

Aero Modeller

MARCH 1971

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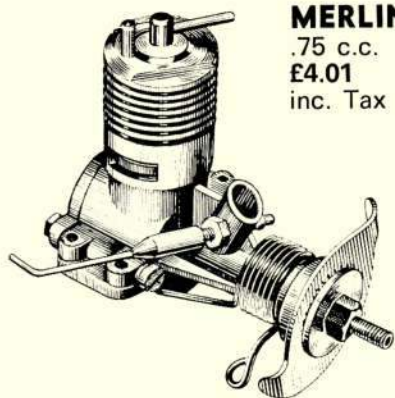
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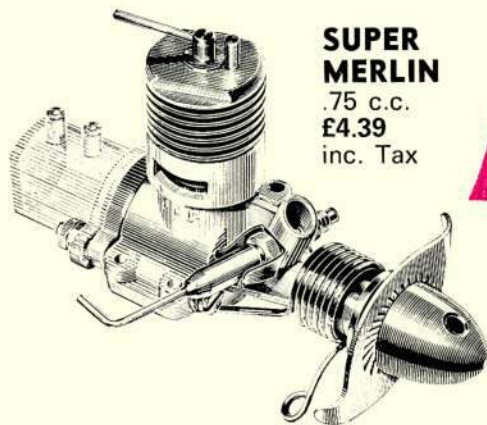
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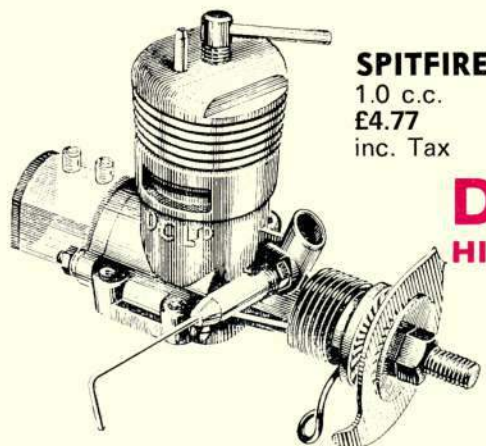


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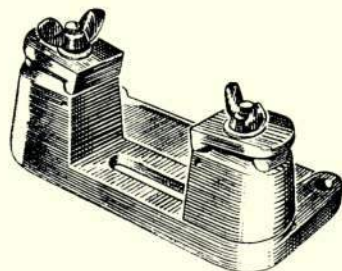
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March 1971

Volume XXXVI No. 422

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Advertisement and Subscription Offices: Model & Allied Publications Ltd., 13/35 Bridge Street, Hemel Hempstead, Hertfordshire. Tel. Hemel Hempstead 2501-2-3.

Direct subscription rate £2.25 (45/-) per annum including December edition and Index. CORRESPONDENCE anticipating a reply to addresses within the United Kingdom must be accompanied by a stamped and self-addressed envelope. News reports should be submitted to arrive not later than the 15th of each month for publication in the next immediate issue. Photographs should be accompanied by negatives where possible and can only be accepted for use on an exclusive basis for British Copyright.

AERO MODELLER incorporates the MODEL AEROPLANE CONSTRUCTOR and MODEL AIRCRAFT and is published on the third Friday of each month prior to date of publication by:

MODEL & ALLIED PUBLICATIONS LTD.

13-35 Bridge Street, Hemel Hempstead, Herts

Tel.: Hemel Hempstead 2501-2-3 (Mon.-Fri.)

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COMMENT

A breath of change is overdue in British Aeromodelling. Maybe 1971 will bring us something new. Three Kings Club will have remobilised H.M.S. 'Flycatcher' for Carrier Deck events and Goodyear racing well deserves the promotion we continue to give it this month. Free Flight Scale is another event that could well pick itself out of the doldrums and Eric Coates starts his series which will surely rekindle dying enthusiasms and generate new thoughts. Stunt and combat are two classes which offer open challenge to the up-coming Control-liner and even the humble chuck glider has its rightful place in Sport flying; but where, oh where, have those adventurous experimenters gone? Helicopters, ornithopters, multiplanes and other unorthodox types were rare in 1970.

Here's hoping that there will be more changes in aeromodelling 1971 than the new pence prices, and that we shall see many new shapes and faces at the rallies.

on the cover

The Yak 18 PS flown by Igor Egorov to win the Individual World Championship for Aerobatics at R.A.F. Hullavington 1970 (Air Portraits photo). Same machine is seen at bottom right and the Yak 18 PM flown to individual Women's Championship by Miss Savitskaya, is at bottom left.

next month

Second part of Flying Scale Models by Eric Coates features choosing a prototype. Two free plans plus a scale drawing of another subject ideally suited to flying scale. Latest Engine News and revelations from the Nurnberg Hobby Fair plus all the regular features. On sale March 19th.

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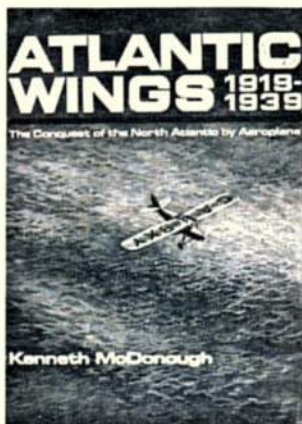


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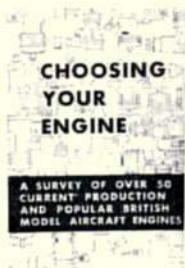


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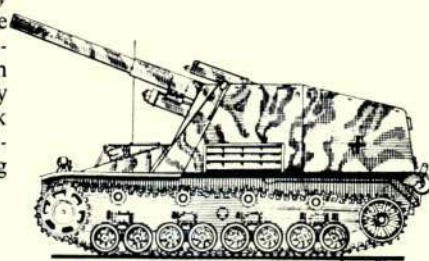


Issue number two of our exciting new title for military enthusiasts looks all set to consolidate the overwhelming success enjoyed by recently published issue number one.

Top line features scheduled for February edition include an intriguing article in modelling Japanese Samurai which contains many illustrations of some really superb figures, the arrival in our pages of wargamer Charles Grant who, as a starter to a regular monthly spot, describes *New Look Ancients*. The Scottish United Services Museum in Edinburgh is described, also the I.P.M.S. Champs and the 'M.E.' Exhibition.

Figure Review deals with Lamming Miniatures and there'll be more Royal Flying Corps markings for modellers who like to get things exactly right. Something of an exclusive – and a feature of which we're particularly proud – is *The Historex Story* which, for the first time, shows the processes involved in the production of these French figures. Then there'll be Self-Propelled Artillery Plans, the U.S. Medium Tank M60A1 and M8 Greyhound Armoured car and many supporting features.

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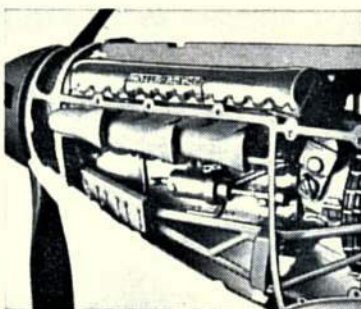
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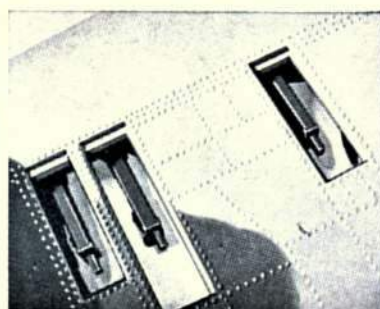
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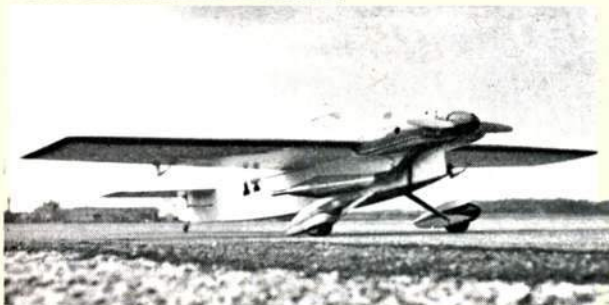
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Radio Models



Formula 1 pylon fans receive a boost in MARCH R.C.M. & E. in the form of plans for Eric Rhodes' hot model of 'Ole Tiger'. Eric has proved that his creation is as fast as any of the Formula 1 breed and plans come just in time for the new racing season.

March issue has something else in store for pylon enthusiasts, in an article which explains, at last, the workings of the American heat system for pylon racing, with complete details of how a series of race heats is arranged.

This month, Bob Jefferies continues his **Introduction to R/C Model Yachting**, with information on the larger sizes of model, and in **Kit Review**, also details his experiences constructing Graupner's Optimist R/C Yacht.

Regular features in this edition include **Scale News**, in which Dennis Thompson examines latest F.A.I. rules amendments, **Sport & Single** with model not-so-frantic R/C activity conducted by David Boddington, views on the news by Pete Russell in **Straight & Level**, **Radio Motor Commentary** and Commercial Developments.

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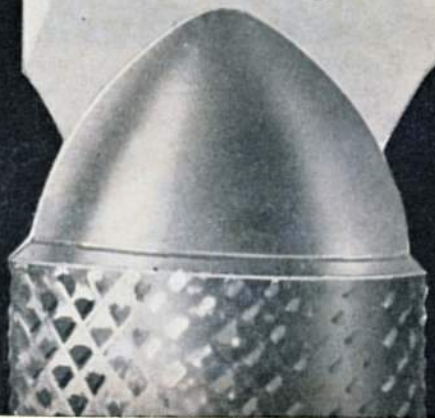
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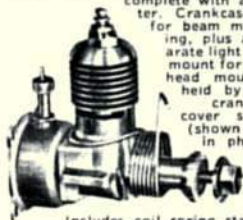


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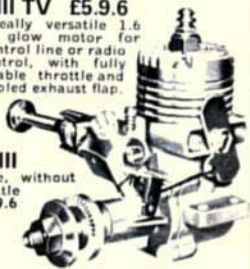


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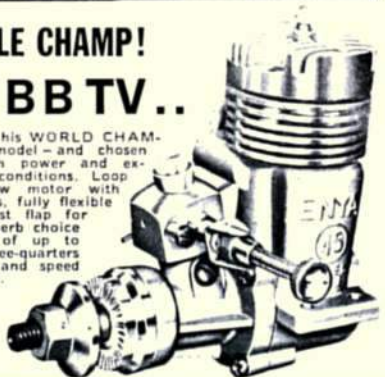
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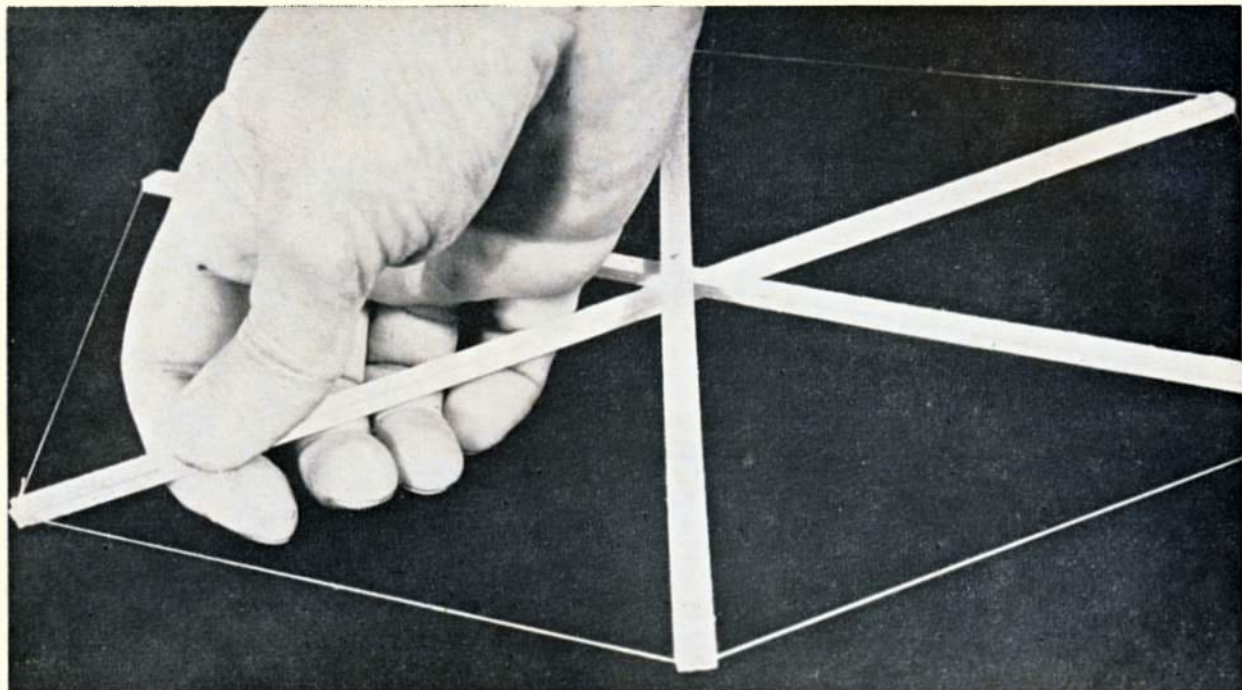


	Main bearing	Bore x Stroke	Displacement cu. in.	Weight oz. Stan-T.V.	Compression ratio	Max. H.P. Stan-T.V.	R.P.M. H.P. Standard	T.V. type	Proper size of propeller dia. x pitch, in. Ucontrol stunt	Free flight	R/C
ENYA 049	Light alloy	0.413 x 0.370	0.049(0.8cc)	1.9	—	8:1	0.06	8,000-17,000	5 1/2 x 6 x 3	6 x 3	6 x 3
ENYA 09.III	Bronze	0.512 x 0.480	0.099(1.62cc)	3.4	4.1	7.5:1	0.20	8,000-16,000	7-8 x 6-4	7-8 x 4-3	8 x 4-3
ENYA 15.III	Bronze	0.590 x 0.551	0.152(2.47cc)	4.8	5.2	7.5:1	0.33	8,000-16,000	8 x 6-5	8 x 4	8.5-9 x 4
ENYA 19.V	Bronze	0.654 x 0.590	0.198(3.25cc)	5.3	5.7	7.5:1	0.42	8,000-16,000	8-9 x 6-5	9 x 4	9-10 x 4
ENYA 35.III	Bronze	0.803 x 0.704	0.357(5.85cc)	7.7	8.6	low 7.5:1 high 9.0:1	0.80	8,000-16,000	10 x 6	10-11 x 5-3	10-11 x 6-4
ENYA 35.III	Bronze	0.803 x 0.704	0.357(5.85cc)	7.7	8.6	low 7.5:1 high 9.0:1	0.80	8,000-16,000	10 x 6	10-11 x 5-3	10-11 x 6-4
ENYA 35.III	2 ball bearings	0.803 x 0.704	0.357(5.85cc)	8.6	9.1	low 7.5:1 high 9.5:1	0.85	10,000-17,000	10 x 6	10-11 x 5-3	10-11 x 6-4
ENYA 45 BB	2 ball bearings	0.878 x 0.756	0.457(7.5cc)	9.1	10.0	8.0:1	0.90	8,000-15,000	11 x 6	—	11 x 6-5
ENYA 60.III	2 ball bearings	0.944 x 0.865	0.606(9.95cc)	13.7	15.0	8.5:1	1.45	9,000-14,000	11-13 x 6-5	12-13 x 6-5	11-12 x 8-6

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Balsa even makes kites fly better! You can knock up the hex. kite shown in the photo in less than half an hour from three pieces of balsa strip, a thread outline and lightweight tissue covering. It needs a three-line bridle to fly properly – and a tail of thread with tissue scraps tied to it. Fun for the kids. Keeps them from wanting to play with your real models! Try them with a miniature sheet-covered box kite next...



We are not kite enthusiasts ourselves, but we do like to check what we often say – 'If it is made to fly, it will fly best made from Solarbo balsa'. The Solarbo part is important – not just any balsa. We take such pride and care in the selecting, grading and cutting of balsa especially for aeromodelling use that the name makes almost as much difference as the material!

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Heard at the HANGAR DOORS

WORLD RECORDS ratified by the *Federation Aeronautique Internationale* at the end of 1970 include some really spectacular performances, and omit some of the well publicised achievements with radio controlled altitude flights in the U.S.A. and both duration and distance flights by radio controlled helicopter in West Germany. Presumably these records will be claimed and ratified in 1971. The U.S.S.R. has improved upon its previous claims in two of the new records. V. Koumanyn made a flight of 141.17 km/h to establish a new speed for free flight rubber models at Moscow on 29th July. This makes the rubber-driven record only 3 km/h slower than that for free flight power-driven models! Anatol Pavlov pushed the helicopter speed record to 116.12 km/h at Moscow on 20th September with a device that looked like a rotating javelin rather than the helicopter as it is generally understood. Czechoslovakia has two new records. Jiri Kalina improved his indoor duration (under 15-metre ceiling) to 30 minutes 7 seconds and Ladislav Ducek busted W. Kaiser's (W. Germany) distance in a closed circuit R/C glider record with 213.6 kilometres. This distance was overtaken by Raymond Brogly of France on September 8th with 322.2 km. and this will now take a lot of effort to beat. It seems inevitable that night flying will soon intrude into the glider record attempts. The U.S.A. captured a record previously held by the U.S.S.R. when Bryce Petersen covered 42.6 km. on 15th August in West Virginia with a radio controlled seaplane.

PRESIDENT of the Academy of Model Aeronautics in the U.S.A. for 1971 is John Clemens who gained a convincing majority in the national vote among four candidates. Total vote was almost 20 per cent of the A.M.A. membership, 6,400, in fact. John had 53.3 per cent of the votes cast, and second runner John Pond was backed by 37.4 per cent. Electioneering campaigns extend to magazine-induced lobbying, circulation of biographies and manifestos. One can only reflect on the comparative S.M.A.E. elections where insufficient officials are proposed to fill the vacancies

The 'Supa - Kite' adopts model plane features, is foldable and made from plans issued by the designer W. L. Manuel of Walton on Thames. Extremely stable, it will fly in all wind conditions. See classifieds for details of plans.



and competitive voting is now a rare occasion.

WINNER of the completed Keil-Kraft *Skyqueen* fitted with Pecon radio and O.S. 40 engine, covered in Solarfilm and ready to be flight tested after construction on the S.M.A.E. stand at the Model Engineer Exhibition, was L. Parnell of Harpenden, Herts. Over £200 was raised through ticket sales for this and other generously donated prizes, and the cash will go to the Society team travel fund. Members of the Eastcote and North London R/C Clubs staffed the stand during the show, and well over half the funds raised came from the specially persuasive efforts of Mick Charles, the R/C Scale Champion whose *Jurca Sirocco* was on display at the stand.

MODEL PLANES IN DRUG INVASION—that was the banner headline on Britain's nationally-distributed *Daily Express* across the front page as the lead story for January 29th. Had it been April 1st, we would have fully understood; but there it was in black and white that a ship to shore airlift gang was being hunted. It was believed that up to 10 lb. of heroin was being landed in radio controlled models near Cuckmere valley at Eastbourne. The report suggested a span of up to 12 ft., an engine of around 15 c.c. and this established a stamp of authenticity until one read on to learn of 30 miles radio range (one mile is the most any manufacturer would claim) plus an engine unheard at 200 ft. (Oh, for such a silencer!) And to cap the story—flown by moonlight and landed right on target! This acceptance of radio control by the national press was in itself encouraging even though the

credibility of the story was questionable. Local police denied any knowledge and the local Customs Waterguard had 'no comment'. To ourselves it was nothing more than a 'load of dope'. Expecting the story to be killed rapidly, we found to our surprise on January 30th that the *Express* was not to be lightly dismissed. **'I built the Smugglers' model planes, says Mr. X'**, was the headline for a second front page feature. Now we had an 'Electronics expert' claiming he built three models, one a delta, and two twin-engine Islander types. They were equipped with model shop-supplied components and were supposed to be for aerial photography. They could fly at 100 m.p.h., carry 30 lb., were 8 ft. span and he had already repaired one model after a crash into the sea. The 'expert' had heard that watches and drugs were being smuggled into Britain using model aircraft and on probing, he discovered that he had been used to launch a business in narcotics smuggling. He was said to come from Brighton, and he claimed that he was owed £500. It is no coincidence that three demi-professional modellers have to our knowledge, made large delta and Islander types in recent months; but none of them come from Brighton. One professional model maker who does live there has never made models to this description and the best known electronics expert in Brighton happened to be thousands of miles away and thus not available for interview to either the *Express* or ourselves. Our identification search for Mr. 'X' was thus shifted to another south coast town, where similar models have been seen under construction. Could the fact that he has been 'caught' for £500 be the clue to a vindictive bleat to the press?



A 32" span near-scale model for free flight or single channel radio control, using .75 c.c. engines.

by Phil McAlroy

THE FAIREY BARRACUDA, although never a popular aircraft, had one main asset. A former F.A.A. Observer in Barras relates that on reconnaissance patrols over towards Norway, it could turn inside the Ju 88s sent to intercept—the allies' scheme, therefore, was to get down to sea level and keep turning!

This model, with the exception of the tailplane, is near scale and designed for flying over rough ground. When looking at a scale model the designer finds that life is made much easier by applying 'Mac's fifty-foot rule'—just picture how the model looks at an altitude of 50 ft. and build accordingly. It won't win the Nats., but you will have more fun flying.

The model was originally flown free-flight, in which form it flew extremely well with its Mills .75 c.c. powerplant. Later, single channel radio control equipment was added (an R.C.S. Guidance System with Conquest escapement) and was found to give excellent results, although not recommended as a first R/C power model. However, anyone experienced in handling a single channel model should have no trouble. A version built for free-flight can easily be adapted to R/C at a later stage if required, with very little 'surgery' involved.

Fuselage sides are cut from medium soft 3/32 in. sheet with former positions marked on the inside. Cut out both under-wing windows and fix sheet acetate to the inside. The fuselage floor from F1 to F5 is of soft 1/4 in. sheet, with a further piece of similar sheet extending to F6. Begin by pinning down the main floor tray, then adding bulkheads F4 and F5, dropping the fuselage sides on to the tray at the same time. (Note the slightly different construction required if using R/C). Ensure that both sides meet squarely at the tail but do not fix yet. When set, add formers F2 and 3. Bring in tail to F11, then add the remaining formers—remember the cutouts for escapement controls if required. Offer up the second piece of the fuselage tray between F5 and F6. Add soft 1/4 in. x 1/4 in. upper and lower spine pieces followed by WF1 and 2. The rear decking may now be applied—this is soft 1/16 in. sheet well soaked and pinned. Rear bottom decking can be persuaded round the formers providing that it is well soaked on the outside, but if in doubt, you could use 1/16 in. planking.

A contour sheet of 1/16 in. ply gives the nose its true shape and locates the 1/4 in. beech engine bearers. The original used a sidewinder-mounted engine but

for 'fifty-foot rule' purposes it could just as well be upright. Downthrust is built into the contour sheet but it will need offset to give some right thrust. With the long nose it might not seem essential but the prototype without offset produced some remarkably stable left-hand vertical banks! Slot the contour sheet egg-box style into F3 after fitting and drilling the bearers. Slot former F1 on to the front of the contour sheet. Leave the cowl open on the right-hand side between F1 and F2, adding soft block between F2 and F3 on that side. Fill with soft block between formers F1, 2 and 3 on the left-hand side. Do not forget to apply a few coats of fuel-proofer inside this compartment before the blocks go on. Chin blisters consist of 1/4 in. sheet stuck on the sides and bottom, then shapes. Fit engine and tank, then remove until after painting.

Build the fin from medium 1/4 in. x 1/4 in. framing covered with 1/16 in. sheet to the rear vertical spar. Make the rudder from 1/4 in. sheet with a hinged trim tab. Refer to the detail drawing for R/C use. Add soft fairing blocks either side of the fin and add similar block tail cones below the rudder. The tail-wheel is bound and glued to soft block let into the space remaining between F10 and the rudder lower outline. The tailplane platform is from 1/16 in. ply,



then 1/16 in. retainer dowels can be added to the fin. The typical *Barracuda* stabiliser bracing struts should be left until after the fin is painted. Tailplane construction is quite straightforward, but after covering, add a layer of cartridge paper between the two ribs T2 to take care of wear and tear. It is advisable to cover the underside with nylon where a radio control model is planned.

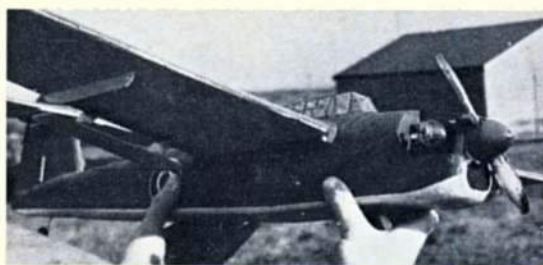
Wing construction should present no problems if built one panel at a time, and its structure is economical as well as simple. Use very hard $\frac{1}{4}$ in. square for wing spars. Lay down the leading edge, bottom spar and lower trailing edge sheet, and build up from there. The dihedral brace is form 1/16 in. ply and serves mainly to give the correct angle when adding the opposite wing panel. Add wing sheeting, but leave the flaps for the moment.

Fix the wing temporarily to fuselage, pin and cement formers WF1 and WF2 in place at leading and trailing edges, and build up wing decking with soft block and finally a strip of medium 3/32 in. carving to shape while wing is still in place. Templates for the canopy are shown on the plan but try these first on writing paper to make sure of a good fit. Give the canopy 'floor' a coat of dark green before the clear acetate is glued in position.

The prominent flaps turned out to be rather vulnerable on the prototype until modified. Flap brackets are from 20 s.w.g. dural sewn and epoxied to both the hard $\frac{1}{4}$ in. flaps and the 1/32 in. ply strip, which is afterwards glued to the lower trailing edge. Flaps are a little shorter than scale to allow the wing to swivel slightly on rough landings.

With all the 'woodwork' now completed, the finishing process may now be begun.

Cover both fuselage and tail with lightweight tissue, but use a heavyweight grade for the wings. A

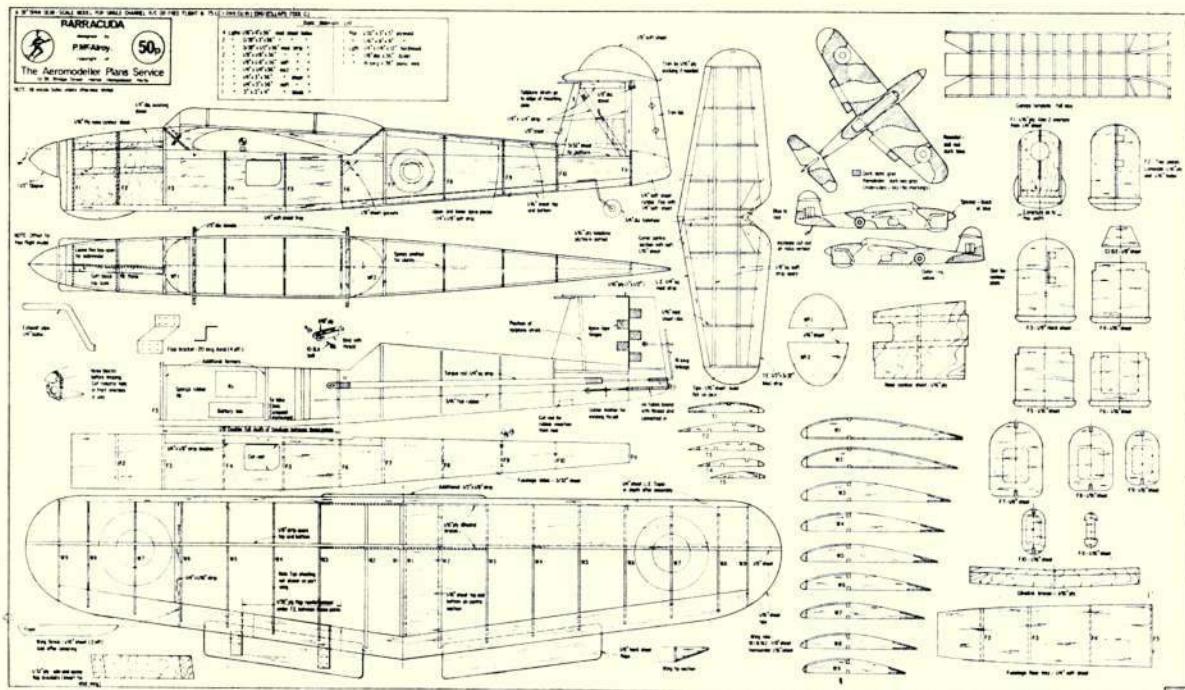


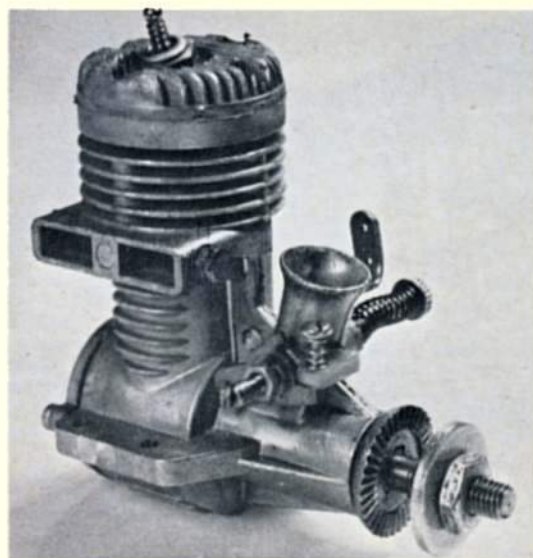
couple of coats of dope—you're not entering the Nats, surely?—then for the fun of adding camouflage. The pattern shown is probably correct and is taken from a study of several wartime photographs. Colours used are Dark Grey and Dark Slate Grey (Humbrol Matt No. 27 and No. 31) and Sky below (Matt No. 20). No markings were applied below the wings—and please remember when applying the top surface roundels (plus flash) that the red was 'Indian Red'—more a ruddy brown—not the bright scarlet of nowadays, while the blue was quite dark.

Spinner is blue. Canopy framing consists of Sello-tape stuck to a tin or glass painted Dark Slate Grey, then cut into 3/32 in. strips which are then stuck to the canopy. Undercarriage? Easy—there isn't one—this is for rough fields, remember?

With the last coat of dope dry, we are now fit for the flying field. Test gliders are quite feasible—even for the R/C versions, which should not weigh more than 16 oz. If more than 1/16 in. packing is needed under the tailplane trailing edge, then the C.G. is too far forward. Aim for a fast straight glide, not a swooping trim. When satisfied with the glide, try short runs at near-maximum revs, then increase in small stages. Happy 'fifty-foot ruling'!

FULL-SIZE COPIES OF THIS 1/8th SCALE REPRODUCTION ARE AVAILABLE AS PLAN No. RC/1095, PRICE 50p INCLUDING POSTAGE, FROM AEROMODELLER PLANS SERVICE, 13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.





THE AMERICAN FOX 15 R/C was first put on the market in 1962. A refined and much more expensive version was offered in 1965. The present version, introduced last year, is something of a compromise between these two, offering most of the advantages of the more expensive model (plus some improvements of its own) but at a price which, having regard to the sharp rise that has taken place over the past few years in engine prices, is more closely allied (in the U.S.A.) to that of the original model.

Like most Fox engines, the 15 R/C is quite a simple design. The cylinder casing, crankcase and shaft housing are embodied in a single pressure die-casting. The throttle features a two-jet fuel system. The throttle rotor does not have the usual cross hole type choke: instead, air is directed either side of a flattened centre section. The rotor is drilled axially and threaded to take, from the left-hand side, the usual needle and, from the opposite side, a brass fuel inlet fitting. Fuel is therefore released into the interior of the throttle rotor. From here it is metered into the intake via two jet holes. One of these (the idling jet) is placed in the centre of the rotor, while the other (the high-speed jet) is placed in the bottom of the rotor and offset to one side.

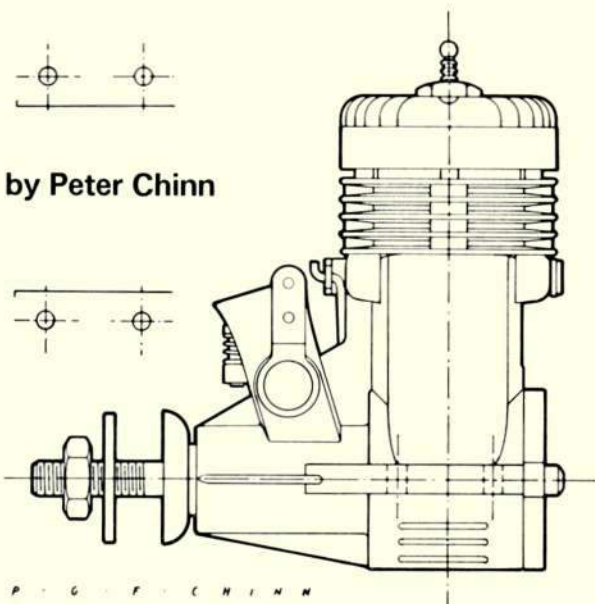
This offset location of the high-speed jet means that, as the rotor is carried in a circular bore intake, it is blanked off and becomes inoperative when the throttle is rotated towards the closed position. The engine then runs on the idling jet only.

The overall mixture strength is controlled, in the usual way, by the main needle-valve. However, in order to achieve the ideal low-speed mixture strength for reliable idling, an additional adjustment is provided. Adjustment can only be effected when the engine is stopped since it is necessary to remove the fuel delivery line. This will uncover a screwdriver slot in the end of the brass inlet fitting which, after the locknut is slackened, will allow it to be screwed in (to weaken the idling mixture) or out (to enrich the idling mixture).

It should be mentioned here that, as any alteration of the inlet fitting also affects the main needle-valve setting (by moving the fitting in or out relative to the needle), it is necessary to make a compensatory

ENGINE TEST FOX 15 R/C

by Peter Chinn



Specification

Type: Single cylinder, air-cooled glowplug ignition, two-stroke with throttle control. Crankshaft type rotary-valve induction and bronze bushed main bearing.

Bore: 0.590 in.

Stroke: 0.540 in.

Swept Volume: 0.1476 cu. in. (2.419 c.c.)

Stroke Bore Ratio: 0.915:1

Checked Weight: 111 grammes - 3.92 oz. (without silencer)

General Structural Data

Pressure diecast aluminium alloy crankcase/cylinder/main-bearing housing with cast-in bronze main bearing bush. Detachable rear crankcase cover secured with two screws. Case-hardened steel counter-balanced crankshaft with 0.375 in. dia. journal, 0.265 in. bore gas passage and 0.156 in. dia. solid crank-pin. Meehanite cast-iron piston with baffle, flat crown and solid 0.125 in. dia. gudgeon-pin. Pressure diecast aluminium alloy connecting-rod with plain eyes. Cylinder liner machined from leaded steel, slip fit in main casting and located by flange at top. Pressure diecast aluminium alloy cylinder head with 0.10 in. soft aluminium gasket, 0.040 in. aluminium decompression spacer and secured to cylinder casing with four screws. Ground steel valve rotor with separate high speed and low speed jets and coupled to semi-rotary exhaust baffle. Beam mounting lugs.

TEST CONDITIONS

Running time prior to test: 1 hour.

Fuels used: (i) 5 per cent pure nitromethane, 25 per cent Duckhams Racing Castor-oil, 70 per cent I.C.I. Methanol.

(ii) 20 per cent pure nitromethane, 25 per cent Duckhams Racing Castor-oil, 55 per cent I.C.I. Methanol.

Glowplug used: Fox short-reach R/C bar type as supplied.

Air temperature: 18 deg. C (65 deg. F).

Barometric pressure: 30.10 in. Hg

Silencer: Nil.

adjustment to the main needle-valve. Thus, if the idling mixture is enriched by unscrewing the inlet fitting, it will be necessary to close the main needle-valve slightly.

Performance

Our test motor came direct from the Fox Manufacturing Company in the USA. After running-in, performance tests were first carried out on our standard mild test fuel containing 5 per cent pure nitromethane. The fuel recommended by the manufacturer is Fox 'Missile Mist' which is a medium nitro mixture. Fox fuels are not available in the U.K. and a blend (containing 20 per cent pure nitromethane) was therefore made up to give approximately the same power as Missile Mist. This raised performance by 400–500 r.p.m. on 8 x 4 props. An equal improvement came with raising the engine's compression ratio by removing the .040 in. decompression spacer from under the cylinder head.

In due course, performance tests were undertaken with the engine (a) in stock condition with head spacer installed as supplied and running on 5 per cent nitro fuel and (b) in high-compression form with head spacer removed and running on 20 per cent nitro fuel. The performance curves plotted from the figures so obtained are shown on the graph.

The power output with the engine in standard low compression form, no more than average for a 2½ c.c. class R/C motor, is certainly much improved by removing the decompression spacer. By using the hotter fuel as well, there was, on test, a total improvement in the region of 30–35 per cent in the peak brake horsepower developed.

In view of the considerably greater cost (and, very often, limited availability) of medium and high nitromethane fuels outside the USA, many U.K. purchasers will probably want to run the Fox on a regular R/C fuel blend. Under these circumstances, we would suggest removal of the decompression spacer. The manufacturer recommends that this is not done until the engine has been adequately run in as, initially, high compression may make the 15 R/C difficult to start. We cannot report on this as we did not try raising the test engine's compression ratio until it had run for two or three hours. However, it is worth recording that, at this stage, we could detect little or no difference in the engine's starting qualities, with or without the spacer.

Typical prop r.p.m. recorded with the Fox, using 5 per cent nitro fuel and high compression included 10,400 r.p.m. on a 9 x 4 KeilKraft nylon, 12,500 r.p.m. on an 8 x 5 Power-Prop, 12,800 on an 8 x 4 Top-Flite nylon and 13,700 on an 8 x 3½ Top-Flite. The engine is obviously best if allowed to unload somewhat, e.g. propped with an 8 x 4.

All our test figures relate, of course, to the 15 R/C's performance in standard trim and without a silencer. The Fox Company do not at present make silencers for their engines and the recommended Irvine silencer for the 15 R/C was not available at the time of testing. However, we would estimate that, based on the power absorption characteristics of Irvine silencers on other engines, the Fox 15 R/C should not lose more than 300–500 r.p.m. on appropriate props.

Starting presented no problems. It was quite good when the Fox was new and became more positive as the engine became run in. Starting from cold was quickest if the throttle was opened and the engine given an exhaust prime. Warm restarts could be obtained with the throttle closed.

Response to the throttle control was rather better than with either of the two earlier model Fox 15 R/C motors tested. At first, the Fox would cut out when slightly throttled. The idling mixture was therefore enriched by a half-turn of the inlet fitting. This was rather too much and the engine ran too rich at idling speed. Closing the adjustment back a quarter turn was just about right and we were able to get a safe idle of around 3,200 r.p.m. on an 8 x 4. This is quite good for a 2.5 c.c. class glow motor.

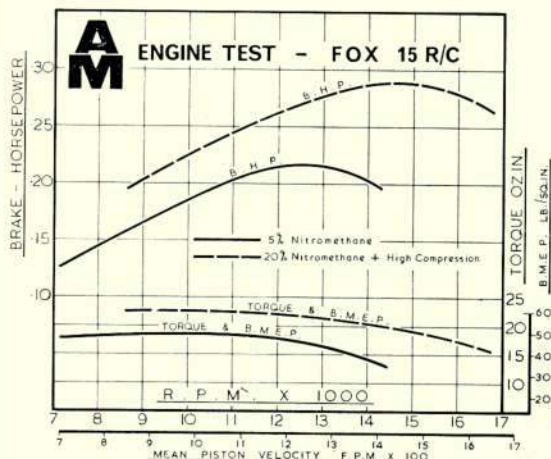
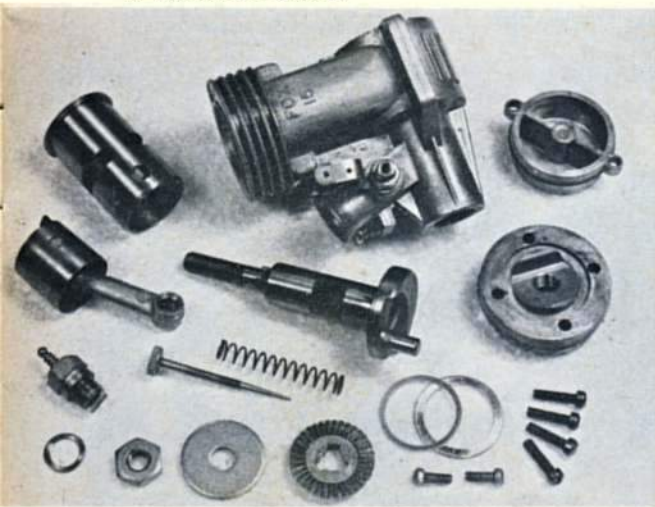
With its somewhat utilitarian external appearance, the Fox 15 R/C may not be particularly exciting to look at, but it more than makes up for this in being pleasingly compact and offering a good power/weight ratio, particularly in high-compression form.

Power Weight Ratio (as tested less silencer):

- 0.89 b.h.p./lb. (low compression, 5 per cent nitromethane fuel).
- 1.17 b.h.p./lb. (high compression, 20 per cent nitromethane fuel).

Specific Output (as tested, less silencer):

- 90 b.h.p./litre (low compression 5 per cent nitromethane fuel).
- 119 b.h.p./litre high compression, 20 per cent nitromethane fuel).

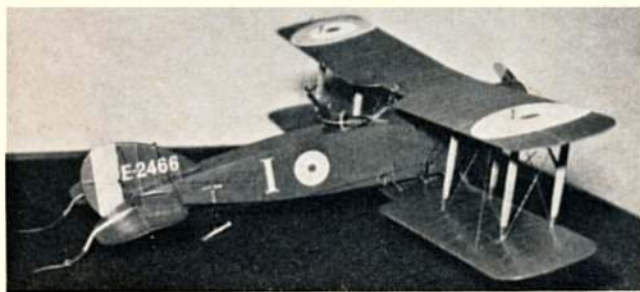




model engineer exhibition 1970

ALMOST 42,000 visitors to this year's Exhibition at the Seymour Hall made it a record occasion. Although the accent has largely been centred upon the engineering aspect, greater interest is shown, year by year, in general subjects particularly the small scale models. Military miniatures and I.P.M.S. exhibits have introduced a new attraction, giving more appeal to the average model maker.

Focal point this year was undoubtedly the electric round-the-pole demonstration area, where models from Grantham,

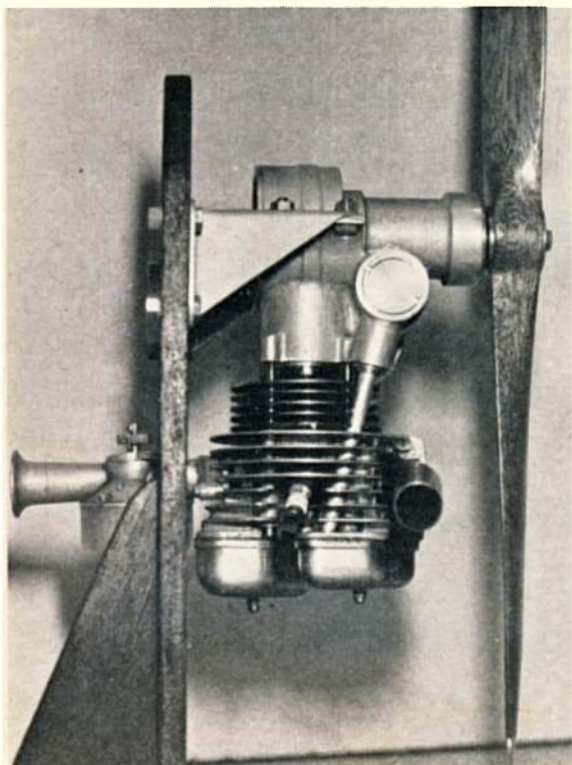


Winner of the Bristol Cup and a Silver Medal was this 1/48th Bristol F2B of 22 Squadron in the markings of Captain W. F. J. Harvey, made by W. A. Vandersteen of Winchester. Model is superbly made with incredible detail - right down to the flight streamers and is surprisingly heavy - weighing one pound.

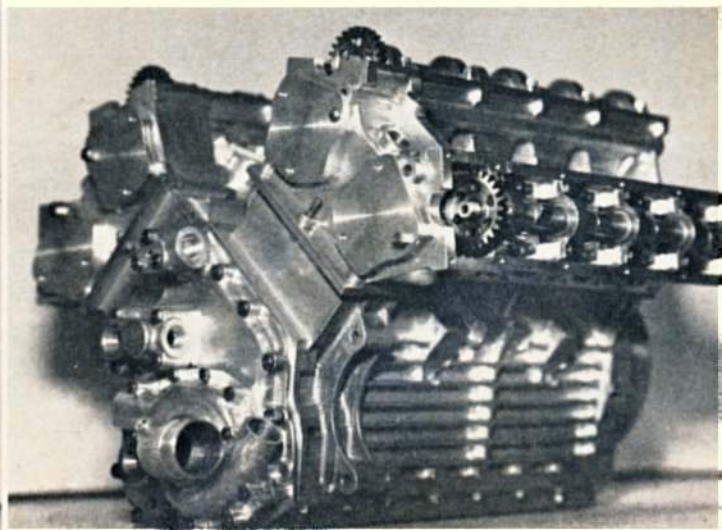


Bronze Medal winner by Clive Hall of Cambridge, was this 1/72nd scale Supermarine Stranraer, exquisitely finished and rigged. The last example of the real machine has recently been delivered from Canada to the Royal Air Force Museum.

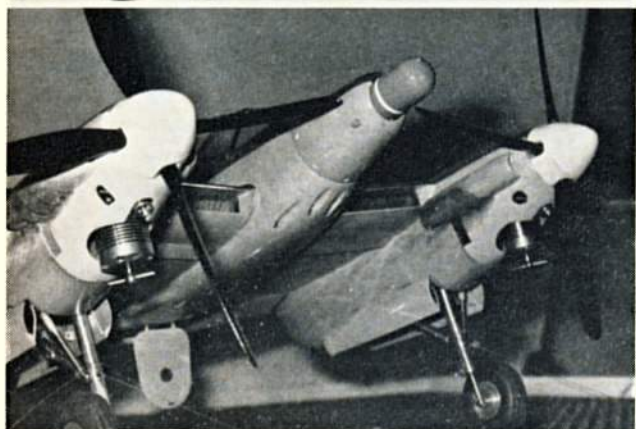
Heading picture shows the main M.A.P. stand, with the boating pool, from the centre of which the electric r.t.p. models were flown. Many aircraft made a soft, if somewhat soggy landing in this pool, greatly appreciated by the crowds!



Left, is a near-actual size photo of Professor Chaddock's 5 c.c. four-stroke engine, which has been specially designed for a duration record attempt. It has a float chamber carburettor with very low rate of consumption using coil ignition. Below, another of Professor Chaddock's engines, this time a remarkable Vee 8 double OHC, quarter size B.R.M. of 15 c.c., destined to work when completed. Photo is practically actual size and the machining detail incredibly well made. It is destined for water-cooled operation.

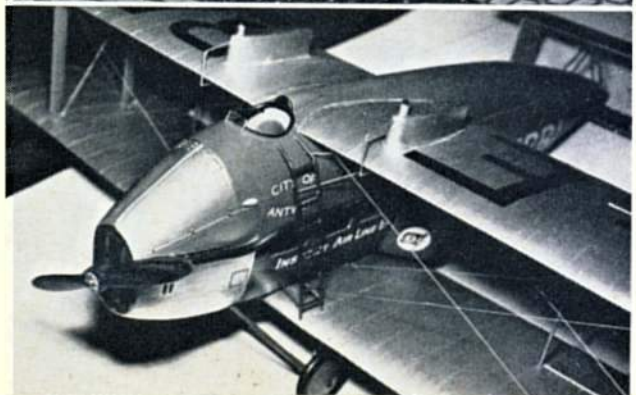
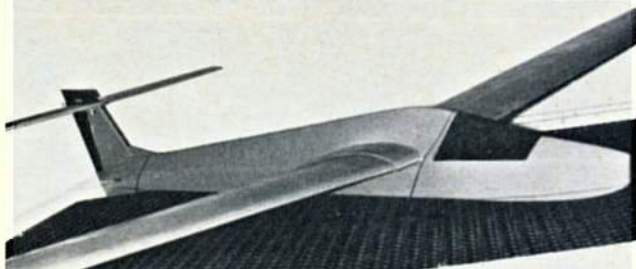


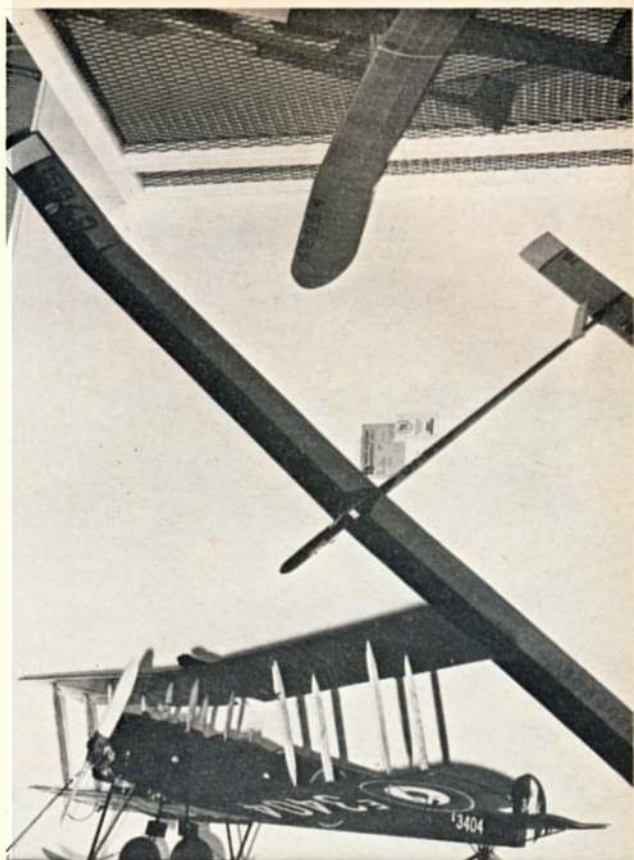
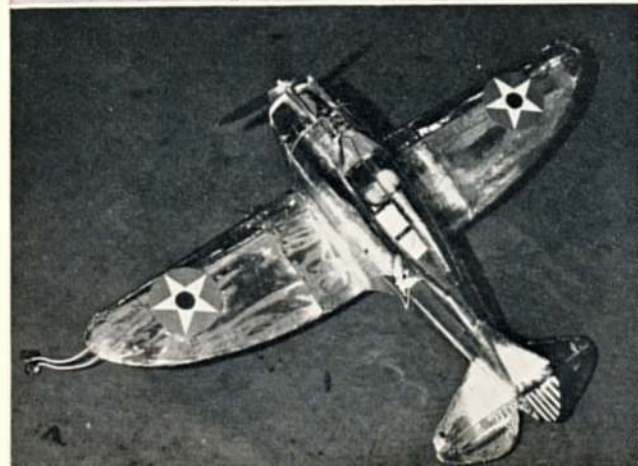
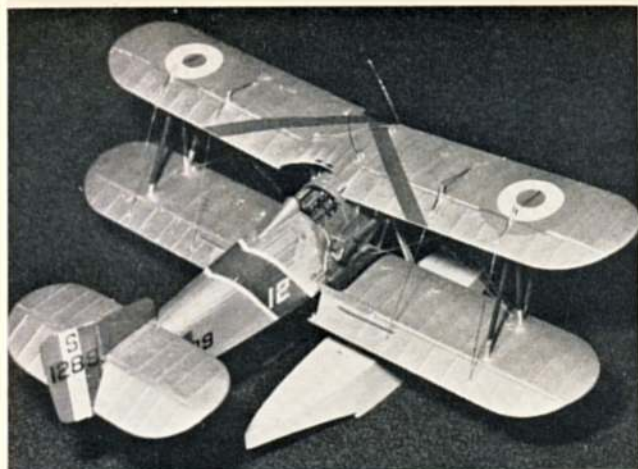
Bristol, Luton and Debdenaires Clubs, as well as our own exponents, were flown almost continuously. The range of models and the degree of enthusiasm for Electric R.T.P. indicates that this development will have a strong following. Some of the interesting exhibits are displayed on these three pages, our sister magazines carry reports of other specialised interests.



Upper picture is a D.H. Hornet by I.P.M.S. member Tony Woollett, made from plastic card and 1/48th scale accessories. It was on show at the I.P.M.S. stand among many other remarkable scratch-built models. Immediately above is A. J. P. Briggs' control line D.H. Sea Hornet, Mark 21 NF, which earned a Highly Commended. 41 in. span it weighs 8 lb., has 2 Oliver Tiger 3.5s, with engine speed control, flaps, working undercarriage and arrestor hook.

Right, top to bottom: Steve Blake's 'Argus' 50 in. control line stunt model with Fox 35. Weight is 2 lb. 6 oz. and the excellent finish on this model earned it a Highly Commended. Next, is J. P. Hancock's R/C Thermal Soarer of 100 in. wingspan with T-tail and an unusual triangular section for the fuselage. Rudder/elevator controls are used and plastic-card employed for the very clean wing root fillets. Next, is a Bede BD-4 by John Cameron spanning 77 in. and using a Super Tigre 71. The scale is portable size and the fuselage cross-section one of the biggest we have seen. Douglas Dakota is a control line model entered by J. Hirst. It is 1/24th scale giving a 47½ in. wing span and powered by a pair of D.C. Sabre diesels. Bottom: Tony Woollett's plastic card 1/36th scale Vickers Vulcan air liner in the markings of Instone Air Lines which was on show at the I.P.M.S. stand.





Top of the photograph shows Bruce Edwards' wife's neatly-constructed Open Rubber model apparently inverted, due to angle at which the photo was taken. In the centre is Martin Dilly's highly commended A/2, featuring rolled 1/64 in. ply fuselage, while in the foreground is Mick Staple's superb replica of an Avro 504K, Bronze Medal winner. Left, from top to bottom. Attractive conversion of the Pyro 1/48th scale plastic kit for the Fairey Flycatcher by 'Mac' Kennaugh of Birmingham with float landing gear, seen on the I.P.M.S. stand. Below, an action shot of the Lindhoef 'Spitfire' flying very stably round the pole. 'Spit'-built by a Luton club member. Below, a small selection of the various models present - in the foreground the Seversky Lancer, a Froggite Ryan PT 20, a Corsair, Guillo F.W. 190, Froggite Hawker Fury and Lindhoef Spitfire. Bottom is a close-up of Pat March's Seversky Lancer - sent from the U.S. for the Grantham lads to demonstrate. Covered in metal-foil paper, this incredible model even features a retract U/C - operated via a polarity reversing switch. John Harvey, arch electric enthusiast from the Luton club, flew his very impressive twin-engined P.38 Lightning.





Are you between 10 and 16 years of age? Then don't delay, join today

Dear John,

I hope to get a Keil-Kraft *Spectre* and I should like to know if there are any modifications which in your eyes would be worthwhile. I am building it mainly for show (I can't stunt!) and I would appreciate any hints on building, finishing and flying this model.

I am surprised that Power has not been incorporated in this year's Junior Kit Contest. I am sure it would draw greater attention to the event and it would certainly stimulate me into entering a free flight. A price limit of, say, £5, would effectively eliminate the Cox Tee Dees, etc., and leave us with the cheaper Cox's, the D.C. Bantam, the McCoy .049, etc.

Control line classes could be introduced, such as class "A" Rat Race, "A" T/R and 1/2A T/R. All excluding professionally modified engines.

A. Coombes.

Stockton-on-Tees, Teesside.

The 'Spectre' in its standard form is a very good performer, and does not need any alteration to the kit. However, some builders prefer to extend the fuselage top decking across the open cockpit, in order to increase the strength at this point. Use of a 'bubble' cockpit canopy then restores the semi-scale appearance. The subject of finishing is too involved to be covered in a few words, and deserves a book in itself—in fact, our latest publication 'Doping and Finishing' is just such an item. Price is just 30p plus 23p postage. With regards to flying, this is covered in detail in another of our publications, 'Control Line Manual'—price 90p.

Your suggestion of incorporating Power in the Junior Kit contest is interesting, but with so few suitable kits available for this type of model, then it is not really practicable. As you may have noticed from the S.M.A.E. contest calendar, published last month, it is hoped to introduce a control-line class this year—probably a simplified stunt contest—but more details will be available later. With the racing classes which you mention, the major drawback would be expense—even excluding professionally tuned motors. The differences in performance (and price) between a cheap, plain bearing diesel and a high quality racing motor is enormous.

Dear John,

I wonder if you could provide me with some information? Would it be possible to give any model glider an aero-tow with the 36 inch span Auster A.O.P.9, A.P.S. code FSP/580, fitted with rudder and elevator R/C? If so what size of engine would be adequate and what R/C set would you advise? My curiosity was prompted by two beautiful Christmas presents, the Keil Kraft *Soarer Baby* 36 inch glider and the 1/2A *Ranger* plus a D.C. Spitfire and 10 c.c. fuel tank. My father said "why not get the *Ranger* to tow the *Soarer Baby* up to a reasonable

height?" And after thinking, I decided that it would be possible with an authentic glider tower, and as the local gliding club uses Austers I thought of taking after them.

S. Murray.

Barnsley, Yorks.

Rather than state that a project is impossible and promptly be proved wrong (!) I would say that it is a fairly ambitious enterprise depending largely on the degree of control which you have available. The only model aero-tows, which I have seen have concerned multi R/C aerobatic models and lightweight gliders—and they have been rather 'hairy' in most respects. You mention rudder and elevator control—if you mean via single channel equipment, then you are certainly going to find difficulties, and if you have 2 function proportional gear, would recommend using elevator and aileron controls. A 'full house' proportional outfit would, of course, make life much easier—and if the glider were also R/C operated, then not too much trouble would be experienced.

However, reverting to your Auster (presumably S/C) and the 'Soarer Baby', the glider seems rather large for the limited power which you have available (and fitting a larger engine to the Auster would not help, as it would be over-powered when the glider is released). Approximately 24 in. span would be better. Remember to incorporate an emergency 'cast-off' system to avoid wrecking both models in case of trouble!

Dear John,

I want to join the S.M.A.E. but I am not sure whether I am classed as a full member or a country member as our village is about 8 miles from Leicester, the nearest town with a model aircraft club. Also, could you tell me if the E.D. Cadet is regarded as a collector's piece, as a friend recently told me that it was a vintage engine.

R. Talbot.

East Gosscote, Leics.

Membership to the Society of Model Aeronautical Engineers is not arranged on an individual basis. Clubs are 'members' of the Society, with individuals being members of member clubs. Should you not be a member of an S.M.A.E. affiliated club, then you may join direct as a 'country member'—but this deprives you (or rather a club on your behalf) of a vote or say in Society affairs. However, you still receive the Society's newsletter 'Model Flying', as well as a free rule book, insurance cover, etc.

The E.D. Cadet is by no means a 'vintage' engine, although collectors may find them a little scarce, due to their short time in production. Introduced around 1963, this 1 c.c. diesel engine was based on the 'Bee' series which it replaced, and held the distinction of being the first model aircraft engine to be supplied with a silencer as standard equipment.

Dear John,

My 1/2A team racer, the Frog Hornet fitted with the quick start Spitfire is now nearing completion. So I wondered if you could tell me the rules and things I need to know etc.

C. Butler.

Bolsover, Derby.

Rules for all competition classes will be found in the S.M.A.E. rule-book, price 25p or free to all full members. The rule book and membership application forms are available from the Secretary, J. B. Stocks of 17 Inham Road, Whittlesey, Peterborough, Northants.

Actually, I'm sorry to say that if you read the rules concerning 1/2A team-race, you will find that your model is no longer eligible, as the present rules require a 90 square inch wing area—and the Hornet was designed to an earlier set of regulations. Although your D.C. Spitfire would provide adequate performance for an introduction to racing and for use in club events. It was designed purely as a 'sports' motor and could not hope to be competitive.

Dear John Bridge,

I am between 10 & 16 years of age and would like to become a member of the 'Golden Wings Club'. With this application I enclose postal order (International Money Order) for 25p (5/-) to cover cost of the enamel club badge, two coloured transfers and membership card.

NAME IN FULL.....

ADDRESS

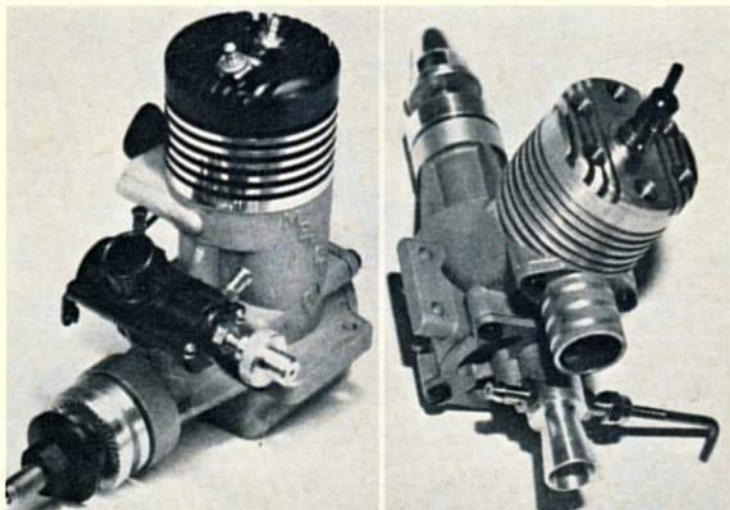
YEAR OF BIRTH..... SCHOOL.....

NAME OF ANY OTHER CLUB OR CLUBS TO WHICH I BELONG (if any)

SEND TO: GOLDEN WINGS CLUB, AEROMODELLER, 13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.

3/71 2d. in the 1/- Rebate plan purchase coupon for Golden Wing Members G.W. No.

TRADE NOTES



THE RipMax range of 'goodies' continues to expand at an amazing rate—every week seems to bring forth yet more accessories for the modeller. The latest parcel delivered to our doorstep proved to contain largely products of the Japanese MK company whose accessories have been available here for some time and have proved to be good value for money.

First to greet our eyes was a range of spinners, moulded in a fairly thick gauge of white nylon. This follows the 'traditional' layout of being a two-part threaded item, the nose-section being tightened with the aid of a tommy-bar—for which purpose reinforced holes are provided. Sizes available are 2½ in., 2 in., 1½ in. and 1 in. (or in new-fangled dimensions, 70, 62, 57, 52 and 47 millimetres). Weight of the largest item is very reasonable at just under 1½ oz. Prices range from 64p (12/9d.) to 94p (18/9d.)—at first glance a little pricey, but they are very strong and should be almost unbreakable.

Control line fliers have not been forgotten by this largely R/C biased company, and three useful sizes (3 in., 2½ in. and 2 in.) of nylon moulded bellcranks are provided. These have a nylon bush for the pivot bolt (supplied) and seem adequately strong for most purposes—although we have slight reservations on the advisability of flying hard-pulling stunts on anything but steel items. The material is nearly ¼ in. thick, and is in a very hard grade of nylon. Priced at 19½p (3/11d.), 17p (3/4d.) and 14½p (2/11d.) they

Some of the M.K. items imported by Ripmax are seen below. The nylon bellcrank is supplied with nylon bush, as is the elevator horn—a particularly robust item. The spinner is available in white moulded nylon only, and is very strong—should absorb more punishment than most airframes in an accident!

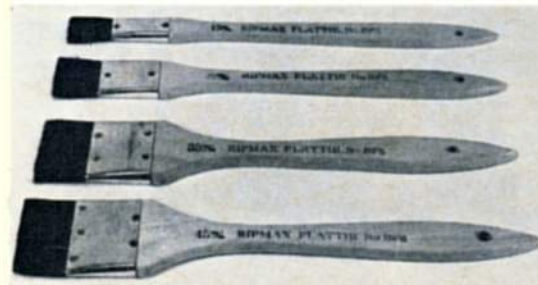


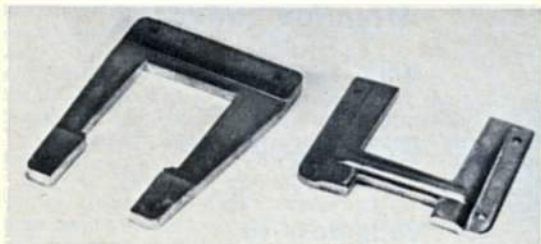
Left, the new Merco 61 'Blackstreak' looks very handsome with its polished head fins and black anodised head. Comes well packaged, too, in a velvet-sprayed expanded polystyrene moulding. Good potential for those requiring an easy handling, powerful motor. The newly imported Kosmic 15D (right) is also available as a glow version. Typical racing layout is evident, and high power can be expected—in fact, .5 b.h.p. is claimed for the diesel.

should provide smooth, slop free controls. Also useful to the control line, as well as radio flier, is a wire mounted elevator horn. Three variations are available, the horn being offset, central or arranged for a differential throw, and the two 'arms' are flattened to provide easy insertion into the control surface. A pair of nylon moulded bearings provide a nice, smooth control set-up. The horn itself is 1½ in. high, the whole 3 in. wide, and costs 22p (4/4d.). A pair of clear nylon moulded fuel filters—essential to all operators of model engines are available at 29½p (5/11d.) the pair, and fit in the fuel line.

Latest of the M.K. products is a series of four engine mounting plates, stamped from dural sheet, and stiffened by having 'ridges' formed in their section. Presumably intended for R/C models (or sport F/F) with 'open fronted' fuselages, these plates are simply screwed to hardwood bearers, allowing easy interchangeability of engine if required. Both downthrust and sidethrust are built into these plates, which cater for 1 c.c. to 10 c.c. engines, and are priced at from 37p (7/4d.) to 54½p (10/11d.).

Still describing RipMax distributed products, we have a set of five wide doping mops, known as Flatties available in ½ in. to 1½ in widths—just the job for applying dope to large areas! Very reason—The RipMax range of 'Flattie' brushes, in fact, encompass five sizes—reason for the discrepancy is that our photographer found them as useful for cleaning lenses as we did for doping!





Two of the M.K. engine mounts. The one on the left is nearly 3/16 in. thick and is intended for .61 cu. in. engines, while the other is typical of the shape and design of the remaining sizes. Downthrust and sidethrust are built in.

ably priced at 7½p (1/6d.) to 22½p (4/6d.) respectively, these should prove to be very popular.

The *Super Jet Oiler* is a very grand name for a simple polythene container with plastic spout, but no doubt it does the job adequately! The clear body holds approximately ¼ pt. of liquid, and could be employed by the modeller as a 'priming' bottle, as well as for its intended use – price being 29½p (5/11d.).

Finally, we come to two more ranges of wheels which this company imports. The *Standard Truspin Airwheels* range from 20 to 50 mm. in diameter increasing in 5 mm. increments, costing from 16p (3/3d.) to 49½p (9/11d.). These are ribbed, trapped-air tyres, with aluminium hubs, while the other range has similar appearance except for the moulded nylon hub, and are available in 40–60 mm. sizes, again in 5 mm. steps. Prices are somewhat higher at 47½p (9/6d.) to 79½p (15/11d.). Unfortunately we were only supplied with a single sample of each size, so until we find another person in a similar situation, willing to 'trade', our models will tend to be lopsided!

KeilKraft too have expanded their accessories line (how did we manage in those bad old pre aids-to-modern-living days?), again aimed primarily at the R/C market. Firstly, we have a three foot strip of ½ in. wide, foam backed adhesive tape – ideal for use as wing mounting tape. Just press the tape in position on the fuselage/wing cut-out, elastic band or bolt your wings in place, and you have a fuel and dirt proof joint. Price is 25p (5/-). Same price, but just two feet long is their double sided adhesive tape, with a dense foam 'sandwich' – very handy for installing servos or even receivers of the non-relay type (the foam is rather too stiff to absorb much vibration, and this might affect a relay). Last of this company's new products is a packet of 12 polypropylene hinges costing 15p (3/-). These are virtually unbreakable, and are not as stiff in operation as one might think. Easy to install – just cut a slit in the control surfaces, apply some epoxy and insert – these should be most useful, particularly as no slop is possible with this form of hinge.

At last away from the luxuries and back to the 'essentials' of modelling, we have a brace of engines, designed for totally different jobs but having in common the likelihood of being amongst the best in their respective classes.

Firstly, we received a sample of the new *Kosmic 15* diesel, sent to us by **D. J. Giles** of 150 Redland Road, Redland, Bristol BS6 6YD, who is importing these Italian built motors. This engine, reviewed last month in *Latest Engine News* is extremely well finished and weighs in at 6½ oz. Sharing many components with the glow version, the diesel with its rear facing exhaust port looks all set for a tuned-length pipe, however, this is not strictly true. The



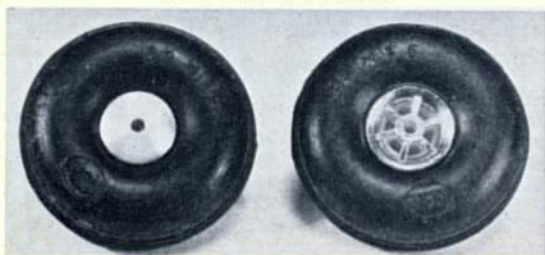
New KeilKraft accessories include the wing tape, polypropylene hinges and double-sided tape, all neatly packaged and competitively priced.

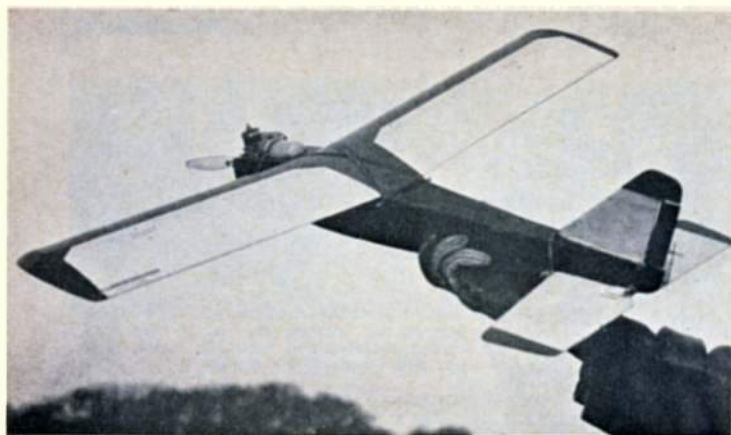
glow version, though, is designed to be used in conjunction with such a fitting, and while experimentation with either a pipe or megaphone on the diesel may produce a power increase, it was not designed to take one.

It is interesting to note that the glow engine is intended to run on straight fuel, and the makers advise varying the compression ratio to suit if nitromethane fuel is employed. Reasonably priced at £16.00 for either version (you cannot expect high performance at low cost) they should be seen in increasing numbers on the contest scene. A tuned length pipe costs an additional £3.25 (£3 5s.), while a megaphone retails at £3.05 (£3 1s.). Apparently R/C and marine versions will follow, but the prices are not yet established.

The other new engine is the latest **Merco 61** variant, known as the *Black Streak*. The main feature apparent on this motor is the enormous new Micro-flow carburettor, moulded in black nylon. Despite its bulk, it is probably no heavier than the previous carb. and is very simple to adjust. The high-speed setting is established with the needle valve and the throttle then closed. Should it cut out, the lever protruding from the left-hand side of the carb body is moved forward to enrich the mid-range setting. This process is repeated until the motor will throttle without dying out – very simple and works well in practice. The only other external difference is the black anodised head designed to combat burnt oil deposits. Internally, the motor has reverted to a single ringed piston, as on the Mk. II, and not of the Dykes pattern. Initial flight tests have proved the engine to have plenty of power and good throttling characteristics. What more do you require from an R/C 60 – especially one of the lower priced models at £21.72½ (£21 14s 6d.)? A useful idea, which should be adopted by all engine manufacturers is the provision of an engine mounting template printed on the back of the box – worth transferring to aluminium sheet to preserve its life.

Two new ranges of wheels by RipMax feature differing hubs and prices. On the left is the *Standard Truspin Airwheel* with aluminium hub, next to the more expensive, 'chrome-plated' nylon hub version.





**Attention 'rudder
only' flyers!**

Roy Peck

**tells how to
enliven your fun with**

BASIC R/C AEROBATICS

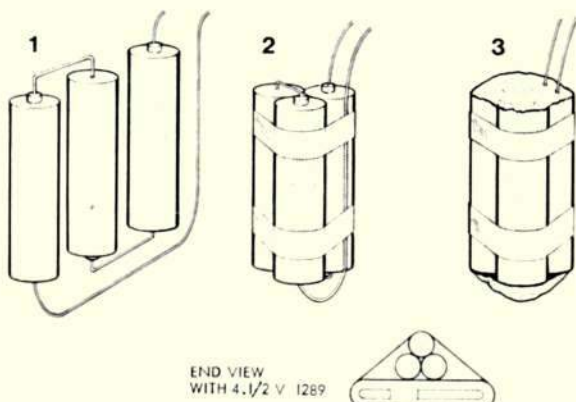
NOW THAT YOU UNDERSTAND the importance of trim concerning single channel flight in gusty conditions, what about those elusive, yet dreamed of, aerobatics? They can prove to be exhilarating for both the man operating the transmitter, and those who watch. If you want to win back the chance to compete in a single channel competition, this may be your chance. You will find that stunting a single channel model successfully will cause those affluent gentlemen with full control systems to stare in wonder. In addition, they might even talk to you, thus breaking down the barrier which appears to divide the radio modeller's hobby!

Before discussing aerobatics on rudder only, it is necessary to outline the typical model layout which I have found to be the key to success. There are many excellent designs on the market which are the result of years of development - you may even design your own, but whatever layout you choose, a wide chord, plenty of wing area, and fairly short moment arms are desirable. The *Veron Robot* has these features, and it is this model which I have found the easiest to handle.

Naturally the transmitter and receiver must be reliable. Modern techniques have ensured that they are, but it is most important that your own handiwork within the model itself leaves nothing to chance. Unsupported joints, receivers that rattle like a chatter box, and actuators which dance a fanatical jig on loose fitting bulkheads, all these must be eliminated. Naturally your early flights will test these points, and it is essential to be painstaking. It is possible that some of these points may have escaped your notice, but when you put a model through its aerobatic paces, your sins of omission will find you out. Soldered battery connections can prove to be particularly troublesome, and I have found that the method shown in the diagram has proved a good solution.

First solder the leads, and do it well, even if the battery tends to heat up in the process. When this is done, bind them in a neat bundle with a few turns of tape. By running the wires beneath the tape binding, you will eliminate all possible vibration and strain on wiring connections. Use plasticine to cover the battery terminals, and this vital component is complete.

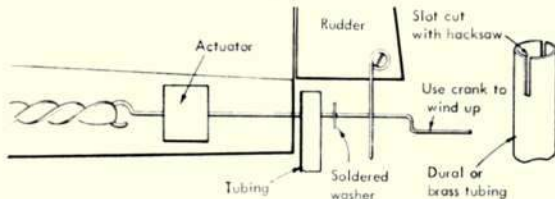
Compound actuators are ingeniously designed and ideal for those who prefer to have a more sophisticated layout, but unless your mind can work with the speed and precision of a computer, I do not recommend them for stunt purposes. For this reason the sequential, self-neutralising escapement is preferable - after many aerobatic flights, I have found this simple escapement surprisingly reliable. However, more than two hundred turns of $\frac{1}{16}$ in. rubber may cause skipping. If you do not



Vibration-proofing of the battery terminals is essential for reliable operation. Note how the batteries are wired in series, bound with tape to prevent strain on the wires, and the ends finally protected with plasticine.

exceed 150 turns and skipping persists, then the chances are you have not done your groundwork correctly. With a sequential escapement you do not need to think in terms of left and right, but simply the direction of turn that comes next. The essence here is simplicity. When you consider that a fully aerobatic session of ten minutes duration did not use all the rubber winding, then you will appreciate that 150 turns is quite sufficient. From a rough assessment of past experience, I find adding fifty turns each flight could lead to overwinding. As for winding, keep it simple - the method illustrated has proved reliable and is very simple indeed.

The amount of rudder movement is very important. The author prefers to keep his installations simple, and re-winds the actuator rubber as shown below. The dural tube has a slit cut in it which fits over the wire crank. Pushing it rearwards against the washer-stop holds the crank clear of the control surface loop, permitting the crank to be used for rewinding the rubber.



This should be as much as possible, yet without of course binding against the loop when operated. If you wish to stunt a single channel model, it is not the slightest use flying a fast moving model which will not respond instantly – I can almost hear the screams of the Sunday afternoon men who stooge around in peaceful circles! Hold on rudder, and it will spin, touch the button, and it will yaw.

Now we can in fact gain the benefit of correct trim. Control is a matter of short transmissions: perhaps no more than a fraction of a second. The moment the wing tip rises, let go the button and the model will continue to perform a graceful bank. Yawing is caused by frantic over control.

Now that I have described the simplest layout, the correct trim, and stressed the need for meticulous inspection of your internal layout, what about some neck craning manoeuvres?

DO NOT OVERCONTROL. Allow the model to complete banking manoeuvres once they are begun – do not worry, it will straighten up since it does fly itself! Any tendency to turn down wind can be corrected at a touch of the button. Once you have the feel of it, you can then consider aerobatics.

You will find that a half-hearted attitude is no use. First gain height, then your mistakes will have time to be corrected – I recommend about three hundred feet as a sensible altitude for your first and easiest manoeuvre, the split S.

Hold on rudder to cause a sharp bank but do not induce a spin. The model will pick up speed slightly, nose down. The moment the nose has begun to rise, hold on rudder. You may find it surprising to see the model flip over on to its back. Let the button go while inverted, and the model will dive into an exhilarating half circle. This in fact is the beginning of the manoeuvres illustrated below, and the multi men will begin to take notice.

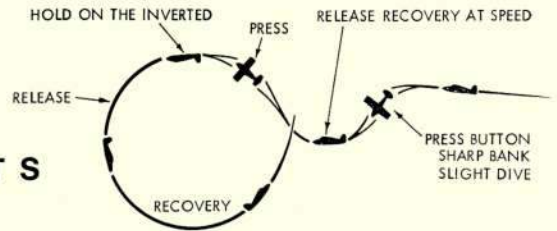
The consecutive rolls may look a bit wavy, but I will always remember the day I managed six in a row! The Cuban Eight will need a fair amount of practice, and a good model, but is certainly worth the effort.

Finally, when you first attempt these manoeuvres, you may lose height. With practice you will astound yourself, and your aeromodelling friends. Never endanger others with low manoeuvres – good relations with the public are of the utmost importance, so don't spoil this wonderful hobby by setting a bad example.

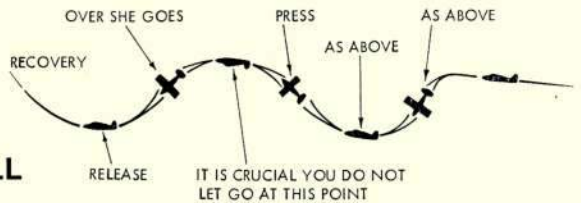
Heading picture shows the 'Bazz Bomb', a highly aerobatic single channel model, designed by Basil Murley. Straightforward, robust model is quick to build, but is not a beginner's model! Available from our Plans Service as Plan No. RC868, price 40p, and uses 1.5 to 2.5 c.c. engines.

Right, Chris Foss's 'Sawdust' design is very similar in design and flies very fast on a 1.5 c.c. engine. Plenty of power is essential for flying aerobatics with single channel. This plan is also available from A.P.S. as Plan No. RC/985, price 40p.

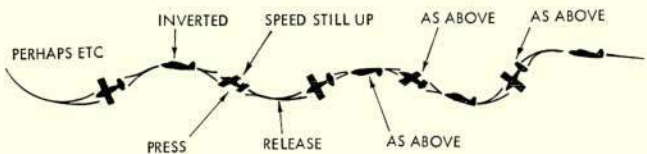
SPLIT S



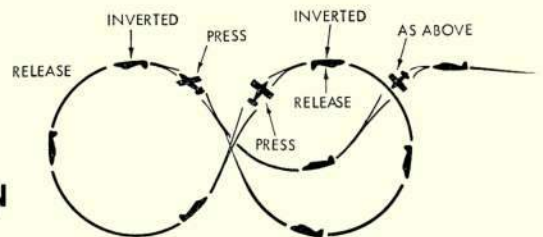
ROLL



CONSECUTIVE ROLLS

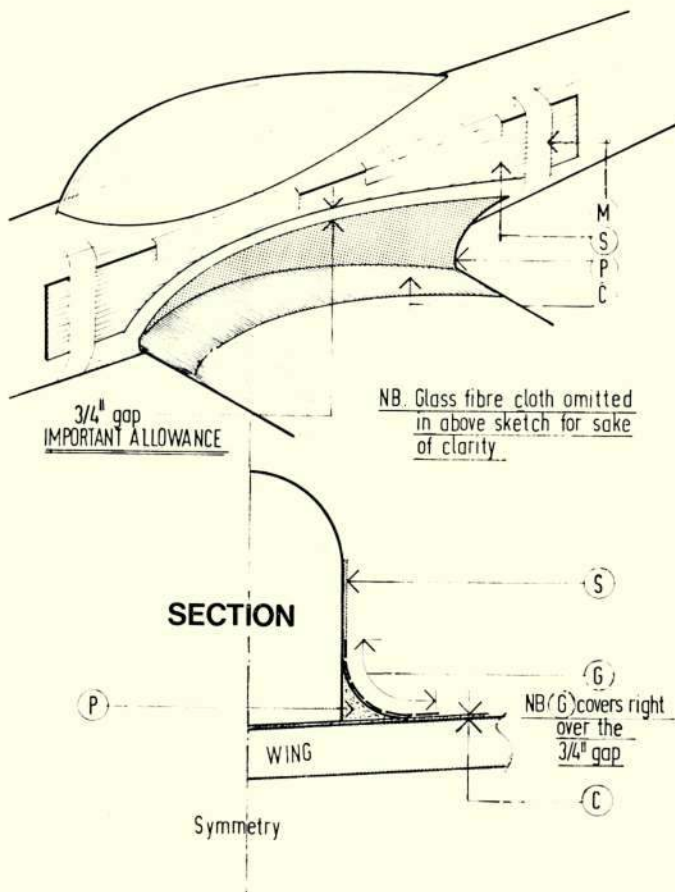


CUBAN EIGHT



GLASS FIBRE WING FILLETS

Novel idea for models with detachable wings, by
H. C. QUEK



WITH DETACHABLE WINGS becoming the vogue once more for all types of models, the problem of building those attractive, smooth, close-fitting wing fillets arises. The following method has been used with great success on the author's radio models, but is equally suitable for all categories, and is easily reproduced—it almost takes longer to explain than to produce the finished article!

Begin by taping the cartridge paper (c) to the centre section of the wing—securing the tape on the underside of the wing only. Now attach the wing to the fuselage in your chosen way. Cut the shape of the outer extremity of the fillet from metal shim, then tape this 'guard' (s) to the fuselage side with masking tape (m). The thickness of this metal shim is by no means critical—old biscuit tins provide an ideal source of material, and should be readily available around this time of the year! Build up the Plasticine fillet moulding (p) between the fuselage and wing, making sure that a gap of approximately $\frac{1}{4}$ in. is left between the edges of the metal shim and the Plasticine.

A thin coat of 'Polyfilla' is now brushed over the Plasticine, taking care not to cover the $\frac{1}{4}$ in. wide gap. When set, lightly sand smooth—this then produces a smooth, hard surface on which to work. Mix up some glass fibre resin (do not use the paste variety) and brush over both Plasticine and the gap. Cut a piece of glass fibre cloth (g) approximately to

size then lay this in position over the plasticine and gap. A woven mat type of cloth should be used, the author frequently uses the tape as sold by *Model Flight Accessories*. More resin is now applied over the glass fibre, stripping it into the cloth to thoroughly impregnate it. An ordinary cheap 'dope brush' is ideal for this task, particularly when the hairs are cut to just $\frac{1}{8}$ in. long as this is then stiff enough to 'force' the resin into the glass. It may be cleaned by either washing in brush cleaner (a powdered solvent is available from *Bondaglass*) or by immersing in acetone, or even cellulose thinners.

When the resin has set, release the tape which is holding the cartridge paper in position and detach the wing from the fuselage. Trim off the edge of the excess glass fibre cloth and cartridge paper, then sand the moulded fillet to the correct contour. It is quite safe to use an electric sander for this task—that is the purpose behind the metal shim, it provides a shield for the fuselage sides. Final sanding should be completed by hand.

The cartridge paper is then removed from the underside of the moulding, and the Plasticine removed—a teaspoon and scraper are useful tools for this job. All that now remains is to tissue cover the top of the fillet to form an integral part of the fuselage—the result is an attractive, strong fillet of very little weight.



AIRCRAFT DESCRIBED

Number 201

**Individual World Champion
Aerobatic Aircraft**
described by John Blake,
drawn by P. Lloyd

YAKOVLEV Yak 18PM & PS

THE FIRST appearance of the Yak 18P, as far as those of us in the West are concerned, at least, was at the first World Aerobatic Championships, in Hungary. A small team from the U.K., consisting of a few brave spirits from the Tiger Club, took part, but to the best of my recollection no special impact was made on them by the Russian aircraft. One cannot, at any rate, recall now any particular excitement on their return. Possibly it was smothered in the panic started by someone in Fighter Command on discovering—as he thought—that one member of the team, a serving officer and Stampe-ing his way slowly home, was apparently overdue from leave and behind the Iron Curtain.

My own first acquaintance with the Yak came at the next championships, held in 1962 at Budaors, the old, grass airfield at Budapest—a sort of Oriental Croydon.

The Soviet pilots did not, at that time, dominate the aerobatic scene quite as much as they did later;

Comparison of the tails on the PM (left) and PS (right) shows the horn balance on the two-wheeled variant rudder. The tail is wire-braced at the spar and strut braced on the underside only at the leading edge. Tailplane position and elevator proportions are major differences from the standard 18 trainer, the surfaces of which have always appeared on Soviet (and thus our own) drawings of the P & PM, so leading to much confusion.

the contest was won by the Hungarian Josef Toth. All the same, the Russian performance was impressive and they were very highly placed, although their best man ran into trouble with an aggressive wind shear in the finals (he was first to fly), and lost heavily on positioning.

First impressions of that early Yak have been overlaid by more recent and more detailed knowledge of its successors, but the size and novelty are still fresh.

In those days the standard aerobatic aircraft was the Zlin 226, the lightweight, nimble original of a long and continuing line, with fixed undercarriage and, mostly, the wooden, fixed pitch propeller. This was, in the opinion of many pilots, including the Czechs, the best of all the Zlins; its final withdrawal on grounds of old age was much regretted.

Against the agile dramatics of the Zlin, which always sounded, particularly with fixed pitch airscrew, as if it were really working to achieve its effect, the Yak was a revelation. The hundred-odd extra horsepower in its big radial, the effortless and almost noiseless progression round manoeuvres imparted by the very effective constant-speed propeller, gave to the Russian sequences a quality of relaxed professionalism that was, then, quite new and which has remained as an indefinable part of their aerobatic

When shown at the Paris Aero Show, the PM was accompanied by a touring variant which has not appeared since and must be presumed to be a prototype. Huge aircraft in the background is the Antonov An 22, subject of a feature in 'Scale Models' this month.



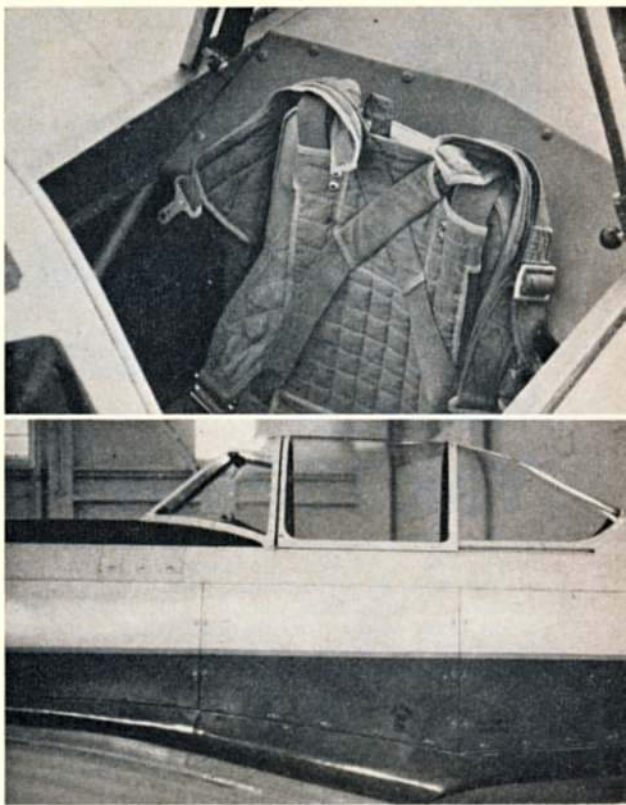
technique. For me, anyway, the magic of those early Yak sequences has never entirely departed, but remains in each subsequent encounter, a now rather nostalgic constant in the fast-changing world of aerobatic presentation.

Those propellers were astonishing pieces of machinery. The massive hubs, with their counterbalance weights were reminiscent of early Hamiltons and the great paddlewheel blades turned out, on close inspection, to be made from glass fibre half shells, roughly bonded together. The results, however, were all that could be desired. Current airscrews, visually, have changed little. The standard of finish appears to be higher, which leads one to suppose that the 1960 sets were hand-made for the occasion.

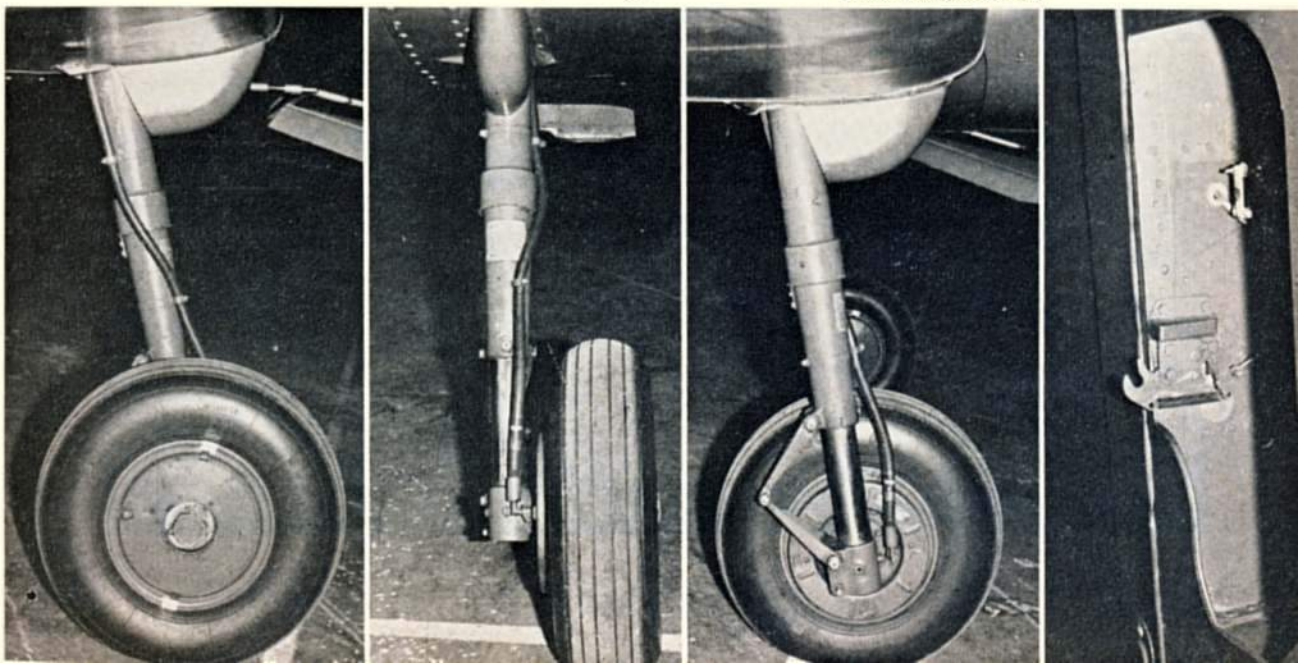
Those early Yaks showed up a number of imperfections as they purred around the sky. Soviet competition flying then—and very largely now—was 'dead regimental' and it is often difficult to identify individual pilots from peculiarities of technique. To those more accustomed to the individualities of approach and style of the rest of the world, there was something awe-inspiring in the methodical way in which the big Yaks flew stolidly round the curves and angles of the sequence, their pilots seemingly following slavishly the exact lines on their Aresti diagrams. Because of this very conformity the imperfections showed up.

They had always great difficulty in getting the aircraft to flick satisfactorily. In subsequent models the dihedral has been successively washed out to almost nothing and on the latest versions the wings have been clipped in span. My own impression of those early contests remains that the Russians did not always enter flicks correctly, but used aileron to ease themselves round—although as far as I know, their marks never suffered. The problem of judging, however, is another thing altogether.

Apart from an increase in engine power up to 300 h.p., the major design alterations in the Yak 18 over the years have been this washing out of dihedral and the repositioning of the cockpit from its forward position, where the pilot could see virtually nothing below him, to an aft position where his eye is over the trailing edge and alignment in the contest area becomes a much easier exercise. This, basically,



Above, seat pack in position, and the cockpit side profile of the PM, showing the sliding rail for the hood. Below are details of the PS undercarriage, adopted from the standard trainer, showing from left to right, the inboard face of the wheel, front view, outboard face with brake line and torque link and at right, the wheel recess with a locking clip which engages the leg.



Right, top to bottom, the PS in detail with the oil cooler prominent under the firewall. Front and rear views of the cooler between the two exhaust outlets illustrate this modification from the PM and bottom photo shows the tailwheel.

distinguishes the Yak 18PM from the earlier Yak 18P.

The newest experiment with the long-suffering beast is the Yak 18PS, which has reverted to the original backward retracting main wheels and tail wheel configuration of the two-seater Yak 18 trainer from which the specialised aircraft was developed. This saves considerable weight, and has the curious optical effect of making the aircraft look even larger than it is.

Weight is something the Yak can do without; it builds up speed like a brick when pointed downwards and pilots have problems getting rid of this in time to start the next manoeuvre within the limits of the space available, quite apart from the question of staying within the permissible G/speed curve.

It has problems, too, in staying in the contest box with other manoeuvres. The super-slow roll, which is one that must last more than 15 seconds, will take a Yak outside the contest box as like as not and in consequence, is a favourite among rival nations selecting sequences.

(The shortcomings of the Yak 18P or PM as a contest aircraft are now familiar, after years of critical visual analysis of sequences by rival pilots, and manoeuvres designed to exploit these weaknesses are known as 'Yak-smashers'.)

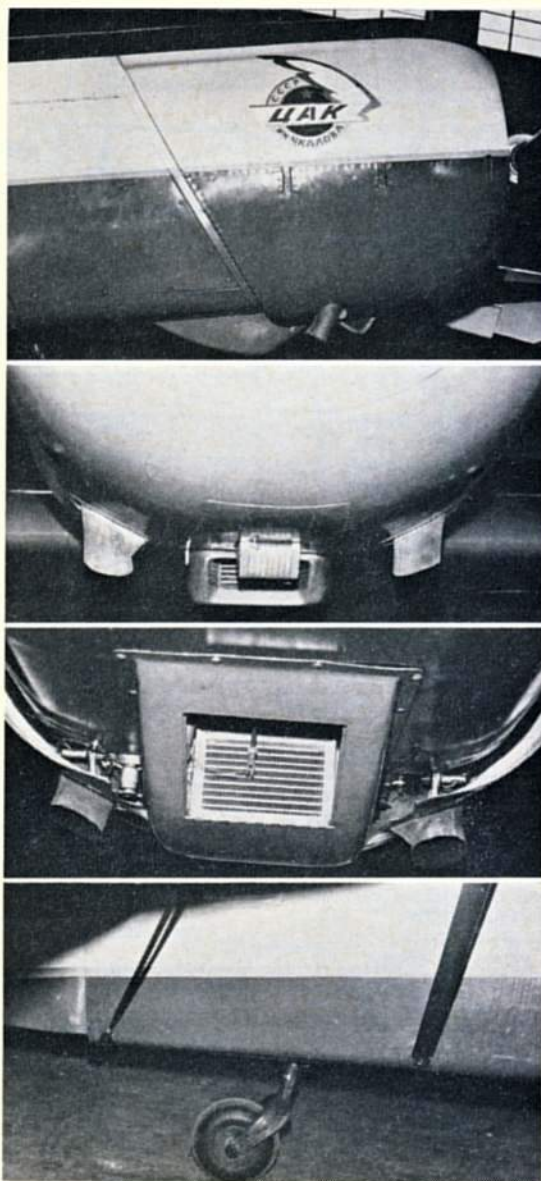
It would be unfair to over-emphasise the shortcomings of the Yak—all aerobatic aeroplanes have faults—but it is basically a ten-year-old airframe, not originally designed for this purpose, which has probably had less effective development than its contemporaries. It is big and powerful, but its limitations impose a heavy load on the pilot and the Russians, who are the most professional aerobatic nation in the world, deserve great credit for the long run of success they have enjoyed.

Structurally, the Yak is very interesting. It is basically a welded tube structure with metal covering and fabric control surfaces, very strong and built with the effective simplicity that characterises the best in Soviet construction. Accessibility is a notable feature, with the engine compartment exposed by a simple 'up-and-back, down-and-forward' movement of the two-piece cowling and the entire length of the fuselage laid bare by removing five large side panels.

In the roomy cockpit, with its big, smooth-moving fighter-type stick, vital instruments are duplicated; there are two of the coloured, globe artificial horizons and two 'G' meters, one erect and one inverted.

Incidentally, there are further pairs of 'G' meters, mounted on the back of the firewall and in the tail end of the fuselage, at points of maximum stress, which are inspected after each flight. The Yak is really flown to its limits.

Although it is a popular assumption that Government supplies one's every need in the Soviet Union, this is very far from being true. Aircraft factories, wherever they are, are bound by the same set of economic rules if they wish to survive and the Russians themselves say that they are running out of Yak with little immediate prospect of getting re-



placements. It is understandable that the factory are unwilling to set up production again for a short run of specialist aircraft. The story ran at Hullavington that the three Yaks there—for 10 pilots—were the last three available, which may be true. In that case, one might assume that the long foretold new aerobatic aeroplane from Russia may, in fact, be on the way.

REPRINTS OF THIS FEATURE PLUS FULL-SIZE DYE-LINE PRINTS OF THE 1/24th SCALE ORIGINAL ARE AVAILABLE AS PLAN PACK AH 2918, PRICE 25p FROM AEROMODELLER PLANS SERVICE, 13/35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS, U.K.

ENLARGED LAYOUT OF FIN LETTERING.

RED. PALE GREY.
ЯК-10

YAK-18 PM & 18 PS AIRCRAFT
 AS SEEN AT WORLD CHAMPIONSHIPS
 HULLAVINGTON JULY '70.

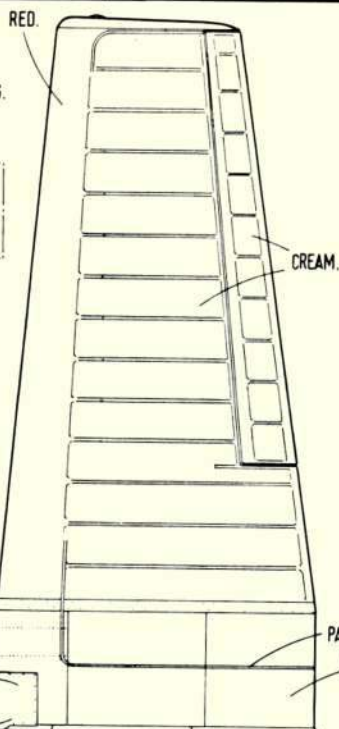
TWO YAK-18 PM'S (TRICYCLE)
 CODED 07-08. (35+36.)

ONE YAK-18 PS (TWO WHEEL)
 CODE 05. (37)

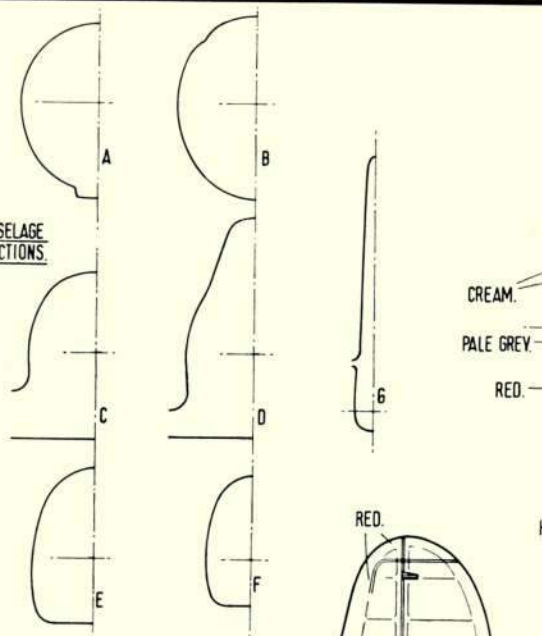
COLOUR NOTES:-

FUSELAGE: RED BELOW PALE GREY
 CENTRELINE STRIPE; CREAM ABOVE.
 MATT DARK BLUE ANTI-GLARE PANEL.
 WING: CREAM WITH GREY OUTLINED
 RED TRIM ON L.E. & TIPS. ALL RED
 UNDERSIDES.

FIN: CREAM. RUDDER: CREAM &
 RED STRIPES. STAB: AS WING.



FUSELAGE
 SECTIONS.



PLAN VIEW: 18-PM & PS.

PALE GREY.

RED.

CREAM.

PALE GREY.

RED.

ST'ED ONLY.

SPOILER.

UNDERPLAN: 18-PM.

WING ROOT SECTION.

TIP SECTION.

WHEEL & LEG REMOVED
 TO SHOW WHEEL HOUSING
 APERTURE.

YELLOW OUTLINE.

PLAN VIEW: 18-PS.

RED. PALE GREY.

CREAM.

COLOUR NOTES, MARKINGS:

FUSELAGE CODES: YELLOW WITH
 PALE GREY OUTLINE STRIPE.
 TRIM TAB NOTE WORDING: RED.
 OTHER ACCESS PANEL WORDING:
 BLACK. FIN 'SPEEDBIRD': PALE BLUE.
 FIN TYPE DESIGNATION: RED WITH
 PALE GREY OUTLINE. W/CHAMPS
 COMP N°S: BLACK.
 WING UNDERSIDES HAVE OUTLINED
 NATIONAL STAR: YELLOW.
 PITOTS: RED & CREAM STRIPES.

WHITE.

GOLD.

BLACK.

DARK BLUE.

PALE BLUE.

RED.

BLACK.

ENLARGED CENTRAL AERO CLUB
 BADGE (ON COWL.)

NOTE: 'WING' FACES FORWARD
 BOTH SIDES OF COWL.



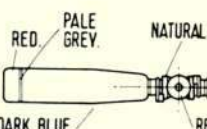
18-PM ONLY.

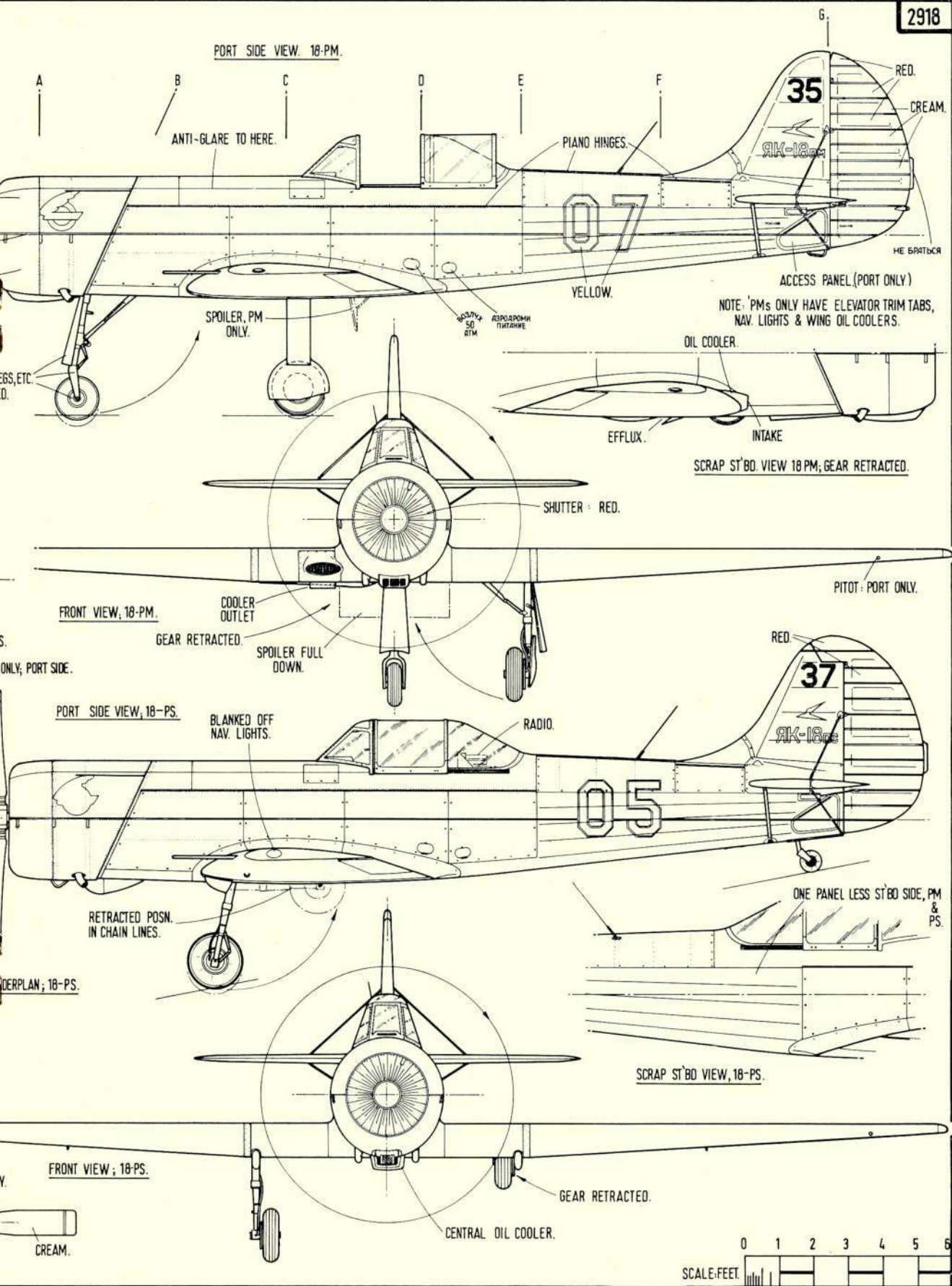
* SLIGHT WASHOUT UNDER
 WING TIPS.

YAK-18 PM & PS.

DRAWN & TRACED BY:- A. A. P. LLOYD.

MATT DARK BLUE
 REAR FACES.







Left: launching 'from a line' will require new techniques. Here a Hungarian team member uses a preliminary run before hurling his power model. (Wiener Neustadt '69.) Centre: Rumours that Sweden will not accept World Championship entries from South Africa have deep implications. The F.A.I. has not rejected R.S.A. membership. Here, John Swallow with what now looks a 'dated' platform at Kauhava 1965. Right: Hungarian G. Simon lifts himself as well as model in launch at Wiener Neustadt.



FREE FLIGHT COMMENT

BY JOHN O'DONNELL

BY NOW THE EXPERIENCED competition enthusiast should be used to regular "surprises" from meetings of the C.I.A.M. (or "the F.A.I." as it is usually regarded). The recent meeting in Paris is no exception.

The first report came as a very brief and stop-press mention at the end of January's *Heard at the Hanger Doors* and a somewhat amplified résumé followed in the S.M.A.E. newsletter *Model Flying*. Hence, it can be expected that almost everyone concerned or interested will know of the decisions made.

For better or worse, the situations will have to be "lived with" for some time. Just prior to the C.I.A.M. meeting, the General Council of the F.A.I. decided to "freeze" all its regulations. These embrace not only full-size aviation, gliding, parachuting and the like—but also aeromodelling. There are obviously good reasons behind such a concept—not the least of which is the opportunity for adequate discussion before introducing some rule change or revision. There is a natural enough tendency for repercussions to follow in the value of some isolated but well publicised incident. The result may be justified, but it can also be a case of "hard cases make bad laws".

In this context, it is unfortunate that major changes in the flying procedure for International events have been introduced at this time. "Tactical Flying" in all its various guises, has never been liked by contest organisers. Recently the widespread adoption of this technique has made mass launches commonplace. This in turn has produced congestion, collisions, and timekeeping confusion. The situation was further compounded by the requiring of flyoffs to be made within a four-minute period. In particular, difficulties in timing engine runs (whilst other engines were

running) culminated in Guilloitteau being given a hotly disputed over-run at the European championships in Yugoslavia.

The agenda for the C.I.A.M. meeting contained several proposals designed to stop competitors from congregating together in the downwind portion of the launching area where there is the most opportunity to launch under another model in good air. The alternatives suggested involved either subdivisions of the launching area, or the spacing of fliers along a line. Final choice was the simplest scheme—a launching line with markers spaced 7 to 10 metres apart. Countries are allocated a marker by draw, and move position each round. This arrangement has the great virtue of simplicity. Its weakness from the administrative viewpoint is the stipulation that "launching must take place from a line". Taken literally, this is very restrictive, especially when one considers some of the vigorous launches employed to accelerate F.A.I. power models up to climbing speed. Some tolerance about the line or marker is going to be needed. This might appear a minor point, but I can remember the arguments that arose when the Northern Area tried this same idea of a starting line at their 1969 F.A.I. meeting!

Whether the rule will work out as intended is another matter. Fliers will still attempt to take advantage of any lift marked by adjacent (or even distant) competitors—even if it involves using all the permissible departure from the nominal launching spot, followed by a crosswind launch. With a straightish climb trim, many power models can be launched "at" others in lift. Glider, of course, is little but a thermal catching contest. Whilst the helper can be "tied" to a launching spot, the tow-er is free to stand anywhere and to tow where he wishes. Crosswind tows are not difficult, provided there are no obstructions, and will be undertaken to follow marked lift. This is sure to perpetuate the risk of line tangles and collisions.

Three different countries proposed changes to the flyoff procedure for power models. These proposals were so similar in content that there had obviously been some prior discussion. Unfortunately this did not include the C.I.A.M.'s free-flight sub-committee, of which I am a member!

The proposals were certainly controversial—and vigorously opposed by some countries. Nevertheless it was decided that future power flyoffs will be flown consecutively, not simultaneously. According to the French proposition, qualifiers will draw for flying order. Each will have two minutes to "begin effectively his flight" commencing when the preceding flier's engine stops. Furthermore, the allowed engine run is being reduced for the flyoffs, as compared with increasing the max for the flight. The first flyoff (round 8)



New minimum weight for F.A.I. Indoor will mean relatively robust models—of similar 'strength' to JOD's first real attempts at this class in the Manchester Corn Exchange in the late 1950s. Here, brother Hugh holds while JOD winds—Gonzoph's design (from 1955-6 Zaic YB) is similar span but less area to current 65 cm. class.

will have 8 seconds engine run, the next six, and any subsequent four. The three minute max will apply throughout. I do not intend to pretend that I like these rules. The "staggered" flyoff *could* do more harm than good. Clearly it will improve the timing of engine runs by preventing distracting noise from other motors. On the other hand it introduces the "luck of the draw". The 1969 World Championships at Wiener Neustadt had eleven qualifiers to flyoff at the end of seven rounds. With the newly decided procedure the eighth round *could* last almost twenty-four minutes. There is more than ample opportunity for the weather to change noticeably in this time. If this happens the flyoff is little more than a raffle for the best weather as the competitor is forced to fly whether or not the conditions are right.

Reducing the motor run for flyoffs is contrary to previous F.A.I. policy in that it has always been maintained that timing runs of under 10 seconds was subject to gross inaccuracy. The problems are well known, and different timers can and do give widely varying verdicts on the same run. Perhaps I can quote an instance when I ground checked a run with three timekeepers, each with a stopwatch. They said "nine", "ten", and "eleven"!

The shorter the allowed run the more important it becomes to go to the absolute limit. Yet the human reaction time remains substantially the same—but represents a bigger percentage. There are problems with recalibrating clockwork timers, and ensuring "clean" stoppages. Furthermore many models have a power pattern such that a smooth transition to glide depends on the motor cutting at a particular point in the climb. Such a model can be in difficulties on short runs. Others depend on speed to assist the changeover from power to glide—and may still be accelerating in very short runs. The modern F.A.I. model is far from light—and takes a definite time to build up to its ultimate climbing speed.

It is probably relevant to mention that the Americans have been using the reduced run concept at their last two Nationals. The first try taught them that it was necessary to specify a lower limit to the allowed run. Jack Pfeifer, who won class B with a final 3 minute max off an allowed three second run, thereby qualified for a further attempt using up to one second run V.T.O. or minus two seconds H.L. The fact that his last max was made off only 1.4 seconds actual run highlights the difficulty in getting the short run right.

Once the power flyoff is reduced to two or three contestants, tactics are liable to reappear. There is then a definite advantage in being *drawn* to fly last. If those obliged to fly first then over-run, the last man merely has to avoid the same mistake. Conversely if the first off are

Magnet Slope soarers are now allowed one model per flight—a reflection on both recovery problems with this type of flying, and a certain inconsistency is the usual F.A.I. concern with travel considerations and material availability/expense. Here, Doug Robinson adjusts the magnet settings before launching his slope soarer.



Another magnet enthusiast, Ray Sutton, with his swept wing model at Clywd in 1967. Well proved layout is combined with all sheet and simple construction.

too cautious, then those following have the opportunity to judge whether to play safe or go to the limit.

Suggesting alternatives, or even solutions, to these and other difficulties may be academic till the F.A.I. "thaw" is due. Now fliers have realised the importance of legislation intended to prevent it. Knowledge is not easily destroyed! Perhaps the situation should be accepted—particularly in glider which is now very far from a contest for lowest rate of sink. For World Championships I would prefer to see an equal chance given to each individual, rather than to each team, by allocating one timekeeper to each flier instead of a pair to a team. There are those who will claim that it is the team award that matters most. This is hardly supported by the relative amounts of prestige enjoyed by the individual and team winners. In any case equal chance for individuals implies the same for teams. The converse, however, is not true.

The other major change that has been decided is the imposition of a *minimum* structure weight for indoor free-flight (microfilm) models. In complete contrast to the power revisions, this and alternative ideas for restricting indoor models have been hotly debated ever since the last Championships in Rumania. At this contest it was reported that well over 50 per cent of the entry failed to survive the meeting. This was attributed to the extremely light and fragile constructions that could not withstand "hangups", retrieving measures and even flight loads on occasions. It was also agreed that only the favoured few could obtain the necessary materials to build so light.

What has been introduced is a minimum weight for the structure (i.e. model without rubber) of 1 gram. (To those unused to the metric system this converts to 0.035 ounces.) This might appear ridiculously low—but is almost *double* the weight of the top two models in the Salt Mines. The additional motion of a limit to the rubber weight was not approved however.

The Americans, in particular were perturbed at these suggestions when they were first advanced. I have seen a little of the correspondence on the topic. It has been pointed out that a weight rule will merely alter the emphasis from structural to other considerations. The rubber will become even more important than it is already—and good rubber is harder to obtain than light balsa. In any case it has been pointed out by the (U.S.) *East Coast Indoor Modellers* that "since the inception of World Championship competition the Europeans have had models equal to or lighter than the 'material' wealthy American's model".

The weight need not go into the structure. A circular letter from Erv Rodemsky quotes Jim Richmond as having "designed a gear shift device which would weigh about one-third of a gram. This would allow him to utilise the full power burst and gain approximately seven minutes. Needless to say, gears such as these are beyond the capabilities of the average builder". (Richmond is a watchmaker, or to be precise Engineering Manager of Timing Products at Sunbeam Corporation!).

An assortment of alternative restrictions have been discussed. Dimensional limits tend to produce unexpected "freak" designs intended to circumnavigate the intent of the restrictions. About the simplest alternative was that of requiring tissue (paper) covering instead of microfilm. At first glance this might be attractive. It would certainly affect duration by increasing the weight—as the "half-thou" condenser tissue usually employed weighs about 0.014 oz./100 sq. in.

This means that for a model the size of Jim Richmond's F.A.I. design the covering alone would weigh about 0.023

ounces. Furthermore those who have flown both types usually reckon that microfilm is easier than tissue on high performance models. I also have the suspicion that some very strange covering materials would appear under the label of "paper".

However the deed is done, and the "restricted" indoor is a reality. There is no doubt that the straightforward approach of a strong model will still allow high durations. The Americans were quick to try weighted-up models – and got around half an hour on their first attempts. The best British score in Cardington last year was Reg Parham's 33 minute flight with a model weighing 0.033 ounces, as described on page 703 of the *December* issue....

Whether the prospects of being able to build a model of relatively robust construction will attract newcomers to this branch of the hobby remains to be seen. Most modellers look on indoor flying with a mixture of awe and disbelief. Although methods, techniques and advice are described in detail in specialist news-sheets, and occasional articles in the "popular press", they have failed so far to dispense the air of mystique. Perhaps there is a tendency to cater too much for the expert.

In an attempt to ascertain what type of structure would be appropriate to the 1 gram limit, I inspected the remains of the models on which I learnt to fly microfilm in the Manchester Corn Exchange. Although these were much less area than the current F.A.I. designs they were about the same span. I don't like to confess what my relics weighed after a decade of dust on top of extensive repairs through much flying in restricted space. Nevertheless it would seem that $\frac{1}{16}$ in. x $\frac{1}{16}$ in. L.E. and T.E. for wings, and the use of red/green microfilm would not be unreasonable for an initial model. At least it's where I would propose to start!

In comparison with most of what has just been discussed the decision to allow the use of five models in magnet-steered slope soaring events may well go unnoticed except by those directly concerned. To allow one model per flight is, however, rather a reflection upon either the retrieving difficulties expected or the need to change models to suit different wind strengths. I suspect the former is the prime consideration and, if so, makes an interesting comparison with the outlook afforded the indoor model.

In the past the F.A.I. has been concerned, and rightly, with the problems of competitors transporting their models to contests and of the need to prevent events being dominated by those fortunate enough to possess special or unique facilities or materials. The allowing of 5 models for magnet events is not quite consistent with previous policy.

On the whole the F.A.I., or at least those who have a say on making the F.A.I.'s rules, favour a numerically defined specification intended to produce a model of reason-

able size and strength that is within the capabilities of many modellers. This aim has not been successful in some cases – but has been achieved remarkably well with the A/2 glider specifications. That the accent then moves on the manner of flying such a model is not only noteworthy, but should serve as a salutary warning.

There is an appeal in the "unlimited" model, unrestricted by artificial or arbitrary dimensions or weights, and flown for as long as possible. Indoor free-flight filled this bill admirably well, being devoid of such factors as weather variations and timekeepers' eyesight. World Championships worthy of the title should be for experts – for whom the extreme model is appropriate. To complain that some people cannot cope with the requirements is merely to underline the fact that some others can – and this is surely a vital part of competition. The whole idea is surely to demonstrate that "all animals are not equal".

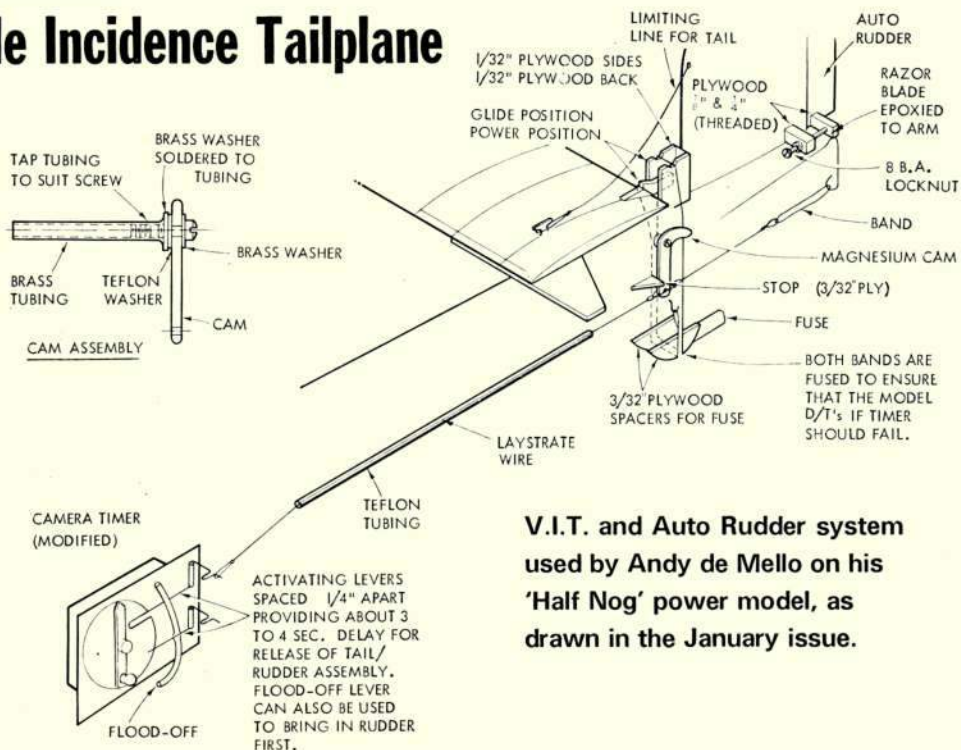
On the domestic front, the S.M.A.E. competition programme, published last month, is remarkable mainly for its conservatism. It is very much "the mixture as before".

There are of course some detail improvements. Events at the Nationals have been rearranged so as to have two open events and one F.A.I. on the first day, and vice versa on the second. This events out the number of flights required, and also separates the classes counting towards the year's overall Senior and Junior Championships. There have been other changes in the eligible events. The same events at the six area meetings now count for both the Plugge Club championship and the individual senior award. The balance of classes is unaffected. This should prevent a clash of interests and encourage any all-rounder to participate. The junior events have been respecified to include Coupe d'hiver, A/1 glider, and $\frac{1}{2}$ A Power instead of the three F.A.I. categories. This is worthwhile as it implies more suitable models even if just as many! I wonder if Country members will be allowed to fly "on their own" in the three team events to gain championship points?

The rest of the programme offers little opportunity for comment other than what I have said in previous years. Whether this situation arises from satisfaction or apathy is debatable. Certainly it contrasts with the lively discussions originating within the U.S.A. The Americans seem to debate continuously the best way to specify rules, base their records, and pick their International teams. It is a better sign of healthy interest than our apparent lack of concern.

To illustrate my point could I mention that I recently received from Dave Linstrum, currently their F.A.I. Team Programme Administrator, not only fully detailed results (complete with every flight and position each round) but also proposals re the selection system for 1973. Need I say more?

Variable Incidence Tailplane



topical twists

by 'Pylonius'

illustrated by 'Sherry'

'Shouldn't we throw him off?'
'Throw him off! Why, he's the Club
President!'

Not much Cop

Looking at the various cop series on the telly, particularly at the way the hierarchies perform, makes me wonder if there is some parallel in club-room status. For instance, what is the domain of the humble constable in one series, such as the weekly rounding up of bank robbers, requires a bit more brass in another series, say, a sergeant, with just an inspector around to give him a good bawling out from time to time, whilst in yet another series it takes all the top brass, from Chief Constable down to Superintendent to rope in one juvenile shoplifter. Much the same sort of status variation seems to apply in model clubs. In many clubs, as you might expect, the Hon. Sec. does all the donkey work, with the others content to hold an Emergency General Meeting every three months or so to bring him to book for various deficiencies and oversights, like not producing a midsummer issue of the club magazine on the flimsy pretext of going on holiday, and failing to suitably fulfil his duties as timekeeper, radio judge and litter clearer at the club rally. However, in another club, you find it is the Chairman who is the big white chief. Either he is a megalomaniac who seeks only the glory of high office, or he is the only one who is prepared to do any work, to which end the non-working members cunningly string him along with grandiose appointments. Often when the club is down to two members he is made President, but usually this office is given to a gentleman of advanced years who holds some minor public post, although his principal claim to distinction lies in the fact that he has never seen a model plane.

Then, of course, there is the model club Pooh Bah. He not only holds every office in the club from President down to Junior Representative at one and the same time, he also does all the model flying. He is inevitably deposed by the inert faction of the club who, perhaps rightly, accuse him of hogging the whole show.

The club that really plays for safety though, is the one that gives an impressive appointment to each of its members. You could have as many as five Vice-Presidents at any one time, three deputy Chairmen, six assorted types of Hon. Sec., but come club night you can be pretty sure they are all stuck at home watching cops on the telly.

One Man Band

The thing I like about the club newsletter is the way it is so skilfully disguised as a full orchestra when, in reality, it is a one-man band. The diverse comment you get, the comp reporting, the plans and



the hints and tips, all of which cover the whole spectrum of club life to give the impression of hordes of eager beaver, fly-happy members in full spate, is the same bloke, who finds in his literary commitments a good excuse for not building model planes.

It could be that newsletter editors are frustrated novelists and poets. To be a novelist nowadays rests largely upon your ability to devise a cover lurid enough to out-shock the others on the bookstand, whilst the only poetry we have today is the spoken variety; the declaimers of some being people who had not benefited enough from their meagre schooling to inscribe their four-letter epics upon the traditional backgrounds.

Skullduggery

The crucial question of our time is whether the pit man's plastic crash hat is a real protection or just a psychological one. One helmetless type, who recently fielded a team racer in full flight with his cranial pit stopper, said from his hospital bed that he was glad he wasn't wearing a helmet as it might have deflected the model to a less fortified area of his anatomy. And, anyway, people who think that because they are wearing a helmet they are *ipso facto* immune to damage, are more likely to get a fourpenny one than the unprotected character who relies for survival upon his native wit and natural agility.

Having seen modern team racing in action it seems to me that anyone venturing within a hundred yards of the screaming monsters would hardly need the added thickness of 1/8th plastic around his skull.

Ex-heads

Old modellers do not fade away, as you might think—they get flushed down the brain drain to the land of opportunity, provided that they have the requisite quantity of drainworthy grey matter, which is why, perhaps, some of us are such old stick-at-heads.

Anyway, two erstwhile well-known modellers recently came on a business trip back to the other end of the brain scupper, presumably to see if we have any old relics to exchange for hard dollars, such as quaint old luxury liners and historic bridges. We do know they came across a few old relics: model designs they produced in the giddy days of their youth, but still very much in vogue over here. This either proves that all the best model designers have gone down the brain drain or the model trade is living in the past.



Jim Kloth concludes his feature on

RACING GOODYEAR

with useful advice on designing and operating your profile scale racer

Note: All three-views drawn to 1/56 scale. Enlarge by seven to meet rule requirements of 1/8th scale models.

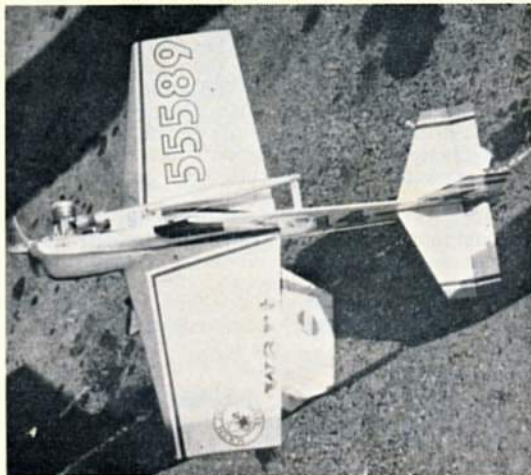
John Woods shows off his Super Tigre G20D-powered 'La Jollita' - diesel tuning is a new problem to conquer for many Americans. Very simple model with external control system and does not use a fuel shut-off.

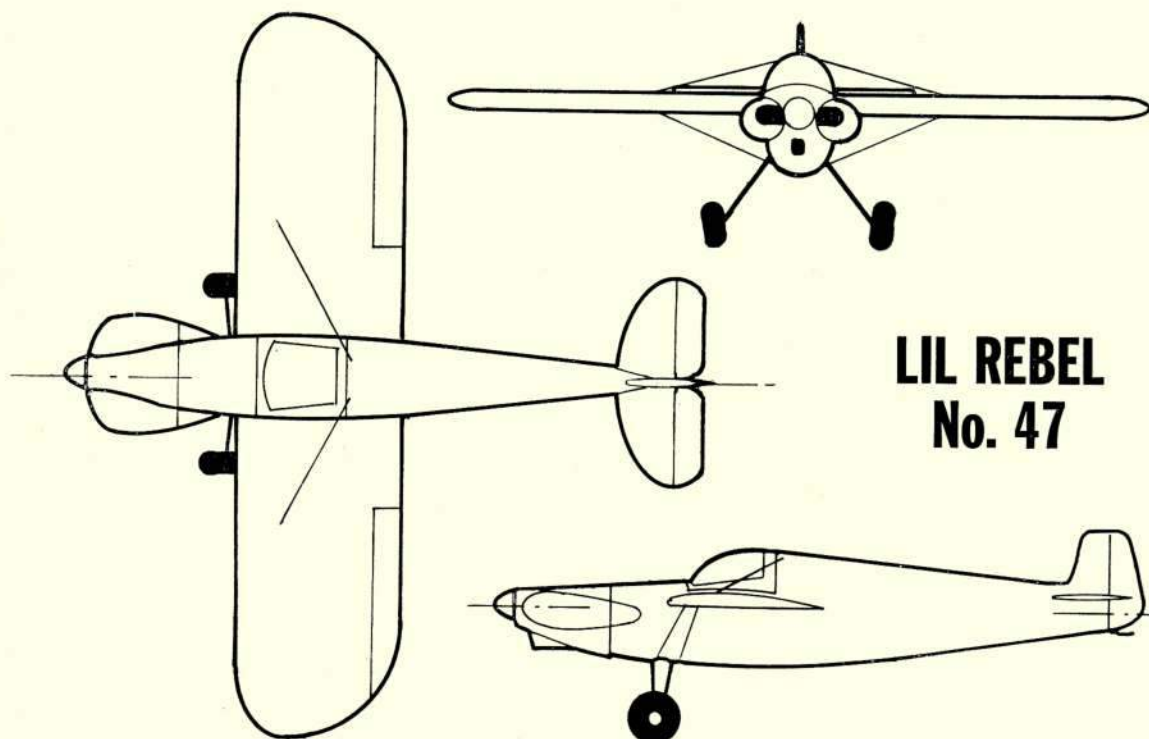
THE USUAL STRUCTURE for this type of model is the all sheet, solid type. They are simple and quick to build, allowing you to have a whole stable of different models. The APS plans of *Shoestring* and *Gray Ghost* (designed by the author and available as Plan No. CL 1034, price 40p the pair) feature some of the building tips which have been contest tried and proven. Adding a $\frac{1}{8}$ in. x $\frac{1}{4}$ in. spruce trailing edge piece adds extra strength in a damage prone area just as the hardwood dowel protects the leading edge. An U/C bent up in two halves of 10 s.w.g. dia. wire, wrapped sandwich fashion with soft wire on either side of the fuselage is a good method. Filleted and reinforced with epoxy-glass fibre yields a very rugged and low drag structure. Inserts of steel or aluminium set into the engine bearers provide additional squareness, rigidity, and support to provide better engine performance. Fillets built up of epoxy-glass fibre strengthen the wing-fuselage and tail-fuselage joints, extend model life and help in further drag reduction. Small $\frac{3}{16}$ in. ply inserts can be added on the wing and tail mean chord lines to aid in the forming of these fillets. An epoxy finish done in the *Hobby-Poxy* 'Easy-Does-It' method, or in the manner described in the Epoxy article of the 1968-69 *Aeromodeller Annual*, provide a tough, durable finish. This adds great strength to the model with little sacrifice in weight.

Choice of an engine is best left up to the individual. Most often it depends on what is at hand. The diesel seems

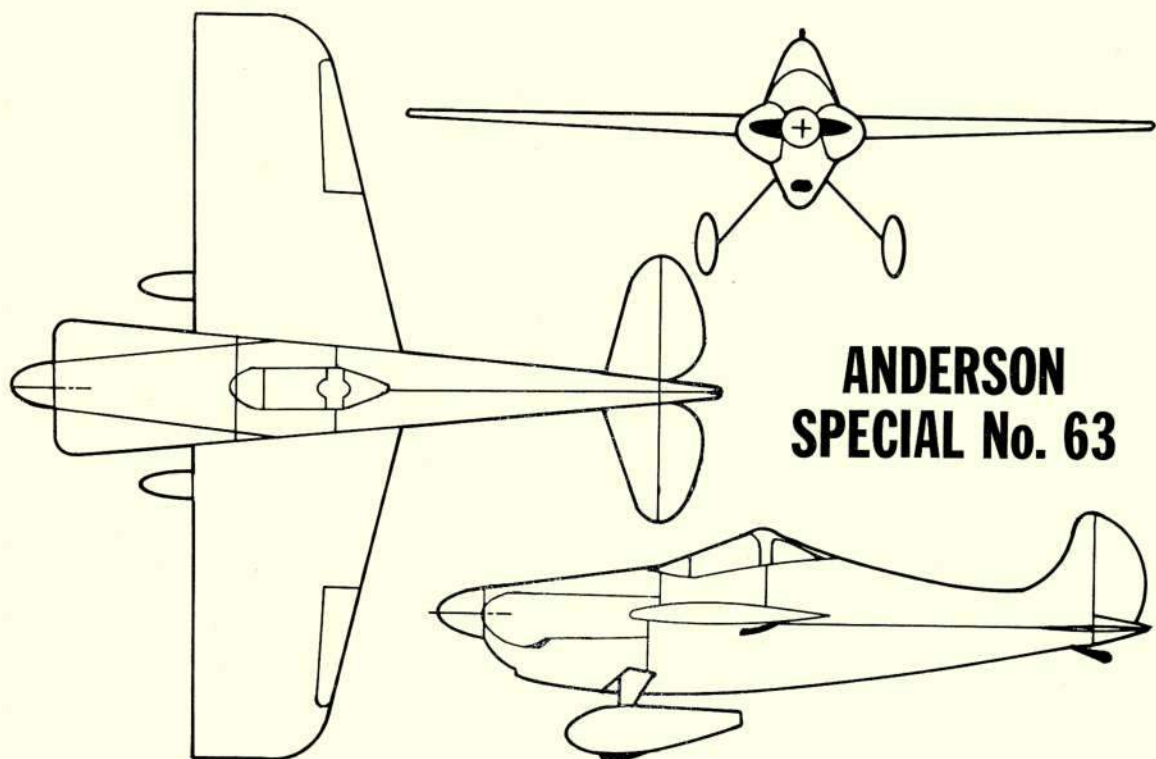
Very smart version of 'Ole Tiger' by David Giles of the South Bristol club. Note the smooth frontal appearance with the cheek cowl stiffening the fuselage to prevent vibration. Engine is an Italian Kosmic 15 diesel fitted with a tuned pipe, which David is importing into this country.

to be more popular in Europe while the glow remains top choice in the U.S. - the pit-stop rule and no tank size restrictions favour the glow engine. The diesel, freed from the economy restrictions of FAI Team Race, can be retuned for maximum power and be very competitive. The elimination of the battery-glow plug problems along with more reliable restarts further enhances the diesel's attractiveness. I have personally experimented with the O.S. Max. 15, Supertigre G15 glow, ST G20D diesel, ST G15RV diesel, Oliver Tiger Mk III and Mk IV diesels,





**LIL REBEL
No. 47**



**ANDERSON
SPECIAL No. 63**

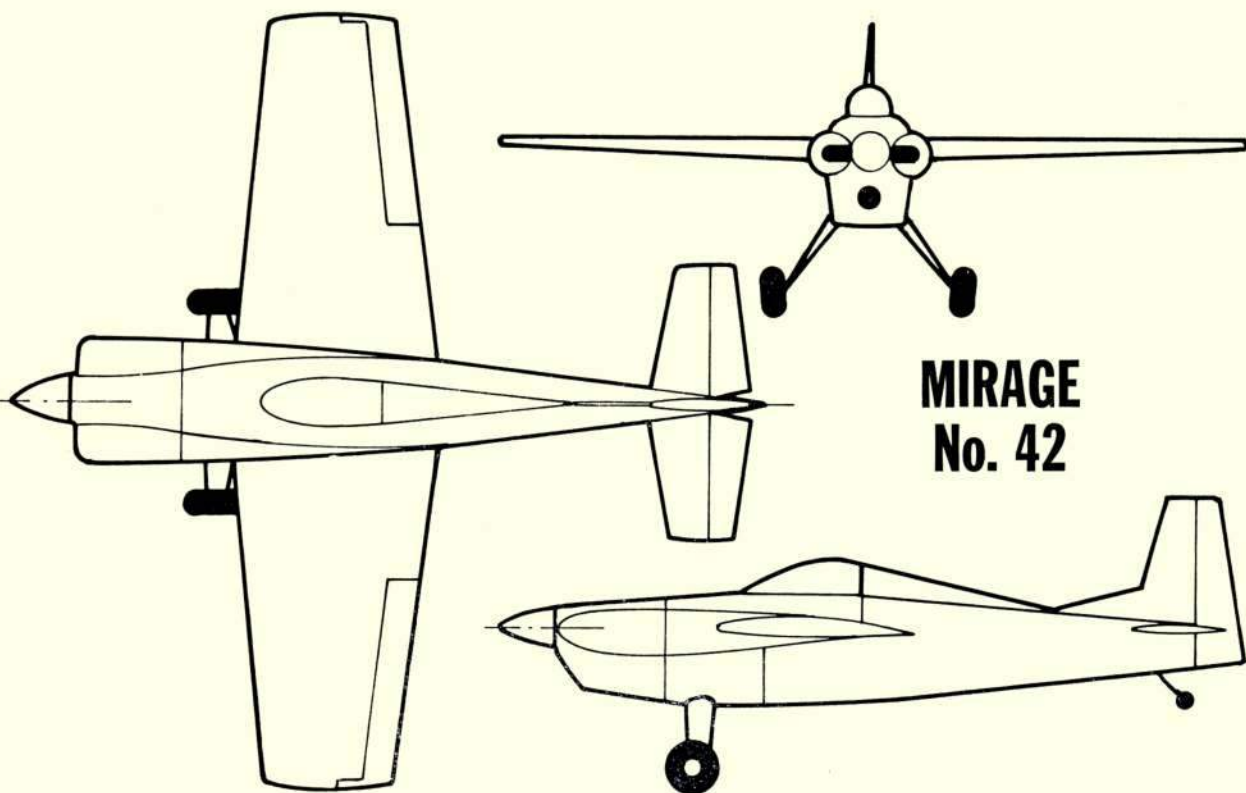


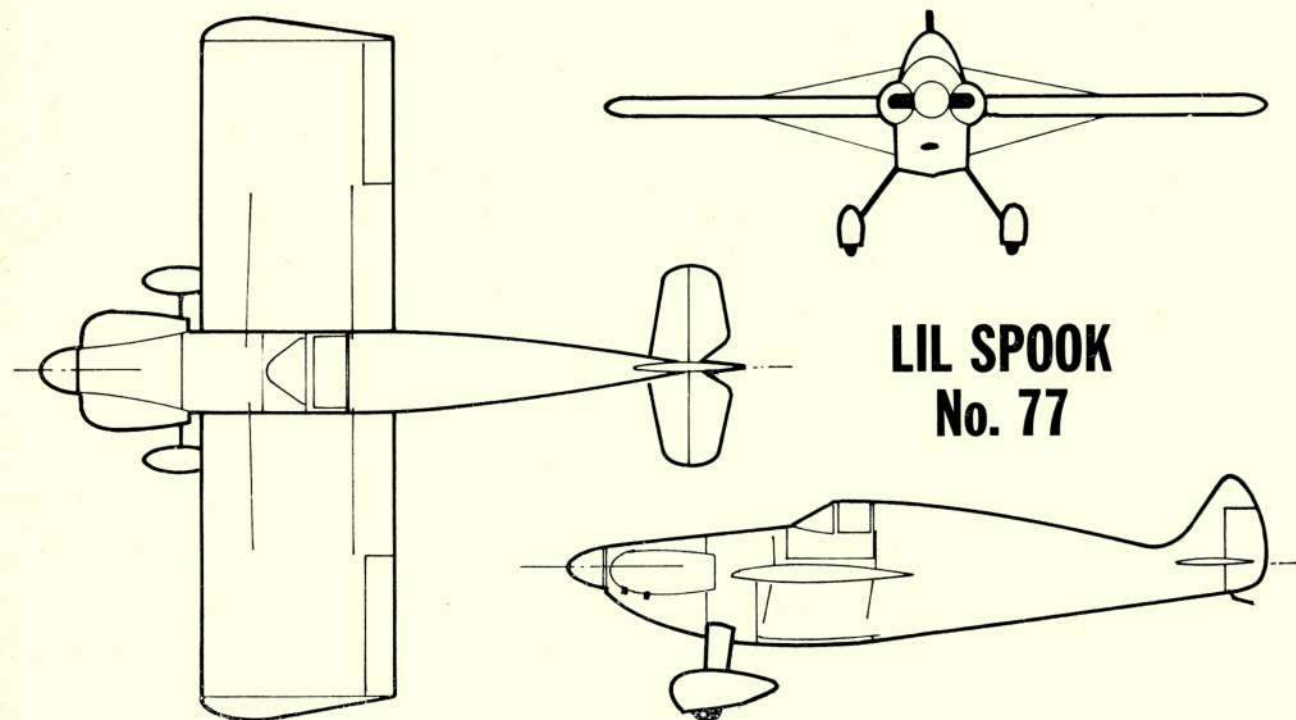
A Super Tigre G20D equipped 'Cosmic Wind' by the Evans/Phillips team (South Bristol) is unusual for this country in that it employs a two-wheeled undercarriage. Note fuel shut-off trip wire running from an elevator horn.

Eta Mk II and Eta Elite Mk II diesels, MVVS 2.5 c.c. rear exhaust glow and diesel, the Cox .15 glow and the HP-15D diesel! All gave competitive performance though my own favourite is the Eta Elite Mk II with the standard induction system. There are undoubtedly others which would also be excellent choices. The main consideration is selecting the engine should be 'performance in your hands' – one which you are familiar with and which will give you fast starts and re-starts dependably. Choice of fuel, plug, and prop combinations are best determined by practice – the same practice which develops you and your team-mate into a well-drilled team will also reveal what works best in your own local climatic conditions.

Once you have tasted the thrill of Goodyear competition, you might want to try some other tricks to gain a little edge. The hollow wing-fuselage construction allows the controls to be completely buried within the model for further drag reduction. Lead-out terminations can also be buried in the wing a la FAI/TR fashion. Rules require that the engine be left uncowed but the tank could be tucked away in a partial out-board cheek cowl. The cross-section of the fuselage could be tapered from front to back. It can also be tapered from $\frac{1}{8}$ in. thickness at the centre to $\frac{1}{4}$ in. thickness at top and bottom in appropriate places. All edges can be radiused and fillets formed to flow nicely between adjoining surfaces. The U/C legs could be airfoil shaped aluminum flat stock rather than the higher-drag round wire. Round wire gear could have shaped fairing pieces added. I don't think that I shall soon forget the 'Scale' landing gear used by one modeller – the struts were shaped from spring steel 6 in. Machinists' Scales. Expensive but effective! A pulley type circular bellcrank could be installed in a solid wing, the lead-outs travelling in hollow passages in the wing, leaving only the push-rod exposed to the airstream. A finely sanded and rubbed finish will add a few miles per hour too.

A certain amount of gadgetry can be used to improve racing performance. The hot-glove technique can be borrowed from Rat Racing for glow engines. This calls for a small plate on the inboard cheek cowl to be wired to





LIL SPOOK No. 77

the engine so that contacts on the pit-man's finger and thumb supply the power to light the glow plug. These contacts are usually rings with wires leading from them, up the pit-man's arm, to the starting battery. Similarly, a pressurized fast fill fuel system speeds the refuelling from a bottle located on the pit-man's wrist or arm. A valved mechanism on the hand mates with the filler outlet on the model's tank. Another gadget which can be used to great advantage is the 'Fuel Kill' or shut-off. This is usually a mouse-trap arrangement to pinch off the fuel line or both fuel and pressure lines. It is held open by a stop which is pulled out of the way by an actuating wire attached to the bellcrank. A quick down-neutral action by the pilot at the handle actuates the trip wire without the model noticing what has happened. The advantages of the shut-off are many. Engine shut-off can be done at the best spot on the circle to assure the model returning to the pit-man and at a speed that he can handle. Timing of the pit-stops over the course of the race can be chosen to avoid other racers on the ground. The pilot can duck out of trouble or avoid line tangles by popping the shut-off. A poor running engine can be returned to the pit-man for returning quickly and keep you in the race - gone are the agonies of waiting out the tank to get it back down to correct an over-lean setting which can burn up the engine. A large tank can be used to eliminate refuelling altogether. Pit-stops can be accomplished early in the race, forcing the other teams to scramble to match your planned smooth stops, and maybe fumble while trying to match them.

There are few contest tactics which might give one team an edge over another. Plenty of practice, careful preparation and a dependable engine-model combination are the things which best help you on your journey to the Winner's Circle. Practice to develop a smooth working team with automatic reactions which will not be jumbled

by contest tensions. Practice to determine and sort out engine and model idiosyncrasies beforehand. Learn and practice what particular motions must be gone through to accomplish a fast pit-stop with your particular equipment and don't let competition jitters disrupt the sound procedures you have developed. Stick to tried and proven things for the races, reserving experimentation for the practice circle. Keep on practising and working to keep your timing sharp and to make any little improvements to keep you ahead of your competitors. Oh, did I mention PRACTICE? I almost forgot.

The Goodyear Event has everything it takes for an outstanding competition event - colour, realism, fast paced action, and all for a small investment of cash and building time. Come join us, it's a real blast.

Since publication of the 'Ginny' three-view drawing in the January issue, some accusations have been made concerning undersized 'Ginnys' seen at recent competitions. This confusion is probably due to the fact that Foss's 'Ginny' was later modified, had its wings clipped and was renamed 'Little Mike'. The example below is Oliver-powered and uses a Coleman's mustard tin tank.





Ron James's IMPRESSIONS of MODEL FLYING in the UNITED STATES

Ron James (left) placed second in Goodyear event flying Jim Kloth's *Bonzo*. Jim's usual pilot Bruce Van Hoozen (right) switched to pitting and placed first with a M.V.V.S. 2-5 RL powered *La Jollita*.

WHILE ON HOLIDAY in the U.S.A. last year, I was fortunate enough to stay with Jim Kloth at St. Petersburg for a few days. I was able to examine his latest Goodyear models – of which he currently has four – all different types and powered by a variety of motors. I also had the opportunity to fly these models and found that they all handled very well. There was to be a contest at the weekend which was being organised by the *St. Petersburg Gulfhawks* model club and I was invited to enter and fly one of Jim's models in the Goodyear event. It was intended that I should fly his *Ballerina II* which was powered by an H.P.15.D. The motor was still fairly 'tight' but fast enough to be competitive and we had several practise sessions at the local flying ground to get things sorted.

This was a very interesting contest for me in many ways as it was the first time I had ever competed abroad and I was curious as to how the contest would be run and what the difference in rules and flying techniques would be.

Entries were \$1 per event and the entrant's licence card had to be shown and the number of the entrant, event and type of model were all noted down on a special form which was then sent to the A.M.A. This is quite different to England where in some five years of competition I have only been asked for proof of insurance at the Nationals!

As I was down to fly in the last heat in Goodyear, there was ample opportunity to watch the other competitors perform. The first heat was for Juniors only and it might be an idea for us to copy this as Goodyear models are easy to make and operate. They had their own trophies and did not have to fly against the senior modellers, so there was no chance of them being intimidated by senior opposition.

The flying circle was marked out in the usual way except that there were no segments. When I enquired about this I was told that they never use the segment rule except in F.A.I. team racing and although they agreed it was a good idea from the safety angle, they weren't too keen to use it. Also none of the pit crews were required to wear safety helmets – glad I was flying. The competition was keen although the atmosphere was very cordial. Watching the pilots it was interesting to note that the majority flew with their arms extended and walked around the flying

circle much more than we do. Whipping was in evidence but not blatant. The three warning system as in FAI was not used and rather than disqualify a team they would be penalised by having to fly some extra laps. When the motors cut most pilots were content to let the model glide and land by itself rather than pull the model around to the pit crew, and more often than not this would involve a lot of running around by the pit crews. When my turn came to fly we took the model to the flying circle and Jim briefly warmed the motor up. There was no official warm up period and with the temperature at 95°F in the shade a short burst from the motor was all that was needed. The high temperatures and humidity can be more of a problem than we realise, as a drop too much nitro in glow fuel soon cooks plugs and the humidity causes problems by making the lines stick – which apparently caused some problems for the control line fliers at the U.S. Nats. Fortunately, my heat was trouble free and we had a fast enough time to reach the final. After the race there were some comments on my flying style as I flew with my arm in and handle on my chest and didn't walk around too much – it seems they don't fly as close to the rules as we do. The final was a four-up affair and was quite uneventful. Jim and I managed second place and I am now the proud owner of one of those attractive American trophies.

Running alternately with the Goodyear heats was a balloon bursting contest which was interesting and entertaining from both the pilots' and spectators point of view. The rules are relatively simple and the object is to try and burst as many balloons as possible in 90 seconds – the only stipulation is that the model must fly above 15 feet once each lap. After take off the pilot is lined up with the position of the balloon on the directions of his helper. Once he has the right line he signals that he is starting to the timekeeper, and the watch is started. The balloons were fixed to 3ft. balsa sticks and this was jammed in the end of a wooden 'X' of about 8 ft. This piece was pivoted in the middle so as soon as the balloon was burst a new one could be swung into line. It is not as hard on the model as may be thought, as one of the models used was a *Ringmaster* some 20 years old – although admittedly it did look a little the worse for wear!

(Continued opposite)

FLYING SCALE MODELS



PART 1

of a new series
on this challenging
and satisfying
branch of the hobby
by Eric Coates

Eric's Sopwith 1½ Strutter and Terry Manley's Scout D were frequently flown together at Borough during the mid-sixties, where they formed upon each other.

THE FREE FLIGHT scale model in recent years seems to have lost popularity; at least with the more serious modeller, being, no doubt, a reflection on the increasing popularity of the radio model. Entries in the *S.M.A.E. Super Scale* event for F/F Scale Models in the last decade have declined almost in an inverse ratio to the increase in entries for the R/C Scale Event. There are many well-known fliers of R/C Scale Models today who have never flown a F/F scale job. This is a pity for many as the delights are in flying radio there is charm, which all who practise the art will endorse, in operating a lightly-loaded F/F scale model on calm evenings which, in the author's opinion, surpasses all other forms of model flying. This charm seems to be enhanced if the subject is a biplane; a type in which the author has specialised for over 20 years.

Undoubtedly biplanes, particularly machines of the *Miles Hawk*, built by the author in 1953 is typical of the more difficult type of model to trim, due to its low wing layout, etc., and is always rather nerve-racking to fly.

1914-18 period with their generous area, are the most suitable subjects for F/F; most of them being relatively easily trimmed. Full realism of flight never seems to be captured if these aeroplanes are produced as R/C models and much less so as control line models. The added weight of the R/C gear increases the wing loading, and the use of powerful motors to provide the necessary penetration for contest flying on all but the calmest days, usually destroys the innate flying characteristics of the prototype.

The necessity to fly at speeds in excess of scale, to maintain line tension, and the unbanked turn of the control line model is completely alien to the vintage biplane also.

The intention is not to decry R/C and C/L scale models, but just to show that certain types are better. Eric's most successful model, contest-wise, is this *Bucker Jungmann*, built in 1966, and is still a regular performer. It won the Super Scale trophy in 1967.



Continued from page 152

When I was in Miami I met some of the local free flight boys who were testing new models. Our fliers might be very envious of the beautiful weather there – for the duration of my holiday it was bright and sunny with hardly any wind at all. I watched Gary Myers trimming out his new F/F 'B' model and it was doing a three minute flight and he would travel no more than 200 yards to retrieve it! I watched him make five or six flights in all and every time he managed to catch the model before it reached the ground. He recently won 'B' F/F in the

Senior class at the U.S. Nats. with this model and I asked him what obstacles they had to contend with in free flight. He said there wasn't too much but if you were chasing a model you had to be careful not to tread on a rattlesnake while looking up and running after the model!

One thing which struck me about modellers in the U.S.A. was that they do not specialise as much as we do, most of them fly three or four classes in control line and free flight. It certainly makes for a better appreciation of the hobby.



Above, built over 20 years ago, the author has never since managed to build a model with such a light wing loading! The 44 in. span Avro 504 K weighed a mere 13½ oz. and flew originally on a .5 c.c. diesel. At left, the fine action shot of T. Manley's Bristol Scout Type D ideally illustrates the appeal of a 'biplane'.

suiting to be modelled as F/F subjects. Without doubt the low wing fighter of World War II is best suited as an R/C model and the multi-engined bomber is best flown on lines. Conversely the more difficult types can be made to fly free flight but these machines are much more troublesome to trim and with the worry of a prang always present the 'charm' is not so much in evidence.

I first became interested in building free flight scale models immediately after the Second World War when the solid scale boom of the war years was over. Most of my early scale models were built from the multitude of small rubber scale kits then offered by the many British kit manufacturers. The kits of those days seemed to offer far greater value than those proffered today, and generally being of much lighter construction put in far better performances than is possible from today's heavyweight kit models. This is a pity for the small scale rubber kit is the usual introduction to modelling by youngsters, and if it doesn't fly another potential aeromodeller is lost.

The natural progression from these models was, in the 1940's, to the larger rubber scale models and it is in this branch I must confess to almost total failure! Many were the scale rubber designs, published in the *Aeromodeller* of those days, by such names as E. J. Riding (tragically killed in an air accident in 1949), J. M. Greenland and C. Rupert Moore, etc., the latter gentleman even patented a device called the 'Moore Diaphragm', to keep the

majority of the rubber at the forward end of the fuselage and so prevent the C.G. moving too far aft—a particular curse of the short nosed biplane, even now with all the weight of the power unit concentrated forward. Although I built several of the designs of these revered gentlemen, success eluded me as I am afraid my models were invariably too heavy for the limited power available and a long drawn out power glide was usually the best which they could manage. I therefore became disillusioned with the F/F rubber scale model and, like the majority of other modellers in the late forties, was swept up with the control line boom. My interest soon turned to scale again and now with plenty of power available from the Mills, E.D.'s and Elfins of those days many were the World War I biplanes to be seen flying on the end of my wires. Admittedly these were appalling creations, by the standards of today, but, as their life was usually short, this was of small consequence compared to the rapidity of building. Two or three weeks at the most was sufficient for a scale model in those days for me!

With the advent of the Amco 0.87 c.c. diesel in 1948, followed shortly after by the Mills 0.75 c.c., the whole world of scale modelling was changed. Here at last were reliable power units no more than 2 in. high and weighing only 2 oz. or so; which could lift a model weighing over a pound, and around 40 in. span, with ease. Indeed, the Mills .75 has never been improved upon as the ideal scale power unit. Easy starting, easy to cowl, due to the rear induction, and the ability to swing props up to 10 in. diameter made it a natural. It is a sad reflection that today virtually all that the model shops offer as free flight power units have front induction, rev like the devil on a 5 in. prop. which won't clear the cowl diameter, and protest and die if shown anything over 8 in. diameter (I shall dwell in greater detail on power units in a later article).

Being well and truly hooked on control line models when these engines were introduced, it was some time before I realised what potential they offered for F/F scale. There was a widely-held view at that time that it was a far more difficult task to fly power scale than rubber scale, and it was not until I saw a fellow member of the old Goole and D.M.S. flying a converted A.P.S. rubber powered *Tiger Moth*, powered by a 1 c.c. E.D. Bee that the penny dropped. Almost overnight the control line handle was discarded and

Terry Manley releases his beautiful *Hannover CL 111a* in the 1967 Super Scale event, held at R.A.F. Upwood, where it took second place.





Compare this picture of the author's latest model, a B.E. 12D with the Avro 504K on the opposite page, to contrast the difference in 20 years of building. Scale accuracy is now far superior to the 'old days' when areas and outlines were frequently altered to increase the flying ability.

I was designing the first of a long line of powered free-flight scale models, stretching over 20 years to the present day.

My first successful powered design was the dear old Avro 504 K; built in 1950. My aim in this model was to produce as light a machine as possible; to fly on very low power. It was fitted with one of the first Allbon .5 c.c. Darts (still produced by Davies-Charlton) and the all-up weight was only 13½ oz. This for a 44 in. span model was quite remarkable for me and I have never managed to produce anything with such a light wing loading again. Unfortunately, the drag was too much for the Dart, which is not an ideal scale motor, and it had to be re-engined with one of the early E.D. 1 c.c. Bees. This combination was perfect. The old 504 lumbered around the small fields surrounding Goole for nearly two years. She flew so slowly that when it hit anything, which was quite frequent, damage was minimal or non-existent. By present-day standards the scale accuracy and finish (red Modelspan was used for the covering) must have been appalling, nevertheless, the old Avro was the biggest milestone in my aeromodeling career and probably gave me more pleasure than anything else I have built; including multi-channel R/C models in latter years.

Between the Avro and the B.E. lies 20 years of continuous development in construction techniques not only by the author, but by many other leading scale modellers, notably Bridgwood, Simmance and Manley, whose ideas have been freely 'cribbed' and incorporated into succeeding models. Some have found to be wanting and rejected on the next model but over the years the technique has slowly evolved. This, together with improvements in materials, adhesives (the coming of epoxies and the ability to bond wire and wood together in a satisfactory manner being possibly the greatest improvement of all) and trimming methods, means that today one can confidently build a realistic looking aeroplane that will fly well, even in quite windy conditions without too great a risk of damaging them. Nowadays most of my models average a five-year flying life. During their first two years I limit their flying to preserve their appearance for contests, but after that they are used as sport models and fly most weekends and summer evenings when the weather is reasonable. I still possess, in flying order, the Jurgmann which was built in 1966, and which had had more contest successes for me than anything else I have produced. Apart from winning the Super Scale event in 1966, it has won three other events and had several other placings. The relatively heavy wing loading and



A long-lived model, which finally met an ignominious end when it was crushed during a house removal, was Eric's Sopwith 1½ Strutter, which often used to 'formate' with Terry Manley's Scout D - as seen in the heading photograph.

stability provided by the 11 deg. sweepback of the wings makes it a safe performer even in half a gale.

The longest lived of all my models was the 1½ Strutter, which was built in 1959 and finally ended its days by being crushed in my move to the South of England in 1967. During the mid-60's a regular sight on Brough Airfield was to see the 1½ and the Scout D of Terry Manley forming together. They both possessed almost identical flight patterns and if launched simultaneously would follow one another round in circles for minutes on end on a calm evening. On only two occasions did they collide and then the damage was only slight. Of course, like old soldiers, good models must die sometime. If one is careful with the trimming this should be only after several years' service when the ravishes of diesel fuel seriously weaken the structure and one is presented with a pile of wreckage.

All the preceding may be rather a personal reminiscence but I hope it portrays something of the joys of building and flying free flight models. In succeeding articles I hope to cover, in some detail, all facets of design, construction and flying of F/F Scale Models. Next month we shall deal with the selection of suitable prototypes. Future articles will cover structure, covering, finish, detail parts such as engines, wheels, guns, etc. A separate article will be devoted to rigging and wing fixing which often causes the greatest problems to novices in scale modelling. We shall then proceed with an article on trimming and conclude with the publication of scale models incorporating many of the features discussed.

It is hoped that this series will re-kindle interest in this fascinating branch of aeromodeling and set some of the new generation of modellers along as enjoyable a road as I have travelled this past 20 years.

In 1971 the S.M.A.E. Super Scale Trophy returns to its rightful place - the Nationals, and I hope that sufficient people will be encouraged to enter this event, and return it to its former glory in the 50's.

Tailpiece. The effects of many seasons of seeping diesel fuel are shown in the demise of the Rumpier CV, after a wing collapsed in flight. Use plenty of fuelproof around the engine bay!



an Australian reader

S. L. SHERLOCK

provides some interesting
thoughts on control line

STUNT THEORY

Asymmetric Thrust

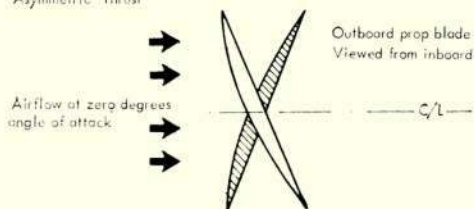


FIG 1 Both prop blades have equal effective pitch.

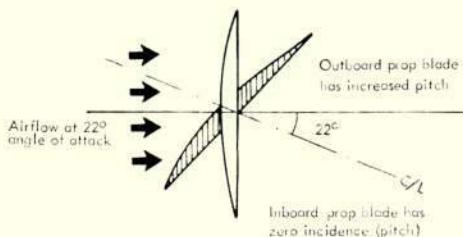


FIG 2 Prop blades have unequal effective pitch, the cause of asymmetric thrust.

THE SUBJECT of control line stunt has not received much technical discussion recently, nor deserved it, since no worthwhile technical advances have been made since Bob Palmer's *Thunderbird* and George Aldrich's *Nobler*.

Slow stunt (say 45 m.p.h.) is a seldom explained region, yet it offers enormous advantages when flying the F.A.I. stunt pattern, as square corners can be flown, as distinct from a reflex jerk on the handle. The chief difficulties of slow stunt are keeping a rich engine running smoothly and maintaining line tension. Doped fuels (nitromethane, iso-propanol, etc.) solve the first problem, but line tension presents a far more difficult solution to find.

At slow speed (45 m.p.h.), applications of up elevator during square turns can cause immediate and disastrous loss of line tension. But why? Two aerodynamic effects—assymetric drag and assymetric thrust—are exaggerated by slow speeds.

Most stunt designs have the inboard wings panel 1 in.–2 in. longer than the outboard wing. The extra lift rolls the model out on the lines, helping main-

Asymmetric Thrust

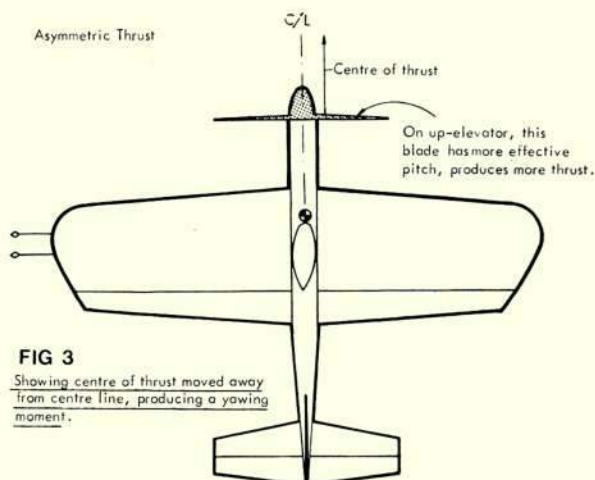


FIG 3

Showing centre of thrust moved away from centre line, producing a yawing moment.

tain line tension. The extra drag yaws the model in, but at 60 m.p.h. causes no trouble. However, at 45 m.p.h., the drag is far greater in proportion to the amount of roll-out achieved and the result is a loss of line tension due to yaw-in. This is *assymetric drag*.

Much more dangerous is *assymetric thrust*. During manoeuvres, the wing must present itself at an angle to the air stream, in order to produce lift. This angle, called the angle of attack, is greatest during square turns and is larger at slow speeds than at high speeds. Unfortunately, during stunts requiring up elevator, this angle adds to the effective pitch of the prop blade on the outboard side, while reducing the effective pitch on the inboard prop blade—the result is called assymetric thrust, and the model will yaw in. At low speeds, the effect is exaggerated, and the yaw can be fatal. (See diagrams 1, 2 and 3.) Fortunately, this same effect increases line tension on down elevator.

These are the problems facing the designer of a slow stunt model. What are the solutions? The gyro-

Asymmetric Thrust

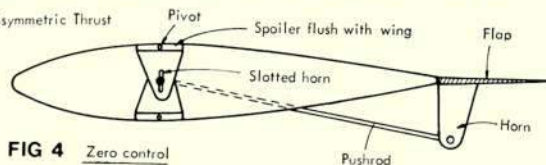


FIG 4 Zero control

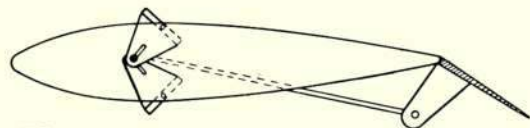


FIG 5 Up elevator

NOTE: Spoilers more effective on up elevator, as required to counteract assymetric thrust.

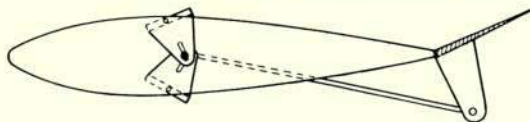


FIG 6 Down elevator

scopic effect of the spinning propeller works in such a way as to cancel the effects of asymmetric thrust. A heavy, fine pitch prop will help (e.g., a TopFlite 10in. x 3½ in. nylon turning 14,000 plus r.p.m.), but because the rate of turn of a slow flying model is less, this presents only a partial solution.

A pair of large spoilers (at least ½ in. x 2 in.) mounted on the outboard wing tip and linked to the flaps or bellcrank provide the real solution. For a model with equal span wings, the spoilers will reduce the lift of the outboard wing causing the model to roll tight on the lines (curling asymmetric drag) and

the extra drag of differentially linked spoilers will counteract the yaw effect of asymmetric thrust. (See diagram 4, 5, 6.)

The author has backed up his theoretical arguments with test models powered by Enya and Merco .35 s, model weights from 38-46 ounces, and which roughly fit the pattern of typical stunt designs. Lowest safe speed in light winds has been 47 m.p.h. on 65 foot lines.

It is hoped that the foregoing article has stirred some people's imaginations and that more development of this outboard spoiler will be made, as well as a better understanding of flight 'mechanics'.

READERS' LETTERS.....

Dear Sir,

The recent introduction of Goodyear and Class A rat racers has, I understand, been introduced to hatch junior racing pilots into the contest world. But has it done this? I don't think so. In January 1971 you published a group of photos of Goodyear racers. All these models had expensive racing motors or some other fancy gadget like a fuel cut off, pressure fed rat race tanks or the unbelievable all up weight of 12 oz. Also most of the pilots are part of a well known Team Race group.

Because all of these things are either too complex or too expensive for the junior. May I suggest that a junior class be introduced. The rules being simple:

- (1) No tuned racing motors.
- (2) Two-man team—age not exceeding 40 years (total).
- (3) No cut outs (Team racers have done without them for years).

This might be farcical to watch but at least the younger modeller might stand a chance of winning and learning.

The same could go for both Class A raters and Goodyears as one engine could be used in both planes and my lowly Enya .19 powered, overweight, A-RAT might stand a chance of being placed.

Paul Hoey (16).

Brighton, Sussex.

Dear Sir,

Recently, I decided that there must be something cheaper than conventional model aircraft coverings, which at best cost often as much as the models' airframe. So, seeing a polythene dustbin liner handy, I covered an aircraft with it. It was extremely successful, as it had the same strength as doped lightweight tissue, same weight too, but in addition, it was a quarter of the price, completely shatterproof and already proof against fuel and exhaust when not very hot. Why didn't anyone think of it you might ask. Surely it's bristling with problems? For instance:

How does one glue it? I used Evo-Stik which is good, though it tends to shrivel the plastic.

More important, how does one stretch it taut? I heated it gently with the hot air from a gas ring which is better than using any electric heater.

The wrinkles formed when the glue attacks the polythene can be avoided by being careful to let the glue half set before applying it, by spreading the glue very thinly, and by heating carefully (with an iron on low), the frame where wrinkles have formed and smoothing them in, though usually they are quite insignificant if one follows this procedure; wherever pos-

sible, spread glue on both sides and leading edge of the airframe, then cover both sides simultaneously by folding the sheet around the leading edge.

Please note: if one paints the tautened polythene with enamels or similar oil-paints, the polythene will first shrivel up, then as it dries, re-tauten again, so one can use enamels on it.

I foresee, when this letter is published, a great demand for polythene dustbin liners.

N. A. Downie

Coventry.

Dear Sir,

As one taking a good hard look, at the Wakefield scene, after a voluntary 16-year 'retirement', I must admit being disappointed (and a little saddened), at what I see.

Not only does luck, and thermal flights, play as big a part as ever (if not more so), but the models have degenerated into a series of "Flying-Broomsticks"; which must have the founder, Lord Wakefield of Hythes, rolling over in his grave! Not only that, but we have the disgraceful spectacle of competitors holding onto fully-wound motors, for up to fifteen minutes, to make a thermal flight; using "Thermal sniffers", to further augment the "luck" element; and, after numerous rounds of flights, still umpteen bobs, all thrashing their way through three or four fly-offs, to try and select a 'winner', to say nothing of the mechanical skull-duggery, which now practically excludes beginners (or anyone without access to a fully-equipped machine shop), from having a go!

So I think the time is long overdue, for the custodians of the trophy to take everything back to first principles and take a good hard look at why the Wakefield Contest was first instituted! In an age of "stick" models, in 1929, Lord Wakefield introduced a contest for fuselage models, which looked like an aeroplane, took-off like an aeroplane, and flew like an aeroplane! After all that, performance counted! Whereas today (who could deny) performance is the ONLY thing which is taken into consideration! Therefore, let me say in comparison: who could forget the classical appearance of Jim Cahill's 1938 "Clodhopper" design; or, for that matter, the sheer streamlined beauty of the pre-war British Wakefield teams' models, in Bob Copeland's day? And, let me ask you, what ever equalled the thrill of seeing a beautifully-designed Wakefield, hurtle up into the air, after a copybook Wing-and-prop-tip take-off?

So, in a last plea, for a return to commonsense, I am going to offer a

scheme, which could usher in the "Golden Age" of Wakefield once again, only in a far better form, which minimises the "luck" elements, rewards ingenuity, beautiful design and construction, while still putting most of the accent on performance!

1. Return to 1953 rules; requiring fuselage cross-section = (Length)² / 100
2. To 5-flight, 180 sec. maximum, 900 sec. total "possible", record as 900 points; and ADD 100 bonus points, as follows: (Making a new 1,000 point max total.)

- (a) Beauty of design (as affecting an aesthetically pleasing appearance. Max. 35 points)
- (b) Neatness of construction. Max. 15 points
- (c) Ingenuity and practical gadgetry. Max. 25 points
- (d) Stable (realistic) flight characteristics. Max. 15 points
- (e) Take-off. (Smoothness, and control). Max. 10 points

So there you have it: a scheme which clearly rewards the "good" model, in every respect; and gives incentives to all the things that "make" a "Good Wakefield" and flyer! "Fly-offs" become a thing of the past; since a really "top-notch" model would probably chalk up, say, 982 points; against the "not-so-good" model's 945 points; although they both recorded the same 5 x 180 sec., 900 flight-points maximum! Strictly adhere to the old "3-minutes-to-get-your-model-in-the-air" rule (or take a "delayed flight") strictly "as-the-name-came-out-of-the-hat", to eliminate bad sportsmanship and "thermal sniffing". Two flights to be completed by 9 a.m., two after 4 p.m., and the fifth during the day, at a time when conditions acceded "Non-Lifting" by the judges (as far as possible).

Well, there you have it! While I don't pretend, the "Lonergan Formula" is the perfect solution, I'm sure it would go a long way towards ensuring, not only that the best model won, every time; but that the Wakefield developed the way it was intended to do, as a skilful, satisfying and dignified type of model aeroplane.

Art. Lonergan

Sydney, N.S.W., Australia.

Footnote. Our correspondent was a prominent Australian Wakefield flyer, during the years 1948-54, won the Australian Wakefield Trophy in 1951, and placed 18th (proxy flown) in the International Wakefield at Jami Jarvi, Finland, that year. He 'retired' when Australia's 1st and 3rd at the 1954 contest in America failed to bring the contest to Australia for the first time!



The civil airport at Behala was once again – for the ninth successive year – the venue for the Indian Nationals. Held on the 20th of December, the Championships attracted 131 competitors from all over the country.

The weather this year was very 'seasonal' with blue skies and lots of sun throughout the day, but unfortunately, the wind, while not particularly strong, was in an awkward direction with the hangers right in line to 'catch' maxing models. Besides, the recovery country was rather depressing with swamps, nullahs and some dense bushes and consequently quite a few models were lost. Lift was plentiful but was rather weak and 'localised', and launching near a thermalling model did not always result in a good flight.

First event of the day was **Open Glider** with 62 entries. Best time to fly was early, as was demonstrated by the enthusiasts from the Bengal Air Squadron who made their flights within a couple of hours in the morning and managed to take the first three places flying A.P.S. *Lucifers*. Twice winner, and the most experienced flier present, Shekhar Dutta, came fourth after dropping his second flight when he misjudged the air.

Concurrently run, **Open Power** was chiefly remarkable for the excellent climb-rates of the models. This year the trend was to employ large-capacity power-plants in relatively small and lightweight airframes. Several $\frac{1}{4}$ A class models sported racing 2.5s running on 'hot' fuels. Two of the fastest climbers were S Chandrasekhar's Sifflet-designed *Maximus* and Shekhar Dutta's V.I.T. *Swiss Miss*. Both could have won the event but came to grief with a lost model and sank respectively on their first flights.

As usual, the hardest-fought event was the 'Aero Modeller' **Challenge Cup** (69 entries). Most of the entrants flew power although the top three places went to gliders. Winner P. Banerjee (flying a modified *Caprice*) relied on protracted tows for lift seeking and only dropped the first flight before maxing out. In contrast, second man D. K. Bhowmic flew tactically throughout with his hastily-constructed *Meanderer*.

Open Rubber was held in the evening (in dead calm) and resulted in a win for D. K. Bhowmic. In this event several likely-looking contenders had trim troubles of various sorts. Shekhar Dutta power-stalled, Mrs. Sharda Singh tightened up under power, while P. Banerjee proceeded to damage his Baguley-designed *Last Resort* after having lost his *Maxie* in the morning. A. Biswas came second, flying an *O-Hi-O* with 2.8 oz. of rubber.

Several new designs could be seen in the **Payload** event where Conover-type sections, long tail moment arms and sturdy structures were almost universally used. Another feature was the use of bigger and stouter wheels for the improvement of the take-off capabilities of the models.

Concurrently run **Precision** saw Nilmoni Ghose in the first place with a well-made *Auster Alpine*. Other models in this event included *Pushpaks*, *Tiger Moths* and a *Cessna Bird Dog*.

F/F Seaplane had many entries, although not all passed the 'floatation test'. Surprisingly, R. O. W.'s were accomplished fairly easily by most and altogether very few models got 'dunked' in the stagnant pond where the contest was held. Winner flew a duration-type model which displayed strong Ian Lucas influence.

Stunt and **Speed** events were certainly not very impressive, although Stunt winner Vanu Mazumdar flew excellently to rack up a respectable total. Speed went to the ubiquitous Shekhar Dutta, flying an O.S. Max-powered *Pink Lady*.

Radio events had indifferent support from the modellers. **Multi** (6 entries) went to S. Viswanathan Pillai with Taifun Bison-powered/Hinode-equipped *Circus* and Single channel

1970-1 INDIAN NATIONAL CHAMPIONSHIPS

reported by P. Banerjee

was taken by Nilmoni Ghose ahead of the only other competitor present, S. Roy.

Plenty of timekeepers, strict adherence to the flight schedule and good co-operation between the Event Controllers made the 22nd 'Nats.' a very pleasant affair and the competitors went home very happy and satisfied with the organisation. Full marks to the A.I.A.A. for successfully conducting yet another Nationals.

Above left, D. K. Bhowmic, a regular competitor, placed second in the 'Aeromodeller Challenge Cup' with his well-built *Meanderer*.



Right, T. Streivas-tava uses a $3\frac{1}{2}$ oz. (less the O.S. Max 15) *Eliminator* and was unlucky to suffer a crash due to heat warps on his second flight. Below, another A.P.S. user was S. Viswanathan – his *Lively Lady* having such visibility aiding devices as orange wing tips and tail plane, plus reflecting tape on the leading edges.





CLUB NEWS

Everything from the humble chuck glider to the sophisticated multi aerobatic model on show at the stand for model aircraft organised by the joint co-operation of the Grimsby and District M.A.C. and the North Lincs. M.A.S. at the *Hobbies for All* show at Cleethorpes. Stand made by Ted Scoles.

ALTHOUGH WE LIVE in a noise-ridden age and have acquired a pretty high tolerance for that which registers the decibels, we all like a nice curtain of hush to surround our homes and gardens, particularly on a Sunday. For this reason all complaints of model aircraft noise should not be automatically taken as reactionary and mischief making. Whilst the model plane is much less noisy than a jet plane it can more than make up the deficit by its very persistence, and it is the constant, high pitched drone that private residents find so maddening.

With this thought in mind we open our columns with a report of the situation vis-a-vis radio flying and local residents at Hanworth Airpark. Wing Commander N. M. Boffee, D.F.C., writes to tell us that, in order to defend an amenity of long standing, the local radio flyers have formed themselves into a club, known as **Hanworth Airpark M.F.C.** Sensibly, their approach to the situation is one of accommodation rather than militance, and it is hoped that the bye-law restricting flying to a few hours on Sunday morning, now in the hands of the Ministry of Environment, will be modified in the light of assurance about noise from the new model club. Since the club has control only over its own members—a control which will be severely exercised—they cannot discipline the unconnected noisy flier in the same way. Naturally it would be a help if model flying was restricted to the club only, but such a rule could be difficult to apply. We can only wish the club all success, with the hope that the situation quietsens down.

Often, when I go into the country, I pass the miniature airfield known as Stapleford Aerodrome. Somehow the planes seem to land between the stocks of corn. Anyway, the **Debdens M.F.C.**, report gives news of a club visit to the 'drome under the aegis of ex-club member Bruce Stiggoe, who happens to be the flying instructor. It gave the lads, particularly the scale minded ones, the chance of getting close to a lot of interesting detail on the array of private aircraft. A machine which caught their fancy was the **D.H. Hornet Moth** of Baroness Wilberforce (G-AEZG) notable for the rampant lion on the fin, which the fluorescent paint makes even more rampaging. A dramatic touch was provided by the sight of a twin Commanche arriving, lights a-twinkling, in the dusk. The visit ended with a welcome cuppa in the clubhouse. Caution learnt: never touch the prop of a stationary aircraft—it might not be switched off. Back at the club a decisive move has been made from the old Loughton Hall meeting place to West Hatch Technical School, where, it is hoped, better facilities will be available with the possibility of roping in a few scholarly members. It is emphasised that the move will not be detrimental to senior members, but if they do tire of the academic environs there is always the **King's Head** down the road, the inn upon which Charles Dickens based the Barnaby Rudge Maypole. Why not look in at the West Hatch School in the High Road, Chigwell, any Friday evening.

They say a rose by any other name, etc., but sometimes a change of name becomes politically desirable. Thus it was decided at the A.G.M. of the Baildon M.F.C., to widen its scope by renaming it the **Leeds and District M.F.C.** We are assured, however, that the Baildon standard of opposition on the contest field will in no wise diminish under the new flag. The Secretary, Mr. J. Moseley, also puts out an invitation for any lone hand modellers in the general region of Leeds to join the happy band. His address is 37 Springmead Drive, Garforth, Leeds LS25 1JW.

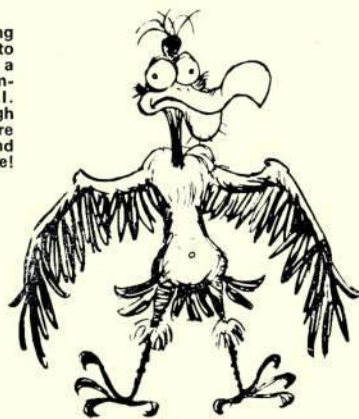
There is nothing like a friendly get together between clubs to foster the true spirit of aeromodelling, and the **Warminster R.C.F.C.'s** Spot Landing event held at Keovil Airfield was no exception. Neighbouring clubs invited were

the **Bristol R.C.M.A.C.** and the **Flying Druids**. The event was divided into two separate attempts at the target, and the average of the two results taken as the final score. Winner, who was right on target, was, appropriately enough, **Tony Bull**; a gentleman of whose prowess we have heard before. Tea and refreshments were provided and an enjoyable day's flying was had by all. Report from Richard J. Jeffery.

A club that now seems more 'up and come' rather than 'up and coming' is the **South Essex M.A.S.** Derek Rolfe has sent, for our delectation, the two last issues of the club's lively *Marsh Gas* newsletter, and very good they are, too. The quality and presentation are of a professional standard, and I particularly admired the clarity of the well realised illustrations. One snag in the happy club life, though: the club has, at present, no secretary. No reason given, but we glean from editorial matter that members are striving towards a benign and unpressurised hierarchy, with the donkey work spread over the representative officers instead of being heaped upon the shaggy back of the Secretary. The editorial also makes the point that the white man's burden, administration, has to be undertaken by someone, however much we would all rather be left in peace to fly our little toy planes. What this club seeks to avoid is its breaking up into hostile, antithetical elements, which so often happens when there is more talking than flying. Many useful tips in the mags. For instance, the use of $\frac{1}{8} \times \frac{3}{4}$ spruce for outlines and rip cappings on scale flying surfaces can, when rounded off, give a very authentic tube structure look.

The **Heswall M.A.C.'s** December newsletter deals almost casually with what some would consider to be a quite ambitious club project: a helicopter contest. This type of

Well, are they trying to encourage us all to fly F.A.I., or is it all a subtle Canadian complaint that F.A.I. models have very high wing loadings, are underpowered, and generally unattractive!



FLY
FAI!
TORONTO F.A.I. GROUP



Neat radio installation used on Stan Boynton's *Luton Minor* the whole radio compartment is a single unit combined with the undercarriage. Very accessible, making battery charges, etc., very easy, without spoiling the model's appearance - combines the ideas of Messrs. Boddington and Fearnley.

aircraft presents the most formidable problems of power transmission and stabilising, so it is understandable that not all would succeed. Nevertheless, two entries came up to standard, those of Malcolm Brewer and Junior, Mark Winstanly. Malcolm was the eventual winner, but both designs, we are told, were extremely ingenious. In view of Mark's performance here, it is not surprising that he was awarded the 'Best Junior' shield for his contribution to club life in 1970. He is known to us for his lively and pertinent *Mark's Column* in the club newsletter.

A man who bravely battles on with the club newsletter month after galloping month is Mr. M. V. Cook, of the *Maidstone M.F.C.* In common with all such editors he cries out for contributions, but the response is even thinner than the anaemic stencil ink. Bashing out the verbiage can be a tough business as well I know, but most model flyers have some pet ideas they would like to communicate, and I am sure the mag editors would only be too glad to assist with the presentation. Lots of interesting potential listed in the report of an evening of r.t.p. flying. Eight models took their turn at stretching the line, including a large delta, the brainchild of Arthur Roberts. A flexible fuselage gave a somewhat phugoid flight pattern, but it circulated manfully. Other notable craft were made for the job *Pole Star* and *Pole Cat*. Surprisingly enough the winning model was a scale *Nieuport 17c*, with a *Fokker D VIII* in fourth position. Notable club model seen flying at *Headcorn* in one of the winter's less rigorous Sundays were *Adrian Harris's Belanca Special Racer*, and *Les Townley's Cessna 172*, powered by an Enya 09. Shaky do for the latter as it was his first venture in R/C. Damaged on its first flight, due to a sticky actuator, it showed stalling tendencies on its next flight, and came into land rather sheepishly - on the back of a sheep. Also flying together, curiously enough, were *Miss Bikini* and *Bob's Thing*.

The *Watford Wayfarers* short newsletter contains quite a few heresies, or rather, accusations of same. First it is thought that the sparse attendance at a film show evening was due to a football match on the box. Then there was the discovery of press report headlined, *Toy plane flyer may be prosecuted*. Apparently he was guilty of the heinous crime of flying a power model on a public common on a Sunday. Plenty of model flying opposition in these parts, it would appear, so the watchword is, 'Keep it Quiet'.

No news is good news. And as most airfield news is usually bad, the *Leicester M.A.C.* is happy to have little to

report on their Wymeswold and Arnesby flying sites, except to inform members that no difficulty is expected in obtaining a licence renewal for the latter. Other news is that Mr. Kendall has kindly donated a trophy for the ladies to compete for. Perhaps hopefully, since all the ladies seem to be playing football these days. On the question of the recently divulged insurance claim starter - all the big claims coming from the radio side - Mr. C. H. Abbey, who is responsible for the club bulletin, is of the opinion that combat and F/F power models are potentially more dangerous than radio. No doubt a lot in this, but the proof of the pudding is in the claim ratios. Perhaps one reason is that F/F power and C/L models operate in rather limited accident potential areas, the power model (under power) for a few hundred feet down wind, and the combat model in the immediate vicinity of the circle, whereas the radio model covers a wider range of possible contact, putting at some risk all spectators and open space users. However, I do agree with him that all models should be flown with utmost care. As a personal example I have discontinued the use of a handy public open space with my radio glider since it spiralled in quite dangerously as a result of signal interference. To end on a sad note, the bulletin reports the death of Derek Sirrell, one of the club's leading flyers, at the young age of 41. May we add our condolences.

From what I remember, Boxing Day was such an arctic one, a real ear tingler, with an odd blizzard or two thrown in for good measure, that it was more a case of feet up at home than model up on the airfield, so we wonder how the *Wolves M.A.C.* fared at their nominated time event held at, wait for it, *Glacier Boulder* on *Cannock Chase*. Winner of the comp to get a most priceless prize, a wooden spoon mounted on a *Brylcreem* container. And so to a cosmopolitan comment on the globe trotting antics of member who looks in between circuits, *Brian Perry*. He half built a *Junior Nobler* in Sweden and went on to purchase a *Silver Swallow* diesel in the seemingly not-so-exotic east. This he proceeded to bury in the soil of *Olde Englede*, using an inscrutable device called a model plane. A list of club records is attached to the newsletter. Some good times returned, such as 6 min. 10 sec. for *Wakefield* and 14 min. for *Glider*, but there are obvious opportunities for devotees of *Canard*, *Tailless*, *Biplane* and *Floatplane*.

Just how many hush-hush clubs there must be in the country is anyone's guess, but something of an insight into the numbers of such unproclaimed groups is given in the *Area list* appearing in the *East Anglian Area newsletter*. No less than twenty-six clubs are listed, and this seems to be indicative of plenty of flying space on the broad, *East Anglian* acres.

Many clubs measure success in sheer quantity of members, but surely a truer index would be the amount of activity which the members generate, regardless of numbers. Certainly the *Crookham Contest Modellers* keep up a fair head of steam in spite of admitting to a mere eight members, but as they are all very active flyers and put up a 100 per cent attendance at all meetings, more would seem a crowd. They are happy to state that they regained the *L.D.I.C.C. Trophy* (top London contest club over the season), the first time it has been won by an all F.A.I. team, *Fred Chilton* and *Paul Steward* flying o/d *Power* models and *George Welsh* a *Lively Lady A/2*. *Fred Chilton*, by the way, got to 6th place in the first trials, and altogether had a highly successful season with his power models. Also extending himself, or at least his model, *Andrew Chilton* earned a cheque from *Keil Kraft* for his 30 mile *K.K. Caprice* flight - just about covered the cost of the *D/T wick*! Apart from flying in all the F/F comps, the eight unflagging members are organising two contests this year: an *Open* in March and an *F.A.I.* in October. *Cups for Glider* and *Power* in the first event and plaques in the second. Look out for details in *Contest Calendar*.

Warning in *Nitro*, the *Belfast M.F.C.'s* newsletter, to the effect that, although the prospects for the coming season are highly encouraging, with the club most probably supplying the bulk of the Irish representation at the *F/F World Champs* in Sweden, and *Ulster '71* keeping the display team in continuous employment, membership has tended to remain static, and as all who pass through this *Val of Doonican* will eventually go to greener flying fields, a younger generation of model flyers needs to be cultivated. Surprising how many oldies are in our ranks these days. I'm no chicken, except when confronted with an enraged pylon racer, but greyer heads than mine, and sparser, lend ashy colour to the flying field. *John Seacombe*, who writes wittily of a *C/L* sojourn at *Sydenham* field, has named his model *Goonrocket*.

Although the last thing, it seems, that people want to have is a tarmac strip on their doorstep, or perhaps, over it, the *Three Kings Aeromodellers* welcome the use of the piece of tarmac, which is all that remains of the old *Croydon* airport. Room on it for two large circles, but the privilege is hedged around with some pretty formidable restrictions. No cars, fully silenced models and only two

machines in the air at any one time, but it is more or less private, and this at least reduces the risks to the general public, an ever present bogey when flying on an open space. From the not so wide open spaces, then, to indoor matters. Newest club idea is a model of the month cup. It is held by the member bringing the niftiest looking model along to the clubroom. Plane of the month was Ken Gardner's Spitfire 1Xe. Back to wider open spaces, the newsletter reports of the intention of the Epsom Borough Council to rationalise the bye-laws governing the Downs. It is hoped that this will give model flying interests another chance to open up facilities on this old and valued venue.

The newsletter of the **Southampton M.A.C.** begins by wishing us all a happy new year in Eskimo, which is all very well, but doesn't say much for the weather outlook. Looking backwards, however, 1970 was a good year for the club. The move into Redbridge School has given members a bit of much looked for elbow room after the constrictions of the club hut. There is also the opportunity to get in a bit of indoor flying: a sport very much on the up and up these days. And a good year on the contest field, too, with the club finishing in 8th position in the *Plugge Cup*, coming out above a few well known F/F clubs. Tribute paid to Mrs. Hook and the lads.

The editorial of *Exhaust Fumes*, newsletter of the **Speke M.A.C.**, opens with a question, which is essentially this: How many would-be model flyers do not become full fledged practitioners because of lack of knowledge either in the finer constructional points or the intricacies of trimming? The number is undoubtedly legion, but it is here suggested that the function of the model club is to provide just that sort of advice and assistance which will remove the stumbling blocks betwixt model shop and flying field. Also suggested here that instead of filming crashes at the World Champs, the T.V. cameras would be more gainfully employed filming the unintentional humour that is a relieving feature of the flying field. Intentional, however, is Phil 'Hopcity' Taylor's endeavour to re-create Dick Dastardly's aeroplane. Muttely's Fan Club please note.

The **Rand M.A.C.'s Tarmac Torque** regards the industrial type helmet, designed for things that flop rather than swipe is unsuitable for team racing. What is needed, we are told, is something giving full side face protection. Growing heavy sideboards, however fashionable, is not enough.

A big R/C event, held at Taupo, New Zealand, is described in *News of the North* as the 'Woodstock of the Wireless World', mostly, it seems, because pylon racing is hairy and rather hysterical. The chap who reported the event bravely volunteered his services as a pylon judge. Main criticism was that the models were overcontrolled and underpowered. Many would have been eliminated had there been an altitude limit.

Because of the postal strike in the U.K. - I'd like to help the **Midland Area** club representatives by reminding them that they should attend their Area Meeting at Bingham Sports Centre, Bingham, Notts., at 3 p.m. on Saturday, 27th February - end of Parish Notices.

Looking forward to some balmy flying days now that winter is on the way out - we hope.

The Clubman.



Possibly this is your last chance to see the above emblem of the **Radio Control Flying Club of British Columbia** - as President of this 85-strong club, John Hutchinson, informs us that a new design is on the way. Neatly executed in blue and white.

CONTEST CALENDAR

March 14th	CROOKHAM CONTEST MODELLERS OPEN CONTEST. Open R/G/P, 1/4A power, A/1 glider, chuck. Re-entry allowed. Crookham cups and replicas for open P/G winners. 10 a.m. start at Chobham Common.
March 21st	S.M.A.E. AREA CENTRALISED MEETING. F.A.I. Glider, Open R/P. Area venues.
March 21st	S.M.A.E. CENTRALISED C/L MEETING. Stunt, Rat Race, Combat, Speed.
March 21st	EASTCOTE R/C SPOT LANDING COMP. Spot Landing + nominated time at Eastcote club field, Greenfield, Beds. 10.30 start.
April 11th	ELLIOT SPEED MEET. All classes (1.5, 2.5 open. F.A.I., 29, 40 and 60) 40 class on 60 ft. lines. At Elliot Bros., Airport Works, Rochester, Kent.
April 25th	LONDON AREA C/L CHAMPS. Stunt and Junior stunt - silencers obligatory, at Fairmile Common, Esher, Surrey. Details from W. J. Chapman, 55 Langdale Avenue, Mitcham, Surrey.
April 25th	S.M.A.E. AREA CENTRALISED MEETING. F.A.I. Power, Open R/G. Area Venues.
April 25th	NORTHERN AREA PYLON RACE MEETING. R.A.F. Topcliffe, Yorks. F.A.I. & Formula 1 (S.M.A.E. members only).
April 25th	LUTON D.M.A.S. SLOPE SOARING RALLY. Ivinghoe Beacon, Single Channel with Spot Landing, Multi Aerobatics. Pre-entry forms (pre-entry essential) to T. Clark, 'Windyridge', 126 Alexandra Avenue, Luton, Beds. Telephone: 22742.
May 2nd	ELLIOT M.E.C. C/L RALLY. Goodyear (2.5 c.c. max) Stunt, F.A.I. T/R, Combat. 15p (3/-) pre-entry to C. Atkins of 12 Hillcrest Road, Chatham, Kent. 25p (5/-) on field.
May 9th	NORTH LONDON R/C M.F.C. Open Fun-Fly meeting (Aerobatic schedule). Restricted to competitors and their families, Baldock, Herts.
May 16th	MIDLAND AREA RALLY, Barkston Heath. (S.M.A.E. only).
May 30th/31st	BRITISH NATIONALS.
June 6th	SOUTH MIDLAND AREA THERMAL SOARING RALLY. Multi & Single. Venue to be announced. Pre-entry to G. Dallimer, 6 Angle Way, Stevenage, Herts.
June 13th	S.M.A.E. AREA CENTRALISED MEETING. F.A.I. Rubber, Open P/G. Area venues.
June 20th	AEROMODELLER/SCALE MODELS/R.C.M.&E. ALL SCALE RALLY at Old Warden, Biggleswade, Beds.
June 27th	FINCHLEY M.A.C. GALA. C/L Stunt, Combat (A & B) Rat Race (A & B) 20p (4/-) pre-entry to J. F. Goodwin, 77 Gallants Farm Road, East Barnet, Herts.
July 10/11th	SHEFFIELD TWO-DAY SLOPE SOARING RALLY (venue - peak district site). Single Channel, Multi & Scale.
July 11th	LONDON AREA C/L CHAMPS. Stunt and Junior stunt. Silencers obligatory, at Fairmile Common, Esher.
July 18th	S.M.A.E. CENTRALISED C/L MEETING. 1/4A T/R, F.A.I. T/R Goodyear, Speed.
July 25th	SOUTH BRISTOL M.A.C. GALA. F/F-Open R/G/P, Vintage, All-in F.A.I. (7 fts) C/L - F.A.I. T/R, Goodyear, Combat. R/C - Thermal soaring to F.A.I. - S/C or multi. Venue to be announced. Refreshments available.
July 25th	NORTHERN AREA PYLON RACE MEETING. R.A.F. Topcliffe. F.A.I. & F.1 (S.M.A.E. members only).
July 25th	SOUTH BRISTOL M.A.C. GALA. R/C Thermal Soaring to F.A.I. rules - single channel or multi. Venue yet to be announced.
August 8th	S.M.A.E. AREA CENTRALISED MEETING. Team glider, F.A.I. power, C'd'Hiver. Area venues.
August 14/15th	SOUTHEND TWO-DAY R/C RALLY - Leigh Flats.
August 21/22nd	S.M.A.E. CENTRALISED F.A.I. F/F MEETING.
August 23/27th	MANX NATIONAL OPEN SOAR-IN CHAMPIONSHIPS (Slope & Thermal). Bring the family. Details and holiday brochure from H. Bailey, 'Sunrise', Linden Avenue, Port St. Mary I.O.M. Tel: P.S.M. 3184.
August 29/30th	COTSWOLD R/C SOCIETY TWO-DAY PYLON RACE MEETING. Venue to be announced.
August 29th	WEST OF ENGLAND SCALE AIR DAY, Westland Airfield, Yeovil, Somerset.

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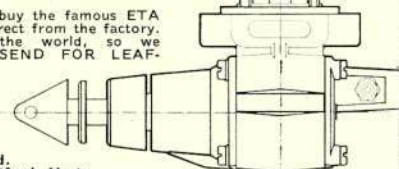
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We've got quite a number of new and interesting features lined up for our March issue of *Mecanno Magazine*. We kick off with a very unusual one describing dolphins, creatures which are one of the most intelligent on land, and without a doubt the most intelligent of all water mammals.

Still on a nature theme, a new contributor, Frank Madigan, who lives in Australia, describes with numerous photographs the

story of kangaroos and wallabies. From the pen of Richard Wiggan comes another feature on a 'sea' theme, this time the story of the U.S. Coastguard.

Meccano lovers are amply catered for in this issue with some truly interesting models which take the form of two simplicity models for young builders, the Eiffel Tower and a model tram and a live steam wagon using the Meccano Steam Plant for the more advanced constructor.

These, plus others and, of course, all the regulars such as 'Air News', 'Have You Seen?', 'Stamps' and 'Among the Model Builders' all help to make another issue to look forward to.

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K.K. Snipe F/F ... 30/1 Mercury Picador C/L 29/-
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We stock: Engines - Merco, Fuji, Webra, OS, AM, ED.
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WE ARE MAIN AREA DEALERS FOR MAINSTREAM/
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Mainstream Single Channel Gift Sets. Completely wired out-
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AVAILABLE EX-STOCK

O.S.DP2B Digital Set: Comprising: Transmitter, Receiver. Two Servos,
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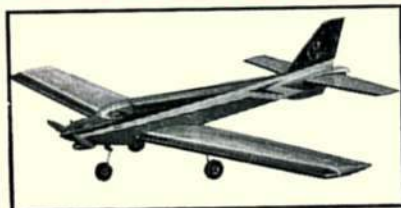
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You've got to work at the first two but you can buy the third at any good modelling shop. Your models deserve the best and you'll certainly get the best from Humbrol. Ask for these products by name—enamels (matt or gloss) for brushing or spraying; modelling adhesives of every kind; craft knives, dopes, thinners, brush cleaners, fuel proofers, authentic colours, metallics and poster colours. Remember—Humbrol helps you make better models.

KEILKRAFT

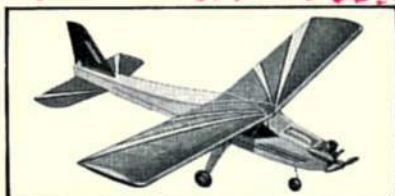
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IN MODEL KITS

RADIO CONTROL



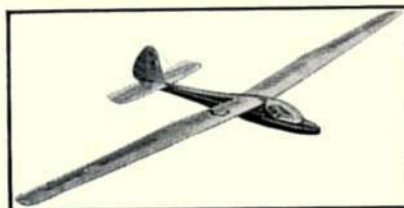
Intruder

Flagship of the KeilKraft fleet. The Intruder is an all-out multi-aerobatic contest model. Straightforward construction employing pre-covered expanded foam wings and fuselage top deck. The kit complete with wheels, tank, spinner, etc., for 49-61 size engines. Wingspan 72" £19.25 £19.5.0



Outlaw

A single channel sports model designed to take the newcomer through the first difficult steps of getting a radio controlled model successfully into the air. Designed to recover from difficult situations, the 'Outlaw' gets away with MURDER. Wingspan 45". Engines .09-15 cu. in. Complete building and flying instructions. Die-cut fuselage sides. All wing ribs identically cut. Preformed dural main undercarriage. Preformed wire noseleg. Paxolin motor mount. Fuel tanks and wheels. £5.95 £5.19.0



Elmira

A big graceful 10-footer (almost), span 116"! The ultimate in slope soarers but can also be launched by catapult or winch. Control is by rudder and elevator. A very complete kit with many preformed parts. Hardware, hinges, etc. included. £9.95 £9.19.0

OVER 200 KITS TO CHOOSE FROM IN THE KEILKRAFT RANGE

RUBBER POWERED

Ace 15/- 75p 30" span



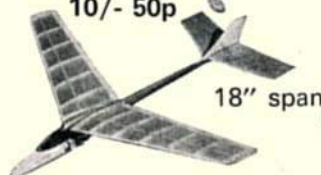
Gipsy £1.10.0
40" span £1.50



JETEX POWER

Skyjet 50

10/- 50p



18" span

GLIDERS

Dolphin 14/- 70p
30½" span

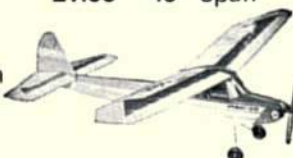


Caprice
51" span £1.16.0
£1.80

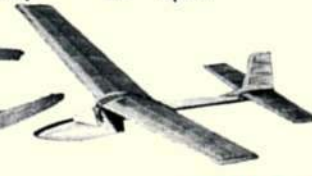


FREE FLIGHT POWER

Snipe £1.19.0
£1.95 40" span



Wisp 15/- 75p 20" span



Polaris 7/- 35p
20" span

CONTROL LINE **Champ**
20" span



£1.10.0
£1.50



42" span

OBTAINABLE AT KEILKRAFT AGENTS.

ENLARGED LAYOUT OF FIN LETTERING.

RED. PALE GREY.

ЯК-10

YAK-18 PM & 18 PS AIRCRAFT
AS SEEN AT WORLD CHAMPIONSHIPS
HULLAVINGTON JULY '70.

TWO YAK-18 PM'S (TRICYCLE)
CODED 07-08. (35+36.)

ONE YAK-18 PS (TWO WHEEL)
CODE 05. (37)

COLOUR NOTES:

FUSELAGE: RED BELOW PALE GREY
CENTRELINE STRIPE; CREAM ABOVE.
MATT DARK BLUE ANTI-GLARE PANEL.
WING: CREAM WITH GREY OUTLINED
RED TRIM ON L.E. & TIPS. ALL RED
UNDERSIDES.
FIN: CREAM. RUDDER: CREAM &
RED STRIPES STAB: AS WING.

COLOUR NOTES, MARKINGS:

FUSELAGE CODES: YELLOW WITH
PALE GREY OUTLINE STRIPE.
TRIM TAB NOTE WORDING: RED
OTHER ACCESS PANEL WORDING:
BLACK. FIN 'SPEEDBIRD': PALE BLUE.
FIN TYPE DESIGNATION: RED WITH
PALE GREY OUTLINE. W/CHAMPS
COMP N°S: BLACK.
WING UNDERSIDES HAVE OUTLINED
NATIONAL STAR: YELLOW.
PITOTS: RED & CREAM STRIPES.

WHITE.



ENLARGED CENTRAL AERO CLUB
BADGE (ON COWL.)

NOTE: 'WING' FACES FORWARD
BOTH SIDES OF COWL.

YAK-18 PM & PS.

DRAWN & TRACED BY: A. A. P. LLOYD.

