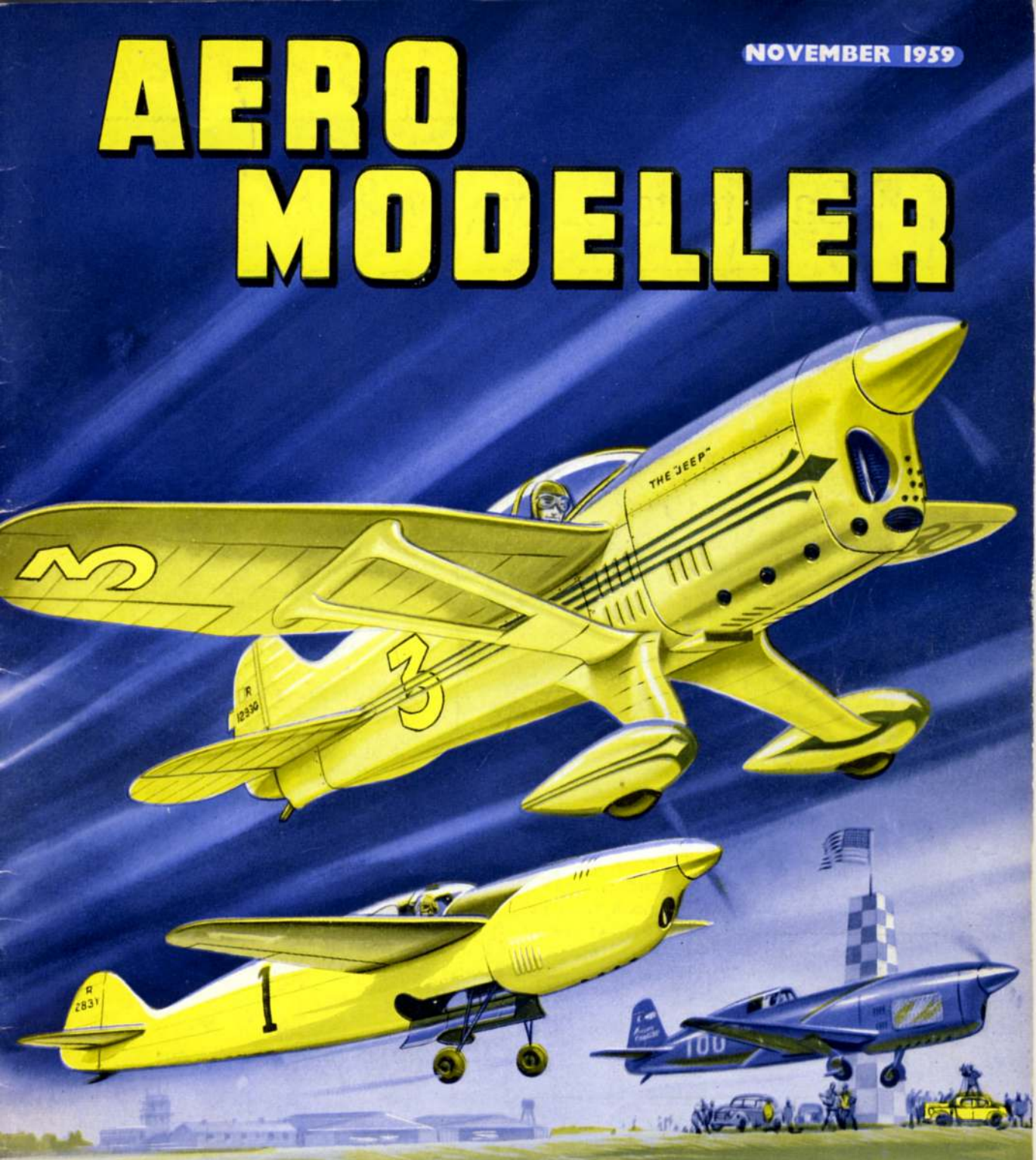
AERO MODELLER

NOVEMBER 1959



CHESTER JEEP in full detail

RADIO CONTROL CHAMPIONSHIPS

2/-

Kenneth McDonough

Lab tests prove

HUMBROL

GLOSS ENAMEL

29% lighter than ordinary dope

Under laboratory conditions New Humbrol Gloss Enamel was tested against normal colour dope. Two coats of clear dope were put on separate panels of tissue for a firm, taut surface, then panel A was given a coat of ordinary colour dope and panel B a coat of **New Humbrol Gloss Enamel. Results show that Humbrol is 29% lighter than ordinary colour dope.**

SHEET A. Heavy Tissue 3" x 3"
2 coats clear dope
1 coat colour dope
Total weight .507 grams
Weight of colour dope alone .128 grams

SHEET B. Heavy Tissue 3" x 3"
2 coats clear dope
1 coat NEW HUMBROL
Total weight .469 grams
Weight of New Humbrol alone .090 grams

No Fuel Proofer needed over Gloss Humbrol

Just one coat of new Humbrol over your clear dope gives a smoother, stronger surface. And Gloss Humbrol (with the exception of metallic colours) is *proofed against diesel fuels*—no need for the special coat of fuel proofer required with ordinary colour dope—*more weight saved!* Humbrol is specially formulated to give flying models a glossy, prize class finish. With consistent matching shades in a choice of 18 colours it gives *all* flying models added realism.

One coat of Humbrol gives . . .

BETTER FINISH — LIGHTER WEIGHT — COMPLETE PROTECTION

Handy ½ oz. tins 8d. Sizes up to ½ pt. and easy to use multiple colour kits 3/- to 12/11 from all good model shops and hardware stores.

THE
HUMBER OIL CO. LTD.
Paints Division
Marfleet · Hull · England

Clever with your hands?

Learn a man's trade at 15½, earn a man's pay at 17½, as an R.A.F. Boy Entrant

Why waste time in a dead-end job when you leave school? In the R.A.F. you can be learning a skilled trade at 15½. Maybe engineering. Maybe radio, accounts or catering. The R.A.F. teaches a whole range of trades—many recognised by the T.U.C.—and pays you while training.

Start young and go far! Normally, 18 months after joining as a Boy Entrant, you're on man's service—a fully qualified tradesman. Putting your expert knowledge into practice on jets, radio, electrical equipment, instruments, administration, whatever your special line might be. Earning the money an expert should. Travelling the world, making new friends wherever you go. Plenty of sport—lots of adventure.

Good chances of promotion too. Many R.A.F. Boy Entrants become Warrant Officers, and, if you're really good, it's possible to get a commission.

How to become a Boy Entrant. There's no complicated exam, just straightforward tests. You must be intelligent, clever with your hands and really fit. If you're between 15½ and 16½ (15-17 in exceptional cases), send this coupon for a free booklet all about life as a Boy Entrant and the trades he can learn. (If you're not yet old enough, why not join your local A.T.C. squadron?)

A FULL LIFE IN THE R.A.F.

To: R.A.F. Central Recruiting Office, AM34, Victory House, Kingsway, London, WC2

Please send me full details of your Boy Entry Scheme.

NAME .....

ADDRESS .....

..... DATE OF BIRTH .....

BALSA STORY

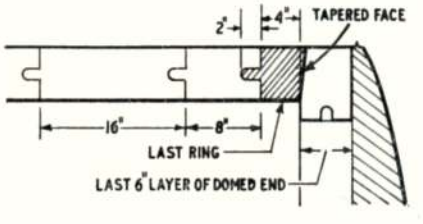
John Paterson, Managing Director of Solarbo Ltd., concludes his present series of articles describing the construction of the large tank lining fabricated in Balsa—one of the most complicated jobs of its type ever attempted.

LAST MONTH I described how the individual rings of Balsa Wood were put into the tank and how we proceeded down the tank putting in first one six-inch ring of the outer layer and then one six-inch ring of the inner layer which, as you will remember, covered the joints of the outer layers. This was, perhaps, relatively easy until we came to the manholes which also had to be lined with 12 inches of Balsa Wood. These manhole linings, which were approximately 4 ft. 6 in. outer diameter, were prefabricated as units and dropped in as we came to them, but they, too, had to have joints machined to them so that they interlocked with the main tank lining.

It is a pretty problem, if you think of it, to work out and machine joints that occur with a small horizontal circle meeting a large vertical circle, but we did it.

I am always asked the question as to how we put in the last ring. It is quite easy when you have done it, but I must say it looked at one time to be almost insoluble, and still maintain an effective joint.

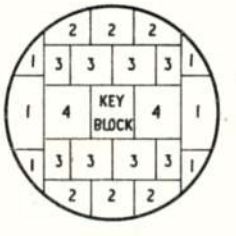
As I described earlier in this series, we had already built in the domed end that we were approaching again leaving a flat face perpendicular to the axis of the tank. The normal width of a balsa wood ring was about 24 inches, but as we approached the end we gradually reduced the width of the rings until when the last ring went in it left a space of six inches between it and the flat face of the domed end. We had to have special little stumpy-jacks which thrust this last ring home into the circumferential joints — working off the end of the tank.



If you look at the first diagram you will see that in order to enter the twelfth segment of this last ring and because the circumferential joint was two inches deep, the maximum width of the ring (apart from the joints) could only be four inches if we wanted to leave just a six-inch space.

Before this four-inch ring had been put in we had a space of ten inches, so the width of the last ring but one could be eight inches. For the third last ring we had a space of 18 inches so we could insert a 16-inch ring. So you will see why I said above that we had to gradually reduce the width of the rings as we approached the end.

Now the last six-inch thick layer of the domed end cake was manufactured with a tapered edge as shown in photographs four and five of the September issue. The face of this last four-inch segment was also cut to a bevel and the space between it and the domed end was so arranged to give a tight fit for our tapered edge ring.



These tapered edged segments of this last flat face layer were then forced home by jacks into this annular slot and then the rest of the flat face segments jacked home into the tapered edge segments until finally a centre key block was forced home as shown in the second diagram.

What happened to the tank after we had done it was another story not within my province to tell, but I can say that we were complimented by Shell of our workmanship.

So I think I must end our Balsa Story with this description of what was undoubtedly the most complicated piece of wood working that we have carried out. Indeed, I venture to say that very few pieces of more complicated or accurately-machined wood have ever been used in any job. Finally I beg leave to say that there is no job in wood, let alone Balsa Wood, that we could not undertake, and on our skill as wood-workers we are happy to let our reputation rest.

Copyright photograph by permission of Imperial War Museum

Just like the real thing!

Airfix kits are not just models—they're exact replicas, each series to a constant scale.

Airfix Lockheed P 38J Lightning. 3/-

There are models galore in the Airfix range! Aircraft from fighters to bombers (*all* to the same 1/72nd scale), 00 gauge railway accessories, vintage cars, historical ships. Airfix value is *unbeatable*—ask your dealer for the latest list.

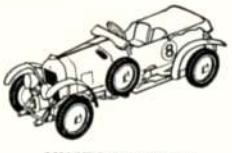
Nearly 100 kits from 2/- to 7/6d.

AIRFIX

THE WORLD'S GREATEST VALUE IN CONSTRUCTION KITS

From Model and Hobby Shops, Toy Shops and F. W. Woolworth

TRACKSIDE SERIES
Level Crossing 2/-.



VINTAGE CARS
1930 Bentley 2/-

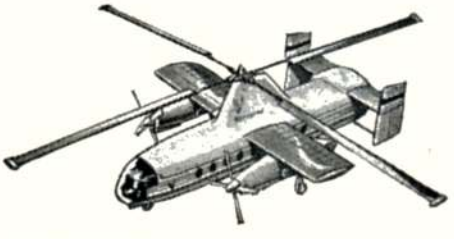
MODEL FIGURES
Lifeguard 2/-

HISTORICAL SHIPS
H.M.S. Victory 2/-

[A259]

STOP PRESS!

Latest Airfix Production



FAIREY ROTODYNE

A superbly accurate 1/72nd scale model of this famous vertical-take-off airliner. Length 10 inches, moving propellers and rotor blades, opening loading doors, retractable undercarriage. Complete with marking transfers, **6/-.**

Also new: 1/72nd scale *ZERO* fighter, best known of all Japanese wartime aircraft, **2/-.**

She's all yours!

'This is it! Solo for the first time. Start with cockpit checks—instruments, oil pressure, take-off trim. Good. Brakes off... a quick look round... full throttle.'

'Keep her straight. Ah — not so bumpy, nose wheel is off the ground. Faster... faster... gently back with the stick... up and away in a steady climb.'

Today's pilot starts on jets!

You could be in a Jet Provost learning to fly within a few months of getting your R.A.F. uniform. Quick progress, and so it goes on. Once you are qualified, the world is your parish. Flying is your profession, but you will add to it experience and increasing authority. A career in the R.A.F. blends adventure with high responsibility.

A full life... in the Royal Air Force

Could you make the grade as an R.A.F. aircrew officer? For details of how to apply, of pay*, conditions and allowances, write to the Air Ministry, M.9 (AM28a), Adastral House, London, W.C.1. (Applicants must be between 17½ and 26 and have gained a good G.C.E. or equivalent.)

**A Flight Lieutenant of 26 can earn, with full allowances, nearly £1,700 a year.*

Three types of commission: (1) Permanent, leading to retired pay. (2) 12 years with the option of leaving after 8 years, and the chance of gaining a permanent commission. (3) 5 years, also with the chance of gaining a permanent commission.

'Steady though; we've still got to land... down undercarriage... down flaps... This is living! This is why I wanted to join the R.A.F.'

'Not bad... not bad at all. A little wide on the approach, but a smooth enough touch-down. And my best take-off yet! Hope my instructor was watching.'

JETEX POWER MAKES THE MODEL

No other form of model-power can match Jetex for performance and realism. Now new Jetex fuel gives even greater thrust and better flying for only about 1d. a flight. New Jetex motors have been developed to control this extra power, which could fracture or distort certain original-type casings unless modified,

Ask your model dealer for full details.

New Jetex Fuel

New Jetex fuel, motors, models and kits are exclusive products of the Jetex Division of

SEBEL PRODUCTS LIMITED

WEST STREET, ERITH, KENT Tel.: Erith 3020

'Grams: Sebelco, Erith

WORLD WIDE MAIL ORDER Service

BRITAIN'S LARGEST STOCKISTS

of specialised modelling equipment. Full up-to-date ranges by all leading makers stocked. Prompt despatch to all parts of the world. Carriage charged at cost.

FLYING MODELS

★ CONTEST *including*

Captain	3/2+6d.
Cygnet	4/-+8d.
XC4	5/6+11d.
Spitfire C/L	12/-+2/-
Cranwell	6/4+1/-
Calypso Cub	12/-+2/-
Calypso 50	18/-+3/-
Calypso Major	29/4+4/10
Inchworm	18/-+3/-
Voodoo	18/-+3/-
Combat King	21/-+3/6
Empress	24/11+4/-

★ MERCURY *including*

Lightning	48/6+7/3
Swan Glider	10/1+1/5
Agressor	24/-+4/-
Grebe	12/4+2/1
Marauder	14/6+2/5
Marvin	16/-+2/8
Matador	21/6+3/7
Midge	4/11+10d.
Monocoupe 40	28/6+4/9
Monarch	30/-+5/-
Spitfire	31/3+5/3
Texan	12/9+2/2
Jnr. Monitor	19/3+3/3
Tiger Moth	28/6+4/9
Toreador	22/4+3/5
Wasp	10/6+1/9

★ FROG *including*

Condor	25/-+4/2
Aerobat	20/2+3/5
Frog 45	25/-+4/2

★ D.C.

Chipmunk	12/9+2/1
Ballerina	13/6+2/3
Bipe	10/3+1/9

★ JASCO

Tracer	14/9+2/2
Trojan	8/10+1/5

★ KEIL *including*

Demon	24/9+4/3
Gazelle	16/6+3/4
Talon	21/3+3/7
Spectre	28/9+4/10
Halo	17/6+2/9
Caprice	13/6+2/3
Bandit	18/4+3/1
Cessna 170	18/4+3/1
Contestor	17/6+2/11
Pacer C/L	15/-+2/6
Jnr. 60	45/-+7/6
Pacer C/L	15/-+2/6
Piper	18/4+3/1
Southerner 60	40/-+6/8

★ YEOMAN

Dixielander	23/9+3/9

★ VERON *including*

Deltaceptor "Imp"	31/3+5/3
Cardinal	15/6+2/7
Deacon	28/9+4/10
Fairy D	41/3+6/10
Focke Wulfe	22/-+3/8
Lavochkin	26/-+4/4
Minibuster	15/9+2/8
Nimrod	15/6+2/7
Panther	26/-+4/4
Philibuster	23/6+3/11
Sea Fury	23/6+3/11
Sentinel	11/3+1/10
Vortex	19/6+3/3

ENGINES

GLO-MOTORS

Merco 29	£5/11/0+19/6
Merco 35	£5/11/0+19/6
A.M. 0.49	33/6+6/-
Fox 15 2.5 c.c.	70/6
Frog 0.49 RG	42/6+7/-
Frog 0.49 PG	49/6+8/-

DIESELS

Taplin Twin	£7/7/0+25/-
Taplin Twin Watercooled	£8/10/0+28/-
A.M. 2.5	56/-+10/5
A.M. 3.5	58/6+11/1
A.M. 10 1 c.c.	49/1+7/10
A.M. 15	50/-+7/1
Allbon Bambi	65/-+10/-
Allbon Manxman	65/-+10/-
Allbon Sabre	44/1+7/-
Allbon S. Merlin	44/1+7/-
Allbon Dart Mk. II	54/-+8/8
D.C. Rapier	67/-+10/9
Eta Mk. V	£6/2/3+20/6
E.D. Bee I c.c.	44/6+8/-
E.D. Fury	63/9+11/6
E.D. Hornet	46/-+8/4
E.D. 2.46 c.c.	65/-+11/9
E.D. Hunter	66/-+11/11
E.D. Comp. Spec.	52/-+9/5
E.D. Mk. IV	65/-+11/9
Frog 0.79 c.c.	37/5+6/1
Frog 2.49 B.B. Mod.	79/-+13/6
Frog 1.49 Vib.	45/9+7/2
Frog 150 R...	46/-+7/2
Frog 80	39/-+5/-
Frog 100 Mk. II	46/-+7/6
Mills .75	48/-+9/-
Spitfire Mk. II	44/1+7/2

RADIO-CONTROL

Complete E.D. Outfits *P. Tax*

Boomerang	£10/7/0+37/6
Mk. IV Senior	£18/4/0+65.9
Everest	£25/0/0+90/3
Transitrol	£11/0/0+39/9
Airtrol	£12/1/6+43/7

E.D. Receivers

Airtrol	£6/2/0+22/-
Everest	£15/0/0+54/2
Boomerang	£5/7/6+18/8
Mk. IV Mini	£16/16/8+72/11

E.D. Transmitters

P.C.1	£5/0/0+18/-
Mk. IV Mini	£10/0/0+38/-
Hand Trans.	£4/4/0+15/2
Everest	£10/0/0+38/1

E.D. Components

Esc. Mk. II or III	20/-+3/8
Clockwork Esc.	48/-+8/8
Self-Cent. Rudder Mech.	62/6+11/4

All other E.D. items available.

TRI-ANG

Crystal Cont. Trans. £6/10/0

FRED RISING R/C Equipment Full range stocked.

Prompt attention to all orders received by post. C.O.D. facilities wherever available. Orders over 40/- acknowledged by Air-Mail.

SOLARBO · ACCESSORIES · MATERIALS · FUELS · DOPES

NO PURCHASE TAX ON OVERSEAS ORDERS

ARTHUR MULLETT, LTD.
16 MEETING HOUSE LANE
BRIGHTON - SUSSEX - ENG.

● **SPECIAL ATTENTION GIVEN TO SERVICES CUSTOMERS**

This photograph was taken at over 500 m.p.h. by a photo reconnaisance Scimitar of the Fleet Air Arm during the first fly-past of the S.B.A.C. show at Farnborough in September. Prints of the photograph were distributed within 30 minutes of exposing the film and our reproduction is not in any way retouched.

Cover story

Ken McDonough portrays the dramatic start of the 1936 Greve Trophy race at Los Angeles in 1936. Michel Detroyat, the French aerobatic ace was soon to lead the field of eight famous racers from a simultaneous start, his Cauldron C-460, Number 100 taking full advantage of superior power and a V.P. prop. Harold Neumann in the Folkerts, Number 1 placed second, and a few yards behind came Art Chester in his Jeep Number 3

AERO MODELLER

Editorial Director D. J. Laidlaw-Dickson

Advertisement Director C. S. Rushbrooke

Editor
R. G. MOULTON

Editorial and Advertisement offices:
38 CLARENDON ROAD, WATFORD, HERTS.
TELEPHONE WATFORD 32351 (Monday-Friday)

VOLUME XXIV
No. 286 NOVEMBER 1959

CONTENTS

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:

MODEL AERONAUTICAL PRESS LIMITED. SUBSCRIPTION RATE: (Inland) 28/6, (Overseas) 27/6 per annum prepaid including the special Christmas Number.

NOT OUR YEAR!

WHEN THE 1959 International contest programme concluded with the Criterium d'Europe (actually renamed Criterium of Aces this year), it was time for Britishers to take stock of our performances and International standing. Apart from the Wakefield team pulling themselves up by the bootlaces from 6th to 3rd place at Brienne le Chateau, we have little to boost our hitherto meritorious rating in the World Championships.

For some, it has been a tale of misfortune. In radio, everyone would agree that Chris Olsen's flying was of the highest standard yet seen in European competitions, yet his model failed to complete the course, through inexplicable engine cutting, and Frank Van den Bergh's disqualification for losing a prop-nut just prior to landing, was nothing short of niggling robbery.

But this does not excuse our general lack of ability in the face of stronger than ever competition in free flight and control line events. We were totally outclassed by superior techniques and obvious know-how in model operation.

Let's not get involved in a soviet style epistle of self-criticism, but go straight for the heart of our failings and give ourselves more practice. If Nery Bernard of Belgium can make an Oliver Tiger team racer circulate at up to 108 m.p.h. and complete 5 kilometres in 4 : 27—why can't we? If the Finns and Swedes with their tough climatic conditions can learn to sense thermals at ground level—why not us? If three Americans domestically spaced thousands of miles apart, can combine to provide a much admired trio of Wakefield World beaters—why should we not do the same with our closely knit organisation.

For once we can truthfully say we've lots to learn, and next month we hope to help in one way by providing vital statistics of the victors. The other side of the story, that of model preparation and field practice in all conditions is up to you—the international team aspirants.

A new Magazine?

Are there enough radio control fans to justify a new magazine entirely devoted to their interests? This is a poser we are inviting readers to help us solve by completing the questionnaire enclosed with each issue. It requires no stamp so if *you* are one of our potential supporters in this project please complete and return it to us. If and when such a new magazine is launched it does not mean that AEROMODELLER and *Model Maker* will cease to carry articles on radio control—simply that they will be of a more general nature, leaving specialist material for the new medium. New developments in the radio control field are indeed following one another so thick and fast that we could easily devote a whole issue to them—this is just what we have in mind to do by "hiving off" if enough of you would like it that way.

Leading with a Spade

It was no Whist Drive when angry Toronto tobacconist led with a spade to put doctor neighbour into hospital with a fractured skull, but a distinct case of *circulo irritans*, or rage engendered by youngsters flying control line in the next door garden. We view this snippet from Canada, sent by reader Barry Brown of Toronto, with some degree of dismay, since it is the editorial practice to run up engines in the home garage. Any purchase by our neighbours of agricultural implements will be considered on its merits, and our skid lid, saved from motor cycling days, will be kept at the ready. Readers who find their after-lunch naps disturbed in this way are urged to try the voice of sweet reason first . . . it might work just as well!

Hovercraft

Ever since the announcement of Britain's first successful air-riding vehicle the Saunders Roe SRN-1, we have been plagued with enquiries — and suggestions on the subject. Production of an elementary Hovercraft is very simple and any of our aero engines driving a conventional propeller can be encased within a vertical duct to ride on its own air cushion, although stability without the Saunders Roe system of air-flow curtaining leaves something to be desired. We have heard of successful units ranging from E.D. Bee to Fox 35 power, but the most ingenious and remunerative is the one by Sergeant Bill Vaughan, an engine fitter at R.A.F. Weeton. Using newspaper articles and magazine pictures to guide him, he built a working model of acetate compound similar to that from which the gondola of the "Small World" balloon was constructed. Nine inches in diameter, it is enclosed in a water-tight compartment, which in turn is housed in a wooden cabinet. Air is pumped through a transparent perspex tube and the model floats on it above the water.

Sergeant Vaughan made it in his spare time, but owing to the considerable interest in it he adapted his creation so that it now operates when a penny is inserted in a slot. It is now on the sea front at Blackpool !

Aviation history in Miniature

Peter Farrar's fantastic collection of 1/72nd scale solid models was once more in the news when it made an air journey by Vickers Valetta from Exeter to R.A.F. Biggin Hill for its annual display. This was the 20th anniversary of Peter's first show when 150 of his models were exhibited at R.A.F. Linton-upon-Ouse for Empire Air Day 1939. At Biggin Hill the collection had been expanded to the extent of requiring a floor area of 6,000 sq. ft. and 165 display tables for 1,023 models.

Movement of such a large collection involved 15 full days of preparation for the one-day show which was much admired by the continual flow of visitors. Photograph shows the first moving stage by a 3-ton lorry to the capacious Valetta fuselage (the Anson used for previous years is no longer big enough!) and all this tremendous effort of transportation, not to mention Peter Farrar's industry in making so many excellent models, is turned to very good use in providing a handsome collection for Service charities. Good show!!

Willard's "Gasser"

Long before Ken Willard's Gasser first made headlines in the American model press we were in touch with the designer for a set of advance plans for our own personal use. Copies were made and distributed to several well-known British single channel enthusiasts who have been trying out the design over the past season. Without a doubt the Gasser is the real answer to all single channel fans who want a "hot" model. It takes one right out of the old stability groove of high wing cabin R/C sportsters and brings single channel almost into the multi field of manoeuvres.

Beautifully simple to construct and compact for transport, Gasser is our finest recommendation for anyone who wants to find a new thrill in radio flying, but be warned, don't under-power it or you will be disappointed. Test models have performed best with engines ranging from the A.M.15 to the E.D. Racer Enya 15 and OS Max 15 power.

Christmas Aeromodeller

MORE PAGES, plans, pictures, and colour than ever before is our proud claim for the December issue which will sell at the usual price of 2s. 6d. — including a fine free plan for Clive Hall's *Hawker Fury* control liner. Among the many features we have lined up for this issue will be a technical summary of the years' International events including 3-view drawings of the world's leading combat, speed, team race, multi-channel, A/2 and R/C glider designs as sketched on the field in our recent journeyings abroad. Whatever your interest, there will be a drawing to suit your taste, and our statistical summary of leading models in the A/2 Championships will be a guide for future design studies.

Latest in perfecting plastics; application of professionally made models in industry; servo survey; latest news of radio control; photospread on the U.S. Nationals; a fully detailed report on the Criterium of Aces with winning model drawings, plus a host of other contributions, including an *exclusive* from Russia, and startling news of British 300 m.p.h. model rocket experiments, are but part of the exciting contents.

Cover feature for this outstanding issue will centre on the Hawker Fury—a thoroughbred among aeroplanes, and one which George Cox introduces to his renowned Famous Biplanes series with another detailed drawing giving data on the three most famous versions of this classic fighter.

Add to this a top notch selection of new designs for A.P.S., including J. M. Bodey's superb A.V. Roe *Shackleton* for two or four engines, spanning 61 inches with trike undercarriage and S.A.A.F. colour detail, plus a couple of surprises for the high performance fans and you'll agree this will be the best half-crown's worth of modelling literature ever published.

EXPERTS FORUM No. 9

Ace American R/C Artist Ken Willard offers . . .

Gasser

top single channel design of the year

LET ME BEGIN THIS article by telling you quite frankly —if you're a beginner in radio control, put these plans and this article away until you've got a little experience in flying. Or, if you prefer, go ahead and build yourself a Gasser, but get an experienced flyer to check you out before you solo.

You see, the Gasser is deceptively simple to build—as radio jobs go. Also, when you watch it fly, it looks very easy— and it really is, once you get on to it. But —and this is the important point—this airplane isn't called the "Gasser" for nothing. When it gets going, and you give it a down elevator to get up to high speed, you've got a handful of lightning, and it can strike faster than you can see the ground coming up! I know—I've clobbered mine twice just by getting fascinated watching it zip along upside down, then forgetting to pull out in time. Fortunately, it's rugged and repairable.

But enough of this warning—you're probably going to go ahead and build it anyway. So let's talk briefly about the idea behind the design.

The Gasser was designed for pylon racing. It is a legal A.M.A. class .09 pylon racer; the wing area figures out right on the button at 386 sq. in. The prototype won first place in the LARKS pylon racing contest early last year. It had a flat bottom wing which gave vicious zoom characteristic when rounding the pylon, so the final design incorporated the semisymmetric airfoil to reduce this tendency. Also, the tail moment was increased, and the aspect ratio lowered from five to four. Finally, the downthrust was increased from 5 degrees to 8 degrees to help hold the nose down under power at high speed. This in turn caused a reduction in the right thrust, since the prop. wash now is directed so that it just hits the top of the fin. Right thrust is from 0 degrees to 1 degree, depending on the trim of the model. Bill Glick, John Shearer and I each built one. John did a beautiful job on his, with a detailed cockpit and all, as you can see in the photos. Mine was functional in nature, as was Bill's. But they all do a terrific job of flying. (Test models made from advance plans for British R/C gear are similarly impressive.—ED.)

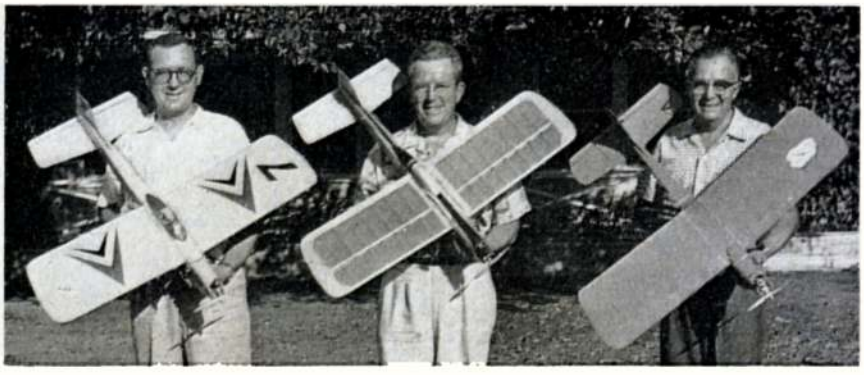
The A.M.A. only has one class for pylon racing, so it soon became apparent that the multi-channel boys would dominate this event. However, at the LARKS Western Open, we had two classes, so I pointed for that meet. In practice I was making between 27 and 30 miles an hour for the five-lap course, and figured to place pretty high. Occasionally I would tire of practising racing and would grab a little altitude and try a few manoeuvres. This was when I discovered that the racing design has really great potential for precision flying. The manoeuvres are large, but exceptionally smooth for single channel operation. I have my "poor man's multi-control" modified four position Babcock excapement mounted in my Gasser, and with it I found I could do excellent loops, Immelman's, Cuban eights, and a power dive that is frightening.

I went to Bakersfield with the intention of winning the single channel pylon event; but the time allotted for pylon racing was very short, so just for kicks, I also entered precision. I didn't have a motor control installed, for fear it might work when I didn't want it to, during a race, so I had to do the pattern and manoeuvres all at high speed. The entry list was long, but I got in three flights. Then came pylon. I took off, was flying along fine until the third lap, when suddenly my receiver began dropping out and I lost control. The result was that I never finished the pylon race—but I came in second in the intermediate precision event! Actually, I had used up my batteries in flying precision, and they were too weak to hold a prolonged signal which was required for racing.

So, although the Gasser was originally designed for racing, (and a multi-channel version could probably do all right in coming events) it turns out to be a top flight performer in precision—and that's the event it's competing in now.

As I said in the beginning, this airplane is for you fellows who have a little experience under your belt. With that in mind, I figure you also have some pretty good ideas of your own regarding installations, so I haven't gone into much detail, except to show that your gear must all be packed well forward in order to provide the necessary balance. Let's consider the various steps in building the Gasser.

The wing is very straightforward in construction. Use medium hard balsa for the leading edge, spars, and trailing edge, and medium balsa for the other parts. Build the wing in one piece, right on the plans, using



Heading opposite shows author with prototypes. Ken set up new high points record in recent U.S. Nationals when he won intermediate control class with the Gasser.

John Shearer, Ken Willard, and Bill Glick with beautifully constructed models. Kick elevator or motor control can be used in addition to rudder, with standard compound escapements.

Below, opposite, strictly functional lines can be disguised with attractive colour schemes as on John Shearer's K and B .09 model.

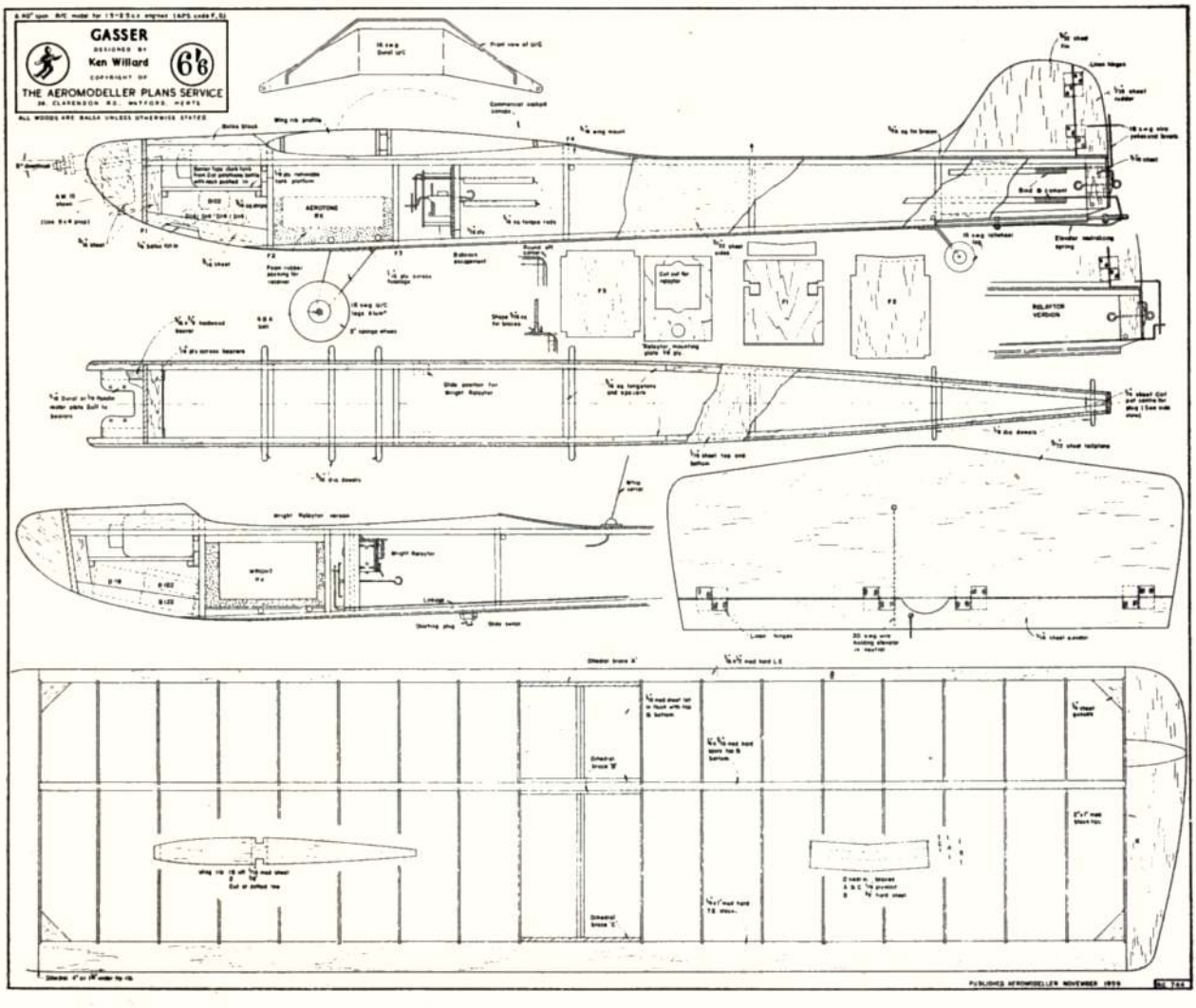
36 in. wood, then cut it in two and splice it back together at the centre section, fitting the four degree dihedral braces as shown.

Use a good, straight grained sheet of $\frac{3}{32}$ in. balsa for the tail, and $\frac{1}{16}$ in. balsa for the elevator. Cover both with silk for strength.

Either a formed aluminium gear or $\frac{1}{16}$ in. wire can be used. I used a wire gear, John Shearer and Bill Glick have formed aluminium gears. The aluminium gear looks better, and it also lends itself to the addition of wheel pants if you want to dress your model up more.

The fuselage, compared to many designs, is really a joy to construct. The two basic sides are cut from $\frac{3}{32}$ in. x 3 in. stock, the $\frac{3}{16}$ in. longerons added to the top and bottom, the upright $\frac{1}{16}$ in. braces and doublers added. Then, using the firewall and the crossbrace at

FULL SIZE COPIES OF THIS 1/5th SCALE REPRODUCTION ARE AVAILABLE AS PLAN No. RC/744 PRICE 7/- inc. post from AEROMODELLER PLANS SERVICE. THIS VARIANT OF THE ORIGINAL U.S. DESIGN HAS BEEN FLIGHT PROVEN WITH BRITISH R/C GEAR



back of the radio for alignment, the sides are joined. The tail post then joins the sides together at the rear, and the basic structure is set up. The rest of the cross-bracing can then be added as you fit in your equipment. I have shown a structure suitable for the Unitone or Aerotone single channel receiver, the Babcock super compound escapement, tripping either down or up elevator and a small bottle tank for precision flying. Other equipment is also detailed on the APS plan, and Gasser easily carries the slight increase in weight. My battery complement consisted of one of the small, square 22½ volt B batteries, which is about the same size as a pencell, and one pencell for filament and two pencells for the escapement. These four batteries are mounted in the forward fuselage bay. It makes a very compact and convenient battery pack. You may want to vary the arrangement to suit your own taste in receivers. But the fuselage structure can be varied and width increased to take any R/C gear.

After you've figured out your radio installation and mounted your escapement or servo, add the wing cradle to the top longeron. Note that it is one piece from the firewall back to where it tapers into the longeron behind the wing. This makes for a very strong and crash-resistant structure. Next cover the top and the bottom with 1/16 in. balsa, except where the landing gear fits. Cover this with 1/16 in. plywood, so the gear won't be cutting into the bottom of the fuselage. Also, the bottom of the fuselage from the firewall back to the crossbrace forward of the radio is filled in with ¼ in. balsa, shaped to fit the fuselage line. You need the extra strength here for those occasions when you have a hard landing and the ship noses up and skids along. Note that at the rear, the bottom of the fuselage is cut away so the stab fits flush with the bottom. Add a couple of small stringers on the inside, then leave this open so you can get at the torque rods if you need to. The tail will close it up when mounted so dirt won't get in.

The fin is butted to the top of the fuselage, then the reinforcing braces are added. This gives ample strength. Rudder movement is ¼ in. either way for pylon, ⅜ in. for precision. This is rather violent, but necessary for horizontal rolls.

Note the detail on how the corners of the fuselage are rounded. This makes a very pretty structure and is also very strong.

Cover the fuselage with silk for added strength.

The building instructions are pretty brief, but you experienced modellers won't have any trouble. The weight can go as high as 36 oz. without killing its performance. Airspeed with the K. and B. .09 is usually 40-45 miles per hour.

FLYING

Now here's where you're going to be a little busy at first. To begin with, let's assume you want to get familiar with the model before you try any fancy manoeuvres. If you start with rudder only, don't do sharp turns near the ground—wait until you've got some altitude to see how your model reacts. If you are using the kick-up elevator, you'll find that sharp turns can be made by starting with rudder, then flipping in elevator just as the nose starts to drop.

Incidentally, the Gasser makes beautiful take-offs. The long tail moment gives it very good ground control, so if you're hesitant to hand launch it on the first flight, try a take-off and be ready to make a turn in case your model may be a little tail-heavy in trim.

After you've had a few familiarisation flights, and you want to try pylon racing, there are several things you can do. The simplest, if you have a Babcock compound, is to reverse the elevator control so that on the third pulse, instead of getting up elevator, you get down elevator. This is the system I used at first, and it was good enough to win. But be careful—don't put in a lot of down—just a little, and then don't fly the pylon pattern too close to the ground, because you don't have any up elevator to pull you out of a nose down attitude on the turns.

A system which is well fitted to the Gasser is the Cobb Hobby escapement-servo set-up. With it you can get both elevator and rudder, and motor control as well.

In any event, no matter what your preference is, you'll find that this job will be a real crowd pleaser, a top competitor, a lot of fun to fly, and in short, as Frank Sinatra would say—"It's a real Gasser!"

IMPORTANT PATENTS

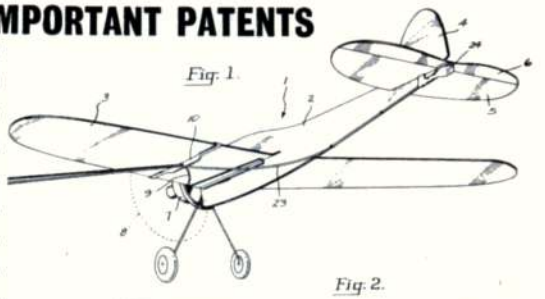


Fig. 1.

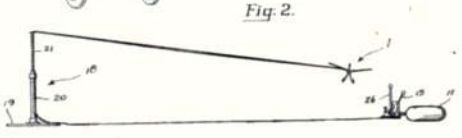


Fig. 2.

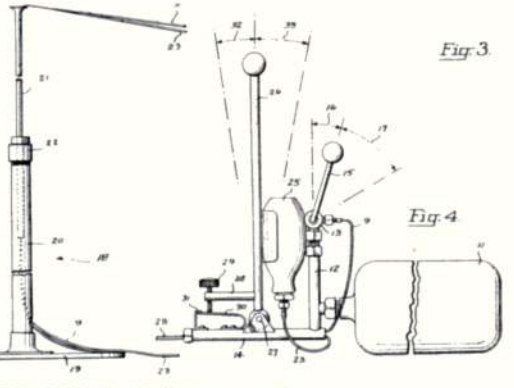


Fig. 3.

Fig. 4.

2676013 N. E. Walker (U.S.A.).
Application date 23/7/51.

COMPRESSED AIR DRIVEN model aircraft are almost as old as the hobby itself but this invention gives both control line flying and compressed air power a new twist. Intended mainly for indoor demonstration purposes, the apparatus provided by the invention offers a compressed air source, a joy-stick type of control and a throttle control outside the flight circle. The joy-stick operates the elevators by means of a compressible air storage bottle, a conduit leading via the pylon to the airframe and an expansible element arranged to displace the elevators in either direction according to the pressure transmitted. This is a principle now used for other subsidiary controls such as exhaust throttle and/or choke clapper valve on conventional external combustion engines.

READERS WRITE...

Combat Organisation

DEAR SIR,

With regard to the running of Combat Events at the Nationals (*re* the letter from the Kenton Club, September issue), anyone browsing around the Combat circle at the Nationals this year, would ask themselves, why DO clubs volunteer to run this event anyway.

I am not suggesting the organisers were perfect by any means, but I doubt very much if their efforts were really worthy of the vicious criticism that was continually being voiced, and NOT in the English language either.

As I see it, the only successful way to run this, and similar Combat events, is to compile rules which make the competitors and their clubs take part in the organisation themselves, and not leave the job entirely to that mysterious body of S.M.A.E. members usually referred to as "THEY".

The North Midland Association of Model Aircraft Clubs, of which I am Secretary, has during the past two years continually experimented with rules for Combat events, with the above aim in mind, and our final results seem to work quite well.

Each club competing is required to appoint a Club Manager, plus one helper (for scoring, etc.) for every five entries, two helpers for 6 to 10 entries; their names being entered on the pre-entry forms. Both Managers and helpers report to the Contest Controller a half hour before the commencement of the first heat. Helpers are allocated times of duty (this is often only a quarter or half an hour depending on the size of the event). The club managers are briefed with any special instructions for the day, and assist in making the first "draw".

Details of the heats are chalked up on blackboards, and it is the club manager's responsibility to see that his club members are in the circle when required. The Organising Team do have a "rounder-up" of "bods", for the immediate vicinity of the circle, but not beyond.

A great help here has also been the providing of linen embroidered strips bearing the name of the club, which are worn by the Club Managers.

Competitors are not given a time for their joust. The system is simply that as soon as one pair go into the circle, their names are erased from the blackboard, and that is a sign for the next two on the list to take their places on the outside of the circle.

I might add here that we do not use a P.A. (we haven't got one, or the funds to keep hiring one, anyway.)

The Club Manager is also responsible for seeing that his members' have lines, etc. at the ready, and that lines have been checked for length.

The result of these rules has been greatly increased efficiency in the running of Contests (of which we run about a dozen a year for some sixteen clubs), a very high standard of team work, amongst competitors; and arguments are almost unknown.

One other important change in the rules, has been the introduction of the two coloured streamers. This gives each competitor a fair share of chops, by not penalising him if his first chop takes the whole of his rival's streamer. When this happens, the competitor can only hope that his opponent will either not chop at all, or chop the lot, or spend more time on the ground, or prang.

The two-coloured streamer is used until none of the colour farthest away from the model is left. At the next re-fuel, the mechanic fits a new streamer.

The number of "organisers" required to run our Combat events has been drastically reduced, so that no one club is tied-up all day running things.

One final note . . . every encouragement is given to the wives of our members, to take part in our activities. Consequently, we are building up a team of experienced women "runners of contests" who will one day in the near future leave our present organisers, helpers and Club Managers, to fly in contests. Perhaps the Combat at the Nats. might not fair too badly in the hands of the "fair sex" either, some year?

Sheffield 4 MRS. FREDA SHIRT.

Letters to the Editor should always be accompanied by a stamped and self-addressed envelope for the convenience of our reply. We regret that without this gesture we cannot undertake either to acknowledge correspondence or provide answers to readers' queries.

Boeing P26

DEAR SIR,

With reference to the article on the Boeing P.26A in the August issue of your magazine, I would like to point out that the decoration of the aircraft in the Air Force Museum is incorrect in detail and that the heading photograph and also the cover drawing are misleading, not only the under-fuselage numbers being incorrect but also the white "V"-notch on the engine cowling. This other fault is not present in the fine 4-view plan however, but modellers might be mislead by the photographs, thinking that it is more likely to be correct than a drawing.

Hythe, Kent. R. K. VINSON.

Appeal for F.A.I. power

DEAR SIR,

I should like to appeal to all organisers of rallies to seriously consider running an F.A.I. power comp. in their programmes as a regular feature. I realise that the numbers of those who will fly "the heavy weights" will be restricted—they are not everybody's cup of tea—but surely it should not be too difficult to include them in the open class but with separate prizes. A pair of scales and a good tape measure will soon sift the F.A.I. jobs from the "lightweight"s and anyone who enters the F.A.I. class can have his card marked accordingly. I make this appeal for two very good reasons:

1. Heavyweights are funny beasts, difficult to get up high enough and difficult to keep up when they are up. They need a lot of time to trim out and competition is a wonderful bug finder in a "perfect" trim.

2. By attracting "heavyweight" contenders to regular competition, you are giving members out of touch with the development in the bigger clubs a chance to meet and discuss their problems with more fortunate fliers. A third reason comes to mind. The S.M.A.E. will also have a better idea of the number of those interested in F.A.I. and whether or not the trials can be held at a centralised drome or through eliminators, which being held at different dromes in different weather conditions are never very satisfactory. I believe that the standard any future British team puts up may well be improved by the stimulus of regular competition.

Brierley Hill, Staffs. C. WEBB (*Sec. Brierley Hill Aeronauts.*)

Just a few lines

Dawn was breaking to the eastwards,
Dawn was breaking o'er the lands
When approached a band of strangers
With their yo-yo's in their hands.

Screeching, scorching, hell-bent yo-yo's
The dreaded Rangipoids they are;
Outcasts from civilisation,
Shunned by all men, near and far.

Why they gyrate in their circles
No one knows, no one can tell,
Least of all the dread spin dizzies
Though above the noise they yell.

Like a tribe of blood-crazed Indians
In their circles streaked with fuel,
They perform their devil dances
While round about disciples drool.

Not for them the gentle Wakefield,
Not for them the free flight crate;
They are lost to us for ever
Condemned alas to circulate.

WIZE GIZE.

From Derby M.A.C. Newsheet.

Excuse me—but do you have a hobby?

Radio Control International

Reliability of Swiss equipment wins the "King of the Belgians" trophy at Hirzenhain in Germany, Sept. 18-21

reported by **R. G. MOULTON**

SIX NATIONS WERE represented at the eagles nest of a site in Hirzenhain, where an area 500 x 1,000 yards with dense pine forests bordering three sides, was to be a proving ground for all that is new in European radio control gear. Centrally disposed on this hilltop arena was a newly laid 60 x 85 yards tarmac rectangle, specially prepared at no little cost for the organising Deutscher Aero Club, and only just completed in time for Chris Olsen to make the first flight of the meeting. It was a magnificent flight, unfortunately terminated early when the motor cut when ending the vertical eight and one which launched the contest into a speculative game that was to last throughout the two days.

For once, the long run of success enjoyed by Karl-Heinz Stegmaier (and Dr. Gobeaux, who was not present) was being challenged with a verve that fully merited loud applause. Through loops and eights, the "*Uproar*" literally cleaved a way for itself in the clear blue sky, containing its range of aerobatics in the forest bordered field, and falling short of perfection only in the stall and inverted turns. When the ETA ran dry, the landing was perfectly judged, and no sooner had Chris put down his overworked transmitter than Stegmaier himself offered congratulations for the fine performance. It remained to be seen whether the loss of up to 120 points for lost spins would set a handicap in the German's favour.

Willy Schoorel of Holland made a very nice single channel flight with his E.D. Racer powered *CQ*, now four seasons old and enjoying new leases of life with transistorised Lorenz receiver pulsing a magnetic Trammel actuator; but bit the dust on landing in an overshoot. Next off was the prettiest model of the meeting, Alfred Bickel's 74 in. low-wing for the OS Max. 35 Multispeed with Webra Bully pump fitted to charge a self-made vacuum system. Though wandering in manoeuvres, and terminating in an overshoot landing, the Swiss entry tackled and completed everything save the tailslide stall, and massed a respectable points total. His wingover was the closest to a full-size Harvard stalled turn one could imagine.

Frank Van den Bergh came to show the flag for Britain, but dunked his single channel Fox 35 R/C model on take-off and wisely called off the "flight" as a first attempt, while measures were taken to ensure getting airborne, and then the lone Italian entry took the floor.

Signor Corghi appeared to have so much wire and vacuum tube in his low-wingers' fuselage it looked as though he had brought his own tinted spaghetti for lunch when the lid came off for several inspections prior to eventual take-off. This was one of the few all-commercial models on the field in the sense that the Webra Boxer, OMU 8 Tx and Rx plus Stegmaier vacuum gear were perfectly standard and not designer operated: but a case of reversed ailerons rendered the lovely model to matchwood when a servo over-rode its limit stop and confused both crowd and owner. The power of these vacuum units is not generally realised and their dependance on cleanliness in the selection valves, makes their installation more demanding of care than the simple appearance implies.

When Fritz Gerber's huge 110 sq. dm. glider (weight 8 lbs) soared up to full height on a 200 metre line and proceeded to emulate the Buzzards over Hirzenhain, we began to realise why radio gliders are so popular in Germany and Switzerland. The heavy model held wave lift from the hillside and must have been at all of 1,000 ft. above the field when the pulsing rudder was held over for a spiral dive. But would that model come down—would it hook! Gerber finally lost it to the treetops in the landing approach, the only case of "Forestry" in the contest.

Another false attempt to take-off, this time by Belgian Roland D'Ursel, brought the two bright boys of single channel on in succession. Hans Schumacher, whose ideas are considered to be far in advance of most other European R/C inventors, had a tiny 1.5 c.c. Hurricane powered model on 2-channel tone with his Micromax servo. Tuned filters eliminate reeds in the new HS multi-channel sets, and components are encased in resin blocks for insulation and stability. Some idea of the range of his Bellaphon Tx and the Ultraton Rx was given by an altitude flight verging on O.O.S. conditions, followed by a spiralling, looping and rolling descent. Erik Bergelund had his Telepilot R/C gear to the same terrific height, as if not to be outdone, and using his manual pulse system (flyball actuator) with "off" for left, full "on" for right and a button signal per second holding neutral, his soon to be kitted and much admired *Viking* low-wing with Taifun Tornado 2·5 led single-channel by one slim point at lunch break. One unusual aspect of his small hand held Telepilot Tx is the fact that Carrier is pulsed while tone is permanently on at 5,000 cycles.

Willy Vandermeulen maintained the high "Monocommande" Standard with his 2-reed O/D model, Howard Boys came out to find his actuator malfunctioning and then the Stegmaier brothers brought the 9 lb. blue and white streamliner to the sacred square in an air of great expectancy. So keyed up were the lads from Berchtesgaden, that the

Heading shows victorious Albert Bickel from Zurich with his O.S. Max 35 low-wing model using self-constructed vacuum gear with Neivergelt receiver 8-reed. Full data on model will be revealed next month. Lower left, Fritz Gerber searches skywards for his very high-flying large glider. Below, fixed trailing edge flaps on neat all-red Swedish design by Rolf Dilot are claimed to add efficiency.

(1) Efficient Swiss team led by Erns-Klauser (centre) readies Alfred Bickel't model for its second flight. (2) Outstanding all-white German glider winner by Hans Buhring is near to scale, Mu 118 Sailplane, uses new Schumacher radio gear. (3) Outstanding single-channel winner was Eugen Setz of Switzerland with pulsing nose rudder, Belaphon/Microton radio, Enya 19 (4) Vagabond kit model design from Sweden, Rolf Dilot prepares his Webra Bully in prototype model. Uses manual pulsing on rudder with flyball actuator. (5) British single-channel entry Frank Van Den Bergh had a large model with Fox 35 R/C, Bonner servo, latest E.D. "Black Prince" and "Black Arrow" radio. (6) Last year's winner, third this time, was Eric Bergelund, beautiful low-wing for pulsing rudder, soon to be kitted. (7) Mrs. Samann waits for hubby's turn to fly with black and yellow streamliner. (8) The man himself. Hans Schumacher and mechanic prepare his tiny very fast single-channel model used for first flight. Schumacher is responsible for many of the outstanding German radio advances


ZH 33 X
1


2


3


VAGABOND
4


5


VIKING
AC
VIKING
6


UHU
UHU
7


8

Stegmaier brothers before unfortunate crash with their blue and white streamliner. Above, Roland d'Ursel, Belgium, Right, other Belgian single-channel entry, Wilhelm Vandermeulen.

model was airborne within seconds and a delightful series of so smooth loops, the eights and rolls delighted the enthusiastic crowd. Stegmaier is a "smoothie" with nice flow from manoeuvre to manoeuvre. His bunts and inverted turns are untidy by critical standards of judgment, yet viewed by a crowd at greater distance, faults are hard to perceive and a spin down to less than 50 ft. climaxed quite a different but no less thrilling flight than that by Olsen.

Gustav Samann followed. Though newly experienced in R/C after years of triumph in free flight (doctors told him to rest!) he handled the 10-channel (Polyton) model well through several tricky situations, making up for pilot errors with some fine spins and a "ker-plonk" spot landing. Technique was to hit both spot and prop. at the same time to arrive without running over the edge of the square.

Another superb display of R/C Glider soaring by Germany's Hans Buhring with a *Scale* Mu-118, using the new Schumacher designed equipment and towed at incredible speed with 100 lb. b/strain perlon line, set up the high total of 414 pts. with perfect pattern flying. Howard Boys had sorted out his batteries but confessed amid British groans that he had no right rudder, and brought his hardy Mills 1·3 model back to bite the dust. Adding to our misfortunes, Stewart Uwins suffered aileron reversal on his Fox 29 *Uproar* and having sorted *that* out through pot. trimming while roaring round at 40-50 m.p.h., lost elevator control as well! It was not Stewart's day — a dud valve and transistor power pack fault on a servo had dogged him, then a broken wire, and now this!

Typical British luck!!!

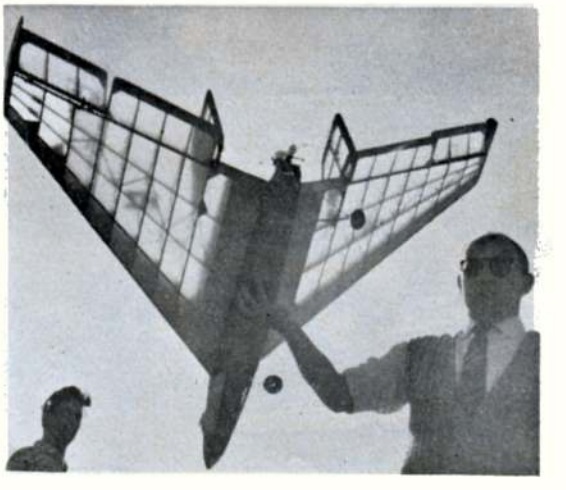
As if to rub the salt of misfortune into the British wounds, it was then discovered that somehow or other, the old free flight rule of "disqualification for dropping components" was included in the new F.A.I. *Code Sportif*, R/C section, which none except the vigilant jury had been privileged to see. As Frank Van den Bergh's Fox 35 R/C, E.D.-equipped model discarded its propnut when the motor backfired before landing — his fine effort, well within range of the leaders, was void!

Just as the first flight by Olsen had set a standard, so was the day's last flight a classic single channel demonstration of pattern flying. Eugen Setz of Switzerland uses the Bickel delta design (after the A.P.S. Vultan) with Enya 19 pushing and nose rudder pulsing. The result is a model which seems to run on rails, holding turns in perfect circles, and running as straight a course cross wind as could ever be desired. The proportional pulsed rudder (Microton Rx) helps, of course!

So the position at the first day was Setz 371, Vandermeulen 370 and D'Ursel 368 for single control; and Stegmaier 1,874, Olsen 1,824, Bickel 1,504 in multi.

Stegmaier's lead had been shortened by failure to start off correctly, and the same also handicapped the Swedish entries when they flew straight from take-off into the schedule instead of turning back and passing over the Tx into wind. It was more the fault of the organisation which did not circulate the new pattern or call a managers' meeting to thrash out the various interpretations of the new schedule, than that of the competitors. This *contretemps* which had the judges just as confused, should resolve itself when the elusive yellow-jacketed *Code Sportif* appears.

Sign of trouble at left when Stewart Uwins reached for a screwdriver and Chris Olsen whipped wing off Stewart's "Uproar". Below, silhouette view of the single-channel winner reveals construction.



COSI FAN TUTTE, or "that is the way it's done". Erminio Corghi had a few problems with his involved vacuum gear as can be seen in this 3-stage pictorial study of an unfortunate flight. His mechanic Roberto Bacchi had difficulty getting everything to work and then at last when Erminio had splayed his arms in despair it was decided to risk a take-off, but after a few manoeuvres an aileron reversed action with results as on right

Stewart Uwins worked through the night to remedy his errant gear, and the next day's flying sarted — as it had concluded the previous day — with another perfect delta demonstration by Setz which immediately put him in unassailable first place. One only has to consider the relatively simple "Mono-commande" schedule to realise how good was his effort to gain no less than 500 points.

Frank Van den Bergh seemed to be suffering in a downdraught on landing approach to fall short and bite the dust on his second flight, and Willy Schoorel thoroughly lost course to land in the large crowd, as if to stimulate their enthusiasm for the Stegmaier who were next on the list.

From the start, those near the take-off sensed that all was not well with the large model. Straight flight and turns seemed to be all right but the loops and bunts were way out of class and it was not long before the reason showed itself violently as an aileron jammed. Putting the powerful Ruppert twin into slow speed made matter even worse, and a vicious spiral terminated the flight amid stony silence. Now it was clear that Olsen had only to make a normal flight with no special effort, to place first. He made sure of a full tank to avoid the previous error of running dry, and set forth on a rousing take-off with only an occasional elevator jerk to mar a smooth pattern, the extra fuel giving nose-heavy trim. Then alas, amid partisan cheers from the locals, the engine cut on the second perfect bunt, and so British hopes were lost.

Alfred Bickel had put on a fine show, losing points for ragged loops and inverted turns, plus a landing overshoot: but his points were handsomely ahead of the rest now that the chief protagonists had finished.

Uwins started well but lost all control and the model in a vicious spiral; Veenhoven put his finger in the prop when setting his powerful in-line twin and found it difficult to blip his controls, and as if to refute all the groans of yesterday, Howard Boys flew very well and spot landed with a slowing motor to earn a round of applause.

Victory in both classes went to a keen, closely co-operative Swiss team which met the first requirement of any race or competition, that to seek a chance of winning, one must first complete the course.

		Round		
Class I — Multi				
1.	Alfred Bickel (Switzerland) ...	1	2	*Total*
2.	Karlheinz Stegmaier (Germany)	1,504	1,477	2,981
3.	Christopher Olsen (Great Britain)	1,874	862	2,736
4.	Gustav Samann (Germany) ...	1,824	528	2,352
5.	Stewart Uwins (Great Britain) ...	987	1,308	2,295
6.	Erminio Corghi (Italy)	501	76	557
7.	G. J. Veenhoven (Holland) ...	151	—	151
		38	28	66
Class II — Single Channel				
1.	Eugen Setz (Switzerland) ...			
2.	Hans Schumacher (Germany) ...	371	500	871
3.	Eric Bergelund (Sweden) ...	348	585	853
4.	Wilhelm Vandermeulen (Belgium)	349	416	765
5.	Rolf Dilot (Sweden)	370	330	700
6.	C. W. Schoorel (Holland) ...	301	394	695
7.	Roland D'Ursel (Belgium) ...	341	284	625
8.	Michel Louis (Belgium) ...	368	230	598
9.	Howard Boys (Great Britain) ...	315	198	513
10.	Otto Hunziker (Switzerland) ...	176	333	509
11.	Frank van den Bergh (Great Britain)	270	229	499
12.	P. J. W. Kraaipoel (Holland) ...	—	326	326
		84	151	235
Class IV — Gliders				
1.	Hans Buhring (Germany) ...			
2.	Fritz Gerber (Switzerland) ...	414	249	663
		181	228	409

Team Order

1. Switzerland. 2. Germany. 3. Great Britain.

EQUIPMENT DETAILS—*Multi*

A. BICKEL (Swiss): O.S. Max 35, 74-in. low-wing. Weight 7 lb. 8-reed/relay and vacuum gear home made on Nievergelt super regen transistorised Rx. Tornado nylon 11 x 4 prop.

K. STEGMAIER (Germany): Ruppert 8·5 c.c. twin, mid-wing. Weight 9 lb. 8-reed/relay and vacuum gear home made (four aileron servos) on Stegmaier Tx and Rx. Topflite 13 x 5½ wooden prop.

C. OLSEN (G.B.): ETA Mk. 6 with throttle. Standard Uproar design with all R/C gear (8-reed) home constructed. Olsen Mighty Midget servos. Frog nylon 10 x 6 prop.

G. SAMANN (Germany): Ruppert 8·5 c.c. twin, mid-wing. Weight 7½ lb. 10-channel tuned filter Polyton Rx (additional servo for spin rudder), Bellaphon Tx, Micromax servos. 65 dm² area.

EQUIPMENT DETAILS—*Single*

E. SETZ (Switzerland): Enya 19 pusher. Delta design, pulsed nose rudder, Microton Rx, Bellaphon Tx.

H. SCHUMACHER (Germany): Taifun Hurrikan high-wing. Weight 2 lb. Two-channel tuned filter Polyton Rx, Micromax servo, Bellaphon Tx, all own design.

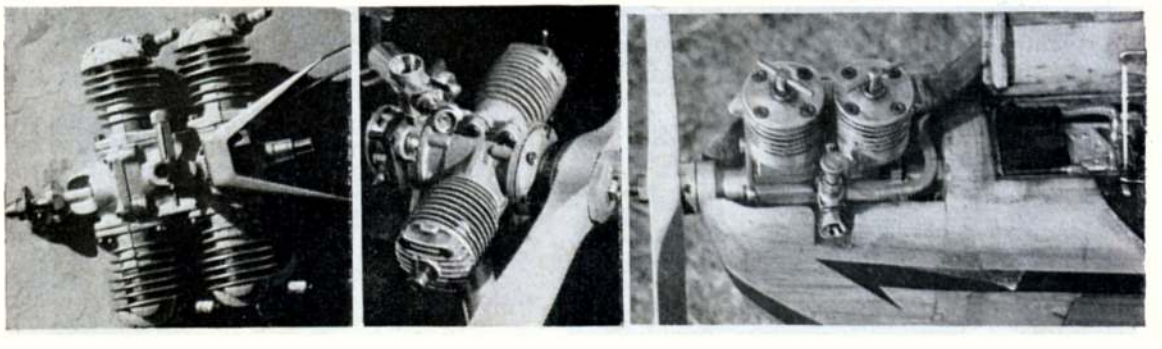
E. BERGELUND (Sweden): Taifun Tornado, low-wing Viking design. Weight 2½ lb. Telepilot Tx and Rx tone at 5,000 cycles, carrier pulsed for flyball actuator.

W. VANDERMEULEN (Belgium): Webra Mach 1 high-wing. Approx. 54 in. Weight 3¼ lb. Own designed two-reed system.

R. DILOT (Sweden): Webra Bully in o/d Vagabond high-wing kitted in Sweden. Equipment as for Bergelund.

W. SCHOOREL (Holland): E.D Racer, high-wing C.Q. design. Own Tx with Lorenzistor Rx, Trammel magnetic actuator.

Seen at Hirzenhain, left, strictly not for sale, a pre-war Elf 4 from America, retained as a proud exhibit in one of the model shop display stands. Centre, the latest Webra Boxer twin with neat grey cast cylinders and crankcase but still with short front shaft and at right the Dutch Veenhoven twin 7 c.c. rotary crankshaft valve with separate vacuum pump and a two-speed throttle. Engine showed remarkable acceleration



INDIVIDUAL VICTORIES for **Belgium's** Grondal in stunt (Fox/Nobler), Bernard in team race (O/Tiger) and **Italy's** Ugo Rossi in speed (New Super Tigre G 20V) were backed up by **Hungary's** 2nd placing in *all* events at the Criterium des As (Aces), new name for the European control-line Champs. now that entries come from afar off as Australia. Full report next month on this meeting at Brussels where models and flying were of higher standard than ever before, Rossi making 138 m.p.h., and Bernard's *slowest* heat time was 4 : 59.

Full credit must go to the A.M.A. for the most detailed Nats. results list ever published. Covering 26 duplicated pages, it gives first five in every event, addresses included, plus vital model data on first three in each case —a terrific job of compilation and most revealing on items used in **U.S.A.** Holland Hornet eclipsed all other 049's in free flight, Cox engines for C/L (use a 4½ x 7 to get 90 m.p.h. with a T/Hopper) and K. and B. 45 dominated multi R/C with the 19 sharing popularity with OS Max 15 and Veco 19 for single. Pirelli was universal for rubber and very few diesels made the grade, exceptions were Walt Mooney's D-C Merlin Bleriot scale winner and Howard Timlin's Open F.A.I. winner with Oliver Tiger heading long lists of Cox 15's. Special congrats. to Bob Palmer, who told us how he was preparing new ideas (*July Expert's Forum*) for the Nats., and he went on to win Open class with new Veco T'bird. Champs. of the whole meeting were undoubtedly the flying Hunters of "Satellite" design fame. Bob was Champion twice over, and his son Billy earned Junior Championship through two 1st and a 5th free flight placings in power — not bad for a youngster!

The Nordic countries Championships took place in terrific weather at Haslev, **Denmark,** on September 6th. Clever Finns won practically everything only being displaced in power and then by the youngest competitor, 14-year-old Gudbrand Dalseg of **Norway.** Of 180 flights, 96 were max's yet no fly-offs were needed. Atmosphere was pleasant and amicable, just as such a reunion meeting should be and the Finns knocked up a team total in seconds of 7,553 against **Sweden's** 6,600, Denmark's 5,770 and Norway's 5,508. How does **Finland** come to the fore so often? This year their success has been notable, and their leadership in A/2 is undisputed. One answer put to us is that in spite of small population, interest in aeromodelling is extraordinarily high. There are about 5,000 organised modellers and 100 clubs. Experts are relatively numerous, and contests are held the year round in *all* weathers. In country districts where motoring and T.V. are not there to distract, modelling is a major interest. We would add on personal observation that the Finns take a great deal of trouble to build tough models that will survive countless trimming escapades, and having survived, those models are flight proven and thoroughly understood from every launch to touchdown. Do YOU know what your model will do next flight?

The International C/L events at Basle, **Switzerland,** over August 29th/30th attracted four nationalities, Jarry-Desloges coming from Paris to win all three speed classes. Hans Hedinger, the local boy, won stunt handsomely and also provided a surprise at the Criterium with his perfect triangles (Fox/Thunderbird) and fastest time of 31 entrants in F.A.I. team racing was by Siegfied Post, who came from Stuttgart, **Germany.** Fourteen entered 5 c.c. racing, but times were slow, best being 8 : 19 by Swiss Richard Spohrer. As is usual in Continental events, Germany provided the combat winners, this time with the Kroh brothers tying, from Munich.

Seventy competitors met at Bucharest airport for the **Rumanian** Championships at the beginning of August. Ionel Georgescu made a perfect total of five max's to win A/2, as did Otto Hints in Wakefield, but our correspondent offers no explanation why teams have not been sent to the World Champs. Certainly the top times indicate a high standard. Most entrants in free flight power employ the Zeiss Aktivist IV or V and the locally produced I.O.R. 2.5 c.c. diesel is a control-line favourite.

Down-under in **New Zealand,** we learn of indoor rubber powered team racing by the lads of Wellington M.A.C. with as many as a dozen models entered for the club event. Fastest time for 30 laps (radius not quoted) stands at 2 : 12, which shows the models are not hanging about. Radio is popular and get-together rallies are organised. One in September at Palmerston North was planned to have film shows and talks after Saturday afternoon flying, then a contest on the Sunday. This type

Heading snows three individual winners in Nordic Championships, Gudbran Dalseg, Norway — Power, Seppo Takko, Finland — Wakefield, Sune Westerholm, Finland — A/2, with Secretary General of the Danish Aero Club, Capt. J. Foltmann. Left, competitor in Rumanian championships, Alexander Bedo with a neatly decorated A/2, note the Rumanian practice of built-un A/2 fuselages, also common in Hungary.

At the German RfC championships, left, Wegewitz's diminutive radio design is Cox .020 Pee Wee powered, yet uses Pashchke 3-reed equipment. Top right, rudder only design with loads of vertical tail surface by Horst Grunge, flew well in a very strong wind making dft type landings with 100 ft. vertical descent when the motor stopped. Below, is Werner Paschke's manoeuvrable design with Webra Boxer Twin and own design 6-channel gear placed second in championships.

of social contest seems to be a rarity these days—is it because we're all too busy to relax, except those lucky lads in Wellington?

Prophetic article on towing technique by Tam Thompson of **Canada**, appeared in the *Montreal M.F.C. Bulletin* while Tam was winging his way to Europe with his A/2's. He outlined thermal hunting technique, concluding with the aspect that is usually completely ignored, that of physical fitness. How true it is that thermal searching demands the ability to run like mad without flaking out, and how right were Tam's words when he said he believed a great many top European fliers could keep going for that extra minute or two. There were very, very few smokers among the top twenty at Bourg Leopold!

As usual, location of next year's World Championship meetings has been a topic for discussion among contestants at this seasons' meetings. The outcome for '60 seems to be definitely Budapest for the first World Champs. covering control-line classes, 2·5 c.c. speed, 2·5 c.c. team race, aerobatics and possibly a supporting jet event. Radio control location swings between Switzerland and Great Britain, with a strong possibility for a Swiss meeting, and F.A.I. power to be held in Great Britain. Just as long as all countries know soon enough, *and* get a copy of the elusive new *Code Sportif*, we should be happy.

We are getting quite used to hearing of long distances travelled by enthusiasts in **Australia.** Last October four members of the Newtown M.A.A. made a round trip of 900 miles from Queensland to compete at a small-town event in New South Wales and returned with trophies and a speedo needle that broke off on the 90 m.p.h. stop. For the 1959 Queensland Centenary Model Championships Darcy Peck of Sydney travelled 1,400 miles over the week-end to win Class "C" team race and second in each "A" and "B" classes!

The placid lakes of Lucerne are used for the Annual Swiss hydro-model championships organised this year by H. Diana, who very conveniently won the duration event! Pictures show him fuelling and take-off with the large 2-float design. Note only one tail float is used, engine torque helping to keep the model upright.

Hotting up a FROG 150

THIS is a special article prepared by Ron Warring in conjunction with George Fletcher, Frog engine designer, on the possibilities of "hotting up" a standard Frog 150 to give maximum performance for ½A team racing. The Frog 150 was chosen for the subject since it is one of the few British production engines employing a relatively soft cylinder liner, which means that modification to porting can be carried out with a file. Thus the reworking found to give best results can, virtually, be carried out by anyone, without special tools, or any particular engineering skill.

FOUR POSSIBLE modifications to a standard Frog 150 were undertaken in separate stages, and the gain in performance (if any) assessed at the end of each stage. Thus the effect of each individual modifications was established. To avoid prolonged tests, performance was evaluated on the r.p.m. figure achieved with a standard Frog nylon 7 x 4* propeller, this being a selected size for team race application.

The modifications undertaken were:—

1. "Waisting" the spraybar by filing flats each side (parallel with the choke tube when assembled) so that less restriction was offered to intake flow.
2. Enlarging and squaring the intake port on the crankshaft but leaving the timing (opening and closing) unaltered.
3. Enlarging the transfer passage areas.
4. Opening up the transfer ports and squaring them in shape.

Of these modifications, (1) produced no measurable increase in performance. A very slight gain—a matter of around 100 r.p.m. was achieved with modification. (2). Modification (3) produced a marked improvement and modification (3) and (4) together a substantial improvement—equivalent to almost a 10 per cent. increase in r.p.m. with the 7 x 4 propeller. At the same time the handling characteristics of the engine were affected, being definitely more vicious for starting and appreciably "fiercer" in note. From a "busy" little engine in fact, the Frog 150 has been turned into an angry-sounding power unit.

Modifying the spray bar seems largely to be a waste of time. Similarly, in view of the time and painstaking work involved in filing out the shaft port square and the almost negligible gain resulting, this also is hardly worthwhile attempting. That leaves attention to the transfer ports and passages, which is certainly worth while doing for "top" performance.

The cylinder liner on all the latest production 150's is relatively soft. Older 150's had a hard liner, identified by its silver colour (the soft liner is "blued" in colour). The price of a replacement liner set—liner, piston and contra piston—relatively low (21s.) that even if the job of reworking is spoilt, the engine can be restored to its original form at little cost—or alternatively the liner set may be bought specifically for reworking, leaving the original engine as it was until satisfied with the job.

A point to bear in mind is that the Frog 150 employs a mild steel piston which over an initial running period, is quite stiff and prone to seize. The engine must not be run fast when absolutely new, but the piston should be quite free and remain free after some 10-15 minutes running time on an 8 x 6 propeller. A brand new liner set, or a brand new engine, should be run in to this stage before attempting to rework the liner.

Reworking can be done entirely with Swiss files. Unscrew the cylinder and cylinder jacket from the engine, carefully knock out the contra piston and replace the cylinder jacket, screwing up tight. The cylinder unit can then be held in a vice by the jacket (use soft jaws or pieces of wood each side to protect the jacket fins from damage). Alternatively, the whole of the reworking can be done holding the liner in the hand, although this is not so convenient. The liner should not, under any circumstances, be gripped in a vice by the bottom end.

It is helpful if the file is first used through the exhaust ports to remove any traces of feather edge and clearly define the outlines of the exhaust ports, but do not enlarge the ports beyond this. The transfer ports are then filed out completely square as defined in Figs. 1 and 2 and the photographs, right up to the level of the bottom of the

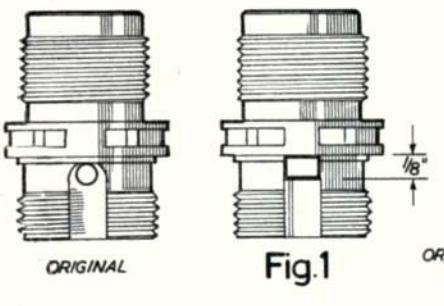


Fig.1

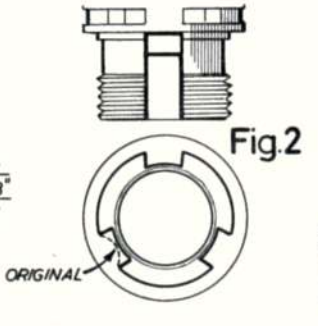


Fig.2

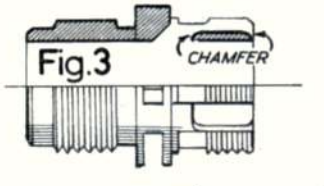


Fig.3

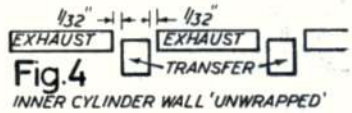


Fig.4
INNER CYLINDER WALL 'UNWRAPPED'

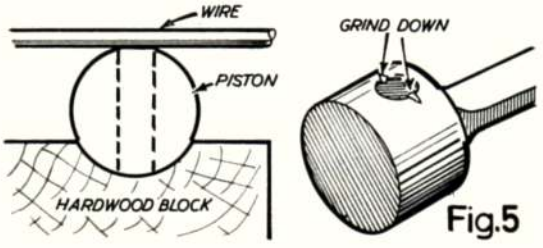


Fig.5

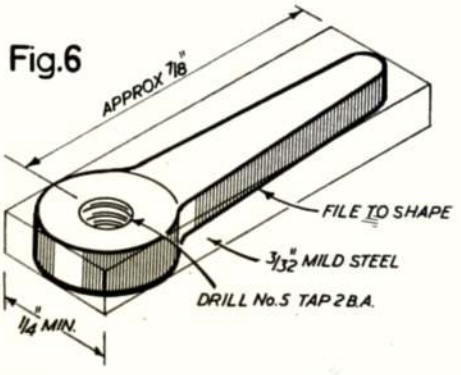


Fig.6

Heading opposite shows Frog Vibramatic after a very long bench run of some 60 hours with finless head. On examination, engine showed no signs of excessive wear and was ready for further use, still providing the very low fuel consumption figure expected of Frog engines.

cylinder flange. The rounded transfer passages of the original liner are then filed out completely square in section over their whole length, running into the squared-off transfer ports.

Each *end* of each transfer passage should then be rounded off, as shown in Fig. 3, taking down almost to a knife edge at each end. The *tops* of the transfer ports can then be squared off by filing to end by overlapping half the exhaust port opening, as on the original liner, but now square.

The limit to this reworking is the extent to which you feel you can weaken the liner and get away with it. Squaring the top of the ports to start with, removes a certain amount of cylinder wall below the exhaust "pillars". Squaring the tops of the ports still further reduces the amount of metal actually holding the top of the cylinder on. This modification *must*, in fact, weaken the cylinder, but one can go down to a bare $\frac{1}{32}$ in. of metal between the transfer port and exhaust port, where they overlap on the inside, with the liner still strong enough for "racing" use.

Because of the enlarged ports the gudgeon pin must now be fixed in the piston. If left floating, as originally assembled, it could work sideways and get trapped in one of the ports. It is a relatively simple matter to lay the piston assembly on a block of hard wood, as in Fig. 5, lay a length of 14 gauge wire over the end of the gudgeon pin hole and tap smartly to "burr" enough piston wall over to lock the end of the gudgeon pin in place. Then repeat for the other side of the gudgeon pin hole.

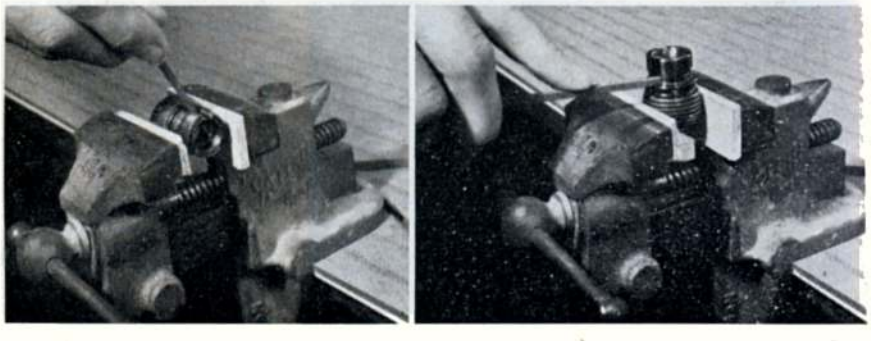
The piston wall on each side should then be rubbed down with an oilstone to smooth the surface and make sure that the two burr marks raised do not project enough to score the liner when the piston is assembled. It does not matter how much the piston wall is relieved in this area within reason, provided the skirt is not touched in stoning.

Any burrs on the inside of the transfer ports should also be removed very carefully before reassembling the cylinder unit, *e.g.*, using an emery stick, fine emery paper wrapped around a dowel or fine or medium grinding paste on the end of a dowel. Be careful not to touch the liner bore *above the exhaust ports* with abrasive and if an abrasive paste is used, wash the liner absolutely clean with petrol or paraffin before reassembly. The engine is then simply assembled in the normal way and is ready for running.

It was found on bench test that the modified Frog 150 ran best on 2 per cent. nitrated fuel with 30-33 per cent. ether. More nitrate and less ether required as much as a quarter of a turn more compression with a slight reduction in r.p.m. achieved. It is possible, however, that the more heavily nitrated fuel with lower ether content might show up best under actual flight conditions where the propeller is unloaded and the r.p.m. figure increased accordingly.

For team racer applications, it was also felt desirable to fit a locking compression screw and the "nut" fitted with a tommy bar extension for easy manipulation. A suitable design is sketched in Fig. 6. One-handed simultaneous operation of the compression screw and locking device is quite straightforward, it merely being necessary to press the locking nut tommy bar back (anti-clockwise) to release the compression screw for adjustment and forward (clockwise) to lock any desired compression setting. This simple attachment was considered a thoroughly worthwhile addition, especially as the contra piston fit on the original engine was a trifle on the slack side.

* *A 4-inch pitch propeller may seem an odd choice for team race work, but in practice this particular propeller gives excellent results with the Frog "150" and other 1.5 c.c. motors. This is probably because the nylon blades flex readily and assume an appreciably higher pitch in flight. The new Frog 7 x 6 still improves performance with greater economy.*

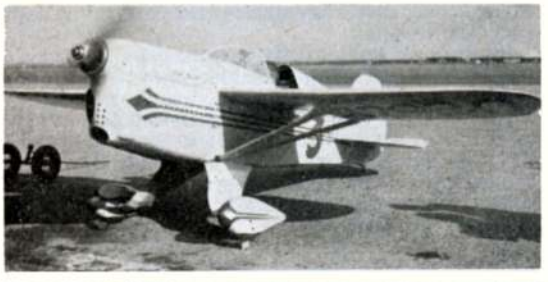


Amateur kitchen table top modifications to the Frog 150 cylinder are within the capabilities of any careful modeller if he closely follows the details in this article. To avoid damage to the external faces, one must use soft wood clamps between vice jaws.
Square section file is being used in these views to open out the transfer passages as detailed in figures 1 and 2 on opposite page. Note that such modifications do weaken the cylinder and you proceed at your own risk! We accept no responsibility for engines which break up through over-zealous filing.

AIRCRAFT DESCRIBED No. 98

Art Chester's JEEP

One of the most colourful American racers detailed and drawn by J. H. ROBINSON



ARTHUR C. CHESTER, of Glenview, Illinois, U.S.A. arrived at the 1933 National Air Races with the aircraft he had designed and constructed in his garage during 1932. Powered by a 185 h.p. Menasco C4-S engine, the 16 ft. 8 in. span, 15 ft. 1 in. long "Chester Special" differed from the more familiar Jeep in several respects.

The wing was of greater chord and its maximum chord was located closer to the fuselage. The tailplane was of smaller chord with a rounded leading edge, and the elevators were nearly rectangular in outline. Rudder and fin were almost circular in shape, and the large diameter wheels were fitted with large spats. Fuselage, fin, wing struts, and spat stripe were finished dark green, with cream wings, tail, wheel spats and fuselage stripe.

At the National Air Races in Los Angeles, Chester gained one first and four fourth places, and his best speed was 154·365 m.p.h. Later in 1933 at Chicago, Chester gained four first places in 375 cu. in. events, one second and two thirds in 550 cu. in. events, and second place in a 1,000 cu. in. race. His fastest speed improved to 190·95 m.p.h.

By 1934, all tail surfaces were modified to their final familiar outlines and a new curved windshield was fitted. Smaller wheels and spats were fitted, and a spinner added to the Chester one-piece metal propeller.

During the 1934 National Air Races Chester collected eight prizes, his best speed for a closed course being 203·38 m.p.h. For the straightaway Shell Speed Dashes the highest speed of the Special was 229·72 m.p.h.

For 1935 wing chord was reduced to give the distinctive graceful proportions which were retained until 1947. Wing struts of wider chord were fitted, nose openings were revised, and the words "Chester Special" appeared on the rear fuselage. All angles were carefully filleted, and the entire aircraft was highly waxed. An oil radiator appeared on the port fuselage side.

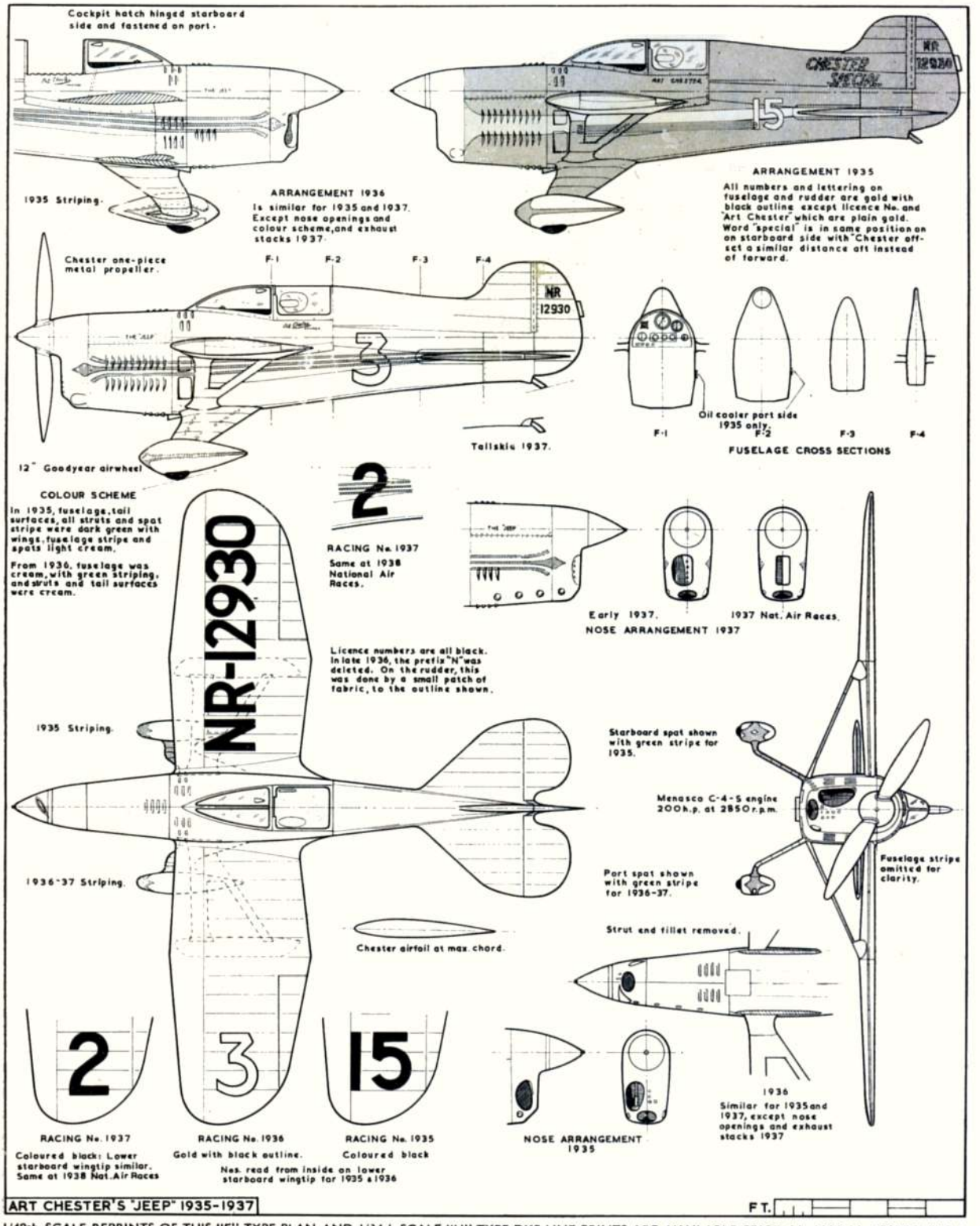
Chester won two 375 cu. in. races at the National Air Races, as well as a third and a fourth place in 550 cu. in. events. At the Miami Air Races he took two first places and one second.

For 1936 the entire aircraft was finished cream, with distinctive green trim, and carried the name "The Jeep" (after the "Popeye" cartoon) on its cowling. Further modifications had been made to nose openings, a new Menasco C4-S engine fitted and the oil radiator deleted.

This year Chester placed third in the Greve Trophy Race at 224·7 m.p.h. although his fastest speed was 230·5 m.p.h. in one of the three Shell Trophy Races. At Miami, Chester took two first places and one second.

(continued on page 545)

Top left, Chester's No. 15 collected eight prizes in the 1934 National Races and bore the original dark green and cream decoration. Next is the 1936 Jeep, No. 3, being run up without the spinner, and below it is the 1937 racer with number 2 denoting higher rating in the race results. Bottom photo is a fine Jeep model by Dan Clutz, span 27 in., area 130 sq. ins. free flight for Skyfury .049, placed second in tough contest at 1959 U.S. Nationals. Shows how the Jeep makes a fine modelling subject for free flight or control-line



ART CHESTER'S "JEEP" 1935-1937

F.T.

1/48th SCALE REPRINTS OF THIS "E" TYPE PLAN AND 1/24th SCALE "H" TYPE DYE-LINE PRINTS ARE AVAILABLE PRICE 6d. AND 2/- RESPECTIVELY FROM THE AEROMODELLER PLANS SERVICE. PLEASE QUOTE PLAN No. 2726 WHEN ORDERING.

all-British Glowplug engine-only 34/10

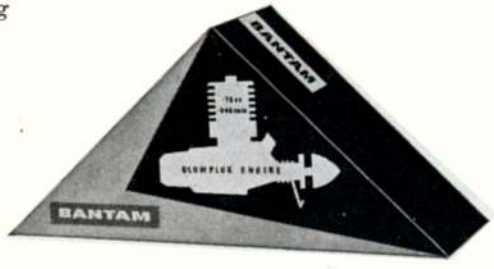
* Precision engineered throughout
* ·046 capacity with ·049 performance
* Cuts the cost of power flying

Here it is! The sensational Davies-Charlton Bantam — a glowplug engine, British from prop to plug, which outstrips its rivals on every count . . . quality, performance, price.

OUTSTANDING PERFORMANCE is achieved by good design and the precision engineering which is a feature of all Davies-Charlton engines.

Reliable ignition is provided by the new Miniglow X plug specially developed for the Bantam by K.L.G. Ltd.

EASY STARTING is ensured by the exclusive Quickstart, a new device that eliminates weary propeller flicking, cannot jam or foul the propeller and is unbreakable.



ok for the distinctive three-cornered box

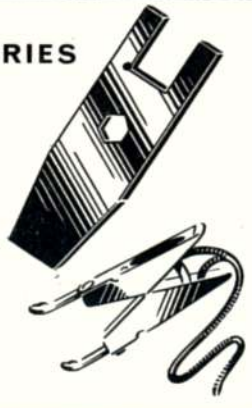
BANTAM STATISTICS

BORE ·408 in.
STROKE ·35 in.
CYLINDER CAPACITY ·046 cu. in. (·75 cc)
WEIGHT less tank 1·3 oz. with tank 1·47 oz.
RPM 15,000 plus
TANK CAPACITY 3·5 cc
RECOMMENDED PROPELLERS
Free flight 6 x 3 in. or 6 x 4 in.
Control line 5¼ x 3½ in.

BANTAM ACCESSORIES

Bantam multi-purpose spanner which fits cylinder head, glowplug, rear crankcase cover, and acts as a screwdriver for propeller bolt. **1/6**

Davies-Charlton Quicklip, a quick-release positive glowplug connector that cannot short the battery. **5/5**



DAVIES-CHARLTON LIMITED MODEL DIVISION

HILLS MEADOW DOUGLAS ISLE OF MAN

SERVO STABILITY and the Patient Pterodactyl

another fascinating model experiment from the inventor of the single blade helicopter.

By
C. W. McCutchen

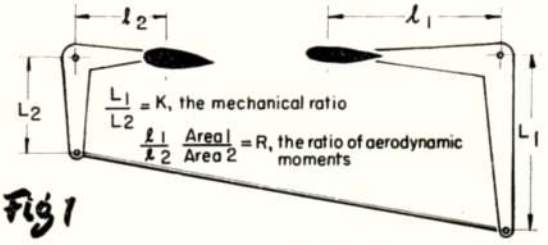


Fig 1

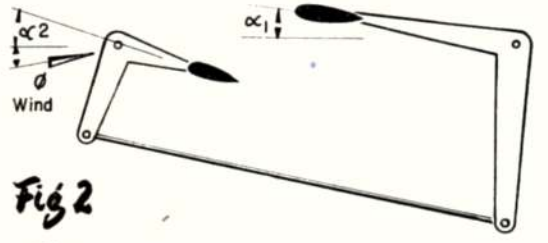


Fig 2

Fig 3

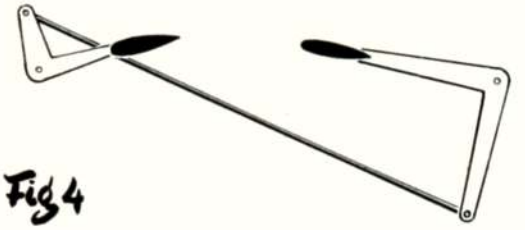


Fig 4

IF ON AN AIRPLANE we mount two hinged surfaces and have one surface ahead of its hinge and one behind, and if we mechanically couple the surfaces and then fly the works through the air the pair of surfaces may show interesting and useful behaviour. Consider the very general arrangement shown in Fig. 1.

If the angle of attack is called Ø then the surfaces will set themselves at angles a_1 and a_2 as shown in Fig. 2

where $a_1 = \frac{K-R}{R-K^2}$ Ø and $a_2 = Ka_1$.

The formulae are quite general and still hold for negative as in Fig. 3. In this case an angle of attack produces the result shown in Fig. 4.

$a_1 = \frac{K-R}{R-K^2}$ gives the equilibrium position for any values of K and R, however only when K^2 is greater than R will the equilibrium be stable.

Where does all this come into airplanes, and especially, into model airplanes? The answer is in many places if the model builder has the patience. These systems can be used to provide automatic stability for, as our key equation shows, if K^2 is just slightly larger than R a small change in Ø produces a large change in a_1 and a_2 which, if the system has been correctly thought out, can be used to stabilise the aeroplane.

This is a field that the full-sized aeroplane people have been shy of entering because, like all complicated devices, servo-stabilisers can go wrong as well as right. It is therefore one which, to some extent, the modeller can really call his own.

As an example, if you take the arrangement with positive, and put the surface which leads its hinge in front of the one which trails its hinge the two hinges can be combined as shown in Fig. 5, which changes to Fig. 6 when the angle of attack is increased.

This will obviously make a small tailplane more effective. Woe betide you, however, if the small tailplane stalls. I have tried out this scheme on a towline glider and it works. The full sized airplane boys have tried it out too, though as far as I know only in the watered-down form of an aerodynamically over-balanced elevator or all-flying tailplane with a "geared anti-balance tab". This works as shown in Fig. 7, which alters itself to Fig. 8 as the angle of attack increases. This is discussed on pages 14 and 15 of *The Soaring Pilot* by Welch, Welch and Irving, published by John Murray.

The full "Servo-Tail" should make it possible to fly the wing closer to the stall than is normally possible by virtue of its extremely powerful correcting action.

Patient Pterodactyl

Here we break new ground with a more powerful, and more interesting use of the servo-principle.

Patient Pterodactyl ("P.P") illustrated in heading picture uses negative K as in Figs. 3 and 4. As shown in Fig. 9, the hinge-leading surface is the tail and the hinge-trailing surface is a full-span wing-flap. A little study of Figs. 3, 4 and 9 will show that increased angle of attack will move the control system so as to produce a nose-down pitching moment from the tail and, at the same time reduce the wing life by reducing the camber. This is the

same combination of control movements which has become so popular for stunt controlliners.

The moving parts are statically balanced to avoid troubles from acceleration. This arrangement requires spring or rubberband which pulls down on the stabiliser, or the riding angle of the flap and tail will not be efficient. In the servo-tail this was not required as the lifting forces on the two parts of the tail oppose each other. With the P.P., if the spring loading were omitted, an efficient trailing angle for the flap would occur only if there were a down load on the tail.

The cynic may object that I have an airplane which would have flown even without the servo. My reply is to ask how many other models with a 7 in. chord flapped aerofoil fly well with a 16 per cent. tail on a 15 in. moment arm. Following this line further, the model was persuaded to fly, but less well, with a 12 per cent. tail.

The model flies best with the C.G. at the 35 per cent. chord point indicating that the tail is lifting some, in fact, quite a bit when its small size and short moment arm are considered. You would expect a model with this trim to be easily stalled and have a sluggish recovery, but neither is the case with P.P. Rough weather gives the servo-system a real chance to show what it is good for by getting the P,P. quickly out of unusual attitudes.

Phugoid stability is conventional. Over elevate (or actually, make an equivalent adjustment to the control system) and P.P. roller-coasters like any other airplane; reduce the elevation and any swooping quickly damps out. P.P. looks odd because it was designed and built by a lazy man. The lack of dihedral angle enables the flap to be built in one piece while the trip plates keep the said lack from making P.P. a spiral diver.

Trimming

Here is the rub, or the fun; it depends on one's attitude. The conventional glider has two variables. P.P. has four. These variable are, in the order in which I find it easiest to adjust them.

(1) Servo amplification factor; given by
(2) Servo operating point; determined by the length of the control rod.
(3) C.G. position.
(4) Servo-loading; determined by rubber band tension.

(1) is adjusted by varying the length of the control horns and this is why there are several holes in each of them. The position is chosen so that a small change in angle of attack produces a large change in flap position but still does not make it slam all the way. I find that the poor man's wind tunnel, *i.e.*, presenting the model to the breeze while riding a bicycle, is the easiest way to do this.

(2) is adjusted by the setting the C.G. in a reasonable place, say 25 per cent. of the chord and kinking the control wire till the plane flies well. This adjustment is similar to adjusting the longitudinal dihedral of a conventional airplane. Increasing the length of the control rod increases the elevation. At this stage the model will be gliding fast and the trailing angle of the flap will not be as positive as it should be.

The C.G. is then moved back to 30 per cent. The aeroplane will try to stall but will probably only succeed in mushing with the flap well up.

The rubber band loading is then applied. This increases the droop of the flap and, in consequence, lowers the gliding speed.

From here on everything is adjusted simultaneously. This is where it gets confusing. The following general observations may be helpful.

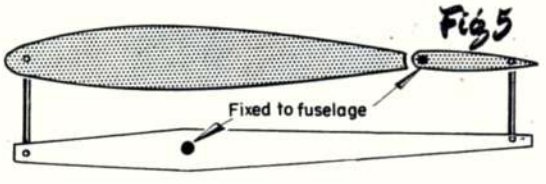
1. C.G. position determines how the lift is apportioned between the wing and tail just as with any other airplane.

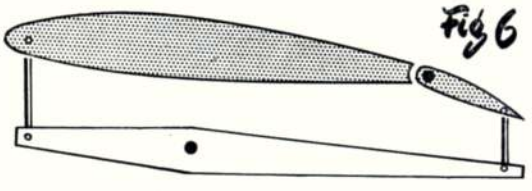
2. The length of the control rod determines the elevation. There is some change in gliding speed but less than in a normal airplane for the tail is coupled to the flap and thereby to the amount of lift produced by the wing.

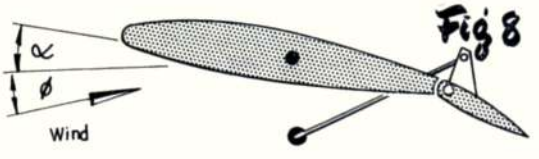
3. The rubber band loading adjust the effective chamber of the wing by varying the trailing angle of the flap and simultaneously adjusts the tailplane angle of attack. Increased wing lift occurs simultaneously with increased tail lift so this adjustment varies the gliding speed while producing little change in elevation.

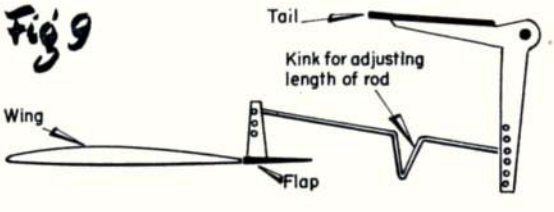
4. The servo-amplification factor, once it has been set by wind tunnel methods, can be left alone.

This all sounds, and is, quite complicated, but it has one redeeming feature. Even when P.P. is adjusted for max. duration, it should still have more rapid recovery. One final word. Make sure that all the joints are as friction-free as possible. The forces which run the servo-system are quite small and if the system sticks, the model won't fly.









ENGINE ANALYSIS No. 65

Cox Olympic ·15

SPECIFICATION

Displacement: 2·423 c.c. (·1478 cu. in.)
Bore: ·585 in.
Stroke: ·55
Bore/Stroke ratio: 1·07
Bare weight: 4 oz.
Max. B.H.P.: ·287 at 16,500 r.p.m.
Max. Torque: 22 ounce-inches at 10,000 r.p.m.
Power rating: ·118 B.H.P. per c.c.
Power/Weight ratio: ·072 B.H.P. per oz.

Material Specification
Crankcase: Light alloy, machined from bar stock
Cylinder: Mild steel
Piston: Hardened steel
Connecting rod: Hardened steel
Crankshaft: Hardened steel
Main bearing: Twin ball races
Cylinder head: Light alloy (integral glow element)
Rear cover and venturi: Light alloy (anodised red)
Prop driver: Light alloy (anodised blue)
Manufacturers:
L. M. Cox Manufacturing Co., Santa Ana, California, U.S.A.
Price in U.S.: $12.98

By R. H. Warring

THE NEW Cox "Olympic" must be the complete answer to any European modeller who maintains that no production glow motor under 3·5 c.c. can hope to compete with a top class diesel for power output. Developing a peak B.H.P. figure, on test, of almost ·29 at 16,500, performance over the whole of the speed range has the edge over the top "racing" diesels. In free flight, in particular, this superiority should be even more stressed by the smoother running, absence of vibration and greater speed up in the air. Only in team racing will its greater fuel consumption put it at a disadvantage.

The "Olympic", we are told, has been some three or four years in development. In point of fact, it has turned out to be a typical "Cox" design, featuring the same layout and porting arrangement as on the smaller Cox engines. Similarly, every component is machined from bar stock, there being no castings used, with the greater majority of the production work carried out on fully-automatic machines, so that the finished product, although not "untouched by hand", has far less manual labour associated with it than any British counterpart. All major machining operations, too, are carried out under temperature (and humidity) controlled conditions to ensure maximum geometric accuracy.

The result is a relatively simple design, beautifully and accurately made and with all running fits and clearances just right. The Cox is ready to run fast "as made", extremely easy to handle and very consistent in performance.

Induction is via the now familiar Cox-type reed valve, mounted on the rear of the crankcase. Induction timing is thus automatically controlled by the "breathing" of the engine. Exhaust timing is conventional, but the transfer almost fully overlaps the exhaust. There is also a measure of sub-piston induction (which is the reason why the bottom of the exhaust ports come below the top of the piston at B.D.C.). The fuel entry is a little unusual (although again typically a Cox idea) in that the actual needle valve is mounted to one side of the induction tube, feeding into an annular passage opening into the induction tube via three small holes.

The "Olympic" incorporates a starter spring as standard. This is virtually an essential item. There is considerable "kick-back" when hand starting, particularly on smaller propellers, and with manual starting the engine is more likely to start and run backwards than forwards. Use of the spring ensures instantaneous starting in the right direction, provided the spring is wound backwards to its fullest extent when using the smaller propellers. If only half wound, the engine can still backfire and start in the wrong direction.

The spring is just the right size and power for the job, fitted as simply as possible. It does not appear to have any damaging effect on wooden propellers. The only thing that has to be watched is to hold the propeller by the tip and withdraw the fingers smartly outwards, otherwise the following blade raps the hand. We have always been a little dubious as to the virtues of a spring starter for anyone but a beginner, but this is one the expert will really appreciate. Re-starting is instantaneous when hot without altering the needle or even priming. When cold, a fairly generous prime is advisable, with the needle slightly opened.

The "Olympic" was run on propeller loads down to 7,000 r.p.m. where it was still most consistent and smooth running, although there was some falling off in torque. Torque is well maintained at the higher speeds, accounting for the high peak r.p.m. figure. Even over the lower part of the torque curve, however, performance is up to

PROPELLER—R.P.M. FIGURES

Propeller dia.xpitch		*r.p.m.*
10 x 4	Trucut	7,300
9 x 4	Trucut	11,200
8 x 4	Trucut	13,800
8 x 3	Trucut	14,000
7 x 6	Trucut	12,600
9 x 3	Tiger	12,400
8 x 4	Tiger	14,800
10 x 6	Frog nylon	7,800
9 x 6	Frog nylon	10,200
7 x 4	Frog nylon	16,000 *plus*

Fuel: 20 per cent. nitromethane, 20 per cent. castor, 60 per cent. methanol.

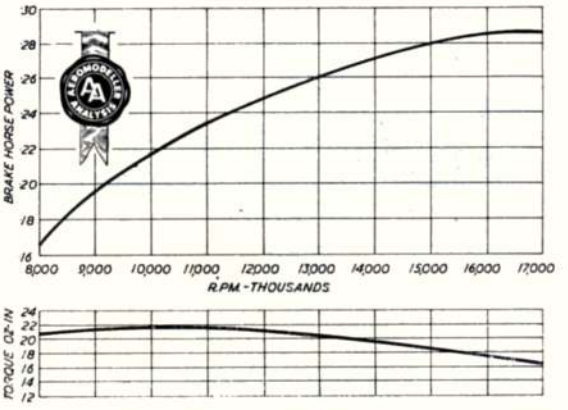
the best "diesel" standards, so this is truly a remarkably efficient engine.

It would not even seem necessary to try to use anything like peak r.p.m. for contest performances, in fact. A worked Frog nylon 9 x 6 propeller would probably give an outstanding performance and possibly speed up to something approaching 14,000 r.p.m. in the air. Any propeller which gave more than about 14,000 static r.p.m. on the ground would probably overspeed in the air, with some loss of power. The power peak is, however, very broad and flat, so propeller selection should be far from critical. An "ideal" size would appear to be something like an 8 x 4, 9 x 3, or 9 x 2½ for free flight, and a 6-inch pitch propeller for control line (higher pitch for sheer speed). To accommodate 3-inch pitch propellers, the propeller shaft screw requires shortening.

Constructionally the "Olympic" features a soft steel cylinder screwing into a turned crankcase unit. The cylinder is bored before precision honing to obvious very high standards. The bottom of the bore is slightly relieved and the cylinder unit treated for an oxidised black finish. The light alloy head, incorporating the glow element, screws into the top of the cylinder and seats on a copper gasket. All threads are an excellent fit. Diametrically-opposed exhaust ports are cut in the cylinder walls. The two transfer ports are milled on the inside up between the land areas between the exhaust ports.

The piston is of steel, hardened on the outer rubbing surface only. The connecting rod, also of hardened steel, is ball ended and locked into a "cup" shape formed inside the piston head by peening over. There is a certain amount of up and down play in the fitted assembly, but this is of no consequence. Similarly, the hardness of the con. rod and crankpin appear to be of suitable values to eliminate wear.

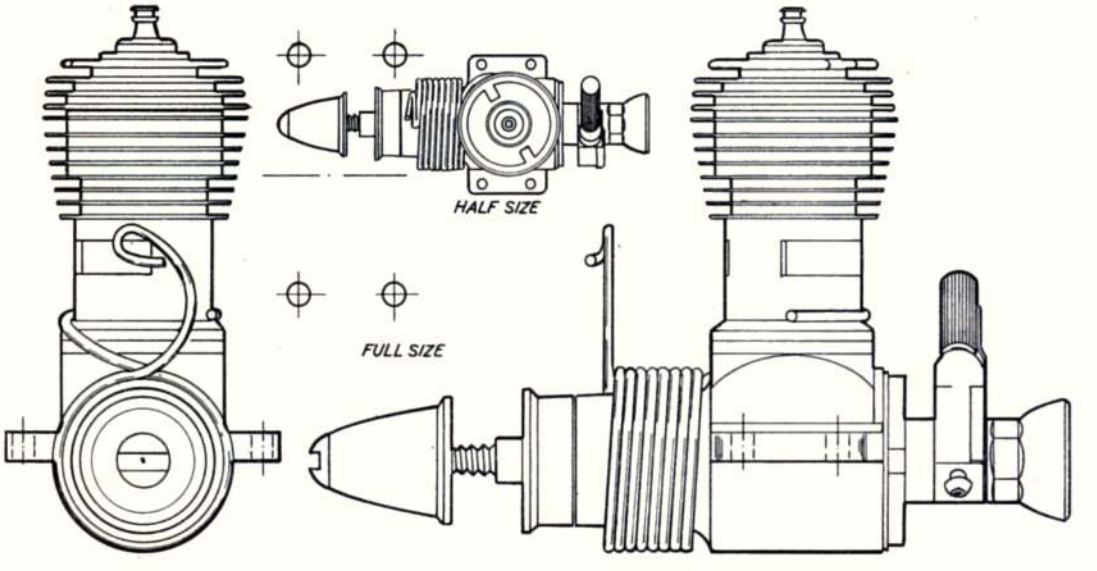
The crankshaft is of relatively small diameter, ¼-in., and runs on two ball races, one at each end of the bearing. Again the fit is delightfully free and *true*, as with the piston/cylinder assembly. The piston will, in fact, fall to bottom dead centre under gravity. The shaft terminates in the prop driver and the extension shaft for



carrying the propeller comprises a ·160-in. diameter American No. 8 NC thread screw. The driver boss, however, is ¼-in. diameter, requiring this size clearance hole in the propeller hub.

The reed valve assembly has been simplified over earlier Cox designs and features a single reed with tag ends loosely located by a wire clip. Fuel induction is *via* the three small spray distributing holes, connecting to the needle valve. The needle valve unit can be set in any convenient position and has an easy-to-manipulate thimble locked by a neat design of spring. It is fed by a comparatively large bore jet to the metering orifice—which has been enlarged since the original Olympic production batch, and the choke tube reduced to approx. ⅛-in. bore at the same time to improve suction.

Everything about the Cox "Olympic", in fact, is neat and attractive. The colouring on the induction assembly, propeller driver and cylinder enhances the attraction of the polished machined parts. The presentation is equally eye-catching with moulded plastic base and "bubble pack" top, the engine backed by a printed red, gold and blue card. The final "proof of the pudding" — how it performs, is even more attractive. This is truly a top class engine in every respect.



Our favourite zany Peter Holland presents a fiendish flying machine

DUPLEX DELTA

DO YOU WANT something to build in an evening, something on lines, for instance?

How about a Duplex Delta? . . . A what ?! . . . Well, a sort of a low-wing delta with a high-wing delta doing its best to go t'other way opposite on top . . . You know, we would be lost without pictures. Take a look . . . There, see what I mean?

The reason? No, not just to be different. The need arose for a tough little C/L model for quick production, to be used in a local display. To some this was to be their first taste of handle-waving . . . so Item 1: must bounce; Item 2: could be built in a few hours; Item 3: stall resistance should be high; Item 4: stuntable with small radius manoeuvres when on short lines; Item 5: adaptable to suit different motors.

With these points in mind, a spot of research was carried out with various wing plan forms in order to make the wing area as compact as possible yet retain good control characteristics. The final layout has leanings toward the Delanne type; avoiding some of the interference associated with close gap biplanes, and gaining the rigidity of a delta. As flight tests proved, deltoid plan-forms when opposed appear to reduce the undesirably excessive stability associated with some C/L delta models.

Duplex Delta, having proved itself, was handed over to a learner pilot who hitherto had been unable to fly a tank dry, partly to see if it was easy to fly, partly to stress-test it in the obvious way.

The former obviated the latter and horizontal and overhead eights became intentional on his second tank full. Later we found it bounced unscathed. Eventually, of course, we were chasing the pieces; funny how the ground is not always where one thinks it is, nevertheless there are so few components to chase, as it were, that repairs are a matter of minutes, and, of course, being sheet balsa construction, uncomplicated and accessible.

The prototype still circulates and still bounces. It's old and it's oily; and it loops in about 4 ft. diameter.

Well . . . don't just sit there reading AEROMODELLER, get some wood and start . . .

Take your motor, ·75 - 1 c.c., drill and bolt on a couple of pieces of hardwood bearer, measure carefully the gap between them and cut F1 to fit. All the parts except the wings are drawn full size. Wings are *half* full size.

Mark out the 4 in. wide sheet as indicated on the plan to give the minimum of waste. Cement the edges of the wing sheets together on a piece of greaseproof paper over a flat surface. When set, cut to form elevator which is hinged to the lower wing T.E. with tape clothes horse type pattern.

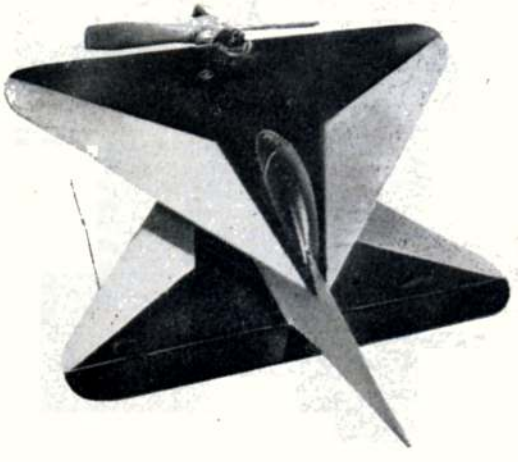
Now chamfer the sides of the bearers slightly to accommodate the angle of the fuselage sides, glue bearers to lower wing, fit F1, add fuselage sides and F2, warping the fin part of the sides for starboard offset. Add top wing and allow to set.

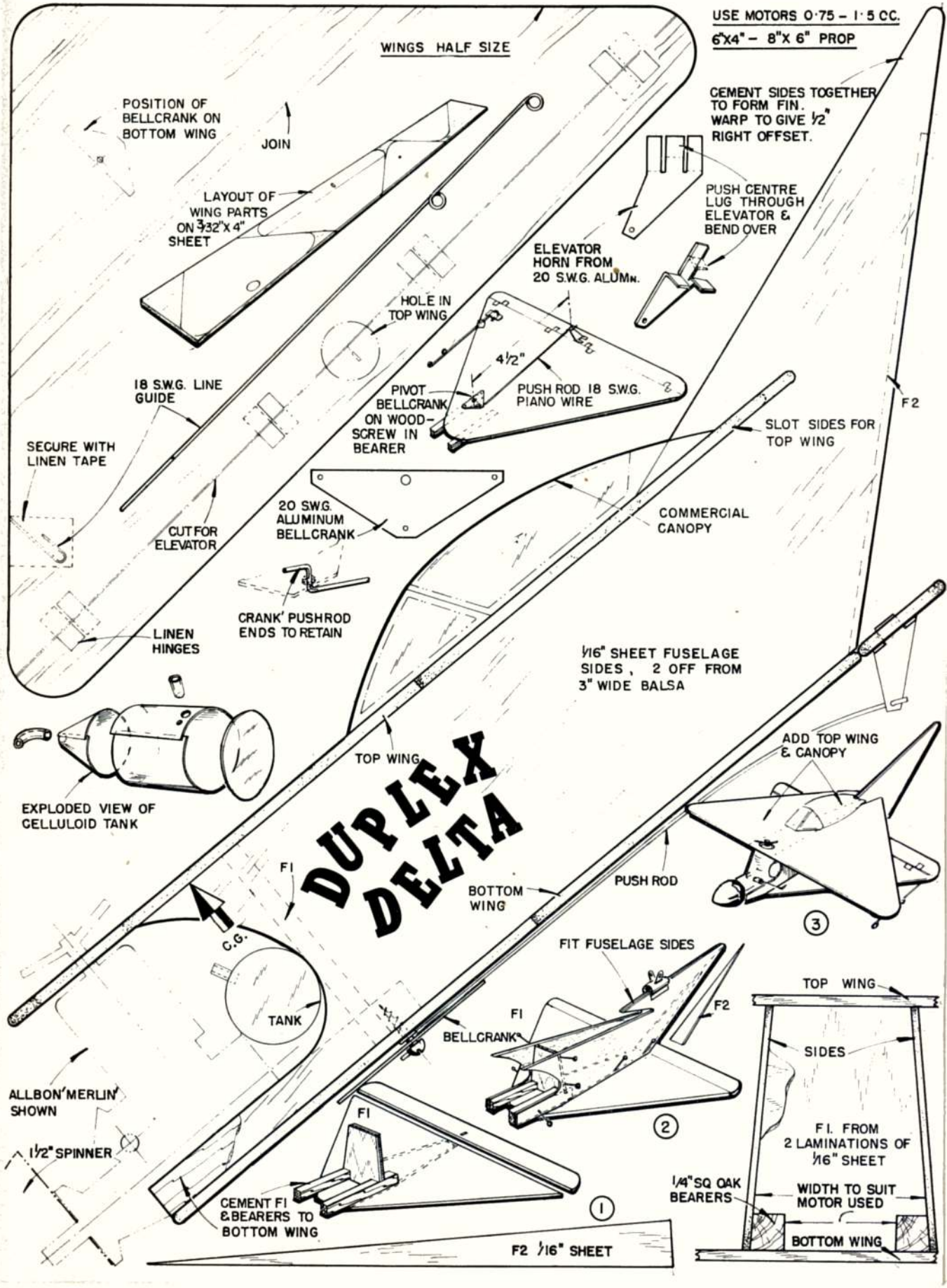
It looks like a model already, doesn't it? . . .

For extra strength you can add silk strips at the wing/fuselage joints. Commercial bellcrank and horn of the size shown may be used if the odd scrap of aluminium cannot be found in the junk box. The home-made elevator horn is secured by piercing the elevator and bending the tags on the horn, one of which passes through this hole and is bent over on the upper surface. The pushrod is joggled at both ends to obviate soldering, so assemble control system before screwing the bell-crank to the bearer.

Paper-clips form connecting links between the bell-crank and the lines. Providing there is not less than two degrees motor offset to starboard and the line guide is fixed as plan there is no need for wing weight, unless you fly on barge rope!

Final sanding and light modelspan tissue covering adds strength and provides a lightweight form of colouring. and reduces the risk of thumbprint patterns on colour doped surfaces! An easy way of applying this is to clear dope all surfaces, cut the tissue oversize, place in position and brush thinners or thin dope through. Two-tone effect is achieved by overlapping a darker tissue and cutting through both with a razor blade before the dope dries. One can then peel away the surplus edges of both tissues, over-riding any "mixing" of the colours. A cockpit canopy and a small commercial C/L stunt tank to fit, or celluloid tank as plan completes the job, and you are set to fly . . . Use a 6 in. x 4 in. or 7 in. x 5 in. plastic prop. Check C.G. carefully. Move motor along bearers if necessary. A position ¼ in. aft of that shown is possible for extra sensitivity, not recommended for tyros, further forward for in-the-groove stability. Take your pick. (Who's the man who said "shovel"?).




USE MOTORS 0·75 – 1·5 CC.
6"X4" – 8"X 6" PROP
WINGS HALF SIZE
POSITION OF BELLCRANK ON BOTTOM WING
JOIN
LAYOUT OF WING PARTS ON 3/32"X 4" SHEET
CEMENT SIDES TOGETHER TO FORM FIN. WARP TO GIVE ½" RIGHT OFFSET.
PUSH CENTRE LUG THROUGH ELEVATOR & BEND OVER
ELEVATOR HORN FROM 20 S.W.G. ALUMN.
HOLE IN TOP WING
4½"
PIVOT BELLCRANK ON WOOD-SCREW IN BEARER
PUSH ROD 18 S.W.G. PIANO WIRE
18 S.W.G. LINE GUIDE
SECURE WITH LINEN TAPE
CUT FOR ELEVATOR
20 S.W.G. ALUMINUM BELLCRANK
SLOT SIDES FOR TOP WING
F2
COMMERCIAL CANOPY
CRANK PUSHROD ENDS TO RETAIN
LINEN HINGES
1/16" SHEET FUSELAGE SIDES, 2 OFF FROM 3" WIDE BALSA
TOP WING
EXPLODED VIEW OF CELLULOID TANK
DUPLEX DELTA
ADD TOP WING & CANOPY
F1
BOTTOM WING
PUSH ROD
C.G.
TANK
FIT FUSELAGE SIDES
F1
F2
BELLCRANK
TOP WING
SIDES
ALLBON MERLIN SHOWN
1½" SPINNER
F1
F1. FROM 2 LAMINATIONS OF 1/16" SHEET
1/4"SQ OAK BEARERS
WIDTH TO SUIT MOTOR USED
CEMENT F1 & BEARERS TO BOTTOM WING
BOTTOM WING
F2 1/16" SHEET
1
2
3

MORE NEWS from the American Nationals, which was almost a benefit for the Larks Club in Radio Control, tells of Bonner and Dunham really rocking the opposition with their two Delta pylon racers.

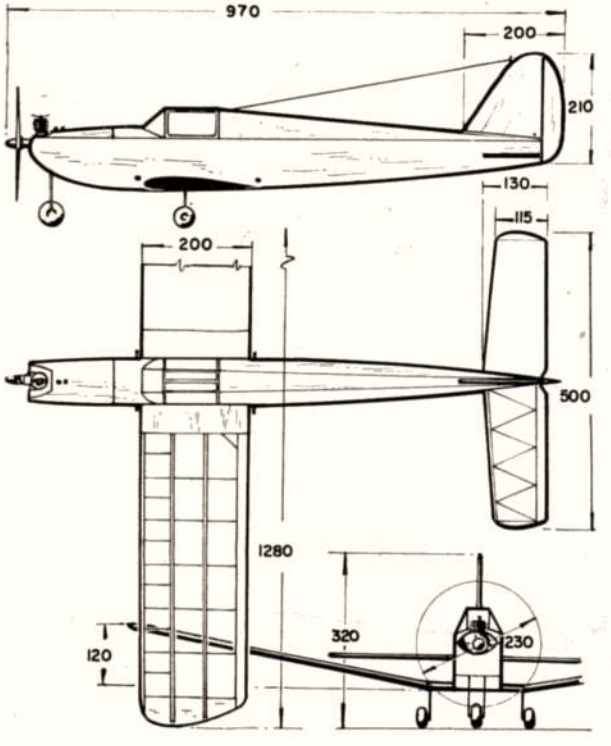
Dunham's was yellow with conventional engine pulling and Bonner had a white one with a pushing engine. Recorded speeds were not high with the Deltas, but they are going to be respected when the operators get more practice. As is usual at these events some of the most entertaining flying took place *after* the contest was decided. Bob Heise flew a twin-engine "Heisendoppel" looking like an Aero Commander with two 35 engines, and Walt Good, Chuck Boyer and Bill Deans had a combat session until Walt's plane chewed off the right aileron of Chuck's model. Both landed safely. In the scale entries Dr. Elizondo of Mexico City flew a scale Fokker D VII and is planning a Fokker Tri-motor as his next subject! Ken Oliver from Omaha flew a two-third size Astro Hog (4 ft.), still with 8-channel gear, total weight 41-oz. New receiver being used by many of the Larks aces in pylon racing was the latest Orbit 6-channel to replace the much-favoured Orbit 5 and a new engine specially produced for R/C has appeared on the scene in Los Angeles. This is the Lee 45 with McCoy appearance, ball races, coupled throttles, and is said to be vibration-free.

In this country, Electronic Developments are about to release their long-awaited lightweight tone gear which incorporates specially-produced relays and reed units (*see* pictures).

Neatly produced in black Anodised boxes and appropriately christened the *Black Prince* series, tone transmitters will be available for single-, four-, six-, or eight-channel with *Black Arrow* receivers to match. Typical prices £29 1s. 1d. for the complete four-channel Tx/Rx set, £32 15s. 11d. for six-channel Tx/Rx. This is considerably cheaper than overseas equivalents and we might say from inspection of all the first examples, the quality is absolutely top-class.

For the single-channel man, carrier wave is not neglected and the new *Black Knight* CW Tx will be £7 0s. 1d. and its Black Prince tone equivalent is £11 3s. 7d. All transmitters are fitted with 5-ft. chrome-plated telescopic aerials and are designed for hand-held operation, tone stabilisation being achieved by use of Ferox Cube pot cores, used in conjunction with many new circuit features. Light current drain will ensure long battery life. The receivers employ high gain Mullard transistors and again claim very low battery consumption so that lightweight batteries can be used.

Heart of each receiver is the new *Bleep* relay retailing separately at 24s. each and which will be produced with fixed contacts as distinct from the adjustable type in the photograph. The reed bank for eight-channel is christened *Octave* to sell at £3 and is one of the neatest we have seen. Its light weight and compact dimensions will make it a favourite for



Left, Harold Kurth's (Bremen) low-wing for the 1.5 c.c. Taifun Hurrikan. Measurements are in millimetres. Teko R/C gear is used, this is a miniature transistorised set as above, matchbox and plug emphasise its small proportions. New Gruner 957 relay is incorporated and the set sealed costs around £8 10s. 0d. Photograph below shows attractive lines of the model

Heading shows John Dumble of R.E.P. Ltd., launching his Unitone Glider at a Cranfield meeting

home constructors entering the multi-channel field.

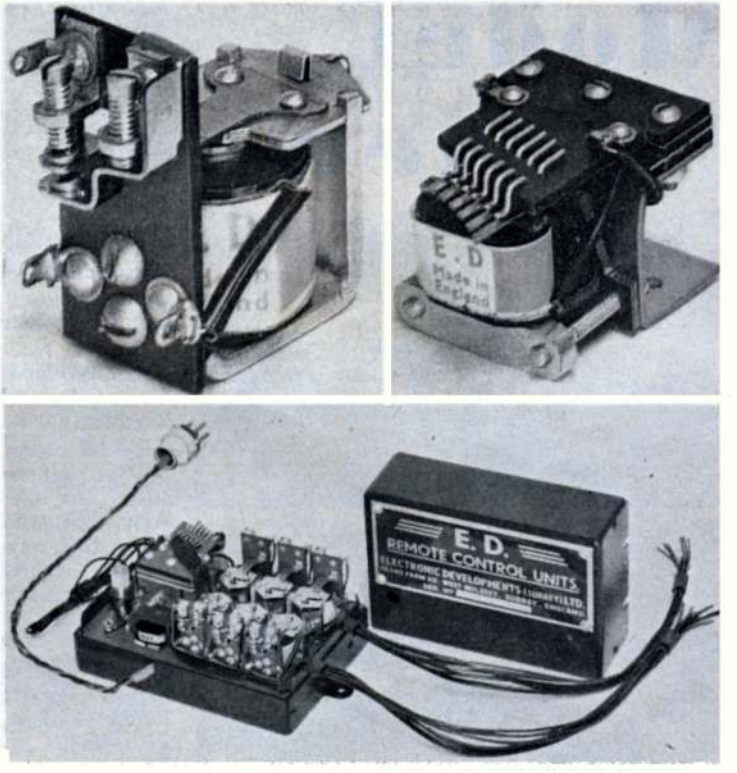
All of the new Electronic Developments radio gear has been exhaustively tested in recent months and one of the main attributes has been the complete reliability of the outfits, very few adjustments being required to maintain full control over a lengthy period. Tuning is elementary.

Dual Proportional

The Sinclair dual proportional system described in August issue has evoked considerable interest. We know of several home constructors apparently engaged in adapting their models for this interesting simultaneous control. Unfortunately in our explanation in the working of the system we overlooked the capacitor across the motor. This changes the picture completely and one of our highly-qualified readers offers the following explanation of "how it works". *(Refer page 377)*

The circuit shown does not operate from the back E.M.F. of either the relay or the rudder servo motor (the capacitor across the rudder servo motor would cancel such an E.M.F.). This pulse-rate discriminator is the well-known diode-pump circuit and in this case is deriving its signal from the alternating voltages which are created by the successive connections of the contacts of Relay 1 to the 3-volt batteries, one of which gives a positive voltage with respect to earth, and the other a negative.

When the contact of Relay 1 moves to the lower position, the positive battery is connected and the polarity is such that the left-hand diode then conducts and the ·1 mfd. capacitor becomes charged quickly (since the forward resistance of that diode should be small) to 3 volts with the lower plate negative with respect to the one connected to the relay arm. When the relay arm relaxes to the upper position, this capacitor is connected to the -3volt battery which means that instantaneously the lower plate is now at - 6 volts relative to earth (*i.e.*, battery centre tap). The left hand diode blocks but the right hand diode is connected in the sense that it now conducts. While the relay contact remains in this position the capacitor discharges through the 50 K resistor and the base of the transistor, making the latter conductive so that Relay 2 is then operated. Relay 2 stays operated until the capacitor has become discharged to the extent that the current flow through the second diode has become so low that the transistor will not pass enough current to maintain the relay. At some later time, the next pulse operates Relay 1 and the cycle begins again.

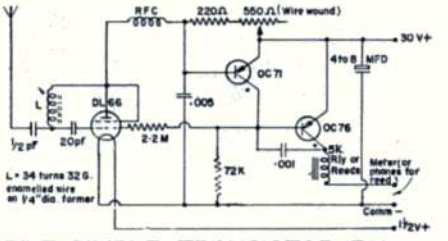


It will be seen from the above explanation that it is important that the time constant of the ·1 mfd. capacitor and the 50 K resistor (together with the forward resistance of the second diode and the base emitter resistance of the transistor) be less than the minimum time for which Relay 1 may be held into a "mark" situation. If this is not complied with, then the rudder control signals will tend to alter elevator in addition. These time constants, therefore, should be carefully chosen for the range of pulse rate variations used by the pulse generator connected to the transmitter. It also shows how important it is to "re-tune" the circuit should Relay 2 or the transistor characteristics change, and users should be warned to check their circuits for susceptibility to temperature variations. Such variations do not always matter much in a proportional system since the operator makes unconscious corrections to the stick according to aeroplane behaviour, but if some of the circuit characteristics, such as that of the relay, are marginal sudden changes could occur.

The circuit is, of course, unaffected — it was simply that we worked out the wrong explanation of the manner in which it operated!

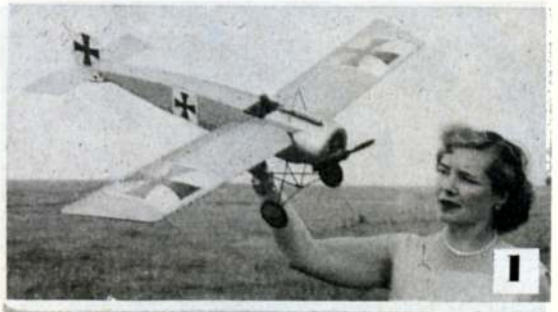
New Pike RX

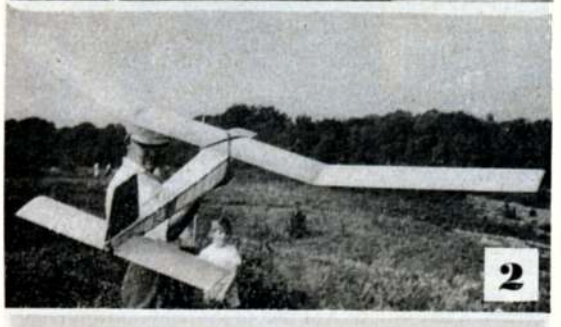
Finally, another circuit for the home builders this time from Geoffrey Pike, and it is his simple transistor receiver which he has been flying for a long time with considerable reliability. It is similar to our own AEROMODELLER circuit and a commercial set, but employs slight differences and according to Geoffrey has always behaved perfectly even when the model was dead overhead in the supposed "dead-spot" as high as 1,850 ft. altitude.



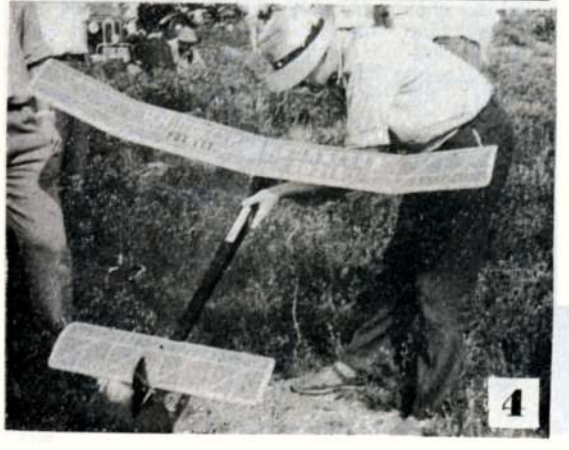
PIKE SIMPLE-TRANSISTOR RX.

Model News


1


2


3


4

APPROPRIATELY enough, this MODEL NEWS in an issue with the accent on radio control, starts off with a distinctly unusual scale model so equipped. Picture No. **1** portrays D. E. Thumpston's Fokker Monoplane as recently flown at Wellesbourne. D.C. Sabre-powered, it has a span of 43 in. and a weight of 31 oz. Wright radio equipment is installed, with three 15 v. B.121s and two miniature kalium batteries in parallel for L.T., plus, of course, relaytor. Good take-off characteristics, and only vice a tendency to build up a right turn after a couple of circles or so. More dihedral would probably cure it, but wise builder prefers to keep as scalish as possible and endure this minor snag.

Picture No. **2** is of W. L. Manuel's radio-controlled slope soarer, a regular Chobham performer. Description may be short, but model is anything but that in the way of wingspan.

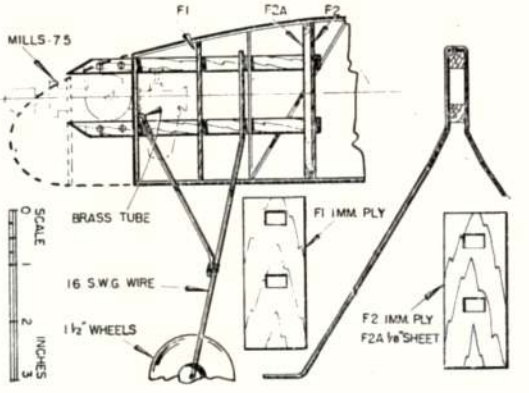
No. **3** comes from proud builder L. E. Carroll of Harrogate and is of another well-known slope soarer, the German tailless glider Sparrow, from AEROMODELLER's Plans Service. Builder hopes to use it that way soon, but meanwhile reports it as a good flyer, but something of a problem to get up on the line in the light winds we have been having this summer.

Back to Chobham Common again for No. **4**, taken at the Croydon Gala, where it was, as it happens, windy — with excitements like fires on the famous blasted heath to add to the fun and all. Pete Muller is shown starting his glow-powered Phlook — funny how everyone is climbing back on the glowplug wagon these days! — note his cross-rib anti-warp wing structure featured both on mainplane and tail.

Radio again for No. **5**, none less than Chris Olsen's Uplift, a low-wing version of Uproar. Pose is not just untidy placing, but represents an action shot from Roger Clark's camera, as the machine comes in for a touchdown. The Olsen prowess at the International Meeting is reported elsewhere in this issue.

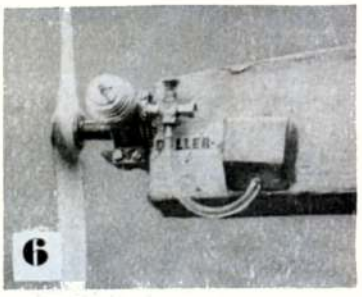
Line drawing and picture No. **6** strikes a really novel note from Scottish reader W. G. C. Glander of Wick, who has adapted a Golden Wings A.P.S. glider to take a Mills ·75. This is specially meritorious as reader is only 14 years of age, and offers the conversion as a cheap road to power flying by other teenagers. His instructions are: "Cut three formers as in sketch. Remove side sheeting and nose block and insert formers and beams. Replace side sheeting and trim to length. Fit engine and adjust C.G. to approximately one-third of chord by adding weight to the tail. The U/C is optional. Model has a fast climb and good glide. Wing tips were very slightly modified."

No. **7** illustrates an excellent idea provided by the I.R.C.M.S. at their Annual Rally this year. Everything that can possibly be needed for simple wing patching-up to a complete rebuild is there — there were even stocks of balsa under the table. This sort of service is one to be encouraged, but, alas, will never be found on those occasions when

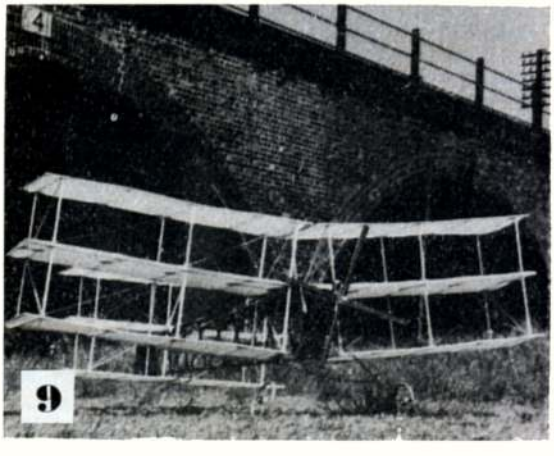


we leave the tool kit at home!

No. **8** is the *piece de resistance* this month, being a truly ambitious — and successful! — effort by A. V. Waller of Hayle, Cornwall. Model will be recognised by the more expert as a Nord 1500 Griffon. Reader used our 1/48th scale plan on its reverse side to produce all the building details for a 1/14th scale ducted fan controliner of 22 in. span, and 38 in. length. Power unit is an A.M.15, using a 3½ in. dia. Veron-Imp impeller, with 20 c.c. Yeoman tank located behind the cockpit. Fuselage is built in two halves, upper and lower, of ⅛ in. planking over ¼ in. double laminated formers. Duct is 1/32 in. sheet lined. Wing is ⅛ in. spars and ribs, covered with 1/32 in. sheet, as is the fin. All up weight is 23 oz. Engine and bellcrank are mounted on a ⅛ in. ply plate, buried in the wing roots. Ailerons and elevators are coupled. The Griffon will take off in 20 yards at about 30 knots, and full up flap (60 degrees) will loop her in about 6 ft.! Reader Waller reports that so far he has only flown it f.f. with static lines to trigger off controls. This should be something to watch!



We wind up with a note of nostalgia in No. **9** by D. Walters of Walthamstow. This is a model of the A. V. Roe triplane, which first flew on Hackney Marshes in 1909, very happily posed against the original viaduct, where that pioneer built it so long ago "underneath the arches". Wing span is 51 in., weight 22 oz., power unit an E.D. Bee — or Hornet. Flying tests have yet to be made, when a further report is promised. Picture is by the builder.



In signing off for another month, may we remind readers that we welcome pictures of their models, with particulars of any special problems overcome in their building. They need not be original designs, curious structures, or fantastic in performance, but just the sort of picture and story that you think would interest *you* if someone else had done it.

Home of Yeoman

FOUR YEARS OF captivity, sweltering or freezing in the prison camps of Italy and Germany, gave Allan Hales ample time to plan his post-war career. As a volunteer in the 1st Middlesex Yeomanry, T/A, it is not surprising that he chose to make a Yeoman of England his trademark and emblem when in 1948 he was able to realise the first stage of a planned advancement by the formation of A. A. Hales, as a model trade wholesaler and manufacturer. Premises then comprised two small lock-ups in Eleanor Road, Bowes Park, which on fine days overflowed onto the pavement to facilitate packing operations by a youthful Georgie Fuller, now risen in status to Works Manager. He can recall with a smile the remark of the small boy, visiting with his father: "Coo, what a load of junk!" and his reply: "Yes, son, but valuable junk!"

But it was in 1949 from these first premises that he commenced to distribute the famous "Wavemaster" boat kits made in conjunction with Hammersmith Models, which set the pattern for a wide range of pre-cut boat kits, known all over the world. Expanding business, built up on a reputation for prompt delivery—no order takes longer than 48 hours to leave the works—brought the next move forward into more spacious accommodation in New Southgate. After Eleanor Road, the new warehouse looked immense, and seemed likely to contain the business for long to come, but in a year or so, it too began to bulge at the seams and demand still further expansion.

Happily, Allan was able to spot a pleasant little newly built factory on a convenient trading estate at Potters Bar, which he was quick to acquire. His premises comprised half of a single storey building, complete with administrative suite, reception hall and usual offices. Hardly had he settled in than the opportunity arose to take over the whole building, which he seized upon eagerly so that his next expansion move could be accomplished right on the spot. So there we have the present home of Yeoman, providing a nationwide service to the model trade.

What sort of an approach has Allan made to break into the magic circle of successful model trade wholesalers? Well, strangely enough, he must be almost the only big man in this field, who is not himself a modeller, though supported in his staff and representatives by those that are. This has enabled him to consider propositions and new lines with a degree of detachment impossible to the specialist enthusiast. He has been able to develop products that expert aeromodellers might have missed. As a family man, his tendency has been to support the younger element of the public with such a range as the Yeoman Quickbuilds, which offer good flying, stout construction, sure results to even unskilled hands, and

Heading: Bright and airy modern Home of Yeoman. Above: Allan Hales confers with Manager George Fuller on "something new". Right: Part of the storage racks and packing tables that make prompt despatch no difficulty.

Left: George reorders Solarbo from the constantly emptying balsa store. Wood bulk makes a heavy demand on space.

Above: Competition model "Dixielander" extensively flight proven by its designer Georgie Fuller has met with instant popularity by virtue of its trouble-free performance and ready acceptance of a wide range of engines. This one by George Fountain (Luton) is for OS MAX 15.

One for the youngsters! This is the lovely Yeoman Trophy presented by A.A. Hales Ltd. for annual competition by juniors in the South Midland Area.

good value for money. He has supported and encouraged youngsters by instituting the Yeoman Pilot scheme of badges—always a draw for small fry—and by such gifts as the Yeoman Trophy, an annual award for young fliers in the keeping of the South Midland Area.

Very early in his career he saw the growing future for model boats. The H.M.M. Wavemaster and other H.M.M. kits did much to promote that interest. He backed it with the Yeoman range of low priced metal boat fittings, and in 1955 launched his first Yeoman boat kit, in the shape of the little balsa "Mite" which proved an outstanding success. His own personal trademark products have always been produced to fill gaps rather than compete with items already on the market. That many are, in fact, now duplicated in the trade is only evidence that his judgment was sound! These Yeoman specialities are now firmly established all over the world—including Germany, which is perhaps the model trade equivalent of selling coals to Newcastle.

The general business of A. A. Hales Ltd., covers the whole range of model goods, including engines, plastics, balsa wood, every conceivable model fitting and accessory, and even embraces many model railway accessories, stopping short only of the toy trade. No manufacturer who has accepted his good offices can have anything but pleasure out of the mutual business resulting, and we can truly say that the genial golf-playing proprietor has progressed in friendship with his business rivals to the ultimate benefit of the end product—satisfied buyers over the counter.

Chester Jeep *(Continued from page 530)*

The year 1937 saw additional nose openings and baffles added, and a new tailskid. Chester placed third in the James J. Davis Trophy Race at 230·746 m.p.h. and second in his qualifying heat of the Greve Trophy Race at 217·883 m.p.h., although he did not fly in the Greve Trophy Race. In the Feature Race "Jeep" placed third at 231·580 m.p.h., and Chester won the Consolation Race at 234·272 m.p.h.

By 1938 Jeep was considerably outclassed in appearances at Oakland and Cleveland. In 1939 Jeep was bought by Tom Staunch but did not fly at the National Air Races. In 1947 Jeep was owned and flown by W. F. Falk, and powered by a Continental C.85, bore little resemblance to the buzzard-winged beauty of pre-war years. With untapered square-tipped wings, a broad blunt-nosed fuselage, and unspatted undercarriage, this quite revolting version of Jeep was maroon and silver. It placed seventh in the Goodyear Trophy Race at 142·519 m.p.h.

From its first appearance, constant modification and improvements kept the Chester Special/Jeep in close competition with later and higher-powered designs from 1933 to 1937.

CONSTRUCTION DETAILS

Fuselage: Welded steel tube structure, dural covered immediately behind the cowling and over the wing. Plywood upper decking aft of cockpit, remainder fabric covered.

Wings: Two three-ply birch spars, built-up birch compression members, solid plywood ribs at 6-inch centres, with spruce caps and stiffeners. Double wire drag bracing, and plywood covered leading edge and tips. Airfoil of original Chester design.

Ailerons: Composite wood and steel construction fabric covered with dural torque tube actuated by push-pull tube and bellcranks.

Empennage: All surfaces steel tubing construction, fabric covered.

Landing Gear: Cantilever members hinged at lower longerons and extending into fuselage, with rubber-snubbed spring shock absorbers.

Vital statistics

Span: 16 ft. 8 in.
Length: 15 ft. 0 in.
Wing Area: 48 sq. ft.
Empty Weight: 765 lb.
Useful Load: 385 lb.
Gross Weight: 1,150 lb.
Wing Loading: 24 lb./sq. ft.
Power Loading: 5·7 lb./h.p.
Fuel Capacity: 30 U.S. gallons.
Oil Capacity: 5 U.S. gallons.
Engine (1936 on):
Menasco C4-S: 200 h.p. at 2,850 r.p.m.
Max. Speed: 255 m.p.h.
Landing Speed: 96 m.p.h.
Range: 325 miles.

НОВЫЕ АВИАМОДЕЛЬНЫЕ ДВИГАТЕЛИ

МД-25 «СПУТНИК»

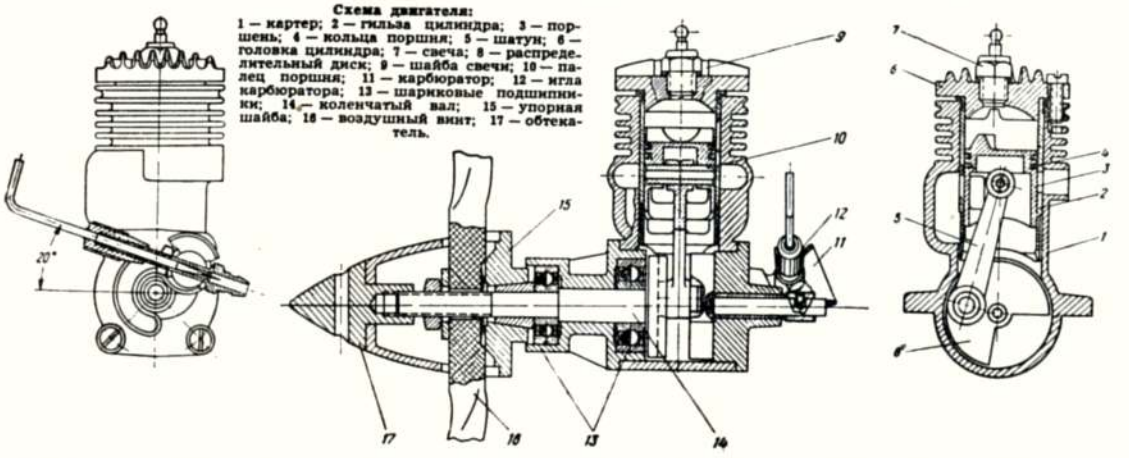
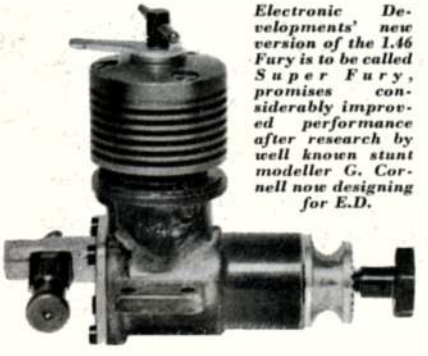


Схема двигателя:
1 — картер; 2 — гильза цилиндра; 3 — поршень; 4 — кольца поршня; 5 — шатун; 6 — головка цилиндра; 7 — свеча; 8 — распределительный диск; 9 — шайба свечи; 10 — палец поршня; 11 — карбюратор; 12 — игла карбюратора; 13 — шарнковые подшипники; 14 — коленчатый вал; 15 — упорная шайба; 16 — воздушный винт; 17 — обтекатель.

MOTOR MART

New styles, new sizes for the coming engines

CZECH INFLUENCE is obvious in the new Soviet *Sputnik* 2·5 c.c. racing engine published in the Russian model magazine, as above. Voluminous transfer passage, comparatively long connecting rod for standard 14 mm. stroke and special attention to the rotor disc and carburettor assembly are trademarks of the Czech M.V.V.S. Like the Spanish and Hungarian speedsters, this Russian motor uses a heavy spinner backplate to act as a flywheel.



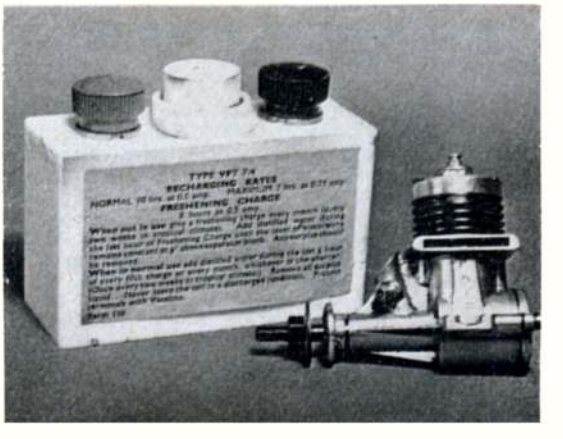
Electronic Developments' new version of the 1.46 Fury is to be called Super Fury, promises considerably improved performance after research by well known stunt modeller G. Cornell now designing for E.D.

New, in England, is the revised **E.D.** *Fury*, aptly christened Super Fury and due for distribution next season. This blue-head is devoid of exhaust stacks, has a new backplate, compression screw lock and modified porting to offer a new standard in the 1·5 c.c. class. In Germany, much the same has taken place with the **Webra** *Record*. A new crankcase, still with shaft valve, allows a longer con-rod and porting changes have improved output.

In the smaller capacity class, **Allbon-Saunders Ltd.** of Milton, Berks. will announce availability of their "55"—a popular-priced diesel featuring a 90 degree fuel feed, metal tank, 360 degree porting and easy starting with high performance. Designed by Allan Allbon the "55" title indicates its ·55 c.c. capacity. Engine mounting holes are thoughtfully spaced so that it will be interchangeable with many other engines in the same power range.

The **Rivers** 3 c.c. diesel mentioned in our Nationals report (July issue) will not become a production engine. Essentially this was a bored out 2·5 c.c. "Silver Streak" with "fore-and-aft" porting arrangement and only two or three of these engines have been made for flight testing and report. Latest is a glow version. This one *may* be a prototype for a production Rivers "19" glow motor.

Left, the new Allbon - Saunders Ltd. 55 diesel, has radial or beam mounting, metal tank, 90 degrees fuel feed and bright performance. At right, the new Frog accumulator developed to suit the .049 glow plug motor. Note new miniature K.L.G. plug fitted to this engine



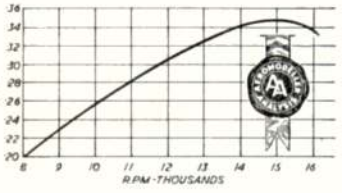
Rivers 3·5 c.c. *Silver Arrow* diesel, on the other hand, is already tooled up for production and follows the "Silver Streak" outlines and construction, but with practically every component different! Only the roller race crankshaft is common, and that has a different throw. New cylinder has three transfer and three exhaust ports (instead of four), transfers are a different shape and shaft intake is enlarged. Photograph shows a prototype with sandcast crankcase (production model will have a die-cast unit), delivering around ·35 B.H.P. at 15,000 r.p.m. Bore and stroke of the Rivers "3·5" are ·647 in. Production engine will deliver ·4 bhp.

News from **International Model Aircraft** is that they are putting out a jelly-acid ("dry") accumulator as a starter and weighing only 11 oz., the use of a "dry" electrolyte means that this can be carried in the pocket (although keeping in a polythene bag, just as a precaution, is advised). Capacity of the battery is approximately five ampere-hours — good for about ninety starts on a single charge. Recharging rate specified is 10 hours at half an amp, or maximum charge rate of ·75 amp for 7 hours. Price 21s. 6d.

Also coming along as a **Frog** accessory is an exhaust unit to screw to the Frog 3·49 stack. This makes the 3·49 respond perfectly to a barrel-type throttle, which presumably will be the next accessory.

Propeller corrections

Between the design-tooling-production stage, incidentally, Frog's have made a "geometric error" over their new 9 x 4 plastic (nylon) propeller. Actual diameter of the propeller works out at 9¼ in. The pitch is a true geometric 4 in. throughout the blade length. By comparison, the old 9 x 6 Frog nylon propeller has washed-out tips and an effective pitch of around the same figure — *i.e.*, 4 in. So the new 9 x 4 prop drives *slower* than the old 9 x 6 Frog nylon, which is a real puzzle to everyone without the above explanation !



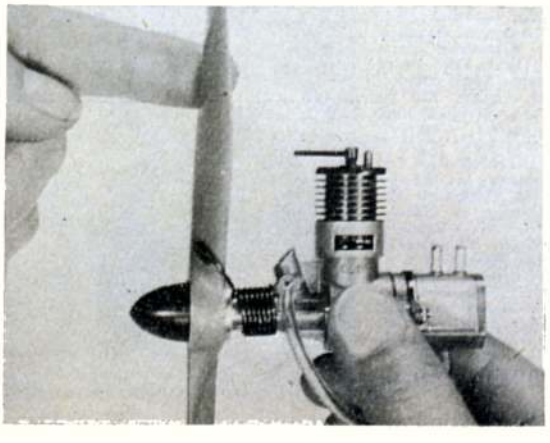
The Frog ·049 appears to be enjoying happy acceptance as the first of the new small glow engines to hit the market and also serves to introduce the new K.L.G. plug. Smaller, cheaper and lighter, this plug has been specially developed to meet the increasing demand for glow ignition in Great Britain and is also standard equipment on the **Davies-Charlton** *Bantam*.

Innovation for the "Quickstart" on this ·046 is the use of a special catchplate for the spring engagement. Checking an advance engine we found the Quickstart system invaluable, allowing a wide tolerance of needle settings, but better to be on the rich side for a certain start after a small upper cylinder prime. The small size of the Bantam (built on a ·5 c.c. crankcase) and its sharp exhaust crackle from shallow ports will make it a favourite choice — leaving alone the low price. Actual capacity is ·75 c.c. and bare weight, a mere 1·3 oz.

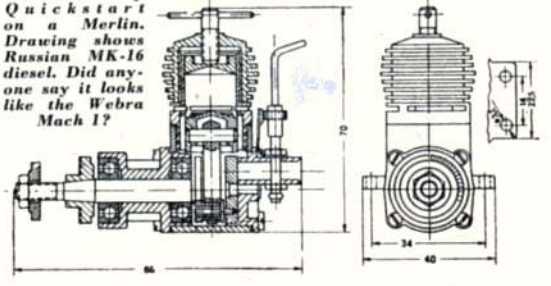
To meet demand for suitable propellers for these small glowplug engines, **Stant** tools have produced the P53, a 5 in. diameter wooden prop of most useful shape and pitch selling at 1s. 9d. including purchase tax, sanded and polished.

New Rivers Silver Arrow 3.5 c.c. with our test results at left. Engine promises to be most powerful available for combat in its capacity class, and introduces long carburettor

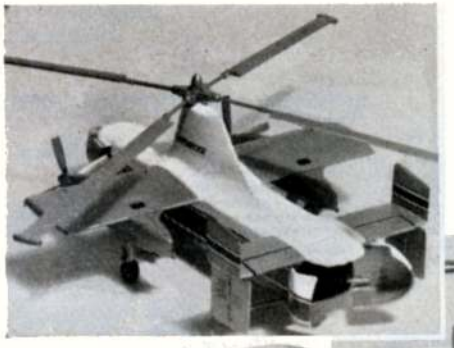
One way of getting reduction gearing plus a flywheel. This Hungarian engine made by A. Vella, is one of several sizes. Gear ratios are in the order of 1 : 5 and he has employed this on engines down to 0.25 c.c.

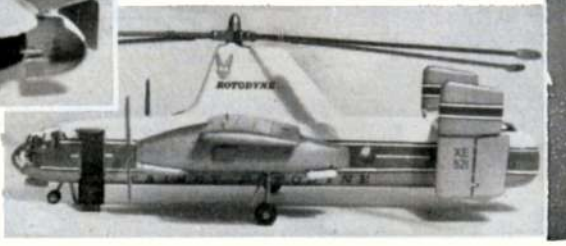


Above right, Davies Charlton's Bantam .75 c.c. is easy to start with their patented Quickstart Left, is a demonstration of how to wind up Quickstart on a Merlin. Drawing shows Russian MK-16 diesel. Did anyone say it looks like the Webra Mach 1?



Trade Notes





Two views of Airfix's Rotodyne display opening doors and fine detail with authentic colour scheme. Undercarriage is retractable, elevators are moveable and rotor head spins.

Above, Frog Condor and Keil Kraft Gazelle, built for our testing have been performing well. Condor is good on Frog 249 B.B. and Gazelle has O.S. Max 15.

No less than 115 separate pieces go to make up what must really be the greatest value ever in the plastics market. We refer to **Airfix's** Rotodyne, pictured above. This is no one evening knock-up, it's a model that deserves lots of attention and at 6s. with moving parts, and current livery transfers, the Rotodyne is sure to be a rousing success.

Airfix have made this kit their pride and joy with full justification and if what we know of their future programme materialises to plan, modellers can expect even more pleasant plastic kit surprises before the year is out. Another plastics manufacturer we admire for extreme skill in devising fascinating new kits is **Rosebud Kitmaster.** Their kits for Loco's are now enhanced by the 2-6-2 Prairie Tank and 4-6-2 Coronation Class "Duchess of Gloucester", 4 mm. scale to a very high standard, and a measure of the way these all-British kits are appreciated is the way we observed them on sale at all leading Continental model shops (holding their own against stiff competition) during our recent tour.

What a refreshing new design is **Keil-Kraft's** new Marquis stunt model for 1-1·5 c.c. This elliptical winged 30 in. span trike undercarriage creation by Ernie Webster, is as near a modern high speed lightplane as one can get in semi-scale, reminding one of the Italian Falco. Diestamped parts, wheels, tank and controls are supplied in a 32s. 6d. kit, which we rate highly for value. Design weight is a mere 13-oz. and with coupled flaps, we expect our test model to go through the book on many a 1·5 c.c. diesel.

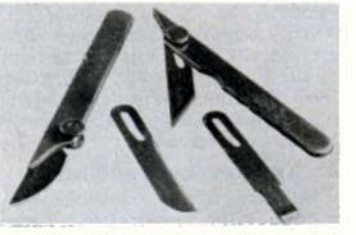
Only criticism we have of this kit is the flimsy cabin moulding, but there we know are production and costing difficulties. Its surprising how much a thou' or two thickness adds to the expense of a canopy. In the same way those who complain of bleak boxes for contest type models, should remember that a pretty box is only cheap when the kit run is several thousands. These points are often overlooked by complaining Saturday morning shop counter fliers.

The new plastic props from **Frog,** 7 x 6 at 1s. 3d. in red plastic and 2s. 6d. in translucent nylon, 9 x 4 in nylon only at 3s. 6d., are just the job for the 1·5 team racers and 2·5 free-flighters. The Frog 150 will now complete a ½A race with only one stop, using a 7 x 6 (5 per cent. nitro Benzine added to fuel). By the time this appears in print, the 8 x 4 will join the range in plastic and nylon.

Frog's Gladiator Combat/stunt wing for the 2·49 is a practical 36-inch swept forward tough design reminiscent of the very successful American kit by deBolt. Selling at 28s. 9d., the Gladiator introduces the new red moulded nylon bellcrank—just the job for a combat design.

For several years we have been envious of American use of Butyrate dopes. **Hamilton** Color-Craft Ltd. of Gateshead now announce availability of these Fuel -proof dopes for British modellers. Seven colours, plus clear and special thinners will be included in the range, and our initial tests prove the claims to be correct. Complete immersion of the colour in a nitro methane mix tended to soften the surface; but this would be an exceptional circumstance. For everyday use, Butyrate is fuel-proof and has many advantages to recommend its use.

Above, Lepage's new stand for shop counter display emphasises their P.V.A. white glue which we find ideal for modelling. New propeller profiles are in the Frog plastic and nylon range and are of efficient shape and section, sizes 7 x 6 and 9 x 4 at reasonable prices. Below, Swann Morton modelling knives are invaluable for balsa cutting, version at right useful for field work.

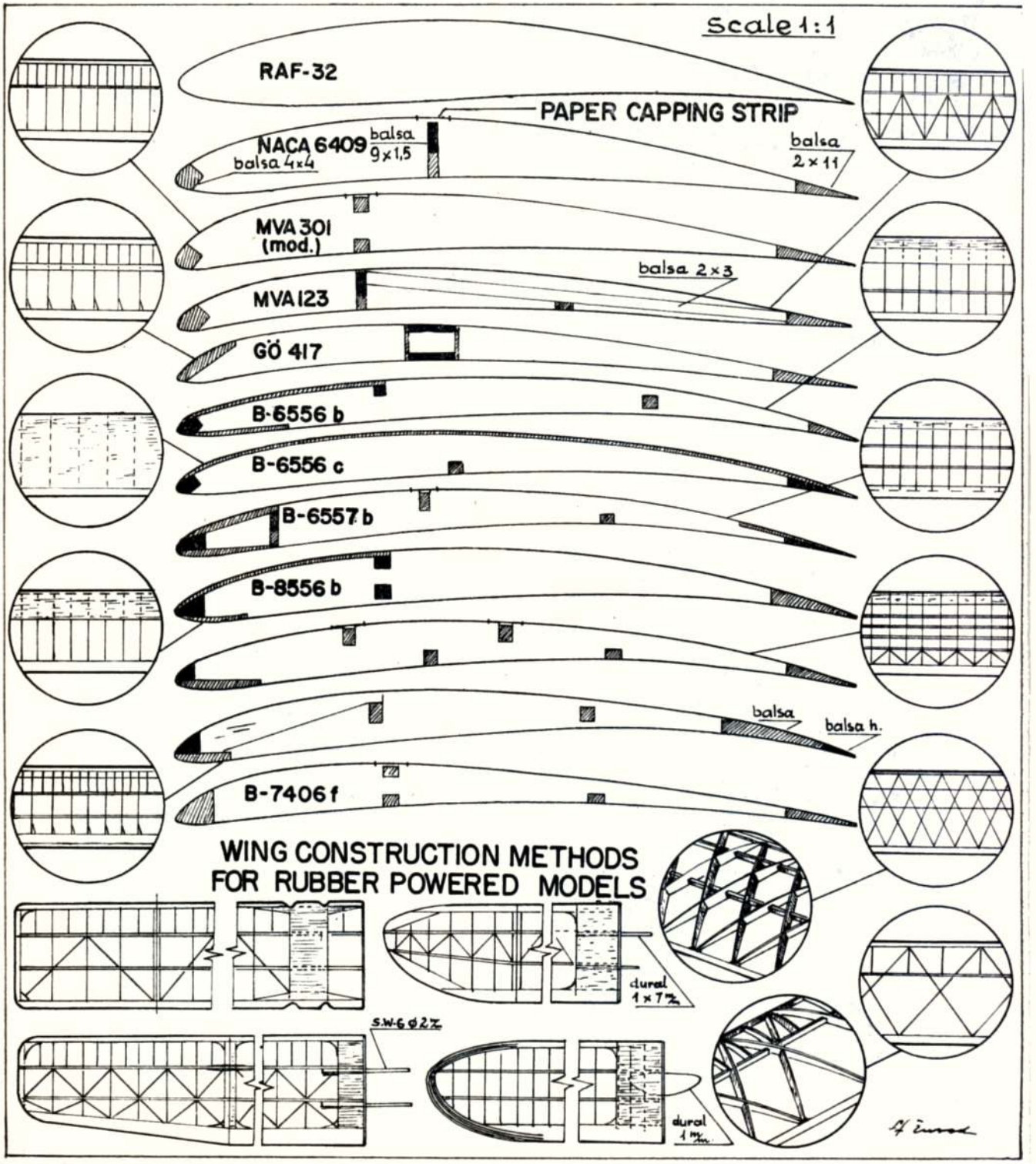


Latest Revell plastic in U.S.A. and Continent of Europe is 1/36th Sopwith Camel. Right, Brussels rendezvous for visiting internationalists, is Henry Stouffs shop in Rue de la Fourche. Here U.S. and Pakistan teams are made welcome.

Wing Structures . . . by Stanislav Zurad

This selection of a dozen different approaches to rubber power model wing construction methods as employed by the well-known Polish Wakefield Contest flyer illustrates how one can utilise materials to best advantage. The centrally-disposed spars used in some sections are popular in East European countries but provide construction difficulties. In a number of Benedek airfoils, emphasis is laid upon obtaining a smooth entry to the underside of the wing with use of an extended leading edge. Paper capping strips are indicated by tick marks on the upper surfaces of five airfoils and are useful for maintaining true rib depth where tissue sag might otherwise spoil the section.

Each of the airfoils illustrated belongs to the popular current school of thought and R.A.F. 32 is shown at the top for comparison as being the classic example of early Wakefield model airfoil selection.



Now's the time to think of Exhibitions. This fine show by Deal M.A.C. attracted over 4,000 visitors

WITH THE END OF summer time, dark evenings and week-end flying possible only on the better days, live club secretaries must be exercising their minds on projects to maintain interest. Once upon a time, r.t.p. flying of light rubber jobs was the thing, with occasional mike models for those lucky enough to have lofty meeting places. What do the flyers do in the wintertime these days? Is there any growth in flying of electric powered plastics? Do the unscrupulous darken the floors of church halls with diesel fuel flying the new "teenies" indoors? Are highbrow theoretical discussions held? Does the chairman insist on showing his colour slides? We shall be most interested to learn what clubs have planned, so work out a programme and tell us your views.

London

NORTHWOOD M.A.C. reports that it is again top combat club. Together with ally **KENTON M.A.C.**, it has gained five firsts, one second and six semi-final placings in the eight rallies entered this year. Oliver-powered Razor Blades are used exclusively. Combat flyers Pete Perry, Dick Pratt and "Tib" Tribe, finished one, two three in the Club Championship.

NORTH KENT NOMADS have been flying this season on Dartford Heath, with rather fewer entries than normal, though this should not be considered the reason that Chairman Ray Parker, is well ahead of the rest of the field! Prangs reduced support for Dance R/C Trophy at Gravesend, but Roberts Cup held in Danson Park, produced a claim for a new British flying boats record by Ray Parker with a 76 secs. flight. Club's Annual Dinner will be on November 28th at Grove Tavern, Dulwich. Visiting modellers will be welcome and tickets (17s. 6d.) can be obtained from Hon. Sec. W. Hubbard, 161 Hook Lane, Welling, Kent.

HAYES M.A.C. are getting some good times in speed C/L with 107 m.p.h. for 2.5 c.c., 115 in 5 c.c. and 131 in 10 c.c. Top team race time is 4 : 27 set up by Graham Rivers.

Midland

LEICESTER M.A.C. have been active with a Gala Day that boasted usual fine weather and a fine airfield, but produced moderate entry only. Events were run for Power, Rubber, Glider and Junior cups. Their Control Line Rally however, attracted entries from all over the Midlands, plus **PORTSMOUTH** and **BOLTON.** Sixty-six stalwarts fought in the Combat, winners being Devonshire **(Mansfield),** Deville **(Derby),** Gibbard **(Derby)** and Wilkes **(West Bromwich).** Stunt attracted nine, with B. Horrocks, **(Wolves,)** winner by a small margin. Winter programme includes film show, bring and buy sale and a dinner.

GEE DEE MODEL CLUB, Nottingham, have been doing good work by officiating at the Wigsley Meeting for Combat, giving displays at British Legion fete at Radcliffe-on-Trent, with stunt, combat and scale C/L, and will follow with an exhibition at the Elite Ballroom, Nottingham, in first week of November.

WEST BROMWICH M.A.C. have been active in Combat, Mike Kendrick taking the event at Cranfield, Dave Wilkes taking third at Leicester's rally, using Oliver-powered "Black Ghosts". Mac Grimmett's Fox 35 "Smoothie" took the club stunt event comfortably. **OUTLAWS (CANNOCK) M.A.C.** is another well travelled club, with places recorded at Leicester's rally by Eric and John Burke. Trip to Cranfield, however, failed to bring back any prize money or silverware!

East Anglian

DEBDENAIRS M.F.C. writing on new notepaper with delta symbol for the initial D, printed by junior member Bernie Stilgoe, are another well-travelled Combat-Team Race club, possessing withal enough free flight members to vote them into a C/L-less coach trip to the area gala, when Allen lost his Y-Bar o.o.s. on its maiden flight, but was later solaced by winning the club Glider Cup with his G.B.IX from Mike Pointing, who in turn won a Premium Bond prize for free flight power. Pete Hall took the juniors' Woodford Special, and a good time was had by all.

East Anglian Area Gala was held at Debden and their C/L Gala at Martlesham in August. Well supported events produced winners from Belfairs, Clacton, Debdenairs, Anglia, Cambridge, Brentwood, Norwich and Essex clubs, so that the prize list evidently went thoroughly into circulation.

South Midland

LUTON AND DISTRICT M.A.S. strike a sad note with the report that one of their oldest members—joined 1937—Sam Barrett has died, aged 65, only six weeks after his retirement. With interests in Wakefield, power and glider models, he was always appreciated for his unassuming help in the background, and will be greatly missed.

Western

WESTON CONTROLINERS have had a good season. At the area R.A.F. Champs., "Red" Phinn took first in Combat and F.A.I. Team Race, second in Stunt and third in ½A Team Race. R. Robertsson was second in Combat. At the Blake Hill Farm Area Rally, R. Johns won back the Weston Cup, presented by model shop proprietor Evans, in 1949. In the free flight department (in spite of club title, apparently they do!) N. Wilkins put up his Merlin powered K.K. Skylon for 14 : 10 on a 17 sec. engine run.

WHARFEDALE CLUB'S visit to S. Midland Rally at Cranfield was marred by a fatal accident in which their coach was involved. Eight members were involved, six being taken to hospital for treatment, one being detained. Alas four occupants of the car in collison died, both vehicles being regarded as completely written off. In spite of this, ten members continued to the Rally, and Richard Place was able to secure third place in Class A Team Race. The club played an active part in Northern Gala at R.A.F. Rufforth, by organising the three T/R events, and hope visitors enjoyed the result.

Southern

SOLENTS HEIGHTS M.F.C. took part as usual in International Correspondence Competition, between clubs in I.O.W., Germany, Holland, U.S.A. and Canada. As a team the club were first in unlimited glider, chuck glider and power events, and second to New England, Mass., in rubber. Glider individual was won by Keith Humber, Solent; power by John Wood, ditto. Organisers of this established "postal" event would like to have club entry or two from Southern Hemisphere, so would-be flyers are asked to contact Hon. Sec. Contest Director, Ferdy Joosten, 3654 Oxenden Avenue, Apt. 4, Montreal 18, Prov. of Quebec, Canada.

Another Southern club has been in touch with overseas, since BEXHILL AND DISTRICT A.C. send details of their happy relationship with Glenelg M.A.C. of Victoria, Australia, whose club magazine they forward for general interest. Bexhill has just started R/C with moderate success, but echoes the heart cry: "How do you keep them out of trees?"

Services

R.A.F. KHORMAKSAR is with us again, though former Hon. Sec., J/T Gallagher has gone home on medical grounds (not at the thought of flying C/L as rumoured!). New sec. is 1928775 J/T Woodward, Block 5 T.W., R.A.F. Khormaksar, B.F.P.O. 69, who tells us that their local N.A.A.F.I. has just produced a brand new Elfin 2·49, circa 1950 (sic) complete with guarantee. It is getting a little chilly for the M.E. out there with temps. down to a mere 98 degrees in the shade, but interest is high.

North Western

WALLASEY M.A.C. is enjoying a newly awakened interest in rubber models, with new jobs nearly off the building boards from John Hannay, Eric Davies and John Manson. These were not in time to prevent poor rubber showing spoiling the club's chances in the Area Rootes Trophy event, though John Done won Glider, and G. M. Hutton was second in power after a fly-off.

WIGAN M.A.C. were the lucky people (or skilful would be more polite) who *did* take the Rootes Trophy at Stretton. Vast numbers of members took an active part—with at one time no less than ten club gliders all being ready to go as called. Several members made the long journey to the Scottish Gala, where B. Talbot was rewarded by first in Glider and second in Power, while Mike Hosker took the rubber event. Wigan have also won the English Electric Trophy, and are making room on the club sideboard for any other items that come their way.

The CLUBMAN

New Clubs

GIRLING M.A.C.
B. Young, Esq., 11 Farne Lane, Town Centre, Cwmbran, Mon.

FOUR ASHES M.A.C.
A. R. Owen, Esq., 75 Slater Road, Bentley Heath, Solihull, Warks.

Change of Address

LUTON AND D.M.A.C.
E. C. W. Clark, 26 Heywood Drive, Luton, Beds.

Secretarial Changes

SOUTHEND SENIOR M.C.
J. L. Delmue, Esq., 11 Nayland Crescent, Prittlewell, Essex.

WICKFORD M.A.C.
L. Warren, Esq., Bromfords Villa, Borwick Lane, Wickford, Essex.

N. KENT NOMADS
B. Hubbard, Esq., 161 Hook Lane, Welling, Kent.

CHORLTON M.F.C.
J. A. Hart, Esq., 47 Firbank Road, Newall Green, Wythenshawe, Manchester 22.

See also page 552.

For Your Diary . . . & S.M.A.E. Results

October 25th
Blackheath Gala, Chobham Common. NOT October 4th or 3rd as previously announced. Bill White Cup Rubber, Glider, Power.

November 8th
East Midland Area and Northern Models Association winter rally. R.A.F. Wigsley, Lincoln, all F/F events, combat and radio (Ripmax Rules).

November 15th
Loughborough College Winter rally. R.A.F. Wymeswold, 10 a.m. F/F rubber, glider, power and combat.

December 21st
North Western Area Winter Rally. Open to N.W. Area only. F/F all classes, R/C, C/L. R.N.A.S. Stretton.

Northern Gala

September 6th, 1959, R.A.F. Rufforth

Open Rubber — *Caton Trophy*

1. J. O'Donnell		Whitefield	12.00+ 5.28
2. N. Elliott	...	N. Kent	12.00+ 4.30
3. E. Black	...	Glasgow	12.00+ 4.10
4. N. Cliff	...	Prestwick	12.00+ 3.34
5. A. Kimber	...	Eng. Elec.	12.00+ 3.27
6. J. Pool	...	Halifax	12.00+ 3.15

153 *Competitors:* 9 *triple maximums.*

P.A.A. Load

1. A. Collinson	...	Baildon	9.08
2. A. Farrar	...	Wakefield	6.41
3. P. Muller	...	Surbiton	5.18
4. E. Lord	...	E. Lancs.	5.15
5. R. Firth	...	Sheffield	3.15
6. A. Robson	...	Teeside	2.29

7 *Competitors.*

Open Glider

1. C. Jackson	...	Chorlton	9.00+ 2.13
2. J. Rider	...	Wigan	9.00+ 2.12
3. J. M. Sheppard		New Zealand	9.00+ 1.58
4. R. Shirt	...	N. Sheffield	9.00+ 1.55
5. A. Garnett	...	E. Lancs.	9.00+ 1.25
6. E. Broadbent		Ashton	9.00+ 1.23

99 *Competitors : 6 triple maximums.*

Open Power — *Hamley Trophy*

1. A. R. Collinson		Baildon	12.00+ 7.58
2. G. Hutton	...	Wallasey	12.00+ 4.51
3. M. Hosker	...	Wigan	12.00+ 4.03
4. J. H. Hopkins		Chorlton	11.52
5. T. Smith	...	Cheadle	11.33
6. J. O'Donnell	...	Whitefield	11.20

70 *Competitors*

Team Racing—Class ½A.

1. M. Bassett	...	Sidcup
2. D. R. Dew	...	Sidcup
3. J. Templeman		

Class A

1. F. Stevens	...	Enfield
2. N. Kirton	...	Stanley
3. J. Riley	...	Enfield

Class B

1. P. Drewell	...	Lomac
2. T. Rowley	...	Neath
3. L. Steward	...	West Essex

Radio Control — AEROMODELLER TROPHY

1. C. H. Olsen	...	C.M.	208.5 pts.
2. J. E. Johnson	...	A.R.C.C.	165.5
3. J. Singleton	...	A.R.C.C.	65.5

Scottish Gala

August 23rd — R.A.F. Abbotsinch.

Open Rubber

1. M. Hosker	...	Wigan	12.00
2. J. O'Donnell	...	Whitefield	11.51
3. U. A. Wannop		Edinburgh	11.28
4. B. Picken	...	Wigan	11.11
5. J. B. Pool	...	Halifax	9.43
6. H. Tubbs	...	Baildon	9.35

Open Glider

1. B. Talbot	...	Wigan	9.00
2. G. Tideswell	...	Baildon	7.53
3. A. W. Spurr	...	Teeside	7.17
4. W. Meechan		Glasgow	7.15
5. R. Foster	...	Sheffield	7.06
6. B. Picken	...	Wigan	6.58

Open Power

1. A. Farrar	...	Wakefield	10.30
2. B. Talbot	...	Wigan	9.55
3. D. Reid	...	Edinburgh	9.24
4. A. J. Smith	...	Stranraer	9.03
5. T. Lawrie	...	Paisley	8.48
6. J. Campbell	...	Paisley	8.36

Radio Control

1. G. W. Parkinson		Kendal	28 pts.
2. J. Craig	...	C.M.	21
3. P. Dowker	...	Kendal	17

Team Race—Class A — 1. J. Stoddart

Class B — 1. R. Forrest

Modellers can be assured of personal service coupled with expert knowledge of aeromodelling requirements at any of the following shops.

HARROW *Tel.: Har 5958*

WEALDSTONE MODEL SHOP

39 THE BRIDGE, WEALDSTONE, MIDDLESEX

FULL RANGE OF AIRCRAFT KITS, FLYING, SOLID AND PLASTIC. BOATS, CARS, BALSA, DIESELS, etc. Mail Orders by return

AUSTRALIA *Tel.: Melbourne Cent. 918*

CENTRAL AIRCRAFT CO., PTY.

5 PRINCES WALK, MELBOURNE, C.1

Australia's Main Distributor for: "Aeromodeller", "Model Maker" and their Plans Service.

CRAWLEY

KIRKMAN

40 The Broadway

(next to Premier Supermarket)

AIRCRAFT AND BOAT ACCESSORIES
RADIO CONTROL — ELECTRONICS

HONG KONG *Tel.: 62507*

RADAR CO. LTD.

2 OBSERVATORY ROAD TSIN SHA TSUI, KOWLOON

The most complete stock of aeromodelling and hobby supplies in the Far East. Run by an experienced modeller. Agents for Solarbo, Britfix and Sole Agents for O.S. engines and radio control equipment

BIRMINGHAM *Tel.: EAS 0872*

THE PERRYS

769 ALUM ROCK ROAD, WARD END

Agents for all leading kits, engines, radio control model car racing. Advice without obligation by return postal service.

DARLINGTON *Tel.: 66399*

HANDCRAFTS

31 BONDGATE, DARLINGTON COUNTY DURHAM

Boats, Model Railways, Aircraft
Everything for the Model Maker
Send S.A.E. for Lists

LEEDS *Tel.: 27891*

THE MODEL SHOP

58 MERRION STREET (Nr. Tower Cinema)

Model Aircraft — boats — cars — railways, all makes engines. Every accessory, R/C equipment, same day postal service.

BLACKBURN

RAWCLIFFE'S

FOR MODELS

38 WHALLEY RANGE BLACKBURN

MODEL BOAT KITS
AIRCRAFT KITS
ENGINES & ACCESSORIES

DONCASTER *Tel.: 2524*

B. CUTTRISS & SONS

MODELS AND HANDICRAFTS

49-51 CLEVELAND STREET

Call and see our Shop

LEIGH

LEIGH MODEL CENTRE

97 RAILWAY RD., LEIGH, LANCS.

We will supply anything from stock. Specialists in engine repairs. R/C conversions.
Mail order by return anywhere in the world

BOLTON *Tel.: 7097*

ROLAND SCOTT

The Model Specialist

147 DERBY STREET

The obvious shop for all Model Aircraft Requirements

EASTLEIGH *Tel.: 2469*

PRECISE MODEL KRAFT

80 SOUTHAMPTON ROAD EASTLEIGH

EASTLEIGH! Famous for trains, large and small. *The Complete Model Stockists.*
You want it — we stock it

LINCOLN *Tel.: 588*

THE MODELMAKERS MECCA

13 CLASKETGATE

(Next Door to Theatre Royal)

Large stocks of all Plastic Kits, Engines, uels and accessories. Stockists of Triang, Trix, Rivarossi Railways.

BOURNEMOUTH

WESTBOURNE MODEL SUPPLIES

2 Grand Cinema Buildings, Poole Road, Bournemouth West

IS THE SHOP WITH THE STOCK
Why not visit us when in Bournemouth?

GLASGOW Central 5630

CALEDONIA MODEL CO.

Model and Precision Engineers

5 PITT STREET, C.2

Our works at your service for engine repairs, rebores and rebuilds
Everything for beginner and enthusiast

LONDON *Tel.: PAD 8827-8-9*

BURLEIGH'S

303 EDGWARE ROAD, W.2

THE MODEL MAKERS' PARADISE

BURLEIGH of Edgware Road, Ltd.

CANTERBURY

MEERS (Engineering) LTD.

THE MODEL SHOP, 20 SUN STREET, CANTERBURY

(Under the Shadow of the Cathedral)
The largest stock of Aeromodelling Equipment in East Kent. Your visit welcomed. By-return Postal Service.

GRIMSBY *Tel.: 3220*

THE MODEL SHOP

49 NEWMARKET STREET

Plastic, flying model kits and accessories
Send S.A.E. for price list

RADIO REPAIRS — PROMPT SERVICE

LONDON *Tel.: HOP 3482*

MODEL AIRCRAFT SUPPLIES LTD.

171 NEW KENT ROAD, S.E.1

The oldest established aircraft shop in London. Service with satisfaction

CLASSIFIED ADVERTISEMENTS

PRESS DATE for issue January, 1960, November 20, 1959

ADVERTISEMENT RATES

Private	**Minimum 18 words 6/-, and 4d. per word for each subsequent word.**
Trade	**Minimum 18 words 12/-, and 8d. per word for each subsequent word.**

Box numbers are permissible, to count as 6 words when costing the advertisement.

COPY and Box No. replies should be sent to the Classified Advertisement Department, The "Aeromodeller" 38 Clarendon Road, Watford, Herts.

FOR SALE

E.D. Everest 6-reed Receiver, Transmitter and Control box, complete £16 o.n.o. Edmonds, 24 Carrington Road, High Wycombe, Bucks.

K.B. 29 40s. Eta 29 55s. Elfin 2·49 40s., 1·49 30s., ·49 25s. Hill Rx 20s. P100 relay 15s. Conquest Escapement 15s. Also wheels, props, plans, five models, etc. Modelling cupboard-cum-building board on legs, ideal for bedroom modeller 20s. (Buyer collects.) AEROMODELLERS Set 48 to date; *Model Aircraft* January, 51 to date; both mint condition. Offers? Rose, 3 Kingsway, Woodford Green, Essex.

O.S. 35, bench run only £4 or nearest offer. Gendle, 41 Nut Lane Middlesbrough.

Unused Veco ·19 £5. A.M. 3·5 50s. E.D. "Bee" £1. Allbon 1·5 30s. Dean, Vineyards Road, Northaw, Herts.

Hardly used Ohlsson 35 petrol ignition engine £3, o.n.o Matthews, Weehoose, Knollway, Warden, Leys Down, Kent.

Fox 59, hardly used £8. Atwood Glo-Devil terrific £6. Would part exchange for 19, 29 or 35 Glow engines. G. Halley, 46 Poplar Road, Methil, Fife.

Good Allbon Spitfire Mk. II, unflown 30s. Dart, fair condition, 8s. Allport, June Rise, June Lane, Midhurst, Sussex.

E.D. 2·46 Racer, recently overhauled, in perfect running order £3, o.n.o. Elliot, 36 Longcroft Crescent, Hawick.

Dooling, McCoy, Anderson, Fox, Cox, Johnson, Pulse Jets, etc. New or perfect, reasonable prices. 54 Lebanon Court, Twickenham.

New 2·5 Webra Mach I £4. Enya 29 with two-speed control £5 10s. Bonner Varicomp £6 10s. Two Mullard 3.V.4 valves 20s. E.D. Polarised Relay 15s. "Aircraft of the Fighting Powers" 1-4 £3 10s. Taylor, 33 Cecil Avenue, Bournemouth.

E.D. 3-reed Mini Receiver, Transmitter, 6-way control box., eight months old £13 10s. E.D. Transitrol Receiver, Transmitter. New valves throughout £7 10s. New Uniac Servo 30s. E.D. Clockwork Actuator 35s. E.D. Racer 246 £2. O.K. Cub 29 Glow, used twice 85s. D.C. Spitfire 1 c.c. 30s. Adcock, 26 Violet Road, West Bridgeford, Nottingham. Phone: 88503.

A.M. 25 45s. Also Thermal Hopper in exchange for Frog 500. Other engines considered. Brennan, 4 St. Annes Gardens, Woolston, Southampton.

McCoy 29 stunt, Enya 19, Webra Mach. I, all bench run only. Oliver Mk. II works tuned. Offers, s.a.e. Rowell, 48 Richardson Road, Thornaby, Yorks.

EXCHANGE: E.D. Racer III, excellent condition, for A.M. 15 and any other good engine. Sale £3. Savage, Ratcliffe College, near Leicester.

Berkeley B.25 kit £4. Thermal Hopper 0·49 engine £3, o.n.o. Bennett, 20 St. Edmunds Road, Sleaford, Lincs.

Sell any American Glow Engine, ·020-·049 £2 10s. 6d.; ·074-·150 £4 0s. 6d.; ·190-·350 £8 0s. 6d. Exchanges for British ·049's (glow) also. J. Noble, Bridgewater, Nova Scotia, Canada.

Three E.D. Racers £5 the lot. Frog 500 £1, E.D. Comp. Special and Bee 10s. Elfin 1·49 30s. Z. H. Batlivala, Clifton College, Bristol.

Transitrol Receiver, as new, complete with switch. Also 5ma, meter, perfect working order £5, o.n.o. P. C. Stanley, Police Station, Malvern. Worcs.

Unflown Mercury Aeronca Sedan with new A.M.25 £12. A.P.S. Libellula with rebored Amco 87 45s. Various aeromodelling books, magazines, and accessories, s.a.e. for list. Barnes, 4 Copleston Road, London, S.E.15.

Near completed R/C model, boxed Fox 15, Hill Receiver, Typhoon Esc., Airwheels, Batteries. Wanted: Redhead Dynajet, as new. Webb, 16 Buxton House, Snaresbrook Road, Leyton, E.10.

New, unused Ripmax Receiver, £6 5s.; Mactuator, 17s. 6d.; 0-5 milliameter, 7s. 6d. Perfect working condition. Hazell, 39 Hillside Grove, Chelmsford.

Good Reliable Engines, two A.M.s, 35's, 35s. each; one Allbon Merlin, 30s. S.A.E. Holmes, 49 Brothertoft Road, Boston, Lincs.

E.D. 2·46, Mills 1·3, Allbon Merlin, Frog 45, M. Matador uncovered, accessories, etc., £7 lot or exchange 00 gauge Railway equipment. Also 1937 *Janes All The World's Aircraft*. Offers. "St. Rumbold", Alton Road, Odiham, Hants.

Fox 35, £6 10s.; Wing off K.K. Competitor, 2s.; Skystreak 26, 8s. Box 600.

Little used Tiger II, Mk. III fins, choke, 90s.; Early Eifflaender 2·5, Checksfield rework, fast motor, £5; reworked Tiger III, 90s.; new Amco P.B., 30s.; Amco P.B. less shaft, 10s. Hill, 73 Park Road, Ilford, Essex.

Tuned Racer, completed combat model, other accessories, £4 10s. the lot. Seabrook, 50 Morley Crescent East, Stanmore, Middlesex.

E.D. Hornet as new, hardly used, 39s. o.n.o. J. Sillett, 36 Galway Avenue, Ipswich, Suffolk.

Two-speed E.D. 3·46, under one hour's running, 55s.; Actuators: Elmic Conquest, perfect condition, 24s.; E.D., 12s. 6d.; Sallis miniature relay, 10s. o.n.o. S.A.E. to Thacker, 18 Wilton Park Road, Shanklin, I.O.W.

For Sale.—AEROMODELLER Transmitter without aerial, and Hill 2-valve receiver, £7; Frog 2·49 c.c. BB, 50s.; Elfin 1·8 c.c., 30s.; Comp. Special, 25s.; Jaguar 0·8 c.c., 50s. Send S.A.E. to 148 Nottingham Road, Alfreton, Derbys.

AEROMODELLER Transistorised Receiver, P.C. Transmitter, £6 o.n.o.; McCoy 29, perfect, no plug, £5 o.n.o. S.A.E. to Temple, Lockites, Charterhouse, Godalming, Surrey.

A.M. 25, just run in, 40s.; Taifun Hobby, ·98 c.c., 20s.; "Boomerang" R/C, complete outfit less batteries, £5. C/T Bryant, Sergeants' Mess, R.A.F. Hospital, Wroughton, Wilts.

Must sell.—E.D. 3·46, £2; E.D. Boomerang, complete, £9; all only bench tested, with model if collected. Also Triang Aircraft Receiver, £2; ETA 29 Mk. 4, £3; and 2-volt Varley Accumulator, 10s. R. P. Hardy, 37 The Oval, Sidcup, Kent.

Oliver Mk. III, 75 minutes on bench, £6. Ward, Oaklands, Egerton Drive, Langdon Hills, Basildon, Essex.

Frog Aerobat, without flaps, with Modified Frog, unflown, £4 10s.; A.M. 35, 30s.; Frog 3·49 BB, not run in, £3; 4 inch Airwheels, 15s.; Boomerang Rx, unused, 70s. All replies to: Asst. Sec., Hucknall & D.M.A.C., 11 Tichfield Terrace, Hucknall, Notts.

WANTED

A powerful 10 c.c. glowplug engine in good condition, *e.g.*, Nordec, McCoy, Anderson Spitfire. Details to B. Pinyon, 21 Transmere Road, Petts Wood, Kent.

Will pay £10 for any complete Janes A.W.A. 1909 through 1926. Also want W.W. I.R.A.F. Technical Rigging Notes. Mathieson, 1912 Monterey Avenue, Berkeley, California, U.S.A.

AVIATION BOOKS WANTED: Old aviation and airship books wanted by world's largest dealer in aeronautical literature. Cash by return of post. Stuart, Fairlight Hall, Hastings.

Foreign stamp collections valued and purchased at highest prices. Send to John Lister Ltd., 186/8 Shaftesbury Avenue, London, W.C.2.

TRADE

Ex-Services Stop Watches (Wrist and Pocket). Split Action Stop Watches, Time-off-Trip Clocks. Wrist Chronometers and Watches, etc. All with 12 months' guarantee. From 52s. 6d. Binoculars, Telescope.s Send S.A.E. for list. United Technical Supplies Ltd., Dept. A, 3 Harrow Road, London, W.2.

A few specially assembled 3·5 Amco P.B. engines are available, fully guaranteed, 65s. Spares and repairs. Weaver, 26 Selborne Gardens, London, N.W.4.

Ex-Government Stop Watches, 45s. Illustrated leaflet on request. Charles Frank, 67-73 Saltmarket, Glasgow, C.1.

BOOKS

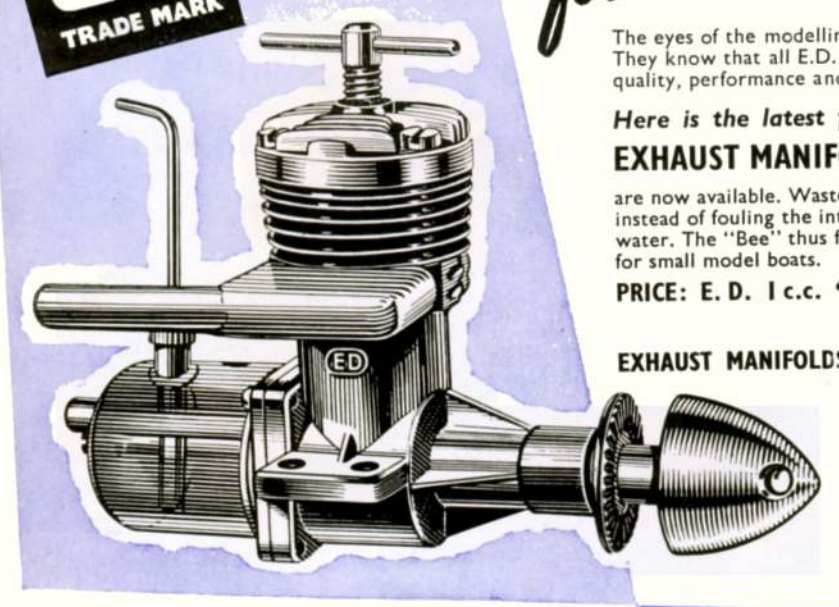
American Magazines. Year's subscription. *Model Airplane News*, 35s. Full catalogue free. Willen Ltd. (Dept. I), 9 Drapers Gardens, London, E.C.2.

MODEL AVIA—the monthly magazine for model flying in Belgium. Send for free specimen copy and subscription details. Model Avia, 67 Avenue Victor Emmanuel III, Uccle, Belgium.

SAILPLANE AND GLIDING—Published every month. Send stamped addressed envelope for descriptive leaflet; or 2s. 10d. for current copy; or 17s. for a year's subscription to British Gliding Association, Dept. A, 19 Park Lane, London, W.1.

ED TRADE MARK — The Finest Equipment for the MODEL MAKER

The eyes of the modelling world are always on E.D. They know that all E.D. Products can be relied upon for quality, performance and value.



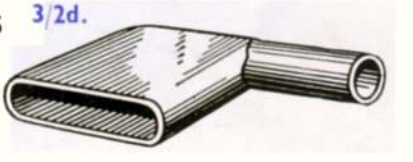
Here is the latest from E.D.

EXHAUST MANIFOLDS for the E.D. 1 c.c. 'BEE'

are now available. Waste oil can be collected ready for disposal instead of fouling the interior of your 'plane or boat or the water. The "Bee" thus fitted makes an ideal power unit for small model boats.

PRICE: E. D. 1 c.c. "BEE" *Aircooled* £2.12.6
Watercooled £3.8.6

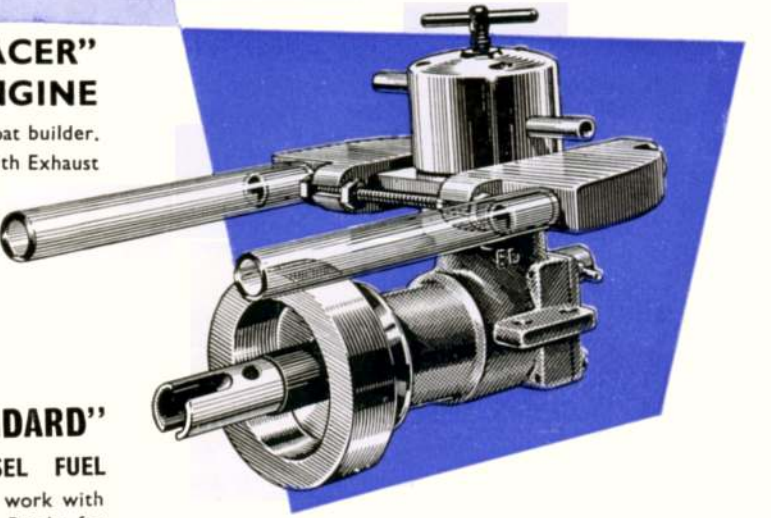
EXHAUST MANIFOLDS 3/2d.



E.D. 2.46 c.c. "RACER" MARINE ENGINE

Specially produced for the model boat builder. A super water-cooled engine complete with Exhaust Manifolds, Flywheel, Marine Unit and Ball Joint Coupling and Plastic Tubing.

Price complete 142/3
Plastic Manifold Tubing 1/- per foot
Exhaust Manifolds only 16/5



E.D. "CONTEST" and "STANDARD"

HIGH PERFORMANCE DIESEL FUEL

A Nitrated Fuel for high speed work with Compression Ignition Engines. Ready for immediate use. Obtainable from your model shop only. Cannot be sent by post.

PRICES
"CONTEST" 3/3
"STANDARD" 3/-

All prices include P/Tax

NOW AVAILABLE FOR RADIO CONTROL ENTHUSIASTS

5-ft. Chromium Plated Telescopic Aerials 24/- each
27 M/C Crystals 30/- each

Write for illustrated Lists giving full details of all E.D. Engines, Radio Controls, Mechanisms, Spare Parts and Accessories, etc. They're free on request.

E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD
DEVELOPMENT ENGINEERS
PHONE MOLESEY 6037-6038
ISLAND FARM RD. WEST MOLESEY. (SURREY) ENGLAND.
GRAMS "EDEE" EAST MOLESEY

Made and printed in Great Britain by the Croydon Times Ltd., 104 High Street, Croydon, for the Proprietors, The Model Aeronautical Press Ltd., 38 Clarendon Road, Watford, Herts. Published by the Argus Press Ltd., 8-10 Temple Avenue, London, E.C.4, to whom all trade enquiries should be addressed. Registered at the G.P.O. for transmission by Canadian Magazine Post.

FIREFLY

STUNT MODEL

RAPID CONSTRUCTION!
FULLY AEROBATIC!
20" WINGSPAN!

Another exciting
NEW KK KIT!

for engines **UNDER 1 c.c.**

De Luxe Kit contents include

- ALL WOOD PARTS DIE-CUT
- METAL STUNT TANK
- BELL CRANK and CONTROL HORN
- NUTS, BOLTS, WASHERS, etc.
- WIRE, COVERING TISSUE
- FULL SIZE PLAN and INSTRUCTIONS

15/9
INC. TAX

KEILKRAFT

(Trade enquiries only)

For Super Performance with your Firefly... use KEILKRAFT Fuel