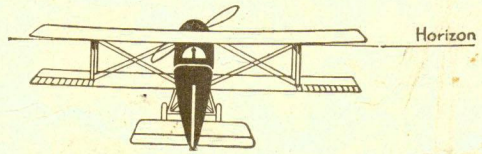
Pushing the stick forward causes the machine to put down its nose and dive.

Joy-Stick and Rudder

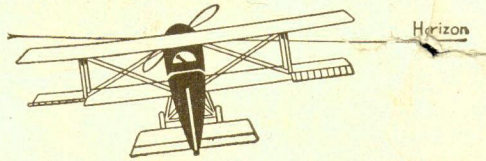
The joy-stick is the most fascinating factor in the control of an aeroplane. If you wish to fly level, you keep the stick in a central and vertical position. If you move it forward, the elevators are depressed and the machine promptly puts down its nose and tries to dive. If you pull the stick backward, 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."

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.

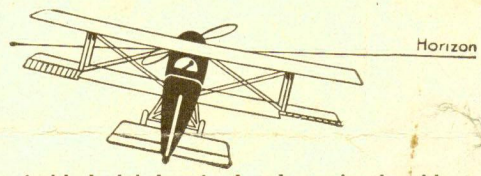
When a pilot has entered the cockpit of his machine, and ascertained that his engine is running well, the chocks are removed from under the wheels, and the machine is taxied into the wind. It is kept pointing in the correct direction by means of the rudder, and the pilot prevents the tail from rising 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.



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.

INSTRUCTIONS

How to build Model Aeroplanes with Meccano Aeroplane Constructor Parts

Commence by building up the fuselage, the details of which are clearly shown in the illustrations. The manner in which the propeller drive is arranged is shown in Fig. A. The Propeller is secured to one end of the 6½" Axle Rod 1, and the Rod is then pushed through the lower hole in the Fuselage Front. A ½" Pulley 2 is placed on the Rod together with the Rubber Driving Band 5. The end of the Axle Rod 1 is then pushed through the hole in the Propeller Shaft Bracket 3. The 6½" Axle Rod 1 is kept in place by means of the Collar 4. The 3¼" Axle Rod (part No. P62) is pushed through one Undercarriage Vee Strut and Wheel Shield and a ½" Fast Pulley 6 is placed on the Axle. A Rubber Tyre is now fitted to one Landing Wheel and the complete wheel is then placed in the Wheel Shield of the second Undercarriage Vee Strut. The end of the 3¼" Axle is then passed through the hole in the Undercarriage Vee Strut and through the centre hole in the Landing Wheel. A Rubber Tyre is next fitted to the second Landing Wheel and the complete wheel is placed in its Wheel Shield. To do this the 3¼" Axle is drawn slightly to one side and is then pushed back so that one end of the Axle passes into the centre hole of the Landing Wheel. Each Landing Wheel is locked in position on the Axle by rolling the Rubber Tyre to one side with the fingers so that the grub-screw is exposed and may then be rotated by the Screwdriver.

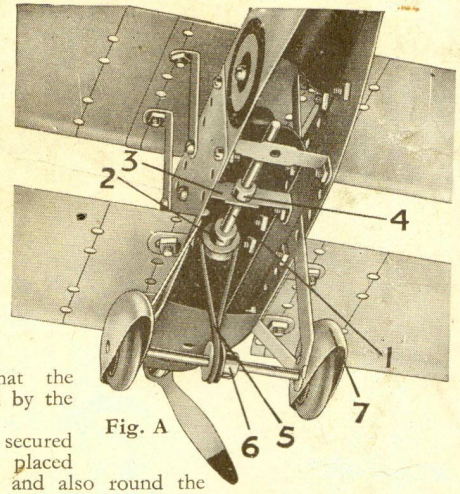


Fig. A

After the Landing Wheels have been secured in place the Driving Band may be placed round the groove in the ½" Pulley 2 and also round the groove of the Pulley 6. The Pulleys 2 and 6 may then be locked in position on their respective Rods by means of the grub-screws in their bosses.

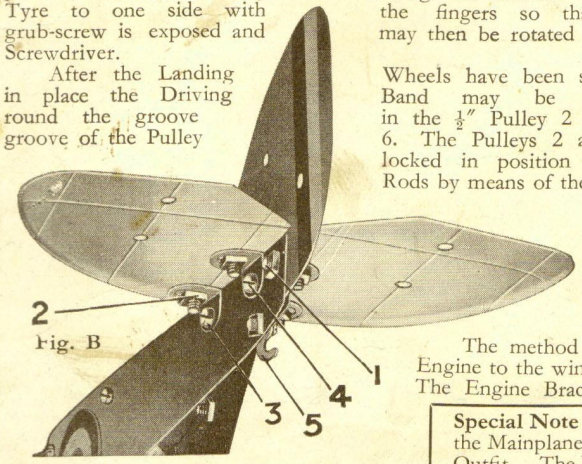


Fig. B

Fitting the Radial Engine Units and Engine Casings. (Water-cooled type)

The method of fitting the Radial Engine to the wing is shown in Fig. C. The Engine Bracket 1 is first of all bolted to the wing. A Nut is screwed on to the projecting screwed shank 2 of the Radial Engine and the shank 2 is then passed through the hole in the Engine Bracket 1. The Nut 3 is now screwed into place. When an engine of high horse-power is to be represented the Large Radial Engine (No. P46) may be used.

For a water-cooled type of engine, the Engine Casing unit is used separately. First bolt the Engine Casing Base to the wing by two Bolts. Next pass a Pivot Bolt through the boss of a small Propeller and screw a Nut on the end of it. Pass the projecting end of the Pivot Bolt through the hole in the front of the Engine Casing Base and lock the Bolt in place by another Nut. The Engine Casing Top is placed over the Base piece, and a 1" Screwed Rod is passed through the holes in the sides of the Top and through the perforated lugs in the Base. A Nut is screwed on each end of the Rod to hold it rigidly in position.

Assembling the Tail Planes and Rudder

The method of assembling the Tail Planes and Rudder will be followed from Fig. B. Two Angle Brackets are bolted to each Tail Plane, and the front Bracket 2 of each Tail Plane is secured to the fuselage by a 7/32" Bolt 3. A ⅜" Bolt 4 is passed through the rear Angle Bracket of one Tail Plane, through the Fuselage Side Rear sections, and through the rear Angle Bracket of the second Tail Plane. A Nut is placed upon the end of the Bolt and the Bolt is screwed up tightly so that the Tail Planes are locked rigidly to the rear of the fuselage of the model. The Tail Skid 5 of the machine is held in place between the Fuselage Side Rear sections by means of a 7/32" Bolt.

The Rudder is pushed into position between the ends of the Fuselage Side Rear sections, the lug on the front portion fitting into the slot in the Fuselage Top Rear section. It is held in place by the 7/32" Bolt 1.

When the Landing Wheels are mounted independently, a Pivot Bolt is first passed through the Wing Stay. A Landing Wheel with Rubber Tyre is placed in the Wheel Shield. The Pivot Bolt is then passed through the Wheel Shield and Landing Wheel and is held in position by means of two lock-nuts.

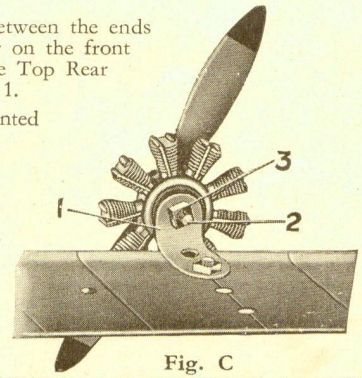
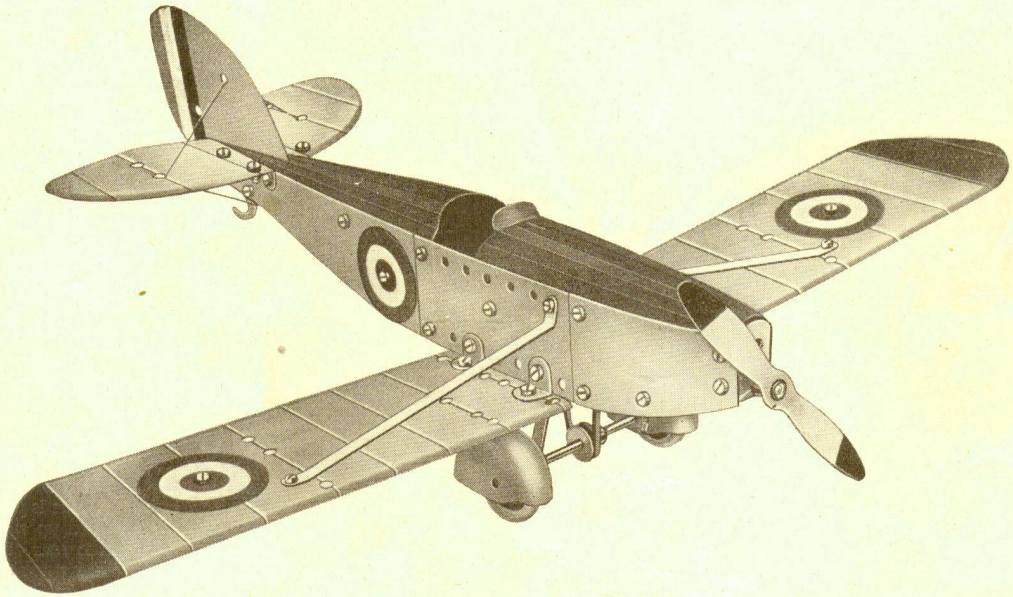


Fig. C

Special Note : The Military Identification Markings (P.101 and P.102) shown on the Mainplane and Fuselage of the models illustrated are not now included in the Outfit. The Mainplane and the Fuselage now carry civil registration letters. The Military Rudder (P.32) has been replaced in the Outfit by the Civil Rudder (P.64)

Model No. 1 Low Wing Monoplane



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

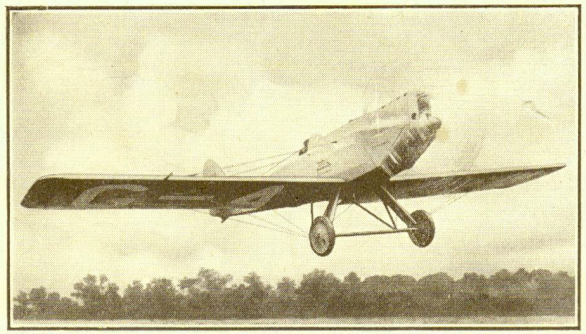
Model No. 1 is a monoplane of the low wing type. Machines of this type are often regarded as the best for speed. They have greatly increased in popularity in recent years and are largely used on German air lines.

A typical British low wing machine is the Miles "Magister," a two-seater training machine. It is fitted with a 130 h.p. D.H. "Gipsy Major" engine that gives it a top speed of 145 m.p.h.

Parts required:

1 of No. P1	1 of No. P20	1 of No. P62
1 „ „ P2	2 „ „ P31	1 „ „ P64
1 „ „ P10	1 „ „ P34	8 „ „ 12
1 „ „ P11	2 „ „ P44	1 „ „ 14
1 „ „ P13	1 „ „ P52	2 „ „ 23a
1 „ „ P15	2 „ „ P53	43 „ „ 537a
2 „ „ P16	1 „ „ P54	42 „ „ 537b
2 „ „ P17	1 „ „ P55	1 „ „ 540
1 „ „ P18	2 „ „ P56	1 „ „ 611c
1 „ „ P18a	1 „ „ P58	
1 „ „ P19	1 „ „ P59	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit. To secure the Pilot in position, a 7/32" Bolt is passed through each side of the Fuselage, and through the perforated lug attached to the Pilot's body. Nuts are then screwed on to the projecting shanks of the Bolts, thus locking the Pilot rigidly in place.



An Avro "Avian" Monoplane landing. This interesting British machine is a monoplane of the low wing type.

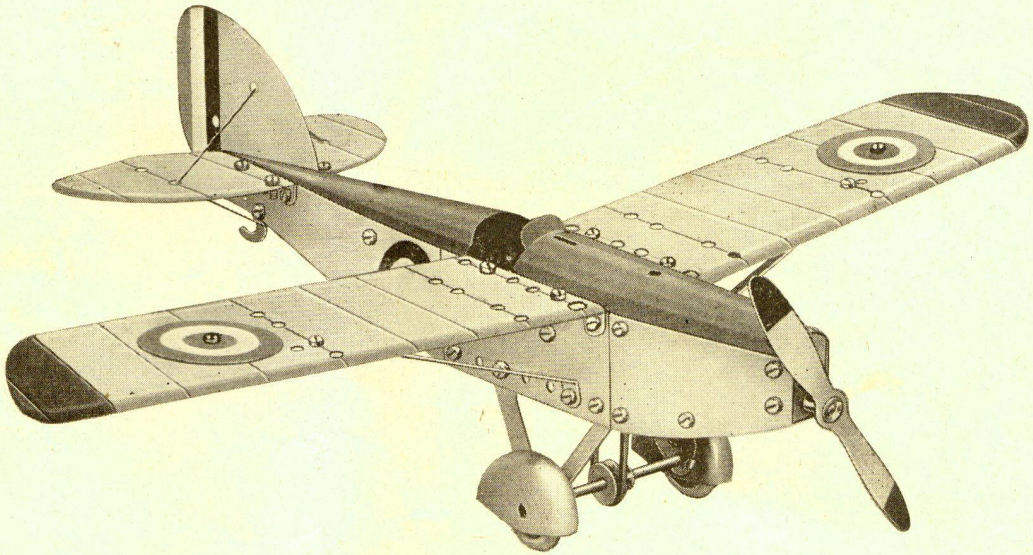
Model No. 2 High Wing Monoplane

High wing monoplanes are probably the most popular monoplane aircraft. They are usually more stable than the low wing type, and the view downwards is much better, being practically unobstructed.

Machines of this type are used in all parts of the world, and they range from small single-seater machines to huge aircraft seating as many as 40 people.

A British example is the Wicko two-seater light cabin monoplane, which is fitted with a 130 h.p. D.H. "Gipsy Major" engine and has a top speed of 140 m.p.h. Other notable machines include the Heston "Phœnix," a five-seater of similar type.

A good example of a military high wing monoplane is the Westland "Lysander" army co-operation machine.



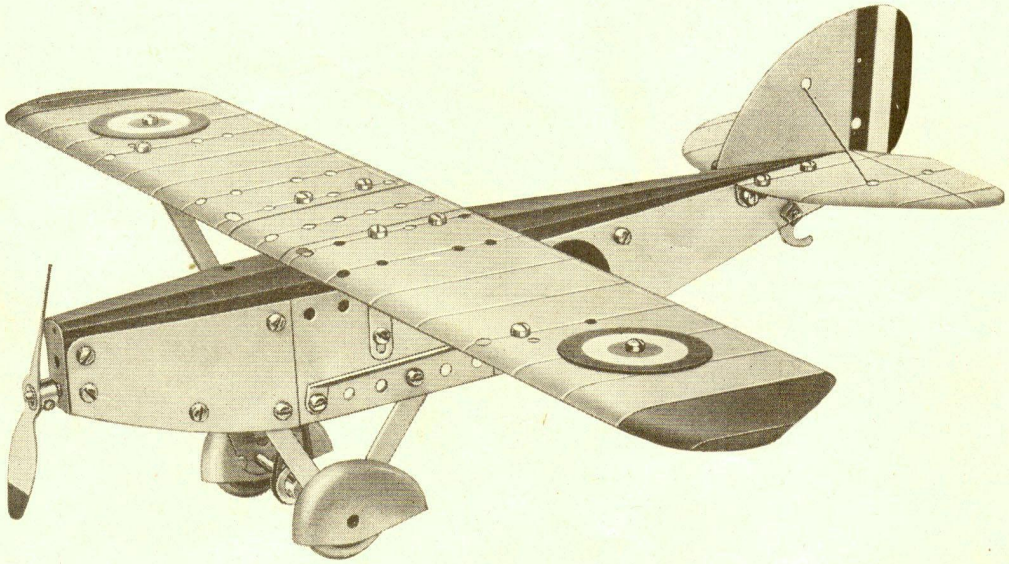
The Desoutter monoplane fitted with a "Cirrus Hermes" engine. This machine has numerous excellent flights to its credit.

Parts required:

1 of No. P1	1 of No. P20	1 of No. P62
1 „ „ P2	2 „ „ P31	1 „ „ P64
1 „ „ P10	1 „ „ P34	8 „ „ 12
1 „ „ P11	2 „ „ P44	1 „ „ 14
1 „ „ P13	1 „ „ P52	2 „ „ 23a
1 „ „ P15	2 „ „ P53	47 „ „ 537a
2 „ „ P16	1 „ „ P54	46 „ „ 537b
2 „ „ P17	1 „ „ P55	1 „ „ 540
1 „ „ P18	2 „ „ P56	1 „ „ 611c
1 „ „ P18a	1 „ „ P58	
1 „ „ P19	1 „ „ P59	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

Model No. 3 Parasol Monoplane



Parasol monoplanes may really be included in the high wing category. The characteristic feature of this type is that the wing is raised above the fuselage and is connected to it by means of struts. This method of constructing aircraft is employed mostly on small machines, for in many ways it is inferior to the type of construction in which the wing is bolted firmly to the fuselage. One great disadvantage is that the struts required to keep the plane in position offer great resistance to the wind and thus detract considerably from the all-round performance of the machine.

Parasol monoplanes are now little used in Great Britain, but in France this type is quite popular. Well-known examples are made by the Morane-Saulnier and Potez firms. A typical German parasol machine is the Henschel Hs.122, a two-seater military monoplane in which the wing is supported by a series of short struts.

Parts required :

1 of No. P1	1 of No. P19	1 of No. P58
1 „ „ P2	1 „ „ P20	1 „ „ P59
1 „ „ P8	2 „ „ P29	1 „ „ P62
1 „ „ P10	2 „ „ P31	1 „ „ P64
1 „ „ P11	1 „ „ P34	4 „ „ 12
1 „ „ P13	2 „ „ P44	1 „ „ 14
1 „ „ P15	1 „ „ P52	2 „ „ 23a
2 „ „ P16	2 „ „ P53	41 „ „ 537a
2 „ „ P17	1 „ „ P54	40 „ „ 537b
1 „ „ P18	1 „ „ P55	1 „ „ 540
1 „ „ P18a	2 „ „ P56	1 „ „ 611c

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

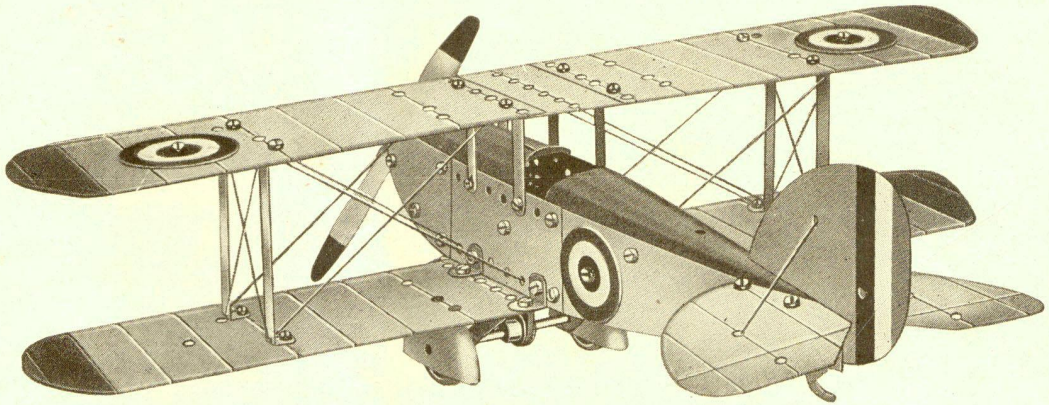
The Westland "Widgeon," a typical parasol monoplane. This machine is a two-seater and is made by the Westland Aircraft Works Ltd.

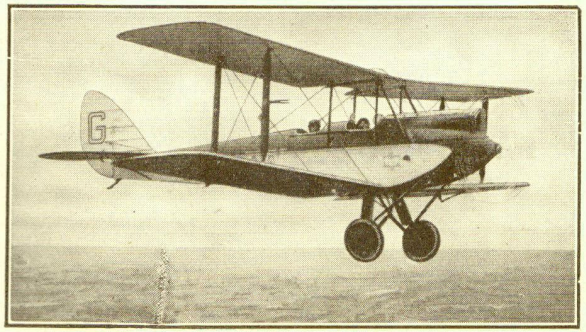
Model No. 4 Standard Light Biplane

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

Model No. 4 is a biplane of the light type. These machines are used mostly for civilian flying, although they are also employed in the R.A.F. Machines of this kind have been specialised in by British aircraft designers and British light biplanes are the finest in the world.

One of the most widely known single-seater light aeroplanes is the Gloster "Gauntlet," and a typical example of a British two-seater biplane is the D.H. "Hornet Moth" cabin machine, and the Avro "Tutor," which has open cockpits.





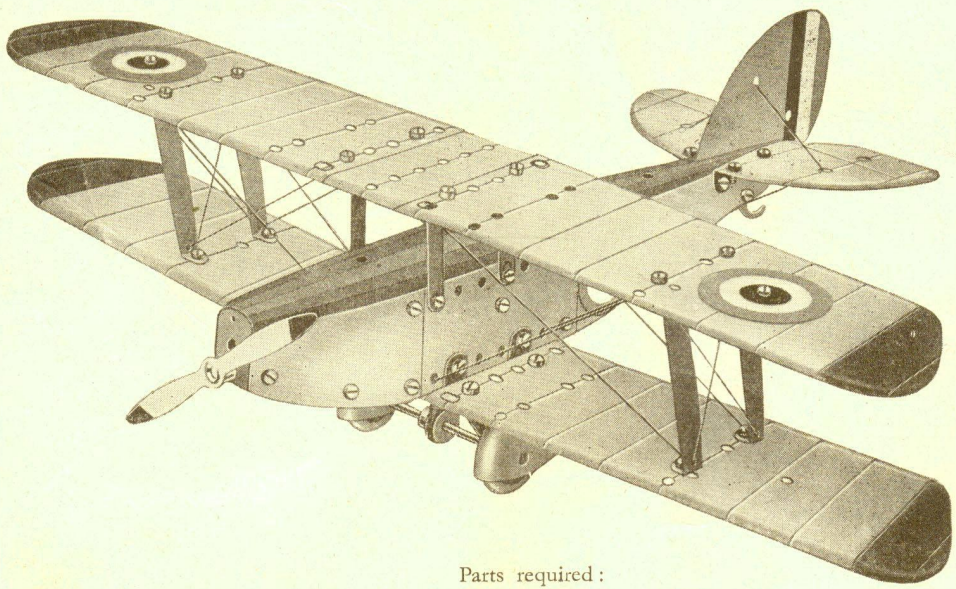
The de Havilland "Gipsy Moth," the most popular light aeroplane in the world.

Parts required:

1 of No. P1	1 of No. P18a	1 of No. P58
1 „ „ P1a	1 „ „ P19	1 „ „ P59
1 „ „ P2	1 „ „ P20	1 „ „ P62
1 „ „ P2a	4 „ „ P28	1 „ „ P64
1 „ „ P8	4 „ „ P29	8 „ „ 12
1 „ „ P10	1 „ „ P34	1 „ „ 14
1 „ „ P11	2 „ „ P44	2 „ „ 23a
1 „ „ P13	1 „ „ P52	57 „ „ 537a
1 „ „ P15	2 „ „ P53	56 „ „ 537b
2 „ „ P16	1 „ „ P54	1 „ „ 540
2 „ „ P17	1 „ „ P55	1 „ „ 611c
1 „ „ P18	2 „ „ P56	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

Model No. 5 Single-Seater Biplane



In the early days of aviation the single-seater civil biplane was very popular with the private owner who did not require a machine large enough to enable him to be accompanied by one or more passengers. Many civilian pilots regarded this limitation as a drawback, however, and two- and three-seater biplanes rapidly came into favour. During recent years the monoplane has very largely superseded the biplane, and to-day there is no single-seater civil type of biplane produced in this country. Two-seater biplanes are still used, however, for training purposes, and there are several types of light biplanes seating from five to seven passengers, machines of this capacity being used extensively on internal air services.

Parts required :

1 of No. P1	1 of No. P18a	2 of No. P56
1 „ „ P1a	1 „ „ P19	1 „ „ P58
1 „ „ P2	1 „ „ P20	1 „ „ P59
1 „ „ P2a	2 „ „ P24	1 „ „ P62
1 „ „ P8	2 „ „ P25	1 „ „ P64
1 „ „ P10	4 „ „ P29	8 „ „ 12
1 „ „ P11	1 „ „ P34	1 „ „ 14
1 „ „ P13	2 „ „ P44	2 „ „ 23a
1 „ „ P15	1 „ „ P52	55 „ „ 537a
2 „ „ P16	2 „ „ P53	54 „ „ 537b
2 „ „ P17	1 „ „ P54	1 „ „ 540
1 „ „ P18	1 „ „ P55	1 „ „ 611c

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

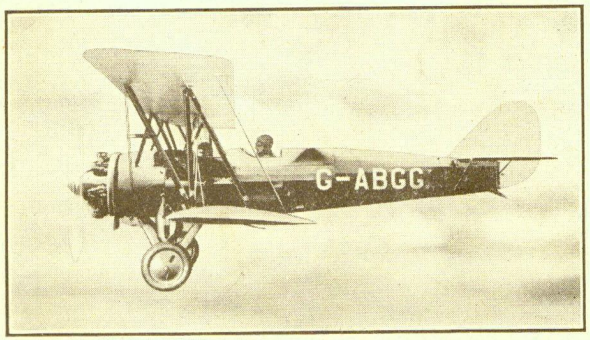
The Bristol "Bulldog," a typical example of a modern single-seater military biplane.

Model No. 6 Training Biplane

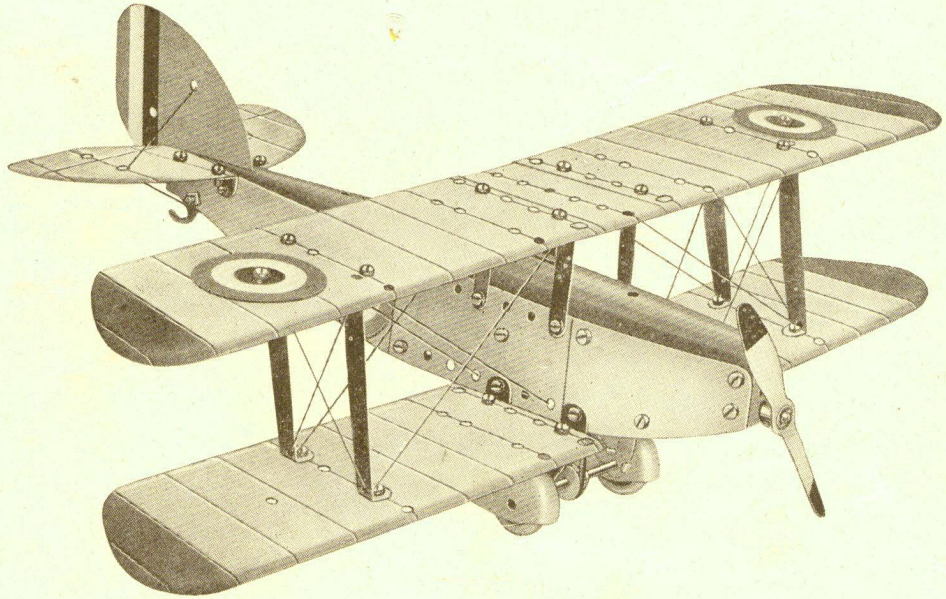
The requirements of a good training machine are many. It must be easy to fly and must be stable; its maximum speed must be fairly high, while its landing speed should be low. A biplane is well suited to comply with these conditions, and ordinary light aeroplanes are now frequently employed.

A training machine has been taken as a prototype for Model No. 6. The most famous machine of this type is the Avro 504, first designed and constructed in 1913. Since then it has been in constant service in all parts of the world. In 1932 it was replaced by the Avro "Tutor," which is now used to a great extent in the R.A.F. The Avro 626 is an advanced training machine for complete instruction in all duties.

Many modern training machines are arranged so that a hood can be placed over the rear cockpit in order to enable training in "blind flying" to be carried out. Machines intended for this purpose are, of course, provided with more instruments than an ordinary light aeroplane.



A pupil undergoing instruction in the Avro 626, an up-to-date training machine produced by the famous firm of A. V. Roe & Co. Ltd.

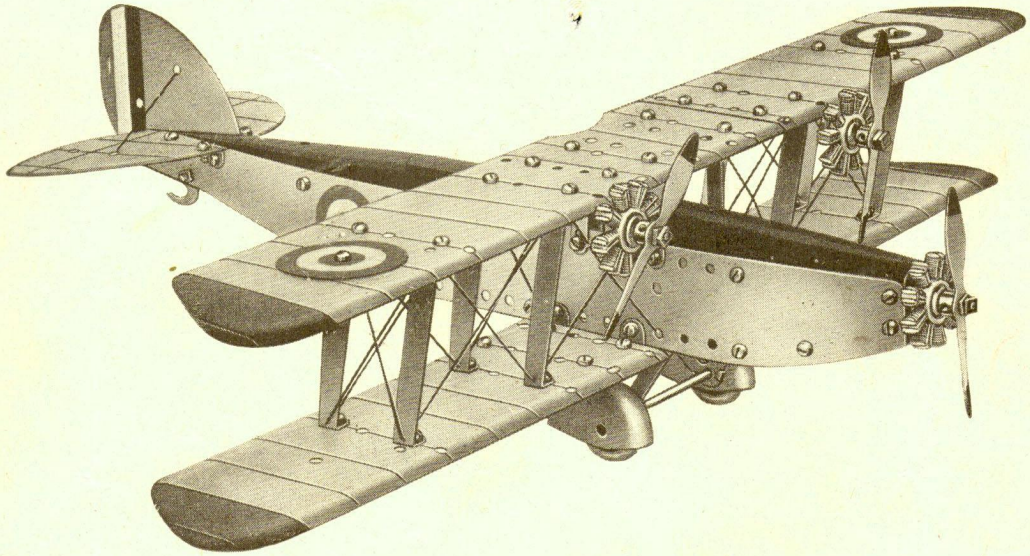


Parts required:

1 of No. P1	1 of No. P18a	2 of No. P56
1 „ „ P1a	1 „ „ P19	1 „ „ P58
1 „ „ P2	1 „ „ P20	1 „ „ P59
1 „ „ P2a	2 „ „ P24	1 „ „ P62
1 „ „ P8	2 „ „ P25	1 „ „ P64
1 „ „ P10	4 „ „ P29	8 „ „ 12
1 „ „ P11	1 „ „ P34	1 „ „ 14
1 „ „ P13	2 „ „ P44	2 „ „ 23a
1 „ „ P15	1 „ „ P52	53 „ „ 537a
2 „ „ P16	2 „ „ P53	52 „ „ 537b
2 „ „ P17	1 „ „ P54	1 „ „ 540
1 „ „ P18	1 „ „ P55	1 „ „ 611c

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

Model No. 7 Triple-engined Air Liner



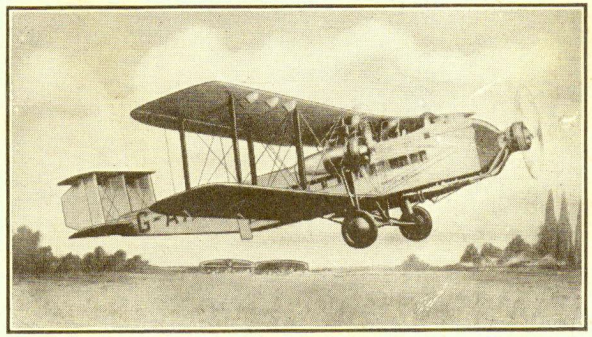
All the passenger-carrying machines employed on the cross-Channel services of Imperial Airways Ltd., are equipped with at least three engines. This is to ensure the safe operation of the services, for these machines can maintain flight with one engine out of commission. Thus in the event of engine failure while the machine was over the water, land could be reached without mishap.

Model No. 7 is a triple-engined biplane similar to those favoured for many years by Imperial Airways Ltd. and by many other air line companies all over the world.

A good example of a British triple-engined biplane air liner was the Armstrong Whitworth "Argosy," a machine that was fitted with Armstrong Siddeley "Jaguar" engines. The "Argosy" had seating accommodation for 20 passengers, a maximum speed of 110 m.p.h., and an endurance of 5½ hours at a speed of 95 m.p.h.

Parts required:

1 of No. P1	4 of No. P17	1 of No. P55
1 „ „ P1a	1 „ „ P18	2 „ „ P56
1 „ „ P2	1 „ „ P18a	1 „ „ P58
1 „ „ P2a	1 „ „ P19	1 „ „ P59
1 „ „ P7	1 „ „ P20	2 „ „ P61
2 „ „ P8	4 „ „ P24	1 „ „ P62
1 „ „ P10	4 „ „ P25	1 „ „ P64
1 „ „ P11	4 „ „ P29	8 „ „ 12
1 „ „ P13	3 „ „ P35	87 „ „ 537a
1 „ „ P14	3 „ „ P43	74 „ „ 537b
1 „ „ P15	2 „ „ P44	1 „ „ 540
2 „ „ P16	2 „ „ P53	1 „ „ 611c

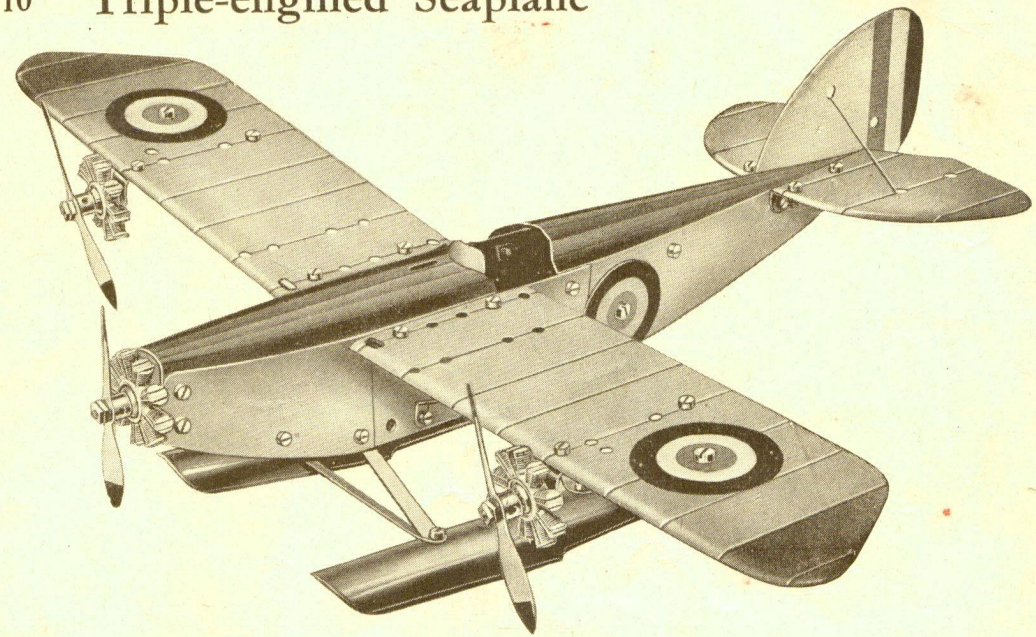


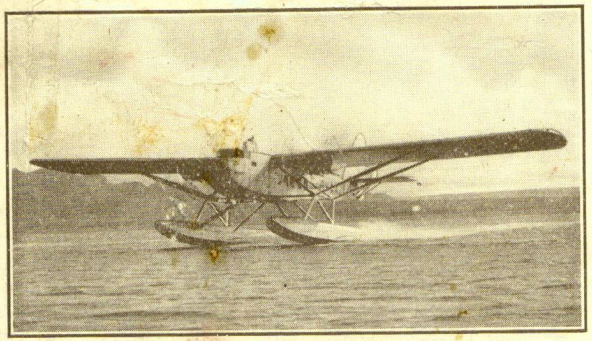
An Armstrong Whitworth "Argosy" taking off from an aerodrome. These machines have been used on the cross-Channel services of Imperial Airways Ltd.

Model No. 10 Triple-engined Seaplane

All aircraft of the multi-engined type are naturally safer to fly than single-engined machines, for if one of the engines should fail the machine can still carry on, and it is not necessary for a forced descent to be made. Seaplanes and flying boats that are passing over water can usually alight safely on the surface, except during stormy weather, but there is always the danger that if the machine is not found very quickly a storm may spring up that it is unable to survive. For this reason forced descents are to be avoided if possible, and a multi-engined machine is therefore the safest type for marine work.

A seaplane of the three-engined type is shown in Model No. 10, which is modelled on the Short "Valetta." There is a seaplane version of the well-known Junkers Ju 52/3m air liner. This German machine can carry 17 passengers and when used as a seaplane has a top speed of 167.7 m.p.h.



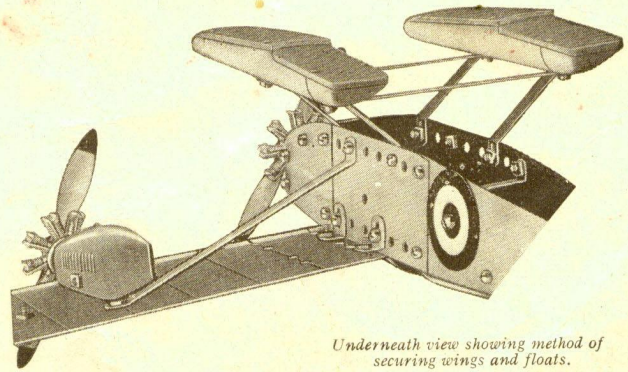


The Short "Valetta" seaplane taxying. The small wake left by the machine should be noted.

Parts required :

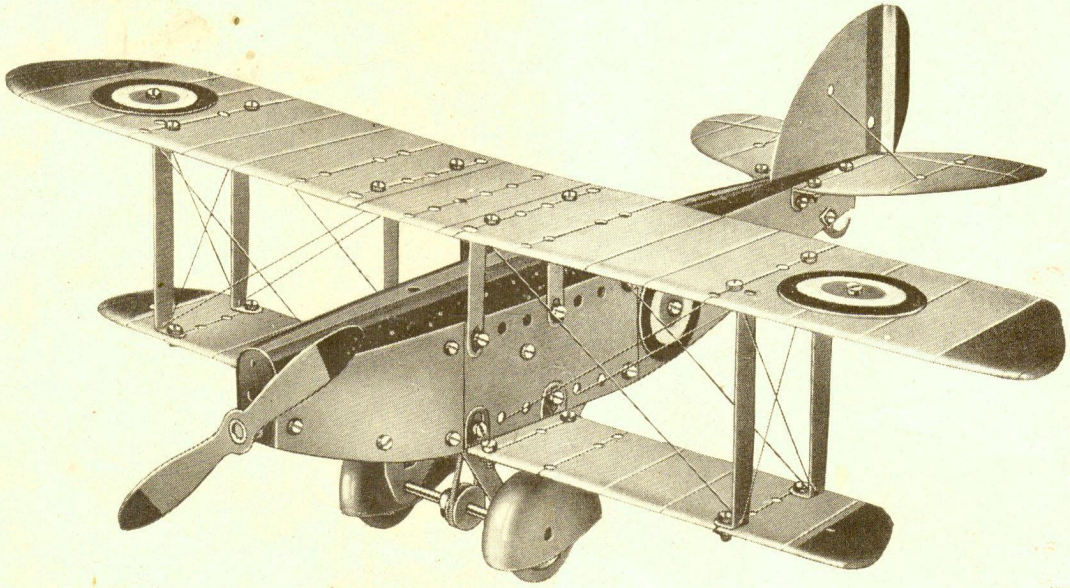
1	of No. P1	2	of No. P31
1	„ „ P2	3	„ „ P35
1	„ „ P10	2	„ „ P40
1	„ „ P11	2	„ „ P41
1	„ „ P13	2	„ „ P42
1	„ „ P15	3	„ „ P43
2	„ „ P16	2	„ „ P57
2	„ „ P17	1	„ „ P64
1	„ „ P18	8	„ „ 12
1	„ „ P18a	57	„ „ 537a
1	„ „ P19	48	„ „ 537b
1	„ „ P20	1	„ „ 540
4	„ „ P30	1	„ „ 611c

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.



Underneath view showing method of securing wings and floats.

Model No. 11 Unequal-Chord Sesquiplane



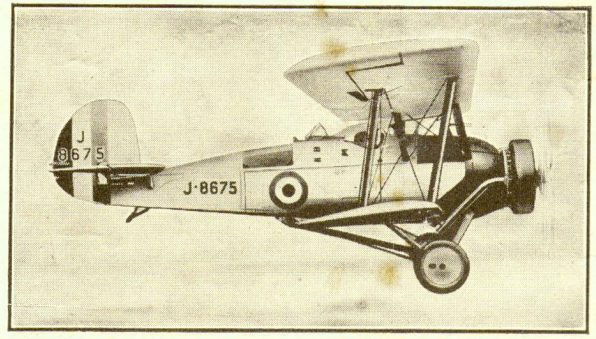
A sesquiplane is, literally, a machine with one-and-a-half wings. In general practice, however, the term is applied to all biplanes in which one plane is shorter than the other. This method of construction is particularly favoured for fighting machines, and for other aeroplanes where a good "speed range" is required. This means that the machine must have a fairly high maximum speed, together with a low stalling point.

A machine of this kind has been taken as the prototype for Model No. 11. Excellent British examples are the Blackburn "Shark" torpedo-bomber and reconnaissance biplane and the Fairey "Swordfish" torpedo-spotter, which is also a biplane. Another notable British type of unequal-span biplane is the single-engined Hawker "Hind" two-seater day bomber.

Parts required:

1 of No. P1	1 of No. P18a	1 of No. P58
1 „ „ P2	1 „ „ P19	1 „ „ P59
1 „ „ P3	1 „ „ P20	1 „ „ P62
1 „ „ P4	4 „ „ P28	1 „ „ P64
1 „ „ P8	4 „ „ P29	8 „ „ 12
1 „ „ P10	1 „ „ P34	1 „ „ 14
1 „ „ P11	2 „ „ P44	2 „ „ 23a
1 „ „ P13	1 „ „ P52	55 „ „ 537a
1 „ „ P15	2 „ „ P53	54 „ „ 537b
2 „ „ P16	1 „ „ P54	1 „ „ 540
2 „ „ P17	1 „ „ P55	1 „ „ 611c
1 „ „ P18	2 „ „ P56	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

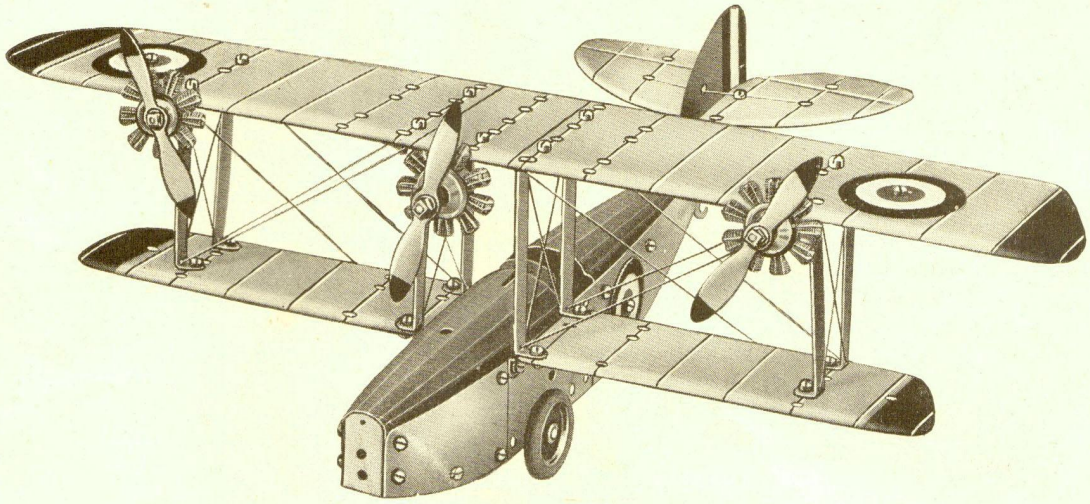


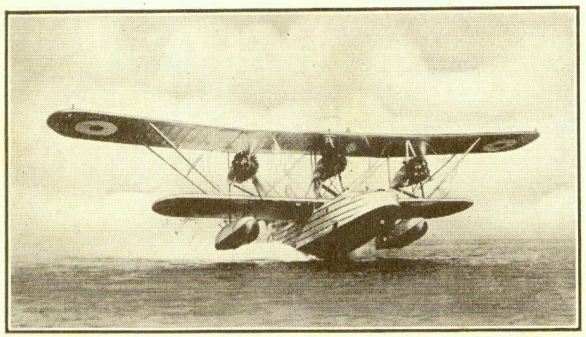
Armstrong Whitworth "Atlas" machines similar to the one illustrated have been extensively used in the R.A.F. for Army co-operation purposes.

Model No. 12 Triple-engined Flying Boat

The triple-engined type is probably the most popular flying boat constructed in this country. The use of three engines makes it possible for a heavy load to be carried and also adds greatly to the security of the machine, for even if one engine gives out, the other two are sufficient to maintain the machine in flight.

Model No. 12 shows a triple-engined flying boat fitted with beaching wheels. An early British machine similar to this model was the Saunders "Valkyrie," while later types were the Blackburn "Iris" and the Supermarine "Southampton Mark X." The "Iris" was fitted with three Rolls-Royce "Condor" water-cooled engines, while the "Southampton Mark X" employed Armstrong Siddeley "Panthers." An unusual feature of this machine was that the hull was flanked with stainless steel up to the chine or water line.





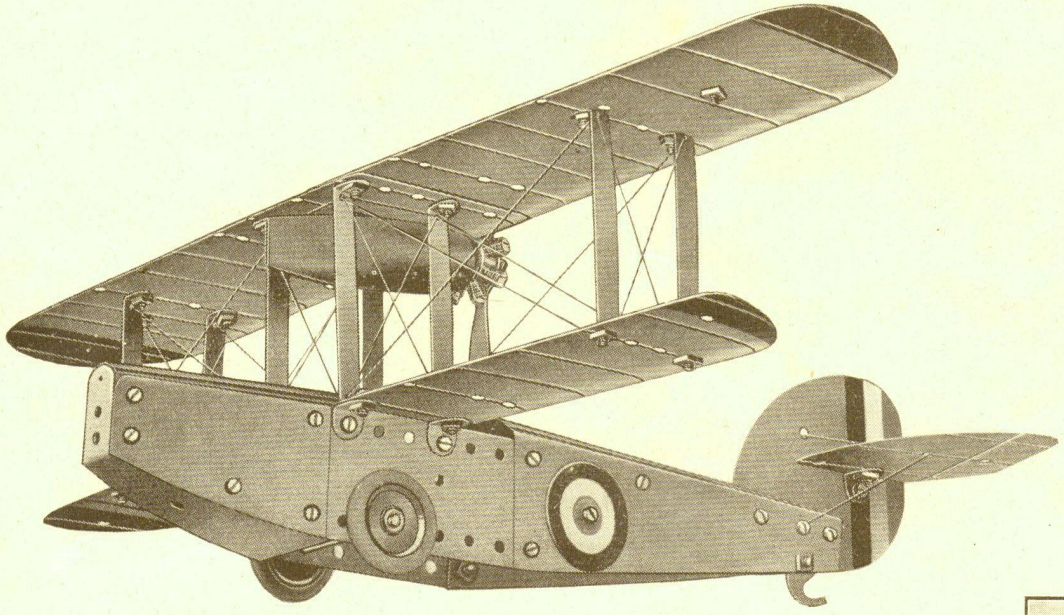
Taking off in the Supermarine "Southampton Mark X," a flying boat fitted with Armstrong Siddeley "Panther" engines.

Parts required:

1 of No. P1	2 of No. P17	1 of No. P55
1 „ „ P2	1 „ „ P18	1 „ „ P56
1 „ „ P3	1 „ „ P18a	3 „ „ P61
1 „ „ P4	1 „ „ P19	1 „ „ P64
1 „ „ P8	1 „ „ P20	6 „ „ 12
1 „ „ P10	8 „ „ P28	1 „ „ 16a
1 „ „ P11	3 „ „ P35	61 „ „ 537a
1 „ „ P13	3 „ „ P43	49 „ „ 537b
1 „ „ P15	2 „ „ P44	1 „ „ 540
2 „ „ P16	2 „ „ P53	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

Model No. 13 Single-engined Biplane Amphibian



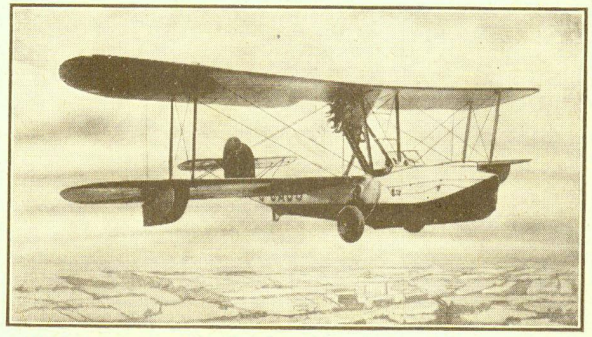
Single-engined biplane flying boats and amphibians are constructed in Canada, America, France and Italy, although in this country there is not a great deal of attention paid to them, British designers having more faith in marine aircraft of the multi-engined type. A single-engined amphibian was produced in this country as early as 1912, however, and since then many similar machines have been constructed. The Supermarine "Sea Eagle," and "Scarab," and the Canadian Vickers "Vedette" were all of this type. The Schneider Trophy was won in a single-engined Supermarine "Sea Lion" flying boat in 1922.

The majority of single-engined flying boats employ pusher airscrews and are usually constructed so that they are easily adapted for use either as flying boats or amphibians. They can be obtained with either air-cooled or water-cooled engines, and Model No. 13 shows a single-engined flying boat fitted with an air-cooled engine and a pusher airscrew.

Parts required:

1 of No. P1	1 of No. P18	1 of No. P55
1 „ „ P2	1 „ „ P18a	1 „ „ P56
1 „ „ P3	1 „ „ P19	1 „ „ P64
1 „ „ P4	1 „ „ P20	6 „ „ 12
1 „ „ P8	8 „ „ P28	1 „ „ 16a
1 „ „ P10	1 „ „ P35	1 „ „ 82
1 „ „ P11	1 „ „ P40	58 „ „ 537a
1 „ „ P13	1 „ „ P41	52 „ „ 537b
1 „ „ P15	1 „ „ P43	1 „ „ 540
2 „ „ P16	2 „ „ P44	
2 „ „ P17	2 „ „ P53	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

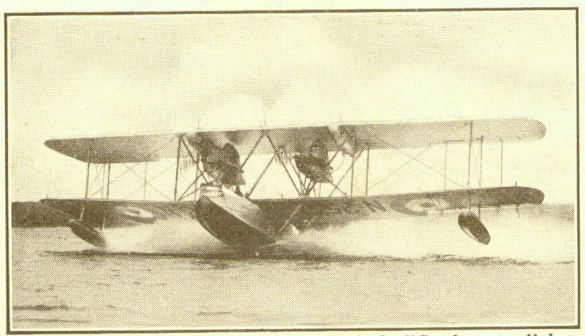


Machines similar to the Canadian Vickers "Vedette," shown above, can be put down on either land or water.

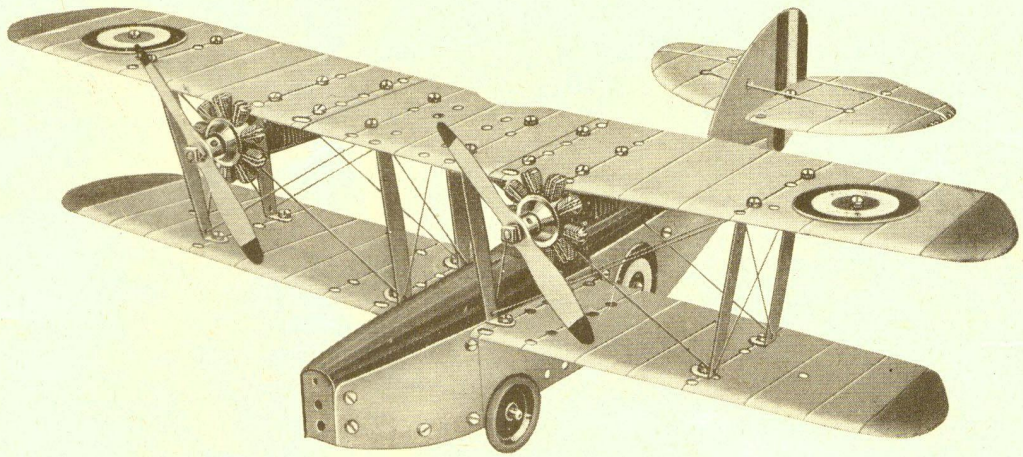
Model No. 14 Twin-engined Amphibian

An amphibian flying boat is a machine capable of taking off from, or alighting on, either land or water. The landing gear for use when alighting on an aerodrome is in actual practice so arranged that it can be raised or lowered while the aeroplane is in flight. This type of machine is of particular value for operation over country such as that experienced in Canada, where often no safe landing ground can be found on which to make a forced descent, but where an airman will nearly always be able to find a sufficiently large stretch of water on which to alight.

In this country designers of flying boats specialise mostly on large machines, but several amphibians similar to Model No. 14 have been constructed here. Among them may be mentioned the Supermarine "Swan" commercial flying boat and the Supermarine "Seamew" military amphibian. A well-known American amphibian flying boat is the Sikorsky S-43, a twin-engined aircraft seating 15 passengers.



Another Supermarine Flying Boat. This is the "Southampton" that was until recently extensively used by the R.A.F.

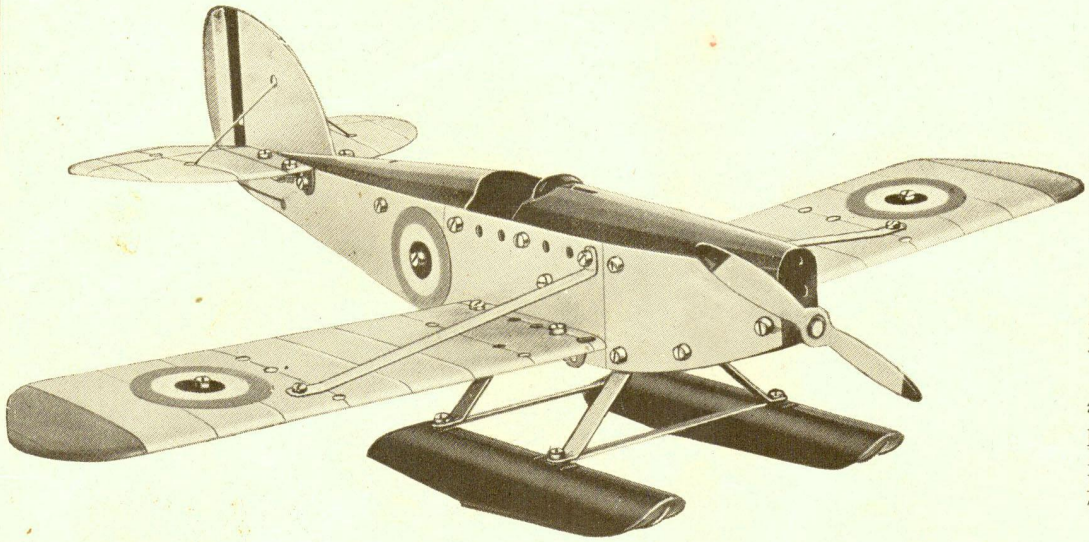


Parts required :

1 of No. P1	1 of No. P18	2 of No. P44
1 „ „ P1a	1 „ „ P18a	2 „ „ P53
1 „ „ P2	1 „ „ P19	1 „ „ P55
1 „ „ P2a	1 „ „ P20	1 „ „ P56
1 „ „ P7	2 „ „ P26	1 „ „ P64
1 „ „ P10	2 „ „ P27	6 „ „ 12
1 „ „ P11	4 „ „ P28	1 „ „ 16a
1 „ „ P13	2 „ „ P35	2 „ „ 82
1 „ „ P15	2 „ „ P40	68 „ „ 537a
2 „ „ P16	2 „ „ P41	56 „ „ 537b
2 „ „ P17	2 „ „ P43	1 „ „ 540

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

Model No. 15 High-Speed Seaplane



In recent years the low-wing monoplane seaplane has become the accepted type where high speeds are required, and even the Gloster Aircraft Co. Ltd., who for many years favoured the biplane construction for their Schneider Trophy machines, have at last abandoned it in favour of the monoplane. A model of the low-wing seaplane type of machine is shown on this page.

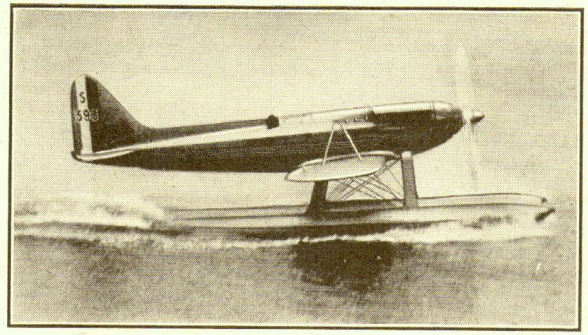
Another machine of this kind was the Vickers-Supermarine Rolls-Royce S.6B, which won the Schneider Trophy Contest in 1931, at a speed of 340.08 m.p.h.

The high-speed machines of other countries also are usually of the monoplane seaplane type, and a particularly interesting one is the Italian Macchi M.67. This machine, which is fitted with an Isotta-Fraschini engine, was produced for the Schneider Trophy Contest in 1929.

Parts required :

1 of No. P1	1 of No. P18a	2 of No. P57
1 „ „ P2	1 „ „ P19	1 „ „ P64
1 „ „ P10	1 „ „ P20	8 „ „ 12
1 „ „ P11	4 „ „ P30	1 „ „ 14
1 „ „ P13	2 „ „ P31	46 „ „ 537a
1 „ „ P15	1 „ „ P34	49 „ „ 537b
2 „ „ P16	2 „ „ P42	1 „ „ 540
2 „ „ P17	1 „ „ P52	1 „ „ 611c
1 „ „ P18	2 „ „ P56	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

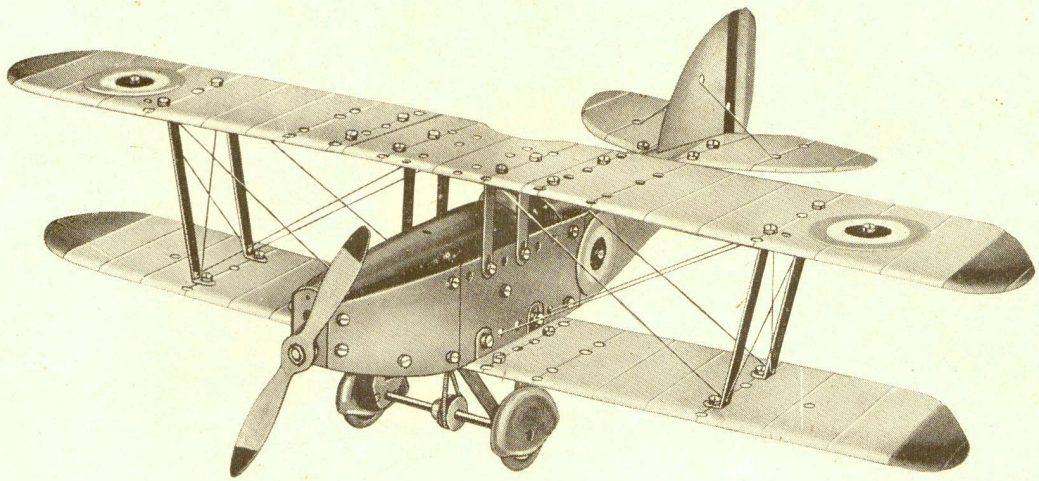


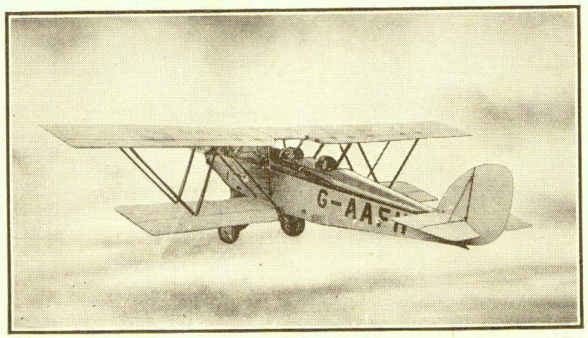
Taxying before taking off in the Vickers-Supermarine Rolls-Royce S.6B, on which a new record for the Schneider Trophy Contest was set up in 1931.

Model No. 16 Unequal Span Biplane

Biplanes of unequal span, or sesquiplanes, vary considerably in individual design, although the principle on which they are constructed is the same in all cases. Model No. 16, for instance, should be compared with Model No. 11. In the latter model the span of the lower plane is considerably less than that of the upper one, while the chord, or the width of the plane from the leading or front edge, to the trailing or rear edge, differs in the two planes.

On Model No. 16, however, the wings are nearly of equal length, while the chords of the upper and lower planes are equal. If machines of equal size similar to these models were fitted with similar engines of the same power, the one resembling Model No. 11 would have the higher maximum speed, and that similar to Model No. 16 the slower landing speed. The first one would have the better speed range.





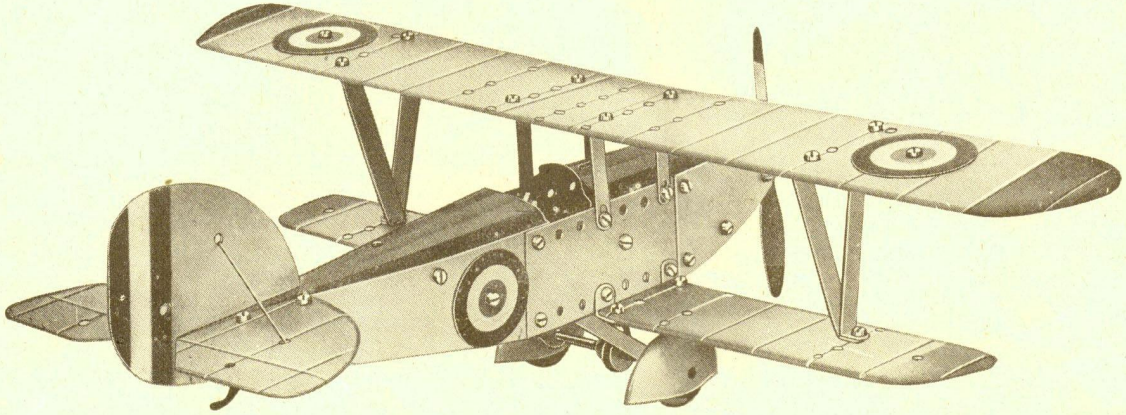
This unequal span biplane, the Parnall "Elf," is a light machine specially designed to provide the maximum safety for its occupants.

Parts required:

1 of No. P1	1 of No. P19	1 of No. P59
1 „ „ P1a	1 „ „ P20	1 „ „ P62
1 „ „ P2	2 „ „ P26	1 „ „ P64
1 „ „ P2a	2 „ „ P27	8 „ „ 12
1 „ „ P7	4 „ „ P29	1 „ „ 14
1 „ „ P10	1 „ „ P34	2 „ „ 23a
1 „ „ P11	2 „ „ P44	59 „ „ 537a
1 „ „ P13	1 „ „ P52	58 „ „ 537b
1 „ „ P15	2 „ „ P53	1 „ „ 540
2 „ „ P16	1 „ „ P54	1 „ „ 611c
2 „ „ P17	1 „ „ P55	
1 „ „ P18	2 „ „ P56	
1 „ „ P18a	1 „ „ P58	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

Model No. 17 Light Biplane

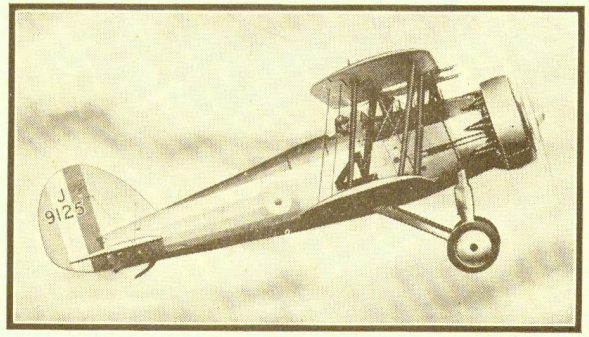


Single-seater civil biplanes are no longer produced. At one time they were popular, and Model No. 17 is therefore of interest as it gives a good idea of the general appearance of this type of light aeroplane. Some single-seater civil biplanes had wings of unequal span, as in this Model, but usually both the upper and lower wings were of the same span. These machines were not built for high speed flying, and their chief merit was their exceptional stability in the air. Single-seater biplanes designed for Air Force work are still produced in large numbers, and form part of the equipment of the fighter squadrons. Rapid rate of climb and high maximum speed are essential in these military aircraft.

Parts required:

1 of No. P1	1 of No. P18a	2 of No. P56
1 „ „ P2	1 „ „ P19	1 „ „ P58
1 „ „ P3	1 „ „ P20	1 „ „ P59
1 „ „ P4	2 „ „ P24	1 „ „ P62
1 „ „ P8	2 „ „ P25	1 „ „ P64
1 „ „ P10	4 „ „ P29	8 „ „ 12
1 „ „ P11	1 „ „ P34	1 „ „ 14
1 „ „ P13	2 „ „ P44	2 „ „ 23a
1 „ „ P15	2 „ „ P52	53 „ „ 537a
2 „ „ P16	2 „ „ P53	52 „ „ 537b
2 „ „ P17	1 „ „ P54	1 „ „ 540
1 „ „ P18	1 „ „ P55	1 „ „ 611c

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

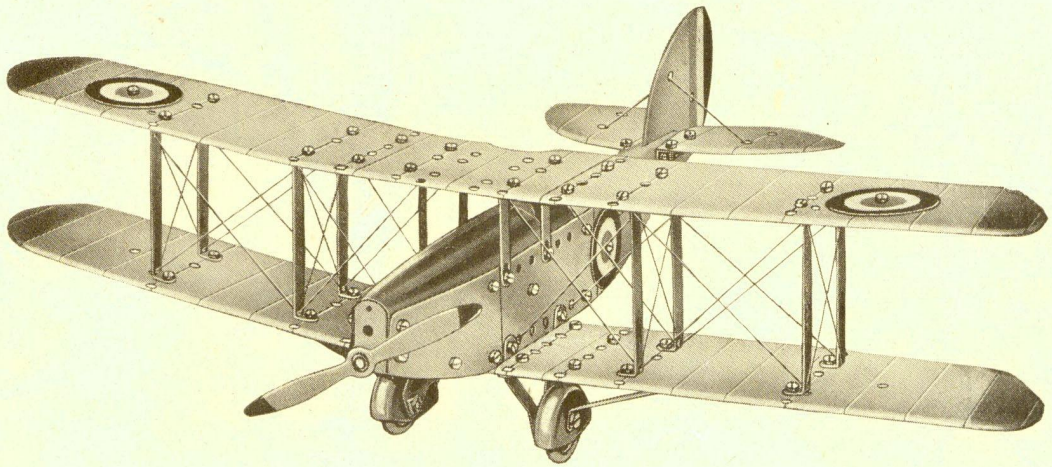


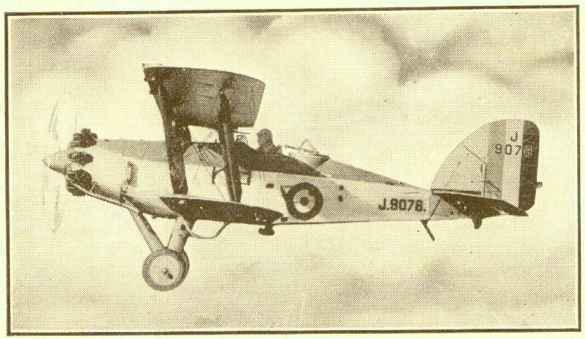
One of the world's deadliest fighting machines, the Gloster S.S.19. It is equipped with six machine guns.

Model No. 18 Two-Seater Biplane

Biplanes seating two, three, four or five people are very suitable for the private owner who requires a light aeroplane sufficiently large to enable him to be accompanied by his family or friends. Similar aeroplanes, with twin engines and accommodation for six or seven people, are more generally used by air transport concerns for operating internal air routes and services "feeding" the main air lines.

In this country a few types of two-seater training biplanes are produced, the best known being the Avro "Tutor" and the D.H. "Tiger-Moth." There are three two-seater types produced in France, the Romano R.82 trainer, the Caudron "Luciole," and the Leopoldoff "Colibri" which has staggered wings of unequal span.





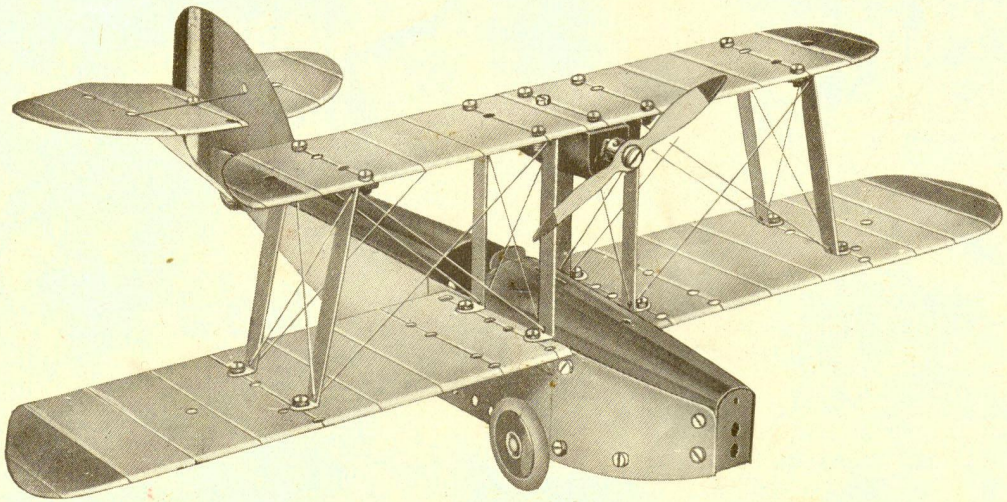
A general purpose machine, the Westland "Wapiti," used by many squadrons of the R.A.F. in various parts of the world.

Parts required:

1 of No. P1	1 of No. P18a	1 of No. P59
1 „ „ P1a	1 „ „ P19	2 „ „ P60
1 „ „ P2	1 „ „ P20	1 „ „ P64
1 „ „ P2a	8 „ „ P28	8 „ „ 12
1 „ „ P7	4 „ „ P29	1 „ „ 14
2 „ „ P8	2 „ „ P31	71 „ „ 537a
1 „ „ P10	1 „ „ P34	70 „ „ 537b
1 „ „ P11	2 „ „ P44	1 „ „ 540
1 „ „ P13	1 „ „ P52	1 „ „ 611c
1 „ „ P15	2 „ „ P53	
2 „ „ P16	1 „ „ P55	
2 „ „ P17	2 „ „ P56	
1 „ „ P18	1 „ „ P58	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

Model No. 19 Sesquiplane



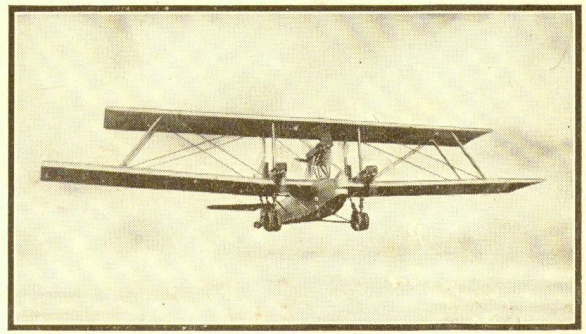
Sesquiplanes similar to Model No. 19 are not constructed in this country nor in many others, this type being favoured most particularly by the Italian Società Italiana Caproni, although not all the machines constructed by this firm are sesquiplanes. The most unusual feature of the type depicted in our model is that the longer wing is the lower and not the upper one. No machines of this kind have been constructed for commercial purposes, but the type is included here on account of its unusual interest.

Machines of this design were constructed by the Caproni firm. All were bombers and were fitted with anything up to six engines. The six-engined bomber was known as the Caproni Ca.90P.B. This machine was the largest bombing aeroplane then in existence, and was the possessor of six world's records. It was equipped with six 1,000 h.p. Isotta-Fraschini "Asso-1,000" engines, which gave it a maximum speed of 127.3 m.p.h.

Parts required:

1 of No. P1a	1 of No. P18a	1 of No. P55
1 „ „ P2a	1 „ „ P19	1 „ „ P56
1 „ „ P3	1 „ „ P20	1 „ „ P60
1 „ „ P4	2 „ „ P26	1 „ „ P64
1 „ „ P10	2 „ „ P27	6 „ „ 12
1 „ „ P11	4 „ „ P28	1 „ „ 16a
1 „ „ P13	1 „ „ P35	1 „ „ 82
1 „ „ P15	1 „ „ P40	49 „ „ 537a
2 „ „ P16	1 „ „ P41	47 „ „ 537b
2 „ „ P17	2 „ „ P44	1 „ „ 540
1 „ „ P18	2 „ „ P53	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.



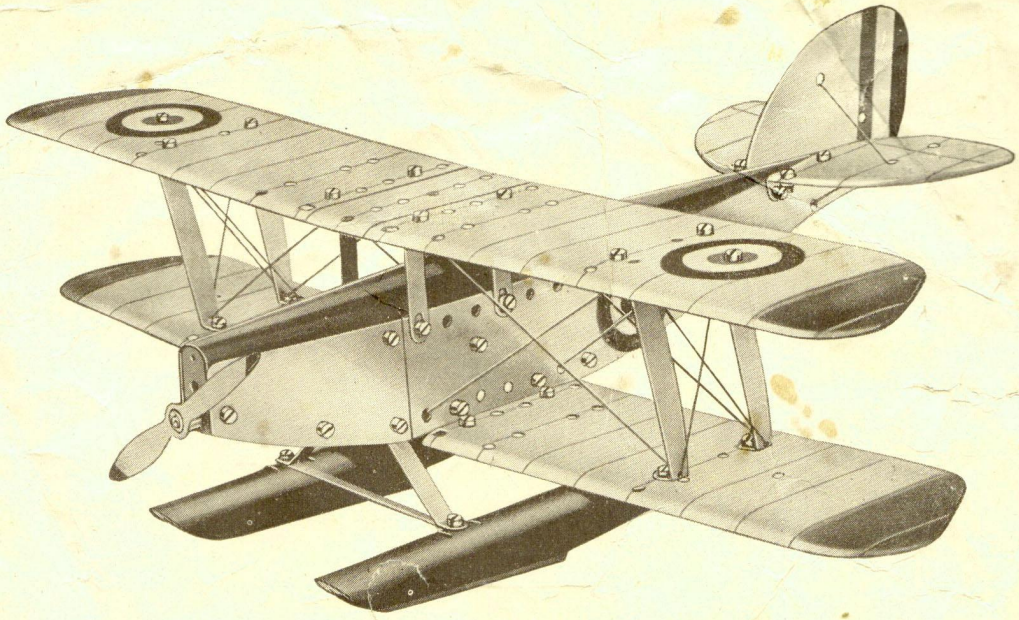
The six-engined Italian Caproni bomber, which was at one time the world's largest bombing machine.

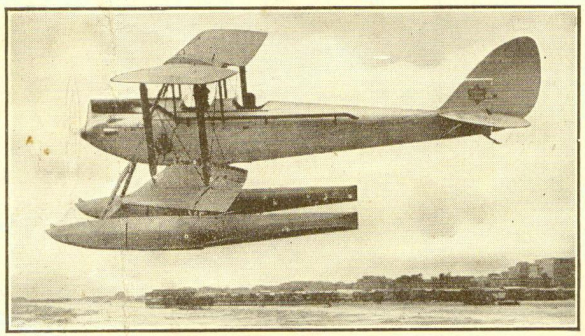
Model No. 20 Light Seaplane

Most of the light aeroplanes constructed in England can be obtained either as landplanes or fitted with floats for operation from water. The fitting of floats to a light aeroplane appreciably reduces its maximum speed, and makes the machine more difficult to fly. The floats are made of duralumin, an aluminium alloy that is exceedingly light and also does not readily corrode.

Seaplanes are not frequently seen in this country, but in Canada they and flying boats are almost the only types of aircraft used. 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. 20 shows a light aeroplane such as a D.H. "Hornet Moth" and D.H. "Dragonfly" fitted with floats in place of the normal land undercarriage.





A D.H. "Gipsy Moth" seaplane nearing the surface of the water.

Parts required:

1 of No. P1	1 of No. P18	2 of No. P56
1 „ „ P1a	1 „ „ P18a	2 „ „ P57
1 „ „ P2	1 „ „ P19	1 „ „ P64
1 „ „ P2a	1 „ „ P20	8 „ „ 12
1 „ „ P8	2 „ „ P24	1 „ „ 14
1 „ „ P10	2 „ „ P25	51 „ „ 537a
1 „ „ P11	4 „ „ P29	54 „ „ 537b
1 „ „ P13	4 „ „ P30	1 „ „ 540
1 „ „ P15	1 „ „ P34	1 „ „ 611c
2 „ „ P16	2 „ „ P42	
2 „ „ P17	1 „ „ P52	

The realism of this model may be increased by fitting the Pilot No. P100 in the cockpit.

MECCANO AEROPLANE CONSTRUCTOR PARTS

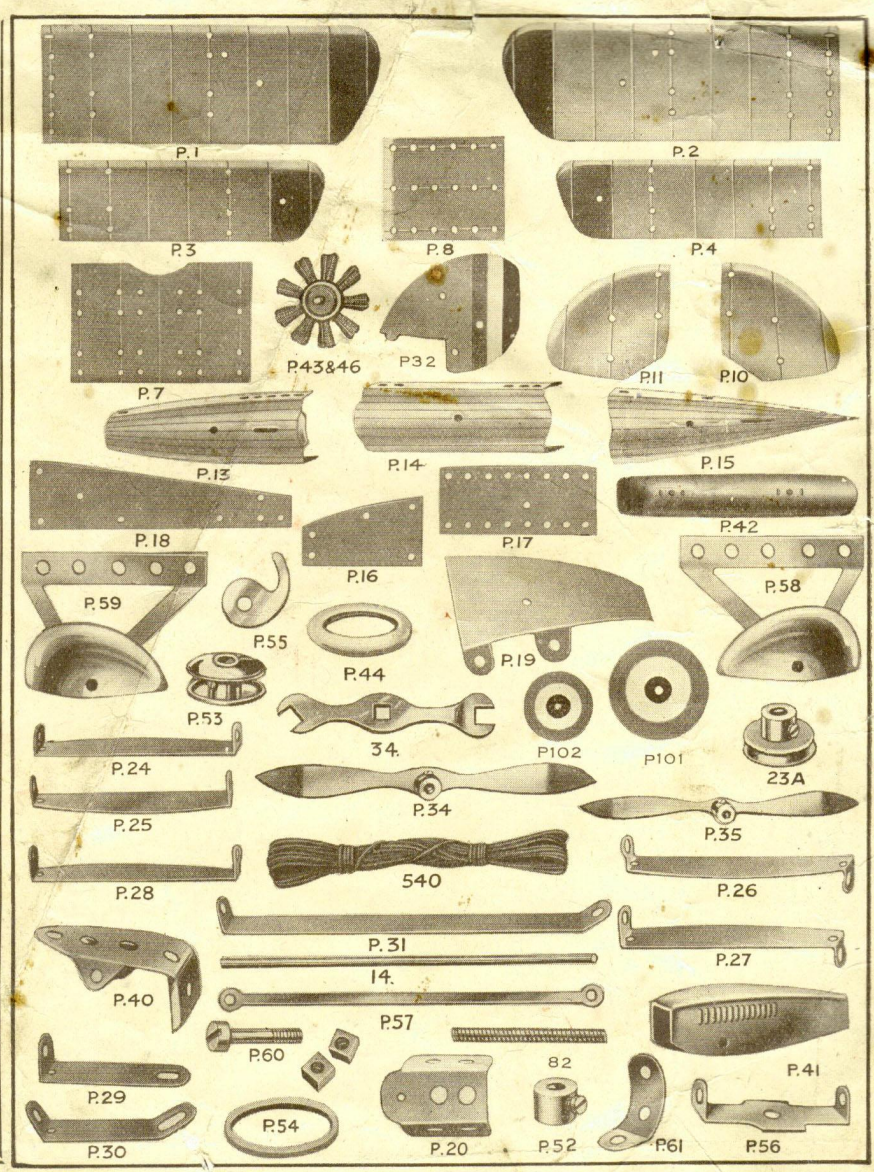
No.		No.	
	Main Plane	P53	Landing Wheel ... ...
‡P1	Large, Top, R.H.	‡P2 Top, L.H.	P54	Rubber Driving Band ...
P1a	,, Bottom, R.H.	P2a Bottom, L.H.	P55	Tail Skid ... ...
P3	Small—R.H.	P4 L.H.	P56	Rear Bracket for Propeller Shaft
P7	Centre Section Plane		P57	Tie Rod for Floats ... ...
P8	Extension Plane		P58	Undercarriage Vee Strut and Wheel Shield—R.H. ...
P10	Tail Plane—R.H.		P59	Undercarriage Vee Strut and Wheel Shield—L.H ...
P11	,, ,, L.H.		P60	Pivot Bolt with Two Nuts ...
	Fuselage Top		P61	Engine Bracket ... ...
P13	Front P14 Middle P15 Rear		P62	Axle Rod, 3¼" long ... ...
	Fuselage Side		P63	Screwdriver ... ...
P16	Front P17 Middle		P64	Rudder (Civil) ... ...
P18	Rear, R.H. P18a Rear, L.H.		P65	Tail Wheel ... ...
P19	Fuselage Underside P20 Front		P75	No. 1 Aero Manual ... ...
	Interplane Strut		P76	No. 2 Aero Manual... ...
P24	Staggered—R.H. P25 L.H.		P100	Pilot ... ...
P26	Angled—R.H. P27 L.H.		*P101	Identification Marking—Large
P28	Interplane Strut—Straight		*P102	,, ,, Small
P29	Centre Section Strut—Straight ...		12	Angle Brackets, ½" × ½" ...
P30	Float and Centre Section Strut—Angled		14	Axle Rod, 6½" long ... ...
P31	Wing Stay P32 Rudder (Military)		16a	,, ,, 2½" ,, ...
P34	Propeller—Large		23a	Fast Pulley, ½" diameter ...
P35	,, Small		34	Spanner ... ...
P40	Base for Engine Casing		82	Screwed Rod, 1" long ...
P41	Top for Engine Casing		537a	Nuts 537b Bolts, 7/32" long
P42	Float, Complete		540	Hank of Cord ... ...
P43	Radial Engine—Small		611c	Bolts, ⅜" long ... ...
P44	Rubber Tyre for Landing Wheels ...			
P45	Radial Engine—Large			
P52	Collar			

** The series includes identification markings in the correct colours of 16 different countries.*

‡ The large Mainplanes (Parts Nos. P1 and P2) can be obtained without civil registration letters, for use with Military Markings, to special order.

CONTENTS OF MECCANO AEROPLANE CONSTRUCTOR OUTFIT NO. 2

No.		Quantity	No.		Quantity
	Main Plane—Large		P52	Collar	1
P1	Top, R.H. 1 P1a Bottom, R.H.	1	P53	Landing Wheel	2
P2	Top, L.H. 1 P2a Bottom, L.H.	1	P54	Rubber Driving Band	1
P3	Small—R.H. ... 1 P4 L.H. ...	1	P55	Tail Skid	1
P7	Centre Section Plane	1	P56	Rear Bracket for Propeller Shaft ...	2
P8	Extension Plane	2	P57	Tie Rods for Float	2
P10	Tail Plane—R.H. ... 1 P11 L.H.	1	P58	Undercarriage Vee Strut and Wheel Shield—R.H.	1
	Fuselage Top		P59	Undercarriage Vee Strut and Wheel Shield—L.H.	1
P13	Front ... 1 P14 Middle ... 1 P15 Rear	1	P60	Pivot Bolt with Two Nuts ...	4
	Fuselage Side		P61	Engine Bracket	3
P16	Front ... 2 P17 Middle ...	4	P62	Axle Rod, 3¼" long	1
P18	Rear, R.H. 1 P18a Rear, L.H.	1	P63	Screwdriver	1
P19	Fuselage Underside	1	P64	Rudder (Civil)	1
P20	,, Front	1	P76	No. 2 Aero Manaul	
	Interplane Strut		P100	Pilot	1
P24	Staggered—R.H. 4 P25 Staggered—L.H.	4	12	Angle Brackets, ½" × ½"	8
P26	Angled—R.H. 2 P27 Angled—L.H.	2	14	Axle Rod, 6½" long	1
P28	Interplane Strut—Straight	8	16a	,, ,, 2½" ,, ...	1
P29	Centre Section Strut—Straight ...	4	23a	Fast Pulley, ½" diameter	2
P30	Float and Centre Section Strut—Angled	8	34	Spanner	1
P31	Wing Stay	2	82	Screwed Rod, 1" long	2
P34	Propeller—Large	1	537a	Nuts	100
P35	,, Small	3	537b	Bolts, 7/32" long	100
P40	Base for Engine Casing	2	540	Hank of Cord	1
P41	Top for Engine Casing	2	611c	Bolts, ⅜" long	2
P42	Float, Complete	2			
P43	Radial Engine—Small	3			
P44	Rubber Tyre for Landing Wheels ...	2			



Printed in England