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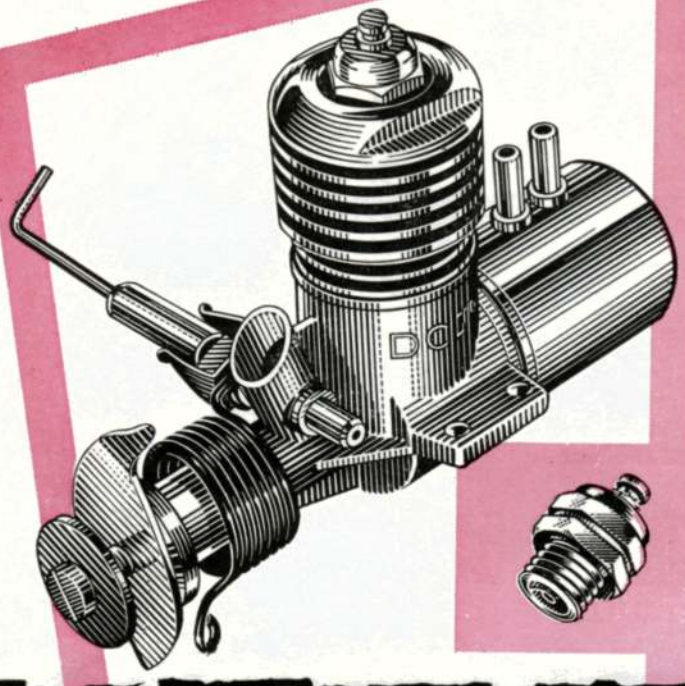

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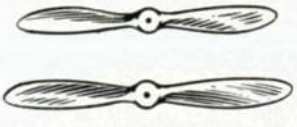

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AERO MODELLER

MAP HOBBY MAGAZINE

February 1963

VOLUME XXVIII No. 325

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cover

Conversions from standard American Guillow kits, Ken Willard's Spitfire and S.E.5a make most attractive radio control subjects. Pages 70/71 give Ken's details of how to modify the similar AEROMODELLER Plans Service designs for the same aircraft, using single channel radio control. Note Ken's multi purpose transmitter on the left of which is mounted a "Pulsi-tran" pulse control box and on the right, a Cod-a-matic box for selection of compound escapements. These are fitted to a standard C & S Falcon tone transmitter with normal push-button control for non-selective operation.

other modelling angles . . .

Radio Control Models and Electronics for February carries details for Scale enthusiasts who will appreciate the "*Miles Monitor*" on the cover. An *R/C Police Car* offers something for vehicle modellers, and a selective filter switcher makes an extremely simple and most useful constructional item for converting single channel receivers to simple multi- or providing "two up" operation. *Reeds* are simply explained and construction of a reed bank should encourage those with a little mechanical ingenuity. For the boat enthusiast there is an automatic recovery system and some theory on hull design. A swept wing "X.10" as flown by E. Corghi, offers a 3-view subject, *Metz* 3-channel equipment forms the subject of a test report.

Among other features in February *Model Maker & Model Cars* there will be a working *keel-boat* (drifter type fishing vessel), full plans for a winter-evening model that will also hold cigarettes, miniature ship modelling, drawings for the *Porsche* 2L 8-cyl. Sports Coupe and the 3.3L *Bugatti*, and many others to provide another interest-filled issue.

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next month . . .

Tail first models have often been considered somewhat of an oddity. Gradually, the **Canard** is becoming accepted as a satisfactory layout for competition purposes and **full-size plans** for a 27-in. span, high performance, Canard model for small engines will be included in March AEROMODELLER with the background story by designer Jim McCann. **Model Rocketry** has been going on for many years in overseas countries and at long last is receiving international recognition. Details of progress overseas will be the subject of a fascinating feature, adding further scope to the range of aeromodelling interests. **Adhesives** are a very "sticky" subject these days. They range in character from the old style liquid glue through to the latest epoxy resins. An explanatory article gives the whys and wherefores of adhesives as they concern the aeromodeller. These and many other varied articles will be included in March edition—out on **February 15th.**

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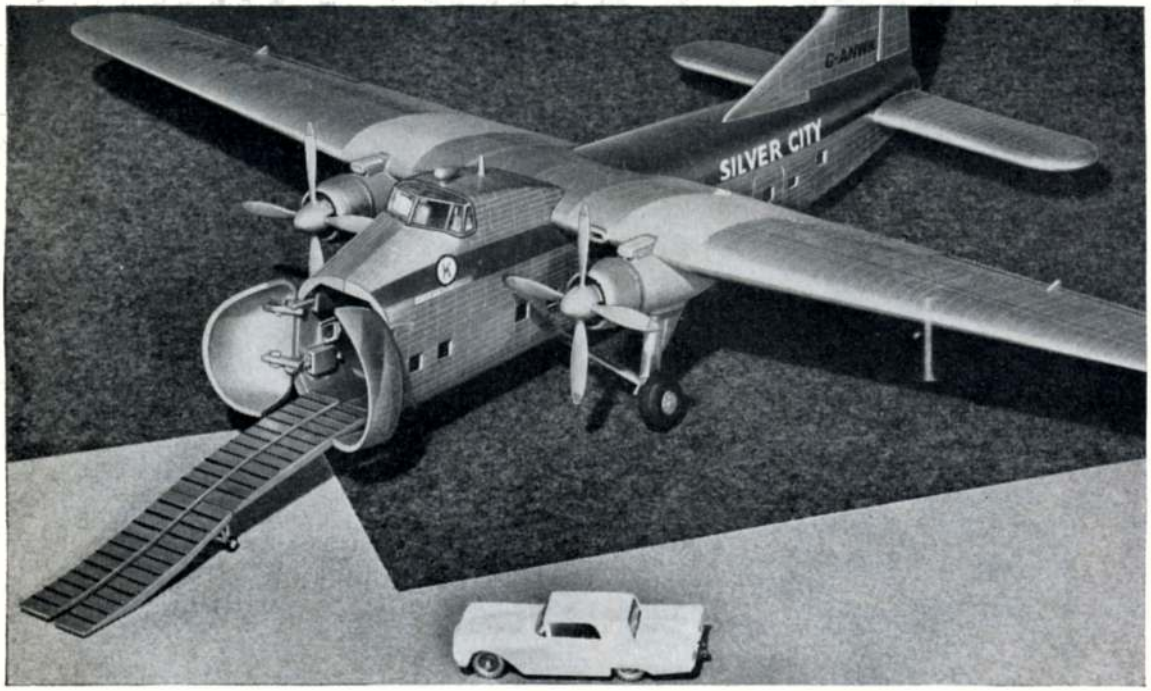

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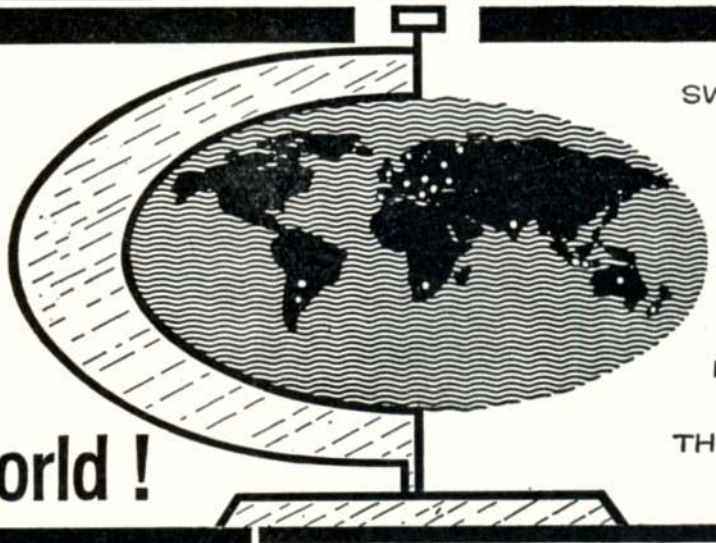

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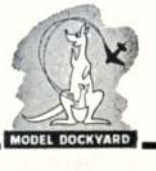

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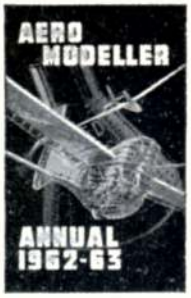
AEROMODELLER ANNUAL 1962-63

This is the fifteenth annual appearance of this ever-popular volume. Cover shows man-powered Puffin against the starry sky and space capsule Friendship VII. Articles include electric free flight power, man-powered experiments, attache case models light weight rubber, theory facts and fallacies, control surfaces, anti-warp methods, Italian Schneider Cup models, R/C prototypes small transistor R/C receiver, plus a wealth of model plans from all over the world, fully dimensioned, engine analysis, contest results, etc., etc. 160 pages, size 8½ by 5½ in., covering the world of aeromodelling, printed on high quality gloss paper with modern colourful board cover. **10/6**



CONTROL LINE MANUAL

Our most ambitious publication for very many years, this new book bids fair to be the most sought after of its time. Only Ron Moulton has the background of experience in this subject right from the start of the hobby (he introduced it to Great Britain!); the valuable contacts with American pioneers and leading present day exponents and manufacturers; the up-to-the-minute knowledge of all that is best and new in the hobby. 216 pages size 8½ by 5½ in., bound cover, gold blocked spine, three-colour dust cover, over 300 diagrams, sketches, photo - illustrations, 74,000 words of text. 15/-

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This is the famous book by Harry Hundleby which sold some 40,000 copies, and has now been brought right up-to-date in line with modern practice by Tommy Ives. It has been written as a practical guide to radio control for those aeromodelling enthusiasts who wish to make their first attempt at this fascinating modern medium. Bound in stiff card with two-colour photo cover, 96 pages size 8½ by 5½ in., profusely illustrated with line drawings; plus eight art plates showing equipment and models; appendices covering battery equivalents and sockets, colour code for resistors and capacitors, etc. **6/-**

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HEARD at the HANGAR DOORS

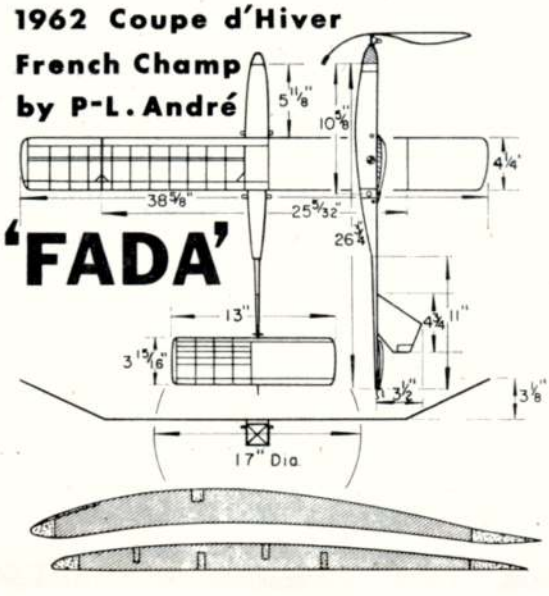
A new control line circuit. With surrounding tall wire mesh protection fence and control tower for judges and officials, this circle at Sosnowiec in Poland was opened on October 4th for the Polish C/L Championships. It is permanently established for contest and sport flying.

Gone to Earth?

Activities of the Low Speed Aerodynamic Research Association (L.S.A.R.A.) have often been quoted in this magazine and their airfoil research work and published reports are highly regarded throughout the aeromodelling world. We were surprised, therefore, to have correspondence returned in recent weeks, from the previously known address. It appears that their last known address is now occupied by the *British Rabbit Council*. Far be it from us to suggest that the L.S.A.R.A. and B.R.C. should have related production rate or that we should expect to have a new breed—Laminar Rex (?); but if any kind soul in the once active L.S.A.R.A. could provide us with the address we would be happy.

Coupe d'Hiver Contest

An encouraging flow of entries for the 1963 Anglo-French challenge organised by AEROMODELLER and the French magazine *Modele Reduit D'Avion* gives us every hope of increased enthusiasm for the "Coupe d'Hiver" rubber driven model class. The event is open to all-comers in Great Britain and France and regulations are available from AEROMODELLER office free of charge. Entry is free; but flights must be made on either February 17th or February 24th.



This, therefore, is a *last notice* for intending competitors. The individual winner with the highest total flight score will be the holder of the individual challenge cup and the Nation which produces the highest score with its three leading competitors will hold the AEROMODELLER—*Modele Reduit D'Avion* challenge trophy.

Individual winner of last year's event was P-L André of France, with a perfect score of six minutes. He followed this victory with a string of successes in France, which have gained him a most honourable individual championship. He won the contests at Avignon, Valence, and Apt also with perfect scores and in the final contest on September 15th last year he was outright winner with a total of 348 seconds. His model, which is shown below left, has a rather unusual fuselage appearance with the rear motor peg almost below the wing trailing edge! Six strands of ¼ Pirelli, 1½ in. long, are given 460 turns for a 33 second power run, taking "Fada" up into a fast righthand climbing spiral. The large single blade propeller, carved from block, folds against the fuselage side and is 16 in. pitch. The fuselage has silk covering over 3/16 sq. longerons and the tail boom is made of solid balsa. Perhaps the details of this championship winning model, with its fine record, will inspire Coupe d'Hiver enthusiasts. Incidentally, a number of overseas modellers have asked us if they are eligible to enter the competition, which we regret to say is limited to British and French competitors. There remains the possibility of organising a universal postal competition. We would like to hear from all who are interested.

Lucky People

The Society of Model Aeronautical Engineers operated a pre Christmas lottery in aid of the International Team Travel Fund. Tickets were distributed to all affiliated clubs, country members and officials of the Society and although the response could not be said to be tremendous, there is at least a sufficient return to encourage further ventures of this sort in the future.

In consequence of the reduced support, prizes were proportionately cut, but even so Mr. M. Burke of Birmingham will be the fortunate recipient of 40 Guineas for his winning ticket. Other winners were:—

2nd G. Stewart (Henor) 20 gns.
3rd Mrs. Beryl Ivans (Walsall) 10 gns.

Five consolation prizes, each of 2 gns. were awarded to K. Briganza (Nantwich), W. Disley (Bolton), D. R. Dillon (Peckham), E. Cotton (Thames Ditton) and to the West Essex Aeromodellers—Lucky people!

†

C. S. Rushbrooke

IT IS WITH the greatest regret that we have to announce the death of our close friend and colleague C. S. Rushbrooke, always known to the aeromodelling fraternity as "Rushy". Following a collapse at his home on the evening of Boxing Day, December 26th, he died in hospital on January 3rd. His passing comes with tragic suddenness in his 57th year.

We shall miss him dearly. The caustic quip of disapproval which was his especial characteristic, born from a particular ability to foresee a fault, whether in model construction, typescript, artwork or policy, became a guide for ourselves and had similar effect in his many committee duties. His standards were the highest, and in the 22 years of his association with AEROMODELLER, as contributor with "Fancier" or "Moving Finger" as pen-names, as Editor, as Business Manager and Advertisement Director, his interest never flagged nor did he ever waver from his enthusiasm for the welfare of aeromodelling. His was an opinion to respect, however controversial it may have seemed at the time. On many occasions his (to use his own expression) *sticking his neck out* on a lonesome viewpoint won through in the end and was proved to have been the right course. He was a man of application to the job in hand. A "Rushy" produced scoreboard, contest organisation, or social function was something to admire for its perfection.

In aeromodelling literature, his "ABC of Aeromodelling" remains unmatched as a best seller with over 50,000 copies distributed. His collaboration in the production of the AEROMODELLER ANNUAL has done much to maintain its constantly ascending success. Nor can we overlook the fact that AEROMODELLER Plans Service was his idea and his origination, building itself up from humble beginnings over twenty years back to the vast plan range of today. This pioneering of a scheme which would boost the hobby was so typical of the man.

In pre-war days "Rushy" was secretary of the Lancashire M.A.S. and his drive and initiative built it into the largest in Northern England. He obtained an old hut from the A. V. Roe directors, rebuilt and decorated it with help from clubmen, then utilised it as an HQ on the flying field at Woodford. The Northern Rally, also his particular pre-war pet, actually usurped Manchester Airport at Barton! It was a tremendous stimulant for the relatively new hobby with balsa wood kit models. His organising work with the *Daily Dispatch* as sponsors of very large meetings with one-design simple models brought in many a new enthusiast.

Organisation was not his only activity of those formative years from '35 to '39 when aeromodelling began to boom. "Rushy" was an active participant with his name constantly in the results. In '36 he narrowly missed a Wakefield team place. In '37 he proxy flew Jim Adam's Canadian model in the Wakefield Trophy contest, in '38 he held the British Indoor duration record and in '39 he proxy flew H. Hill's glider in the King Peter Cup, to 2nd place in the British team. Rubber duration, indoor and beautifully finished scale models—winners of many Concours d'Elegance events, were his favourites and have remained so over the years. His first and only power model, a Tomboy—won the Bowden Trophy of 1954 in his only post war contest! It seems ironic that he had just prepared a loft workshop ready to relax with radio control in the coming year.

As delegate for Lancs M.A.S. he was involved with S.M.A.E. matters at an early stage and his abilities were soon recognised by appointment to the Council committee, a position he held for 24 years. His diligent services have included the duties of fund raiser (starting with the '39 Wakefield travel fund), scoreboard organiser, Records Officer, Vice Chairman, committee man for Finance, Radio Control and Indoor matters, Team Manager, Radio Control Judge, President of the S. Midland Area and for many years, Secretary of the Midland Area. In fact, the whole system of Area organisation was his conception which he proposed in 1939.

It was for his valuable services on behalf of the Northern clubs and the S.M.A.E. as a whole that he was elected a Fellow of the Society in January 1940. This was an honour which he always held in high regard. It became his personal challenge to execute the duties of a Fellow as he viewed them and there could not be finer eulogies for the manner in which he carried those responsibilities than in the International praise for his work at the Cranfield and Cardington located World Championships. His liaison with the Royal Air Force also resulted in those memorable National Championships at Waterbeach in '53, '54 and '55.

In recent years he was asked to represent New Zealand at the F.A.I. reunions, and such was the respect for his counsel, he was nominated for official duties on the International Radio Control Sub-Committee. His impartiality gave him the ideal temperament for judging and many is the hour he has spent with scorepad in all sorts of weather. This same capacity for good judgment led to his election as President of the Federation of Model Aircraft Manufacturers and Wholesalers for 1961, and it was largely his inspiration which led to the abbreviation of title to the Model Trade Federation with wider scope. He was currently the M.T.F. Vice Chairman.

Aside from all these modelling interests, he maintained considerable fondness for Caravanning. His immaculate van was to be seen at all model rallies, proudly displaying the annual pennants of the Hertfordshire Centre of which he was secretary. It was so typical of "Rushy" that few outside his immediate circle of friends in aeromodelling knew of this other responsibility.

As with his hobbies, so was he industrious in the office. We are saddened with a void that is hard to accept, and still find difficulty in believing that we shall no longer hear his cheery chuckle which greeted our arrival—for he was always first in at "38".

We know that all of his many friends throughout the World join us in offering deepest sympathy to his devoted wife Lily, daughter, Joan and son, Peter in their bereavement.

At top "Rushy" the aeromodeller, in the 1937 Wakefield trials at Faireys Aerodrome, Heath Row.

At right, "Rushy" the organiser committee man, Vice-Chairman and respected judge of aeromodelling.

COVER STORY!

How to have fun with small scale models and single channel radio control described by U.S. expert Ken Willard with his

R/C S.E.5a and Spitfire

ALMOST ANY SMALL free flight scale model which flies well, can readily be adapted to radio control. A much more challenging assignment is to install R/C in a marginally stable model, then control it by radio and keep it out of trouble.

The S.E.-5a, a beautiful free flight scale model, becomes a very docile and easy to fly R/C model when the equipment is properly installed. Exact scale dihedral and tail areas are quite practical.

On the other hand, the Spitfire, to exact scale, can be quite difficult as a free flight model, and requires both increased dihedral and larger tail area for reliable performance. Even with R/C installed it is still prone to spiral dive—so much so, that in my case it was necessary to remove the normal full throw escapement system and install proportional rudder actuation. Now it can be flown, but it's very much like balancing a pencil on one's finger. I recommend a little increase in dihedral—2° in each panel, and 10 per cent increase in tail area if you don't want to be constantly fighting off the spiral dives. A pulser control box has to be fitted to the transmitter for the system.

Although I used the *Guillow* kits for the basic structures on my S.E.-5a and Spitfire, you can easily modify the AEROMODELLER Plans Service designs to accomplish the same result.

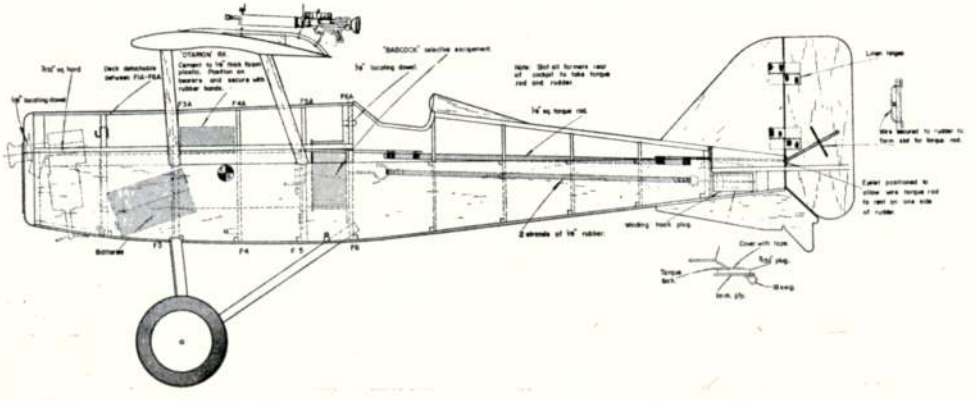
Perhaps the biggest problem in England is the availability of the small transistorized receivers that operate on a three volt power supply from two pen cells. However, they are almost mandatory for two reasons—*weight* and *space*. A third reason is that the simple wiring makes it possible to 'stuff' the radio and batteries in place with foam plastic and a minimum of additional structure. Fortunately, some of these small receivers are now available in England.

So, lets start with the APS S.E.-5a. Here only a few changes are required.

1. Extend the removable hatch from F3A back to F6A for easy access to receiver, battery and escapement locations.

2. Combine F6 with F5, locate at present F6 station. Make from 3/32 in. plywood with cut-outs as required to mount your choice of escapement. Also have cut-outs for the rear landing gear struts to move back and forth.

3. Cut out holes for torque rod through formers F8-F13. Location will depend on the escapement



Basic radio conversion is shown in this reduced scale view of the S.E.5a fuselage taken from AEROMODELLER Plans Service drawing FSP.682. This plan (3/6d. plus 6d. post) now gives all R/C details for the 1/12th scale 27in. model which takes .5 to .8 c.c. (.049 cu. in.) engines.

used. Align torque rod to go through the rear eyelet, in fairing block behind F13, which causes torque rod to come out along-side of rudder; either side is satisfactory. Thus, by bending the torque rod up rear of the eyelet, rudder action is achieved, the amount of rudder travel is determined by degree of bend. Hold torque rod to rudder with a retaining clip made of wire.

4. Cut out hole in bottom of F3 to allow insertion of batteries. Batteries butt up against F2 and are held in place by 'stuffing' with foam plastic.

5. Receiver (Otarion, Pioneer, C and S, or equivalent) can be mounted right on engine bearers, using ¼ inch foam plastic and snubbing down *gently* with rubber bands to reduce vibration.

That's about all there is to the installation. True, it will take some individual thought, cutting, and fitting to install the various shapes and sizes of receivers and escapements—but if you can build the basic model you certainly can figure out these minor details.

One thing—the batteries are taped together and connections soldered. This not only saves weight and space, but eliminates possible 'chattering' contacts of a battery box under vibration. You'll have to insert the batteries at an angle to pass them through the engine bearers, then twist them into position. You'll get the hang of it after a couple of tries.

The location is required because of the C.G. position. Run drain lines from fuel tank out through sides or bottom with tube extensions. This will keep fuel off the batteries and prevent it from soaking into the foam plastic stuffing.

As for flying, it's easy. Adjust your S.E.-5a to fly in neutral rudder as any sport free flight. For the first R/C action bend the torque rod to yield about 5° rudder movement (it's a *big* rudder). After you've become familiar with the model's reaction to rudder, you can increase the rudder action for more violent manoeuvres if you wish.

Spitfire R/C Mods

Now for the *Spitfire*. The actual modification is simple. It's the flying that's tougher.

1. Extend cowl hatch back to forward edge of windshield. Add former F3A there to fit contour. Glue ¼ inch dowel in place as shown to hold rear of hatch in place.

2. Make a 'radio equipment tray' form 1/16 inch plywood to sit directly on the engine bearer, where it can be anchored with a couple of small wood screws in each bearer. A hole through which the proportional magnetic (Septalette) actuator can be inserted and then glued in place can be cut by starting with a slot to permit the crank axle to slide through then tailoring the hole for a close fit.

The radio receiver can be mounted to the tray by attaching a thin sheet of foam plastic to the base of the receiver (1/16-1/8 inch thick is enough) and then gluing the unit to the tray. Contact cement will do the job.

3. Again, for space reasons, a 'battery pack' is used. However, the battery drain with the magnetic actuator is somewhat high, so make several packs, with a quick disconnect plug (you can use twisted wire, *firmly* joined, in an emergency) and hold the batteries to the tray with either tape or rubber bands. Former C1 will prevent the batteries from sliding forward in hard landings.

4. Add a cross member F4a to house the forward bearing of the torque rod. This can be of ¼ inch balsa with a small eyelet for the bearing. Cut a recess in the bottom which will permit the actuator crank arm to move freely, but limit the travel to 37½° in either direction.

5. Substitute rudder for one with 1/16 inch sheet either side of 1/16 inch square ribs and hinge to fin post.

6. Install the torque rod similarly to the method used with the S.E.-5a.

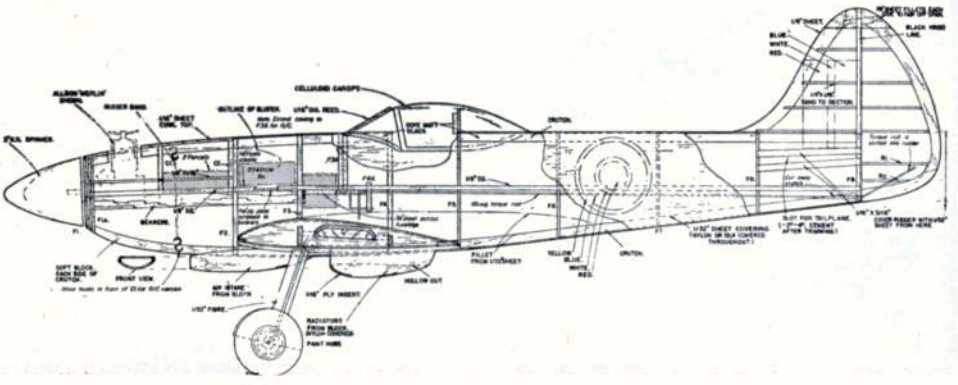
7. Cut away part of elevators at centre to allow more rudder action. This is necessary only if you use scale dihedral and may need extreme rudder action to keep out of spiral dives.

So now you've installed the radio and are ready for test flights.

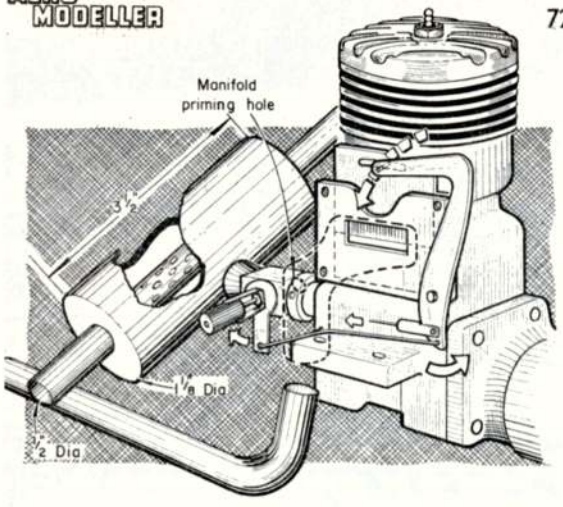
Unless you want to live dangerously, I suggest you use the 'high power' 2¼ inch dihedral—maybe even 'fudge' a little when you cut out the tail and add area. And—unless I miss my guess, you'll probably add a couple of degrees downthrust before you're through with adjustments. Find some tall grass for those first flights, like I did.

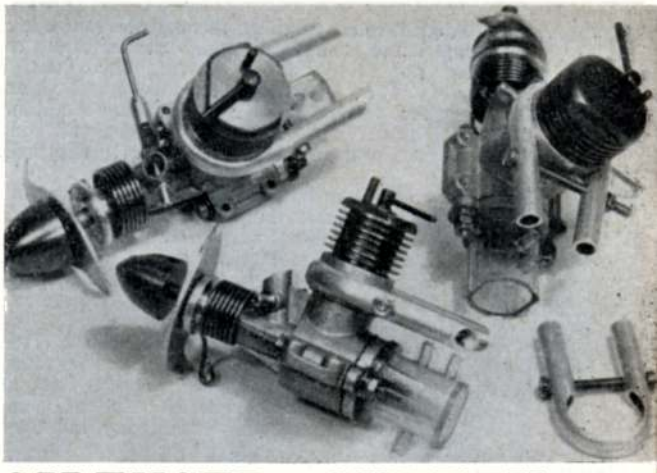
With the proportional system you can use as much rudder as required. I suggest that you keep the model out of tight turns because the speed can build up to the point where the airflow 'streamlines' the rudder even though full movement is commanded—and SPLAT!

Finally, in case you can't acquire the proportional system, then with only minor changes you can install an escapement—like in the S.E.-5a and in this case *be sure* to use the higher dihedral, larger tailplane, and about 15° of rudder travel, and you'll have a hot but flyable Spitfire. And let *me* tell *you* from experience it's one of the most exciting models to fly that you'll ever build. Good Luck!



Undoubtedly the apple of many a modellers' eye is an R/C Spitfire. This conversion of existing AERO-MODELLER Plans Service design FSP.607 (4/6 plus 6d. post) makes the dream possible with single channel control, proportional systems preferred. This is the Spitfire LF XIV, wingspan 26½ in. for .8-1 c.c. (.049 cu. in.) engines.



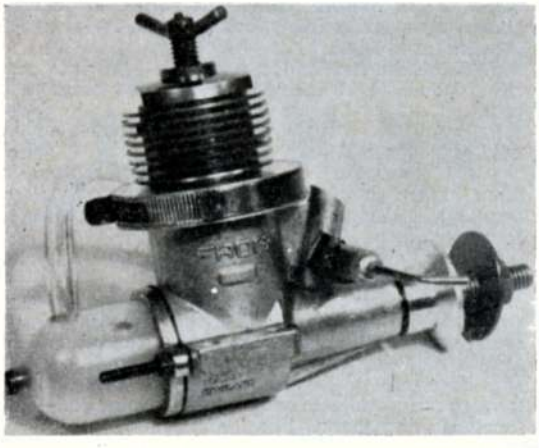


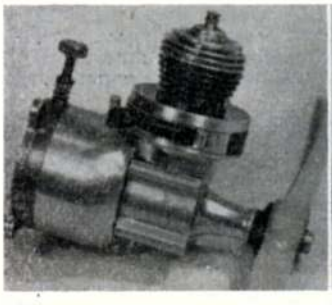
SILENCER SURVEY

"That man's silence is wonderful to listen to," so spake Thomas Hardy. Our long campaign to preserve good relations with the general public seems at last to be bearing fruit following a survey we have just made of the model engine market and prospects for silencers.

It is quite evident that unless the means of silencing model engines is provided, many flying facilities will be lost. Moves are being made within official modelling organisations to encourage manufacturers in the production of silencers and many of them are anticipating official regulations as can be seen in the illustrations on these pages.

The most annoying aspect of model engine operation is the continual high pitched note, especially in the case of radio controlled and control line models. The silencer's first duty should be to reduce the noise level of the note without introduction of peak pressure on the exhaust system and consequent loss of power. There are many methods of approach. It is simple enough to completely block off the exhaust





Top left, Rogers-McCoy 60 with guillotine exhaust throttel coupled to carb: and car type sound absorption silencer unit which plugs on manifold (see picture opposite). Top right; Davies Charlton Merlin, Spitfire and Sabre with ingenious steel wool packed tube wrap, soon available. Simple and very effective, with little power loss (less than 3 per cent.). Left: Frog silencer to fit the 100, 149 and 150 types at 7s. 6d. adds to their already established 3.49 unit. Closes off completely to silence, as also with Cox unit below it, seen on Golden Bee .049. Box jacket fits all reed valve Cox engines, has ratchet set spring steel control band, loses approximately 8 per cent. power when closed

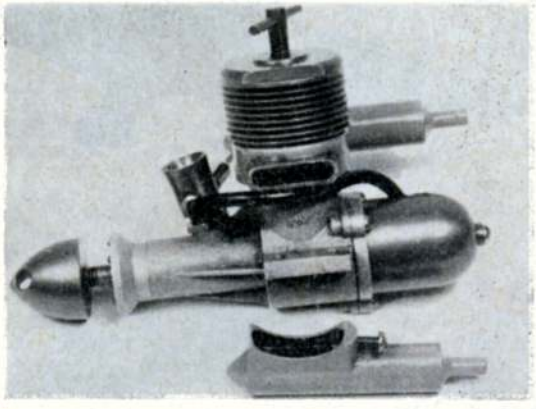
Left: the Fox Silencer is a simple casting, can be filed to fit range of engines, has pack of slotted bars to vary silence and power loss effect.

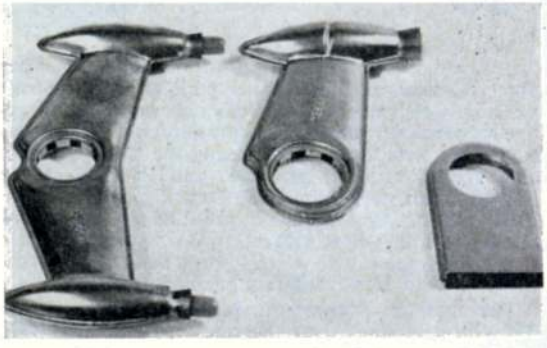
Above: the latest Graupner silencer is for the Zyklon, to be added to their range soon. Should also fit other engines.

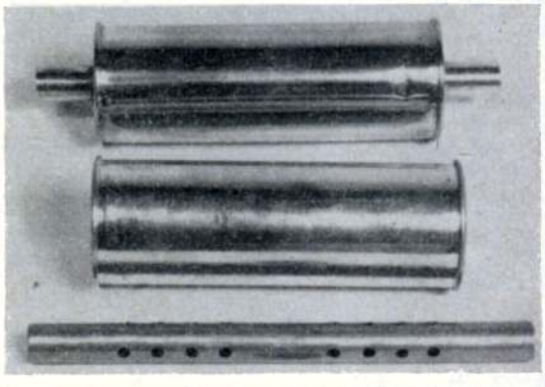
Introduced in 1947 for Ohlsson 60 and Super Cyclones, the Mart-Lee Muffler was 13 in. long, 1 in. dia., steel wool packed with saw cut outelts. Held to engine stack with lugs on fuselage. Right, the Marown Snipe and b r n silencers will be sold in pairs for about £1. Most efficient of all units tested, they take off less than 200 r.p.m. in 10,000 and reduce noise level to a low hum. Below is the range of Graupner silencers introduced for the Hurrikan, Rasant, Tornado and Blizzard in '59; neat, light and effective

within a box as can be seen in the *Cox* and *Frog* units; but this is executed at some sacrifice of peak power, and the silencer is only effective when the box is completely shut. *Fox* provides an ingenious casting with a stack of bars, each of which permits the gas to escape through narrow slots, which takes the peak off the note without destroying too many r.p.m. *Davies-Charlton* use one of the most ingenious and simple of all systems with a tube wrap plugged by steel wool. Again, very effective. In the *Veco* and *Graupner* Silencers there are simple expansion chambers, which serve to redirect the gas flow and absorb the noise resonance. *Marown* and *Birchington Engineering* introduce the double barrel sound absorption silencer, which has very little affect at all on power for the most effective form of silencing. Others, which we have not illustrated and are yet to come, include the *OS Jetstream* small and large sizes scheduled to fit the full range of the glow plug engines. *E. D. Engineering and Electronics Ltd.* supply their 1cc *Cadet* with effective silencer already fitted. Their 10 cc engine will be similarly equipped. *Merco* have field tested their unit to full satisfaction. Then there is the wide variety of home constructed units, in particular the *Rogers-McCoy* 60, which is illustrated as a fine example of how to retain an exhaust throttle with silencer stack.

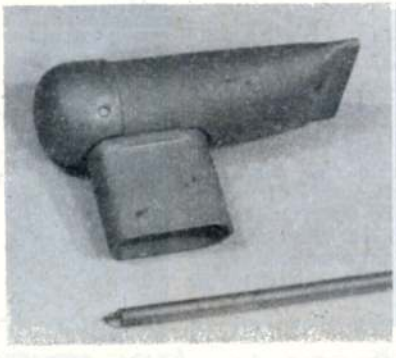
K & B, Super Tigre, Eta, Veco and many others have the silencer problem well in mind, so the outlook for future public relations is decidely more encouraging than in the past.

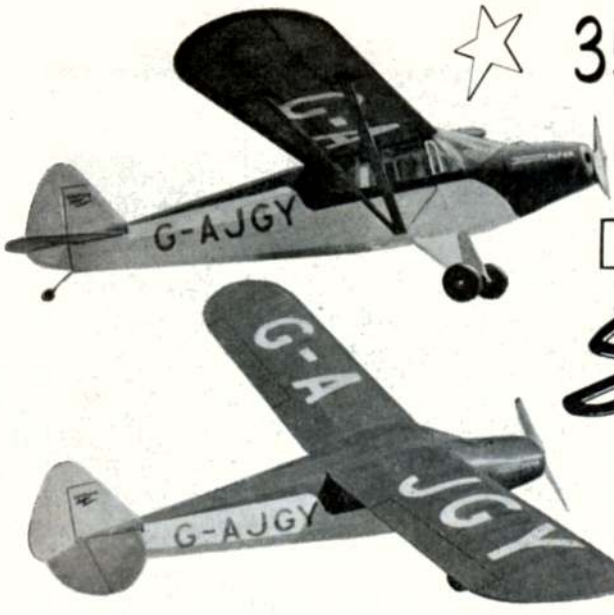






Remarkably cheap at 4s. 9d. each, the Birchington Engineering silencer at right is limited to diesels because of soft soldering and larger aircraft, or boats due to the weight. Centre holed pipe has a blanking plate so that gases are forced into expansion chamber so reducing noise considerably without affecting power. Ideal for the Taplin Twin, and very useful as a sludge collector to keep a model cleanly quiet. Weight is 3¾ ounces. Below left is the Rogers-McCoy 60 with exhaust stack fitted, see sketch opposite and at right, an early Veco silencer, located in a U.S. model shop, which fits engines like the Enya .09 shown. Spring retains the unit to the cylinder. Silencer can have steel wool packing or operate as a simple expansion chamber. It is an ingenious example of press tool work





35" span free flight scale model

PIPER CUB Super Cruiser

— for ·020 cu. in. or ·5cc

by D. E. GARRETT

ALTHOUGH NO LONGER in production, the Piper Super Cruiser remains a very popular light aircraft and one which offers the aeromodeller a most attractive subject of ideal scale proportions. Prototypes have been tested in America using the Cox .020 glow plug motor, radially mounted, and in England by Bill Newman, using the D.C. Dart .5 c.c. diesel with beam mounts. The model Super Cruiser has turned out to be a first-class subject and, with its near scale type construction, will offer a most distinctive appeal to those who like realistic modelling.

The fuselage is constructed by first pinning down the ¼ in. keelpieces over the side view—formers 1-10 are then erected (excepting those with letter suffixes —e.g. 3A, 4A, 5A, 7A, which are added in one piece at later stages), making sure to keep them vertical and properly aligned. When joints are dry, 3/32 in. sq. stringers may be added in place along with ¼ in. SK. When this assembly is complete, locate carefully the 3/32 in. window frame and glue in place.

After the port (left) side has set, remove from plan and add right side half formers and cross braces 5A and 5B. Before adding stringers on the starboard (right) side, install the undercarriage, by binding to 4A which is one piece, and the tailwheel. The piece SS is a stop for the adjusting tail, so line up sides carefully. When the tail is down on SS, there is 3° negative incidence. The notch in the tail post should be a good fit, not loose. A 3/32 in. dowel on the tailplane fits into the notch, and acts as a pivot for the tail. The ¼ in. sheet root ribs K2 can be added at this time. They are surfaced later by 1/32 in. ply facing ribs.

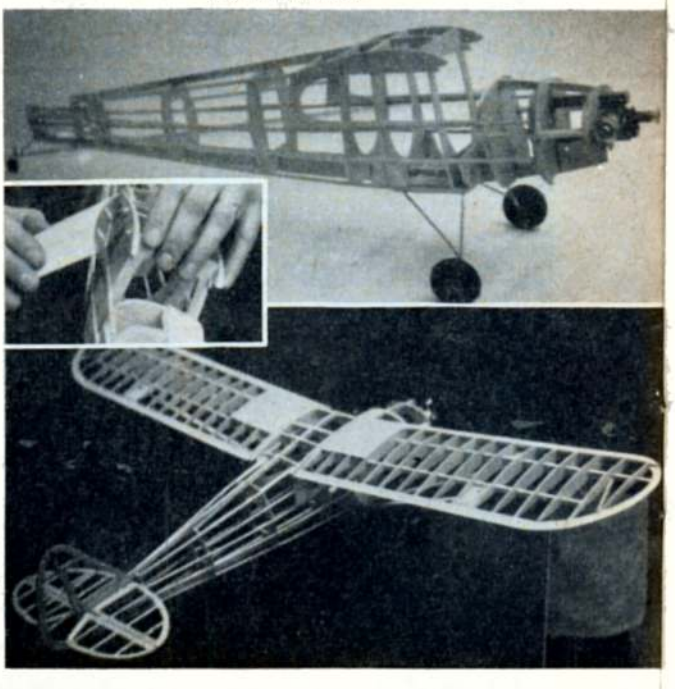
Before planking the nose, install the model engine fuel tank and a timer if needed. On one original model a Tatone ½A timer was installed and the tank placed under the windscreen, with the filler tube coming out through former 2, and curving upwards. The overflow tube came out the bottom of cowl as shown on the plan. An extension arm was fitted to the timer and this extends out of the left side of cowl. An access door was provided on the right side of the upper cowl between 1 and 2 to allow timer to be set. The nuts for the engine bolts were soldered to a tinplate "staple" and embedded and glued to the back of former 1.

The "tunnel" shown on the plan allows exhaust and excess oil to pass from the cowling area. The carved block cowling may be cut for access in the manner of your choice.

The tail surfaces are of simple construction. The wires are used for a scale separation in the surfaces as well as providing trim. The fin base is the upper stop for the tail, and should be cut accurately. When tail is up tight on the fin base, there is 2° positive incidence. The surfaces have rounded edges, with the control sections having a slight taper. Filler blocks used on the fin as shown by the asterisks. Glue the brace wires (linen thread or nylon) to fin and fuselage only.

The tail adjusts in the following manner. The centre piece contains a slot in its forward edge, and a smaller space in the rear. The dowel which com-

Finished model in British markings and constructional shots below, showing wing fixing (inset) are of British test version made by Bill Newman of Harlow.



prises part of the structure fits in the notch in the tail post. The forward slot rides up and down on the vertical piece of ⅛ in. x ¼ in. at the rear of the fuselage and this should be a firm fit—not loose!

The degree of trim is obtained by the following method: To obtain 0° incidence, insert a piece of 1/16 in. sq. *over*, and a piece of 3/32 in. sq. *under* the tailplane. When this 0° point is located, mark lightly on the model surface for future reference. From this point one can adjust trim to suit model requirements. The two "inclined planes" provided will give ample range of adjustment. Allow enough length on the packing strips to adjust easily, and, when final trim is formed, trim and glue the tailplane in place.

The wing is made in two panels, Newey dress snap fastened to the fuselage, and held at proper dihedral angle by the struts. Pin the spars and trailing edge down over the plan and add the ribs, checking WR angle with the dihedral gauge before the cement dries. Add the upper spar. Fit the 1/16 in. sheet centre section while still pinned down over the plan.

When the panel is dry, remove and add the leading edge with 1/32 in. sheet covering. Do not add the ply face ribs yet.

The struts are built of 1/16 in. sheet to the outline shown. Each strut is made in halves, with 20 s.w.g. dia. wire glued well between. When dry, sand to symmetrical section. The strut fittings are wound lengths of 20 s.w.g. soft wire, subsequently firmly attached at the fuselage and wing points.

Snap fasteners and strut fittings are fitted at this time. Cut four 1/32 in. ply ribs to outline PW. These ribs should have no notches and should match wing and fuselage roots exactly. Separate ply ribs into pairs and tape together.

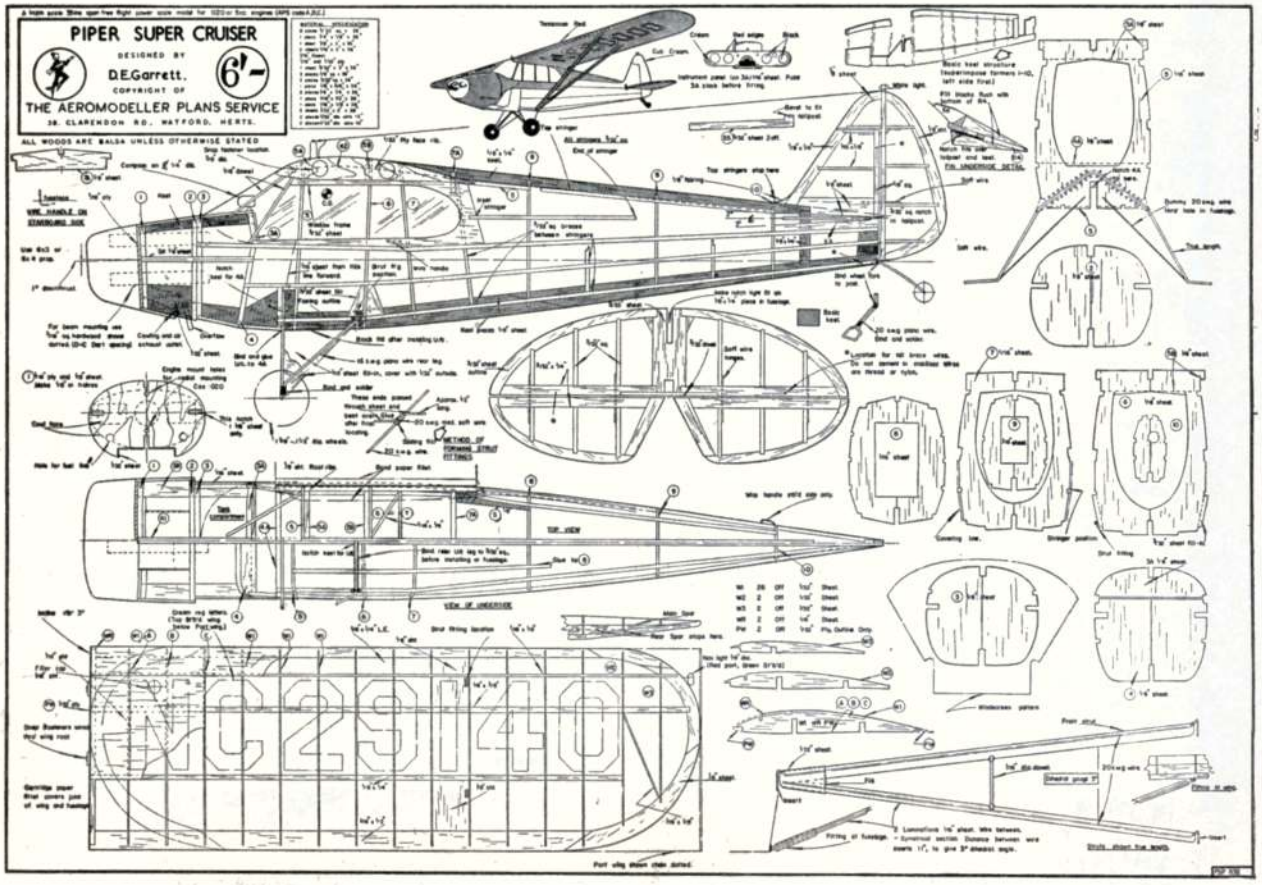
Drill a small hole in the centre of the circle formed by the maximum diameter of the snap fastener. Glue one rib of each pair to fuselage wing root ribs K2. Insert a pin through the studs of the fasteners, pass the pin through the hole drilled in ply rib, and through the root rib, glue stud in place, leave to dry well, then remove locating pin and pass fine wire through holes in fastener, clinch, and glue well.

Snap female part of snap on to the stud on the wing roots, then glue them to the other two ribs remaining of each pair. When cement has set, unsnap the rib from the fuselage and glue ribs to end of wing panels, pass wire through wing parts in the same manner as fuselage roots.

To engage wings, slip struts into each wing fitting, engage strut to fuselage, and then snap wings in place. While wings are on the model, cement the cartridge paper fillet to the *fuselage* only. When dry, remove wings.

The model was finished with two coats of clear, three coats of colour with a cream fuselage and fin, red wings and tail. Registration letters are in cream on the wings, red on the fuselage. British registration is G-AJGY over the same basic Piper PA12 colour scheme known as Tennessee Red and Cub Cream. **The trade name transfer appears on the fin and is** identical to the heading title of this feature.

FULL SIZE COPIES OF THIS 1/5TH SCALE REPRODUCTION ARE AVAILABLE THROUGH A.P.S. AS FSP832 PRICE 6/6 INC. POSTAGE.



World News

Above left, although an overshoot, this spot landing attempt by Ing. Dettelbacher from Klagenfurt, *Austria*, with his Metz 3 channel scale "Mucha-Standard" glider, makes an impressive picture over the centre cross. Taken during a contest at Lienz, Austria, picture also shows typical use of wing flap spoilers used for landing these models. At right is an "Orion" A/2 glider, flown by Liem Goan Tan of Pasuran, *Indonesia* in the international postal contest held with Timperley D.M.F.C, in September. This model was one of the best finished in the Indonesian team, using imported tissue covering, unlike the rest of the models which had to employ local paper

TEN FLIGHTS ARE retained in the Swiss national competitions, also used for international team selection. The event is held over a late Saturday evening, and an early Sunday morning flying session in order to capture best weather. Naturally enough in sheltered **Switzerland,** it was very calm and standards high. E. Eng, (see picture opposite page), led power, dropping only 18 secs. in a 30 minute total target, C. Riva won A/2, only 20 secs. short of a perfect time, and it is interesting to note that even down to 5th place in A/2 glider, the time was only short of a full ten maximum score by 94 secs. Wakefield, usually the better scoring event, has always been a weak point in Switzerland, this time won by R. Rothenbuhler with 1,614 seconds. World champion Fritz Schneeberger had misfortune in power through time trouble and scored three zeros—it can happen to the best of 'em!

Championships also took place in November over in **Japan.** S. Kawasaki leads A/2 with 678 seconds and confusion is bound to arise now that H. Ono is the power champion (637 seconds) and T. Ono the Wakefield champion with 833 seconds.

The Third International Dolomite Cup was held in Lienz, **Austria,** in late September, over the new asphalt landing strip specially prepared for model flying. This is almost triangular in shape, varying in width from 10 to 25 yards over a length of 75 yards. While there were 40 competitors in each of the single channel power and glider events, there were only four multi-channel competitors. Many beautiful gliders were to be seen, especially those from Klagenfurt, including the one in the picture above, left. Some were more than 10 ft. span and all scale or semi scale. Nevertheless the winner used a model now 12 years old, subsequently adapted for radio control. Among the trade demonstrations, which were made during the opening ceremony of the new landing strip, was a *formation* flight by two Mu 118 motorised gliders from the local club at Lienz.

Very high times were made at the location for the 1963 World Free Flight Championships at Wiener-Neustadt, Vienna, Austria, when the Austrian Championships were held. Full maximum scores were registered in all the three free flight successes and particular merit should go to Vaclav Horcicka, who was the winner of power, 2nd in A/2 and also 2nd in Wakefield. Looks as though he is likely to be a busy man next August!

International postal contests are always a pleasure to organise and we are specially pleased to see most distant clubs getting in touch with one another to exchange information and progress with their aero-modelling through competition. Timperley and DMFC competed with the Persatuan Tjinta Angkasa club in **Indonesia** in late September. Classes flown were A/1 and A/2 glider with Timperley taking both team places and from the extent of the individual reports received from both clubs, it is evident that everyone thoroughly enjoyed the event. A flight by flight, round by round report was exchanged by each of the club secretaries and this has probably done a lot to cement good relations across the world. Each club had its difficulties, but possibly Indonesia were most unfortunate as their ex-Japanese air strip (made during occupation in the 2nd World War), was blasted by a constant wind which destroyed some models even before they could be launched. Every detail is included in the Indonesian report, right down to the colouring of the tissue, types of design and material used, some of which is of the local available Meranti wood. Supplies are still very difficult to obtain in those parts.

A few details are now available of the equipment used by the power team who will represent the **U.S.A.** in 1963. In the Eastern zone, Jim Warnock, who was the only one to complete five maximum flights, uses a Cox Special 15 in a standard "Lightning Rod" design. He was chased along in his area by Tom McDonald using a Super Tigre and in 3rd place was Doug Joyce. We understand that Joyce, who comes from Reynoldsburg, Ohio, was a little unfortunate on this occasion, although he has racked up several other important successes with his design, the point being that the model in question is a *Canard*. A Cox Special 15 is mounted as a pusher mid-way between the wing and nose plane, giving a considerable unorthodox aspect which we shall be illustrating next month when AEROMODELLER will carry a special feature on the subject of Canard models, together with full-size plans for a design in miniature to take very small engines.

Over on the West coast the power eliminators were run in excellent weather for glow plug engines.

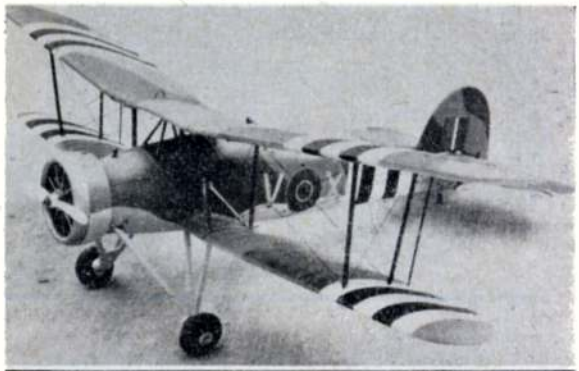
Several Cox Special 15's were tachometered at over 18,000 r.p.m. on 8 in. x 4 in. Top Flite nylon props. Van Nest had one turning 18,750 on home brew fuel. Doug Galbraith of Davis, California, "maxed out" as they say in the West, for the Western team place, with the model having the appearance of a *Spacer* and 12 degree downthrust for the Super Tigre 15. The same engine is used by Frank Spearman of Chicago, who uses a high aspect ratio model with high thrust-line. It seems that there is plenty of design variety in the U.S. team.

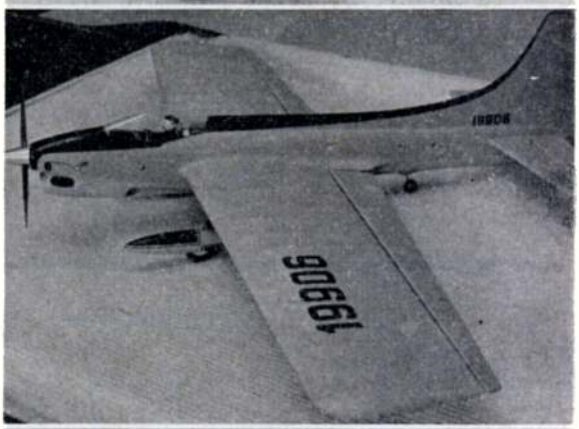
The marathon team racing craze, which started in **Brazil** now has an international aspect. In 1,000 lap marathon run by the Indiana M.A.A. at Muncie, Ind., U.S.A. Eighteen teams entered and the only tank requirement was for one pit stop, although some made as many as 18. The winning crew of Bob Pruitt and Dick Crawley made five stops over the distance, which they completed in 63 minutes 31 seconds with an Enya 29. At that stage they were 130 laps ahead of their nearest rival.

Another type of contest which is gaining international popularity is the "Old Timer" event. Chicago Aeronuts held theirs in October and others have been held in Canada and California.

A **New Zealand** indoor record for class 1 rubber microfilm models is claimed by Henry Grocock with 11 minutes 3.7 seconds using a 20 in. Gitlow design in a hall with a 22 ft. ceiling. Shows what can be done in a small space. We should like to hear of more of this kind of activity around the British club rooms this winter—makes an active change from the usual natter and gossip.

Indoor flying has at long last attracted interest in **South Africa.** "Let's do it again soon" was the verdict after the first contest held at the Hotel Cecil, which has for a long time been the meeting place for Cape Town aeromodellers. Western Province M.A.C. are using the 18 ft. x 18 ft. x 13 ft. room for small models, with designs like *"Soap Bubble," "Dinky Dip,"* and *"Parlour Mite."* Times are not terrific, but Geoff Brooke-Smith managed to average just on the minute in the restricted conditions for the first time out. We hope that this will encourage enthusiasm for larger models in bigger Cape halls Division between the radio control and other sections of South African aeromodelling is further emphasised by the separate national contests each to be held next Easter. Much as we old codgers dislike this separation of the "specialists"—it seems the idea has much to commend it.

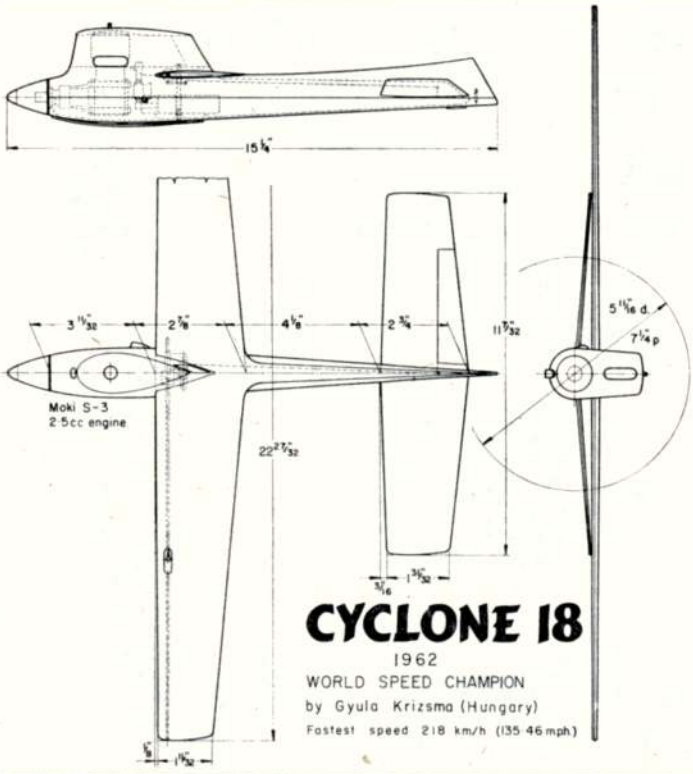




Top, Frank Palmer of Calgary, Alberta, *Canada* (whose "Pfalz D111" was featured in our December 1960 issue and is a popular A.P.S. design), added this superb Fairey Swordfish to his collection last year. Made rib for rib and spectacularly coloured with invasion markings, it is a ¼th scale stablemate for his "Pfalz", "Bulldog" and "Fury" and has been modified for single channel radio control. Next, is a *USSR* stunt model showing the typical and very attractive lines introduced by Sirotkin with a tall tapered fin, forward cockpit, fully enclosed cowling, with neat exhaust ducts, hatch for a balloon tank and racey spatted undercarriage. This one is called the "Carp" and the picture was handed to us by Kondratenko at the World Championships, Kiev. These Soviet stunters are not only elegant in appearance, but also have several constructional and design features, more of which we hope to give in a later issue of AEROMODELLER. A number of people have asked us who could have been the man who travelled direct from *Singapore* to the R/C Championships at Kenley to spectate. Our third photograph shows the man himself, Richard Tan, with his Frog Jackdaw. Richard is a most ardent R/C enthusiast also an airline pilot and currently engaged with the intricacies of Space Control and Orbit 12 channel. Bottom of the column is *Swiss* old timer, E. Eng with his Cox Tee Dee .09 (1.5 c.c.) F.A.I. power model, which leads the Swiss eliminators for the 1963 power team. In a series of 10 flights he dropped only 18 seconds from a perfect maximum score. Details of the Swiss events are given in the text

CONTEST DESIGNS

a further selection of outstanding models for your study



CYCLONE 18

1962

WORLD SPEED CHAMPION

by Gyula Krizsma (Hungary)

Fastest speed 218 km/h (135·46 mph)

Cyclone 18

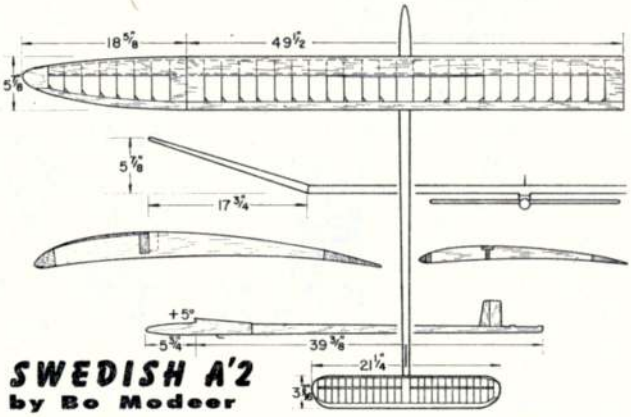
Gyula Krizsma's bright orange finished speed entry at the 1962 World Control Line Championships held at Kiev, capital city of the Ukraine, was outstanding for its clean-cut performance and "groovy" flying. The single control cable system is used only as a trimming device and it is not surprising that the Hungarians do not consider a modeller proficient enough for world championship speed events unless he has made over 200 flights, when one remembers Krizsma's performance. The achievement is all the more remarkable in that the model and the engine were made entirely by Krizsma himself, who is a leader of the Moki Institute at Budapest. To some extent the design is influenced by the Wisniewski model, first seen by Europeans at the Budapest International of 1960 and this is perfectly understandable since it was the American team which first emphasised the tremendous advantages of the single line system.

Two Dutch Stunters

Buffalo Bill by Willy van Dorp is a fast flyer of unusual appearance, which uses the Enya 35 engine, running two stroking at high speed through all manoeuvres and level flight. The general appearance of the model may supply a refreshing change of shape for those about to design their 1963 models. *Stiletto* by Paul Tupker, who is the secretary of the Hague M.A.C., is a more conventional type, using a Fox 35 and the normal technique of 2-stroke-4-stroke operation. Bob Palmer type tanks are used in both models and they are usually flown on the Heliport at Rotterdam.

Swedish A/2

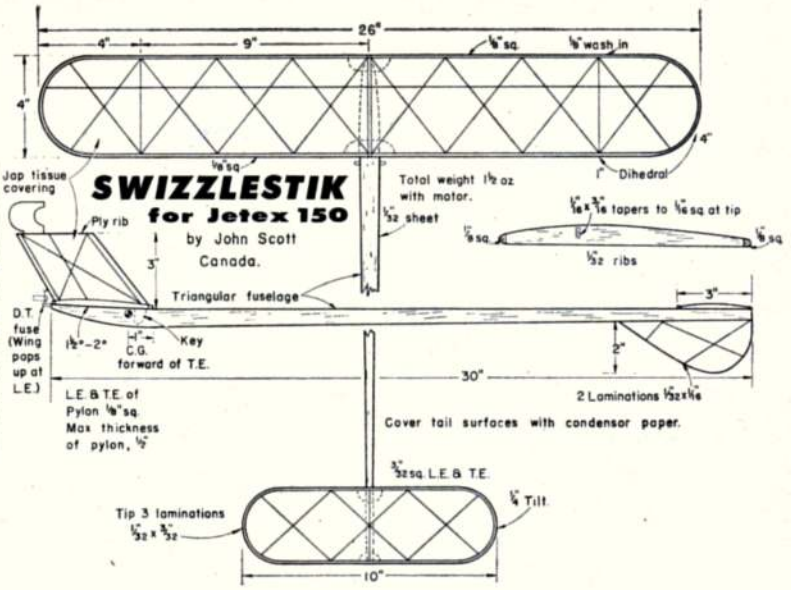
Bosse Modeer's latest A/2 design, which is known as the *Zirkonika*, is the current model in a long line of developed designs from this well-known Swedish flyer. Bo was right out of luck with the thermals at Leutkirch for the triple World Championships in 1961, placing 50th with three brief flights to spoil his record, but we are sure that the elegant proportions of his design will be of interest. The fuselage appears to be of the wound tube type and general construction simple in nature, with reasonably thick airfoil sections to accommodate spars of handsome dimensions.

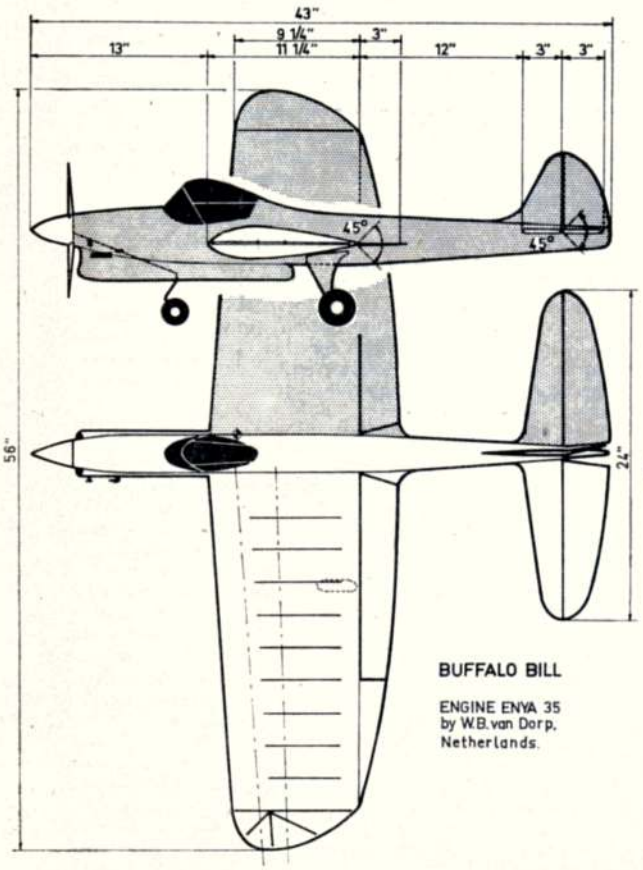


SWEDISH A'2
by Bo Modeer

Swizzlestick

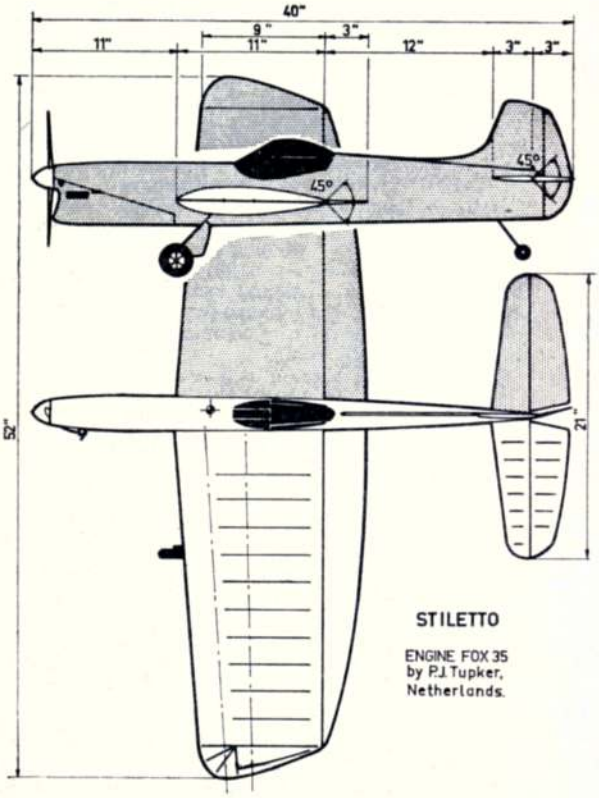
John Scott's design for the Jetex 150 unit, which is mounted with a high thrust line on top of the nose pylon, is created on the minimum weight for minimum size formula to obtain a maximum climb. In fact, *Swizzlestick* is said to climb as fast and as high as most of the .049 glow plug engine contest models. Unfortunately, there are very few contests for this type of model for it to be able to display its prowess, but on its last outing, it placed third in the American King Orange Internationals held at Miami, Florida. Even though there may not be contests for this type of design, we are sure that there are many Jetex enthusiasts who would like to try the layout for their own amusement and pleasure flying.





BUFFALO BILL

ENGINE ENYA 35
by W.B. van Dorp,
Netherlands.



STILETTO

ENGINE FOX 35
by P.J. Tupker,
Netherlands.

ENGINE ANALYSIS No. 105

COX *Special* 15

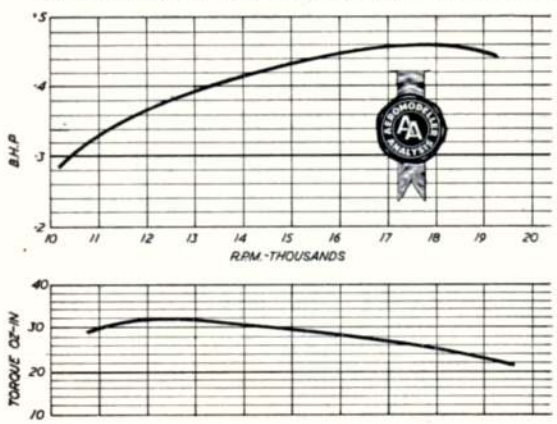
by R. H. Warring

THE COX IS a remarkable species of engine. Having arrived at a design layout which lends itself to exact scaling up or down to produce a whole family of sizes, each specific size then seems to lend itself to further minor variations, reflected in an appreciable difference in performance. Virtually, in fact, you get what you pay for. The more expensive the model in any particular size, the more powerful it is. Just where the extra comes from is difficult to detect, for workmanship throughout the range is outstanding.

The Cox Special 15 replaces the Tee Dee 15 (see AEROMODELLER, January 1962), which itself was an engine of outstanding performance for its size and weight, but suffered on the initial production run, at least, in having a cylinder with too thin a wall. As a result the cylinder was prone to crack between the exhaust ports, in line with the bottom of the ports. This was rectified by increasing the cylinder wall thickness quite substantially.

Despite its high speed performance, and a peak B.H.P. figure well in excess of 0.4 on heavily nitrated fuels, the Tee Dee 15 did not receive the contest honours one could have anticipated (particularly in the free flight field), which position the Special 15 looks like rectifying. It has already proved itself an outstanding unit at the U.S.A. 1963 F.A.I. power team eliminations. Although basically the same as the original Tee Dee it does give the impression of being a more rugged and contest-worthy engine, to say nothing of having found some additional power. The only major change, in fact, is the abandonment of a ball-and-socket con rod/piston assembly in favour of a more conventional gudgeon pin fitting. In other details, the comments of our January 1962 report generally apply.

The Cox Special is an out-and-out high speed engine. It is not happy on the larger propeller sizes, and even at 12,000 r.p.m. load-speed displays a certain reluctance to settle down. Starting characteristics, too, deteriorate at these lower speeds. But let it wind up to 17-20,000 r.p.m. with an 8- or 7-inch low pitch propeller and it becomes one of the sweetest running engines you could wish for, not particularly critical on settings and almost instant flick-starting, following a prime. About the only critical feature as regards handling is the fuel tank level for starting. Suction lift is relatively low when flicking over and the best tank position is just below the level of the spraybar. Gravity feed is not to be recommended as it makes it all too easy to flood the engine, especially if the battery is not right up to scratch.



Performance is noticeably improved running on high-nitro fuels and 30 per cent. nitro seems about the best selection for normal free flight contest work. Although shortage of nitromethane in this country has led to the virtual disappearance of commercial high-nitro fuels, Cox racing glow fuel (30 per cent. nitro) is now available in Britain—and at quite a reasonable price for this type of fuel, too—and is an ideal match. Performance is still good on standard Cox fuel (15 per cent. nitro), but definitely down (and high speed running less consistent) on straight fuels. Starting characteristics also deteriorate on straight fuels, although the compression ratio is high enough for running on non-nitrated fuels.

A 30 per cent. nitro fuel also gives a reasonable element life with the standard glow head. A new "*long life*" head has recently been introduced to fit the "15" (and also in other sizes for the 09 and 049), the only differences being that the element wire appears to be slightly thicker, and the actual machined surface of the combustion chamber slightly rougher (i.e. not polished as in the standard Special head). We noticed no difference in performance at all at low to moderate load-speeds (which in the case of the Special ranges up to some 15,000 r.p.m.!) but at higher speeds the normal head was worth several hundred extra r.p.m. Whether this was a characteristic of just the samples tried or not we cannot judge. Certainly, however, the "long life" element is much more robust and will stand up to a 2 volt accumulator for starting—provided the leads are not left on too long and the ac. is of reasonably small size so that the terminal voltage is pulled down a bit under load.

Performance we found to be quite markedly affected by weather. Initial runs in very cold conditions were somewhat disappointing, but subsequent runs in a higher ambient temperature produced outstanding results. By this time, too, the engine had received some 1½ hours running and although Cox engines are noted for their accuracy and are never "tight" even when brand new, performance does improve with about an hour's running time. The manufacturer's also make a special mention of "shellacing" or the formation of varnish-like deposits which can build up on the walls of the cylinder and contribute high frictional drag, although there was no evidence of this in our handling time, using Cox fuel throughout. The only time we experienced marked loss of power was in very cold weather, or when the cylinder has become accidentally unscrewed. It is relatively easy to loosen the cylinder

Specification

Displacement 2.449 c.c. (.1494 cu. in.)
Bore: .591 in.
Stroke: .556 in.
Weight: 4½ ounces
Max. power: .46 B.H.P. at 18,000 r.p.m.
Max. torque: 32 ounce-inches at 12,000 r.p.m.
Power rating: .185 B.H.P. per c.c.
Power/weight ratio: .102 B.H.P. per ounce
Material specification
Crankcase: machine from light alloy bar stock
Intake housing: injection moulded plastic
Cylinder: mild steel (integral fins)
Cylinder head: turned from light alloy (integral glow element)
Back cover: machined from solid
Crankshaft: hardened steel $\frac{7}{32}$in. diameter
Connecting rod: machined from light alloy (plain big- and little-ends)
Piston: cast iron special alloy
Propeller shaft: .161in. N.S.F. steel screw and spinner (turned from light alloy)
Venturi intake: machined from light alloy
Carburettor collar: light alloy (anodised gold)
Needle: steel (spring ratchet)
Propeller driver: machined from light alloy (anodised gold)
Manufacturers: L. M. Cox Manufacturing Co., Box 476, Santa Ana, California, U.S.A.
U.S. Retail Price: $14.98. Price in G.B. 146s. 0d.
British importers: A. A. Hales Ltd., Potters Bar, Middlesex.

Propeller—R.P.M. Figures

Propeller	*R.P.M.*
8 x 4 Trucut	17,500
9 x 4 Trucut	13,800
9 x 6 K-K nylon	11,800
9 x 4 K-K nylon	14,200
8 x 4 K-K nylon	16,300
7 x 4 K-K nylon	19,200
9 x 4 Top Flite nylon	13,600
9 x 3 Top Flite nylon	15,800
8 x 4 Top Flite nylon	16,700
7 x 6 Top Flite nylon	16,600
7 x 4 Top Flite nylon	20,000

Fuel used: Cox Racing glow fuel (30 per cent. nitromethane).

when removing the head soon after a run for instance, as the head-cylinder fit is very tight, due to the greater expansion of the aluminium head when hot.

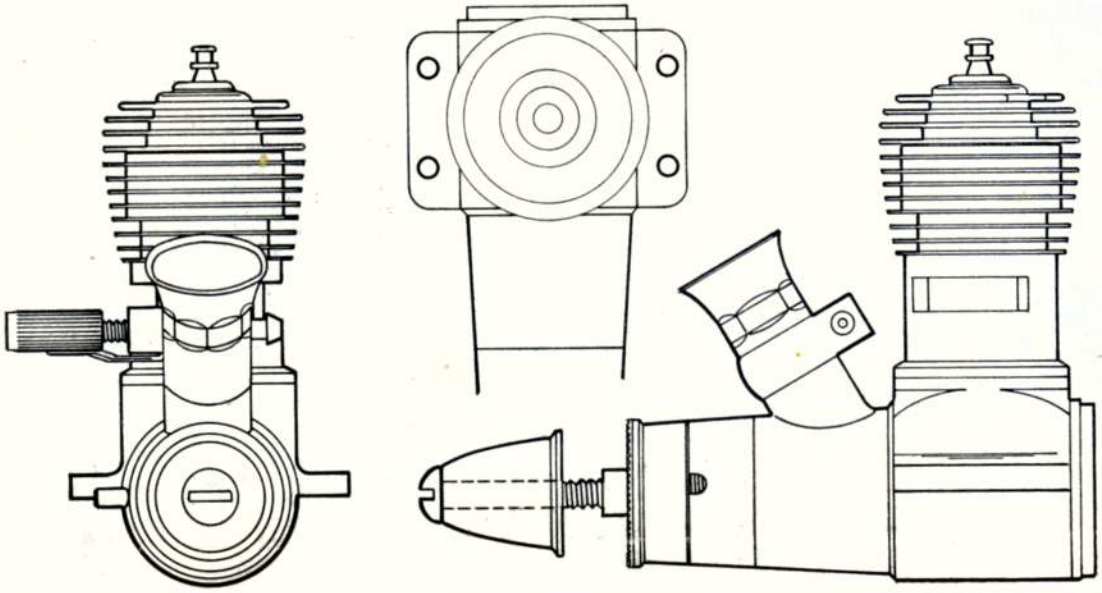
Test figures showed the remarkably high r.p.m. of 16,700 to 17,500 on 8 x 4 propellers, which appears a logical free flight size. A typical 9 x 4 pulls the revs. down quite a bit, but a 9 x 3 would also seem a good choice. Peak power, as determined from the dynamometer test, was developed at 18,000 r.p.m. although with smaller loads speeds well over 20,000 r.p.m. could be attained and held with remarkable steadiness. For a plain bearing engine this is a most remarkable performance. The only "fussy" characteristics we found, apart from fuel tank level for easy starting, was that the Special, like all Cox engines, readily suffers a blocked jet if the fuel is at all dirty. Clean fuel—and preferably filtered fuel—seems a "must" to be sure of avoiding this trouble.

Constructionally the Special features the now familiar Cox layout, with virtually all metal parts turned from bar stock on automatic machines and produced to very close tolerances. The same 7/16 in. o/d crankshaft as on the Tee Dee 15 is retained with the large 7/16 in. by .290 in. port opening, although the edges are flat. The plastic housing surrounding the crankcase unit forms, in effect, an induction chamber above the port, as well as taking the screwed-in intake venturi and carburettor assembly. The plastic moulding also incorporates a stub tube for pressure feed, if desired.

To make use of this facility the underlying metal must be drilled through to open up a hole which is then "timed" by the crankshaft port. We have heard of people doing this with the shaft *in situ* (rotating the shaft into a position where the drill enters the port), but this is hardly to be recommended in view of the burr which could be produced on the inside, leaving this to be "smoothed" by the shaft! To drill for pressurisation demands a complete disassembly job.

This also raises another important point. Modellers used to rugged diesels and apt to use more than a reasonable amount of brute force on disassembling motors. Although the Cox is not a weak engine by any counts, it must be handled with extreme care when taking apart and putting together, and *only* using the combination tool provided in the proper manner. The cylinder is quite soft and readily damaged if mishandled. The piston on the Special, incidentally, is also unhardened and incorporates a floating gudgeon pin on which are located two tightly fitting spacers to position the con. rod centrally. Another detail feature is that the top edge of the piston is quite generously radiused off. The Tee Dee 15 had a hardened piston and ball and socket little end.

Summarising, we can only again rate the Cox Special as an outstanding example of precision production engineering with an exceptional performance, rendered even more remarkable in terms of power/weight ratio. It is not everybody's engine in that it is essentially intended as a high speed unit and it will give a disappointing performance if used with large props. It is also not as easy to start as a sports type glow motor, and is vicious on mistakes or carelessness flicking over with a 7-inch prop. Compared with a diesel, too, it will undoubtedly have a more limited life—but prop. for prop. it will out-rev any other engine of its size we know over its optimum speed range. It would appear to have outstanding potential as a contest engine.



Try a simple ...

BOOMERANG

for fun!

Holding boomerangs in his left hand, an Aborigine of the Kimberley region of tropical Western Australia, stands ready to throw a boomerang. This is a returning type, widely distributed throughout Australia, but not used in Central Australia or the Northern territory (Australian News and Information Bureau photo).

Typical

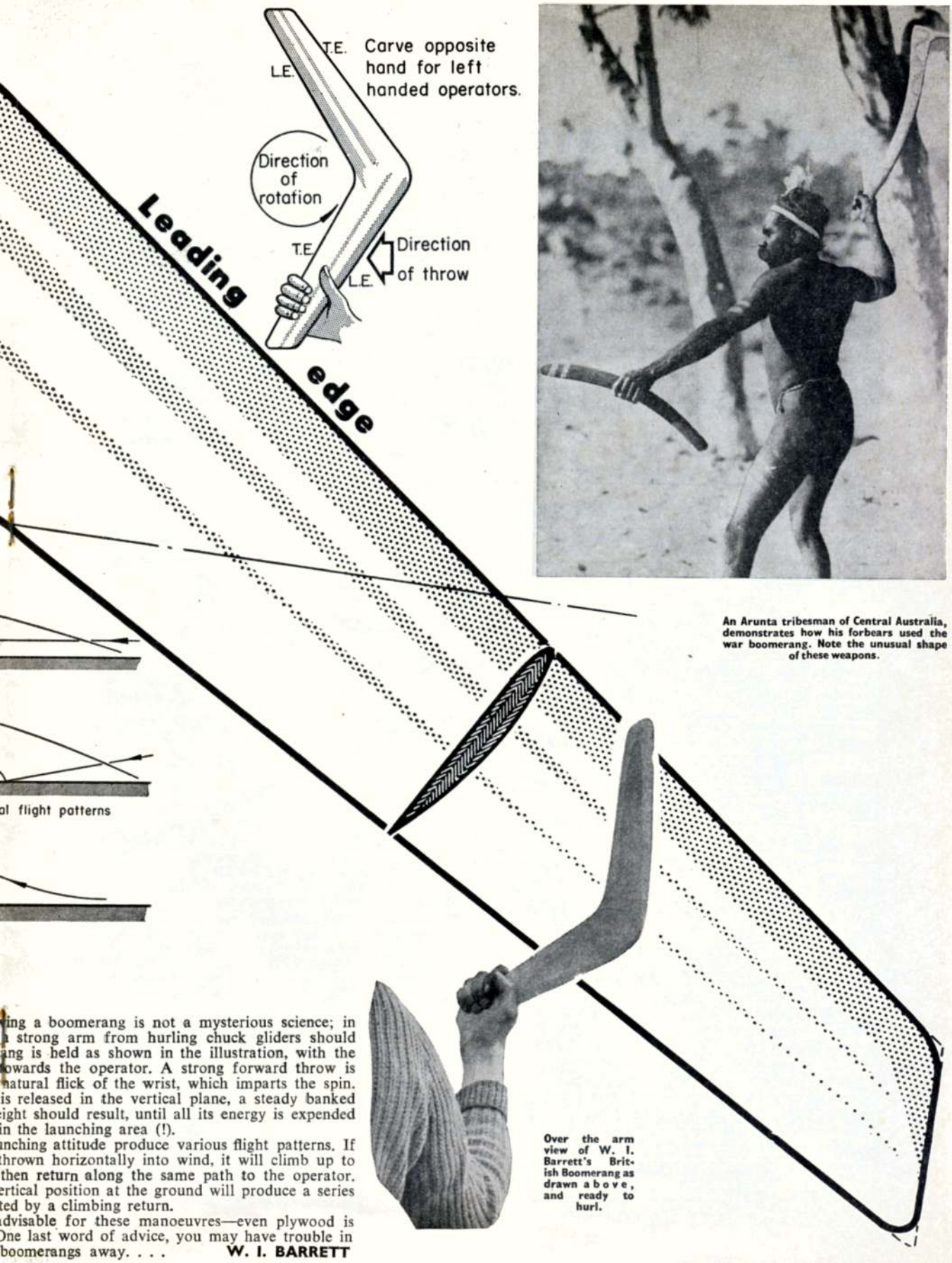
MANY THE TIME has a despairing modeller watched his latest pride and joy floating away downwind. Several devices have appeared to overcome the wanderlust tendencies of free flight models, including radio control, magnetic steering and tethered flight. Perhaps the oldest aerodynamic vehicle known to man has the answer—the boomerang.

Construction is cheap and simple, and reasonably good results can be obtained even in unskilled hands. For the boomerang described here, a piece of good quality ¼-in. plywood is required, if possible with five laminations. Birch ply is the ideal. Using the above drawing as a guide, mark out and cut the outline. The upper surface of the boomering is then cambered to the section shown on the drawing; a sharp knife or a small plane should be used for initial roughing out of the section. Finish off with a file and sandpaper. A polished surface helps performance considerably, as the necessary rotation of the boomerang is then prolonged in flight. With the centre of gravity at the correct position, the device is now ready for flight.

The art of throwin
fact, anyone with a s
excel. The boomerang
cambered surface tow
accompanied by a hat
If the boomerang is r
turn at constant heigh
and it lands back in t

Variations in launch
the boomerang is thre
a fair height, and the
Throwing it in a verti
of bounds, terminated

Soft ground is advi
not indestructible. One
throwing your old boo



An Arunta tribesman of Central Australia, demonstrates how his forbears used the war boomerang. Note the unusual shape of these weapons.

al flight patterns

ing a boomerang is not a mysterious science; in
a strong arm from hurling chuck gliders should
ang is held as shown in the illustration, with the
owards the operator. A strong forward throw is
natural flick of the wrist, which imparts the spin.
is released in the vertical plane, a steady banked
ight should result, until all its energy is expended
in the launching area (!).
unching attitude produce various flight patterns. If
thrown horizontally into wind, it will climb up to
then return along the same path to the operator.
ertical position at the ground will produce a series
ted by a climbing return.
dvisable for these manoeuvres—even plywood is
One last word of advice, you may have trouble in
boomerangs away. . . .

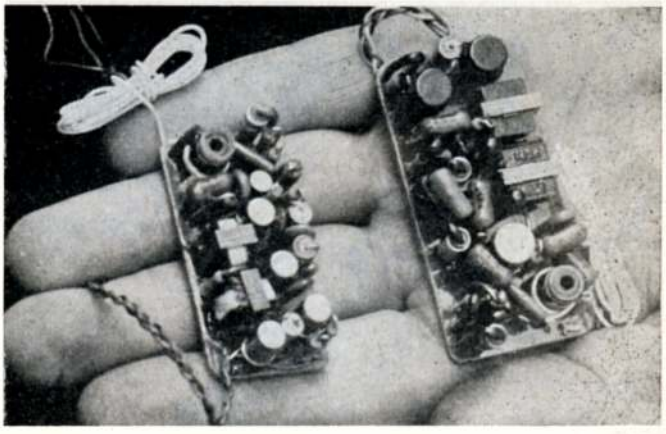
W. I. BARRETT

Over the arm view of W. I. Barrett's British Boomerang as drawn above, and ready to hurl.

Over the Waves

THERE CAN BE little doubt that by far the greatest number of R/C enthusiasts fly single channel sport models.

We have, therefore, prepared the table presented here, detailing a selection of all transistor *relayless* receivers. This type of receiver is likely to become the standard in its class for the forseeable future. The table is, therefore, worth a close study and is also a good guide to receivers suitable for the models described on page 70 by that "man of a Thousand Models", Ken Willard, the champion of the single channel sportster. Readers should note however that the heaviest receivers detailed are not really suitable for the very small scale models.



Prototypes for J-Que 3volt all transistor receiver, circuit first published 1962-3 Aeromodeller Annual. Smaller size is final version. Kits only now available from Radio Control Specialists, price £4.18.6d.

A SELECTION OF RELAYLESS ALL TRANSISTOR

Name	*Manufacturer*	*Type*	*Size*	*Wt. ozs.*	*Trans-istors*	*Working Voltage*
BRITISH Guidance System	Radio Control Specialists, Burlington Rd., Osterley, Isleworth, Middx.	Tone	1¾ in. x 1¼ in. x 1 in.	1½	4	4.5
J-Que	Kit set from RCS as above.	Tone	2 in. x 1 in. x ½ in.	¾	5	3
Microdyne One	EssVee Electronics, Market Cross, Malmesbury, Wilts.	Carrier Wave	2 in. x 1½ in. x 1¼ in.	1¾	6	9
Mini Reptone	Radio & Electronic Products, 75 S. Western Rd. St Margarets, Middx	Tone	2 5/16 in. x 1 33/32 in. x 1 9/16 in.	3	4	4.5
TR/1	EssVee Electronics, Market Cross, Malmesbury, Wilts.	Tone	2 in. x 3 in.	1½	6	6
AMERICAN Babcock BCR-16	Babcock Models, Newport Beach, Calif., U.S.A.	Tone	2⅜ in. x 1½ in. x 7/8 in.	2		9
Courier	Ecktronics, 2109 South Wright St., Santa Ana, Calif., U.S.A.	Tone	1 7/8 in. x 1¼ in. x ¾ in.	⅞	4	3
CS501 Humming Bird	C & S Electronics, 7377 Beverley Blvd., Los Angeles 36, Calif., U.S.A.	Tone	2 in. x 1¼ in. x ¾ in.	¾	4	3—3.6
CS 505 Finch	C & S Electronics, 7377 Beverley Blvd., Los Angeles 36, Calif., U.S.A.	Tone	2 in. x 1⅜ in. x ¾ in.	1	5	3
CS 511 Honey Bee	C & S Electronics, 7377 Beverley Blvd., Los Angeles 36, Calif., U.S.A.	Tone	1⅜ in. x 1 in. x ⅝ in.	½	4	3
Citizenship R/C Pack	Citizenship Radio Corp., 810 East 64th St., Indianapolis 20, Indiana, U.S.A.	Tone	3 1/16 in. x 2½ in. x 1 7/16 in.	5	4	3
Kraft K3VK	Ace Radio Control Box 111 Higginsville, Mo. U.S.A. (Kit)	Tone	1 11/16 in. x 11/16 in. x ¾ in.	¾	4	2.5—3.6
LT—3	Citizen Ship Radio Corp, 810 East 64th St., Indianapolis 20, Indiana, U.S.A.	Tone	2½ in. x 1¼ in. x 7/8 in.		4	3
Orbit 1	Orbit Electronics, Dept. R., 11612 Anabel, Garden Grove, Calif., U.S.A.	Tone				3
Otarion 0—21	Otarion Electronics, Post Rd., Ossining, New York, U.S.A.	Tone	1 in. x 1¼ in. x ⅝ in.	½	4	3
Otarion 0—22	Otarion Electronics, Post Rd., Ossining, New York, U.S.A.	Tone	1 in. x 1½ in. x ⅝ in.	9/16	5	3
Pioneer	F & M Electronics, 153 Vermont Street, N.E., Albuquerque, U.S.A.	Tone	2⅜ in. x 1½ in.	1⅛	4	3
Sportsmaster R.R.1.	Min-X Radio, 8714 Grand River Ave., Detroit 4, Mich., U.S.A.	Tone	1 13/16 in. x 1⅜ in. x ⅝ in.	1	5	3
NEW ZEALAND Wright Mk.V.	L. Wright, Glanmire Rd., Newlands, Wellington, N.Z.	C.W.	2 in. x 1 in. x 7/8 in.	1½	2	9

An opinion expressed in an R/C Club newsletter recently was that single channel holds by far the greatest challenge in R/C, a point in which there is a great deal of truth. To perform aerobatic maneouvres with only a single surface control or perhaps the benefit of a cascaded escapement system, requires a high level of skill and judgment, which once achieved, provides immeasurable satisfaction.

R/C Equipment at U.S. Nats.

Our own *Radio Control Models & Electronics* previously published a full technical breakdown on R/C models and equipment on both the 1962 British Nationals (August 1962) and 1962 World R/C Champs (November 1962).

Radio control equipment flown in competition at the 1962 U.S. Nationals, should be of interest to those interested in statistics. In order of numerical popularity the gear used was:—

Orbit (59); F & M (20); Kraft (19); Min-X (16); Controlaire (15); C.G. (14); Bramco (11); Space Control (9); Citizenship (8); Marcytone (5); Ga-Lin (4); Deans (3); TTPW (3); TR 4.5 (3); ACL (3); Pullen Proportional (2); Rameco (2); Micro-Mite (2); Gyro R Z (2); Micro-Tone (1); Klinetronics (1); Multiplex (1); Own design outfits (36).

The figures are presented irrespective of type, single or multi.

Of the 209 models flown 19 were Taurus', 18 Orions, 19 Stormers, 12 Live Wire Champions, 6 Chargers, and 45 own designs.

This information was taken from the *Windy City Newsletter*, publication of the Chicagoland RCM's.

World R/C Championships 1963

The 1963 World R/C Championships will be held at Genk in Belgium from August 21st to 25th and will be run in conjunction with the 1963 Criterium of Aces (Control Line). The site at Genk is one provided by the Mining community and is virtually a "Model airport". The setting is therefore ideal for a grand festival of R/C and C/L flying.

RECEIVERS SUITABLE FOR MINIATURE R/C MODELS

Batteries Required / Ever Ready type quoted	*Total Battery weight ozs.*	*Price*	*Remarks*
Rx: 3 x U7	1⅝	£18 18s. 6d Complete with Tx.	Receiver and Transistor Transmitter sold as complete outfit. (Detailed RCM&E, December 1962).
Rx: 2 x U7 Escapement: 2 or 3 x U7	2¼ or 2¾	£7 5s. 0d.	Caseless: Featured in 1962-3 Aeromodeller Annual: May be used for manual pulsed Rudder, driving Micromax TO5.
Rx : PP3 esc : 3 x U7	2¾	£8 17s. 6d.	Caseless: Current rise on signal up to 1 amp. according to escapement requirement (Reviewed RCM&E, May 1962).
Rx : 3 x U7	1⅝	£17 2s. 4d. complete with Esc. + Tx	Sold as complete R/C outfit, with Transmitter, Battery Box in Rx case and escapement. (Reviewed RCM&E Sept. 1961).
4 x U7	2¼	£8 7s. 6d.	Caseless: Current rise on signal up to 500 mA.
Rx : PP3 Esc : 3 x U7	2¾	$41.95	Lightweight Superhet Rx : Decoders mandatory : BDC—6 "Double Decker" decoder links Rx. to Babcock escapement for single channel operation. (See RCM&E, February 1963).
Rx : 2 x U7	1⅛	$21.95	Caseless: Also supplied as part of complete R/C outfit; "Pacesetter" Tx., "Translator" Esc., "Courier" Rx.
Rx : 2 x U7 or 225 DEAC pack	1⅛ or 1½	£10 13s. 6d.	Caseless : 3.6 v. DEAC power supply may be necessary to trigger some escapements effectively.
Rx : 2 x U7	1⅛	£12 19s. 6d.	Double ended output : Provides "quick-blip" actuation or Pulse Proportional.
Rx : 2 x U7	1⅛	$19.50	Caseless : For 8 ohm escapements : Not yet available in G.B. at time of writing.
Rx : 2 x U7	1⅛	$32.95	Completely wired R/C unit for immediate model installation Comprises LT-3 Rx., PSN-2 ($32.95) or SE-2 ($34.95) escapement, Switch and Battery clip all mounted.
Rx : 2 x U7 or 3.6 DEAC	1⅛ or 1½	£6 15s. 0d. (Kit) £9 19s 3d. (Made)	Caseless : Supplied in kit form, or made up by Kraft ($16.95).
Rx : 2 x U7	1⅛	$27.95	Caseless: Sold with either Citizenship PSN-2 sequence, or SE-2 compound escapement ($29.95).
			Not yet released : To weight approximately ⅞ oz. including case : Supplied with matching all transistor Tx.
Rx : 2 x U7	1⅛	£11 13s. 9d.	Caseless : Pea bulb illuminated on reception of signal, indicates Rx on Tune: Smallest Rx currently available.
Rx : 2 x U7	1⅛		Caseless : Provides "quick-blip" motor control via auxiliary escapement or Proportional rudder control.
Rx : 2 x U7	1⅛	$21.95	Caseless : Introduced 1959.
Rx : 2 x U7	1⅛	£10 0s. 0d.	Caseless : Double ended output provides auxiliary "quick-blip" engine control or proportional control.
Rx : PP3	1⅛	£8 2s. 0d.	Wright Mk.V. relaytor escapement size 1¼ in. x 1⅜ in., weight 1½ oz. mandatory : Caseless Receiver.

R.F.C. SQUADRON MARKINGS

PART 13

Described by Leslie A. Rogers

Drawn to 1/72nd scale by K. McDonough

Top: a Bristol F.2a, one of the first batch issued to 48 Sqdn. about March, '17. Note individual number on top of fuselage. Bristol F.2b No. 3 shows Sqdn. marking and individual marking. Bottom: shows oversize roundel of Summer, 1918.

48 Squadron R.F.C.

FIRST SQUADRON TO be equipped with Bristol F.2b Fighters, No. 48, went to France on March 8th, 1917, and flew this type continually until the Armistice.

In the first few months Squadron markings were not used but **individual markings** were indicated by numbers painted in white behind the cockade on the fuselage sides and repeated on the top decking immediately behind the observer's gun ring.

Numbers used were from 1 to 18 and are believed to have been allocated as follows:—

"A" Flight 1, 2, 3, 4, 5, 6.

"B" Flight 7, 8, 9, 10, 11, 12.

"C" Flight 13, 14, 15, 16, 17, 18.

Of this early batch of Bristols: A'3336 was marked 1, A'3324 was marked 2, A'3334 was marked 3, A'3325 was marked 4, A'3322 was marked 5 and was lost on April 4th, 1917.

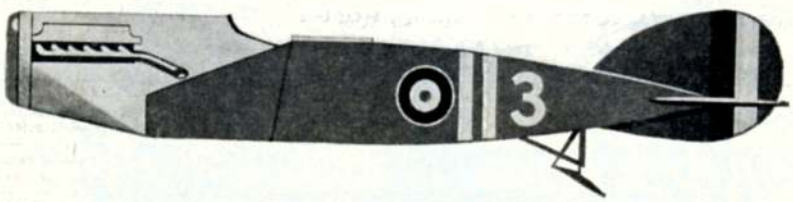
The **Squadron Marking** was introduced about August, 1917, and used until March, 1918. It was two vertical white bands painted on the fuselage sides behind the cockade.

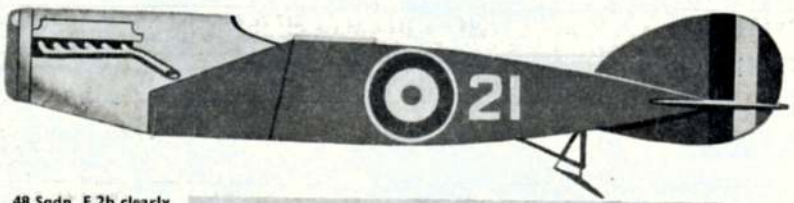
Indvidual Markings were as previously carried and painted behind the Squadron markings. It is not known whether the numerals were still marked on the top decking. After the Squadron markings were discontinued in March, 1918, the same method of individual markings continued to be used.

Strength of the Squadron was greatly increased during the second half of 1918 and in September as many as 28 aircraft were on strength, so that the individual numbers went much higher than before.

In comparison with the neat figures used earlier, the later period showed figures of all shapes and sizes, some having small cockades and large numerals, others large cockades with small numerals. Aircraft number 11, with the numeral same size as cockade outer diameter was C-841, flown by Lt. R. H. Little from 26th April to 26th June, 1918.

Serial numbers were all white on these Bristol Fighters.





48 Sqdn. F.2b clearly shows earlier smaller roundel and other markings.

1 Squadron R.N.A.S.

During February, 1917, this unit was equipped with Sopwith Triplanes and flew their first offensive patrols during the battle of Arras which opened on April 9th, 1917.

In the first instance no Squadron marking was used but **individual aircraft** were numbered with large white figures on the fuselage side in place of the cockade. The numbers ran from 1 to 18.

About June/July, 1917, a **Squadron marking** of two vertical bars was introduced in front of the Tailplane. Individual markings were by numbers as before.

1, R.N.A.S. Sqdn. Sopwith Triplanes showing earlier marking and No. 17 used by Flt/Comdr. H. V. Rowley in June, '17 with white fin and non-standard spinner.

On November 2nd, 1917, the Squadron went from its attachment to the R.F.C. back to the R.N.A.S. and at the same time began to re-equip with Sopwith Camels. Judging by combat reports the Squadron was still in action but flying both Triplanes and Camels. As late as November 13th, 1917, the Triplanes were still in action, but by December the Squadron was entirely Camel equipped. During this period of re-equipment, the Squadron marking used on the Triplanes was still in use.

During January/February, 1918, the Squadron was out of action. On March 22nd, 1918, the marking was changed to a single vertical white bar aft of the cockade on the fuselage. This marking was used until the Armistice.

About August 1918, the white bar was accidentally painted in the wrong position on some "C" Flight machines. In fact the position of the bar was the same as for No. 80 Squadron R.A.F.

Although the R.N.A.S. and R.F.C. became the R.A.F. on April 1st, 1918, this made no difference to the markings, but in this text from this point No. 1 Squadron R.N.A.S. becomes No. 201 Squadron.

It had been the custom in the various Naval Squadrons to "paint up" their aircraft in various ways. The Naval Authorities turned a "Blind Eye" to this harmless practice, but after becoming a member of the R.A.F. the Squadron was ordered to stop the decorating. The existing decorations were not immediately painted over, but as replacement of aircraft was frequent the Squadron became less gaudy.

Flight Markings.

"A" Flight—wheel discs and fin painted red.
"B" Flight—wheel discs and fin painted white.
"C" Flight—wheel discs and fin painted blue.

Individual Identification.

"A" Flight—used the letters A, B, C, D, E, F painted in white on the red fin..
"B" Flight—used the letters S, T, V, X, Y, Z painted white on fuselage behind cockpit.
"C" Flight—used the numbers 1, 2, 3, 4, 5, 6 painted white on fuselage behind cockpit.

These markings were in use up to the Armistice.

Flight Commander's Markings.

No particular letter or number was allocated to the Flight Commander, but they carried streamers:—

"A" Flight—a pair of streamers—one above the other fixed to the trailing edge of the rudder.
—Flight/Commander—a pair of streamers—one attached to the trailing edge of each elevator.
—Flight/Commander—a pair of streamers—one attached to each rear interplane strut.

(It is uncertain which is "B" or "C" of these.)

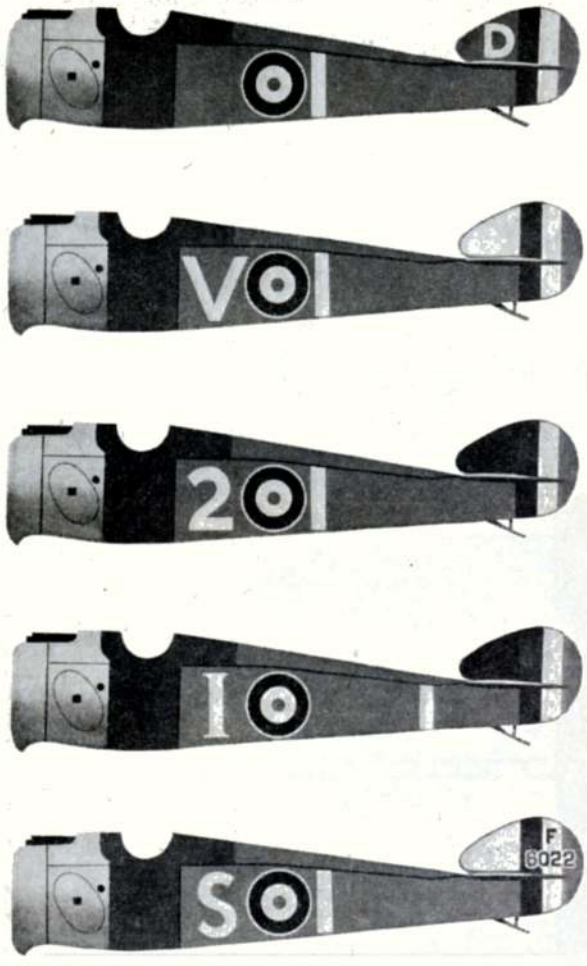
In November, 1918, composition of "A" flight was:

Capt. R. Sykes (Flight/Commander)—Aircraft "E" Serial No. F.5941.
Lt. Tearle—Aircraft "D" Serial No. D.6431.
Lt. Morrison—Aircraft "F" Serial No. F.5227.
Lt. Paton—Aircraft "B" Serial No. D.9667.

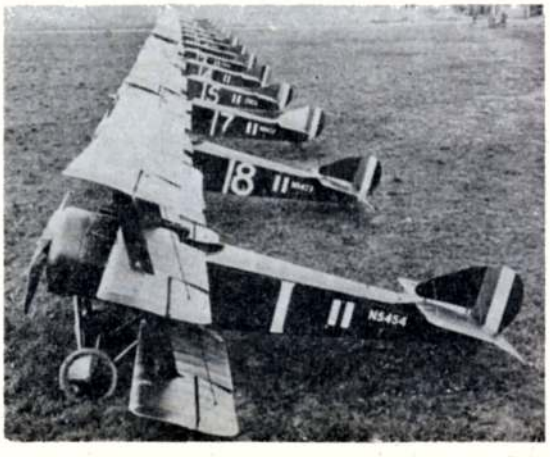
Lt. Paton's aircraft was marked ROSSLYN CASTLE in white on the fuselage aft of the cockade.

As is well known Major Barker was attached to No. 201 Squadron during October, 1918. The reason was that 201's Camels had Bentley Rotary engines B.R.I. As Barker's Snipe had the B.R.2 engine he was able to have it maintained by mechanics who were used to Bentleys.

Barker's Snipe did not carry No. 201's Squadron markings — no markings at all except the usual cockades. He had a figure of a devil painted red mounted between the muzzles of his twin Vickers M.G.'s.

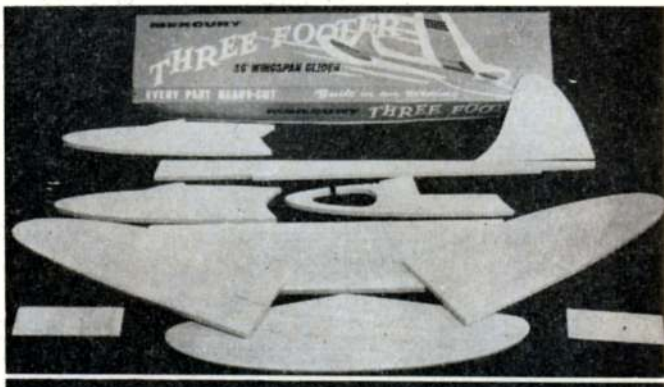


Above: 201 Sqdn. R.A.F. Camels Aircraft "D" of "A" Flight with red fin and wheel discs. A/C "V" of "B" Flight with white fin and wheel discs. A/C "I" with blue fin and wheels shows wrong Sqdn. mark position and A/C "S" with white fin and wheels plus chequered tail. Below: I.W.M. photo Q.66794 shows 1 Sqdn. R.N.A.S. line-up at Bailleul, June, '17.



TRADE NOTES

Left, Solarbo balsa coming from the drying kiln at Lancing. Below, new from KeilKraft are the completely pre-cut "Three footer" solid glider and "Robin", a neat 22 in sportster for 9s. 8d., both excellent kits. Also out is the 1963 K.K. Handbook, a real 2s. worth

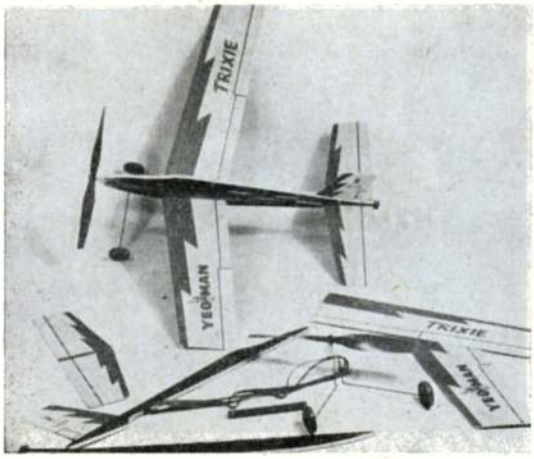


NO-ONE WELCOMES A price increase, but with rising costs of production, including two wage awards in the engineering industry, it is inevitable that there must be slight increases in engine costs for 1963. **Davies Charlton** have announced their new schedule of prices and the increases are very small indeed, the *Bantam* rising from 37s. 9d. to 39s. 10d, the *Merlin* will now sell for 51s. 2d. instead of the previous 49s. 7d. but some prices, for example the *Rapier*, remain unchanged. D.C. also announce their *Quickstart Silencer Manifold* costing only 5s. 4d. and which will be found illustrated on page 72. It can be fitted to all existing engines but for most effective use, should be lapped to the crankcase to prevent leakage. All production engines will have standard external lapping to accept the Manifold. Manufacturing changes at the Isle of Man factory have improved the crankshaft strength of D.C.engines and a change in formula of *Quickstart Diesel fuel* will now permit the fuel to be stored in cold conditions without the risk of oil separation.

Recently we paid a visit to the home of **Solarbo** at Lancing, and were simply amazed at the vast quantity of balsa which flows through the efficient cutting shop. A particular feature of Solarbo is that all of it is kiln dried after arrival and our photograph (above) shows the enormous cavern into which the wood is rolled for a curing period, which removes excess moisture and stabilises the texture. Most active aeromodellers will appreciate the clever way in which Solarbo manage to use practically every scrap of wood cut from the large baulks which arrive from Equador. Even working from small cut sheet and strip the average modeller accumulates a large scrap pile of offcuts, yet this large factory manages to produce almost nothing but sawdust as a waste product. This is the result of extraordinarily careful planning by the managing director, John Patterson and his staff.

When we reviewed the **Humbrol** *Jet Pak* spray gun in December, we referred to the advantage of having spare jars for various colours. Humber Oil tell us that these are available at 1s. 6d. each, including a spare piece of feed tube and we consider this most reasonable for a useful accessory.

Biggest news within the trade over the past month has been the announcement by **Lines Bros.** (*Frog, Tri-ang*) that they have purchased a majority shareholding in **A. A. Hales Ltd.** In effect this means that the Potters Bar factory and the staff of A. A. Hales will be distributing all Frog kits, engines and accessories, operating as an individual unit within the Lines Bros. group. This will considerably widen the scope of Frog sales outlets and no doubt will also aid the distribution of the *Yeoman* range, including their two new kits for *Scorcher* and *Mini Scorcher* combat flying wings. The *Yeoman Trixie* 20 in. ready to-fly balsa and plastic model is one of the most clever models of its type we have seen selling at 7s. 11d. It is produced under licence from the American North Pacific Products Co. and by an ingenious system of wing root clips and nose block which includes thrust settings, is virtually indestructible. Flight performance is equally of impressive standard.



Left: The clever Yeoman "Trixie" ready to fly rubber model assembled, and in pieces as if after a heavy collision. Flies well for 7s. 11d.

Above, pre-fabbed and with formed u/c and tank the Bradshaw Products "Kitten Trainer" is a practical if rather raw kit from a new source.

Right, the remarkably clever Monogram "Bild'n fly" Mr. Mulligan kit with absolutely complete prefabrication including coloured covering! Distributed by A. A. Hales at 17s. 6d.

Famous Biplanes

NUMBER 31

BREGUET XIX

'Question Mark'

described and drawn by G. A. G. COX

DURING THE 'twenties and 'thirties there were still opportunities in flying for men and women whose courage and adventurous spirit urged them into the new unknown. Every progressive nation brought forward such people; they were often deified for their achievements, only to be forgotten by the fickle public as the scale of their achievements seemed to diminish in the light of newer conquests.

Of France's many air heroes, the most distinguished was Captain Dieudonné Costes, who broke a remarkable number of records in an equally remarkable aircraft. A pilot in the first war, he later flew on the London-Paris route for the French Air Union (later part of Air France) before transferring to the Breguet firm as a chief pilot. It was fortunate that his appearance at Villacoublay coincided with the design of a new machine which was to carry him and the company to the pinnacle of success.

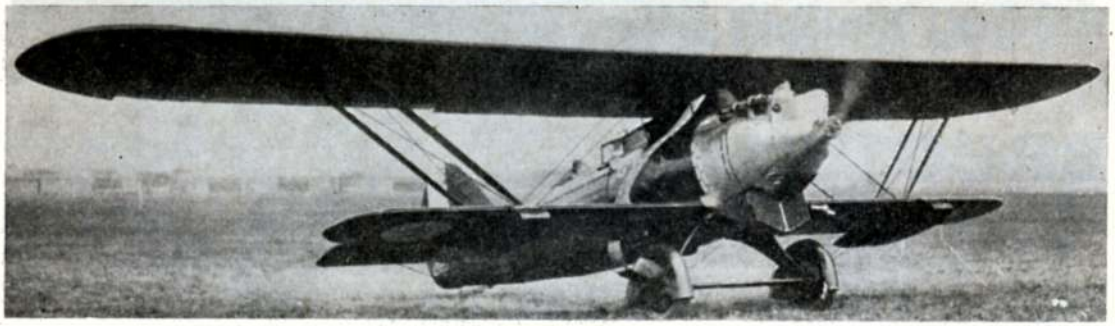
The new aircraft was the Breguet 19, first shown to the public at the 7th Salon d'Aéronautique in Paris in 1921. It was revolutionary in its construction of dural tube and thin steel ribs and formers, also in the power installation which consisted of two Breguet-Bugatti in-line engines side-by-side, geared to a four-bladed propeller. This novel arrangement was replaced by a 450 h.p. Renault engine for the first flight in May, 1922. In the following year in Madrid, at an international competition organised by the Spanish Ministry of War, the Breguet 19-01 out-performed all its competitors. Fully equipped, it attained a speed of 236 k.p.h. (147 m.p.h.), while no other machine exceeded 200 k.p.h. A month later the same aircraft, with a load of 500 kg., broke the World altitude record with a climb of 5,992 m. (19,650 ft.). Spain bought the prototype, and the licence to manufacture the aircraft: thus began a remarkable success story.

At a time when orders were hard to come by, production at the Breguet factory ran at four airframes a day, and by the end of 1926 this plant alone had delivered 1,100 planes to the air forces of France, Poland, Argentina, Belgium, Greece, Bolivia and Persia. The aeroplane was also built under licence in Spain, Belgium, Greece, Japan and Yugoslavia. The engines fitted to the Breguet 19 included Lorraine, Farman, Salmson, Gnome Rhône and Hispaño, and varied in power from 370 to 650 h.p.

In 1926 the Breguet firm modified three machines for long distance flying (Grand Raid). The principal differences were the displacement of equipment in the fuselage to allow for extra fuel tankage, and the increase in span of the upper wing of about six feet. The three G.R. aircraft put up astonishing performances, particularly No. 1685 flown by Captain Costes. It was in this machine, named "Nungesser et Coli" in memory of the two Frenchmen who perished in an attempt to fly the Atlantic, that Costes and Captain Rignot broke the World Distance Record with a flight to Jask in Persia (3,390 miles). In October, 1927, again in No. 1685, Captain Costes with Lt.-Cmdr. Le Brix navigating, flew non-stop from Paris to St. Louis, Senegal, and then, in one hop to Natal, Brazil, making the first direct crossing of the South Atlantic Ocean. This journey had only been made twice before, the first time by the Portuguese Cmdr. Cabral and Capt. Couthino, and again by Major (later General) Franco, but both these attempts were made via the Canary and Cape Verde Islands. Captain Costes' flight was followed by a tour of America via New York and San Francisco, shipment to Japan, then a return flight to Paris from Tokyo.

Such long-range flights by Breguet 19 GR and "Bidon" (further adaptation with 4,000 litre fuel capacity) aircraft became almost commonplace in the late 'twenties. No fewer than ten World Records for speed, altitude and distance fell to this series of light bombing and reconnaissance aircraft, but the most distinguished of all was the final adaptation, the "Super Bidon". Financed jointly by Breguet and Hispaño, it was of all-metal construction like the

Now resting in Musee de L'Air, Paris, France's most famous biplane is preserved with full honours and remains a brilliant red memorial to some of the most outstanding long distance flights ever made. Inscriptions include city listings during American tour and world flights.



Breguet XIX continued

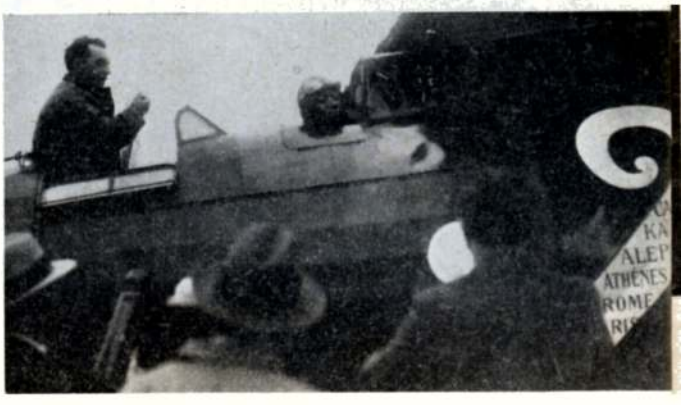
rest, but major structural changes were made in order to give it a fuel capacity of 5,570 litres (1,462 galls.). A centre-section was added to the upper wing, increasing its span by 2m.40, and it was raised above the pylon mounting by means of steel struts. This increased the gap by 0.43m. The lower wing span was increased proportionately, and the characteristic "I" of the Breguet 19 was replaced by wire-braced parallel struts. The fuselage was lengthened to accommodate two huge tanks about the centre of gravity, occupying almost the entire cross-section of the fuselage. Another tank was situated in the wing centre-section, between the spars, and there were three similar tanks in each upper wing panel. Finally, a 200-litre tank was made to sling under each lower wing, but these were discarded by Costes just before he departed for New York. The wheel track was increased, as was the tail area. The oil and water tanks and all engine accessories were mounted at the sides of the 650 h.p. Hispaño engine, within the polished aluminium cowling. The pilot and navigator were seated in tandem, well protected from the elements by close-fitting cockpit flaps. The pilot's curved side windows could be swung through 180 degrees to facilitate entry. The aircraft carried survival kits with inflatable dinghies, radio and every possible navigational aid. A wind-driven generator which supplied the transmitter retracted into the port fuselage side directly below the navigator's seat. The rear cockpit was equipped with a full set of flying controls. An anemometer was mounted above and in front of the pilot, and a mounting for the sextant was fitted behind the rear cockpit.

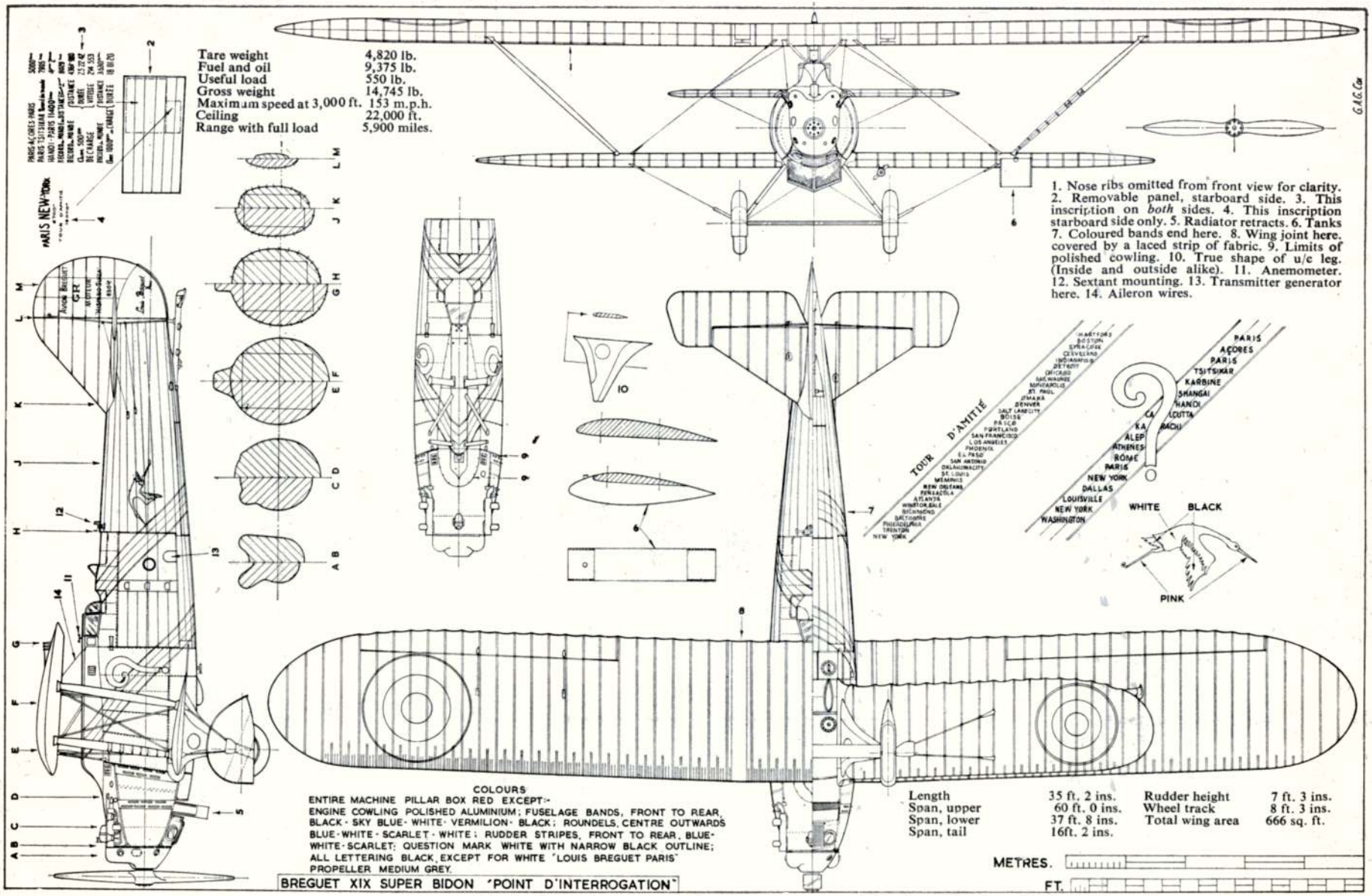
At 9.54 G.M.T. on September 1st, 1930, Costes and his co-pilot/navigator Maurice Bellonte acknowledged the last farewells from the crowd at Le Bourget. The throttle was opened wide, and, with a roar from the mighty Hispaño, the 6¼ ton flying reservoir slowly gathered speed along the turf. With the full load of fuel, the take-off run would take 53 seconds, but at the last minute Costes had decided not to use the 200-gallon tanks on the lower wings, yet it was a full 46 seconds before the "Question Mark" parted company with France and, heading westwards, left an even bigger question mark in the minds of those Frenchmen who remembered the disappearance over the Atlantic of Nungesser and Coli three years earlier. It was of course the weather which gave cause for anxiety, both the machine and the crew were well proven. In September, 1929, Costes and Bellonte left Le Bourget with the intention of flying to Harbin in Manchuria. They landed at Tsitsihar, near Vladivostok after covering 5,200 miles non-stop; for this flight, which regained the World distance record for France, the flyers won a government prize of £8,000.

The Paris-New York flight was, however, a different proposition altogether. They had a constant 40 m.p.h. headwind to contend with, and the unpredictable weather. And for thousands of miles they would be over the Atlantic Ocean, practically helpless and hopeless should they be forced down. There had so far been two successful east-west flights, the first by three Germans in 1928, flying the Junkers "Bremen", the second just three months earlier in June, 1930, by Sir Charles Kingsford-Smith and his crew in the "Southern Cross", but these flights had been made from Ireland to Labrador and Newfoundland. A "Lindbergh" flight in reverse had yet to be achieved.

The weather which Costes and Bellonte encountered could hardly have been worse, but 37 hours 18 minutes after leaving Paris, the "?" touched down on Curtiss Field, New York, with only 450 of her 5,170 litres of fuel remaining. One of the first to welcome the flyers was Lindbergh himself, and the 25,000 people waiting at the field showed them what America thought of their achievement. There followed the traditional ticker-tape parade in New York, and a 15,000-mile goodwill tour of the United States before the "Question Mark" was returned by sea to Paris. She had flown for 602 hours and covered about 64,630 miles. This unique aeroplane was proudly shown at the 12th Paris Salon, and later presented, with the "Nungesser et Coli" to the Musée de l'Air. The famous pair are now displayed adjacently in the famous hangar at Chalais Meudon, and it is with especial thanks to the Curator and staff of the Musée de l'Air that we are able to publish this first-ever detailed drawing from actual study of the machine and Musée references.

Large upper wing overhang is evident in top picture showing the "I" fitted with wing slipper tanks. Below: the famous flyers, Costes and Bellonte prepare to depart for their American tour.





BREGUET XIX SUPER BIDON "POINT D'INTERROGATION"

1/96TH SCALE REPRINTS OF THIS "O" TYPE PLAN AND 1/48TH SCALE "A" TYPE DYE-LINE PRINTS ARE AVAILABLE AS PLAN PACK 2760 FROM AEROMODELLER PLANS SERVICE PRICE 2/6 PLUS 4d. POST.

Colouring Footnote for American Readers

Three different shades of red were used in the finish of the Question Mark, varying in their proximity to orange. The writer is indebted to Mr. William N. Fleming of New Jersey for the following identification with propri tary U.S. dope colours: *Vermilion* (Stearman Vermi'ion), *Pillar-box* or *Post Office red* (Insignia red), *Scarlet* (Fokker red).

Note: There is no such place in the United States as "Winston Sale". On the port side the inscription is correct, viz "Winston Salem".

News of important annual meetings for modelling administration:—

A.G.M. of the S.M.A.E.

FIREWORKS WERE expected at the very important and well attended (almost 200 present, including club delegates from Scotland and the extreme south) 15th A.G.M. of the S.M.A.E. Ltd. at the Queen's Hotel Manchester, on December 2nd.

The meeting opened with a scathing attack on the Minutes of the 14th A.G.M. by the delegate for Whitefield, J. O'Donnell. Each of the points he made were valid and the Minutes corrected accordingly.

When the Treasurer presented an interim draft account indicating a heavy deficit, the delegate for East Lancashire M.A.C., K. McClave, moved that a *"vote of strong criticism of the manner in which the accounts have been presented"* be Minuted. This was carried by the meeting and it was moved that a further meeting be held at which the full accounts be presented. The straightforward election of Ron Firth as an obviously popular Technical Secretary with an overwhelming majority of postal votes, was employed for the expression of discontent by many club representatives who claim that the Society has not been utilising properly notified addresses for the issue of voting papers and notifications of meetings. The ballot was declared valid and accepted after a vote.

Whilst the Chairman's report was accepted as read, that from the Competition Secretary provoked lengthy discussion. The point at issue was the large decline of 33 per cent. in competition entries between the years 1961 and 1962. The 1963 contest programme, which has been issued in draft form to Area officials and council delegates, did not meet the approval of many well known aero modellers. John Hannay, representing Wallasey, stated that *"Emphasis should be placed on the British modellers as distinct from the heavy concentration on F.A.I. matters."* Views were expressed to the extent that Great Britain could do well without participation in events which commit the Society to heavy financial expenditure and should divert the resources of the Society to the benefit of the membership in general. Such views, coming from people who are recognised as leading exponents in F.A.I. events, were typical. Never was it more clear that the welfare of the Society is a major concern of those who have exercised most grievances.

Reports from the Records Officer and P.R.O. were accepted without comment. Then came the bitter controversy over discrimination of membership and rates for membership fees. Freda Shirt, representing Sheffield, raised an unexpected point by suggesting it was *"high time that the S.M.A.E. recognised women members and that there should be special membership at the equivalent of the full junior rate, for women"*. This proposition was later accepted by the meeting. It will give independent recognition to lady participants and a rightful voting status.

Coupled with the discrimination of membership is the vexed problem of insurance. Dissatisfaction had been expressed over the terms of cover offered by the Society's insurance brokers. An undertaking had been made at the Open General Meeting to re-examine certain points. Sharp questions were asked on this matter and a further undertaking made in that for the future there will be no discrimination in the terms of cover offered to the various grades of membership. It was significant that here again was a case of the Full Members speaking up on behalf of the Associates. Anomalies in the expression of insurance terms were thrashed back and forth and bought to a final halt with an inspired speech by Dave Posner. Speaking with considerable authority, he scotched once and for all, some of the misnomers of third party, member-to-member protection and made it clear to all present that the Society's insurance was adequate.

The question of actual fees still remained. An amendment that they should be 30s, 15s, 10s was discarded by a vote 36 for, 62 against; and the original proposition, arising from the Birmingham meeting, was accepted with 70 votes for, 24 against. Thus the membership fees are to be as follows:

Full Affiliated Members. Senior (over 21 years) 40s. per annum. Intermediate (under 21 and over 16 years) 20s p.a. Junior (under 16 years) 12s 6d p.a. *Associates* 12s 6d p.a. Lady members 12s 6d p.a. It should be noted that all full affiliated members will receive independent direct communications from the Society with copies of newsletters, contest results, etc. Clubs will be able to deduct 10 per cent. from affiliation fees for all full members but no discount is allowable in the case of an Associate.

The meeting closed with announcement by the Chairman, Mr. A. F. Houlberg, M.B.E., to the effect that he would be retiring in 1963.

We sincerely hope that introduction of the new fees and streamlining of Society organisation will bring satisfactory stability to the S.M.A.E. for a very happy retirement to Mr. Houlberg after his countless years of devoted service.

S.M.A.E. Top Table of Council Officers at Manchester. Left to right, S. E. Uwins (Public Relations), N. J. Butcher (Records), R. L. Taylor (Secretary), A. F. Houlberg M.B.E. (Chairman), H. W. Barker (Treasurer), the late C. S. Rushbrooke (Vice Chairman) B. A. Messom (Competition Secretary) and one of the many Area delegates to the Council, E. A. Coates (Northern Area). Reason for the pensive expressions? The Treasurer is explaining his view of the financial situation

F.A.I. Top Table at the Paris meeting. Left to right, C. E. Hennecart (Director General, 1963), H. R. Gillman (Director General, F.A.I. until 1962), H. J. Meier (retiring President), H. J. Nicholls (President for 1963), Dr. W. A. Good (Vice President for 1963), J. Jaaskelainen (retiring Secretary), S. Pimenoff (Finland). Note the paperwork involved in this intensely active re-union of the F.A.I. Models Commission

. . . and the Federation Aeronautique Internationale

RECOGNITION OF **Model Rocketry** as a part of model aviation activity within the *aegis* of the F.A.I.; a go-ahead to the **scale** committee to prepare general regulations; establishment of a **speed** flying pylon of standard dimensions together with revision of the control line handle specifications; adoption of **Indoor** model specifications and contest regulations; use of three **control line aerobatic** flights to the A.M.A. schedule; and acceptance of a system whereby **judges** are selected from an approved panel were major points of decision at the F.A.I. reunion in Paris, November 22nd-24th, 1962.

A number of **rule changes** have been adopted to overcome the weaknesses of the Sporting Code as evident at the Kiev meeting. In radio control, the system tried at Kenley with best two flights out of three to count, is adopted for the future.

These brief notes do not give indication of the amount of work covered in 2½ days by the Models Commission. Discussion on all points was long and detailed in the various technical sub-committees, and it is significant that there are no proposals for model specification or contest procedure changes.

The greatest need at the moment is the re-writing of the Sporting Code, copies of the existing issue being exhausted. Each sub-committee is now to suggest revisions of arrangement in the Code, and close co-ordination of the new President (H. J. Nicholls) in the English language and the new Secretary (A. Roussel) in the French language should produce a 1963 edition which will remain unaltered, we hope, for many years.

Among items which have been referred back to Aero Clubs for opinion and study are:—In **Radio Control:** reduction of flight time from 15 to 10 minutes, investigation of radio frequencies (with representation for modelling at the International Conference on Intercommunications), constitution of a "team" entry, and publication of judge's scores to be left to the decision of the organizing Aero Club.

In **control-line:** study is to be made by the sub-committee of possible International rules for Combat flying, following a request from the U.S.S.R.—this will be based upon existing rules in Great Britain, Belgium, Sweden etc. The U.S.S.R. also requested study of a standard fuel application to team racers. The F.A.I. Bureau is to issue a directive to all Aero Clubs urging early attention to the noise problem and asking engine manufacturers to produce silencers.

In **Free Flight:** there are no references for further study, but the Indoor regulations now to be circulated are (in brief):—

(*a*) Span not to exceed 90 cms. (*b*) 6 starts allowed for 2 official flights. (*c*) In case of collision the expired durations may count or the flight re-started. (*d*) Retrieving balloon to be used only twice per start and cable not to remain in contact for longer than 10 secs. (*e*) No limit to the number of models used. (*f*) Proxy flying permitted.

These are to apply from January 1st, 1963, which was also the effective date for compulsory use of spec. cards and identity stickers to go with all pre-processed models to International meetings.

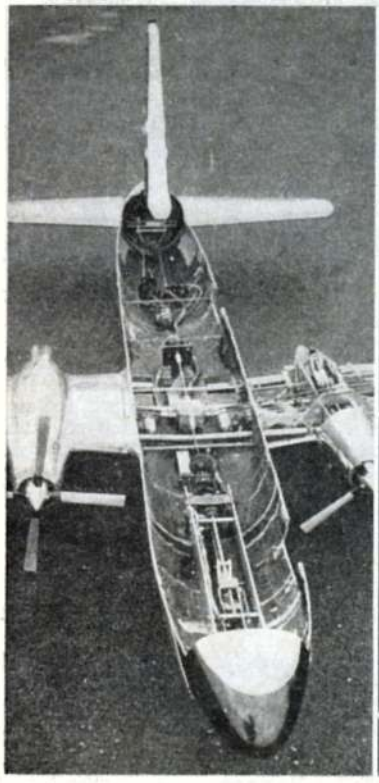
In **Scale:** the following points are still under discussion: Extension of the 11 lb. max. weight limit, and 10 c.c. engine capacity limit for multi-engined models.

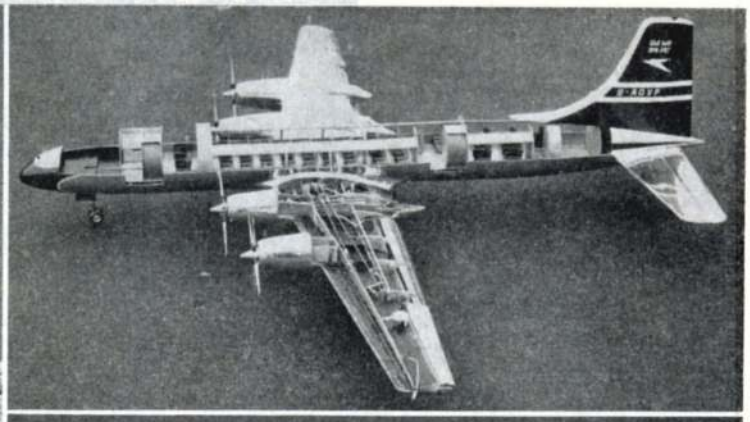
In **Model Rocketry:** a technical sub-committee has been formed to establish International contest regulations, with representatives from U.S.A., U.S.S.R., Czechoslovakia, Italy and France.

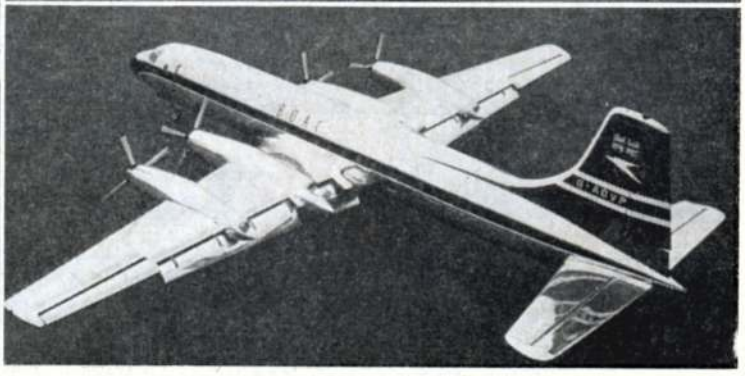
Other sub-committees were re-elected almost without change.

Elections for Official posts resulted in Henry Nicholls (Great Britain) becoming President; Dr. Walter Good (U.S.A.) the Vice-President; Rudi Beck (Hungary) remains Tech. Sec.; and Albert Roussel (Belgium) is the new Secretary.

Thirty-four delegates and technical representatives attended the 1962 F.A.I. meeting, among them, reading left to right around the table; A. Degen (Switzerland), M. Bienvenu and A. Roussel (Belgium), G. D'Audeteau and technical reps in background (France), G. H. Derantz (Sweden), just in the picture is the late C. S. Rushbrooke (New Zealand), then backs to camera, F. Sugar and R. Beck (Hungary) and the F.A.I. Directors' heads







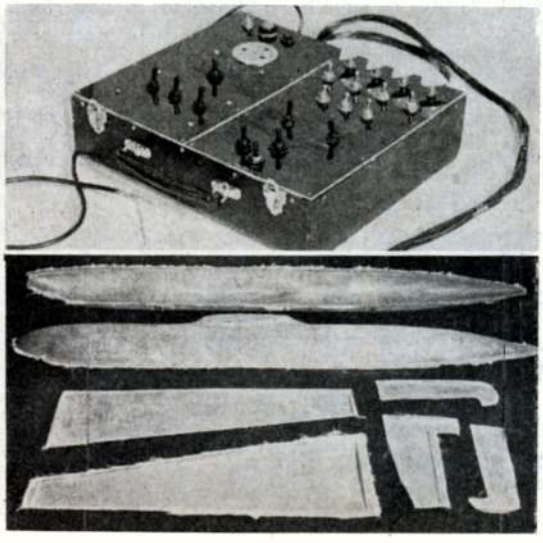
more Scale models

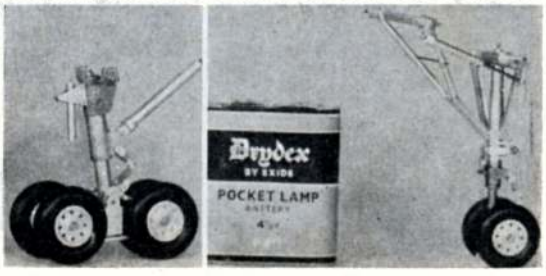
THE *Bristol Britannia* (above) started life as a "multi engined control-liner" which, constructor J. Rayne of Cheltenham thought, could be completed in 6 months. That was in 1957! It is now almost complete after approximately 3,000 hours work.

A scale of 1/28th was chosen to accommodate four Amco 3.5 c.c. diesels. This brought the span to 58 ins. and the fuselage diameter to 5ins. It was decided from the outset to have a retracting undercarriage but it was not until the actual mechanism was explored that it was discovered that a completely scale undercarriage would not afford sufficient strength for Control Line Landings.

This, then, was the turning point, when the concept of the model changed to that of a full operating, remotely controlled *static* exhibition model. In order to obtain sufficient unobstructed space for the various mechanisms and the scale interior, the orthodox balsa and ply construction was discarded and experiments were made with Glass Fibre/Resin laminate. After several failures with patterns, moulds, and final parts, success was achieved and the 42 moulded parts were produced (see below, left). The next problems were the undercarriage and flap mechanisms; here the Bristol Aircraft Co. and British Messier Co. were most helpful by supplying information on the actual units; photo below shows the final units.

All three undercarriage units are telescopic, sprung and damped. The nose unit is steerable and has a scale





retraction jack which is sprung internally to provide a bias on the knuckle during retraction. The main legs have fully articulated brake mechanisms, hop dampers, rotation and retraction jacks. The doors open and close in the correct sequence and limit switches cause red and green lights on the control box to indicate the undercarriage positions. Mighty Midget motors are used as the motive power, and are so arranged that the undercarriages operate in the same time interval as the full size units. A set of relays in the control box prevent damage to the units which would be caused by inadvertent reversal during operation.

Flaps are located on curved flap tracks identical to the actual machine and are operated by one motor in the fuselage driving the flaps via oil filled gear box and six universal joints ¼ in. in diameter, they can be seen in the rear ¾ view. Operating time is once again as on the full size aircraft. The rudder elevators and ailerons are driven by small electric motors and operated from the multi button control box in the picture on page opposite.

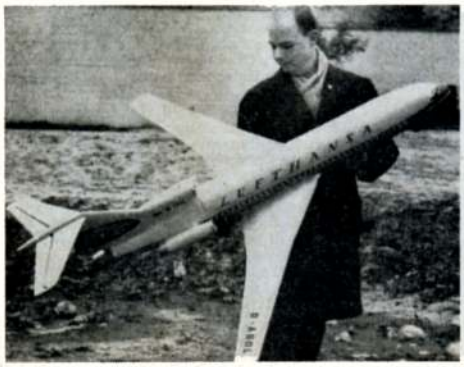
Propellers, made from dural, are powered by electric motors of which there is a total of eleven. Cabin and cockpit are illuminated and navigation lights are fitted, the collision light flashing once every second.

In order that the various mechanisms can be readily accessible for maintenance, the upper half of each wing and the fuselage top are removable. The cabin detail can then be lifted out as a tray, exposing all the mechanical parts. Wings and the fin and rudder have been made removable so that the model can be transported easily. The interior, which was not quite complete when the photographs were taken follows the layout of the actual machine G-AOVP.

Polish aeromodellers are renowned for their detail work and at the 1962 C/L Nats, on the new SOSNOWIEC circuit (see page 68) there was a collection of really outstanding craftsmanship as illustrated in the group of three above, right. Top is J. Fiuk and 1/10th scale *AN*-2 Biplane, the result of two years spare time activity and long study which placed third. Centre is a little known subject, the Polish trainer *M*-4 "*Tarpan*" by R. Zmidzinski to 1/8th scale with 5 c.c. glow engine. It was noted for extremely good finish and flight performance placing first in the single engine class. Finally an adventurous *PZL*—"*Wicher*" by J. Koczkodaj from Warsaw; seen with the judges. Note the flaps, slightly drooped for take-off. Original photographs show a very high standard of work in these models.

Two pictures below of Eric Heimann's 56 inch span 1/24th scale *Boeing* 727 finished in Lufthansa colours give but little indication of the 500 hours involved in what must surely be one of the largest jet powered models in Europe. This Dusseldorf, Germany, modeller has tested the 727 up to 80 m.p.h. after a two lap take-off run. It weighs 10 lbs., is 6 ft. long and is fitted with a Hungarian jet unit in the rear fuselage.—*Quite* a model!

Interesting points are that the radar nose cone detaches so that air comes straight through the fuselage to the jet. A nose profile plate is fitted to retain the side view appearance, also the central jet orifice has to be larger than scale for the pulse jet. The model is fitted with navigation lights and the area around the jet is insulated with a highly polished aluminium jacket and a winding of asbestos string.



CLUB NEWS

Winners at Wanstead: Group at Wanstead Flats after the finals of Rat Race and "35" Combat. Standing left to right: R. Hindess, M. Attwell, K. Fuller, D. Sizmur, F. Bradley, R. Sibbald. Kneeling: D. Fairbank, B. Bumstead and B. Dodds, who won the six-team Rat Race final.

FIRST REPORT RECEIVED this month came from the **NORTH WESTERN AREA** where the *Evening Post* ran an illustrated feature on **Southport M.A.C.**, with valuable hobby publicity. The photographs in the newspaper cutting received are of generous size and do the Southport lads justice, although the write-up, obviously written for the lay-public, places an unfortunate emphasis on the ease with which model aeroplanes may be damaged and the cost of such a catastrophe. Anyway we hope the Southport clubsters profited by their newspaper publicity and that their ranks have since swelled.

Aeromodelling activity increases in the Manchester area if club reports are any judge. **South Manchester Models Group** held their Annual Exhibition last October (bit late with the news chaps) at the Stanford Hall, Altringham, where over 1,100 visitors saw model aircraft displayed together with model railways, R/C boats and land vehicles. Next time they hope for an even better show. On November 24th 14 members of **Urmston & D.M.A.C.** flew a 20 minute control line demonstration at Old Trafford Football Ground, before the match: Manchester United *v.* Aston Villa. The 38,000 strong crowd were treated to Stunt and Combat flying, including George Vernon's *Nobler* which replaced the unflown, six foot span, *McCoy* 60 whopper. Spectators enjoyed the demonstration so much, there is likely to be a return performance in the near future. **Sharston D.M.S.'s** F/F Champion is John Feeney, who amassed 33 pts., just enough to beat Warwick Clegg with 32 points, while third placer was Geoff Bridson who scored 28 points. Recent highlight of **Liverpool M.A.S.** activities was a Barbecue-cum-flying meeting held at their local Woodvale Aerodrome flying field, where the number of hot dogs a competitor could consume during a flight was the scene of some keen rivalry, and consequently aching stomachs. New members are welcome at the Common Hall, Hackins Hey, Liverpool, on alternate Fridays which commenced November 30th.

Warrington M.A.C.'s R.T.P. contest on November 8th was an event purely for Keil Kraft scale rubber power models, won by Jack Mercer's *Hurricane*, powered by special rubber cut from old inner tubes and boot soles! The scale prize was captured by Bert Skeels with an extremely well detailed *Ju* 87 *Stuka*. Best Junior performance was P. Sutherland's, also with a *Hurricane*. During the past few weeks Arthur Bellis has taken colour movies of club and general aeromodelling activities. The results of which have proved most enjoyable. Anyone who wishes to join the fun may do so at Stubs Ltd. Recreation Club, Warrington on Thursday evenings.

To the **NORTH EASTERN AREA**, now, where **Novocastria M.A.S.** (1962 N.E. Champion Club) have been on their travels, to the S.M.A.E. Dinner in London where they collected the Davies A Trophy and to the S.M.A.E. A.G.M. in Manchester. Highlight of their own annual social was a film of the 1962 Rush Gala, a rally they hope to repeat for 1963.

December edition of **NORTHERN AREA** *News* carries tips on thermal hunting, more of John Barker's excellent propeller theory, and drawings of Open and Tailless rubber models. **Wharfedale M.A.C.** are on the ball, announcing a *provisional* date and venue for their 1963 Rally to be held at Rufforth on June 23rd—nice and early!

Priory M.A.C. in the **MIDLAND AREA** have staged two half time displays for the local football club, to the approval of spectators—treated to Team Racing and Control Line Aerobatics. Two demonstrations have already been run, the second on November 10th in blustery conditions, the pitch a sea of mud.

Always keen to capture local public interest, **Hinkley M.A.C.** took over a large, corner shop window in Hinkley town centre, where they displayed over 40 models, for six days. Club nights, every other Tuesday at the Albert Road School, are scenes of indoor flying and film shows, to which, unattached modellers in the Hinkley area are welcome. Other information from Dennis Nixon, Hinkley 2776. **Sutton Coldfield R.C.M. A.C.** have *purchased* a pavillion, now erected at their *private* flying field (Shows what initiative brings as reward!) Fully heated, this will doubtless be a welcome amenity during winter flying sessions. Following an illustrated lecture by Mr. J. V. Paterson, director of *Solarbo*, members are better informed on the subject of aeromodelling's basic commodity. "*Switch*" is their monthly newssheet issued free to members. A club competition is flown once each month and a prize awarded every three months to the competitor achieving the greatest success over that period.

Tough note from **Leicester M.A.C.** concerns their first eviction of a club member for unfavourable behaviour on the club airfield, a stern but necessary measure.

Leamington Vultures M.A.C. have just become affiliated to S.M.A.E. in preparation for next season, when their Combat enthusiasts will be flying their own design *Billy Bones*. Meanwhile they have settled down to Friday club nights of sedate R.T.P. flying. Sedate that is, until Chris Bowden's monster breaks loose from the line. Several interesting and ambitious scale projects are at the moment on the building boards one of which is a 6 ft. span *Bristol Britannia* control liner for .35 engines. Visitors will find a warm welcome during flying sessions at the Victoria Park, Leamington Spa on Saturday Mornings.

SOUTH MIDLAND AREA'S Northampton M.A.C. run a very informative monthly newsletter, including, this month, *Elite* F/F Power, complete with building and trimming instructions. There are hints and tips too. If you have a piece of warped trailing edge, one way of curing the warp is to rub the opposite side to the bow with the wrong side of a sheet of sandpaper until the warp disappears. Their Control Line Speed competition On October 3rd was flown under ideal conditions, little wind and bright sunshine. Eight entrants each flew twice, the faster of the two flights counting. Eddie Varley with his Cox powered *Dongus* started favourite in the Senior class, but his recorded 74 m.p.h. was not up to expectations. **Stevenage** *News and Views* tells of the all-Stevenage Film Productions 8 mm. "Stevenage and Aeromodelling", given its premiere at the clubroom on December 19th. Plans in the newsletter include Mick Harris's individual winner in the Farrow Shield (Open Rubber) and G. Castell's Chuck Glider.

Club exhibitions seem popular at the moment, and **Colchester M.A.C.** in **EAST ANGLIA** are yet another group who recently staged a successful show. Over 50 models were displayed to the public on November 16th—17th, including Stunt, Combat R/C, Free Flight, and Glider types. A worthwhile inovation was an invitation to the public to judge the best exhibit in each class.

"*An outstanding success*" is how **LONDON AREA'S Northwood M.A.C.** describe their annual club exhibition, held in conjunction with the Eastcote club. Every type of model was on display, ranging from tiny Jetex speed jobs to 10 Channel R/C machines, interspersed with Combat models of course. Refreshments were supplied whilst visitors gazed at the exhibits. **Cosmo A.C.'s** two recent Rat Races were won outright by Ron James who used Oliver engines in both "A" and "½A" events. In the "½A" event B. Chiswick proved a very good runner-up and in the "A", P. Crowhurst, a keen young flyer, was extremely close to Ron James in the four-in-a-circle, two hundred lap final.

Hayes & D.M.A.C. C/L Rally on December 16th started with 51 entries in Combat. Consistency proved the important factor, leading up to the semi-finals with three Kombo men and Alan Dell of Hayes. The final, between Alan and Pete Tribe was a very close affair; Pete emerging as winner by one point. Much of the Combat Area was waterlogged but the Speed circle was dry and blessed by a large number of entries (50), small number of actual flyers, large number of attempts, small number of timed flights. Pete Drewell received the outstanding flight prize for his 130 m.p.h. in Class 1, being 103 per cent. of the fastest S.M.A.E. recorded class 1 flight in 1962. A very annoying "fault" stopped Brian Hopkins getting in a complete run with his jet; the straight Benzene fuel *froze* solid one lap after take-off! One bod turned up with a "Class C" McCoy 49 team racer, weighing 3¾ lbs., to fly in Class 3. Standard S.M.A.E. pull test would have been over 100 lbs. but the lines gave in at 60 (!)

Combat

1. P. Tribe	Kombo	
2. A. Dell	Hayes	
Speed		
Beginner's Class	No flights.	
Class 0	1. Burden, Springpark	77 m.p.h.
Class 1	1. P. Drewell, Sidcup	130.0 m.p.h.
	2. R. Gibbs	127.1 m.p.h.
Class F.A.I.	No flights.	
Class 2.	1. G. Robinson, R.A.F.M.A.A.	95 m.p.h.
Class 3.	1. M. Billington, Brixton	163.2 m.p.h.
	2. Kelsey	147.1 m.p.h.
Class 4.	No flights.	

Moving down to the **SOUTH EAST** now we hear that the merry lads of **East Grinstead & Horley M.F.C.** are fortunate in having the opportunity to rent a piece of ground on which to construct a landing strip for R/C models. A few members have spent a great deal of time and money on this project, which is now completed. Interested R/C flyers in the area should contact Roy Payne, Tel. Lingfield 252. **Gravesend M.A.C.** are pleased to have gained a flying field within easy striking distance. Member P. Williamson joined recently without an engine and on the differing advice of fellow clubsters, bought a Merco 49, Merco 35, an ETA 15, Frog 150R and an E.D. Racer. That lot should keep him going for some time. Same member also bought a van and fitted it out with a workshop in the back—just the job for rallies. The new club headquarters will soon be the local R.A.F.A. Club. Inter-group winter activity is well under way in this Area, the first winter R.T.P. Team Race meet took place at **Worthing Bald Eagles'** clubroom, Lancing. Number of laps required in this event is 40, an increase over last year's 30. Few entries were however able to cover more than 15 laps and despite frantic winding, were seldom able to beat 20 laps. Fastest time was A. Paige's **(Tunbridge Wells)** 2:38. No doubt the next meeting, due to be held at East Grinstead, will show a great improvement in model performance. One of the few good flying days for the time of year was November 25th, the date of the Area Slope Soaring event held at Wilmington. Wind speed at the top of the ridge was about 10 m.p.h., through which most models were able to penetrate well. A *Slope Rhino* by K. Denton of Tunbridge Wells made the best time, of 4:37. G. K. Gates flew an interesting Compass steered glider but troubles precluded an outstanding performance.

Leatherhead & D.M.F.C. have enjoyed local paper publicity for their C/L activity at Fetcham Grove where a streamer catching carrier deck comp was held. New club is being formed at **Westcott,** where one member has a 17 x 24 ft. studio which can be used as a clubroom, contact P. Summerville at 1, The Rockery, Westcott, Dorking Surrey.

Moving **WEST** now we visit **Stroud M.A.C.,** now renamed **Cotswold Radio Control Society,** reason being that all active members have flown R/C models for at least a year and some for three years and more. Furthermore, since their membership has spread over half Gloucestershire, from Tewkesbury to Wolton-under-Edge a change of title seemed even more necessary. Flying takes place every Saturday and Sunday, weather permitting, at Brockworth Aerodrome, Gloucester and also at Astone Down Aerodrome on Sundays only.

Services

The 1962 F.E.A.F. Model Aircraft Championship meeting was held in somewhat disastrous conditions at R.A.F. Seletar on Saturday 3rd and Sunday 4th November, by kind permission of Gp. Capt. R. D. Williams, Station Commander. Teams from R.A.F. Stations Changi, Seletar and Tengah and one representative from R.A.F. Gan took part. Weather on Saturday was good, overcast with a light wind and slight thermal activity. Sunday was hot with a light wind, good thermals and equally large downdraughts. Unfortunately at 3 p.m. it started to rain and in the next hour 1¼ inches of rain fell delaying proceedings for two hours until the team race exponents could be driven out of the marquee. Test flying of ½A Power models for the Open Power event produced considerable amounts of scrap, and one flyaway due to a recaltrant timer so the ½A Power competition was run with very depleted ranks. After the deluge, the "B" and ½A team races were run, the weather apparently affecting the models as well as the contestants so much that times are unmentionable in public. Combat and the second round for stunt were abandoned. Due to the weather the official guests had to be advised not to attend and the prizes were distributed by the Chairman of the F.E.A.F.M.A.A. Final positions for the Inter-Station Challenge Cup were:—R.A.F. Tengah—20 points; R.A.F. Seletar—18 points; R.A.F. Changi—9 points.

Afterthoughts.

(1) Why was the marquee pitched in a hollow so that during the downpour there was 3 inches of water underfoot? (2) Falconer, Pickford, 1st, 2nd in Control Line Stunt *yet* again! (3) R.A.F. Tengah's mobile workshop, that only *they* seemed to need. (4) The Chairman's delightful nosedive on getting his feet mixed up while launching an A/2.—and on that thought I leave you. THE CLUBMAN

Pen Pals

Jan Bartovic, Rooseveltova 51, Piestany, Czechoslovakia, an R/C and A/2 glider enthusiast wishes to correspond with a British modeller and exchange Czechoslovakian *Letecky Modelar* for AEROMODELLER.

Contests

January 20th — *Northern Area Winter Rally*, Open Glider, Rubber, Power, ½A Power, F.A.I. T/R, Combat, Scramble, Chuck Glider, Pre-entry 1s. 6d., late entry 3s., Chuck Glider 1s. to G. E. Stringwell. 11 Green Lane, Wickersley, Rotherham, R.A.F. Elvington, Nr. York.

February 3rd — *Bristol & West M.A.C. Winter Rally*, Open Glider/Rubber/Power, ½A Power, Blakehill Aerodrome, (Nr. Cricklade, Wilts.) Pre-entry 1s. 6d. (2s. 6d. on day) to J. K. Cartwright, 10 Bush Avenue, Little Stoke, Bristol. Starts 10 a.m.

S.M.A.E. 1963 Contests

April 7th
*K.M.A.A. Cup (F.A.I. Glider) } *Area*
Halifax Trophy (F.A.I. Power) } *venues.*
Rubber (U/R)

April 14th
C/L Meeting — *Centralised*

April 21st
1st RADIO CONTROL TRIALS — *Barkston Heath*

April 28th
*Astral Trophy (F.A.I. Power) } *Area*
Gutteridge Trophy (F.A.I. Rubber) } *venues.*
Glider (U/R)

May 19th
*Weston Cup (F.A.I. Rubber) } *Area*
S.M.A.E. Cup (F.A.I. Glider) } *venues.*
Power (U/R)

May 19th
2nd RADIO CONTROL TRIALS

June 2nd
BRITISH NATIONAL CHAMPIONSHIPS
Thurston Cup (U/R Glider)
Lady Shelley Cup (Tailless)
Women's Cup (U/R Glider/Rubber)
S.M.A.E. Cup (R/C Multi)
Scale (Radio Control)
Knokke No. 2 Cup (C/L Scale)
Super Scale Trophy (F/F Scale)
Gold Trophy (C/L Stunt)
Davies A. Cup (T.R. Class A)
Combat (Prelim. Heats)
Speed (Class 1, 2, 3)

June 3 — *R.A.F. Barkston Heath*
Sir John Shelley Trophy (U/R Power)
Model Aircraft Trophy (U/R Rubber)
Short Cup (P.A.A. Load)
S.M.A.E. Cup (R/C Multi)
R.A.F.M.A.A. Cup (T/R Class ½A)
Davies B Cup (T.R Class B)
Combat (Finals)
Speed (Class 4, 5, 6)

June 22/23
1st FREE FLIGHT TRIALS. — *R.A.F. Barkston Heath*
Single Channel and Intermediate Class R/C (Experimental Contests)

June 30th
Gamage Cup (U/R Rubber) } *Area*
Pilcher Cup (U/R Glider) } *venues.*
Quickstart Trophy (½A Power)

July 7th
C/L Meeting

July 13/14th — *R.A.F. Barkston Heath*
2nd FREE FLIGHT TRIALS

July 28th
White Cup (U/R Power) } *Decentralised*
Frog Junior (U/R Rubber/Glider)

August 11th
SCOTTISH GALA
K.L.M. Trophy (U/R Power)
C.M.D. Trophy (U/R Rubber)
(U/R Glider)
Team Racing (Class A & B.)
Ripmax Trophy (R/C Mono)

August 18th
*Keil Trophy (Team U/R Power) } *Area*
C.M.A. Cup (U/R Glider) } *venues.*
Rubber (F.A.I.)

September 1st
NORTHERN GALA
Hamley Trophy (U/R Power)
Caton Trophy (U/R Rubber)
(U/R Glider)
Taplin Trophy (R/C Mono)
P.A.A. Load Trophy
P.A.A. Load Class A.
Budapest Trophy T.R Class ½A)
Wharfedale Trophy (T/R Class A)
Eta Trophy (T.R Class B.)
C/L Stunt
Speed

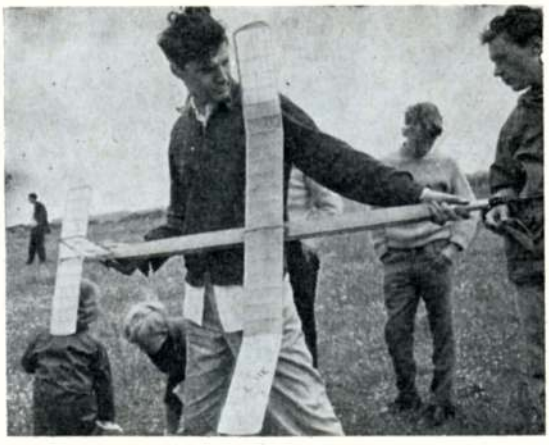
September 15th
*Farrow Shield (Team U/R Rubber) } *Area*
Frog Senior Cup (U/R Power) } *venues.*
Glider (F.A.I.)

September 29th
Aeromodeller Trophy (R/C Multi) } *R.A.F. Barkston Heath*
Area Championships

October 6th
*Model Engineer Trophy (Team U/R Glider) } *Area*
Flight Cup (U/R Rubber) } *venues.*
Power (F.A.I.)

October 13th
C/L Meeting

* Plugge Cup Events.



Top rubber models

Surveyed by John Pool & Ron Firth

Leaders: at left, Dan Poole holds clubmate Reg Lennox's winning model before 10 : 16 flight; right: Norman Elliott holds for R. Leppard, each using similar designs for 2nd and 5th places.

THIS SURVEY OF the leading 6 out of 14 rubber driven models in the fly-off at the 1962 Nationals for the "Model Aircraft Trophy" was made in order to establish a guidance for intending entrants in 1963.

Size appears to have little effect on performance, all the models being between 250 and 180 sq. ins. with 220 sq. ins. being the most popular. Most fuselages were slightly longer than wing spans and were rather slim.

Wing-loadings were on the low side, ranging from Urlan Wannop's (6th) 3.4 ozs./sq. ft. to Paveley (3rd) and Wolstenholme (12th) at around 4.5 ozs./sq. ft. Power/weight ratios range from Wolstenholme at 1.55 down to Paveley's 0.9, the higher ones coming usually with the higher wing loadings. Most were around 1.25 to 1.

Of the twelve props, recorded, four had pitch/diameter ratios at an even 1:1, and two went as high as 1.5 to 1. The remainder were about 1.3 to 1. Eleven were two blade folders and Wolstenholme's a twin-blade featherer.

If there is a moral in this, it is that these are perfectly ordinary models, well trimmed. A Wakefield area model with a 3 oz. airframe and about 3½ oz. of rubber arranged to run off in about 90 secs. will not be difficult to build and should have every chance in any weather next year.

		1st (12:00) + (10:16)	2nd (12:00) + (10:06)	3rd (12:00) + (10:01)	4th (12:00) + (8:41)	5th (12:00) + (8:18)	6th (12:00) + (7:54)
	Name	R. Lennox	N. Elliott	D. Paveley	R. Monks	R. Leppard	U. Wannop
	Club	Birmingham	Croydon	Hornchurch	Birmingham	Croydon	Country Member
WING	*Span*	44 in.	50 in.	46 in.	46 in.	50 in.	51 in.
WING	*Chord*	5 in.	5 in.	4½ in.	5½ in.	5 in.	4½ in.
WING	*Tip*	Elliptical	Square	Elliptical	Square	Square	Elliptical
WING	*Section*	O/D 10% 1/16" u/c	O/D Flat base	NACA 6049 mod	O/D u/cambered	O/D Flat base	O/D u/cambered
WING	*Dihedral*	Poly, 5 in.	Tip, 5½ in.	Poly, 4¾ in.	Polyhedral	Tip 5½ in.	Poly, 4¾ in.
WING	*Ribs*	Straight	Straight	Straight	Split + nose ribs	Straight	Straight
WING	*Spars*	3 top, 1 bottom	2 top, 2 bottom	Three	2 top, 2 bottom	3 top, 3 bottom	3 top, 2 bottom
TAIL	*Span*	20 in.	20 in.	17½ in.	21 in.	20 in.	18 in.
TAIL	*Chord*	3½ in.	4 in.	3½ in.	4 in.	4 in.	3½ in.
TAIL	*Tip*	Square	Square	Radius	Square	Square	Radius
TAIL	*Section*	Flat base	Flat base	Flat base	Flat base	Flat base	Flat base
TAIL	*Ribs*	Straight	60 degree	Straight	St. top, 60° base	Straight	60 degree.
TAIL	*Spars*	2 top, 1 bottom	One	Two	Two	2 top, 1 bottom	One
	Fin	Elliptical	Tapered Rectangle	Radius tip	Radius tip	Tapered Rectangle	Elliptical
FUS.	*Length*	50 in.	48 in.	46 in.	50½ in.	48 in.	45 in.
FUS.	*Section*	Diamond	1¾ in. sq.	1¾ in. sq.	2⅛ in. sq.	1¾ in. sq.	1.7 in. sq.
FUS.	*Wing seat*	'Midland' type	Runner 17" aft.	Runners	Raised box	Small pylon	Streamline pylon
	C of G (C%)	100%	110%	80%	95%	95%	85%
	Power	12 str, 48 in.	16 str, 46 in.	14 str, 36 in.	16 str, 4 ozs.	14 str, 51 in.	12 str, 44 in.
	Make	Pirelli	Pirelli	Dunlop	Pirelli	Pirelli	Dunlop
	Prop P/D	28/21½ in.	30/24 in.	26/22 in.	30/23 in.	30/24 in.	30/24 in.
	Airframe	2½ ozs.	3½ ozs.	3 ozs.	3.3 ozs.	2½ ozs.	2½ ozs.
	Power	3½ ozs.	4½ ozs.	2⅞ ozs.	4 ozs.	3½ ozs.	3 ozs.
	Wingload	4 oz./sq. ft.	4½ oz./sq. ft.	4.6 oz./sq. ft.	4.10 oz./sq. ft.	3.4 oz./sq. ft.	3½ oz./sq. ft.
	Pwr./Wt. ratio	1.4	1.2	0.91	1.2	1.0	1.2
	Remarks	*Warren Girder fuselage bracing*	*Diagonal Longerons Warren Girder fuselage*	*34 in. between motor hooks 80 sec. motor run*	*36 in. between motor hooks 95 sec. motor run*	*Elliott's similar*	*Very neatly finished*

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M T F

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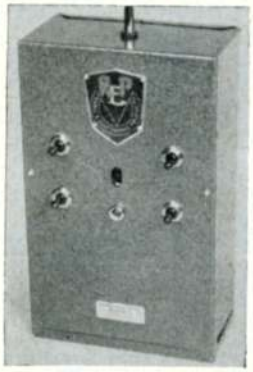

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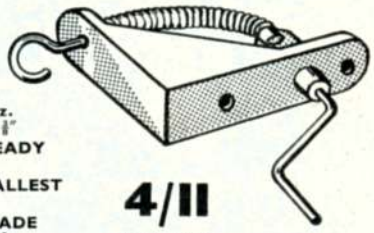

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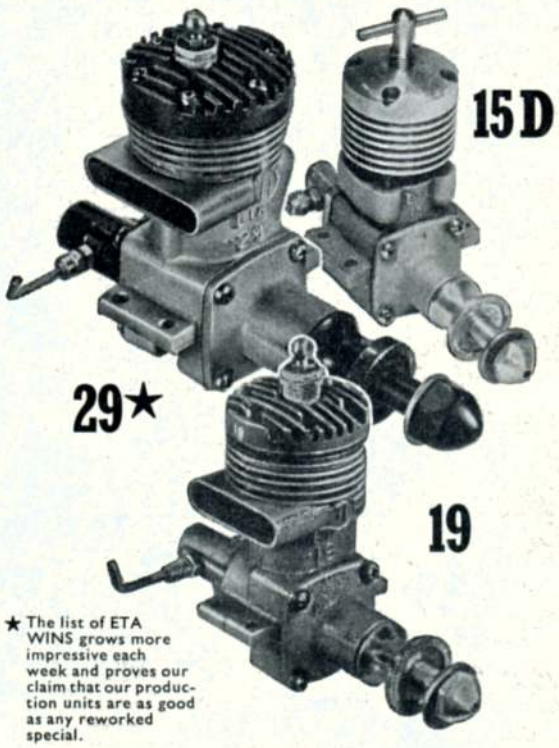

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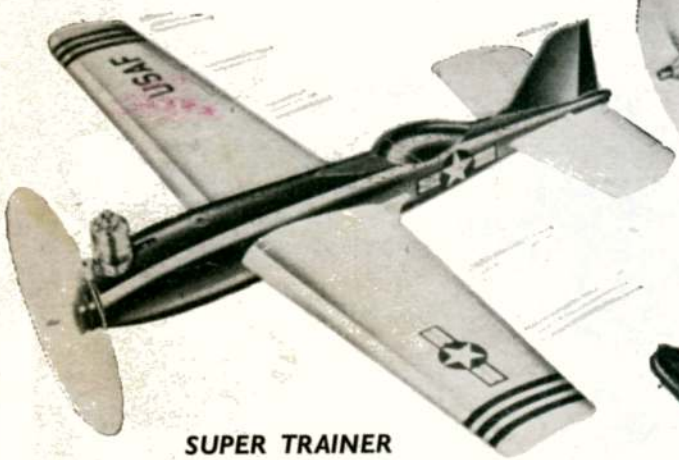

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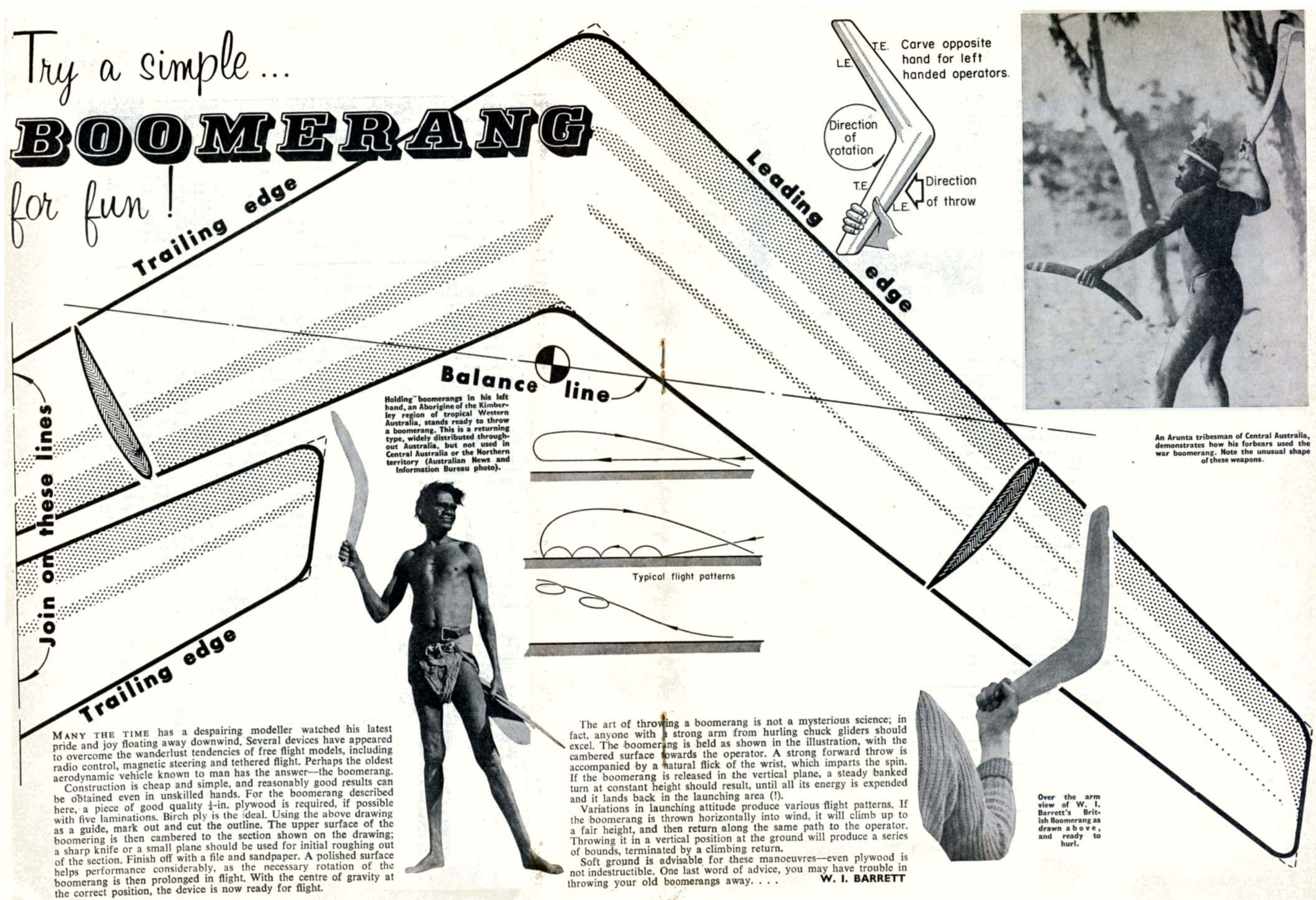

Carve opposite hand for left handed operators.

An Arunta tribesman of Central Australia, demonstrates how his forbears used the war boomerang. Note the unusual shape of these weapons.

Holding boomerangs in his left hand, an Aborigine of the Kimberley region of tropical Western Australia, stands ready to throw a boomerang. This is a returning type, widely distributed throughout Australia, but not used in Central Australia or the Northern territory (Australian News and Information Bureau photo).

Typical flight patterns

MANY THE TIME has a despairing modeller watched his latest pride and joy floating away downwind. Several devices have appeared to overcome the wanderlust tendencies of free flight models, including radio control, magnetic steering and tethered flight. Perhaps the oldest aerodynamic vehicle known to man has the answer—the boomerang.

Construction is cheap and simple, and reasonably good results can be obtained even in unskilled hands. For the boomerang described here, a piece of good quality ¼-in. plywood is required, if possible with five laminations. Birch ply is the ideal. Using the above drawing as a guide, mark out and cut the outline. The upper surface of the boomering is then cambered to the section shown on the drawing; a sharp knife or a small plane should be used for initial roughing out of the section. Finish off with a file and sandpaper. A polished surface helps performance considerably, as the necessary rotation of the boomerang is then prolonged in flight. With the centre of gravity at the correct position, the device is now ready for flight.

The art of throwing a boomerang is not a mysterious science; in fact, anyone with a strong arm from hurling chuck gliders should excel. The boomerang is held as shown in the illustration, with the cambered surface towards the operator. A strong forward throw is accompanied by a natural flick of the wrist, which imparts the spin. If the boomerang is released in the vertical plane, a steady banked turn at constant height should result, until all its energy is expended and it lands back in the launching area (!).

Variations in launching attitude produce various flight patterns. If the boomerang is thrown horizontally into wind, it will climb up to a fair height, and then return along the same path to the operator. Throwing it in a vertical position at the ground will produce a series of bounds, terminated by a climbing return.

Soft ground is advisable for these manoeuvres—even plywood is not indestructible. One last word of advice, you may have trouble in throwing your old boomerangs away. . . .

W. I. BARRETT

Over the arm view of W. I. Barrett's British Boomerang as drawn above, and ready to hurl.