

No. 38-1 AC

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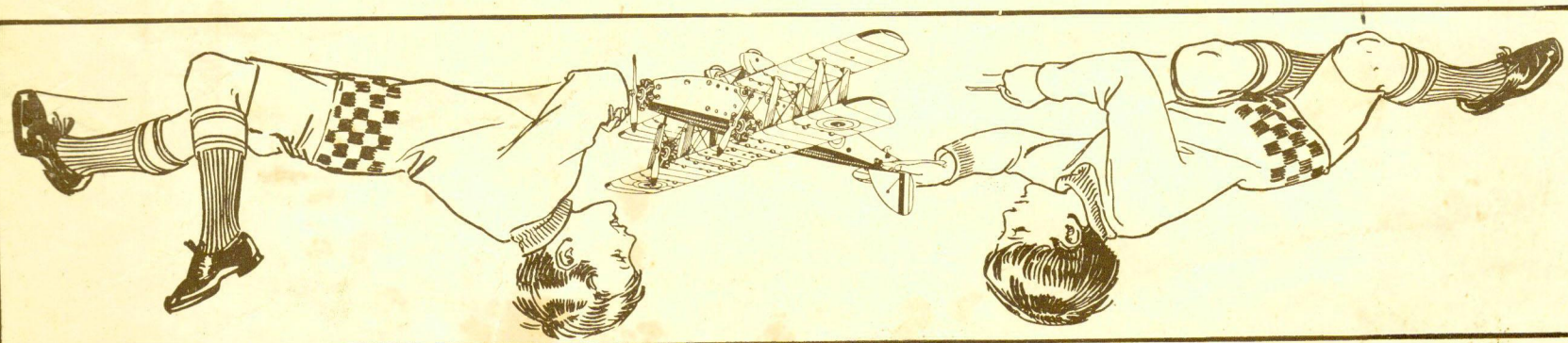
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OUTFIT No. 1

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 today 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 many other equally realistic 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 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.

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."

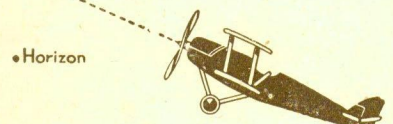
If you find that the aeroplane is veering to the left, you put on right rudder by moving the right foot gently forward; and similarly veering to the right is corrected by applying left rudder. If you wish to turn the aeroplane round, however, you must not attempt to do it by rudder alone, because in 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 checks 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.

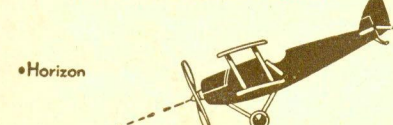
The aeroplanes used for training purposes have two cockpits, one in front of the other, the controls in each being exactly the same, and connected together. This arrangement enables the instructor, who sits in the front cockpit, to see exactly what manipulations are being made by the pupil behind, and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



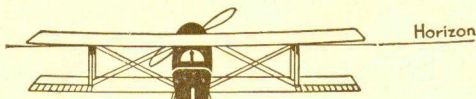
When the control column or "joy-stick" is vertical, the elevator is horizontal, and the machine flies parallel with the ground.



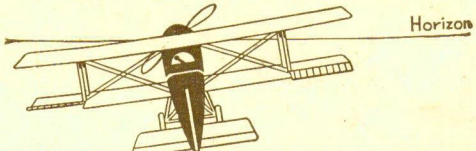
When the stick is pulled back, the elevator is raised and the machine climbs.



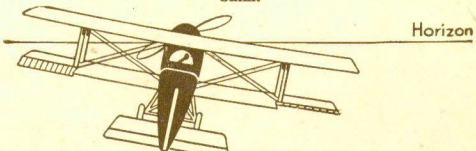
Pushing the stick forward causes the machine to put down its nose and dive.



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, Top, R.H.	P52	Landing Wheel
P2	Bottom, R.H.	P53	Rubber Driving Band
P3	Small—R.H.	P54	Tail Skid
P4	Top, L.H.	P55	Rear Bracket for Propeller Shaft
P5	Bottom, L.H.	P56	Tie Rod for Floats
P6	Extension Plane	P57	Undercarriage Vee Strut and Wheel Shield—R.H.
P7	Centre Section Plane	P58	Undercarriage Vee Strut and Wheel Shield—L.H.
P8	Extension Plane	P59	Pivot Bolt with Two Nuts
P9	Tail Plane—R.H.	P60	Engine Bracket
P10	Tail Plane—L.H.	P61	Axle Rod, 6 1/2" long
P11	Fuselage Top	P62	Screwdriver
P12	Fuselage Sides	P63	Rudder (Civil)
P13	Front	P64	Adjustable Tail Wheel
P14	Middle	P65	No. 1 Aero Manual
P15	Rear	P66	No. 2 Aero Manual
P16	Front	P67	Pilot
P17	Middle	P68	Identification Marking—Large
P18	Rear, R.H.	P69	Identification Marking—Small
P19	Rear, L.H.	P70	Angle Bracket, 1/2" x 1/2"
P20	Fuselage Underside	P71	Axle Rod, 6 1/2" long
P21	Interplane Struts	P72	Fast Pulley, 1/2" diameter
P22	Staggered—R.H.	P73	Spanner
P23	Staggered—L.H.	P74	Screwed Rod, 1" long
P24	Interplane Strut—Straight	P75	Nuts, 5/32" Bolts, 7/32" long
P25	Centre Section Strut—Straight	P76	Hank of Cord
P26	Float and Centre Section Strut—Angled	P77	Bolts, 1/2" long
P27	Wing Stay	P78	Collar
P28	Propeller—Large	P79	Landing Wheel
P29	Propeller—Small	P80	Rubber Driving Band
P30	Base for Engine Casing	P81	Tail Skid
P31	Top for Engine Casing	P82	Rear Bracket for Propeller Shaft
P32	Float, Complete	P83	Undercarriage Vee Strut and Wheel Shield—R.H.
P33	Radial Engine—Small	P84	Undercarriage Vee Strut and Wheel Shield—L.H.
P34	Radial Engine—Large	P85	Pivot Bolt with Two Nuts
P35	Radial Engine—Large	P86	Engine Bracket
P36	Radial Engine—Large	P87	Axle Rod, 6 1/2" long
P37	Radial Engine—Large	P88	Screwdriver
P38	Radial Engine—Large	P89	Rudder (Civil)
P39	Radial Engine—Large	P90	Adjustable Tail Wheel
P40	Radial Engine—Large	P91	No. 1 Aero Manual
P41	Radial Engine—Large	P92	No. 2 Aero Manual
P42	Radial Engine—Large	P93	Pilot
P43	Radial Engine—Large	P94	Identification Marking—Large
P44	Radial Engine—Large	P95	Identification Marking—Small
P45	Radial Engine—Large	P96	Angle Bracket, 1/2" x 1/2"
P46	Radial Engine—Large	P97	Axle Rod, 6 1/2" long
P47	Radial Engine—Large	P98	Fast Pulley, 1/2" diameter
P48	Radial Engine—Large	P99	Spanner
P49	Radial Engine—Large	P100	Screwed Rod, 1" long
P50	Radial Engine—Large	P101	Nuts, 5/32" Bolts, 7/32" long
P51	Radial Engine—Large	P102	Hank of Cord
P52	Radial Engine—Large	P103	Bolts, 1/2" long

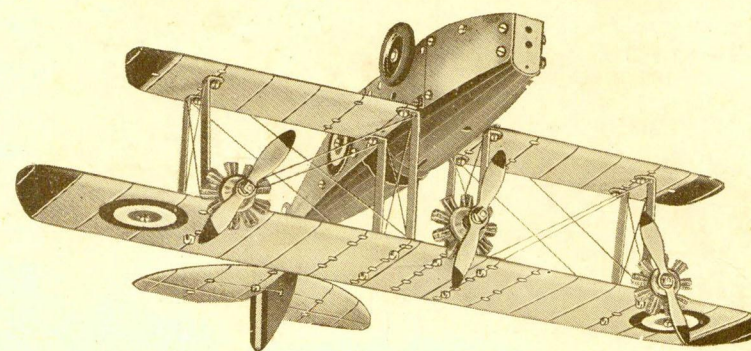
*The series includes identification markings in the correct colours of 16 different countries.
†The large Mainplanes (Parts Nos. P1 and P2) can be obtained without civil registration letters, for use with Military Identification Markings, to special order.

CONTENTS OF AEROPLANE CONSTRUCTOR OUTFIT No. 1

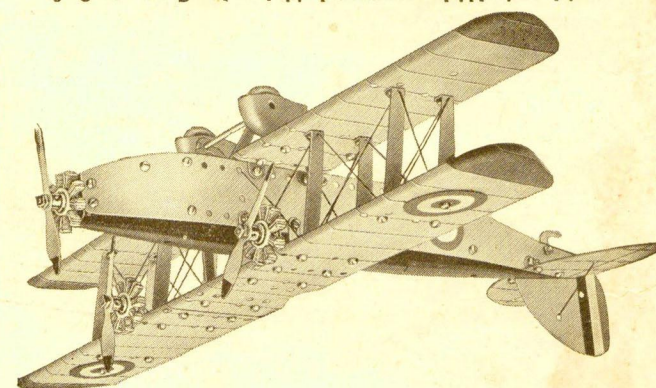
No.	Quantity	No.	Quantity
P1	1	P52	1
P2	1	P53	2
P3	1	P54	1
P4	1	P55	1
P5	1	P56	2
P6	1	P57	1
P7	1	P58	1
P8	1	P59	1
P9	1	P60	1
P10	1	P61	1
P11	1	P62	1
P12	1	P63	1
P13	1	P64	1
P14	1	P65	1
P15	1	P66	1
P16	1	P67	1
P17	1	P68	1
P18	1	P69	1
P19	1	P70	1
P20	1	P71	1
P21	1	P72	1
P22	1	P73	1
P23	1	P74	1
P24	1	P75	1
P25	1	P76	1
P26	1	P77	1
P27	1	P78	1
P28	1	P79	1
P29	1	P80	1
P30	1	P81	1
P31	1	P82	1
P32	1	P83	1
P33	1	P84	1
P34	1	P85	1
P35	1	P86	1
P36	1	P87	1
P37	1	P88	1
P38	1	P89	1
P39	1	P90	1
P40	1	P91	1
P41	1	P92	1
P42	1	P93	1
P43	1	P94	1
P44	1	P95	1
P45	1	P96	1
P46	1	P97	1
P47	1	P98	1
P48	1	P99	1
P49	1	P100	1

Ask your dealer for a Complete price list of Aeroplane Parts

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 combined). This illustration shows one of the most interesting of them. It is a model of a triple-engine amphibian.

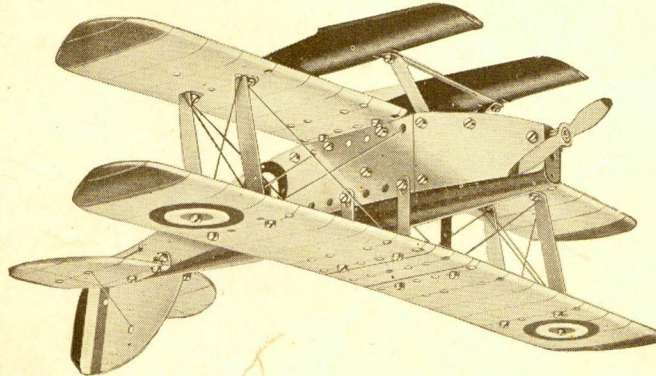


A triple-engine biplane constructed with Aeroplane Constructor Outfit No. 2. This is an example of the many true-to-type biplanes that can be built with the No. 2 Outfit (or No. 1 and No. 1a Outfits combined).

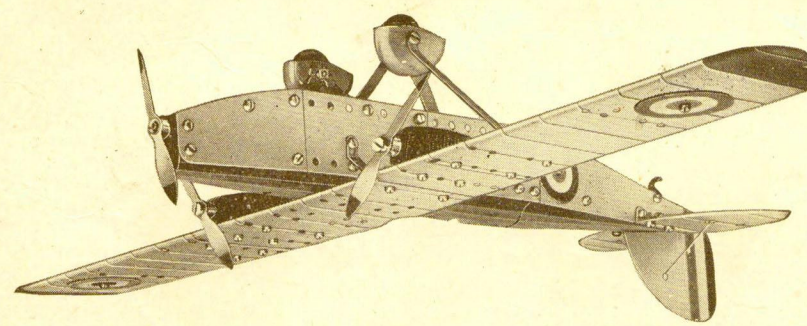


Now that you have expended the pleasure of building model aeroplanes you will be keen on proceeding further with this wonderful hobby. You may do this by purchasing a No. 1a Aeroplane Constructor Accessory Outfit, with which many additional parts may be added to your No. 1 Outfit by adding to it separate 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 light aeroplanes, seaplanes and flying boats, and commercial air liners of both monoplane and biplane types.

Ask your dealer for a complete illustrated Price List.



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



Another fine model that can be built with Aeroplane Constructor Outfit No. 2 (or No. 1 and No. 1a Outfits combined). It 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.

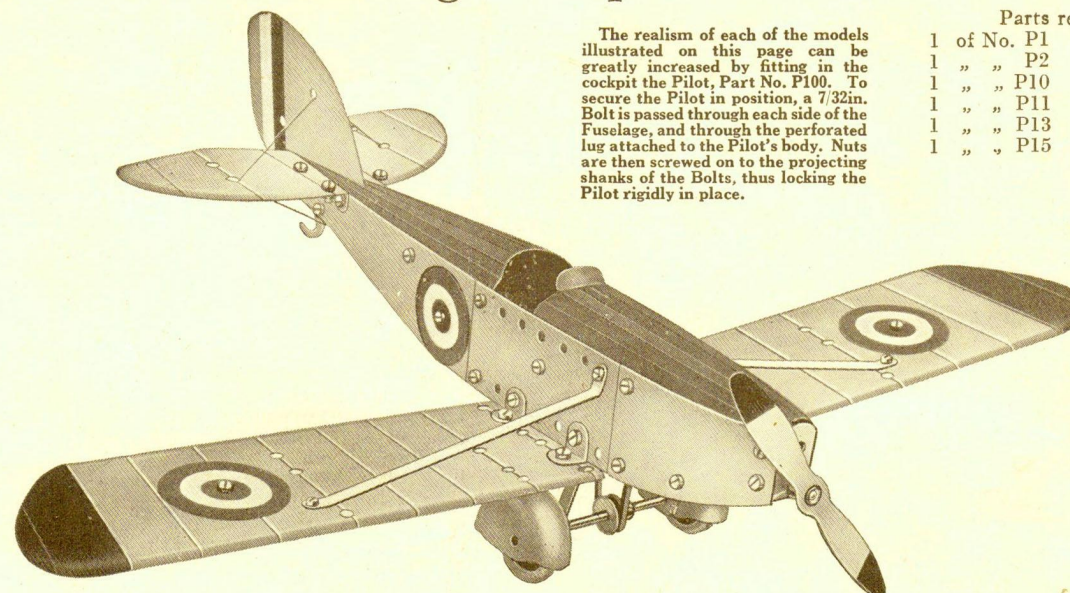
AEROPLANE CONSTRUCTOR ACCESSORY OUTFIT No. 1a will enable you to build many additional models

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, middle wing and the high wing 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.

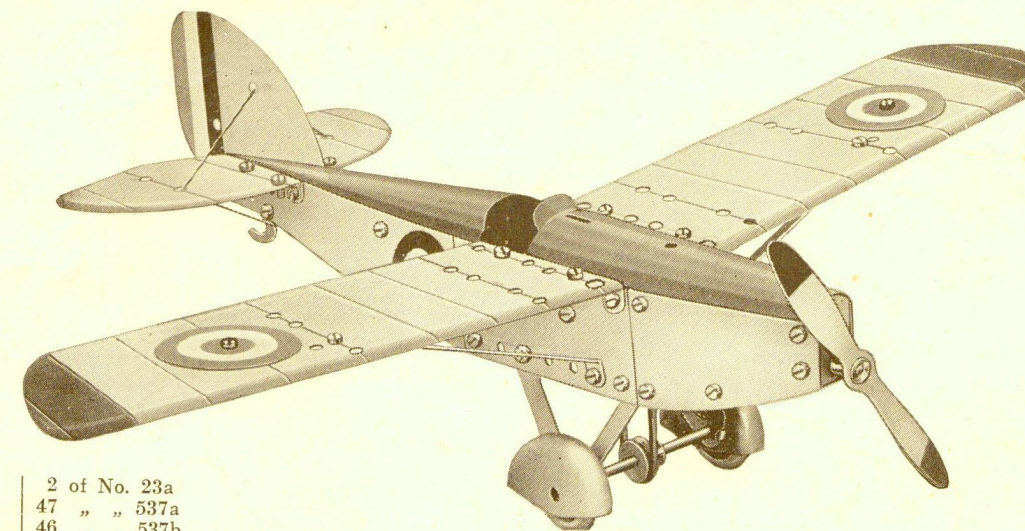
A typical British low wing monoplane is the Miles "Magister," a two-seater training machine. It is fitted with a 130 h.p. D.H. "Gipsy Major" engine that gives it a top speed of 145 m.p.h.



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	1	" "	P18
1	" "	P11	1	" "	P18a
1	" "	P13	1	" "	P19
1	" "	P15	1	" "	P20
			2	" "	P31
			1	" "	P34
			2	" "	P44
			1	" "	P52
			2	" "	P53
			1	" "	P54
			2	" "	P55
			1	" "	P56
			1	" "	P58
			1	" "	P59
			1	" "	P62
			1	" "	P64
			8	" "	12
			1	" "	14
			2	" "	23a
			43	" "	537a
			42	" "	537b
			1	" "	540
			1	" "	611

Model No. 2 High Wing Monoplane



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 40 people.

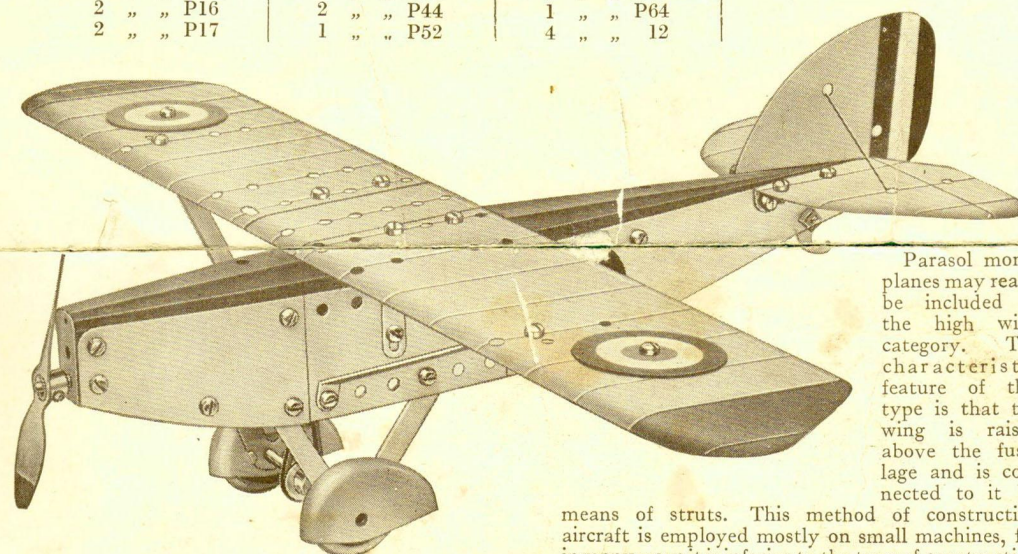
The B.A. "Double-Eagle" is a good example of a British light high wing monoplane of the cabin type. This is a six-seater in which the pilot's compartment is in front of the passenger cabin. Other notable machines include the Heston "Phoenix," a five-seater of similar type. A good example of a military high wing monoplane is the Westland "Lysander" army co-operation machine.

Parts required :		
1	of No. P1	
1	" " P2	
1	" " P10	
1	" " P11	
1	" " P13	
1	" " P15	
2	" " P16	
2	" " P17	
1	" " P18	
1	" " P18a	
1	" " P19	
1	" " P20	
2	" " P31	
1	" " P34	
2	" " P44	
1	" " P52	
2	" " P53	
1	" " P54	
1	" " P55	
2	" " P56	
1	" " P58	
1	" " P59	
1	" " P62	
1	" " P64	
8	" " 12	
1	" " 14	

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

Model No. 3 Parasol Monoplane

Parts required of			
1 of No. P1	1 of No. P18	2 of No. P53	1 of No. 14
1 " " P2	1 " " P18a	1 " " P54	2 " " 23a
1 " " P8	1 " " P19	1 " " P55	43 " " 537a
1 " " P10	1 " " P20	2 " " P56	42 " " 537b
1 " " P11	2 " " P29	1 " " P58	1 " " 540
1 " " P13	2 " " P31	1 " " P59	1 " " 611c
1 " " P15	1 " " P34	1 " " P62	
2 " " P16	2 " " P44	1 " " P64	
2 " " P17	1 " " P52	4 " " 12	



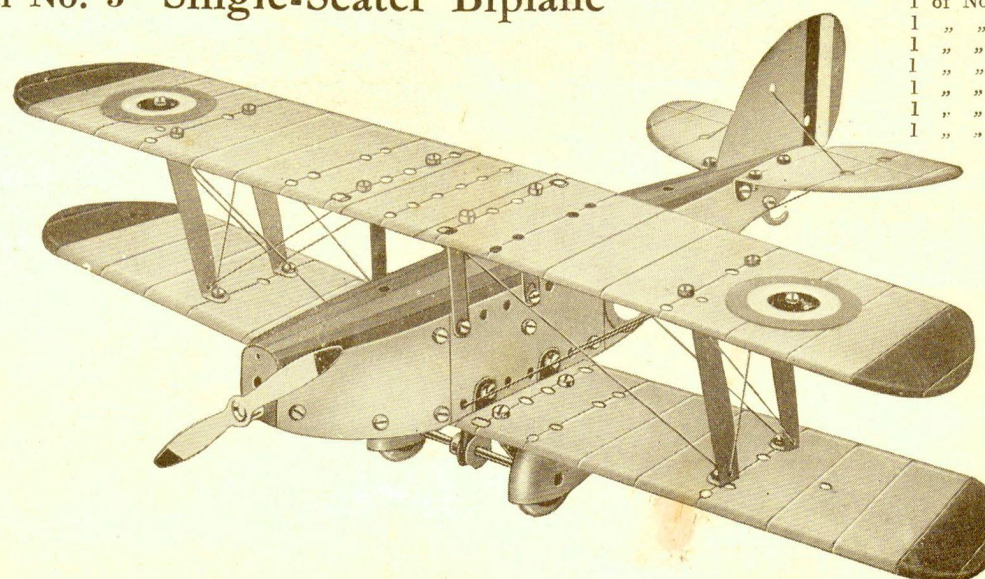
Parasol monoplanes may really be included in the high wing category. The characteristic feature of this type is that the wing is raised above the fuselage and is connected to it by

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.

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

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 61st Axle Rod 1, and the Rod is then pushed through the lower hole in the Fuselage Front. A 1st 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 61st Axle Rod 1 is kept in place by means of the Collar 4. The 3rd Axle Rod (part No. P42) is pushed through one of the Undercarriage Vee Struts and Wheel Shield and a Fast Pulley and Rubber Band 5 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 and secured to the Undercarriage Vee Strut. The end of the 3rd 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 the Wheel Shield. To do this the 3rd Axle is drawn slightly to one side and is then pushed back so that the one end of the Axle passes into the centre hole of the Landing Wheel. Each Landing Wheel is locked in position 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.

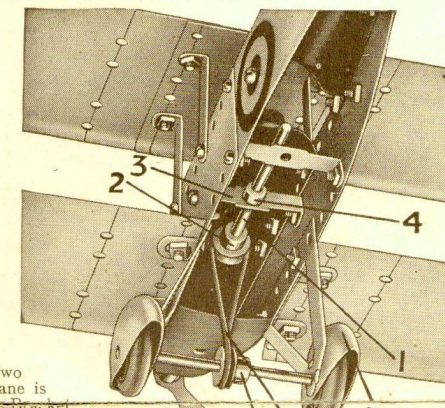


Fig. 1.

ASSEMBLING THE TAIL PLANES AND RUDDER

The method of assembling Angle Brackets are bolted to the fuselage by a set of one Tail Plane, through of the second Tail Plane, so that the Tail Planes and the fuselage are held in one piece.

The Rudder is on the front portion of the fuselage, and the

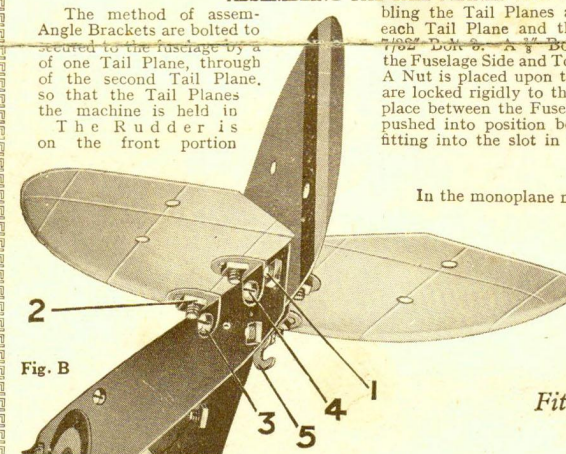


Fig. B

METHOD OF FITTING THE MAINPLANES

deals (with the exception of Model No. 3), the Mainplane sections 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 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.

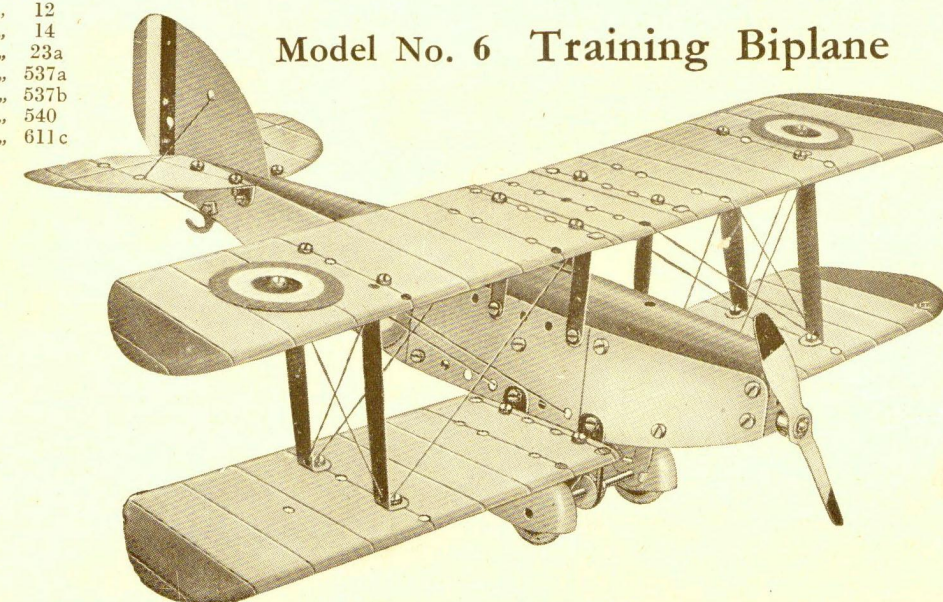
The method of securing the bracings (lengths of Meccano Cord) between the Struts will be clear from the illustrations.

Fit an Aero Clockwork Motor into your Model Aeroplanes.

Ask your dealer for prices and full particulars

Parts required :		1 of No.	P64
1 of No.	P1	8	12
1	" "	1	14
1	" "	2	23
1	" "	53	537
1	" "	52	540
1	" "	1	611
1	" "		
1	" "		
1	" "		
1	" "		
2	" "		
2	" "		
1	" "		
1	" "		
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2	" "		
2	" "		
4	" "		
1	" "		
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1	" "		
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1	" "		
1	" "		
1	" "		

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 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 has been adopted by many light aeroplane clubs. The Avro 626 is an advanced training machine for complete instruction in all duties.

Special Note : The Military Identification Markings (P.101 and P.102) shown on the Mainplanes and Fuselage in the models illustrated are not now included in this Outfit. The Mainplanes and the Fuselage now carry civil registration letters. The Military Rudder shown is replaced by a Civil Rudder.