## ABO SEPTEMBER Free Holiday 1961 Free Holiday PLAN Offer NODBLEB

# GREAT LAKES BIPLANE PLANS INSIDE !

## Full size Drawings for Midget C/L & F/F versions



## In 6 months you could go solo in a jet

Join the Royal Air Force on a Direct Entry Commission and within 6 months you could be flying the Jet Provost on your first solo. As a pilot you will win your 'wings' after a year on Jet Provosts and go on to advanced training in aircraft appropriate to the Command for which you are selected. Navigators and Air Electronics Officers concentrate on their specialist roles from the start of flying training.

**THE BEST OF TWO WORLDS** You will enjoy the best of two worlds. There is the world of the air: an adventurous life that can take you to any one of a dozen different countries —and give you the satisfaction of doing a vitally important and responsible job. Then there is the world of the off-duty officer: the companionship that only Service life can give, the traditional hospitality of the Officers Mess, generous leave and the chance to take part in any game or sport you can name.

**£950 A YEAR AT 21** As an aircrew officer you will be a key man and you will be well paid from the very beginning of your flying career. As a Flying Officer of **21** you will earn

£950 a year. As a Flight Lieutenant of 25 drawing full allowances you could earn over £1750.

HOW LONG WILL YOU SERVE? Depending on the terms of your commission, you may serve to the age of 38 or the age of 55. Alternatively you may leave after 8 or 12 years. There are also a few commissions that allow you to leave after 5 years. All periods of service entitle you to a tax-free gratuity—from £775 after 5 years, to £4000 after 12 years. If you serve for 16 years or longer you will receive a pension of at least £455 a year, together with a tax-free gratuity of at least £1365.

HOW DO YOU QUALIFY? You must be between 17 and 25. You must be fit, keen to fly and to accept the responsibilities of an officer. And you must hold, or expect to gain, G.C.E. at 'O' level (or equivalent) in five acceptable subjects including English language and mathematics. You can obtain further details without obligation by writing, giving your date of birth and educational qualifications, to Group Captain J. A. Crockett, R.A.F., Air Ministry (AM 162a), Adastral House, London, W.C.1.







## Just like the real thing!

Believe it or not, the nearer one is the Airfix model of the Sunderland Flying Boat, 1/72nd scale (Kit 10/6). Behind it is a picture of the real thing. That's how wonderfully realistic Airfix models are. Close attention to every detail gives them their faithful-to-the-original look—makes them true collector's pieces. And every Airfix series is to a constant scale. This means Airfix models look proportionally right, one against another, because they *are* right! You can't beat Airfix for realism—or value.



YOORUSE

## make yours a GREAT mod



AND

Add Quickstart engines to Veron aircraft kits and you have the most exciting combination in model-flying. For control line or free-flight flying, Veron design and Ouickstart power will put you into the very top flight!

engines

NORWOOD PLACE

Spitfire 1c.c. '06 c.i. Price 56/8



Span 48 in. Perfectly proportioned.

Bantam

•75 c.c. •046 c.i.

Price 37/9

UUIUKSIAK

**MODEL AIRCRAFT (Bournemouth) LTD** 

Specially designed for latest transistorized Single-Channel units for rudder only, Price 30/11

## Velox

kits

44 in. Span. Perfectly designed. Special engine protection housing. Easy to build. Price 39/6

**\*** All Quickstart engines fitted with unique

BOURNEMOUTH

MODELLER

## el aircraft combination!





AN ARMY APPRENTICE TESTING MOBILE RADAR EQUIPMENT

16



## AND THE SKY'S THE LIMIT

If you're aiming high when you think of your career, think of electronics-the keyword to success in the space age. The Army trains boys in electronics, as well as many other trades. But, of course, you'll want excitement, adventure and fun as well-the Modern Army offers all this with lots of travel and really good pay.

THINK ABOUT IT EARLY – WHEN YOU'RE BETWEEN 141 & 161 An Army Apprentices school can start you

on a top-line career. There's first-class training in any one of 40 trades and you're paid as you learn. Board, lodging and uniforms are free – with two months' paid holidaya year. After your training you can earn up to £20 a week...or more if you become an officer. FIND OUT ABOUT IT. Post this coupon today. (Applications for the next entry in January must be sent in by November 13th or earlier.)

	ر بری این این این این این این این این این ای	این وی به ای این این این می بین بین بین بین این این این این این این این این این ا
TO THE WAR OFFICE (MPO)	NAME	AGE
LONDON, S.W.1.		
Please send me	ADDRESS	
full details of Army Apprentices		
-without obligation		AA11/AM



CHOOSE YOUR FREE PLAN FROM THIS LIST:

I STUNT C/L: SIMPLE SIMON This 28 in. span model for 1.5 c.c. is fully stuntable, and also makes a neat, easy to build trainer with L.c., Handsome, raked lines are in keeping with latest design trends and the semi-scale appearance lends itself to bright decoration.

- 2 BEGINNER'S SCALE POWER: LUTON MINOR A large, light scale model of a popular ultra light aircraft, and one of the easiest scale models in the A.P.S. Span 421 in. For up to .5 c.c. engines.
- 13 SCALE POWER: S.E.Sa

### STOCK CLEARED

- 4 BEGINNER'S GLIDER: GOLDEN WINGS Simple 445 in. design to A/I specification. Already very popular for Club "one model contests" this design is a certain success.
- 5 BEGINNER'S SPORTS POWER: MAM'SELLE Most attractive cabin sport plane with elliptical section fuselage and neat nose cowling. A fine flyer in all conditions. Wing span 374 in. For engines up to 1.5 c.c.

**6 BEGINNER'S RUBBER: RUBBERDUB** Parasol wing model with attractive lines, with wingspan of 30 in. Rubber powered, uses a commercial 10 in, prop. and is ideal for novice or expert.

- 7 RADIO OR SPORTS POWER: CHATTERBOX For pure sport, or radio control this smart 30 in, span cabin model is ideal. Takes escapement or "Galloping Ghost" control with light weight radio equipment. For engines up to I c.c.
- 8 CONTROL LINE SCALE: HAWKER FURY A 20 in. span model of the famous between wars fighter. Spritely performance with moderate stunts make it a most rewarding project for 1.5 c.c. engines. Extensive sheet areas make for easy and quick construction. 9 CONTEST WINNING A/2: SERAPH

#### STOCK CLEARED

#### IO A/I CONTEST WINNER: AIGLET

- Refined high performance model to the popular class of small glider. Plan includes photo of finished model and complete instructions. Span 454 in.
- 11 SCALE RUBBER: MILES KESTREL

#### STOCK CLEARED

12 SCALE POWER: DRUINE TURBULENT A French home-built lightplane in miniature. Most realistic in flight, easy to build and fool-proof to fly. Wing slots aid stability. Wing span 32 in. For .5 to .87 c.c. engines. 13]SCALE POWE CESSNAR: BIRD DOG

#### STOCK CLEARED

14 CHAMPION'S A/1: LAMOUETTE Czech expert, Rad Cizek, is renowned for his clever, high performance, contest models and this one is no exception.

No. 8 Hawker Fury No. 5 Mam'selle No. 21 G. A. Cygnet

THE HOLIDAYS offer a grand chance to make a real start on your model building programme. We want to help you and so are offering you a choice of sixteen FREE PLANS, which cover nearly every kind of aeromodelling. All you have to do to take advantage of this grand offer is to complete the coupon below, marking your first choice of FREE PLAN in the top square and second and third choice underneath (just in case we do run out-though we have good stocks at the moment!). Post coupon to us together with 6d. in stamps or P.O. to cover postage and packing. YOUR FREE PLAN WILL COME BY POST and you can start on a real winner right away! Coupon is valid until first post September 30th, 1961.

OVERSEAS READERS: You may send unused stamps of your country to value and offer remains open for you until December 31st, 1961. **IS CHUCK GLIDER: OCTET** 

a sixpence and should enliven many a bout fitted with A.M. 35 or similar 24 to 34 c.c. engine. **19 JETEX SCALE MIXTURE** 

A duration design for the 50 unit, the "Ukkie" is a Dutch design which comes with a profile plan for the Swedish "SAAB J.29" for Atom 35, the French "SIPA Miniget" for a 100, or the famous "Folland Midge" for either the 50b or 100 using Service and Midge" for either the 50b or 100

units. Four really first-class jetex models, with

Revival of one of our most popular little rubber-

driven models in a new and up-to-date form. A truly perfect little flyer, and very pretty to watch in flight. Plans contain fully illustrated building instructions. 20 in, wingspan.

Drawn to 1 in. scale, this detailed G/A drawing

of 344 ft, wingspan side-by-side tricycle u/c scale

enthusiast to develop for R/C or sports power.

wing monoplane should encourage o.d.

21 DETAILED SCALE DRAWING: G.A. CYGNET

the SAAB specially advised for the beginner.

20 BEGINNER'S RUBBER: THE NEW A/M CABIN

#### STOCK CLEARED

- 16 POTTED ANALYSIS: ENGINE DATA SHEET No model designer can work satisfactorily without this mine of information on engines of all types. Installation views, full details of power analysis figures, power curves, identification photos.
- 17 SCALE RUBBER (or Power Basis) : AIRSPEED ENVOY A well proven model by an acknowledged expert in this sphere of model work. Span 52 in. Can be used as a basis for a control-line model with sheet covering and heavier structure.
- **18 COMBAT CONTROL LINE: ROGUE** Developed from a highly successful larger U.S.

design this

FILL IN COUPON STRAIGHT AWAY AND **GET YOUR** FREE PLAN NOW SAVE MONEY AND GAIN PLEASURE

rugged	combat model turns on flying. It's a beaut!		
1	To: Plan Offer, M.A.P. Ltd.		7
	38 Clarendon Road, Watford, Herts,	e Holiday	
1	I enclose stamps/P.O. value 6d. for postage and packing of MY FREE PLAN selected on right.	ntember	
1		Ist Choice	
	Address	2nd Choice	
		3rd Choice	Ξ

DURATION

low







Winner of 1960 and 1961 Australian National Championship Events in record times. An extremely fast 5 c.c. team racer which is easy to build and fly. Kit is fully prefabricate.



TYPHOON F86 One of the prettiest 2.5 c.c. stunt designs ever and with a performance to match its good looks.



Rugged, easy to build trainer for all .75 c.c.—1.5 c.c. engines. Moulded wing, die-cut parts, ready formed undercarriage etc. Ideal for learners.



THUNDERSTREAK A great stunt model. Giant 54-in, wing span and the smoothest pretrest stunt design you'll ever fly. A beautifully produced kit for .19-.35 engines.



INVADER RADIO CONTROL 50-In. span radio control for 1.5-3.5 c.c. engines. Simple, rugged construction coupled with a lively performance, makes this an outstanding radio design.



COBRA De Luxe Trainer with fully moulded sheet wing, die-cut parts etc. Good for beginners or sport flying.



**VULCAN P17** The ideal 2.5 c.c. stunt model for beginners. Simple to build and fly and a great performance.



SPITFIRE Fully flapped semi-scale stunt model of this famous World War II fighter. Suitable for I.S and 2.5 c.c. engines, the Spitfire is a wonderful stunt model.

### AUSTRALIA'S GREATEST NAME IN MODEL AIRCRAFT

These are just a few of the top selling range of Aero-Flyte model kits. Look for them all at your local hobby store and remember — all Aero-Flyte kits contain fullsize plans, ready formed wire parts, smoothly moulded block parts and accurate, clean diecutting. The fact that they are produced in Australia's largest and most modern model factory is your proof of their tremendous appeal.

SOUTHERN MODEL SUPPLIES LTD., 63 Boothby Street, Springbank, Sth. Australia

454

2

455

2

Ē

## FREE - TO EVERY READER OF THE "AEROMODELLER"

A LARGE 16-PAGE ILLUSTRATED CATALOGUE DESCRIBING "HARBOROUGH" AIR HISTORICAL BOOKS.

"HARBOROUGH" AIR HISTORICAL BOOKS ARE COMPILED, EDITED AND ILLUSTRATED BY A TEAM OF EXPERTS, AND ARE ACKNOWLEDGED THROUGHOUT THE WORLD AS THE "STANDARD REFERENCES" ON THE AIRCRAFT, THE MEN AND THE TIMES WITH WHICH THEY DEAL.

> WRITE YOUR NAME AND ADDRESS ON A POSTCARD, FIX A 2d. STAMP, AND POST TO DEPT. A/M AT ADDRESS BELOW

HARLEYFORD PUBLICATIONS LTD. LETCHWORTH, HERTFORDSHIRE, ENGLAND

model maker

Mechanisms, Spare Parts etc.

Write for full details of all E.D. Engines, Radio Controls,



HARLEYFORD PUBLICATIONS LTD LETCHWORTH · HERTFORDSHIRE · ENGLAND



The E.D. 2.46 c.c. Marine "Racer" is specially produced for the model boat builder. A guaranteed super watercooled engine, complete with Exhaust Manifolds, Flywheel, Marine Unit with Ball Joint Coupling and Plastic tubing. Exhaust Manifolds are supplied separately.

> Exhaust Manifolds for the E.D. I c.c. "BEE" Engine are also available. The "BEE" thus fitted makes an ideal power unit for small model boats.

> > E.D. I c.c. "BEE"

ELECTRONIC DEVELOPMENTS (Surrey) LTD. Island farm road, west molesey, surrey, england

E.D. 2.46 c.c.

MARINE "RACER"



## One of the best jobs in the world

Fleet Air Arm Buccancers moving at ten miles per minute above H.M.S. Ark Royal. The Buccaneer is the latest aircraft ordered for the Fleet Air Arm, giving still greater speed and power to Britain's nuclear age Royal Navy.

The men who fly these machines have a training second to none in the world, starting with a six month's course at the Britannia Royal Naval College, Dartmouth. The basic qualities required of to-day's officers of the Fleet Air Armare the same as in Nelson's day-initiative, intelligence, resourcefulness and determination.

The responsibility is great and the rewards are equal to it—adventure, enjoyment, travel—and after 12 years a tax-free gratuity of £4,000 or £1,500 after 8 years. Of course only a select number can qualify as pilots and observers. But why shouldn't *you* be among them? You must have a zest for flying, be attracted to the Naval way of life and be able to pass the Interview Board which is designed to test your fitness, intelligence and charactor. The age limits for entry are 17-25. You must have passed the G.C.E. at "O" level in English Language, Mathematics and two other approved subjects (three other approved subjects after 1st September 1961).

When qualified, pay at age 20 is £949 a year; a married officer of 25 can receive up to £1,760 a year. Selected officers serving on a 12 year engagement have the opportunity of transferring to a pensionable career.

#### 5-year commissions for Helicopter Pilots

There is a scheme of engagement for men wishing to specialise as helicopter pilots only. They join between ages 17-26 on a 5-year commission and receive  $\pounds775$  tax-free gratuity on termination.

Candidates who wear spectacles may in certain cases be considered for Helicopter Pilots. Send for the new illustrated booklet "Fly with the Fleet Air Arm" which will give you full details.



## Fly as an Officer in the ROYAL NAVY

The Admiralty, D.N.R. (Officers), Dept. AM/22 Queen Anne's Mansions, S.W.1, 744-14



#### AEROMODELLERS tend to be fussy people, particularly over the selection of the right sizes and grade of balsa for their models. We fully appreciate their attitude — after all we are the fussiest firm in the world when it comes to selecting and grading *and* cutting Balsawood for aeromodelling use.

Balsawood sheet and strip sizes are standardised and offer a wide enough selection, based on experience, to cover almost every need. The specialist contest modeller, however, may not always agree and we recently had a letter saying . . "I often find myself faced with dimensions where certain components, such as wing ribs, are too flimsy in 1/32 in. sheet and too heavy in 1/16 in. sheet . . . Would it be possible to supply an intermediate size?"

So we supplied him with a special order of 1/20 in. sheet to his choice of grade (and this, incidentally, is a thickness we often cut for kits).<sup>9</sup>Just another example of the service we can give.

POSITIVELY THE BEST BALSA Whether you reckon to use an inch rule for measurement, a vernier rule or work in "thou" with a micrometer, SOLARBO BALSA will always offer you the best value for money, best quality and the best cut wood in *any* size. There just is no better Balsawood.



Fabricated from carefully selected bulk lumber in the world's largest and most up-to-date factory of its kind, Solarbo Balsa is available from your local model shop in all standard sizes.

ALWAYS ASK FOR IT BY NAME

Solarbo commerce way, Lancing, Sussex.





MODELL





## Heard at the Hangar Doors

Site for the World Champs. Leutkirch airfield, a 1,900 ft. strip with hangar and tower in foreground and castle amid wooded hills behind. In many respects it reminds one of the airfield at R.A.F. Halton



Editorial A dvertisement Director Director D. J. Laidlaw-Dickson C. S. Rushbrooke

#### Editor R. G. MOULTON

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

VOLUME XXVI

#### No. 308 SEPTEMBER 1961

#### **CONTENTS**

HANGAR DOORS		 460
<b>R F C. SOUADRON MARKING</b>	is	 462
MOTOR MART		 465
"CLEAVER"		 466
WORLD NEWS		 468
NORTHERN HEIGHTS GALA		 470
FAMOUS BIPLANES-		
GREAT LAKES SPECIAL		 471
GREAT LAKES BIPLANE		475
OVER THE WAVES		 478
CONTEST GLIDERS		 481
ENGINE ANALYSIS-		
P.A.W. 19D COMBAT SPECIAL		 484
BRITISH TEAM TRIALS		 486
"SURE FLIER"		 488
GADGET REVIEW		 490
CLUB NEWS		 492
ON THE COLUMN		

ON THE COVER . . . At top, Frank Palmer's magnificent scale free fight Great Lakes Biplane from Calgary in Canada is based on the original Cirus-engined version and has the company colour scheme. In contrast is Harold Krier's much modified air-show special in which he has won many aerobatic championships. The "Lakes" is a much respected and well-loved aircraft in North America and one which richly deserves a place in our "Famous one which richly deserves a place in our "Famous Biplanes" series although comparatively litle known in Europe.

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the MODEL AERONAUTICAL PRESS LIMITED.

Publishers of the monthly MODEL MAKER & MODEL CARS RADIO CONTROL MODELS AND ELECTRONICS SUBSCRIPTION RATE: (Inland) 28/6 (Overseas) 27/6 per annum prepaid including the special Christmas number. U.S.A. and Canada \$4.

### What makes an expert?

WE ARE IN the height of the "Championship season". Finals of the Indoor class have already taken place most successfully in this country at Cardington (by the kind permission of the Royal Air Force) and now all eyes in the contest fraternity turn towards the triple meeting to be held at Leutkirch in the first three days of September.

For weeks, our postbag has indicated a steadily mounting enthusiasm for what is to be the best supported and certainly the busiest of all Internationals. World News could well have been filled with team selection results from many countries; but since you will be reading all about the finalists in our report, we restrict the news to those incidentals which we know will have widest range of interest at this stage. The matter which excites most speculation is that of diesel versus glow in the F.A.I. Power class. In recent months we have checked advance supply engines from overseas which indicate an increase in power that would never have been anticipated even 12 months ago when first signs were seen at Cranfield. They are all glowplug engines, and for their maximum output they require a pressurised fuel system, a high Nitro methane content in the fuel, and a tough plug. These engines are in extremely short supply, and since the distribution of them has been such that well-experienced fliers have been able to make first assessments of their utility and have demonstrated their potential in no uncertain manner, this new generation of 2.5 c.c. glow motors is generally regarded as an immediate pathway to success. So much was this so in the London Area that several would-be power trials competitors withdrew on sight of one searing climb which made a mockery of the reduction of power run from fifteen to ten seconds.

Now we would be the last to deny that when one is faced with making each contest flight one of 18:1 glide to power ratio, then horse power is not paramount. However, and to the misfortune of some in both the U.S.A. and the British team selection trials, it is also clear that this increase in power output brings with it attendant problems of trim, engine operation and expense.

In free flight power, the engine has now become more important than ever before. Just as in control-line classes where speed is a criterion, then the most powerful engine dominates, so could the process develop for free flight BUT for one thing, and we refer to that as "expertese"

No engine ever made an "expert" though many have contributed to make a reputation. It takes a lot of know-how and experience to extract the best of one's resources, and some accepted "experts" have had fame rubbed from their shoulders when their resources overtook their capability. Thank goodness for the fact that there is no easy path to contest success,—wouldn't it become a bore if such did exist?

#### **Crystal Ball Dept.**

Well, we suppose it had to happen, but we at least thought our readers could do just that ..., READ! The work created by the enormous response to our Holiday Plan Offer has been complicated by those who just cannot follow simple instructions, with letters addressed in various ways and wildly different from the explicit instructions given on the coupon.

But even less understandable are the types who sent us the coupon with correct money . . . but no name or address! We know we are good, particularly at deciphering the occasional weird handwriting of some correspondents, but our ultra-viole(n)t ray equipment does not bring to light information that has never been written. If you have not yet received your plan, think hard as to whether you gave us a return address.

The same applies to the one or two who sent in a fully completed coupon, but *no* stamps or postal order. Also those who forgot to stamp their envelopes and involved us in 6d. a time excess postage charges. If they have been waiting in vain for their plans, they now know the answer! We just do not have the time to deal with orders that are not correctly presented.

### Foresaking the hobby for wider pastures?

We learn that Rudi Lindner who made history by winning the A/2 Championship twice in succession in 1954 and 1955, has now added third place in the German Sailplane Nationals to his credit. We wonder if he applied modelling techniques on the full size machine. From the U.S.A., comes news that Dave Kneeland, Power Champion in 1953 and also a Wakefield team member for his country, is now re-building a veteran Waco ZKS-7 Biplane which is quite a task. If Dave finishes it like he did the famous "Vapour Trail", it will be something worth seeing.

#### 1.300 by one modeller

Yes, that is the total Peter Farrar can now claim to have made for his mammoth colleciton of solid scale models, and all 1,300 of them are to be seen on show at London's Selfridges store between August 28th and September 9th. The collection covers the history of aviation in miniature and every one of the subjects is to 1/72nd scale so making a fascinating comparison of size. For example, the large Martin Mars flying boat absolutely dwarfs the diminutive Comper Swift. Beside the range of types in the show, another interesting aspect is the way Peter Farrar has illustrated development of one particular type through all of its varied marks. There are 24 different Spitfires in the range with British markings and several others bearing the insignia of other Nations which operated the Spitfire. Entrance to the show is free, and as the dates coincide with the S.B.A.C. display at Farnborough, it provides an opportunity for aeronautically minded visitors to London to see something that is undoubtedly "different".

#### Straight facts

Writing in the American Hobby Industry Merchandiser, a prominent retailer puts forward some startling opinions on the present and future state of the acromodelling industry in the U.S.A. Dealing with kits, he offers the view that modellers have had enough of the profile and will be crying for detail in scale type models. He asks the plastic people to produce cockpit furnishings, instrument panels, wheel pants and canopies to meet the challenge.

On the subject of engines, the imported lines are becoming a threat to the home producer. They will fetch full list price whereas almost all of the U.S. makes have to be marked down to sell. In this retailer's view . . . "some engine manufacturers have given up the idea of producing quality and are more concerned about producing a motor at a cheaper price. And brother, I mean CHEAP and not, inexpensive. There is a difference.

"Instead of beautiful, close fit tolerances, motors are loaded with rubbing compounds in hopes that the consumer will wear in the parts during the break-in period. I can assure you that many a model builder has gasped as that red gook came pouring out of the exhaust stack of his new motor."

Food for thought there! We know at least two U.S. manufacturers we could except from this scathing criticism, in fact we would rate their products as being of very highest quality available *anywhere*. However, as the proverb says,—"There's no smoke without a fire" and the opinion must be regarded as a fairly widely expressed viewpoint.

#### Half-A free flight power

Completely "open" rules are proposed for inclusion in the S.M.A.E. programme for the Half-A class. Maximum engine capacity of 0.85 c.c., 12 seconds engine run and a three minute maximum are the only regulations, so allowing complete freedom of design of model.

#### Price increases

Advertisers will not have had the opportunity of adjusting price changes in time for this issue, after the Government announcement of immediate surcharge in Purchase Tax; but as a general guide, here is how the changes affect model goods. For items up to 2s. 6d., no change. From 2s. 6d. to 7s. 6d., increase of 1d. From 7s. 6d. to 12s. 6d., increase of 2d. From 12s. 6d. to 17s. 6d., increase of 3d. From 17s. 6d. to  $\pounds$ 1, increase of 3d. From 17s. 6d. to  $\pounds$ 1, increase of 4d..., and so on.



"Well Sir-it's a 40 incher..by M. Bridge PET 589, Merlin powered and .. it's called SNOW WHITE"



As IN ALL things connected with World War One Flying and Aerial Fighting, the system of Squadron and Flight Markings grew from nothing and had not been finally standardised by the Armistice.

While the system of Squadron markings had been laid down by high authority much was left to the discretion of the Unit Commanders that in later years was the subject of reams of paper and countless orders.

With this in mind, it is not surprising that all types of operational markings varied from Squadron to Squadron, from Flight to Flight and even from aircraft to aircraft. In many photos, of Sqdn, aircraft differences in the application of markings are visible—different thickness in the Bands or Bars in the actual marking—some vertical Bands stop at the upper longeron while others go right over the deckings—even the position of them varied.

When considering markings, there are two very important points to bear in mind:---

1. Many aircraft at the front flew, fought, and were lost without any markings other than the usual Cockades. Under the stress of War it was obvious that it was more important that patrols went out at full strength than fully decorated—this means that many photos show both marked and unmarked aircraft.

2. Serial numbers—these have no bearing on Sqdn. and Flight markings and can be ignored as they were continually changing due to losses and write-offs, e.g. if aircraft "A"—Serial No. B 1234 was lost the replacement machine would be marked "A" even though the Serial No. would be totally different. Therefore unless a definite aircraft is mentioned no serial no.'s have been given.

3. Establishment of Squadrons was normally 18 aircraft and the sequence of individual letters/numbers was arranged accordingly. However, quite often the number of aircraft was more than 18, often 21, and some two seater Squadrons had 24, some *Canel* Sqdns. were also up to 24 aircraft. It is quite certain that other letters were used other than the original 18, most likely they carried on from the 18th one used. It is probably that these were not allocated on a Flight basis as these extra aircraft and pilots would be classed as "spare".

4. In July 1918 the French Authorities asked the R.A.F. to delete the Letters "T" and "X" from their aircraft markings. The Latin Cross recently adopted by the German Air Service was causing confusion at a distance. Photos show that this was not always carried out.

5. When a date is given for a change of marking it should be noted that this was the official Date of Change. Quite often Sqdns. did not change for some time.

## Royal Flying Corps Squadron Markings

#### Beginning a new series for scale-fans by Leslie A. Rogers with all drawings to 1/72nd scale by Ken McDonough

Heading shows Captain P. J. Clayson in his S.E.Sa cockpit, with individual letter "F", the aircraft which he flew at one time in No. I Squadron R.F.C. (H. H. Russell photo). The Nieuport Scouts in the snow at Bailleul, France, belong to No. I Squadron, and were photographed on December 27th, 1917. I.W.M. Photograph Q11596.

GENERAL NOTE.—Unless otherwise stated, all aircraft were in the standard Khaki-Green finish on all upper surfaces and clear doped undersides with normal wing and fuselage cockades and normal tail stripes, no mention is made of the finish of cowlings, wheel discs or other parts unless they have a direct bearing on the aircraft markings.

The following notes on Sqdns. are not exhaustive but show their own systems of identification.

No. 1 Sqdn. R.F.C. (R.A.F. When reformed as a Scout Sqdn. equipment was *Nieuport Scouts* of various types. Most of these were doped Silver but a few were in French camouflage and some in British khaki-green. On the silver doped aircraft the markings were usually in black or red, on the dark painted aircraft white was used. Sqdn. marking (in use from January 1917 to January 1918), one vertical Band immediately behind the Cockade.



#### September, 1961

463

I FRIER



Individual identification was by letters aft of the Sqdn. marking and also on the top decking—letters used were "A" to "S" with "I" missing. Re-equipped with S.E.5a in January 1918. Carried a fresh Sqdn. marking (from January 1918 to March 1918) of a sloping white bar either side of the Cockade. Individual markings were as on Nicuports but in white and only on fuselage sides. Capt. P. J. Clayson (21.E.A.) flew aircraft "F" at one time. In March '18 the Sqdn. marking became a white circle. Individual letters were as before to begin with, but when the establishment of aircraft was increased,

1 Squadron R.F.C. (at left) Nleuport 27 (serials were censored) Nieuport 23 (serials were censored) S.E.5a (Capt. P. J. Clayson's A/C Jan.-March, '18) S.E.5a (March-November, 1918)





individual letters took the full alphabet less "I", but exact sequence is unknown. These markings were in use until the end of the War.

No. 2 Sqdn. R.F.C. One of the original Sqdns. that went to France with the Old Army on the outbreak of war. The Unit was fully equipped with B.E.2's and 2a's. In fact, B.E.2a No. 347 was the first British machine to land in France after the outbreak of War. Piloted by Lt. H. D. Harvey-Kelly No. 347 landed near Amiens on August 13th, 1914. As the war progressed, so the B.E.'s progressed and the unit flew at various times B.E.2a', d, e's.

Sqdn. markings were not carried before April 1916. From April 1916 to January 1917 the Sqdn. used a black triangle on the fuselage sides which were clear doped and on later aircraft which were kahki green a white triangle. From January 1917 to June 1917 the Sqdn. marking was a white zig-zag on the sides and top decking of the fuselage.

Flight and Individual Markings, no details are known of "A" and "B" Flights. "C" Flight:— all aircraft of the flight marked "C"

on the fin above the serial number in white. Individual marking was in the form of white dots painted domino fashion in front of the "C". Wheel discs painted white. In April/June 1917 the Sqdn. re-equipped with

A.W.FK.8's which it retained until the Armistice.

The Sqdn. Marking, a white zig-zag was retained until March 1918. Individual Identification was by large white numbers on the fuselage sides in front of the cockade and repeated on the top decking. Numbers used from 1-24.

AGRO YODRUGA

15 Squadron R.F.C.

R.E.8's as on 25th March, 1918



Below: R.E. 8's of No. 15 Squadron lined up on March 25th, 1918. I.W.M. Photograph Q11987.



No. 15 Sqdn. R.F.C./R.A.F. changed their B.E.2's for R.E.8's in May/June 1917 and carried the same Sqdn. marking from then until March 1918 when all markings were abolished on all aircraft other than Single Seat



Scouts, Sqdn. Marking was an 18 in. Band around the fuselage immediately in front of the tailplane and in many cases this overlapped the leading edge of the fin. Individual Markings,-large numbers were painted in white aft of the Cockade and also on the top decking. Numbers used were 1 to 24. On March 25th 1918 during the First Battle of Bapaume, aircraft No. 13 was Seria No. B'2276 and Aircraft No. 15 was B'836.

No. 23 Sqdn R.F.C./R.A.F. exchanged F.E.2b's for S.P.A.D. Scouts many of which were flown in French camouflage and still retaining the Spad Factory markings on the rudder. Sqdn. marking (carried from February 1917 to March 1918) was a white Triangle on the fuselage sides aft of the cockades.

Individual identification by letters painted in hite behind the Triangle. "A" Flight used letters A.B.C.D.E.F. "B" Flight used letters L.M.N.O.P.Q. "C" Flight used letters T.U.V.W.X.Y.

It would seem that (from photographs) the Squadron painted their wheel discs white. On February 25th, 1918, when on La Lovie Aerodrome near Poperinghe and ready to leave for Ham on transfer to the 5th Army,

aircraft were serialled as follows:— Aircraft "L" Serial No. B'8847—in French Camouflage Aircraft "M" Serial No. B'8846—in French Camouflage Aircraft "N" Serial No. B'3478—in British Camouflage Aircraft "O" Serial No. B'8850—in French Camouflage It is known that "A" (B'6732) was shot down by Haupt, Adolf Ritter von Tutschek.

In April 1918, re-equipped with Sopwith Dolphins (the third Squadron to do so) Squadron marking changed to a white disc aft of the cockade. Individual identification was again by letters, but exact sequence in unknown, it included "C" "M" and "P".

Unusual photograph of a Sopwith Dolphin of No. 23 Squadron. Pilot in front of nose gives a good impression of the size of this aircraft. (H. H. Russell photo)

#### 23 Squadron R.F.C.

S.P.A.D. SVII of "A" Flight

Sopwith Dolphin of "B" Flight





WE'VE HAD A succession of really pleasant experiences with new engines this past month. Starting with the Cox Tee Dee .020 in our free flight "Lakes" Biplane, which appears to match the power utility of many .049's we passed on to the Tee-Dee .049 which is a queen of an engine and one which we are sure will become dominant in its class. Then to the other end of the scale, and the Ron Checksfield designed Merco 49 R C which in prototype stage has surpassed all expectations. It will swing an 11 x 6 at 11,400 r.p.m., or a 12 x 4 at 11,600 on straight 3:1 fuel and throttle down to a mere dribble of revs. This makes it more powerful than the best of the non-racing 10 c.c. engines by a wide margin. Frank Van den Bergh has air tested another prototype in his wellworn Nats winner of multi R/C and reports a great gain in performance. First impressions are of utter smoothness of running and control, the way it does not fade; but builds up revs, and the squat proportions of what is actually a large engine. Twin ringed piston and double ball races, together with the Merco airbleed carburettor setting are refinements that have contributed to its success. Price, and delivery period are yet to be announced. Next we have a home built engine from the winner of our "Ideal Engine" contest two years ago, V. Dumpe of Carlisle. With 7/16 in, bore and stroke giving just over 1 c.c., it has twin Hoffman ball races supporting the shaft, reed valve induction and butterfly choke for speed control. 8,300 r.p.m. on a Trucut 7 x 4 is a typical figure, which indicates that in its first half hour of life, the hand lapped engine has promise of improvement. Finally, an engine from Australia, where Gordon Burford is now producing his 2.5 c.c. racing diesel with twin races in a smart crankcase and topped by a bright red anodised head. Ours is still running-in but is already showing itself to be a "good-un",

> Left : Rear drum type valve on this Czech Tono glowplug engine, produced in 5.6 c.c. and 6.6 c.c. capacities, does 14,000 r.p.m. on a 101 × 71 in. prop on 3 : 1 fuel in the smaller size

Top left: Merco 49 with exhaust closed for low speed. Screws on carb. adjust airbleed and stop, plug is an A-M Idlebar. Above: Polish Stan Gorski's latest Wankel engine is "4cc" and has dural outer case. Carb. projects from centre at rear. Below: Gordon Burford's 2'5 c.c. balleace diesel which shows good promise and is well made





V. Dumpe's home designed and constructed I c.c. diesel. Drawing is exactly half size and shows the reed valve, twin races on the crankshaft and the incorporated butterfly choke valve for speed control. Case is from the solid, the cylinder is hardened silver steel with a mild steel piston. The crankshaft and connecting rod are also from silver steel

## Cleaver

#### Want to get battling into combat? —here's the model toughest with

THIS "WING" DESIGN for combat has been developed over four years of successful competition flying by various members of the Kenton M.A.C. It is the twentyfourth in the designer's own line of development, during which he has built over forty models. This is one of the most successful to date. Add to these forty, the wings built by other members of the club and the total number cannot be far short of two hundred in four years!

When designing, the following qualities have been sought:— high airspeed, manoeuvrability, smoothness of flight, efficient tank giving consistent engine run, strength, light weight and reliability. The order of importance of most of these qualities will be dependent on the pilot's style of flying combat. For instance, if you prefer not to manoeuvre a great deal during a combat joust then you will need a fast model, if you manoeuvre a lot, a consistent engine-run, and so on. This version of the "Kenton Wing" is most suited to George Copeman's particular style of flying and it is hoped, equally so to yours.

Cut engine bearers and  $\frac{1}{2}$  in. balsa fuselage parts to shape and glue with "Araldite" or similar. Cut out T.E. and ribs 1 (2 off), 3 and 4 and 1/16 in. ply fuselage sides. Plane and sand T.E. to sections shown. Glue sides to fuselage and leave to dry. Make tank. Cut away as little wood as possible from fuselage to clear engine crankcase and drill engine bolt holes. Pass balsa L.E. and one spruce mainspar through fuselage and glue in place, likewise T.E. Before the glue has set pin and glue ribs 1, 3 and 4 and tip gussets in place, check for alignment everywhere and leave out of harm's way to dry.

Cut out the rest of the ribs, (with lead-out holes where necessary) elevator and tip lams. Make bellcrank and pushrod and loops on lead-outs. Glue all other ribs in position except No. 6, chamfering the angled ones to fit. Pass the other mainspar through fuselage and more cuts to its credit than your modelling knife !



glue in position, similarly spruce L.E. Add gussetts where shown (Everywhere!).

Next, install the bellcrank, shape L.E. and elevator and give latter one coat of sanding-scaler and cover with tissue. Glue tips in position (weight in starboard) and carve and sand to shape, drill leadout guide holes in part one and screw pieces of spring curtain-rod (smeared with glue) in place. Insert leadouts, bend ends to pass through bellcrank and solder on cup washers likewise push-rod. Note that rear lead-out washer is *beneath* bellcrank to prevent it fouling the push-rod. Check for freeness and give a drop of oil at all four holes.

Install tank and rib No. 6 and glue both firmly. (Tank is positioned by hooking vents over L.E. from beneath wing and then sliding upwards into position it won't go in from the top!) Sheet centre section and add tank fairings.

Sand all parts perfectly smooth and give entire model, including rib edges, two coats of sanding sealer and sand again. Cover model with silk using thick dope as adhesive. Give silk three coats of "Britfix" full strength glider dope thinned a little if desired; when dry fix elevator in position. Give two coats of sanding sealer to all wood parts covered by silk (except rib edges) but do not allow it to run to the panels of silk as this causes cracking after a short while. Sand lightly all over and give entire model a coat of fuel-proofer.



#### September, 1961

## designed by George Copeman

Views at foot of page opposite show George Copeman's self-modified Oliver Tiger installation with fuel filter in the feed tube from the tank. Structural picture illustrates the functional use of anti-warp and strong rib positioning on this remarkably successful flying wing. At right and opposite are the dasigner's model, with Kenton club emblem displayed in due prominence. Note the slotted elevator on this earlier model is of greater span. Plan has latest details

The designer has never found it necessary to cover the fuselage with silk for added strength since most have lasted for several models and are only rejected when they have soaked up too much fuel for glue to take!

All up weight should not exceed 16 oz. Most of those in the club are between 13 and 15 oz.

The tank shown will give a consistent run throughout manoeuvres if the needle is at a slightly richer setting than that which gives peak revs, on the ground.

Speeds up to 90 m.p.h. have been recorded with tuned Olivers though 85 m.p.h. is more usual with a works tuned motor and a standard unit will do 80 m.p.h. Do not use colour dope on the model; it adds unneces-

sary weight and makes fabric repairs more difficult. If you want to win competitions, get organised and

leave nothing to chance. Check everything before you start. Such points as the following often get overlooked: Fuel tubing must be tight at all joints; needle valve must not be loose; control system must be free; squash bottle must contain enough fuel to fill tank several times over since if the fuel tubing does become disconnected in flight, the tank will empty itself in one circuit, even on the glide; complete box of spares must be ready at hand for emergency repairs during a heat; spout on squash bottle must be such that the tank can be filled quickly.

This model will all but fly itself enabling the pilot to keep a close watch on the opponent's model. Once familiar with this design you will find that, even with a stock motor, its high airspeed and manoeuvrability offers a decided advantage over most other models that you can expect to meet in competitions. So sharpen that modelling knife and start building!

FULL SIZE COPIES OF THIS 1/6th SCALE REPRODUCTION ARE AVAILABLE AS PLAN CL799 FROM AEROMODELLER PLANS SERVICE. PRICE 4/6 INCLUDING POSTAGE.





467



EIGHT CLUBS HAVE joined as founder members of the "Federacio de Aeromodelismo da Bahia, (Brazil) and are to follow F.A.I. rules, with their first Championships for the Bahianos next year. The models flown out there have a truly International flavour, coming as they do from all quarters of the World, along with local Brazilian kit designs. As an encourager, one of the newspapers carries regular aeromodelling news once a week.

Australians are extremely sad over the loss of Alan King at such an early age. This truly great modeller who inspired so many to high standards through his work, will be sorely missed. A fund has been raised in the form of a memorial, and since we know that in his travels across the World, via the U.S.A. to Europe, Alan made many friends, we publish the address for those who would like to contribute:— Hon. Sec.: Victorian MAA, 102 Willis St., Hampton, Vic. Australia. Needless to say, all contributions will be acknowledged.

After some time spent in getting "accepted" against stiff opposition from other imported engines, we are pleased to learn that the British Merco is going great guns in the Australian contests. Stunters are from 650 up to 700 sq. ins. wing area weighing up to 56 ounces and Merco's took 4 out of first 6 places in the Victorian State Champs stunt event plus 2nd and 3rd in Carrier and now it is going for the unique Australian Class 3 team race with considerable lappage. To quote, "Successes of this fine British motor are gratifying . . . especially when one considers how it is so outnumbered." Good news indeed,--we bet they'll go wild over the 49! (Apologies for the flag waving, to other overseas readers: but we thought it about time we gave credit where due -Ed.) Across the Tasman and to New Zealand where we learn of Indoor activity in the Upper Hutt area. They've started some low ceiling flying (only 20 ft., with girders down to 15 ft.) and raised seven 24 in. and several 14 in, models at the first meeting, Devon Sutcliffe made top time of 4:06 with those active F.A.I. fans John Malkin and Bill Cook chasing close. Just shows what a club can do if it tries, we wish that more would use their meeting halls this way. The N.Z. Macdonald Memorial Trophy for outstanding flying goes this year to World Record Holder Ian Barber for his 9 hours 4 mins flight.

Pekka Ruokolahti of Helsinki is the 1961 Control line Champ of Finland by virtue of taking top place in stunt with his Johnson 35 *Thunderbird* (Merco's taking 2nd and 4th). Standard is higher than ever, also in team race where the Tortilla/Raatikaainen team manage over 50 laps with an Oliver. Though they had best heat time of 5:25 they lost the final to the Sundell Bros. Guy and Juhani with their ETA 15. Speed suffered through cold and rain, Simo Saukko using the latest K & B 15R to place top with 174 k.p.h. In free flight, the Finnish A/2 team is led by Torsten Strang and his elegant model which we published last month. Hamalainen, who pilots a Convair Metropolitan for Finnair when not modelling, is in Wakefield as well as Indoor teams and Sandy Pimenoff leads Power with his ETA 15 "Number 18." The Finns had a 7010 points victory over Sweden's

Left: top to bottom, Ron Cranmer of Durban, SOUTH AFRICA with his 82 inch control line scale Trimmer amphibian, note the pikot! Unusual pusher Delta is by Ray Richard of California U.S.A. and is a Clipper Cargo design. The Lagg SFN Russian fighter flies at up to 62 m.p.h. with an MVVS 5.6 c.c. glowplug engine for K. Kadrmas of CZECHOSLOVAKIA. Vickers Viscount controliner made from the A.P.S. plan has two AM 10's and two Frog 2.49's. Has full lighting, flies at night for T. Sampathkumar of Meenambakkam, INDIA. Who's the gent with the semi-Eindekker??? None other than our roistering Cartoonist Roland from Rio in BRAZIL Says it flies like a lumbering lorry, drops its nose beautilully square... when the engine stops and planes down like a loaded brick with rubber stamp action! Keep it up Roland we all like your wonderful outlook on the hobby Twin engined Delta with E.D. Racer and Frog 2.49 is a controliner by R. B. Damania of Baroda, INDIA. Will fly on one engine and though no stunter is pleasant to fly. Named "Subroto" after the greatly respected and admired Chief of India Air Force, A. M. Mukherjee who died earlier this year. Right, is Jan Hafstom of SWEDEN enjoying nordic sun with his Wakefield winner at Swedish contest

6571 in the Nordic Countries free flight champs although the individual honours went to Rolf Hagel in power and Chr. Moberg in Wakefield, each with full maximum scores for Sweden, and to P. Lauridsen who won A/2 for Denmark. (Torsten Strang 2nd by 18 secs.). The event was run at Ljungbyhed, Sweden.

Gunnar Kalen, who qualified at third place in the Swedish A/2 team this year, now establishes the record of having flown for his country in five successive World Championships—surely this is an achievement unequalled by any other modeller?

All the more remarkable when one considers the very high standard of A/2 flying in the country of its origin. The International "Alpenpokal" contest at Weiner-Neustadt, Vienna, Austria over July 1/2nd was for teams of four with each member flying power and A/2 with combined totals. Six teams went from Austria, Germany and Switzerland, enjoying one of the finest flying fields in all of Europe in fiery heat and cloudless sky. The Olten team from Switzerland led Vienna in the final results with Beck from Germany top individual in A/2 and Brukwiller of Olten top in power. Sounds like an event that should attract more competitors, as does the Coppa Stella D'Italia, Italy on August 15th. This slope soaring meeting appears to be the best organ-





ised of all competitions in the calendar and certainly issues the most attractive invitations to attend. No less than 32 pages of prospectus, plus publicity leaflets from the local tourist bureau!

We're pleased to see that the French lads are getting their Micron engines tuned up to International standards. Magne and Malfait of Paris won with a Micron 2.5 Racing in 4:52 at a contest at the Montesson track. Speaking of engines, here are a few interesting top performances on straight fuel in F.A.I. speed contests G. Ziegler (Germany) 169 k.p.h. J. Sladky (Czech). 175 k.p.h. J. Cappuyns (Belgium) 180 k.p.h. Looks as though speed will see close competition at the *Criterium* of Aces in September!





2 (1) Les Fuzzard of East Grinstead had Gerry Ritz influenced A/2 with wing and all ribs generously sparless zussetted, plus tiny tail. (2) That nan Ray Monks again !! He won the half-A free flight power event with this 280 sq. in. wing model using Ed. Miller's Texan type of construction with diagonal ribs and sheeted top surface. Holland Hornet provides the power. (3) Always prominent in felicopter is Francis Boreham and he won the event. Here's his latest experiment with the engine (Mills 75) mounted very low and clutch drive to the rotors with freewheel for auto-rotation landing. Pusher prop on the engine shaft is protected by tripod u/c. Model is called "Spraycopter" as it Model is called "Spraycopter" as it has cigar tube smoke container. Was flown tethered for us on trailing line. (4) George French with Hornet-powered Ramrod was unplaced. (5) Peter Aston with a 1/8 scale Somuch Buffelo and Hoth Inter-Sopwith Buffalo and Herb. Jackson with Avro 504 (both using old E.D. Comp Specials) and John Darnell with Mills 75 Taube from Watford were among the very few scale free flighters oresent at Halton. (6) Westwind with Kraft Rx and A.M. 049 is by C. Dowsett of Esher. (7) New look among model copters is Roger Dudley's 27-inch dia. rotor design with four blades from Weston. Merlin '8 c.c. diesel is Weston. Merlin '8 c.c. diesel is enclosed in near scale glass fibre fuselage using dummy turbine intakes for cooling

FOR AS MANY YEARS as we dare to remember, Northern Heights Gala has been renowned for the magnificent weather which always blessed the day. Once at Langley, it did rain; but not for long! The date has always been set as the Sunday nearest the longest day of the year. However, for this year the plan was changed and N. Heights' luck stretched to one Sunday too late and . . . much too wet! The record has at last been broken! But aeromodellers are not to be put off by a little dampness, and enthusiasm was high as ever. Entries in the comparatively new 4-A Class seem to include all the top experts to the extent that we might suggest a "novice" section open only to those who have never won anything ever before. In Glider, novices need no special handicap for this is a class in which everyone gets a good chance and young Mike Burrows of St. Albans seized his opportunity by winning the coveted Queen Elizabeth Trophy, awarded this year to A/2's. Free flight was unfortunately responsible for some corn-wandering downwind and we gather that complaints have been made to the organisers. A pity this, for we would hate the action of a few inconsiderate modellers

6

to prejudice the excellent reputation of this well-established annual event. On the same day the Chester Model Flying Club held their annual slope soaring contest in Moel Famau near

Mold in North Wales. During the earlier part of the day D. Barber of Southport and R. Oakley of Chester (first and second in the Open Class) fought it out for the Gosling Trophy, awarded for the best individual time, Barber winning with 1:46. Late in the afternoon a serious challenge came from K. McClave of East Lancashire who topped A/2 with 1:31.

Twenty-four R/C contestants were required to make a nominated flight time of five minutes losing a point a second for time above and below this time. Winner R. Donohue of Kersal passed his five minutes away by doing some really fine manoeuvres including perfect loops. "Single" came second, third and fourth. When the contest closed at 5.30 p.m. many future R/C flyers were still undecided between "single" or "multi" after J. Fellows of Kidderminster made a perfect second round score of "0" penalty points which brought him second place. Below, are Northern Heights Gala Results.

Queen Elizabeth Cup (A/2 Glid	der)	2. D. G. Latter (Brighton) 6:35	R.A.F. Review Cup Radio
1. M. Burrows (St. Albans)	9:2.1	3. D. Fuller (Bristol and West) 5:49	(Spot Landing) error
2, P. Giggle (Stevenage)	9:02	De Havilland Frophy (Open Power)	1. S. E. Uwins (A.R.C.C.) 7 ft.
3. V. Jays (Surbiton)	8:36	1. G. Fuller (St. Albans) 12:02	2. C. Olsen (A.R.C.C.) 13ft 6in
Flight Cup (Open Glider)		2. A. Mussell (Farnham) 8:00	Keil Combat Cup: P. Tribe,
1. F. Young (Birmingham)	7:58	3. J. West (Brighton) 6:55	Thurston Trophy (Helicopter);
2. W. Cleghorn (St. Albans)	7:50	A Power	F. G. Borcham,
3. C. Jackson (Surbiton)	6:01	R. Monks (Birmingham) 5:41	
Fairy Cup (Open Rubber)		2. A. Young (St. Albans) 5:10	Acromodeller Challenge Tronhy:
1, L. G. Barr (Hayes)	7:44	3. J. Berryman (St. Albans) 4:43	J. Berryman,

J. Berryman.

Famous Biplanes Number 29 By G. A. G. COX



## Harold Krier's Great Lakes "Special"

NOWADAYS, FLAMBOYANT personalities are something of a rarity in aviation and positively unique aeroplanes even harder to find. It is with pleasure therefore, that readers will view the rise to fame in the U.S.A. of Harold Krier and his Great Lakes Special. To the older enthusiast this man-and-machine partnership recalls some of the romance of pre-war days and the vivid red and white biplane is sure to be popular with modellers although some details of the decor will be difficult to reproduce on any but the largest models.

Although it is true that Harold Krier selected a Great Lakes Trainer as the basis of his personal aerobatic machine, after extensive reconditioning and redesigning there is little to identify the Great Lakes Special with the original aircraft. The 2T-1 Sports Trainer was manufactured by the Great Lakes Aviation Corporation between 1929 and 1933, and when it first appeared it represented a considerable advance on contemporary trainers. It was small, light, responsive and, except for a reluctance to recover from spins, safe to fly. The spin-



happiness was corrected at an early stage by enlarging the vertical tail surface, and nearly all machines were converted to "large tail models". The 2T-1 found immediate favour among flying schools and clubs and private-owner sport flyers. Even today it compares favourably with more modern types and it is probably the most popular biplane in America for restoration by antique aircraft enthusiasts. Many are in regular use today.

The original Great Lakes was powered by an Americanbuilt Cirrus four-cylinder in-line engine, enclosed in a cowling reminiscent of the De Havilland Moth. This cowl later gave way to a smoother but bulkier version. The fuselage was of welded chrome molybdenum steel tube with wooden formers and stringers. It was all fabric covered except for the nose panels, the underside as far aft as the rear spar, and a small headrest.

The wings consisted of routed spruce spars, dural tube compression members and steel wire drag bracing. The ribs were of spruce and dural, and the leading edge

Continued on page 473



Air show stunting in the U.S.A. demands verve and audacity plus a powerful aircraft. With the increased power of a 185 h.p. Warner radial replacing the Menasco inline engine, considerable cleaning up of the airframe and a variable pitch prop, the Krier Great Lakes Special stunts from the ground up and needs no altitude for starting a manoeuvre. At top is an inverted banner pick-up, always spectacular; and right, the diminutive proportions of the Great Lakes are emphasised by Harold Krier in the foreground. The "Lakes" is said to have a tighter loop diameter (about 350 ft.) than other aerobatic mounts and will flick roll three times without too much speed loss. Full span leading edge disputers are sometimes added to aid tight manoeuvres. These pictures show Curtiss Reed prop and M struts



#### Famous Biplanes (Continued from page 471)

was aluminium covered. The entire centre-section between the spars was occupied by the fuel tank, capping strips being attached to this to maintain the fabric contour. Frise type ailerons were fitted to the lower panels only, and these were operated by a torque tube from the rear stick. The upper wing was rigged with 3 degrees dihedral and 9 degrees 13 mins. sweepback. The lower wing, unswept, had 2 degrees dihedral. The tail was all metal with fabric covering and characteristic split-axle undercarriage had a track of 5 ft. 10 in.

When Harold Krier began restoring his 2T-1A in 1956 he completely stripped the airframe and cleaned down to bare metal. The 125 h.p. Menasco in-line engine was replaced by a 185 h.p. Warner radial for which a cowling from a Fairchild 24 was an exact fit.

Krier Special details show the revised wing strutting, latest propeller (from a Navion) and the red and white decor of this colourful stunter. Would make a cracking subject for radio control scale!



The 40 in. diameter cowl necessitated a more rounded fuselage tapering to the original section aft of the rear cockpit, and this was achieved by means of aluminium formers and stringers. A 6 gallon tank for the smoke forming equipment and a 12 gallon fuel tank from a Piper J3 Cub were installed in the front cockpit, and the opening faired over; an extra-long metal headrest completed the fuselage.

The wings were completely rebuilt, the rib spacing being altered because of the reduced span of the lower panels and the fitting of ailerons to the upper wings. There is now a nose rib in every space between full ribs, and the metal leading edge covering extends 13½ in. aft. Incidence of both wings has been reduced from three degrees to one; the upper wing has no dihedral, and the lower, one degree. The one pair of landing wires on each side of the aircraft was replaced by three single ones in "N" formation, and the interplane wires were fitted with balsa fillets as shown on the scrap view.

An 84 inch diameter Curtiss Reed propeller was fitted to the new aeroplane, while wheels, brakes and spats from a Cessna 170B completed the transformation. The track is now 6 ft. 3 in. At this time there were no twin stripes on the fuselage of N21-E, no decoration on the headrest, no lettering on the cowl. The spats had a simpler design in red, while the undercarriage struts and windshield framing were white. At intervals changes have been made bringing the craft to its present form: "I" shape interplane struts of welded steel tube with balsa fairings and fabric covering have replaced the "N" type, there is now a variable-pitch propeller from a Ryan Navion on the engine with its ignition wiring in front of the cylinders. There is now an elaborate colour scheme which tends to gild the lily. Lastly, there is a clever cockpit hood which is probably only fitted for cross-country flights.

Harold Krier, 37 years old, is America's ace professionae acrobatic pilot and has moreover earned world-wide fame through the showing of the NBC TV film of his work in the "Danger is my Business" series. Born near Ashland, Kansas, he joined the U.S. Army Air Corps in 1939 and served as a flight engineer in heavy bombers. After the war he learned to fly, and having built his own experimental clipped-wing Piper Cub, practised aerobatics above the plains of his native Kansas. Aware of the limitations of the Cub, Harold and his brother Larry bought the 1931 Great Lakes and by their own labours made from it what is possibly the finest aerobatic machine flying today. Not content with this, Harold is looking for a Buecker Jungneister to add to his collection and needs all the information he can get on this type. There may be readers who can help him in this matter.

For three years Harold Krier has won the Col. Joe Mackey Trophy for precision aerobatics, and his performances must be difficult to surpass. Inside fifteen minutes he executes 44 manoeuvres including, the programme tells us, "vertical Nassau eights, the Yankee Doodle loop, Cobra roll and the inverted Texan eight." One of his most spectacular feats must be the picking-up of a ribbon held aloft on cane poles, flying inverted at an altitude of about fifteen feet. Last winter at the Williston, Florida National Air Show Harold Krier looped, slow rolled, did a hammerhead stall and an inverted low-level pass with a man riding on the centre-section. If only Mr. Krier would follow the example of his fellowcountryman Al Williams and bring his act over here!

The writer is indebted to Mr. Harold Krier for his co-operation in the preparation of this article, and to Mr. William Fleming of New Jersey who lent documentary material.



- KEY TO DRAWING
- I. Red and white Kendall Motor Oil trade
- mark. Black lettering on cowling only.
- 2. Black lettering on cowl 3. Polished rim to cowl. 4. Red leather padding. 5. Metal headrest.

- 6. I in. wide chromlum tape trimming to fuselage band. 7. I in, wide tape trimming to strut decora-
- tion. 8. Red undercarriage struts.
- 9. Red outline to fin and rudder. 10. Double wire bracing at front of centresection, single at rear. 11, Oil filler cap.

- 12. Double flying wires.

- Double filler cap.
   Fuel pipe.
   Fuel pipe.
   "N" formation single landing wires. 16. "N" forma 17. Oil pipes.
- Ignition conduit.
   Baffles between all cylinders.
- Push rods at rear.
   Push rods at rear.
   Red windshield frame.
   Step.
   Throttle.
   R.P.M.
   Engine primer.
   Concernent and

- 26. Compass card.
- 27, Compass.

- 28. A.S.I. 29. Level. 30. Engine switch.
- Championship badge.
   G Meter.
   G Meter.
   A irboy Senior V.H.F. radio.
   Rudder pedal.
- 36. Corrugated heel boards,
- 37. Altimeter. 38. Winged head as on cowl.
- 39
- Black rear surface to propeller.
- 40. 2 in. chrome strip around headrest decoration. 4]. This and alternate squares red.
  - (on 3 view)

### Fly your own 18 inch **Great Lakes midget** biplane

#### Free Flight or Controline AN ALL-SHEET BALSA SIMPLETON FOR ·5—·8 cc. OR COX TEE-DEE'S

YEEOOW!!! That was our immediate reaction to the first free flight we made with the Cox Tee-Dee .020 bipe, plans for which are on the following pages. It's a pip of a model, and we've no doubt at all that it'll go equally well on an .010 too. Be sure of that side thrust (same for control line) and to fit the prop on back to front if you don't want a searing race track performance on YOUR first flight too. We grossly underestimated the power of the new Tee-Dee!

The control line version has had checks with the AM .049 and the AS 55 diesel, either of which give loops, wingovers and inverted flight on lines as short as 15 ft. long. Wings are set at zero incidence and the balance is forward for C/L use, otherwise there's remarkably little difference between the two, except of course for the tailplanes.

#### Here's what you need:-

Here's what you need: Two sheets  $\frac{1}{2}$  in. x 3 in. one of  $\frac{1}{2}$  in. x 3 in., one strip of  $\frac{1}{2}$  sq. balsa, Sanding Scaler, 1 in. Balloon wheels, Celluloid, Cement and dope. One each 16 and 18 s.w.g. piano wire. In addition for FIF (radial mount)  $\frac{1}{2}$  in. x  $\frac{1}{2}$  in. x  $\frac{1}{2}$  in. ply, Yeoman obscure of plain teore for thet

chequer and plain transfer sheet. In addition for C/L 18 in.  $\frac{1}{2}$  in.  $\frac{1}{2}$ horn, 22 s.w.g. small light alloye levator horn. One 20 s.w.g. piano wire

Cut out all  $\frac{1}{4}$  in. balsa parts. Fit engine bearers in  $\frac{1}{4}$  in. fuselage on C/L model, drill holes for engine bolts and woodscrews. For Tee-Dee F/F version, mount the scrap 1 in. fairing and 1 in. ply bulkhead. Coat all surfaces with two applications of sanding scaler and when hard, commence assembly. For C/L model join top wing halves *flat*, key interplane struts (with 18 s.w.g. strengtheners) into wings, using the card templates as a jig to set the angle of wing stagger and equal incidence. For the F/F version the dihedral angle is set by cracking the lower wing down its centre line and keying the two sets of wing halves with the interplane struts, using the same jigs. The centre of lower wing is then pinned down and the jig sets the dihedral. Use spacers between upper and lower wings at centre (referring to plan for gap) and butt join top halves with upper 1 in. fairing to strengthen. While the wings are setting, make up the "N" struts from 1 in. sq. When set, add fairing below upper wing c/section, join fuselage to lower wing, and fit N struts. Mount fin. Attach 18 s.w.g. brass control horn as bellerank mount and 22 s.w.g. light alloy elevator horn to C/L elevators which are joined with  $\frac{1}{8}$  dowel and sew to tailplane. Bolt bellcrank in position and make up controls, noting the lead-out guide at Port strut. Fashion the undercarriage legs and bind with thread at the axle end. Then sew to fuselage. Retain wheels with fuel tubing. We used H.M.G. dopes on the C/L model and Yeoman transfer decoration for F/F. When dope is dry mount engine and tank. For C/L this is retained by a length of fuel tubing secured by two § in. woodscrews, (see plan)



กิกสณสก

Decorated red, white, blue as Ken Cook's G. Lakes for C/L and with Yeoman transfer for Harold Krier's as F/F, the pair of midgets have captivated all who've seen them. Below is the template jig arrangement for wing assembly (C/L, without dihedral) and layout of all parts to emphasise the utter simplicity. For beam mounted engines in F/F version, set bearers at downthrust





475





#### **Field testing the Veron Viscount**

HAVING SURMOUNTED ALL the stages in the serious business of preparing for one's radio control debut, let's assume that all is ready for the test of our efforts to fly the model.

From the start we must decide our attitude to the subject. It is so easy to drop into the trap which so many modellers fall, doing more fiddling than flying. In fact one might say that R/C'ers fall roughly into two camps, the "*Fliers*" and the "*Fiddlers*." The Flier's model is always well treated. Every detail of both model and electronic equipment is given the full and undivided attention it deserves. If we look inside such a model we see that everything is laid out neatly and can be easily removed when required. The Flier checks everything from the receiver to the rubber bands before taking his model out to the flying field and the receiver is always tuned and checked at home before the day's flying begins. Above all, the Flier has an unhurried approach to the subject and if something does not work when it should, then he finds out why and rectifies the trouble. The Fiddler on the other hand, pays little attention to maintenance, leaving all preparations until he is actually on the flying field. This, in itself would not be quite so bad were it not for the temptation to rush through checks in order to put the model in the air as soon as possible. Once the engine is running of course. there is no stopping him and he will launch the model into the blue in the hope that any trouble which manifests itself when the engine is run up (like actuator skipping) will sort itself out when the model "gets up there". Unfortunately in this case the model usually sorts out the modeller with an expensive crunch.

Of the two types, you naturally will be the former so let us see just how we fared with our *Veron Viscount* on its first outing.

We carried out the field test as detailed last month and went even further by testing ground range to the extreme. So far in fact was the distance between model and transmitter that neither operator could see the other's signals! Even so, the meter plugged into the receiver showed no less a current fall than at close proximity

At right: upper plcture demonstrates our method of launching the "Viscount". R/C model in lower picture comes all the way from Uganda, East Africa, is the work of G. Harber. Frog 1.49 powered 48 ins. span, using Krait single-channel receiver.

to the transmitter. We then took the Viscount back to base and double checked everything before commencing test glides. With our 41 lbs. model we much prefer the launch as demonstrated pictorially here; support the model under the wing with one hand and steadying with the other at the tail. Then launch the model, following through from the rear to push the model off. Always launch the model straight into wind and remember that with a heavy model such as ours, every effort must be made to obtain a true straight launch with ample air speed. One particular point we found during test glide tumbles was that the protruding valve in our vertically mounted receiver would have fared very badly had the receiver been mounted in a horizontal position. The effect would in fact have been either for the valve to fall out completely or for the valve pins to bend-and there is no doubt about it, a 41 lbs. Veron Viscount can land fairly heavily. We did in fact retain the valve in our receiver using a wide rubber band (a worthwhile idea) but the value of the vertical mounting cannot be over emphasised in this case.

Being satisfied with the radio operation and the glide trim (1/16 packing under the tail L/E) of the Viscount we ran up the engine and again tested the radio. As everything worked precisely as desired we decided we were ready for the first test flight. Flying trim with the engine (Enya 15-11) running was still something of an unknown quantity so we did not put too much fuel in the tank. With one final check to find which signal would come first (right or left) on the sequential Conquest escapement the model was hand launched for its first powered flight. Immediately after launching the model adopted a natural left turn, but could be held on a straight course with frequent application of right rudder. However, our model tended to tuck its nose down when either left or right rudder were applied. After a quite brief power run the engine cut and the Viscount glided in for something of a bumpy landing, to which the airframe stood up very well. After five more flights with increasing success we decided that we would make a few improvements on the model. The undercarriage



Using the tun-Ing meter on the Veron' VIscount'' to tune the receiver. Left hand picture shows a standing current of 1.6 milliamps, while at right, the meter shows a reading of 0.4 mil-[] a mps on signal,



had a habit of turning upside down when landing on the rough field damaging the covering on the underside of the wing, our remedy for which is to sheet the underside forward of the spar for three rib panels either side of the centre section. The nose down tendency on application of signal can at least be part remedied by washing out the wing tips 1 in. We also decided to key the tailplane more positively by cementing 3/16 in. sq. balsa rails to the underside, flush with the outside of the fuselage. These little practical tips are a logical outcome from first tests with a brand new model. The Viscount is already a robust design and needs no "beefing up." It is reasonably fast, and responsive, and will take a tip to tip ground tumble with relative impunity. However, we are sure that before long we will devise a means of fixing the fin to the fuselage in order to avoid any risk of changing directional trim. The tail assembly keys we suggest are the most important of our modifications after the first outing.

We cannot say too much for the Servistor 31 conversion on the Ivy-AM receiver, to replace the relay, we think it does in fact make the receiver what it is, easy to tune, very positive in operation and above all—cheap! The engine we chose for the Viscount, the Enya 15-11 also gives most reliable service with plenty of power on a *Top Flite* 9 in. x 4 in. propeller.

We shall continue to pass on our experiences with test models and new radio equipment with, we hope, helpful suggestions to make your radio flying more enjoyable and trouble-free. Foolproof R/C operation is still a distant dream for most of us; but the more we can help the novice with practical advise derived from our own experience, then the nearer will radio aspirants be to realising their ambition.

## New equipment

MOST INTERESTING NEWS in the radio trade this month concerns transatlantic license to manufacture. By arrangement with Howard Bonner, E.D.'s will soon be assembling imported parts for the world famous Duramite and Transmite servos. The basic "E.D." Bonner Duramite servo will be competitively priced at £4 10s. 0d., slightly less in fact than the direct U.S. equivalent price.

#### **Rising engine servo**

Another little servo just on the market is the Motor Control unit now being distributed by Henry J. Nicholls Ltd., at 55s. 6d. This, like the Rising Self-Neutralising Clutch servo is built around the popular Mighty Midget motor. It employs the normal gear reduction onto a worm drive push—pull actuating arm above the motor. Stops limit travel and a slipping clutch on the larger gear wheel ensures that the motor does not stall when the stops reach their limits.

#### **D.C.** Converter

George Redlich (R.E.P. Ltd.) sent along his new transistor D.C. converter, which delivers 30 volts at 15 n.a. output from 4.8 volts. Designed for use with valve/transistor receivers and high resistance reed units, it gives sufficient power for most receivers. Connections are Orange and Blue wires for input, Red and Black output. The unit measures  $1\frac{3}{4}$  in. x  $1\frac{1}{4}$  in. by  $\frac{1}{2}$  in. and weighs  $\frac{1}{4}$  oz. Using two Mullard O.C. 70 transistors, the baseboard is enclosed in a neat plastic case with trans-

Our Ripmax Viking complete after many months intermittent building, has home built Quetone receiver, Quad-Trol escapement and Webra Mach-1 (8 x 4 prop). An impressively smooth flyer, we are most pleased with the performance of our example and found it required plenty of side thrust and some downthrust. Weight is 3½ lbs. parent removable top. Retail price is £4 2s. 0d. Detailed tests will appear in our companion magazine, *Radio Control Models*.

#### **Mannings Servistors**

The range of transistor amplifiers marketed by Mannings Sales Ltd., have been well received. We used the Type 31 (single channel) in our "Once Upon a Button" experiments. The Type 21 received is for Single Channel pulse proportional work, using four transistors. It would indeed be invaluable for the *Galloping Ghost* system which requires a relay capable of *accurately* following (Continued overleaf)



Right top: The three Mannings Servistors receiver for test, Left is a prototype for the Type 31 single-channel version, which explains its rather rough exterior potting. Centre is the Type 21 single-channel pulse proportional unit and at right the Type 1213 multi-channel version in unpotted state, showing its saven transistors. Lower shows the neat layout of components in the R.E.P. power converter.

#### New equipment (continued)

pulse rates and mark/space ratio. Of course, Servistors, unlike relays, have no mechanical movement and thus follow the pulses to the letter and on test our Type 21 gave most satisfactory results. Fully encapsulated in translucent potting compound, the Type 21 costs £2 19s. 0d.

The Servistor Type 1213 is the most complex of all, using seven transistors, intended for relayless operation of servos for multi-channel. Again encapsulated in resin, although ours was received in a bare state so that we might examine the inards. The manufacturers emphasise that the transistors cannot be burnt out by the accidental switching of two opposite reeds, and the value of this cannot be dismissed lightly. Price for the Type 1213 is £6 10s. 0d.

#### **Orbit** books

Ed. Johnson sent along a sixteen-page booklet, size 74 in. x 51 in., published by Orbit Electronics. Intended as a guide and maintenance handbook to owners of



Orbit equipment, it should be of interest to all students of Radio Control for it contains the circuits and component values for all Orbit Transmitters and Receiver.



• What happens when a model circles in wind? Contest Gliders Part SIX by Jim Baguley • Author seen with one of his A/2's at the International team trials

PERFORMANCE HAS BEEN dealt with in Parts 4 and 5 but an aspect of model design which seriously affects a model arrived at purely from the performance aspect, is its stability.

It is suggested that stability is of greater importance than performance which cannot exist without it. To quote an earlier part of the series "a low sinking speed is desirable, but is not the full story, as stability of the correct order both on tow and glide is essential". Stability on the glide is concerned with three principal axes. These are the longitudinal axis of the fuselage, the tongitudinal axis of the wings and the vertical axis. See *Diagram* 74.

These give respectively rolling stability, longitudinal stability and directional stability.

Rolling and directional stabilities both come under the general heading of lateral stability. Obviously some inter relation also occurs. Stability on tow is of importance only with reference to two of these axes, the longitudinal axis of the fuselage and the vertical axis. This means that on tow only lateral stability is of great importance while longitudinal stability will only affect the angle of tow with speed variation.

Various stability requirements will obviously conflict and, therefore, our model must be a compromise in stability, quite apart from the compromise between performance and stability.





#### Designing "by eye"

For initial design of some aspects, perhaps the best approach is that by way of appearance. This theory may be stated "If it looks right it must be somewhere near right". This is not as stupid as it may at first seem. Consider the number of models an experienced modeller will have built and seen over the years performing in various manners under various conditions. Each will (Continued on page 482)



"Would you call back a bit later, please? The new speed champion is very much tied up just now!" have left an impression on his mind which will unconsciously build up a statistical analysis in his mind. Eventually experience will enable us to predict on seeing a model how it is likely to fly, assuming a fair attempt at trimming has been made. Various features and combinations will have left a good or bad impression.

The best way to assure good stability is by development. We, therefore, design and build a model and steadily eliminate faults in the design by observing it in flight and either modifying it or building another incorporating the modifications. This is where a lot of theoretical screed can be useful. If we are aware of the undesirable



effects which can occur and their cause (i.e. excess or lack of some feature causing instability) we can give general guides in initial design and we can also cure the faults which inevitably occur in flight.

The disturbing effect which wind undoubtedly has on a circling model on the glide (and with powered models on the climb) is often attributed to turbulence and gusts



alone. These we can do nothing about, except to maintain adequate stability reserve so that although the effect may still be detrimental to performance, it is not dangerous. It is not generally realised, however, that there is another effect which is present even if the windspeed is constant and no turbulence exists. Consider first a model flying in a straight line downwind in a settled condition. The normal airspeed of the model is v and the windspeed V. The total groundspeed of the model will, therefore, be v + V. See *Diagram* 75.

Consider next a model flying in a straight line upwind in a settled condition. With the same airspeed v and windspeed V the groundspeed in a forwards direction will be v - V. See *Diagram* 76.

Consider now a model flying directly sidewind in a settled condition. Its airspeed will still be v but its ground speed will be the vector sum of v & V. See Diagram 77.



We can similarly apply this reasoning to a model flying in any direction relative to the wind direction providing it is settled to fly in a straight line in that direction. See *Diagram* 78.



In a flat calm a model will be in a peaceful state of equilibrium. Its airspeed and sinking speed will be constant. It will be persuaded to fly in the same circle by its auto rudder lifting the rear of the model outwards at a constant rate. Thus a constant centripetal acceleration is caused which will cause a skid balanced by the centri-



fugal force of the consequent sideways load on the side area and dihedralled wing tips. There will be a rolling and yawing tendency due to the increased outerwing lift and drag and decreased inner wing lift and drag. Also a yaw will cause increased incidence of the inner dihedralled wing and decreased incidence of the outer dihedralled wing. These will all exactly cancel each other out to produce equilibrium. See Diagram 79.

Consider now the effect of applying the external disturbing influences of a wind of constant speed. See Diagram 80.

Between the points A and C of the circle (assuming



#### for the moment that our circling rate is still constant) to achieve constant airspeed the model will have to change its groundspeed from v + V at A to v - V at C. This is a change of twice windspeed! If the circle is very large, the change will be so gradual that it will be unnoticeable to the model. If, however, the circle is a normal diameter of about 40 ft, we cannot expect the model to change its groundspeed in this way as it has inertia relative to the ground and a definite force must be applied to accelerate and decelerate it between the two points. Neither can we expect the groundspeed to remain constant, otherwise the model would never drift down wind and the airspeed would not remain constant but would vary between V - v and V + v. Note again a change of twice windspeed. In practise, neither state is possible and a state exists between the two where neither airspeed nor windspeed remains constant. The fact that the groundspeed varies is of no consequence when considering its effect on the performance of the model. The effect of the variation of airspeed, however, could have great effect depending upon the stability of the model. It will any case tend to decrease sinking speed between B and D as the model comes into wind and increase sinking speed as it turns downwind, i.e. D to B. It will also modify the forces on the side area and dihedralled wing panels in rather a complex manner and will at least affect the turning rate of the model.

NEXT MONTH we shall be dealing with particular aspects of stability on the longitudinal and lateral planes. We shall learn more of tail moment arm design requirements and of what happens to a model when it is stalled.

#### Hartill writes Rill DEAR SIR.

I must take exception to the glider analysis comments by Mr. J. Van Hattum in the June issue, Mr. Van Hattum makes some very conflicting statements. He says the following:

1. "A reduction of camber in the tailplane

section does not imply a change in position 

avoided since it is both wasteful acrodynamic-ally and will make it impossible to achieve that fine degree of trim necessary for rapid reaction to changes in angle of attack due to gusts etc." 3. "My calculations show that this model (Lucifer) possesses a very high, frankly excessive, degree of longitudinal stability and this was the reason why the C.G. had to be shifted forward."

to be shifted forward."

Some reference is made to a design procedure advocated by Beuermann of Germany, which is supposed to confirm the opinion stated. Unfortunately this work is not available to me so I may be missing the point attempted by Mr. Van Hattum. For the moment then 1 must reject his

I. If the camber of the tailplane is reduced (no other change) the C.G. must be moved forward or the tailplane incidence increased. This is a basic fundamental mastered by muse who has trated as feed flott model.

This is a basic fundamental mastered by anyone who has tested a free flight model. 2. There is no such thing as too much longitudinal stability. Mr. Van Hattum is confused on this point since he also states that reducing the tailplane moment of inertia would improve longitudinal stability implying that if this were done the per-formance would improved.

implying that if this were done the per-formance would improve! 3. Lucifer and any other free flight model you can devise cannot have too much longitudinal stability. The model must react quickly to maintain correct flying speed and effective angle of attack. The C.G. was moved forward because the stab. power was reduced. If it had not been moved, the decalage would have been

reduced and this would have decreased the stability. I suspect that Mr. Van Hattum is equating longitudinal stability with only the product of tail moment arm and tailplane area. The stability characteristic, however, is a dynamic response function that is <sup>18</sup> a dynamic response function that is affected by many factors including tail moment, tailplane area, wing and tail airfoils, C.G. location, decalage, down-wash sweep back, moment of inertia etc. I suggest that Mr. Frank Zaic's year books be consulted for a clear explanation of the effects of these parameters. Frank's

of the effects of these parameters. Frank's books are especially helpful to the interested beginner and cover the material with a minimum of confusion and lots of practical experimental observation.

W. HARTILL. Southern California Aero Team.

#### J. Van Hattum replies...

DEAR SIR.

I am glad that Mr. Hartill raises the points expressed in his letter, so that I am able to expand some of the statements I made in my letter, published in the June issue of AEROMODELLER.

. When the camber of either wing or tailplane section is changed-or when both are changed-a change will occur in the are changed—a change will occur in the location of the Aerodynamic Centre or Neutral Point of the model. When either or both are reduced, the optimum distance between the A.C. of the wing and the A.C. of the tailplane (at quarter chord position) of the tailplane (at quarter chord position) will be reduced, that is, the distance between wing and tail will become less. The Aero-dynamic Centre of the model will shift forward relative to the wing chord. The location of the Centre of Gravity ahead of the A.C. of the model, is a fundamental condition for longitudinal stability.

Mr. Hartill and I do not differ on this point. But what I wanted to make clear was the fact that for any given set of design elements there is an optimum moment arm, which should be modified whenever a change is introduced in the nature of these elements. Altering the camber of wing and/or tailplane should, therefore, always be followed up by a re-appraisal of the model's longitudinal stability. These two steps should go together. When this is done, it will be seen that the C.G. will be shifted further forward, but only as a result of the shift in the A.C. The relative importance of the above is indicated by a typical example where the camber of the tailplane was where the camber of the tailplane was reduced; the distance between the trailing edge of the wing and the leading edge of the tailplane was reduced by 1.3 inches, while the C.G. came 0.14 inches forward, (2.5 per

. . . . .

 cent. on a chord of 5.7 inches).
 2. Considering Mr. Hartill's reputation as a top designer, I am sure that he will agree with me that excessive static stability is detrimental to optimum dynamic stability, with the result that the model will execute a series of ever increasing dives and climbs. It is the proper mean between static and dynamic stability which leads to the ideal set-up, taking into account all the relevant devices elements.

set-up, taking into account all the relevant design elements. 3. I think that my notes under (2) fairly well cover Mr. Hartill's remarks here. As to the last but one paragraph, I would like to refer Mr. Hartill to the German aeromodelling journal *Flugmodellbau* first quarter of 1960, in which he will find a very full account of Mr. Beuermann's method. I still maintain that stability around the C.G. greatly benefits from a small moment of inertia of the complete model. Surely the

inertia of the complete model. Surely the orrecting forces will have to be greater as the moment of inertia increass? Hence the rule to group the heavy masses near the C.G. and to keep the tail unit and wing tips as light as possible.

However, as next best, a condensed description of the method will appear in the next edition of ALROMONILLIR Annual for the use of practical modellers.

Finally, I am glad to state that the Year Books of my old friend Frank Zaic have been my joy and mainstay since 1938 and his work is included in Beuermann's list of references.

Rijswijk, Holland.

J. VAN HATTIM.

SPECIFICATION	
Displacement: 3.128 c.c. (.1912 cu. Bore: .6425 in. Stroke: .590 in. Bore Stroke ratio: 1.09 Bare weight: 5½ ounces Max. power: .347 B.H.P. at 15,000 Max. Torque: 27-3 ounces inche 9,000 r.p.m. Power rating: .111 B.H.P. per c.c. Power/weight ratio: .063 B.H.P.	in.) Is at per
ounce	
Material specification: Crankcase: light alloy gravity die ca Crankshaft: hardened steel Cylinder: hardened steel Piston: cast iron Contra piston: cast iron Bearings, ball race (rear), cast sleeve (front) Cylinder jacket: turned dural Crankcase back cover: turned dural Spraybar: brass Connecting rod: turned from RR light alloy Manufacturers:	iron , 56
Progress Aero Works, Chester R Macclesfield, Cheshire, Retail p £4 8s. 6d. plus 16s. Purchase Tax.	oad, rice:

OMBAI

## ENGINE ANALYSIS No. 87

Tough and powerful new diesel from Macclesfield which is already proving itself in contests

reviewed by R. H. Warring

BASICALLY THIS ENGINE is virtually identical in appearance construction and overall size to the 2.5 c.c. P.A.W. Special, although it is, in fact, an *entirely* new engine throughout and not a bored out 2.5. The crankcase body, for example, is slightly enlarged to accommodate a larger cylinder liner; and the crankshaft is new to accommodate a greater stroke. As a result it gains in being *proportioned* to a specific displacement size rather than being an existing engine modified to a new size and the power increase is roughly proportional to the size increase.

The P.A.W. 19-D is a good, rugged engine with easy



handling characteristics and plenty of power. Developed specifically for combat use, it should equally well make a good free flight or radio control motor. It is a very noisy engine and the compression screw is rather small for comfortable adjustments. General handling characteristics, however, are very good. Starting is excellent, provided a really strong flip is given to the propeller. Adjustment is non-critical although optimum settings can only be achieved by letting the engine warm up, when the compression can be backed off a considerable amount. By this time the cylinder head is extremely hot hence the comment about the small compression screw.

Running is smooth and consistent over the whole of the speed range although at the higher speeds there is some tendency to spit and pop, but this does not appear to produce any loss of power. As supplied new the P.A.W. 19-D needs considerable running-in time to free up properly—the actual time required depending very much on the original fits of the particular engine. One hour's running at fairly high speeds would appear to be a minimum requirement and some further improvement in performance will probably be realised over the next ten hours or so. Progress Aero Works state that they take motors up to around 13,000 r.p.m. before despatch so that, for combat work, running-in is merely a matter of putting the motor in an uncowled model, using the recommended propeller and fuel, and flying it.

using the recommended propeller and fuel, and flying it. Speaking of fuel, "Gig" Eifflaender gives us an interesting mix for those who prefer to make up their own fuel in bulk for reasons of economy. Tests show that the P.A.W. 19-D is as happy on this fuel as any other.

The mixture is:  $\frac{1}{2}$  pint Castrol R,  $\frac{1}{2}$  pint Castrol XXL, 1 pint ether, 1 pint Esso blue paraffin, to which is added 30 c.c. of amyl nitrite. For really high speed operation one should increase the quantity of nitrite in order to obtain smooth running.

A	1:	
27	M	DDELLER

Decentrice D D M Erci	
ROPELLIK K.F.W. FIGU	an a an
ala x plich	r.p.m.
9 x 6 Frog nylon	11,000
8 x 4 Frog nylon	14,200
8 x 5 Frog nylon	13,000
10 x 6 Frog nylon	8,800
10 x 3 Top Flite	10,300
9 x 4 Top Flite	12,000
9 x 6 Top Flite	9,800
8 x 6 Top Flite	12,200
9 x 6 Keilkraft nylon	9,000
9 x 4 Keilkraft nylon	12,800
8 x 6 Keilkraft nylon	12,200
9 x 6 Trucut	10,200
9 x 4 Trucut	12,200
10 x 4 Trucut	9,800
8 x 6 Trucut	13,000
Fuel used: Equal parts ether,	paraffin,
castor plus 5 per cent, two stroke	mineral
oil plus 3 per cent. nitrate.	



Progress Aero Works also make a particular point about fuels, recommending that the oil content never be less than 30 per cent. as a lower figure can be detrimental to engine life. This is understandable in view of the very limited piston area acting as an effective rubbing surface. Nitrate content of the fuel does not appear important but is necessary for smooth running at the higher r.p.m. figures. Another important point is that the cylinder gels extremely hot and thus requires good ventilation to provide cooling.

Design and construction wise the P.A.W. 19-D is a highly practical engine, well made and with proper attention given to the parts which really matter without bothering too much about some of the liner points of finish. The crankcase is a gravity die-casting of simple functional shape with generous lugs giving a long spacing between mounting bolts. A Hoffman ball race is fitted as a rear bearing with a cast iron sleeve supporting the rest of the shaft bearing surface. This sleeve is cut with a rectangular port locating under the intake hole forming a shallow expansion chamber between intake tube and the shaft port as well was extending the port opening axially. The crankshaft port is similarly opened up axially but tapered down to the actual opening connecting with the hole drilled in the shaft. Shape is obviously considered more important than finish and no attempt is made to clean up the edges of the shaft port.

The crankshaft itself is  $\frac{3}{2}$  in. diameter, tapering very slightly from front to rear. It is a very free fit in both the Hoffman High Speed ball race and bearing bush. The bushing appears to have been reamed to finish whilst the shaft itself is hardened and ground between centres over the journal and plain length of the reduced diameter front length. The crankpin and back of the crank web is also ground to finish. The web is scalloped to provide a measure of counterbalance.

The cylinder liner is a plain shape seating on a narrow flange in the crankcase unit and quite a loose fit in the casting. It is held in place simply by three screws passing right through the finned jacket. Cylinder overall diameter is .809 in., equivalent to a wall thickness of approximately 80 thou. Three exhaust ports are cut through the walls of trapezoid shape. Transfer ports consist of three wide but shallow scallops machined out of the bore, the rounded apex of each scallop almost completely overlapping the exhaust. This method of forming the transfer ports is peculiar to the P.A.W. engines, seems to pose an awkward machining and finishing operation and reduces the effective bore section at the bottom of the stroke to practically nil-but it obviously produces a very efficient transfer system. The cylinder is hardened ground and finished to size by lapping.

The piston is of cast iron, perfectly conventional in form with a shallow conical top. It is ground and lapped to finish. The 3/16 in. diameter silver steel gudgeon pin

The unique Eifflaender transfer porting system is prominent in this picture, showing one of the three large scallops which remove much of the bearing surface in the lower cylinder. Note also the long shaft port and stout con-rod

is press fitted and mounted well to the top of the piston The connecting rod of substantial size, very nicely machined from solid dural with generous little end length. The big end is drilled with an oil hole to assist lubrication. The contrapiston is of cast iron, ground and lapped to fit and nicely fitted. It held all settings positively yet was never stiff to adjust.

The crankcase back cover is a straightforward turning which screws into the back of the crankcase on a relatively shallow thread. No gasket is used to seal. The propeller driver is also turned from dural and locates on a taper length of the crankshaft. Threaded shaft diameter is  $\frac{1}{2}$  in. B.S.F. and of sufficient length to accommodate all practical propeller hub thicknesses.

The intake tube is an integral part of the crankcase casting, vertical but machined to a slightly tapering bore. The spraybar assembles at the throat section and is angled back slightly. Spraybar and thimble are of brass with a steel needle.

Summarising, a rugged, extremely practical engine with a very good performance and excellent handling characteristics. Particularly attractive for combat or stunt, it could equally well make its mark in the free flight field. Good down-to-earth British "diesel" engineering, in fact, at a very reasonable price.



485







REPRESENTATIVES TO FLY for Great Britain in the World Championships this year passed through flight trials which were possibly more arduous and fraught with suspense than ever before.

Indoor men had the use of Cardington Shed on July 8/9th and had a fiesta of high times with no less than 45 flights recorded at over 20 minutes. A year ago this was a hallmark of indoor prowess; but now it's the magic half-hour time that's the aim, and to qualify, Birmingham's Phil Read broke the 30 sign three times for a total of 1 hour 34 mins .02 secs which gave him a handsome lead. Ron Draper made second best time of the meeting with one 31:47 flight and another just 7 sees short of the half hour and Reg Parham worked up his times with great consistency for a close third place. But it was Monks' effort, with his best model and prop firm in the girders (refusing to dislodge in spite of coercion with fishline and a hydrogen balloon) and leaving him to rely on an inferior prop that caught the eye. He made 14 flights, working up from 11:30 to 27 minutes ("flogging a dead horse" as he would say) in one prolonged challenge to the leaders. Ray is rewarded by nomination as team manager.

P. Read (Birmingham) R. Draper (Coventry) R. Parham (C.M.) 32:12; 31:06; 30:44 31:47; 29:53; 27:00 29:08; 28:25; 28:15

At Barkston Heath on July 15/16th, the pattern of the F.A.I. contests was entirely changed by the end of two rounds in blustery weather on the first day. The misfortunes of some whose agony we shall not prolong by mentioning their names, gave opportunity to those more consistent. George French stood out as a clear team man in power with full max's right through from the first trial, giving him a perfect 21 mins. total, Ray Monks lifted a place to 2nd and Dave Posner swept through from 14th to 3rd! In Glider, Mike Burrows (in his second year of aeromodelling) came through from 7th to 1st with Dallimer, Latter and Monks close behind. Wakefield, always more consistent, provided a shuffle of top places with the order at O'Donnell, Elliott, Nelson and Roberts . . . then Monks.

So to the second day, bright, less windy and yet fraught with change for at the 3rd round in Power it was French, Monks and now Tony Young suddenly up from 8th place to 3rd with Glynn and Buskell only a few sees behind. In Glider the order changed to Dallimer, Freeston and Monks, and in Wake, to O'Donnell, Elliott, Roberts.

Only in Glider, where Halford and Burrows displaced Monks, was there any change in the 4th round, and all seemed set for the 5th flights (tenth in the series of trials) to confirm placings. **Power** models were off first . . . and Monks missed a max with 2:08 whereas Glynn and Young made sure. French did not fly as he already led with his total from 9 flights. So the order became:—

G. French (Essex) 26:14, A. Young (St. Albans) 26:05 and K. Glynn (Surbiton) 26:00.

Next came the Wakefield decider, with excitement as

FOUR LEADERS at left: Norman Elliott prepares to "Javelin" his "Goblin Fox" Wake for final flight, Geoff Dallimer watches the wind as helper hooks towline on all yellow A[2. Geoff alternated two models, live flights each. George French's "Night Train" ( A loco ran over its "Nightmare" predecessor!) with chequered silk on tips and tail and O.S. Racing Glow IS inset to show plumbing for pressure and shut-off. Timers also actuate tail incidence, and auto rudder—a beautiful job. Phil Read casually despatches his mike model on a 32-minute tour of the Cardington shed. At right, the remarkable all-rounder Ray Monks releases all-red Super Tigre G.20 Jubilee power model, now 3rd in team. Far right, Graham Freeston plays his A/2 (above) on the line for important last launch, which got him a team place and Bruce Halford laughed his head off when he learned he was 2nd; but he did not anticipate that our blockmaker would chep his modified Altair tail off.



Tony Young with Oliver Tiger enlarged Amazoom (450 wing) came 2nd to be in two consecutive teams, likewise Lou Roberts with Pandora in centre. Ken Glynn was 3rd but under weight by a fraction. Rules are rules, so he lost his place with ETA 15 model. Below him, Ron Draper holds his 2nd placing mike job as Janet Roberts winds full turns for a 31-minute flight.

Roberts and Monks tussled for 3rd place. Elliott made sure of 1st by launching under a black cloud as the round started and visibility was on the wane. *If* Monks made a max he could catch Lou Roberts, *provided* Lou made 1:45 or less. Monks got his max, and Lou scored 1:46!! So Ray was pipped by a second into 4th place, a position he now held in Indoor, Power and Wake. John O'D's 9 flight total was good enough to hold 2nd place.

N. Elliott (Croydon) 27:18, J. O'Donnell (Whitefield) 25:09, G. Roberts (Lincoln) 24:46. Finally to Glider. Geoff Dalliner made certain with

Finally to Glider. Geoff Dallimer made certain with yet another impeccable launch but Graham Freeston was not so well placed and Bruce Halford came up from fourth place with one of the few last round Glider max's to pip him, and knock Mike Burrows out of the running. Yet, when all was added, there was still a chance for Ray Monks. If he made 2:58 he could be 3rd. It was too late in the day to hope for such a time and after a valiant effort, Ray's eventual 5th seemed hard justice.

G. Dallimer (Stevenage) 25:33, B. Halford (Norwich) 24:18, G. Freeston (Sheffield) 23:45.

Tailpiece. After one official and two confirmatory examinations, K. Glynn's power model was found slightly under weight for area, so Monks gets his Power team place after all, and Glynn flies for New Zealand as a nominated proxy.









MOST HIGH-PERFORMANCE models employ built-up construction for higher strength-to-weight ratio. You can learn some of the important basic techniques by building Sure-Flyer and you'll have plenty of flying fun

Start by covering the plan with waxed paper and laying out a fuselage side over the side view. Pin the longerons down first by holding them in place with pins either side as shown. Use medium hard 3/32 in. sq. balsa, cutting two of each vertical spaces as you go along and sticking one in place, saving the other for the second side which is made over the top of the first.

While the side frames are drying, cut out parts F1 to F5, using the materials noted on the plan. Bend the landing gear from 18 s.w.g. piano wire and lace it to F2 as shown. The holes for lacing must be bored first, using a pin drill or a sharpened length of piano wire.

Now remove the sides from the plan, sand them, using a sanding block, and separate with a razor blade. Join the two sides on former F3; then add F2. Block up the frame (upside down) making sure that it is



#### **Keith Laumer's**

## Sure Flyer

#### A 30 inch rubber driven model with specially simple construction

perfectly aligned, and let the cement set. You can make use of the waiting time by cutting out the rudder from medium 1/16 in. balsa, and the elevator from soft 3/32 in. balsa. Sand the edges to a smooth contour and smooth the surfaces, rounding the corners.

You can return to the fuselage now and add bulkheads F1 and F4. Use rubber bands to draw the sides together, to hold the parts in place. Add the cabin roof, part F5after first bending the wing hold-down wire and attaching to the underside with a piece of silk. Now measure the spacers on the top view and add to the top and bottom of the fuselage. Cut and place 1 in square shaped for cabin and let in balsa panels at the front and rear of the fuselage at end of motor positions as shown on plan. Add the two triangular gussets behind the cabin.

Cut the nose block to approximate shape from medium hard balsa and cement a frame of 3/16 in. sq. strips to the rear face to hold it in position in the nose of the model. Bore a hole through the block to accommodate either a wooden thrust button or a brass bush. Now sand the nose block to shape, following the lines of the fuselage.

Bend the propeller hook from 18 s.w.g. piano wire, insert it through the nose block from behind, then through the bearing. Add the washers and a commercial or hand carved 10 in, propeller and complete the assembly as shown on the plan.

Using a sanding block and fine sandpaper, go over the fuselage to remove any rough spots, then cover the framework, using lightweight tissue. Each side can be covered with one piece, with the exception of the top, which will require two. Spray the tissue with water and set aside to dry.

Start construction of the wing by cutting a trailing edge from  $\frac{1}{5}$  in. by  $\frac{1}{5}$  in. by 261 ins. If you cannot get shaped trailing edge, use a strip and place it on the edge of your work table, using a sharp knife to bevel it to the cross-section shown on the side view of the fuselage. Now place the strip on the plan, mark the positions of the notches and cut them, using a razor blade or a length of fine-toothed hack saw blade. Be sure to cut the notches no more than 1/16 in. deep.

Build up the leading edge over the plan using  $\frac{1}{2}$  in. sq. balsa and notch it in the same manner as the trailing edge. Next cut 22 of rib W2, 2 of ribs W3 and W4 and 3 of rib W1. Stack the 22 ribs in one "block" and sand as a unit to ensure uniformity. Cut tip parts and join them together over plan. Cut shallow notches in the trailing edge at the positions of the dihedral breaks and crack to the proper angle (see plan) cementing the joints carefully. While the trailing edge is drying, cut the landing gear fairings and attach them to the landing gear struts with strips of silk. Give the fuselage and tail assembly a coat of clear dope. Cut the rudder tab free of the rudder and re-attach using soft wire on pins. Then sand rudder and elevator and cement together.

The trailing edge should be set by now, so pin it to the plan, position the leading edge, and add the first six ribs W2 in the main right panel. Allow a few minutes to dry, then re-position the structure and build up the left panel. Add the centre ribs; put two strips of 1/32 in. balsa under the centre section to position them.

Next, block up one tip so that the opposite tip panel is in contact with the plan. Add tip parts and the remaining ribs. Then reverse the procedure, and complete the other tip.

When dry, remove the wing from the plan and sand it carefully, shaping the leading edge to the cross-section shown on the side view. Cover the centre section, top and bottom, with 1/32 in. sheet balsa.

The bottom of the wing can be covered with a single piece of tissue. Use 5 pieces for the top (1 for each panel). To simplify covering, mucilage glue or photo paste may be used as an adhesive which allows time to pull the paper into position.

Moisten the paper by "flicking" water from a brush over it and when dry apply clear dope to shrink and water proof. The tail assembly can now be cemented to the fuselage. Take care to align it properly. Bend the tail-skid and cement it in place, holding it down with a strip of silk. Install the wheels and retain them with soldered washers or by bending the ends of the axle up. Insert the hardwood dowel for the rear wing hold-

down. Make a windshield pattern from heavy paper,



Fuselage construction gives experience in box frame assembly, using bulkheads for accuracy of alignment

using the cut- and-try method, transfer to thin celluloid, and install.

Make up the rubber motor by laying out 12 ft. of rubber in 4 strands 36 in. long (if you use  $\frac{1}{4}$  in. flat rubber; use correspondingly less for a larger size). Twist the rubber 50 to 100 turns in the direction *opposite* to normal winding; then join the ends and allow the loop to twist itself together (giving 8 strands of  $\frac{1}{4}$  in. rubber). The resulting pre-tensioned motor should be approximately 16 in. long.

Install the motor from the front, retaining it at the rear with a strong hardwood dowel. Hook the motor to the prop shaft and fit the noseblock in place. Attach the wing using 2 or more lightweight rubber bands. You are now ready for test glides.

Don't he alarmed if *Sure-Flyer* balances near the trailing edge of the wing. This is quite normal with this type of model. Make the first test glides over tall grass on a calm day. If the model dives, add a 1/32 in. strip of balsa under the leading edge of the wing to increase the angle of incidence. For stalls, decrease the angle. When a smooth flat glide is achieved, try a short flight with 100 turns. Use the rudder tab to establish a right turn under power. When you are satisfied with the turn, stretch the motor out to double its length and use a geared winder to pack in about 300 turns. Launch the model quickly after winding and settle back to watch *Sure-Flyer* spiral up into the blue—it'll really go!!!

FULL SIZE COPIES OF THIS 1/5th SCALE REPRODUCTION ARE AVAILABLE AS PLAN D800' PRICE 4/- PLUS 6d. POST FROM PLANS SERVICE



## GADGET REVIEW

A It's EASY to make a control line handle from a piece of  $\frac{1}{2}$  in. ply but, making the thing adjustable is a little more difficult. P. Baudine came up with this simple solution, which was published in the Belgian model magazine *Model Avia* in January 1961. The unit is in two parts, with a pivot bolt through one arm of each part. At the other end of the handle, the other two arms are joined with a bolt and wing nut which slides in a channel in the hand grip part. To adjust the lines to elevator neutral, one mercly pivots the handle about its bolt, locking with the wing nuts. Holes for different line spaces are provided. Very neat.

Do you have difficulty strengthening wing tips? S. J. Chipperfield found the answer illustrated in **B**. A piece of 18 s.w.g. wire is shaped as shown and bound and glued in position with Araldite or P.V.C. The wire acts not only as a shock absorber but to some extent prevents warps.

C will be a money saver to radio enthusiasts, it is a method of repairing burst valves in K.K. airwheels. If the small hole in the valve splits or elongates it can render the wheel useless. A small piece of fine metal tube is pushed into the valve, past the split and a second hole made further along. The rubber sleeve is then replaced and a small piece of neoprene tubing goes over the tube to accept the pump adapter.

D is for those who require a heating tool. R.T. Brownson of Timperley & D.M.F.C. used a normal domestic Gas Cooker lighter and a 12 ins. length of 1/16 in. brass tube. By blowing down the tube, a miniature blowlamp is created and operations requiring a really good sweated joint can be obtained.

Glider fans will appreciate **E**. Yet another adjustable tow hook, this one by Peter Lee of Liverpool uses an 8 B.A. bolt which slides along the 18 s.w.g. hook. A slot in the bottom of the fuselage allows movement of the bolt. The bolt can be moved to obtain optimum towing position, then locked in position with its nut.

Have you ever wanted to use a large fuel tank in a control line model but found that in doing so the tank would foul the lead-outs? D. Price of Winchester, Hants. found the answer in  $\mathbf{F}$ . A piece of tube, through which the wire lead-out will slide smoothly, is soldered in the tank, the tube protruding at each side. Position of the tube in the tank must be adjusted to coincide with the line of the lead-out after optimum tank position has been decided. The lead-out is then threaded through the tube and the tank mounted as desired.

G. How often one is reminded of the need to use

clean fuel, especially in contest models. Ian Black of Belfast has a clever little idea whereby all fuel which goes into the fuel tank of a model is filtered by incorporating a fuel filter in a squeeze bottle top. A piece of brass tube of suitable diameter is pushed through the spout and to this the fuel filter is attached by means of a piece of fuel tubing. The filter and the tube are then pushed up inside the spout as far as possible.

H. Balmer of Belfast needed an air scoop for a controlline model, so he used the idea illustrated in **I**. He took an acorn and allowed it to harden. Scooped out the inside, cut off one end and hey-presto one air scoop!

Modellers have found liquid detergent bottles most useful for fuel squeeze bottles, but Richard Howard of Edinburgh has another use for at least part of the bottle, shown in **J**. He found that the stopper from a Fairy Liquid bottle made a fine propeller bush for rubber models, the only modification needed to the stopper being that its body needs cutting down slightly.

**III.** Is a method of bending wire and tube metal used by aircraft engineers in the field where a bench vice is not available and should prove invaluable to modellers similarly indisposed. Two steel bars, at least twice the thickness of the subject of the operation are fabricated to the size given in the illustration, with  $\frac{1}{2}$  in. to 3/16 in. hole drilled in each bar  $\frac{1}{2}$  in. from the rounded end. Both right angle and radius bends are possible with this method, achieved simply by steadying the wire or tube in one bar and applying leverage with the other. The radius bends make this method ideal for shaping fuel vents, without kinking the tube.

The noise problem associated with model engines is common conversation but P. Head of Reading decided to do something about it as Photo 1 shows, with his most workmanlike silencer. This was constructed by rolling 1/32 in. sheet brass round a suitable former to make the main tube and soft soldered at the scam. Treblet tube may be used instead if available. Inside the silencer tube are three equally spaced baffles made from  $\frac{1}{2}$  in. hardwood, spaced at 120 degrees round the tube. The spaces between baffles are filled with wire wool.

Photo B shows G. H. Hughes' handywork on an *Airfix Jet Provost* covered with metal foil from a *Player's Flip Top Twenty* cigarette packet, which can be used to "metaliscise" a model without the use of additional adhesives to hold down the foil. The foil, when its backing tissue is removed, has a thin layer of self-adhesive and is then applied to a surface by rubbing on with a thumb nail and then worked over in a similar manner to remove the texture. A hair comb is then used to simulate control surfaces and rivet lines. Mr. Hughes has used this idea successfully on many plastics.







ABU MODELLE

#### London

Gala but with spirits and bodies somewhat dampened by the rain they did not enter any of the events. However, Fred Andrews braved the elements with his pylon joh, only to drop a classic clanger when he remarked "I won't bother with the D.T. its only a trimming flight!" and promptly launched forgetting to trin the engine times when he remarked "I won't bother with the D.T. its only a trimming flight!" and promptly launched forgetting to trip the engine timer for a 42 sec. engine run, which resulted in a long heetic chase, for-tunately successful. The Demonstration Team put on a static exhibi-tion at the Falconwood Community Centre and a flying show at Stone Parish Fete, both of which were highly successful. In the latter show the combat between the F.W.190 and Mk.14 Spit roused the crowd to such an extent that they would have been lynched if the lift had won. e 190 had won. Three HAYES & D.M.A.C. members qualified to compete in the

A'2 Trials, good fortune did not smile on them, Jim Baguley faring A 2 trials, good fortune did with sinte on their Barr followed up his best and finishing in 13th position. Laurie Barr followed up his Nationals 2nd in Rubber, by winning the Fairey Cup (Rubber) at Northern Heights Rally. A soaking in the rain was not enough for him, he had to wade in a river as well Ian Russell, found much of his old form, to reach the Final in Combat, which he lost to

The FELTHAM & D.M.A.C. want to thank all those who made the Nationals a happy Whitsun weekend, at which their T. Calvert tied for 1st place in the [A Team Race, They also found a black and yellow [A model at Halton (where members collected 7th and 13th in combit) and wait a chief. in combat) and await a claim. Several members of NORTHWOOD M.A.C. went to the Dover

Rally which, with a little more support could have been one of the best meetings of the year, numerous timekeepers being available and refreshments laid on. Although their confidence in the weather for Halton was rather shattered, Pete Tribe won Combat, keeping the Keil Cup in the "Northwood/Kenton family" for the fourth

the Keil Cup in the "Northwood Kenton family" for the fourth consecutive year. At the Northern Heights Gala, ST. ALBANS M.A.C. upheld their reputation for being all weather fliers. M. Burrows, who has been modelling for 2 years only won the "Queen Elizabeth" Cup. He was soaked to the skin but happy, and this effort earned him a report and photograph in the local press. George Fuller was 1st in power, W. Cleghorn 2nd in glider, and Tony Young 2nd in  $\frac{1}{4}A$  not bad, ch?

Although there has been a lack of interest recently in ENFIELD M.A.C., several members visited R.A.F. Halton, R. Moore flew his Delta Wing Free Flight job but landed in a tree and took several hours to get down. The very next flight he hit a car thus breaking his model

model! HAYES & D.M.A.C. spent the first Nats, day organising 120 entries and the Davies A Trophy F.A.I. Team Race. On the second day Laurie Barr did lots of walking to place 2nd in rubber. It just wasn't Dave Balch's day; he watched his model "stack" in the §A T R semi-final. Their three class 2 speed entries. Dick McGladdery John Taylor and Kevin Lindsey all put in flights. The Hayes Rossi-Vulcan jet plane (plane or missile?) was unfortunately not allowed to show that 500 e.e. of combustion chamber can go faster than 10 e.e. of evlinder. 10 c.c. of cylinder.

#### South Eastern

A large contingent of BRIGHTON & D.M.A.C. attended Barkston Heath for the first F.A.I. free flight trials. John West, despite a poor fifth flight, was well placed in the Glider and Ian Lucas finished ninth in power.

ninth in power. At the end of May, LEATHERHEAD & D.M.F.C., held their 4th annual C L precision contest, winner was Keith Young with a Rivers 2.5 "Talon". 1st, 2nd and 4th places were taken by the Competition Sec., P.R.O. and Treasurer in that order. The Chairman and Secretary were the judges. (Fiddle!). The 2nd round of the R.A.F.A. shield was held on June 18th at Ashdown Forest. Excellent weather made for an enjoyable day's flying. TUBRIDGE WELLS increased their lead to 105 pts. followed by E. GRINSTEAD who improved to 2nd place with 55 pts., followed by CRAWLEY-50. MEDWAY-35, HORSHAM-15, and LEATHERHEAD-10. LEATHERHEAD-10.

Top Sco	rers:				
Glider:		W. Horton	Crawley	 7:38	(Caprice)
Power		R. Taylor	F. Grinstead	 5:33	Divielander

Power:		К.	laylor		E. Grinst	cad	5:33	(Dix	iclander)
Rubber:		F.	Puttock		. Tunbridg	e Wells	7:30		
ALTER	= 0 m 0	122	onting C	D A	AWEEV M.	C C	i	Den	Displant

At the same meeting CRAWLEY M.A.C. Chairman Don Plunkett was testing his new A/2 when it hooked a king size thermal and was chased by car as far as Tunbridge Wells, where it was lost in low cloud. He was fortunate enough to be contacted by a farmer the next day who saw the model land in his field that had just been harvested at 6 p.m. in the evening. The model was launched at 3 p.m. and the farm was 12 miles south of Tunbridge Wells. The model having flown a dog leg course of approx. 20 miles, on inspection it was found that the DT fuse had only charred the D/T rubber bands and they had fused themselves back together again!

bands and they had luxed themselves back together again! Also at the same meeting E. GRINSTEAD Secretary Les Fuzzard broke the club distance record with a flight of 13-14 miles lasting about 1 hr. 10 min. with his A.P.S. "Shorty" A 2. The raily held by JUNIOR LEADERS REGT. (DOVER) on Sunday June 18th was a great success. The winners of the flying events were Combat: 1. R. Meekings—Kenton M.A.C. Stunt: 1. G. Oswell-Ashford M.A.C. Team Race: 1. Mr. Trussler— Tunbridge Wells **Tunbridge Wells.** 



**CANTERBURY PILGRIMS** outdoor meetings are held near Barham Mill on the A.2 road between Canterbury and Dover. Although marred by poor weather these meets have been well attended. The local thermals are bigger than ever this year and the lost model score continues to rise. One in particular, a *Rumrod* 750 with an O.S. Max. 29 aboard landed in a corner of the local wood. "Oh—it's too big to lose even in there", went up the cry. "Oh—you of !ittle faith", how they underestimated the 'anglewood graveyard where only between an hour before and after mia-day G.M.T. is it possible to glimpse the sky! Roll on the autumn! *SORRY I mixed up the Pilgrims last month fellows! That heading picture of the lads in front of a coach showed the club from Sutton-in-Ashfield, Noits. To make amends, the ple, above from the "Kent Messenger" illustrates what the Canterbury boys can do!* CANTERBURY PILGRIMS outdoor meetings are held near

#### East Anglia

On June 18th ANGLIA M.F.C. visited R.A.F. Oakington for the Model Engineer Cup, D. Roche scoring three max's, but lost his model. M. Willsmore also did well with two max's, but caught a down draught on his last flight, using his much repaired K.K. *Caprice* The total time by the team was 28:19 placing them top in the area

The total time by the team was 28:19 placing them top in the area results and second nationally. CAMBRIDGE M.A.C. members were among the British modellers invited to enter contests at the U.S.A.F. Molesworth meeting. Club secretary Sue Allsopp came 2nd in Glider (*Empress*) while David (Dusty) Miller was 1st in POWER (*Cox Olympic-Climax*), also 1st in Glider (*Caprice*) and 2nd in chuck glider. Discussions are going on between NORWICH M.F.C. and an advertising agency who want to make a television film advertising a famous detergent and featuring an adult modeller and family. I urther news about this at a later date. Member 0 the British A.2 team.

for the club by becoming a member of the British A/2 team.

#### Northern

Members of ROTHERHAM & D.M.F.C. continue to do well in area events, Ron Boid triumphed over a howling gale at Rufforth to win area open power with his Merco '35 Monster, which gave everyone, including suspect Ron, heart failure at each launch, by adopting a vertical bank and screaming round right handed before howling straight up.

The Northern Area News July edition is a real beanfeast of model gen, and plans. Those energetic newsmen will be making us look to our laurels! Four three-views in one issue is going insane. Those who want simple back numbers should send is, to John Pool, 3 Rothwell

our laurels! Four three-views in one issue is going insane. Those who want simple back numbers should send 1s. to John Pool, 3 Rothwell Drive, Savile Park Road, Halifax. J. Bullock, one of HALIFAX M.A.C.'s Speed enthusiasts, has produced a potent looking Class II Speed job for an ETA 29 VIc. Finished in yellow and black trim and with polished mahogany wings, it will be flying at the Northern Gala he promises. Thirteen members of the WHARFEDALE CLUB attended the Midland Area Rally at Wellesbourne on June 11th. Their most significant achievements were in the C'L events where Ray Hilyard placed 5th in Stunt. The Ken Long/Les Davy F.A.I. TR team won with the Tigress VI, their best time was 4:36 in the second round. The Long Davy team also took 4th place in Class B. During their heat the TA 29 fc powered Dalesman II set a new unofficial British record for the 5 mile race 3:08 was recorded. WHARFEDALE would like to thank the Midland Area clubs associated with running the C L events for a very well organised contest. November 5th is the date for the WHARFEDALE sponsored Rufforth 1,000 for S.M.A.E. class B T Racers. Pre-entry is essential for this event (2s. 6d. per entry) and all entries should be sent to the Wharfedale Comp. Sec., Don Hawoth, 38 Lidgett Park Avenue, Roundhay, Leeds 8, Yorks, not later than October 2016, 1961. HUDDERSFIELD D.M.A.C. took over 40 members to Rufforth, the UNE

HUDDERSFIELD D.M.A.C. took over 40 members to Rufforth, where John Woodhouve and Allan Field got through into the second round of the combat. Junior Members have been busy making Chuck Gliders, which had to be completed in one club night. They were then flown at the following week's meeting to find which was the best built and trimmed model. The winner of this competition was Graham Gerrard, with a time of 41 secs, for three flights, second was

Granam Gerrard, with a time of 41 secs, for three mights, second was David Shaw followed a close third by Martin Whitely. Several BAILDON M.F.C. members made the trip north to the P.A.A. Festival with some success. Henry Tubbs gaining second place in Power and Gerry Tideswell third in Rubber. Interest seems to be swinging towards open power models with Gerry Tideswell's new lightweight A.M.35 powered 380 square inch 13½ oz. model and

Tom Stoker's 400 square inch 14<sup>1</sup>/<sub>4</sub> oz. elliptical model with the new *P.A.W.* 19*D* which almost puts it into orbit on a K.K. 9 x 4. The Lewin Trophy Comp. for precision power flying in the **BLACKBURN AIRCRAFT (WELFARE)** M.F.C. where points are scored for appearance, take off, error from a nominated flight time and landing for three flights was keenly contested and results in a tie for Eric Coates—Mills .75 Leopard Moth and Allen Solly—Frog *Feiseler Storch.* After 24 flights only 22 points separated first from last in which only scale and semi-scale models are clivible. last in which only scale and semi-scale models are eligible.

#### Midland

Midland Ten members of LEICESTER M.A.C. entered combat at Welles-bourne on June 11th, but were not able to get into the final in spite of their numbers, while 5 out of the twelve entries in the concours event were from Leicester. Junior members are being encouraged by a special chuck glider competition, the prize being a Jetex motor and accessories donated by a member—pleased to hear this. OUTLAWS (CANNOCK M.A.C.) are to hold what they believe will be the first open Rat Race Rally in this country. Two classes will be held (1) Up to 3-5 c.c., 50 ft. lines. (2) Up to 0-40 cu. inch, 60 ft. lines. No model specs. No minimum line diameter—10G pull test. No tank limit, fixed undercart. 1st heat over 35 laps. 2nd heat over 70 laps—must include one pit stop. Finals over 140 laps—must include two pit stops. Provisional date October 29th. Venue to be announced next month. A stunt event will also be held. They have played around with the smaller class and recommend something round about 80 sq. in., upright motor, interchangeable

They have played around with the smaller class and recommend something round about 80 sq. in., upright motor, interchangeable tank, medium moment arm and generous size wheel(s). GEE-DEE M.A.C. recently gave two displays of C/L flying at Notts. County Fair at Southwell, and at a fete and gala at Notts Rugby Football Ground. Both of which were poorly supported by he seniors, and had it not been for some of the keenest juniors, the events would have been complete failures. On the brighter side, since the local aerodrome became licenced the Club Committee came to an agreement with the authorities there, and have obtained further.

since the local aerodrome became licenced the Club Committee came to an agreement with the authorities there, and have obtained further use of the airfield,—hic! The MARKET HARBOROUGH M.A.C. had its annual bus outing to the Northern Heights Gala on Sunday July 2nd. Although the weather was bad a few of the club members attempted to fly in the various competitions. During the R/C event Mr. J. Johnson crashed his single channel *Thermalist* on its third time out. A provision date of August 20th is set for an R/C spot landing competition and a chuck whider competition for inners.

competition, and, a chuck glider competition for juniors.

#### East Midland

**PETERBOROUGH M.F.C.** have been quite busy recently, largely owing to the fact that they have put on a display at the local "Hotpoint" sports day. The usual crowd made a pilgrimage to the Northern Heights Gala, but the atrocious weather disappointed all. However, everyone made the most of it. Several scale models are on the list of new models among the members, and their advent seems most refreshing as against the usual combat jobs. In the preliminary stages at the moment are a *Bearcat*, and an *Ansaldo S.V.A.5*, whilst J. Hutton's Max, powered *Fokker DR.*1, which has yet to take to the air.

#### North Western

At the Clywd Slope Soaring event, HESWALL M.A.C.'s M. Noble At the Crywe stope soaring event, HESWALL M.A.C. <sup>4</sup> M. Noble flying his well tinished *Lucifer* placed first in the Junior Event and can now be seen sporting a Bronze Medal. The recent news about silencers going into production brought cheers from B. Davies, as he will soon be able to fly his *Merco* 35 powered *Crusader*, "without complaints

With the Nationals now over, the majority of LIVERPOOL

With the Nationals now over, the majority of LIVERPOOL & D.M.A.S. club are doing their utmost to get round as many of the "local" galas as possible. Along with many others their efforts at Barkston Heath were folled by the downdraughts. On the radio side they have a Doug Spring Stormer nearing com-pletion for O.S. the channel equipment. S. Catchpole had this in a converted Super 60 which proved very manoeuvrable until it shed a wing while executing a roll at about 400 ft. I Surprisingly the engine and endia were not too hold downeed though the model war so and radio were not too badly damaged though the model was so much scrap balsa. A power models are being talked about earnestly, especially amongst the juniors. This could prove a very popular class

if given good support by rally organizers. In an exciting finish to the Model Engineer Cup, WALLASEY M.A.C. were beaten into second place by ASHTON, Despite Wallasey's "Thinking" Ashton's model into a spiral, they were beaten by I min. 50 secs. on the last flight with only a few seconds of the Comp. left. So sees, on the task ingit with only a few seconds of the Comp, left, Leading glider finalist, John Done, returned from the first trials with one model, the bits of another, and second place. A furious fortnight's building produced another A 2, repaired another, leaving him with three models for the second trials. (Alas John had a lot of pieces there too!) On the radio side the P.R.O. has produced a "U.K." receiver, the only mistake being to connect the transistors the wrong way round! A quick reversal and all was well. Being the second time he has done this it prompts the thought that transistors are not damaged by a few m a in the wrong directions, despite all the warnings!

#### Western

Three members of SOUTH BRISTOL M.A.C. visited the Paris Air (Oh, yeah!). Show recently and they were able to witness the take-off of the *Hustler* just before it crashed. A number of members made the long journey to Barkston Heath for the Nationals. Only notable contest achievement was the performance of D. Bennet and R. Underhill whose model reached the semi-finals of the A team racc.

#### S.M.A.E. Contests

			HAL	лах	TROPHY			
- P.7	I.I. Power	76	Entries	1	rea Central	ised 30	th April,	1961
1.	V. Jays				Surbiton	• •		14:41
2.	L. Binse	44.4			St. Albans			14:40
3.	R. Draper	in a la compañía de la			Coventry			14:34
4.	D. Cook	***			Canterbury	/		14:31
5.	D. Posner				Surbiton			14:20
6.	G. Fuller				St. Albans			14:02
			WF	STO	N CUP			11102
E.	I.I. Rubber	7	3 Entric	5	Arca Cen	trolised	30th An	r// 1961
1.	D. Latter				Brighton	15 00	+ 3.30	
2.	1. North				Croydon	15.00	+ 2.12	1 1.00
3	U. Wanne				Edinburgh	15.00	2.01	
4.	G. Robert				Lincoln	14:52		
5	L O'Donr	rell			Whitefield	11.50		
6	R Nichol	SOB			Cantorbury	11.49		
·	161 14161101	P	LUCCE	PO	INTS (to d	ato)		
	1 (	'rowla					678.41	
	1 6	a Alles					673.91	
	<u> </u>	IL AIDE	ns	• •			674:10	
	3. E	Brighton	1				639:46	
	4. E	Sirming	ham	. ,		0 - 4	624:33	
-								

#### South Western

The SOUTH WESTERN RADIO CONTROL M.F.S. are holding The SOUTH WESTERN RADIO CONTROL M.F.S. are holding an open rally at Dunkeswell Aerodrome, near Honington, on Sunday September 24th for multi and single channel. Entrance fee of 5g, per flier pooled for prizes, Insurance cars and licences must be produced before flying. All enquiries to Hon. Sec., 18 Wolseley Terrace, Multey, Plymouth, Flying commences 11 a.m.

#### South Midland

ABINGDON M.F.C. had a full coach to the Northern Heights this year, and, despite rain planes were flown immediately. Albert Fathers had the bad luck to prang both power models before making an official flight, not disheartened though he has just recovered his P.A.W. 2.5 which was lost at Chobham, thanks to a quick-thinking shop assistant who collared it when a boy wanted to sell it, having "given up modelling". Andrew Crisp entered four events and spent much time in the pleasant (?) woodlands downwind. Dave Wake has gone in for glo-motors, providing himself a Veco 19 and a battered fore-finger.

On Saturday June 24th, 1961, a new modelling club was formed and will be known as the HAWKS M.F.C. at Stanstead Abbotts, There are seven founder members and already they have had inquiries

from other intending members, STEVENAGE M.F.C. "News & Views" for July is bright, with D T sketch details as used by the top liners, Geoff Dallimer, who leads the A 2 team, is Area Competition Sec. and Area delegate, also produces this notable news letter.

#### Wales

Wales JUNIOR LEADERS (TONFANAU) A.C., formed last September has two large huts in which to work. They possess an epidiascote which together with a 16 mm. film projector and loaned films helps to liven up the evenings when they are not flying at a disused airfield just a mile from the camp. This was the group, which helped out so well at the Nats. They issue an invitation to visitors provided due notice is given to 19032805 Sgt. R. Bott, R.A., All Arms Junior Leaders Regiment. Tonfanau Camp, Towyn, Merioneth. Club and area events are attracting less and less interest from CARDIFF M.A.C., and keener members are now trying their luck at some of the rallies. John Phillips was successful at the South Midland Rally. Getting first in glider, but losing his O.D. model in so doing. This model was a legend in the Cardull Club, having survived three seasons of hard flying and not so much as a tissue tear. Much to his own surprise, S. G. Morgan found himself in the power fly-off at the Nationals and finished seventh. Ireland

#### Ireland

NORTH DUBLIN A.C. had eight members at the Butlins C/L NORTH DUBLIN A.C. had eight members at the Buttins C.L. rally on July 16th at Mosney. Weather was better than usual and the club collected 2 firsts, 2 seconds and a third placing. The team of Heirevan-Brennan-Rafter won Class B proxy flying T. Morelli's model and placed second in F.A.I. (Oliver Mk. 111). Graham Dickson and Paul Wilson of BELFAST M.F.C. were drawn against each other in [A at Butlins, and Graham won by [ Jap] He went on to finish second in the all Tiger Cup final. In "B", Maurice Doyle's ETA 29 took a fit of plug blowing, which was subsequently traced to the fuel. Combat was fast and furious with plenty of good flying and few manges. A hectic 2 lang between Graham

subsequently traced to the fuel. Combat was fast and furious with plenty of good flying and few prants. A hetcic 2 laps between Graham Dickson, and Tony Stuart of Dublin ended abrupt when Tony's *Dongus* went in vertically with jammed controls. Graham won over Brian Timmins of Belfast by a scant margin and proceeded to methodically cut his way into the final. Here, in one of the very few collisions, he demolished the greater part a of *Razor Blade* belonging to Brian Harper of Dunhaoghaire, and emerged victorious. Graham used a fast and very manoeuvrable conventional model with a Rivers 2.5 "borrowed" from one of the juniors. Scale was won by Tony Stuart of Dublin with a beautiful Veco 35 Sopwith 12 Strutter which was greatly admired by the Belfast bays. greatly admired by the Belfast boys.

BELFAST M.F.C. burst into feverish activity some weeks back in preparation for the Butlin C'L Gala, a large number of new models continued overleaf have been built, mostly team-racers, and a lot of practice flying is taking place at Newtownards Aerodrome, share the newly formed NEWTOWNARDS M.F.C, has been keeping on good terms with

An effort is being made to reform the LIMERICK M.F.C. interest in which has lapsed. Mr. Feeney and J. O'Hare seem to be the only active modellers in Limerick at the moment, and these two would like to hear from all keen fliers in the area, whatever their interests. Contact: M. Feeney, "Glencairn", S.C.R., Limerick.

#### Scotland

CADZOW M.F.C. have done well in F.A.I. Racing, at the Woodford Rally the low aspect-ratio Dumbo with Oliver was 4th. They made the round trip to the Nationals of 450 miles in a vintage Alvis withou round trip to the Nationals of 450 miles in a vintage Alvis withou mishap. Consistent times were recorded, likewise at Wharfedale, but were rather slow. Up north, in F.A.I., G. S. McPhail, and *Startiger* was 1st with C. Young 3rd at the P.A.A. Rally. B. Parkes, as usual, was combat runner-up. At the Scottish Nationals, they collected 1st and 2nd in racing and compatriots Badger & Co. were at the West of Scotland Area Gala. Here, the F.A.I. Comp, was run strictly to F.A.I., rules and it was evident that more practice is needed by most contastant.

MONTROSE M.A.C. is once again leading in the Strathmore competitions organized by the Angus and District Aeromodelling League. Montrose has scored 6986 points, but the other clubs in the League just haven't been seen. What are the Arbroath and Dundee

League just haven't been seen. What are the Arbroath and Dundee people doing? GLASGOW HORNETS M.A.C. have had a busy time recently-with four competitions in five weeks, one of which gave them their first ever contest win by G. Neill in combat at the Pan Am. One week later they made their way to the Kirkealdy M.A.C. Rally, where the wind dealt all too effectively with models, their sole success being that G. McCree was one of the finalists in  $\frac{1}{2}$ A T/R.

#### Services

**Services** R.A.F.M.A.A. is running "The Summer Double Contest" for Open Power and Open Gliders. The nominated competitor *must* have built both models and has three flights each model ON THE SAME DAY, total time for all six flights to be added together for final score. Engine run for power model 10 seconds. Towline length not to exceed 164 feet. Also an F.A.I. Team Race and Scramble for one hour, no flights less than 30 secs. to count. All contests close on September 1st. 1961, and signatures of two timekeepers, and Officer i/e Club must be sent to the R.A.F.M.A.A. Comp. Secretary. THE CLUBMAN.

#### Secretarial Changes

Cosmo A.C.: S. Robinson. 29 London Road, Crayford, Kent. City of Newcastle Aeromodellers: T. Gardner, 222 Grace Street. Byker, Newcastle-on-Tyne 6. Hawks M.F.C.: 3 Fieldway, Stanstead Abbotts, nr. Ware, Herts. Liverpool & D.M.A.S. R. Thompson, 10 Caulifield Drive, Greasby, Wirral. St. Albans M.A.C.: D. Tipper, "Highfield" 239 St. Albans Road, Hatfield, Herts.

#### Pen Pals

Wanted for V. K. Jhunjkunwala, aged 14] years, a beginner who would like to correspond with a modeller from France. V. K. Jhunjkunwala, P.O. Motinagar, Faizahad, U.P., India, For B. Gibbins, a "solids" fan requiring a pen pal outside G.B. B. Gibbins, 34 Brewster Road, Leyton, London, E.20. For Bernard-Hellmuth Kratzsch, wishes to exchange German for British model magazines Bernard-Hellmuth Kratzsch, Zella-Mehlis Thuringen, Stalinstrasse 18, E. Germany, For M. J. Smith who requires a pen-friend in Sweden interestication in Ellister for Science in English interested in all three free-flight classes to correspond in English. M. J. Smith, I Pettus Road, South Park Avenue, Norwich, Norfolk, England, For L. W. L. Welener, P.O. Box 261, Welkom, O.F.S., South Africa.

#### For your Diary

- August 20th, C. H. Roberts Cup—Flying Boats. Dariford Heath. August 20th. Devon Rally—Open F/F, A Power, Combat. Woodbury Common,
- August 27th. South Midland Area Gala—All Classes. Cranfield. August 27th. I.R.C.M.S. Annual Aircraft R/C. R.A.F. Wellesbourne. September 3rd. Wanstead Combat Rally—A and B Combat, Waistead Flats.
- September 10th. Wharfedale "All F.A.I." Meeting -C/L Stunt,
- TR Speed. R.A.F. Rufforth. September 17th, Croydon Gala—Open Rubber, Glider, Power 1A Power Slope Soaring. Chobham Common. September 24th, South Western Radio Control M.F.S. Open Raily—

- September 24th, South Western Radio Control M.F.S. Open Raily— Multi and Single Channel R.C. Dunkerwell Aerodrome.
  October 1st. South Coast Gala—all F/F Classes, F.A.I. T/R, R/C, Tailless, Combat. R.A.F. West Malling.
  October 1st. "The Northern Area F.A.I. Meeting"—all F.A.I. R.A.F. Rufforth.
  October 1st. Luton D.M.A.C. Slope Soaring Rally—Single, Multi R/C, F/F Glider, Solid Glider—Ivinghoe Beacon. Pre-entry D. W. Bateman, 14 Ridgway Drive, Dunstable, Beds.—R/C, 2s. 6d., F/F, 1s. 6d.—Cambridge Rules, No power models.
  October 29th. Outlaws M.A.C. Rat Race Rally—venue to be announced.
- announced.
- November 5th, Wharfedale M.A.C. 1,000 lap Class B Team Race R.A.F. Rufforth.

#### S.M.A.E. Contest Calendar

August 20th. Scottish Gala and U.K. Challenge Match-all classes.

- R.J.F. Abbotsinch, September 1-3rd, World F.F Championships, Germany, September 9-10th, British Indoor Nationals, R.A.F. Cardington, September 10th, Northern Gala—U/R, Rubber, Glider, Power, R/C Rudder only, A and B T/R.



## AIDS TO S

SWANN-MORTON tools for the handyman are made in Sheffield from the finest materials.

## The Swann-Morton CRAFT T

For light and medium cutting of all kinds, including the most intricate work. The two detachable blades are of finely tompered sharpness. A flat handle gives correct upright grip and ensures that the tool won't roll away when laid down.



Price per set (with one each Nos. 1 and 2 blades) 2/6. Spare blades (3 shapes available, Nos. 1, 2 & 3) 6 for 2/6.

## The Swann-Morton HANDI-TOOL

An all-purpose knife with 4 sturdy blades of enduring sharpness. The blade in use stows away in the handle when the job is done-a valuable safety feature. The flat handle prevents accidental rolling when the tool is put down, and makes sure your grip is a firm one.



Price, complete with 4 blades 5/-. Spare heavy-duty blades 6 for 3/-.

#### TRADE ONLY SUPPLIED

Manufactured by

Swann-Morton (Sales) Ltd • Penn Works • Sheffield 6 • England 3841A



#### BRITAIN'S OLDEST, BRITAIN'S BEST \* GLO-MOTORS E.D. RADIO CONTROL

D.C. Bantam 0.75 D.C. Bantam de luxa D.C. Tornado Twin

+ DIESEL MOTORS

ETA 15D-2.5 c.c.

A.M. 10 R/C Version A.M.15 R/C Version

Silver Streak Mk. II ...

Fox 15 2.5 c.c.

Frog Venom Frog 0.49 RG

Ets Mk. VI C

Merco Multispeed for R/C 130 6 + 21/9

Merco 29

Marco 35

#### CRYSTAL TRANSMITTERS I ch. Tone ... £11/18/6--41/6 4 ch. Tone ... £16/6/0+54/-8 ch. Tone ... £18/5/0+60/-... £16/6/0+33/ £18/5/0+60/-TRANSMTRS. AND RECVRS. 4 ch. Tone <u>£29/17/6</u> 82/6 6 ch. ... <u>£31/2/6 + 117/6</u> 8 ch. ... <u>£42/8/6 + 141/6</u> 6 ch. ... 8 ch. Black Knight/I single ch.£5/17/6+21/3 Black Prince/I Black Prince/4 4 ch. £10/0/0 + 21/4 £12/0/0 + 43/4 Black Prince/6 6 ch. £13/2/6+47/5 P.C.I single ch. carrier £5/0/0 + 18/-E.D. RECEIVERS Airtrol Hard Valve I ch. £6/2/0 + 22/-Black Arrow/I I ch. £6/6/6 + 23/6 Black Arrow/4 4 ch. £12/17/6 + 42/6

Black Arrow/6 6 ch. £14/16/0 + 49/-8 ch. Tone £16/14/0 + 56/-Boomerang(1 ch.carrier) £5/7/6 : 18/-ACCESSORIES

ACCESSORIES E.D. Octave 8-tuned relay £3/0/0 E.D. Multi-channel motorised Servo Unit £3/0'0 + 10/10 E.D. Mk. II Compact Esc £1/0/0 3/8 E.D. Mk. III Standard Esc £1/6/0 + 3/8 ALL E.D. RADIO CONTROL EQUIPMENT AS ADVERTISED BY THE MAKER

## **TWO PACKS FOR RETAILERS**

11-1m

MODELLER



★ Full rates on foreign currency.

£7/7/0 + 25/-

★ Goods sent C.O.D.

Taplin Twin ...

A.M. I.e.c.

32 6 + 5/3

#### KITS

30/- post free. Under, please add 1/6 for p/p.

25th ANNIVEI To celebrate our 25th yea FREE CEMENT WITH FREE TO HOM with every engine purchased a Britis	RSARY OFFER or of continuous trading : EVERY KIT OVER 5/- E CUSTOMERS sh-made prop. Specify ty	pe required	EAGLE LINDBERG and many FALLER CREDIT FACILITIES
			AIRFIX IROG MERIT AURORA IROG REVELL
ver Streak Mk, II £7/10/0+35/8	P.A.W. 1.49	72/10-13/2	stockroom full ranges by
M.IS R/C Version 60/-++10/-	Frog 1.49 Vib	45/9 - 7/2	In our special new plastics
M. 10 R/C Version 59/9-9/11	Frog 3.49 PB	59/8-10-	PLASTICS
S MAX III Mulei 133/-+22/4	Frog 3.49 BB	68/-+11/2	* PROPS all leading makes
TA 15D-2.5 c.c. 101/-+18/11	Froz 2.49 B8 modified	73/4 + 12/2	12° 450 DK 6/6
DIESEL MOTORS	From Viper 1.5 BB	72/-+13/-	1" x 7, 222 DK 4/6
1 Pik. VIC 13/19/0 + 22/3	Haron I.c.C	41/	* DEAC CELLS
og U.47 KG 34/ -+ 3/6	E.O. Hunter	A6/ 11/11	P.V.A 2/6; 3/9; 4/9; 5/9; 8/9
og Venom 50/ 8/-	E.D. Sunar Fuey 1 49	47/4 12/10	Cascamite 2/6
x 15 2.5 c.c. 70/6	E.D. Baby U.Ho	44/6 0	Araldite per box 6/-
erco Multispeed for R/C 130 6 + 21/9	D.C. Spittire	40/ //-	SUNDRIES
erco 35 101/4 ⊢ 18/3	D.C. Dart Mk. II	56/-+ 8/7	by makers shown here in confidence.
erco 29 I01/4 ; 18/3	D.C. Super Merlin	46/ 7/-	GRAUPNER YEOMAN Order any kit
C. Tornado Twin £9 19 0   33/1	A.M. 2.5 c.c.	56/3 ÷ 10/2	MERCHAY KK VERON FROG
C. Bantam de luxe 39 6+ 6/9	A.M. 1.5 c.c.	49/	dye works of kits factors fresh by
C, Bantam U./5 SZ 6 + 5/5	A, the tasks and the second	AD1 D12	Min costs, the locate and most up to

to HOME offered CUSTOMERS in certain cases ordering £10 worth or more of goods which may be purchased by nine equal monthly pay-ments. Details on request.

together with alternative choice. FREE TO CUSTOMERS OVERSEAS spending £15 or more in one transaction, a year's free current subscription al AEROMODELLER, Model Aircraft or R.A.F. Flying Review, sent direct to you by post. Offers and 31 Oct. '61, for a seas customers and 30 Sept. '61, for home customers.



EROUROWE





Ideal for Radio Control and all models where minimum weight and maximum shock absorbent qualities are required. Completely sealed tyres, no valves to give trouble. Pressure variable by means of adjustable hubs. Replacement tyres available.

DIAMETER	PRICE PER PAIR INC. P.T.
2-	12/3
2 <u>1</u> ″	<b>I4</b> /
3 <u>1</u> ″	17/6

Produced by

MODEL AERODROME LTD. 131 STRATFORD ROAD, **BIRMINGHAM II** Makers of the famous Marinecraft range of Boat Kits

#### THE MODEL SHOP (MANCHESTER)

**R/CONTROL PLANE KITS** ORION, MULTI 230 -TRUEDSSON VAGABOND 125 VECO SMOG HOG GRAUPNER SATELLIT STIRLING P.T. 19 STIRLING MAMBO 229 6 117 8 E.D. 73:9 STIRLING PIPER CUB 82 3 STIRLING WIZARD 124,3 PACER 124 3 GRAUPNER PIAGGIO 99 6 R.E.P **GUILLOWS EXPLORER** 150 \_ MERCURY GALAHAD MERCURY AERONCA 36:-70 6 K/K SUPER 60 K/K JUNIOR 60 97 6 58 -VERON VISCOUNT VERON SKY SCOOTER .. 112 6 30111 R.E.P FROG JACKDAW 117.6 BERGFALKE 90" GLIDER PASCHA 67" GLIDER 138 6 R.E.P 53/3 AMIGO 71" GLIDER 46 -HEGI K8 B R/C HEGI STYROFIX 106 106'-RC ACCESSORIES E.D. BLEEP RELAY WITH ADJUSTABLE CONTACTS 28/-R.E.P. SEALED RELAY R.E.P. 8 REED RELAY 25 6 60 -R.E.P. 10 REED RELAY 80 -OCTAVE 8 REED E.D. RELAY 60/-METZ TELES. AERIAL 251-129.6 IVY TONE TX KIT 139 6 has. IVY CARRIER RX KIT IVY TX MODULATOR KIT THE IVISTORKIT FOR 39 6 39.6 FOR RELAYLESS RX OUTPUT 29/6

**R/CONTROL GEAR** E.D. SINGLE COMPLETE 373/-E.D. SINGLE XTAL COM-PLETE 440 E.D. FOUR COMPLETE 630 -FOUR XTAL COM-PLETE 680 -E.D. SIX COMPLETE 700 -E.D. SIX XTAL COMPLETE 750-E.D. EIGHT COMPLETE 840 -E.D. EIGHT XTAL COM-PLETE 990/\_ REPTONE COM-PLETE 308 -R.E.P. MINI REPTONE COMPLETE 336/-R.E.P. NEW UNITONE R.E.P. QUADRATONE COMPLETE ... 330 6 580 -SEXTONE COM-PLETE E.P. OCTONE COM-637 -1000 ~ MULTI 114/11 R.E.P. P POWERTROL 82/-REMTROL-OLSON MULTI 70/-NEW ! ! ! RISING SLIPPING 68/6 E.D. MULTI SERVO 70/10 RISING L/WT 25/3 49/11 RISING 2 PAWL CLOCK-WORK 41/4 RISING 4 PAWL 44/3 ELMIC CONQUEST 31/6

13 BOOTLE, STREET, MANCHESTER, 2 TEL. BLA 3972 Mail Orders By Return Post Free Over £2 CIL, & FREE FLIGHT KITS ENGINES TOPFLITE NOBLER MILLS .75 DIESEL .... 89 --TOPFLITE TOPFLITE STREAT

Ċ,

DSSON VIKING 132 6	E.D. SINGLE XTAL COM-	TOPFLITE JUNIOR NOBLER 6	29 MILLS 1.3 DIESEL	95,9
DSSON VAGABOND 125 -	PLETE 440 -	TOPFLITE JUNIOR FLITE	E.D. BEE I c.c. DIESEL	56/3
D SMOG HOG 229 6	E.D. FOUR COMPLETE 630 -	STREAK 3	1:0 E.D. SUPER FURY 1.5	796
UPNER SATELLIT 117 8	E.D. FOUR XTAL COM-	TOPFLITE COMBAT FLITE	E.D. 2.46	82'7
ING P.T. 19 73/9	PLETE 680 -	STREAK 4	6/11 P.A.W. 1.49	
ING MAMBO 73 9	E.D. SIX COMPLETE 700 -	VECO THUNDERBIRD	9 - P.A.W. 2.49 Mk. III	98/-
ING PIPER CUB 82 3	E.D. SIX XTAL COMPLETE 750-	MERCURY CRUSADER 6	9.6 P.A.W. 19D COMBAT	104 6
ING WIZARD 124.3	E.D. EIGHT COMPLETE 840 -	MERCURY MONARCH 34	10 ETA 15 2.5 DIESEL	119'6
ING PIPER TRI	E.D. EIGHT XTAL COM-	MERCURY MAC.A TR	7.6 FTA 29 GLOW	141/11
CER 124 3	PLETE 990/-	MERCURY PICADOR	93 KYOWA 45 8/C	150/-
UPNER PIAGGIO 99 6	R.E.P. REPTONE COM-	MERCURY COBRA 21	8.6 O.S. MAX 35 Mk III	130/-
LOWS EXPLORER ISO_	PLETE 308 -	K/K SPECTRE 2 5/3 5 c.c. 31	7 6 MERCO 29 & 35	119.6
CURY GALAHAD 36:-	R.E.P. MINI REPTONE	K/K TALON	4.6 MERCO 29 & 35 R/C	152/6
CURY AERONCA 706	COMPLETE 3361-	K/K FIREBIRD	46 A.M. 10	56/8
SUPER 60 97 6	R.E.P. NEW UNITONE 330 6	K/K GAZELLE 1.5 c.c.	9/10 A.M. 10 R/C	69/8
UNIOR 60 58 -	R.E.P. OUADRATONE	K/K MAROUIS 3	26 AM 15	57/10
III III III III III III III III III II	COMPLETE 580 -	STIRLING RUFFY	2.3 A.M. 15 R/C	70 8
ON SKY SCOOTER 30/11	R.E.P. SEXTONE COM-	STIRLING IMPERIAL	2 3 K/K COBRA GLOW	39 6
GJACKDAW 117.6	PLETE 637'-	FROG TEMPEST	8 2 D.C. BANTAM	37/9
FALKE 90" GLIDER 138 6	R.E.P. OCTONE COM-	FROG D.H. MOSOUITO 4	8 2 COX PEE WEE	38 6
HA 67" GLIDER 53 3	PLETE 1000 ~	FROG S.E.SA	2.6 COX TEE DEE .010	77/6
O 71" GLIDER 46 -	GRAUPNER, BELLAPHON	K/K GAUCHO 2	6 COX OLYMPIC	122/-
K8 B R/C 106 -	"A" TX 6 VOLT ONLY 400 -	K/K SNIPE IS	9.9 RIVERS S. STREAK	125 8
STYROFIX 106/-	ESCAPEMENTS AND SERVOS	VERON VELOX	9.6 RIVERS S. ARROW	125 8
ACCESSORIES	GRAUPNER UNIMATIC 55/-	VERON CARDINAL	87 VECO 19 R/C	137/6
BLEEP RELAY WITH	GRAUPNER DUOMATIC	VERON COLT C/L 21	7 6 VECO 35C.	165/-
JUSTABLE CONTACTS 28'-	MULTI	YEOMAN DIXIELANDER 21	76 M.E. HERON I c.c.	47/3
. SEALED RELAY 25 6	R.E.P. POWERTROL	GRAUPNER FW190 71	1/- FUJL 15	47/3
. 8 REED RELAY 60 -	MULTI 82/-	GRAUPNER PIPER TRI	ENYA .09 Mk. II	64/7
. 10 REED RELAY 80 -	REMTROL-OLSON MULTI 70/-	PACER 75	5/6 ENYA 15-28	79/2
OCTAVE 8 REED	NEW ! ! ! RISING SLIPPING	GRAUPNER ULTRA	ENYA ISD Mk II	130/-
LAY 60/-	CLUTCH MULTI-SERVO 68/6	STUNTER 3	9'6 SUNDRIES	
TELES. AERIAL 25/-	E.D. MULTI SERVO	GRAUPNER ATLAS	CHARRON GLIDE	2
ARRIER TX KIT 129.6	RISING L/WT 25/3	STIRLING FOKKER DVII 7:	3/9 WINCH	
ONE TX KIY	RISING COMPOUND 49/11	GLIDERS	D.C. TEST STANDS	12/3
CARRIER RX KIT 39 6	RISING 2 PAWL CLOCK-	CONTEST INCHWORM 2	I/- GRISH NYLON PROF	°S i i i
X MODULATOR KIT 39/6	WORK 41/4	CONTEST EMPRESS	96 6x9&7x9only	5/-
IVISTORKIT FOR	RISING 4 PAWL 44/3	VERON PHOENIX	5/- X-ACTO TOOLS	& HOBBY
LAYLESS RX OUTPUT 29/6	ELMIC CONQUEST 31/6	K/K CAPRICE I	5/9 CHESTS IN STOCK.	
WE HAVE THE LAR	SEST AND MOST COMPREHI	ENSIVE AEROMODELLING	STOCK IN THE NO	DRTH.

ohone: VICtoria 0824

63/10

95;9

1.TB



invisible joint is required. H.M.G. All purpose Clear Adhesive.

For all non-porous surfaces, or where instant contact adhesion is required.

H.M.G. Polystyrene Cement. Welds two polystyrene surfaces together.

#### MARCEL GUEST Н. LTD.

H.M.G.

boat modellers.

Clear

Coloured Dopes. Outstanding and durable finish in wide colour range.

H.M.G. Marine Finish. Actual finish supplied for yachts in Mediterranean etc., now packed for

Shrinking

and

Riverside Works, Collyhurst, Manchester. 9, Telephone COLlyhurst 2644 & 1536

#### RADIO AND ELECTRONIC PRODUCTS G. HONNEST-REDLICH LTD., 44 SHEEN LANE, MORTLAKE, S.W.14

- Telephone: PROSPECT 9375

THE COMPLETE RANGE OF RADIO CONTROL EQUIPMENT + From components to complete kits of parts there is R.E.P. equipment to satisfy novice or champion, for aircraft or boats designed and produced by practical experts.

#### "REPTONE"

SINGLE CHANNEL Unit construction with Plug-in Batteries and Motorised Com-pound Actuator, complete,

LIS/8/0 "UNITONE" sin

Controlled Transmitter £9/8/0
"UNITONE" single channel tona. Hand-held Transmitter £9/3/0
21 oz. Receiver £7/7/6
"TRITONE" 3-channel reeds. Hand-held Transmitter £9/6/6
5 oz. Receiver £11/6/6
"QUADRATONE" 4-channel trystal controlled Transmitter, 7 oz. Receiver £29/0/0
"SEXTONE" 6-channel reeds. Crystal controlled Transmitter £31/1/3
"OCTONE" 8-channel reeds. Simultaneous operation. Crystal controlled Transmitter £31/1/3 matched I0-oz. Receiver 650

NOTE,-Unitone and Tritone Transmitters are available crystal controlled at extra cost of £2/7/0 and £2/14/0

#### MINIREPTONE

Full transistorised, relayless, special compound escapement with provision for an extra control, Receiver/Battery box unit. 28 x 18 x 18. All up flying weight of Receiver, Batteries and Excempent on the file of and Escapement only 5½ oz. Three U12 pencells provide total battery requirements. No soldering, plug-in batteries and escapement cable. Low conescapement cable. Low con-sumption hand held transmitter with fully telescopic aerial. Complete £16/16/0. Receiver Separate £9/9/6

**RELAYLESS TONE** RELIABILITY

ACTUATORS, REED UNITS, RELAYS R/C COMPONENTS FOR THE HOME CONSTRUCTOR

★ Extended Payments available on equipment from £15 ★ You can order R.E.P. equipment from your local model shop 🛨 S.A.E. for Price Lists and Information. Trade enquiries invited.

THE POPULAR DEMAND FOR THE

M.E. HERON c.c. DIESEL

IS PROOF OF ITS SUPERIOR OUALITY



Only 47/3 Inc. P.T.

Marine Version 64/11 Inc. P.T.

DISTRIBUTION:-Home: E. KEIL & CO. LTD.

Export: MODEL EXPORTS LTD.

MANUFACTURED BY:--

MAROWN ENGINEERING LTD Isle of Man

**Glen Vine** 





in the world.

#### SCOTT-BROW **Prompt Mail Order Service** ★ $\star$ + AIRCRAFT KITS BOAT KITS Veron Titan tug boat, 20° com-plately prefab. for diasels under I c.c. or electric Caribbean Coaster 32° diesel up to I c.c. or electric. Ideal R/C Marlin Marine Cruiser, 36° I-I.5 c.c. or electric. Prefab. Suitable R/C Police Launch, 26° Replica of London River Police Veron Combateer 38" C/L 2-5 c.c. 27/10 Panther 41" H/S Stunt 3-6 c.c. Prefab 30/2 Spitfire 271" for A.M. 10 and Sturf" for A.M. 10 44/1 95 9 1.49 c.c. 15/8 Colt Trainer C/L .5-1.49 c.c. 27/6 78'4 Colt Trainer C/L, S-1.49 c.c. Bomb-Bat 25 J<sup>\*</sup> Bat-wing Stunt 1-1.49 c.c. Minibuster 19" Class A ... Vipper 17" up to 1 c.c. Velox F/F powered pod and boom .5 to .9 c.c. Deacon 52" F/F 1-1.49 c.c. 23/6 of London River Police launch I c.c. or electric 44/I Dolphin, 24" cabin cruiser 18 3 13/11 electric ... 36/6 Vosper Rescue launch, 28" .. 39;6 I c.c. or electric. Very complete kit suit s.c. R/C 33/4 63/-Veronica Hard Chine Yacht 27" complete with sails, rigging, etc. ... ... 62 7 Maycraft H.M.S. Meteor M c destroyer 48" L. 6" peller driven 1-1.49 c.c. 36,6 class Frog Mosquito 36° Twin, electric or diesel, Ideal for R/C I-I.S c.c. C/L profile. Parts cut to shape 48.2 Aerobat 38" stunt 2.49 c.c. 32;6 Tempest 26" scale C/L 2.49-Aerokits. Sea Commander 34" up to

24" Profile scale C/L Hurricane, ME109, Spitfire I-1.49 c.c. each 18

Cash with Order or C.O.D. We pay U.K. postage on orders over £1 in value. Under £1 please add 1/6. S.A.E. please for enquiries, Cheques and Postal Orders should be crossed. Names and addresses in BLOCK LETTERS please.

J. SCOTT-BROWNE (NEWTON) LTD. 51 QUEEN STREET, NEWTON ABBOT, DEVON 'Phone: 1179

#### PREVIEW

OF WHAT WE HAVE IN STORE FOR NEXT MONTH'S

### AEROMODELLER out Sept. 15

Full report with pictures and all the gen on the World Championships for microfilm covered indoor models, flown in the Airship Hangar at Cardington. More Royal Flying Corps Squadron markings for the scale fans. Full test report on another new engine. Chas. Taylor's amazingly fast class B team racer the "Razzamachas", which has been making such fast times. Contest design threeviews. Latest Model News. Another Keith Laumer design for the novice—the sport power free flighter for small engines called "Sharp Scooter" and a whole load more of fascinating reading for the keen aeromodeller, including a really first class feature on Chuck Gliders.

#### AND IN OUR COMPANION Model Maker & Model Cars Out Aug 25

Drawing of the fabulous Ferrari FI to 1/32 scale, full-size plans for an electric-powered vehicle ferry which cruises comfortably with a cargo of Matchbox model cars drawings and details of the last of the North American stern-wheel lake and river steamers, a build-it-yourself 3½ c.c. marine diesel engine, Type IS and Loch class anti-submarine frigate plans, merchant ship and small boat drawings, model car wheel construction, Minic roadways reviewed, plus regular favourites such as Lathe Lore, Talking Tracks, Model Miscellany |



#### PLUS CURRENT EDITION OF Radio Control Models

Chris Olsen discusses the high or low wing design problem and supports his theory with plans for the vary latest Uproar (below) with trike u/c gear and lots of new details which are now in the revised A.P.S. plan. In fact it's a new model altogether. Free pull-out service sheet on the R.E.P. Mini-Reptone gives all the gen, circuits, trouble shooting and operation advice. Telephone Dial Control is described for boats. New Equipment, Query Col:, "Feedback" and loads of news...



All 2/- ea. at your local newsagent or Model shop or in case of difficulty 2/4d by post from MAP LTD., 38 CLARENDON RD., WATFORD, HERTS

## MODELLER



#### CLASSIFIED ADVERTISEMENTS

PRESS DATE for issue October 1961, August 18 1961

#### ADVERTISEMENT RATES

Minimum 18 words 6s. and 4d. per word for Private each subsequent word. Trade Minimum 18 words 12s, 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

FOR SALE
Mercury Aeronca Sedan complete with A M.35 diesel and E.D. Boomerang R'C Unit, well built and unused, £12. K.K. Cessna 170 with A.S. 55 diesel £5. Lane, Old Court Cottage, Red Lane, Corfe Mullen, Winborne, Dorset, Mini-Reptone outfit complete with actuator. Perfect working order. £12 o.n.o. Borrett, 21 Dixon Drive Oulton Broad, Lowestoft. New, unrun Merco 35, £5; Enya 15D, 50s.; Fox 15, 35s.; A.M.25, 25s.; four 11 × 4 Top Flite props., 10s.; Tatone engine timer, 15s. J. Burke, 136 Felbrigge Road, Goodmayes, Essex.
E.D. 2.46, run 30 min., with accessories, £4 o.n.o. Payne, 67 Ley Hill Road, Sutton Coldfield, Warwickshire.
Mills -75, 30s.; Dart -5, 30s.; Mills 1-3, 10s.; Elfin 1-49, 20s.; Unused Frog 2-49, modified, £3; Hill 3-5 c.c. needs rebore, 25s.; Frog 500, 35s.; ETA 29, 50s.; Tri-ang Tx., slight defect but range unaffected, 50s.; Crystal controlled tone Tx., £5; Ultraton Rx., £8; 23 in. MS Airwheels, 5s.; R. Brown, 14 Eton Road, Clacton-on-Sea, Essex.
E.D. 2.46 Racer, 40s.; Frog 80, 20s.; (new cylinder head required). Jelp. 50 Billington, New Cross, London, S.E.14.
Rivers Silver Arrow, works modified and more. Not run-in, very fast—£7 o.n.o. Alvo Oliver Tigers re-worked 10-14 days, 30s. G. Copeman, 191 Chamberlayne Road, London, N.W.10.
Auxilary nylon parachutes, type 15D 390, ideal model covering, 2 in. box 5s. incl. p. and p. E. W. Beale, 10 Mill Street, Newport Pagneli, Bucks.
P.A.W. 15 unrun; A.M.10 unrun; Mills .75 little used; ActoMottPELTERS and Midel Alread 195.660 complete. Offers? Many old od selections books, s.a.e. for complete list. P. Morgans, 115 Wellington Hill West, Henleaze, Brittol.

Bristol

A M.10, as new, £2 o.n.o. Elfin 2.49, rebored, £2 o.n.o. S.A.E. to 33

A M.10, as new, £2 o.n.o. Elfin 2:49, rebored, £2 o.n.o. S.A.E. to 33 Milward Road, Loscoe, Derbys. 10 channel Debolt Custom Biplane, unflown, equipped with unused R.E.P. Dekatone, new Merco 35 Multispeed, 2 Tornado props., Bruka tank, 34 in. airwheels, D.E.A.C.'s and charger, silk covered, Butrate finished. Transmitter fitted with R.E.P. power convertor and 6 volt high capacity accumulator, cost £135. Owner going abroad. Offers, consider delivering up to 400 miles. Cavanah, "Trevailia", Egloshayle, Wadebridge, Cornwall. Little used Oliver Tiger III in Dixelander with Autoknips Timer, offers? E.D. 2:46, 35s.; Good Hornet, 25s.; Allbon Spitfire, 20s.; Autoknips Timer, cut-out, 25s. Fast A.M.10 with 4A Kenton wing, props., 3 sets Laystrate, 50s.; Various AFROMODILLER plans worth 25s. only 7s, 6d.; Good Bee needs rebore, 20s. D. Rowe, 74 Walton Road, Harrow, Middlesex. Telephone Harrow 1385. New and Unused: R.E.P. Sextone Tx and Rx £20. Miniuniac £2. Enya 60

Harrow 1385.
New and Unused: R.E.P. Sextone Tx and Rx £20. Miniuniac £2. Enya 60 multi £8. E.D. Miles 5 c.c. D multi £5. ETA VIc £4. Used but good: Bonner Duramite £3 10s.; Reptone Tx £4; Rx less escupement £2; F.R. Comp. Escapement £1; Frog 80, Bec and ex. stack, E.D. 1-46 and Hope 19 Glow, £1 10s. each. Mills 1-3 and Racer multi £2 10s. each. Graupner Tourist, silk covered, D.C. Spitfire, F. R. Esc. immaculate £5 10s. Ultraton 6v Rx, suit Tourist £7. 225 C. Taped TV Deac £1 5s.; Frog 500 scruffy but tuned, £1 10s.s.a.e. please to T. Airey, New Cheriton Garage, Cheriton, Nr. Alresford, Hants Hants.

Frants. Selling up: magazines, models, engines, plans etc. S.A.E. to M. Watts 55 Oak Street, Fakenham, Norfolk. AFROMODELLERS, complete 1955—'60 inc., 10s. per year; Annuals 1952-'56 inc., 5s. each. o.n.o. M. Lesley, 14 Filton Avenue, Horfield, Bristol. AEROMODELLERS: 1956—July 1961 (1958—July 1961 complete), £3. 25 miscellaneous 1946—'55, 12s. 6d. Royston, 5 Southend Gardens, Whitby, Vorkebing. Yorkshire.

#### TRADE

American Props:--boxed-Tornado-nylon. 11 x 4, 11 x 6 at 7s. 2d. each; 12 x 4, 12 x 5, 12 x 6 at 10s. 9d. each. Add postage. Ed. Johnson, Larkhill, Wilts.

Ex-Government Stop Watches, 45s, Illustrated leaflet on request. Charles Frank, 67-73 Saltmarket, Glasgow, C.I. Well known and reputable Model Making Company requires IDEAS in

Well known and reputable Model Making Company requires IDEAS in connection with scale model plastic construction kits and toys, suitable for plastic manufacture. Box 655. Portsmouth and Southseas' biggest hobby shop is "Robin Thwaites". Now at 28 Arundel Street, (Commercial Road End). For Sale: Multicore elastic Ex Parachutes; any length; 9d. yard. Miniature motor tyre wheels on Rubber Tyres, 11 in. dia., 36s. gross. P. Postage. Lewis 44 High Street, Whitechapel, London, E.I. Tatonecherk work Timers 101 (0.6 mine hand End Surt off (0.20 cm.) Miniature

44 High Street, Whitechapel, London, E.I. Tatone clockwork Timers DT (0-6 mins.) and Fuel Shut-off (0-20 secs.). Weight 4 oz. Also i A shut-off. 30s. each post free from: Dave Posner, 61b Cantield Gardens, London, N.W.6. Pirelli Special-made expressly for Wakefield aeromodelling. Genuine top quality 4 in. strip in 17 oz. hank direct from Italy. Remit cheque or 1.M.O. value 24s. Edgardo Sadorin, Via Assietta 25/11. Milano 10/3., Italy. For Sale: O.S. Max 15, 65s.; Enya 29, 69s. 6d.; Merco 35, 78s. 6d.; Super Tigre G.4 60, 10 c.c., 180s.; Tiger Cub Mk. 1, 82s.6d.; Taplin Twin, 95s.; Allbon Spitfire, 37s. 6d.; and many others. Good engines taken in exchange. Hobby Supplies, 4 Station Parade, Burlington Lane, London, W.4. CHIswick 9930.

#### BOOKS

Catalogue No. 14 Government surplus and model radio control, over 500 illustrated items. 2s. (refunded on purchase) P P 6d. Arthur Sallis Radio

200 MODELLER

Control Ltd., 93a North Road, Brighton. American Magazines. Year's subscription Model Airplane News, 39s. Full catalogue free, Willen Ltd., (Dept. 1), 9 Drapers Gardens, London, E.C.2.

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

School and States and

#### WANTED

Wanted: a Davies Charlton Tornado Twin, either new or secondhand in good condition. Complete with throttle unit. Apply: N. Lyon, P.O. Box 9514, Nairobi, Kenya. Wanted: Fox 99 engine, or O.K. Twin or any engine over 10 c.c. All replies to Lancaster, 37 Spring Lane, Combrook, Warwick, Phone Kineton 449. New and old model engines, suitable for collection. Cash or American engines in trade. J. Earl Newland, 1921 Redondela Drive, San Pedro, California U.S.A.

California, U.S.A. R.E.P. Sextone or Octone outfit complete, will consider any R.C. plane in flying order for cash. Letters only please giving full details to: B. Walker, 24 Melrose Road, Merton Park, S.W.19.

#### MODEL AERONAUTIC YEAR BOOK 1959-61

Largest ever of FRANK ZAIC'S incomparable YEAR BOOKS. Contains the largest collection of fully detailed and dimensioned plans ever published. 288 pages. 80 articles and 250 plans by Benedek, Ritz, Lindner, Monks, Bilgri, Kazminski, Good, etc. A magnificent book; indispensable to the serious flier. 15/- post free from:

> U. A. WANNOP, 36 Park Way, Cumbernauld, Glasgow.

Mastermodels Ltd. have a number of opportunities under the following headings: Pattern makers for wind tunnel models and general precision woodworking. Fully skilled professional model makers. Lettering artists for airline livery work. Production model makers (we can train you) and young learner model makers. We are particularly interested to hear from those who are competition standard in free-flight scale and solid scale who are currently employed as woodworkers or have been employed as skilled workers in another trade. All jobs are paid according to ability and are graduated to increase with skill. High rates, bonus, travelling allowances etc.

Mastermodels, Greenhill Crescent, Harrow. Tel: 2428.





BARGAINS: End of production run, PATHFINDER UNITS, the original Magnetic Glider Steering Device. Complete compass switch and actuator, 10/-. RUDDERMAG . . one-way Actuator and Motor Cut-off. A useful movement for other R/C installations, \$/-. All post free . . . only a few left . . . Send P.O. at once to:

> WOODSIDE MODEL AIRCRAFT SUPPLIES 72 Shirley Road, Croydon, Surrey

Tel: 62507

Tel: 27891



September, 1961





Kindly mention AEROMODELLER when replying to advertisers

503



## SUPER DIESEL ENGINES

IA (J Z.40 C.C.	E3/17/11
IVERS 2.48 c.c.	£6/5/8
RABANT 2.48 c.c.	£6/7/2
NYA 15D 2.47 c.c.	£6/1/3
AW 2.49 c.c.	£4/18/0
UPER TIGRE G/20	R.C. 67/12/6
ROG 2.49 Mod.	£4/5/6
AIPAN 2.49 c.c.	£4/16/0
ROG VIPER 1.5 c.c.	£4/0/3
Maria C.	- 1 KT - C
AALICE 10	LIZE OF OASL I
Send S.A.	E. for LISTS of or

TAIFUN HURRIKA
1.48 c,c.
WEBRA PICCOLO
.78 c.c.
PAW 149 c c
FROG 3.49 BB
AM 10 1.0 c.c.
AM 15 1.5 c.c.
AM 10 R/C 1.0 c.c.

	64/2/6
	£3/14/5
	£4/6/0
	£3/19/2
	£2/16/8
	62/17/10
	£3/10/10
c .	

**00** types of ENGINES ver 350 PLASTIC KITS

#### **JONES BROS. OF CHISWICK**

56 TURNHAM GREEN TERRACE, CHISWICK, W.4. (Phone: CHI 0858 | min. from Turnham Green Station) Est. 1911



MERCO 29 or 35	65/19
MERCO 29 or 35 R/C	<b>£7/12</b>
COX OLYMPIC (2.5)	£6/5
M.E. HERON	£2/7

/6	VECO .19 R/C	
/6	DRABANT 2.5 c.c.	
;/O	RIVERS SILVER STREAK Mk. II	
13	AM 15 R/C	

#### ROAD, LONDON, S.E.1 29 OLD KENT

6d. in Stamps for Lists

Tel: HOP 3482

66/17/6

£6/7/2

66/5/8

23/10/8

## **Bud** Morgan

#### THE MODEL AIRCRAFT SPECIALIST

Send Stamped Addressed Envelope for Free Leaflets on K.K., Veron, Mercury.etc., and my S/H Engines List. K.K. Handbook 1961 2/6 Inc. P/P.

PAY CASH FOR GOOD SECOND-HAND ENGINES Second Hand Engines in Stock

E.D. Bee 32/6; E.D. Hunter 42/6; Super Merlin 29/6; Frog 80 29/6; A.M.10 35/-; A.M.35 42/6; E.T.A.29 75/- and many others.

Full range of E. D., FROG, A.M., diesel engines and spares, REPTONE ane E. D. Radio control equipment in stock.

22 AND 22A CASTLE ARCADE, CARDIFF Tel.: Cardiff 29065

#### PIAGGIO **FW P 149 D**

the brand-new design of a genuine super scale 3-channel R/C model for either r.o.g. or handlaunched starts. Span 44" — For. 15 cu. in. displ. engines with speed control. Indent No. 4613

#### TOPSY

The smallest German free-flight and R/C model, span 32". Lively performer on single or 3-channel R/C gear-fully aerobaticdesigned to take engines from .02 — .049 cu.in. displ. Indent No. 4611



Learn more
about my
complete model
building pro-
gram from the
GRAUPNER
15FS catalogue.
printed in four
anaugges
lengt) fr sn
it ] available
from my agente
nom my ugama.

Special prospectus free of charge

New Zealands Burton Brailsford Agencies 261 Willis Street Wallington, C. 2. British Guiana: Petambar Dindayal 104 Regent Street Georgetown

E 12

JOHANNES GRAUPNER · KIRCHHEIM-TECK · GERMANY All items are available through recognized dealers anly



★ VECO ★

THUNDERBIRD Bob Palmer's winning stune model for 29's and 35's. A complete kit £4/9/0

\* VECO ENGINES \* The best for Sport or

Veco 19 3.2 c.c. (illustrated) 65/15/0 Veco 19 R/C 3.2 c.c. Glow

AEROMODELLER) Veco 35 C6 c.c. Glow **£8/5/0** Veco 35 R/C Glow **£9/15/0** Veco 45 R/C 8 c.c. Glow **£14/18/0** As used by U.S.A. Champs.

Get started in Stunt with "Little Tom Tom" 28 in, span for 1.5-2.5 c.c. 27111 Or the larger "Tom Tom", 40 in, for 3.5 c.c. 44/-

16 17 6

Contest.

(See Test in June

ALL THE BEST MODEL SHOPS NOW HAVE THE NEW

Veco Range

IN STOCK



\* LI'L PINTO \*

Span 25 in. Wing area 92 sq. ins. Designed for the Cox DIO and light weight R/C £1/7/11

ACCESSION OF THE REAL PROPERTY OF THE	VECO SCALE WHEELS
	As recommended for many C/L and R/C planes:
	2 in. Semi-pneumatic pair 12/1
	21 in. Semi-pneumatic pair 14/6
	3 in. Semi-pneumatic pair 19/-
	For Single or Multi R/C: "THE WHITE CLOUD" will please in every way. Ideal for Veco 19 R/C. £6,19,6
* VECO ALI SPINNERS *	"Smoothie" stunt 6 c.c. £4/9/0
Standard 12 in 7/11	"Firebird" Rat Racer £1/7/11
Standard 2½ in	"Mustang" SI in. Fully stuntable scale kit £4/9/0

VECO ACCESSORIES INCLUDE: SPECIAL TANKS, ENGINE EXTENSION UNITS, BELLCRANKS, ETC. VECO CATALOGUE Illustrates all these and many more items 6d. Each



#### RADIO CONTROL WITH MODERN METZ UNITS

IN LOOKS AND OPERATION YOU WILL FIND METZ IS

STOCKED AND DEMONSTRATED BY ALL DISCERNING MODEL SHOPS



\* METZ 3-CHANNEL R/C \*

Three-channel, hand held Tx with control stick €18/12/8

Three-channel relayless Rx. as illustrated above £19 New Mecatronic two-channel Servo (for relayless) £7/18/6 (for New Mecatronic single-channel Servo 64/12/3 relayless)

The Complete three-channel unit with Servos 258

WHOLESALE ONLY

designed to give trouble-free operation. No tuning is necessary. Two soldered joints only. Transmitter operates off two U2 cells. Receiver and Servo off one Deac battery. Out of sight range, complete unit £21/17.0 sight range, complete unit

METZ "BABY" UNIT This is a complete single-channel R/C unit

#### SCHUCO HEGI STYROFIX

48 in. span. quick assembly, foam filled fuselage for single or multi R C 6560 The Full range of METZ R/C and Schuco kits are illustrated in the New 1961 Catalogue



FOR R/C FANS "Smog Hog", 72 in. span. Multi trainer for 35-45 engines. New 1961 version £11/9/0

## YEARS AHEAD OF ALL OTHERS

**BRADSHAW MODEL PRODUCTS LTD.** 4 NORTON STREET, SALFORD 3, LANCS. PHONE: DEANSGATE 2023

#### -THE FIRM OF THE FUTURE-

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.

A Keilkraft glider will give you hours of building and flying fun!

### CAPRICE

The beautifully clean-cut lines of this 51-inch span contest sailplane will appeal to all glider enthusiasts. The kit contains ample highest quality materials, including die-cut parts for easy 15/9 building.



#### DOLPHIN

Easy-to-build towline glider with a performance to please even the most critical. 30 in. span. 5/6



Great Fun for a small outlay!

KE

TRY A

GLIDER

11

ner's model. Sim

Ideal beginner's model. Simple, strong construction, and very easy to trim. 30 in. span. 5/6



NOMAD

20 in. span prefabricated model with all fuselage parts, tailplane and fins pre-cut and coloured. 4/6



#### CUB

Snappy little beginner's model that flies very well indeed. Neat design that is simple to build. 24 in. span. 3/9

The Greatest Name



in model kits

#### CONQUEST

Towline glider for the novice with a very good performance. Kit contains die-cut parts. 30 in. wingspan **7/11** 

OVER 100 MODELS IN THE KEILKRAFT RANGE SEE THEM AT YOUR NEAREST

MODEL SHOP