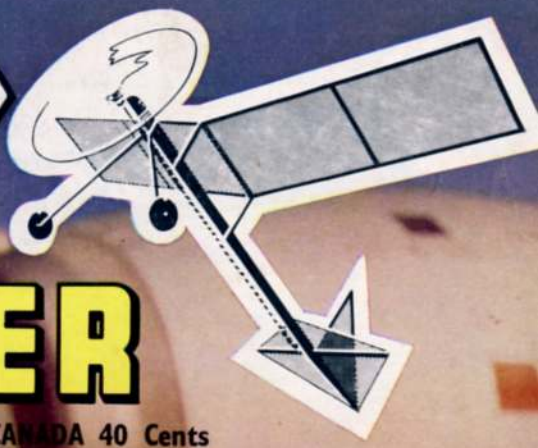
Indoor Flyer full size plan



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AERO MODELLER

MAP **HOBBY MAGAZINE**

other modelling angles . . .

April edition of *Model Maker and Model Cars* offers a simple boat project, ideal for schools, beginners or just impecunious modellers. For car enthusiasts a complete summary of track and wheel base dimensions for about 200 cars will offer a constant ready reference for club scrutineers. Drawings include the Alfa Romeo Bimotore and the Le Mans Tojeiro Climax. Ship enthusiasts will have a Battle class destroyer, rigging gen and there will be lots of gadgets, a motor test etc. By the way did you spot "Model Maker's" fantastic electric motor summary, which is making March issue a collector's item already?

In *Radio Control Models and Electronics.* Beginners will receive a large slice of instruction in an article dealing with the construction of a simple pulsed transmitter kit. Practically no resistor has been left unturned to ensure a really fully explained feature.

For those who like to try something a little more advanced; a battery saving conversion describes the application of a new power supply for a popular multi transmitter. For those who want to know more about reeds, an informative article gives much valuable data for matching transmitters to reed units in receivers.

A new series on renovating second hand equipment starts with this issue, boats form the subject of the first few sections, and it is hoped that readers may be saved a few frustrating hours of trouble shooting when they purchase a "bargain boat".

The R.E.P. "Dekatone" 10 channel transmitter and receiver form the subject of the technical test, and latest news from the Toy Fair is incorporated in "Commercial Developments".

April 1963

VOLUME XXVIII No. 327

contents

cover

Now in full Squadron Service for Royal Air Force Transport Command is the Armstrong-Whitworth Argosy. This air to air photograph illustrates typical Service markings, which wil be of use to modellers working from our plan 2736, *originally published in September* 1960 *AEROMODELLER and available as a reprint in* 1/72*nd and* 1/144*th scales, price* 2*s.* 6*d. from the editorial offices.*

next month . . .

Gadget Review returns with some most useful ideas suggested by readers for the benefit of your future modelling. More details of latest **helicopter** experiments come from specialist F. G. Boreham with explanation of the use of Watteyne stabilisers. Free flight scale fans will admire the most attractive little true scale **Hanriot HD-1** Biplane World War I Fighter as used by Belgian Ace Willie Coppens. This neat model presents an ideal introduction to the free flight scale model with its simple structure. Other interesting special features are lined up for your enjoyment, including another **full-size model plan,** which we are sure will appeal to all sport flyers and many clubs as a "one-model" project. **Le Petit Knight** is, as the name implies, a miniature version of our *Coupe d'Hiver* class model.

Editorial and Advertisement offices

38 Clarendon Road, Watford, Herts

Telephone: **Watford 32351** *(Mon.-Fri.)*

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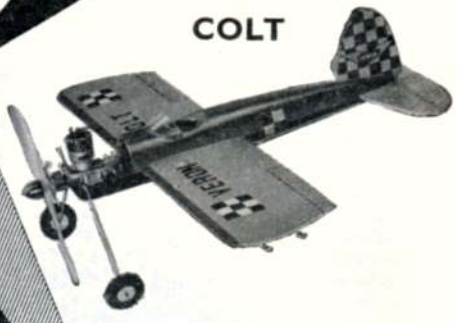

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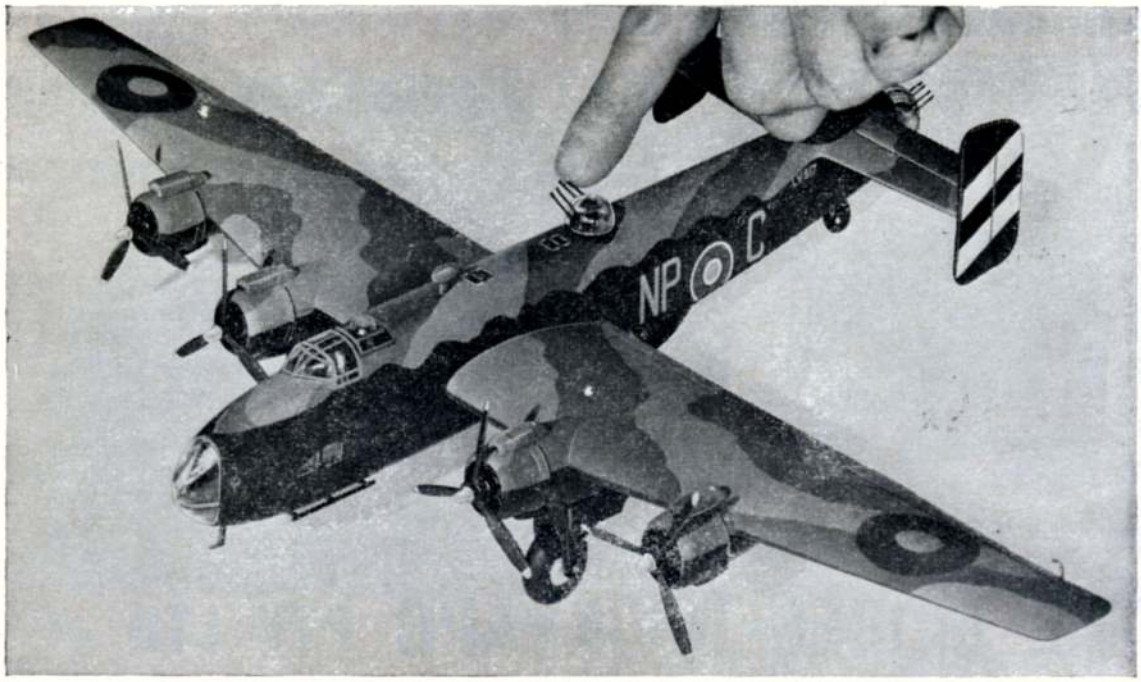

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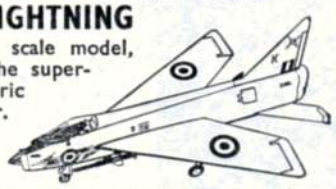

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METAL WIRE				◤		◤	◤		◤	◤	
MOULDED PLASTIC		◤	◤	◤		◤		◤			◤
GLASS FIBRE MOULDING		◤	◤	◤		◤		◤			◤
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AEROMODELLER ANNUAL 1962-63

This is the fifteenth annual appearance of this ever-popular volume. Cover shows man-powered Puffin against the starry sky and space capsule Friendship VII. Articles include electric free flight power, man-powered experiments, attache case models, light weight rubber, theory facts and fallacies, control surfaces, anti-warp methods, Italian Schneider Cup models, R/C prototypes, small transistor R/C receiver, plus a wealth of model plans from all over the world, fully dimensioned, engine analysis, contest results, etc., etc. 160 pages, size 8½ by 5½ in., covering the world of aeromodelling printed on high quality gloss paper with modern colourful board cover.

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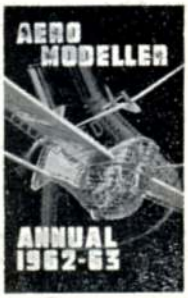

CONTROL LINE MANUAL

Our most ambitious publication for very many years, this new book bids fair to be the most sought after of its time. Only Ron Moulton has the background of experience in this subject right from the start of the hobby (he introduced it to Great Britain!); the valuable contacts with American pioneers and leading present day exponents and manufacturers; the up-to-the-minute knowledge of all that is best and new in the hobby. 216 pages size 8½ by 5½ in., bound cover, gold blocked spine, three-colour dust cover, over 300 diagrams, sketches, photo - illustrations, 74,000 words of text.

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This is the famous book by Harry Hundleby which sold some 40,000 copies, and has now been brought right up-to-date in line with modern practice by Tommy Ives. It has been written as a practical guide to radio control for those aeromodelling enthusiasts who wish to make their first attempt at this fascinating modern medium. Bound in stiff card with two-colour photo cover, 96 pages size 8½ by 5½ in., profusely illustrated with line drawings; plus eight art plates showing equipment and models; appendices covering battery equivalents and sockets, colour code for resistors and capacitors, etc.

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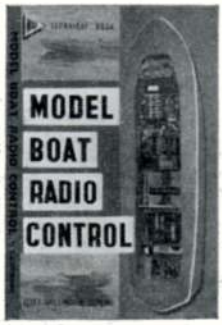
This is essentially a practical book for all who are interested in making things with reinforced glass plastics, or using this most versatile material for repair work. It is the first work of its kind to cover materials, techniques and a vast range of applications in a single comprehensive volume—giving the reader literally all the information he will ever need for producing successful glass fibre mouldings of any shape, form or size. Joint authors are well known—Ron Warring is an old friend and Geoff Lewis is a working director of a leading glass fibre firm. 122 pages size 8½ by 5½ in., printed litho with hundreds of illustrations and diagrams. Drawn-on card cover in two colours. (A hard-bound library edition is also available at 10/6).

7/6

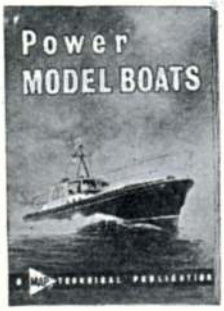
MODEL BOAT RADIO CONTROL



Considerably enlarged and brought up-to-date to include latest methods, transistor equipment etc. Apart from chapters dealing with general principles quite non-technical—and only enough given to suffice without overloading. Many sets and components described in detail, including Crystal Controlled Transmitter, Hard Valve Receiver, Single Valve Transmitter, Pulsing Control Systems Dual Purpose Pulse Box, Steering Unit Construction, installation of equipment, tuning, testing etc. 127 pages size 8½ by 5½ ins., plus 8 pages art plates, 20 chapters, 8 appendices, 162 line drawings, and circuit diagrams, 38 halftone pictures.

7/6

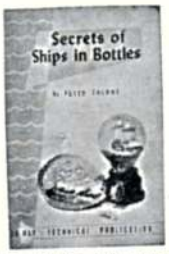
POWER MODEL BOATS



Intended for the "average" modeller, and does not pretend to advise the expert. As such it should prove a welcome source of guidance and inspiration to the beginner, the dabbler, and the not-so-expert. It is written entirely from practical experience, with a certainty that success will attend the efforts of anyone who follows the procedure described employing care, patience and common sense. 128 pages, size 8½ by 5½ in., printed on fine quality paper with some 250 photo-illustrations and line drawings. Bound in hard boards linson covered with gold foil title on spine. Two-colour photo dust cover.

12/6

SECRETS OF SHIPS IN BOTTLES



Of all the fascinating models it is possible to make, perhaps the ship-in-a-bottle is the most intriguing. Such models, made by old seadogs, have for generations puzzled the landlubber. This book solves all the problems for would-be builders in beautifully-illustrated sketches, fine photo pictures and explicit text, 64 pages, size 7¼ by 4¾ in., and 8-page art inset for photo plates. Bound in two-colour card cover.

4/6

PLASTIC MODEL CARS

First effort ever to provide a plastic car "how-to-do-it." Virtually every enthusiast prepared to devote a little time and care to the project can create models that will be a pride and joy to him. 110 pages size 8½ by 5½ ins., 59 halftone pictures, 40 detail sketches, bound BRG linson, gold blocked title.

10/6

MODEL CAR RAIL RACING

Your own racing circuit on the dining room table with full speed control on corners, flat out on the straights—in fact a fireside Stirling Moss! 176 pages, size 7¼ by 4¼ in., colour drawn on card cover. Profusely illustrated, many full dimensioned working drawings to a total of 180.

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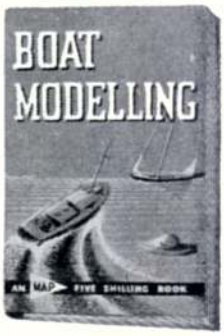
The BEST that your money can buy!

AMATEUR ROD MAKER

Author L. W. Taylor, who is well-known as an expert, shows how the average handyman/model maker can make his own fishing rods and other accessories to the highest professional standards without the use of any elaborate workshop or special tools. 64 pages 7¼ x 4 in., many line illustrations by the author. Two colour card cover.

4/6

BOAT MODELLING



A comprehensive book for the not-so-expert modeller covering every aspect of model boat work from construction through to sailing. Author Vic Smeed provides a wealth of practical assistance. Chapters include: Tools and materials; hard chine hulls; round bilge hulls; superstructure; fittings; yacht fittings; finishing; I.C. engines; electric motors; hydroplanes and special models; operation; radio control. 96 pages 8½ by 5½ in., 223 line drawings. 50 photos of finished models, and, models under construction, two-colour card cover.

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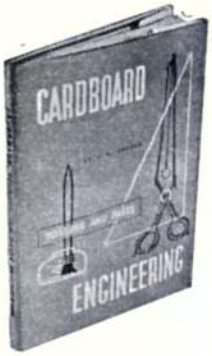

With no more than cardboard, scissors and paste enables every armchair model maker who has been prevented by lack of facilities from doing more than day-dream on the subject to put his hand at once to practical and rewarding work. 120 pages size 9¾ by 7¼ in., printed on stout antique wove paper and glossy art paper with 76 line drawings, 68 photo illustrations. Bound in heavy boards covered in linson, with bold modern-style dust cover.

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Plans Plans Plans Plans

Do you realise that the finest range of "solid scale" plans in the world includes some hundreds of different types, British, American, German, Canadian, Italian, French, Swedish, Dutch, Polish, Belgian, Russian etc.? All plans sold in 2s. 6d. packs, scale range from 1/240th to 1/24th, the majority are 1/72nd. All to an impeccable standard of accuracy for which AEROMODELLER has become renowned. Examples are:—
Pack 2692 Bristol F2b Fighter 1/48th & 1/36th scales 2/6
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Ancient or modern, Famous Biplanes, Aircraft in Service, Aircraft Described or Racers, Fighters, Bombers—they are all listed in our 'Scale Drawings' sheet. Send a stamped and addressed envelope for your copy and be up to date with your scale modelling.

Scale Scale Scale Scale

Finest range of Technical Model Books available

Heard at the Hangar Doors

Fly Baby

by Peter Bowers

Home Built

WINNER OF THE Experimental Aircraft Association Design Competition in 1962 was this all wooden single seater with a Continental C-75 h.p. engine; rigid wooden landing gear struts carrying low pressure tyres and a streamline suitcase suspended beneath the belly. It was created by Peter Bowers, once very well known for his outstanding model designs and whose name could be traced through the annals of power modelling history in many a Frank Zaic *Yearbook*. Describing his "Fly Baby" Pete admits that there is a lot of modelling experience incorporated in the design (which, incidentally, carries his trade mark tail shapes, always used in his models). His original "Fly Baby" was, in fact, a 48 in. model made in 1940 and it set a rise-off-water record under A.M.A. rules.

Needless to relate, we are publishing the small 3-view, taken from *Sport Aviation* because we are sure that a lot of aeromodellers will want to turn the wheel full circle and scale down this attractive low wing Monoplane for their own enjoyment in miniature. Colouring, incidentally, is that used by Boeing pro'o'ypes, Pete being a Boeing Flight Test Engineer, and is yellow and brown with white trim. It would also be authentic to carry registration N13P instead of N500F. The first registration was most unfortunate in that the prototype crashed after running out of fuel, wrecking the fuselage.

Rushbrooke Trophy

We are very pleased to report that the S.M.A.E. has arranged with the F.A.I. to name the Indoor Individual World Championship Trophy, presented by Great Britain during the meeting last September, *The Rushbrooke Trophy*.

There is a particularly happy twist to the story since, as many readers will recall, the late C. S. Rushbrooke designed the trophy. In discussion with the sculptor, P. E. Norman, the Mayfly was actually chosen as the insect to be inscribed in Perspex. This was indeed a most happy coincidence and one which we shall now always associate with the memory of Rushy, for *Mayfly* was also the name of his successful Wakefield design, which he flew so successfully in the years from '35 to '38.

Triple Zilch

The unusual marking of North American F100D Super Sabre 63000, which was chosen for our 1/48th and 1/72nd scale drawing, published in March 1959 issue is still very much actively in service. A vigilant U.S.A.F. Information Officer, also an aeromodeller, spotted "Triple Zilch" passing through Aviano base in Italy en route to Tripoli and sent us the picture bottom left, showing the aircraft with a snow capped Northern Italian background.

Over the intervening five years of service the F100 has lost its red, yellow and black nose stripes and fuselage flash with Wethersfield Squadron badges but retains the fin flash and 20th T.F. Wing insignia on the fin. Seems as though the aircraft has changed owners although its has been kept in the same Wing.

Records

Last month we mentioned a remarkable distance record claimed but which we now find has *not* been confirmed by the F.A.I. However, the international record for power duration *is* established at 6 hours 31 minutes 52 seconds in the name of Nikolai Malikov, who made such a flight on October 3rd, 1962 at Miasnov

using a 4.7 cc K-16 diesel. Another record for the U.S.S.R. is the distance category for helicopters established by Valerie Slepkov from Kasani on September 27th 1962 for a distance of just over 25 miles (40.364 Kms.). Anatol Kouznetsov's world speed record which we mentioned in December issue has also been ratified at 196.36 m.p.h., established on September 30th at Lenningrad.

Uniline

The feature on page 202 of this issue will undoubtedly arouse tremendous interest among all control line enthusiasts. Subsequent correspondence with John O'Dwyer gives us the advice that whereas the recommended drive ratios are perfectly satisfactory for 60 ft. of .028 in. line, the change to .014 in. diameter for F.A.I. purposes leaves very little trim control. Research has found that whereas two turns were satisfactory for the thicker line, some 26 turns are required with the F.A.I. line. This is evident when calculation shows that halving the line thickness reduces rigidity of the line to 1/16th. In consequence John suggests changing to a finer pitch gear and rack (120 pitch and a .15 in. PD. spur gear), also a 4:1 bevel set or an added set of spur gears after the bevels.

Miniature Nats.

Last minute addition to contest calendar in *Club News* this month is the North Western Area two day meeting at R.A.F. Ternhill near Market Drayton. This first full-week-end meeting is intended to encourage fresh enthusiasm for the hobby in the provision of multiple contests. Camping facilities can be arranged on application to the address quoted in *Club News*.

R/C to the rescue

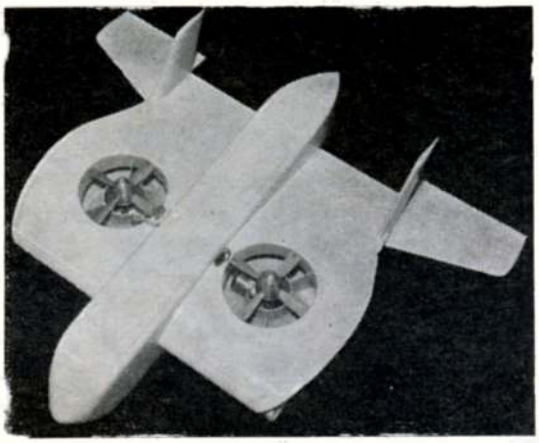
The marvels of modern commercial radio control equipment were introduced to millions of B.B.C. Light programme listeners on February 9th and 11th during the two broadcasts of the play "*Crack of Doom*". This naval drama by Gilbert and Margaret Hackforth-Jones concerns the mystery surrounding loss of a submarine. When a sister-sub also becomes overdue, the play reaches its climax as two sons of the Engine room Articifer begin to receive morse messages from father. Means of communication is adequately explained as the rudder on their R/C model moves left for "dots" and right for "dashes" in Morse Code (though we are led to believe their "Silver Queen" has a single reed driving a selective escapement and the transmitter possesses 200 miles range! Thus the Sub returns to base and a mass search operation is averted by use of model radio control.

In an earlier scene, the lads return home with most realistic descriptions of a fly-away, complete with the barbed wire fence and bull hazards known so well to all aeromodellers. It was because of this out of range flight that father took the Tx off to work in the Submarine to improve the output power.

The authors are to be congratulated for the novel way in which they have employed model radio control. From the frequent mentions of escapement turns, it sounds as though they've had personal experience of "running out of rubber" with a single channel model.

GETOL

The initials stand for Ground Effect Take-off and Landing. In other words, a flyable hovercraft and the picture at top right shows one of several experimental models made by the only Company currently investigating this rival to the full-size V/STOL tilting wing aeroplane. Of special interest to modellers is the use of a pair of McCoy 60's driving clipped Power Props arranged as



four blade fans. This model has been used for observation of various spray patterns from changes of ground effect nozzles on the underside. It has been mounted on a travelling rack which passes over a water trough and is strictly non-flying. However, that is not to say that the configuration; illustrated above will not inspire thoughts of an experimental control line model. Who will be the first with a C/L GETOL?

Obituaries

We are very sorry to have to report the early death, on December 16th, of J. A. B. "Tony" Pannett, that very keen power modeller from Bradford M.F.C. in the Northern Area. Tony was also a most active worker for the Society and we have every reason to believe that he sold more of the recently issued lottery tickets than any other individual. He will be sorely missed by his fellow competitors who join us in offering sympathy to his mother.

The name of W. A. "Frank" Nixon has been connected with aeromodelling for as long as we can remember. Only the other day we came across a fuselage jig feature, published in the November 1932 edition of Harry York's old *Model Aircraft*. Frank was a great personality and as Chairman of the North Western Area, had that unusual capability of being able to direct any excess of youthful enthusiasm into the right channel. We are very sorry to learn of his passing on December 17th and know that his wise counsel will be greatly missed.

We must apologise for these late announcements, unfortunately the sad news took some time to reach us.

Coupe d'Hiver contest

Never could a contest have been better named! The luckless Ron Firth even had to give up due to hazardous recovery in deep snow drifts! Nevertheless for those, able to canter across our frozen terrain, the air conditions for February 17th and 24th were as good as could be hoped. For example, last year's individual British winner Geoff Kent of Watford started off well with two maximums from only 15 second power bursts. Results give the following best British placings. A difference of opinion over the value of the R.O.G. rule in France has unfortunately precluded French participation but of that, more anon.

1963 Provisional Results

1. D. Furbank	*Lincoln*	106	120	120	**346**
2. B. T. Faulkner	*Cheadle*	120	116	76	**312**
3. G. F. Kent	*Wayfarers*	120	120	71	**311**
4. J. O'Donnell	*Whitefield*	110	120	51	**281**
5. R. T. Faulkner	*Luton*	100	80	85	**265**
6. R. Flain	*Crawley*	58	107	60	**225**

ABLE GULL

There's many a fresh idea in this new style Class B team racer from U.S.A.

by T. GRANGER WILLIAMS

AS AN ADVOCATE of all metal Team Racers for several years, (see P.177, *Control-line Manual*), Granger Williams decided to build a Team Racer of wood for a change, in order not to get into a construction rut. He wanted an aeroplane that was small, light, fast, manoeuvrable, and with the clean lines of a racer. All of these requirements were realised in *Able Gull*, so named because of its gull wings and ability to live up to its designer's needs.

The basic plywood frame of the model makes it rigid and strong without too much weight. Finished model weighs just twenty three ounces. To start construction, cut two 1/16 in. sheet plywood sides, note that they taper to a point on the thrust line just behind the spinner and are a full 18 in. long. Now cut two $\frac{1}{4}$ in. sheet balsa sides the same size and shape as the plywood sides (do not cut out slot for hardwood U/C mount) and lay them aside for later use. Cut two 1/16 in. sheet plywood bulkheads F1 and F2 as shown on the drawing. Here is where one must decide the type of engine bearers.

Cut wooden engine bearers from $\frac{3}{4}$ in. by $\frac{1}{2}$ in. hard maple or birch and glue them to the plywood sides in the proper position. For those using metal engine bearers, cut them $\frac{3}{4}$ by $\frac{1}{2}$ by 12 s.w.g. aluminium angle. Taper the $\frac{3}{4}$ in. wide leg from the control horn mount, to the aft bulkhead as shown. The $\frac{1}{2}$ in. leg of the angle is tapered from the forward bulkhead, forward to match the plywood sides. Drill and tap the holes in the angles as shown, and drill holes to match in the plywood sides. Screw the engine bearers to the sides in proper alignment. Block up the sides and F1 and F2 on a flat area and check for alignment, then glue the formers in place. If you can get hold of some pattern makers leather fillet material, glue this in the corners where the sides and formers join. The leather fillet will increase the strength of the fuselage tenfold.

While the glue on the fuselage is drying, cut two wing spars from 1/16 in. sheet plywood and one from 16 s.w.g. aluminium. Drill a number of holes through the aluminium spar for glue penetration and using white glue, epoxy, or contact cement, sandwich the aluminium between the two plywood spars and clamp tight. While the spar is drying, cut the U/C from 16 s.w.g. Dural. File the U/C legs to a streamlined shape and bend to match the drawing. Drill and tap holes for the wheel screws and drill holes for the mounting screws.

Now cut the wing struts from sheet metal, the starboard or outboard strut from 16 s.w.g. brass and the port or inboard strut from 16 s.w.g. aluminium. The difference in weight will have the same effect as adding lead to the outboard wing tip. The holes in the ends of the strut tabs are for glue penetration when they are assembled in the wings. Now we will go back to the fuselage. Pull the tail of the fuselage sides together and bevel the corner until there is a flat area for a good glue joint. Take the two $\frac{1}{4}$ in. balsa sides you cut earlier and glue them to the plywood sides, at the same time pulling the tail of the sides together and glueing them. Use plenty of clamps (spring clothes pins) and set aside to dry.

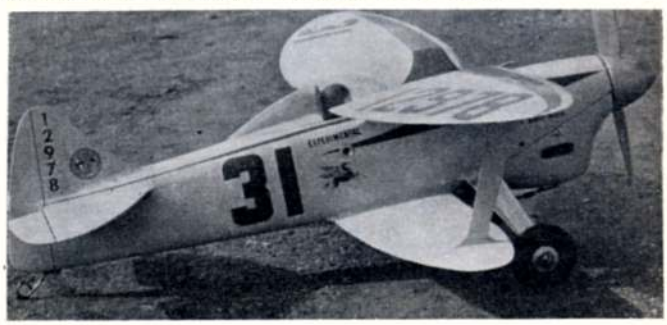
The lower wing is cut from a $\frac{1}{4}$ in. balsa sheet $3\frac{1}{2}$ in. wide and 18 in. long. Carve and sand to a symmetrical airfoil section except for the area where the wing joins the fuselage. Leave this area flat for later blending into the fuselage contours. Locate the strut positions on the lower wing and cut a cavity to fit the strut tabs.

The upper wing, from the gull section out, is cut from $\frac{1}{2}$ in. sheet balsa. The $\frac{1}{2}$ in. by 1 in. leading edge should be cut from fairly hard balsa and the $\frac{1}{2}$ in. by 4 in. section of the wing from medium grade balsa. Cut a 3/16 in. by 3 in. notch in the wing to shape. Use the type of elevator hinge you like best. Linen hinges are shown. The elevator horn used is bent 18 s.w.g. piano wire and serving as elevator connector.

The bellcrank mount is a piece of $\frac{3}{4}$ in by $\frac{3}{4}$ in. hardwood screwed and glued below the tank as shown in the drawing. Use a bellcrank with the pushrod hole about $\frac{3}{8}$ in. from the pivot. This is not a stunt model and too much elevator travel or too quick a control will be dangerous. Attach the bellcrank with the 16 s.w.g. wire pushrod in place and after placing the elevator on the end of the pushrod, glue the tailplane to the fuselage. Cut holes in the fuselage sides for the control lead out wires and install the wires.

A fuel tank of 30 c.c. capacity can be bent and soldered from tin can stock or thin brass, its inside dimensions should be 10 m.m. by 30 m.m. by 100 m.m. A piece of 16 s.w.g. wire bent and slipped through a short piece of brass tubing soldered to the tank as a pivot, is tripped by the wire extended from the push-rod.

From $\frac{1}{2}$ in. sheet balsa cut a piece for the top of the fuselage from F1 to the tail and slot it for the shaped fin. Cut block for fuselage top between the two bulkheads, carve and sand to the proper contour and cut cockpit.



Locate the position of the spar and cut the slot in the block to match. Glue the spar and blocks in place, check for alignment and carve and sand the entire fuselage to the proper contours. The fuselage is eliptical in section, becoming flat sided at the tail. Slip the upper wings on to the spars and if alignment is satisfactory glue them in place. All surfaces on this model are set neutral. Place the wing struts in place and glue securely.

Cut pieces from $\frac{1}{2}$ in. sheet balsa to fit in the gull section between wings and fuselage and cement in place.

The engine will have to be mounted in place to fit the cowling blocks. Fit a $1\frac{3}{4}$ in. spinner to the engine and give the engine two degrees of right thrust. Carve the top cowling from block to fit clear of the engine and to blend into contours. Glue the top block into place.

Carve the lower cowling from one large block or several small ones glued together. Make a plaster cast from the wooden cowling and after sealing it with shellac, apply a coat of release agent and lay up a thickness of about 1/16 in. of fibre glass. Fasten with two small screws threaded into tabs glued to plywood sides.

Give the entire model a fine sanding and sand between coats of filler until there is no grain showing. The original model was painted Chartreuse with Red trim using synthetic enamel. Numbers were Red, experimental and model name were black. U/C was polished natural.

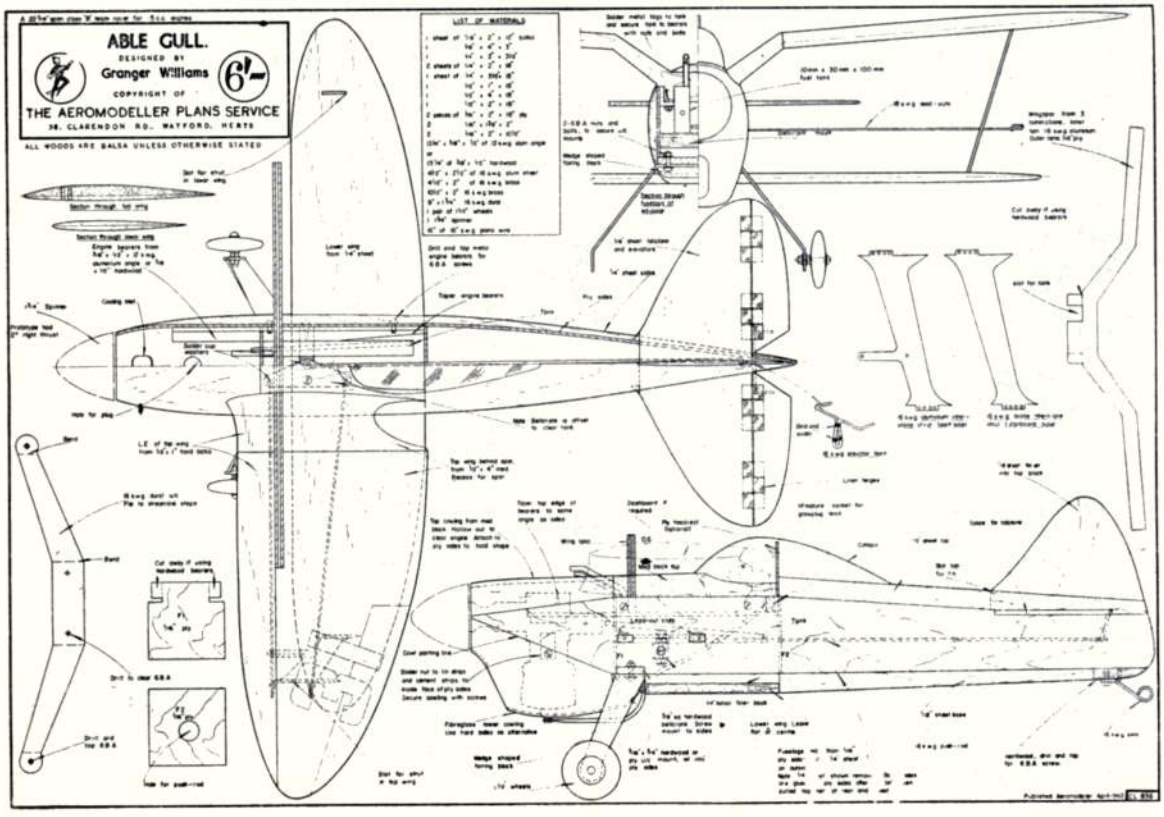
Bend tail skid from 16 s.w.g. wire and drill and tap the hardwood tail piece for a machine screw. Screw skid into place. Install $1\frac{1}{2}$ in. wheels. Point both wheels about five degrees to the outside of the flying circle to help keep model on tight lines in take off and landing roll.

If you are going to fly fast in Team Racing, a quick-connect booster lead is a must. Install a miniature phone jack on the right side of the cockpit, through the metal engine bearer if they are used. If wood bearers are used install the jack below the bearer and an extra wire will have to be run to the engine for glowplug body connection. Alternatively, place a brass contact strip above and below wing trailing edge for a clothes peg type boost connection which will automatically detach on release.

Install the pilot and instrument panel in the cockpit and fit a plastic canopy. You should now be ready for flying. Remember this is a small plane for the power plant. It takes off quickly so keep your eyes open, and it lands with a fast flat glide. In the air she is as fast as any of them and more responsive than most. Best results were found with an $8\frac{1}{2}$ in. diameter 8 in. pitch prop.

Gull top wing on Granger's snappy Bipe adds realism to a functional design with great potential. Granger was a pioneer of Team Racing—one of the first ever to take up this section of the hobby in the FAST Club, California. Currently he manufactures a fine line of plastic mouldings for bell-cranks, horns, hinges, etc., wheels and pilots under the trade name of Williams Bros. Another example of a good modeller developing his own business with speciality accessories

FULL SIZE COPIES OF THE 1/5th SCALE REPRODUCTION BELOW, CAN BE OBTAINED (WITH EXTRA DETAIL ADDED) AS PLAN CL.836 FROM AEROMODELLER PLANS SERVICE PRICE 6/6d. INCL. POST.



Alan Hales, British agent for L. M. Cox, demonstrates ejector seat with parachuted pilot in new "Helldiver" ready-to-fly. Alan was only trade rep. to take part in Chicago, Brighton and Nuremburg shows—busy man! 20-inch model is Navy blue, has rockets, long range tanks and spring start .049 engine.

1963 TRADE FAIR NEWS

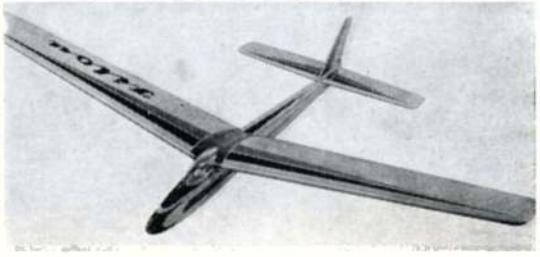
Latest kits and accessories announced at London, Brighton and Nuremburg trade shows

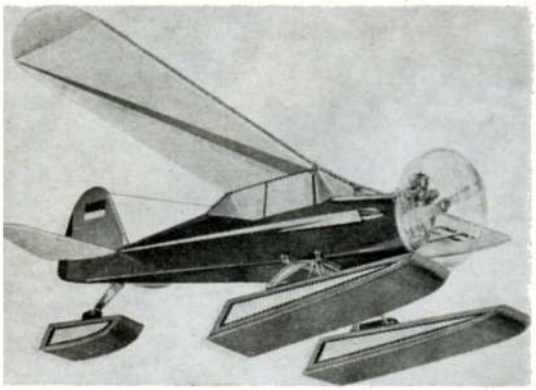
NUREMBURG TOY FAIR attracted over 1,000 exhibitors occupying over 375,000 sq. ft. of floor area (10,000 sq. ft. is enough for a *very* adequate factory!) spread over some twenty floors. Not all this is *model* material, but it is so mixed up with less interesting items that every stand simply must be viewed. Virtually every manufacturer in Europe who is in the least interested in export markets will be found there, either in person, or through wholesalers. American and Japanese firms, led by enterprising **Cox,** are beginning to find it worthwhile but so far offer only a trickle of exhibitors.

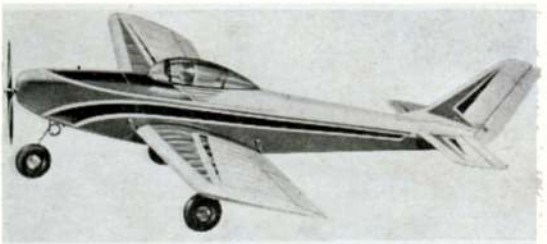
For aeromodellers, interest must be centred upon the now accepted expanded polystyrene kit, which has jumped from a clever novelty straight into trouble free major kit use, thanks to a great deal of time and experiment devoted to it in the past twelve months. Both **Graupner** and **Schuco** are providing some very fine components that take the sting out of advanced construction. This may well be the bridge between C/L ready-to-fly models and the true model builder, as exemplified by Graupner's elegant *Consul*—their first expanded polystyrene bodied power R/C kit, of which more anon. Ready to fly models are bigger and better than ever—we liked the colourful Cox *SB2C Helldiver* complete with *working* arrestor hook *and* ejector seat with parachuted pilot. On the balsa and tissue side many big new kits are aimed at the R/C flyer, such beauties as the **Robbe** *Tipsy Nipper* which at just under 6 ft. span is three-tenths full-size and Schuco's bright pair, "*Telstar*", 64 in. shoulder wing for multi with smaller brother, "*Starlet*" a 42 in. low wing single channel job, each with trike gear. Graupner's introduction of Gustave Samann's 71 in. *Caravelle* multi R/C contest design will surely produce quick demand in view of admiring comments on the model at Kenley last year.

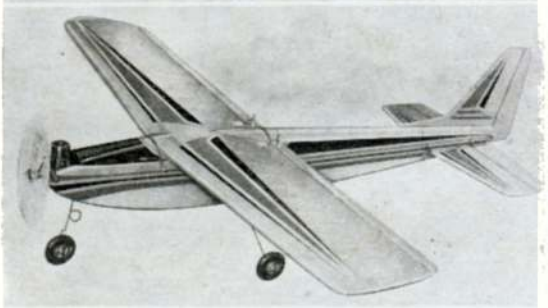
Engel's "*Iris*" is another for 3 channels with 50 in. shoulder wing to take up the 2.5 c.c. On the R/C side, **Metz** have now released their 10 channel triple simultaneous gear with plug-in crystals for any of 5 freqeuncies, controls still German (as against British, Jap and U.S.) style with a 4-way joystick, 2-way lever and 4 push buttons. Receiver is a Superhet, and comes in two

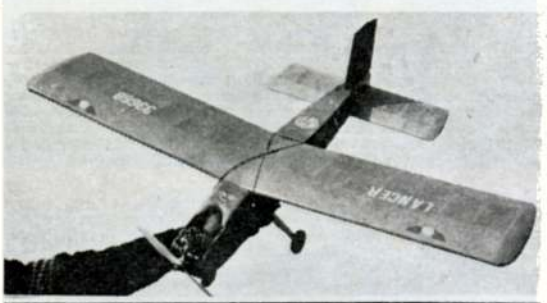
Robbe "Tipsy Nipper" scale for multi should have wide appeal, is 6-ft. span for Enya 29. Next is Robbe "Zeus", 58-in. strip aileron design to take 9-channel Telecont (soon out in Superhet form). Third is Graupner's "Caravelle" by Samann, 71-in. with 713 sq. in. wing for full house multi. Ideal for proportional control. Bottom is elegant "Consul", all moulded polystyrene except sheet tail, 41-in. for 1.5 c.c., an appealing single-channel job from Graupner. Below is third new Graupner kit for "Filou" a 50-in. R/C glider, with optional power pod.

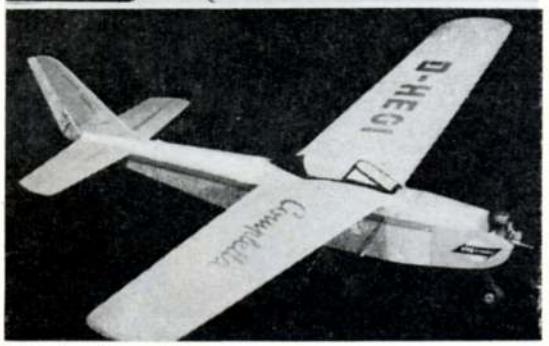












Schuco's float kit for up to 4½ lb. models are balsa covered expanded polystyrene, seen on their Auster. Right: the 42-in. "Starlet" for a single, and "Telstar" 64-in. for Multi R/C, also by Schuco.

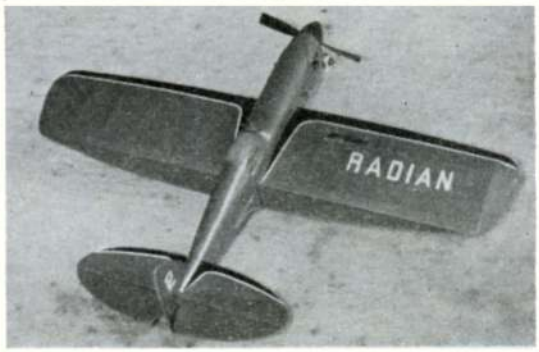
parts, each in solid plastic casing. The 10/6 basic 6v. Rx has 4 plug sockets, one of which can be taken to the extra channel attachment, adding 4 more to the basic 5 channels. Seems as though the 'development' from 5 to 10 is intended as an economy attraction and help for beginners. A new 6v. electrical servo, only 2 ozs. weight, has been produced for this exciting new gear, which incidentally, employs a total of 36 transistors and 13 diodes if 10 channels are used. **OMU** are also on 10 channels with their light Rx and are also producing a very neat "Monocontrol" Rx for 6 volts. **Grundig's** latest is *Variophon* 2, a logical breakdown of the 8 channel set introduced last year and which offers the simplest of model installations with plug and socket connectors. Their *servo automatic* is a new, non neutralizing trim drive, ideal for throttle or boat rudders.

Interesting range of undercarriages, coil spring or compression tube spring was displayed by **Klaus Krick** who has just about covered every possible combination with his ready to fit legs. Strange that the British and U.S. market should be without them.

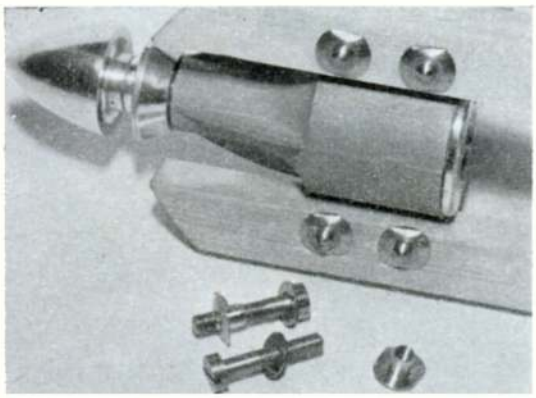
A trend we noted is the introduction of R/C throttle controls to smaller engines, now possible, it is claimed, without loss of power range. **Webra** 1.5 c.c. now has it, and within twelve months may be extended to under 1 c.c. engines. Silencers too are looming larger in continental expansion plans—noise is just as much a problem for urban German model clubs as our own.

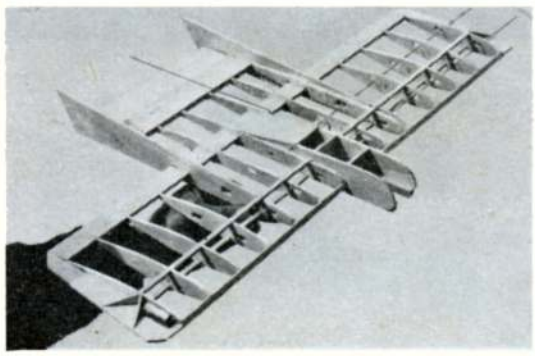
At the U.S. Trader Center, London, **A. C. Gilbert**

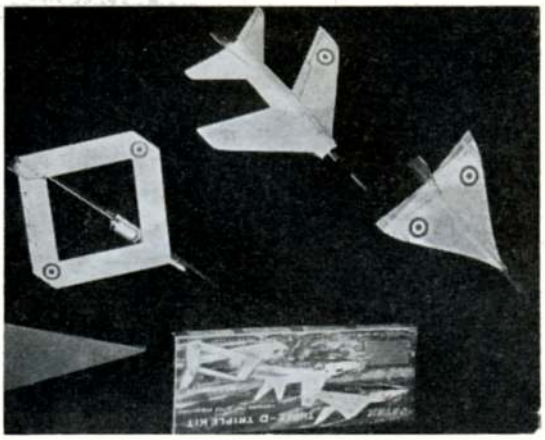
Right: Bradshaw Model Products new Lancer 49-in. from Roland Scott's design, will be a 99/6 pre-fab. kit for up to .35 engines, single R/C. Also through B.M.P. is a remarkable ready-made Schuco "Completta" for .8 c.c., assembled in expanded polystyrene with sheet tail and spring U/C to take single R/C. Below, left to right: Griffin .92 c.c. diesel from Ripmax, the new Webra 1.5 Record with R/C throttle, the .8 c.c. Piccolo with spring starter, the Krick .5 c.c. Tomboy and the Taifun Orkan new 2.5 c.c. contest diesel, seen at Nuremburg.



Keilkraft's 36 in. .049 R/C "Gyron" has sheet fuselage and leading edge on 178 sq. in. wing, weighs 13 oz. with R/C gear in capacious 2 11/16 x 3⅜ x 4½ in. cabin 22 in. "Radian" is a 105 sq. in. flapped stunter for .049's with all big-stuff features. Below, new blind nut fixings save much trouble, to be made in BA sizes by Ripmax, were a hit at Nuremburg Bottom is new 30½ in. Wildcat combat kit from Bradshaw M.P. with novel extended tail at 26s. 11d. or 48s. a pair. Above right is display of Jetex "Three-D" triple model kit including two Jetex 50 units for £1 1s. a Delta, a Dart and a Diamond







showed their range of ready-to-fly models, fitted with larger than usual engines of their own make, they also have silencers. No representative was around to give us indication of possible importation. In contrast **Estral Models Ltd.**, were demonstrating the unique press button starter on O.K. 049 engines in the **Comet** "*Starfighter*" (which looks like a metalised *T*.38) and "*Mustang*". This works simply by back winding the prop against a ratchet which the button releases,—*most* effective. Estral are also bringing in the new range of 44 flying scale balsa kit models by Comet.

First call at Brighton where the show is spread throughout hotels and halls, was at **D. Sebel & Co.** where the **Jetex** division introduced the new *Mobo Hovercraft*. As a kit, it takes a range of beam or radially mounted .049 glow engines, driving standard props. Ready made, with vacuum and injection moulded parts well fixed together, it comes with an A.M. .049 at £7 5s. 0d. Hover height of ½—¾ in. prompts thoughts of radio control over the lawn (when snows have cleared). First international release of the latest from **Cox** was made at Brighton on **A. A. Hale's** stand, where the ejector seat and parachuting pilot in an all-blue *Curtiss SB2C Helldiver* was regularly demonstrated by tug on a 3rd line. At £5 19s. 6d. this was a "hit" item. The *Piper L-4 Grasshopper* and *Mustang* are Service colour variants of already popular Cox Ready-to-fly types, now out for '63. New 1/72nd scale World War II subjects in plastic form in interesting "off-beat" list (with the *Wessex* helicopter thrown in for good measure) from **Frog** at 3s. each, and will be popular, unusual titles, filling the gaps in other ranges. **Revell** announced a nine-subject list of well known W.W.2 fighters, all to 1/72nd scale at 2s. 11d. each and showed a fine display of prototypes. In their more detailed series, the Thompson Trophy winning *Bell Airacobra II* is a new one. **Lincoln International** have now metallised six of the larger aircraft in their range of plastics, at 7s. 11d. A silver *Sunderland* looks a trifle odd, but the *Avro Lancaster* lends itself perfectly to authentic R.C.A.F. insignia.

Airfix had a large area, but aircraft are seemingly a small part of this ever increasing plastic empire. Very latest is the *Hawker P*1127 in the 2s. series—others to come include the *Liberator* and *Catalina* which many have awaited for some time.

The German company, **Faller** was first in our knowledge to offer a motorised plastic. The cigarette diameter motor fits their 1/100th scale models which cover a large and most interesting range little known to many plastics enthusiasts. Among those which take our eye are the *He* 162*A*, *Noratlas* 2501, *F*-104, *Ju*-88 and *Ju*-52,

the latter taking *three* motorising units!

Ripmax had what can only be described as the finest trade *display* of accessories we have yet seen, at Brighton, and they introduced many entirely new items too. *Mac Pacs* will be packaged R/C components, *Minimac*, an £8 19s. 6d. 5 transistor relayless McQue Receiver and **MacGregor's** latest single channel transmitter, designed by Tommy Ives is selective, carrier or tone, complete for £10 19s. 6d. These in themselves are good new lines to appeal; but the display of no less than 4 new servos, all promising a high standard of manufacture and performance was an eye opener.

Selectagear at £3 5s. 0d. has a choice of gear ratios as the name suggests. *Permagear* is the same size, ideal for boat steering at £4 2s. 6d. *Maxamite* is less than 2 ounces, fast and powerful for all multi channel operation at £4 5s. 0d. and can be supplied with transistor amplifier too.

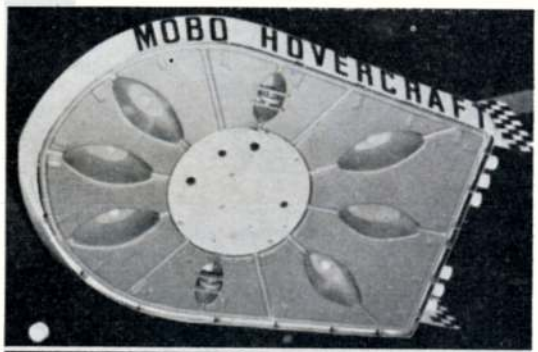
Designed with aircraft use in mind, the *Maxamite* is thin enough to go inside a wing, and has double adjustable link ends for push-pull action, perfect for ailerons; full side to side movement is claimed at under 1 second on two *Deac's*. As distributors for these Nickel Cadmium cells, Ripmax have introduced press-stud ends for single and packed cells to make for better, vibration proof connections. These are welded to the Deac cell.

"*Griffin* 92" is the name for the new diesel offered by Ripmax at 47s. 6d., a front rotary valve engine, stated to be easy to start. Beside all these new items, the **Graupner** range for 1963 was on show. "*Filou*" (Rascal) is a neat glider with power pod converter and "*Consul*", one of the most elegant R/C designs yet. It takes full advantage of expanded polystyrene techniques—see picture and further details in "*R.C.M.&E.*"

Though not at the shows, we have sought out the new designs from other manufacturers, **Keilkraft** and **Bradshaw Model Products** in particular. Prototypes have been well and truly tested so that kit production will soon be under way for the models we have photographed.

All considered, it looks like being a very bright year for lastics, radio control and control line—but free-flight, especially rubber powered is quite the orphan of the season.

Top, new Airfix 1/72nd plastic is the 3/-. E.E. Lightning F1A. Comet Mustang ready to fly distributed by Estral at £4 17s. 0d. has push button starter that really works! Below, under and over the Mobo Hovercraft with A.M. .049 at £7 5s. 0d. ready to go, or £2 2s. 0d. (less engine) as a kit. Vacuum formed in plastic, it rides the air cushion from peripheral skirt. Left are new Frog plastics, the Wessex, and Oxford at 3s. each. They are joined by G. A. Hotspur II, Bristol Beaufort, Martin Marauder, Miles Master II in new World War II 1/72nd series.



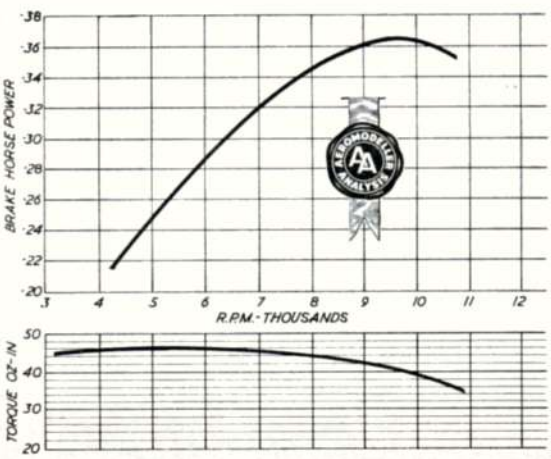
TAPLIN TWIN

MARK 2
8cc DIESEL

ENGINE ANALYSIS No. 108 by R. H. Warring

REVERSING THE USUAL role where a marine engine is usually a conversion of a standard aero-engine the Taplin Twin has been developed primarily as a marine engine, in which field it has achieved considerable success and an excellent reputation. The air-cooled aero-engine is the "junior partner" as it were, and obviously limited in application by the bulk and weight of the unit. The "Taplin Twin" *is* a heavy engine at 17½ ounces (twice the weight of a typical glow motor of similar power output); slow revving with its side port cylinder induction, and an in line alternate-firing twin, which may at first sight seem to complicate the issue unnecessarily.

Those are normal reactions of an aeromodeller. Having *run* a "Taplin Twin", however, one cannot help but be impressed by its really excellent handling qualities, first-time starting, extreme flexibility and perfect throttle response. The "Taplin", in fact, is one of the easiest starting engines of *any* size or type we have ever handled. You simply leave all settings at running position, choke twice, set the throttle about one-quarter open and flick—and it is almost uncanny how the engine starts *immediately*. Even if you "lose" the compression and mixture settings (and there are two separate compression adjustments), it is virtually child's play to set them up again—needle about one and a quarter turns open, start on one cylinder in the normal "diesel" manner and then adjust the compression on the other cylinder to pick up. If the noise gets a bit too much after bench running for a while, close the throttle to produce a purring 1,500—2,000 r.p.m. tick-over (depending on the prop. size) as steady as anything—or select any intermediate speed you prefer. It is certainly easier to start and simpler to handle than some "beginner's" engines we have had through our hands.



The "Taplin Twin" is a high-torque rather than a high power engine, developing approximately 46 ounce-inches torque at full throttle opening over the range 4-6,000 r.p.m. Peak power is developed at the comparatively low r.p.m. of 9,500 and is of the order of .36 B.H.P. These are almost ideal "sports" engine characteristics.

Propeller size recommended by the makers is 13 x 8 (Trucut wood), which gives around 6,000 r.p.m. static. A 13 x 6 Trucut steps the r.p.m. up to 6,800, and on a 10 x 6 nylon the "Taplin" positively races at 10,000 r.p.m. plus. Despite the fact that the latter is an undersized prop., the "Taplin" starts just as easily on it, and runs just as smoothly. Virtually any propeller size between 12 x 4 and 14 x 4 or 14 x 6 is useable, but to approach maximum power output in flight 13 x 4 is about right for free flight, with a 13 x 8 best for control line.

The "Taplin" makes available a favoured type of engine for British sports flyers—a diesel—to suit really large models; and an alternative to the universal glow motor for radio control models of 5 ft. to 7 ft. span where all-out aerobatic performance is not the main aim. In the latter respect the throttle fitted as standard gives complete motor speed control via a "progressive" servo, and the alternate-firing cylinders reduce engine vibration to a remarkably low level for a compression-ignition engine of 8 c.c. capacity.

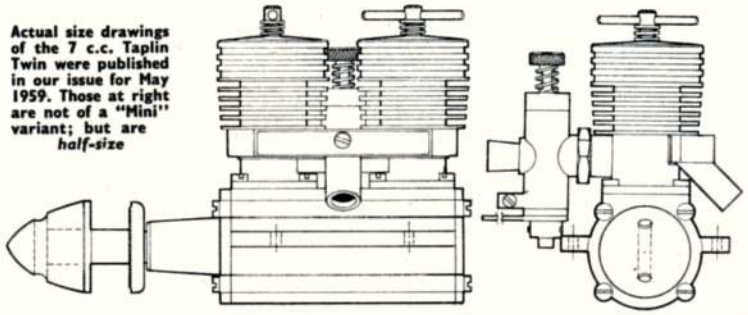
Basically, the overall design has changed little from the original "Taplin Twin", although there are numerous detail improvements and the displacement has been increased to a full 8 c.c. by opening out the bore slightly. Modified porting has also resulted in improved "breathing" and an improvement in power output, and shaft friction has been reduced by fitting a cageless needle roller race for the front bearing on the main $\frac{3}{8}$ in. diameter crankshaft. This shaft is now carried on a roller race at the rear and needle rollers at the front; whilst the intermediate shaft is carried on two roller races. Whilst this arrangement is original enough, the shafts are also unusual in being nickel plated to resist corrosion—Col. Taplin being under the strong conviction that diesels fuels inherently do tend to be corrosive, particularly when "trapped" in twins.

The main crankcase casting is a solid affair some 2½ inches long with full length mounting lugs. The centre section houses the two ball races carrying the intermediate shaft, which is virtually a short crankshaft with integral disc and $\frac{7}{32}$ in. diameter crankpin, made in the conventional manner, and a further disc and pin fitted at the other end. The front pin carries the connecting rod for the forward piston and engages in a hole in the main crankshaft web to pick up the drive. The crankpin on the rear intermediate shaft web, of course, merely carries the rear piston connecting rod. The main crankshaft is carried in a detachable front housing, secured to the crankcase with four screws; and the bottom assembly is completed by a crankcase back cover.

Propeller R.P.M.

Propeller	*R.P.M.*
14 x 6 Trucut	5,800
13 x 8 Trucut	6,100
13 x 6 Trucut	6,800
12 x 6 Trucut	7,400
12 x 4 Trucut	9,000

Actual size drawings of the 7 c.c. Taplin Twin were published in our issue for May 1959. Those at right are not of a "Mini" variant; but are *half-size*



The two steel cylinders are of substantial thickness, turned with an integral square flange to sit on the crankcase and a substantial collar or ring above the exhaust A smaller rectangular intake portis cut through the port. cylinder wall 90 degrees (circumferentially) to the exhaust. The cylinders face intake to intake and are connected by a cold drawn manifold, which incorporating a boss facing sideways into which the carburettor screws. Two transfer passages are scalloped out on the inside of the cylinder, opposite the exhaust and overlapping the exhaust opening some 90 per cent. Each cylinder is then mounted by locating in its respective hole in the crankcase and securing with four screws through the bottom flange. Only weakness in this layout appears to be the possibility of the induction manifold connecting the two cylinders breaking away from one or other of the cylinders and so introducing an air leak.

Cylinder assembly is completed by the addition of finned jackets machined from dural, surmounted by turned dural heads each secured with six screws extending down to the cylinder flange. Both jackets and heads are anodised red. On an original version of the aero-engine Mark II "Twin", a series of separate sheet dural fins enveloping both cylinders were "stacked" in position and secured by deeper, recessed heads. This was found not to be entirely satisfactory and so the conventional jacket arrangement has now been adopted, with separate jackets for each cylinder. Each head, of course, carries a compression screw, and a small compression spring provides locking action to hold adjustments.

Cylinder bores are "armour" plated (hard chromium plated), the advantages claimed being increased wear and corrosion resistance—at a cost, incidentally of considerably complicating production. Hard chrome plating of cylinder bores is coming more and more to the fore and appears to have definite advantages. Pistons are of conventional form of cast iron, and quite substantial in section. Connecting rods are light alloy forgings with the big ends bronze bushed. Gudgeon pins are silver steel, $\frac{5}{32}$ in. diameter.

Exhaust ports are connected by a plated manifold, sealing on a cork gasket. A downward facing stub exhaust is brazed to the bottom centre of the manifold and the complete unit is attached with a single screw. The position of the stub exhaust pipe ensures complete draining of the manifold with the engine in the normal (upright) position.

The carburettor unit is clever and quite straightforward. Fuel entry is metered via a needle valve at the top and thence to the centre of the choke tube traversing the centre of the body. Intake opening at the throat is controlled by a barrel valve, actuated by a lever at the bottom of the body. This lever has limited movement given by one fixed stop (barrel valve wide open) and an adjustable screw stop at the other extreme for setting the slow speed adjustment. An adjustable air bleed is also incorporated for setting the slow speed mixture with the barrel valve closed, this bleed being shut off when the throttle is opened. Thus adjustment of air bleed has no effect on open throttle mixture.

Being of cylinder port layout, the "Taplin Twin" timing is symmetrical, thus the engine will run equally well in either direction of rotation. Transfer timing is quite generous, ensuring the introduction of a full charge in the head and probably also assisting scavenging at higher speeds. Speed is, however, ultimately limited by the induction timing, which is taken right up to the limit,—i.e. up to the bottom of the exhaust. Any greater induction timing would mean both exhaust and induction port being simultaneously uncovered by the bottom of the piston. The amount of charge which can be inducted is quite high for a sideport engine, as shown by the fact that the "Twin" will run at 10,000 r.p.m. plus although its design speed is in the neighbourhood of 6,000 r.p.m.

Workmanship throughout we found to be excellent, and an improvement in many respects over the original version of the "Taplin Twin" which was rather crude in certain details and also tended to suffer from tight ball bearing fits. The bearings carrying the intermediate crankshaft we still feel lack diametrical clearance, but this is a very tricky assembly in any case and the engine did not appear to suffer any loss of power or undue friction from this region, as evidenced by no signs of overheating of the crankcase. As a model engineering production the "Taplin Twin" represents excellent value for money and we imagine more time must be spent over every individual engine than a dozen mass-produced sports engines normally receive. A lot of diesel-twin 'know how' gained over the past years with the original model has also been built into the Mark II, which accounts for its delightful handling characteristics. It is not really competitive with glow motors of similar capacity, but is rather in a class of its own; and for "sports" performance in a large free flight or control line design, or easy-flying radio control it could justly win a lot of regard.

Specifications

Displacement: 8 c.c. (.488 cu. in.)
Bore: ·705 in.
Stroke: ·625 in.
Weight: 17½ ounces
Max. power: ·363 B.H.P. at 9,450 r.p.m.
Max. torque: 46 ounce-inches at 5000 r.p.m.
Power rating: ·045 B.H.P. per c.c.
Power/Weight ratio: ·021 B.H.P. per ounce
Material specification
Crankcase: light alloy gravity die casting
Cylinder: high tensile steel, hard chrome plated bore
Pistons: Meehanite
Contra pistons: Meehanite
Connecting rods: light alloy forgings
Crankshaft: main—nickel plated steel; intermediate—nickel plated steel
Main bearings: front (main shaft) roller race rear (main shaft) ball race
Intermediate shaft bearings: two ball races
Front bearing housing: light alloy die casting
Crankcase back cover: light alloy die casting
Cylinder jackets: dural, anodised red
Heads: dural, anodised red
Carburettor: gravity die casting with turned light alloy components
Spraybar: brass
Propeller driver: dural, anodised red
Spinner: dural, anodised red

Australian National Championships — by R. Lloyd

THE 16TH Australian National Model Aircraft Championships were held on Camden civil aerodrome from December 28th to January 4th 1963. Camden is 40 miles south of Sydney in N.S.W. and situated in rich dairy country. Seven inches of rain had fallen over the area in the four weeks prior to the Nats and the countryside was a lush green in marked contrast to the usual dry and dusty conditions that prevail during the hot Australian summer months.

Weather conditions were fair and ranged from calm morning air to winds from 15-20 m.p.h. in the afternoons which on F/F days helped to sort the men from the boys.

Control line scale was won by W. Woodcock of N.S.W. with a 48 in. span *Stearman Kaydet* enlarged from A.P.S. scale plans. Detail and finish was superb and the O.S. 35 fitted with a throttle control for realistic landings.

In **Free Flight scale,** Alan Talbot of N.S.W. entered an *Etrich Taube* enlarged from AEROMODELLER drawings. Alan is a real scale craftsman and this 30 in. span model

was complete down to the last rigging wire, it was powered by a Cox .020 motor that fitted nicely into the scale motor. Alan had trouble trying to R.O.G. and eventually settled for a hand launch in gusty conditions. Bob Greenhills' 72 inch *Bristol Bulldog* took second place. What the big model lacked in detail it more than makes up in realistic 25 yard take-offs and stable flights.

There were a large number of entries in the **C/L Stunt** and **Combat** events and three very full days instead of the scheduled two were needed to decide the placings.

An added incentive to the Stunt flyers was the Super Swift Lawn Mower, generously donated by the makers to the first place winner. This year it was Paul Turner of Sydney. Combat was a hectic affair and crashes numerous. Title holder is Sydneysider Ken Lloyd who thoroughly deserves his win.

Multi radio was virtually a N.S.W. affair for only one Victorian modeller made the long trip to Sydney. Tom Prosser won the event for the second time with some beautiful precision flying. Besides the perpetual Trophy, Tom also won a handsome Refrigerator that had been donated by Sydney philanthropist and refrigerator manufacturer Sir Edward Hallstrom, a fitting prize for an event that demands the tops in aeromodelling.

This year the Sydney **speed** merchants proved again that practice is needed to keep in the winning circle and they took the first three places. O.S. 15, Super Tigre G20 and K & B 15R, were in evidence but it was a Fox 15XX powered speedster flown by C. Wheatley that racked up the winning time in F.A.I. with 109.1 m.p.h.

The first rounds of **Free Flight** started at 5.30 a.m. and were flown in calm air conditions although later rounds had to contend with breezy conditions which made retrieving difficult, for Camden airfield is bounded on three sides by the Nepean River and a number of contestants had unexpected swims to regain wayward models.

The **Wakefield** classic was again won by Victorian flyer Sean O'Connor who racked up 5 perfect maxes, Wesley Penfold the S.A. expert was not far behind with a beautifully constructed Max Maker.

F.A.I. power was another triumph for Cox motors and Keith Murray's functional model flew very well to win the event. Conditions were far from ideal, a light drizzle and breeze and it was soon evident that the heavyweights needed thermal activity to max consistently. Victorian flyer Ron Greeve's was a hot contender for the F.A.I. event but he tree'd his model on the third flight and his Enya 15D powered reserve lacked the punch of the Cox Special 15. Cox motors also had a benefit in class I power and placed 2nd in Class II.

Open power was flown for the first time this year and although most contestants were using the formidable Cox's the winning model of B. Allcock was powered with a vintage Elfin 1.49 which proves again that the model and not the motor decides most events.

Nordic A/2 was a triumph for Victorian junior, R. Wilkins, who defeated the "experts" with an A.P.S. *Sans Egal*, in what was a very hotly contested series of rounds, young Bob also flew well in Wakefield and placed third in Open Rubber.

Hurl Glider saw a new figure enter the ranks of the strong arm brigade in the person of I. Virri a muscular six footer from Canada, who flew three consecutive maxes to win with Dave Hegarty and S. O'Connor filling the minor placings.

The 16th Nationals concluded in the traditional manner with the **1 hour power scramble.** Over 40 contestants awaited the word "go" and then the fun started. Because of the wind, times were not high but Bankstown Shamble's expert Ivor Stowe won in convincing style. The perennial Mills .75 again powered the winning model.

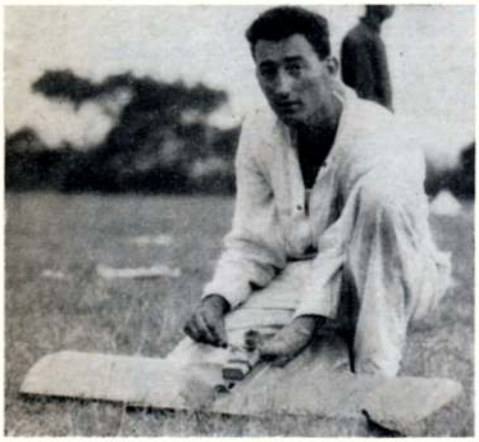
National Champion for the second time is South Australian all-rounder Wesley Penfold who, this year contested *all* the free flight events. Wesley thoroughly deserved his win for on one of the F/F days he flew in four events, Wakefield, Open Power, Class III power and Hurl Glider, some 19 flights and two swims across the river to retrieve his models.

Young Bob Wilkins is the Junior Champion and there is no doubt that this young fellow will be a force to reckon with at future Nats for his models are beautifully constructed and expertly flown, Bob is just 15 years old.

(Above) Victorian Ron Greeves with his Cox 15 powered F.A.I.—Ton which has brought him so much success, including 2nd in Power Ratio and in F.A.I. power at this meeting

(Opposite) Winning Stearman Kaydet, enlarged from AEROMODELLER scale drawings by W. Woodcock has an O.S.35 and scale type prop fitted here

(Centre, Opposite) Place winners in multi-channel radio control. L. to R. Tom Prosser's winning Gee String from A.P.S. Plans, John Marquette's O/D model, Basil Healey's Pegasus and background model is Australian "Model News" Editor Russ Hammond's



(Above) Kombat King Ken Lloyd flew a straight wing with trailing edge elevator, rubber band and tank for K & B 35 engine on pressure feed

(Opposite) De Havilland Mosquito was entered in control line scale, fitted with a pair of O.S. 15 glow engines

(Below) What hats! Sean O'Connor fits his prop with Ralph Kenyon holding the winning Wakefield class model, only one to make five max's

FREE FLIGHT SCALE

1st A. Talbot	N.S.W.	A.P.S. Taube Cox .020	120 pts.
2nd R. Greenhill	Vic.	Bristol Bulldog Glo-Chief 35	115 pts.
3rd C. Cox	N.S.W.	Spitfire. Holland Hornet	95 pts.

POWER RATIO I

1st W. Penfold	S.A.	Scaled Down Dixielander	T.D.051 24.2 ratio
2nd R. Lloyd	Vic.	Minicano	T.D.051 21.1 ratio
3rd B. Potter	N.S.W.	A.P.S. Dynamo	T.D.049 19.4 ratio

POWER RATIO II

1st W. Penfold	S.A.	Cox 15 Special	23 ratio
2nd R. Greeves	Vic.	T.D.15	20.9 ratio
3rd L. Fahey	N.S.W.	Oliver Tiger	20.1 ratio

POWER RATIO III

1st R. Lloyd	Vic.	Pressurised O.S. 29 III	15.45 ratio
2nd Murray & Cooper	N.S.W.	Eta 29 VI	13.3 ratio
3rd W. Penfold	S.A.	K & B35 61 Series	12.2 ratio

POWER SCRAMBLE (One Hour)

1st I. Stowe	N.S.W.	Mills .75	1436 secs.
2nd D. Hegarty	N.S.W.		1345 secs.

CLASS ½A TEAM RACE

1st J. Partland	N.S.W.	Modified Oliver Cub	9.56.9
2nd Oehme & Silva	S.A.	Oliver Cub	11.58.4
3rd S. O'Connor	Vic.	P.A.W. 1.49	12.19.6

CLASS II TEAM RACE

1st J. Partland	N.S.W.	Enya 29 IIIB	7.31
2nd Pullin & Abel	N.S.W.	Enya 29	

CLASS III TEAM RACE

1st Wilson, Cincotta & James	Vic.	O.S.35 III	8.25.7
2nd B. French	Qld.	O.S.35 III	9. 4.7
3rd Pfeifer & Hughes	Vic.	Kyowa 45	9.24.4

CONTROL LINE SCALE

1st W. Woodcock	N.S.W.	Stearman Kaydet O.S.35	144 pts.
2nd A. Talbot	N.S.W.	D.H.4 O.S.15	143 pts.

OPEN COMBAT

1st K. Lloyd	N.S.W.	K & B35 61 Series (Pressure)	
2nd J. Jacobson	Qld.	O.S.23 III	
3rd A. Kerr	N.S.W.	Fox 35	

CLASS II SPEED

1st A. Kerr	N.S.W.	K & B 29R	136 m.p.h.
2nd J. Morgan	N.S.W.	Fox 29X	127.8 m.p.h.

CLASS III SPEED

1st P. McGee	N.S.W.	McCoy 60 8¼ x 12¼ Prop. 40% Nitro Methane	146.3 m.p.h.
2nd L. Buck	S.A.	McCoy 60	143.4 m.p.h.

CLASS PROTO SPEED

1st J. Morgan	N.S.W.	Fox 29X	111.3 m.p.h.
2nd J. Jacobson	Qld.	O.S.29 III	107.8 m.p.h.

INTERMEDIATE RADIO

1st L. Winley	N.S.W.	Houdini Glo-Chief 19	Silvertone
2nd N. Fell	Vic.	Viking O.S.19	
3rd N. Winley	N.S.W.	Mustang O.S.15	Silvertone

JUNIOR ½A TEAM RACE

1st B. Stretch & Polderman	Vic.	Oliver Cub	12.31
2nd J. Densham & Babington	N.S.W.	E.D. Fury	17.51

JUNIOR STUNT

1st I. Brown	N.S.W.	Thunderbird Veco 35	
2nd G. Lynch	N.S.W.	Commanche O.S. 35	
3rd L. Follet	Vic.	Merco 29	

JUNIOR COMBAT

1st C. Parry	S.A.	Glo-Chief 35 (Ball Race)	

OPEN RUBBER

3 Flights

1st S. O'Connor	Vic.	540 secs.	1st S. O'Connor	Vic.	900 secs.
2nd R. Greenhill	Vic.	434 secs.	2nd W. Penfold	S.A.	840.5 secs.
			3rd J. Christie	N.S.W.	762 secs.

WAKEFIELD

OPEN POWER

5 Flights. Total Motor run must not exceed 35 secs.

1st B. Allcock	N.S.W.	Elfin 1.49	703.1 secs.
2nd R. Greeves	Vic.	T.D.15	634.3 secs.
3rd R. Lloyd	Vic.	O.S.19	624 secs.

F.A.I. POWER

1st K. Murray	N.S.W.	Own design Cox Spec.	796 secs.
2nd R. Greeves	Vic.	Texan F.A.I. Ton Cox Spec.	745 secs.
3rd T. Carver	Vic.	A.P.S. Pulteri Cox Spec.	644 secs.

MULTI RADIO CONTROL

1st T. Prosser	N.S.W.	G. String K & B 45 Home built Kraft Tran. and Rec.	3576 pts.
2nd B. Healy	N.S.W.	Pegesus K & B 45 8 channel Reptone	2514 pts.
3rd J. Marquette	N.S.W.	Own design Veco 35 Silvertone Multi Gear	1510 pts.

SINGLE CHANNEL RADIO

1st T. Prosser	N.S.W.	Penetrator Sabre 19.	Home built Gear
2nd L. Winley	N.S.W.	Graupner Electra Silvertone	Glo-Chief 19

A. SAILPLANE

1st R. Wilkins	Vic.	(A.P.S.) Sans Egal	817 secs.
2nd S. O' Connor	Vic.		734 secs.

SENIOR STUNT

1st P. Turner	N.S.W.	Thunderbird O.S.35 III	
2nd D. Harlow	Vic.	Small Shark O.S.35 III	
3rd K. Taylor	Vic.	Large Shark Enya 45	

F.A.I. TEAM RACE

1st B. Eather	N.S.W.	Eta 15	5.37.3
2nd L. Neight	Qld.		7.14.5

TOP STATE—AEROMODELLER SHIELD

1st ... N.S.W. 2nd ... Vic. 3rd ... S.A.

BOOST PORTS

An explanation by R. Kinnersly

Author's remarkable 10cc engine pictured at right with two experimental pistons.

CONFUSION EXISTS AS to the nature of boost ports and how they work, arising from the review of my 10 c.c. engine in the May, 1962, issue of AEROMODELLER.

There are two forms of port now in use, loosely termed "*boost port*". One is the form of port positioned diametrically opposite the exhaust port in Schnürle system engines (*Fig.* 1) whose function is to utilise the gases under the piston crown and so increase scavenging efficiency. The timing was originally rather "short" in relation to main transfer port timing, but subsequent development has enlarged this port, with increased understanding of its potential, until its chordal width is now governed solely by the room available before the positioning of the main transfer ports is detrimentally effected. In the same manner, the port height has increased so as to equal in some cases the height of the main transfer port. A second point with this form of port is that the thermal stresses on the piston are considerably reduced, due to the circulation of cool charge directly under the piston crown.

The apparent upper dimension of the port is not necessarily its true time-area, as for reasons of mechanical strength, it is impossible to cut a relating window of such chordal width in the upper regions of the piston. Therefore the piston port is normally narrow and deep, which naturally modifies the flow characteristics of the port. (*Fig.* 3).

In fact it is worth experimenting with the shape of this piston window to find the optimum performance of the port as a whole. The manner in which this is done depends on the concept of the designer.

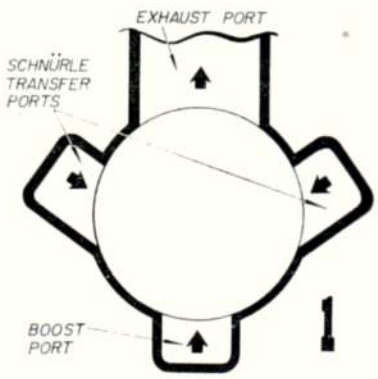
It has been used with outstanding success by the M.Z. designer, Walter Kaaden, who obtained a 20 per cent. power increase by combining this port with the standard Schnürle system.

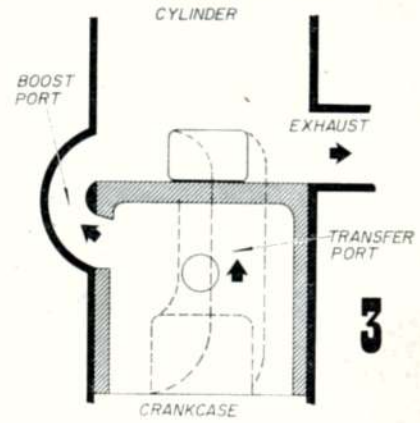
This form of port is not really new. Its use dates back to pre-War derivation from the Schauer patent, which was used by Zundapp motorcycles of the period.

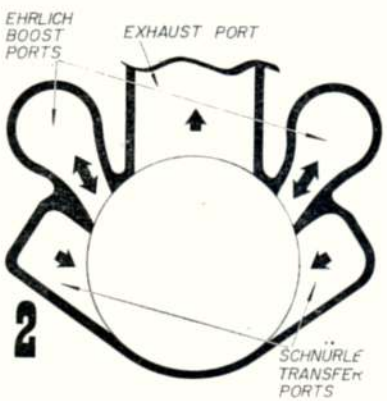
Description of my 10 c.c. engine in the May issue aroused considerable controversy and I ought to make it clear, that the above is the type of port used.

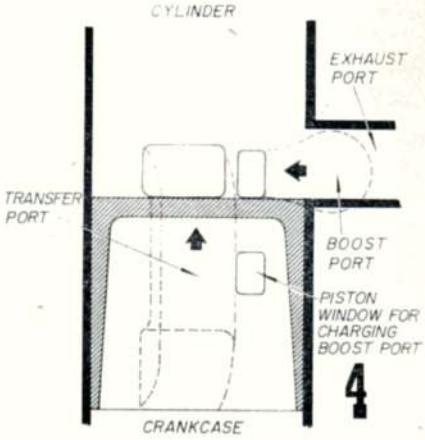
The second type of port in use is the Ehrlich boost port, for which patent No. 824,673 was granted in 1956. It is the invention of Dr. J. Ehrlich, the well-known two-stroke designer. The object of this port is identical to the type just described—*i.e.*, to increase scavenge efficiency—but the principle is entirely different. These two ports are situated *between* the normal Schnürle ports and the exhaust port, at a similar angle to the main transfer ports. *(Fig.* 2.)

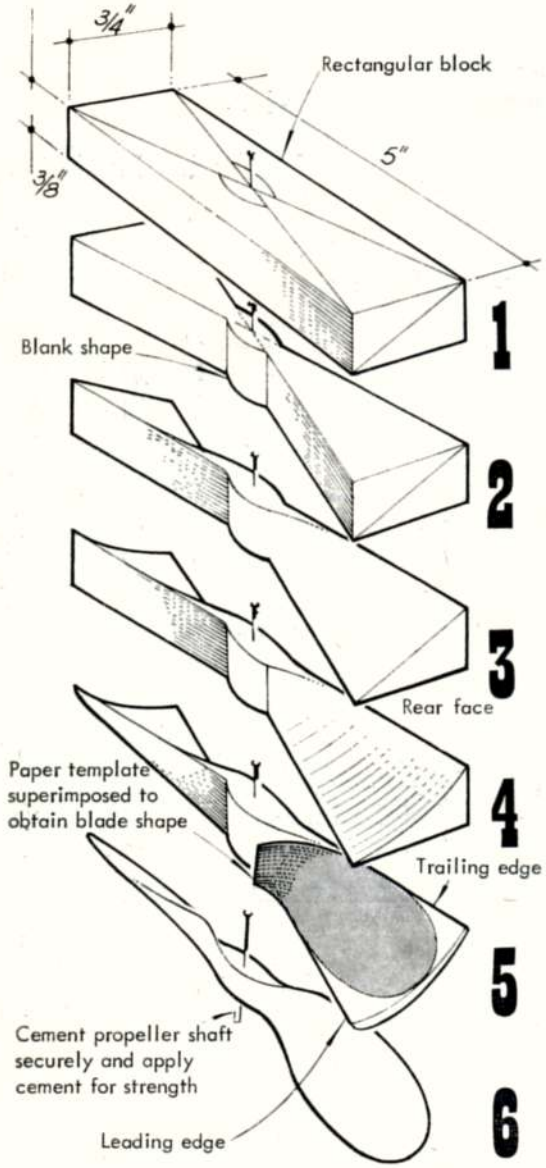
The operation of the port is as follows: near the maximum crankcase pressure for the desired operating r.p.m., two windows set high in the piston skirt uncover and charge the boost ports shown in *Fig.* 4. The piston

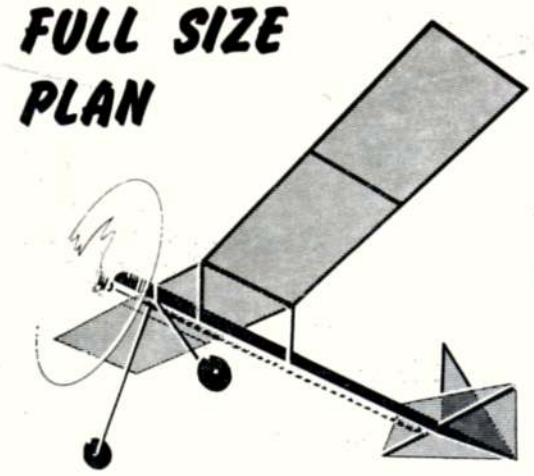












12 inch Indoor Flyer

make this simple quickie for flying fun in clubroom or your own home parlour

Crude it may be; but this little creation, which can be knocked off in an evening, provides an exercise for any aeromodeller whether he is a novice or expert. Details of prop carving given at left apply to all types of rubber driven model. Why not make the *Indoor Flyer* a club subject? Great fun can be had with these little jobs in quite small rooms. The materials list only calls for two lengths of 1/16th square, a piece of 1/16 by ¼ in. for the motor stick, a propeller block, scrap of 1/32 sheet for wheels and a length of the finest gauge piano wire you can get in the model shop. 24 gauge is satisfactory, 26 gauge even better. The aim is lightness as can be seen by the utter simplicity of the tailplane and the slower you can get this midget to fly, the more fun and duration you will have. Once experienced, you can graduate with a cambered airfoil, but even with flat plate surface the *Indoor Flyer* knocks off a most respectful and impressive performance. Developed from an original design by Victor Fritz of Philadelphia by David Lane Call and W. T. Hawkes, this little airframe is trimmed for flight by simply shifting the wire wing mounts back and forth along the motor stick.

BOOST PORTS continued

continues its downward travel and the remaining charge in the crankcase is transferred at low velocity into the cylinder via the main transfer ports. Shortly after this main action, the boost ports open and pass their charge at high velocity into the cylinder. This gives in effect a two-stage transfer system which, with the development work carried out by Dr. Ehrlich, has been made to yield an impressive power curve which is much "fuller" than that usually associated with two-stroke engines of that power output.

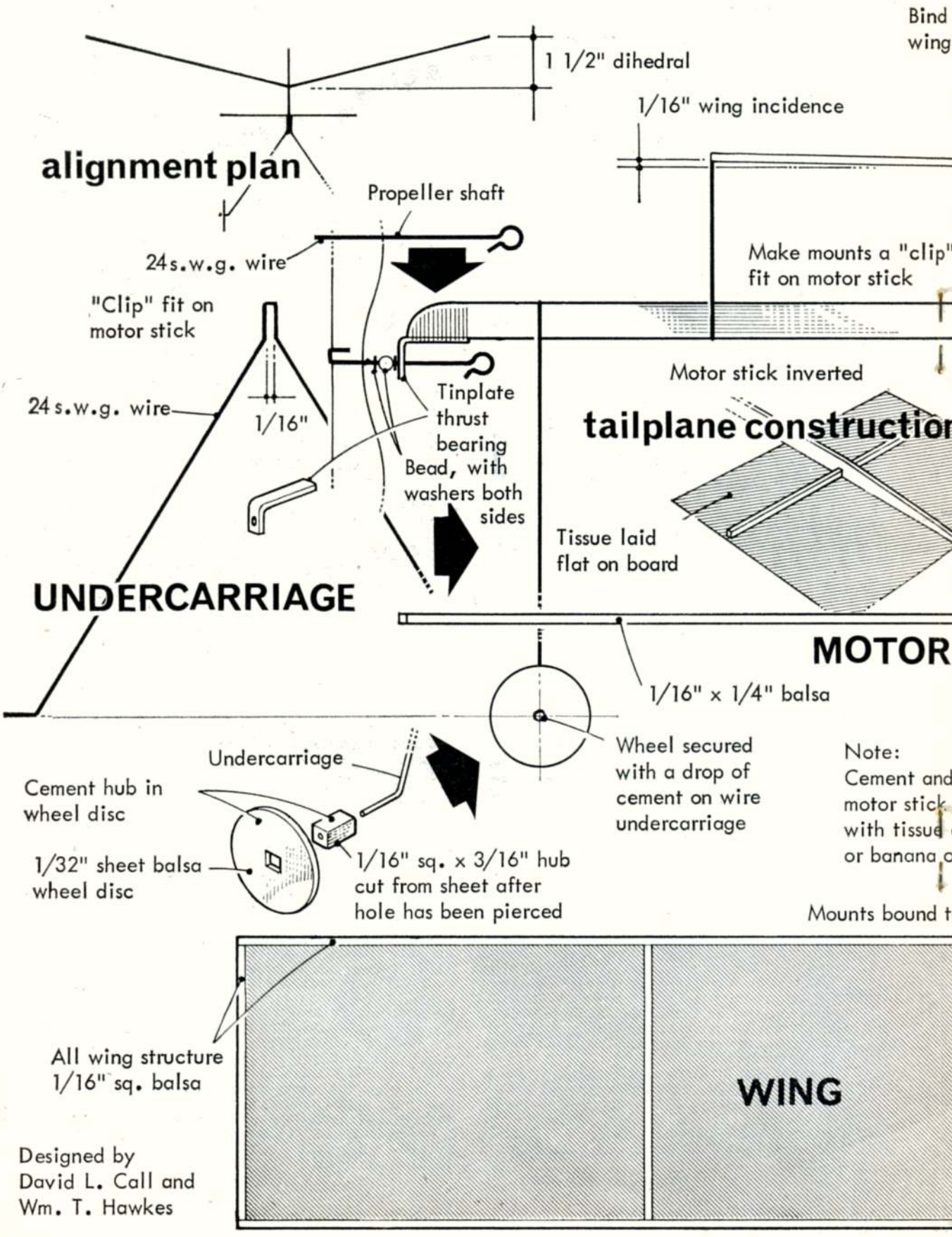
As can be seen, the idea is capable of many variations. As regards dimensions, their limit of chordal width is dictated by the need to avoid upsetting the main transfer port positioning, and the excessive proximity to the exhaust port which, apart from raising the temperature of the stored charge, will lead to undue charge loss or pollution.

No information is available on the volume of these ports, but I would "guesstimate" that they represent a potential 15-20 per cent. of the total transferred charge.

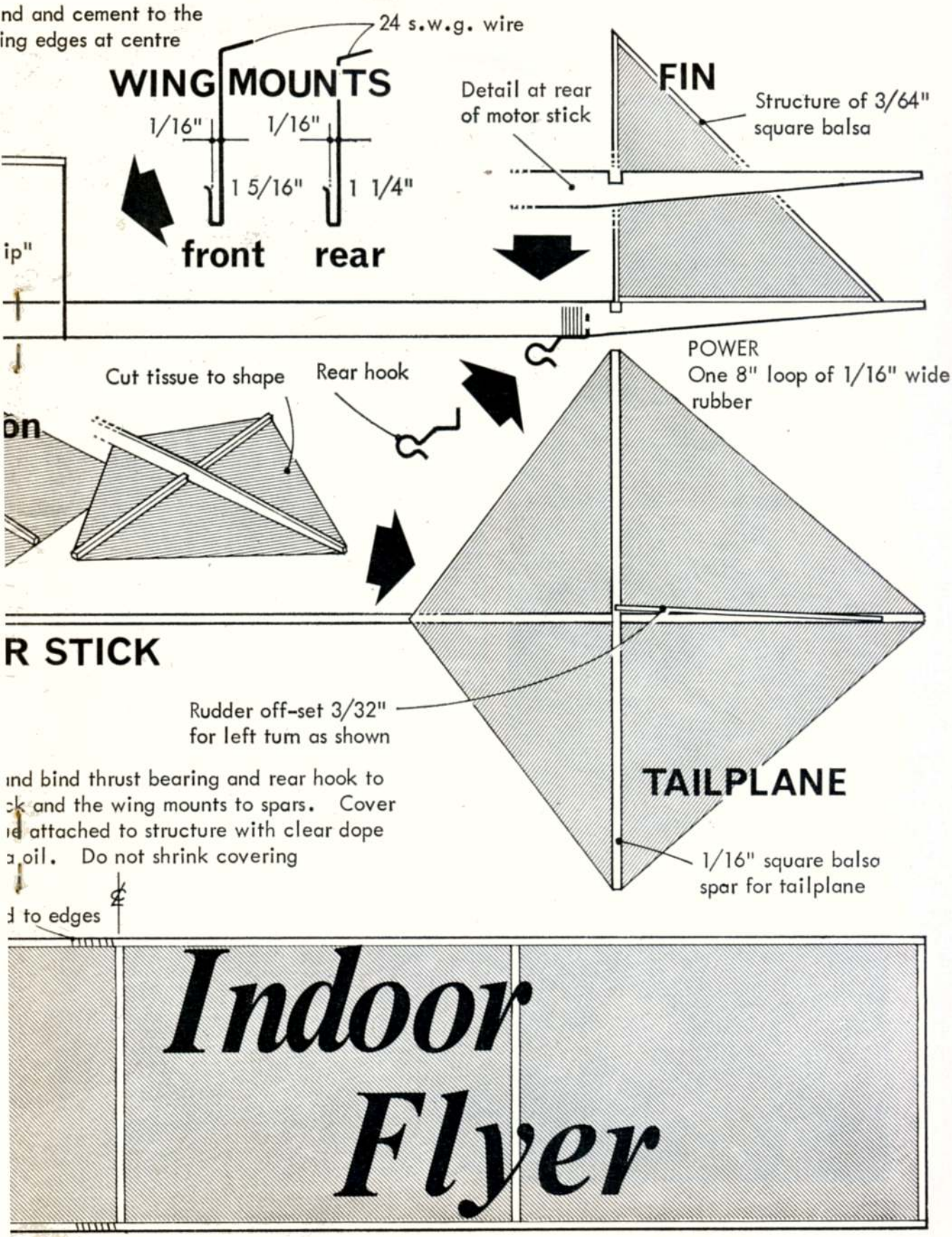
As to height of the ports in relation to the main transfer ports, I should imagine their value to be approximately 70-80 per cent. of the latter.

Comparing the two systems just described, we see that, in terms of positioning as regards directional gas flow, the Ehrlich system would seem to have a better potential. The other system can tend, if not very carefully designed and timed, to reduce effective filling by pushing the normal Schnürle loop nearer the exhaust port.

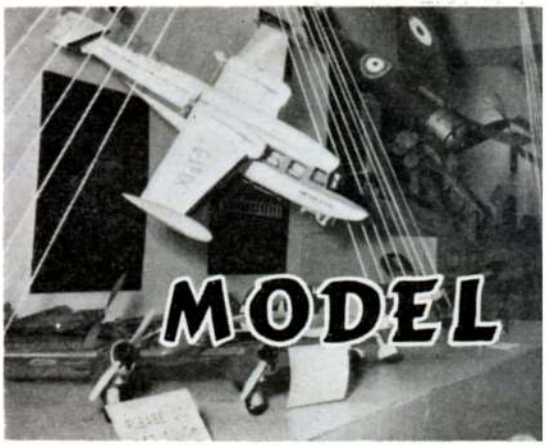
In conclusion it is essential to realise that both forms of port are, as their name implies, secondary in importance to the normal porting used in modern racing two-strokes. Correct application can yield great improvements in power and power characteristics, and I feel boost ports have great potential in the future development of the two-stroke engine.



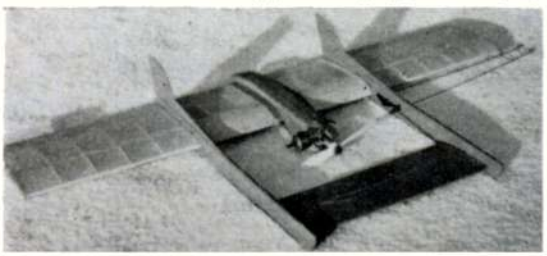
Designed by
David L. Call and
Wm. T. Hawkes



Indoor Flyer



WE RECENTLY HAD the pleasure of joining Ray Booth (of the A.V. Roe wind tunnel department and well known scale modeller) and Sid Lawton (S.M.A.E. North Western Area delegate) as a judge at the N.W. area exhibition in Manchester. Henry's Stores allocated a fine area on one of their upper floors, supplied a display expert and with the co-operation of clubs in the district, built-up a most impressive exhibition to tell the story of aeromodelling. Two small sections are seen in the heading photographs. On the left, scale models with the familiar shape of Maurice Bodey's *Piaggio P.*166 in the foreground, a *D.H.*88 *Comet* on the table and suspended in the background, a *Bristol Monoplane Scout*. It was quite flattering to find that all of the flying scale entries had been made from AEROMODELLER Plans Service drawings! Next picture covers the range of model flying, with a *Pulteri*, *Slingsby Motor Tutor* and *XL.*56 Wakefield, plus the framework of a *Keilkraft Super* 60. Around the exhibition walls were typical stages of model construction, so arranged that the casual visitor could not fail to be impressed by the effort put into the hobby. It was specially encouraging too, to find that John Hannay's young daughter gained an award with her *A*/1 glider, which seems to be a standard design in those parts.



Congratulations to the North West on a fine show.

Last month's *Canard* feature bought forth a number of interesting comments, including one from team race enthusiast Dick Place who submitted the next picture. The model is 30 in. span, 150 sq. in. wing with P.A.W. 1.49 diesel. It is an experiment to determine ideal C.G. positions and location of the pivot point, which can be detected on the inner boom. Results of the experiment will be used to build a Canard F.A.I. team racer. There is nothing like originality and this one has more than its share of that commodity!

On the other hand, having committed ourselves to such a comment we shall probably be inundated with control line Canards from all parts of the world! A reader came up the other day with the bright idea of building a *stunt biplane* and he thought it highly original that for semi scale purposes and stunt efficiency, he should utilise full span flaps on the lower wing trailing edge after the manner of full span ailerons used on a number of full-size biplanes. As we have said so many times, there is nothing new, so we dug out our picture, of just such a model taken last year at the South Midland Area Rally when we found control line pioneer and veteran enthusiast, Fred Guest, having some fun with one of his earlier models, re-engined with a Merco 35. Readers may not realise it but practically all of the British aluminium spinners and a very high proportion of the commercial fuel tanks, are made by Fred.

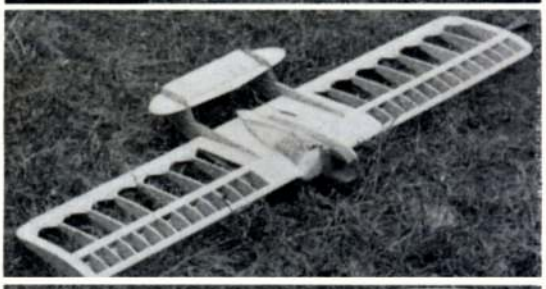
Bottom left is F. J. Pateman, semi control line champion of the Northampton M.A.C. and he is seen holding the trophy along with his P.A.W. 19 powered *Gunslinger*, 85 m.p.h. combat model, which won him the honours

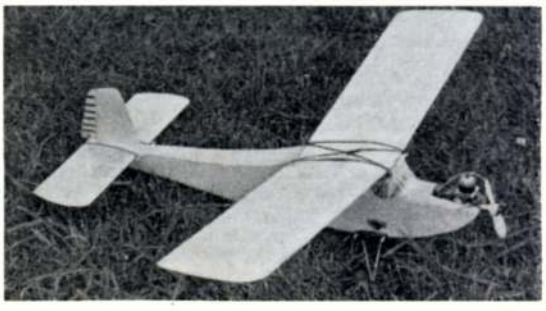
in 1962. Note the extended elevator on this design. There seems to be a division of opinion as to whether this or the outrigger elevator has best control advantage.

Over to top right and a change among stunt models. A. J. Dowell made this shoulder wing 50 in. original *Centurion* with 500 sq. ins. wing for a Veco 35. It proved to be a most forgiving model and is now doing a second term of service as the stunt trainer for local school lads at Putney. Alan Dowell has been most concerned at the apparent lack of enthusiasm for stunt events. This has also been our own concern, especially as the S.M.A.E. went out of its way to programme seven meetings in 1962 and a number of rally organisers included stunt in their programme. Result was the same few names turned up each time. Does the stunt man really like to enter the competitions or does he get far more enjoyment flying for fun? A lot of this size model are made and it would be interesting to learn where they all go to. Constructional photo shows I. Turner's "*Shim-Shek*" *combat* design from Wolverton, Bucks. Made for the Rivers 3.5, it uses a 36 x 8 in. wing with half ribs to strengthen the leading edge and maintain airfoil section. The tail is supported on twin booms, but the interesting point is that this is now discarded because in a crash removing part of the outer wing, the outer boom weakened and destroyed control so that a single vertical tail is now used to support a lifted tailplane. Other interesting construction feature is the use of three pieces of $\frac{1}{4}$ in. square balsa stuck to one another to form an "L", which is then set on angle and makes a light yet extremely strong leading edge. Hardwood spars are used and top claimed speed is 103 m.p.h. with a re-worked 8 x 6 in. propeller. Now a familiar shape in a *Poppet* built from our full-size plans and converted to radio control by D. J. Bond of Yeovil. He used an Ultratone receiver, Elmic Conquest and total weight was 14 ozs. In consequence Mr. Bond extended the wing chord by $\frac{3}{4}$ in. and says he has a very nimble model, which gives out all spiral dives very well indeed.

Below left is quite obviously a model bearing the P. E. Norman trade mark. It was only natural that he should scale down his remarkable *ducted fan* semi-scale fighters for the .010 and .020 Cox engines and this is the result, moulded plywood fuselage, solid sheet wing, retained by a very simple rubber band system on extended engine mount "ears" make this a most fascinating project and we gather they go like the proverbial Bumble-Bee. It won't be long before one of these is radio controlled!

Finally to cap all our models of this month we have D. R. Hughes' R/C twin which he calls *Double Talk*. A pair of Cox .049's are ready to haul this 25 oz., 42 in. model which has been waiting weather conditions for a test flight. Receiver is a Microdyne-One operating rudder only. The small diameter close set engines should help to minimise torque troubles and we look forward to hearing of successful tests now that Spring has shown its face.





Gus Johnson checks over the new

ROSSI 60

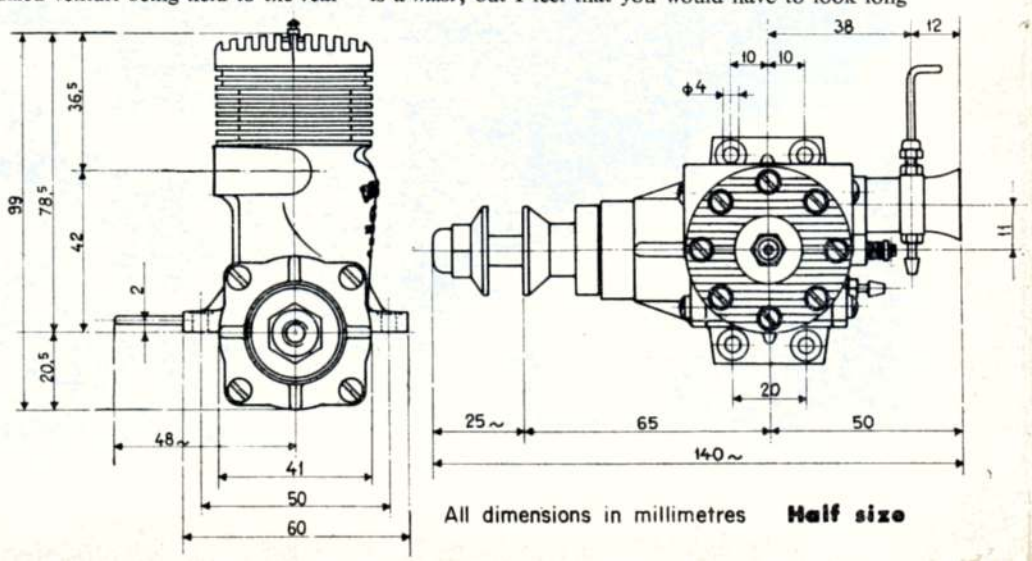
FIRST IMPRESSION OF the new Rossi 60 10 c.c. speed unit is of a really powerful and tough engine. Although resemblance to the McCoy 60 is striking, the Rossi has the appearance, and is certainly a much more robust engine than its counterpart. Some of the items which are usually modified, in the McCoy 60 by specialists are already incorporated in the Rossi as standard production items. Workmanship is of high quality throughout and it would be difficult not to be impressed with this latest 10 c.c. design on the model engine market.

The sand cast case, stiffening webs included, is very rugged and consequently should be adaptable to very heavy duty work normally associated with boat and race-car operation. Most striking area is in the transfer port side, this being quite large and adequate. Only minor grinding to remove "flash" from the inside transfer area was apparently needed in the casting and no apparent effort was made to polish the transfer area. Another notable item is the inside of the lower case. The front half, receiving the front cover is about 1/16 of an inch heavier than the rear section that accepts the rotor, and is a result of a determined effort to "pack" the crankcase volume. The crankshaft itself has been designed utilising the full disc counter weight principle to further aid in packing the crankcase and is moderately counter-balanced, with a bronze ring sealing off the cutaway area on the balanced shaft, similar to the new K & B Torpedo series engines as designed by Wisniewski. The crankshaft is of short design and very finely machined and polished, with a front extension and propeller driver held in place with an Allen head grub screw. This extension receives a $\frac{1}{4}$ in. bolt approximately $1\frac{1}{4}$ in. long on which is mounted the propeller nut. The entire set-up certainly minimises extensive engine and crankshaft damage in the event of a "prang", needing only to replace a short $1\frac{1}{4}$ in. bolt, or at most, a new turned front adaptor. The entire front assembly is mounted to the case using $\frac{1}{4}$ in. bolts rather than the $\frac{3}{8}$ in bolts used in the rest of the engine.

It was not deemed necessary to further dismantle the front assembly and therefore the type and size of the two front ball bearings remain unknown, they are nice and free running. The "back door" is one of the finest stock rear cover assemblies seen on any production engine. The casting is quite rugged and clean, with the large, black anodized venturi being held to the rear casting by a small set screw. The fuel jet, which extends into the venturi throat about $\frac{1}{4}$in., lines up perfectly with a needle valve having a long taper, and needle valve tension is set with the normal lock nut assembly. Rotor is made of a translucent nylon material and has been "relieved" on the outside edge about 1/32 in. and lightened and balanced with a milled slot on the rear face. The rotor pin extends through the casting and is fitted with a coiled spring of mild tension, held in place by a small brass washer and cotter key. A pressure tap and fitting is provided on the left side of the backplate at the nine o'clock position for those desiring to use a pressure tank in lieu of a balloon tank.

The Rossi cylinder head, which is also anodised in black, has a centre mounted glow plug extending into a conical shaped head with smooth transition from glow plug to firing chamber. The head is fastened in place by eight, $\frac{3}{8}$ in. machine screws and although the front and back plate are fitted with gaskets, the head is a metal to metal gas tight seal onto the sleeve. A slot is milled across the domed head to accept the straight, bar type piston baffle, and this piston is heavy, apparently designed for extraordinary heavy duty. It is equipped with a single ring, the ends of which are *not* butt jointed, but rather are cut on a 30 degree bias and in effect create a rather better seal, particularly in view of the single ring which is "pinned" in place to prevent rotation during running. The wrist pin is quite a bit shorter than the piston diameter and is held in position with small spring coil clips on either end and rides on exceptionally heavy bearers milled inside the piston. It rides on at least a quarter inch of aluminium on each end and no effort has been made to grind away excess weight inside the piston. Two bypass ports align with those cut in the sleeve. It is interesting to note that by "eyeball measurement", the sleeves of the Rossi and McCoy are identical.

Summing up, the Rossi 60 speed 10 c.c. racing engine is a fine engine, whether to be used in aeroplanes, boats or race cars. It lends itself easily to moderate hop-up procedures and it is my belief that most speed merchants, with a little "enginuity", thought, and applied personal attention, could really enjoy themselves in modifications to this engine, particularly if a couple of extra pistons could be obtained. In my opinion, lightening the piston is a *must*; but I feel that you would have to look long



All dimensions in millimetres **Half size**

Burly casting is obvious in view opposite. Pictures at right show the flat top, plain baffle piston and bevelled transfer ports. Below is the encased crankshaft disc and the nylon rotor each showing excellent workmanship. Figures below show standard engine performance against Gus Johnson's re-worked McCoy 60

and hard to improve the remainder of the engine other than applying the "personal touch" with polish.

During the dismantling of the Rossi 60 it was readily apparent that the engine had been operated for considerable time but in order to be certain that various parts were properly seated the engine was further run-in using a fuel mixture consisting of 20 per cent. Castrol M, 10 per cent. Nitro Benzene, 15 per cent. Nitro Methane and 55 per cent. Methanol (Regent Grade) for 15 runs of two minutes duration, totalling 30 minutes. At the end of this period the engine crankcase was still quite warm so it was deemed necessary to operate the engine for an additional 45 min. using the same procedure and fuel as listed above. Although the manufacturer recommends 20 per cent. oil, 50 per cent. Nitro, 10 per cent. Nitro Benzene and 20 per cent. Methanol this engine would not operate on this percentage nitro at this time, but did seem to run quite well on the lower nitro mixes. Thus, the following data was recorded using only two mixes of 25 and 30 per cent. Nitro. When an attempt was made to run comparative tests on 40 per cent. Nitro the Rossi definitely sagged and although the engine felt good it was noted that the single pinned ring had become "unstuck" and was rotating in the ring groove. In view of this and the fact that increased Nitro content would not result in an increase in performance at this time, it was decided to terminate the tests.

1st Series

FUEL: 25% Nitro Methane 20% Castrol M 10% Nitro Benzine 45% Methanol (Regent Grade). Rossi plug & OK plug in McCoy
WEATHER: Temp. 51 deg. F. Humidity 97%. Press Alt 29.50 in. hg

PROPELLER—R.P.M. TESTS

T.M.H.K.	Rossi 60	McCoy 60
9 x 12	12,900 r.p.m.	14,200 r.p.m.
9 x 13	12,650	13,850
8¼ x 12	13,350	14,600
8¼ x 13	13,100	14,100
TORNADO (Wood)		
9 x 11	13,200	14,300
9 x 12	13,050	14,100
8¼ x 11	13,700	15,050
8¼ x 12	13,450	14,700
REV-UP		
9 x 12	13,150	14,700
9 x 13	12,800	14,050
8¼ x 12	13,650	14,900
8¼ x 13	13,500	14,750

2nd Series

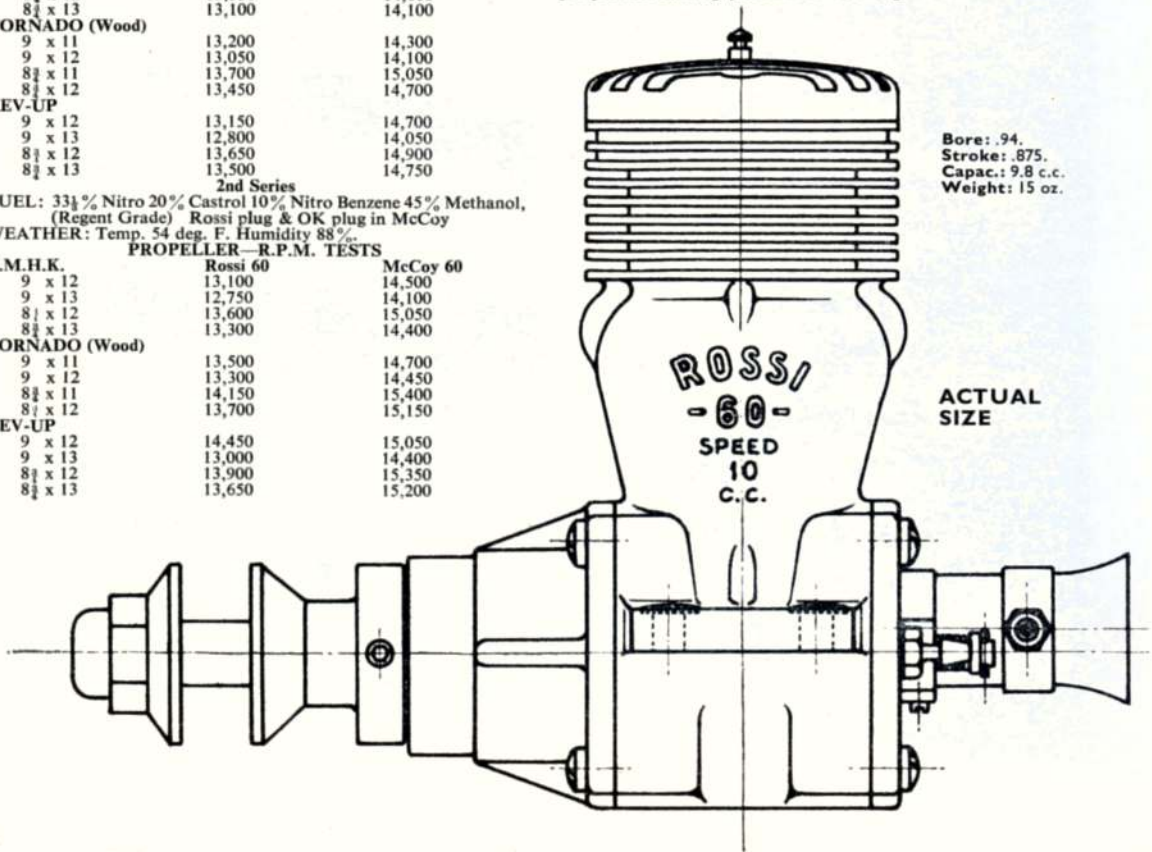
FUEL: 33⅓% Nitro 20% Castrol 10% Nitro Benzene 45% Methanol, (Regent Grade) Rossi plug & OK plug in McCoy
WEATHER: Temp. 54 deg. F. Humidity 88%.

PROPELLER—R.P.M. TESTS

T.M.H.K.	Rossi 60	McCoy 60
9 x 12	13,100	14,500
9 x 13	12,750	14,100
8¼ x 12	13,600	15,050
8¼ x 13	13,300	14,400
TORNADO (Wood)		
9 x 11	13,500	14,700
9 x 12	13,300	14,450
8¼ x 11	14,150	15,400
8¼ x 12	13,700	15,150
REV-UP		
9 x 12	14,450	15,050
9 x 13	13,000	14,400
8¼ x 12	13,900	15,350
8¼ x 13	13,650	15,200

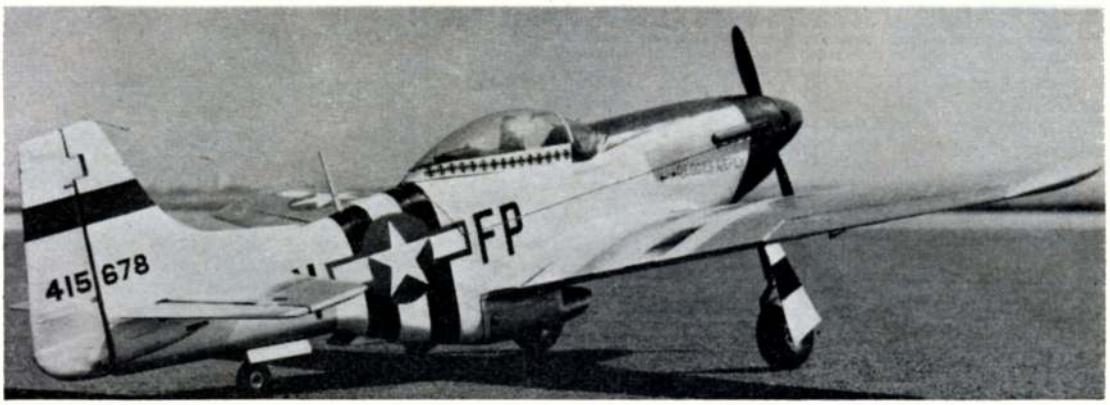
The author wishes to make it clear that the McCoy 60 performance figures are those of his own engine which is fully run in and which has been turning in creditable speeds (168 *m.p.h. record claim—Ed.*) In contrast, the Rossi *still* looked like it needed much more handling time, particularly in the front plate bearing assembly.

The information listed at left is an average of two runs per engine, using the same fuel, and merely exchanging propellers during periods of cooling.



Bore: .94.
Stroke: .875.
Capac.: 9.8 c.c.
Weight: 15 oz.

ACTUAL SIZE



OVER THE WAVES

RADIO CONTROLLED MODELS of scale subjects become increasingly popular each month. Kits have an enormous influence. Whereas it was once thought by most people (ourselves included) that exact true-scale versions of real aircraft might be tricky to fly, it seems that with full 10 channel equipment, maybe 12, one can get away with even a scale airfoil section. The *North American Mustang* has been a popular subject through provision of a kit by Sterling from the U.S.A. This has been modified to improved scale but the model in our heading is entirely original in design and comes from a North American employee. Bill Schurr. This is as close to scale as possible and he has chosen the markings of 336 Squadron based at R.A.F. Debden during World War II. Unfortunately the markings are not quite correct in that the individual letter should be P and the unit identification, VF, reading P-VF instead of as shown. Otherwise we must congratulate Bill for a fine job in his replica of John Godfrey's *Reggie's Reply*. Captain Godfrey, a renowned rebel who ran away from home to join the R.C.A.F. and thence the A.A.F. so named his Mustang in answer to loss of a brother at sea. With 36 victories, Captain Godfrey was a top scoring fighter pilot and his Mustang was placed on permanent exhibition beneath the arches of the Eiffel Tower after the war. The nose stripe is bright red. Sad news is that this fine 10 channel model burst into flames from an engine back-fire—which perhaps in one way makes it doubly realistic.

Most exciting scale project we know of on this side is Dave Walker's *Boeing B17 Flying Fortress* with four K & B 19 R/C engines and full house radio by F & M with transmite servos. Test flights have been shelved due to the heavy snows, but all systems are ready to go, including quadruple throttle on this 8 ft. 6 in., 12½ lb. remarkable model. Harry Brooks is due to make the initial test flights just as he did for Dave's earlier mult engined scale project, the *Miles Monitor*.

Besides scale, there is a natural interest in what the experts are preparing for the coming World Championships. Chris Olsen, now with Radio & Electronic Products, is not committing himself to any particular design as yet. Tapered and constant chord low wings have been tried but Chris has yet to be convinced that these will be better than his conventional *Uproar*, which incidentally he is now flying with latest transistorised Dekatone, using 5 Musclemites which have been ideal and, of course, weight saving. A "package deal" is offered by R.E.P. with the new gear, in that purchase of the complete outfit; (Tx, transistorised Rx and servos) gains a 5 per cent. discount.

Harry Brooks has named his new design the *Soraco*, 68 in. span, with 756 sq. ins. and 14 per cent. symmetrical section. He has changed to a Veco Lee 45 engine and an unusual feature is that he has adopted a split rudder with one piece elevator across the full span of the tailplane. This means that the vertical tail surfaces are disposed above and below the fuselage. Harry is also

Top left, high tail on Jean Konicheff's 90 in. span "Taiara" for Merco 35 and E.D.8 channel gear in Algeria. Elevator is operated by Bowden cable through fin, which has already proved vulnerable in a crash but nevertheless offers a "new look'. Below it is Bobby Brown's much modified "Smog-Hog", which has been a very popular design among the Southern Multi Flyers. Converted to radial cowling with a Woolworth's aluminium saucepan around a Rogers McCoy 60, the paint scheme gives an impression of the D.H.C. Beaver, making a nice semi-scale Beaver Hog

using the three blade 9 x 6 in. new Top Flite prop and strip ailerons—quite a few changes from his *Reb*.

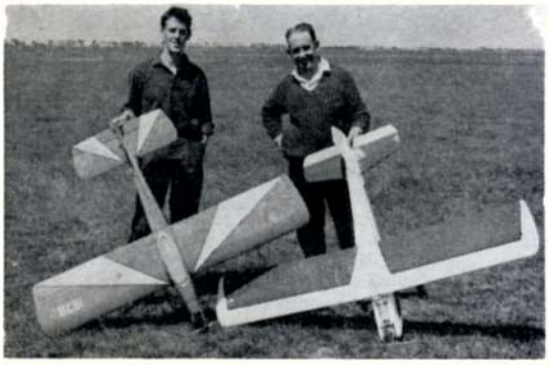
Over in the U.S.A., most prolific builder on the team is Jerry Nelson, his latest known as the *Pharaoh*, which is a stretched version of his successful *Sultan*, with longer nose and tail moments, and larger tail surfaces. Designed for proportional, it is to be fitted with a new Sampey 404 gear and Jerry has other proportional outfits on order ready to try those too, so that he is well prepared for Genk. We shall be reproducing some of Jerry's designs in detail 3-view form in our companion magazine *R.C.M. & E.*

Radio control rules in the U.S.A. are the subject of mixed opinions now that it is proposed to change the three classes (rudder only, intermediate and multi) to the new definition of class 1, 2 or 3, according to the application of aerodynamic control. In class 1, control is restricted to either *yaw*, or *roll* control. Class 2 can employ either *yaw* and *pitch*, or *roll* and *pitch* controls. Motor speed control, steered gear, and flaps are allowable optional controls. Class 3 permits control of the model in all three forces, *yaw*, *pitch* or *roll* and also allows optional controls.

On this basis, the simple single channel, escapement flyer will be suffering a tremendous handicap and there is little doubt that all winning models will be multi channel or proportional. One corrective suggestion is that a price limitation of $100 value equipment be employed, but while this might be an acceptable suggestion in principle, it would be very difficult to administer.

Another cause for controversial discussion is the "builder of the model" rule which enforced Doug Spreng's disqualification at last year's Nationals and team selection trials. *Larks* newsletter carries an informative editorial in which it is stated that at the Chicago Nationals, the editor sat with 7 Californian flyers, 6 of them flying O.P. (*other peoples*) models. Eastern States flyers are said to use commercial glass fibre fuselages and ready built plastic wings are soon to become available. The argument is that if full commercial equipment is permitted, and many of the manufacturers of this equipment have to spend so much time in development and servicing of the gear they sell, then there should be no reason why *these* people should not fly O.P. models in competitions.

We have just taken delivery of a *Schuco Completta* almost ready-to-fly single channel radio control model, moulded in expanded polystyrene with balsa tail surfaces, sprung undercarriage and plywood engine mount all fused into place. As the picture shows on page 177, all one needs to get this model airborne is a set of radio gear with motorised servo and a .8 c.c. engine—the mounts will accept a Merlin or Piccolo.

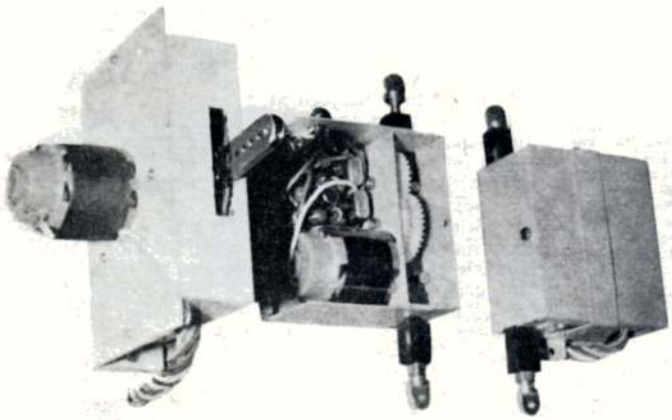


John Lamont with his Stormer and Geoff Glass with his "Smog-Hog", of Victoria, Australia. Stormer has 10 channel O.S. gear and Hog, R.E.P. Octone. Both use O.S.49 engines and Geoff's speciality is a spin out of a flick roll

Ethically, it hurts us that the amateur spirit of aero-modelling construction should be so easily cast aside. But who can argue in these days where time is the irreplaceable commodity, that provision of such a model will enable people to continue with the hobby when they do not have enough time to construct their own? Another angle is that provision of such a model as the Completta forms a very easy introduction for the novice to simple radio control although limited with this design (unless modified) to small receivers and electric servos such as the Metz Baby.

Speaking of single channel servos, there does seem to be increasing manufacturer consideration in this line. Hitherto, slow action and the need for extra batteries have been a handicap. Wide acceptance of the re-chargeable nickel-cadmium cell and the development of the relayless receiver are easing the weight problem, whilst the new C & L Unimite and American Temco RLE-T fast action servos will go a long way to replacing elastic drive. The latter unit, just announced by Tomoser in the U.S.A., has made a considerable impact among single channel flyers on the other side of the Atlantic. Designed for operation with the relayless equipment, having its own transistor amplifier, it also offers secondary escapement triggering and weighs only 1½ ozs.

Speaking of servos in general, Mighty Midget motors are likely to go in short supply for a time until another manufacturer takes over existing stocks and production facilities. We do hope that this popular unit used by so many manufacturers and especially the proportional enthusiasts, will not fade into obscurity.



As mentioned in our Trade Fair feature, the new Ripmax servos were a surprise innovation, developed around specially wound Marx-Luder motors (which are becoming popular power units for latest servos), those at left are "Permagear", primarily for boat work, in the centre, the transistor amplified version of Maxamite and at right, standard Maxamite for relay receivers. Push-pull action, light weight and small size make these ideal for aircraft use. Price of the Permagear £4 2s. 6d. and Maxamite, £4 5s. 0d.

R.F.C. SQUADRON MARKINGS — PART 14

by Leslie A. Rogers

No. 10 Squadron R.N.A.S.

Originally equipped with 15 Sopwith Triplanes in three flights of five, 10 R.N.A.S. Squadron joined the 11th (Army) Wing on 15th May, 1917, from Dunkerque.

No details of markings on the Triplanes have been definitely proved, but it is believed that no Squadron marking was used and individual identification was by letters painted on the fuselage side behind the cockade. The illustration of "H" is a Triplane captured by the Germans, but the serial number was not shown.

At the end of August, 1917, the Squadron re-equipped with Sopwith Camels, retained until the Armistice.

Squadron Marking carried from 26.8.17 to 22.3.18, was two white vertical bands, one in front of the fuselage cockade and one in front of the tailplane.

Shortly after the arrival of the Camels the Squadron adopted some very distinctive flight markings as well as unusual individual markings. Basic details are given.

Flight Markings. "A" flight—three white bands painted from the cowling to the end of the panel below the cockpit. The space between the white bands was painted black. All aircraft in the flight were marked "A" painted between the end of the stripes and the first band of the Squadron marking. *See below.*

Sopwith Triplane "H" at top is to 1/72nd scale, showing early summer marking of 10 R.N.A.S. Sqdn., and Camels "A" and "S" at right to same scale, show an "A" Flight A/C of 210 R.A.F. Sqdn. after stripes were removed and individual letter style used later, each with new Sqdn. marking. Non-scale views here show "A" Flight marks, Flt. Cmdr. used chequered wheel discs. "B" Flight above and left.

"C" Flight markings, with blue stripes and rings on wheel discs.

Photo from G. S. Leslie's collection clearly indicates a "B" Flt. aircraft. B 6204 behind is similarly marked.

"B" Flight. Used the same markings as "A" flight except that the colour used was red and all aircraft in the flight were marked "B".

"C" Flight. As "A" and "B" flights, but the colour was blue and all aircraft in the flight were marked "C".

Individual Identification. Pilots' own markings were painted on the wheel discs in the fashion of geometrical designs painted in the flight colours.

No. 210 Squadron R.A.F.

The amalgamation of R.N.A.S. and R.F.C. into the R.A.F. produced a quick change of Squadron markings.

Squadron Marking. Was changed to a white disc painted aft of the fuselage cockade and was carried from 22.3.18 until the Armistice.

Flight Markings. "Officially" the nose stripes were supposed to be painted out; but this was not carried out overnight. As aircraft were written off, the replacements were left unpainted.

The flight letters: "A", "B", "C" were still used. This method of marking was used until about mid-1918.

About the middle of 1918 the system of flight letters was discontinued and although the white disc Squadron marking was still used, the aircraft were marked with individual letters. The exact sequence of letters is unknown, but they included M, S, U and V.

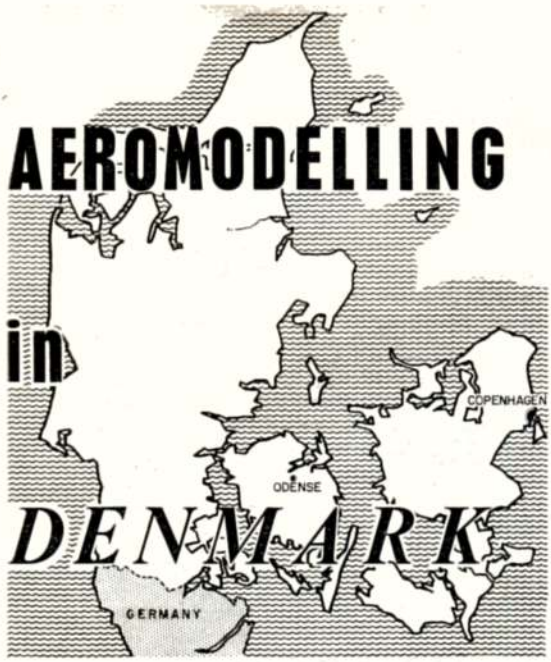
These markings were used until the Armistice.

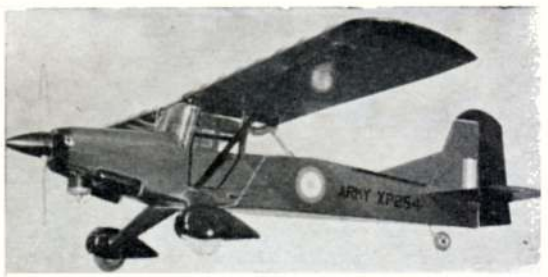
General Notes. The blue in the cockades was much lighter on Naval aircraft than on the R.F.C. aircraft.

Sopwith Triplanes of "B" flight. Legend had it that the Triplanes were painted all black then it was said that the cowlings were black, but it seems as though this, like many more stories of W.W.I., should not be taken too seriously. The aircraft are recorded as being named "Black Death", "Black Maria", "Black Roger", "Black Prince" and "Black Sheep", but no details of how, why or where, have been discovered. What *is* known, is that this flight between May and July, 1917, accounted for 87 enemy aircraft, were originally all Canadians as below.

Flt./Comdr. Ray Collishaw	60 E.A.	Total victories at the end of the War.
Flt./Sub./Lt. E. V. Reid	18 E.A.	
Flt./Sub./Lt. J. E. Sharman	11 E.A.	
Flt./Sub./Lt. G. E. Nash	8 E.A.	
Flt./Sub./Lt. W. M. Alexander	7 E.A.	

AEROMODELLING in DENMARK





by C. C. Brunckhorst

Author's efforts above are at top, a Beagle-Auster A.O.P.11 control line model and a Tom Brett Nimbus Mk.2 multi-channel design for Orbit radio control equipment.

ANY COLD CLIMATE modelling enthusiasts's chief concern (apart from his model aircraft) is that of weather, weather and then weather again. Denmark, located between the North Sea, Kattegat, Oresund, the Baltic and with the Jutland peninsular a continuation of northern Germany, is not particularly favoured for climatic conditions. The Gulf Stream by-passes the country and the climate, therefore, tends to be chilly, rain and wind-swept, often with cool summers. Modellers usually operate in difficult conditions. Nevertheless, approximately 50 clubs are active all over the country in a population of about 4½ million.

In the mid-fifties interest declined somewhat and the total enthusiasts went down to 500, but there are now 25 clubs on Zealand (where Copenhagen is situated), five on Funen and 20 in Jutland, with a total individual membership of approximately 650. There are no governmental or other subsidies for club work. The oldest active club dates from 1935.

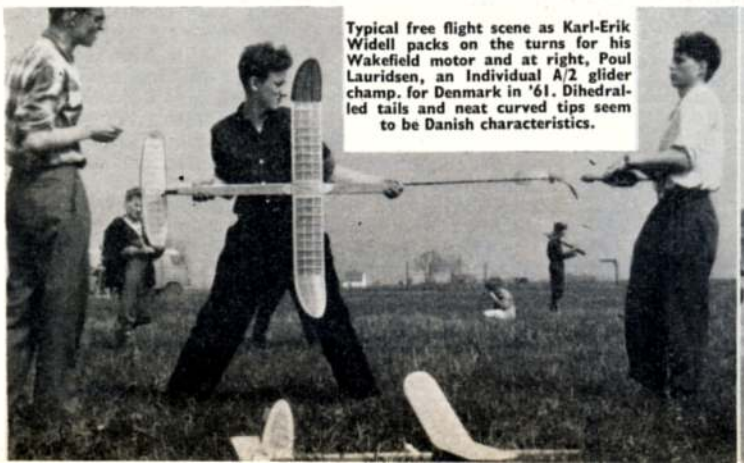
Supply of building kits and the many accessories is well cared for through local manufacture and through imports from U.K., U.S.A. and the principal European countries. A local item found particularly useful for control-surfaces, formers, landing gear covers, etc., is Scandinavian Birch plywood, which is exceptionally supple and tremendously strong (a thickness of 1-2 millimeters is usually sufficient).

Gliders are by far the most popular types flown with controliners coming second. Radio controlled models are however, moving up at a steady pace.

Apart from club contests, there are approximately 15 annual meetings, plus participation in Scandinavian and other International Championships. An outstanding occasion is the Summer Meeting at Vandel in Jutland, of the Royal Danish Aero Club's Model Section, where about 75 contestants live for eight days in tents, and weather permitting, fly until sunset each day. Victories, crack-ups and lost-out-of-sight flights are taken in the best possible spirit. New ideas on construction and flying techniques stimulate coming designs. Another popular feature is the National All-Class Championships. The last two took place in Esbjerg and drew about 125 contestants.

Nearly all clubs are affiliated to the Royal Danish Aero Club (Model Section). The institution holds instructor courses in model building technique and it is of course, the link between clubs and the Federation Aeronautique International.

From the above it can be appreciated that Danish modellers are not especially contest enthusiasts, but there appears to be a good deal of experimental work. One idea now being adapted from Swiss and German origins, is a spar and ribless, solid-block glider wing construction, utilising expanded polystyrene plastic material covered with thin balsa sheet. The material is cut span-wise into a single length rib shaped unit with an electrically heated wire mounted in a bow. Electric mains current can be transformed with a miniature railway transformer. The construction is reputedly very strong, but does not have the elegance of a spar and rib wing.



Typical free flight scene as Karl-Erik Widell packs on the turns for his Wakefield motor and at right, Poul Lauridsen, an Individual A/2 glider champ. for Denmark in '61. Dihedralled tails and neat curved tips seem to be Danish characteristics.

Above, striking picture of Per Nilsson, Gothenburg, SWEDEN with his A/2 held against the sun—not a shot for amateur shutterbugs! Below, Wieslaw Schier's PZL-P24 control-line model caught in flight at Warsaw, POLAND, using elderly British Keil K-6 engine, span 39 inches

Below, Botafogo Club in Rio de Janeiro, BRAZIL, better known for its football, also has a keen aeromodelling section as seen here with impressive scale Jet types

Site for World free flight Championships in August is Wierner-Neustadt, Vienna, AUSTRIA. This view of the vast expanse shows the ideal free-flight airfield with 2 mile clearance. Well known modeller Ossie Czepa seated in centre

IT SEEMS A great pity that the people who originated the thousand lap marathon of team racing in Brazil should have missed the opportunity of competing in the International postal event organised by Wharfedale M.A.C. As reported last month, this contest was won in 65:21 by a team from the U.S.A. They would have been beaten by the *Xavantes* team from Sao Paulo, who won the thousand laps of Guanabara held in Rio de Janeiro during November. Seven teams competed and once more it seems as though a Japanese engine was dominant as the winners employed an Enya 29-III. Incidentally, word reaches us that now the gauntlet has well and truly been thrown down, there may well be a personal challenge thousand lap event taking place during the British Nationals between three of our most renowned leading teams, and from which a very fast record speed can be anticipated.

Talking of speeds, we see mention in that lively "Balsa Beavers" Club newsletter, *The Airfoil*, that Ray Miller of Rochester, N.Y., **U.S.A.**, set a record rat racing time for the ten mile course of 6:04 with the claim that this may well be the fastest time over the distance. Rat racers have the advantage over Class B racers in that they only have to make two refuelling stops in the ten mile distance but even so, this compares more than favourably with fastest British Class B times of about 6:35.

Following a postal ballot, George Parry has been officially appointed President of the Model Aeronautics Association of **Canada** (approximately 780 members). George is well known for his international contest participation and we wish him all success in his Office. Administration of M.A.A.C. is not easy. The widely dispersed centres of modelling with differing interests, climatic conditions and facilities tend to produce disjointed effort. Nationwide Nationals are held on a de-centralised basis, even Combat! Fortunately, to the Canadian, distances are of less importance. For example Balsa Beavers members travelled over 30,000 miles to 17 contests outside their district during 1961. This makes the average mileage per member more than 1,200 miles.

Elections have also taken place in the Academy of Model Aeronautics, U.S.A., where congratulations are due to John Worth, who succeeded in gaining most votes in the postal ballot for Presidency. John is well known for his pioneering with pulse proportional radio control and work as Radio Control Rules Committee Chairman.

Interest in the *Coupe d'Hiver* class in the Illinois Model Aero Club has resulted in arrangements of a postal contest with British and other clubs participating. We would be only too pleased to convey further details to those not in touch.

Over in California, where winter has provided them with cold weather (but we'll bet nothing like that in Europe), the indoor men have been utilising the Santa Ana hangar for indoor flying. Bob Cummings made 37:55, the best of many high times on January 13th which included Bill Atwood's 32:10 with a geared F.A.I. model. On February 3rd, Cummings again made top time of 34:29 and the geared jobs still hovered in the 32 minute range. Up to 3,000 turns is the potential on a geared model. They use small plastic gears, one on the shaft, another on a second pair so that motors of small cross-section can be employed. Since duration is a function of the power run, these developments are very closely followed by the microfilm fraternity.

In **Finland** the annual indoor New Year contest was held in very cold weather, Esko Hamalainen making top F.A.I. time at 13:52.

Model Aviation is a regular 24 page magazine issued monthly by the A.M.A. It is very well produced under the editorship of William Winter and now, Technical

Director Frank Ehling has announced his intention to publish an annual A.M.A. book of model 3-views which have not appeared in magazines. Information is to include specification, construction and performance details of outstanding models in all phases of the hobby. Contributions are en irely voluntary and the whole concept is for the general well-being of the hobby. Knowing something of the costs involved in production, we congratulate the A.M.A. on their enterprise and look forward to being able to review a copy.

Bob Dunham, well known for his Orbit radio control equipment and prowess as a radio control flyer in National and International events, has been appointed 1963 team manager for the U.S.A. He will travel with Kazmirski, Nelson and Brooke to Genk in Belgium for the August 21—25 meeting.

Rat racing enthusiasm in the U.S.A. has probably outnumbered numerical support for all the other classes and there has been a request for its inclusion in the U.S. Nats programme. The matter was thrased by executive committees who report that the only way this event could be administered, would be by limitation of the entries to 100. This in turn involves an increase of 34 per cent. personnel required for control line administration and 25 per cent. extra field facilities. The 100 entrants operating on two circles for three days are estimated to absorb 500 official man hours. Compare this with the numbers required to run a 300 to 500 entrant glider event and consider the general disinclination to volunteer for running events like combat and rat racing and you will begin to understand why the A.M.A. have been cautious in this matter.

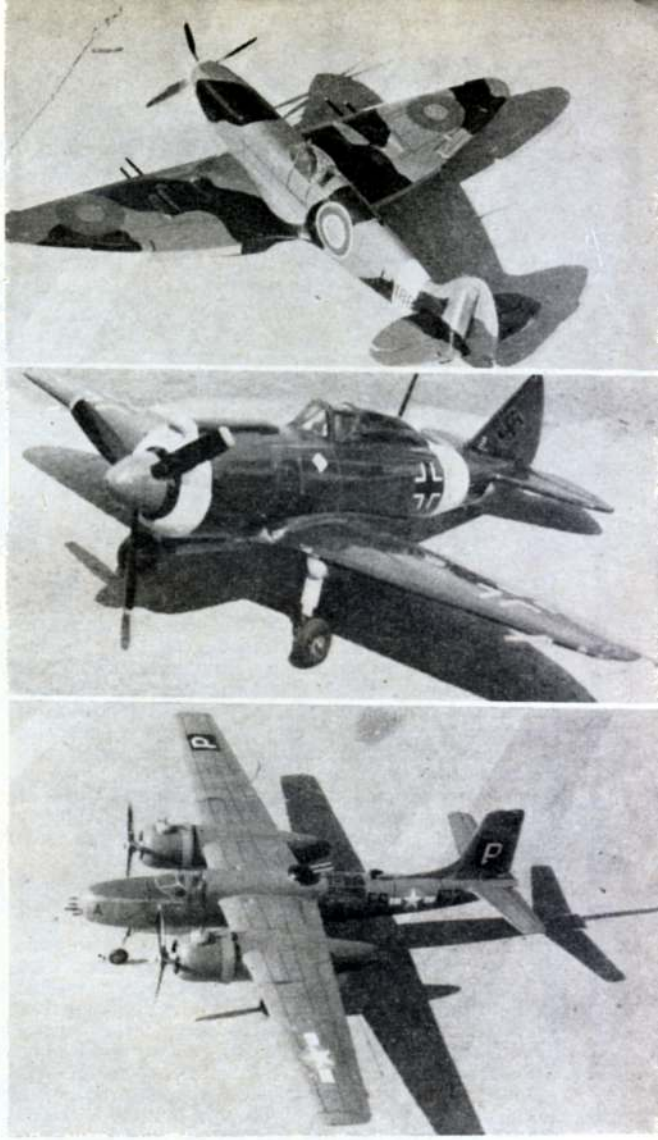
Beautifully colour printed invitation leaflets received for the 1963 *Zell-Am-See* Wakefield-A/2-F.A.I. Power international contest makes us wish we could leave the office from 20 to 21 April to travel to **Austria** for what we are sure will be a most pleasurable contest. Time is short, entries must be returned by April 9th, we have some spare sheets, so anyone travelling in those parts will be most welcome to our copies.

From **Italy,** we have received a set of the 1963 rules for the Schneider Trophy Cup. In brief, more emphasis has been placed upon the scale of the model which must be a miniature reproduction of any of the aircraft which took part in, or were built for, the full-size Schneider Trophy.

We will be happy to provide a full run down of the rules to those interested in this fascinating event, which was described in greater detail in our issue for December 1962. A suggestion was made in that article that a contest might be organised for land plane racers (Thompson, Bendix Trophy types, etc.). Provisional rules for scale pointing, workmanship and flight points have now been received. The general idea is for racers to be of a scale about ¼th full-size; flying on standard F.A.I. 15.92m line length with engines up to 6 c.c. Here again we would be only too pleased to supply further details.

News from the **U.S.S.R.** tells us that the sole glow plug entry in F.A.I. team racing at Kiev operated by the Lucas/Adams team for Great Britain, created a good impression to the extent that the existing champions are seriously investigating glow plug engines for team race and several engines have been specially prepared.

In **Belgium,** plans are now well ahead for *La Semaine Mondiale d'Aeromodelisme* at Genk. Manufacturers of kits and engines are being solicited for stand space in an exhibition of latest products, which will be on show during the World R/C Championships and Criterium of Aces. The Royal **Netherlands** Aero Club announces June 28—July 1st as dates for the International Flying Wing contest at Ypenburg, and have coupled an A/1 contest with it. Further details can be supplied on request, but entry must be made through National Aero Clubs.



ITALIAN scale models. Top: Italico Gozzo's Spitfire MK21 for 5 c.c. Super Tigre is 37 inch span. Next, Carlo D'Agostino's Reggiane Re 2000 and above, Giorgio Peressini's winning Douglas A-26 Invader at Lombardy Championship meeting. Below, from CZECHOSLOVAKIA, a Letov S-50 by V. Stastny with two Zeiss Activist 2.5 c.c. diesels and R. Metz's Sabler Special for MVVS 5.6 glow engine

AIRCO D.H.5

Aircraft Described No. 121 by P. L. GRAY

IN PRODUCING THE D.H.5. for the Aircraft Manufacturing Co. (or Airco as it became known in its abbreviated form), Capt. Geoffrey de Havilland sought to retain the excellent all round view of the D.H.2, while achieving improved performance from the tractor layout; compromise was inevitable but a considerable measure of success was obtained by the unorthodox application of some twenty seven inches of negative stagger. Otherwise the aircraft was structurally typical of the period with the basic fuselage a simple wire braced box girder of spruce longerons and spacers, reinforced in the forward and rear bays with fretted plywood panels. Light ply formers and stringers faired the basic structure from the circular section of the cowling to octagonal aft.

Of parallel chord with raked tips, the wings were based on two main spars, spindled for lightness, with tubular compression members. Upper and lower wing panels were identical and both were attached to wide flat centre-sections. Ailerons of generous area were fitted to all four wing tips. The lower ones were connected to the control column and linked to the upper ailerons by cables which were in turn connected by a balance cable running along the leading edge of the upper wing. Tail surfaces were of conventional construction with the fin and rudder of the profile that was to become a D.H. trademark. On the prototype a horn balanced rudder was fitted but this was not effective enough at take off. It was replaced on production machines by an unbalanced rudder of similar profile but greater in area. The undercarriage chassis was an orthodox vee structure wire braced to spreader bars. The axle was bound to the vees with bungee elastic cord.

The 110 h.p. Le Rhone rotary engine was housed in a circular cowling of two differing types as shown in the drawing. The front opening was smaller than usual but additional vent slots were cut in the lower face: the rear lower portion was also cut away to allow exit of exhaust gas and sludge between the undercarriage legs.

D.H.5s made their appearance in France in May of 1917 replacing the D.H.2s of No. 24 and No. 32 Squadrons. In July No. 41 Squadron traded their F.E.8. 'pushers' for the back-staggered de Havilland tractors. In the Autumn No. 64 and No. 68 (Australian) Squadrons went to France with their D.H.5 equipment and took part in the Battle of Cambrai in November 1917, being employed almost exclusively in a low level (ground attack) capacity, an exceedingly dangerous role. The D.H.5 had been used more and more on this duty due to the fact that its performance at altitudes in excess of 10,000 feet was surpassed by its contemporaries, the Sopwith Pups and Bristol Fighters. On the ground straffing sorties four 25 lb. bombs were carried and used to good effect on enemy gun positions and similar strong point targets. Cambrai activities marked the swan song of the D.H.5; more efficient aircraft were becoming available and by the end of January 1918 all squadrons had been re-equipped with S.E.5a machines.

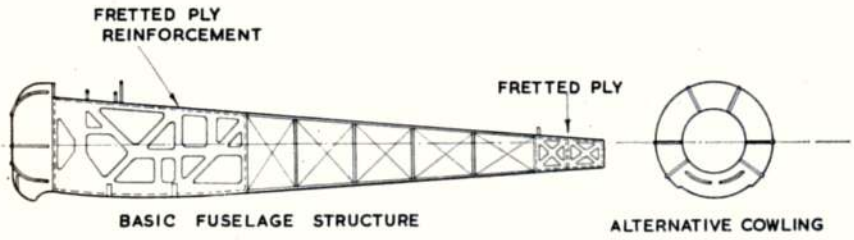
As an instance of the experiences of D.H.5 pilots during this Battle, and the calibre of such men, mention may be made of Capt. J. Bell and Lieut. H. Taylor of No. 68 (Australian) Squadron. During an attack through the dawn mists of 20th November 1917 Capt. Bell was wounded in the chest by rifle fire from the ground and so badly stunned he later remembered nothing of what happened. Nevertheless he still managed to control the D.H.5, seek out a possible spot to land among the myriad shell-holes, and put down the aircraft without damage. Unhappily he died in hospital later.

Meantime Lieut. Taylor had been shot down just within the German line. The machine had sustained considerable damage and completely disintegrated as it struck the ground; Taylor however scrambled unhurt from the wreck. He found himself among a scattered platoon of German infantrymen but managed to locate a discarded rifle, together with a handful of ammunition and managed to shoot his way through to neutral ground eventually contacting one of our advanced patrols. Here he picked up a wounded soldier and carried him for a distance of some 600 yards, under fire, to shelter. Finding a bewildered body of our infantry there, without an officer, Taylor rallied them and led them forward. On his return he found an abandoned D.H.5 (which proved to be Capt. Bell's machine) but to his disgust he was unable to get the engine going so he reluctantly had to leave it and make his way back on foot to the advanced landing ground from which No. 68 Squadron were operating.

Left, A9435, the subject of Peter Gray's drawing and A9513 with inscription "Presented by the Native Administration of BENIN in Southern Provinces of NIGERIA". Similarly donated DH5's (value £2700) were B371, "PRESENTED BY THE SOLANKI Provinces of CHIEFS & NOBLES" and A9242 "AUSTRALIA No. 15 NEW SOUTH WALES No. 14 'THE WOMEN'S BATTLEPLANE' Presented by the Women of New South Wales." These inscriptions placed under cockpit. A9242 was presented on 12.4.17; A9432 on 14.4.17 (Women's Battleplane N.S.W. No. 15)

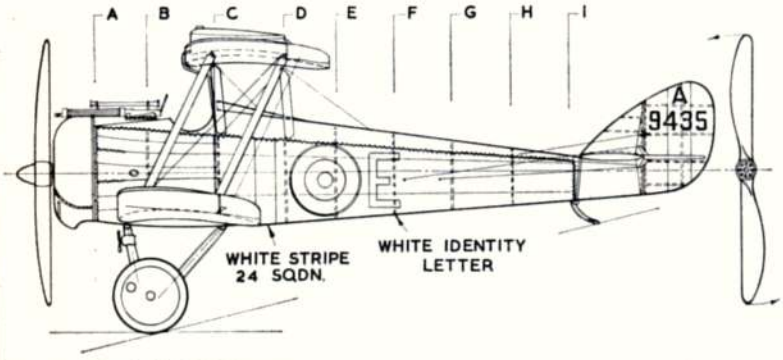
G. S. Leslie photos

1/72nd SCALE REPRINTS OF THIS "J" TYPE PLAN AND 1/48th SCALE DYE-LINE PRINTS ARE AVAILABLE AS PLAN PACK No. 2765 FROM AEROMODELLER PLANS SERVICE PRICE 2/6d PLUS 4d. POST.



BASIC FUSELAGE STRUCTURE

ALTERNATIVE COWLING



A total of 550 D.H.5s were built. Service was with R.F.C. Squadron Nos. 24, 32, 41, 64 and 68 (Australian No. 2) also Schools of Aerial Fighting at Turnbery, Marske, Sedgeford and Freiston. Advanced Air Firing School, Lympne.

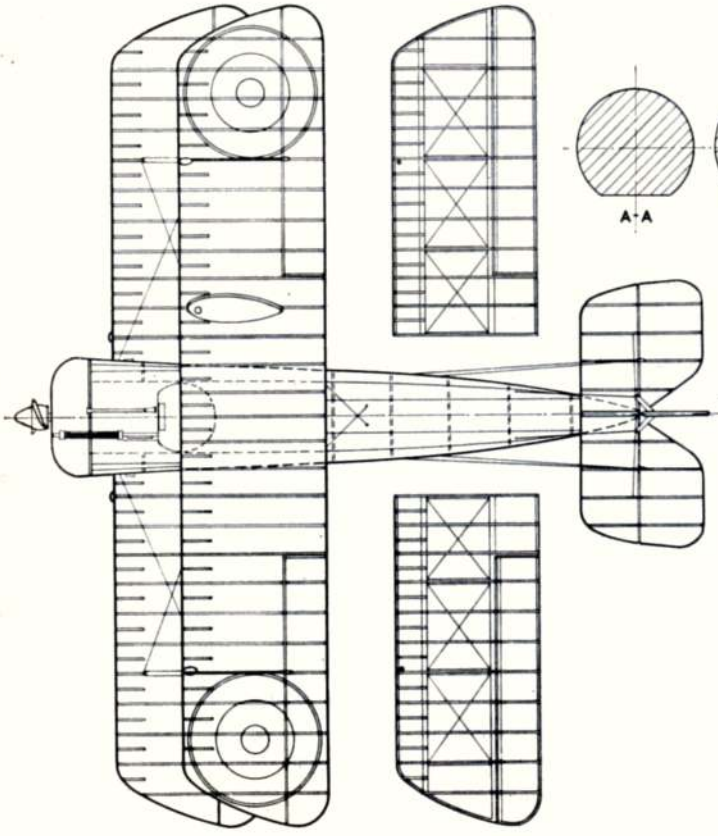
WING SECTION

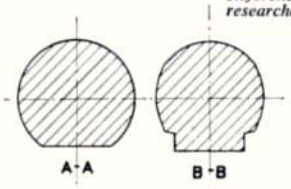
COLOUR DETAIL. Fabric surfaces of all D.H.5s were finished in standard khaki-green dope on top and sides and underneath the fuselage, the fabric extending right up to the cowling on the sides. Under surfaces of the wings and tailplane were clear doped natural linen fabric with protective varnish which soon darkened (yellowed) with age and dirtied in use. Red, white and blue roundels were carried above and below the wings and on the fuselage sides, those against the khaki-green surfaces being additionally outlined narrowly in white. The rudder was equally divided into red, white and blue sections with the blue foremost. Serial numbers were painted in black across the rudder stripes, usually in fraction fashion if the number consisted of four digits. For details of Squadron Markings additional to accompanying drawing reference may be made to the "*R.F.C Markings*" series in AEROMODELLER by L. A. Rogers.

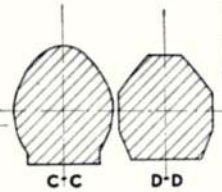
DATA (Relevant to production aircraft).
Span: 25 ft. 8 in. Length: 22 ft. Height 9 ft. 1½ in. Chord 4 ft. 6 in. Gap: 5 ft. Stagger (negative) 2 ft. 3 in. Dihedral 4½ degrees. Area: 212.1 sq. ft. Weights: empty 1,010 lb. loaded 1,492 lb. Engine: 110 h.p. Le Rhone rotary.
Performance:
Climb to 1,000 ft. in. 50 secs. Service ceiling 16,000 ft.
6,500 ft. in 6 m. 55 secs. Max speed 102 m.p.h. at 10,000 ft.
10,000 ft. in 12 m. 25 secs. Endurance 2¾ hrs.

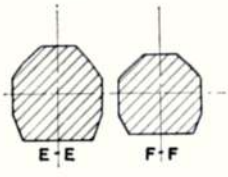
MANUFACTURERS: (with serial number allocation).
A 5172 (Prototype)
A 9163—A 9361
Aircraft Manufacturing Co. Ltd., Hendon, London, N.W.
A 9363—A 9562
Darracq Motor Engineering Co., Fulham, London, S.W.6.
B 331—B 380
British Cauldron Co. Ltd., Cricklewood, London, N.W.2.
B 4901—B 5000
Messrs. March, Jones and Cribb, Leeds, Yorks.
B 7775
No. 1 Southern Aeroplane Repair Depot
(Single aircraft only).

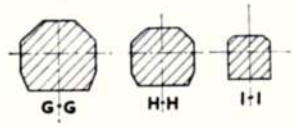
Reference to J. M. Bruce M.A. researches is acknowledged.

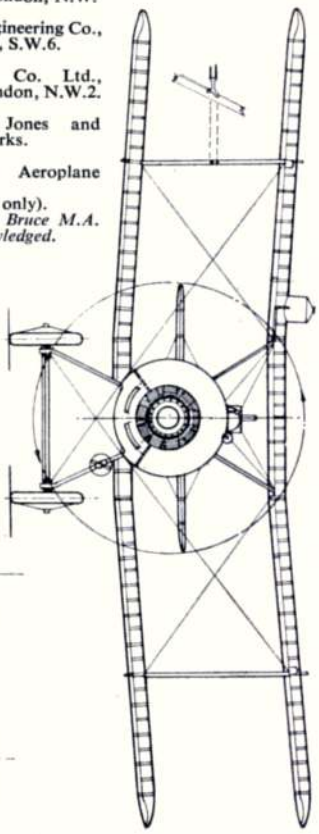












AIRCO D.H. 5

FT.

Club News

Hardy types who flew over 6 in. of ice caked snow at Blakehill farm on February 3rd included Brian Bow of host club Bristol & West, collecting 2nd place in open glider for his troubles—using an A.P.S. "96A" design

DETAILS OF RALLY dates and contest fixtures have been flooding into Clubman's desk and the Calendar is already beginning to fill up. Now's the time to make diary notes,—read on for the gen.

A sudden surge in radio control activity has prompted **LONDON AREA'S Wanstead M.A.C.** to purchase a single channel tone transmitter for members' use. Meanwhile, they propose a change of title to Wanstead Warhawks and to this end have designed a club transfer, depicting a hawk in gladiator style armour carrying a Wanstead banner. Following the success of their 127 entry Combat Rally last April, they propose to run an S.M.A.E. Class Combat event over 4 circles for 192 streamer clippers in September where it is hoped, refreshments will once more be provided free for competitors. Anyone in the Wanstead-Woodford-Ilford area who would like to join this active club should call J. Franklin at Wanstead 2168, after 7 p.m.

Demonstration *Kentish Wind* models are under construction by members of **Cosmo A.C.**, including A Tick's twin engined version, while designer Stan Robinson's latest is a twin engine control line Dornier. Question from innocent junior member: "What is the best 2.5 c.c. ½A Team Racer?"

St. Albans M.A.C.'s Mike Burrows is really exploring the high aspect ratio wing it seems, for he has a new 104 in. span A/2. You should see the wings flex they say. A free flight snow ball broke one of the clubroom windows on its first trimming flight recently but the culprit has now turned to R/C with a scale Slingsby glider.

Diaries at the ready? The **EAST ANGLIA Area** F/F Gala will be held at Chobham Common on May 12th. Events will be Open free flight, plus ½A Power, each at 2s. 6d. per class. The organisers have applied to the S.M.A.E. to sanction the contest and competitors will be required to show proof of insurance cover.

During this bitter winter, **Norwich M.F.C.** members have been tucked away enjoying films of the 1961 and '62 Nats and the 1961 World Free Flight Champs. But they have not neglected the building board and twelve F.A.I. F/F models have been prepared for the eliminators and trials.

Debdenaires M.F.C. are shopping around for new blood, and are to stage a display in the shop window at their local Dry Cleaners. Their clubroom is Loughton Hall, a fine community centre where alternate Friday evening meetings start at 8 p.m. Plenty of flying space too they report. Moreover—this Epping Forest area club has just *reduced* its fees.

"*Eagles Beak*" (circulation 56) is the title of **Worthing Bald Eagles M.A.C.'s** newsletter which really does credit to this **SOUTH EASTERN AREA** club. The content is well worth reading and Combat fans looking for a new design may well find Neil Tidey's *Twister*, stabilator type Combat machine just what they are looking for with plan full size parts and instructions, **R.T.P.** team racing at **Lancing** found **Tunbridge Wells** leading and their member **A. Paige** fastest at 2:38. "*Eagles Beak*" carries full listing of their **R.T.P.** rules which call for 40 laps of 12 ft. dia. 2nd meet at **East Grinstead** found the Worthing Bald Eagles firm in the lead and Neil Tidey fastest at 2:25.

This year's **South Coast Gala** will take place on September 22nd. All classes of F/F, C/L and R/C will be catered for, but as yet there's no definite venue.

Crawley & D.M.A.C. plan to hold their free-flight rally on September 8th at Great Buckswood Farm on the A264 road.

Woking D.M.A.C. is to hold a free flight Gala on May 5th at the popular Chobham Common venue. Shop opens at 10.30 a.m. and flights must start not later than 11 a.m. (What happens to those that don't?). Events will be Glider, Rubber, Power, ½A Power, Chuck Glider, and Coupe d'Hiver. Pre-entry is 2s. 6d. per event, except Chuck Glider at 1s. 6d., to P. Carey, 2 Burnum Close, Knaphill, Woking, Surrey.

After their February 8th A.G.M. where Bob Wand collected Senior Cup and Tim Westcott the Junior Trophy, **Maidenhead M.M.C.** are planning their third trip to the Nats for 1963. New members of any age are always welcome at club meetings every Friday at the Furze Platt Memorial Hall, 8 p.m.

SOUTH WESTERN AREA's Exmouth & D.M.A.C. announce the 1963 Devon Rally, to be held as usual at Woodbury Common, on August 11th. Events here will be free flight, Power, Glider, Rubber and Chuck Glider, plus S.M.A.E. Combat. Entry fee is 2s. 6d. per event. Re-entry will be permitted in the free flight events after the first round only and of course, this nullifies previous scores. The organisers wish to draw the particular attention of all attending to the fact that there is now a car parking regulation covering the Common. It is by compliance with this regulation that permission for the use of the Common for model flying is granted, so park properly. Following the increase in S.M.A.E. affiliation fees, the Exmouth lads have decided to provide assistance to any who in future wish to be affiliated as S.M.A.E. full members. This they hope, will help maintain the level of full members in their club.

SOUTH MIDLAND AREA's flourishing **Luton & D.M.A.C.** are benefiting from their new and large meeting hall, where they can now practice indoor flying, **R.T.P.** Indoor Team Racing is all the rage in preparation for a fray against **Stevenage M.A.C.** Any other clubs in the Area who would care to pick up the gauntlet may obtain full details by telephoning Luton 6119 or Dunstable 61388. The local rag devoted a whole page feature to their activities, with photographs of last season's prize winners. Trevor Faulkner, who has been flying for but one season, has developed an all sheet Wakefield, with a performance that promises great things. With numerous single and multi R/C enthusiasts active, the advantage of superhet equipment is becoming more appreciated. The expense of such equipment seems to be something of a deterrent however.

Stevenage M.F.C.'s "News and Views" newsletter is always a treat. The January edition is concerned, among other things with noise and engine silencers. They have a point when they ask if a silencer on a free flight model engine, running for only about 30 seconds is *really* necessary. Plan for January is Chris Thorne's *Bungo-Oh Mk. I.* Chuck Glider, trimming instruction begins with a month at physical training school! Tony Nichols has a few words to say on full size gliding with some interesting performance comparisons with our own smaller sailplanes. Apparently a Skylark 4 would do 1:34 off an A/2 tow line!

In the **MIDLANDS, Small-Heath M.F.C.** (Birmingham) has a hardy slope soaring contingent using O/D models and U.K. receivers to clock up flying time in preparation for an attack on the British duration record. Junior members are being helped along by U.K.'s and a transmitter provided by the club. Any unattached modeller in the area will find a welcome at Golden Hillock Rd. School on Tuesday evenings.

West Bromwich M.A.C.'s main interest this year will be F.A.I. T/R the construction of 8 models and the formation of an organised team (the "minute men") is under way, working up for the Nats. Secretary Tony Day has two models coming with glass fibre fuselages. Recently a junior member's team racer was timed at a consistent 98 m.p.h. using a 1957 Oliver Tiger III, standard Oliver brew and a 7 in. by 8 in. Tornado prop. Lappage was between 38 and 43 L.p.t. The lads travelled over two thousand miles to 1962 rallies and contests. They're looking for recruits too, so if you're a travelin' man why not get in touch through the secretary at 158 Greenstone Ave., Handworth Wood, Birmingham 20.

Moving **EAST** a little to **Peterborough M.A.C.** we have news of their annual Concours de'Elegance where the standard of entries was the best yet. Overall winner was Pete Smith who designed his beautiful 54 in. span trike undercarriage stunter himself. The scale prize went to Brian Wade, whose excellent Gruman Bearcat, although unfinished, displayed excellent workmanship. They all await the better weather so that they may emerge from hibernation (collective expression for Pubs and Coffee Bars).

Here's a rally announcement from the **NORTH EAST. Novocastria M.A.S.** have fixed the date of their annual *Rush Trophy Gala* to be held at Thornaby Aerodrome on June 16th. The usual Glider, Rubber and Power free flight events will be run, plus ½A, F.A.I. and Class B Team Race classes. Entry fees, at a rate of 2s. 6d. per event should be sent to F. Harvey, 91 Lancefield Ave., St. Anthony's Newcastle-on-Tyne 6.

Yet another too, from the **NORTHERN AREA** where **York M.A.S.** propose to hold an Open Rally tentatively at R.A.F. Elvington near York on May 12th. Events to be run are Open Glider, Rubber and

Power, Chuck Glider and "Single Channel Radio" (Rudder only). May be the organisers would care to clarify the last mentioned event. Will radio equipment actually be limited to the single channel type, or will multi channels operating only the rudder be permitted? A small point perhaps but one worth clearing up. Pre-entry for each event except Chuck Glider is 2s., payable to D. Wiseman, 34 Burton Stone Lane, York. On the fields, each event will cost 3s. 6d. except Chuck Glider at 1s. 6d., for which pre-entry is not required.

Technically minded and Contest modellers news media, that's the way to describe "*Northern Area News*" and two more editions have reached Clubman's desk since the last "Club News." In these two issues alone there are three view drawings of eight different models, covering Open Rubber, Tailless Rubber, Wakefield, F.A.I. Power, A/2. Anyone who enjoys the really serious stuff will be unable to tear himself away from Northern Area News once he has sat down to read it.

NORTH WEST now to **Lancashire Area Radio Control Aircraft Society**, endeavouring to ferment interest in R/C pylon racing. There is much to be said for this class, no guess work as to correct angle of recovery, roundness of manoeuvres. Just first or fastest and that's that. Let's hope the idea catches on in this country at last. The established set of rules have certainly been neglected. **Sharston D.M.S's** 1963 activities began on February 3rd with a Rat Race, a very exciting chase won by Alan Morriss. This was the first of nine control line and free flight events scheduled to be held during the year. Any modellers in the South Manchester area will be welcome at their clubroom at Sharston Hall on Friday evenings after 8 p.m.

Chester M.F.C. announce the 1963 Clwyd Slope Soaring Contest, date for which is July 21st. Further details will be announced later.

The lads in **SCOTLAND** will welcome a few competitions on home ground and thanks to the South of Scotland Area Committee we can make a few announcements here. The *Caledonia Shield* will be held at R.A.F. Abbotsinch on May 19th and the **Kirkaldy M.A.C.** C/L Rally at Beveridge Park, Kirkaldy on June 16th. English entrants will be welcome at the *South of Scotland Gala* at Abbotsinch on June 30th, the *Scottish Gala* at the same venue on August 4th and also at the *Scottish Nationals* on September 15th and that's at Abbotsinch too, where incidentally, insurance cards are essential to gain admission. Full details of all these events may be found in this month's Contest Calendar. Pre-entries should be sent to W. Douglas, 3 Dudley Drive, Glasgow W.2.

Well, well that's thirteen rally dates announced this month, so it looks like being a boom year for competitions and, I hope, aeromodelling in general, including all our sports flying friends who like to fly just for fun.

Cheers,
CLUBMAN.

S.M.A.E. Contests

April 7	K.M.A.A. Cup (F.A.I. Glider) Halifax Trophy (F.A.I. Power) Rubber (U/R)	*Area venues*
April 14	C/L Meeting	*Centralised*
April 21	1st RADIO CONTROL TRIALS	*Barkston Hth.*

Contest Calendar

April 14/15	*North Western Area "The OPEN"*. 2 day meeting R.A.F. Tern Hill on A41, 3 miles from Market Drayton. Sunday 14th, Open Rubber, Power, Chuck Glider, F.A.I. T/R, C/L Stunt. Combat R/C Single and Multi. Monday 15th Open Glider, ½ Power, ½A, B T/R, Combat and R/C finals. Field entry only. Camping permits by 1st April from K. McClave, 33 Boundary Road, Cheadle, Cheshire.
May 5	*Woking D.M.A.C. F/F Gala*. Chobham Common. G/R/P, ½A, Chuck Glider, Coupe d'Hiver. Pre-entry 2s. 6d. (Chuck Glider 1s. 6d.) to P. Carey, 2 Burnum Close, Knaphill, Woking, Surrey. (Event starts 10.30 a.m.).
May 12	*East Anglia Area F/F Gala*. Chobham Common. Open G/R/P, ½A Power, Entry 2s. 6d. *York M.A.S. Open Rally*. R.A.F. Elvington, Nr. York (Tentative). Open G/R/P, Chuck Glider, Single Channel (Rudder only) R/C. Pre-entry 2s. D. Wiseman, 34 Burton Stone Lane, York. Entry on field 3s. 6d. Chuck Glider (no pre-entry) 1s. 6d.
May 19	*Caledonia Shield* (*S.A.A. Team event*). R.A.F. Abbotsinch. Open G/R/P, F.A.I. T/R, Combat Rat Race, R/C.
June 16	*Kirkaldy M.A.C. C/L Rally*. Breveridge Park. All classes. Field entry 2s. 6d. *Rush Trophy Gala*. Thornaby Aerodrome. Open G/R/P, ½A, F.A.I., B T/R. Pre-entry 2s. 6d. per event to F. Harvey, 91 Lancefield Ave., St. Andrews, Newcastle-on-Tyne 6.
June 30	*South of Scotland Gala*. R.A.F. Abbotsinch. Open G/R/P, ½A, F.A.I., B T/R, Combat, R/C, Chuck Glider. Pre-entry 2s. 6d. W. Douglas, 3 Dudley Drive, Glasgow W.2.
July 21	*Clwyd Slope Soaring Meeting*. (No details).
August 4	*Scottish Gala*. R.A.F. Abbotsinch. Open G/R/P. T.R.A., B. R/C. Mono control.
August 11	*Devon Rally*. Woodbury Common. G/R/P, Chuck Glider, S.M.A.E. Combat. 2s. 6d. per event.
September 8	*Crawley Rally*. Great Bucksworth Farm (on A264 Road). Details to follow.
September 15	*Scottish Nationals*. R.A.F. Abbotsinch. Open G/R/P, ½A, F.A.I., B T/R, Combat, R/C, Scale. Pre-entry 5s. to W. Douglas, 3 Dudley Drive, Glasgow, W.2.
September 22	*South Coast Gala*. All classes F/F, C/L, R/C. Venue to be announced.
October 27	Wharfedale 1000 lap marathon (International Postal event).

BRISTOL Winter Rally

BRISTOL AND WEST Winter Rally at snowbound Blakehill Farm Airfield, on February 3rd, attracted twelve clubs, many travelling up to 150 miles. Those who braved the arctic weather were rewarded with good flying and surprisingly reasonable travelling conditions. A rumour that John O'Donnell was bringing a sledge complete with Huskies as a substitute for his recovery bicycle was proved wrong when he was first to arrive just after 10 a.m. The rally commenced with a clear sky and a light breeze across the 6 in. of snow on the airfield. Maximum flights were made without exceeding the airfield boundary. Lift was practically non-existent, only one max being scored throughout the day in the open glider event. Recovery of models was easy for those light on their feet who could run across the frozen surface. For those with excess poundage it was better to walk otherwise the frozen surface crumbled away leaving their feet bogged in the softer snow. Spades and shovels were the order of the day and the digging out and pushing of cars in the snow seemed to be a good way of keeping warm. One car load of bods even brought their own brazier complete with coal (Where *did* they get *that*!—Ed.).

In the F.A.I. event B. Eggleston D.T'd his T.D. 15 power model at 2:18, spoiling a complete set of maxes which nearly cost him his 1st place to J. O'Donnell who came a close second with his Wake.

In open power C. Aitkenhead was unlucky not to reach the fly-off. While retrieving his second max. the car boot snapped down onto his model. However, this misfortune was offset by placing first in glider with his *Lucifer*, narrowly defeating B. Bow who was flying a 96*A*, both A.P.S. plans. D. Hipperson completed three easy maxes to come top in ½A power ahead of fellow club member K. Smith. Towards mid-afternoon the wind strength increased and changed direction making full use of the large airfield. This wind change was accompanied by a period of light snow. J. Cartwright then proceeded to score three maxes in rubber, each flight well inside the airfield. A dodgy last flight nearly put him out of the fly-off when it D.T'd at 2:55 and landed only 1 sec. over 3 minutes.

Tony Young made a token flight using a 5 sec. engine run to win the power fly-off after Al. Wisher had an over-run. J. Berryman lost his feathering prop. rubber model in one of the few thermals. This made him produce his new model which fascinated many people with its pear section fuselage formed from 1/32 sheet, complete with rather odd shaped prop. blades.

Using the tube winding method J. O'Donnell proceeded to blow up a motor in the rubber fly-off. After replacing the broken one he was last seen disappearing into the late afternoon haze complete with compass and binoculars following his winning flight.

Engraved plaques were then presented to the remaining.

Open Glider		
1. C. Aitkenhead	*Glevum*	8:00
2. B. F. Bow	*Bristol & West*	7:53
3. R. Cummins	*Bristol & West*	5:37
Open Power		
1. A. Young	*St. Albans*	9:00+ 4:11
2. A. Wisher	*Croydon*	9:00+ over-run
3. D. Harper	*Glevum*	8:12
Open Rubber		
1. J. O'Donnell	*Whitfield*	9:00+ 4:11
2. J. Cartwright	*Bristol & West*	9:00+ 3:33
3. J. Johnson	*C.M.*	8:00
½A Power		
1. D. Hipperson	*Croydon*	9:00
2. K. Smith	*Croydon*	7:53
3. H. W. G. Bunney	*Bristol & West*	7:25
F.A.I.—All Classes		
1. B. Eggleston (Power)	*Bristol & West*	8:18
2. J. O'Donnell (Wake)	*Whitfield*	7:59
3. Stevens (Power)	*Swindon*	5:42

Rally Champion
J. O'Donnell.

THE *Federation Aeronautique Internationale* regulations for control line speed flying in the international 2.5 c.c. category are such that when a single line is employed, all of the controlling mechanism must be *behind* the pylon. This is an anti-whipping procedure. It introduces technical difficulties in the provision of a handle with natural action and the first thoughts of reverse type "Monoline" handles prove to be awkward, especially with fast models.

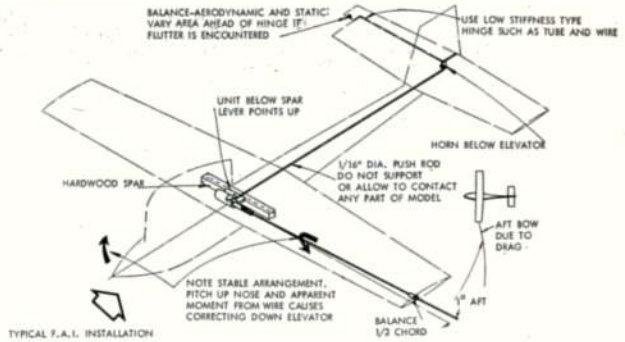
John R. O'Dwyer of Arlington, Texas, is a keen F.A.I. speed enthusiast. He had been flying on two lines for over 15 years and found the reverse type "pump" style handle almost impossible to use. In consequence, he devised this prototype handle which is aptly named *Uniline*. It was made from materials to hand and he has been very good enough to offer details so that others may enjoy the benefits of his new method of control, the great advantage of which is obvious.

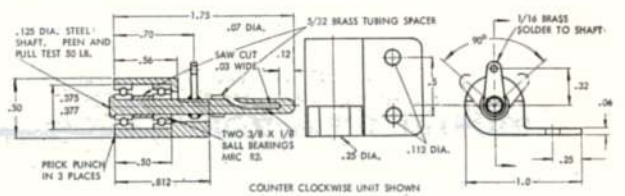
Natural action, as with a two line control-line handle, is converted to torque on the single line by means of a trolley, which moves up and down a rack. As the trolley shifts up and down according to the relative angle of lines and the handle, so the gears are rotated to drive the torque rod connected to the line. The handle has been thoroughly tested and Mr. O'Dwyer tells us that the ball bearings used in the trolley may not be needed, although they are advisable in the aircraft unit.

In order to conform with the latest F.A.I. regulations, the handle should be fitted with a cross-bar to engage the pylon. This could be screwed in on each side of the trolley into adaptors, but modifications would be needed to prevent the flyer from inadvertently pressing forward on the handle and disengaging the trolley from the rack. One answer would be to have a double racking with the trolley rotated between.

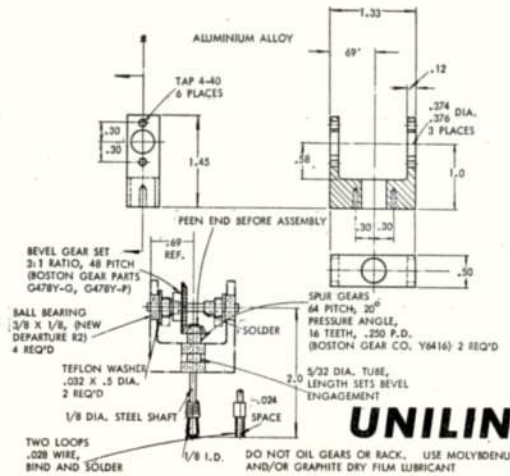
Mr. O'Dwyer emphasises that this system of control should be regarded as a *trim* device specifically created for speed models and not as a *control* device for other classes.

We are sure that a number of our more ingenious readers will soon adapt the system for their own use and we look forward to hearing of their experiments.

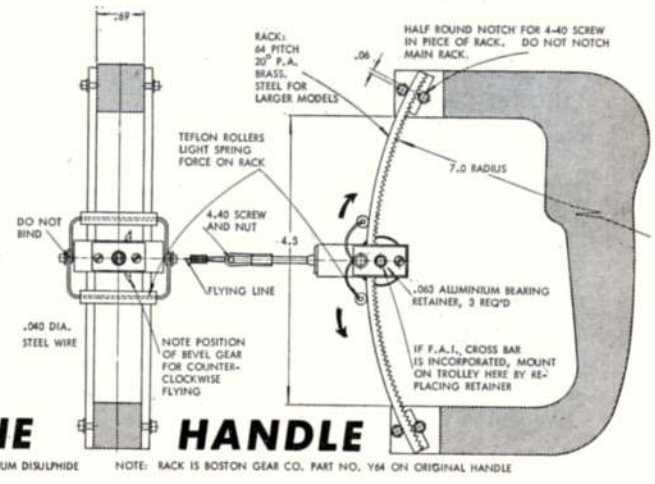




UNILINE  **PLANE UNIT**



UNILINE



HANDLE

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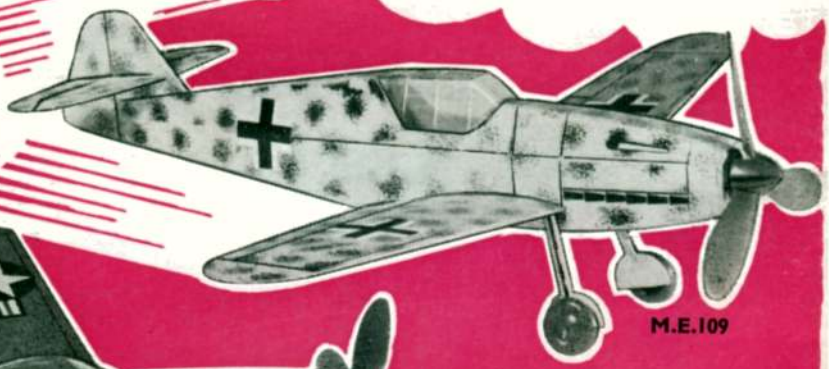

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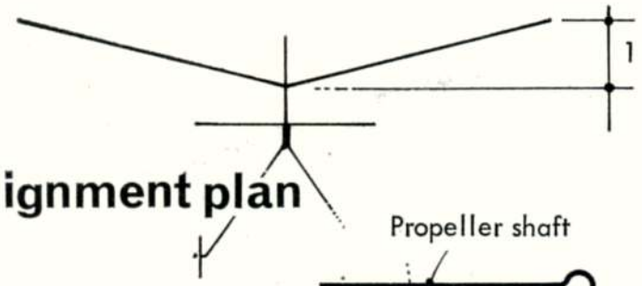
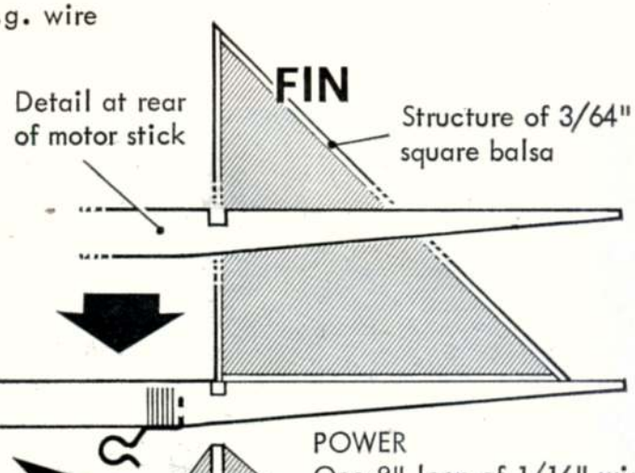
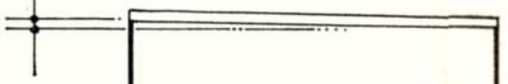
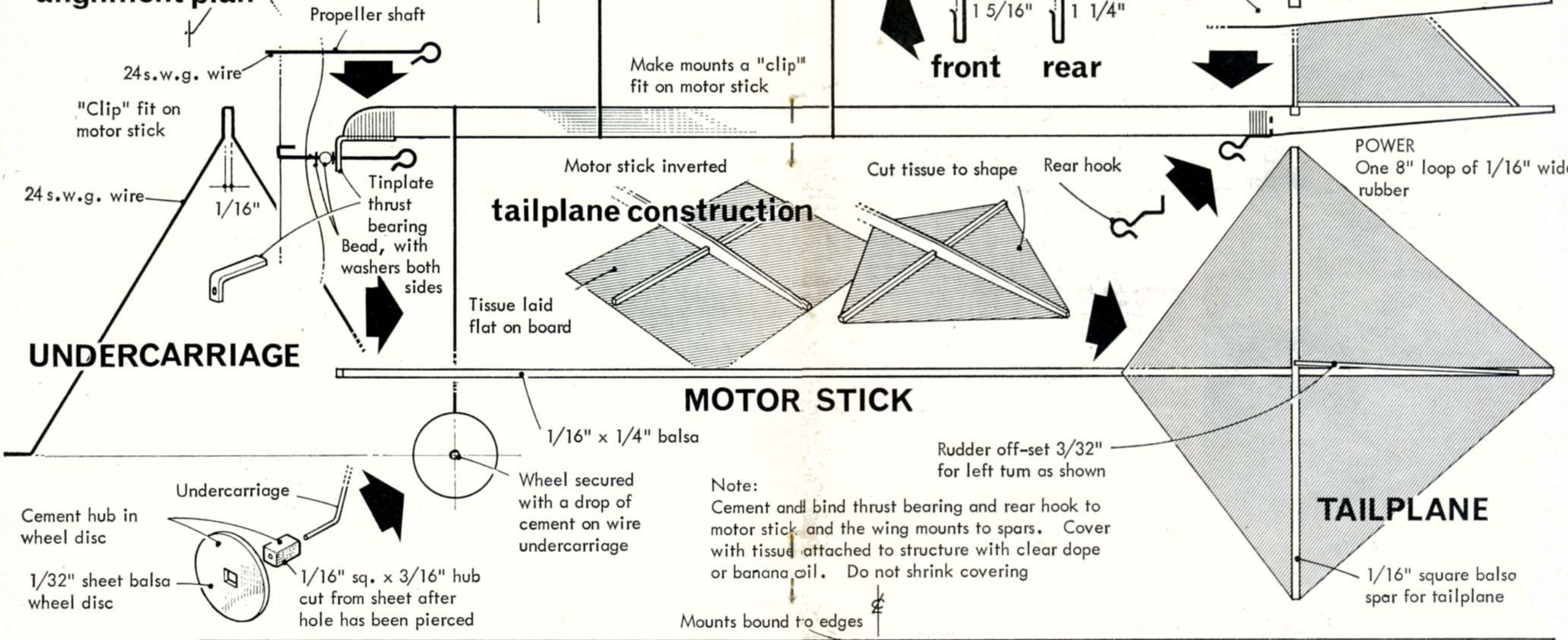


WING MOUNTS

FIN







Wheel secured with a drop of cement on wire undercarriage

Note:
Cement and bind thrust bearing and rear hook to motor stick and the wing mounts to spars. Cover with tissue attached to structure with clear dope or banana oil. Do not shrink covering

Mounts bound to edges

Designed by
David L. Call and
Wm. T. Hawkes