AERO MODELLER

DECEMBER - 1938
Vol. IV No.37

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CONTENTS

	PAGE
Frontispiece—The Westland "Lysander"	6
Editorial	7
The Power Behind the Pilot	8
I Know 'Em All...	10
The "Lysander"	15
Model Aviation in France	20
Simple Aerodynamics	24
An Open Letter to the S.M.A.E. Council	26
Beginners' Flying Scale Models—Part II	28
Heard at the Hangar Doors	32
The Miles Kestrel Trainer	35
Covering	40
Cranks	44
The Lost Model	49
A Brief History and Description of the S.E.5	51
Solid Scale Models	56
More "Solid" Hints and Tips	58
The Society of Model Aeronautical Engineers' Monthly Report...	59
Build this fine Hawker "Hurricane" Silhouette Glider...	61
Build a Scale Model of the Hawker "Hurricane" ...	62
More Letters to the Editor	64
Letters to the Editor	66
At the Sign of the Windsock	68
Club News...	72

EDITORIAL.—All communications should be addressed to the Editor, THE AERO-MODELLER, Allen House, Newarke Street, Leicester, and contributions must be accompanied by a stamped addressed envelope for their return in the event of being unsuitable. Whilst every care will be taken of MSS. submitted for consideration, the Editor does not hold himself responsible for safe keeping or safe return of anything submitted for his consideration.

ARTICLES should (preferably) be typed or written on one side of the paper only, and should normally not exceed 1,200-1,400 words.

DRAWINGS should be in Indian ink on white card or linen tracing cloth. Actual size is not important, but the length/width ratio should be 10:7 (for full-page reproduction) and 4½:7 (for half-page reproduction).

PHOTOGRAPHS must have sender's name and address and full description written on the back.

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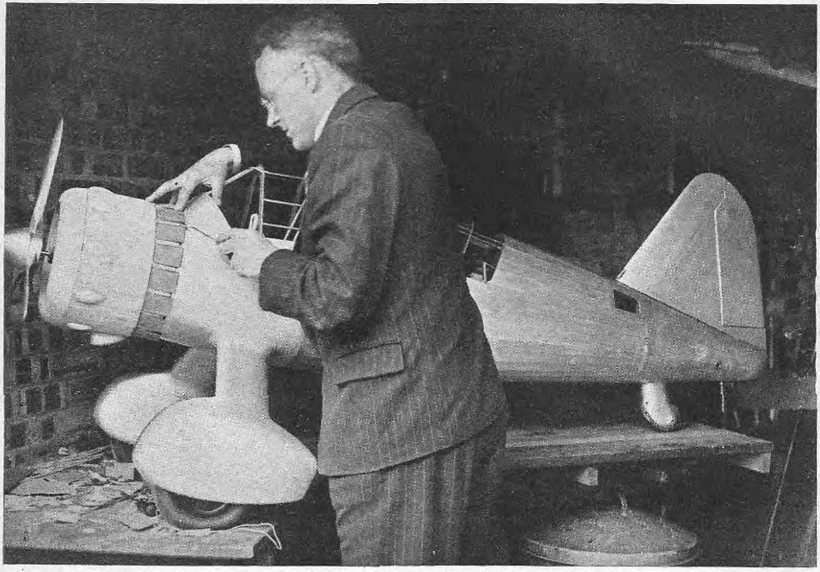
CHEQUES are posted on or before 14th of the month following publication.

SUBSCRIPTION RATES.—THE AERO-MODELLER will be mailed, post free, to any address in the world for an annual subscription of 7/6.

THE WESTLAND "LYSANDER"



Here is Mr. D. A. Russell at work on his one-fifth full-size, petrol engine driven, model of the Royal Air Force latest type Army Co-operation Aircraft.

DECEMBER, 1938
Vol IV. - No. 37

Tel. Leicester 65322

The AERO MODELLER

INCORPORATING THE "MODEL AEROPLANE CONSTRUCTOR"

EDITORIAL

FINE, warm weather, many a tree still in leaf, no sign of snow or frost, and the Editorial to be written for our Christmas Number! What a climate—and what a funny idea publishing each issue a month ahead—this being the December issue published in November!

Still, it's a way they have in the publishing trade—or should we say—profession? We have been publishing THE AERO-MODELLER for some eighteen months now, and don't feel quite so "amateurish" as when we took it over from its previous publishers.

Anyway, asking our readers to use their imaginations and "make believe" that they are reading these words on December 25th, we offer our sincere good wishes for a Happy Christmas "and all the best for 1939," leaving each reader individually to interpret "the best" as he may desire.

This issue of THE AERO-MODELLER is unique in that it is the largest issue of any model aeroplane journal that has ever been published in any part of the world: 88 pages and a free multi-coloured plan. We are proud that THE AERO-MODELLER can make this claim.

This issue is also different to any previous issue in that it incorporates the *Model Aeroplane Constructor*, which journal has now ceased publication.

One of our first actions, when taking over THE AERO-MODELLER, was to "exchange courtesies" with the proprietors of our contemporary; and note we say "contemporary," and not "competitor"; and particularly during recent months have we been in touch with its proprietors.

Whilst in a number of respects our policies have lain in different directions, in certain respects the two journals have covered similar ground; for instance, club reports.

THE AERO-MODELLER has, of course, steadily expanded, both in size and circulation, since it came under the control of its present proprietors—all experienced aero-modellists—and after careful and prolonged consideration, it was felt that the "common cause" of model aviation in this country would best be served by incorporating the *Constructor* within THE AERO-MODELLER.

As has before been explained, this journal is not owned by some big printing house, to be reckoned as one of perhaps hundreds of publications—and suffering from an impersonal control—regarded purely as a dividend earner its policy directed solely to obtaining the largest number of readers. THE AERO-MODELLER is owned, controlled, and edited by a small body of keen aero-modellists, who, whilst obviously publishing it as a business proposition, are full conscious of the need for a genuine magazine for aero-modellists, and have striven to that end since they took it over. And it is with that aim in view that the *Model Aeroplane Constructor* has been acquired. This arrangement was only come to a few days before this issue went to press, so we are unable to make any special announcements other than to say that we invite readers to write and express their views as to what features they would like to see appearing in future issues of THE AERO-MODELLER.

We might add that all business communications regarding past issues of the *Model Aeroplane Constructor* should be addressed to the same address as before: Vulcan House, 56 Ludgate Hill, London, E.C.4, but we shall, of course, be pleased to deal with all model aeroplane queries from past readers of the *Constructor* if addressed to our Leicester offices, not forgetting a S.A.E. for our reply!

Copies of this issue are being distributed in place of the *Constructor*, and we trust that new readers will become regular readers. An order form, to be handed to the local newsagent, is printed on the back inside cover of this issue, and should definitely be used immediately. We have had a number of complaints from readers who missed prompt delivery of the November issue because further supplies had to be obtained from our distributors, which supplies eventually gave out! We are sorry; we printed extra copies, knowing that the demand is increasing each month, but evidently we did not print enough. This month we are printing several thousands more, so hope everyone will get his copy without difficulty. If not, please let us know.

And so, turn overleaf and read all about life in the R.A.F.; read "Fancier's" "Who's Who"; about the "Lysander," the Miles trainer, the S.E.5, the Hawker "Hurricane," etc., etc., and so through to "Clubman's" latest report; and a good read through of all the advertisements; and we trust you will think your shillings have been well spent!

THE EDITOR.

THE POWER BEHIND THE PILOT

(Photos Copyright Air Ministry)

Wireless operators in a flying classroom. One of the two D.H. 86b's which is equipped for instruction in aircraft operation at Cranwell. There are two seats for instructors and six for pupils, each of whom has a receiver.

CRANWELL TRAINS SILENT SERVICE OF THE ROYAL AIR FORCE

By THE EDITOR

THE dream of most aero-modellers is ultimately to become pilot of a full-size aeroplane. The more adventurous aim to become pilots in the Royal Air Force—to patrol the skies for the safety of the realm and the protection of their homes.

Since the earliest days of aviation the man at the controls has been a romantic figure. A whole library of history and legend has sprung up around our war-time aces. The mere mention of a name such as Ball, McCudden or Bishop still fires the imagination more than twenty years after they performed their daring exploits. Then with peace came our speed and endurance aces to stir the blood.

Those heroes well deserve their fame, to them be honour and glory, but none know better than they that their success depends on the patient work of sure-fingered craftsmen—aircraft tradesmen working unobtrusively to ensure that the fighting machines are working as sweetly as human hands can make them.

Since 1918 the technical equipment of Britain's aircraft has become immeasurably more efficient. With the greater efficiency has come increased intricacy calling for more highly skilled tradesmen than ever.

Four trades have risen to first rate importance in recent years—wireless operator, electrician, instrument repairer, and armourer. Once an aeroplane has been put into commission its successful operation rests largely on men of these four trades—members of the silent service of the Royal Air Force.

The chief training centre of the first three mentioned is the Electrical and Wireless School, Cranwell, Lincs., first and most important of the big aircraft training depôts to be established in this country. The armourers are trained at No. 1 Armament School, Manby, and No. 2 Armament School, Eastchurch, Kent.

Since its establishment by the Admiralty in the critical days of 1915, Cranwell has steadily increased in size and importance.

Visiting there recently to give a talk and demonstration of model aeronautics to boy entrants and apprentices, I was greatly impressed by the vast expansion of the station which is taking place in connection with Britain's aerial re-armament programme.

3,000 acres of the pleasantest country in Lincolnshire, formerly farm land owned by Lord Bristol, Cranwell, is now training between 3,000 and 4,000 aircraft apprentices and boy entrants for the Royal Air Force each year, and the number is rapidly increasing.

During this and next year the Air Ministry will spend an aggregate of £20,000 on further extensions and new equipment for this establishment alone.

With its 5,000 inhabitants, Cranwell is a little world of its own. Methodically laid out with aerodromes, hangars, laboratories and lecture rooms, living quarters and recreation centres, all served with level concrete roads and made homely with green lawns and flower gardens, the station caters for all the needs of normal healthy boys and young men.

Tree-lined roads and creeper clad walls take away the barrack atmosphere, and little remains of the Cranwell of the old farming days, save the quaint grey stone

two-storey farmstead which has become the residence of the Air Officer Commanding.

Let me trace the growth of the Cranwell Command since the stormy days of its foundation.

Already in 1916 it was the most important training station for the Royal Naval Air Service, a great central depot where pilots were taught to fly every description of aircraft from kite balloons to Sopwith "Camels."

During the summer of that year, King George V and Queen Mary visited the camp, and souvenirs and photographs of the occasion are still among the most-treasured possessions of the various messes.

April 1, 1918, brought the unification of all aerial fighting forces under the control of a Secretary of State, the first move of the kind ever made by any nation.

As a result, Cranwell was rapidly expanded. East Camp was built to become the Electrical and Wireless School, giant hangars were built to house airships.

November, 1917, had seen the arrival of King George VI (then Duke of York) in charge of a section of boy trainees, and His Majesty's period of service continued until August, 1918, when King George V made a second visit.

Also in November, 1917, an American air unit arrived and was stationed on the northern aerodrome.

In 1919 the Air Ministry decided to found a Cadet College at Cranwell on the lines of Sandhurst and Woolwich, to train Air Force officers for permanent service.

Early the following year, Lord Trenchard inaugurated the Royal Air Force College with 52 Cadets, and that famous aeronautical pioneer, Air Vice-Marshal Sir C. A. H. Longcroft, became first Commandant.

The College occupied the west-end of the Camp, and East Camp became the training school for 1,000 boy apprentices. Since the commencement of the Royal Air Force expansion programme in 1935 that number has been greatly increased.

Until 1933 the Flight Cadets were housed in old wartime huts about one-third of a mile from the present College, the foundation stone of which was laid by Lady Maud Hoare in April, 1929. In the foundation stone, I am told, there is a copper capsule which contains a scroll.

Pay day at Cranwell.

The intricacies of "George," the automatic pilot, are explained to two trainees at Cranwell.

On that scroll is written the names of all who attended the ceremony, and of all Flight Cadets who had passed through the College.

The new College, designed by Sir James Grey West, carries a 130-foot tower surmounted by a beacon, making it a landmark both by day and by night.

Above the entrance door are the armourial bearings. In the vestibule, beneath a marble tablet, is a table supported by an eagle, and on it the Old Cranwellian Book. Between its covers is preserved the photograph of every Cadet who has passed through the College, with a short record of his achievements in works and games.

The cost of sending a cadet through Cranwell Cadet College is about £300 for the two-year course, but against this he is paid 6s. 6d. a day, and is given an outfit allowance of £50 when he gets his commission.

In the apprentice wing entry is by competitive examination. The course of training is three years, and is on parallel lines to apprenticeship in civil life, with the added attraction of a great deal of flying training. During the first two years' training aircraft apprentices are paid 1s. a day, which rate is increased to 1s. 6d. a day at the beginning of the third year.

For boy entrants trade training, maintenance and medical attention are free. Uniform is provided, and each boy is paid 9d. a day for the training period.

My enquiries led me to the discovery that the Royal Air Force is the most democratic of the fighting services.

Many years ago the old barrier between commissioned and non-commissioned ranks was swept away. I was interested to learn that there is nothing, except keen competition, to prevent an airman with ambition and initiative, who enters the service as a boy of 15 or so eventually rising to the rank of Wing Commander, or even higher.

There is no limit to the possibilities of promotion, which in the early stages can be very rapid.

The tallest and the shortest boys under training at Cranwell debate which bomb falls the faster.

Consider the opportunities afforded the boy entrant to the trade of wireless operator—though any other of the four trades I have mentioned would serve as well for illustration.

He joins the service at the minimum age of 15 years 8 months, entering the Electrical and Wireless School for a training period of between 12 and 16 months. If he shows ability he will pass-out as an aircraftsman 1st Class with a wage rate of 4s. 3d. a day, provided he has reached the age of 18.

The next step, which may be taken only seven or eight months later, is to the rank of Leading Aircraftsman, carrying a wage of 5s. a day.

In computing rates of pay, it must be borne in mind that uniforms and living quarters, rations and medical attention are provided free.

It must also be remembered that airmen are paid for every day of the year, including four weeks' holiday leave, or six weeks for boy entrants and apprentices during the training period.

But to return to promotion possibilities.

A Leading Aircraftsman Wireless Operator may return to Cranwell for a further twelve months to undergo a conversion course to Wireless Operator Mechanic, which carries additional pay, and may pave the way to promotion to full Corporal.

(*Concluded on page* 47).

I KNOW 'EM ALL!

or

(THE FANCIER'S WHO'S WHO)

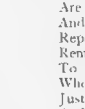
THOUGH many folk have deemed to think
That the Fancier had deceased,
I rise again with thrusts to sink,
And trust that all are pleased
To see my return to life.
Knowing full well that I give
News that's true and some that's not,
Up to the minute and red hot.

A departure I make from my previous style,
Having thought it were worth while
To tell our readers and enthusiasts new,
A few of the facts and just who's who
In this world of balsa and Japanese tissue.
And if I mix the bag and dish you
A queerly assorted collection of humour
And sober fact, garnished with rumour,
Blame it on the festive season,
Or else on the knowledge that I and reason
Are strangers!

So let's to the collection of Queer Birds new
Trusting that I give the clue
To many things you wished to know,
But ask me not just how
I have passed my time these few months past.
"Winchelling" round this movement vast
With ears wide open, and armed by Leica,
Verily should I have to hike a
Heck of a distance from kith and kin
And flee this world to save my skin
Should my identity become known,
To those at whom I poke my fun.

And so, my friends, I leave to you
To sort from the facts that here accrue,
Just who are the men and mice who set
The example to those of us who yet
Are not *au fait* with the full details.
And if this list entails
Repeating of knowledge that is familiar,
Remember that it will not kill "yer"
To spare a bit of space to those
Who are new to the game and wish to know,
Just who is who, and what is what,
And for want of a better finish—"So what!"

ALLMAN, J. B. "Gears." President of the Midland M.A.C. A well known Midland aero-modellist, who won the Wakefield Cup in 1934, and was a member of the English team sent to America in 1936. An expert on all gearing matters, is renowned for his excellent workmanship, "competition nerves," and a complete horror of a microphone.



ALMOND, F. E. J., North Kent M.A.S. A successful southern modeller, distinguished as the highest placed member of the 1938 English Wakefield team, and second in the 1938 Sir John Shelley Cup contest. Of rather slight build, can be noted by the long cigarette holder he invariably uses.

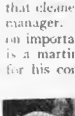
AMIARD, Rev. Father. Alias the "Diplomatic and Amiable." Native of Flers, Normandy. Honorary member of the S.M.A.E. A familiar figure to most aero-modellists; is a diplomat of the first order, and is known for his assistance to visiting English parties, and his annual "Aero-modellists Beano" at Flers. A most likeable soul, he conducts a school in his native town, and has formed a highly successful model section called the Esquadrille de Cedres. Happiest when with the English boys at Fairey's, and should by all rights be an Englishman!

BARNARD, F. R. A long-standing supporter of the aero-modelling movement; is the donor of the Premier Shield awarded to the winner of the British Wakefield Trials. Is a staunch supporter of the club movement.

BOWDEN, Major C. E. Recently promoted from Captain, is at present serving at Gibraltar. The pioneer of petrol-driven models in this country; is well known for his many and successful designs, and is holder of the British R.O.W. Flying Boat record.

BOYS, Howard. A well-known writer of aero-modelling articles specially suited to the beginner. Holder of the British Tailless record. Is noted for his attention to the unorthodox, and his never-ending collection of gadgets. Remembered by many for the weird and wonderful three-wheeled runabout that cruises about the country with the head of the "Boys-bird" protruding through the fabric.

BULLOCK, Flt. Lieut. Ralph N. One of our most distinguished experts. Is Technical Secretary to the S.M.A.E. Winner of the Wakefield Cup in 1929; has been a member of the team on many occasions since, and is especially noted for his consistent high standard of workmanship and performance. Member of the victorious team that cleaned things up in Yugoslavia; is an excellent team manager. An inveterate tea drinker, is apt to get nerves on important events. Dubbed by some as "cantankerous," is a martinet for fair play, and is not afraid to stick up for his convictions.



BURCHELL, C. J. "One of the old brigade." An expert carver—of propellers. A permanent member of many Yorks. Saturday meetings; can be relied upon to produce an excellent piece of workmanship from his pocket at the most unexpected moments.

CAHILL, Jim. One of the best known Americans. Won the Wakefield Cup this year at Guyencourt with the best duration of the day. Native of West Lafayette, Indiana, is a quiet, studious type, and very popular with the English team who met him in France. A very consistent winner in his own country.

CHASTENEUF, E. Blackheath M.F.C. One of the accepted band of British experts, winner in 1937 and 1938 of the Premier Shield, and member of the English team in those years. Is also holder of the Tow-launch Gliding record. Always a power to be reckoned with at competitions. Is a strong adherent of the streamlined theory.

COPLAND, Bob. Northern Heights M.F.C. Another of the exalted band of British experts. Is a great pal of "Chast," whom he accompanied to Yugoslavia, where he succeeded in winning the premier award the King Peter Cup. Is holder of the British Indoor and Outdoor R.O.G. records; also the World record (subject to official confirmation). Won the Weston Cup for 1938. A very consistent winner at all events. Is another supporter of the streamliner.

COSH, E. F. H. Secretary to the S.M.A.E. Late Secretary to the Blackheath club, which position he recently resigned owing to the vast increase in his duties to the governing body. One of the most popular officials; is noted for his small stature and angelic smile! Lets his wife do all the flying for him—to good purpose—Mrs. Cosh being the winner of the Women's Cup for 1938. Highly diplomatic, can put his foot down when the occasions demands. Undoubtedly one of the main reasons for the present prestige and growth of the S.M.A.E.

FANCIER, The. A mythical personage who will doubtless end up as the victim of a gory murder—to the delight of the poor wretches who are the recipients of his banter. Can be recognised by his straw plaited in his flowing locks. Is in the running for the next Poet Laureate. Cursed with an unfailing propensity for leg-pulling. Is attempting to introduce a spot of levity into the movement. Favourite flower dandelion. Favourite fruit—at least the one most received—raspberry. Fond of spotted ties, socks with clocks, loud checks, and top hats.

FILLON, M. Winner for France of the Wakefield Cup in 1937. An extremely shy young aero-modellist. Is a high-class workman and knows how to fly his models! Is now serving his term of military duty.

GUILLET, Monsieur. Secretary of the C.F.M.R.A.—the equivalent to our S.M.A.E. Responsible for a great deal of the arrangements for the 1938 Wakefield Finals, and one of the hardest working officials at that function.

HAWKINS, L. H. Treasurer to the S.M.A.E. Is distinguished by a shining bald head, cheery manner, pork pie hat, strong right arm, and a pocket full of pennies! Always found where the lads are congregated. Is a confirmed "baby-cine" enthusiast, and has given many fine shows to various clubs.

HOLBROOK, H. Chairman of the Lancashire M.A.S. A consistent winner at Northern events, and winner of the Biplane Cup for 1938.

HOULBERG, A. F. Chairman of the S.M.A.E. and the Oxford Club. One of the pioneers of the movement, was largely responsible for the formation of the S.M.A.E., being a member of the old Kite and Model club. Extremely level-headed, speaks French fluently, an accomplishment much appreciated at the Finals in France this year, where he acted on the jury.

JUDGE, A. A. T.M.A.C. Winner of the Wakefield Cup in 1936, journeying to America to do so. Quiet and studious, is one of the regular high performers at all events.

KENWORTHY, J. W. Founder of the Lancashire M.A.S., and 1933 winner of the Wakefield Cup. Pioneer of aero-modelling in the north, has removed to the south coast for health reasons. Designer of many well-known models.

KNIGHT, M. R. T.M.A.C. Well known as a writer of books on the hobby. Is renowned for his sharp wit. Great believer in biplanes. Is noted for the nonchalant way in which he throws a model around. Has developed a simple but very efficient method of "Mayo" launching model aircraft.

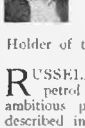
LEADBETTER, J. E. Southport M.A.C. A regular "cleaner-up" of events in the North. Was a member of the 1937 English Wakefield team. Noted for his fine workmanship. Also known as "Big Chief Leadpop."

MOVING FINGER, The Opposite number to the Fancier, is another who lives in fear of his life. Unkindly called the B.F., and many other like appellations. Has gingered up many an individual with beneficial results in some cases.

NEEDHAM, C. W. Secretary of the Bristol and West M.A.C., and largely responsible for the running of things in that area.

RIPPON, C. A. Northern Heights M.F.C. One of the real pioneers. Has done a great deal to popularise the sport. Is noted for his organisation of the annual N.H. Gala Day at Fairlev s. Very keen on pusher type designs, and a staunch supporter of the old style of classification of types—e.g., O1, P1, etc.

ROSS, E. "Bunny." Well known in the South. Is a keen petrol model enthusiast, and won the Bowden Trophy for 1938. Wears terrible shirts, which are the objects of attention to the other lads, who delight in trying to divest the owner of 'em. Never considered properly dressed at a competition unless seen with shirt flapping in the breeze. Recently acquired a sports car, and is the terror of pedestrians and police alike.



RUSHBROOKE, C. S. Lancashire M.A.S. Known better as "Rushy." Is Honorary Secretary to the Lancs. M.A.S., one of 1938's most successful clubs. Known for attention to the "finish" of a model, is more concerned these days with management. Can be recognised at most functions by his beret—the family mascot! Holder of the British Indoor R.O.G. record.

RUSSELL, D. A. A noted builder and writer on petrol model topics. At present engaged on an ambitious project—a ⅛ scale Westland "Lysander," described in this issue. Author of "The Design and Construction of Model Aircraft," one of the few technical publications on the hobby.

SMITH, J. C. Competition Secretary to the S.M.A.E. Dubbed the "Golden Voice," is usually found supporting a microphone. Has his work cut out looking after the various events run by the S.M.A.E., and holds no sinecure of a job, believe you us!

SMITH, R. North Kent M.A.C. Member of the 1938 English Wakefield team. Strong upholder of the slab-sided type of model. Is a policeman by trade, but we don't hold that against him.

SCHROETER, Herr Paul. Leader and manager of the 1937 and 1938 German Wakefield teams. Is noted for his terrific stature and physique, fluent English, and fund of good stories. A regular fellow, is extremely popular with the English aero-modellers.

STOTT, L. Halifax M.A.C. Member of the 1938 English Wakefield team, had a very successful season, having also THE AERO-MODELLER Championship Cup at the Northern Rally, and a like award at the Bolton meeting, besides numerous other awards. A neat Lancashire lad, is distinguished by horned rimmed glasses, slick hair, and accent.

THURSTON, Dr. A. P. F. President of the S.M.A.E. Has done a great deal for the movement, and is responsible for a great deal of the support we get from the "high places." Has a most charming wife, donor of the Women's Cup, who is always to be found at the big meetings. Has a smile for everybody, and is always ready to help the new clubs.

TINDALL, A. Lancashire M.A.S. Coming into sudden prominence this season. has cleaned things up in the North. losing his model nearly every time up. Winner of the Short's Trophy for 1938, and holder of the British Seaplane (Tank) record.

VAN HATTUM, J. Now living in Holland. Was for many years resident in England, and took a great interest in the S.M.A.E. Author of the "Simple Aerodynamics" articles now appearing in this journal. Is a terrible leg-puller, and is known for his "poker face."

WHITE, H. Luton and District M.A.S. Final member of the 1938 Wakefield team. Endeared himself to all by his real hard work at the Finals, where he collected the nick-name of "Rabbit." A cheery individual, has never looked better than in his Chinese coolie hat !

WYMERSCH, A. Van. Perhaps the best known Belgian aero-modellist. Is renowned for his extremely fine workmanship, and is always a potential danger in the international competitions.

YORK, H. Press Secretary to the S.M.A.E. Is well known for the great amount of hard work he puts in for the movement. Has been accused of being the "Fancier," "Moving Finger," "Strube," "The Man in the Iron Mask," and Uncle Tom Cobley and all. Accompanied the English team to America in 1936, and can be found at all functions where the boys gather. Has developed a permanent limp owing to the weight of the thousands of international club badges he has collected. and now has to have the lapels of his suits lined with corrugated iron.

ZAIC, Frank. Editor of the now world famous Year Books on model aeronautics. Is a regular globe trotter, and was seen in England in 1937. Divides his time between lazing around the world and extreme activity on the books. The only one I know who can make a world tour and finish up on the credit side of things.

AND so my friends I take my leave,
Trusting that you all are pleased
With the festive effort of the Fancier.
And though, of course, I can't recant a
Word that's said, I trust that one
And all do not resent the fun
I poke at those who are here denoted,
For, after all, they all are voted
Among the best this game has seen.
And believe me when I say I'm keen
On seeing them all, and claiming friends
With yet more in this game that lends
Itself to such great fun,
Enjoyed by each and everyone.
My final word, of course, must be
To wish you all the best, and see
That when you pull the wishbone tough
You spare a thought to the Fancier.

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12 in.	3/6	3/9	14 in.	4/6	4/9
12½ in.	3/9	4/-	14½ in.	4/9	5/-
13 in.	4/-	4/3	15 in.	5/-	5/6
13½ in.	4/3	4/6	Pitch = Diam. × .62.		

DURATION TYPE "A"

Light-weight Paulownia wood

Diam.	Plain Each
5 in.	6d.
6 in.	7d.
7 in.	9d.
8 in.	11d.
9 in.	1/1
10 in.	1/6
11 in.	1/6
12 in.	1/9
13 in.	2/0
14 in.	2/5
15 in.	2/8
16 in.	3/2
17 in.	3/4

Pitch = Diam. × 1.4.

DURATION TYPE "LB"

Medium weight Ho-wood

Diam.	Plain Each
5 in.	5d.
6 in.	6d.
7 in.	7d.
8 in.	9d.
9 in.	11d.
10 in.	1/2
11 in.	1/5
12 in.	1/8
13 in.	1/11
14 in.	2/2
15 in.	2/6
16 in.	3/0
17 in.	3/6

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THE "LYSANDER"

A one-fifth full size scale flying model petrol plane

By D. A. RUSSELL, A M.I.Mech.E.

BEFORE giving a general description of the one-fifth full-size flying scale model of the Westland "Lysander," which I am now building, I think it is desirable that I should explain the reasons for my embarking on such an ambitious proposition.

Firstly, I personally like tackling difficult jobs, provided they are pleasant!

Secondly, I like building large 'planes; and, thirdly, I consider that one can most usefully learn from the *mistakes* one makes, and not from one's *successes*, although, of course, the ultimate aim is to produce a "success," if possible.

Some three-and-a-half years ago I commenced the construction of a 10 ft. span low wing cabin monoplane of my own design. It was a first attempt at a large "heavyweight." The wing area was 10 sq. ft., and the "designed" weight was 10 pounds, and a number of folks told me I would never get it off the ground. For a long time I *didn't* get it off! It took me quite a while to evolve a suitable type of undercarriage that would stand up to its work; and it is also quite a job to get a 'plane of this type to taxi at over 20 m.p.h. across a grass field in a straight line!

However, time passes, and with it there is a tendency for the weight to increase!

At the end of September last I had this plane, G-ADAR, taking off with a run of about 60 feet from the tarmac runway at Cranwell Aerodrome. The all-up weight was 16 pounds, and the engine the 18 cc. "Comet," which has powered the 'plane since it was first built.

Thus the wing loading is over 1½ pounds per sq. ft. of wing area, and the power weight ratio only a trifle over 1 cc. per pound of weight.

The machine is obviously over weight or underpowered, and it is *not* capable of flying in a wind! Nevertheless, its construction, which took nearly a year, and the large amount of time I have spent on experimental work, have been well worth while, as is shown by the fact that, having arrived at the correct combination of airscrew diameter, thrust and speed, together with the correct wing incidence, I can definitely get this machine to take off from tarmac entirely under its own power, with an all-up weight more than half as much again as the original figure!

Encouraged by the results obtained from this 'plane, and fired with the idea of building a flying scale model, I commenced a survey of modern 'planes, and decided on the Westland "Lysander." Why? Well, there were several reasons. It was a high-wing model. It had good cabin space, which meant that I could reckon to have good access to the interior. It was one of our latest military types, not likely to be soon superseded, and, as the 'plane would take at least a year to construct, it must not be out-of-date when completed! Then I knew

where I could obtain a suitable engine that would fit inside the engine cowl. And the idea of slots and flaps appealed to me, if only because there would certainly be some experimenting required to get them to operate satisfactorily!

Finally came the decision to be made regarding the scale to which the machine should be built. The full size 'plane is 50 ft. span. A nice, easy figure to work to. And no great stretch of imagination was called for to think of dividing this by 5.

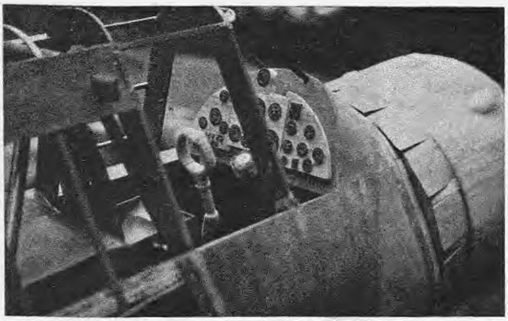
Thus the model was to be 10 ft. span and 6 ft. long. This size appeared "handy," if only calling for tyres approximately 8 in. diameter for the wheels, a size I had in stock, and have used with great success. They are 8 in. × 2 in. inner tubes, made by Dunlops, cost 2s. 6d. each, are provided with proper car-type valves, and are normally used inside outer covers of normal design for small trolley and barrow wheels.

In getting out the plans I was fortunate enough to obtain the services of Mr. C. W. Harris, who built a 32 in. span solid model of the "Lysander," which was fully described in the March and April, 1938, issues of THE AERO-MODELLER.

Mr. Harris drew out for me a set of outline drawings, a complete set of bulkhead drawings, and also constructed the engine cowl and all the interior fittings.

Mr. Harris's solid model clearly demonstrated his ability to turn out an exceedingly well-finished article. The photo showing the instrument board on my "Lysander" clearly shows that his skill is of no mean order; and I wish to take this opportunity of recording my appreciation of the assistance he has given me.

Returning to the model, the first job was to construct the bulkheads. These are all of $\frac{1}{16}$ in. 3-ply birch, into which fit the longerons. These are of $\frac{1}{4}$ in. × $\frac{1}{4}$ in. hard balsa, there being 40 of them.



A fine view of the cowl and instrument panel built by Mr. C. W. Harris.

The cutting of the slots in the bulkheads for these longerons presented a nice little problem. About 200 slots were required to be cut, each exactly $\frac{3}{8}$ in. deep by $\frac{1}{8}$ in. wide. As the longerons were $\frac{1}{8}$ in. wide this meant that they would stand "proud" of the edges of the bulkheads by $\frac{1}{8}$ in., and thus prevent the fabric touching the bulkheads. It was essential that the slots should be exactly to size, to afford a snug fit on the longerons.

How to do this! Well, frankly, I didn't fancy cutting all these slots with a chisel or razor blade, so I made up a special tool consisting of a striking die of steel, $\frac{3}{8}$ in. × $\frac{1}{8}$ in., which was actuated by a hand lever in such a way as to punch the slot out of the bulkhead.

This gadget took me about four hours to construct out of scrap, but enabled me to cut all the slots accurately to shape in under half-an-hour.

No jig was used in assembling the longerons in the slots: they were pushed into position, and rubber bands tied round to hold them during the drying of the glue with which they were fixed.

In the full-size aircraft, the end of the fuselage, as far forward as the front anchorage of the fin, and the forward portion, are built of metal, and on my model this is represented by sheets of $\frac{1}{32}$ in. 3-ply birch, silk covered.

A section of Mr. Russell's workshop. Various parts of the "Lysander," also other models, may be seen.

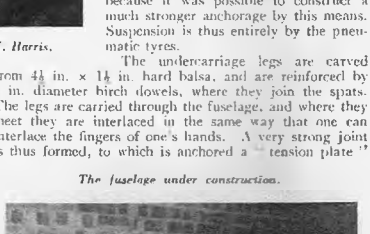
The fuselage, as shown in the accompanying photo, but with the forward covering of 3-ply, weighs about 2 pounds.

The spats are carved from solid blanks of balsa, are some 13 in. long, and weigh about $2\frac{1}{2}$ pounds the pair. They are, of course, hollowed out to accommodate the wheels.

The question of springing the undercarriage occupied my mind for a considerable time. After designing a somewhat elaborate arrangement whereby the legs were hinged and able to move backwards and forwards, I discarded this, and have made them solid with the fuselage, partly because they are so in the full-size aircraft, and partly because it was possible to construct a much stronger anchorage by this means. Suspension is thus entirely by the pneumatic tyres.

The undercarriage legs are carved from $4\frac{1}{2}$ in. × $1\frac{1}{8}$ in. hard balsa, and are reinforced by $\frac{1}{8}$ in. diameter birch dowels, where they join the spats. The legs are carried through the fuselage, and where they meet they are interlaced in the same way that one can interlace the fingers of one's hands. A very strong joint is thus formed, to which is anchored a "tension plate"

The fuselage under construction.



of $\frac{1}{8}$ in. 3-ply birch, several inches wide, which is carried right back along the floor of the fuselage to the tail of the model.

In addition, the interlaced joint is braced by compression struts, which run up to the front bulkhead; and finally there are two tubes in compression when landing, and in tension when flying, which run up to a cross tube at the top of the fuselage, and which form the anchorage to which the wings are attached.

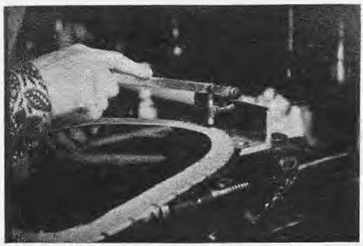
Altogether, the construction is very robust, and a complete "crack-up" will be necessary to disturb the landing gear.

The weight of the fuselage, covered, doped and painted, with fin, spats, wheels, all instruments—in fact, as shown in the accompanying photographs—is some 15 pounds.

The engine weighs $3\frac{1}{2}$ pounds; twin coils, 1 pound; and with battery, leads, switch, etc., will bring the total

up to about 20 pounds. The elevators will come out at about 1 pound, and I hope to build the wings for about 2 pounds each, thus bringing the all-up weight to about 25 pounds. As the wing area is about 10 sq. ft., the wing loading will be 2½ pounds per square foot.

As the Westland "Lysander" is still one of this country's latest types of military aircraft, it is not possible to obtain full particulars of the airfoil characteristics, but by various means I have been able to get, I think, pretty near to the correct section. I do know that with slots and flaps it is possible to increase the lift fourfold, and this means that the flying speed (with flaps and slots operating), can be reduced to half that of the flying speed when they are in the normal position. According to my calculations the speed with flaps and slots operating should be approximately 20 miles per hour.

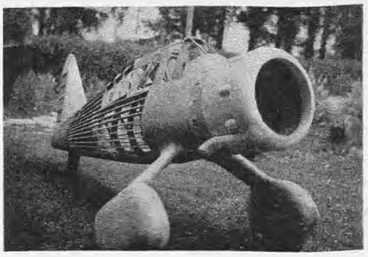


Cutting the slots in one of the bulkheads.

The centre-of-pressure travel is quite small, even with the slots and flaps fully extended. However, I intend to use the two coils as a pendulum, suspend them inside the dummp petrol tank (which is located over the centre of gravity of the whole machine), and connect by a simple link control to the elevators, which will be arranged to pivot. (An article by Mr. C. R. Jeffries, describing this method of control, will be published in our next issue.—Ed.).

The slots and flaps will be held in the "open" position by springs or rubber bands, so tensioned that as the machine gathers speed the air pressure will tend to close them. This means, of course, that as they close the lift coefficient of the airfoil (considered as a whole) decreases, but at the same time the *drag* decreases much more rapidly, this enabling the machine to more quickly gather speed, until, at the take-off, the flaps and slots are fully closed. This is actually what happens on the full-size aircraft; the operation is entirely *automatic*, and not controlled by the pilot.

When in flight, and power is cut off, the immediate failure of the propulsive thrust of the airscrew causes the 'plane to slow down; and so, due to the decreased air pressure, the slots and flaps commence to open.



Another photo of the model, showing the imposing appearance of the cowl and landing gear.

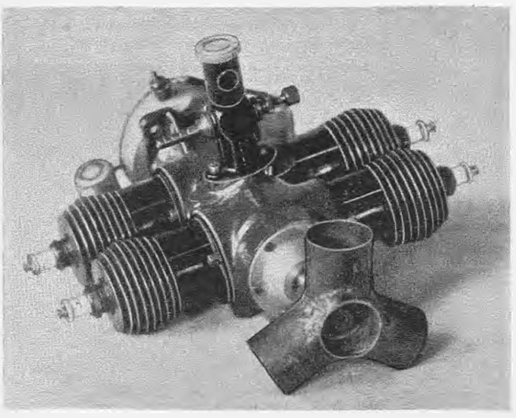
It should be possible, also, to lock the slots and flaps in the fully "open" position, and get the machine to fly comparatively slowly. We shall see!

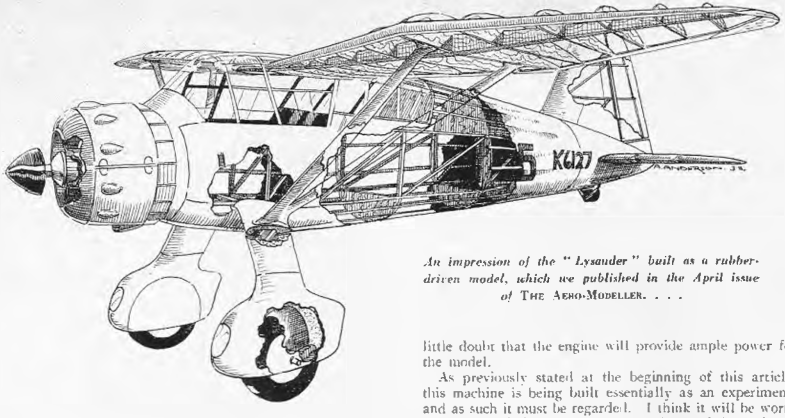
A few words about the engine: As will be seen from the photo, it is a 4-cylinder unit. The bore is 1 in. and stroke ¾ in., which gives a cubic capacity for the four cylinders of just under 40 cc.

This engine is known as the "Condor," and is of American manufacture, and I bought it from the Model Aircraft Stores, of Bournemouth. The rating is 1·6 h.p. at 7,500 r.p.m., at which speed I shall *not* run it!

The airscrew diameter is 2 ft. 2 in. There are three blades of Clark Y section. They will be mounted in

The 4-cylinder 40 cc. engine to be used on the model.





An impression of the "Lysander" built as a rubber-driven model, which we published in the April issue of THE AERO-MODELLER. . . .

the hub shown in the photo, provision being made to allow of adjustment of pitch.

The crankcase is of cast iron and carries three large ball races supporting the crankshaft. As the engine is a two-stroke, opposite pairs of cylinders fire together. At the rear of the engine is a case in which is contained the contact-breakers, there being two units, each with its own coil and condenser.

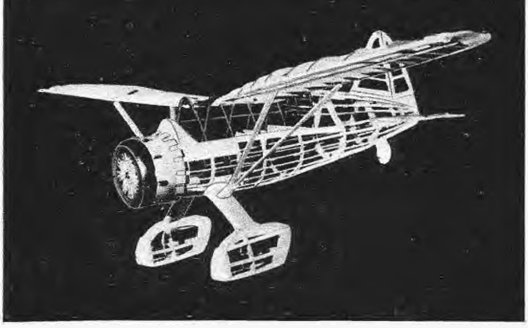
According to preliminary calculations, a speed of 4,000 r.p.m. will be sufficient, giving a thrust of 7 or 8 lb., depending on the pitch of the blades, but there is little doubt that the engine will provide ample power for the model.

As previously stated at the beginning of this article, this machine is being built essentially as an experiment, and as such it must be regarded. I think it will be worth while to fit ball races to the wheels, as I have found that quite an amount of friction can be developed when these wheels, of such small diameter, are revolving at a speed of close on 1,000 r.p.m. This is a point not fully realised by all petrol 'plane enthusiasts; but my figures are right! (The diameter of these wheels is 8 in. Say the circumference is 2 feet. 20 m.p.h. is approximately 30 ft. per second; so a wheel must revolve 15 times per second, or 900 times per minute).

It may be thought that the allowance of 2 pounds per wing is inadequate, but it must be remembered that they are supported by struts from the undercarriage legs. I do intend to make the wings as light as possible—they can much more easily be repaired than a fuselage!

In a future article I will deal with some of the theoretical calculations involved in estimating the performance of this model; meanwhile I hope that this general description will have been of interest. If any readers care to offer observations or advice I shall appreciate their views, sent c/o of the Editor: but don't say it won't fly—*I don't guarantee* that it will—but no one can assert that it won't, until it has been tried out. In due course I will publish results, with photographs "in flight," or in pieces, as the case may be!

. . . and a photograph of a 1 in. scale=50 in. span model built by Mr. G. Cudmore, of the Ealing Club. Motive power is by four geared spindles ratio 2½ to 1, driving a scale airscew. Weight is 12/13 oz.



Announcement
For all Model Aeroplane Designers

A *certain* method of getting results when you design a model that is entirely your *own* is to build on established theory.
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By D. A. RUSSELL, A.M.I. Mech.E.

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Don't for ever be a 'Copyist'

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And this is what a reader from Leeds says:

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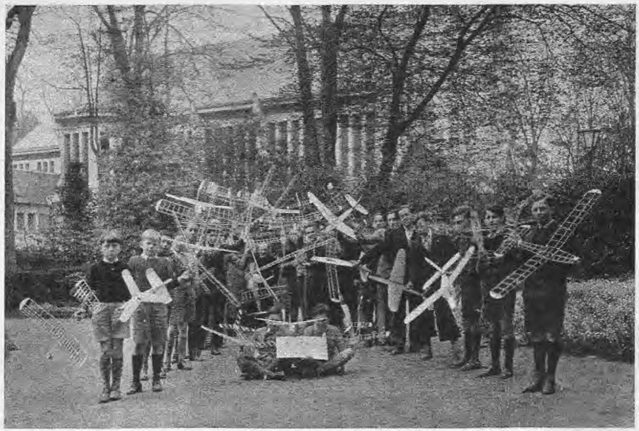


MODEL AVIATION IN FRANCE

By FATHER AMIAD, Escadrille des Cèdres, Flers, Orne

MODEL aviation started in France in 1930, and immediately it was a question of propaganda which gave birth to three great associations :—

(1) Aeronautique Club de France.
(2) Ligue Aeronautique de France.
(3) School Clubs.

In 1934 a small group of enthusiasts was organised under the name of M. A. C. F. (Model Air Club de France).

All these associations were affiliated to a great body called " Fédération Aéronautique de France." Considering the importance of the wide-spreading movement, the " Ligue Aeronautique " created in November, 1935, the " Comite provisoire des Modéles Réduits," whose function was to group the representatives of the various associations in existence. After one year of good work the Air Ministry created the " Comité Français des Modèles Réduits d'Avion "=C.F.M.R.A., to take the place of the other " Comité Provisoire." This "comitè" actually groups in an equal number the representatives of the Fédération Aéronautique de France, of the new " Federation Populaire des Sports Aéronautiques " and of the " Ligue Aéronautique."

This committee organised last year the elimination trials for the Wakefield Cup, and in 1938 had to prepare and distribute in every district the 35,000 kits bought by the Air Ministry, and originally to be given to the previously named associations and to the State Schools. In fact, all the kits were given to the State Schools and to the Clubs of the Popular Aviation.

1. The young F.P.S.A. (" Fédération populaire des Sports Aéronautiques "), has considered model aviation as the first step towards real 'planes, and its aim has been to help young men and slowly guide them towards real gliding first, and after a little practice to real aviation.

At the head of this group is Mr. Maulboussin, the well known constructor.

Being united with the National Education Ministry, the F.P.S.A. can do much work in schools, and it is interesting to notice in some State Schools small groups of eight boys working on the construction of the same 'plane under the direction of a manager. Prizes are presented to the group, but never to individuals.

A cup for speed models has been created at Puteaux, and in the magazine many good suggestions are proposed to the modelists. At last, they have a special shop where they can get at low prices wood and dopes.

2. The " Ligue Aéronautique de France " is one of the oldest groups in France. A few years ago, when the modelist movement started, they took part in it. At this time it was under the direction of Colonel Watteau, and it gave a great help to schools all over France. The members can be numbered about 20,000, united by the magazine, *L'Air pour les Jeunes*, but very unluckily in

The photo on left shows a group of young aero-modellists at Father Amiad's School at Flers, Orne.

many cases those members are satisfied with paying their annual contribution, and never build a model!

However, many meetings are organised by the Ligue, and a small book, the "A.B.C. des Modéles Réduits," has been very widely spread in the country, with the approval of the Air Ministry.

3. F.A.F. (Fédération Aéronautique de France). This great association is very popular in France and in foreign countries. Many people know the small badge with three 'planes, blue, white, red. The interest they took in model aviation is quite recent but very deep. They have under their flag 359 clubs, and starting the modelist movement only in 1936, they have actually 182 clubs affiliated and at least 6,000 modellists.

The statistics established during 1937 give the good number of 3,053 models built, and we can consider this number far under the real figures.

At the head of the committee is an enthusiast, Mr Bardel, Vice-President of l'Aero Club d'Auvergne.

Two wonderful little books have been printed this year as propaganda.

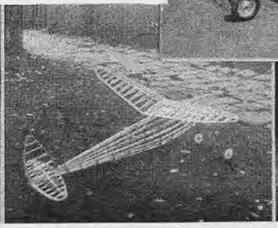
(1) "Manual élémentaire d'Aviation." Elementary text-book of aviation.

(2) "Modélés Réduits d'Avion." Model airplanes.

We can recommended them to every English modellist, as they give a very practical and well-studied idea of the modellist movement of propaganda in France.

Besides these great associations we must mention the names of some new groups.

The "Féderation Jean Merinoz" was started after the death in the ocean of the famous pilot, and now it is a splendid movement of propaganda, with evening classes and lectures, during which many technical subjects are studied.



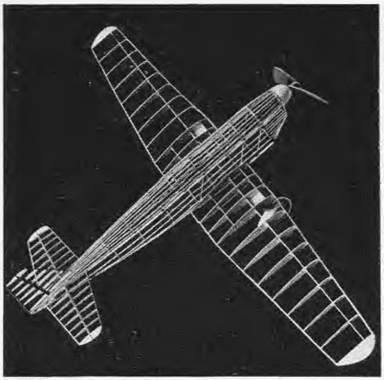
(Top) Mm. Capelier, Chabot and Vincre.

(Second) A large 'plane seen at Flers last year. Span about 7 feet. Motor power rubber, about 60 or 70 yards.

(Third) Starting up a petrol 'plane.

(Fourth) A very good-looking petrol 'plane, and looking like the real thing too.

(Bottom, left to right) M. Guillemaud's 1935 winner of the Coupe Andre. A 'plane built by M. Fillon. And another of Frank Zaic's 'planes seen in France.



A well-built scale model of the French 'plane Aiglon.

Another interesting group is "Jeunesse Aviation." Under its direction and with thee great help of a magazine for boys, 400 squadrons make the union between 20,000 boys of 10 or 12 all over France. The magazine gives drawings and details of construction, and organises meetings.

Many English people must know the Escadre de la Rose des Veuts. It is a small group, created by Mr. Weber, 51 Rue des Francs Bourgeois, Paris. But in this small group of enthusiasts there is a boy who went over to England last year, and whose name is engraved for ever on the famous cup presented by Lord Wakefield. You all know Mr. Fillon and his happy smile. He is a very good fellow, and we have not to introduce him now.

Before closing this part, we must pay great attention to a wonderful group, the M.A.C.F., the Modèle Air Club de France. The badge is well known in England, with two silver wings and at the centre a part of a small insignia, blue, white and red.

Created in 1934, it is actually in France the most powerful body of modellists. To have an idea of the evolution of this group, we have only to read the following numbers: 1934, 28 modellists; 1935, 200 modellists; 1936, 1,200 modellists; 1937, 5,000 modellists; 1938, 12,000 modellists. A great number of meetings have been organised by their President, Mr. Catier, 8 Rue Faidherbe, Paris. Three of those contests are international, and the most in favour in the country.

1. Coupe de France, for rubber models.
2. Coupe de France, for petrol models.
3. Coupe de France, for gliders.

And it is worth to be noticed that the rules edicted by the M.A.C.F. have been used as examples by most of the clubs.

In 1934 and 1935 this association organised the elimination trials for the Wakefield Cup.

In 1936, Mr. Vincre, our "Frank Zaic," was the French representative in the contest at Detroit.

To be able to understand the real technical value of the club, we can give the names of Chabot, Ducrot, Robert, Blanchet, who were in the French team at Fairey's Aerodrome. If we want some famous name for petrol models we have R. Lèvy, who was winner at la Coupe de France last year; Messrs. Suzor, Lartigue, and Culliez, known even in England.

This association has a magazine, where many drawings and prints are published every month. As for books we have:

1935, "Avions modèles Réduits," by P. Legros.

1937, Modèles Réduits d'Avions," published with the contribution of the M.A.C.F.

1938, "Petits moteurs pour modèles réduits," par Mr. Suzor.

Another very interesting model. Note the single wheel and the high aspect ratio of the stabiliser.

To this wonderful work we might add the first national congress, held in Paris at the beginning of May, 1938, and during which 200 French modellists met in the most friendly way to exchange different points of view concerning model aviation.

We know the different groups, and it would be too long and without any practical interest to insist upon this point. We shall notice now during those past two or three years the different ways of construction in 'planes and gliders.

In 1935 balsa wood is more and more used, and many models being not so heavy as in previous years, can use thermals, and after climbing steadily to sixty or seventy feet in the air, sometimes more, circle and commence a long, graceful glide. It is very clear to see in those models the influence of English and American models. Many modellists use wing sections of the type R.A.F.32 or Eiffel 400, and our models are real gliders with a propeller.

Some models have gears, and in some cases, especially when there is a strong wind, they prove very successful.

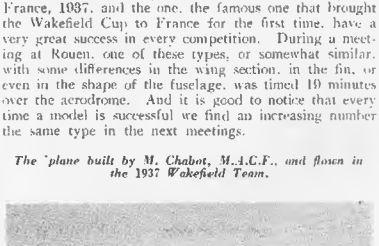
In 1936, the regulations of the F.A.J. bring the models to a great change. Under those rules, there is a minimum of 10 grammes per square decimetre, but those who are more and more in favour of light-weight models bring into existence hundreds of models with a span of 80 centimetres. They are very successful, and have brought in many cases first places in competitions. One of them, under the name of Céko 35, is in great favour in every French Club.

In 1937 the rules of the F.A.I. are the same, but for the Wakefield Competition there is now a minimum of 17 grammes per square decimetre. All the modellists have very carefully studied English and American construction. They know that they must add a surplus of power, and have a better proportion between propeller and rubber. High-wing monoplane is the most popular type, and undoubtedly will be so a long time. It is easy to build, and has good flying qualities.

There is a great improvement in the beauty of lines and appearance, and in every model we find the free-wheel that was practically unknown before. The great competitions are won by single-skein models with rubber tensioning devices.

The model made by Mr. Vincre for the Coupe de France, 1937, and the one, the famous one that brought the Wakefield Cup to France for the first time, have a very great success in every competition. During a meeting at Rouen, one of these types, or somewhat similar, with some differences in the wing section, in the fin, or even in the shape of the fuselage, was timed 19 minutes over the aerodrome. And it is good to notice that every time a model is successful we find an increasing number the same type in the next meetings.

The 'plane built by M. Chabot, M.A.C.F., and flown in the 1937 Wakefield Team.



And now, what about the present period. The regulations of the F.A.I. have brought the wing load to 15 grammes. That is quite near the 17 grammes of the Wakefield models, and it is a fact that the development of models will grow in this way. We shall see a greater number of circular, ovoid, or pear-shaped fuselages.

One of those fuselages, seen at a recent meeting, was constructed in a very special way that is worth to be noticed. The covering was composed of 75 or 80 balsa strips glued together, and carefully sanded and polished.

Wings will be in many cases tapered, and will have a noticeable sweep back. A great number of good modellists are in favour of elliptical construction, which gives a great advantage and a smart appearance. Tail units will have a symmetrical section, the tail plane being slightly thicker than the rudder. And at last every model will have a carefully worked and well-studied arrangement of propeller, with tensioning device and free wheel.

Gliding has always been very popular in French elementary schools, and propaganda has used this desire of flying paper arrows, and some big firms sell at a very low price (9 or 10 francs) small gliders made with balsa blocks and ready to fly. But the number of enthusiasts is still very small, and in every competition bigger prizes are presented to rubber-driven machines. However, we can notice some very good flights. One of the best was, in 1925, timed 9 minutes 26 seconds. The gliders of this period are more or less under the influence of commercial models. Most fuselages are triangular and built of spruce or poplar, wings have no section, and tips are made of light reed cane, and sometimes of steamed strips.

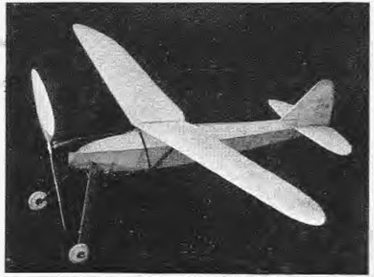
When balsa wood appeared, it was a great change in wing construction, and we had wing section with balsa ribs. In 1935 we have two classes of gliders, light-weight and middle-weight. It is the time when gliding becomes more and more influenced by German methods of construction. Gliders of 2 or 3 metres are common and give good flights. All those gliders have a minimum of 10 grammes per square decimetre, and many of them between 15 and 20. The only way in the launching of gliders during competitions is the towline worked by a strong gearing machine. During a recent meeting one of those heavy-weight gliders was towed to a height of 200 metres, and had a splendid flight of 31 minutes, but on account of the wind was lost at a great distance.

The construction of gliders has been very seriously improved, and we find in most cases splendid monocoque fuselages with very fine painting or polish of two, three or even four coats of dope on a well-finished and sanded construction.

The interest of aero-modellers centres around the international contest for the Wakefield Trophy held every year. Undoubtedly it leads to a hard struggle between the different countries, because everyone knows the importance given to the victory. New ideas come into light, and out of those ideas spring up a new enthusiasm. Let us hope that the great international friendship ever felt in those meetings, will help to a greater union between the members of the great family spread all over the world.

Next month we shall publish an article on Model Aviation in Palestine.

A fine model built by M. Degler, one of the best modellists in Paris.



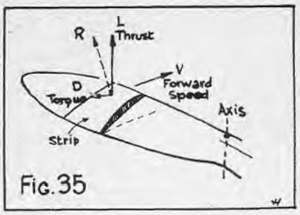
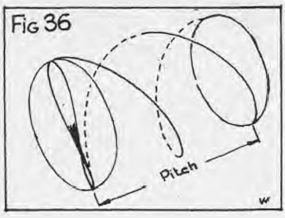


Fig. 35

PART NINE OF



SIMPLE AERODYNAMICS

By J. VAN HATTUM, A.F.R.Ae.S.

THE airscrew requires a section to itself, not because it involves any new notions of aerodynamics, but because it must be properly understood if one wants to make a real success of any model one has designed oneself.

To begin with, there ought to be a law against using the name "propeller," unless it refers to a real airscrew which pushes the aeroplane along. If it pulls it is a tractor, and to call it a propeller is about as logical as calling a tug a push-boat. There are more terms like that which one might criticise if one is so inclined. Personally, I always feel utterly baffled when one talks of "low wings" and "high-wings," neither allowing for the fact whether the thing is monoplane, aeroplane, or even submarine. It is very much like referring to a man as "bald-head" or "flat-foot." It is not polite.

Somehow we shall have to get back to the more serious side of this article, on the Editor will be on to me.

The airscrew then may be regarded simply as two small wings which are revolved round a common axis. When we look into it more closely we shall find that these wings must have a special shape. Let us, however, first consider a narrow strip of the airscrew blade—that is, of one of the wings—and let us assume that this blade turns in a horizontal plane. (See sketch, Fig. 35).

If we regard a narrow strip, it is of no importance that the path is not straight, but circular. Therefore, we may expect the strip to behave exactly like a wing, and we shall have a reaction force R, which may be split up into a lift-component L, and a drag-component D. Again, if the speed is sufficiently high, the strip will tend to rise. The same applies to any strip at any distance from the axis; in other words, revolving the blades will supply a lifting-force. Also, there will be a drag-force, trying to hold the blades back. Just as in the case of the wing: we have to pay for the lift supplied by each blade. All this is a known fact.

Now we turn the axis through 90 degrees, and so make the airscrew turn in a vertical plane. This will not change any of the air-forces, but they go under different names. The lift is now directed forward and parallel to the axis and is called Thurst. The drag is still a retarding force, but is now called Torque. Let us now go into more detail, and see what happens to the little strip while the blades are rotating.

Fig. 36 shows the path that is followed by the tips of the blades. It is assumed that they leave their trail on an imaginary transparent cylinder. The distance parallel to the axis over which the tips travel in one revolution is called the pitch of the airscrew. Now it is obvious that all strips along the blade must travel the same distance or the airscrew will not work efficiently. But as the strips towards the axis travel at a much lower speed than those near the tips, we must try to increase their lift. This can be done in two ways: first by increasing the area, and second by increasing the angle of incidence. The first method is not of much use, as it results in a very inefficient form of blade, but the second is always adopted. So one of the first things we must remember is: "The pitch angle increases towards the centre of the airscrew blade."

These angles we must investigate more thoroughly before we can draw any more conclusions. In the first place we know that when we place a wing at a certain angle it will follow an inclined path, and it is the angle the wing makes with the flight path that is called the angle of incidence. (Not the angle the model makes with the ground any more than with a hill-side). We can now turn to Fig. 37. The side AB of the triangle ABC is the distance covered by the strip of the blade per second. AC is the distance moved forward per second. The angle α is the angle the strip makes with the plane of the airscrew. This is the same sort of thing as the rigging angle in the case of the wing. The angle β is the angle the flight path makes with the plane of the airscrew, and the difference between these two is the actual Angle of Incidence. We want to know something of the relation between the sides of the triangle, and particularly between the sides AC—the distance covered—and AB—the distance moved forward. For these will give us the relation between the pitch, the diameter, and speed of the airscrew, and from these will follow the pitch angles. (We assume that the strip we consider lies very near the tip of the blade).

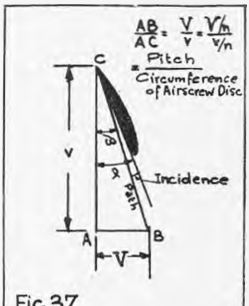
Now, AB/AC = V/v = Distance moved forward per second/Distance the strip has travelled. But if V and v are the distances moved per second then, if n is the number of revolutions per second, the distances moved per revolution will be respectively V/n and v/n. *But V/n is the Pitch* (see above) *and v/n is the circumference of*

the Airscrew Circle (for we have taken the strip near the tip of the blade).

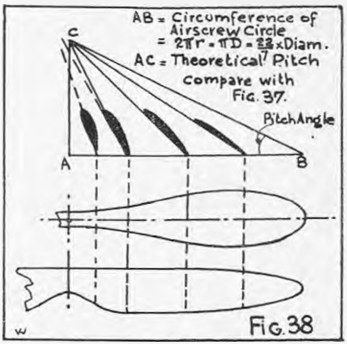
Therefore, the ratio between the sides AB and AC is the same as the ratio between the pitch and the circumference of the airscrew circle. But this ratio AB/AC is called the tangent of the angle ACB. Therefore, we know the Pitch Angle.

This gives us a method by which we can determine the pitch angle at any point of the blade, provided we know the required pitch, the diameter, and the number of revolutions per second.

The method is illustrated in Fig. 38. Horizontally we measure off a length, which represents the circumference of the airscrew circle, while vertically we take a length equal to the pitch. Then, if we draw lines from various sections on the blade to the point B, the pitch angles of these sections are known. We can then draw the sections in their actual attitude.



There are two different values for the pitch: Theoretical Pitch and Practical Pitch. When we refer back to Fig. 37 this will at once become clear. The various sections of the blade must be placed at a certain angle of incidence to the flight path. This angle must be added to the one obtained. In other words, the angles which the sections of the blade make with the plane of the airscrew must include this angle of incidence. Therefore the actual pitch, or, as it is called, the Practical Pitch, will be smaller than the Theoretical Pitch. There is also a loss owing to the fact that the airscrew works in a compressible substance, air. So we usually assume that the Practical Pitch is only three-quarters to seven-tenths of the Theoretical Pitch. This "loss" of 25 per cent –30 per cent is called the slip.



(*To be continued*).

AN OPEN LETTER TO S.M.A.E. COUNCIL

[Whilst we publish this letter in the interests of British—even International—Model Aeronautics,, we accept no responsibility for the views expressed therein.

The writer, who, for obvious reasons, asks to sign under a "pen name," is a member of the S.M.A.E., and is personally known to us. We are fully satisfied that he writes with a genuine interest in the hobby, and feel that the publication of this letter will be of interest to all aero-modellists.—Ed.]

DEAR SIRS,

I am moved to address you in this manner by the remarkable atmospheric conditions lately noted by all model aeroplane enthusiasts. Even in your elevated Hall of Wisdom you must have noticed the astonishing strength of the thermals rising from the lower levels of modeldom —thermals begot of the hot-air expended by the masses (notably strong thermals felt were started by some prominent members of S.M.A.E.), of aero-modellers when expressing their opinions on the Wakefield Cup and its long sea voyage. Possibly, it may be felt that the Cup may suffer tarnish during the exposure to sea air? Again, it is possible that many may have realised the great effort which will be required in order to return the trophy to this country. Whatever the reason, the fact remains that the atmosphere is tremendously disturbed, and shows little sign of abatement. In the hope that I may create a little thermal of my own which will waft my opinions, humble as they may be, to your Olympian dwelling, and that my little thermal may even be honoured by your expert examination, I will express the reactions I have to recent events.

Recent weeks have been notable for peculiar disturbances created by individuals who did not altogether enjoy themselves during their recent visit to France. These peculiar disturbances must have, regrettably, made their presence felt in that country, and I feel sure that many Frenchmen have lately experienced "fly-ways" of even greater duration than those recorded in the recent Wakefield Contest, after translating some of the remarks made by English competitors and their associates. I wonder if these complaining gentlemen have ever, after visiting some friends or acquaintances for dinner, afterwards publicly declared that the dinner was horrible, the food bad, and the service worse? Of course, they would not behave so grossly. Why, then, return from their visit to France and immediately give vent to their pent-up feelings of annoyance? Do they not realise that to foreigners there can be only one explanation of their

behaviour—that their chagrin at losing the Cup was so great as to overcome their sense of propriety! Not content with grumbling at all and sundry aspects of the actual competition, these gentlemen next saw fit to emphasise that the trophy went to America solely by the circumstance of a single "lucky flight." That point made unmistakably clear, they next go to great pains in analysing results and setting forth proof that, *had the event been a team event*, England would have won! To this illuminating statement, I would add that, under similar ruling, it is quite likely that the trophy would have been reposing in U.S.A. since 1930, and you, gentlemen, might have had the invidious task of raising an annual amount around £500 for the past eight years, in order that an English team might continue to pay an annual visit to America in an endeavour to rescue the trophy for its native shores.

Because I fear that the movement for altering the rules of the contest so as to make the result dependent on the team's scoring, may gain sufficient strength to disturb your decisions, I hasten to appeal to you to leave undisturbed the rule that awards the prize to the *individual* obtaining the highest average duration. The Wakefield Trophy is the goal of every aero-modeller throughout the world—they all dream of the day when the prize will repose on *their* sideboard. The appeal and glamour of the contest is due in no small measure to this individual honour. It is seriously doubted whether the competition could maintain its premier place in the model world if the rules were so altered as to make the award the property of a team instead of an individual.

Now, permit me to start some critical thermals of my own. Under the present rules relating to specification of models for the Wakefield Contest the result, each year, must be likely to be affected by pure chance. Indeed, it is safe to say that the winner each year will win, not by virtue of skill but by sheer good luck. You realised this objectional factor some time ago, and raised the weight ruling from four to eight ounces, in a laudable effort to minimise the element of luck. Many were the moans on all sides from modellers who considered that the maximum time under the new rules would be something in the neighbourhood of thirty seconds. Theory was ousted by practice, and duration under the new rule increased, and "fly-aways" became more and more common. Why? Because the rule permitted an hitherto undreamt of amount of power being stored in the model, which was thus enabled to climb to much greater heights and so have a much greater chance of finding an up-draft. Modellers began to construct machines which were ridiculously overpowered, and which took off in what might well be described as a completely out-of-control vertical climb. The climbing member being the propeller, instead of the rightful mainplane. Whereas a model will stall completely if overpowered, if *greatly overpowered* it will stall the wing, but *continue its climbing flight on the propeller*, the mainplane merely serving to prevent the fuselage from turning around the propeller. If the rules of the contest remain unaltered, and this type of take-off and climb is to continue as a feature of Wakefield models, then the Wakefield Trophy will no longer serve the purpose for which it was intended by the donor. I am completely confident that Lord Wakefield would not appreciate the value to aeronautical science rendered by such freak performances as are put up by present-day Wakefield types. I may say that I am aware that your President does not appreciate these freaks, either, as he was overheard to remark at the recent trials, upon seeing a machine take-off in orthodox manner: "Look, a perfect take-off and climb, nothing freakish about that performance." The model in question having left the board in a reasonable climbing attitude which it maintained throughout a steady, fast, but orthodox climb, such as one sees by full-scale craft. The rules *must* be altered so as to ensure that modellers shall not aim simply to "shoot" the model up high and pray for a thermal.

Amongst those people who have already come to this viewpoint, there is a common belief that the cure is to raise the all-up weight to twelve ounces. That, I submit, would be little improvement on the existing rules. Many present-day Wakefield models weigh very little short of that weight. A twelve-ounce model would still be capable of soaring flight, and could still be "shot up" by excessive power. The only new development would be a race of modellers with arms like Popeye, as the result of training in winding of still larger motors.

To place the minimum weight at eight, ten or twelve ounces, and limit the rubber to a certain percentage of the total weight, would still leave us with a powered soarer. Granted, it would overcome the objectional freak climbs, but it would not rule out the luck of thermals, which may be found quite low down—witness the winning American flight in the last competition

How, then, are we to rule out the luck element? I would suggest that, rather than raise the weight ruling to twelve ounces with existing dimensions unaltered, the weight of eight ounces remain unaltered, but that the total mainplane area be reduced to 150 sq. in., and the power limited to 25 or 30 per cent of the total weight. This would result in real model aeroplanes instead of freak monsters. Further, it would encourage the younger builders, who find the present Wakefield machines difficult to handle and their motors troublesome to wind. Under the suggested ruling streamlining would be all-important, instead of as at present a debatable asset. Under present rules the added weight of streamline construction is a liability, as it pays to put that extra weight into the motor instead of the airframe. With limited power percentage and increased wing loading, constructors would be compelled to put everything they knew into the design and construction of their models. They would no longer build reasonably efficient 'planes in the confident knowledge that, provided they packed enough power and obtained requisite trim for a rocketing climb and a fairly flat glide, they would stand as good a chance as the other fellow and, provided it was their luck to strike the best draught, they would be victorious. Let us have rules that will ensure that we build and experiment along lines that might conceivably be of benefit to aeronautical science, instead of breeding freaks with which to gamble in thermals. I believe a well-designed model conforming to the rules I have suggested would be capable of *regular* flights of 90 to 120 seconds. Every second would count, and the designer would have to make use of every possible expedient in order to obtain the vital seconds. Under present conditions, it is simply waste of time to strive for the ultimate performance as a considerably inferior model may easily surpass the time returned by the better design, simply on account of luck. Under the rules I suggest, luck would be no longer the vital factor and its place would be taken by skill.

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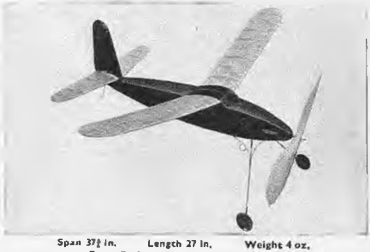

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I fear it is too much to hope that your august councils will stoop to adopt a ruling suggested by an outsider, but I most earnestly implore your full consideration of my suggestions and remarks. Further, I humbly suggest that your patron be consulted and that his views on this momentous matter be taken into consideration. I know there will be an outcry from the front rank modellers who now lead the field with freak machines which go upstairs on the elements. I expect them to fall on my arguments and endeavour to rend them to pieces. But your Council must not be swayed by the noise of those who fear that they would be displaced from their leadership if new rules, calling for real model aeroplanes, are introduced. It is your part to give unbiassed consideration to a suggestion made in the hope that it may lead to a new dignity and worthiness for the whole movement.

One last suggestion for new rules—limit the tailplane area to 25 per cent.

Before my thermal cools down, permit me to make some few observations on the running of the Trials. This year's Trials showed the need for some weeding-out process. If no change is made in the rules for the Trials next year, then there is sure to be absolute chaos, as there will be far more entries than you had a few months ago. Thee only reasonable solution appears to be decentralised preliminaries, the percentage from each centre which is permitted to participate in the Trials proper to be decided *after* the preliminary event, when you will know what percentage will give you a manageable number of competitors at the Trials. But these preliminaries must take place at numerous centres, so that no modeller will be called upon to travel a considerable distance in order to take part. Also, it is important that the preliminaries be held *at least* four weeks before the Trials.

The suggestion, mooted at this year's trials, that the team be elected, instead of winning their places will, no doubt, be relegated to the special kind of waste-paper basket which you should keep handy for the depositing of all high-handed projects.

In conclusion, may I earnestly implore that you give most careful consideration to the conduct of the Trials. This year the organisation was far from perfect. Indeed, had it been an event in which foreign competitors took part, such visitors might well have returned to their home countries to give expression to such unfortunate remarks as we have lately heard about the organisation in France. Timekeepers, promptness of time in commencing competition, character of take off boards, facilities for refreshment, all invited strong criticism. It is trusted that all these items will receive better attention another year.

Finally—location. Why, oh why! should competitors be expected to journey from Scotland and the far north of England for these Trials? Except for the convenience of Southerners, what is there to prevent the location being moved to the Midlands, where everyone would be treated fairly in the matter of time and expense. It cannot be said that there is no suitable ground. To mention only one, there is an ideal site at Wolverhampton Airport, and when I say ideal, I mean just that! Foreign visitors could still be entertained in London when the contest proper is again held in this country, but please move the trials to the Midlands, and so make the travelling less arduous and expensive for so many competitors.

Yours sincerely, ENTHUSIAST.

BEGINNERS' FLYING SCALE MODELS—Part II

By HOWARD BOYS

I THINK I ought to start this article with a little more about fuselages, for instance, cutting out formers, etc., also wing ribs.

For a model up to about 30 in. span I should recommend ¼ in. sheet balsa of the hard variety, or better still use two thicknesses of soft balsa glued together, with the grains crossing. In this case it is best to stick the balsa together before cutting it. When cutting single thicknesses, always cut into the grain and cut a bit of a curve at a time. Let me explain a little more with the aid of a sketch. Fig. 6 explains itself, and it depends on the sharpness of the curve as to how many cuts you need to make. In cutting it this way, you see that any tendency to split the wood does not tend to split the former or wing rib, or whatever it is you are cutting out. You can get special tools for cutting balsa, or you can use a safety razor blade. The razor blade should be broken across the corner, so that it is easier to cut curves, but my own preference is a penknife with a sharp point, that I keep razor-sharp on an oil stone.

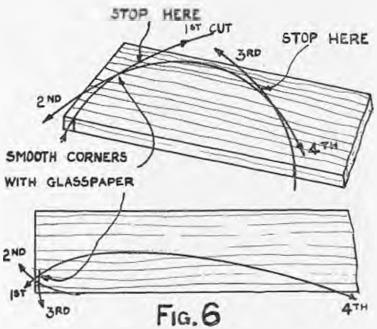


FIG. 6

I only use this blade for cutting out balsa and such particular work. One advantage of the special balsa cutting tool is that you can obtain a number of specially shaped blades for various work. (See Fig. 7).

Another thing I would like to say about fuselages is to do with the rectangular type. While it is pinned down on its particular flat surface, see that it is square by using a set square on each side, and put gussets in the corners, as shown in Fig. 8. These gussets should not be necessary on a model less than about 15 in. long, but are useful on larger models. If the fuselage is not true when completed, it can be put right, holding it in the correct place, in a jet of steam from a kettle spout. For this, make sure that the water does not come above the spout, and also be careful not to boil it dry.

For the benefit of new readers, I think I will make brief mention of the various types of glues or cements, as they are sometimes called.

Glues, such as Seccotine and Croid, are useful for hard woods like spruce and birch, and are, perhaps, the most useful for these. Durofix is suitable for hard woods and very good for balsa, and then there are a number of quick-drying glues for balsa. For sticking the paper or silk covering on the model, a photo-mounting paste like Grip-fix or Bond-fix is best. I regularly use all these adhesives for the jobs they suit best. One big advantage of the quick drying glues is that it is often possible to stick two pieces together by holding them in place for about half-a-minute.

Wing, tail and undercarriage attachments will have to be fixed up before the fuselage is finished. Wing and tail surfaces can be made detachable for ease of transport and also to help avoid damage when the model lands or hits an obstacle. I shall say more about these attachments as we come to the parts concerned.

The next part I want to deal with is the undercarriage. There is sometimes quite a lot to think about in this item. First of all, we must decide whether the model is to be strictly to scale or whether we shall use a larger propeller and consequently a larger undercarriage, to obtain a better flight. The undercarriage can be increased in size without looking out of proportion, and larger wheels may also be used. Also, if you are modelling a machine with a retractable undercarriage, you must decide whether you want this feature to work or remain fixed in either the "up" or "down" position. I think a beginner would be well advised to have it fixed in the "up" position. Letting the model land without an undercarriage will do no harm in the ordinary way, especially if the propeller is arranged to lock horizontally across the fuselage when the power has run out. I will tell you how to do this in a later article. If an undercarriage is used it is as well to have some spring in it to take the shock of landing. There are lots of ways of making the undercarriage do this, and I think we ought to make it work in a similar manner to that of the full-size machine, if possible. I have made a number of sketches of different methods of springing undercarriages for models. I have copied some of these from sketches and models, and show them in Fig. 9, for the benefit of beginners. I cannot acknowledge them all, but feel that I must mention Mr. Towner's as being the smartest I have come across. I think that whatever undercarriage you wish to reproduce, you will

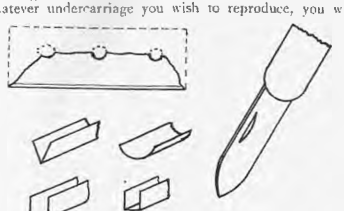


FIG. 7.

find something suitable among the sketches. Most of them rely on steel wire, and the gauge will depend on the weight of the model. For a small model, use say, 20 s.w.g. wire, and larger models up to say 14 s.w.g. For bending the wire you will generally find it best to use two pairs of pliers, and in any case you will find two different pairs must useful. Those I recommend are shown in Fig. 10. One is ordinary type with square nose and a cutting edge, and the other pair has tapered nose, one side being round and the other square. Don't bend the wire too sharply or it will break. You might try bending a few odd bits for practice, and see how sharp it bends without breaking. I think it may help if I describe the making of the undercarriage for the Lysander, as this will give you a good indication of how to do such a job.

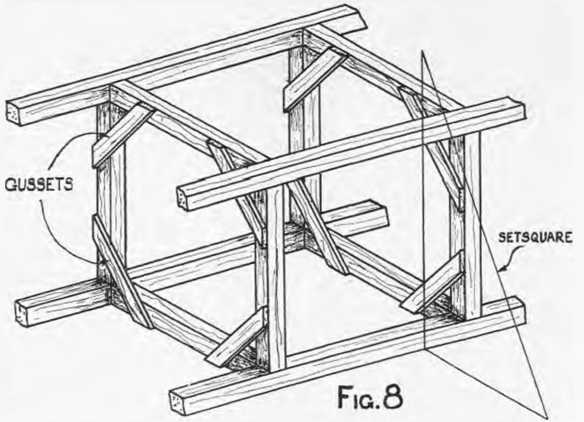


FIG. 8

This one is, perhaps, on the intricate side, but really only requires care and patience to make a good job of it. The frame is shown in Fig. 11.

A study of the Lysander shows that its undercarriage is made from a channel section, curved to the required shape and covered with a fairing. No springing is arranged in this part, but the wheels are sprung internally. That is, the ordinary axle is fixed and the outside of the wheel springs up and down on it. The springs are inside the bearign that the outside of the wheel runs on. Now, to reproduce a wheel like this for a model would be rather a job, and I did not think it worth while. The spats over the wheel are very large to take the spring of the wheel, and there is a fair amount of room between the wheel and the undercarriage leg. It seemed best to make the axle slide up and down in guides in this space and use good stiff wire with a balsa fairing for the legs. One piece of 14 s.w.g. wire did not seem stiff enough, so I used two pieces side by side. In any case two pieces were required to prevent the axle twisting sideways. A drawing was made to show the shape required for the wire, and the two pieces were bent to fit the drawing. These had to be exactly alike, which meant getting the bends in just the right place. A little explanation of how to do this will no doubt help the beginner. Grip the wire with the pliers just short of where the bend is required, and bend the wire to the necessary angle, but be careful not to bend it too sharply. If the bend is not quite in the right place, you can correct it by slightly opening out the short end and bending the long end back to the correct angle. Remember that the sharper you make the bend the more difficult it will be to correct. It is a good didea to practice this a little on an odd piece of wire, if you are not used to it, as spring wire soon breaks if it is bent about sharply. After bending the wire some small strips of brass were cut, and a pair of holes drilled ½ inch apart to take the wires. One piece of brass was drilled first and the others drilled from this, so that all the holes were just the same distance apart. These holes had to be just the right size for the wire to push through, and it is not always possible to have the right size drill for the job. However, a drill can be made from a piece of the wire itself. File or grind the end of the wire to the shape shown in Fig. 12, and then get it red hot in the fire or gas flame and quickly plunge it into water. This makes a drill that will at any rate do for thin brass. Two triangular pieces of

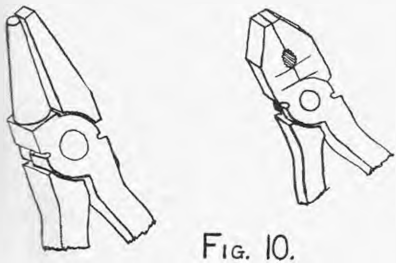


FIG. 10.

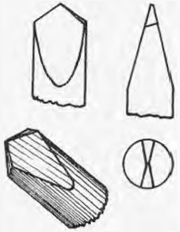
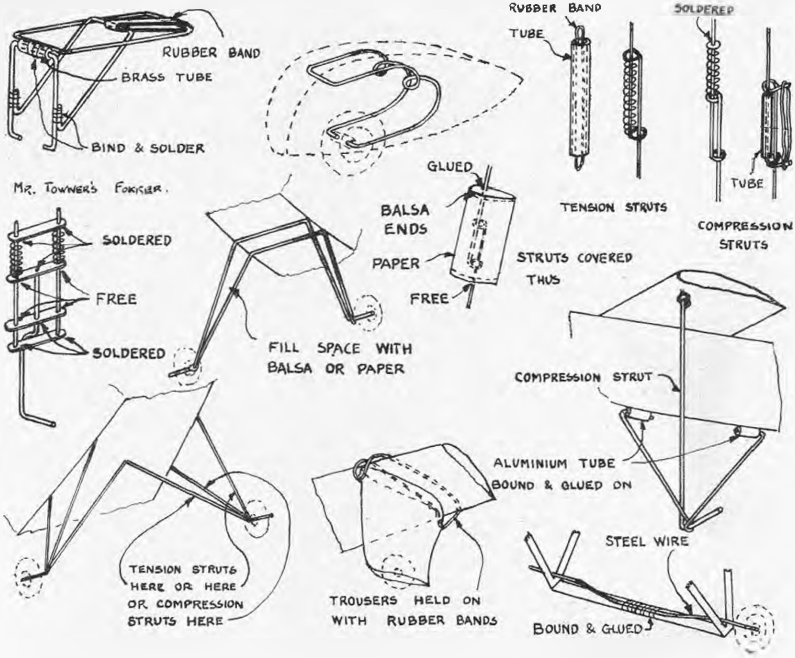


FIG. 12.



brass were made with holes ½ inch apart for the wires, and another hole was made to take the wing strut fixing. After this a large hole was made in the middle to lighten it. These two triangular pieces and two strips were soldered in place on the wires, and an extra hole was drilled in the centre of four more strips for the axles. These axles were bent at right angles and the axles and strips were threaded on to the wire legs, and the axles soldered in place. Before soldering the bottom strips in place, springs were made and put on the wire. The springs were made from one strand of wire from a broken cycle brake cable and were made by winding it round a ¼ inch dia. tube. It was first tried round a piece of 14 s.w.g. wire, but this made the spring too strong. To make such a spring, grip the wire and the tube or rod in the pliers, with the wire a bit on the "skew," and holding the wire tightly, wind it on, leaving a gap of about ¼ inch between each turn. You must hold the pliers very tightly and keep the wire just tight all the time, and if you have someone to help you, so much the better. When you have enough turns on, push them all up together, winding them round to keep them just tight, and then let them go again. This helps to even up the gaps between the turns. Cut the ends off and your spring is finished. I think from this you will be able to sort out the making of other types of under-carriage.

Next month I shall deal with the wing, and also strengthening the fuselage for the wing and under-carriage.

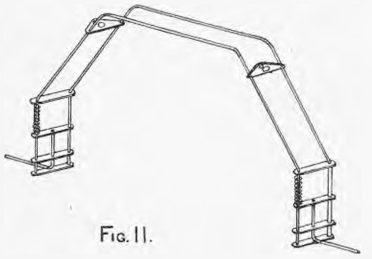


FIG. 11.

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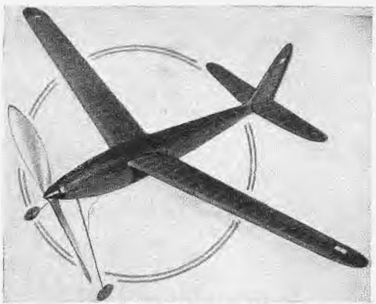

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Wakefield Trials	1st.	Average 4 min. 21 sec. Best flight 7 min. 40 sec.
Wakefield Cup		Model lost on test flight.
North Kent M.F.C.	2nd.	Average 2 min. 35 sec. Model lost on 2nd flight
T.M.A.C. Rally	1st.	Average 2 min. 40.6 sec.

1938 (Same design with slight modification)

Pilcher Cup	3rd.	Average 1 min. 51·68 sec.
Wakefield Trials	1st.	Average 4 min. 7 sec. Best flight 8 min. 35 sec.
Wakefield Cup		Average 5 min. 19 sec.
France	7th.	Best flight 10 min. 12 sec.
King Peter's Cup	Team	Best flight 6 min. 40 sec.
Yugoslavia	Contest	4 min. 45 sec.

ZAIC'S 1938 YEAR BOOK contains 97 plans, 26 articles on streamlining, radio control, single bladed propellers, indoor models, N.A.C.A. report on aerofoil characteristics, geodetic construction, push-pull speed models, etc., 192 pages in all. Price **4/3** post free. We have a few copies specially bound with stiff covers, price **6/-**.

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10 ft. x 1/8 x 1/16 in.	10 ft. x 1/8 x 1/8 in.	2 ft. x 3 in. x 1/32 in.
10 ft. x 1/8 x 3/32 in.	6 ft. x 3/16 x 3/16 in.	2 ft. x 3 in. x 1/16 in.
10 ft. x 3/16 x 1/8 in.	2 ft. x 2 in. x 1/16 in.	2 ft. x 3 in. x 1/8 in.

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—THAT the recently issued Air Ministry notice entitled "Effect of Hoar Frost on the Take-off Run and Stalling Speed of Aircraft" should be studied with reference to model 'plane streamlining and finish by all interested in obtaining a high performance from their models. Briefly, it is a warning to pilots that hoar frost on wings and airscrew blades seriously impairs the performance of an aeroplane, especially the lift. Not only does it increase the take-off run, but it decreases the rate of climb and puts up the drag. Now, if a fine layer of hoar frost can so affect a full-sized craft, with its usually ample reserve of power and lift, what must be the effect of roughly-finished surfaces on model 'planes? For, apparently, it is the rough surface of the hoar frost that is responsible for the ill-effects, not any question of increased weight as with ice. Some time ago similar reports of the bad effect of a layer of dust on the wing surfaces of sail 'planes came from abroad.

The strange thing is that the dust does not blow off during flight, but clings tightly to the wing covering.

The theory is that the boundary layer of air (that is the layer immediately next to the wing) is the most important of all the layers of air surrounding the wing, and any roughness of wing surface causes eddies in that layer and breaks up its continuity. So it would appear that the practice of polishing glider wings might well be applied to rubber-driven models with good results.

—THAT the widespread impression fostered by reports in the popular Press that the aeroplane in which Douglas Corrigan made his famous "wrong way" trans-Atlantic flight was an "old crate," tied together with "baywire," has now been dispelled by Roosevelt Field experts. Examination of the 'plane after its famous flight revealed that motor, wings, fuselage, landing gear and all accessories were in perfect condition, and that the 'plane was in every way airworthy.

—THAT if the flying of speed models ever becomes very popular in this country great care will have to be exercised by their owners when flying them before an audience.

Judging from the speeds obtained in American contests (60—75 m.p.h.), these machines could inflict a severe injury to anyone unfortunate enough to get in their way.

—THAT just over 28 years ago it was widely believed that flying an aeroplane over a large town would be dangerous. It was said that the heated air currents from the buildings and streets would cause disaster.

However, Robert Latham put these fears at rest by flying for an hour over the city of Baltimore on November 7th, 1910, thereby winning a prize of 5,000 dollars, offered by a local paper.

Just another case of arm-chair theory being proved wrong when submitted to a test.

—THAT it is estimated the number of gas models in the U.S. and Canada now totals 50,000.

It sounds like good business for the battery makers if much flying is done!

—THAT for contest planes, wing section, R.A.F. 82, or one of its many "improved" variations, still holds its popularity, with our old friend Clark Y a close second.

—THAT our speed jobs have got a long way to go before they approach American speeds. Is it the American air or lack of development over here that is responsible?

—THAT polyhedral and tip dihedral, for long looked upon over here as somewhat freakish, or anyway very American in style, is at last finding increasing support from the high power duration fans.

The torque set up by a powerful motor has all to be corrected by the wing, and wings incorporating polyhedral or tip dihedral seem to be more efficient for this purpose. A 'plane with this type of wing certainly seems to yield those tight, right-turn, spiral climbs that get the 'plane up searching for a friendly thermal.

—THAT the controversy, streamlined fuselages versus the old slab-sided, is still causing argument among model 'plane builders. Those favouring the old flat-sided fuselage contend that at the slow speeds achieved by rubber-driven models the only advantage of the streamlined job is that of appearance, while it is far more difficult to build.

—THAT many people are afraid to build as strongly as they would like because they have a quite unjustified fear of adding weight. This is quite a needless fear, as it is surprising how well a properly designed heavy weight will perform, providing it has not less than 2 sq. ft. of wing area.

—THAT Wilbur Tyler, flying his indoor tractor, Class C, in the Canadian Championship Meeting at Toronto on August 31st, put up a record flight of 15 minutes 26 seconds. This record was obtained in a hall with an effective height of 50 ft.

—THAT the following adventures of a runaway petrol 'plane in America make it clear that trouble can soon follow careless flying of these planes. The report comes from the *New York Herald Tribune*, and was headed " Corrigan Flight of Model 'Plane Worries Town." " Craft must find New Field after Wings Hit Roofs at Somerville, N.J."

" A Corirgan flight on a miniature scale, performed by a gas model 'plane which buzzed out of the south, brushed the roofs of several buildings, zoomed across the business district, just missing a church steeple, led police to-day to issue an order grounding the craft and all like it.

" The flight of the model, which has a wing spread of 7 ft. and two-cylinder motor, with a fuel capacity of 1¼ oz., occurred on Saturday afternoon and spread consternation among the storekeepers and crowds of shoppers. The plane was later found in a tree just north of the business centre.

" They then found the owner, a youth of 16, who explained that he forgot to set the time-switch, and that the wind had altered the rudder setting, causing the wrong-way flight.

" The authorities, fearing that similar flights might cause personal injury or a bad traffic accident, have ordered the club to abandon the use of their present flying field and to find a field farther away from the town."

—THAT a recent competition for petrol 'planes at the Curtiss-Wright Airport, Milwaukee, attracted an entry of 150 *petrol 'planes*. This is certainly some entry for a petrol 'plane competition.

—THAT the Japanese Government show their sympathy with the model 'plane movement in a practical manner by giving the Japanese Boys' Aeroplane Society an annual grant of 1,000 yen.

—THAT a number of people are experimenting with finless models, giving the stabiliser a large dihedral angle instead. Apparently an angle of at least 30 degrees on each side is needed in order to make the stabiliser assume the duties of the fin, as well as taking care of the longitudinal stability.

It is claimed that by using this method lateral stability is increased, and also some saving in weight results.

—THAT this winter will see much experimental work being carried out with feathering or folding airscrews by the duration model " fans." With the size of the airscrew getting larger to control the heavy motors now used, wind resistance of even a free-wheeling prop. is quite considerable, and any means of overcoming this will certainly be tried out.

—THAT more attention is being paid to the appearance of petrol models by cowling in the motor, improving the landing gear and in the lines of the fuselage.

The nearer we can get to a replica of a full-sized machine, in appearance at any rate, the more likely we are to be taken seriously by the general public.

—THAT after a phase of slavishly copying winning American models it is a healthy sign that more and more individually designed models are appearing on the flying grounds.

After all, a modeller will learn more by the mistakes he makes when building his would-be world beater than by much copying of other people's designs. Start with a well-proved design by all means, as nothing gives the beginner such pleasure as to see his first model flying well, but when the first principles have been mastered don't be afraid to try our your own ideas. It is obvious that a modeller will never get to the top unless he is prepared to use his brains and spend much spare time in exploring fresh grounds to get " just that little something extra " that makes the difference between a mediocre and a first-class machine.

—THAT a new American monoplane fighter is fitted with a twin-row engine turning two props., one in either direction. This arrangement is similar to the Italian Macchi seaplane racer of a few years back, the advantage being the counteraction of the enormous torque set up by the new high-powered engines.

—THAT according to the published details of a new fighter 'plane the fire from the guns converges at 1,000 yards ahead of the ship.

—THAT all radial engines have an uneven number of cylinders, such as 5, 7, 9 and so on when the cylinders are all in one row. When twin rows of cylinders are used, however, the number then is even—10, 14, 18. Space does not allow of giving the reason for this, but it is a point that scale modellers must note.

—THAT it is just over 25 years since the first four-engined aeroplane took the air. The machine was a Sikorsky, 73 of which were built and successfully flown between 1913 and 1917.

—THAT the large-scale building operations at the German airport, Tempelhof, are in anticipation of a large increase in German air travel. During the period 1932-1937 the numbers carried to and from Berlin by air rose from 33,757 to 200,000. Most of Germany's latest passenger machines, by the way, seem to have been designed with a view to easy conversion into bombers.

—THAT experimental twin-engined fighters have so far proved to be rather disappointing in the speeds reached at full throttle.

As far as can be ascertained no twin-engined fighter has got near to the Spitfire in performance, one type in particular being little better than the Blenheim bomber.

—THAT the interest in the wide possible applications of air-borne infantry in wars to come is well beyond the theoretical stage. Vigorous preparations for using and combating this new strategy are in effect throughout the " civilised " world. Other powers have not been slow to note the progress made by Russia in positioning attacking troops by parachute.

—THAT this issue contains 84 pages plus cover, and includes a 4-page supplement of an all-balsa glider, making a total of 92 pages.

—THAT this is the largest issue of a Model Aeroplane Journal that has ever been published in any part of the world.

—THAT the proprietors of THE AERO-MODELLER are proud to have achieved this distinction, and are confident that they will be able to sustain, if not improve upon, the high standard set in this issue.

—THAT an order form, to be handed to your local newsagent, to ensure regular delivery of THE AERO-MODELLER each month, is printed for your convenience on the back inside cover of this issue.

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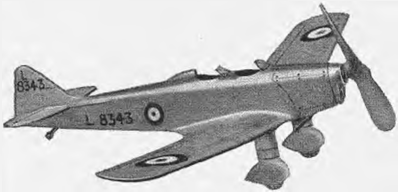

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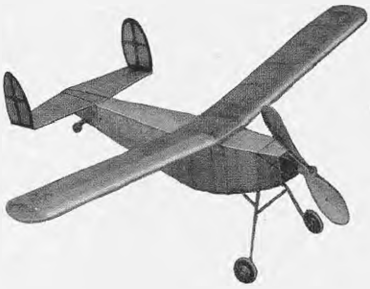

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THE MILES KESTREL TRAINER M. 9

(Scale 1 in. to 1 ft.)

Designed and constructed

***by* J. H. TOWNER**

Mr. J. H. Towner launching his model.

THE Miles Kestrel Trainer, now going into production for the Royal Air Force, is for the purpose of training pilots to fly the new types of low wing high-speed fighter jobs. Fitted with a Rolls-Royce Kestrel engine, it has a top speed of around 290 m.p.h.

Scaling down this high performance prototype presented unusual difficulties in low-speed aerodynamics as applied to model work, especially with a wing section having at its root a thickness to chord ratio of 25 per cent.

The model also is intended to fly without an undercarriage, which in flight gives it the appearance of the undercart being fully retracted. All landing stresses have been taken care of, and the model will touch down at speed on its " tummy " without doing any damage, and ensures it finishing the " right way up."

The construction is fairly simple, and in order to ensure the correct positioning of various parts, such as formers, ribs, spars, etc., these are cut out on the egg box principle, that is, slots are cut in one part which register with slots cut out in the part to which it has to be fixed.

We take as our datum line the two main longerons lying along the centre line.

These longerons are made of hard balsa $\frac{1}{8}$ in. square, steamed to shape, and pinned down upon the plan. It is advisable here to insert three or four cross pieces to maintain its shape while building, which will be taken out at a later stage.

The lower formers are made from $\frac{1}{16}$ in. sheet balsa and braced across the grain, with $\frac{3}{32}$ in. square lengths. These formers are then cemented in place, care being taken to see that they are perfectly square and vertical.

You will note that the fuselage is being erected upside down. Now add the keel longeron, also $\frac{1}{8}$ in. sq. balsa carefully steamed to shape before cementing. Fix the centre section ribs in place. Rib M is so designed that by inserting it on the flat through the cut-out portion of former " d " and turning it through 90 degrees, it will assume its position and lock altogether firmly.

The leading edges are pushed into their respective slots in the ribs, and a packing piece cemented to the keel longeron to take their inner ends. Note the trailing edges of the centre section are made in two pieces in order to keep the grain of the wood running more or less parallel to the edges. Note slots in former " g " to receive the rear ends of trailing edges.

The partly completed fuselage can now be lifted off the plan, and formers A B C D cemented into place with a $\frac{1}{8}$ in. square longeron connecting their tops.

Now fix in place all $\frac{1}{8}$ in. diagonal braces. You will

observe that they start at the front end at each side longeron, converge to the keel at former "b," then spread out and upwards to the side longerons at former "c," and converge again downwards to the keel, and so on as far as former "g."

You will see that the main longerons project above the formers by $\frac{1}{16}$ in. on the front part of the fuselage. This is to allow for the $\frac{1}{16}$ in. balsa covering on the cowling, which can now be added. Strips $\frac{1}{4}$ in. wide and $\frac{1}{16}$ in. tapering in width to the front, are cemented and pinned in position as far round as the radiator cowling underneath, except between formers "a" and "b," when the strip should be continued right round. The radiator cowling front can now be carved and cemented in position, and the rest of the strip, $\frac{3}{4}$ in. × $\frac{1}{16}$ in. balsa continued round to complete the cowling.

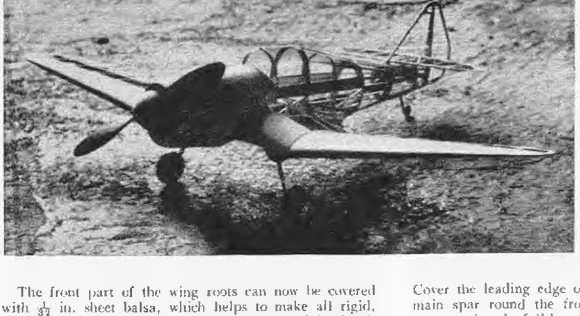
The centre section fairing into the fuselage consists of a $\frac{1}{4}$ in. × $\frac{1}{16}$ in. strip of balsa, carefully steamed to shape, springing from the leading edge, curving upwards and flowing back to former "d," where the trailing edge terminates. Formers "c" and "h" can now be cemented in place, and all longerons and paper supporting strips can be completed.

here and there to tack into position. And when set add further cement until all is firm. The other windows are added in three separate pieces of light celluloid, and the joints finally covered with thick writing paper.

The wings are quite straightforward, cementing the slots in the ribs into the slots in the formers.

One word of caution on this method. Do not make the slots too big: it is far better to make them a tight fit, otherwise the tightening effect of the cement may tend to draw the slots together and distort the whole job. The paper tubes can be fitted, being sufficiently long to be pushed through holes in both the first and second ribs for support. Care must be exercised here to see that both wing tips are each the same height on assembly, that is, 1 in. above the centre line of the fuselage. Less than 1 in. may cause the model to spin in flight.

Although the actual dihedral is built into the wings automatically, yet it is essential to check this for any error that may have occurred. Whilst on this subject, although all slots for the minor stringers are shown on the formers, it is as well to cut them out after assembly to ensure the longerons having clean sweeping curves.



* * *

These two photographs give a good indication of the construction of the model. Span is 39 in.; weight, complete with rubber motor, 9½ oz.; performance, 25-35 sec. The model is fitted with wheels, and will, of course, rise off the ground: but normally it is flown without them, thus giving the impression of flying with the wheels retracted. The underside of the fuselage is specially reinforced to take landings on its "tummy."

* * *

The front part of the wing roots can now be covered with $\frac{1}{32}$ in. sheet balsa, which helps to make all rigid, and at this stage it will be as well to fix the $\frac{1}{4}$ in. hardwood dowels for the wing fixings, making sure they are quite parallel. The centre lines of these dowels are shown on the half-front elevation. We can now take out the temporary cross bracings, and proceed with the cabin top. The three formers which carry the celluloid are made of $\frac{1}{16}$ in. balsa steamed to shape and pinned down on a board on edge. An inner $\frac{1}{32}$ in. strip is then cemented in place, and when all is dry we have a strong two-ply fixture, which will keep its shape. Do not forget to insert paper between the board and the formers while in construction, to prevent sticking. Note the $\frac{1}{16}$ in. vertical pieces shown in detail, which continue up four formers "e" and "f" to give rigidity.

The windscreen is cut from a clean knitting wool container, or other suitable object, obtainable at any popular 6d. bazaar, and firmly cemented in place. Very great care must be exercised here to see that no cement shows on any part of the celluloid which is visible. Probably the best method is to "spot cement," that is, a spot

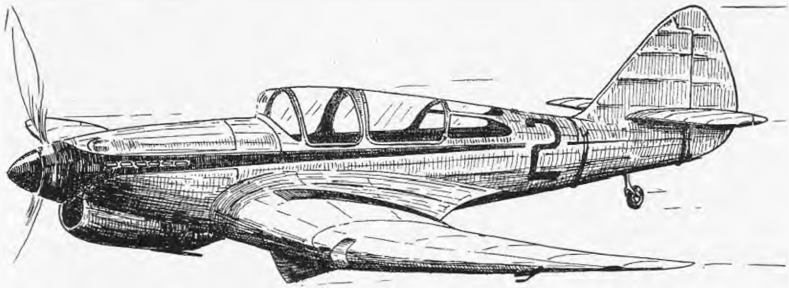
Cover the leading edge of the wing from the top of the main spar round the front and underneath to a small spar running the full length of the wings. If well steamed this balsa will go on quite easily and makes the wing very strong and rigid.

The tail unit is quite orthodox, and is detachable, with a small part of the top deck. The sketch shows how the elevator is inserted through the fin, and the balsa covering here makes it quite easy to cover with paper without getting any bad wrinkles. Note a small dowel at the end of the fuselage to locate the tail. Also two small pieces added to the bottom of the front end of the tail to register inside the main longerons.

The whole is kept in place with rubber bands and hooks.

Full details of the gear assembly is shown on the drawing and should need no explanation, except to add that an odd number of gears is used to obtain length of motor run, and not to avoid distortion of the fuselage.

The propeller can be carved from hardwood or a suitable one purchased. Actually, the propeller on the original model was a proprietary one known as



"Pawlonia." A $\frac{1}{4}$ in. three-ply 2 in. dia. disc was cemented to the back, and the spinner built up with odd pieces of balsa, and sanded to shape. This is probably far easier than attempting to carve an air-screw and spinner complete in one piece.

If you are not gifted in carving propellers I strongly advise purchasing a ready made one, because however well the model may be constructed we must get the greatest efficiency from our rubber. A 12 in. air-screw with 15 in. pitch is advised, although different propellers can be fitted as required by removing the screw in the driving plate through a hole provided in the back plate. See detail on the drawing.

An undercart is made for display purposes, and can be used for speed contests. It consists of a short length of expanding curtain rod with piano wire pushed through and well soldered either end, one end turned at right angles to form the axle. Attached firmly to the upper end is an "U"-shaped wire, which holds all snug in place. The whole unit (there are two, of course, one for each wheel) is a push fit in the "carved from solid" wheel fairings. This construction of undercart lends itself admirably to scale construction, and gives ample movement to absorb landing shocks.

The whole model is covered with white Japanese tissue, water tightened and doped. The covering includes the cowling and balsa sheet on the leading edges of the wings. Decoration consists of a black spinner with a broad black band tapering to nothing at former **H**, and a larger black figure 2 between formers **G** and **H**, either side.

This, of course, will not be the R.A.F. colour scheme, but was used on one of the experimental prototypes.

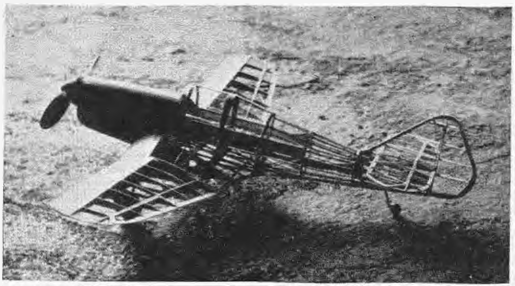
The model is powered with three motors of four strands, each $\frac{1}{4}$ in. × 1-20 in. × 18 in. long, well-lubricated rubber.

Trim is obtained by adding a lead weight to the under side of the nose, and when correct can be cemented in place, although you will observe that a final trim can also be obtained by using either one or the other rear rubber dowels. This is also very useful when fitting a different motor or different combination of strands and thickness.

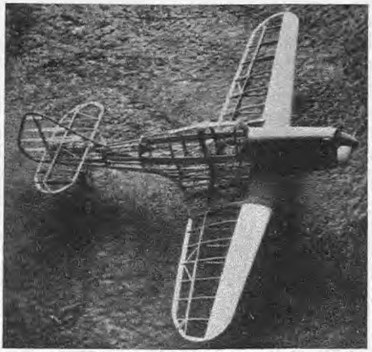
Flying is quite straightforward. Do not use the ailerons to correct for torque, as when the motor is run out the model may tend to go into a spin. The side-thrust and downthrust take care of torque, so that the model should fly with all controls neutral.

Launch fairly fast (into the wind, of course) and you should be rewarded with a long, steady and spectacular flight.

(*Continued overleaf*).



Above is shown a fine sketch by Mr. Towner, depicting his model in flight. Overleaf is printed a full list of materials required for this model. Also is printed a page-size reproduction of the full-size scale plan, 40 in.×27 in., available for 3s. post free from our Leicester offices. These plans contain every part fully detailed, and with the aid of the instructions here published readers may build this 'plane with confidence.



It is not advisable to fly in windy weather, and trial flights should be carried out over long grass.

The total all-up weight in flying trim is 9¼ ounces with a wing area of 210 square inches. The airscrew spinner and gear assembly should weigh 1½ ounces, and the added weight anything from ¾ to 1 ounce, depending on how light you have managed to construct the rear part of the model.

LIST OF MATERIALS REQUIRED.

3 ft. × ⅛ in. sq. hard balsa, 3 lengths. Main longerons.
3 ft. × 3 in. × 1/16 in. balsa, 4 lengths. Cowling, formers, ribs, etc.
3 ft. × 2 in. × 1/32 in. balsa, 1 length. Main spars.
3 ft. × 4 in. × 1/32 in. balsa, 1 length. Leading edge covering.
3 ft. × 2 in. × 1/32 in. hard balsa, 1 length. Tail ribs, etc.
3 ft. × 1/16 in. sq. balsa, 1 length. Rib bracing.
1 ft. × ¼ in. round birch dowel. Wing fixing.
1 ft. × ⅜ in. round birch dowel. Motor rear fixing.
2 in. × 1⅛ in. × 1 in. hard balsa. Radiator cowl.
6 in. × 1 in. × 1 in. hard balsa. Undercarriage fairings.
1 pair celluloid 2 in. balloon wheels.
1 pair celluloid ¾ in. tail wheels.
Celluloid, 12 in. × 6 in. light gauge.
Celluloid windscreen cut from wool container.
¼ in. hardwood ply. 12 sq. in.
1/16 in. hardwood ply. 4 sq. in.
½ in. brass gears, 8.
16 s.w.g. steel wire for shafts.
3 brass bushes screwed and nuts. And cup washers.
18 s.w.g. 12 in. long. Landing gear.
Expanding curtain rod, ⅜ in. dia. outside, 6 in. long Undercarriage.
24 s.w.g. retaining hooks. 12 in. long.
Rubber ¼ in. × 1-20 in. 6 yards.
Light-weight paper, white, 20 in. × 30 in. 2 sheets.
Aluminium foil, 3 in. × 2 in., for hinges.
Valve tubing, dope, etc.

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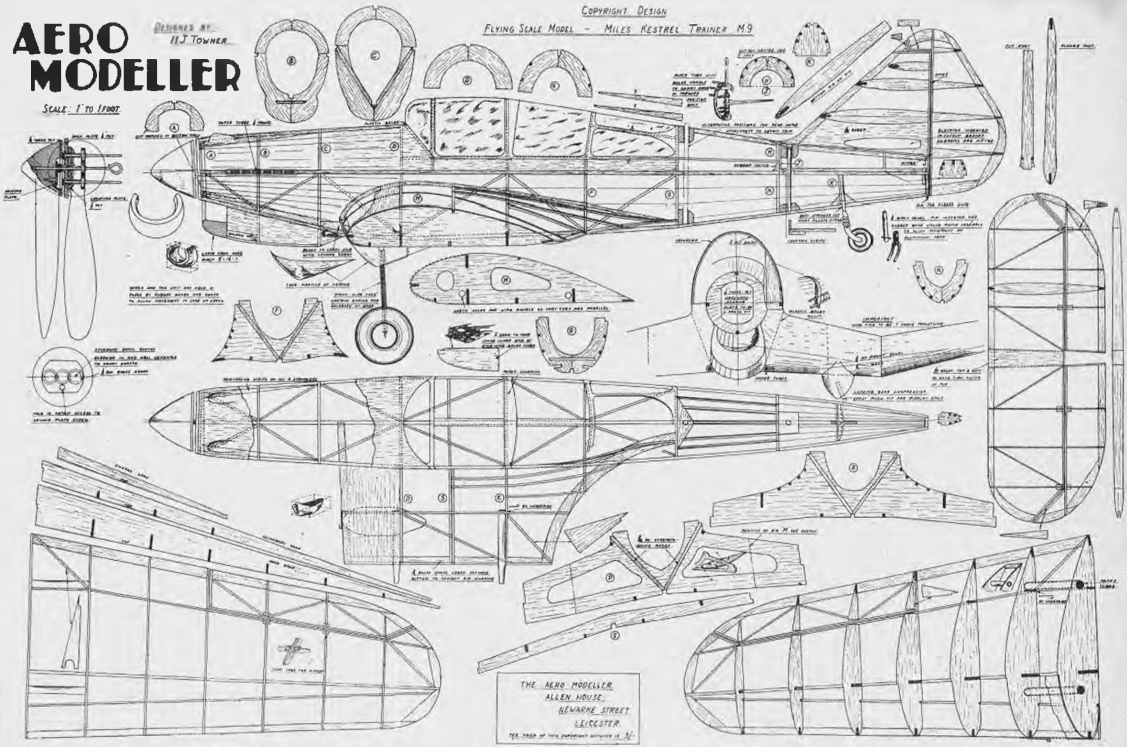

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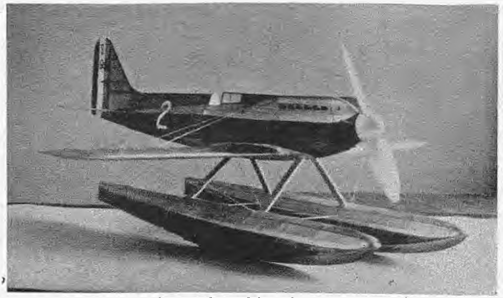


A beautifully finished flying-scale model of the Supermarine "S6b," built by Mr. Rushbrooke.

COVERING

By C. S. RUSHBROOKE

DURING contacts with all kinds and grades of aero-modellists, my attention has been drawn time after time to the many and varied—and occasionally weird—methods adopted when it comes to the final and most important item of covering a model. When I say weird I speak more of the results obtained than the method of application, though this is at times enough to make a fellow feel like snatching the job out of the vandal's hands!

Evidently the Editor has had the same experiences, and has asked me to explain, as simply as possible, the method I adopt when covering and finishing a model—be thinking, rightly or wrongly, that I am qualified to execute so important an undertaking. Before I start, let me say definitely that I have my own way of going about things, my main asset being unlimited patience when on this section of the construction, and I am told I take far longer than most. Well, this may be, but if the results justify the time spent, what is the odds of a few extra minutes if the finished article is perfect? To my way of thinking, one cannot be *too* careful with the final touches to a model, and it seems rather futile to rush the covering of a well constructed framework.

Firstly, only use the best materials. A few pence is nothing on the cost of a model, and, after all, how much tissue and adhesive do we use on even a fairly large model? Good materials are easier to handle, and produce a better result, so go in for the finer grades of tissue, etc., and get a more satisfactory job at the finish.

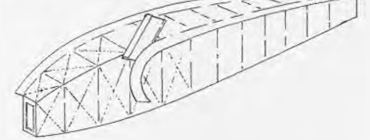
High-class superfine tissue is best for most types of model, with light- and heavy-weight bamboo paper reserved for extra large types, including power models. As adhesive, for some time I used ordinary cellulose cement thinned right down to a dope-like consistency, which was quite easy to use, but rather quick drying, making fast work necessary, and resetting of a misplaced sheet difficult. One advantage this cement had was that the glue penetrated the framework to a certain degree, making for an appreciable strengthening of the structure, though whether this was any particular use is hard to say.

Nowadays I use mostly photographic paste of the "Gripfix" type, which I find quite satisfactory on the majority of the work—but must *not* be used on any undercambered parts. The reason for this is that when water-doped for shrinking purposes, the tissue tends to leave the undercamber when drying—so for this part of a covering job I still use the thin cement, which is unaffected by the shrinking process.

A pair of scissors and a *sharp* razor blade are all the tools required, and, having these, let us start on that model we have all ready for covering.

Fuselages are fairly simple if of the ordinary slab-sided type. Cut the required number of strips, leaving about ½ in. margin all round, and start with the bottom portion first, following up with the two sides, and finishing with the top. Using paste—not too much of it, a thin application is all that is required—coat the widest part of the framework, and fix the sheet of tissue in place. We now work towards each end, a section at a time, drawing the tissue to an even surface but not trying to stretch too tight. An evenly tensioned surface, free from wrinkles, is what to aim at, and leave the tightening to the shrinking and doping.

Fixing the tissue to each bay, and "thumbing" well down to the longerons, we finish each side at a time, and trim the excess tissue with the razor blade held at an angle, as shown in Sketch 1. There is no need to lap the tissue over the edges, as the amount of area afforded by the longerons is quite sufficient.



Many people have asked why I fix to every bay, both on fuselage and wing structure, a common practice being to just paste all round the outer edges and stretch the covering in one go. Well, there is a very simple and important reason, to my way of thinking, and is answered by one term—cross-bracing.

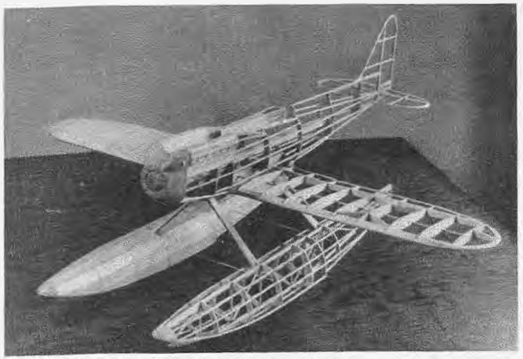
Cross-bracing is the tension given by two lines taken from corner to corner of a four-sided frame, and is shown best in the sketch. It stands to reason that a fuselage having a series of small sections all cross-braced, is stronger than one having just one cross-bracing from end to end. Also it is very easy to cut out a damaged bay and replace—whilst a rip in a "full-sided" section generally travels right through the side.

When considering Wings, we have an important factor to take into consideration—grain. Hold a piece of tissue up to the light, and we see that there is a definite grain in the paper. For wing covering—and this applies also to tail-plane and fin, the method being the same for all these parts—it is advisable to cut the tissue with the grain running from leading to trailing edge.

Taking as our demonstration job an ordinary high wing—two panels and a centre section—six pieces of tissue are required. Leaving a margin as before, cover the under surfaces first, finishing with the top, centre section coming last in each case.

Fastening at the root rib, work a bay at a time towards the tips, fastening to each rib, *but not to the leading or trailing edges*. As before, do not over stretch, but concentrate on getting the tissue laid on smooth. Leaving the tip to be attended to later, trim the edges of the tissue, leaving a margin of an eighth of an inch, and nick opposite each rib. Having pasted these small "flaps," just *fold* round on to the leading and trailing edges—but don't *stretch* as you do so. This will help preserve the section, the tissue tightening up to practically a true form, whereas if the tissue is pulled at all, a definite tendency to sag between ribs will be evident. This takes place to a certain extent anyway, and cannot be avoided, but there will be less tendency with this method than otherwise.

Now trim the tip, leaving a margin as before. Nick all round at about ½-in. intervals, and stretch over the tip. When dealing with the top surface of a wing, where the tip makes rather a steep drop from the last rib, it is advisable to cut the tissue at the last rib, replacing this last section as a separate piece, thus obviating the many wrinkles that would otherwise appear.



The model partly covered. Weight is 1¼ oz. Duration 15 sec. R.O.W. Very fast flying.

When all covering is finished, spray or brush the whole with water. Do not be afraid to use plenty of water on the tissue, but be careful that the paper is not touched whilst sodden, as these "blobs" will never straighten out. If the tissue is placed evenly and square, there should be no tendency to warp when water or cellulose doping, but it is a good idea to pin the supporting surfaces to a flat board whilst drying. Wash-in and wash-out can be set into a wing by inserting small blocks in the required positions whilst the drying process is taking place.

When *thoroughly* dry—it is a practice of mine to cover and water dope at night, leaving the frames to dry overnight—the whole framework can be doped with any of the special model dopes on the market. Here again, use only a good brand and a good camel hair mop. Work fast, brushing the dope on as thinly and evenly as possible. Remember, two thin coats are better than one thick one, as any painter will tell you! And work in a warm, dry room, as any damp will soon make itself evident with a nasty-looking milkiness called "blushing"—evidently the feelings of the model at being subjected to the wrong treatment! This can sometimes be remedied by giving another thin coat of dope in a really warm room, but prevention is better than cure, and if the job is tackled right in the first place there should be no necessity for such extra work.

Colouring and finish are matters on which I personally have many fixed and definite ideas, but this is too much to go into here. I would say, however—if you have made a good job of construction and covering, surely the model is worth a bit of "tittivating." We do not see full-sized aircraft flying around with the raw fabric exposed to the gaze of all, so why turn models out like it? That's subject for a later confab., however, and I will content myself with the final warnings:

Use good materials.
Don't be frightened of wasting a bit of stuff
Smoothness rather than excessive tightness
Cover slow, and dope fast.
And store up plenty of patience.

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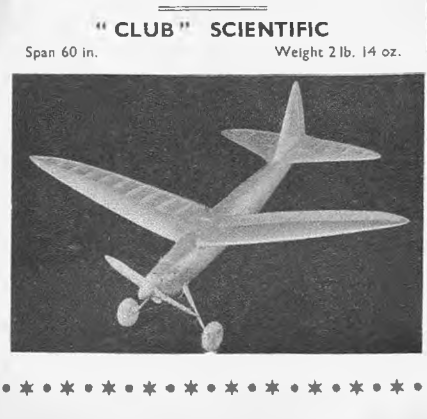

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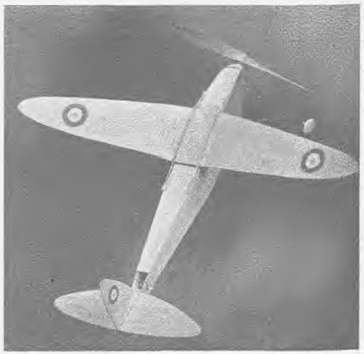

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We have received more letters about the achievements of this 'plane and its small brother White Wings than we could ever hope to publish,

By S. E. CAPPS

THOUGH possibly not so well known as airscrew drives employing gear-wheels, the crank-driven airscrew using cranks instead of gear-wheels is not a new idea. The crank being one of the oldest known mechanical motions, it is surprising that more use has not been made of it in model aircraft work when considered from its simplicity and the fact that a number of cranks coupled together with a common link ensure all of them revolving in the same direction, thereby enabling multi-skein rubber motors to be applied to the airscrew spindle without much trouble.

The writer has tried many different types of crank drives for his models, and the few illustrated here are among those that have shown improvement in performance over other types of geared heads used, and it is thought that a few remarks about crank construction will be of interest to some and possibly of help to others.

Firstly let it be clearly understood that in all straightforward designs of crank-driven units the twist of the rubber motors is all the same way, and in consequence the fuselage should be strong enough to withstand the strain. Most modern machines use a single-skein motor of any weight up to 4 oz. of rubber, and as the fuselages of these stand the twist of these motors exceptionally well we need not worry that with the use of crank-driven heads we shall have to increase the structural strength, as the twist of any of those shown has never been greater than the single motor.

From this it will be seen that no alteration to the fuselage need be contemplated or attempted, but the covering should always be doped with a good quality dope and not the cheap shrinking dopes that are available. This will ensure almost complete freedom from distortion.

The crank sets fitted to the writer's machines have caused no trouble in this direction. It was rather the high cost of geared heads and the difficulty of their construction that led the writer in the first place to try the units described here. Construction of a crank-driven head was soon found to be on building the first set, not only simple, but the making of the frame parts and the link much easier than the construction of a gear-driven head.

There are, of course, certain little details that must be considered, and the most important is the number of cranks it is decided to employ. It should be stated here to prevent any unfortunate encountering trouble that nothing less than three cranks should be contemplated. Two will work, but it is absolutely essential that both skeins should be exactly the same weight and cross-section area, and wound up singly or both together with a double winder to ensure the exact number of turns on each. This will also have to be done from the rear. If any attempt is made to wind a twin-crank set from the front end by the airscrew it will soon be found that while the crank connected to the airscrew will wind up the motor on its hook the other crank will only oscillate backwards and forwards, and not revolve completely.

When considered with the performance of the triple-crank unit the vast difference in ease of manipulation will be apparent, and twin-crank units should be avoided.

In operation it will be at once noticeable that when correctly-made crank sets run absolutely silent, and when compared with the whir and shriek of toothed gear-wheels under strain of the motors, the difference has to be heard to be appreciated. Another and very prevalent trouble with gears is the breaking of the soldered joint between the gear-wheel and the shaft; this cannot happen with cranks, as the crank throw and the motor hook are made on the same shaft, and no soldering is necessary.

The construction of these crank sets requires no elaborate tools other than a good wheel-drill brace, some good sharp drills, a small file, etc., a quantity of $\frac{5}{16}$ in. × 1 mm., or $\frac{1}{4}$ in. × $\frac{1}{8}$ in. steel or brass strip.

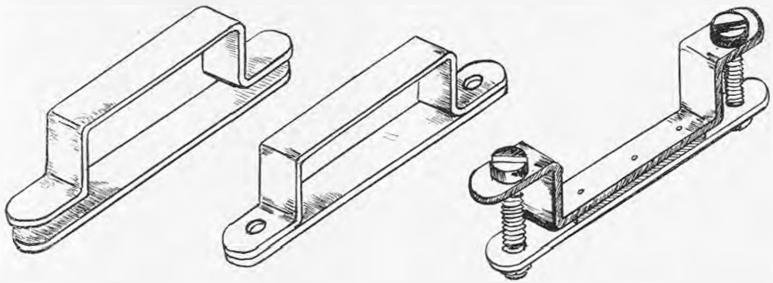
Duraluminium can be used for very small units where the rubber load is not heavy. Most of this equipment can be found in the average aero-modeller's workshop.

The procedure adopted will be clearly seen in the sketches, and does not require a lengthy explanation, but certain details should be given good consideration. One of these is not to use too heavy material for the framework and link; another is, make sure that the frame parts do not move while drilling the holes for screws or crankshafts. The method of securing gear-wheels while drilling spindle holes, published in THE AERO-MODELLER recently, will be found to be equally

applicable to the construction of the framework of these crank sets. A third point to be watched is to take care that all the cranks are bent the same.

As will be seen, the frame is made from two main members, one of which is shaped as at A, Fig. 1, by bending with a good pair of pliers, or bent round in the vice. The other is simply cut off the length required. The link is cut from the same material, and should be long enough to take the number of cranks it is desired to use. The frame and plate are now arranged as at B, Fig. 1, and the side-holes are drilled to take the clamping screws. When these are correctly fitted the frame is complete. The writer's method of fitting these screws is to drill the holes in the formed part of the frame clearance for the screws and to cut a thread to suit them in the flat plate. This excludes the use of a nut, but is more difficult than drilling the holes clear in both plates and using a screw and nut to tighten them together with. This way would probably be favoured by most in view of its simplicity.

Next the link and the frame parts should be clamped together as at C, Fig. 1. Making use of the side-screws, mark carefully the position of the crankshaft holes. Drill these slowly and carefully with a sharp drill the size to fit the gauge of wire used for the shaft. The largest size shafts the writer used were 18 s.w.g., with a throw of $\frac{3}{16}$ in. These should stand the greatest strain required for all normal size models. The position of the holes will depend on the number of cranks in use, and this will depend on the space available in the nose of the model. If space is limited a twin-hook drive with the centre shaft cut off short will be more

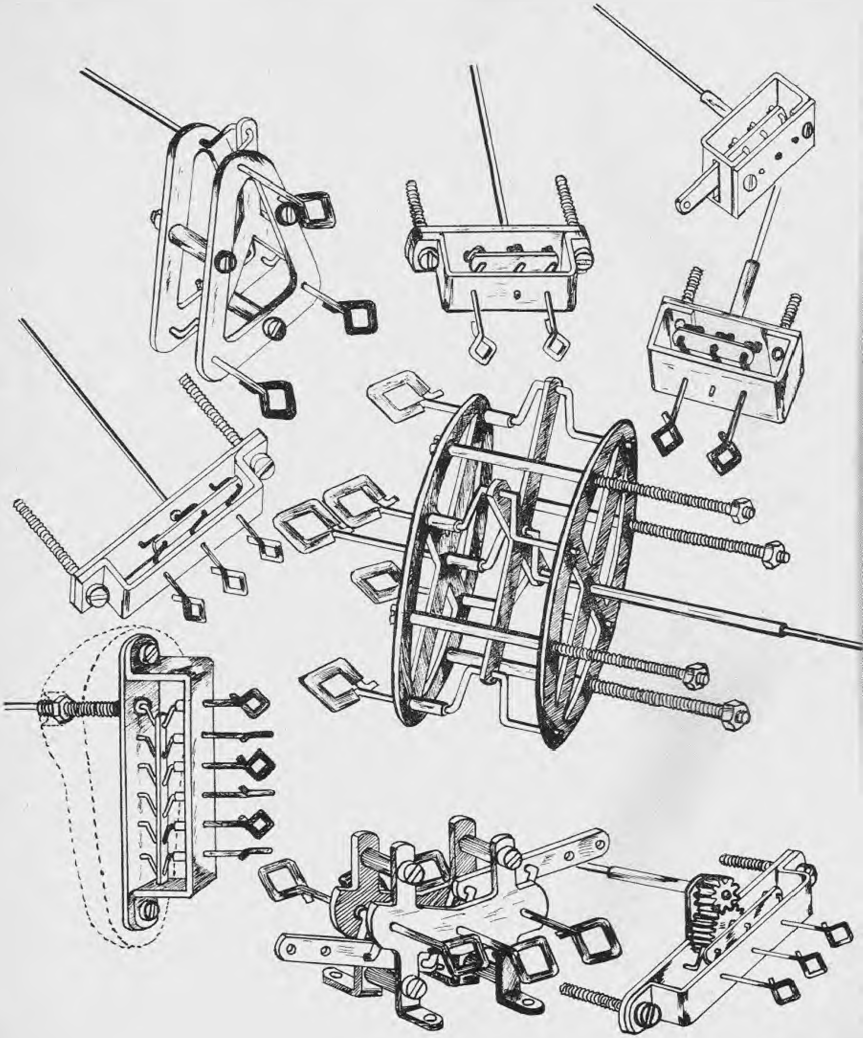


suitable than three. If there is room for the three skeins then the centre can also contribute to the performance of the model. It is as well to make sure on this point that there is sufficient room, as a number of rubber skeins running too close together are apt to wind together and become entangled. Both types of this unit are illustrated, and it is up to the builder to decide for himself just which suits his purpose best.

A big advantage of crank units is that hooks can be positioned just where one wants them, and one is not bound to any particular size of head as is so with gear-wheels. One only has to increase the length of the link to be able to make a large head or shorten it to make a small one. Next form the shaft throws, and again let it be understood that they should be all the same, as should any one be badly formed in the throw a distinct knock will result in a noisy and inefficient unit which will not work long before fracturing. A good pair of pliers are all that is required to make these cranks correctly. When these have been shaped they can be assembled in the frame, which can now be tightened up by the side-screws. The whole should revolve freely, but should there be any stiffness (which there may be) the holes can be enlarged on the inside of the frame. This can be done best with small taper reamer, and should not be overdone, as a slack-fitting shaft will also cause trouble. However, if all the parts have been made correctly when assembled the whole unit should revolve freely on twisting the centre crank. When this part is satisfactory the rubber motor hooks can be formed, and these should not be bent too sharply, as this will interfere with dismantling should it be necessary at any time. Also beware of the sharp cuts that plier jaws can impart to rubber hooks if carelessly formed.

When assembling finally do not forget the small pieces of tube to take the thrust. These can be either steel or brass, but steel is better, as it is harder. Tube that fits the shafts should be used, and tube that is too large avoided. The extending airscrew spindle bush shown in some of the sketches is optional, but the builder is advised to fit them if necessary, but in many units it will not be needed, as the existing bush in the nose-block will serve. In cases where it has to be installed it should be fitted to the frame or plate by threading the hole in the plate and using a screwed bush, or by making a plain bush a tight fit in the centre hole and soldering. In most instances the existing bush will probably be sufficient, and the shaft to take the airscrew can be passed through the complete unit, being secured to the noseblock by the side-screws.

Arrangement of crank-driven units for various positions in model aircraft for the airscrew drives is much simpler than with the equivalent gear-driven heads and units as, for example, in a multi-screw machine employing an airscrew on each wing the location of the main driving unit in the centre of the fuselage will allow motors connected to each end of the crank shafts, and the link ends being in turn connected to smaller units direct, located in the wing edge by means of light arms of suitable length, without recourse being made to bevel gears and revolving spindles. These wing units can be constructed small enough to be enclosed completely in



the wing rib shape, and at the same time being strong enough to withstand any load required to drive the airscrews. Size for size as compared with the geared unit for the same purpose, the crank unit is about half the weight and much stronger. A complete unit arrangement such as has just been described can be seen in the sketches. The six-hook double link double throw unit in the centre at the bottom was used in conjunction with the small hookless type in the top right corner. These were connected together with light duraluminium arms, and this arrangement worked very well in practice, being silent in action and vibrationless. It will be seen that as the parts of the unit, such as the links and the throws of the crankshafts revolve, they could, not being balanced, set up vibration, but owing to the extreme lightness and the comparatively low speed of rotation this does not happen.

All the crank units in the sketches were built by the writer, some of which are still in his possession, among them being the large circular unit in the centre and the geared-up unit at the bottom right corner. These all look considerably larger and much heavier than these words would imply, but that is not so, as they have been drawn large to show the various parts.

The five-hook centre unit will probably be more interesting than any other, as this can be accommodated in almost any round fuselage model, and as a unit which will fit inside the modern machines fitted with cowls. This type is slightly more difficult to construct, owing to the extra work involved in cutting the side-plates and the corresponding distance pieces. The outside size of the one illustrated is 1¼ in. diameter, weighs complete half an ounce, and will take four loops of ⅛ × 20 hard rubber on each hook, and under the strain of ¼ lb. of this rubber wound to breaking point revolves at a high speed in absolute silence. This type of unit should appeal in many ways to builders of "Wakefield" models, as a large power output can be imparted to the airscrew shaft devoid of excessive friction. The six-hook shown at the bottom left corner was designed for incorporation in a scale model, and, as will be seen, is particularly suitable for scale models of machines with inverted engines. The fixing of this is very simple. The airscrew spindle bush is screwed, and the side-screws securing unit, to the nose block. The remaining units are straightforward types usable on almost any shape of machine. That in the top left was used on a model with a triangular fuselage, for which it is most suitable. That in the bottom right is interesting, and, as mentioned earlier, includes a step-up ratio to the airscrew shaft. This is the last unit constructed to date. May it be pointed out in conclusion that the advantages of these units over the geared types are almost frictionless power delivered to the airscrew spindle, the total absence of noise under working conditions, their light weight, and lastly the ease of construction.

THE POWER BEHIND THE PILOT

(*Continued from page* 8).

A Corporal Wireless Operator Mechanic is paid 7s. 6d. a day, so that a boy who enters at 15 years 8 months can be earning £2 12s. 6d. a week at the age of 20 with nothing to pay for clothes, living quarters, or food.

This is no theoretical progress. It is the real life story of a recruit who entered Cranwell Electrical and Wireless School in September, 1934. Exactly four years later he was promoted full Corporal.

Nor has this example been handpicked. Of a class of 20 boys who began training as wireless operator mechanics in 1931, 90 per cent are now airmen pilots with the rank of Sergeant or higher.

Splendid openings also exist for armourers, instrument repairers and electricians. With the ever increasing demand for men in these trades the opportunities are becoming more frequent every day.

But it is not all work at Cranwell by any means. There is hardly an outdoor or indoor sport that is not played from baseball to billiards, from boxing to backgammon. Large well-ventilated gymnasia are equipped with wall bars, vaulting horses, fencing foils, and every kind of apparatus necessary for all-round physical training.

Cranwell even has its own cinema, where talkie films are shown three times a week. Though admission prices are as low as 4d., the cinema shows a handsome annual profit, which is devoted to the comfort and welfare of members of the Cranwell Command.

But the most important recreation of all, because it teaches while it entertains, is the Cranwell Model Aero Club.

Affiliated to the Society of Model Aeronautical Engineers, the club is not, strictly speaking, part of the establishment, but the Air Ministry has put funds at the disposal of the organisation to buy materials for model aircraft construction.

Members, who now number 120, have a well-equipped workshop in which to build models, and plans are under way to secure another modelling workshop.

The club possesses 50 model aeroplanes, and there are several others under construction. Aeroplane sizes vary from large 6 ft. span petrol planes to tiny rubber-driven models built to 1 :72 scale.

The extent to which aero-modellers joining up have introduced their fascinating hobby into the service, is shown by Cranwell club's membership increase from 10 to 120 in the past 18 months.

The sudden increase is more striking when it is remembered that Cranwell Club has been established for five years.

Now-a-days, I am told, the modelling shop is always open, and many enthusiasts spent Saturday and Sunday afternoons working at the benches.

Of course, Cranwell is not the only Royal Air Force Station with a model aero club. Halton, too, has its aero-modellers, but that is another story.

It is, however, encouraging to know that the importance of aero-modelling is officially recognised. The Air Ministry in recent years has realised that the model aero club gives the best introduction to a thorough knowledge of aerodynamics.

This means that there are thousands all over Britain who are training themselves in their spare time to be expert aviators.

Many of them I feel sure will be admitted to Cranwell Training Command, with its quiet efficiency and cheerful camaraderie in the not far distant future to become patrollers of man's latest conquest—the air.

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(Continued from next page).

hard lines. The competition was only two days away. There was little hope of him recovering the model which he had spent so much time and money on, and which had been almost a certain winner of a trophy Joe particularly coveted.

But what was so aggravating was the mystery of the thing. That the plane had dropped in the field Joe had little doubt. He had seen it go down behind the trees at the end of it. Moreover, he had the testimony of the two boys, who had declared that they had seen it land in the middle of the corn.

Of course, it was possible, ruminated Joe, that someone, possibly the two boys, had gone over and collected it in the night. But against that theory we had the yokel's declaration that nobody had been over in that field.

"Everywhere," he had said, "the corn was as smooth as a baby's celluloid rattle."

And if he couldn't tell whether anybody had been there, who could?"

Joe, toying with his beer, wondered whether the farm hand had found it and decided that it was worth keeping. Possible, but hardly probable. His chagrin had been too genuine when he told us that he had been unable to find the model. Joe began to work out how long it would take to save up enough to build another model like Jan Stewar. About twelve months, he thought, if he could manage to keep away from the *Plough*. And with that sad reflection we left and went out into the gloaming.

Then, believe it or not, Jan Stewar came out of the evening sky and landed almost at our feet.

I shall never forget the look on Joe's face, nor the solemn way in which he stroked it. "Gosh!" he said. "How's that for an unofficial record?"

He looked at his watch. "Forty-eight hours, sixteen minutes," he crooed, and went home with shining eyes. He still has that flight entered in his notebook, and I should hate to disillusion him.

You see, when Joe was looking at his watch I saw two kids come rushing round the corner, pull up dead, and then go back. I said good-night to Joe and followed them.

It wasn't difficult getting the whole story.

"How did you get it from the field?" I asked.

"We didn't. It came down in the road, and before them two came along on the tandem we hid it behind a wall."

No, I didn't tell Joe anything about it. One of them kids happens to be mine.

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IT was hard lines on Job Wood being called that. When somebody said that his name was Job, also Wood, it was only natural that we at the club should call him Joe Balsa Wood.

But it was a greater misfortune still when Joe's latest model flew away. That model had cost Joe something, and he was just trying it out a week before an important event which he was hoping to win.

Oddly named himself, Joe had an odd idea of naming his models, and this one was called Jan Stewar. And, true to its name, that model went certainly up along, out along, down along lea.

As soon as Joe realised that Jan Stewar wasn't coming back he looked round for a suitable means of transport with which to follow it. The only locomotion available happened to be a tandem cycle, which, together with his girl, another member had happened to bring along. Joe, always a particular chap, said he couldn't ride it solo, and the owner, being at the moment engaged with a broken rubber motor, lent him his girl without question.

She, poor girl, said that riding with a strange man on a tandem was preferable to listening to a man swearing about a paltry piece of elastic.

So Joe, the girl and the tandem made a somewhat shaky exit from the field in the direction in which Jan Stewar had flown. We, knowing Joe, hoped that the lady wouldn't be disillusioned too much when Joe did, or did not, find his model. Her chap thought somehow that she would fall into his own arms when they returned.

But they didn't come back. Now don't get me all wrong. There's nothing romantic about Joe, especially when he's looking for a lost model. I'll tell you the story as I pieced it together afterwards.

Joe saw his model go down about a quarter of a mile ahead. When they got to the place, as far as they could judge it, they dismounted. Enquiry from two boys disclosed the fact that the model had dropped right in the middle of an extensive cornfield. Jan Stewar had done the job properly.

There's no record of what Joe said, except that the girl still hits it with her boy friend, and has hardly looked at Joe ever since. They went down to see the farmer, who said that the field would be harvested two days later, which cheered Joe no end.

He offered the farmer ten shillings, to be given to the man who cut the field, provided the model was returned undamaged by the reaping machine.

"Tain't enough," said the farmer. "If thee's ever sat on one o' them machines all day, thee's know why, too. Thick man'll have to sit with his head looking sideways all day, and that'll mean a stiff neck for 'n, as well as a aching back."

So the price was raised to fifteen shillings and a bargain struck. Joe was to call for his model in the evening. But the farmer was a stingy, cautious old blighter.

"What if he don't find it?" he asked. "What do he get?"

Joe was generous. After all, he knew that people don't go wandering across fields with golden corn five feet high. The machine was sure to be found. So he offered five bob if the machine couldn't be recovered.

Well, this is where I come in. The next evening I called in for a bitter at the *Plough*, which is quite near the field. I happened to bump into a yokel, who told me all about it. He was harvesting the field, and he had received his instructions from the farmer. The hunt for the *aeroplane* was an item in his life. He was only too pleased to talk about it to me.

"Tain't much as I'm getin' for it, though," he said. "Half-a-crown for holding me 'ead sideways all day isn't enough."

Well, I know that farmer, and seeing that he was trying to make twelve-and-six out of it, I decided to put a spoke in his wheel.

I explained the position to the yokel. He agreed to meet us with the model outside the farm just before Joe was supposed to call, hand over the machine, collect his fifteen shillings, then go up to the farm and say that he had met the gent coming in. The gent had been generous and paid him fifteen bob instead of the half-a-crown.

Joe fell in when I explained, and we turned up hopefully at the appointed hour the next evening.

We met the yokel, but Jan Stewar was missing.

"There was nothing there at all," he said. "I've done the whole field, and ne'er a sight on him did I get."

Joe paid the five shillings, and we went to the *Plough*, where Joe suitably drowned his sorrows. After all, it was

(*Continued on previous page*)

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A BRIEF HISTORY AND DESCRIPTION OF THE S.E.5

By J. A. BRAMAH

IT is hoped that this article will be of use to both the enthusiastic model-maker and the student of aeronautical history. Information has been gathered from many sources, and has enabled the writer to give a most comprehensive description of the machine itself. The history of the S.E.5 has been written and rewritten through the years, and only the salient incidents are retold here.

The S.E.5 single-seat fighter-biplane was one of the most successful and most attractive aeroplanes used by the Royal Flying Corps and the Royal Air Force in the last war. As its designation implies, it was the fifth version of the "Scouting Experimental" (S.E.) type of aeroplane designed by the Government-owned Royal Aircraft Factory at Farnborough, an establishment which was renamed the Royal Aircraft Establishment in 1918, owing to its initials R.A.E., by which it was generally known, clashing with the then recently formed Royal Air Force. The S.E.5 was built in quantity by the Royal Aircraft Factory, and such outside firms as Austins, Martinsydes and Vickers.

The men responsible for the design were Messrs. Folland, Goodden and Kenworthy. Mr. Folland later joined the Gloster concern as chief designer, and was responsible for the design of their "Grebe," "Gamecock," "Gauntlet," and other types.

The design of the S.E.5 was based on the use of the direct-drive 150 h.p. Hispano-Suiza eight-cylinder "V" water-cooled engine, a type which came into prominence in France in 1915, and was used in the famous S.P.A.D. scouts and observation machines. A number of engines of this type were ordered in France, and at the same time arrangements were made for this engine to be built in Great Britain. The production of the S.E.5 began in 1916, and the first squadron to be equipped with this type of machine was No. 56 Squadron, R.F.C. This squadron received its first S.E.5 on March 13th, 1917, and it proceeded to France fully-equipped with this type on April 7th.

This first issue of machines had the type of windscreen shown in the accompanying sketches, but this was removed soon after they reached France and replaced by the normal rectangular glass type, as used on all subsequent models. Two unusual exhaust systems are also shown.

To improve the performance of the S.E.5 a 200 h.p. Hispano-Suiza geared engine was fitted in place of the original 150 h.p. engine of the same make. This variation of the S.E.5 was known as the 5a, and was also fitted with an all-metal undercarriage in place of the original wooden one, which was very susceptible to breakage in anything other than a perfect landing. A still later development of the type was the 5b, and came into

use by the Royal Air Force after the war. With a 180 h.p. Wright engine, it was used by the United States Army Air Corps until 1926 as a trainer. Two-seater versions were used by R.F.C. in England during the war as trainers.

The first S.E.5 was received by No. 56 Squadron in June, 1917, and on August 15th Capt. McCudden was appointed Flight-Commander of "B" Flight in that squadron. In his book, "Five Years in the R.F.C." he writes: "The S.E.5, which I was now flying, was a most efficient flying machine, far and away superior to the enemy machines of that period. It had a Vickers gun shooting forward through the propeller, and a Lewis gun shooting forward over the top plane, parallel to the Vickers, but above the propeller. The pilot could also incline the Lewis gun upwards in such a way that he could shoot vertically upwards at a target that presented itself. As a matter of fact, these guns were rarely used in this manner, as it was quite a work of art to pull this gun down and shoot upwards, and at the same time manage one's machine accurately. The idea of using a Lewis gun on the top plane of an S.E. was first put forward by the late Capt. Ball, who used his top gun with such excellent success in another squadron while flying Nieuports. Other good points of the S.E. were its great strength, its diving and zooming powers, and its splendid view. Apart from this, it was a most warm, comfortable, and easy machine to fly."

On the ground in a gusty wind or a cross wind it was very difficult to handle on account of its lightness and big dihedral.

The S.E.5 was the first fighter type to be fitted with the Constantinesco interrupter gear, which became the standard gear to enable a machine-gun to fire through the airscrew. Earlier gears (Ross, Kauper, and Vickers) had been used in France, but their complicated mechanism led to unreliability. In the Constantinesco gear a column of oil in a thin tube was used to transmit the impulses from a pressure pump driven by a gear-wheel behind the propeller-boss to the gun trigger, and thereby eliminate all intermediate rods and cranks which had led to unreliability in the earlier gears.

The upper plane mounting, known as the Foster mounting, was originally developed by a workshops officer in the A.S.C. (M.T.) for the use of No. 1 Squadron, before the interrupter gear was invented, to enable a machine-gun to be fired forward over the airscrew. The original mounting only enabled the gun to be pulled down for reloading. This was later developed to permit the gun to be locked at any position on the curved rail, so that it could be fired at any angle between the horizontal and the vertical.

By November, 1917, there were five S.E.5. squadrons in France, and by the end of the year other squadrons which had been previously equipped with earlier types of fighters, such as the Nieuport 17 C.1 and the D.H.5, were being equipped with the new type. In addition to the squadrons whose markings are shown herewith, the S.E.5 was used by No. 17, 50, 61, 72 and 111 Squadrons.

The April of 1917 became known as "Bloody April," due to the heavy losses inflicted on the Royal Flying Corps by the Imperial German Air Service. This German superiority was largely due to the fact that they were using machines, such as the Halberstadt and Albatross, which mounted two forward-firing machine-guns, and it was not until the S.E.5 appeared at the front that this superiority was removed.

The success of the S.E.5 as a fighting machine is exemplified by the achievement of No. 56 Squadron in shooting down 250 enemy aeroplanes between April 23rd, 1917, the day on which machines of this unit first flew over the lines, and January 9th, 1918. Many other squadrons put up similar remarkable performances with this type of machine.

The S.E.5 was a single-bay biplane of typical wartime construction, that is, a spruce structure, wire-braced, with metal engine-bearers and metal struts, the outer wing-struts being of wood. The fuselage was rectangular, the top being rounded and surmounted by a streamlined fairing behind the pilot's cockpit. This fairing, although a standard attachment, was often removed. Capt. McCudden did not have one on his machine. The top plane was in three sections, and the lower planes were attached to stubs on the sides of the fuselage. There were ailerons on both wings, and the incidence of the tail-plane was adjustable in flight. The whole machine, with the exception of the metal engine cowling, was fabric covered. On the earlier models the undercarriage was of wood, but so many breakages occurred under active service conditions that it was replaced by an all-metal structure. Hydraulic or metal-spring shock-absorbers were little used during the war, and the S.E.5 was no exception, for rubber cord bound round the axle took up the landing shocks. Another feature that was later removed was a windscreen almost entirely covering the cockpit.

The armament consisted of a Vickers gun mounted on top of the fuselage in front of the pilot, and a Lewis gun on a Foster mounting above the top plane, 400 rounds of ammunition being carried for the Vickers and four 97-round pans for the Lewis. Since the line of fire of the Lewis gun was outside the airscrew-arc no synchronisation was necessary. The guns were fired by pressure on triggers mounted on the control-stick, the Lewis gun being connected by a Bowden cable. A telescopic sight was used. In addition to the guns, four 25 lb. Cooper bombs were sometimes carried.

Various engines were used and are listed below:—

S.E.5 150 h.p. Hispano-Suiza (direct-drive).
S.E.5a 200 h.p. Hispano-Suiza (geared-drive).
220 h.p. Hispano-Suiza (geared-drive).
240 h.p. Hispano-Suiza (geared-drive).
200 h.p. Wolseley Viper (geared-drive).

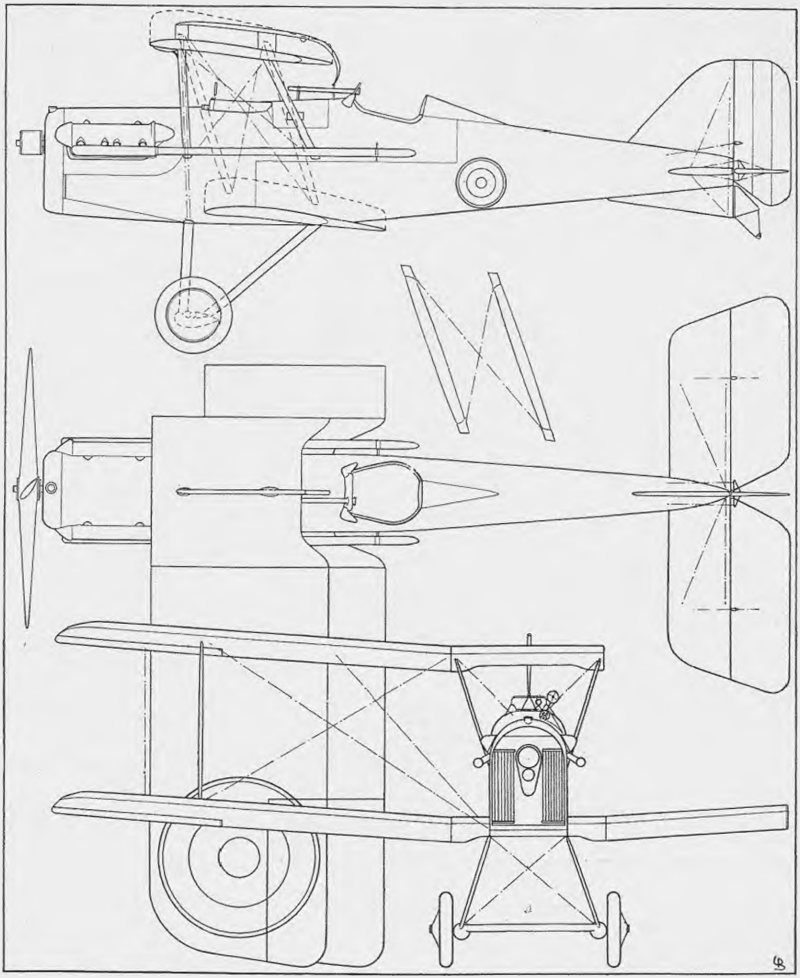
The machines with geared engines frequently used four-bladed air screws in order to promote smoother running.

Dimensions of the S.E.5 and S.E.5a were identical, except for small variations caused by the installation of the different types of engines. The main dimensions are given herewith.

Span	20 ft. 9 in.
Length	20 ft. 0¼ in.
Length (including airscrew)	20 ft. 10⅜ in.
Height	10 ft. 0 in.
Chord (both planes)	5 ft. 0 in.
Stagger	1 ft. 6 in.
Gap	4 ft. 6 in.
Tailplane (span)	11 ft. 0 in.
Tailplane (chord)	3 ft. 3 in.
Wheel track	5 ft. 0 in.

The writer has not seen any official performance figures

SCALE LINE DRAWINGS OF THE S.E.5



for the S.E.5, but it seems to be generally considered that with the 150 h.p. Hispano-Suiza engine it had a top speed of about 115 m.p.h. With the 200 h.p. Wolseley Viper engine it could do about 130 m.p.h.

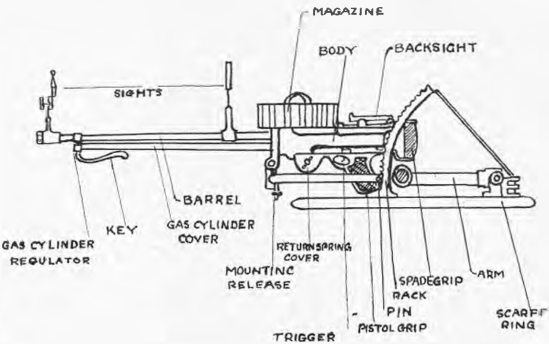
The usual British insignia were carried by all machines: two cockades on the top planes and two more on the under surfaces of the bottom planes. There were also small rings on each side of the fuselage just behind the cockpit (see squadron markings), and three stripes on the rudder. The circles were red, white and blue, the red being in the centre. On the rudder the blue stripe was next to the rudder-post.

Various colour schemes were made use of by the Royal Flying Corps. Some machines were clear-doped all over and this gave them a dirty yellow appearance. The majority had ochre wings with either dark green, blue or brown doped fuselages, all under-surfaces being cream or pale blue. The undercarriage and centre-section struts were painted grey, as were the radiator shutters and airscrew blades. The outer wing struts were usually plain-

on the nose, and others aft of the wings, either in front of, or behind, the cockades. For example, No. 74 Squadron, when it was commanded by Major Mannock, used both letters and numbers. "A" Flight had letters on the nose, "B" Flight numbers on the nose, and "C" Flight letters between the rings and the rectangular squadron markings. Since the choice and position of the various flight markings were left to the discretion of the squadrons themselves, it is impossible to give complete details of them. All the information given here is necessarily of a general nature, and many exceptions occurred.

Both Capt. Ball and Capt. McCudden had the spinners from enemy machines, which they had shot down, mounted on the airscrew bosses of their S.E.5's. These spinners both happened to be red.

The colour scheme of Capt. McCudden's machine was as follows: Fuselage dark green, also top surfaces of wings, all under-surfaces cream. The outer wing struts were varnished spruce and the undercarriage, centre-



This detailed sketch shows full particulars of the type of Lewis gun (observer's pattern) fitted to the S.E.5.

varnished, but were sometimes painted green. All details were black. The serial number was painted in white on the tail-fin and the points on the fuselage for lifting purposes were indicateed by arrows and words also in white.

Squadron markings came into force in 1916, and were allotted to all types of squadrons. In March, 1918, all markings were abolished, with the exception of fighter squadrons. The markings of some of the S.E.5 squadrons are shown in the accompanying plates, and indicate those used before and after March, 1918. The notes alongside are self-explanatory.

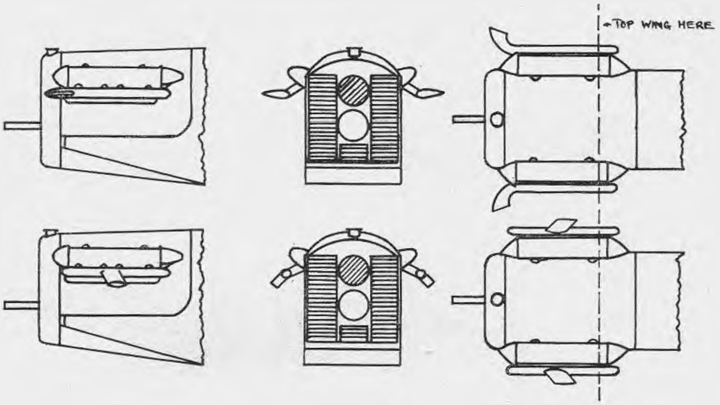
In addition to the approved markings, each squadron was allowed to distinguish the machines of its three flights either by consecutive letters or numbers. When letters were used "I" was omitted to avoid confusion with the figure "I." These identification letters or numbers were painted on the sides of the fuselage and on the upper centre-section or wings. The positions on the fuselage varied according to the flights, some being

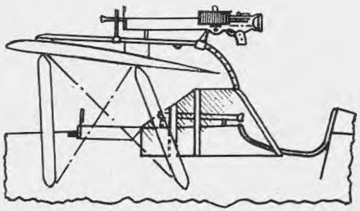
section struts, radiator-shutters, and airscrew blades were grey. As mentioned above, this machine carried a red spinner taken from an L.V.G. The serial number A 4891 appeared in white on the tail-fin. A number "6" was painted in white on the fuselage just aft of the cockades, and also on the top right-hand plane. The "6" on the lower surface of the bottom wing was black. The cockades on the top planes and fuselage, being against a dark ground, were surrounded by a line of white paint in order to make them clearer. This machine, of course, carried the markings of No. 56 Squadron, as used prior to March, 1918.

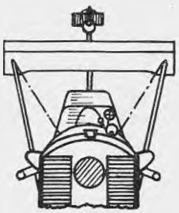
Major Mannock flew a machine with the serial number D.276 on the tail-fin in white, the "D" being above the numbers. The machine itself was the usual khaki-green, and had the letter "A" in white, on the nose and wings.

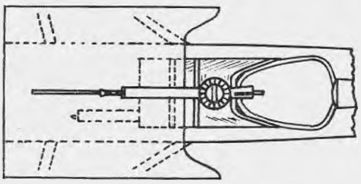
Model enthusiasts are reminded that no matter how good their workmanship may be, it will be entirely wasted unless they make a very neat job of the painting.

DETAILS OF THE S.E.5.



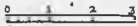






THE TWO EXHAUST-SYSTEMS SHOWN HERE WERE NOT GENERALLY USED, BUT DID APPEAR ON SOME MACHINES. THE EXHAUSTS SHOWN ON THE THREE-VIEW PLANS WERE MOST COMMONLY USED. SIMILARLY THE CELLULOID WINDSCREEN WAS NOT STANDARD, AND IT WAS NECESSARY TO SLIGHTLY ALTER THE RAIL ON WHICH THE LEWIS GUN WAS MOUNTED. THIS MODIFICATION WILL BE SEEN BY COMPARING THIS PLATE WITH THE THREE-VIEW PLANS. THE PITOT-TUBE WAS A STANDARD FITTING ON THE LEADING RIGHT-HAND WING-STRUT

ALL THE DETAILS SHOWN ON THIS PLATE ARE DRAWN TO THE SAME SCALE.



SCALE IN FEET. 3/8" : 1'

J. A. BRAMAH. 1938.

SOLID SCALE MODELS

By B. CARVER

HERE we are again! Right in the midst of another season of indoor activities. Long, dark nights and cold weather during the day, poor conditions for flying, but just the time for solids. By the time you receive this issue of THE AERO-MODELLER you will have just over a month in which to prepare models for Christmas presents. To friends interested in aircraft, a well-finished solid model will prove most acceptable, and you will have great pleasure in giving something which you have made yourself. Why not get busy *now* and have those models ready for presentation on Christmas Day? You will find the idea a wonderful success—and the cost will be very reasonable.

News of several new types of full-scale craft makes it evident that our pastime is to become more absorbing and interesting than ever. From a machine which thrilled the enthusiast alone, the aeroplane is developing into a creation of real beauty which must appeal to everyone. As a consequence, our models, in addition to their interest and appeal to the enthusiast, become objects which attract wider attention and appreciation. They become more than models—they are really artistic creations which prove most ornamental. Further, their streamlining means that they are no longer delicate dust-traps which everyone is afraid to dust, or clean.

Many clubs will be holding exhibitions during the winter months, and I would emphasise the great appeal of scale models at such displays. To the general public the average duration model is no very great attraction. In fact, it must be admitted such a model has an inherent ugliness which no amount of streamlining can ever overcome. The disproportionate propeller and landing gear inevitably give the whole a spindly and unattractive outline. As the object of an exhibition is to arouse the greatest possible interest amongst the general public, it is essential that a comprehensive collection of solids be on view. Believe me, the crowd will gather round the solids—*not* round the "durators." But club officers can do little, unless *you* do your part by providing the necessary models—so get busy!

Present-day design of military types make it imperative that the modeller should pay particular attention to the construction of cockpit-covers and turrets. These are the most difficult parts of the model and, unless well made, can ruin the appeal of the whole. The solid cover, integral with the solid fuselage, can never look really good. It is very necessary that some method of constructing a transparent cover be mastered. Cellophane, moulded, after soaking in hot water, over a suitable "form" of solid wood, is probably the best method for most types. However, this method, with framework drawn in ink on the cellophane, is little better than the solid wood representation. Some method of making the framework more realistic must be found. For this purpose you may use bamboo. The splitting qualities of bamboo are well known and, with practice, this material can be split or shredded into practically hairline dimensions. Such pieces of bamboo can be readily moulded after soaking thoroughly in very hot water, and the "hoops" of the cover should be made in this way. Cross braces are cemented between the hoops after the latter are secured in position. An alternative method is to use fine copper wire. This is easily shaped, but soldering will require considerable practice. The soldering should be done with the wire in position in grooves cut in the surface of the solid form. It is preferable to flatten the wire before use. This wire can be joined with "cold solder," should ordinary soldering prove beyond your capabilities or patience, and will prove quite durable with ordinary care.

I have seen many otherwise excellent models spoiled by detail work. I do not mean careless application of insignia, etc., but over-emphasis of detail. For instance, ribbing of wings on fabric-covered types. It is very easy to make such ribs too prominent; actually, they should protrude rather less than true scale would require. The reason for this is the proximity with which the model is viewed. Remember, to gain a comprehensive view of a full-scale machine it is necessary to stand some considerable distance away, from which viewpoint many details become rather vague. Ribs are notable features in this respect. Viewed from a distance the protrusion of ribs is scarcely apparent, therefore take care that this feature is not too prominent in your model. The same criticism applies to many other features of the model. Always remember the impression you would have of the actual machine at sufficient distance to have a comprehensive view—you would certainly not have an impression of comparatively heavy black lines at the junction of plates! Yet, these features are commonly indicated by heavy lines of Indian ink. Be content to show such lines by scoring the surface. A useful guide to the amount and character of detail desirable in a model can be easily obtained from photographs. These will show you just what the eye sees, and does not see, at distances which render the machine in similar dimensions to your model. This over emphasis of detail is common practice and spoils thousands of models.

Another common fault on models is bad assembly. Many modellers make nearly perfect component parts and then completely spoil their work by mal alignment of such component during assembly. To the trained eye this simply shrieks carelessness and destroys the value of the model. Watch the incidence of the wings and the alignment of propellers and nacelles, both in plan and side view. These are very important features in the original design, and you cannot claim to have built a scale model if you have altered all the original lay-out of the components. Maybe you think you know better than the original designer, but your object is to faithfully reproduce his design, not improve on it!

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I have just seen some really excellent scale propellers. These are available in both two-bladed and three-bladed types in various sizes. They are scale representations of modern metal propellers, and are certain to enhance the appearance of any model. They are of metal construction, and are finished in chromium plate. The finish is really first-class, and the whole piece shows very fine workmanship. Naturally, as they are plated, they are completely finished, and require no work whatsoever on the part of the modeller. If you want a super finish to your models you should certainly obtain these propellers.

A tip for securing of tailplanes and fins. There is always a risk of these being accidentally detached from the model if they are simply cemented to the sides of the fuselage. A much more secure method is to "pin" the parts together, as well as cementing. "Pins" are made from small pieces of rounded bamboo, pointed at both ends. These are simply pressed into the fuselage for half their length, and the component then pressed over the protruding half of the "pin."

Many modellers stumble when it comes to the "wells" for retracting undercarriages, and represent them by filling in an appropriate outline on the under-surface of the wing with Indian ink. I have previously stated that I do not consider the attempt to make an undercarriage which will retract a worthwhile effort, but I do consider it worth while to take trouble to make proper "wells," and not simply draw them in ink. Admittedly, the operation is not a simple one, and may be very difficult with suitable tools. In last month's issue of THE AERO-MODELLER an ideal tool for the work was advertised. This is a small power-driven tool, handy for the job and capable of a multitude of operations connected with solids. With such a tool you can do any amount of "hollowing-out" with speed and precision. Besides its many applications in solid activities, it would have many uses in flying model construction, notably nose-blocks. Such a tool would be of immense benefit to any serious worker; the price is, perhaps, a consideration, but why not see what Father Christmas can do about it? I have not used this particular tool, but I must confess that I should be greatly handicapped if I did not possess a power-tool which I adapted for such purposes from another machine. Actually, the tool advertised is a great deal handier than my adaptation, and I now covet such a tool for myself. Any reader like to be a kind Father Christmas to this toiling scribe?

Well, the pen is running dry and space is defined, so I must close down for this month. By the time you purchase your January issue you will probably be in a rather lazy, contemplative mood—such is Christmas and scarcely your usual, active self. In such a mood you would probably like to examine the efforts of fellow modellers, rather than make any notable efforts yourself. Therefore, I make an appeal. Will any reader who has a good photograph of a solid send me a print *at once*. Remember, this journal goes to print for the next issue a few days after you receive your copy of current number. Therefore, prompt action is essential. Send me your photographs at once, so that we can print a selection in the January issue, and readers can sit back in their easy chairs on Christmas Day and admire and be inspired by the efforts of their fellow enthusiasts. Please! I know you have some good models—let the other fellow see them. Remember, also, photographs should be clear and distinct.

Greetings and Good Wishes

to all Aero-Modellers and Aero-Model Dealers, from SCALECRAFT. May we take this opportunity to greet all our many friends and to thank all those Modellers who have been so kind as to write and congratulate us on our kits? Our thanks also to all our retail friends for the support they have afforded us. In the New Year it will be our aim to cement all our friendships by a continuance of our policy of offering British Kits of unsurpassed value, accuracy and quality—plus that little something: SERVICE.

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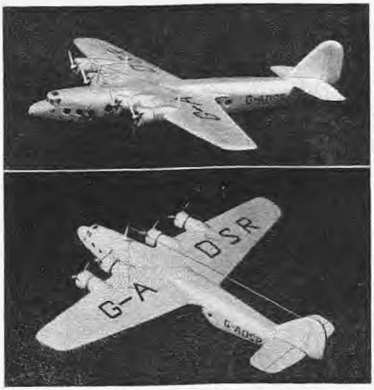
MORE "SOLID" HINTS AND TIPS

By JOHN LANG



This solid model of the "Ensign," Imperial Airways latest air liner, was built by Mr. S. D. Marsh, Aero-model Staff Draughtsman.

A CORRESPONDENT in a former issued advised trying doping a former with clear dope to make cockpit covers. One way of doing this is to make the former of candle grease and smearing Durofix glue over it. I have tried this and find it to turn out satisfactorily. It may need one or two coats to produce a coating that is thick enough. As this glue is supposed to be quite heat and waterproof it is simple to remove the wax by warming.

One way of making cabin windows on either military or commercial planes is by making a shallow pit the shape of the window, but a trifle larger all round. Cut out a piece of celluloid to the shape of the window and the right size. This should be cut with a knife and the edges bevelled, so that the inside is a trifle larger than the outside. Smear a thin coat of glue in the pit and press the celluloid firmly in place. When the glue is set take a piece of plasticine and using it as putty, fill in the groove which has been left all round the celluloid, smoothing it all off flush with the knife or finger. This plasticine will keep the celluloid in place because of the bevel on the edge of it.

These windows are difficult to paint round when finishing the model. If a piece of tissue paper is cut to the shape of the windows and stuck on with a cheap liquid glue that is *not* waterproof it can be removed easily by sponging with water after the painting is finished. This tip brings into use modern industrial ideas (masking tape used in motor body finishing). Needless to say, the model must be constructed with waterproof glue, or great care must be taken in the soaking of the paper.

As several modern fighting planes are fitted with stainless steel interplane struts it seemed necessary to find a method of making them look real on models. Aluminium paint or dope does not give the right impression. Cut off a piece of wire long enough to make the strut and allow a tang to fix in each wing. Measure the gap and cut off a strip the right width from a piece of silver paper (cigarette wrapping or chocolate wrapping). Glue the wire at one end of this strip and let the glue dry, then roll the wire carefully along the silver until the roll is a bit smaller than the fore and aft dimensions of the struts. Cut off the remainder of the paper and secure the loose end with glue. When this is set flatten the paper slightly. When several of these struts are in place it will be found that they relieve the drabness of aluminium paint.

Hawker planes and others have the nose covered with plates, while the wings and tail are covered with fabric. Therefore, there should be a difference in the colouring of this. The nose looks quite well if covered with silver wrapping paper, such as is used for the struts. It can be rubbed out smooth before applying, and must be rubbed well when being applied to the fuselage. It should not be beyond the powers of aero-modellists, for I have seen a model of Eyston's "Speed of the Wind" covered in this manner, and the nose of a plane is more streamlined than the body of this car.

Townend rings can be made of a ring of stout paper covered with silver paper in this manner. On small models a layer or two of silver may be found to be stiff enough without the stout paper ring. If this can be dispensed with it will be easier to shape the ring correctly.

The scalloped edges on many of the war-time machines are difficult to portray neatly on models. The smallest difference in the depth from front to back is very noticeable, as is any difference in width. The little jig described will make almost perfect scallops on any wing, of almost any size.

The drawing makes the construction quite clear, and it will be seen that it consists mainly of Meccano parts. The base is a Meccano flat plate. On each side are bolted two upright strips and across them another strip. This cross strip may be bolted at any height, but one side must be one hole higher than the other. An angle strip is bolted across the middle of the base. A block of

hardwood is then cut to a suitable thickness to bring the wing up between the crossbars. A Meccano crank is threaded through the holes in these bars when adjusting the block, so that the trailing edge of the wing touches this crank and prevents the block from touching the angle strip.

When all this has been adjusted to suit the wing to be treated, a strip of fine glasspaper is stuck on to the crank. To use this jig the wing is pinned on to the block, which is pushed under the sandpaper covered crank so the crank comes directly over the position of the scallop. The crank is turned gently and the block pushed towards the angle strip on the base.

It will be seen that the angle will act as a depth gauge and the block being the same thickness along its length the scallops will be bound to be all the same.

This jig may be used for any scale model, but must be adjusted according to the scale and the particular model. If the block is made long enough the projecting end may be marked with the width and the scallops and then pushed along so that these marks coincide with the end of the plate for each scallop.

Should the wings be of the Fokker or Albatross pattern, i.e. of varying chord, they can be treated in this jig by marking the angle on the block and putting the wing along this line instead of square along the block.

THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS MONTHLY REPORT

Notes on a Council Meeting of the S.M.A.E., held by kind permission of the Royal Aeronautical Society, in their Library, Albemarle Street, Piccadilly, on Wednesday, October 12th, 1938.

Dr. Thurston took the chair.

The minutes of the previous meeting were read and confirmed.

In the correspondence was a letter from Messrs. Letts, the diary publishers, in which they suggested that the S.M.A.E. might care for a 1939 diary. The Council discussed this, and decided that an S.M.A.E. diary should be issued, the matter being left in the hands of Mr. Cosh.

A letter from the Southport and District M.A.C. was discussed, and it was decided to reaffiliate the club as from April last, and that the Pilcher Cup be held by the Southport Club.

The following clubs applied for reaffiliation :—

Liverpool M.F.C., with 16 members.

Short's Sports Club, Model Aero Section, with 30 members

These clubs were reaffiliated.

The Hayes and District M.A.C., in applying for reaffiliation, stated that their members totalled about one hundred. The Council could not accept this approximate figure, and requested that the exact number should be applied, according to General Rule 7. The Northern Heights' balance sheet had been received, and they were reaffiliated.

Alterations to timekeepers and Council delegates were made to the following clubs :—

Liverpool M.F.C.
Kingston and District M.F.C.
Birmingham M.A.C.
Woking and District M.A.C.

In the list of timekeepers submitted by Northern Heights M.F.C. was the name of Mr. H. Barber. This gentleman is to be called before the Council *re* the timing of the Wakefield Trials. The Northern Heights M.F.C. were requested to submit another name in place of this gentleman pending the Council's decision. Cranwell M.A.C. requested that they might be allowed three extra timekeepers, owing to the fact that their timekeepers were liable to be on duty or suddenly posted abroad. After some discussion, the Council decided that in the case of a Service club three deputy timekeepers would be allowed.

The Council next discussed the necessity of sending a team in 1939 to America to compete in the Lord Wakefield International Trophy Competition. It was decided that a fund should be launched, and the following gentlemen were elected to organise the appeal :—Messrs. A. F. Houlberg, L. J. Hawkins, J. R. Blunt, C. S. Rushbrooke, J. C. Smith and H. York. Mr. York asked to be allowed to resign from the Exhibitions Committee so that he might give more time to the Wakefield Cup Fund. The resignation was accepted, and Mr. R. T. S. Gillette was thereupon elected to the Exhibitions Committee

The Schoolboys' Exhibition, which will be held from December 31st, 1939, to January 14th, 1940, was next discussed, and the matter was left in the hands of the Exhibitions' Committee.

Dr. Thurston then read some letters which had passed between himself and Monsieur Wibault, President of the C.I.M.R.A., *re* the S.M.A.E. letter on the Wakefield Cup Contest. A discussion lasting well over an hour followed. The Council finally decided to place the matter in the hands of a special committee composed of

responsible officials. The following gentlemen were thereupon elected :—

Dr. Thursten, President.
Mr. A. F. Houlberg, Chairman.
Mr. E. F. H. Cosh, Hon. Secretary.
Mr. L. J. Hawkins, Hon. Treasurer.
Mr. J. C. Smith, Hon. Competition Secretary.
Mr. R. N. Bullock, Vice-Chairman and Hon. Technical Secretary.
Mr. H. York, Hon. Press Secretary.

The Council passed a vote of confidence in Mr. Cosh, and stated that the committee were not to detract from the original letter sent to the C.F.M.R.A.

The Area Scheme was then debated upon. Mr. Cosh stated that in spite of him requesting clubs to send in their vote, 44 clubs had not replied. Those clubs that had replied showed a good majority in favour of the scheme. The Area Committee were thereupon requested to carry on investigating the possibilities of the scheme, and to report at an early date.

Owing to the urgency of various matters which the Council had had no time to discuss, another Council meeting was called for October 19th. Mr. J. C. Smith was requested to bring forward at the next meeting any suggested alterations to the 1939 competitions.

The meeting closed at 11.25 p.m. with a vote of thanks to the chair.

H. YORK,
Hon. Press Secretary.

Notes on a Council Meeting of the S.M.A.E., held by kind permission of the Royal Aeronautical Society, in their Library, Albemarle Street, Piccadilly, on Wednesday, October 19th, 1938.

Dr. Thurston was in the chair.

The minutes of the previous Council meeting were read and confirmed.

Yorks. M.F.C. wished to know whether they could have four grounds for flying petrol models. The Council decided that if each of these grounds were suitable they would in all probability consent to their use.

The special committee set up to deal with the Council's letter to the C.F.M.R.A. next gave their report. Dr. Thurston read a letter suggested by the committee, and after considerable discussion, the Council passed this letter.

The Wakefield 1939 Competition was then brought before the Council, and in an endeavour to restrain competitors from pushing their models, various methods of launching were proposed. The Council finally decided that in launching 1939 Wakefield models, only the propeller and wing-tips should be held. Suggestions were put before the Council to make the Wakefield a team contest. This motion was defeated, but the Council passed a vote that a supplementary prize should be given to the winning team.

The meeting closed at 10.15 p.m. with a vote of thanks to the chair.

H. YORK,
Hon. Press Secretary.

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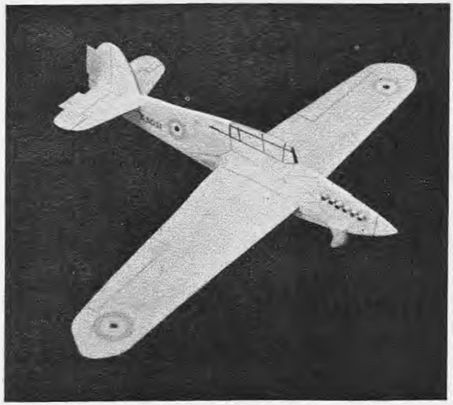
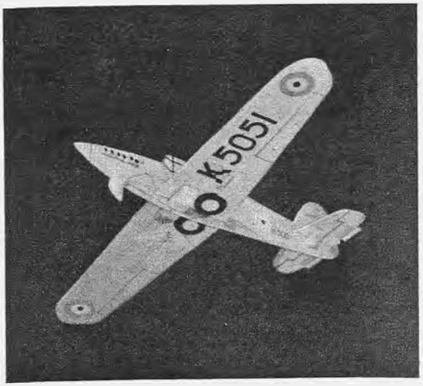


USING THE COLOURED PLANS GIVEN AWAY FREE WITH THIS ISSUE

THE model about to be described has proved itself to be a steady and consistent flyer, and when launched by means of a catapult will remain in the air for a considerable time. For the beginner or an aero-modellist with a little time to spare it is ideal. Designed from the famous Hawker "Hurricane" fighter, besides being a good flyer, it is "easy on the eye," and costs very little to construct, while the few tools required are of the kind most model-makers possess.

First of all, assemble your tools and obtain the materials as per the list printed at the end of this article.



Next, carefully cut out the top and bottom of the wing, both sides of the fuselage, tail-plane, etc., *leaving a margin of about* $\frac{1}{16}$ *in. all round the printed outline*, from the coloured plans given free with this issue of THE AERO-MODELLER.

Then carefully gum the *top* of wing sheet to the piece of 18 in. × 3 in. × $\frac{1}{32}$ in. balsa, using as little gum as is possible, and taking care to smooth out all wrinkles in the paper. Then, with a sharp razor blade, cut round the outline of the wing. Next gum the sheet for the underside of the wing on the other side of the sheet of balsa, taking care to see that the outlines coincide. Trim away surplus paper.

Now proceed in a similar way with the two sides of the fuselage, making quite sure that the outlines coincide.

Next cut the slot for the main wing; and, after carefully bending and steaming the correct dihedral into the wing, slide it through the slot in the fuselage; cement in position, and fix the support blocks.

Proceed in a similar manner with the tail-plane, adding the supports and checking that everything is set up "true."

After this the catapult hook is made, which is a piece of pine or a harder wood, cut to the shape shown, with a $\frac{1}{8}$ in. slot in the top, that gives a tight fit on to the fuselage. This should be *glued* in place.

Apart from the weight in the nose, the model is now ready to fly. The right weight can only be determined by experimenting with the plane, launching it by hand, adding more weight if the nose goes up. Do not forget to keep the trimming tabs straight while you are doing this. As soon as you obtain a flat glide without stalling everything is ready. The catapult has been made by attaching a stout rubber band to a length of dowel rod, so you take them both out to the middle of a large field.

When launching, incline the 'plane upwards into the wind, when it will wise steeply, and give a good flight, under normal conditions circling round in a wide arc down to a gentle landing. On several occasions, however, the model has remained almost motionless, whilst at other times it has soared up again after descending several feet.

LIST OF MATERIALS

Sheet of balsa, $\frac{1}{16}$ in. × 3 in. × 11 in., fuselage; sheet of balsa, $\frac{3}{32}$ in. × 3 in. × 18 in., wing; sheet of balsa, $\frac{1}{16}$ in. × 2in. × 8 in., tail-plane; block, 2 in. × $\frac{3}{8}$ in. × $\frac{1}{2}$ in.; block of pine, $\frac{3}{4}$ in. × $\frac{1}{4}$ in. × $\frac{3}{4}$ in., catapult hook; length of dowel and a stout rubber-band catapult, tube of cement, a little glue, a length of cane, some patience and common sense.

BUILD A SCALE MODEL OF THE "HAWKER HURRICANE"

By G. B. ATKINSON

THE "Hawker Hurricane" is a high-performance single-seater fighter, designed specifically for the defence of Great Britain. The actual performance figures are not yet made public, but its recent flight to Edinburgh (in spite of the tail wind) will give one a good idea of its performance.

The actual figures issued so far are —

Speed at 16,000 ft.	330 m.p.h.
Service ceiling	30,000 ft.
Cruising range	900 miles.
Tare weight	4,400 lb.
Gross weight	6,000 lb.

Equipped with the "Rolls-Royce Merlin" II. 1,050 h.p. engine.

Construction Templates.

This model may be cut from wood or built up from a kit. If the former is done you will have the pleasure of knowing that the entire model is your own work. If the latter, much time will be saved but a little expense incurred. Let us imagine that we are going to make the whole thing from the very beginning.

Trace out the side elevation and plan of the more important parts, and stick them on suitable-sized blocks of either Canadian spruce or pine (actually any of the deciduous woods will prove satisfactory). Now cut round these outlines carefully, and shape up the resulting outline blocks.

Fuselage Construction.

First obtain the correct shape with coarse sandpaper. Then get the required finish with fine sandpaper. Give it three coats of cellulose, with a rub over with fine glass-paper in between each coat. Remove the cockpit and fit all details. (System shown in the diagram). Next scour the rib lines along the sides of the fuselage with a compass point, make the runners for the sliding wind shield smooth, and ensure that the nose is the right size to take the boss. The flame dampers are best made from a piece of celluloid sanded to shape.

Wing Construction.

Shape the wing with a sharp knife, and finish the same as the fuselage. Small slits must be cut to take the flaps, and the ailerons must be removed and fitted with aluminium hinges to make them operate. After the final coat of cellulose the wing ribs are marked out and scoured with a compass point. Such details as navigation lights and gun ports are now fitted. The wing is finally given one coat of dope to ensure a perfect finish.

The Tail Unit.

This is usually made of celluloid or fibre, and is shaped with a file and sandpaper. Otherwise it is treated exactly the same as the wing.

The Airscrew.

The airscrew may be made either from a solid block of wood or laminated from two or three thicknesses.

Landing Gear.

This may be fixed either retracted, or out. It can be made to operate. The main body of it is made from thick sheet aluminium streamlined with a file. The wheels are usually bought, as this saves a lot of trouble. The retracting gear shown in the diagram should not be attempted by any but experienced modellers. (A small flange must be cut in the wing to ensure the flush fitting of the wheel well cover).

Assembly.

Firstly glue (preferably with a cellulose adhesive) the wing to the fuselage, then the tail plane and rudder into their slots. Now fair in them all with plastic paste or wood; if a reasonable amount of moisture is added to the

plastic paste it will be found easier to work. These fairings should be made to merge perfectly into the fuselage, as the lines of the model depend on them to a large extent. The tail unit fairings should not be too large, as this would tend to make it look unwieldy. Now fit the undercarriage and tail wheel, then lastly the radiator and air intake. The whole thing is now given a light coat of very fine glasspaper and a coat of dope.

Painting.

Difficulty is usually experienced in this type of machine in obtaining a good flat finish. Reeves produce a paint known as "Flatone," which will serve, with a little doctoring, admirably for our purpose. The doctoring process is as follows. By experiment with light green, black, and a touch of red, make a shade that is slightly too light for the purpose. Then tone it with a little *ordinary* blue enamel, the resulting colour should be a lightish olive. For the brown part of the shading this process is repeated, but with red, green, and toned with *ordinary* yellow enamel. The under surfaces are painted one half a chocolate brown, and the other a light cream. These colours are used one on the other for the identification numbers. Final detail is added in Indian ink (numbers on the sides, etc.).

(The actual system of shadow shading can be obtained from photographs and some of the aeronautical periodicals).

If anyone has any difficulty in carrying out any of the ideas portrayed in this model, if they would communicate with me I shall be only too glad to assist.

The final brown should be slightly darker than khaki.

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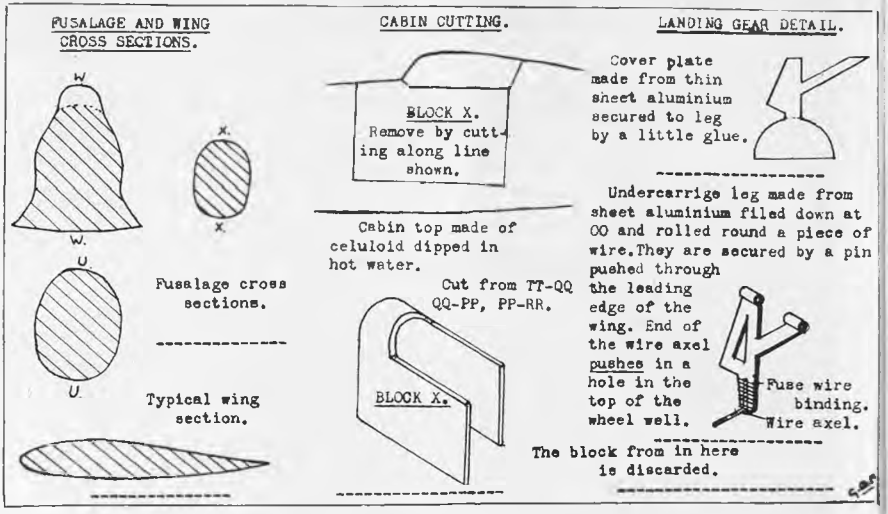


MORE LETTERS TO THE EDITOR

DEAR SIR,

It is with very grateful thanks that I am acknowledging receipt of your letter of September 16th, 1938, and of the magnificent silver cup which was forwarded under separate cover.

That a lady so well known in aero-modelling circles should take an interest in our club to the extent of giving us the trophy, is very encouraging to all our members, and when its receipt was announced at the flying meeting held yesterday afternoon, the excitement was intense. Our club has been through a trying year, and we are now well established on a firm footing, although the degree of financial support is one of our biggest difficulties. The obvious need for a trophy has worried the organisers for a long time, and with this magnificent gift our principal troubles have now been ended.

In thanking you personally for your assistance in the matter, I should also mention that THE AERO-MODELLER is the most popular publication read by our members.

Yours sincerely,

R. F. DUBERRY,

Hon. Sec. Batley and District M.A.C.

[This letter acknowledges receipt of a silver cup, which a certain lady, not entirely unrelated to the President of the Society of Model Aeronautical Engineers, sent to us with the request to forward it to the Batley Club, with her good wishes.—ED.]

DEAR SIR,

As it appears that a number of readers are building the duration models described in my recent articles, it may be of help if I mention that the smaller model should be fitted with an 8 in. diameter air-screw, with pitch of from 8 in. to 12 in., and that the larger model should be fitted with a 16 in. diameter airscrew with pitch from 16 in. to 20 in.

The small model should be powered with from 4 to 6 strands of $\frac{1}{8}$ in. flat rubber, and the larger model should have 10 strands of $\frac{1}{4}$ in. flat.

Yours faithfully,

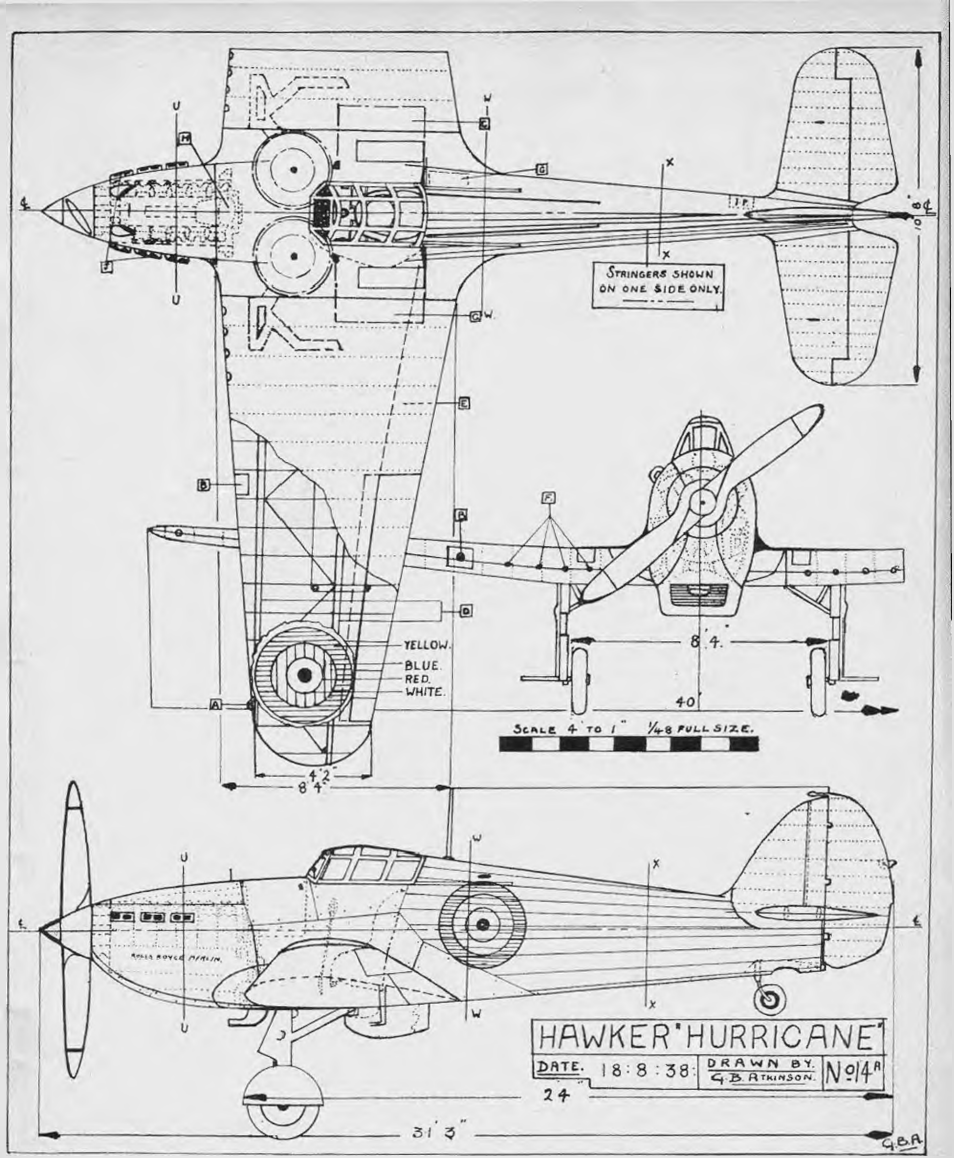
HOWARD BOYS.

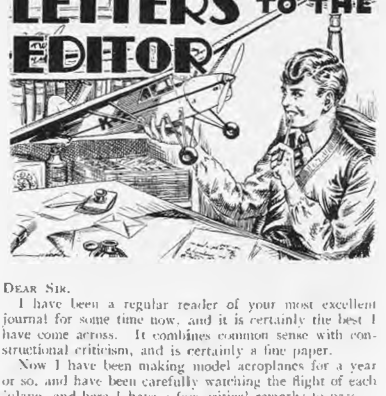
DEAR SIR.

I had the great pleasure of being a competitor in the "Frost" Trophy Competition held at Fairey's on Sunday, August 28th. And it certainly was a pleasure. I have never seen a better organised petrol competition. What a difference the length of rope made. All the spectators stayed behind it. The organising staff were efficient and courteous; such a difference to some competitions.

And Mr. J. C. (Golden Voice) Smith excelled himself, with his witticism and useful information for both spectator and competitors alike. One little point which demonstrated the careful thought given to details was the provision of leaflets enabling one to follow the results of the competition. This is the type of competition needed; it will bring out the best in models and modellers. Congratulations Hayes and District, and many thanks, Mr. Frost.

R. J. O'NEIL,
Surrey Model Aero Club.


STRINGERS SHOWN ON ONE SIDE ONLY.
YELLOW.
BLUE.
RED.
WHITE.
8' 4"
40'
SCALE 4' TO 1" 1/48 FULL SIZE.
4' 2"
8' 4"
ROLLS ROYCE MERLIN.
HAWKER "HURRICANE"
DATE. 18:8:38
DRAWN BY. G.B. ATKINSON.
No 14A
24'
31' 3"
GBA



DEAR SIR,

I have been a regular reader of your most excellent journal for some time now, and it is certainly the best I have come across. It combines common sense with constructional criticism, and is certainly a fine paper.

Now I have been making model aeroplanes for a year or so, and have been carefully watching the flight of each 'plane, and here I have a few critical remarks to pass.

Do these 'planes which we construct really fly, in the sense of the word, as we know of flying to-day. To me there is what I call *true* flying and then gliding, and there is, I think, some difference in these two words—flying and gliding.

Take, for instance, the duration type of 'plane, which has the camber on the under surface of the wing. This type of plane is *powered* by elastic and propeller. We hear of some remarkably good flights of these planes, but they are apparently dependent on thermals, plenty of breeze, or other favourable atmospheric conditions, and one apparently wants a fair slice of Old England to fly them in.

One reads of Mr. —— having put up so many minutes' flight, and then his 'plane vanishes out of sight. Now is there any achievement in this? Bearing in mind that the 'plane was caught by an upward current I feel that the 'plane has *not* been flying on its *own* merits. Personally, the fact that I had lost a 'plane like this—well, I don't think it would thrill me very much. I rather think it would annoy me.

Now this is where I wish to state my own case. I am a "Lincol" fiend, and here may I congratulate Messrs. Linfoot and Cole on what I think is a truly aerodynamically well-designed 'plane. I have been experimenting with a "Lincol" for some time now, and have not come across anything to beat it for actual flying performance.

I have increased the wing area by some good few inches, and now I have a 'plane which has a very fast climb and good altitude, not dependent on thermals or wind for this.

In my opinion, records created in windy weather are of no account, for I claim that a machine flying in such weather is *not* flying—it is only *blown by the wind and that is not flying.*

Personally, the calmer the air, the better results I can get, and furthermore, I don't have to go tearing across the countryside after it.

Where we fly here space is definitely limited, for Shropshire, as a county, is rather heavily wooded everywhere. One has to *control* one's flight or up the trees you go.

My argument is this: I should like to see the style of *flying* improved. The flight of the duration type I can hardly describe. You cannot call it *flying* when a 'plane is at the mercy of all and sundry air currents and is *dependent on them* for its duration. The type of flying I like to see is that done in *still* air, and where a machine is flying solely on *its own* constructional merits.

In my opinion the Lincol will do this.

I don't know what other aero-modellers think. Perhaps an exchange of ideas might be of interest?

Yours truly,

G. R. PUGH.

DEAR SIR,

Thank you for the information contained in your letter of the 12th.

I should like to take this opportunity of saying how much more interesting model aeronautics has been to me since I first purchased THE AERO-MODELLER in January of this year and later found, much to my delight, the very articles I had always looked for, namely, those of Mr. Boys, whose very clearly written articles have enabled me to build my first model aeroplane.

Yours very truly,

Shepherd's Bush, London. S. J. SMITH.

DEAR SIR,

I thought that it might be of some interest to you to hear that I have built a "Kirby Kite" from the plans issued in your journal; a very interesting one, if I may say so.

To those who find it difficult to scale up it may be worth noticing that I began on this model on the Saturday evening, Aug. 13th, 1938, and had the model ready for flying at the Brighton Club's Gala meeting on Sunday, August 21st, 1938. I have never tried to scale anything before, and, in fact, I did not start building models until the beginning of this year.

Mr. Rippon, who was at the meeting, was kind enough to pass some very complimentary remarks about it. It flew very well indeed, being launched by catapult made of $\frac{1}{16}$ square rubber. Unfortunately, I did not have any time flights, as the watch-keepers had a very busy day with the competitions.

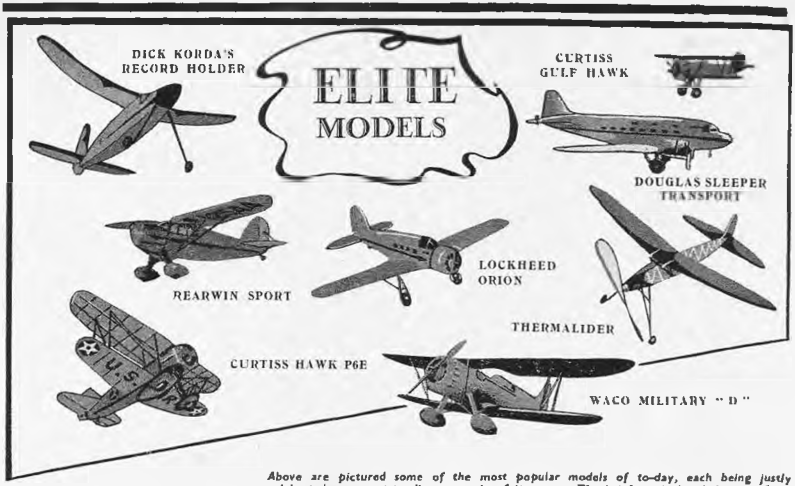
If an amateur may be allowed to pass criticism on such experts as yourselves, I have one or two things to say about the construction of this model.

I think that there must have been a mistake in the translation, for I found it quite impossible to do any good with cane as a T.E., or as a L.E., so I made the L.E. of $\frac{1}{8}$ birch round section, and the T.E. of $\frac{1}{16} \times \frac{3}{8}$ and this withstood some very heavy bumps in the initial flights. Also, the gap between the bottom stringer and the first of the top three stringers is so great that it makes it very difficult to know just where to hold it for launching. To get over this difficulty I have put in two panels of $\frac{1}{16}$ sheet just behind the T.E. Apart from these minor details, it is a very fine model, and has completely killed my interest in power models. From now on it is gliders and more gliders for this lad!

Here's luck to the best journal pertaining to the model world.

Yours truly,

Drayton, Portsmouth. D. H. BALDWIN.



Above are pictured some of the most popular models of to-day, each being justly celebrated as an outstanding example of its type. The brief particulars below are from our 1939 Catalogue—just published and post free to you for 2d.

THE FAMOUS 'BURD' KITS IN SIX SIZES

All post free

18-inch span. Six models. Mr. Mulligan, Fokker D7, 1936 Stinson Reliant, Curtiss Hawk, Ryan ST., and Curtiss Robin	1/3
25-inch span. Six models, including Consolidated P30, Waco Military "D," Monocoupe, etc., Westland Co-op. Grumman Fighter	2/3
30-inch span. Douglas Observation, Mr. Mulligan, Boeing P26a, 1936 Stinson, Aeronca C70, Curtiss Gulf Hawk	3/3
36-inch span. Douglas Sleeper Transport; movable controls, retractable landing gear. Fine model	12/6
50-inch span. Curtiss Hawk, Pfitz. Aeronca K, Ryan ST.	6/6
66-inch span Fairchild 24. Two other models. Include 12-inch propeller, ready cut out ribs and shaped cowl where needed	9/6

GWYN Aero Motors Stocked

DOUGLAS SLEEPER TRANSPORT. 36 in. span, 24½ in. overall. Movable controls from cockpit, true cabin interiors, retractable landing gear, two hand-carved finished propellers, **12/6** post free.

DICK KORDA'S WORLD RECORD HOLDER. 54 min. at Detroit. 43 in. span. 38 in. overall. A Wakefield type within the reach of all. **6/6** post free.

CURTISS GULFHAWK. A fine 30 in. "Burd" model you will be proud to own. The value of these "Burd" kits is remarkable. **3/3** post free.

THE THERMALIDER. A remarkably consistent endurance model, earning praise wherever it is flown. 30 in. span. **3/3** post free.

CURTISS HAWK P6E. 50 in. span. The name "Burd" behind this model is a guarantee of satisfaction. Price, only **6/6** post free.

WACO MILITARY "D." A remarkable model at a remarkable price. A fine flying model. Kit is very complete, yet only **2/3** for a 25 in. model.

LOCKHEED "ORION." Build this plane with Selley-Tex moulded material. Lighter than balsa yet practically indestructible. 20 in. span. Fine performance with this model is the rule. **8/-** post free.

REARWIN SPORT. Another Selly-Tex Model. Finished in red and silver, this is a splendid little plane. 16 in. span. **5/-** post free.

DEALERS, APPLY FOR TERMS

ELITE MODEL
AIRPLANE SUPPLIES
14, BURY NEW RD. MANCHESTER
& 45, TAMWORTH AVENUE, PRESTWICH

AT THE SIGN OF

STUDIETTE Handcrafts this month bring to your notice four kits of their own manufacture.

The Studiette "Tutor Mk. 1" duration model is an entirely new design, and incorporates various new features in the construction of this type of aircraft.

Worthy of note is the Studiette Special Spring Assembly Landing Gear; an ingenious method of making, in the shortest time, a landing gear both light in weight, and capable of withstanding very hard knocks. It is readily detachable, and should it suffer damage, can be remade in about five minutes, without the use of tools.

The construction of the model is very easy, as all parts (wherever possible), are built flat on the plan. Down-thrust and side-thrust are incorporated in the nose-block by a simple adjustment, and an efficient but simple free-wheel attachment is used. No soldering or difficult operations are needed, and the whole plane could be constructed on the diningroom table.

The Miles "Magister" R.A.F. Trainer forms the subject of another kit advertised, and is a 12 in. span flying scale model. Studiette claim that it is the easiest and quickest built model of the type yet produced.

Features are a semi- "slab-side" method of fuselage assembly, which ensures accurate shape with ease of construction. The "printed-out" sides show correct positioning of wings—a detail which is not always so easy to determine on scale models.

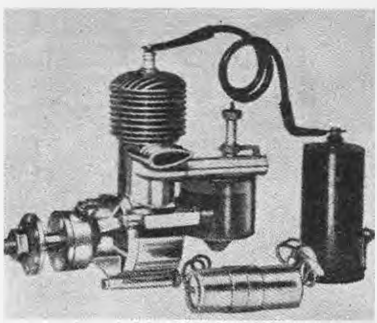
Endurance is not, of course, a strong feature of such small scale models, but satisfactory flights have been obtained with the test model which Studiette built.

* * * * * *

Messrs. Model Supply Stores, of 17 Brazennose Street, Manchester 2, are probably well-known to most of our readers as one of the oldest houses in the trade dealing solely in model aeroplane kits and materials, and their issues of new catalogues are always looked forward to by the model-maker, not only as a catalogue, but for its reference purposes. Their 1939 issue is just off the press, and we would recommend all readers to send for this at once, as the demand is sure to be very heavy. It is profusely illustrated and well worth the 4d. stamp requested. This new issue contains full details of the new miniature gas model kit—the "Eaglet." This is one of the famous Scientific Co.'s kits, and is complete in every detail, with plentiful supply of all materials, full-size plan, and instructions, etc. Also included are genuine M. and M. air wheels. The kit sells at the extremely low price of 26s.: less engine. The total span of this model is only 44 in., with the surprisingly low weight of 17 oz., with motor. Another new line from this house is the "Brat" baby petrol motor. This motor is particularly recommended by them for the above machine, and was selected after testing various makes of small motors, for its wonderful performance and excellent finish. The engine only weighs 3¼ oz., has a bore of ½ in., and stroke of ⅝ in. Total height 3 in., and is rated at 1-10th h.p.

* * * * * *

Aer-o-Kits, 135 Scotland Street, Sheffield, inform us that the Ohlsson "23," smaller edition of the popular "Gold Seal '38 Ohlsson," is now available. The "23" is of 1·7th h.p., and the weight of the motor, less coil and condenser, is only 4½ ounces. It is ideal for introducing into any type of machine from 40 in. to 54 in. wing span, and even larger models. The general appearance of the "23" is very impressing, as all parts of the assembly are of clean precision lines. The overall



The 1·7 h.p. Ohlsson "23" petrol engine.

dimensions are 8$\frac{3}{16}$ in. high by 4½ in. long, and as in the "Gold Seal '38," the special clear composition gas tank is incorporated. Every motor is fully tested before leaving the manufacturers, and perfect results are assured.

Stocks of the "Golden Eagle 40" wing span gas model kit are now available, and for the low sum of £4 18s. 6d. you have a perfect flying machine, complete with the "Ohlsson '23." Features of the "Golden Eagle Standard Kit," which retails at 21s., are very attractive: ribs are die cut, shock absorbing bent music-wire landing gear, motor mount ready to instal, detachable wing and tail unit, three view plans with full size patterns, plus many other accessories of outstanding quality. This model can be flown as a high wing, mid wing, or low wing monoplane. This feature alone will be of special interest to all builders.

* * * * * *

Mr. J. W. Kenworthy, 127c Hankinson Road, Bournemouth, asks us to point out that he supplies only to the trade. Amongst his latest "lines" are the Mars Propellers, which comprise no less than eight different types, in both two-bladed and three-bladed; in addition two types of metal props. for scale models are stocked.

A range of tissue paper includes the usual coloured Jap tissue, and a New Light-weight Bamboo Paper. This is transparent and very light, and is stocked in all the usual colours, indeed, the colours are really bright, and I venture to say that this paper, which has been named "Superlite," will, once it has been used by the modellist, supersede the ordinary coloured tissue. The price has now been reduced to 8d. per sheet retail, and when the size of the sheet is taken into consideration it is actually cheaper than the usual coloured tissue.

A new line is a winder for elastic motors. Phosphor-bronze gears screwed and hard soldered to the shafts make it possible for the largest motor to be wound. Two types are listed, one for large motors, and the other for small motors. Incidentally, they are small enough to fit the pocket. The gear is 5 to 1.

THE WINDSOCK

Attention is drawn to Le Page's Transparent Waterproof Cement, Le Page's Liquid Glue, and Grip-spreader Gum. The former is a medium quick-drying clear cement specially designed for light and heavy balsa woodwork. When once set the joints are unbreakable, but just that latitude required for final adjustment is present while the cement is setting. The self-sealing tubes with pin stopper keep the cement fresh and usable right down to the last drop.

The power job enthusiasts will ensure success with their "gas" jobs, where a larger proportion of the harder woods, such as birch, spruce, etc., are required, by using Le Page's Liquid Glue. There is a really *liquid glue*, with a world-wide reputation of over fifty years' standing. For wing covering with silk fabric this adhesive has no equal.

When covering with bamboo paper, Japanese and other tissues, Le Page's Gripspreader Gum has proved a real boon to the aero-modeller. This gum is put up in handy 6d. bottles, with a specially designed rubber spreader top, which facilitates easy, even and quick distribution of the gum on necessary surfaces.

* * * * * *

Model Aircraft Stores, Bournemouth, write to us, saying:—"We pride ourselves on the tremendous improvement that we have made in the Spitfire 2·5 cc. engine. Early in the year we set ourselves the task of making the Spitfire the finest engine in the very small cc. class, and despite many annoying setbacks we have achieved our object, for we say, without fear of contradiction, that the Spitfire is the leading small cc. engine in the world. Let us remind you of the 'On Test' article in this journal a few months ago, and since then we have received numerous letters of congratulation from well-known petrol modellists."

* * * * * *

Attention is drawn to a new improved glue in powder form, put on the market under the trade name of "Casco" Waterproof Glue, by Leicester, Lovell & Co. Ltd., 14-18 Nile Street, London, N.1. This glue will be found advertised in our issue to-day on page 63. It is available in small containers at a price from 6d. upwards.

"Casco" Waterproof Glue appears to have a casein base, and is guaranteed by the manufacturers to pass the Air Ministry specification, 3.V2. Being thus suitable for full-size aircraft, it should also fully satisfy the aero-modeller, for whom definitely only the best is good enough. More than its actual impressive strength, the builder of model aeroplanes should appreciate the permanence of the bond secured by this glue, which is both water resistant, oil resistant, and heat resistant, without any tendency to crystalize, and thus develop brittleness and crack.

"Casco" glue is easily prepared by mixing in cold water. After five or ten minutes a smooth glue solution is ready for use. No heating is required. Thus there is no risk of the glue chilling, and repairs can, therefore, easily be carried out on the field.

* * * * * *

Messrs. A. Hunt, of Croydon, inform us that since its introduction through THE AERO-MODELLER last month, orders for the Hunt Propshaft Assembly have been coming in from all parts of the country. This device, which is illustrated on page 82 of this issue, incorporates a rubber tensioner and free-wheel, and enables the propeller to be removed instantly. A special feature is that no soldering whatever is required, and the complete set of parts can be assembled in a few minutes. The free-wheel loop is absolutely positive in action, and the tensioner works every time, holding the elastic motor nicely suspended between front and rear hooks; this will be appreciated by modellers who wish to use motors longer than the fuselage, in order to pack more turns for greater duration. Messrs. Hunts also carry one of the largest stocks of balsa wood and kits in the country, and have recently issued a 32-page well-illustrated catalogue, which will be sent immediately on receipt of 8d. in stamps. Anyone able to visit them in Croydon (trams and buses pass the door) is sure of a fine selection of kits and materials, and those unable to do this can confidently rely upon the catalogue details when ordering by post.

* * * * * *

Messrs. E. W. Evans and Co., Stanhope Street, Euston Road, suppliers to the trade of balsa wood, send us some samples from their range, and say:—

"One of our latest additions is veneer one-eighty-fifth of an inch thick. This should prove useful with suitable treatment for covering various shapes. The cutting is remarkably smooth and even.

This 1-85th of an inch thick veneer is remarkably strong, and should be excellent for wing and fuselage coverings. Supplies can be obtained from any model shop.

"We have been complimented on our E. & S. propeller blocks, the efficiency of propellers carved from them causing agreeable surprise, especially in the case of propeller blocks for petrol planes, which may be regarded as an acid test.

"Having had many enquiries for piano wire, and having been in the piano trade many years, we are now supplying the right material at competitive prices, and we hold stocks ready for immediate delivery."

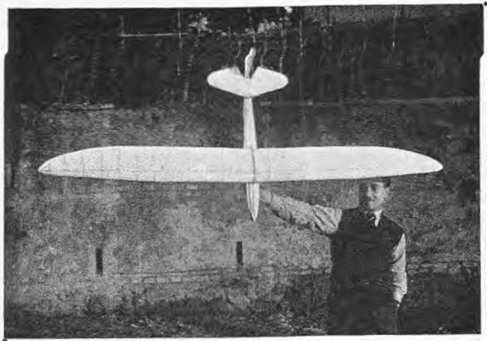
* * * * * *

Cloud (Model) Aircraft, Dorking, are this month advertising the latest addition to their already well-known range of models. This latest "Baby" is a very healthy youngster, and is known as the "Airmaster." It is a 7 ft. petrol model of very sleek lines; not only is it a good looker, but it has a super-performance.

This model has a very steep but stable climb, and a slow flat glide. This desirable feature has partly been obtained by means of the wing section employed, i.e. Grant 8X.

Any 9 cc. engine may be fitted, but "Cloud" recommend any one of the "Dennymite" range of engines. There is no doubt that the De Luxe "Airstream" is the most up-to-date engine on the market. A most useful point is the engine mount. This is supplied with the De Luxe "Airstream" and the "Roundhead" Standard. The long sweeping exhaust pipe on the De Luxe model adds greatly to the appearance of an already handsome engine.

For those who wish to give a present of a ready-made model, there is a choice of three types, the Pursuit at 2s. 6d., the Hornet at 1s. 6d., and a remarkable little monocoque balsa fuselage model, the A.J.44 at 5s. 6d. Due to the fact that so many modellers are only able to visit a store in the evening, after the day's work is finished, Cloud keep their showrooms open until 8 o'clock every evening, except Wednesdays, and 9 o'clock on Saturdays.



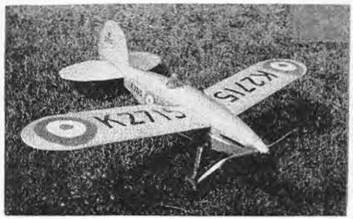
THE "KIRBY KITE" a 6 ft. 4 in. span GLIDER

Designed by our Italian correspondent, Dr. Ing. Fidia Piatelli, this is one of the most successful gliders produced. Full-size scale plans may be obtained from the offices of "The Aero-Modeller," price 3/- post free. Size of drawing, 40 in. x 27 in.

No instructions have been printed, as the construction is quite straightforward with the aid of the fully detailed plans.

VIPER II. Winner of the 1937 Coronation Cup

A 48-in. span semi-scale rubber-driven flying model. Fully described in the October and November, 1937, issues of "The Aero-Modeller." Detailed list of materials in December, 1937, issue.



Two large full-size scale prints, and photo of the model with the "Coronation Cup," may be obtained from the offices of "The Aero-Modeller," price 5/6 post free.

Designed by C. Rupert Moore, this model is a rapid and steady flyer. Every single part is carefully detailed on the plans.

THE HESTON "PHOENIX." A 34 in. span Flying Scale Model

Designed by Eric Fearnley, this fine model is fully described in the June, 1937, issue of "The Aero-Modeller," with photos showing the completed but uncovered model. Full-size scale drawings may be obtained from the offices of "The Aero-Modeller," price 2/6 post free.

Size of drawing, 30 in. x 23 in.

THE MILES KESTREL "TRAINER"

1 in. scale = 39 in. span

Designed by Mr. J. H. Towner, this is one of the finest flying scale models that have ever been built. A fast, steady flyer, the R.O.G. performance is twenty-five to thirty seconds. Fully described in the December, 1938, issue. Full-size scale plans, 40 in. × 27 in., may be obtained from the offices of "The Aero-Modeller," price 3/- post free.

FIRST-CLASS MATERIAL

for any of these fine models can be purchased from any of the Advertisers in this Journal.

ALL PLANS ARE PRINTED ON WHITE PAPER—AND ARE FULL SIZE

ALL DETAILS AND WORKING INSTRUCTIONS ARE GIVEN

All plans drawn by STAN. D. MARSH, "Aero-Modeller" Staff Draughtsman

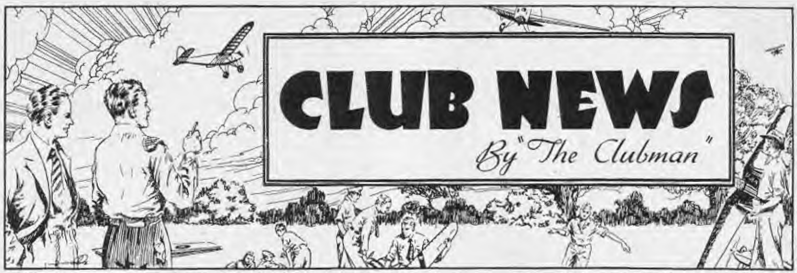
STUBB'S "WAKEFIELD" DESIGN

A twin gear airscrew drive. Conforms to all S.M.A.E. regulations for 1939 Wakefield Competition

BUILD THIS PRIZE WINNING DESIGN FOR NEXT YEAR'S COMPETITION

Full-size drawings, 30 in. × 23 in., may be obtained from the offices of "The Aero-Modeller," price 2/6 post free.

Full-size blue print of the twin gearbox, 6d. extra.



IT has always seemed a peculiar position in the magazine world that we are reading the Christmas issue in November, with yet another number to read before the actual holiday arrives, but I must keep my section in keeping with the rest of the journals, and wish you the usual wishes that go with the season. Here's hoping that the movement makes the same steady growth that it has in 1938, and my greatest wish is to see a yet firmer bond of friendship and co-operation among the clubs—our experience this year showing the possibilities and advantages gained by this means. So, fellows—all you wish yourselves; and don't start designing those 1939 Wakefield jobs until the effects have worn off!

One thing I feel comes into my province very largely, and that is to spread the word about the Wakefield Fund instituted to finance the team expenses to America next year. This is a matter that cannot be undertaken too soon, and I am glad to see that the S.M.A.E. have taken early steps to get the fund under way. An influential committee has been formed to deal with the details and organisation, and I think it a good scheme to include men who will be able to get at the root of things in various areas.

Various methods of collection have been suggested, and I understand that a shield is to be awarded to the club subscribing the largest sum *per head of membership*. This is a wise move, as all clubs can compete on an even footing by this means. Also certificates will be presented to all clubs subscribing £5 or over. Well, chaps, here is a grand opportunity to show our generous patron, Lord Wakefield, that besides appreciating his generosity we are also eager to do our bit. Remember, if all clubs pull their weight and get down to things, it will be a fairly easy matter to collect an appreciable amount towards the necessary expense required, and I am sure his Lordship will appreciate the keenness of a body who wish to do their utmost to once again bring the premier award in model aeronautics back to the "Old Country."

So, folks—clubs and individuals alike—get the old think-box to work and rattle the collecting box to good purpose. If anyone has any bright ideas on the matter I would appreciate a letter from him, and I will undertake to see that the special committee are made aware of any worth-while schemes.

I was extremely pleased to see the reinstatement of the Southport Club—and would point out that there is a lesson here for some of those clubs who are inclined to let things amble along on one man's shoulders. It is evident that the Southport Club would not have got into the fix mentioned if regular committee meetings had been held, and I strongly advise all clubs to make a point of holding proper meetings at regular intervals. There is always something that can be done at a meeting, and if all the committee members are *au fait* with current position and matters there is always an opportunity to remedy defaults before they get out of hand. I don't want to preach, but I'm afraid there are too many clubs managed on a hit-and-miss method, which only leads to trouble at the end.

Another point that some clubs need boosting on is to vote when given the opportunity. It comes as rather a shock to find that just over fifty per cent of the clubs had not sent in their vote on the Area Scheme—and, on one of the few occasions that the clubs get a chance to make a thorough vote, it is surprising, to say the least of it. If you don't trouble to take your rightful part in the governing of the movement, for goodness sake don't start complaining at any moves taken by the Council on the wishes of those that do! I am sorry to say that that is an attitude taken by too many—and I can only state that the solution is in your own hands. Don't just affiliate and leave it at that.

Of the clubs that had voted, eighty per cent were in favour of giving the scheme a try-out, and the special committee are proceeding with the details as far as possible. Again, if you have any suggestions, now is the time to forward them—and the sooner the better. No time like the present, and we cannot look too far ahead.

As will be seen from the S.M.A.E. report, a definite launching method will be introduced in next year's Wakefield event, with a view to eliminating any charges of incorrect take-off. The "wing-tip and prop." method is quite feasible, but I advise all intending entrants to get busy practising this launching style, and be thoroughly prepared at the time required. A tightening up of the rules has been drafted, and it is to be hoped that there will be no recurrence of this year's unfortunate hitches.

Whilst on the subject of this year's Wakefield event, I see that a certain writer in another quarter is criticising the criticisms made over the contest, etc. Whilst fully agreeing that care must be exercised in published matter, I would point out that all criticisms made were fully justified, and to do justice to the team itself it was very

necessary to place the *facts* before the public. Anything that has been written in this journal was obtaineed from first-hand observations on the spot, and I think I am correct in stating that the writer mentioned is going on information received second-hand—which leaves him open to charges of talking either through his hat or without full knowledge of the essential details.

As I pointed out in the analysis of the results published in the October issue, the article was written purely with a view to placing the full details before the public, and some folk who had criticised the showing of the English team in my opinion a basely unreasonable attitude to take. Whilst the "team" consideration was purely a personal opinion, it has recieved a deal of support from others interested, and I am pleased to see that this very important aspect has been recognised, and a supplementary award is to be considered. Whilst fully agreeing that the present trophy should in no way suffer any detraction, the team as a whole should receive some recognition, and I certainly think this addition will enhance the importance of the event.

Winter activities are well under way now, and exhibitions seem to be receiving a lot of attention. As noted in last month's Editorial, a large Exhibition has been held in Manchester, organised by the Lancashire, Windsor and Ashton Clubs and having since visited this show, I can endorse all that has been said about it. I think this certainly is the largest exhibition of model aircraft yet held, and if this is a sample of what three clubs can do, the S.M.A.E. suggestion for an exhibition held in conjunction with the I.A.P.T.B. should be an assured success, considering the material they can draw upon.

The Manchester exhibition, which ran for four weeks, closing on October 29th, attracted the astounding total of 44,874 interested visitors, whilst a lecture given by "Rushy" in the Library Theatre was attended by nearly three hundred people. A fine array of exhibits was on show, photos of which will be published next month, and I really must compliment the clubs concerned on the high standard of workmanship and showmanship exhibited—and in particular the terrific array of silverware owned and won by the Lancs Club during a very successful season. One thing I was pleased to see was the way the S.M.A.E. had been boosted, the clubs keeping individual mention in the background. Altogether a good show, and well earns the "Clubman's" congratulations—also, I understand, the congrats. of the chairman, Mr. A. F. Houlberg, who looked in.

The "Comet" petrol 'plane built by our contributor from Iraq.

King Ghazi (in dark suit) examines the finish of one of the wings of our contributor's petrol 'plane.

And now to the month's news, starting off with some interesting matter from far Iraq.

Forwarded by a correspondent who styles himself "W.P.," who tells us:

"So far as can be gathered, there has been very little activity concerning the building and flying of model aircraft in this country.

"Shortly after my arrival, at the beginning of 1936, I constructed a gear tapered-wing monoplane, with the object of giving young Iraquis an opportunity of seeing something of the possibilities of this interesting hobby. It must be remembered that until then they had never seen a model in flight—and they were duly impressed!

"Many of these boys would welcome the facilities enjoyed by the youth of England, as it is impossible for them to obtain materials for model-making, except by importation. This brings the total cost up to a rather prohibitive figure, as the additional charges in respect of carriage and Customs duty must be considered. The result is that their pockets will not stand the strain of their enthusiasm!

"Several models have since been produced, some of which have been built by two other interested members of the British contingent, and at least two Iraquis are shortly joining our small band of constructors.

"Our present duration record for rubber-driven models stands at 110 seconds, but it is hoped that this will be considerably improved under more favourable weather conditions.

"It will be interesting to search for 'thermals' in this country, and to compare them with the English variety, but one can only guess at the fate of a model unlucky enough to be caught in a 'sand-devil'.

"(These disturbances are by no means uncommon in the Middle East. A long column of sand or dust is seen ascending spirally, the column itself moving rapidly over the ground. Any light articles in its path are carried upwards to a considerable height, depending on the strength of the particular 'sand-devil.')

"Whilst on holiday in England I became interested in petrol models, and returned to Iraq with a kit set for building one of these types.

"During the construction of this model the standard specification was followed generally, but sundry original details have been introduced. These include a special engine bay which provides an internally sprung flexible

A group in one of the hangars. H.M. King Ghazi is standing behind the petrol 'plane with his arms crossed.

mounting, with inspection door, the engine itself being enclosed in a suitable cowling.

" The first trials took place on December 2nd. The machine flew well, but the glide was rather too steep. Experiments with angle of down-thrust and tail-plane setting were then carried out, and the machine now has a remarkably consistent performance.

" All flights commence with a straight take-off : no turn occurs until the model is flying level after the initial climb, and the gliding angle is all that could be desired.

" On December 12th, with a full petrol tank and new battery, the model was sent off with the time-switch set for 20 seconds, this flight being perfectly normal in every way. The switch was then set for 30 seconds, and, on being released, the model continued to climb so high that I soon realised, with some concern, that the time-switch was not functioning.

" Luckily, there was only a slight breeze at the time, but, although set for circular flights, the machine was gradually carried away from the aerodrome. When it disappeared from normal view, its height was estimated by several experienced observers to be between 2,000 and 3,000 feet—yet it was still climbing. It was actually seen with the aid of glasses—apparently gliding—25 minutes after leaving the ground !

" The area in which the model was last seen is served only by a single rough track, and the surrounding country is a maze of irrigation ditches. Obviously, therefore, a search by car was out of the question, more so in view of the fact that the Diala River—a tributary of the Tigris—flows past about two miles distant in that direction. Fortunately, however, a friend very kindly came to the rescue with an aeroplane, so together we proceeded on our search.

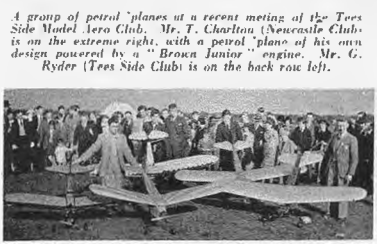
" The model was eventually located about three miles away, well over on the other side of the river, it having turned over in very rough ground which consisted of furrows about two feet in height. We were able to land on a smooth patch in the vicinity and found that the model was undamaged, except for a slightly strained undercarriage—in fact, it was flown later that same day.

" It was also ascertained that the runaway flight had been caused by some rubber band stretched across the trailing edge of the centre section. These bands had twisted and fouled the switch arm, thus preventing its operation—an arrangement which has since been modified.

" By this time a large crowd of Arabs had been attracted to the scene, and we congratulated ourselves on the fact that we had arrived before them ! The model was dismantled, packed into our machine, and we returned to the aerodrome, where an expectant crowd awaited the result of our search.

" The many enquiries subsequently received, concerning the fate of the model, were a further proof of the great interest that this flight had aroused in the district.

A group of petrol 'planes at a recent meting of the Tees Side Model Aero Club. Mr. T. Charlton (Newcastle Club) is on the extreme right, with a petrol 'plane of his own design powered by a " Brown Junior " engine. Mr. G. Ryder (Tees Side Club) is on the back row left.



" His Majesty the King of Iraq is keenly interested, and well well-informed, in aeronautical matters. His private air fleet comprises machines of the most modern British types, and he is an experienced pilot. I was therefore very delighted the following day on receiving an invitation to demonstrate the model before him at his private aerodrome, where I had the honour of being presented to His Majesty.

" The King was very interested in the model, and a very pleasant hour was spent in the Royal hangar whilst the details of its construction were explained to him. A considerable din was created by running the ' Cyclone ' —to the great amusement of the distinguished party present, and a move was then made to the aerodrome. The great moment had arrived !

" The weather conditions were definitely against the model putting up a good show, the strength of the wind being about 25 miles per hour. I therefore explained to His Majesty that, although the machine was set for circular flights, it would undoubtedly be carried back by the wind, so that the landings would occur at some

Another photograph of the Newcastle Model Aero Club meeting, held last September, showing some of the petrol 'planes lined up in the enclosure.

distance from the point of 'take-off.' To this he smilingly replied that he had plenty of aeroplanes available in the event of another search party being required!

"The machine then made three excellent flights, landing into wind on each occasion. One exciting incident occurred during the second flight. As the model turned down wind after taking off, it proceeded to execute a power dive from about 100 feet, with the strong wind under its tail! When within about 20 feet of the ground, however, it recovered and climbed away into safety.

"The walls of the Royal hangar are covered with a wonderful collection of enlarged photographs connected with events of aeronautical interest in His Majesty's life, and a place has now been found for a group of the party taken that day, which includes my model proudly sitting under one of the King's aeroplanes!

"So ended a memorable day.

A Kanga "Kite" towed by Mr. W. B. Patterson gliding in to land. Mr. Patterson is chairman of the Tees Side Model Aero Club.

"During its construction this model was optimistically wired for night-flying, and the necessary brackets for the lamps were built in. It was therefore a simple matter to complete the installation by fitting the 'navigation lights'—red and green on the wing-tips and white on the tail. These are controlled by a single switch, and supplied with current from a separate battery.

"The first night flights—three in number—were carried out just before midnight on December 20th, and were very successful.

"It was most impressive to see the model rushing off into the night, and to follow the tail light rising as the machine flattened out after the initial climb. Also to watch the changing positions of the wing-tip lights as it circled overhead with the engine roaring away. Then came the silence which followed the operation of the time-switch, with the lights gliding noiselessly through the air, and finally the rumbling of the wheels as they touched the ground.

"I have never heard of this being attempted before, and although sending a model off for its first night flight is certainly a test of one's faith in it, I consider that the experiment was well worth while—if only for the sake of the extra thrill provided!

"In the first two months of its life this model carried out a total of sixty day and night flights, all without damage which necessitated replacements.

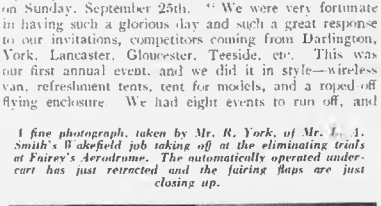
"I am certain that the difficulties experienced in obtaining the necessary materials in this country are very definitely offset by the many interesting hours it is possible to spend in the construction and flying of model aircraft.

Finally, I trust that these ramblings will serve to inspire those aero-modellers who find themselves far from the glamour of international competitions, and that they may still derive more than a little pleasure from their isolated efforts."

Well, fellows, it is certainly interesting to hear of progress in a place that perhaps nine out of ten knew existed, and I must congratulate "W.P." on his night flying activities. I believe this has been experimented with in the Bournemouth area, but doubt if much has been done elsewhere. Still, ideas are worth trying! Three photos included with this letter are reproduced here, and King Ghazi will be noticed showing great interest in the model mentioned.

Two photos of "home" interest come from the NEWCASTLE M.A.C., together with a report of their first big rally, which was held on the Newcastle Town Moor on Sunday, September 25th. "We were very fortunate in having such a glorious day and such a great response to our invitations, competitors coming from Darlington, York, Lancaster, Gloucester, Teeside, etc. This was our first annual event, and we did it in style—wireless van, refreshment tents, tent for models, and a roped-off flying enclosure. We had eight events to run off, and

A fine photograph, taken by Mr. R. York, of Mr. L. A. Smith's Wakefield job taking off at the eliminating trials at Fairey's Aerodrome. The automatically operated undercart has just retracted and the fairing flaps are just closing up.



the prizes were stop-watches, clocks, barometers, ash-tray sets, pens and pencils, silver propelling pencils, wrist watches and aeroplane kits—a change from the usual cups, and a change which everyone appreciated. We started about 11.30 a.m., and everything went very smoothly all day, the best flight of the day being by Mr. R. Renam, of the Newcastle Club, with 525 seconds, out of sight. I am proud to say that Newcastle held its own, and out of twenty-four prizes we topped the list with eighteen. York came second with three, Teeside took one and Gloucester one. Entries were round about 150. I would like you to know we intend to hold another rally next year, and we invite all and sundry to come and have a good day on one of the best flying fields in the country."

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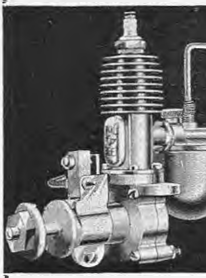

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The photos show an interesting collection of models, and it is evident that the Newcastle wallahs had a good time. But why didn't I receive notice of this meeting, Newcastle—are you shy of advertising?

Mr. L. A. Smith has replied to my request for a snap of his interesting Wakefield model with the photo shown here, and sends the following particulars that I think will interest you all.

"The machine is a parasol wing monoplane with lifting tail. The wing set at approximately 7 degrees pos. and stabiliser at 3 degrees pos. Wing section Grant x 8. Stab. section Clark Y. The wing is parasoled on a streamlined mounting permanently fixed to the fuselage. Wing being fixed to this by rubber bands. The fuselage is built round a double spiral balsa motor tube 1½ in. dia., the front portion of which is built up of five laminated formers and planked with $\frac{1}{16}$ in. sheet balsa. The rear of fuselage is mereely the motor tube. A retractable undercarriage is used, which is totally enclosed by hinged flaps when the machine is under way. This undercart works well, as can be seen by the photograph. The undercarriage legs are kept very short, in order to prevent too great a C.G. shift, also giving a snappier retraction. This model was not completed until fifteen minutes before the closing time for entry on the trials day, and up to then hadn't been in the air. A short test hop was given under low power, and everything seemed quite satisfactory, the glide being excellent. Then for the full wind-up and the first R.O.G.

"At the take-off board trouble was encountered, due to the spring of the undercarriage legs and the torque of the fully wound motor tending to wist the machine, so making the prop. blades touch the board. Back to the pits to chop a slice off the blades and everything would be O.K. Forgetting in the rush that the C.G. was now altered, back again to the take-off board. Off she goes! Undercarriage went back with a clap. A steep climb and right turn, and then a stall, and more stalls to the end of the flight, which was 30·5 sec. Pretty poor! But it gave hope. But upon retrieving the model it is found a broken prop. right off at the boss. More repairs and another similar flight, having no time to trim. But from these flights quite a lot was learnt. Next year will see a stouter undercarriage and a folding prop., and probably a lowering slightly of wing position—and it will be finished weeks ahead of time."

Mr. C. W. F. Cudworth, of the SHEFFIELD AIR LEAGUE SOCIETY, has an interesting scheme to put forward for the consideration of the other clubs in Yorkshire. He suggests an inter-club shield should be subscribed between the clubs in the area, and competed for on an annual championship basis—the initial contest to take place in Sheffield—"the largest town in Yorkshire" (is that right?)—and subsequent events to take place on the ground of the winning club. Those interested are asked to communicate with Mr. Cudworth at 18 Derbyshire Lane, Sheffield 8.

The LANCASHIRE M.A.S. report: "Autumn's inclemency forced us for three occasions to postpone the Lancastria Cup Speed Competition, but Sunday, October 16th, favoured us with semi-suitable conditions. The entry was good and passed with not a little hilarity, for this competition seemed to be the cue for bringing out our oldest and most obsolete models for a generally 'smashing'

time. Many an old pal went to glory before P. L. Smith placed first with a flight over a 50-yard course of 2·2 sec. (46·48 m.p.h.). Mr. Tindall placed second with 3·3 sec., and Harrison, a junior member, third.

"A fine exhibition of model aircraft has been made possible by the courtesy of the Manchester Libraries Committee, taking place in the Manchester Central Reference Library.

"No doubt this exhibition is the biggest of its kind ever devoted exclusively to model aeronautics. The exhibits have been forwarded by members of the L.M.A.S., as well as two other Manchester clubs, the Windsor and the Ashton. The models were on show for the whole of October, and during the first three weeks 35,591 people visited the hall, sufficient proof of the popularity and interest in our hobby.

"Everything possible connected with model aircraft was shown—sectionalised petrol motors, 1/24th scale to 8 ft. gas models, outdoor and indoor, skeleton and covered, gliders and rubber-driven, photographs, trophies and medals and in all—a grand show. If this has not made Lancashire air-minded, nothing will!"

I have commented on the Exhibition, but this speed business interests me. I should think this is a record, but what was the wind speed, and which way was the model flown?

Two competitions held by the recently formed ILKLEY M.A.C. resulted as follows:

H.L. DURATION.

Average of three flights. Av.

1. H. E. Anning ... ... 35·5 sec.
2. A. D. Fearnside

Nearest to 30 sec.

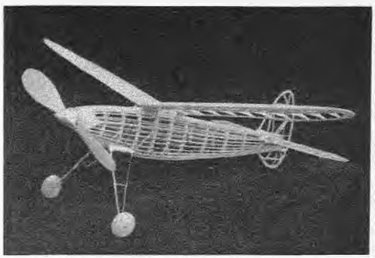
1. J. Townsend ... ... 32·2 sec.
2. M. Tordoff ... ... 24·0 ,,
3. H. E. Anning

Mr. Anning has raised this club's duration to 92·2 sec.

Mr. S. H. Harvey, of 9 Victoria Crescent, Douglas, Isle of Man, asks all interested in the district to get in touch with him, he being secretary of the DOUGLAS S.M.E. What about a team for the Wakefield next year, I.o.M.?

The HINCKLEY M.A.C. has made good progress since its formation, and now has 20 members. A scale

"Clubman's" thanks to the reader who sent in this photograph, in response to his appeal in the last issue: Mr. J. B. Allman's petrol model ("Baby Cyclone" engine) which won first prize in the Concours d'Elegance at the recent Midland Rally.



A beautifully-made model designed by E. W. Evans, of the Northants Model Aircraft Club.

competition is to be held in December—the prizes should come in handy for Christmas.

MACCLESFIELD M.A.S. are extremely lucky in having the use of a bungalow for headquarters, by permission of the father of a member. Some blokes have all the luck! The monthly medal was won by Mr. Higson with 110 sec. Mr. Eifflander second with 106 sec., and Mr. Turner third with 105 sec. Pretty close running!

The flying season of the SALISBURY AND DISTRICT M.F.S. wound up with a consolation competition for non-prizewinners only. Mr. R. Snooks was the winner, and Mr. Scammell won an impromptu steering event. Mr. D. E. Neale was presented with a cup for the club duration record, and he announced that he was putting up a trophy for annual competition.

Members of the WAKEFIELD (Yorks) M.F.C. paid visits recently to Barnsley and Doncaster, and met with fair success. This club's record now stands at 9 min. 43 sec.—not a bad figure for a club in its first season.

Another welcome member to the roll of clubs is the CAMBRIDGE M.A.C., with a membership of 41. With the building of a new aerodrome at Cambridge, this club have the good fortune to use the old field—a great help, as it seems that the biggest bugbear at the moment is getting the use of suitable grounds for our hobby.

Mr. G. Whitfield, of Earsden Grange, Earsden, is anxious to hear from interested aero-modellers in the Whitley Bay district, with a view to forming a club.

The HACKNEY M.A.C. are fortunate in having an experienced draughtsman in the membership, and he makes all their blue prints buckshee! Pylon flying is being considered, and a member has already constructed the necessary equipment. The club heavy-weight contest has resulted in Mr. A. C. Marvin placing top with 75·85 sec. for average of six flights, the runner-up being F. T. Jones with 36·21 sec.

The PARK M.A.L. have formed a new branch at Streatham, whilst the Entertainments Committee have been pulling their socks up, and prepared an interesting list of events for the winter season, including pole flying, dinners, dances, etc.

After a rather dormant period, the NEWCASTLE (STAFFS) AND DISTRICT M.A.C. is experiencing a revival, and several new members have been added to the list. Two splendid new flying grounds at Camp

Members of Gloucester and District Club at one of their recent meetings.

Hills and Hanchurch have been acquired, since the advent of the R.A.F. at the Meir Aerodrome necessitated leaving that admirable spot.

Nevertheless, they have discovered that the new grounds have distinct thermal-producing tendencies, and with the help of these and the almost mythical "American Brown," it is hoped to achieve some worth-while times.

Notwithstanding the typical English weather, three competitions were seen during the last two or three week-ends, with results as under.

One member (who ought to have known better) gave a wonderful exhibition of backwards aerobatics, achieved by the simple expedient of winding the propeller the wrong way!

COMPETITION RESULTS.

Models up to 150 sq. in.

G. Oakes (silver cup).
D. H. Challinor (bronze medal).
A. B. Challinor (bronze medal).

HARRISON CUP COMPETITION.

Models over 150 sq. in.

1. A. B. Challinor (cup).
2. A. Washington (silver medal).
3. A. Cooper (bronze medal).

Models under 150 sq. in.

1 S. Rateliff (silver cup).
2. T. Oakley (silver medal).
3. L. Malpass (bronze medal).

The BRIGHTON DISTRICT M.A.C. report: "The weather during the last month has prevented much flying taking place. Sunday, September 25th, the biannual contest for the Brigden Cup was held, after two previous postponements. This competition is for the average of three flights R.O.G. Mr. T. J. Lance, the holder, made a strong effort to retain it, but he was just beaten by Mr. J. Billeness. Results:

1. J. Billeness	... ...	118·1 sec.
2. T. J. Lance	... ...	117·0 ..
3. A. Woodley	... ...	69·1 ..

Flying was not possible again until October 23rd, when the B.D.M.A.C. held its last competition of the season, the consolation contest, which was won by Mr. Morse, flying a Pelly Fry. This is the first competition he has entered for, and we hope he will continue with his successes.

The B.D.M.A.C. Speed Cup was also held on this date, and was won by Mr. Roy Bennett, the only entrant who took 6 sec. to cover the 150 ft. course. Mr. Towner was test flying his new Miles Kestrel Trainer, which showed great promise.

The B.D.M.A.C. has been offered a stand at the Handicrafts Exhibition, to be held at the Dome on November 30th and December 1st. It is hoped that this will result in an increase in membership.

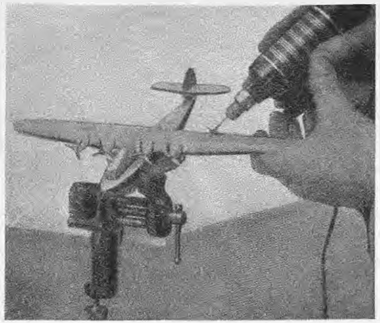
During the recent crisis the club-room was turned into a gas-mask assembling and distributing depot, and several members helped the Air Raid Wardens in their job. This, of course, has put a temporary stoppage on building until we obtain full possession of our club-room, and as a result table tennis has become very popular with the members."

At least the atmosphere should be prepared for a spate of "gas" models. Har, har, har—ain't I killing! How's the table-tennis going, Brighton—found a Perry yet?

Mr. W. J. McKendry, of the Ulster Model Aircraft Club, with some of the cups and trophies which he has won this season.

Two kind folks have forwarded me photos of Mr. J. B. Allman's Concours winning petrol model, and one is reproduced here. The fine workmanship has to be studied closely and at first hand to be appreciated, but some idea of the job can be gleaned from this view. A certain gentleman had to forward one of the photos on to me, with an indignant note saying that he had been assumed to be myself—much to his disgust. Am I that terrible!

Mr. Needham, of the BRISTOL AND WEST M.A.C., says: "The outdoor competitions being over now, the annual prize-giving was held here on October



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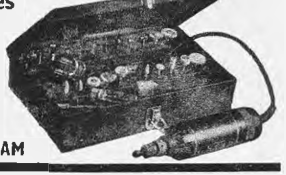

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13th. Competition results having been reported here from time to time, I need mention only the results of these three contests, which are based on the season's activities: (1) The Club Championship Cup, won by the hon. secretary, with A. H. Lee runner-up. (2) The Consistency Cup (put up this year by C. Dickins, Esq.), won by A. H. Lee, with the hon. secretary runner-up. (3) The Packer Cup, for the best Wakefield performance, won by R. T. Howse, with 6 min. 27 sec. These and other cups and a couple of dozen assorted prizes, medals, replicas, etc., were speedily disposed of by a well-known member, and then we got down to the serious business of the evening—the Annual Inquest. The Committee invites criticism, etc., of the past season—and the invitation is accepted! Our Committee doesn't really enjoy being abused, but the affair is conducted most genteelly (we are so refained!)—and we don't make the same errors next season! We had quite a likely couple of hours this year.

"There are several models in the club which hold, or have held, British records, and these, with a few other models, form a small display at a shop situate in the centre of the city, and this affords us useful publicity, the record-holding models especially making an impression upon the gullible public through the medium of the local papers."

That "Inquest" stunt is a good idea, and I must get my own club to try it—but I think I shall stay away while the crockery is flying around.

The HALIFAX M.A.C. are holding their annual prize-giving on November 12th. Will you please note the change of address of the hon. secretary Mr. Len Stott—who now resides at 146 Spring Hall Lane, Halifax. At least Mrs. Stott does—the old man lives in a hut at the bottom of the garden! Another aero-modeller's widow!

The results of the WESTON-SUPER-MARE M.A.C. Willmott Cup Competition, held in three rounds throughout the flying season, were as follows:

SENIORS.

1. L. A. Green	..	47·8 sec.
2. S. W. Voules	..	42·7 ,,
3. F. Lindsey	..	40·0 ,,

JUNIORS.

1. J. Greenland	..	35·6 sec.
2. W. Cooke	..	34·3 ,,
3. K. Lindsey	..	30·4 ,,

The cup and the kit awarded to juniors in this competition were presented to Mr. Green and Mr. Greenland at the first meeting of the winter season, together with the cup for the duration record holder, which went to Mr. Cooke, a junior member of the club.

A fine-looking model is seen in the photo of the "Rocket," designed by that old hand, F. W. Evans, and I understand a number of members of the NORTHANTS M.A.C. are busy building replicas of this model. Mr. Evans recently flew his parasol job for 15 minutes—some flying!

The LIVERPOOL M.A.S. Glider Competition was held at Liverpool Airport on Saturday, September 10th, for a trophy presented by Capt. Andrews, the Society's president. The gliders were launched from the balcony of the control tower, the machine landing the greatest

Members of the Coventry Club in their "hangar."

distance from the point of release being adjudged the winner.

Eight competitors entered for the event (including a lady member, seen in photo), there being a most interesting variety of glider designs on view, varying in weight from a little over one ounce to six ounces.

There was a rather strong wind blowing throughout the afternoon, which created troublesome air currents to leeward of the control tower.

In the circumstances the distances covered were quite good, the judges being kept busy measuring. The results were as under :

D. Gilbert	73·3
H. S. Coombe	65·6
3. W. G. Gaskill	1,801 ft. 6 in.

Saturday, September 7th, saw the last of the EALING AND DISTRICT M.F.C. summer club meetings at the Ealing Town Hall. Owing to the increase in members, it has been decided to rent a larger hall for the winter meetings, which will be held once a fortnight, and they are hoping to run off a series of indoor flying competitions. The results of the heavy-weight contest were as follows :

N. Vidler	75·33
D. Gilbert	73·30
H. S. Coombes	65·60

The Steering Competition was held on a 75 yards course, down wind, and points awarded for steering between four posts at the opposite end. This competition proved a little too much for some, hand launching an 11 oz. plane down-wind being no joke. The following were the results :

H. S. Coombes	7 points
A. Presland	6 "
L. B. Mawby	5 "

Mr. Coombes is building a new version of his stratosphere plane and will, I believe, have a propeller at each end, presumably with the idea of making sure that the back end follows the front. Those of you who visited the show last March may remember seeing this very interesting model, and there was much speculation as to whether it would ever fly. Well, it did fly, and it went straight up into the air, and, having reached its ceiling, promptly acted on the well-known theory of "what goes up must come down." The impact with Mother Earth was so terrific that he had to ask Australia to post it back to him! However, as I said before, Mr. Coombes is building a new version of this model, and there is every indication that a regular air service may yet be maintained between this world and Mars.

Another new model is being constructed by Mr. Cudmore. This is a 1 in. to the foot flying scale Westland "Lysander." Four geared motors will be used, and the propeller, which will be to scale, geared up 2½ to 1. (A photo appears on another page of this issue.—ED.).

And now a piece of news for all who say it can't be done. Mr. Mawby has recently been seen flying a scale "Leopard Moth" with a scale prop. which is only 6 in. in diameter.

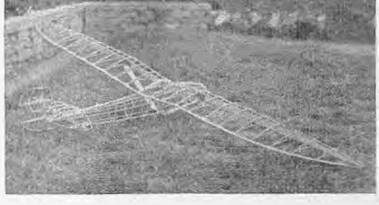
The total weight of the model is 8 oz., and flights of 20 to 30 sec. have been obtained, the noise of the gears being audible all over the flying ground.

Three photos from the GLOUCESTER AND DISTRICT M.A.C. are shown. This club recently put on a display of models at a local cinema, the manager being so pleased that the members were allowed in at reduced fees. Now, lads, there is an idea for cheap winter entertainment!

The ULSTER M.A.C. proceeds apace, membership now being 50. Mr. Weaver won the "Thornton Cup" for seaplanes, whilst that old pot-bagger—W. J. McKendry—won the "Croft Cup" for the best duration of the season, and the "Hawley" efficiency trophy for best all-round performance with a score of 44·19 per cent of the possible points. This gentleman is seen with a few of his prizes won this season—great work, sir!

The COVENTRY Y.M.C.A. M.A.C. was formed by Mr. E. Gardiner early in September with the idea of

This photograph shows the "Kirby Kite" glider built by Messrs. K. H. and G. C. Wilkinson, of the Liverpool Club, from "The Aero-Modeller" plans. These plans are full-size and can be obtained from our Leicester Offices, price 3s. post free.



giving members of the Y.M.C.A. increased interests. The membership now stands at 24, and they have meetings on Tuesdays and Wednesdays, but the club-room is open every night, except Thursdays and Sundays. The club-room is a sectional wooden building, 21 ft. by 8 ft., and was generously given by Mr. Earl Shanks, a Coventry timber merchant, for the joint use of the Model Aero Club and the Short-Wave Radio Club. (What about a radio-controlled plane?) The club members themselves erected the building and put in the electric fire and light. Flying meetings are held on Sunday mornings in the Memorial Park at present, but test glides are made in the Y.M.C.A. Hall. This hall is 80 ft. by 30 ft., and the planes are launched from a stage at one end. There will probably be some indoor flying later on.

The proposed Rocket Competition of the Liverpool Model Flying Club, mentioned last month, was flown off on Sunday, October 9th. The weather was windy, but with the aid of two bottles (unfortunately empty), supplied by a member, spectacular if not long flights were obtained. The final result was a draw between Messrs. W. J. Ford and B. B. Harrison, both recording times of eight seconds.

Two brothers, Messrs. K. H. and G. C. Wilkinson, have been busy building a " Kirby Kite " glider, from the plans which recently appeared in THE AERO-MODELLER. From the accompanying photograph it will be seen that they have made a good job of it so far.

By the way, I have been getting it in the neck from some correspondents over the lateness of the November issue. Well, don't blame me—I was up to the eyes in A.R.P. work!

Mr. Jarrett, a new member of the CROYDON AND DISTRICT M.A.C., has raised the club light-weight record of 5 min. 15 sec., while Mr. Wallen's 10 ft. petrol model recently flew over four minutes on a two-minute engine run, and was recovered over a mile away.

Mr. Alec Parker, of the OXFORD M.F.C., won the cup given by the president, Mr. A. F. Houlberg, his average for three flights being 62·8 s.e. A. Parker was second and J. L. Wise third.

The Press Secretary of the SOUTHPORT M.A.C. writes: " On October 23rd we held our Scale and Glider Competitions. The former was won by F. W. Coleman, who persuaded a 34-in. duration-designed F.W. " Wicko Major " to stay up for 42·5 seconds. R. E. Renshaw was second, defeating gravity for 34 sec. with a decrepit Hawker " Hurricane " service model. The difference between the prototype and service " Hurricane," incidentally, apart from the obvious camouflage, lies in the " ejector " flame-damping exhausts, the three cabin panels instead of four, and undercarriage fairing cover.

The gliders occasioned a bit of trouble, since there was no wind. The winner, W. Crusham, overcame this by bicycle-towing, getting his 8-oz. glider up to 75 feet and flying 37 seconds. On the second flight, however, the plane, a converted Leadbetter Wakefield, couldn't take it, the wing folded and the 3½ oz. of nose-weight dived the plane into the ground, a shower of wing and tail-plane halves going up. T. Hisco's sensitive Gull-type sailplane made a fine steady flight of 35 sec., taking second place. Does anyone know how long these German gliders fly? We've got to get ready for next year's King Peter Cup."

News from the Highlands this month, lads. The GLASGOW M.A.C. report that, with a view to stimulating interest in the Wakefield class of machine, they have instituted a system of certificates, a Class A being given for a flight of one minute or over, Class B for two minutes, and Class C for three minutes and over. Not a bad idea, and worth while carrying out in other directions.

Mrs. E. Browne launches her glider from the top of the control tower at Speke Airport during a recent competition.

An inter-club meet, held in August, was attended by three clubs, 40 entries doing their best throughout the day, best time being put up by C. Alexander, of Edinburgh, with 73 sec. An exhibition of models is to be held in January, and the secretary asks that all interested should get in touch with him in order to make this a concerted effort.

The Press Secretary of the BLACKHEATH M.F.C.—one of the regrettably few humorists who write—says: " ' Annual General ' always gives one the impression of business, and business was evidently the last thing in the minds of the many B.M.F.C. members present, unless it was funny business. Although it was a ' smile a face ' evening, the usual routine of an A.G.M. was executed in the most proficient manner. Most officers of the previous year were re-elected. Les. Hawkins was, however, the ' big one that got away.' R. N. Bullock took over the chair from Mr. Hawkins, who would not stand for re-election. E. F. H. Cosh has accepted vice-presidency, with Mr. Gosnell as president. McKenzie is hon. secretary, Crow again Press secretary, and among the time-keepers we have a lady member, Miss ' Pat ' Webb (Glamour Time-keepeer No. 1).

" The proposed Wakefield Fund (Blackheath Section) was given a flying start round the local coffee stall, where many of the B.M.F.C. lads adjourn after a late club meet. Here are the details:

" Freddie: ' Come on, lads—tea and a sausage on a raft on me.'

" The ' Lads ' (altogether): ' O.K., Freddie! '

" Crow (suddenly breaking in): ' Just a minute, you blokes, we can't let Freddie pay, he's getting spliced shortly (meaning that Mr. F. White is getting married).

" Crow thereupon starts collecting the cash, and upon offering it to Freddie, finds that it is refused. He therefore starts a local moan: ' What shall I do with it.'

" Freddie: ' Oh, go and stick it in the Wakefield Fund.'

So B.M.F.C. donation to the 1939 Wakefield Cup Fund to date is 7½d.

" A contest for those members not having won a B.M.F.C. prize during 1938 could not have had a more popular winner, Mr. G. Hinkley flying his improved Wakefield machine (which was well placed in the trials) for an average of 112·7 sec. On one flight Hinkley clocked 4 min. 49 sec. Mr. Green was second with a fine average of 106·7 sec."

Well, someone has made a start already, and am I anxious to see this " Glamour Girl " of the B.M.F.C.'

The last of the series of six duration contests which constitute the competition for the " Mayor Cup " of the HARROW AND DISTRICT M.F.C. resulted in a tie for the whole competition between Mr. J. Young and Mr. J. Hands. These members have now flown a deciding contest, which has left Mr. Young the holder of the cup for the coming year. Mr. Young's first flight put up a new R.O.G. record of 3 min. 52 sec., breaking the previous one, held by Mr. Gent, of 3 min. 45 sec.

Mr. Anderton, of the LEEDS M.F.C., writes: " The main item of interest this month is the fact that our field is now authorised for the operation of petrol models: so now our members can go ahead and try out their models and get them registered. A number of good models are ready, or practically so. One of our members has turned his mind to radio control, in collaboration with a radio expert. One item of interest to other clubs is the fact that, in order to get a field near to Leeds and yet big enough to use petrol, we have to pay a rent of £10 per season; *season*, not year.

" Our Mr. Hempsall (also of Lancashire) continues to do good work in the scale line, his best being three flights all within a second either way of forty-five, in weather that was not ideal. His model is a B.A. Swallow, and is one of the most stable jobs in the club.

" In the duration class nothing very great is doing this autumn, our ground being somewhat devoid of thermals.

" As we have received no reply to our appeal for an alliance of clubs for competition purposes, we must assume that clubs are sufficiently self-contained as to not need anything of the sort. Good!

" The fact that I changed my address last Easter has never been notified in the Club News, despite promises to that effect. It is 272 Stainbeck Road, Leeds, 7. Thank you."

Hm! I have an idea someone got out of the wrong side of the bed when that was written—and I must point out that any change of address must be specifically notified; I cannot pretend to check up every letter-heading each month. No offence, Mr. Anderton, but you see the point!

The LANCASTER, MORECAMBE AND DISTRICT A.C. wish to goodness some of you would cut your titles down a bit. Think how much it wears off my typewriter each month—have been doing a spot of decorating at the club-room, and are very pleased with their efforts. New designs are on the way for next season, when it is hoped to give the club record of 2 min. 12 sec. a hearty wallop in the pants.

And so, fellows, once again I draw to a close, and repeat my heartiest wishes for a jolly time this festive season—and, I suppose, think ourselves lucky that we are able to enjoy it at home instead of some god forsaken dug-out. Why can't all politicians be aero-modellists—they'd be too darn busy designing and building Wakefield models to worry about wars, etc.

Don't forget that Wakefield Fund business; and, remember, there's no time like the present, and a penny a week from now on will total to a nice little sum by next June. I know it only wants a little concerted effort to get the thing on a basis that will surprise you all, so let's go!

With which your old friend, counsellor and gossiper signs off for another month. See you on the Christmas tree!

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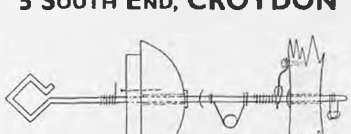

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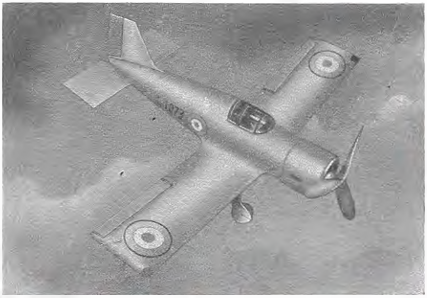

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