

No. 36-1 AC

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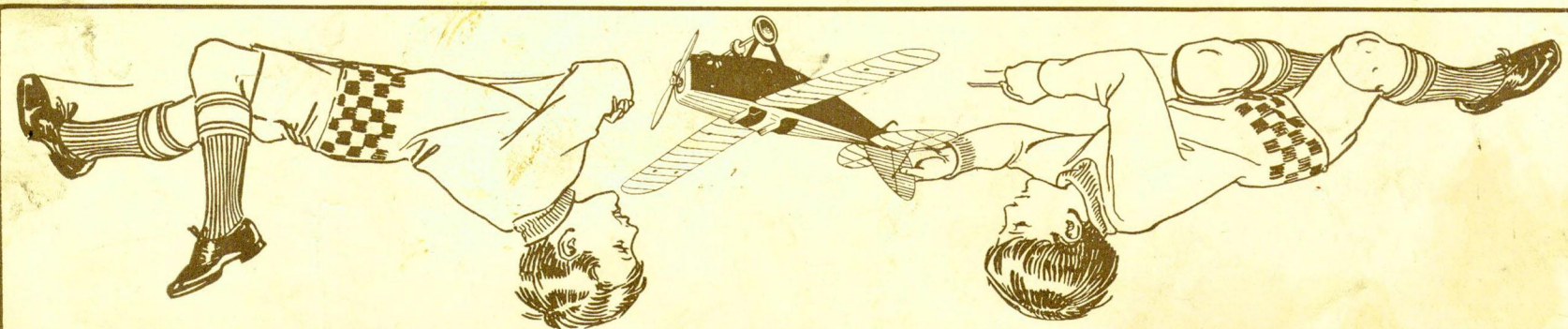
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OUTFIT No. 1

AEROPLANE CONSTRUCTOR

for

Instructions



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 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 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 manoeuvring 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 is operated by the feet. This bar controls the rudder, which is the second main portion of the tail unit.

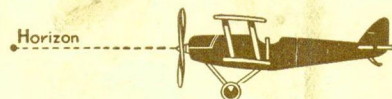
Joy-Stick and Rudder

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."

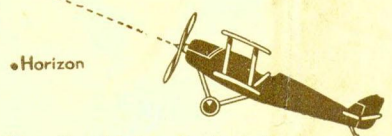
If you find that the aeroplane is veering to the left, you put on right rudder by moving the right foot gently forward; and similarly veering to the right is corrected by applying left rudder. If you wish to turn the aeroplane round, however, you must not attempt to do it by rudder alone, because in 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, the sequence of these operations is reversed, the machine gliding to land with the engine cut out.

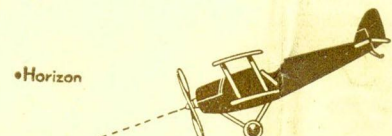
The aeroplanes used for training purposes have two cockpits, one in front of the other, the controls in each being exactly the same, and connected together. This arrangement enables the instructor, who sits in the front cockpit, to see exactly what manipulations are being made by the pupil behind, and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



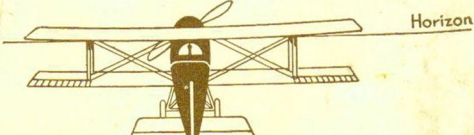
When the control column or "joy-stick" is vertical, the elevator is horizontal, and the machine flies parallel with the ground.



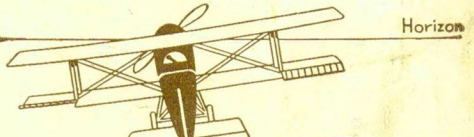
When the stick is pulled back, the elevator is raised and the machine climbs.



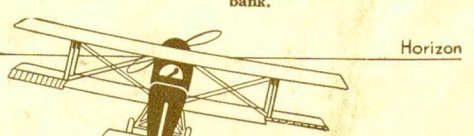
Pushing the stick forward causes the machine to put down its nose and dive.



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 go down, producing left bank.



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

AEROPLANE CONSTRUCTOR PARTS

No.	Mainplanes	No.	Collar
P1	Large—R.H.	P32	Collar
P3	Small—R.H.	P33	Landing Wheel
P7	Centre Section Plane	P34	Rubber Driving Band
P8	Extension Plane	P35	Tail Skid
P10	Tail Plane—R.H.	P36	Rear Bracket for Propeller Shaft
P11	" " L.H.	P37	Tie Rod for Floats
P13	Front Fuselage Top	P38	Undercarriage Vee Strut and Wheel Shield—R.H.
P14	Middle Fuselage Sides	P39	Undercarriage Vee Strut and Wheel Shield—L.H.
P16	Front Fuselage Sides	P40	Pivot Bolt with Two Nuts
P19	Fuselage Underside	P41	Engine Bracket
P24	Staggered—R.H.	P42	Axle Rod, 3 1/4" long
P26	Angled—R.H.	P43	Screwdriver
P28	Interplane Strut—Straight	P44	Rudder (Plain)
P29	Centre Section Strut—Straight	P45	Adjustable Tail Wheel
P30	Float and Centre Section Strut—Angled	P46	Pilot
P31	Wing Stay	P47	Identification Marking—Large
P32	Rudder (Military)	P48	" " Small
P34	Propeller—Large	P49	Angle Bracket, 1/2" x 1/2"
P35	" " Small	P50	Axle Rod, 6 1/2" long
P40	Base for Engine Casing	P51	" " 2 1/2"
P41	Top for Engine Casing	P52	Fast Pulley, 1/2" diameter
P42	Float, Complete	P53	Spanner
P43	Radial Engine—Small	P54	Screwed Rod, 1" long
P44	Rubber Tyre for Landing Wheel	P55	Nuts 537b Bolts, 7/32" long
P46	Radial Engine—Large	P56	Hank of Cord
		P57	Bolts, 1/2" long

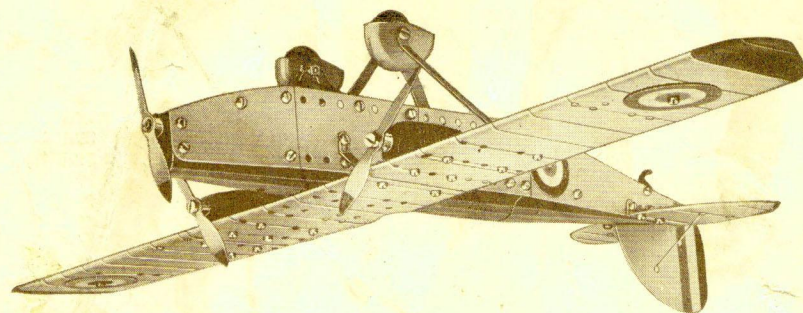
*The series includes identification markings in the correct colours of 16 different countries. †Can be obtained in three different colour combinations.

CONTENTS OF AEROPLANE CONSTRUCTOR OUTFIT No. 1

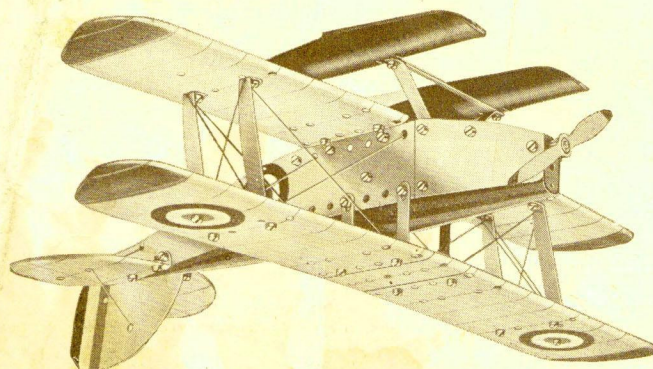
No.	Quantity	No.	Quantity
P1	1	P54	1
P2	2	P55	1
P3	2	P56	2
P7	1	P58	1
P8	1	P59	1
P10	1	P62	1
P11	1	P63	1
P13	1	P100	1
P14	2	P101	2
P16	2	P102	2
P19	1	P12	8
P20	1	P14	1
P24	2	P23a	2
P25	1	P34	1
P28	4	P37a	60
P29	4	P37b	58
P31	2	P540	1
P32	1	P611c	2
P34	1		
P44	2		
P52	1		
P53	2		

Ask your dealer for a Complete price list of Aeroplane Parts

Another fine model that can be built with Aeroplane Constructor OUTFIT No. 2 (or No. 1) is a triple-engine monoplane air liner and is similar in design to the famous "Southern Cross" flown by the late Sir Charles Kingsford Smith.



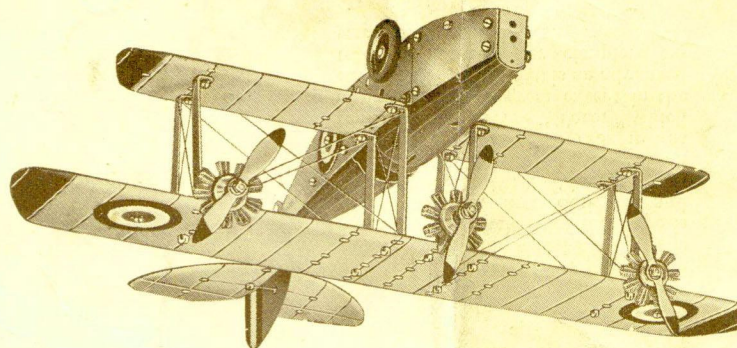
Another interesting model that can be built with Aeroplane Constructor OUTFIT No. 2 (or No. 1) and No. 1a OUTFITS. Instructions for building three aeroplanes are given, one of these being of similar design to the Italian Machi machine that holds the world's speed record.



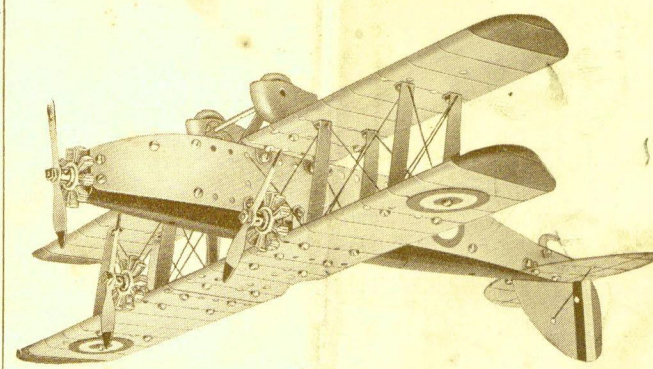
Now that you have experienced the pleasure of building model aeroplanes you will be keen on proceeding further with do this by purchasing a No. 1a Aeroplane Constructor Accessory OUTFIT, with which many additional models can be built, or you may increase the scope of your No. 1 OUTFIT by adding to it separate parts from time to time. The four illustrations on this page show the types of machine you can build when you have a No. 1a Accessory OUTFIT. These include models of military aircraft, seaplanes and flying boats, and air liners of both mono-plane and biplane types.

Ask your dealer for a complete illustrated Price List.

Many amphibians and flying boats can be built with Aeroplane Constructor OUTFIT No. 2. This is an example of the many true-to-type biplanes that can be built with the No. 2 OUTFIT (or No. 1 and No. 1a OUTFITS).



A triple-engine biplane constructed with Aeroplane Constructor OUTFIT No. 2. This is an example of the many true-to-type biplanes that can be built with the No. 2 OUTFIT (or No. 1 and No. 1a OUTFITS).



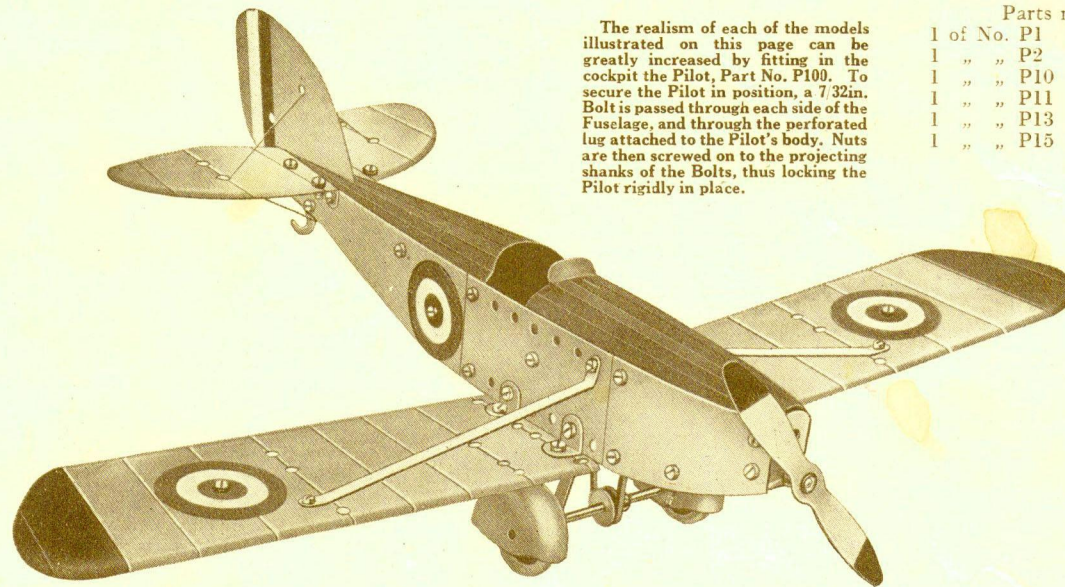
All these Fine Models can be built with Aeroplane Constructor Outfit No. 1

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, and have greatly increased in popularity during recent years. They are largely used on German air lines, notable examples being the Junkers machines.

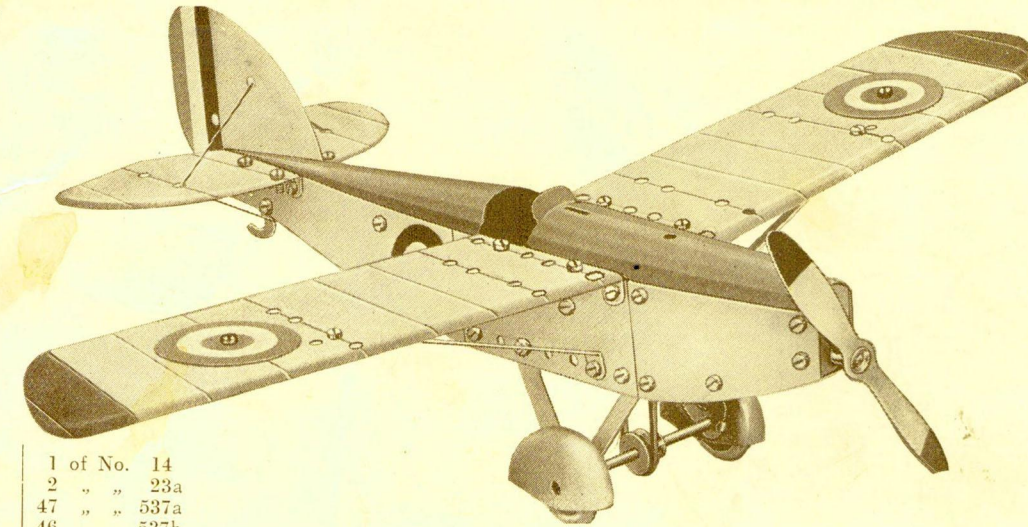
Typical British low wing monoplanes are the Percival "Mew Gull" single-seater high-speed monoplane, the Bristol 133 single-seater fighter, and the D.H. "Comet" that distinguished itself in the England-Australia Air Race of 1934.



The realism of each of the models illustrated on this page can be greatly increased by fitting in the cockpit the Pilot, Part No. P100. To secure the Pilot in position, a 7/32in. 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.

Parts required:	
1 of No. P1	2 of No. P16
1 " P2	2 " P17
1 " P10	2 " P18
1 " P11	1 " P19
1 " P13	1 " P20
1 " P15	2 " P31
	2 " P32
	2 " P34
	2 " P44
	2 " P52
	2 " P53
	2 " P54
	2 " P55
	2 " P56
	2 " P58
	2 " P59
	2 " P62
	2 " P101
	2 " P102
	8 " 12
	1 " 14
	2 " 23a
	42 " 537a
	42 " 537b
	1 " 540
	1 " 611c

Parts required:	
1 of No. P1	2 of No. P16
1 " P2	2 " P17
1 " P10	2 " P18
1 " P11	1 " P19
1 " P13	1 " P20
1 " P15	2 " P31
	2 " P32
	2 " P34
	2 " P44
	2 " P52
	2 " P53
	2 " P54
	2 " P55
	2 " P56
	2 " P58
	2 " P59
	2 " P62
	2 " P101
	2 " P102
	8 " 12



1 of No. 14	2 of No. 23a
47 " 537a	46 " 537b
1 " 540	1 " 611c

High wing monoplanes are usually more stable than the low wing type, and the view downwards is much better, being practically unobstructed.

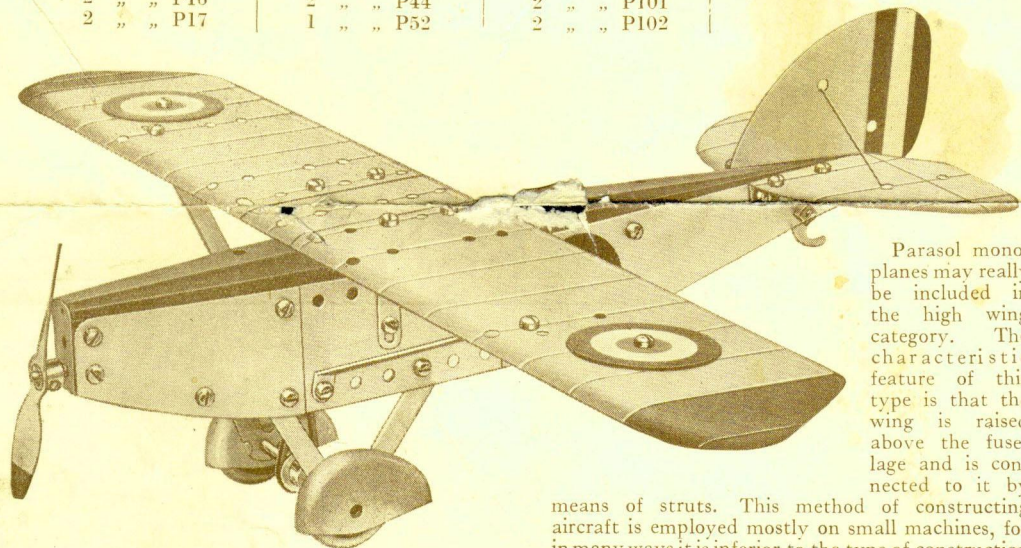
Machines of this type are used in all parts of the world, and they range from small single-seater machines to huge aircraft seating as many as 34 people.

The de Havilland "Leopard Moth" is a good example of a British light high wing monoplane of the cabin type. This is a three-seater in which the two passengers sit side-by-side behind the pilot. Other notable machines include the Heston "Phoenix," a five-seater of similar type; and among military aircraft are the Bristol 130 and Handley Page H.P.51 which are large twin-engined Bomber-Transport Monoplanes.

Model No. 3 Parasol Monoplane

Parts required:	
1 of No. P1	2 of No. P18
1 " P2	1 " P19
1 " P8	1 " P20
1 " P10	2 " P29
1 " P11	2 " P31
1 " P13	1 " P32
1 " P15	1 " P34
2 " P16	2 " P44
2 " P17	1 " P52
	2 " P53
	1 " P54
	2 " P55
	2 " P56
	1 " P58
	1 " P59
	2 " P62
	2 " P101
	2 " P102

4 of No. 12	1 " 14
1 " 23a	43 " 537a
42 " 537b	1 " 540
1 " 611c	



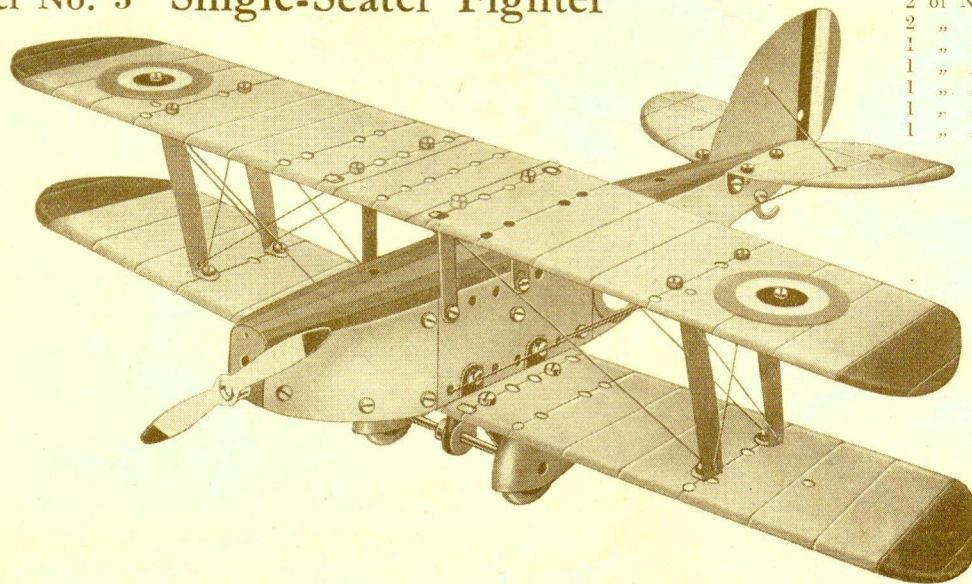
Parasol monoplanes may really be included in the high wing category. The characteristic feature of this type is that the wing is raised above the fuselage and is connected to it by means of struts. This method of constructing aircraft is employed mostly on small machines, for in many ways it is inferior 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.

Model No. 5 Single-Seater Fighter

Single-seater fighter machines are very fast aeroplanes, the function of which is to patrol certain sections of sky so that no enemy aircraft can pass. Recently a new type of machine known as the interceptor fighter has been produced. This is an extremely fast craft, capable of climbing high enough to intercept enemy bombers intent on raiding London, and whose approach is not discovered until they pass the coast. In these aeroplanes military load and fuel capacity are sacrificed to an exceedingly fast climb and a high maximum speed.

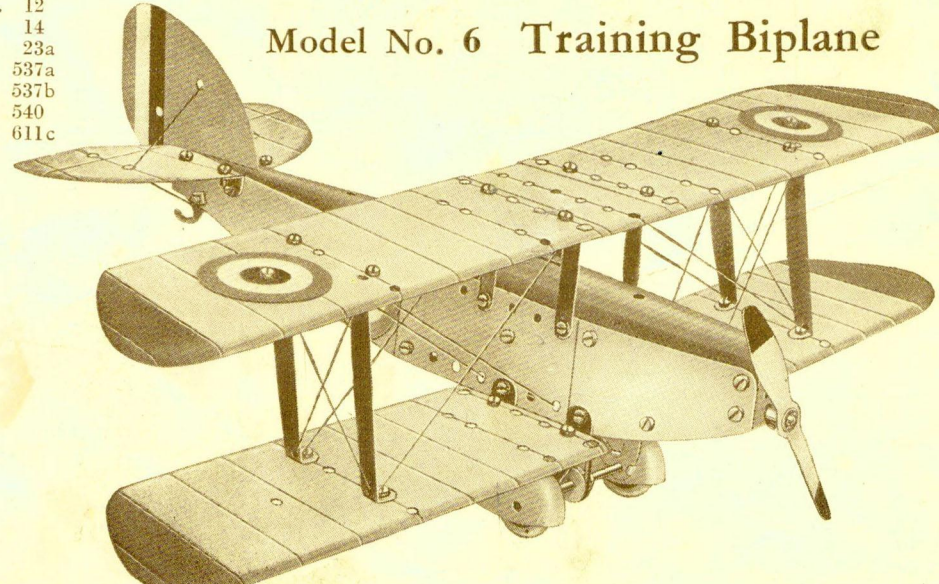
The world's best-known single-seater fighter probably is the Bristol "Bulldog," a machine that is used in the R.A.F. and in the Air Forces of many foreign countries. The Hawker "Super-Fury" is a single-seater interceptor fighter capable of very high performance.



Parts required:	
2 of No. P1	2 of No. P16
2 " P2	2 " P17
1 " P8	2 " P18
1 " P10	1 " P19
1 " P11	1 " P20
1 " P13	2 " P24
1 " P15	2 " P25
	4 " P29
	1 " P32
	1 " P34
	2 " P44
	1 " P52
	2 " P53
	2 " P54
	1 " P55
	2 " P56
	1 " P58
	1 " P59
	2 " P62
	2 " P101
	2 " P102
	8 " 12
	1 " 14
	2 " 23a
	55 " 537a
	54 " 537b
	1 " 540
	1 " 611c

Parts required:	
2 of No. P1	8 of No. 12
2 " P2	1 " 14
1 " P8	2 " 23a
1 " P10	53 " 537a
1 " P11	52 " 537b
1 " P13	1 " 540
1 " P15	1 " 611c
2 " P16	
2 " P17	
2 " P18	
1 " P19	
1 " P20	
2 " P24	
2 " P25	
4 " P29	
1 " P32	
1 " P34	
2 " P44	
1 " P52	
2 " P53	
1 " P54	
1 " P55	
1 " P56	
1 " P58	
1 " P59	
2 " P62	
1 " P101	
2 " P102	

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, but its landing speed must be low. A biplane is best 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.

INSTRUCTIONS

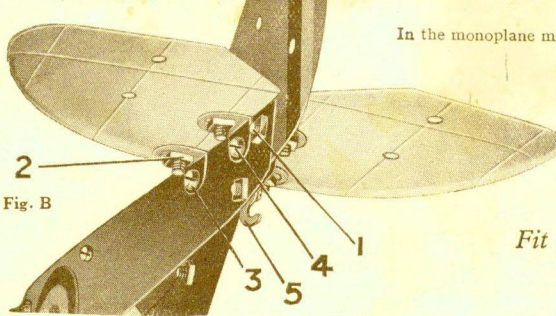
How to Build Model Aeroplanes with Aeroplane Constructor Outfit No. 1

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 61" Axle Rod 1, and the Rod is then pushed through the lower hole in the Fuselage Front. A 1/2" 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 61" Axle Rod 1 is kept in place by means of the Collar 4. The 31" Axle Rod (part No. P62) is pushed through one Undercarriage Vee Strut and Wheel Shield and a 1/2" Fast Pulley 6 and Rubber Band 4 are placed on the Axle. When fitting the Driving Band in position take care to see that it is twisted in such a manner that the Propeller rotates in a clockwise direction when the model is moved forward. 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 31" 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 31" 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 it may then be rotated by the Screwdriver.

After the Landing Wheels have been secured in place the Driving Band may be placed round the groove in the 1/2" Pulley 2 and also round the groove of the Pulley 6. The Pulleys 2 and 6 are then locked in position on their respective Rods by means of the grub-screws in their bosses.

ASSEMBLING THE TAIL PLANES AND RUDDER

The method of assembling the Tail Planes and Rudder is shown in Fig. B. Two Angle Brackets are bolted to the fuselage by a 1/2" Bolt 3. A 1/2" Bolt 4 is passed through the rear Angle Bracket, the Fuselage Side and Top Rear sections, and through the rear Angle Bracket. A Nut is placed upon the end of the Bolt and the Bolt is screwed up tightly so that the Tail Planes are held in position. The Rudder is on the front portion of the 7/32" Bolt 1.



METHOD OF FITTING THE MAINPLANES

In the monoplane models (with the exception of Model No. 3), the Mainplanes are secured to the fuselage by means of Angle Brackets. In Model No. 3, two Wing Stays and two Centre Section (Straight) Struts are used to support the wing above the fuselage. The wing in this model is composed of two Large Mainplane sections, and one Extension Plane which are overlapped and bolted together.

In the biplane models, when the top wing is "staggered," that is to say, is not mounted vertically above the lower wing, the Staggered Interplane Struts are used. In other biplane models, the Straight Interplane Struts are employed.

The method of securing the bracings (lengths of Meccano Cord) between the Struts will be clear from the illustrations.

Fit an Aero Clockwork Motor into your Model Aeroplanes.

Ask your dealer for prices and full particulars.