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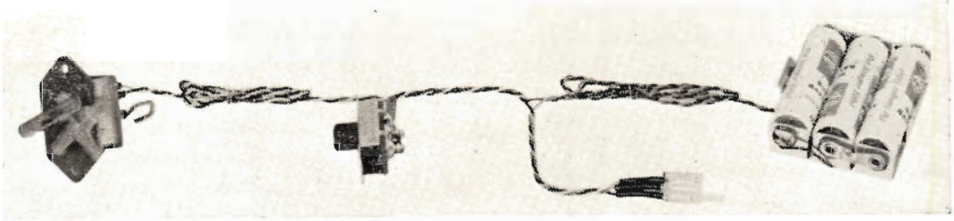

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AERO MODELLER

MAP HOBBY MAGAZINE

June 1964

VOLUME XXIX No. 341

other modelling angles . . .

'Model Cars' July issue has famous pre-war Grand Prix car the Auto Union Type D as cover subject in wooded Nurburgring, with supporting Practical Chassis construction article, and prototype plan. Also featured are Lotus 30, which has just made its debut, Indy Novi-Ferguson 4-wheel drive contender in the Indianapolis 500, and for Bentley fans—Tim Birkin's 1932 Brooklands car.

June issue of **'Radio Control Models & Electronics'** offers a wide variety of interesting items. Maurice Franklin's popular "Skyliner" multi aircraft plans join the R.C.M. & E. Plans Service with full supporting article on building and a most helpful instructional article on piloting. The model also appears on the cover, which has a gay pylon racing influence. The first national pylon race is reported fully. An interesting radio controlled tank is described, and for both boat and vehicle enthusiasts an unusual full-size plan feature shows how to make a radio controlled amphibian "Pulscyle". For the beginner, simple actuators are explained and a new series called "Easy Tips" describes how to make a new type of test.

The opening of the boating season is June **'Model Maker'** and several features are slanted towards the reader who is anxious to get to the waterside. With the 3½ c.c. R/C speed class recognised in boats, the lead feature of this issue is a boat specially designed for this class. The full-size plan is of a very attractive 18 in. yacht. Also of topical importance is an article on the power unit and battery supply, etc., for high-speed electric boats written by the present holder of the European speed record.

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cover

Derek Cook of Canterbury Pilgrims club with his "F.A.I. T-D" after winning the Queen's Cup at last years Northern Heights Gala, held at R.A.F. Halton. This is a Pilgrims club design which achieved handsome success in the 1963 contest season. Derek's is powered by a Cox Special 15 and the streamline device on the fuselage side at the nose is a beaten copper tank which operates under pressure from the engine. The propeller is a 7¼ in. x 4 in. modified Top Flite and to win the Queen's Cup it made three maximums plus 2:55 in the fly-off. Dayglow is used under the wings for improved visibility.

next month . . .

A TRUE BUMPER ISSUE ! This will be our **BIGGEST-EVER** mid year issue ! **FREE** pull-out plan **'plus'** stop press report with picture spread from the British National Championships held over Whitsun. Plan will be for a sport free flight or single channel radio design **Smoke Trail,** just perfect for local field flying with modern lines, simple structure and top performance. Full colour cover painting depicts the famous Dam Busting raid to introduce our drawings by D. H. Cooksey of the **Avro Lancaster Special B Mark I** and other variants as used for operations "Grand Slam" and "Upkeep". First ever true scale details of the bomb fittings in these special fuselages will be scale fans' collection items. This is the result of years of research and patient waiting for official release from secret classification. 1964 version of **Razor Blade** with outline and structure changes will bring combat fans bang up to date with the work of Pete Tribe and Co. from Northwood, while for A/1 glider enthusiasts, Czechoslovakian Rad. Cizek's **Sup** is a highly developed design introduced to A.P.S. for those who want the kind of flying normally expected of big brother A/2 models. Couple these momentous features with some revelations in Motor Mart, another R/C Engine Analysis—the **Fox 15 R/C,** beginner features in radio control and general construction and you will see why we thoroughly recommend you to reserve your copy **'now'** for our own personal Grand Slam edition. Out on June 19th, usual price 2/- per copy.

Editorial and Advertisement offices

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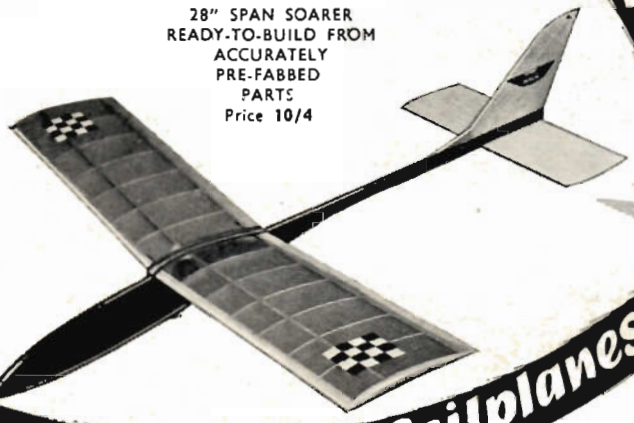

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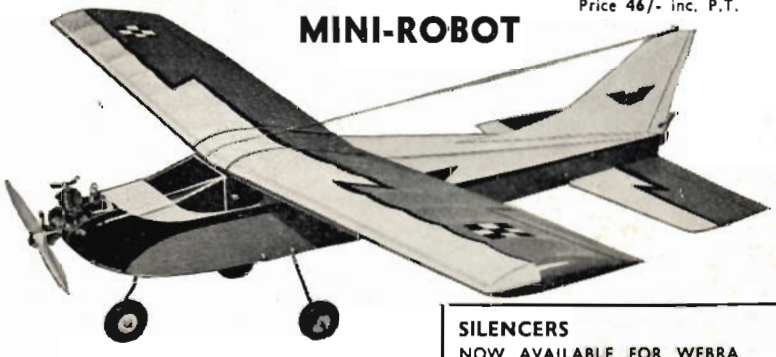

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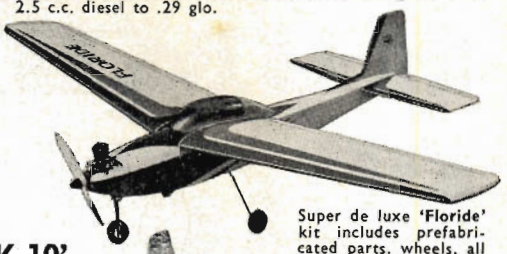

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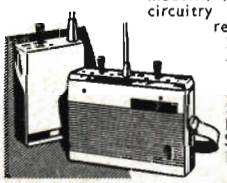

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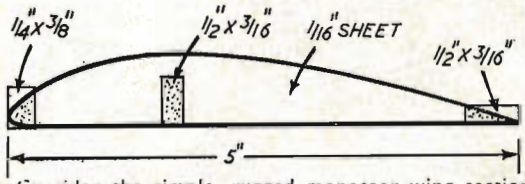
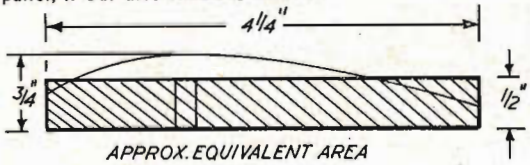
where the weight comes from . . .



Consider the simple, rugged monospar wing section shown above, and suppose the wing is 40" span, parallel chord, with 2" rib spacing and a simple 'square' tip of carved block. Now let's see where the weight comes from.

As an approximation, the surface area of a rib will be a little more than two-thirds of the 'rectangular' dimensions (i.e., length multiplied by full height). There are 11 ribs in each 20" wing panel, and with the ribs cut from $\frac{1}{16}$" sheet that works out to a **wood volume** of approximately 1.55 cu. in. per wing panel, if our arithmetic is correct.

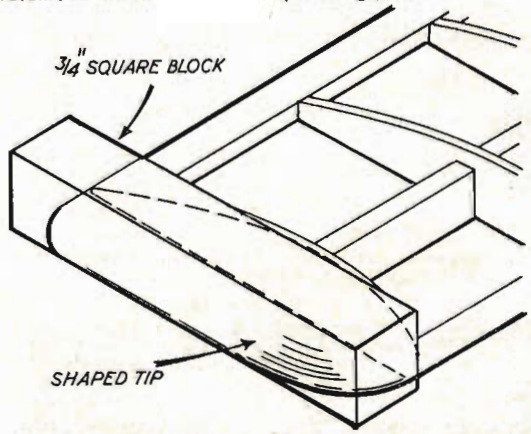


APPROX. EQUIVALENT AREA

The spar section is $\frac{1}{2}$" x $\frac{3}{16}$" which, for a 20" spar length works out at $\frac{1}{2}$ x $\frac{3}{16}$ x 20 = 1.88 cu. in. wood volume per wing panel.

The trailing edge is the same overall size of the spar, but shaped to a triangular section, so its wood volume will be approximately .94 cu. in.

The leading edge, as shown, is carved from $\frac{3}{4}$" x $\frac{3}{8}$" strip and the reduction in volume due to shaping will be roughly one-third of the 'rectangular' volume. That gives the finished leading edge an approximate volume of around 1.25 cu. in. per wing panel.

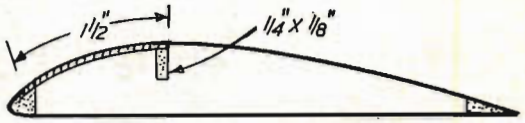


The tip starts off as a $\frac{3}{4}$" square block the same length as the chord (5"). By the time it has been carved to shape and finished off its volume will probably be about half the 'rectangular' volume — say $\frac{1}{2}$ x $\frac{3}{4}$ square x 5 = 1.56 cu. in.

Now let's put all these figures together and see how they add up —

Ribs	... 1.55 cu. in.	... 22%	approx.
Spar	... 1.88 "	... 26%	"
Trailing edge	... 0.94 "	... 13%	"
Leading edge	... 1.25 "	... 17%	"
Tip	... 1.56 "	... 22%	"
Totals	... 7.28 "	... 100%	"

Here are figures which are a useful guide for Balsa density selection. The tip, for example, accounting for 22% of the total volume wants to be of the very lightest grade possible. The spar is the heaviest single member, but it is also the main 'strength' member, so Balsa grade must not be too soft. On the other hand, with a generous spar size, choosing an excessively high density will put the wing weight up a lot. The ribs also account for 22% of the weight. They need to be rigid — which means cutting from quarter-grain stock — but they should also be light, unless you want to end up with a heavy wing. Save some weight on the leading edge by all means with a fairly light density, but don't aim for too soft a grade for the trailing edge. You will not save a lot of weight there, and stiffness is required in this member (quarter-grain again).



Of course, you can also save weight by modifying the construction. A smaller mainspar with a sheet covered upper leading edge will produce a wing which is as strong, or even stronger. Although it may not be apparent at first sight, this wing may be lighter, too. Spar volume in this case is only 0.63 cu. in. which, together with the sheet volume of 0.94 cu. in., still only equals 1.57 or **less** than the original solid spar weight. You could thus afford to choose a denser Balsa for the spar here, and a nice light grade for the sheet covering which is not very heavily stressed. With sheet covering, too, you could afford to cut down a little on the size of the leading edge section.

Analysing design cases in this simple manner can be most entertaining, and instructive. Worked out examples can provide a method of finding an 'optimum' wing design related to possible spar arrangements, and a guide for Balsa selection. You can work out required Balsa densities to produce the same weight in different forms of construction . . . compare 'sparless' with monospar and multi-spar, and so on. **Weight control,** however, is finally dependent on Balsa selection, choosing the best Balsa for the job.

There's a simple answer to this, too. The best Balsa and most consistent quality comes from Solarbo. Your local model shop is bound to stock Solarbo Balsa — but just to be sure, always ask for it by name or look for the Solarbo stamp on every piece of sheet and block.

THERE'S A SUCCESS STORY BEHIND THIS

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You have only to examine any MACGREGOR production—kit or assembled equipment—at your local model shop to see what we mean. Here is first class workmanship which cannot fail to impress. A truly 'professional' appearance, if you like, which gives you confidence in the product right away. But that is only the beginning. Ask any MACGREGOR equipment user and he will tell you that it does just what the advertisements say—functions properly, every time, for GENUINE 100 PER CENT RELIABILITY. And MACGREGOR's have built up this reputation through years of practical development and experience in the radio control modelling field.

Not the least important feature of radio control equipment is the cost. Here MACGREGOR score again with prices which are well within the range of any would-be radio control enthusiast. Whether you choose assembled equipment or prefer to build from kits, MACGREGOR represents the finest value-for-money available in R/C. Besides a quality production, you are also buying RELIABILITY and PROVEN PERFORMANCE.

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WHOLESALE ONLY

THOSE SWISS JUNKERS Ju 52s AGAIN ! Werner Fiebig of Hamburg has sent us this photograph taken during August, 1960, at Hamburg - Fuhlsbittel. This Swiss Military machine was hired and repainted in pre-war Lufthansa markings for production of the film "Counterfeit Traitor", which has already done the rounds of British cinemas. Name under LUFTHANSA, beneath cockpit, is JOACHIM v. SCHRODER. Engine cowls, band around fuselage and vertical tail are red.

Heard at the Hangar Doors

By Special Request

The influx of "vintage" contests for model designs of varying degrees of age, ranging from pre-1940 to pre-1950, has brought forth a demand for many designs which are excluded from the *Aeromodeller* Plans Service catalogue.

We are prepared to make special prints available to order only on deferred delivery, at prices quoted on a list of designs which we have now resuscitated from our archives. More than 100 types are thus now available to special order, so if you have a yearning for an old favourite we suggest you send for our "X-list" of plans excluded from the catalogue. A stamped and self-addressed envelope is all we ask for this special service.

No guarantee can be given that these drawings meet the present-day standard of A.P.S. plans in all respects, and building instructions are not available.

Passing of a Pioneer

IT IS with the deepest sorrow that we have to report the death of the Northern Heights M.F.C. President, Dr. A. P. Thurston, M.B.E., D.Sc., M.I.Mech.E., M.I.E.E., F.R.A.E.S., F.C.I.P.A.

The "Doctor" as he was so affectionately known, was one of the real pioneers of the aeronautical movement in the world and during the early part of his career was associated with Sir Hiram Maxim in building the "Maxim" flying machines.

As a lecturer on "aerodynamics" at London University his work on research led to one of his outstanding inventions for the aerodynamic control of wing lift using "rider" planes at the leading edge of the wing.

During World War I, his work at Farnborough in connection with the safety of aircraft structures laid down the pattern of aircraft 'stressing", much of which is still being used.

For many years prior to World War II his interest lay in fostering the model aeronautical movement and he was elected President of the Society of Model Aeronautical Engineers. During this period he applied himself to extending the International side of the movement and was mainly responsible for obtaining the present Blue Riband of the aeromodelling world, the Wakefield Trophy.

No pre-war International Model aeroplane contest was ever complete without the "Doctor" and his good wife, and many were the functions at which he presided. The "Doctor" could never be a passive participant in any thing connected with the aeromodelling world, and his willingness to undertake tasks on behalf of the movement exceeded that expected of anyone.

He was President of the Northern Heights for more than 20 years, and right up to the last was still interested in the forthcoming gala.

His interest and drive was mainly responsible for the very happy relationships experienced between the movement and the Royal Air Force and his every desire was to foster this aim.

This influence led to a resumption of the Northern Heights gala days at the end of the war, and also to that great honour to aeromodelling, when in 1948, Queen Elizabeth visited Langley to present for the first time, the "Queen Elizabeth Trophy".

No Gala Day has ever been complete without the "Doctor", and his passing from us will be sorely missed by all who had the good fortune to know him. To one and all he was a "True English Gentleman".—*R. Copland.*

Silencers for '65

The following statement issued by the Public Relations Officer of the Society of Model Aeronautical Engineers Ltd., is the most drastic and important decision ever reached by this governing body of aeromodelling in Great Britain.

The Joint S.M.A.E./M.T.F. Silencer Sub-Committee has recommended to the S.M.A.E. Council that the use of silencers should be made compulsory on all engines used in Radio Control or Control Line model flying.

This recommendation has now been expanded by the S.M.A.E. Council to include ALL *internal combustion engines.*

The proposals are : (1) *That as from* 1/1/65, *all*

internal combustion engines used in model aircraft must be fitted with a silencer; a silencer being defined as a device fitted to or built on to an engine (exhaust) which noticeably reduces the noise of operation. This was carried in Council by 11 votes to 3 with 1 abstention. (Proposal 2.) That as from the same date the use of reaction motors (other than Jetex type) in model aircraft be banned except where special permission has been granted for their use at a specified venue. Carried 12 votes with 1 abstention.

The first proposal date coincides with that of the Model Trade Federation resolution, that from January 1st, 1965, no engine shall be made or distributed in Great Britain by any member of the Model Trade Federation without an efficient, fitted silencer.

The second proposal is based upon the opinion of the Council that reaction motors cannot be satisfactorily silenced. If, however, an acceptable reaction motor silencer were produced, the case could be reviewed.

These proposals were made and passed at the S.M.A.E. Council Meeting held in London on Saturday, 11th April. Present were the Delegates of eight Areas and eight Officers of the Society.

Now committed to silencer enforcement, the S.M.A.E. and the Model Trade Federation will, in conjunction with application of the appropriate Home Office Bye-Law, endeavour to recover flying grounds which have hitherto been lost through noise nuisance.

After the many words we have expounded on the subject of silencers over the past three years, there is little we can add at this stage, although controversy still rages concerning the rights of the individual and the manner in which the above requirements can be met in the case of every existing internal combustion model engine.

Clearly, it is inevitable that in order to protect the interests of the great majority of aeromodellers, silencing of engines is absolutely essential.

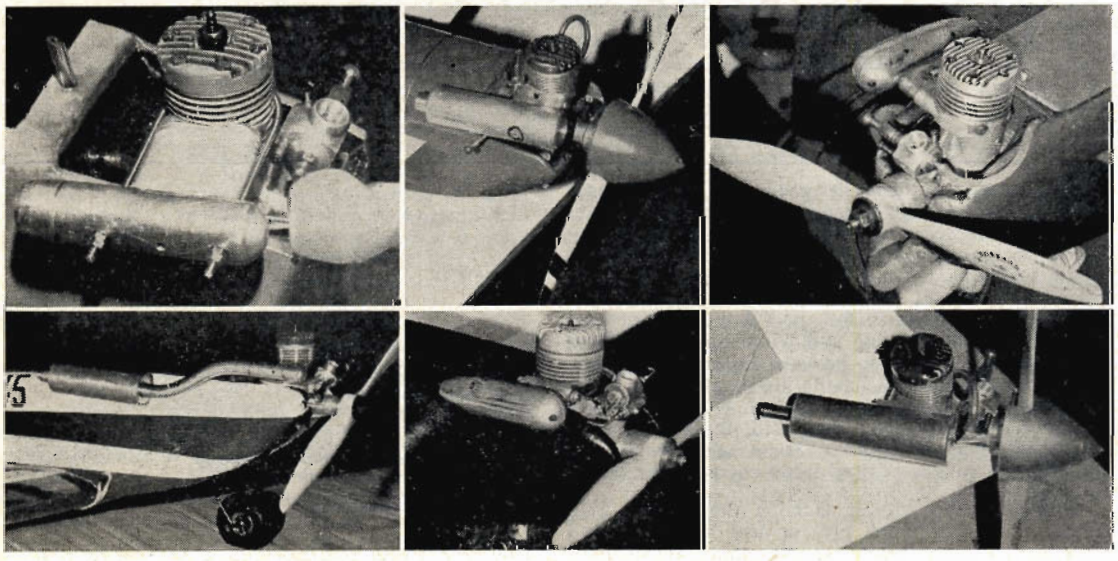
A.M.A. RECORDS. On March 8th the Capitol Condors of Sacramento, California, held a free flight record trials in beautiful conditions. Existing A.M.A. record for F.A.I. Power, allowing extended rounds until the modeller fails to reach a maximum time was 26:53 in nine flights. First, Doug Galbreath of '63 World Champs fame, went through to a total of 40 : 08, then clubmate Bob Cherny went further and established a new record of 41 : 46. Bob was flying his "Orbiteer", which is a "Jai Fai" with elliptical tips and tailplane, plus longer tail moment but otherwise same force layout. Photo shows Bob giving the model a heave-ho. They use Super Tigre G.20 engines and the new Rev Up 8 x 3¾ in. prop for such consistent performance.

We should add, to satisfy the concern of those who compete in international contests, that the S.M.A.E. Council has reserved the power to make limited exclusions, for example for trials involving selection of teams for international events.

Burned Out

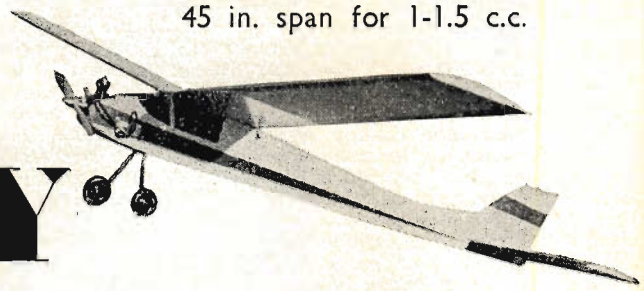
Bradshaw Model Products suffered a disastrous fire on April 28th which completely destroyed all stock and records. It is regretted that there will be a delay in supplies until the Company is re-established in new premises. We sympathise with them in their loss and wish them all speed in return to business.

SILENCE IS GOLDEN! This selection of silencers, as photographed by us in recent months at radio control meetings, shows how various fittings have been arranged without undue difficulty and with most acceptable results, not affecting performance. Viewing, clockwise, are: Australian Burford silencer on Merco 35. Home Constructed Horlicks tablet can silencer on modified McCoy 60. O.S. Jetstream using exhaust valve on Merco 49. Bottom row: Another Horlicks can on Merco 35, O.S. Jetstream welded to exhaust stub of Super Tigre 56 and a Taplin silencer on extension tube from Merco 35.

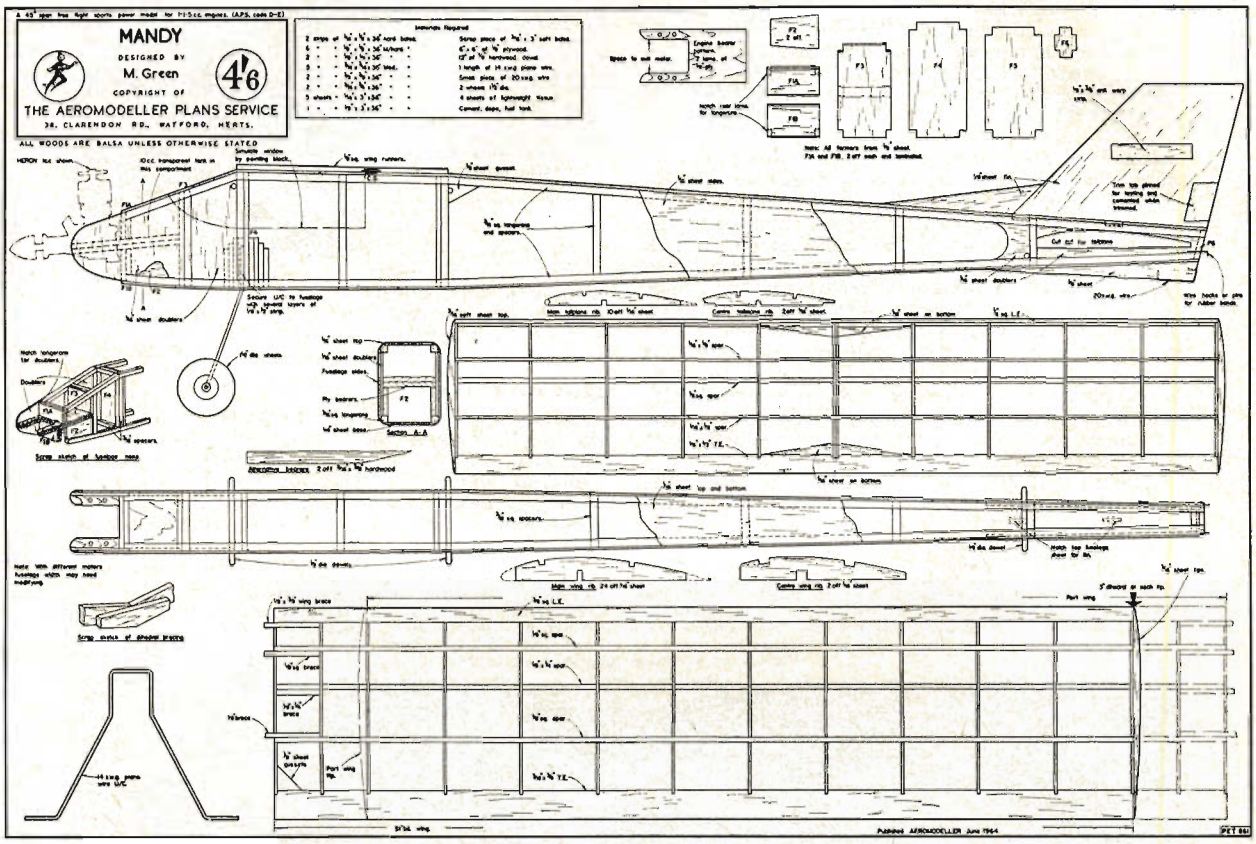


Specially commissioned by "AEROMODELLER" from Britain's leading power contest flyer of 1963—
MIKE GREEN

45 in. span for 1-1.5 c.c.



MANDY

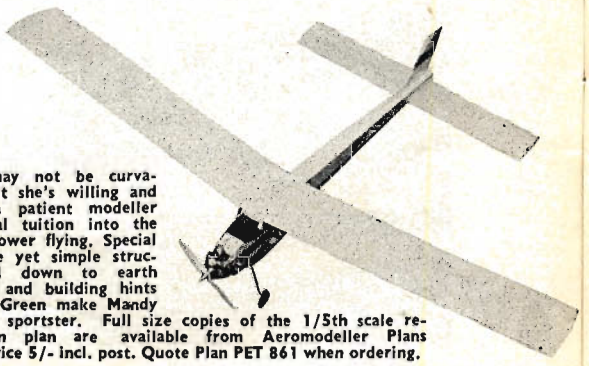


THIS MODEL HAS been designed with the younger sports flyer in mind. It has not been the intention to break any records, but rather to provide an aeroplane of reasonable appearance, easy construction, which will give dependable performance over a long period.

For the newcomer to the sport it must be stressed that patience in building and trimming pays off and can make the difference between failure and possession of a model which has its life measured in years. With this in mind let's run through the construction.

For the most part balsa is used, the vast bulk of which is "medium" grade. Some tolerance is permissible but care is advised when choosing the wood.

Fuselage. We suggest tackling the bearers first. Either cut them from ply, or use adequate sized square section hardwood—see the plan. Wrap tissue



Mandy may not be curvateous; but she's willing and obliges a patient modeller with ideal tuition into the arts of power flying. Special warp free yet simple structure and down to earth trimming and building hints by Mike Green make Mandy a perfect sportster. Full size copies of the 1/5th scale reproduction plan are available from Aeromodeller Plans Service price 5/- incl. post. Quote Plan PET 861 when ordering.

round the exhaust and air intake and bolt the motor to the bearers. The whole assembly can then be fixed to the fuselage properly later, in the knowledge that the motor fits, and is lined up. This may seem obvious; but many people drill bearers when the whole model is practically complete, and when mistakes are less easily rectified.

Cut the fuselage sides from $\frac{1}{16}$ in. sheet, cement in longerons and spacers—$\frac{3}{16}$ in. sq. Cement in the reinforcement at nose and tail — do not overlook the space for the tail or the gussets for the dowels. The width of the front end will depend on the motor, so therefore the top view is a guide and may not be exactly the right size for certain motors. Accordingly, when cutting the fuselage formers make sure they are the *right* size. However, the difference will not be great, $\frac{3}{16}$-$\frac{1}{4}$ in. at most, and it should be within one's capacity to make the necessary modification!

When the parts have been cut, assemble "dry" to make sure parts fit — and include the bearers. If correct, go ahead and cement in the formers first, checking for trueness as you proceed. There is not undue difficulty in actual fact! The engine bearers are best fixed with Araldite, but otherwise ample cement will suffice. Caution — if using Araldite do not make the motor a permanent fixture! When the front is held, complete by adding rear spacers. Shape the u/c wire and cement to former — either well embedded in balsa, or bound on, the former then being of ply, not balsa. Make holes for dowels but do not cement in yet. Sheet top and bottom and cut slots on top to take fin.

TOP TIPS FOR SPORTS FLYERS FROM A LEADING CONTEST MAN

Cut fin from $\frac{1}{8}$ in. sheet balsa, and insert stiffener. Cement dorsal fairing and fin to fuselage, taking particular care that they are on the centre line and also vertical. When the whole lot has set, clean up with fine sandpaper.

Now cement in dowels and solder washers to secure wheels and axles.

Wings. Make an accurate template for the wing ribs from $\frac{1}{16}$ in. ply. Cut the ribs from $\frac{1}{16}$ in. medium sheet balsa. Notch the trailing edge to take ribs. Pin leading and trailing edges on to board. Lay mainspar in correct position, securing with pins either side—i.e., do not pin rigidly. Cement in ribs ensuring a snug, but not overtight fit with the spar fitting right into notch, not protruding. Cement in top spars. Add tips from soft $\frac{3}{16}$ in. When both sides are set, cement together at correct dihedral angle. Do not omit dihedral braces at centre. When set shape L.E. and T.E. as necessary and sand smooth. Sand tips, and carefully sand off any rough projections. Cement bandage to L.E. and T.E. at centre for toughness.

The **Tail** is basically similar to wing.

Covering. Lightweight tissue is adequate for most surfaces, but heavyweight is acceptable for the wing. Fix the tissue to the L.E. and T.E. of the wings and tail with tissue paste, making the tissue smooth rather than excessively tight. I use cement at the centre section as paste is inadequate on ribs and the tissue may pull away. More experienced modellers may prefer to use old (thick) dope, but paste is better for the slower beginner who can then take adequate time over the job. Use lightweight tissue for the fuselage using dope, smoothing out wrinkles as work proceeds.

Either steam or water shrink the tissue on wings or tail. Give the wing two or three coats of dope (ordinary strength) and the tail two. Pin down these items on the board between each coat of dope for 24 hours. Check carefully for warps and steam any undesirable ones out. A little "washout" on each tip ($\frac{1}{16}$ in.) is acceptable; but it must be the *same* each side.

Use colour dope sparingly, if at all, and in any case only on the fuselage or for trim on the wings. The windows can be simulated by painting in black dope or carefully applying black tissue.

If you are using a glow motor do not forget to fuel proof the fuselage, 6-8 in. inboard each side of the wings and very lightly on the tail. Proof the engine area liberally. Put on your name and address *now*, **not** later when you may forget!

Flying. Assemble the model and check that everything sits firmly and squarely. Correct unwanted tilts by shimming where necessary with $\frac{1}{32}$ in. sheet. Use enough elastic bands of the correct size to hold the model together rigidly by the way. This sounds obvious but I have seen numerous models "floppily" assembled and as a consequence not flying properly.

The model should balance about $3\frac{1}{2}$ in. back from the leading edge, though there is some tolerance. If the C.G. is way out, ballast will have to be added either to the nose or tail, but at this stage this is unlikely to be necessary.

Wait for a calm day for the first tests and do find a wide open area away from houses, people, etc.

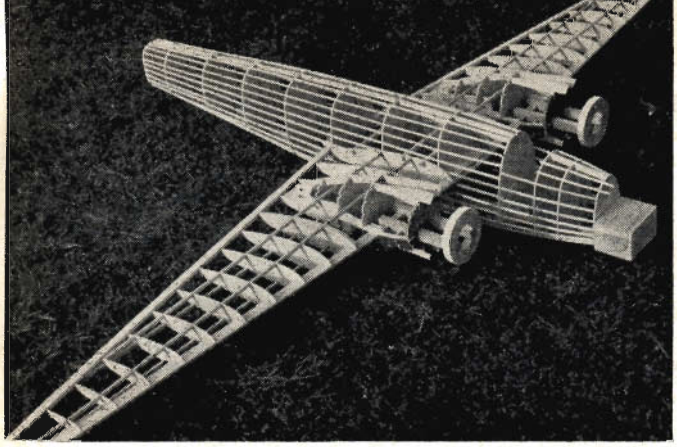
Hand glide to obtain an approximate idea of the trim and cure any diving or stalling tendencies by packing the tail—i.e., pack up the L.E. of the tail to eliminate stalling and pack up the T.E. to cure diving. Use $\frac{1}{16}$ in. hard sheet balsa (or $\frac{1}{16}$ in. ply preferably) for coarse adjustments and $\frac{1}{32}$ in. for fine.

The turn direction is not critical for moderate power. If at the hand glide stage turn is excessive cure this using the fin tab. Make the initial powered flights under low power and shortish runs—5-8 secs. It is necessary to have some idea of how long the motor will run on so much fuel, if using a "visible" fuel system. A timer will be needed for an enclosed fuel tank — though the majority of sports fliers will be employing the former. Ideally the model will climb smoothly in a fairly wide turn and make a good transition into a stable glide. If this is so work up to normal revs in easy stages and if all goes well then increase the motor run to a safe time for the conditions.

Most likely, however, some adjustments will be needed. In the event of too right a turn, make fin tab adjustments in the opposite direction — say $\frac{1}{32}$ in. at a time not more. If the model stalls in the glide, pack up the L.E. of the tail $\frac{1}{32}$ in. at a time. A dive into the ground straight ahead is unlikely, but if it happens, cure by packing the T.E. of tail up!

In the event of power being correct, but glide too steep, a little ballast in the rear fuselage will help. The main thing is to carry out one adjustment at a time and only when the pattern appears satisfactory, increase revs or motor run. Provided reasonable care is exercised the model is unlikely to come to grief and in any case is quite sturdy so should withstand a modicum of mishandling.

Good flying!



C. J. West's constructional epics are becoming a regular serial heading for this feature. This is his latest, a Vickers Wellington destined for radio control and powered by two Allen Mercury 35 diesels. Wings will be sheet covered for additional strength. The undercarriage will be fabricated in dural tube and sprung. Not exactly a beginner's project, but one on which to set one's sights after following this series.

Let's go FLYING

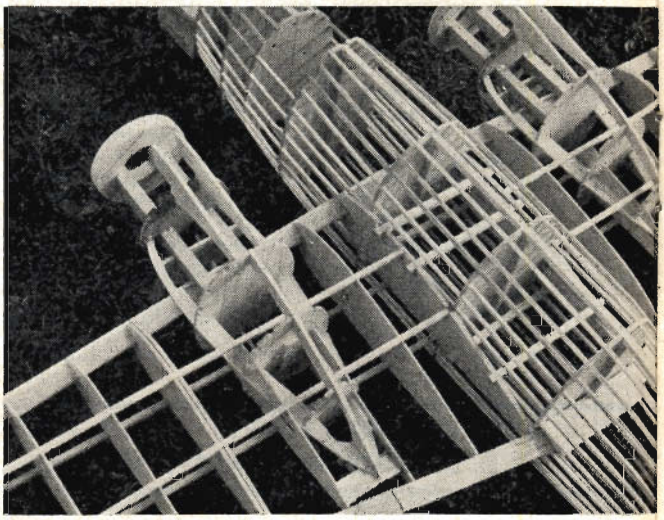
—with John Barker (Part 3)

Basic Construction Methods

AS MENTIONED EARLIER in this series, the structures of model aeroplanes have undergone considerable development over the years. It may seem that some of the modern developments should have been obvious at a much earlier date, but bear in mind that competition rules are usually the factor that stimulates or retards development. The structures which suit the rules of today would have been incompatible with the rules of a few years ago. As most modellers are not competition flyers this may seem rather strange, but it is nevertheless true. It is akin to the fact that competition motoring produces better engines, brakes and suspensions for the family saloon. That is the justification for including a fair amount about competition matters in the model magazines. Even if you do not build contest models yourself, the plans of successful machines are often worthy of study and will yield many useful tips which can help your own building and flying.

The variety of modern constructional methods need hold no terrors for the novice. There are certain basic structures which we shall describe later in this article which form a groundwork for most models. Unusual features will normally be shown clearly on the plan. In this connection the AEROMODELLER Plans Service is recommended. The draughting is to a high standard, and, what is equally important to the beginner, they are to a consistent standard. This means that you find the information where you expect to find it, and how you expect to find it.

Now, a few words of caution. Firstly, building methods are not always what they seem. For instance, the Jedelsky type of wing which appears to be just two sheets of balsa stuck together can take more building than a normal 'rib and spar' type. Secondly, certain structures call for very careful wood selection to the extent of being useless if the wrong wood is used. For this reason always follow any advice given on the plan, and at the same time try to develop your own 'feel' for correct grades of wood.



Fuselages

One of the oldest ways of building fuselages, with four longerons and spacers, is still in wide use today. It was used on many of the earliest full-size aeroplanes and in fact the word longerons to describe the main longitudinal members is of French origin and comes from a time when the French were pioneers of aviation. The wood for the longerons should normally be straight grained and springy and, most important, all four pieces should be similar otherwise a twisted fuselage will result. It should be mentioned that the spacers on the side of the fuselage are often called uprights, and those on the top and bottom, cross pieces. The box type of fuselage is started as shown in *figure* 3.1. After covering the plan with waxed paper, or taking similar precautions against sticking, a row of pins are placed in position along the outer line of the longeron. The longeron is then placed in position and held by pins placed along the inner edge. It is useful to place the outer pins at a spacer position which prevents the longeron from being pushed out of place when the spacers are being cut. The inner pins of course should avoid a spacer position otherwise they will have to be moved before the spacer can be inserted. The spacers are now cut to length to fit between the longerons. Notice the way that the knife blade is held against the inside of the longeron when the spacer is marked for length. This is more accurate than

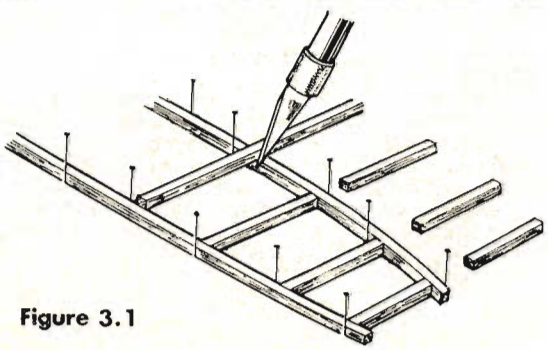


Figure 3.1

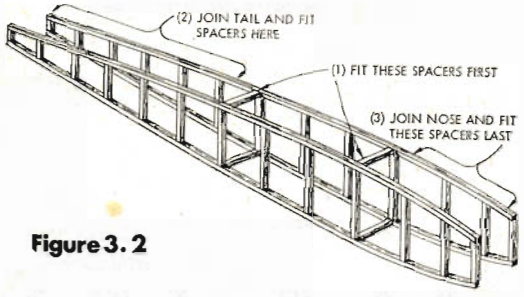


Figure 3.2

'eyeing up' over the top. After marking, the spacer is cut to length on the cutting board. A duplicate spacer is cut at the same time ready for the other side of the fuselage. Do not glue in the spacers as you cut them. Lay them neatly at the side of their correct position until the whole lot have been cut. This saves a lot of picking up and putting down of the cement tube and the balsa knife, usually with the cement oozing all over because you can't be bothered to replace the pin. The spacers are pre-cemented if required and finally stuck into place. The second side may now be built directly over the first, and this is the usual practice.

When dry, the pins are removed, taking care to hold down the longerons close to where a pin is being withdrawn. This prevents breakages if the pin happens to have stuck to the structure. The two sides are separated by sliding a thin blade between them. Again support near the place where you are working. The inside faces of the sides may now be lightly sanded if necessary and they are then ready for joining together. See *Figure* 3.2. The best method of joining the sides is undoubtedly with a jig, but in all honesty most modellers seem to do the job just holding the bits in their hands. The usual method is to cut four spacers, two top and two bottom, which fit near the widest part of the fuselage. These spacers are cemented into place first and a check is kept on squareness and alignment until the joints are dry. The rear ends of the fuselage are then brought together and held by a spring clip or rubber band. Hold the structure over the plan view whilst doing this to obtain correct alignment. The spacers between the midpoint and the tail are usually added next, using rubber bands for holding as necessary. The nose spacers may then be fitted and the fuselage finally finished with any diagonals and sheeting, etc., that are needed.

We have dealt at some length with the construction of the normal box fuselage because most of the points mentioned are equally applicable to any other balsa framework, be they on the fuselage, wing or tail.

Two widely used variations of the normal box fuselage are shown in *figure* 3.3. First is the use of diagonal members throughout the whole fuselage instead of upright spacers. This type of structure, known as a Warren Girder, is more rigid especially in torsion. It has the disadvantage of leaving longer lengths of unsupported longeron unless more spacers are used than with the conventional structure. On the other hand the spacers do not need to be cut to length quite so accurately, for they may be rotated slightly out of position to fit. It should be noted when building a Warren Girder fuselage that the diagonals on opposite sides run in opposite directions. The other variation, less widely encountered, is the use of diagonal longerons. As will be seen, the longerons are made of rectangular instead of square section wood with the long side of the rectangle pointing towards the centre of the fuselage. This gives greater resistance to bending in the direction in which the longerons are usually handled. Also a longer glued joint is obtained between the longeron and the spacer. This type of fuselage is more difficult to build and a fairly elaborate jig is a necessity.

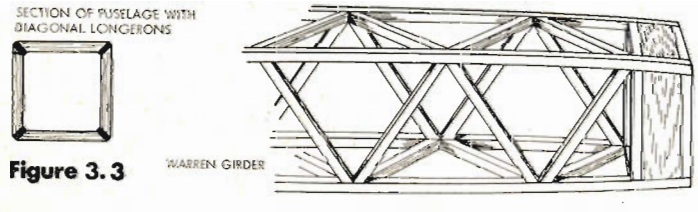


Figure 3.3

Fuselages from Sheet

Many models use fuselages constructed mainly from sheet balsa. There are many minor variations of method but these should cause no trouble if the broad principles given here are understood. *Fig.* 3.4 illustrates some of the possibilities.

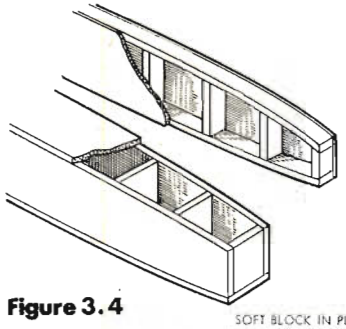
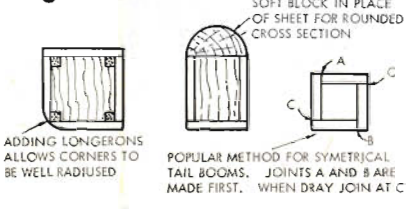


Figure 3.4

The earliest types of fuselages using sheet balsa were not so much sheet fuselages as we know them in that a normal longeron and spacer structure was completed and then covered with sheet. This type of construction is still met today. The main point to watch is that the basic structure is not distorted when the sheet is applied.



In the most normal type of sheet construction, two sides are first cut out to shape and subsequently joined together with formers or bulkheads. The top and bottom are then covered with sheet. These top and bottom sheets are usually cut wider than is required. The excess being trimmed off after the glue has dried. Often longerons are included in these fuselages to strengthen the corner joints and to allow the corners to be rounded off. These longerons are added after the sides have been cut to shape but before they are joined together.

A popular method of construction is to build what is in effect one side of a basic box fuselage. The main difference is that the longerons and spacers are of much larger cross section, say about $\frac{1}{2}$ in. x $\frac{3}{8}$ in. This is then covered on both sides with sheet balsa. These fuselages are not tapered in plan view except perhaps at the very end.

Much of the construction on sheet fuselages is best carried out with PVA adhesive to take advantage of the longer setting time. A final point ; be sure to check that all necessary parts are in place before you complete the sheeting.

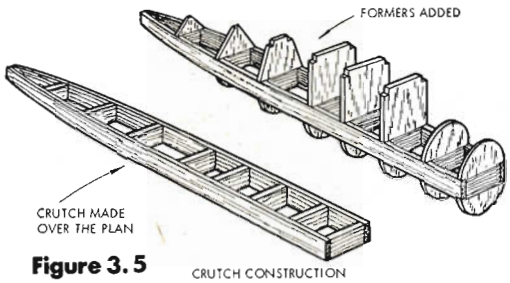


Figure 3.5 CRUTCH CONSTRUCTION

For instance, a glider tow hook must often be fixed in place at an early stage of assembly.

The final method of fuselage construction we will mention is the so called "crutch" construction. This was very popular some years back and it still has its uses for fuselages of rounded or multi-sided form. The method is obvious from *figure* 3.5. The crutch is first built directly over the plan. Formers of any shape can be added to top and bottom and the fuselage is then given it's final form with longitudinal stringers or sheet.

Wing Construction

A good set of accurate ribs is the biggest help in building wings. Construction is carried out in the usual manner by pinning down the parts over the plan. There are, however, a few things to watch and several of these are shown in *figure* 3.6. The wing is built in a number of panels depending on how many dihedral joints there are. When one panel is completed it is propped up to the correct dihedral angle and the next panel is built on to it. The rib at the dihedral joint is not added until the two panels have been joined and the dihedral braces added. When the aerofoil section used has undercamber it will be necessary to use packing under the front part of the trailing edge and probably under any spars which are on the lower surface to maintain their correct position. Alternatively, particularly if the wing also has upper spars, the lower spars may be omitted until the wing is removed from the board. This is easier in many cases.

Whilst hesitating to tell the beginner to deviate from the plan we would mention that many designs call for a plywood dihedral brace at the tip dihedral joint. This is not necessarily a good thing ; in a bad crash the plywood won't break but other things will, and in awkward places. With a balsa dihedral brace, or even a plain butt joint with gussets, the tip will break off cleanly in a bad crash and can easily be glued back in place.

Almost invariably the trailing edge should be shaped to the correct cross section before assembly whereas the leading edge is shaped after assembly.

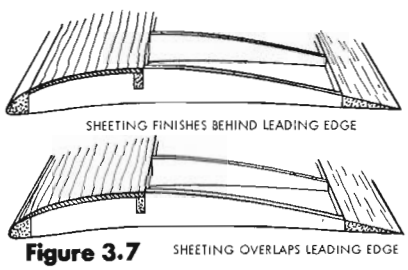


Figure 3.7 SHEETING OVERLAPS LEADING EDGE

Some wing designs call for sheeting to be applied to the upper nose portion of the ribs. This is partly for strength and partly to give a smooth airflow. There are two main ways of applying sheet to the leading edge and these are shown in *figure* 3.7. The first method finishes the sheet just behind the leading edge. This means that the sheet must be cut to accurate width before assembly. The easiest way to do this is to fix the rear of the sheet in position with adhesive tape or pins and then, on the underside, mark the correct width with a pencil drawn along the rear of the leading edge. One part of this job which does call for a bit of extra care is cutting the sheet to proper length to give a good fit at the dihedral joints. This length will be marked at the same time as the width by pencilling along the outside of the dihedral joint rib. But notice that the sheet must be cut half a rib thickness inside the line to leave an abutting surface for the next piece of sheet. PVA is the obvious choice for sticking the sheeting in place using plenty of pins for holding. The leading edge is shaped after the sheet is in place. The 'Zip' razor plane will do most of the work but

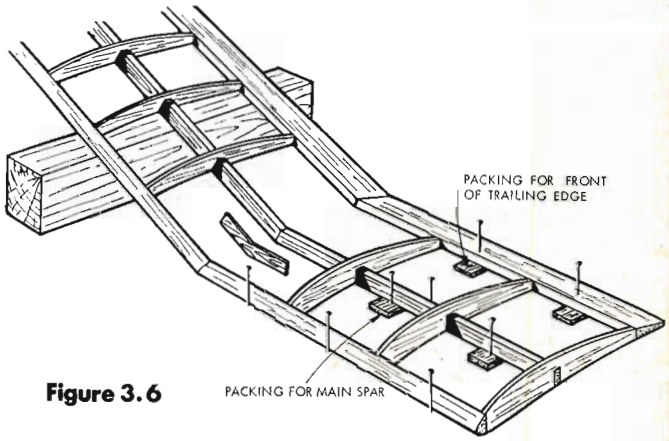


Figure 3.6

a knife will have to be used near the dihedral joints. Finish finally with sandpaper, It is helpful before shaping the leading edge to draw a light pencil line along the wood indicating the extreme point of the leading edge to act as a guide. Strictly speaking a proper checking template should be made but very few people go to this trouble.

In the second method the sheeting is carried right over the leading edge spar. This method is possibly a little stronger and does reduce the accuracy with which the sheet width must be cut before assembly. On the other hand the leading edge must be shaped correctly on the top surface before the sheet is applied and so the time taken is similar for both methods.

You will notice that a pencil is consistently recommended in this series for marking out. This pencil must be really sharp. Use sandpaper to obtain a conical or chisel point as the job demands. A ball point pen is sometimes suggested but the blunt end is useless for good work. Also the ball pen often leaves unsightly ink marks on the wood which can be difficult to remove.

To be continued next month with instruction on model covering.

SIGN POST

A MONTHLY ENQUIRY SERVICE

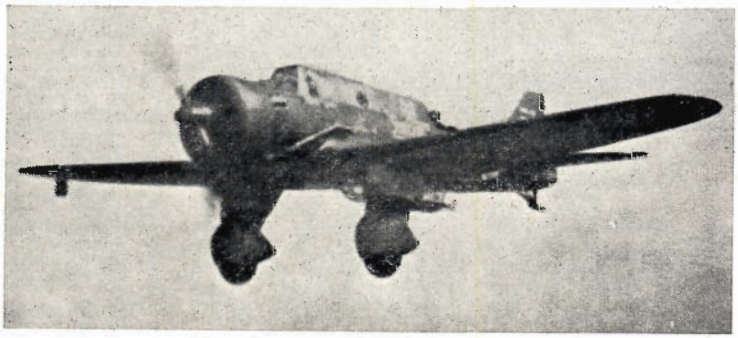
Each month, *Aeromodeller* and *Air-Britain* combine forces to answer interesting questions sent in by readers. Postcards, please, to "Sign Post" c/o Aeromodeller, 38 Clarendon Rd., Watford.

Rumanian Odd Fish

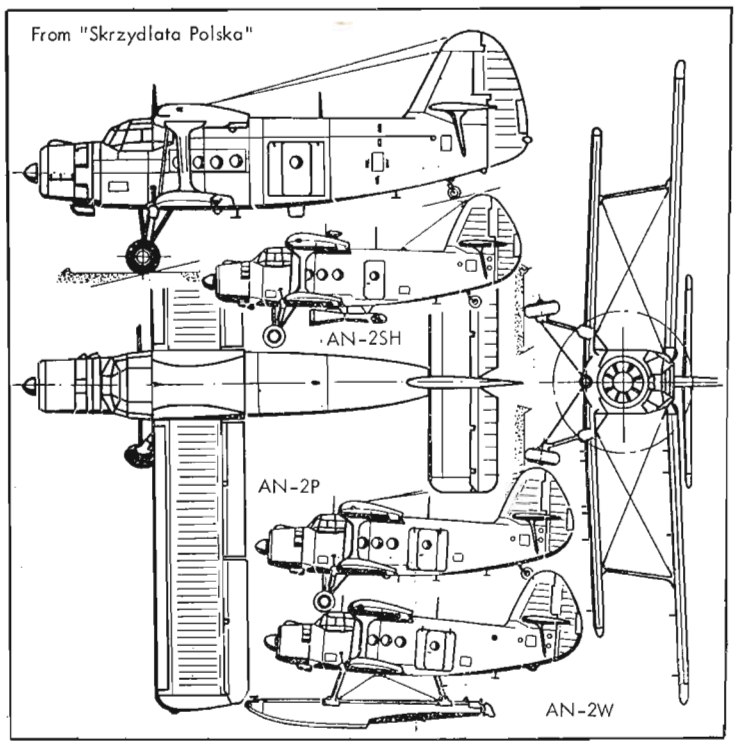
Looking through the old *Aeroplane Spotter* (Vol. V, No. 108, April 20, 1944) I saw a side view drawing of a Polish aeroplane that has always appealed to me, the PZL 23 Karas. Unfortunately the John Stroud drawing does not give much clue as to colour scheme. Can you help?

(M.C., Paris).

The accompanying photograph is quite a rarity and shows one of the 1939 Rumanian-impounded Polish Air Force PZL 23 Karas (Crucianfish) 3-seat reconnaissance bombers in the markings of the Rumanian Air Force circa 1941-2. Note the observation "bath" to the rear of the heavily-trousered and spatted main undercarriage. The national markings of this period had been subjugated to permit Axis identification: being a massive white outlined yellow cross with blue border, with the Rumania roundel of (inner) blue, yellow and (outer) red set in the dead centre of the cross. The fin retained the traditional vertical stripes of blue, yellow and red, the red being on the trailing edge. The upper surfaces were of irregular olive drab and dark green while the undersurfaces were sky blue. National insignia appeared on both upper and lower surfaces of the mainplane. The Karas was powered by a Polish licence-built Bristol Pegasus XVIII radial of 680 h.p.



Hungarian Aero Club AN-2, one of three, ANA, ANB, ANC is olive and pale blue with white letters.



Colt Colours

Can you help me with Antonov An-2 "Colt" colours, please?

(T.C., Barking)

In the February 1964 issue of 'Air-Britain Digest', a member of the Russian Aviation Research Group, Robert J. Ruffle, has produced a 2½ pp. article on the An-2 "Colt" and its derivatives. Apart from an impressive list of serials and registrations, both civil and military ranging from the U.S.S.R. to Air Mali, Mr. Ruffle has this to say on colour schemes:

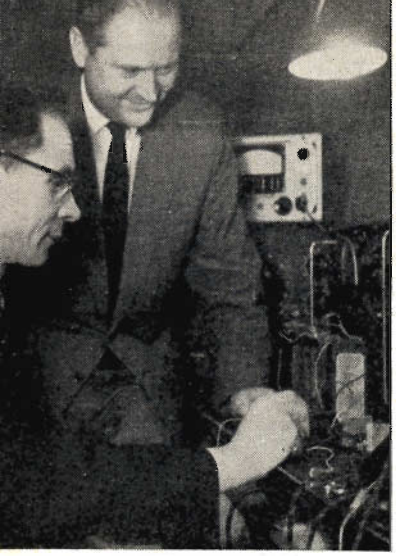
"General military finish is olive or brown drab with pale blue or blue-grey undersurfaces. Civil machines are usually similarly finished. Soviet military aircraft have white outlined natonal insignia stars on the fin and rudder, above the upper wings and below the lower wings. A code number is applied to the rear fuselage. Aeroflot (civil) machines with a similar finish have a white stencilled registration on the rear fuselage and black registration below the lower wings."

Transport Grey

I have seen grey painted De Havilland Comet 4Bs in B.E.A. and the V.C.10 is also painted grey where usually left silver, is this to be standard in future?

(B.C., Ruislip)

True it is that B.E.A. Comets will follow the Vanguard and some Viscounts into "Transport Grey" protective coating as they are overhauled. Only new type likely to remain in natural polished metal finish is the D.H. Trident, said to be at special request of the Chairman. B.A.C. VC 10 starts life painted overall, with "Transport Grey" wings and main fuselage up to cheat line since it is not otherwise possible to treat machined surfaces chemically. Paint adds weight; but protects!



Left: 'Skrzydlata Polska' correspondent Wojciechowski with Vasyla Potapov (with glasses) in the Radio Control department of CAML.

Right: A section of the construction department office, at the first drawing board is Boris Chourski and at the rear is Juri Sokolov the famous A/2 glider designer.

INSIDE U.S.S.R. MODEL H.Q.

Our own attempt to visit the Central Aeromodelling Laboratory at Tushino on the outskirts of Moscow during 1962 were frustrated by circumstances too tedious to report. The visit by Yanucz Wojciechowski representing the Polish aero paper **Skrzydlata Polska** *has, therefore, given us a first realistic insight into the famous institute and we are pleased to re-print this translated summary of his first-person account.*

"At first I feel compelled to say, that I viewed my visit to CAML with very uncertain feelings. From one side I knew that this centre has existed for 32 years (and that speaks for itself), while from the other side, I know very well, that there are no bright prospects for similar model centres in England(?), Spain, Italy, Hungary, Czechoslovakia, Rumania and Yugoslavia (not to forget our own model institute at home [Poland], which has similar experience). Neither of those centres has developed itself to full strength and been able to spread its wings. Sooner or later these model centres have begun to lose their purpose. Very often, they have come to liquidation or have changed to small home workshop production. All of this, I had in my mind, before I opened the door to the hospitable CAML.

What is CAML?

The abbreviation stands for Central Aeromodel Makers Laboratory or Scientific Experimental Centre of Aero Model Makers. CAML occupies a large pavilion at the aerodrome of the Central Aeroclub of the U.S.S.R. in Moscow. It is a sub-division of the DOSAAF sport flying organisation.

CAML was established in 1931 under the management of the prominent Soviet Aero model maker engineer Nikolaj Babijev. Before 1940, CAML was the main source of initiative and organisation of technical development among Soviet Aero model maker, and this same work is continued at the present time.

The main work at CAML is as follows:—

1 Development and instruction for beginners in Aeromodelling.
2 Organisation on the technical side of all Aeromodelling events, central or international in the U.S.S.R.
3 Preparation from the scientific-technical side of teams from the U.S.S.R. for international events or World Championships.
4 Determining the direction or policy of technical development in Soviet Aeromodelling.
5 Developing prototypes of different kinds of engines, radio control and other technical equipment for the hobby.
6 Developing prototypes of components or pre-fabricated kits to build many different kinds of flying models.
7 Permanent control of quality of improving engines and other equipment for model making to be mass produced by factories.
8 Training judges or instructors in Aeromodelling.
9 Maintaining records of technical data of the best models and publishing reports.
10 Regularly publishing a CAML technical Bulletin.
11 Film and photographic service for modelling events used for lectures.
12 Technical aid (direct or by correspondence method) for all the U.S.S.R.

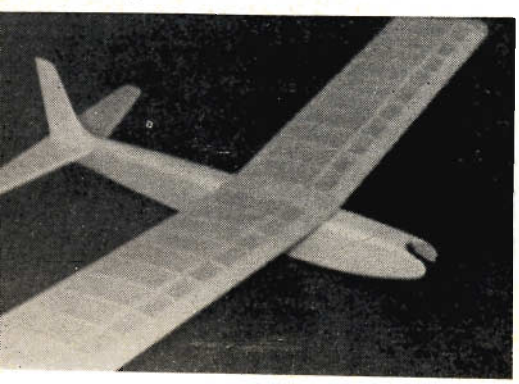
Organisationally, CAML is directed in four sections:

Information Section. In this section there are four persons. All of them have very high standard of knowledge for judging model-makers. Among them is Ludmila Postnikowa, the only woman judge in the international category. There is a very well known model maker and author of many books for model making, Jerzy Chuchra, as well as photographer Grzegorz Rimski who has at his disposition an excellently equiped laboratory for film and still photography. The specialist for making literature is G. Pizonkow, also a judge.

In this section, CAML bulletins are published under the literally translated title "Materials of Information". It is a very interesting internal publication, with contents including plans, descriptions of many different kinds of models, control equipment or technical articles. It satisfies all model makers, with its prompt technical information. The department also deals with all kinds of queries, receiving between 450-600 letters monthly, from the farthest corners of the vast U.S.S.R.

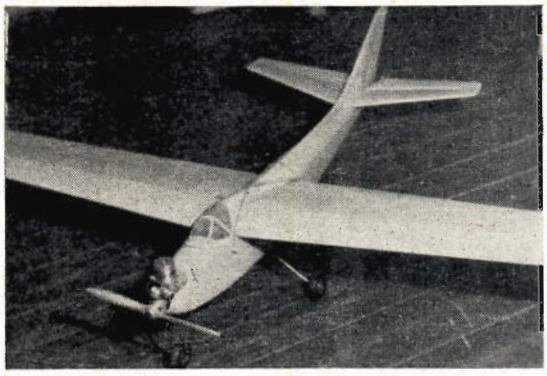
Construction Department. Here one can meet well known names, prominent in the world such as: Master of Sport of U.S.S.R., Juri Sokolov (C/L aerobatics) Honoured Master of Sport of U.S.S.R., Boris Chkourski (team racing) or Master of Sport of U.S.S.R., Valery Szerbakov (speed models).

In this department, prototypes are developed for flying models, which are to be mass produced by factories. At the present time in the Soviet Union, 20 model kits of various types of flying models are in production. From each model kit they are pro-



Right: Jerzy Chuchra of CAML with his R/C model, very much Taurus/Perigee influenced with shoulder wing.

Left: At the present in the building stage in CAML is a prototype "standard" model for single channel control, showing 'Falcon' influence.



Full multi-channel aerobatic model, fitted with CAML 10 channel radio control—and a Merco 49 R/C engine made in England !

ducing 1½ millions (*Sic !*). Among the latest is a new kit for an A/2 glider, designed by Juri Sokolov, and a team racer by Boris Chkourski.

To one side of the construction office is the workshop, where prototypes originate. At the present time the work is concentrated on two "competitive" versions of radio control flying models for equipment, which already is in series production. Models are tested out at the nearby Aero Model Club Airfield, where there is a special take-off area of 50 metres diameter.

Engine Department. This is personally managed by the general manager of CAML—Michael Vasilchenko and has an excellently equipped workshop, with new essential equipment. Two specially trained and highly qualified toolmakers are employed. Engine prototypes are built and tested with special equipment. The best types are then sent to be made by factories. Five different engines are in series production at the present time, and each engine will be produced in numbers up to 50-60 thousand (*Sic !*). It is very interesting to note that CAML collects engines from all over the World, which are necessary for constructional examination and comparative work. Here they do not believe in advertisement claims but take engines on their merit after tests.

Radio Control Department. The radio control department in CAML is managed by a specialist engineer Vasyl Potapov and by the very experienced modeller in this field—Michael Vasilchenko. A well equipped electronic laboratory gives unlimited possibilities to carry out all necessary experiments. It is not surprising, that all prototypes are of high standard. One new item is a 10 channel all-transistor transmitter and receiver with subminiature components.

In December 1963 Soviet industry began to supply the first of 10,000 sets of single-channel model equipment under the name "Signal" as designed by CAML. This is fully transistorised and costs only 30 Roubles (£10). It operates from one 4½ volt flat battery. In the early future it is predicted that 4 and 10 channel all-transistor sets will be mass produced in the U.S.S.R. as designed by CAML.

During 1963, CAML employed 13 people (including two clerks), but for 1964 the staff will increase to 20 and plans are prepared to widen activities further. CAML has already been allocated spacious new premises and technical equipment. Its library includes all published literature concerning model making throughout the world. No report on the institute could possibly be complete without a few words about "Mischa".

"Mischa"

Back in September 1951 at Poznan-Kobylnicy, the second International Aeromodelling Championships between U.S.S.R. and the Democratic States were held and there I was first introduced to "Mischa". In spite of his fame of world record achievement and many championships in aeromodelling, I found "Mischa" a very gay and kind hearted person, willing to help, and warmly regarded by all modellers; added to this, *"Mischa"* ably demonstrated his latest glider. Who is "Mischa"? Mischa is the nickname for Michael Vasilchenko. The name is well known throughout the world for he has been an aeromodeller for 30 of his 42 years. He has participated in all categories of the hobby, holding during this time, an absolute World Record, 13 International records, 20 U.S.S.R. records and he has been rewarded the title of Master of the U.S.S.R. six times. Michael Vasilchenco comes from the Ukraine and during the war he was a pilot after study in a Military Technical Flying Academy, under the patronage of M. Lukowski. In 1947 he was given charge of the engine department in the CAML, then in 1949 he became General Manager, and he maintains this position. From 1955 his duties have included the title of trainer of young model makers.

For his success in sport and activity in developing of Soviet model makers, he received the "Honourable order of work standard" in 1961, and in March 1963 the title "Honoured Trainer of U.S.S.R.". This was the first time such a title has been given for this kind of work in the U.S.S.R. In his collections are 160 diplomas from U.S.S.R. and the rest of the World. Over the years "Mischa" has not changed, he is as I remembered him from Poznan.

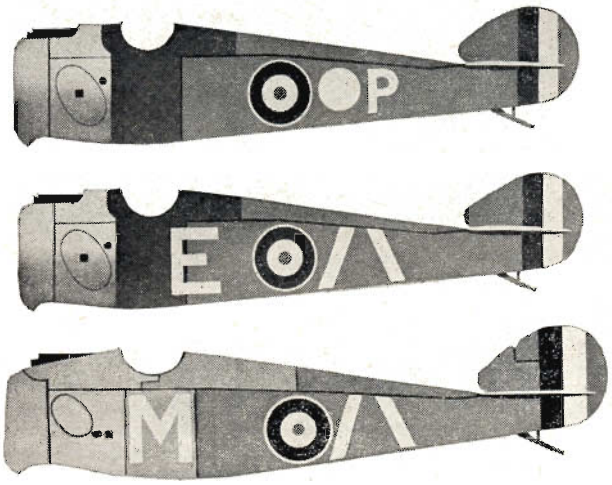
Conclusions. Moscow CAML is certainly unique in the World as a progressive centre of experimental aeromodelling, and certainly I can say that a bright future remains a firm prospect. The secret of the success of CAML is tied to the progress of Soviet model making. In recent years we have seen victories at World Championships (Kiev, Austria and Belgium) and people from CAML are saying:—"Without a CAML there would be no success in the international arena, and without such success, there would be little encouragement for development for CAML."

"Mischa" Vasilchenko, General Manager of CAML with Ivan Ivannikov's jet — first to break the 300 Km/h barrier. Jets are home constructed in the U.S.S.R. and very popular.

Squadron Markings

Described by Leslie A. Rogers Part 19

Drawn to 1/72nd scale by K. McDonough



1/72nd drawings show at top, the first Squadron Marking in early '18 on a "C" Flt. Camel. Centre: Change of position for letter and new marking in Summer of 1918. Bottom: a "C" Flt. Snipe of October '18. Photo above shows Camel after forced landing near Cherisy with rare opportunity to display underside detail. (IWM Photo.) Below: left is a Snipe of "A" Flt. (Photo, Major C. Draper.)

No. 8 Squadron R.N.A.S.

By September 1916 the R.F.C. was strained to the limit by heavy losses during the Battle of the Somme. The R.N.A.S. was asked to help and No. 8 Naval Squadron was formed from R.N.A.S. units at Dunkerque. The original equipment was as follows.—

"A" Flight was equipped with 6 Nieuport Scouts.
"B" Flight was equipped with 6 Sopwith Pups.
"C" Flight was equipped with 6 Sopwith One and a Half Strutters.

By November 16th the One and a Half Strutters were exchanged for Pups and by the end of the year "A" Flight's Nieuports were also changed for Pups.

The Pups gave excellent service but by April 1917 were changed to Sopwith Triplanes but in July 1917 the Squadron began to equip with Sopwith Camels which they retained until late October 1918 when they received Sopwith Snipes.

Squadron Markings. The Period before equipping with Camels is a blank as far as markings are concerned, no mention of them is made in the Squadron History. As from 26.8.17 to 22.3.18 the Squadron marking was a white disc painted behind the fuselage cockade.

Flight Markings. Flights were identified by groups of letters:—

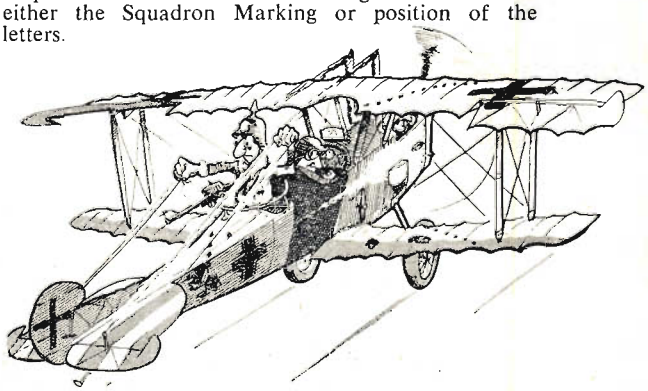
"A" Flight used letters A, B, C, D, E, F.
"B" Flight used letters G, H, I, J, K, L,
"C" Flight used letters M, N, O, P, Q, R.

These letters were painted on the fuselage sides behind the Squadron Marking. The letters were not used immediately on the Camels. The letters were introduced about the beginning of 1918.

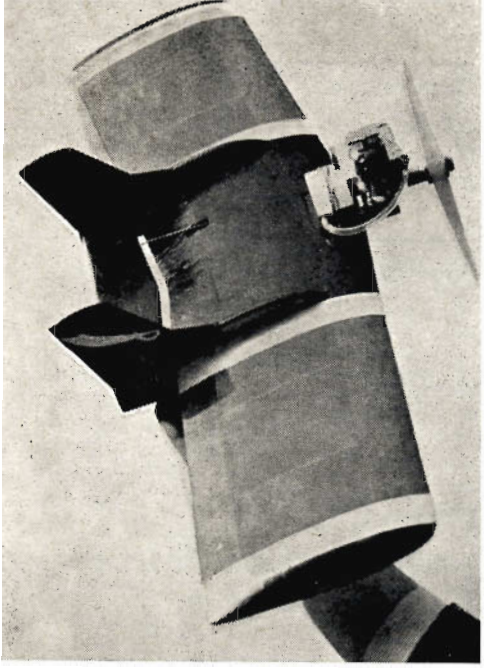
208 Squadron R.A.F.

On 22.3.18 the white disc was discontinued, and the **Squadron Marking** became two white sloping bars behind the cockade on fuselage sides.

Flight Markings were again by letters but position was changed to under the cockpit, same groups of letters being retained. On re-equipping with Sopwith Snipes in October 1918 no change was made in either the Squadron Marking or position of the letters.

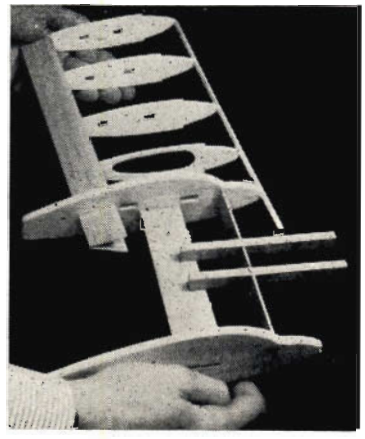


"Himmel — dis ist nein Jo-Joke"



CUTLASS

Materials required are as follows, all are balsa unless otherwise stated: two $\frac{1}{16}$ in. x 3 in. x 36 in.; one $\frac{1}{32}$ in. x 3 in. x 7 in.; one $\frac{1}{8}$ in. x 1$\frac{1}{4}$ in. x 6 in.; one $\frac{1}{4}$ in. x 3 in. x 16 in.; one $\frac{1}{2}$ in. x 1$\frac{1}{4}$ in. x 12 in.; one $\frac{1}{8}$ in. x $\frac{1}{8}$ in. x 36 in. hard, 3 in. x 7 in. 2 mm. plywood; 9 in. x $\frac{1}{4}$ in. x $\frac{1}{8}$ in. engine bearer; 24 in., 18 s.w.g. piano wire; 4 in., 16 s.w.g. piano wire; one sheet heavyweight tissue, gauze bandage; four 8 B.A. bolts, washers and nuts; one 6 B.A. bolt; three washers and two nuts; one 2 in. nylon bellcrank; one small stunt tank; two small eyelets.



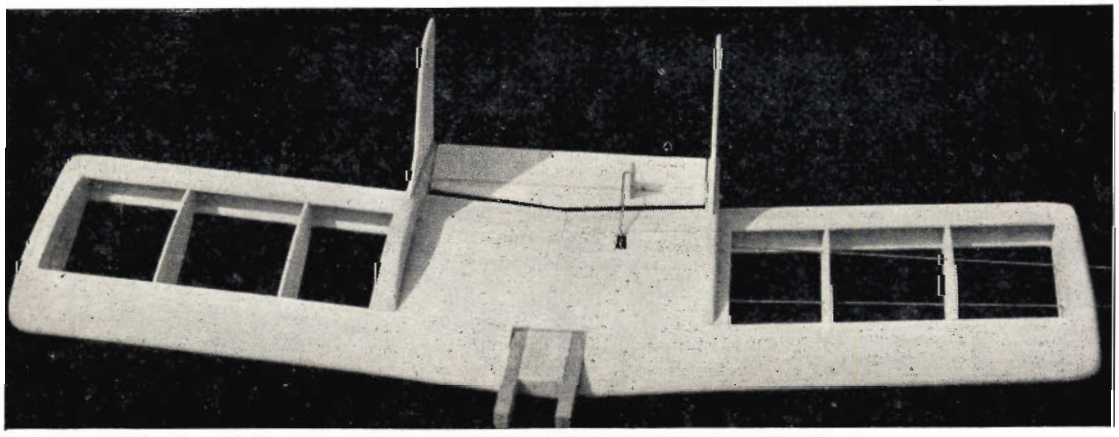
FULL SIZE PLAN ON NEXT PAGES

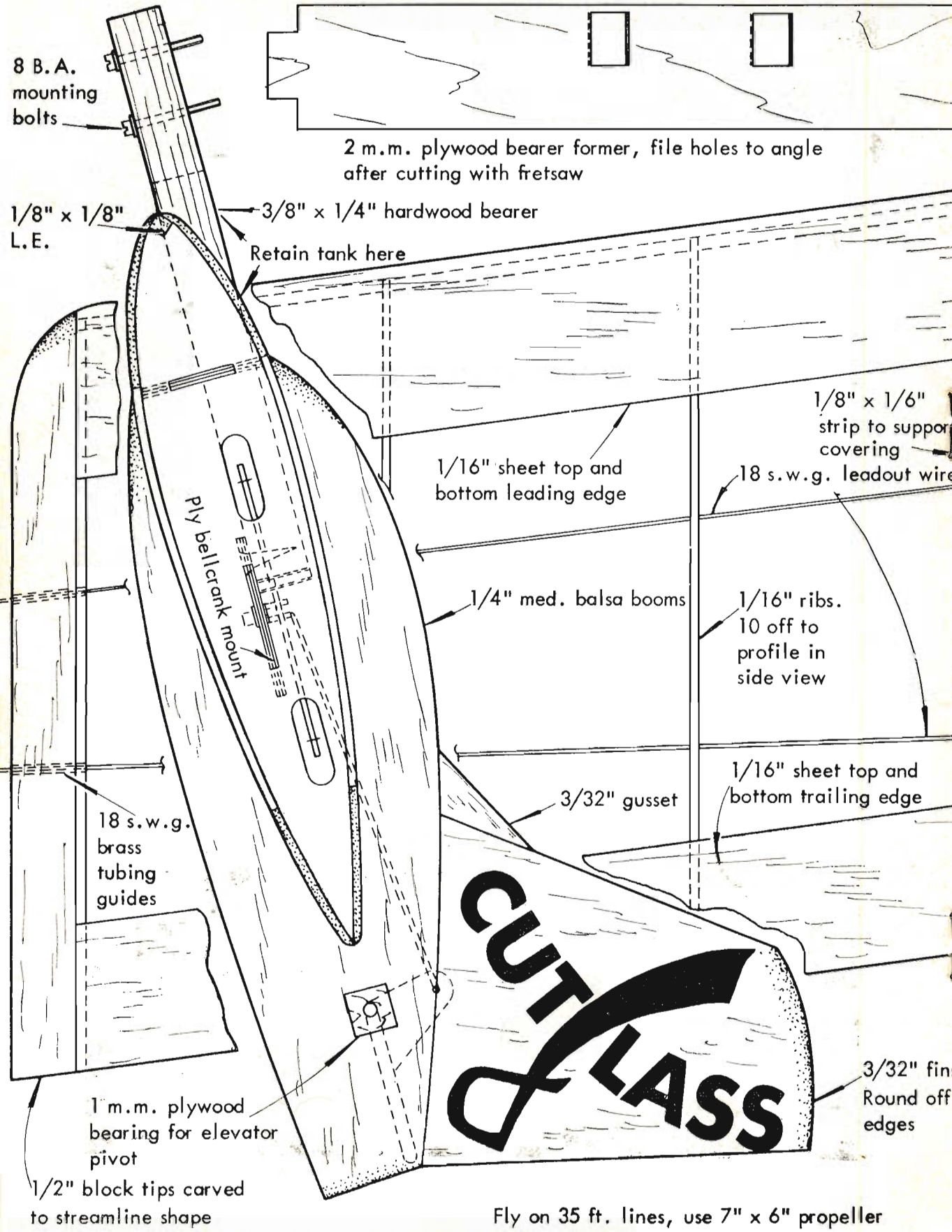
HERE'S A TOUGH $\frac{1}{2}$A combat/sport model, and just the thing for those inter-club contests. We've designed it especially for 'groovey' flying with fast, wide radius manoeuvres and the ability to take a lot of punishment. Our prototype has an A.M.15 diesel installed and is very fast on a 7 x 6 propeller.

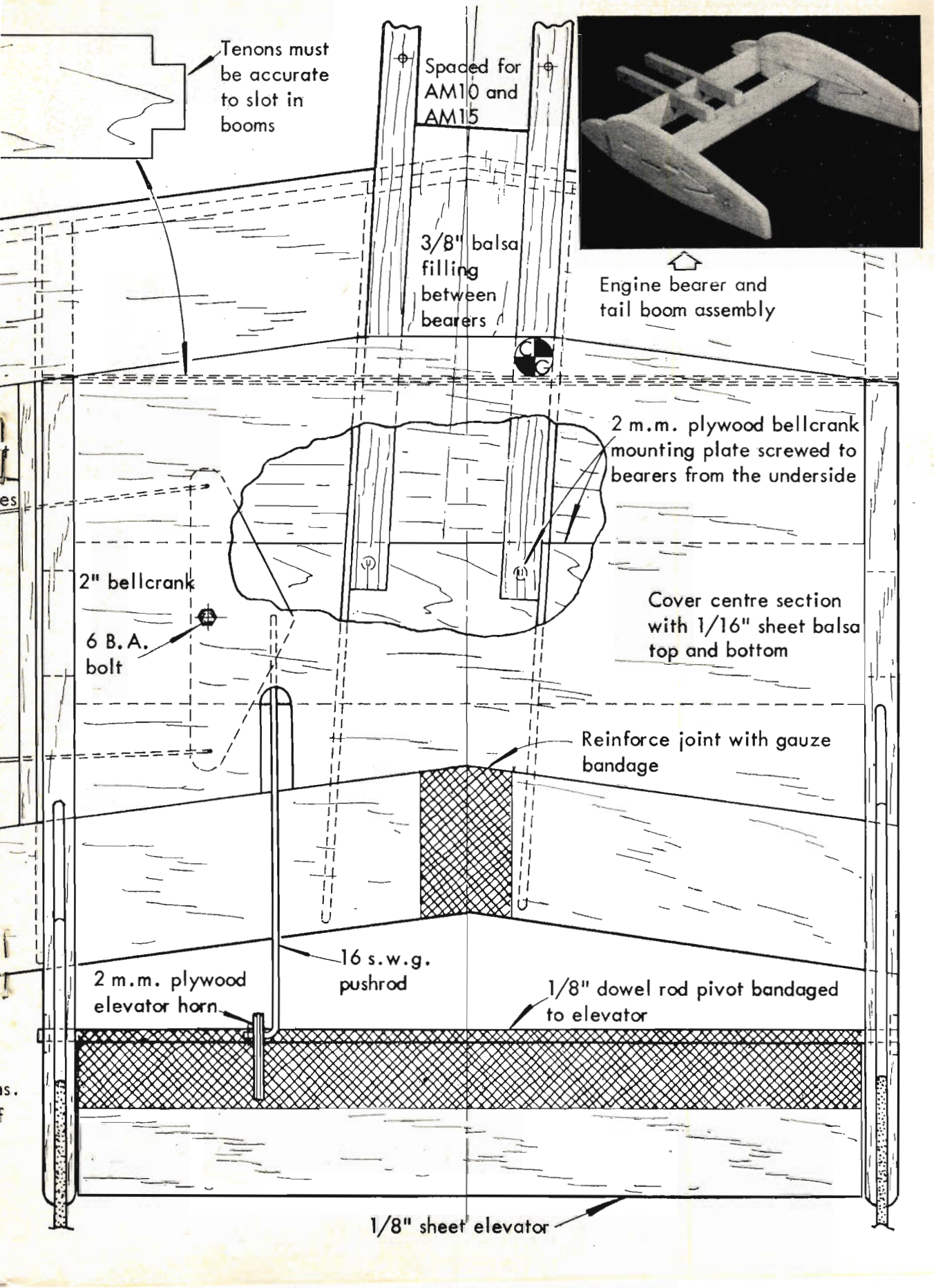
First construction stage is the engine bearer and tail boom assembly. Slot the two $\frac{1}{4}$ in. balsa booms to take the leading and trailing edges, plywood bearer plates (accurate fit needed here) elevator pivot bearings, and holes for the lead-out wires (on one boom only). Cut two ply formers and slot one for the $\frac{3}{8}$ x $\frac{1}{4}$ in. engine bearers. The other should have the bellcrank pivot hole drilled. Now glue the two plywood formers into the booms and leave to set firm. When set, slide the bearers through the slots in the front plate, and screw and glue ends to the bellcrank plate.

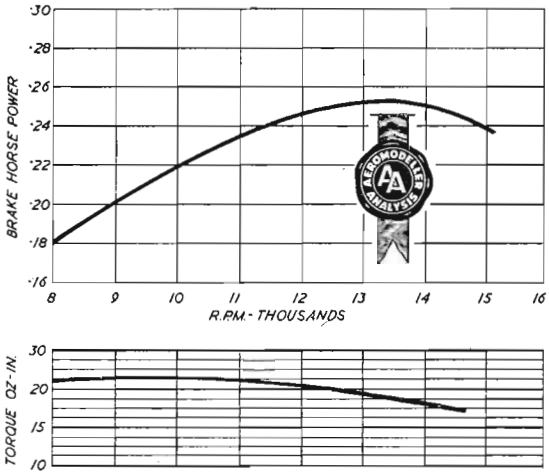
The two wing halves can now be built separately after cutting out 10 ribs, (four of these with lead out clearance slots and all with recess for sheeting) plus the $\frac{1}{16}$ in. leading and trailing edge sheets. Ribs should be cemented to the bottom trailing edge pinned over the plan. Next, cement the $\frac{1}{8}$ x $\frac{1}{8}$ in. leading edge in place, then add $\frac{1}{16}$ in. upper trailing edge sheet. Repeat procedure for opposite wing half over a tracing of the left side. Now cement two ribs (with $\frac{1}{16}$ in. trimmed off edges) to the side of the engine bearers. Check alignment, then slide the two wing halves *through* the booms to meet in the centre (see picture). Cut leading edge to clear the bearers then cement leading edge sheets in place. Cover the centre trailing edge joint with well cemented bandage. Now add $\frac{1}{2}$ in. sheet tips and then insert a $\frac{1}{2}$ oz. weight in front end of the right side tip. 18 s.w.g. leadout tubes are cemented in the opposite tip. Push the elevator dowel through boom bearings and cement the $\frac{1}{8}$ in. elevator in place. When dry, cover the joint with well cemented gauze bandage. Add 2 mm. plywood elevator horn. Bend 18 s.w.g. leadouts to fit on bellcrank and then slide them through the wing and bolt bellcrank to ply mount. Add 16 s.w.g. pushrod. Sheet the entire centre section with $\frac{1}{16}$ in. balsa and add the two $\frac{3}{8}$ x $\frac{1}{16}$ in. tissue supporting strips alongside the booms. Cut fins from $\frac{3}{32}$ in. sheet and slot *into* booms. When all joints are dry carve and sandpaper tips to streamline section. Drill engine bearers for 8 B.A. bolts and either screw two eye hooks or pin brads into them to hold the elastic bands which secure the tank. Cover model in heavy weight tissue and decorate to your choice. Ours used red tissue, black dope and white Sellotape for the decoration.

Photographs of this A/M staff design shows the prototype which differs in minor details from "production" version. Original elevator proved over sensitive so has been cut back to dowel pivot/spar. Unique centre assembly is simple to make and very strong.



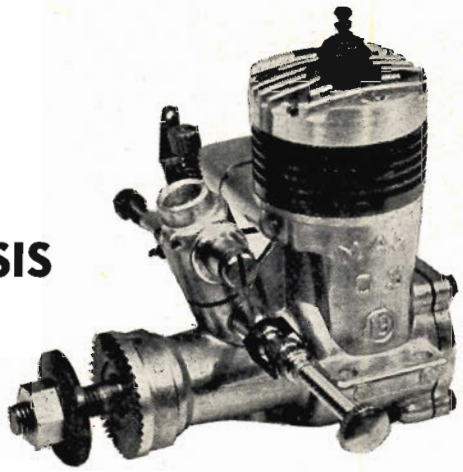

8 B.A. mounting bolts
2 m.m. plywood bearer former, file holes to angle after cutting with fretsaw
1/8" x 1/8" L.E.
3/8" x 1/4" hardwood bearer
Retain tank here
1/8" x 1/6" strip to suppor covering
1/16" sheet top and bottom leading edge
18 s.w.g. leadout wire
Ply bellcrank mount
1/4" med. balsa booms
1/16" ribs. 10 off to profile in side view
1/16" sheet top and bottom trailing edge
3/32" gusset
18 s.w.g. brass tubing guides
CUTLASS
3/32" fin Round off edges
1 m.m. plywood bearing for elevator pivot
1/2" block tips carved to streamline shape
Fly on 35 ft. lines, use 7" x 6" propeller


Tenons must be accurate to slot in booms
Spaced for AM10 and AM15
3/8" balsa filling between bearers
Engine bearer and tail boom assembly
2 m.m. plywood bellcrank mounting plate screwed to bearers from the underside
2" bellcrank
6 B.A. bolt
Cover centre section with 1/16" sheet balsa top and bottom
Reinforce joint with gauze bandage
16 s.w.g. pushrod
2 m.m. plywood elevator horn
1/8" dowel rod pivot bandaged to elevator
1/8" sheet elevator



ENGINE ANALYSIS No. 123

BY R. H. WARRING



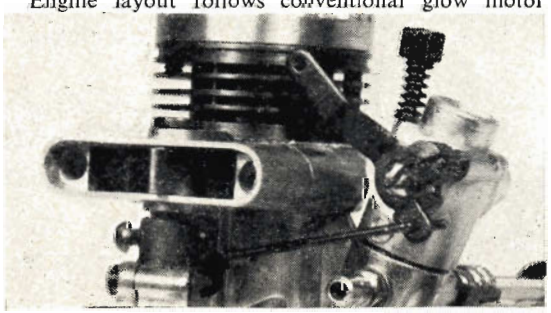
OS MAX ·19 R/C

Excellent handling and throttle characteristics

DEVELOPED SPECIFICALLY as an R/C engine with the relatively complicated O.S. multi-speed throttle unit, the Max 19 R/C is a particularly compact power unit—appreciably smaller and half an ounce or so lighter than the American '19's' for example, with excellent handling qualities. Throttling characteristics are, in fact, every bit as good as those of the larger sizes of R/C glow engines, and better than any of the 19's we have previouusly handled. It also enjoys the distinction of more than 18 months continuous production without modification. Power output possibly suffers slightly as a consequence of the good throttle being fairly moderate for the swept volume, but figures were obtained on 'straight' glow fuel and could undoubtedly be improved upon using a more heavily nitrated fuel. Also the engine appeared still a little on the stiff side when test readings were taken, although well enough run-in to make the throttle fully effective. Extreme power is not all that important in an R/C engine of this size, and hence we were more concerned with general handling and behaviour, especially on economic fuel mixture and throttle response.

Peak power is developed within the range 13,000 to 13,500 r.p.m. although the Max 19 will run readily, and smoothly, at higher speeds with smaller props. Above about 12,000 r.p.m., however, 5 per cent nitromethane is highly desirable in the fuel for smoothing. The ideal R/C fuel would therefore appear to be a 70/25 methanol/castor mixture with 5 per cent nitromethane, although comparable results are obtained with a similar or slightly higher proportion of nitrobenzene (as used in Japan) and no nitromethane. The compression ratio of 9:1 is adequate for easy starting on straight fuel and glow plug type does not appear to be at all critical. The KLG 'Miniglow' (Quickstart EG 200) appears to suit admirably for throttled work O.S. themselves specify OS No. 3 plug for normal and OS No. 6 for R/C.

Engine layout follows conventional glow motor practice with a pressure die cast crankcase unit housing a mild steel cylinder held down by three long screws through the cast head. Three additional short screws assist in holding the head on to the cylinder. A large transfer passage is cast in on the left hand side of the crankcase unit with two rectangular exhaust ports on the opposite side opening into a stub exhaust. The cylinder has large rectangular transfer and exhaust ports cut in the lower walls, diametrically opposed and overlapping by approximately 75 per cent, together with two circular wall ports matching piston ports which are fully opened at the point of transfer opening. Transfer is thus effected both up the outside and through the cylinder wall into the transfer passage.

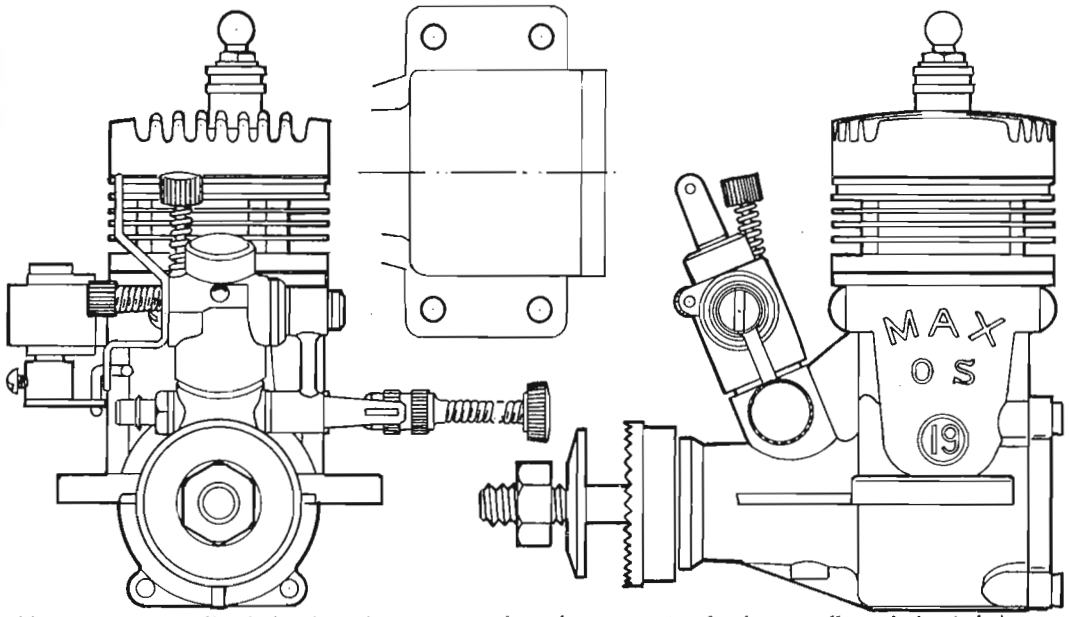


Close-up of O.S. Throttle as on 15 & 19 shows linkage to exhaust muffler bar and two adjusting screws for air bleed and slow speed.

The piston is of conventional form, machined from a Meehanite casting, and with the upper diameter slightly relieved to a depth of about $\frac{1}{32}$ in. A normal flat deflector is incorporated in the head. The .153 in. diameter hollow gudgeon pin is of silver steel, fully floating and fitted with brass end pads. The connecting rod is machined from dural and of stepped section with plain big and little ends, the former having a drilled hole for lubrication. Piston and cylinder are finely finished and appear to have been lapped to fit.

The crankshaft is of nominal 10.5 m.m. diameter (.413 in.), stepping down to .2175 in. threaded length immediately in front of the bearing. The rectangular induction port is $\frac{7}{16}$ in. x $\frac{3}{4}$ in. opening into a $\frac{1}{16}$ in. central hole and giving some 180 deg. induction opening. Despite its large diameter the crankshaft is quite a light unit, weighing approximately $\frac{3}{8}$ oz., due to the fact that so much metal is cut away. The $\frac{3}{4}$ in. o/d crank web is shaped on the front face and heavily cut away for counterbalance. The .193 in. diameter crankpin is hollow. Actual journal length is quite short for an engine of this size—only 1 in. but the shaft appears adequately supported in a well finished bronze bush cast in with the crankcase and reamed and honed to size. The crankshaft is hardened and finished by centreless grinding over the journal length and crankpin.

Front length of the crankshaft immediately after the step is cut with a flat which locates and keys on the prop driver. This is a cast unit which is hollow on the back face with a counterweight segment. Although this type of driver has come to be favoured by O.S. we have some personal doubts that it is an entirely good idea to have a semi-hollow section



backing up the propeller hub when the prop. nut is tightened as the driver could fail by cracking or splitting.

The cylinder head is of substantial thickness, formed as a pressure die casting and subsequently machined on the o/d and bottom face. A solid section some $\frac{3}{16}$ in. thick is surmounted by integral fins. The plug-in portion fitting the top of the cylinder is contoured to give a hemispherical combustion chamber but almost fully blanked off on the transfer side. The plug is offset to the transfer side, the element coming just above the inside of the deflector.

The throttle is a most complex affair, comprising a conventional barrel type throttle linked to an exhaust flap, but with an original fuel feed, and air bleed and throttle stop adjusted by separate screws. Fuel feed is via a pipe traversing the intake and carrying a conventional needle valve. Metered fuel supply is fed up to a jet tube mounted in the body of the carburettor and opening at the centre of the barrel. Feed to this top pipe is accomplished by a sort of banjo fitting which can be easily damaged by bending if the carburettor assembly is dismantled or assembled carelessly. It has been known to fail in flight. Both tube assemblies seal on fibre washers and are best left strictly alone, and *not taken apart* just to see how many individual parts are involved (actually nearly 30 in the complete assembly).

The barrel valve itself is of brass, free to rotate but effectively locked in the carburettor body. In addition to the main passage (giving a fully open bore for full throttle position) there is a second hole in the barrel connecting to an air bleed hole in the body, the opening of which is controlled by a screw with a coil spring lock. This separate hole comes into effect immediately the throttle starts to close, the amount of air actually admitted being controlled by the setting of the adjustment screw. The other screw merely controls the amount of barrel rotation—i.e., acts as a stop for setting the slow running position.

Barrel rotation is controlled by an external lever which is attached to the barrel by a single screw. A wire link from the bottom of this lever connects to a pivoted exhaust flap in the stub exhaust extension so that barrel (throttle) and exhaust flap are closed or opened simultaneously. The result is most effective throttling and the system can be adjusted very accurately. The only shortcomings we noticed were purely mechanical ones — the screw holding the throttle lever to the barrel can vibrate loose and so can the grub screw attaching the link arm to the exhaust flap pivot.

Adjustment needs a little care to get best results, but is not difficult. Initial adjustment should be made with a slightly rich setting on the needle valve with the throttle fully open. The slow running position can then be found temporarily by adjusting the stop screw, and adjusting the needle, if necessary, to maintain consistent running. If the needle *does* have to be adjusted, however, this means that the air bleed is not correctly set. The trick is then to adjust this screw for more or less air when slow running, depending on whether the needle had to be screwed in or out, respectively, to keep running. With a little trial and error, the needle valve can be returned to its original position (slightly rich on full throttle setting), and slow running smoothed entirely by the air bleed adjustment.

Correctly adjusted, really consistent slow speed running of the order of 2,000 to 2,500 r.p.m. can be obtained from an open throttle r.p.m. of 10-12,000,

(*Continued on page* 307)

Propeller — R.P.M. Figures

Frog nylon	8 x 6	10,300
	10 x 6	7,900
	9 x 6	10,100
K-K nylon	9 x 4	11,900
	8 x 6	11,000
	10 x 4	9,400
Top Flite nylon	10 x 3½	9,500
	9 x 4	11,200
	9 x 6	9,100
	8 x 6	10,800
	8 x 4	13,800

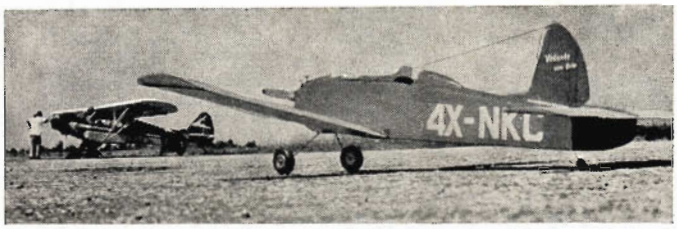
Fuel: 75/25 methanol castor plus 5 per cent nitrobenzene.

Specification

Displacement: 3.159 c.c. (.193 cu. in.).
Bore: .6535 in. (16.5 m.m. nominal).
Stroke: .575 in. (14.5 m.m. nominal).
Bare weight: 5¼ oz.
Max. power: .254 B.H.P. at 13,300 r.p.m.
Max. torque: 22.5 oz.-in. at 9,500 r.p.m.
Power rating: .0805 B.H.P. per c.c.
Power/weight ratio: .043 B.H.P. per oz.

Material specification:

Crankcase: pressure die cast light alloy incorporating lower cylinder and stub exhaust.
Cylinder: mild steel, turned with integral fins, blued.
Piston: cast iron.
Connecting rod: dural (machined).
Cylinder head: light alloy pressure die casting.
Crankshaft: hardened steel.
Gudgeon pin: hollow silver steel.
Back cover: light alloy pressure die casting.

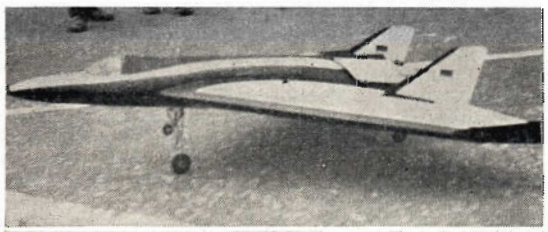


World News

One of the first multi channel R/C models in Israel is Naftali Kadmon's "Volante con brio", using E.D. 4 channel Black Arrow, Frog 2.5 diesel, weighs 4½ lb. Below is Czechoslovakian Fokker DVII by Murek Juricek of Brno. Uses MVVS 5.6 c.c. glow engine.

Sweden. From the well produced "Profilen" newsletter edited by Flodstrom and Sundin, comes the revelation that one of the Dutch Wakefield models flown by Johan Schulten at the 1963 World Champs had a dural wing spar. Schulten is an aircraft engineer. He claims theoretical top Wakefield performance to be five minutes in still air on 80 per cent prop efficiency. It is a good target to aim at anyway! Ake Lofvander from "Skvadern" club won Swedish Champs with an A.P.S. "Pulteri", modified with an extra rib bay and slightly longer fuselage. Ake has a Super Tigre diesel which many consider to be the hottest in Sweden and is said to sound like a glow plug engine. Swedish winter event on March 1st at Tullinge offered good condition with near zero temp., weak winds and dull overcast. 130 entered and in A/2, Bror Eimar of Stockholm made his hat trick by winning the K.S.A.K. Cup for good, in a 3rd successive victory. His total was 842 secs. Top 22 places were above the 700 mark and leading junior, Thomas Stjernberg made 756. There were many fly-offs in Wakefield and Power, Nils Hollander beating past champion Hakansson in the 7th round to take the Wakefield event in which the first 12 were recorded at over 800 secs. Leading junior, Ingemar Johansson was only 10 secs. short of a perfect score. Ralph Hagel proved unbeatable in Power, his companion in the fly-off, Lofvander, had motor trouble. Power standards were a trifle below the other classes, but showed more enterprise among the juniors, Morgan Zetterdahl from Gottenburg being only 5 secs. short of a perfect score and only 3 secs. ahead of his nearest rival. He flew "Pladuska", with which he had previouusly won the Swedish Champs and a photo of which was published in January issue. Not many countries could claim so keen a junior interest.

Argentine. Surprise result in Multi Radio Control was Franz Schweigel's victory with a Delta (see photo) at Argentine Nationals 21st-29th March. Indoor times continue to improve in this South American nation, E. Grippo making 18 minutes 5 secs. and the Masseto/Dona F.A.I. team race pair won in 5:31, which is a considerable improvement on past performances.



West Germany. Coupe d'Hiver has been publicised by the Modellflug-Kommision of the German Aero Club and a decentralised event was held over the first two months of this year. Details of many exciting designs were tabulated, including those which have appeared in 'Aeromodeller', and one club adopted the A.P.S. "Garter Knight" for all members. This was the group which call themselves "Die Kolibris" from Oberhausen. They entered six Knights, each covered with yellow flying surfaces, red fuselages and carrying identification numbers with the prefix CH for Coupe d'Hiver. Leading performer for all three entries made by this club, during different days in February, was Anton Schwarz whose average was almost 70 secs. over nine competition flights.

Italy. A second annual Coupe d'Hiver event held on March 1st at Uggiate near Como, was international and attracted French and Swiss entries. 61 entered, all were allowed five flights and the better three taken for competition. Sandru Schirru made two maxes, plus 108 for top position, closely followed by fellow Fiat club member Guido Fea, who also had two maxes and a 94 sec. flight. Marc Cheurlot was longest travelled entrant from central France and was awarded a special prize among the long list of trophy winners.

Another interesting event in Italy was the first Augusta trophy for scale models of American Goodyear type racers. Franco Bugada of Milan won with just over 100 m.p.h. using a Super Tigre 35 in a Chester "Goon".

U.S.A. March 22nd was the date for an international postal between Illinois M.A.C., Lincoln, Nabraska M.A.C. and Crawley in England for A/1 glider and Coupe d'Hiver rubber classes. Pete Sotich sent us full details of this event with a fine batch of photos, some of which we hope to reproduce later. The I.M.A.C. proved leaders in both classes on a team basis and top individual performers were Mike Haynes of Lincoln with 494 secs. in A/1 and Pete Cameron of Crawley, once more upholding his position in international events, with 260 in C.H.

The Czechoslovakian club who were original promoters of this postal event were so beset by the most foul weather that they could not fly. Needless to say, they want a second opportunity at a later date.

In team racing, wildfire enthusiasm for the F.A.I. class has brought with its tremendous improvement in performance. U.S. team at the World Champs in Budapest during late July should be strongest ever. Fastest to date is the Stockton-Jehlik team, whose average over four official performances is 4:20.5!

Indoor activity also abounds according to "Indoor News and Views" edited by Bud Tenny. This is a lively monthly well worth having, and includes many unusual types, such as the suggestion to use beer as an adhesive for microfilm — far better than human saliva since it contains more "Enzymes" which are, apparently, the things that make the spit stick! U.S. team members Bill Atwood and Frank Cummings have been practising at Santa Ana for their September flights at Cardington in the World Champs and both report flights over 40 minutes. In the same hangar, the N.A.A. "Flightmasters" hold indoor flying scale events, and some measure of enthusiasm can be assessed by the attendance of 45 indoor models, 34 actually entered. Kingsley Kau won with a ½ oz. "Westland

Above left, winning Delta by Franz Schweigel in Argentine Nationals, appears to have two position kneeling nosewheel. Happy gent below is Australian Ford Lloyd, F.A.I. winner in Victorian State Championships, using Conover style wing on "Americano" type fuselage.

Widgeon" covered with silver condenser paper and Joe Bailey led the biplane class with a "Bristol Bullet" made from a Guillow kit. Junior, Dave Maystead, built a "Max Holste 152" from full-size plans in 'Aeromodeller, to win the Jr. class. Rules for this interesting event require rubber power, 30 in. max. span, no prop limit, wings double surfaced, R.O.G., and 100 scale points plus points per second for duration.

France. Flying regional team eliminators, on April 12th at Avignon, the Fabre-Favre team established a fastest yet time for the 10 K/m. course for team racing with an Eta 15 Mark II at 4:05. Their model is said to cover 60 to 80 laps per tank and must, therefore, have an airspeed in the region of 103 m.p.h.

South Africa. Radio Control has made slope soaring duration flying a practical possibility throughout the world and this branch of the hobby is now becoming popular in the Cape Town area. Trevor Loxton has established a record of 63:48 with his "Bergfalke", a popular kit design for slope work. Western Province M.A.C. is now administrating the S.A.M.A.A. following the A.G.M. in conjunction with the annual Nationals at Easter. For once, flying conditions were poor, with wind, rain and downdraughts, most unlikely for Rand flyers. We shall be reporting with pictures next month, but advance highlights are : 35 Combat; Winner, P. Thomas had a K & B 35 "Flitestreak" travel so fast that the bellcrank bolt sheered its way through a ¼ in. ply mounting plate. B. T/R; Winner, Richard Wood, a junior, used Eta 29 at 102 m.p.h. for 46 laps to beat Fred Turner's Rivers 3.5 diesel, both based on "Fresco" design. Open Glider fly-off; was the result of a tie in score, not perfect performance. Of 10 entries, four were A.P.S. "Pelicans". Speed; 2.5 c.c. won by Copeman Super Tigre. ½A T/R; Reguflo tanks extensively used as in other classes. Fritz Boer unlucky here after doing 85 m.p.h. for 70 laps with a crash in final. He also crashed with similar fast models in F.A.I. and B ! Free Flight ; John Swallow, undoubted Champion was first in ½A Power, Wakefield, A/1 Glider, Open Power, 2nd in A/2, 3rd in Open Rubber. Juniors; notable for their absence. Where are they going?

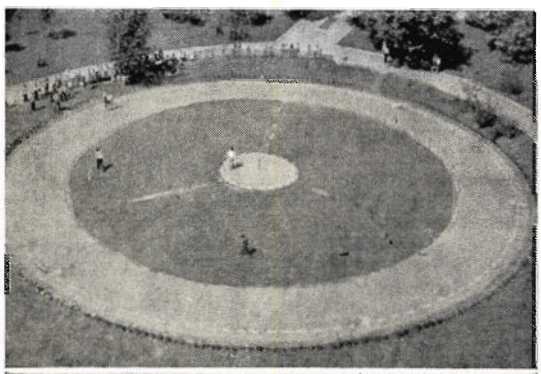
Before departing South Africa, we must mention the Maritzburg M.A.C. newsletter—the only one we receive with a genuine cover pic and what a pic! Must cost them a fortune in photo enlargements, but thanks boys she's worth it.

New Zealand. New regulations demand snuffer tubes for all models using a fuse dethermaliser for all New Zealand competition flyers. The N.Z.M.A.A. is also allowing up to 3.5 c.c. in Combat and is restricting the number of laps flown by team racers after the engine has cut, to a maximum of two.

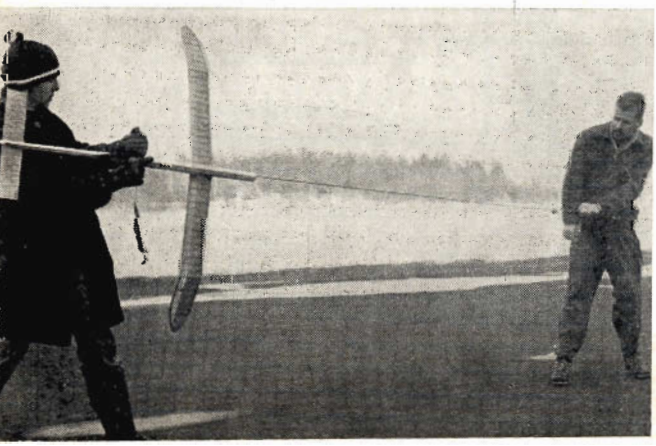
International Events. Tempting invitations on the editorial desk include info. on the 9th Victorian Western district champs at Warrnambool, Australia, at the end of March. Sorry lads we just could not make it in time!! Local Chamber of Commerce description of the venue makes this most attractive. On June 6-7th the fourth "Schneider Trophy" for Flying scale seaplane racers will be held at Gavirate near Varese in Italy. We shall be pleased to forward info. We were also given late gen on a big radio event at Dortmund in West Germany on April 25th-26th. Unfortunately much too late but the Free Flight contest for hydro models, organised in Bavaria at Starnberg near Munich takes place June 13th-14th. Classes are for Free Flight Power and Rubber, plus two classifications of radio seaplanes. Entries must be made before June 1st and we have details at the editorial offices. The model club at Herborn in West Germany is running an international multi channel R/C event at Hirzenhain June 26th-28th, which will attract all the leading German flyers as well as many internationals. The organisers hope that this will be a replacement for the absence of an international contest from the F.A.I. calendar this year. Still in West Germany, the 12th Walldorf International takes place on September 6th about 10 miles from Heidelburg, where magnificent weather is promised for A/1, A/2, Wakefield, 1 c.c. and 2.5 F.A.I. Power, plus Tailless and a unique powered A/2 event which are on the attractive programme.

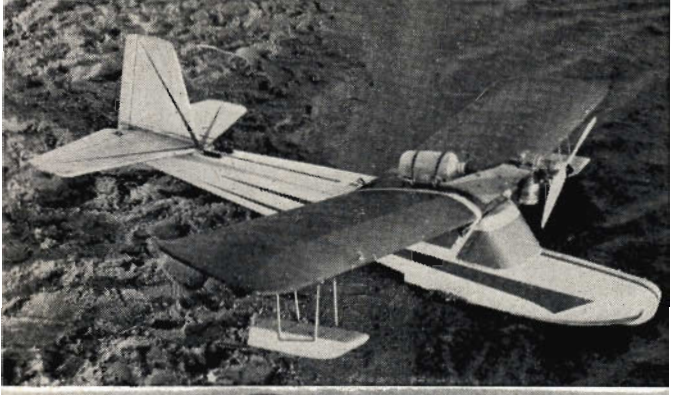
In Jugoslavia the Vartex Cup for A/2 Gliders and Team Racers will be held at Arazdin on July 25th-28th. This is an F.A.I. recognised international contest calling for officially authorised national representatives. This year there will be a special anniversary competiton since the events are being held on the day which celebrates the Croatian rebellion. The organisers suggest that proximity of Budapest and the convenient dates will attract modellers to the Vartex Cup on their way to the C/L World Champs, especially in the Team Race class.

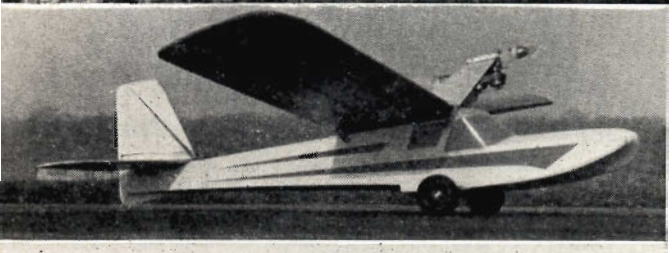
At Swedish winter contest, left, Hans Eklund with sheet wing A/2 glider, Sweden's top thermal hunter, who took first three places in '63. Right is power champ Ake Lofvander with modified A.P.S. "Pulteri". He has six variants of this design, plus another on the way, and uses personally modified engines which are much envied.



Below, Nils Hollander piles on vital turns to win the fly-off at Swedish winter event. Above right, new control line circuit in Rumania, scene of the National Championships near the town of Tasi. Appears also to have special outside service road laid. Next is Guido Fea, who placed 2nd in Italian International Coupe d'Hiver event where hand launch was allowed. Bottom, high thrust ¼A Cox 049 pusher by Don Monson of Minneapolis, one of the most advanced thinking model designers in mid west, U.S.A., has conical camber wing tips.







John Crampton's 68 in. Flying boat beached at top left with Merco 49 driving 12 x 6 in. prop, Weighs 6 lbs ready to fly. Next view show original arrangement with Taplin Twin, and below, how the long hull settles in water while at rest.

OVER THE WAVES

OUT OF THE RUT

R/C FLYING

DESPITE THE FACT that most modellers have fairly free access to suitable water, the flying boat has always been an unusual bird in the British skies. Our recent feature on the subject has undoubtedly encouraged many to take up this interesting side of the hobby which, with the combination of radio control, provides superb enjoyment.

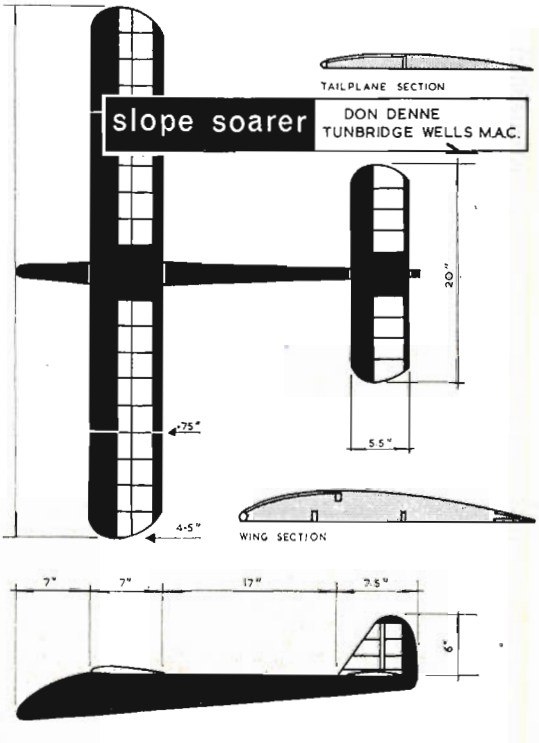
One who is "converted" so to speak is S/Ldr. J. Crampton whose approach is very practical and John has given us a fine run down on his "Crampton's Flying Boat No. 1", otherwise referred to as C.F.B.1. First, he wanted a simple model with low C.G. for good water stability ; a low slung rudder to serve the purpose of working on water as well as air, a thoroughly watertight hull, which is broad and hydroplane type ; plus adaptation for fitting a temporary undercarriage for over-land tests. Six channel operation and use of a standard Keilkraft Super 60 wing with engine mount superimposed over an inserted centre section complete the specification.

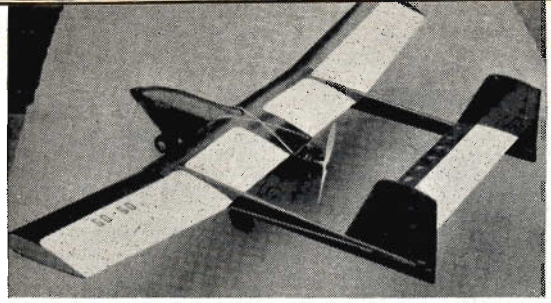
The model was first tested with a Taplin Twin but power/weight ratio was marginal and full throttle level flight was barely one knot above stalling speed. To use John's words "C.F.B.1 flew with all the stability and enthusiasm of an empty gin bottle". A Merco 49 was fitted before heading for the local lake and at this stage the broad hull beam was thought to dispense with need for wing tip floats. Alas, the C.G. was a trifle high so simple wire supported balsa floats were made which clip under the wing panels and can be shifted spanwise as required.

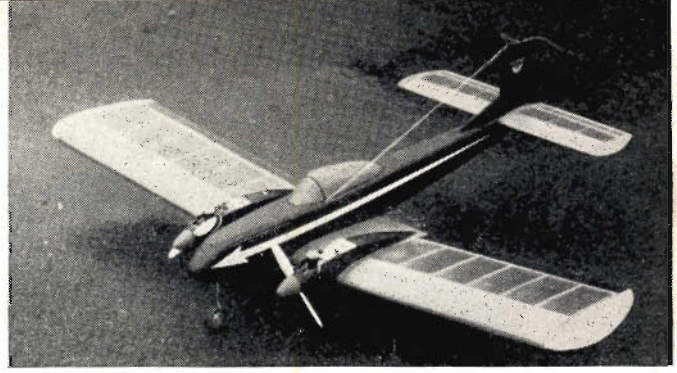
The expanded centre section of four ¼ in. balsa ribs supports the engine mount, on one side of which is a Climax servo wrapped in adhesive plastic, operating the throttle. Readily accessible, the 8 oz. fuel tank is superimposed and though it may look crude, it works, is simple, allows cleaning between outings and has given no trouble. Radio is an R.E.P. Sextone, somewhat old fashioned by today's standards, with valves and relays, real steam stuff but as John says "Jolly good—had it for years".

Made from ⅛ in. balsa, the broad fuselage has no longerons and is strengthened under the forward

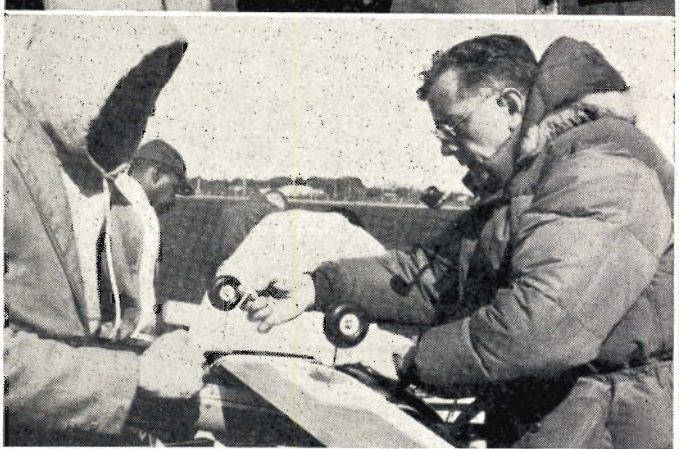
Span missing from drawing below is 48 in. Arrange C.G. at 55-60 per cent and trim with tail packing. Original flies with Mini-Reptone and another is seen below left with John Whittaker launching his Minimac version. Looks like a nice site.







Top Left: G. Dodwell's "Go-Go" single channel twin weighs 2¼ lbs, is 54 in. span for two 1.5 c.c. diesels. Right, J. Dumble's "Avalon" uses R.E.P. Sextone, is 53 in. for two Cox .09s. Said to have rapid rate of roll, a real pilot scarer! Below, Personalities at Woburn Park for S.M.A.E. event April 19th are L. to R., Duke of Bedford, Dr. Walter Good of AMA, H. J. Nicholls, President of F.A.I. Models Commission and S. Uwins S.M.A.E. Central is Ed. Kazmirski tying Taurus Mk. 2 wing down . . . in Japan! Yet another trip abroad for the ex-Champ. Bottom is J. Wingate and his smart O/D Mystic for Orbit 10 and Super Tigre 56 (with O.S. "Jetstream" welded on!) seen in the rain at Woburn.



section with ½ in. sheet, while there is a ¼ in. internal keel and a hardwood external keel. The 4 ft. 10 in. long hull is covered with nylon, heavily doped and fuel proofed. Access to the gear is through a ply hatch, sealed with masking tape and controls to the tail surfaces run through rubber seals so that to John's constant amazement the whole hull continues to be thoroughly watertight. Returning to John's personal description: "The model taxies around on the water looking like an old Thames barge. It shores up a great rolling bow wave ahead of its blunt bow and some water slops over on to the fore-deck. Initially I was frightened to open the throttle in case the high thrust line pushed the nose under the surface. However, with a slight increase in power the nose rises and the boat accelerates to slip easily over the surface, whips level, with the spray from the bow wave arcing right out to the tip floats—which are well clear of the water. At full throttle the model accelerates very quickly and after about a 40 ft. run against a five knot wind it climbs away with water streaming off the underside of the hull. And that, by golly, is a tremendous moment. Absolutely fab . . ."

Inspired?

Slope Soarers

Tunbridge Wells Model Aero Club had a successful 1963 season of R/C Slope Soaring. A duration contest for single channel model was staged between Tunbridge Wells, Eastbourne and Worthing clubs (*prize*: a gallon of beer!). This was duly won by the Tunbridge Wells club, longest time was put up by Don Denne—51:36 minutes. His model is shown on the outline drawing opposite. Summing up the season's experience the T.W. club found:—

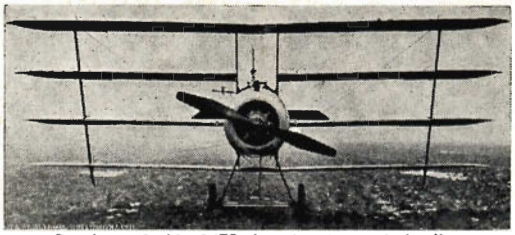
1 Small models—up to 50 in. span are more handy than the larger R/C slope soarers, especially when manoeuvring in a narrow valley.
2 Generous dihedral must be incorporated for stability in the turbulent conditions of the slope.
3 Fourteen to sixteen ounces per square foot wing loading and thin wing section (10 per cent) are necessary for good penetration—ouch, that word again!
4 Good knock-off-ability, e.g., minimum number of elastic bands to survive high speed down wing crashes.

Lines of future development are (1) electric actuators for over one hour flights (2) quick blip trim control (3) semi-scale designs.

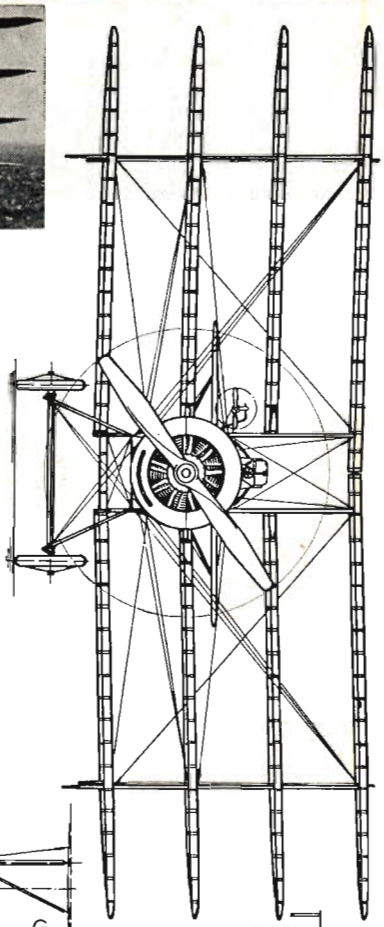
Don Denne's model is not presented as a particularly advanced design, but as a successful model for those wanting to take up slope soaring with the conveniently small span of 48 in. It has made many flights in the 3 to 17 minute range, where rubber length for an Elmic Commander takes about 400 turns, leaving plenty to spare as a 15 minute flight consumes about 120 turns.

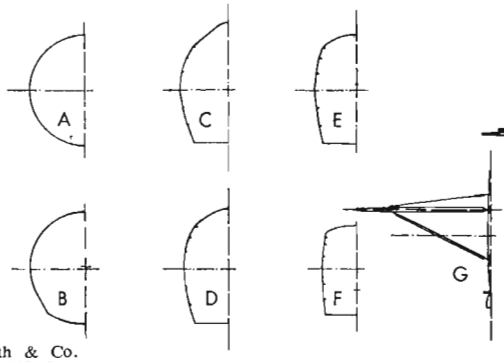
Twins

Tandem or side by side? Twin engined freelance designs are rare but we've two this month for your study and each has a tale to tell. G. W. Dodwell chose push pull with Frog 150 and Quickstart Javelin. Tests on front unit alone were hairy, the tail was trimmed and "Go-Go" went off on two. Result, one loop happy indescribable twist of a flight. High tail and downthrust are on the way. John Dumble's "Avalon" has twin Cox .09s, each pressurising the other's tank for quick cut-out. Climbs like a demon, without downthrust it's unflyable. Moral in this? Could be called double trouble!

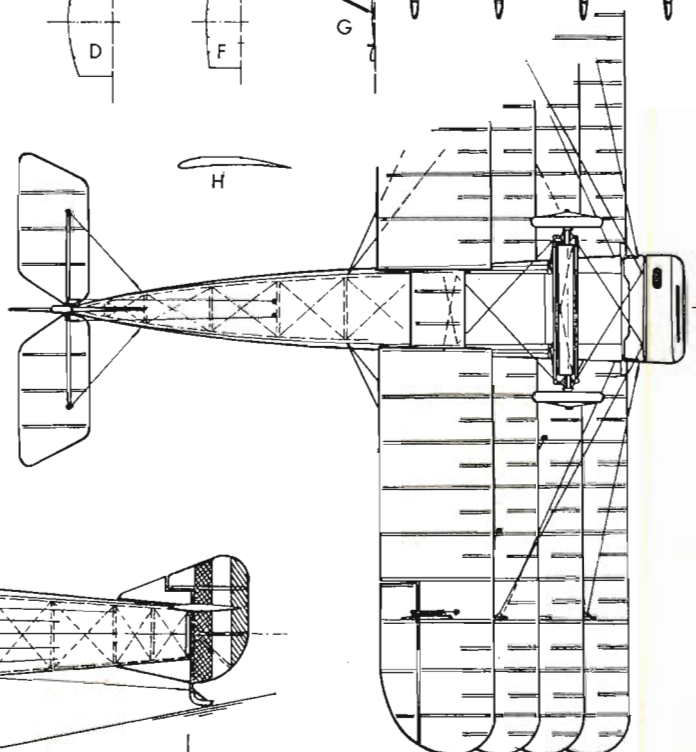


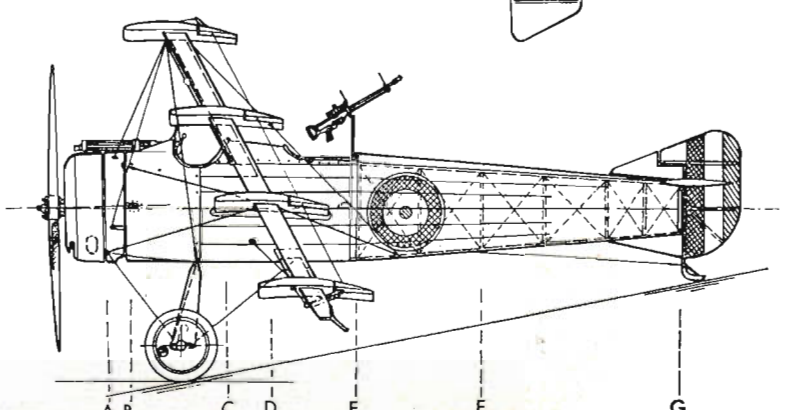
Reprints of this 1/72nd scale plan and dye-line prints of the 1/48th scale drawing are available as plan pack AJ2780. Price 2/6d. plus 6d.





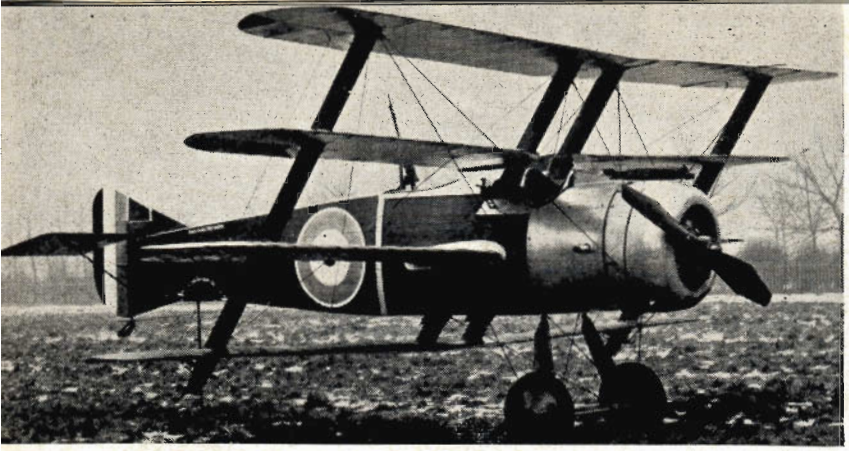
Manufacturers: Sir W. G. Armstrong Whitworth & Co. Ltd., Gosforth, Newcastle on Tyne. **Power:** 110 h.p. Clerget; 130 h.p. Clerget; 110 h.p. Le Rhone. **Dimensions:** Span, 27 ft. 10 in.; Length, 22 ft. 3 in.; Height, 11 ft. 6 in.; Chord, 3 ft. 7 in.; Gap, 2 ft. 8 in.; Stagger, 1 ft. 5 in.; Dihedral, 1°30'. Incidence 3°. **Areas:** Wings, top 102.6 sq. ft., second 92.6 sq. ft., third 92.6 sq. ft., bottom 102.6 sq. ft., total 390.4 sq. ft. Ailerons, each 8.4 sq. ft., total 67.2 sq. ft. Elevators, 16 sq. ft. Fin, 1.9 sq. ft. Rudder, 8 sq. ft. **Armament:** One fixed forward-firing Vickers machine-gun mounted centrally above the engine cowling and synchronised to fire through the airscrew; one Lewis machine-gun on rocking-post mounting or Scarff-ring mounting. **Colouring:** Upper surfaces and sides khaki-green. Undersides, natural unbleached linen clear doped. Cowling and metal panels around nose, natural finish. Serials white. Above information extracted from "British Aeroplanes 1914-18" (Putnam—J. M. Bruce).





ARMSTRONG WHITWORTH FK-10

FT.



Aircraft Described Number 132

ARMSTRONG WHITWORTH F.K.10

drawn by B. Karlstrom

Head on view in plan opposite and view above showing an Armstrong-Whitworth constructed machine, illustrate the sturdy wing strutting. These photographs from the collection of I. Fairbairn-Crawford.

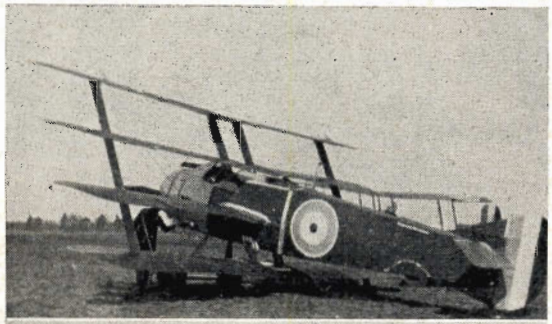
ALTHOUGH AT MOST, only 11 airframes were constructed, the F.K.10 Quadruplane achieved unique fame as one of the most unusual aeroplanes of the first World War. The four, narrow chord identical wings were primarily intended to produce good manoeuvreability, especially with a total of eight ailerons; compact design with high rate of climb, and perhaps most important, good crew visibility.

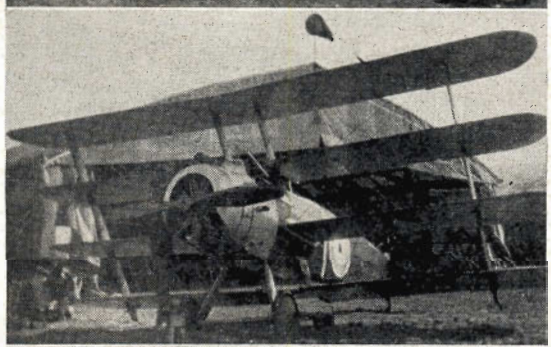
Located either side of the wing structure, the pilot and observer/gunner had an excellent field of view in almost every direction. Armament of a fixed Vickers gun synchronised to fire through the airscrew disc ahead of the pilot and a pillar mounted lightweight Lewis for the observer would have made it a machine capable of defending itself, but in actual fact records indicate that none of the machines left Great Britain. They were flown by the Royal Flying Corps at Gosport and the Royal Naval Air Service at Manston. Three constructors were involved, the Phoenix Dynamo Manufacturing Co. made N.511 and N.512 for the R.N.A.S. and these had cowlings with cut-away bottoms, no windscreen for the pilot and sundry detail differences from the Armstrong-Whitworth aircraft A5212, 5213, and 5214. Both the 110 h.p. Le Rhone and 130 h.p. Clerget were fitted; but in either case, performance was disappointing with a maximum speed recorded of 94 m.p.h. at 6,500 ft. and 23½ minutes to climb to its ceiling of 10,000 ft. These figures were with the 110 h.p. Clerget.

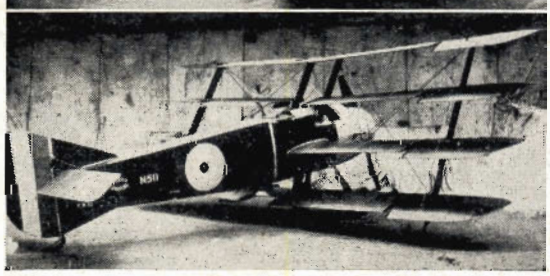
The design by Frederick Koolhoven (hence the F.K. in the title), first used a conventional rigid tailplane but production versions used the Morane-Saulnier balanced all-moving elevator of only 16 sq. ft. against 390 sq. ft. of wing area. For this reason alone, the F.K.10 is hardly presentable as a subject for free flight scale modelling!

Koolhoven produced a large range of most original designs for the Armstrong-Whitworth Company, which was then located at Gosforth, Newcastle on Tyne. To follow the F.K.10, he had a project with no less than 15 narrow chord wings, heavily staggered and mounted close together, using an F.K.10 fuselage and given the project number F.K.11. It was not completed.

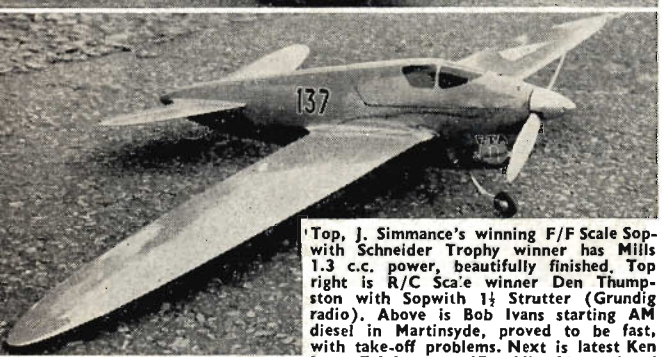
After their short service career, the F.K.10's were scrapped during 1917 but their fame lingers on as the best known of the World War I Quadruplanes.







An Armstrong-Whitworth machine with the horseshoe shaped engine cowling, seen in the upper pair of photographs, is obviously being used for field tests. Manufacturer's name is written in white along upper longeron, between roundel and elevator. Lower pair of photographs show the R.N.A.S. machine N511 made by Phoenix Dynamo Co., whose name is written in white in two curved lines just aft of the serial on side of fuselage. Note the eight ailerons, diminutive elevator and Scarff ring gun mounting in rear cockpit on this machine. Photographs from the collection of G. S. Leslie.



Top, J. Simmance's winning F/F Scale Sopwith Schneider Trophy winner has Mills 1.3 c.c. power, beautifully finished. Top right is R/C Scale winner Den Thumpston with Sopwith 1½ Strutter (Grundig radio). Above is Bob Ivans starting AM diesel in Martinsyde, proved to be fast, with take-off problems. Next is latest Ken Long F.A.I. racer (Eta Mk. 2) produced fastest heat at 4:30 with 60 laps at 95 m.p.h.

N.W. EASTER MEETING

R.A.F. TERNHILL, SHROPSHIRE, MARCH 29/30th

REPORTED BY RON FIRTH

The bold move by the North Western Area S.M.A.E. in undertaking what was virtually a North Western "Nats" relatively early in the season deserves congratulations for organisation, although naturally enough there will be some who disagree with that viewpoint. Free flighters for example were obliged to walk the width of the field upwind from the car park, close-by the entrance. It was a long trek of almost 1½ miles. A Trade Show with bar, refreshments and provision of meals added variety. The cold wind on the Sunday kept numbers actually flying down; but did not prevent fly-offs in rubber and power.

Monday was a far better day since the wind strength dropped to almost zero, bringing out large numbers of gliders and F.A.I. power models. Incidentally, the latter event was run in rounds at short notice and this precluded some entrants who were unaware of the procedure. The air seemed full of models all day long and there was at least one mid-air collision.

Prizes were presented by Mrs. Panton after brief speeches from North West Area Chairman, John Hannay and Group Captain A. D. Panton, O.B.E., D.F.C., R.A.F. Officer Commanding R.A.F. Ternhill, whose co-operation was much appreciated.

Results

Glider. The following made perfect scores of 9:00, fly-off times quoted: 1, C. Morris (St. Albans) 9:55; 2, J. O'Sullivan (Ireland) 7:25; 3, D. Wiseman (York) 7:00; 4, A. Wells (Hornchurch) 5:14; 5, D. White (York) 4:38; 6, R. Brownson (Timperley) 3:35; 7, J. Bailey (Bristol) 3:03; 8, P. Newell (Surbiton) 2:39; 9, A. Wisher (Croydon) 1:23. (99 entries.) **Power.** The following made perfect scores of 9:00, fly-off times quoted: 1, J. West (Brighton) 4:38; 2, D. Miller (Cambridge) 3:51; 3, M. Dilly (Croydon) 2:13; 4, A. Moss (Whitefield) 8:47 (total); 5, A. Carter (Liverpool) 8:40 (total); 6, J. Parrott (Whitefield) 8:33 (total). (88 entries.) **Rubber:** The following made perfect scores of 9:00, fly-off times quoted: 1, D. Morley (Lincoln) 3:25; 2, J. McNamee (Wallasey) 3:19; 3, L. Roberts (Lincoln) 3:18; 4, B. Picken (Wigan) 8:47 (total); 5, K. Horry (Birmingham) 8:37 (total); 6, J. O'Donnell (Whitefield) 8:24 (total). (45 entries.) **Combined F.A.I. (Five rounds).** 1, G. French (Essex) 15:00 (Power); 2, B. Bow (Bristol) 14:33 (Glider); 3, D. White (York) 14:14 (Glider); 4, S. Savini (Wallasey) 14:08 (Power); 5, J. O'Donnell (Whitefield) 14:02 (Rubber); 6, R. Godden (Cambridge) 13:51 (Power). (64 entries.) **½A Team Race** (38 entries) 10 miles. 1, L. Davy (Wharfedale) 8:40.5; 2, R. Place (Wharfedale) 10:19.2; 3, A. Dell (Feltham/Hayes) 10:51. **F.A.I. Team Race** (40 Entries) 20 Km., 1, L. Davy (Wharfedale) 10:15.4; 2, R. Place (Wharfedale) 11:10; 3, Turner/Humphrey (Cambridge) 12:2.4. **B Team Race** (12 entries) 10 miles, 1, J. Horton (Wharfedale) 7:15; 2, Cooper/Allen (West Essex) 10:32.5; 3, Yates/Hampson (Leigh) 10:47.4. **Combat** (71 Entries.) 1, Lee (Wharfedale); 2, Tribe (Northwood); 3, Bowyer-Lowe (Hatfield). **Stunt** (18 Entries). 1, G. Higgs (C.M.) 1,148 pts; 2, T. Jolley (Whitefield) 1,138 pts.; 3, Dobekin (Horwich) 1,132 pts.; **R/C Multi** (16 Entries.) 1, G. Bradley (Lincoln) 6,318 pts.; 2, F. Knowles (Reigate) 6,288 pts.; 3, S. Foster (Lincoln) 6,065 pts.; **R/C Scale.** 1, D. Thumpston (Sutton Coldfield) Sopwith 1½ Strutter. **E. J. Riding Trophy F/F Scale.** 1, J. Simmance (Wharfedale) Sopwith Tabloid, 800 pts.; 2, E. Coates (Blackburn A/C) Sopwith 1½ Strutter, 641 pts.; 3, R. Ivans (Walsall) Martinsyde Buzzard, 500 pts.

Long span pylon design is John Dumble's R/C entry, originally designed for record attempts. Bottom left are the McNamee Twins, M. & J., winding "Topspin" prior to 3rd max, came 2nd in fly-off. Right is Dick Place and Merco powered "Olympic" stunter with all sheet structure.

Getting started in

Radio Control

Part Two of a New Series for the R/C Novice

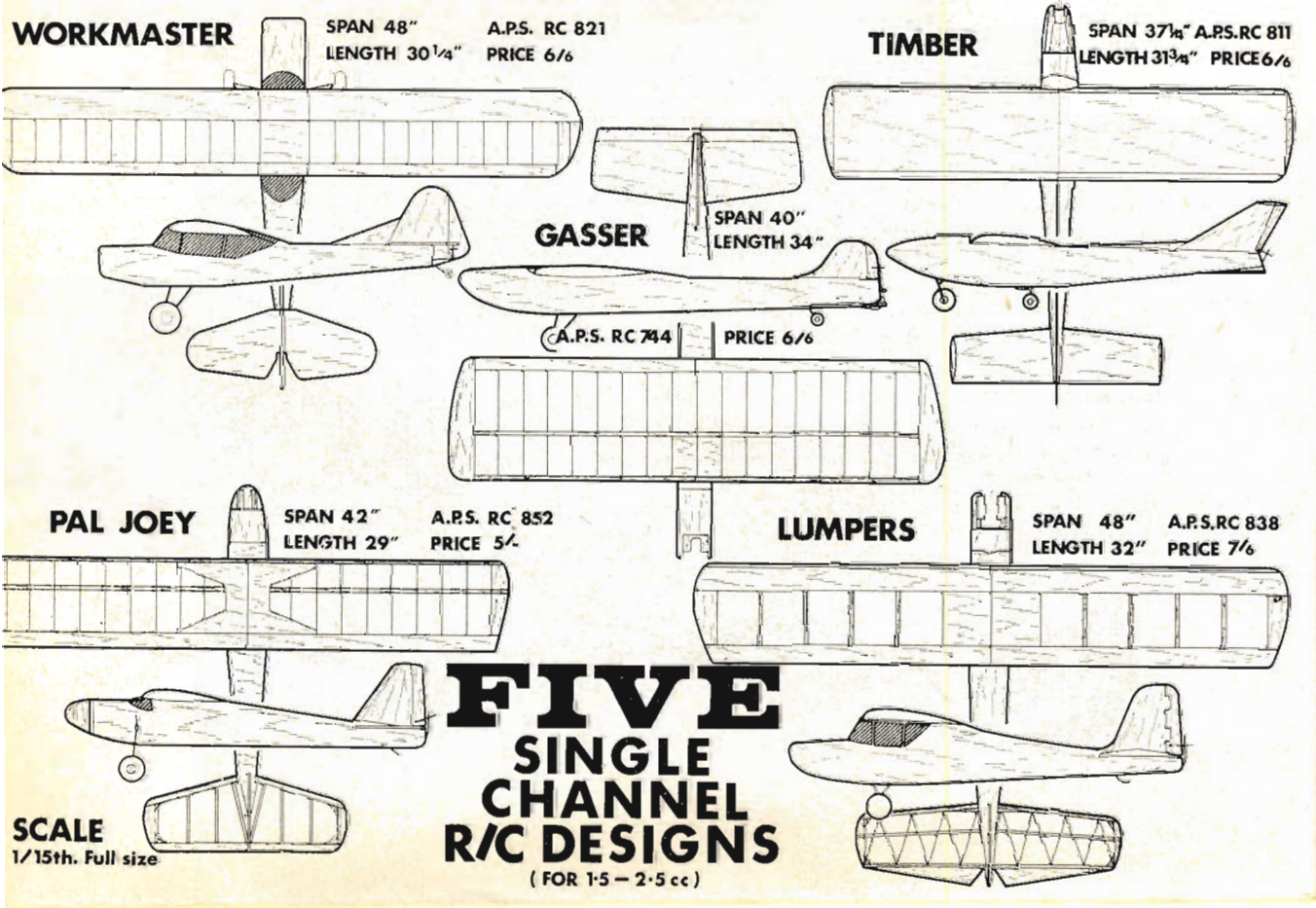
By E. F. BRYANT

OF THE MODEL itself the choice is a very wide one, but it is a fact that, for the beginner at any rate, simplicity is the key-note. His model *must* be stable enough to right itself in flight after any manœuvre caused by operation of the radio and, in fact, must have all the qualities of a free-flight model. When multi-channel sets are being used, and the aircraft is virtually being controlled the whole of the time, then the built-in stability of the free-flight model is a definite disadvantage, but, in the first stages it is a trait to be used as part of the flight pattern and, as such, is very important. When making the choice, the builder must make sure that there is enough room inside the fuselage to take the radio gear, and that the recommended engine is of sufficient power to take the extra weight. The obvious location of the heavier and bigger parts of the radio gear, namely receiver and batteries, is in the part where the fuselage is roomiest. In the average sports model this is just below the wing, and, fortunately, this is the place where the extra weight is least likely to upset the centre of gravity. If, as is often the case, more than one escapement is required, then they must be disposed so as to balance out their weights and, at the same time, make them as easy as possible to connect to the part to be controlled.

When making and fitting the mechanical connections from escapement to control, there are several basic rules which must be observed if success is to be assured. Firstly, all moving joints must be free and without bind, and yet not so slack that there is a lot of free movement. The distance from escapement to actual control should, ideally, be as short as possible, although this is not always convenient. Any torque rods used must have a minimal amount of free twist, and must not be impeded in their movement by other parts of the airframe.

With regard to electrical connections, basic rules again apply, and their importance cannot be too strongly emphasised. All soldered joints must be properly made, using a hot iron because the danger of 'dry' joints in these small connections is a very real one, and on no account should a wire of any length be supported only by its soldered joint. The joint may appear to be quite substantial, but vibration is considerable, and a vibrating wire will quickly break through the best of joints. Wiring can be conveniently supported in the airframe by means of tiny staples or even pins, and, where there is any danger of strain on a joint, the wire can be con-

Scale views of five recommended Aeromodeller Plans Service designs for single channel flyers are to common 1/15th scale, 6d. should be added to each price for postage. Quote reference number when ordering.



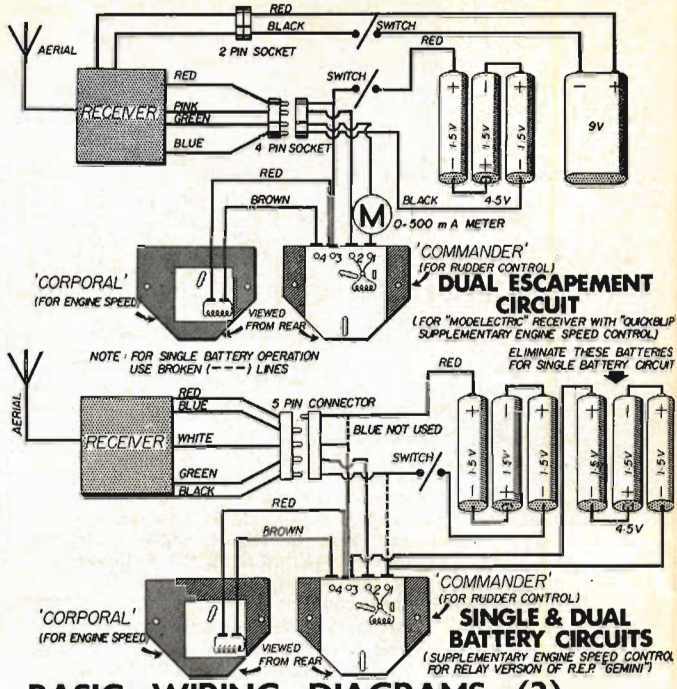
trolled by a small length of string or thread. It is possible that more models are lost and damaged through a broken connection than through any other single cause, so that it is well worth taking that extra bit of trouble.

In days past, when radio receivers were far less robust, and far more susceptible to vibration troubles than they are today, it was the usual practice to suspend the receiver inside the fuselage on rubber bands, rather after the fashion of an old type microphone. Nowadays, however, this is no longer necessary, and most receivers are quite happy when resting in a shaped bed of foam plastic or 'Sorbo' rubber. It is, however, most important that the receiver should be firmly held so that it does not move about during flight or during a heavy landing, and a rubber band, strategically placed will almost always take care of this. Batteries, for they are the heaviest and least prone to damage of our equipment, should be placed forward of the receiver, and very firmly kept in position. It is a particularly good plan to put them into a tailor-made box, fixed into the fuselage once their permanent position is known, where they can be tightly held by rubber band or wedge. Battery boxes in which are incorporated permanent connections, and in which batteries are fitted without soldering, must be viewed with suspicion unless of extremely high standard without any fear of rubbing or intermittent connection. Any failure in this department usually results in a swift demise of the model, and so it is wise to make all battery connections as positive as possible, and soldering is the best method, as long as the battery is not over heated during the process.

With regard to batteries themselves, it is always a mistake to try to get away with the smallest battery possible. Not only is a bigger battery more likely to give the correct current for a longer period, but often, particularly when a free-flight model is being adapted for radio, the extra weight is a great advantage. Use of extra batteries for circuits with secondary escapements is certainly to be advised, as seen in the diagrams—after all three more U7's are unlikely to break the model's back. It need hardly be said that all electrical and mechanical equipment must be protected, as far as possible, from the exhaust sludge of the engine, from spilt fuel and from dust and dirt of the flying field.

When one considers the type of battery to be used, it is perhaps easy to say, more especially in the case of receivers operating from a very low voltage, that the ordinary small "flash-light" battery, obtainable from almost any village store, will serve the purpose satisfactorily. This is undoubtedly true enough, as long as the battery is replaced immediately the output falls below par, but there is no doubt that a large number of apparently inexplicable radio failures could be attributed to low current output from the battery.

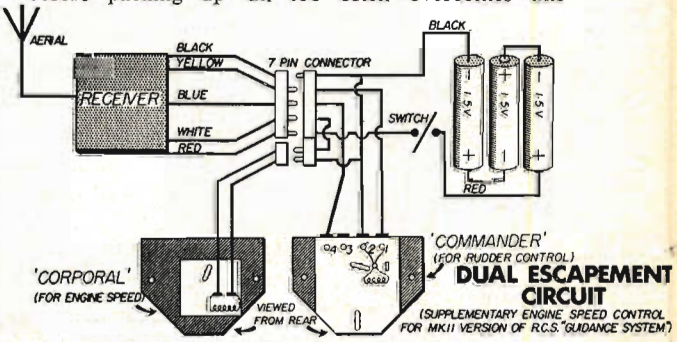
Again, there are many radio flyers who fly purely for the fun of it, on a Sunday afternoon, who have no means of telling when their battery needs to be replaced, and, even if the suspicion of battery failure is there, the temptation to have 'just one more flight before packing up' all too often overcomes this



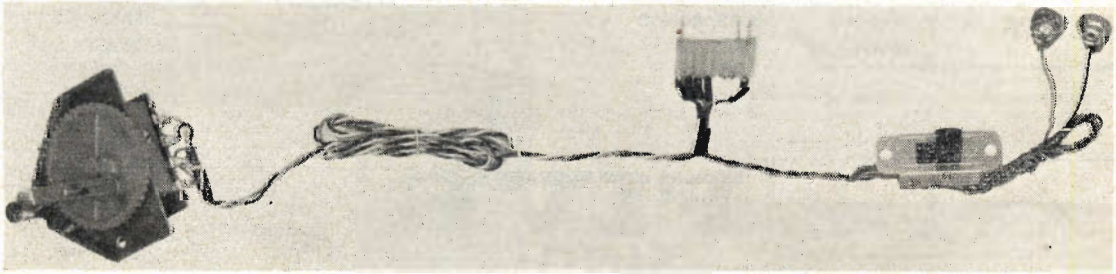
BASIC WIRING DIAGRAMS (2)

Three more circuits, for British Receivers with dual output via relay or electronic circuitry. Dual batteries are advised for Relay "Gemini", alternate single battery circuit is dotted. Blue wire is used for "Quick Blip" from relay instead of Compound Escapement.

NEXT MONTH: Single escapement circuits and Dual output circuits for British and U.S. Rx's.

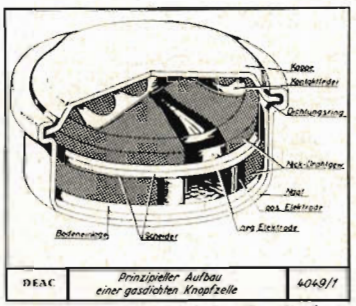


R.C.S. Guidance System Mark II is provided with proper harness for Elmic Commander Compound escapement, including switch, special plug and battery snap, at £4. Additional engine control Corporal escapement with wiring harness and extra switch also available—see special diagram.

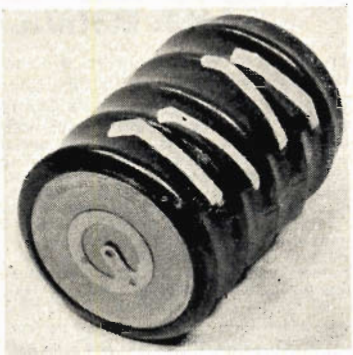


suspicion and yet one more model bites the dust.

It would be almost impossible to estimate just how long the life of any dry battery would be, in association with any receiver, so that the only way to be sure of avoiding trouble, is to *replace the battery* at frequent intervals, which must necessarily be shorter than they apparently need. Obviously this is wasteful, but must be considered as a part of the running costs. The outlay is in pennies anyway.



Typical cross-section of DEAC cell shows intricate construction. For modelling use the five cell welded pack with four tappings for intermediate voltages, forms the most useful power source as in photo.



The beginner, perhaps even more than the experienced flyer, would be well advised to consider the use of the Nickel-Cadmium cell (DEAC) in his circuit. These small batteries have enjoyed much popularity over the last few years, and are extremely satisfactory for use in the circuits of model radio sets. They are not easily damaged, do not corrode, are of a convenient size and shape, and, most important of all, provide a very consistent and reliable source of power. They are easily available, if not from the village store, at least from most model dealers, and their initial cost is soon overcome, by their suitability for the job in hand. They can be made up to any voltage needed by the modeller, by adding more cells, and they can also be tapped at various levels, in order to provide differing voltages, rather after the fashion of the old fashioned "Grid Bias" battery used in pre-war wireless sets. In fact, taken all in all, they are certainly the best proposition to be found currently on the market.

To summarise, then, one could say that, while "flashlight" cells are cheap, easy to obtain and will, no doubt give satisfactory results while still in good condition, the continually rechargeable DEAC battery is generally more reliable, and should be seriously considered as a "must" for trouble-free radio work.

Before leaving the subject of batteries, a few general observations would not, perhaps be out of place. Unfortunately, batteries often seem to come in for a lot of abuse, finding themselves dropped into the conglomeration in the bottom of the modelling box, stuffed into bags and pockets, and generally being kicked around. Under these circumstances, it is a wonder that they work at all, because they are really not as robust as they might appear. It should be remembered that a battery, constructed as it is, will be susceptible to temperature changes and to humidity. If a reasonable effort is made to keep them dry, fairly cool and protected from violent knocks, they will give good service. One last point to remember is that batteries deteriorate fairly rapidly with age, whether they are used or not, and so any battery to be used in the circuit must be a new one, recently bought, and *not* the one left over from last season's flying.

A feature on battery construction and design, with details of characteristics appears under the title of "Know Your Dry Battery" by the editor, in AEROMODELLER Annual 1963/4. This explains the types of primary and secondary (re-chargeable) cells using the Leclanché construction with sal ammoniac, alkaline, mercury, manganese and kalium electrolytes. It is recommended reading. *Next Month the L.S.D. of Radio Control and more circuits.*

OS .19 R/C Analysis (continued from page 297)

with immediate pick-up on opening the throttle and a good range of intermediate speeds. For bench running, slow speeds of 2,000 r.p.m. can be maintained with fully effective throttle response, but for flight work it would be better to aim at little higher — say 2,500 to 3,000 r.p.m. In practice, this means that having established correct adjustment for minimum speed running of 2,000-2,500 r.p.m. the throttle stop screw can be adjusted to give a slightly faster idling speed with some advantage. Re-check, however, that the air bleed adjustment is the best possible with the new stop setting, and that the full throttle setting is *slightly* on the rich side.

The O.S. throttle appears to approach very closely the ideal for a glow engine. Flexible throttling action is provided by the combined barrel throttle and exhaust flap, whilst the air bleed adjustment provides more than enough adjustment to establish an 'optimum' mixture for slow running as well as 'compensating' the mixture over a range of lower speeds. Correctly set up the engine neither tends to starve or flood when idling for a lengthy period, as is often apparent with glow motor throttles. This, in turn, also means that the demands from the glow plug are less critical for throttled operation and a plug with an idling bar is not necessary (although the O.S. No. 6 is a shielded type). A good test of a throttle is to set it for optimum low speed running and continue running at low speeds for some time, or until the engine eventually stops with fuel still in the tank. If the throttle is not completely balanced (or properly adjusted) the engine will either stop 'dry' or 'wet'. In the case of the O.S. it does neither.

Another feature which impressed with the O.S. 19 was the high quality of the workmanship. All of the castings are superb, the detail design is excellent and the machining and general finishing of the highest order. In these respects the O.S. is not just comparable with, but better than, most contemporary R/C glow motors of similar size.

We would recommend any aeromodeller to fit a locking washer under the screw holding the throttle lever in place, and also make sure that the exhaust flap lever grubscrew is tightened down on to a flat on the flap spindle. Logical propeller size for any R/C model would be 9 x 4 or 10 x 3; or possibly a 9 x 5 for a fast flying model. An extra facility is of course the 'Jetstream' silencer type S which fits the 19 easily and is reasonably effective.

Club and Contest News

S.M.F. ECSTATIC OVER SHACKLETON

IT IS NOT OFTEN that even the most rabid aviation enthusiasts rave over the flight of an Avro Shackleton, but Southern Multi Flyers were doing just that on April 26th after the most realistic and thrilling first flight of David Walker's 122 in. model with four K & B .19s. Meticulous engine tuning occupied an hour then the aircraft ran down the S.M.F. field, slowly became airborne, turns naturally to the left and scarcely gaining 30 ft., circled the field. For 7½ minutes without as much as a flutter or stall, it climbed steadily to over 300 ft. To quote the words of S.M.F. correspondent, D. A. Reymond "It was undoubtedly, the most wonderful sight we have seen in the model aircraft world".

Flying speed seemed perfectly normal in true scale. After six minutes, Harry Brooks took over for the landing, progressively reduced speed and came in for the approach when it was noted that one engine had stopped, making no difference to handling. A perfect landing with the remaining three engines still ticking over terminated a superb first flight, unfortunately not repeated that day due to wheel troubles. Wing area is over 1,350 sq. in., R/C equipment, Bonner servos and F & M radio.

Dunfermline M.A.C.

Dunfermline M.A.C. recently moved into larger premises at 2 MacGregors Building, Woodmill with excellent modelling facilities. Activities cover most aspects of aeromodelling from chuck gliders to radio control. A publicity campaign has just doubled their membership to over 20. Anyone interested should visit the clubrooms at 7.30 on Friday nights or see them in action on Sunday afternoons at Pitreavie playing fields.

Junior Rats to the Fore

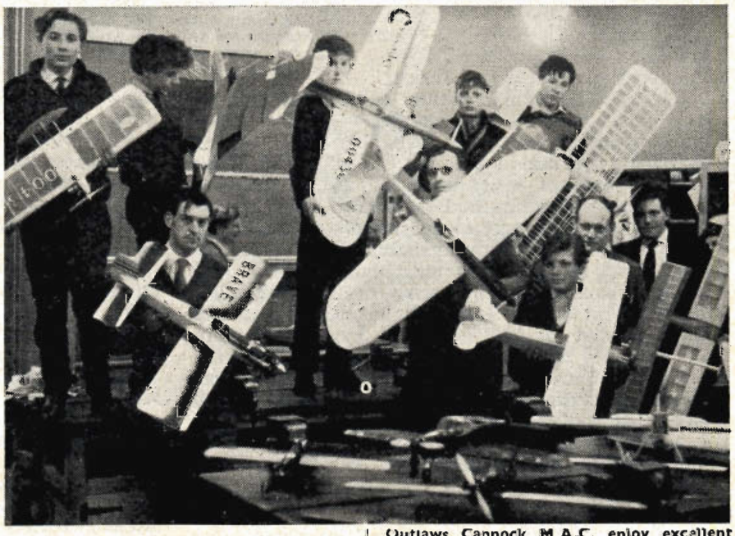
In a recent Handsworth M.A.C. club rat race junior members were well represented. The 140 lap final saw P. Smith first home with a time of 8:25, N. Hughes and J. Bryant following within a few seconds.

Glasgow M.A.C. and Hornets Rally

Held at Abbotsinch on March 22nd, with dry and overcast weather, the best supported event was combat with 20. Free flight power only had three entries, the poorest for years. Success came to G.M.A.C. in the radio event, won by Sandry McAra with 80 points and most people wondered how all the parts and especially the battery slung between the Veron "Robot" U/C legs managed to remain in place. Power was a Frog 3.49 and Rx a Minimac. ½A team race proved a Hornets benefit. S.A.S. (Saltcoats, Ardrossan, Stevensan) took 'B' through Campbell Blair's Rivers Silver Arrow 3.5, the tortoise of the race, which defeated plug blowing hares! Combat saw B. Small of Alloa beating Fraser McMillan's (Stirling) reserve, his "Peacemaker" having been reduced to a nylon bag of pieces. During the affray the organiser had his rule-book filched!

Lefever joins Norwich

Geoff Lefever has joined Norwich M.A.C. much to the appreciation of all their contest members who are glad to see Geoff back in circulation after a lapse of two years. Three times G.B. team member and already back in form this year with 14:20 in the S.M.A.E. Wakefield contest on March 22nd, Geoff is a powerful asset to the Canaries. On the same day Abbs and Haford scored 13:56 and 13:49 in the K.M.A.A. and M. Smith 7:55 in the Frog Senior. All four members missed just one max.



Outlaws Cannock M.A.C. enjoy excellent facilities at new H.Q., Blakeways School, Hednesford. Keen C/L interest is evident. Engines over .8 c.c. must be muffled.

POSTAL STRIP TEASE!

On Sunday March 22nd at Ashdown the Crawley club flew in a three way postal contest with American and Czech. model clubs (See World News). Whilst towing his A/1 glider Bill Horton found his trousers around his ankles. Steady on Bill! They'll be booking you for a Paris show as "Honourable Hobbler Horton" —caught with line out and pants down!

Site for Aberdonians

Aberdeen Aeromodellers have had a very good season. Besides winning the Strathmore Cup in 1963, they have now obtained use of Dyce aerodrome for Sunday Flying, a new clubroom, and eight new senior members.

Finchley Jr. Stunt Rules

The rules for beginners stunt at the Finchley Rally on May 31st are as follows. Age limit 18 years, engine capacity 2.5 c.c.-3.5 c.c., line length 55 ft. max. Models will be judged for design, realism, finish and detail and manoeuvres extracted from the S.M.A.E./F.A.I. Schedule are : 1. Start engine in one minute. 2. Take-off. 3. Two laps of level flight. 4. Wing over. 5. Three consecutive inside loops (4th ½ loop straight into inverted). 6. Two laps inverted. 7. Three consecutive outside loops. 8. Horizontal eight. 9. Landing. There is no flight time but entrants are advised to have at least a three minute engine run.

WHARFEDALE NEWS

Wharfedale started the contest season well with the Place/Haworth team collecting first place (no pun) in Rat Race and ½A T/R at the Northern Area Winter Rally. At the North Western Area Easter meeting the club took no less than five firsts, two seconds and one third. After the recent article on indoor RTP Combat, two members turned up at the club night with some Cox 0.10 combat jobs, flown two in a circle they provided some fascinating flying with John Horton doing a bull fighting act with a larger motor cycling coat to stop the models when the lines became tangled. They have been challenged to a postal F.A.I. T/R comp by the Valley Circle Burners of California and this is to be run off on September 13th. After the success of their 1,000 lap races for class B T/R the club will be holding one for F.A.I. class models at R.A.F. Driffield on June 28th, all comers welcome. It is hoped that this will develop into a postal comp on the lines of the other 1,000 lap event so any results, etc., to R. Place, 87 Westwood Lane, Headingley, Leeds 16.

Irish Interest

Club acquisition by Shankill M.F.C. include a field strength meter for checking transmitter output, and a portable monitor for detecting outside interference. New models include Bill Norman's "Pal Joey", and "Luton Minor" by Tommy Shortt and an almost completed "Septal 3" by Johnnie Carroll. John Falkiner also has a "Luton Minor" on the building board, and Mike Green has completed a "Hegi Styrofix"—easily built but rather heavier than normal construction.

RE-ACTIVATED AREA

AN S.M.A.E. AREA COMMITTEE has been formed to co-ordinate the activities of the South Wales clubs, mainly Rhondda, Cardiff, R.A.F. St. Athan, Swansea, and other unattached groups. The chairman is the well known radio dealer and flyer Peter Waters. A brief round up of area goings on are that the Rhondda club has been active for two years, and operate under the local youth club. Three meetings are held every week, one for Juniors on Thursdays 6 p.m. to 8 p.m. and two for Seniors on Monday and Wednesday 7 p.m. to 10 p.m. at the Tonypandy Youth Club. The long standing Cardiff club is emerging from the doldrums. In two recent combat meetings with Rhondda both clubs came out even and they are both waiting for the next meeting at Ely racecourse to decide the winner. On the same day as the North Western Area meeting Swansea flew against Rhondda in combat, the Rhondda comp sec. K. Jenkins winning.

Club Champion

At the recent Hayes and D.M.A.C., A.G.M. it was revealed that 1963 had been their best ever season for contest placings in control line as well as free flight. Club champions are '½A Team Race' and 'F.A.I. Team Race': Alan Dell. 'Combat': Dave Balch. 'Speed': Lindsey/Copeman/McGladdery. 'Rubber': Ray Wotton. 'Glider': Jim Baguley closely followed by Mrs. Wotton. 'Power': a tie between John Hancock and Jim Baguley. 'Overall Champion' is Jim Baguley.

Contest Calendar

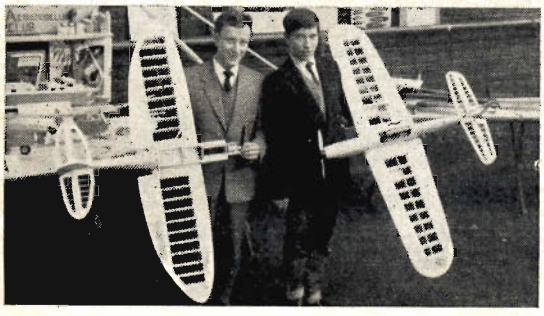
May 31st	*The Welsh Rally*, Swansea Airport, Fairwood Common. Open Power, A/2, Rat Racing and Combat. Details from: J. Bailey, "Garthmor", c/o Neath General Hospital, Neath, Glamorgan, S. Wales. Proof of insurance essential.
May 31st	*Finchley Fliers C/L* Gala, Glebe Land, Finchley, London, N.12. ½A Combat, A Combat, Stunt Class A, Stunt Class B, Rat-Racing all Classes (F.A.S.T.E. Rules). Pre-entry 2/6d. by 1.5.64 to K. D. Lesser, 20 Squires Lane, Finchley, London, N.3.
May 31st	*Barnstormers/Kirkcaldy Rally* Abbotsinch Airfield. R/G/P, ½A, A and B, T/R, Combat.
June 7th	*Wharfedale Rally* (Venue not fixed). ½A T/R, F.A.I. T/R, Stunt, Combat, Rat-Racing (2.5-10 c.c. 60 ft. lines). Entries to P. Secker, 36 Rockwood Avenue, Leeds 9.
June 14th	*1st Wanstead & Northwood All F.A.I. Rally.* Hayes C/L Circuit, Charville Lane, Hayes. F.A.I. T/R and F.A.I. Combat. Pre-entry 2/6d. by 7.6.64 to J. Franklin, 82 Grove Hill, South Woodford, London, E.18.
June 21st	*East Anglian Area F/F Gala.* R.A.F. Molesworth, Hunts. Open R/G/P, Combined F.A.I. event. Entry fee 2/-. No re-entry.
June 28th	*Esher R/C Contest*, Odiham, Hants. Farmland Intermediate R/C (Rudder, Elevator, Engine). S.M.A.E. Multi-Control programme of manoeuvres. Pre-entry 2/6. Entry forms from A. W. Ambrose, 37 Grove Road, Ashtead, Surrey.
June 28th	*R.A.F.M.A.A. Area Rally*, R.A.F. Wroughton. All classes.
June 28th	1,000 *lap postal contest.* F.A.I. team race. Information from: D. Place, 87 Weetwood Lane, Headingley, Leeds 16, York.
July 4th & 5th	*Irish C/L Nationals*, Baldonnell. T/R classes, ½A, A and B, Combat and Stunt.
July 5th	*Devon Rally*, Woodbury Common. nr. Exmouth. R/G/P, ½A Power, F.A.I. Rubber, and Combat. Entry fee 2/6d. per event.
July 5th	*S.A.A. Gala*, Abbotsinch Airfield. R/G/P, ½A, A and B, T/R and Combat. Pre-entry 2/6d. to K. Johnston, 113 Kinarvie Road, Glasgow, S.W.3.
July 5th	*Wharfedale* 1000 *Lap* F.A.I. T/R (International Postal Contest).
July 12th	*3rd Annual Bristol R/C Rally*, R.A.F. Hullavington, Wiltshire. Multi to F.A.I. schedule, R/C Scale, single or multi channel. Pylon racing (min. wing area 1 sq. ft. per c.c.). Field Entry only. Rules from Charles Thorn, 164 Summerhill Road, St. George, Bristol 5. (S.A.E.).
July 12th	*Surbiton Gala*, Chobham Common, R/G/P, ½A Power. Entry fee 2/6. No. re-entry.
July 12th	*Clywd R/C Glider*, Open, A/2 and Junior Slope Soaring. Pre-entry (R/C) by 1.7.64 to C. R. Filtness, 26 Raymond St., Chester.
July 19th	*Lincoln & Wigsley Rally, Wigsley*, nr. Newark. Open R/G/P, Multi-channel R/C. Pre-entry 2/6d. to P. Wyatt, 1 Wharfedale Drive, Fosse Estate, Lincoln.

Rat Race details from N.A. Rally

Reported in last month's Club and Contest News the Northern Area Rally had a Rat Racing event. Some details for those budding Rat-Race fans are as follows: 'Place/Howarth'; had a streamlined model with approximately 110 sq. in. wing area and butterfly tail based on "Dalesman", of typical Wharfedale layout, but with two wheel dural U/C and turned aluminium spats. The ETA 29 was inverted and fully cowled giving this machine approximately 100-110 m.p.m., although Don had 120 m.p.h. on his watch. A Reguflo type tank has replaced the original pressure system, which gave trouble, giving a 40 to 55 lap range. 'Meekins/Bradley'; A typical rat with profile fuselage and 80 sq. in. wing. What most people expect a rat to look like, naked and unashamed. A Golden Fox 40 mounted side winder provided the 100 m.p.h. and deafened the opposition. The pressure tank, was attached by rubber bands and had no vents or valves, but a "Brasso" tin lid filler. 'Malcolm/Adams' and combat pilot 'Terry Lee' operated an ancient class B job, "Son of Fred", with two wheel u/c and a two vent, long thin tank giving up to 35 to 40 laps at 90 to 100 m.p.h. from a McCoy 29. Malcolm also had an ETA 29, upright uncowled rat with similar tank, but this had engine trouble. Among the other interesting machinery present was a shoulder wing VECO 35 job from N. Sheffield, a twin boom McCoy 35 commercial design from York, and another ETA 29, this time inverted and partially cowled from Wharfedale. Next rat race event in the N. Area will be at the Wharfedale Rally. Without Place/Howarth and Adams competing, it should be a wide open event, for all comers.

R/C on the Cheap

Renewed enthusiasm for radio control in Hatfield M.A.C. brings a few opinions on the £.s.d. of R/C. Dave Fairbank's "Pal Joey" (Aeromodeller free plan December '63) cost under £1 to build including the silk covering. MacGregor Minimac Receiver, and a kit built Tommytone Transmitter are used. Found to be overpowered with a Frog 150, a well worn E.D. Bee is now fitted, the combination flying very well. Brian Lukins is modifying a Veron "Deacon" for R/C. Using a Frog 150R Mk. 2 engine, Windy Kreulen single channel tone receiver and transmitter, the cost being £15 complete. Hatfield have unwarranted concern among their combat flyers that the S.M.A.E. may adopt the F.A.I. combat 2.5 c.c. engine limit, club motto being "Big combat is good combat". Place to make proposals is through their Area Committee.



G. Staniforth and A.P.S. "Spitfire" (Fox 35) with W. Vaughan and B.M.P. "Tony" (O.S. 35) at Rhondda club display in re-activated South Wales area. Details top of page.

S.M.A.E. Contest Programme

May 17th & 18th	BRITISH NATIONAL CHAMPIONSHIPS, R.A.F. *Barkston Heath.* All classes.
May 23rd & 24th	Indoor meeting, *Cardington.*
May 31st	*White Cup* (Open Power). *Frog Junior Trophy* (Open Glider/Rubber), Flight Cup (Open Rubber) *Area Venues.*
May 31st	Centralised C/L events at *R.A.F. Topcliffe* (nr. Thirsk).
June 14th	Multi Radio Control, *Woburn Abbey*, Beds.
June 21st	*Scottish Gala.* Abbotsinch Airfield. R/G/P, ½A, A and B T/R and Combat.
June 20th & 21st, July 11th & 12th, August 22nd & 23rd,	*Indoor meetings Cardington.*

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D.C. Bambi (0.15 c.c.); little used and just re-serviced; excellent condition, £2 10s. Marshall, 2 The Mounts, Totness, S. Devon.

Almost new A.M. 15 R/C, 35/- ; good Mills .75, 30/-; reliable Mills 1.3, £1; new Conquest, 15/-; various R/C plans, accessories. Bates, 29 Quarry Lane, Hasbury, Halesowen, Worcs.

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'Sailplane & Gliding'—Published every month. Send stamped addressed envelope for descriptive leaflet; or 3/4d. for current copy; or £1 for a year's subscription to British Gliding Association, Dept. "A", 19 Park Lane, London, W.1.

American Magazines. Year's subscription 'Model Airplane News' 46/6d.; 'American Modeller' 35/6d.; 'R/C Modeller' 46/6d. Full catalogue free. Willen Ltd. (Dept. 1), 61a Broadway, London, E.15.

'Model-Avia', the model magazine that covers the world of model flying. Edited in French. Send for free specimen and subscription details : 'Model-Avia', 31 rue du Printemps, Bruxelles 5, Belgium.

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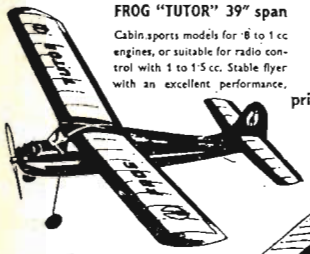
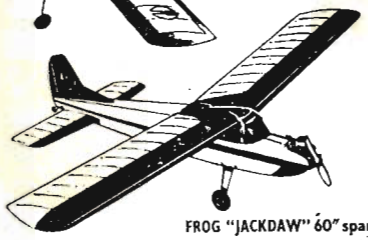




price 119/6

FROG "JACKDAW" 60" span

Specially designed for single- or multi- (2·5-3·5 cc engines) R/C./Kit includes all wood parts shaped, dural U/C, fuel tank and all 'hardwear'.

YEOMAN "DIXIELANDER"

Winner of British Nationals and many other major contests Britain's leading power duration design. Span 50" for 1·5 to 3·5 cc engines.

price 29/6

FROG "NIMROD" 30" span

Sturdy cabin sports model for ·5 cc diesels of ·049 glow. Accent on stability and a long model life.

price 18/6

CONTROL LINE

The "Frog" range of control line kits are the best in design, quality and completeness, incorporating the most up to date features. They are specially matched to the "Frog" engines.

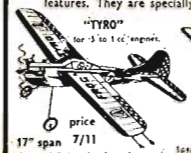
"TYRO"

for ·5 to 1 cc engines.

price 7/11

17" span

All parts full shaped and pre-decorated



"VANDIVER Mk. II" 27" span

price 18/6

Specially developed for full aerobatic performance on 1 to 1·5 cc engines.

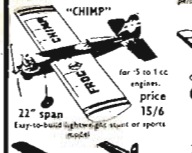
"CHIMP"

for ·5 to 1 cc engines.

price 15/6

22" span

Easy-to-build lightweight stunt or sports model



"AEROBAT"

28" span price 33/-

Fully aerobatic stunt model for 2·5 and 3·5 cc engines. Exceptionally complete DE-LUXE kit.

price 25/-

"HORNET" 21" span

Fast, modern Team Racer to accommodate 1 to 1·5 cc front induction engines with full cowling.

"TALISMAN"

Profile fuselage stunt model with side-mounted engine and built-up wing. For 1 to 1·5 cc engines.

price 18/6

"ATTACKER"

50" span

price 47/6

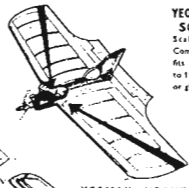
Competition class stunt model designed to latest specification to match '19' to '35' engines. This super kit includes wheels, all wood parts shaped, spinner, all hardware, etc.

YEOMAN "MINI-SCORCHER"

Scaled down 'baby' Combat model - ideal to suit your favourite ·75 to 1·5 cc engine - diesel or glow!

Span 20".

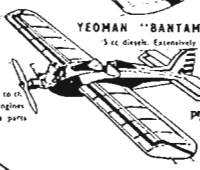
price 14/6



YEOMAN "BANTAM COCK"

·5 cc diesels. Extensively prefabricated kit. Span 22".

price 9/11



"GLADIATOR"

36" span

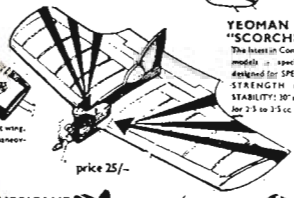
price 29/6

'Designed for Combat with forward swept wing, rugged construction and outstanding manoeuvrability. Takes engines 2·5 to 3·5 cc.

YEOMAN "SCORCHER"

The latest in Combat models - specially designed for SPEED, STRENGTH and STABILITY! 30" span for 2·5 to 3·5 cc

price 25/-



The most complete and realistic scale models of their type - accurate in outline and detail. Fully prefabricated DE-LUXE kits containing all hardware, transfers, etc.

S.E.5A 22" span price 33/-

Suitable for 1 to 1·5 cc front induction engines. Winner of the 1960 BRITISH NATIONALS scale event.

HAWKER TEMPEST

Super scale model for 2·5 to 5 cc engines.

26" span price 49/6

HURRICANE

24" span price 19/6

Takes 1 or 3·5 cc engines.

24" span price 19/6

Me 109

Takes 1 or 1·5 cc engines.

MOSQUITO

36" span

price 25/-

For TWIN 1 or 1·5 cc engines.

SPITFIRE

24" span price 19/6

Takes 1 or 1·5 cc engines.

Ideal for combat, sports flying, etc.

RUBBER POWER

TOO NUMEROUS TO LIST, these include scale, semi-scale and duration types . . . nearly fifty different models from 4/6 to 16/9. Full details in the FROG KIT leaflet.

GLIDERS

PETREL

Tip dihedral for maximum stability.

Span 33".

price 9/11

a model with an outstanding performance.

VENTURA

Modern high-performance sailplane with exceptional stability.

Span 42".

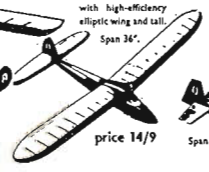
price 17/6

DIANA

Cabin type sailplane with high-efficiency elliptic wing and tail.

Span 36".

price 14/9



WREN

Attractive twin fin miniature sailplane, featuring exceptionally easy construction.

Span 25".

price 5/11

SLINGSBY SKYLARK

sailplane noted for its high performance and stability.

Span 27".

price 4/6

VESPA

Semi-scale cabin sailplane, lightweight construction for long flights.

Span 30".

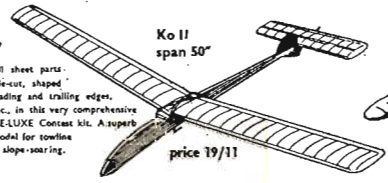
price 8/6

Ko II

span 50"

All sheet parts die-cut, shaped leading and trailing edges, etc., in this very comprehensive DE-LUXE Contest kit. A superb model for towline or slope-soaring.

price 19/11

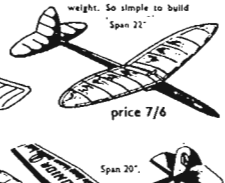


CLIPPER

Simple, rugged construction with strength built right into the design without adding excess weight. So simple to build

Span 22".

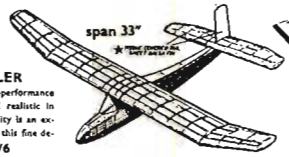
price 7/6



RAMBLER

Simple-to-build high-performance glider . . . stable and realistic in flight. Towline stability is an exceptional feature of this fine design.

price 6/6



JUNIOR SAILPLANE

Realistic scale appearance with short-coupled fuselage and double-taper wing.

Span 20".

price 3/6

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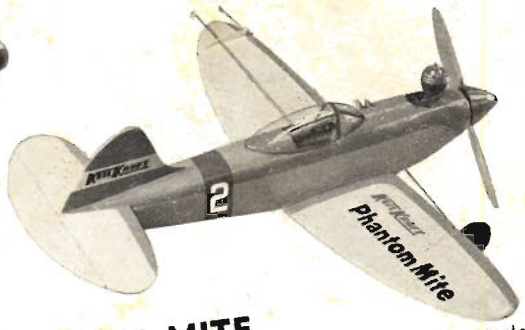
For L flyers *and* experts – the BUY word is KEILKRAFT

There are over 100 models in the KEILKRAFT range — models to suit every taste and pocket. See them at your local model shop.

22" Span RADIAN stunt model

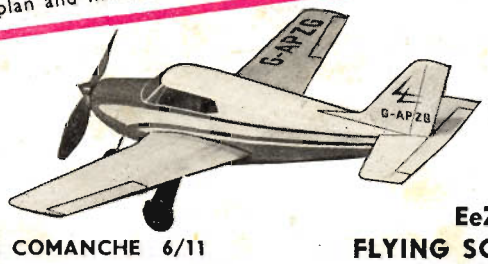
with coupled wing flaps and elevators

The latest thing in small stunt controliners for 049 motors. Kit contents include die-cut parts, stunt tank, preformed U/C, formed canopy, all hardware, full size plan and instructions. **19/4**



PHANTOM MITE

The Phantom Mite is just about the toughest model available to the newcomer to control line flying. Features all sheet construction with wings, tailplane, fin and fuselage sides ready cut to shape. For .5 to .3 c.c. motors. Wingspan 16 in. **16/3**



PIPER COMANCHE 6/11

CESSNA SKYLANE 6/11

EeZeBILT FLYING SCALE MODELS

(RUBBER POWERED)

Kits feature ● Die-cut parts printed in colour ● Plastic prop ● Preformed undercarriage ● Full size plan

SUPER SCALE

FOR THE CONNOISSEUR

40" PIPER SUPER CRUISER 27/-

These are without doubt, the finest scale model kits available. Ideal for .5 c.c. diesels and .8 c.c. glow engines.

40" LUSCOMBE SILVAIRE 27/-

SUPER SCALE KITS FEATURE

- Authentic plans prepared from manufacturer's own works drawings. Lavishly illustrated leaflets.
- Plastic cowls, shaped windshields, all metal parts, ample sheet and strip, tissue, cement, etc.

36" CESSNA 170 27/-

- Crashproof one-piece wings — held by internal bands. Detachable tail surfaces and wing struts.
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- Dural U/C in the case of Cessna 170 and Luscombe Silvaire.

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MODELS THAT REALLY FLY