

Aero Modeller

INCORPORATING
MODEL AIRCRAFT

2F90

NOVEMBER 1967

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HOBBY MAGAZINE

**Free Flight
& Control-line
Championships
reports**





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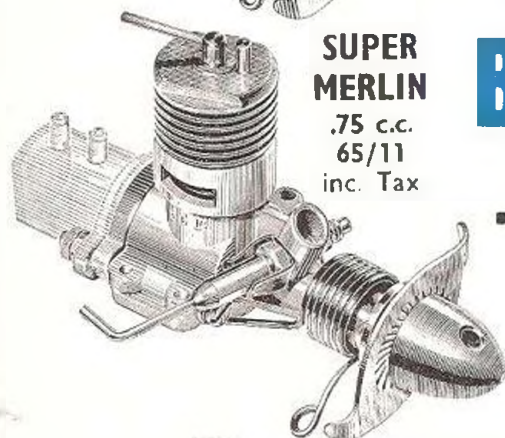


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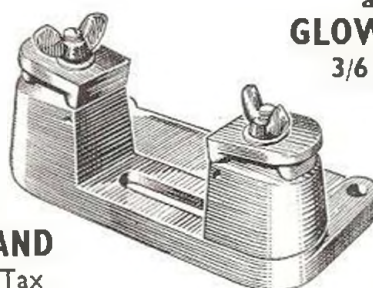
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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

November 1967

VOLUME XXXII No. 382

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CONTROL MODELS & ELECTRONICS . MODEL
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COMMENT

The pleasures of aeromodelling are immeasurable. Through the processes of learning how to assemble to the intricate structures, those early frustrations of wrinkled covering and that fatal stall which can so easily reduce one's efforts to a crumpled mass, the aeromodeller enjoys his hobby in many ways. It teaches patience, extends knowledge of aviation, gives exercise, offers relaxation—and pleasure. When "graduated" to the stage where each succeeding model is more efficient than the last, the modeller begins to think of entering the competitive field. Whichever becomes his favoured class he will find that the challenge always demands that little "extra" from his model which is beyond his immediate reach. Without such a target, the spirit of competition is lost. Unhappily (in our humble opinion) the free flight duration contests are showing evidence of a new development. All sports call for strategy in some way or other, and free flight has never been an exception. But recent trends have introduced questionable tactics. Those who are most involved know that the increasing number of modellers involved in 'fly-offs' is certainly not a reflection on improving model standards. The pleasure of which we speak is tainted not only for the "also ran" entrant, but also for the organisers. Now is the time to seek new schemes for free flight to arrest the decline before some winning ways spoil an otherwise agreeable image.

on the cover

Charming Spanish demoiselle Maria Jose O'Connor from Madrid poses with German Rudi Kessels' Veco 45 powered stunt model in front of an Italian SIAT lightplane at Liege airport Belgium during the Criterium of Aces—how's that for Internationalism?

next month

Christmas Issue . . . FULL SIZE plans for Cyril West's "Tutor", a perfect elementary trainer rubber model and for Tony Slater's "Slarmi" large chuck glider, which holds the British Record. Engine test on the Oliver Tiger IV, superb scale details of the Westland Lysander, drawings of the World Champion's A/2 glider and loads of other features, out on November 17.

FROGFLITE 'ENTERPRISE' SERIES

NAVIGATOR Mk.II

The all-weather 'multi' R/C trainer for 3-6 and 10-channel equipment. Latest design mods include swept fin for better rudder response and one-piece elevator for greater accuracy on trim and dive positions. Kit includes Styro-Por wing and tail cores, fully die-cut wood parts, easy-assembly drawings, all hardware and accessories, etc. Wingspan 54" for engine sizes .35 cu. in. to .49 cu. in. **Positively one of the most popular R/C model kits available today!**



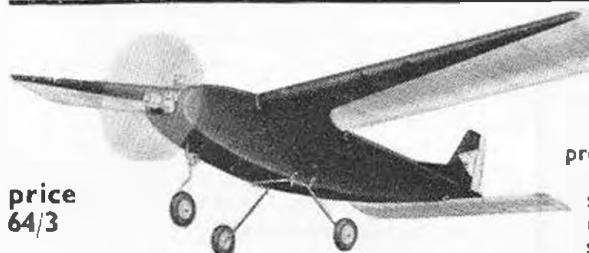
price
193/3



price
279/-

... THE TAURAN

The result of over two years of development flying with both proportional and reed-filter equipment, the **Tauran** represents the ultimate in medium size fully aerobatic models. One of the finest kits ever offered in the 'multi' class, contents include Styro-Por cores with cut outs for aileron bellcranks, undercarriage and servo housing; fully die-cut wood parts, canopy, hardware, accessories and fully detailed assembly drawings. Wingspan 62" for engine sizes .49 cu. in. to .60 cu. in. Your **BEST CHOICE** for 8-, 10- or 12-channel reed, or proportional. The model which out performs all the others!



price
64/3

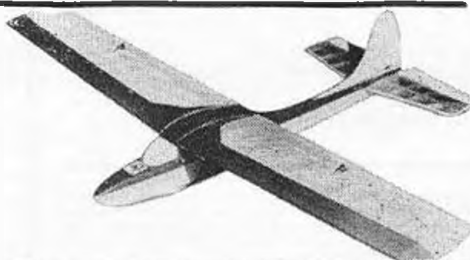
GRASSHOPPER

Specially designed to meet the increasing demand for lightweight radio models and test flown for over 18 months before being finalised for production. Wingspan 36" for powering by 0.49 to .09 cu. in. motors. Ideal for single-channel flying with quick response to rudder and excellent stall recovery. Fully prefabricated kit.

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For the first time a specially developed 73" span radio controlled fully aerobatic multi-channel slope soarer. Can perform consecutive loops, outside loops and rolls, plus inverted flight. Semi-symmetrical wing and almost indestructible construction. Kit includes all parts pre-cut, all hardware and accessories, etc.

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'EAGLE' HOVERCRAFT ... 22/6

Battery powered and fitted with an electric motor, this model flies with scale speed indoors and over smooth outdoor surfaces. Fully formed in lightweight plastic, kit includes lift propeller and electric motor. Packed in attractive display box.



'MEFA II'

HOVERCRAFT

Designed for powering by any diesel or glow motor up to 1 c.c. —and ideal for 049's. Floats over smooth ground, water, ice or snow. Kit is complete and includes lift propeller, tank, fuel line and starting pulley. **Price only 29/6.**

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1 oz. (single vent)	6/6
2 oz. (dual p'pase)	8/-
4 oz.	8/-
6 oz.	9/6
8 oz.	10/-
10 oz.	10/6

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14g wire (12g for R/C)

Horn brazed in posn. for strength.

Large	3/3	Small	2/-
Medium	2/6	Large R/C	4/6



NYLON HORNS

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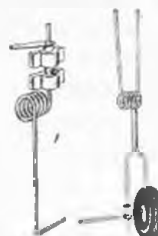
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5/32 leg (long) . 5/3	
5/32 leg (short) . 5/3	

DURAL UNDERCARRIAGES

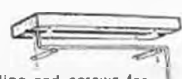
Large 12/9
11 1/2" track

Small 11/9
8 1/2" track

High grade light alloy, with axles.

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5/32" legs



Legs, block, clips and screws for low wing multi models . . . 11/-
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20" STUKA Ju 87



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18" AT-6 TEXAN



20" STEARMAN PT-17



24" ZERO



22" SESA



21" FOKKER D-8



17" Me 109-G



17" BIRDDOG

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SPECIALLY DESIGNED FOR RADIO



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1/6th ACTUAL SIZE (65" span) and absolutely true to scale even to aerofoil section and rib spacing! Kit includes moulded dummy radial engine, all hardware, etc. £21.19.6.

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DENIGHT SPECIAL (Pylon) ... £10.19.6
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54" WIZARD biplane ... £7.2.6
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54" PIPER CUB J3 ... £5.19.6
64" SPITFIRE scale ... £16.9.6
45" FAIRCHILD PT-19 ... £5.9.6
52" MAMBO SPECIAL ... £7.2.6
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also CONTROL LINE ONLY

CROP DUSTER—SE5—FOKKER D7—NIEUPORT 78—CORSAIR



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Here's the quickest and easiest to build R/C model yet! 48" span for single channel up and engines up to 3.5 c.c. Fully aerobatic.

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TOP DAWG

NEW!

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FOR 'MULTI' ONLY

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The world's supreme aerobatic model
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39" span "Compact" for engines up to 1.5 c.c.—the IDEAL R/C TRAINER for single-channel up! 71/6

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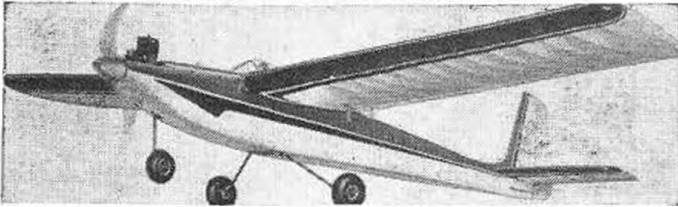
29" SCHOOLBOY s/chan. R/C 38/6
A real delight to build and fly, and specially suited to rudder only or rudder+motor speed with light-weight single channel radio.

30" CESSNA R/C scale (02s) 43/6

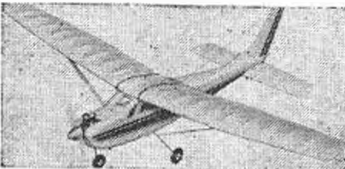
27" RASCAL R/C rudder only 32/6

ROARIN' 20 for 02s and R/C 32/6

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JUNIOR SKYLARK ... 65/-

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HARLEYFORD

AIRCRAFT MARKINGS OF THE WORLD 1912-1967

Compiled and written by **BRUCE ROBERTSON**

Insignia paintings in colour and line drawings by W. F. Hepworth, M.I.S.A., frontispiece and other paintings by J. D. Carrick and John Stroud, produced by D. A. Russell, M.I.Mech.E., and R. E. Dock.

EXPLANATION: Aircraft Markings of the World 1912-1967 has a completely NEW APPROACH in presenting aircraft markings world-wide. It in no way duplicates the information in the author's earlier book Aircraft Camouflage and Markings 1907-1954, but is, in fact, a companion book.

CONTENTS: A COUNTRY-BY-COUNTRY REVIEW of the markings and insignia of 165 countries, states, colonies, etc. (153 pages). A CHRONOLOGY giving a date-by-date history of international aviation marking changes from 1912 to 1967 (37 pages).

COLOUR: The frontispiece is a reproduction of the magnificent dust jacket painting by J. D. Carrick. There are 12 pages with illustrations of 431 national wing, fuselage and tail markings, and civil airline emblems; 8 pages with illustrations of 24 world airline liveries shown in profile; 4 pages with 1939-1945 War and later period international markings on aircraft illustrated by photographs and profile paintings.

PHOTOGRAPHS: There are several hundreds, including a large number never before published. Some are large, others are 'close-ups' of insignia and markings.

FEATURES: Also included are reproductions of 1939-1945 War invasion and Suez stripes, manufacturers' motifs, and chemical warfare, Red Cross, detail, armament, advertising and rank markings, etc. World map of Civil Registration Markings.

TABULATIONS: Aircraft finishes, serialling and designations. Translations of mottoes of the 394 Royal Air Force and Commonwealth Squadron badges illustrated in the 'Camouflage book', plus a further 97 badges illustrated in the 'Markings book'. Reproductions of a further 45 insignia on U.S. aircraft in addition to those in HARLEYFORD's earlier titles on U.S. Army, Air Force, Navy and Marine Corps fighters.

IN ADDITION: There are pages of line drawings of markings and insignia of the 1912-1967 period, similar but in addition to those in the 'Camouflage book'.

SPECIFICATION: 232 pages, over 100,000 words, on high-quality art paper. Book size 8 $\frac{1}{2}$ " wide by 11 $\frac{1}{4}$ " deep. Weight nearly 2 $\frac{3}{4}$ lbs. All colour plates made and the book printed and bound in England to our usual very high standard, with gilt blocked cloth on heavyweight millboard.

PUBLICATION DATE

**OCT. 21st
1967**

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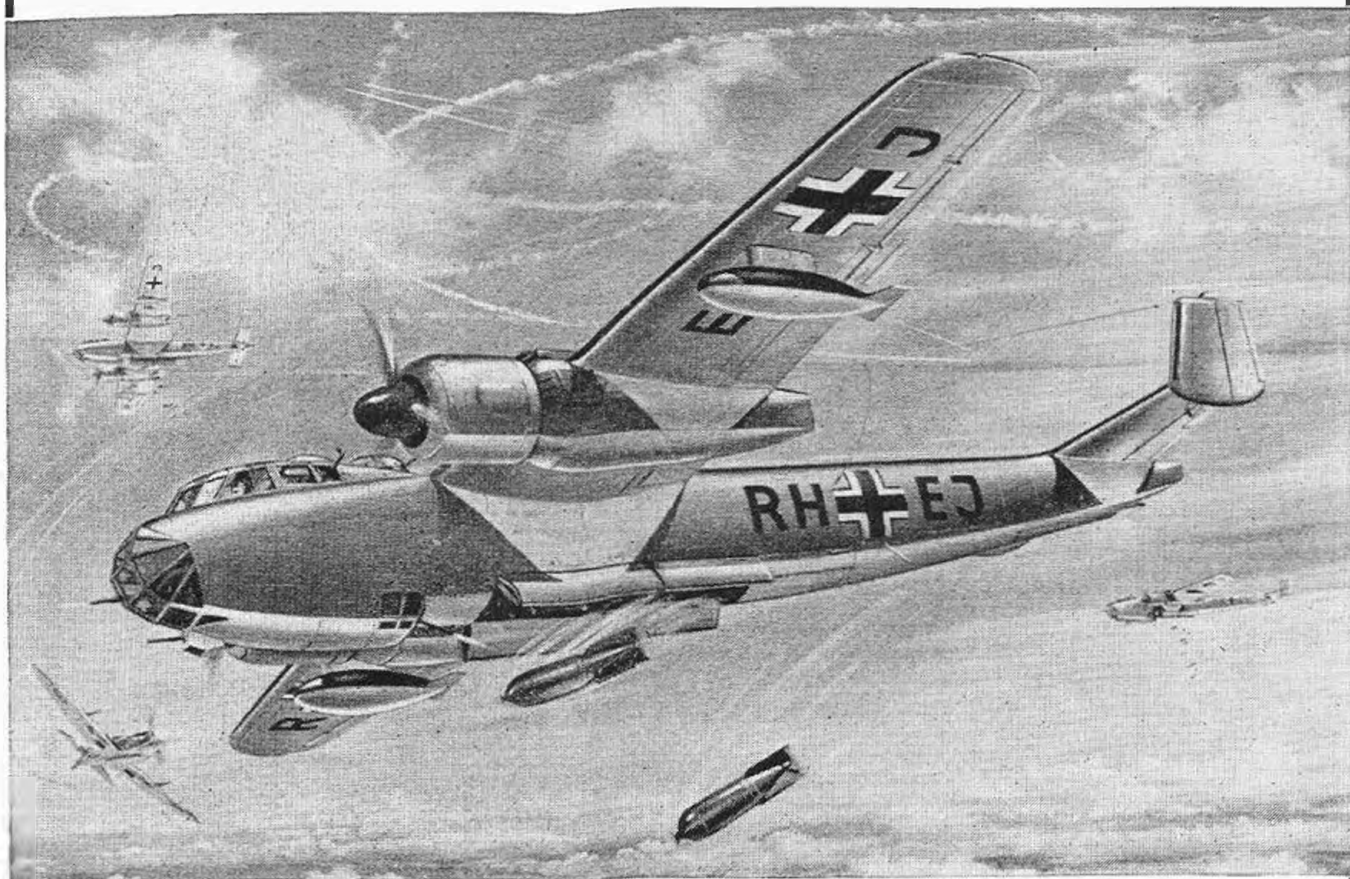
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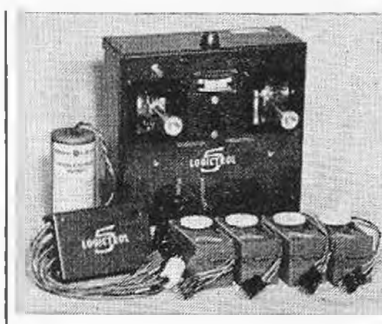
Midwest (all due mid-Nov.)
Lil Esquire 40 in. 049-099 **£3.19.6**
Lil Tri Squire 049-099 **£3.19.6**
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Room does not permit us to list all the C/L accessories we carry including engines, kits, handles, bellcranks, tanks, props, etc., etc. Why not call and see them for yourself.

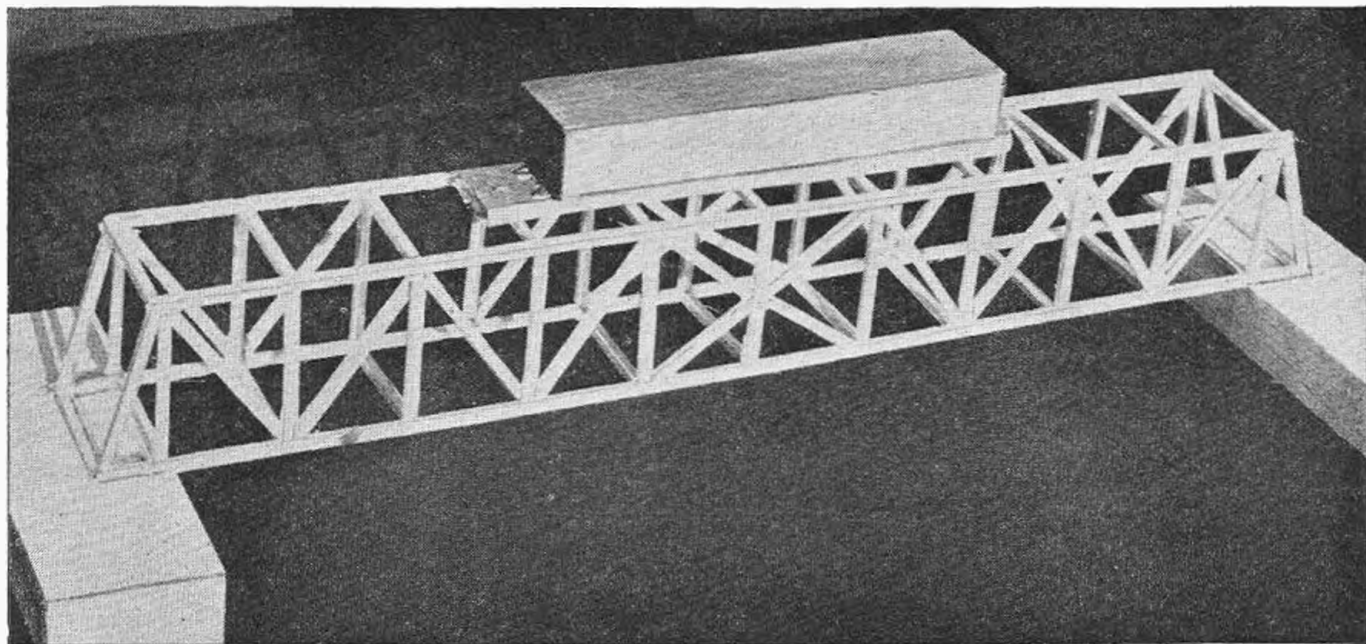
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MONTHLY

features

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Hobbies

Things to make

Electronics

Full size constructional plans

Hints and Tips

Stamps

Engineering and Vehicular

Meccano Magazine will contain 60 pages monthly, with full colour cover. The page size will be our usual Model Aeronautical Press, 9½ x 7½ inch. Full size plans of "models to make" will appear regularly.

Meccano Magazine will feature Meccano model construction in its regular prominent position each month, which will continue to be produced by our old friend 'Spanner'.

Meccano Magazine will have the full support of its Sister magazines in Model Aeronautical Press. These six magazines offer the widest model variety of any publisher in the world, ranging from "Live steam locomotive construction to the latest in radio control for boats, aircraft and cars".

Meccano Magazine's Sister magazines are: Aeromodeller, Model Boats, Model Cars, Radio Control Models, Model Engineer and Model Railway News.

Meccano Magazine will welcome reader participation in all aspects of its production, and all your comments and constructive points will be studied personally by the editor. This magazine should be written by the readers. Together with readers letters on all subjects and submitted features, it will reflect the latest trends in all aspects of model construction.

Meccano Magazine's features will include all the most popular subjects, and such favourites as Aviation News, Engineering, Vehicular and Marine matters will be maintained.

Meccano Magazine will illustrate all construction features with full size drawings or easy-to-follow sketches. The Model Aeronautical Press "Plans Service", already including thousands of full size drawings for the construction of working model Cars, Boats, Aircraft, and Locomotives, will have Meccano Magazine plans added to the range as they are produced.

Meccano Magazine readers also have the World's largest range of modelling books to choose from. In fact, over 100 titles. These range from the basic modelling handbooks, written in simple easy-to-understand form, to the highly detailed and technical reference handbooks, all produced by Model Aeronautical Press.

First issue January 1968, on Sale Dec. 1st, 1967

KINDLY MENTION "AEROMODELLER" WHEN REPLYING TO ADVERTISEMENTS

Heard at the HANGAR DOORS

At the Sazena Hangar Doors, the British Team for the 1967 World Free Flight Championships relaxes adorned in our own special blend of uniform! L. to R. Bailey, Mabey, Savini, Burrows, Monks, French, Halford, Woodhouse and North.

NEW CLASS of control-line model conceived on the eve of the Woodford Rally and first tested at the R.A.F. M.A.A. Championships is for *Mouse Racing*. Yes, you guessed correctly—it's a mini-rat-race category. Rules have yet to be finalised. For the moment, anything powered by up to .049 cu. ins. (.8 c.c.) engines and flying on 35ft. lines will qualify for 50 lap races. This could provide grand encouragement for the junior modellers and club activity.

COUNCIL NOTICE banning power model flying from a public space at Chichester, which we photographed and published in September issue has its compensating notice elsewhere. Reader D. Pentlow-Bartram has been kind enough to send us his photo of a sign which is self explanatory. It is the first to our knowledge, which actually draws attention to *permission to fly*—are there any others?



WINNER of the fifth "Europa Cup" for magnet steered gliders held 5,000 feet up Monte Tomba, near Verona, Italy was Herr Püttner of West Germany with an all-balsa Jedelksy type construction and traditional nose vane. Prominent among the entrants was Sgr. Feruglio of Italy, a pioneer of the rear-rudder magnet control. Data on his model will be found on page 17 of the 1967/8 AEROMODELLER ANNUAL, now on sale. Magnet models are achieving greater popularity in this country and we hope to publish more construction features on the subject in the New Year. (Photo of Feruglio at right)

DATE to note for all S.M.A.E. members, especially the contest fraternity is November 25th when the annual Dinner/Prizegiving takes place at the Great Northern Hotel, Kings Cross, London. Ticket applications should be sent to the S.M.A.E. Ltd., 10a Electric Avenue, Brixton S.W.9.

ANNUAL GENERAL MEETING takes place on Saturday November, 18th at the Grand Hotel, Leicester, a venue selected by vote as being most convenient to the majority of members. Election of officers for five vacant posts and future administration of the Society will be among many important items on the agenda.

RADIO RANGE was the only limitation on altitude record attempts in the U.S.A. on September 4th. The occasion was the F.A.I. R/C Record Trials at Dahlgren and the target was Bill Northrop's 16,610 ft. established in 1965. First attempts were with floatplanes. Bill fitted his "Foo Too" with Gee Bee floats, took off from a pond at a nearby golf course and was ferry flown to the radar control altitude tracking equipment. A flight to 16,500 ft. amazed on-lookers and this was followed by Maynard Hill's 18,500 ft. with a hydro conversion of his new lightweight six footer. Breakdown of weights on this model is:—Floats 1.6 lbs., Fuel 1.4 lbs., Model with ST. 60 and PCS proportional R/C

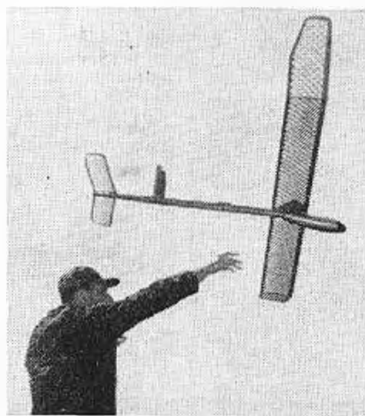
gear 4.4lbs. So a new record was established with a floatplane.

Then Bill took up the challenge and pushed his Kraft KP 5 and ST.56 "Foo Too" up as high as 19,200 ft. after Maynard has achieved 18,900 ft. with his old Merco 12 footer (this flight was stopped through strain on the tracking crew). Maynard then put up his lightweight model (no floats), to 19,500 ft. This 40 minute flight was limited only by slant range of the transmitter (about 4 miles) Monokote covering was extensively used and after one fast return from altitude, ribs were crushed due to pressure differential with a slow venting from the rib bays.

GLIDER records were also attempted but thermal conditions were not good enough. Ray Smith completed his 10½ lb., 14ft. span maximum area glider on the afternoon of the first day of the trials and flew it the next day. These large models are towed at 30 m.p.h. on a 1,000 ft. line behind a car!

MODEL ENGINEER EXHIBITION entries already include many notable models and the visitor is assured of a spectacle of all that is best in each of the aeromodelling categories. Extra cash prize awards have now been announced and brochures, with full details of the various exhibition classes are available from the editorial offices.

MAGIC POWERS? Our wish in Sept. editorial for sunshine and calm at the Woodford and Cranfield rallies was incredibly fulfilled. Each of these meetings was an enormous success. As announced in Club News, the Northern Gala will now become a closed to S.M.A.E. centralised meeting at Elvington on October 29th but the Southern Gala, scheduled for Oct. 15 was thoroughly messed about. Organising secretary Norman Couling refused to give up even after sites at Odiham and Barham Hill were in turn declined. That old standby, Chobham Common was a last resort for free flight, with R/C at Golden Cross. Control-line events could not be arranged.





WORLD FREE-FLIGHT CHAMPIONSHIPS

SAZENA-CZECHOSLOVAKIA

**THIRTY-THREE NATIONS
PARTICIPATE IN
BIGGEST
INTERNATIONAL
EVER HELD.
GREAT BRITAIN WINS
POWER TEAM TROPHY**

FOR FIVE CONSECUTIVE weeks Czechoslovakia had sweltered under a heatwave. As teams from thirty-three Nations, laden with boxes and pursuing courses dictated by economy, traversed the World to a focal point at Suchdol College this idyllic weather changed abruptly to rain and wind! Happily the cold front passed through rapidly, but it left in its wake five days of mysterious conditions that led many of the furthestmost visitors to believe that the mid-European reputation for still air is a myth. All things are comparative, and to the fifty or more visitors from Britain, the weather was calm, hot, and strange. We fancy it was equally strange to the locals and to those who enjoy the genuine mid-European calm from Hungary, Austria, Rumania and Bulgaria. It was a test for everybody!

Suchdol College provided the accommodation and food for more than 600 who were involved in this the largest of all World Champs. Situated north of the capital city of Prague, it was on the route to a grass airstrip at Sazena, normally employed for gliding and light aircraft under Svazarm, the organisation which controls aviation and kindred sports in the CSSR. Luckily, the majority of participants had their own transport, for the distance from Suchdol to Sazena was 18 miles. Coach departures were frequent; but we did not envy the Russians their long trek along the airstrip, or their tedious waiting time. We were also surprised to learn that they had arrived by three day train journey instead of a three hour ride in a jet! But at least they were there. For the Israelis it was quite another story.

POLITICAL INTRUSION

Following the breaking-off of diplomatic relations between the Socialist States and Israel, all applications for visas on behalf of the team of eight and a manager proved unsuccessful. Since there had been similar difficulties at Parachuting Championships with sub-

sequent admonishment of the Nation concerned at the F.A.I. Conference, the CSSR Aero club was extremely anxious that a solution be found. F.A.I. headquarters in Paris endeavoured to aid the Israelis by action through Austria, the negotiating Nation. The team did in fact arrive at Vienna and there met many of the eventual participants. All to no avail. As the Opening Ceremony concluded, the telegrams and long distance telephone calls were still emphasising the urgency—and the implications. Eventually the Jury had to admit defeat. Neither they, nor the CSSR Aero Club could do anything to persuade the Government to waive the restriction. Those who remember the rising progress of Israeli team members at previous Championships will view this intrusion into the otherwise happy world of aeromodelling with the utmost sympathy for the victims and the greatest antipathy towards the Politicians of this day and age. It was the only blot on a meeting which became the epitome of International exchange and saw the beginning of many new lasting friendships. We had always been told that there was a natural affinity between the Czechs and the Anglo-Saxons, now we know this to be true. There is a great deal we have in common.

ORGANISATION

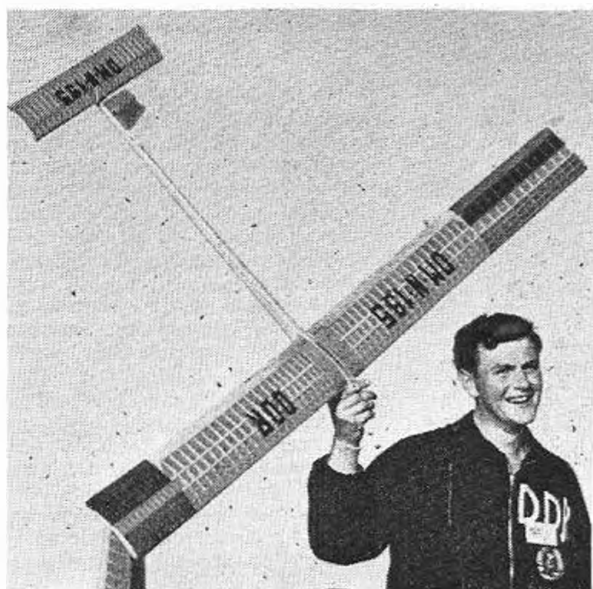
Those who have suffered the task of playing host at a Championship, and who are likely to commit their lives to eighteen months of worry, hard work, scrounging, frustration and exhaustion in running future marathons of this nature were there in person so the otherwise disinterested modeller has no need to read an inventory of equipment or statistical review in these columns. We will, however, draw attention to the fact that the meeting will represent a *loss* equivalent of £3,000, involved 260 working personnel and to take one simple comprehensible statistic—200 new and synchronised stopwatches! To Jiri Schindler, Rudi Cerny, Rad Cizek, Jiri Kalina, Milan Vydra, Richard the translator and the pilots of the two recovery helicopters go our sincere praises for a fantastic job well done. Backed up by many others we neither saw nor heard, and given the full support of the the Minister of Education, the President of the Aero Club and the Vice-President of Svazarm, the officials coped in a way that leaves us wondering what will happen next time.

Flights were arranged in rounds of one hour each, separated by 15 minute or lunch intervals. Some prophesied that this was unsatisfactory, leaving little time for recovery or not enough time for flying. At the conclusion, the view changed to one of "if we can fly at one hour intervals,—why not have eight rounds per event?"

PRACTICE

The breeze was light, falling off to calm during arrival day. Helicopters proved their worth with a vengeance. Ernie Avory, all the way from Vancouver and famed for thermal sensing had d/t failure which an eight mile chase by van failed to recover. A chopper was called, and brought the model back within an hour. Three others were similarly fortunate but Carswell's power model, proxy flown by S. African T/Manager Bas. Moore went into the blue and so did Jon Clements' model which he was flying for fun. The British team was happy with trim and the locality, so were the NZ proxies, but one English (?) speaking entrant who wrote his power chances off was Maurice Doyle. His psychedelic multi colour model chose to fly inverted at the top of the climb, and the tips clapped above the fuselage!

Mathias Hirschel flew a most conventional but extremely well built A/j2 into first place. His sixth round flight would have qualified him for another flight. Close rib spacing was typical of all East German models. 3-view to appear, with airfoils, next month. Heading picture shows a typical worms eye view of a launch. Up to 18 models were released into some thermals.



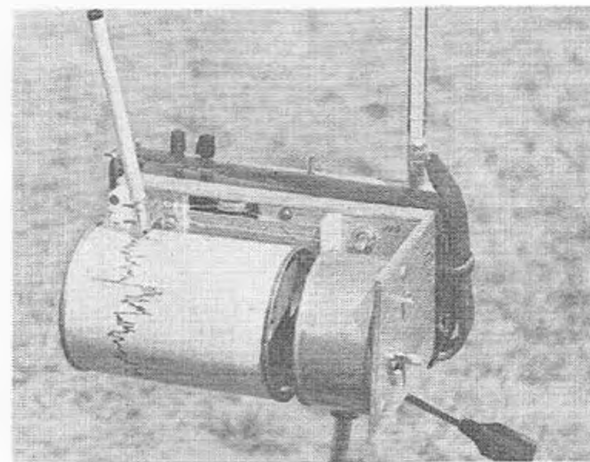
PROCESSING

The two German National teams, Canada, G.B. and N.Z. were commended for being perfectly documented and enabling the organization to cope with long delays caused by inefficient preparation. Swedish models were uncertified by their Aero Club. The U.S. team members had no official stamp on their process certs. Spain, Bulgaria, Italy and Brazil sent models that had not been processed at all and four Nations did not have '67 FAI licences. So much for having a Sporting Code! Our lot were through in a half-hour and able to make full use of the airstrip. On the eve of the opening A/2 event, a chopper brought back Carswell's model. . . . Clements' was still elusive but it was not in the contest anyway.

A/2 GLIDER

Most teams made a tardy start after the Opening Ceremony. Round One was scheduled from 10-11 a.m. and few had bargained for the rigid process check that had to be made before each flight for weight and model identification. The British team had decided to fly in the order in which they placed in the trials, so Halford was to be first, and as he waited under the warm overcast, Woyen of Norway broke the ice with an easy max. Launching was restricted within a roped 50 x 100 metre rectangle, which rapidly filled with something like 300 competitors, timekeepers and helpers. When up to thirty lines might be laid out at any one time and various teams established their high level thermistors on guy-roped rods, the compound became decidedly crowded. Consequently, the British sought a side position, preferring to find their own lift and not be drawn into panic piggy-back mass launches. Halford went off after twenty minutes of waiting, flirted with lift and returned 2:32. A nine model mass launch soon after was a foretaste of tactics to follow. There would be a long spell of inactivity, then as a recognised "expert", or particularly voluble group dashed off with model straining, a whole flock would ascend. A Cuban snapped his wing on the tow in one of these "thermalthysteria". By the law of averages, this gave a fair number of generous maxes to many who neither understood the conditions nor had a two-minute model. North was unlucky as his model left the launch in long straight stalls for 2:21, but what happened to Woodhouse would have deterred many a hardened soul. He waited his time, launched with 5 mins. of the round to go after a long period of "kiting" and immediately, up came the flock to follow. For just 10 secs. the "Wichita" wheeled in a soaring turn, then it sagged, hit violent gusts (some said it rolled!) and was blasted out of the sky for only 66 secs. In the pack was Langevin, a U.S., hope destroyed with 53 secs. and though it's impossible to check we fancy all those flights of about 50-65 secs. in the results arose from this one disastrous upset. Doyle of Ireland spun down from full height in 33 secs! At the end of the round, there were 45 maxes in 81 flights and managers from Austria and Cuba were being lectured for not getting models processed.

Round 2 was a brighter picture. All three British models maxed in a temperature approaching 85 °F. Collisions abounded in the mass launches, Calefato of South Africa lost about twenty vital secs. after a wing knock. Thermals were established as about 300 ft. wide at the base, narrowing like a coolie's hat so that if you weren't in, about 90 secs. was the result. That's how the '65 Champ. Bucher fell out with 1:24. But there were 56 maxes (31 doubles) and the Swedes alone had a perfect team score, as Round 3 opened after lunch.



Martin Kitchins and George Xenakis of U.S.A. devised this thermal plotter. Mighty Midget servo actuates ball pen scriber on rotating drum to indicate thermistor readings. Peaks to right are rapid temperature rises. Clever system demands equally cautious field operation.

GLIDER TEAMS

1 Czechoslovakia	2,554	10 Italy	2,170	20 Cuba	2,019
2 E. Germany	2,504	11 U.S.S.R.	2,160	21 Great Britain	2,004
3 France	2,468	12 Austria	2,146	22 Rumania	1,893
4 Sweden	2,391	13 Yugoslavia	2,141	23 Poland	1,858
5 U.S.A.	2,330	14 Norway	2,130	24 Luxembourg	1,848
6 Hungary	2,237	15 South Africa	2,118	25 New Zealand	1,803
7 Netherlands	2,224	16 Finland	2,110	26 Spain	1,770
8 Canada	2,212	17 Turkey	2,071	27 Bulgaria	1,654
9 Denmark	2,207	18 Switzerland	2,054	28 Argentina	666
		19 W. Germany	2,054	29 Ireland	654

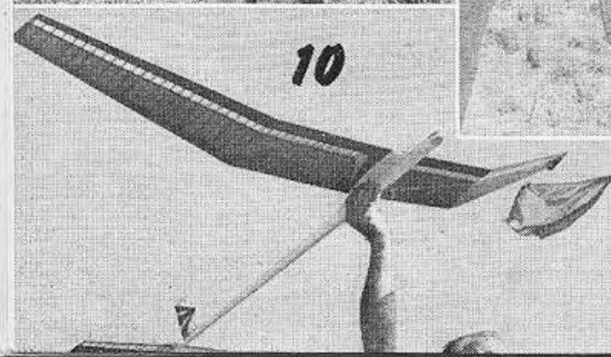
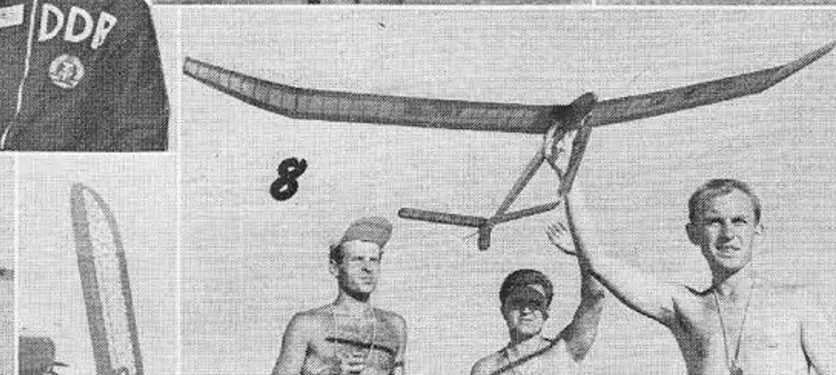
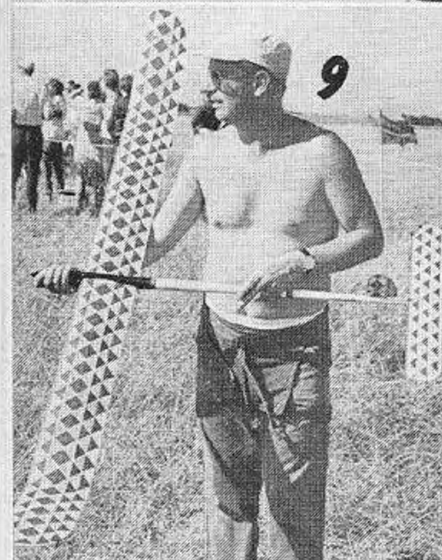
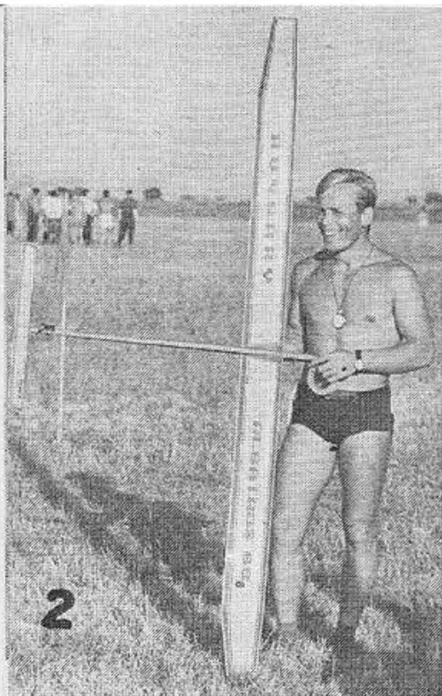
Again it was Norway off first, and Heggøelund was leading with a "triple", followed immediately by countryman Skard—and seventeen others including Halford all in the same bump. But quick lift was no certainty, Barry made 2:40 and a Cuban, Fernandez, actually towed into such powerful down draught having missed the crowd, that the model descended as though d/t'd on the line. Simonov the Russian ace had trailing edge flutter and was down in under 20 secs., then snapped a wing on the second try! Avery spun down for 90 secs., and twice in mass launches we noted only a couple of survivors. Woodhouse collected a beauty but North's model seemed a thermal orphan. Trimmed close to the stall it made 1:48. Now the pattern was taking shape. There were 42 maxes giving 21 with

Continued on page 577

GLIDER RESULTS

1 M. Hirschel	E. Germany	900+240
2 E. Voros	Hungary	900+144
3 B. Modeer	Sweden	900+143
4 A. Tanyu	Turkey	900+113
5 A. Oachatz	E. Germany	180 180 180 180 179-899
6 L. Bernisson	France	180 180 180 180 180-889
7 A. Riches	Canada	180 180 180 180 180-887
8 C. Rak	C.S.S.R.	180 180 180 180 180-885
9 I. Kekkonen	Finland	180 158 180 180 180-876
10 I. Horajai	C.S.S.R.	156 180 180 180 180-876
11 T. Vaeth	Denmark	180 180 180 180 142-862
12 A. Sulisz	Poland	180 180 180 140 180-860
13 C. Broeman	Netherlands	180 180 180 180 134-854
14 E. Mikulic	Yugoslavia	180 180 180 180 120-840
15 T. Heggøelund	Norway	180 180 180 138 150-828
16 B. Roshin	U.S.S.R.	106 180 180 180 180-826
17 A. F. Almagro	Spain	180 180 180 180 104-824
18 N. Martes	Luxembourg	160 180 180 180 100-820
19 A. Cosma	Italy	180 180 180 180 98-818
20 M. Van Nest	U.S.A.	180 180 180 180 94-814
21 M. Lelter	Rumania	180 180 180 94 180-814
22 J. L. Calefato	S. Africa	180 159 180 180 113-812
23 Y. Olard	France	180 91 180 180 180-811
24 E. Avery	Canada	180 180 90 180 180-810
25 B. Langenberg	U.S.A.	180 180 113 180 145-798
26 J. Papp	Hungary	180 180 144 180 113-797
27 S. Hubert	C.S.S.R.	180 180 180 180 73-793
28 V. Lensi	Italy	180 180 136 180 115-791
29 K. Reilmeler	Austria	141 95 180 180 180-778
30 W. Kama	Austria	180 180 93 177 48-768
31 M. Bourgeois	France	180 180 180 180 171-770
32 H. Ahlstrom	Sweden	180 180 120 93 108-758
33 G. Verbrae	Netherlands	180 154 133 180 107-754
34 F. Weyrauther	W. Germany	180 180 107 180 100-747
35 N. Hewitson	N. Zealand	180 180 180 91 114-745
36 P. Grunnet	G. Britain	180 180 112 180 90-742
37 J. A. Valladares	Denmark	180 180 180 79 117-736
38 C. Martenson	Cuba	180 180 82 180 111-733
39 A. Bucher	Sweden	180 180 84 180 106-730
40 S. Akau	Switzerland	100 84 180 104 180-730
41 H. Langevin	Turkey	86 180 180 121 180-714
42 B. L. Halford	U.S.A.	53 180 180 121 180-714
	G. Britain	152 180 144 180 168-724

43	W. L. Pretorius	S. Africa	180	144	99	180	107 - 710
44	D. Ducklausa	E. Germany	-	180	180	163	130 - 705
45	W. Geiser	Switzerland	65	180	180	180	97 - 702
46	A. Bungart	W. Germany	145	180	94	134	148 - 701
47	A. Skard	Norway	180	180	180	38	121 - 699
48	M. J. Woodhouse	G. Britain	66	180	180	180	91 - 697
49	V. Simonov	U.S.S.R.	148	180	-	180	180 - 688
50	U Fernandez	Cuba	180	118	123	180	82 - 681
51	P. H. Lagan	N. Zealand	-	180	180	180	83 - 677
	proxy A. C. Crisp	G. Britain	180	70	68	180	180 - 678
52	N. Jevanovic	Yugoslavia	54	180	180	180	83 - 677
53	K. Abadiyev	Bulgaria	114	180	93	107	180 - 674
54	A. A. Mattano	Argentina	133	180	108	128	117 - 666
55	M. Doyle	Ireland	33	180	175	180	86 - 654
56	G. Charvenko	U.S.S.R.	125	180	88	75	180 - 648
57	P. Lommer	Luxembourg	180	71	180	91	112 - 634
58	J. Silgren	Finland	82	180	150	95	123 - 630
59	J. Masari	Yugoslavia	115	180	77	72	180 - 624
60	F. Gaenali	Switzerland	180	48	154	180	80 - 622
61	A. Van den Dungen	Netherlands	62	64	180	130	180 - 616
62	A. Bedo	Rumania	80	39	180	180	84 - 613
63	M. Vollbrecht	W. Germany	93	112	130	91	180 - 606
64	M. Parola	Finland	180	92	63	180	89 - 604
65	T. Kongstad	Denmark	111	107	64	180	141 - 603
66	T. O. Woyen	Norway	180	80	87	180	76 - 603
67	L. M. Castillo	Cuba	53	117	180	72	180 - 602
68	R. Hobinger	Austria	180	180	76	37	127 - 600
69	J. R. Cowlin	S. Africa	63	180	142	180	31 - 596
70	R. J. North	G. Britain	141	180	109	73	80 - 573
71	U. Acuto	Italy	117	91	143	93	115 - 559
72	T. Sikora	Poland	54	180	70	60	180 - 544
73	G. Petaki	Hungary	55	41	180	115	149 - 540
74	C. F. Perez	Spain	-	180	180	58	120 - 538
75	D. Boduzov	Bulgaria	180	45	130	90	93 - 533
76	J. Tarvin	Canada	62	61	118	180	94 - 515
77	I. Radu N.	Rumania	104	158	63	47	94 - 466
78	E. Stebel	Poland	180	48	35	113	78 - 454
79	V. Grigorov	Bulgaria	26	180	63	88	87 - 442
80	R. Keen	Turkey	46	38	180	123	441 - 41
81	J. R. P. G. Langomlin	Spain	96	180	65	87	- 408
82	J. Ewen	Luxembourg	-	123	115	68	88 - 392
83	A. Leong	N. Zealand	-	180	180	180	83 - 677
	proxy P. Jellis	G. Britain	140	49	45	103	43 - 380





a perfect score (including Martin Dilly flying Hewitson's NZ proxy) and Sweden lost the lead to France and the Czechs.

Round 4, with the launch area now doubled was like another contest altogether. Wind was no more than 5 m.p.h. but a thermal brought ferocious gusts. Halford moved easily but when Jack North flew it seemed the whole field was taking off and after a crossed line he made only 1 : 23. A second attempt was allowed, and such was his luck that the model was downed for only 1 : 13. Woodhouse

scrapped a max so he now had three in a row, and then top rated American, Van Nest was one of the first of fifteen to collect a 4th max. Skard of Norway dropped out of the running with a mysterious 38 secs., and both Dilly and the Cuban Valladares went the wrong side of a bump to spoil their run of maxes. France, the Czechs, and now the East Germans (though they had completely missed a first round flight) were tussling for team honours. There had been 47 maxes this round.

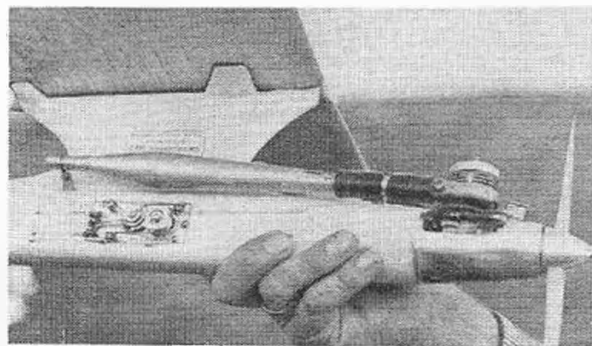
Continued on page 579

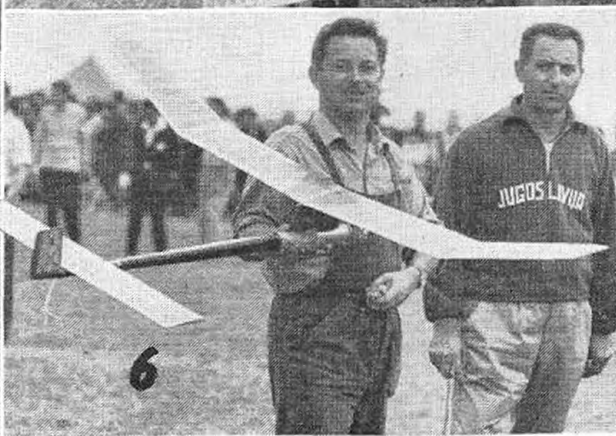
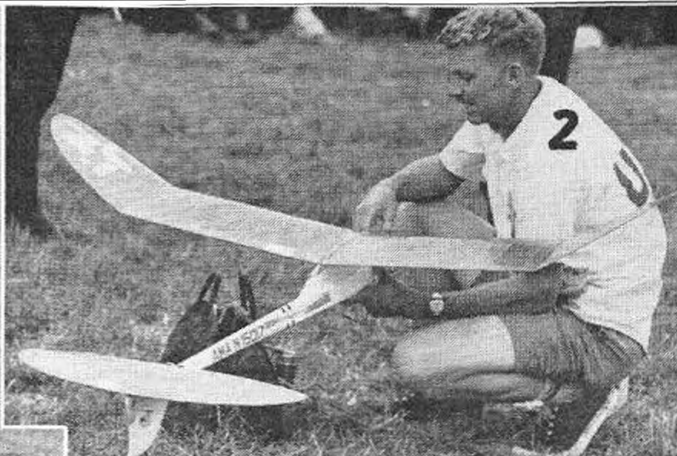
POWER

Above, "Ballet de Sazena" for victorious French, Monks, Savnil Right; Hans Seelig, clear winner is cheered back with all sheet covered model (3 view last month). Close up shows Lindsey KL2 pipe on pan mounted G-15 and Seelig timer with four functions and extension discs.

GLIDER

Left: 2nd Endre Voros. Runner-up in more ways than one, and just one second ahead of 3rd Bo Modeer with his heavyweight Agathe. Bo was released from Prague hospital to compete! 4th was Attila Tanyu from Turkey, enjoying a fine debut in International events. 5th the winner's team-mate, Albrecht Oschatz who employs half ribs for extra close spacing, lost the fly-off by one second! 6th Louis Bernisson with his Averianov influenced design. 7th far travelled British expatriate Alan Riches. 8th, Ceslav Rak, local lad with "Zenit", lost in last round. Picture 9 is Vilim Kmoch holding Emil Mikulcic's decorated Yugoslav entry, was 14th. No. 10 is Bob van Nest (USA) about to release Hugh Langevin's design with Hoerner tips. 11. From Argentina Aimar Mattano snaps Ugo Acuto's complex Italian A/2. 12. Dave Welch, unlucky to lose a second in power, about to release Noel Hewitson's N.Z. Jedelsky model flown proxy by Martin Dilly. Started well with three maxes. 13 is Barry Halford, preparing with Stephen Bowles helping.





POWER LEADERS

1. Bruno Fiegl was third with detachable rear fuselage design. Tube front has inner and outer shells, contains twin timers. Extremely ingenious, excellent glide. 2. Bob Cherny, another "almost" winner with underfin and shallow pylon. 3. P. Broerse wrote off the lone Dutch entry in practice, rebuilt to place 12th in F/off. Is a "glider", note wire Parasol. 4. Czechs Sedlak and Hajek listen in to Walkie-talkie for news of Malina. Czechs climbed highest on MYVS diesels. 5. Joe Wagner of guess-where

had neatest decor in coloured tissue on "Uranus". 6. Vilim Knoch, originator of the tube forward fuselage, was 13th in Fly-off. 7. Always high placed Eugene Verbitsky of USSR was running over 24,000 r.p.m. on his pipe modded G-20. 8. Ivamura Keiichi's Japanese entry proxy flown by L. Kohout had a below par G-15. 9. Doug Galbraith, sixth in Fly-off with very fast climb. 10. Claude Zimmer was eighth for France, his team-mate Guilloteau was ninth. This model was one of the simplest in top twenty!



Round 5 started for us with 2 : 48 for Halford, and soon after, 1 : 20 for North but to show that some Croydon clubsters were blessed with lucky mitts, Chris Hayward helped Attila Tanyu, the Turk, after an auto rudder jam which resulted in a bent best model and sent his reserve off to a fifth max. Not bad for Attila's first ever International eh? Woodhouse made a desperate effort, towing almost OOS but the thermals were patchy and the return was 1 : 31 with the landing still well upwind of the timers. In fact only 30 maxes came out of the round, and even the locals were finding it tough as Hubert came down for 1 : 13 to spoil Czech team chances. Now Bourgeois of France only had to make 2 : 15 for France to win, or a max to get in the fly-off. Using his "wheel and deal" kiting method, the glider was held on the line. Bourgeois stationary and waiting. His moment came, and the model went off in a boomer—only to dit almost immediately! His assistant had forgotten to insert the pin. What a tragedy, but perhaps no less than many other stories of a lost max. For 18 entrants scored 4 maxes, among them East German Oschatz with 2 : 59 in the last round. Van Nest with a disastrous 98 secs. and Canadian Alan Riches making 2 : 47 with a reserve after the better model bust a tip landing in the rough downfield. For the top four in the fly-off there was a real challenge, reminiscent of Bourg Leopold. Calm so that a fast run was needed, the conditions were unhelpful and sheer performance would decide.



Above, Raymond Berteaux from Strasbourg, member of Franco-German "Thermik Schnuffler" club, one of several with torque actuated VP props, note torque arms to outriggers.

Left, efficient U.S. team attends to Jim Patterson and his high A.R. model wound from the rear. Manager F. Miller advises thermal sniffers and recovery crew by Walkie-talkie.



Tanyu ran first and released as the more experienced Modeer ran past and on for a quarter mile. Third away was the young Hungarian Champion, Voros, and chasing him was Hirschel. Voros released to pick whatever Modeer's drifting model had found but the East German, towing "blind" and accompanied by an observant team-mate went on to Modeer's launch point. By clearing the dead air which deceived the others, picking his own time and flying last, Hirschel deserved what he found to win the coveted trophy. Take note too of the East German team score on 14 out of 15 possible flights. There had been 220 maxes in 410 flights and 77 under 1 : 30, what would those great proficient Lindner and Hacklinger say to such an expose of tactics?

POWER

What a different story! Most of it must be told next month when we deal with technical aspects of the Championships, for this was the event in which sheer power is paramount and where we find use of techniques adapted from C/L speed. Climb high enough and you don't need a thermal; but have the slightest power loss or fault in trim and you are out of the running. We'll not embarrass our team by adding up their years at the game. Suffice it to say they won the Team Trophy through sheer experience and utter reliability. Round One saw double over-runs, a model rolled in, under-propped screechers—and high climbers that refused to glide. Dave Welch was robbed of a vital sec. to score 2 : 59 with Lagan's fine NZ proxy and Hagel seemed unusually off trim with stalls for 2 : 48. Thirty-eight maxes in 64 flights indicated a big fly-off prospect. Round two was the decider for many. Wind direction changed, went dead though early thermals created a few mass launches. French triggered one in which fifteen others followed but less than half maxed. As soon as the times were recorded, "Joe" Savini rocketed off, for French's max had ended only 300 ft. away. Alas, the pattern took "Faital" away from the lift cone and Savini was down almost to where he launched, 6 secs. under a max and 36 secs. under his dead air norm. Anxiety increased as Monks over-ran in a fine thermal flight but he got the model back quickly and made sure on the second attempt. The team was now fifth, there had been 43 maxes and 31 had perfect scores.

If anything was in our favour it was the weather, for the Third Round was humid, breezy and much like UK conditions. All three flew and maxed within 18 minutes. Elsewhere, Hagel was not doing

justice to his power. Mike Green was in over-run trouble with Roots' NZ model, Wagner had a pair of 2 : 43s to spoil the U.S. team score and the Czechs, Russians and West Germans had perfect team totals. G.B. was fourth, 46 had maxed and 27 had "triples".

Rainspots, and a 10-15 m.p.h. breeze really took us home in Round Four, and after a long wait Bob Cherny triggered off a flock in which his model collided with another on the glide. But his record was not spoiled and soon after, French and Savini showed their tails to two other bunches. Jim Brooks of Canada shattered a wing to wreck his run with a 1 : 10 and as the sky went gin clear. Frigyes, then Meczner climbed left and stalled to put Hungary down. Malina, clearly the highest climber (MVVS T R diesel) showed how lift was essential for him to max as he returned a "normal" 2 : 40 and West German hopes sagged as Meissnest dived with power on, an antic later repeated by Cuban Diaz who almost wiped out three opposition teams in a Kamikaze attack. Hurrah, hurrah! G.B. was now leading, U.S.A. 28 secs. and Italy 29 secs. behind. There had been 36 maxes, 16 with quadruples. Round Five would have no room for mistakes, and French's shallower climb with a scraping max had us worried. Savini's was an eye-strainer, and as each had been paired by Cherny and Galbreath who also maxed, it was now almost Monks verses Wagner as far as team places were concerned, Carlo Lenti having clanged with an off-tune pipe for 2 : 07 (a similar fate affected W. German Werfl and Polish Sulisz). We should never have worried over Ray Monks, for his fifth max was perfect, so too was Wagner's. We had won! The U.S.A. was runner-up. It is more than coincidence that the only three to drop out were "piped". Thirteen, including two each from G.B., U.S.A., France, were to fly-off, 39 had maxed and no less than 29 had four maxes in their scores.

FLY-OFF

The atmosphere was charged with expectancy as the Very pistol signalled the start and Cherny launched immediately. In the procession, Monks veered off his usual pattern and Knoch was completely cross-wind. Flying almost last and on his own, George French set an example that raised a spontaneous round of applause. Five survived to aim at 300 turns. Again Cherny led the chase and French was last off. Spring, the Swiss, went shallow on the climb and Siegl was clearly highest. Close comparison of Figl and French revealed an enviable glide for the Italian, but George was second and the result a repeat of the earlier Zell/See International, as Hans Seelig was carried shoulder high, the winner.

WAKEFIELD

Clear, calm, and very hot, the final contest day provided a classic finale that was to be an eye-opener for the complacent and a contradiction to those who say 40 grammes of rubber is not enough. How do these people get 400 turns on 16 strands? Why are their climbs equal in some cases to power models? Where do they exchange information so that torque controlled variable pitch props and changing incidence tails suddenly become the vogue? Admittedly, we owe much of this to Ivan Ivvanikov of Russia when he displayed his inventiveness at Leutkirch in '61, but as in power, World class contest modellers can now no longer afford to ignore the "gimmicks" even though the top four models succeeded without them. Round One set the pattern. Burrow and Mabey each had broken motors and all British scores were under two minutes despite endeavour to follow the Danish team's soapbubbles. The round produced 45 maxes in 74 flights including a lost model for Turk Rone Keen who forgot to trip his timer and a knock-out for Woodhouse when hit in the middle by a Yugoslav model!

Continued on page 582

1	Mikko Sulkala	Finland	-900+240+300+238
2	K. Rachkov	Bulgaria	-900+240+300+89
3	V. Matveev	U.S.S.R.	-900+230
4	E. Melentiev	U.S.S.R.	-900+210
5	T. Kosler	Denmark	-900+207
6	I. Farkas	Hungary	-900+203
7	Hans Martin	Austria	-900+196
8	G. Cassi	Italy	-900+181
9	E. Niensstedt	Denmark	-900+171
10	K. Jusufbasic	Yugoslavia	-900+169
11	L. Hansson	Sweden	-900+169
12	K. Rye	C.S.S.R.	-900+160
13	R. Klett	Netherlands	-900+146
14	H. Pasanen	Finland	-900+142
15	K. Sager	Switzerland	-900+140
16	F. Strzya	E. Germany	-900+135
17	J. Peliot	France	179 180 180 180 180 - 899
18	I. Cereanek	C.S.S.R.	180 180 180 180 180 - 899
19	H. Abbing	Netherlands	180 180 180 180 180 - 884
20	P. Gervasi	Italy	180 180 180 180 180 - 882
21	S. Legnani	Italy	180 180 180 180 180 - 880
22	O. Hintz	Rumania	180 180 180 180 180 - 868
23	A. Boidin	U.S.S.R.	153 180 180 180 173 - 866
24	E. Hamalainen	Finland	180 180 180 180 180 - 863
25	V. Kmoch	Yugoslavia	140 180 180 180 180 - 860
26	G. Xenakis	U.S.A.	180 180 180 180 180 - 854
27	H. Wagner	Austria	130 180 180 180 180 - 850
28	J. Löffler	E. Germany	148 180 180 180 159 - 845
29	Ch. Rothenberger	Switzerland	180 180 180 180 124 - 844
30	R. Ahman	Sweden	154 180 180 180 140 - 834
31	J. Kosinski	Poland	180 180 180 180 113 - 833
32	D. Slobennmann	Switzerland	180 180 180 180 180 - 828
33	E. Karley	Bulgaria	106 180 180 180 180 - 826
34	Gordon Roots	N. Zealand	180 180 180 180 180 - 824
35	proxy Darl Morley	G. Britain	180 180 180 180 180 - 822
36	E. Oskamp	Netherlands	102 180 180 180 180 - 822
37	B. Tarnofsky	Canada	180 180 180 180 180 - 820
38	S. McCullagh	S. Africa	176 104 180 180 180 - 820
39	G. Rupp	W. Germany	180 100 180 180 180 - 820

1967 WAKEFIELD CONTEST RESULTS

39	R. Kreisz	Hungary	180 180 98 180 180 - 818
40	K. Lapinsky	Poland	91 180 180 180 180 - 811
41	W. L. Pretorius	S. Africa	180 180 180 90 180 - 810
42	B. Johansson	Sweden	157 180 111 180 180 - 808
43	W. Bolle	W. Germany	180 180 180 83 180 - 803
44	H. Kothe	U.S.A.	180 114 180 180 144 - 798
45	K. Keilich	Japan	113 180 149 175 180 - 797
46	A. Simerda	C.S.S.R.	180 168 180 180 84 - 792
47	P. Rasmussen	Denmark	180 167 81 180 180 - 788
48	R. Hofass	W. Germany	174 180 122 180 132 - 788
49	Yves Germain	France	180 180 180 130 116 - 786
50	C. G. Menendez	Cuba	162 180 85 176 180 - 783
51	J. A. Patterson	U.S.A.	180 180 180 180 62 - 782
52	R. Berteaux	France	138 180 103 180 180 - 781
53	W. Pulick	E. Germany	180 180 102 138 180 - 780
54	E. Pinura	Yugoslavia	109 180 175 148 180 - 774
55	A. R. Perez	Cuba	171 180 63 180 180 - 771
56	J. R. Mabey	G. Britain	114 180 107 180 180 - 761
57	L. R. Burrows	G. Britain	111 142 154 180 153 - 740
58	R. Koen	Turkey	180 180 105 94 180 - 739
59	E. Balasse	Belgium	180 163 108 167 110 - 728
60	K. Bathge	Hungary	128 180 112 180 124 - 724
61	P. H. Lagan	N. Zealand	180 125 180 96 142 - 723
62	proxy R. Godden	G. Britain	180 64 118 180 180 - 722
63	H. Zachamel	Austria	180 110 70 180 180 - 720
64	A. Mabille	Belgium	180 106 180 138 108 - 712
65	J. Markiewicz	Poland	180 106 180 106 180 - 708
66	G. McGlashan	Canada	180 60 180 106 180 - 706
67	J. R. Cowlin	S. Africa	180 180 76 122 148 - 706
68	R. L. Bailey	G. Britain	115 180 180 113 110 - 700
69	L. S. Matud	Canada	105 133 85 180 180 - 684
70	Jose Jimenez Navarro	Brazil	99 127 83 180 180 - 679
71	R. G. Magill	Spain	180 116 136 63 180 - 675
72	proxy J. Clements	N. Zealand	109 180 180 82 78 - 629
73	S. Stamenov	G. Britain	24 76 180 180 140 - 600
74	G. Charlier	Bulgaria	79 108 24 155 180 - 456
75	J. G. Torres Silva	Belgium	78 39 116 75 68 - 376

1	J. Seelig	(G.15*)	W. Germany	-900+240+300
2	G. R. French	(G.15)	G. Britain	-900+240+280
3	B. Fiedl	(G.15)	Italy	-900+240+263
4	Bob Cherny	(G.15)	U.S.A.	-900+240+251
5	P. Spring	(G.15)	Switzerland	-900+240+152
6	J. Sedlak	(MVVS 2.5D T/R)	C.S.S.R.	-900+214
7	D. Galbreath	(G.20)	U.S.A.	-900+214
8	C. Zimmer	(G.15)	France	-900+210
9	R. Guillotou	(G.15)	France	-900+182
10	R. Monks	(G.15)	G. Britain	-900+181
11	E. Verbitsky	(G.20M*)	U.S.S.R.	-900+140
12	P. Broerso	(G.15)	Netherlands	-900+135
13	V. Kmoch	(G.15)	Yugoslavia	900+119
14	P. H. Lagan	(G.15)	New Zealand	179 180 180 180 - 899
15	proxy D. Welch	(G.15)	G. Britain	180 176 180 180 - 896
16	F. Schneebeger	(G.15)	Switzerland	180 176 180 180 - 896
17	E. Frigyes	(Moki S6*)	Hungary	180 180 180 180 - 894
18	S. Savini	(H.P.15G)	G. Britain	180 174 180 180 - 890
19	Bo Wall	(G.15)	Sweden	180 180 170 180 - 890
20	J. Kumpulainen	(G.15)	Finland	180 179 180 154 180 - 873
21	L. Fritsch	(G.15)	Austria	180 180 172 180 180 - 872
22	R. Werft	(G.15*)	W. Germany	180 180 151 180 - 871
23	J. Wagner	(G.15)	U.S.A.	180 163 163 180 180 - 866
24	G. Carrara	(G.15)	Italy	145 180 180 180 180 - 865
25	R. Kemmer	(MVVS 2.5D T/R)	E. Germany	174 151 180 180 180 - 865
26	Z. Mallina	(MVSS 2.5D T/R)	C.S.S.R.	180 180 140 180 - 860
27	N. Soininen	(G.15)	Finland	173 180 180 180 140 - 853
28	V. Mozirsky	(G.20M)	U.S.S.R.	180 180 180 133 180 - 853
29	D. Elliott	(G.15)	Canada	162 165 180 166 178 - 851
30	R. Hagel	(G.15)	Sweden	168 162 180 180 180 - 850
31	N. E. Hollander	(G.15)	Sweden	166 180 180 144 180 - 850
32	V. Hajek	(MVVS 2.5D T/R)	C.S.S.R.	180 180 180 180 850 - 850
33	C. Lenti	(G.15*)	Italy	180 180 180 127 - 847
34	H. Clement	(MVVS RL)	E. Germany	180 180 180 126 180 - 846
35	R. Saukkonen	(G.20)	Finland	120 180 180 180 180 - 840
36	Klaus Engelhardt	(MVVS RL)	E. Germany	180 180 180 135 160 180 - 835
37	H. Keintrath	(H.P.15)	Austria	180 180 180 151 139 - 830
38	Z. Sulisz	(G.15*)	Poland	180 180 180 180 104 - 824
39	Iwamura Keilich	(G.15)	Japan	180 140 135 174 180 - 809
40	J. Szecsenyi	(Moki S6*)	Hungary	180 180 116 180 153 - 809
41	R. Matie	(G.15)	Yugoslavia	142 162 141 180 180 - 805
42	A. Mecner	(Moki S6*)	Hungary	180 180 180 94 169 - 803
43	R. Schenker	(G.15)	Switzerland	96 180 180 180 180 - 796
44	J. Brooks	(K & B15)	Canada	180 180 180 70 180 - 790
45	V. Onufrienko	(G.20M)	U.S.S.R.	108 180 180 48 180 - 768
46	G. B. Roots	(G.15)	New Zealand	144 143 160 180 126 - 753
47	proxy M. Green	(G.15)	G. Britain	125 105 180 180 161 - 751
48	P. Jorgensen	(G.15)	Denmark	131 155 180 180 99 - 745
49	G. Holm	(G.15)	Canada	180 180 180 86 119 - 745
50	R. Meiseneat	(G.15)	W. Germany	110 180 92 180 180 - 742
51	A. Csoma	(Webra Mach 1)	Rumania	180 180 180 91 104 - 735
52	R. E. Bain	(G.15)	New Zealand	107 180 180 87 180 - 734
53	proxy D. Wiseman	(G.15)	G. Britain	137 155 180 180 102 - 694
54	A. Bou	(G.15)	France	94 143 116 160 90 - 603
55	R. D. Castillo	(Rythm)	Cuba	134 180 112 - 600
56	L. Darev	(G.15)	Bulgaria	144 148 - 578
57	J. Krzeminski	(G.15)	Poland	180 180 115 108 - 575
58	S. Arambasic	(G.15)	Yugoslavia	77 100 97 171 110 - 555
59	N. D. Malinov	(G.15)	Bulgaria	122 180 180 27 33 - 542
60	R. Straburzynski	(Cox 15)	Poland	180 180 - 540
61	S. Agner	(G.15)	Denmark	21 73 180 82 180 - 536
62	S. McCullagh	(G.15)	S. Africa	180 102 - 528
63	N. Ch. Christan	(G.15)	Denmark	130 180 77 86 - 483
64	F. R. Holmud	(G.20)	Spain	10 110 103 60 173 - 456
65	O. Ebner	(Rythm)	Cuba	166 64 180 - 410
66	J. F. Diaz	(MVVS 2.5D T/R)	Cuba	98 123 70 45 - 376
67	J. Carwell	(G.20)	S. Africa	- 81 114 122 47 - 364
68	J. L. Calefata	(G.15)	S. Africa	- - - - -
69	M. Doyle	(G.15)	Ireland	- - - - -

* denotes use of tuned exhaust system.

1967 VICTOR TATIN F.A.I. POWER CONTEST RESULTS

1	Great Britain	2,694	13	New Zealand	2,387
2	U.S.A.	2,666	14	Canada	2,378
3	Italy	2,612	15	Yugoslavia	2,280
4	Czechoslovakia	2,610	16	Austria	2,112
5	Switzerland	2,592	17	Poland	1,944
6	Sweden	2,590	18	Bulgaria	1,889
7	Finland	2,586	19	Denmark	1,817
8	E. Germany	2,548	20	Cuba	1,435
9	U.S.S.R.	2,521	21	Netherlands	900
10	W. Germany	2,516	22	South Africa	900
11	Hungary	2,508	23	Japan	809
12	France	2,494	24	Rumania	742
			25	Spain	483

WAKEFIELD TEAMS

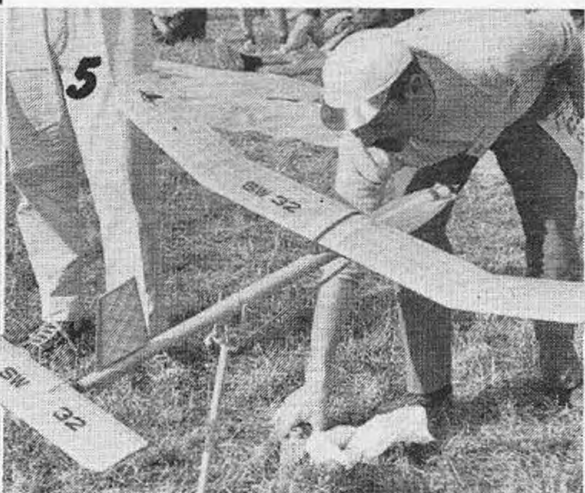
1	U.S.S.R.	2,666
2	Finland	2,683
3	Italy	2,662
4	Netherlands	2,606
5	Denmark	2,588
6	Czechoslovakia	2,581
7	Switzerland	2,570
8	Sweden	2,542
9	Yugoslavia	2,534
10	E. Germany	2,525
11	Austria	2,472
12	France	2,466
13	Hungary	2,442
14	U.S.A.	2,434
15	W. Germany	2,411
16	Poland	2,356
17	South Africa	2,336
18	Bulgaria	2,326
19	Canada	2,210
20	Great Britain	2,201
21	New Zealand	2,178
22	Belgium	1,994
23	Cuba	1,933
24	Rumania	868
25	Japan	797
26	Turkey	739
27	Brazil	670
28	Spain	675

Opposite: 1. Krestu Rachkov hand wound! Has flown for Bulgaria many times, earned 2nd place. 2. Vlad. Matveev lashes rear fuselage on shoulder-wing Wake, placed 3rd in '65, 2nd this year. 3. Winner in '65, 5th this time, Thomas Koster has long fuselage, variable incidence tail. 4. Austrian Cd.H & Wake specialist Hans Martin, 7th in F/off. 5. Self winding mount for Swiss Kurt Sager, placed 15th. 6. Superb construction by young A. Boidin (USSR) included hardwood prop.

Continued opposite



7. Derl Morley, unlucky proxy for N. Z. Brian Roots.
8. Dieter Siebenmann's trio of designs were most intricate on the field. Anodized tube fuselage, V.P. Props, egg-box structure. 9. John Mabey releases for one of three maxes. 10. Cuban Carlos Gonzales Menendez, neat model, was 50th. 11. Son of Wakefield pioneer, Jaques Pettot was 17th—out of fly-off by just one second! 12. With Wake carrying Cranfield '58 process stamps, Edgar & Odette Balasse topped many latter day experts, were 59th with 728—48th with 541 9 years back!





Unassuming Mikko Sulkala, Finnish, and new World Champion rubber driven model flyer prepares to launch during the deciding final rounds. Never hurried, and always careful to pick his time to fly under the watchful guidance of Team Manager Reino Hyvarinen, Mikko was supreme in a contest of experts.

Sulkala climbed past and infinitely higher. Drifting 100 ft. per minute they each d/t'd well over five minutes. Dave Hambley, one of the SMAE's nominated international timekeepers, had been "on" A/2 winner Hirschel, now he worked for Rachkov—was this an omen? Hardly, because Sulkala was away without hesitation in the 8th and soaring almost indefinitely as Rachkov's rubber showed signs of tiredness and the "Raketa" almost spiralled in on the glide. So ended another great event. The story is far too involved for one edition. Next month we shall describe and illustrate the technicalities.

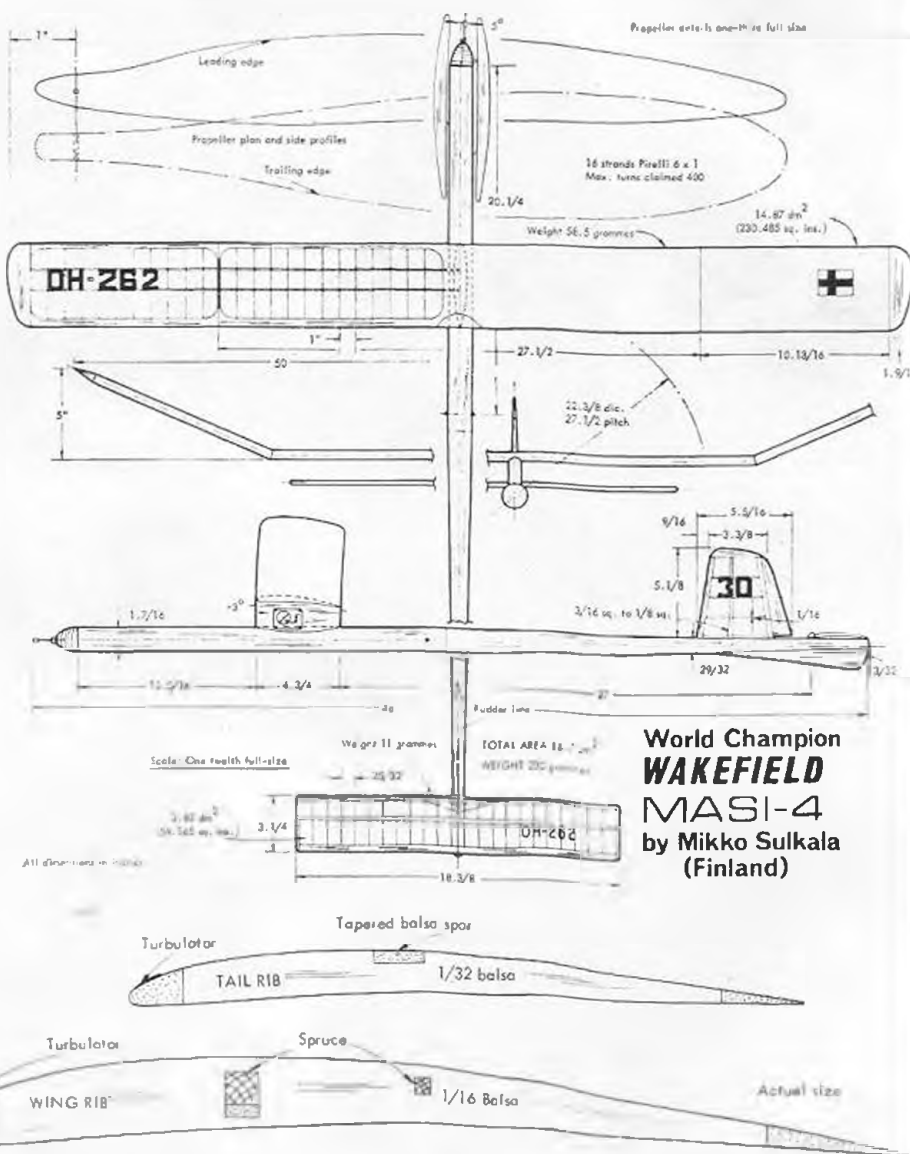
One last word: The fantastic recovery service returned Clements' glider as teams left for home, it had travelled 100 kilometres!

Continued from page 579

Most of the entry had the capacity for waiting up to fifteen minutes with a fully wound motor until there was secure evidence of a thermal. Wind veered 180 degrees in Round 2 and as it did, so the tactics of A/2 became the fashion. Koster and Pretorius (South Africa) set off one bunch of sixteen. It appeared so easy, yet Rupp and Kothe boomed and Bailey came close when his winder fell apart with only a few minutes of the round left. Fifty-six scored maxes, 33 doubled and the Finns were ahead with a perfect score. They repeated the performance in Round Three, a rather sad hour for us with stalls marring Burrows and Mabey's efforts and relieved by a fine max from Bailey. George Xenakis of the U.S. team had already enlivened interest with his thermal barometer, and those who discovered the inner workings of his torque controlled tail gave him a fine chance. Fate played its hand though, and George was down this time for 2:14. So too was Derl Morley's fine effort thwarted with Roots' NZ proxy. He missed a bump through prop stop bother and scored 1:44. Now 27 had perfect scores, 49 had maxed and of the individuals, Matveev and Koster could well repeat the Kauhava duel.

Round 4 was an hour of wonderful calm, under large cumulus. Mabey and Burrows maxed, Bailey broke his run with 1:55 and Finland lost the lead to the U.S.S.R. by 10 secs, when Hamalainen fell out of lift. He was not the only one to fall foul as nine others dropped out of the running in spite of 49 maxes being scored. The percentage of fall-out was arrested sharply in Round 5. Of the seventeen survivors, only Jim Patterson and his long span 15:1 aspect ratio design was to fail, and with such a clang that he fell fifty places! Jim seems fated at World Champs. John Mabey lodged a max for a third time, so giving him top British place. When young Boldin of Russia lost lift, Finnish hopes were raised, but U.S.S.R. still led the team totals by a scant 3 secs. Italy was only a second behind as everyone else had maxed, and 4 seconds separated the top three nations! Thirty-seven had 4 maxes.

Sixteen in the Fly-off included two Danes, two Finns and two from the U.S.S.R. The latter pair were outstanding in rate of climb; but only Sulkala of Finland and the veteran Bulgar, Rachkov made four minutes. Winding by hand, Rachkov flew first in Round 7, past the Finn who was holding a wound motor, then as the Bulgarian prop folded,



**World Champion
WAKEFIELD
MASI-4
by Mikko Sulkala
(Finland)**

TOPICAL TWISTS

by 'Pylonius': illustrated: by 'Sherry'

Smotherland Heroes

Poor old Britain was certainly left in the "Wake" at the recent World Champs. The flightiest rubber flyers we could muster finished so far down among the dead air men that we can never hope again to see the Union Jack fluttering bravely in a bubbly thermal.

But what went wrong? What makes these foreign johnnies so devilishly superior? The answer is quite simple, really: whilst we still continue to build model aeroplanes they build flying machines, with the accent very much on machine. Whereas a bit of wire poked through a brass bush is good enough for the British modeller, as it was for his father before him, the foreign modeller turns out a precision engineering job, usually under the auspices of the State Institution of Model Engineering Advancement or similar body. Again, it is traditional in the British way of model life not to spend more than two weeks on the production of a model whereas the foreigners approach is rather more extended, taking him that much time just to fill in his balsam requisition form. Anyway, who amongst us would be clever enough to think of anything so scientific as winding the motor by hand?

What possibly we lack is that truly national spirit so movingly exemplified in a recent report from the Soviet Union. In the present state of affairs, though, a British version might read something like this:

"Heroes of the Citizens' Model Resistance Movement this week celebrated the 15th Anniversary of the Glorious Fairlop Closedown. The occasion was marked in truly national style by the cancelling of the Northern Heights Gala and the banning of model flying on many commons and open spaces throughout the country.

Speaking at a massed rally of Wanstead Residents, Mr. Skid Tunnup, President of the Motor Cycling Tuners Association, praised the public spiritedness of the local motor cyclists and sports car owners in helping to drown the noise made by model aircraft. He also had a few warm words to say for the government's supersonic tests policy. Mr. 'Crash' Spillmore was to have spoken on the dangers of model flying to the public, but was unfortunately involved in a road accident on the way to the rally. There was also a casualty during the march past of Veteran Complainers across the common. Citizen Jack Biro was struck on the head by a cricket ball. He claimed the incident would not have occurred had he not been looking up at a model plane at the time.

Another event to mark the celebrations was a special investiture in Hyde Park, in which Citizen Councillor Fred Juggins was made Grandmaster of the Boot. The citation praised the resolution he showed in the face of six Radio models, including one multi, three control line models and a kite with weak string. Another notable award was that of a Communal Vigilance Medal, 2nd Class, to Citizen Alec Snoobody for having reached his target of five hundred



"Revisionist!!"

model flying complaints to the council. This was a particularly noteworthy effort as the common opposite Mr. Snoobody's residence had been built on some years ago but he had persisted with his good work through the medium of a relative who lives a few miles from the dreaded Chobham Common. . . ."

Early Days

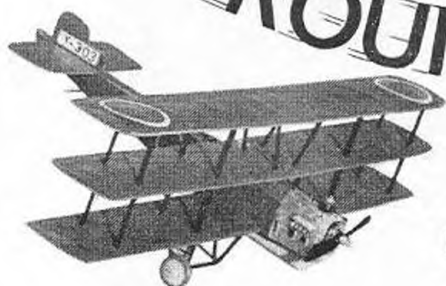
I well remember the day someone came in shouting, "Lillienthal has flown!"

"Can't seem to keep our maids five minutes," snorted the colonel.

It was at this inspiring point in history that I decided to build the first model plane. Gubbins like, I had to make it a tail first job. But what about power? Elastic was tight in those days (we ate well then) and none too easy to get at. But, although the colonel's complaints over the loss of maids became more numerous, I persevered. Now only remained the question of getting airborne. It was then we acquired a new governess called Mary Poppins . . .

"He won it at the U.S. Nats"





ROUND THE POLE

SCALE POWER MODELS

M. F. HAWKINS introduces a couple of R.T.P. scale designs

CLUB NOTICE

Round-the-pole contest. Friday night
Entry fee 1/- Winner collects all.
Maximum engine size .020 cu. ins.
Rubber, Electric or Jetex also eligible.

All models must complete five laps on 6ft radius line.

Judging will be for scale appearance and performance.

BY ORDER:

WHAT to do when Winter cometh? Dark evenings and the call of the fire are automatic signals for more building activity—why not combine the fun with some R.T.P. flying?

Mike Hawkins has been pushing the scale round the pole class down at the Boscombe Down Club winter meetings and a couple of the results are seen here. The selections may be a little obscure for many enthusiasts but why worry when the subjects look so interesting? Perhaps we'd better start by describing the types, and we begin with the Japanese Triplane.

The first Japanese Aircraft Carrier, the Hosho, entered service in 1923. For this Carrier, Mitsubishi produced three types of aircraft, known as the Type 10 Fighter, the Type 10 Bomber and the Type 10 Torpedo Attack Plane. They were called Type 10 as they entered service in the 10th year of the Taisho era, that is the 10th year of the Emperor's reign. Simple enough?

The Fighter and Bomber were conventional biplanes with liquid cooled motors, but the Torpedo Plane was the only triplane ever built in Japan. All three aircraft were designed by Herbert Smith, who had worked with the Sopwith Company before going to Japan after the War. One can see a lot of the Sopwith trademarks in the shape of the aircraft.

Power was provided by a 450 h.p. Napier Lion and span was 43 ft. 6 in. with a length of 32 ft. 1 in. Maximum speed was 127.4 m.p.h. and endurance 2 hrs. 20 mins.

A total of 20 aircraft were built, but there is no record of their ever having served on the Hosho, possibly due to the fact that the middle wing must have completely obscured the view of the Carrier deck during landing approach!

The monoplane is equally unique.

The effort to build military aircraft by the U.S.A. during the First World War resulted in several well known designs such as the Thomas-Morse fighters and the Curtiss Jenny, and several lesser known types such as the Victor Heinrich Scout and the Wright Martin M-8.

This latter was designed by Grover C. Loening as a two seat fighter, following a request from the Wright Martin Corporation for a test bed to fly their Licence built 300 h.p. Hispano motor.

Two aircraft were built, and following successful tests, were supplied to the Army at McCook Field in December 1918. By then, the need for fighters had passed and no more were produced. Span was 32 ft. 10 in. and the length 21 ft. 6 in. The top speed was a creditable 143 m.p.h.

Both models are steady "round the pole" performers on a 6 to 10 ft. line, the originals were powered with "Tee Dee" 010, which can be hidden between the dummy cylinder blocks of the motor.

Construction is similar for either subject.

Start the wings by cutting all the ribs (24 for the M-8, 52 for the Type 10) by the "block" method. Each wing is assembled over the plan. The tips are shaped to the camber of the ribs.

The 18 s.w.g. hook is "Evo-Stuk" in place on the appropriate tip. After completion the wing halves of the M-8 are joined by $\frac{1}{8}$ in. x $\frac{1}{8}$ in. strips of ply, which will be glued to F2 and F4 during final assembly. Note double ribs for the strut positions and ailerons which are cut and re-fitted to the three wings of the Triplane. Cover and dope all wings before assembly to the fuselage. The M-8 fuselage has a basic frame joined by F2, F4 and F5, and filled in between F2 and F4 with $\frac{1}{8}$ in. sheet, noting the cut-outs for the Pilot's cockpit. Add F3 before sheeting the underside. Add the axle, and solder to front and rear undercarriage legs.

Triplane sides are cut from $\frac{1}{8}$ in. sheet and assembled onto the formers, short struts for mounting the middle wing should be cemented to the inner surfaces of the fuselage sides. Top and bottom of the fuselage are from $\frac{1}{8}$ in. sheet.

Tails are from $\frac{1}{8}$ in. sheet with the elevators being adjustable and mounted by small pieces of aluminium sheet let in with Evo-Stik. Complete the cowlings as indicated. If the Tee Dee .010 is used, the integral tank is too wide for the triplane fuselage, and a tank

cum motor mount is soldered as shown. The tank is screwed to F1 and the motor bolted to the front of it using the small mount supplied with the engine. The M-8 presents no such difficulties. Dummy cylinder blocks and exhaust pipes are added, and a radiator grille from wire mesh (Woolworth's Tea Strainer) Araldited in place. Fuel proof well round the motor.

Assembly

Mount the middle wing of the Triplane on the short fuselage struts, and after piercing the tissue, slide the outer struts through the mid wing and cement in place. Hook the axle into the root of the lower wing with a dab of Araldite and cement these wings to the fuselage side and the outer struts.

Slide the inner struts into place from underneath, soldering the axle to the undercarriage struts.

Add the upper wing centre section struts, rest the top wing upside down on the bench, and with cement in the strut holes, fit the model to the top wing.

Build up the undercarriage from $\frac{1}{8}$ in. ply strip and solder on the wheels. The Torpedo is made from a piece of $\frac{1}{2}$ in. square.

The M-8 assembly is of course more simple and covered by the details on the plan.

The wing is attached to F2 and F4 by the plywood

strips and the wing struts, cut slightly overlength from $\frac{1}{8}$ in. ply, trimmed to length and firmly glued to the wing and fuselage.

Colour Scheme

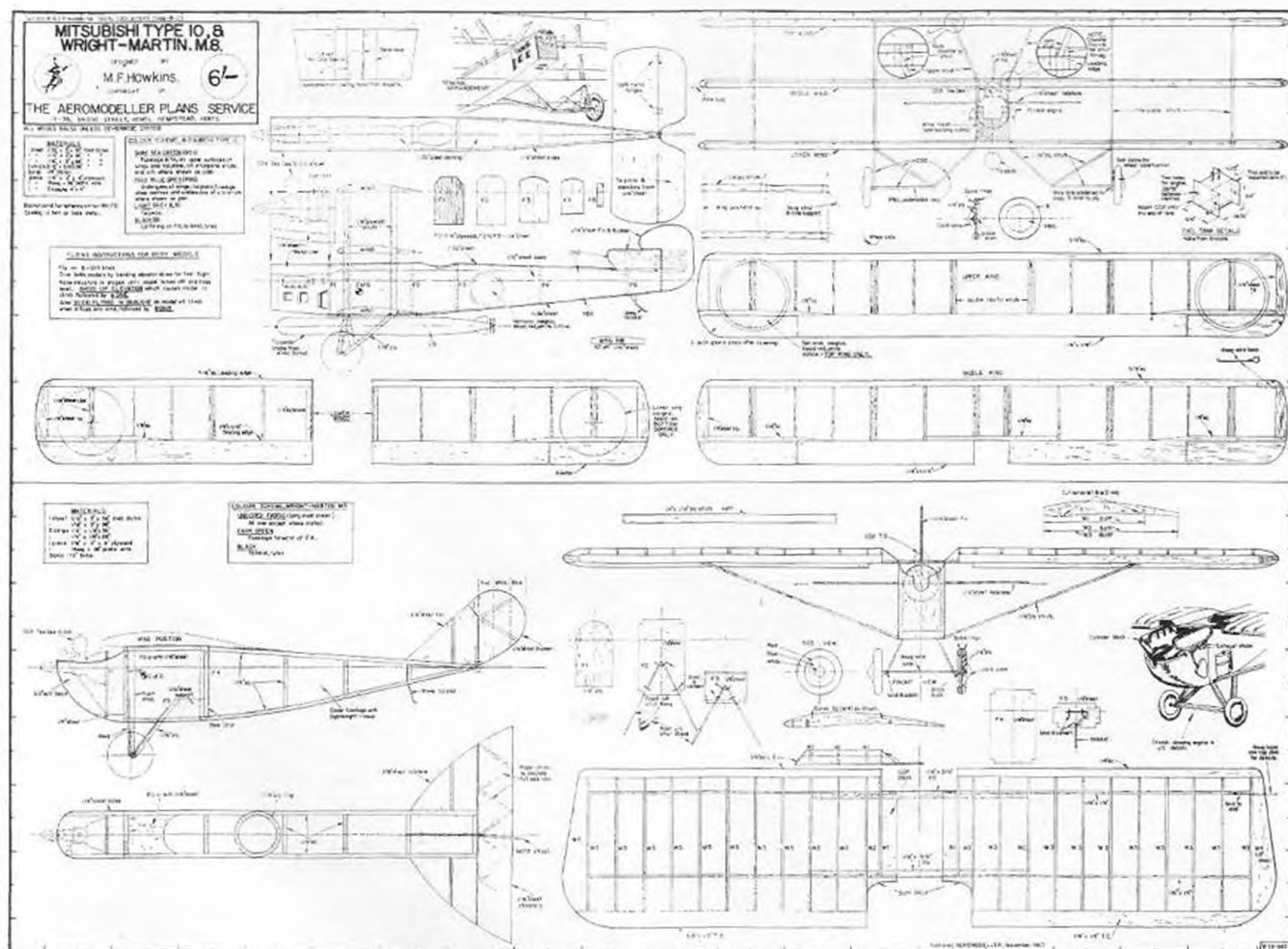
Upper surfaces of the Triplane are dark sea green, under surfaces pale blue-grey. Cowl bare metal. National Marking blood red, with white surround, except under the wing. Tail mark white with black numbers. Torpedo pale grey. The aircraft shown was No. 3 of the Yokosuka Unit. Do not forget to fuel proof the model as the Tee Dee will not run well without nitromethane in the fuel.

The M-8 fuselage is gloss dark green back to F4 and all the rest undoped fabric (dirty matt cream). Markings: Rudder: red, white and blue vertical stripes, red foremost. Roundels are on the wheel cover only, red, blue and white, with red outermost.

Flying

The original models were built to fly in clockwise circuits. It is safest to start with some "down" elevator, and then work upwards until the model flies in a stable fashion, without climbing on one side of the circuit and diving on the other. Use a larger than the normal 3 in. prop if possible to control the speed.

FULL SIZE COPIES OF THIS 1/6th SCALE REPRODUCTION ARE AVAILABLE FROM
AEROMODELLER PLANS SERVICE. PRICE 6/6d (including post) QUOTE RTP 942 WHEN ORDERING





Saturday Night and Sunday Morning

IT would seem that over the past few months I have been straying away from the stated aims of the title of the column, although I know some modellers believe it to refer to the author and not the subject material. For a change, therefore, I will describe for you a typical weekend of flying with our local club and in doing so, possibly pass on a few hints and ideas that may be of some use to fellow enthusiasts.

Saturday is of course the day usually set aside, amongst other domestic duties, to frantic last minute completion of models and preparations for the following day's outing to the flying field. These preparations usually finish sometime around midnight by which time chaos has invaded the work bench, a tin of dope has been spilled over the floor and you have completely forgotten to put the cat out for the night! However, you climb into bed feeling tired but rather satisfied and spend the next halfhour peeling surplus balsa cement off your fingers and contemplating the glory that will be yours in the morrow. My first moments of consciousness on the Sunday usually occur at about 8.30 a.m. with a doubtfully welcomed cup of tea from the wife. My first instinctive action is to peer through the bedroom curtains and try to focus bleary eyes on a tree in the distance. Good! Not too much wind and the skies are clear; when the weather conditions are unfavourable the tea is left to get cold and gloom descends.

Breakfast is consumed at an even faster than normal rate, pile all the models and equipment in the car and off to pick up brother, plus more models and equipment. Big argument as to why he or I was ready first and kept the other waiting and so to the flying field by 10.30 a.m. We are not the first arrivals, John and his son are already on the scene with John's Mini Super way up at about 1,000 feet testing the upper wind velocities. John has been aeromodelling for less than a year as yet but is an accomplished single channel flyer having learned the basic rules of flying very quickly. His first model was the Keil Kraft *Gyron* and, although he made an excellent job of the building, it was too much of a handful for his untutored button pushing. To make the model more stable, John inserted a six inch centre section to increase the wing span and also increased the dihedral and slightly enlarged the tailplane. These alterations proved to be highly successful and so began a series of "John's Mods".

A week-end in the life of our single channel specialist

David Boddington

He made similar alterations to the "Mini Super" wings again with the desired results of improving stability—so desirable for the beginner in S/C. His twelve year old son is now under instruction from dad and looks like becoming a "natural" pilot.

Soon the regulars start arriving at the field and the fine weather also brings out some ex-modellers that have been absent for the past ten years or so, they never quite manage to get aeromodelling right out of their systems. I know of quite a few returning to the hobby after a long break on the pretence that they are doing it for their children's sake—who is kidding who! Charlie has got his McCoy 19 roaring away in the Frog *Jackdaw* and is tweaking the levers on his RCS Inter 6 Tx checking all functions for operation. One of the founder members of the club, Charlie has only recently changed to Multi after flying S/C for many years and with varying degrees of success. He is now finding the transition very much to his liking but not before a few anxious moments through trying to get left rudder by pulsing twice on the rudder lever. He now recommends ground simulation, with the model strung up from the ceiling, to get thoroughly familiar with the Tx before undertaking first flights. Most of the boys in fact fly S/C or "Galloping Ghost" models, for one thing we have no tarmac area or mown strip for operations and we are all fly-for-fun types as opposed to keen competition modellers.

Some flyers seem to have more than a share of bad luck and David H. might be considered as

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PAL JOEY by Bill Winter, 42 inch rudder only for .049-.06 engines sheet fuselage, extremely popular design. Price 5/-. Quote RC 852.

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MORANE-SAULNIER by Dennis Rattle a 34 inch span semi-scale parasol wing version of Warneford's famous aircraft, takes up to .049. Price 3/6. Quote FSP 924.

Add 6d. for postage of each plan.

one of these. A few months ago he lost his model when it went out of range never to be recovered again. Today with his new model and new equipment (borrowed) exactly the same thing happens. After a couple of short trimming flights the model is launched with the engine at about two thirds of max r.p.m. and away she goes upwind, straight as a die. Suddenly comes the dreaded call of "No Signal" and everyone grabs their Tx to try to make contact with the model—all to no avail. Off sets David H. with three lads for another long search. All very sad but is it really bad luck? I'm afraid that the plain truth is that you must be 100 per cent satisfied with the operation of your equipment before flying—there is still room for things to happen (*i.e.* interference, poor motor run, pilot error etc.) even when their checks have been made. Alan is another up and coming R/C enthusiast with a good knowledge of electronics but no previous experience of modelling. His first real taste of flying came with a "Gallop Ghost" equipped *Tyro*, possibly not the ideal combination for the true beginner, but Alan coped creditably well and had got the hang of things before its eventual demise. His current "G.G." model is rather heavy and fast making it difficult to handle, particularly from the launch when it has a tendency to drop a wing suddenly. Unless you are very quick on the lever the model is "in"! We are currently trying to persuade Alan to build a slower and more stable model to give him a chance to obtain more "air" time before progressing again to more aerobatic types.

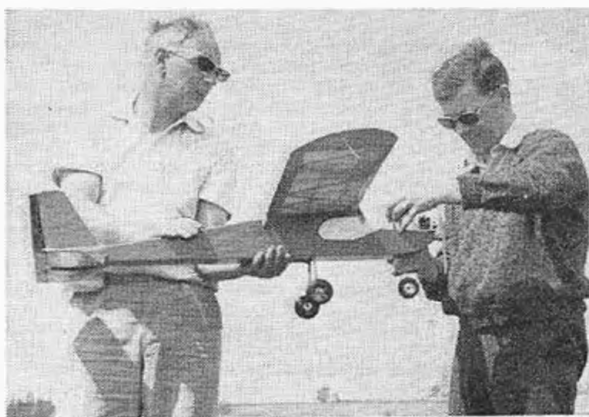
As the day progresses the wind strength increases but with the blue skies and well formed cumulus clouds around it should be possible to do a bit of thermal flying so we got out our powered sailplane. With plenty of turns on the escapement rubber (You can use up a lot of turns on a ten minute flight) the Cox QZ engine is flicked into life and off I set ploughing upwind. Sure enough at about 300 ft altitude the sailplane hooks a strong thermal and starts to rise at quite a rate. The only trouble is that although this model is going upwards it is also, because of the strong winds at altitude, going backwards. Spiralling down will not help much as the model will still tend to drift downwind as it spirals. Fortunately Charles has a spare Tx handy and sets off in the car to a downwind position. With the sailplane still at about 800 ft., and 400 yards or so downwind of the field Charles takes over control with his Tx and lands the model in a field close to the road. On all future flights with this model we have someone posted downwind ready to take over if necessary—something to be said for keeping to superregen equipment after all.

The *Barnstormer* and *Lockheed Santa Maria* are two of David T's favourite models and he usually gives them an airing every weekend. The latter

model is a conversion from the free flight silhouette model published as a full size plan in the August 1963 issue of *Aero Modeller*. With a Cox QZ engine this model makes an ideal introduction to scale R/C modelling, perhaps there will be a chance to publish the conversion details in a later issue. David T. uses a vertical mounting board for his airborne radio equipment. This single board houses the Minimac Rx, Conquest escapement, switch and 225 DEACs and allows him to change it from one model to another in a matter of minutes. The *Barnstormer* is a very elegant performer and David has now modified it for bomb dropping and will soon feature rocket firing! The bombs are simply twopenny bangers with some dethermaliser fuse cemented in the touch paper end with sufficient fuse extending to burn for about a minute before lighting the touch paper. The banger is attached to the model by a piece of cotton which in turn is tied through a hole drilled in the fuse of the banger. The aim is to get the model circling overhead by the time the D.T. has set the fuse alight, the fuse then burns through the cotton releasing the banger which explodes about 30 feet below the model. We have not blown up a model yet, but had one near go when one failed to get away from the launch!

Of course, while all our flying is going on there is another group of free flight modellers in the far corner of the field and a further group of control-line enthusiasts near the gate not to mention interested spectators watching from the road. It is probably a scene typical of many small clubs throughout the country but we hope you get as much fun out of your flying as we do.

Charles Boddington aids "Gallatrol" pulse-propo equipment maker Terry Tippet with his O.D Sports model, also seen being launched during test assessment flights. Model is not unlike D.B.'s "Tyro" with trike gear, one of the most popular R/C Plans for single channel flyers.



Scale Power

Dear Sir,

As a visitor to the all Scale Rally at Old Warden on August 6th I would like to say how much I enjoyed this meeting and how encouraging to read that such a high percentage of the models were equipped with single channel radio.

I am considering using pulse proportional on rudder only as I feel this system is superior to escapements.

Here I meet a basic problem, which I would be extremely grateful if you could answer.

It is the question of engine size to weight—or, wing loading. Could you suggest through your experience, a factor of weight per c.c. which would give realistic performance to this type of model?

Lastly, I would like to congratulate you on the super scale series in recent Aero Modellers and the general contents. Hornchurch. W. J. Willis.

Thanks Mr. Willis! We too agree that pulsed rudder (as Howard Boys showed us back in 1950!) is superior to the escapement though the system costs a little more. You will find on pages 17 and 29 of "Flying Scale Models" (11/- by post) tables which advise 20 ozs. per c.c. of engine capacity and a wing loading of 10-16 ozs. per sq.ft. for faster free flight.

Review of the hobby

Dear Sir,

Your "letters column" in recent months appears to have an increasing incidence of pleas from the non competitive element and those who feel that progress is in the wrong direction.

Having experienced some thirty-nine years of almost continuous participation in all branches of the hobby, during which, competitive flying has always been near the top of the interest list but fun flying never forgotten; I would like to record some observations.

At one time the nature of aeromodeling was such that building anything capable of flight with rubber power was a common aim. Interested people came from all walks of life and were united in achieving this objective to a greater or lesser degree according to skill. This state of affairs brought about a spirit of friendship which, because of the common purpose, embraced the whole of the movement.

During the postwar period many new branches of the hobby have appeared, some of them offering results in return for less effort. This has resulted in the movement being split into groups with the inevitable clash of interests. It is now necessary to specialise if success in any type of competitive event is to be realised and as a consequence, a considerable amount of snobbery has crept in, putting the fly for fun man, in many cases, out in the cold. One can well imagine a young combatant saying "phooey" to Messrs. Jones and Saunders writing in the September issue.

That these fellows are able to enjoy themselves without bringing disrepute to the movement seems to escape notice.

Now it all appears to me to be a question of whether you consider your model to be a means to an end or an end in itself. In the first of these two cases aeromodeling becomes a sport where the model is regarded in the same way as say, a shotgun or golf club. There is a tendency for all main contest classes to evolve in this manner, so that every ingenious detail added by some forward competitor to attain the result more easily becomes a "must" on everyone's model resulting eventually to an inevitable sameness in design.

The second case is much more related to using the model as a means of self expression and gives a great deal more scope for individual taste in design. Here, the designing and building are of prime importance as enjoyment factors; flying comes as an extra pleasure with quality of performance taking precedence over speed or duration.

READERS LETTERS

It should be possible for these two ideals to complement each other for the good of both so that all might benefit.

The competition flyer by not looking down his nose at the fun flyer might encourage him to help with the running of contests, a highly desirable object if the current crop of cancellations is anything to judge by. On the other hand the ardent all weather contest man could be of great assistance to fun flyers in the winter clubroom season by helping with design and construction problems, keeping the younger element amused and generally taking interest in this very necessary branch of the hobby. Apart from the R/C fraternity these modellers are, after all, forming a liaison link with the general public by providing something for them to see which they can more easily understand and appreciate.

Now that noise and crop damage are beginning to blacken the name of the movement it would appear to be logical to encourage a rubber powered "Bowden" type event which, with the possibility of gears, feathering air-screws, slots and flaps returning to popularity, would give a very wide scope to those who like to design and make things for themselves. The fear of loss or damage to a great deal of painstaking work would be considerably diminished and the spectator appeal could be tremendous. It would be cheap too.

Judges for this type of event would soon form a kind of association so that levels of judging could be evened out. This would ensure a reasonable standard of competitive form and enable loopholes in the rules to be blocked before a stagnating trend developed.

I am sure that fun flyers would gain a great deal more respect from more hardened and organised members of the movement if they attempted to do this

kind of thing and followers of the game in general would become more consolidated in some common purpose.

Relationship with the lay public could be improved and as a result the acquisition of flying fields negotiated on a better basis.

Farncombe.

C. S. West.

Pipes

Dear Sirs,

Regarding E. Gillhespy's letter (September issue) in which he raises the question of silencers and the unattached modeller. Although a member of the S.M.A.E. I am not a member of a recognised club—just one of a group of average modellers who meet at the weekend to fly. However, while I appreciate the point that Mr. Gillhespy was making I would like to point out that not all C/L flyers make as much noise as he seems to think.

Since reading the articles "Silencers and Noise" I have made several of the types of silencers. The photo below shows I have an Eta 15 and an O.S.15 with double-coned 'pipes and a Super Tigre G.15 with a wing silencer, the latter being used to quieten it down while running in. My other motors have simple ring mufflers fitted. None of the silencers shown has caused any noticeable drop in performance but the noise reduction achieved is fantastic. This is particularly noticeable on the Eta which now runs with a quiet purr—not the usual ear-shattering bellow.

As a matter of interest the manifold on the Eta is nearly 1/2 in. deep, being made from three strips of aluminium since I didn't have much luck machining one from solid. I also hope to put a K.L.2 type 'pipe on the G.15, when it is run in and I am in the middle of building an A.P.S. "New Devil" to try it out in.

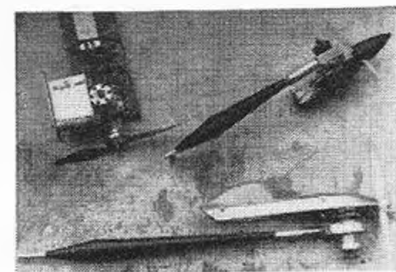
So there it is—if details of these effective silencers had not been published I, and possibly many others, would certainly now be flying very much noisier models.

As Mr. Gillhespy says there are quite a few models flying with little or nothing in the way of a silencer. It is a pity that such a situation exists—but anyway good silencer designs are now available to everyone and many thanks are due to those who did the work of developing them.

London, N.W.2.

G. B. Sadler.

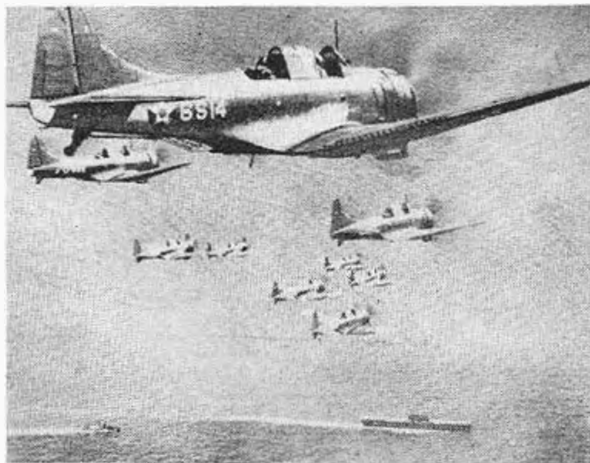
Most of the pipes seen at the recent F/F World Champs were of K.L.2 proportions as published in June and August issues 1966 and practically all were self constructed. A commercial version of K.L.2 is in development.



**Another subject for
flying scale models**
drawn by Dave Platt

INITIALY a Northrop prototype, taken over by Douglas, the "Dauntless" enjoyed the distinction of remaining in service throughout the whole period of U.S. involvement in World War 2, and continued to serve long after with the Air Forces of many other nations. Almost 6,000 of this dual purpose dive bomber were made and it is very much to its credit that the modifications applied mainly to the engine and fuel systems only. The two designations were the A-24 for the U.S. Army Air Force and the SBD series for the U.S. Navy. The difference between the two concerned minor equipment and deletion of the deck landing gear for Army operation. One noticeable external distinction is the pneumatic tailwheel of larger diameter on the A-24 when compared with the solid rubber tyre of the SBD. For a while, the A-24 was known as the "Banshee", no doubt due to the noise created by the wing flaps in the dive bombing position. These, and the fact that the wings were not folded on the Navy version made the "Dauntless" one of the toughest and most effective light attack aircraft ever designed. Though roughly the size of a Hurricane, with comparable power, it carried a 1,000lb. bomb load and relatively heavy armament of two 0.50 in. synchronised guns firing through the airscrew plus twin 0.30 in. hand operated defence guns in the rear cockpit. Pilots did in fact treat it as a fighter on many occasions.

The SBD-1 had a Wright R-1820-32 engine rated at 950 h.p. at 5,000 ft. Normally it was equipped with a single defence gun and it served with the U.S. Marines. Fuel capacity was increased over 50 per cent by addition of wing tanks in the SBD-2 for the Navy which also had an automatic pilot—quite a luxury for those days. Then came the first A-24, or SBD-3 with self sealing tanks, armour and bullet proof windshield under the curved screen ahead of the pilot.



The SBD-4 (or A-24A) was not made in quantity and was generally similar to its predecessor except for a 24 volt system and Hydromatic airscrew and it was the further improved SBD-5 (A-24B) with R-1820-60 1,000 h.p. engine which saw greatest service.

One of the first American aircraft to carry rocket projectiles, the "Dauntless" excelled in the attack rôle. It was worked hard after the disastrous losses of the "Devastator" and was a key weapon in many of the Pacific battles. Even after the introduction of the larger Grumman Avenger and use of the Corsair for bomb attack, the SBD-5 continued to show its value by operation off the smaller carriers. Units of the R.N.Z. A.F. and French Aeronavale were particularly effective against land targets, artillery and troops.

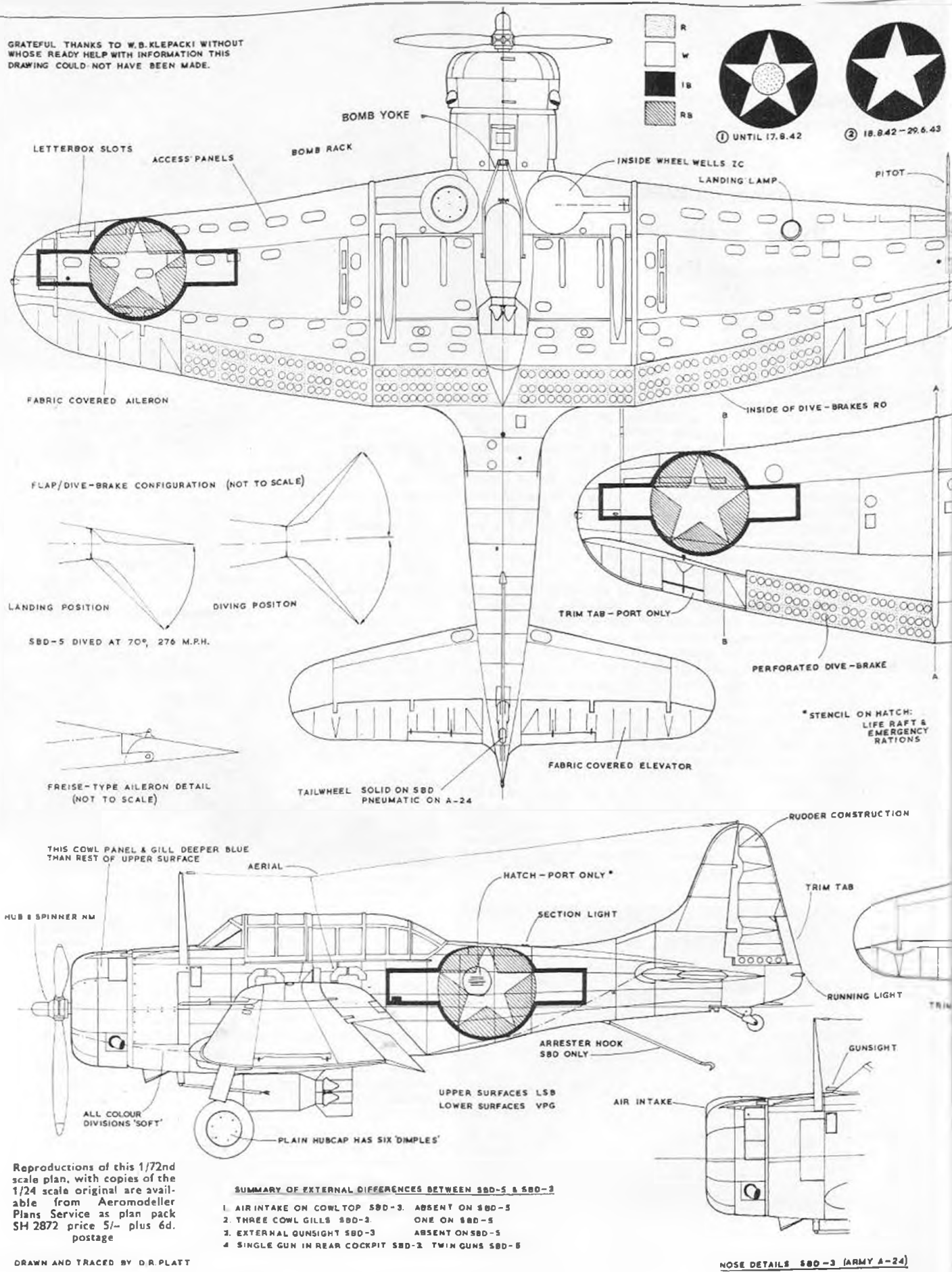


Heading shows a Marine SBD-1 in natural finish with Red cowl, Red fuselage band and Blue, White, Red rudder stripes. Above, a French A 24B used on the Southern Front prior to V E Day, carrying Black and White "invasion" bands on wing panels and fuselage over Olive Drab upper surfaces and Grey undersides. At. Left, VS-6 (Scouting 6) Squadron over U.S.S. Enterprise prior to the Battle of Midway. Note constant use of open cockpit.

Of all metal construction, save for fabric covered control surfaces, the SBD had a dural monocoque fuselage, the rear section of which was divided into watertight compartments. Wing outer panels were attached to the centre section by means of an angled flange and many external bolts, hence the fairing bulges also seen on the North American Harvard. The inward retracting undercarriage has broad track, and this, plus the generous dihedral and large tail surface makes it an attractive subject for a flying scale model.

Few SBDs survive today. One is exhibited in the Air Museum run by Ed Maloney at Ontario, California and may soon be restored to flying condition. Mr. Maloney and French specialist Jean Cuny have been kind enough to check the drawing for us.

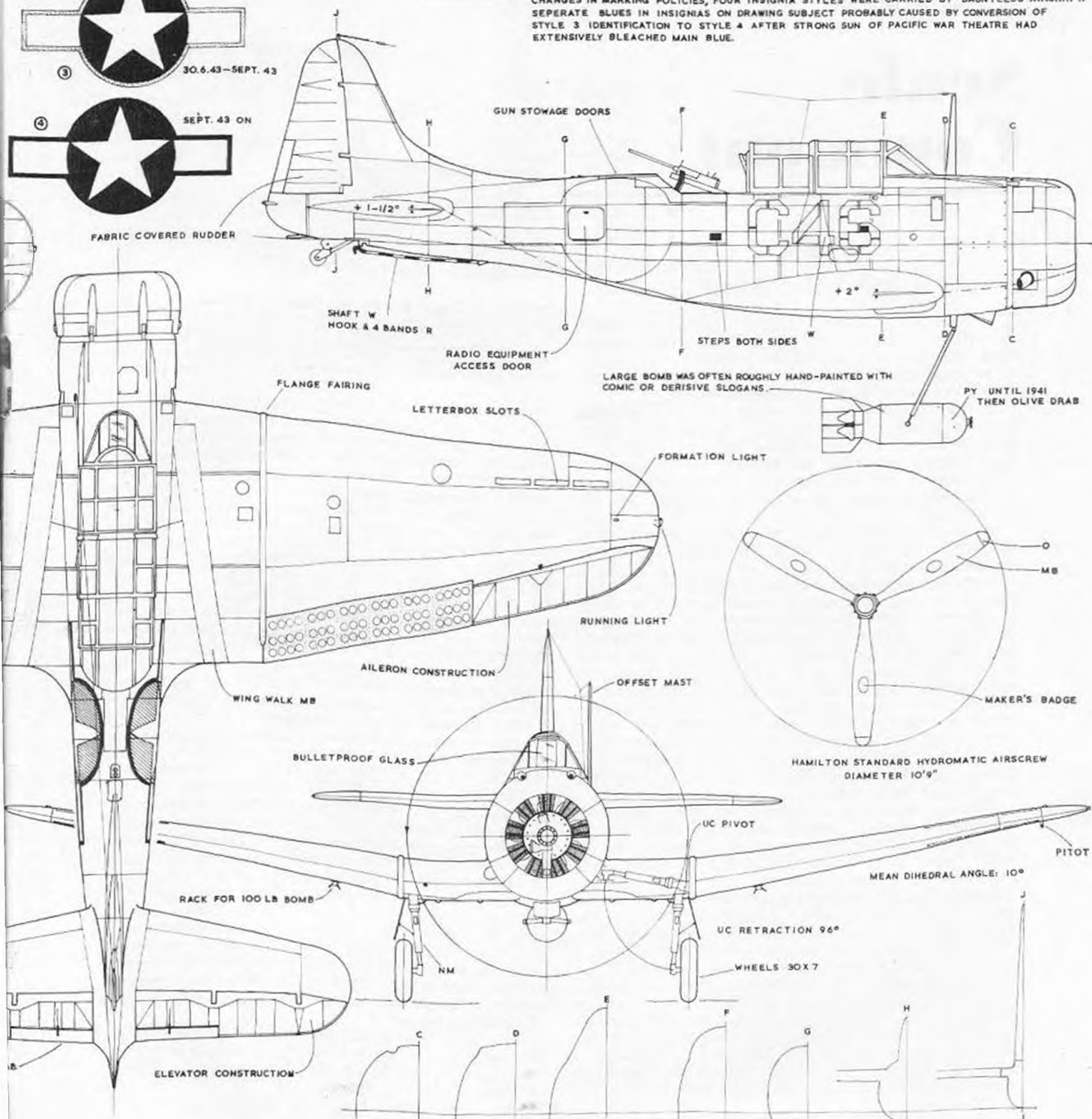
GRATEFUL THANKS TO W.B.KLEPACKI WITHOUT WHOSE READY HELP WITH INFORMATION THIS DRAWING COULD NOT HAVE BEEN MADE.





INSIGNIA NOTES.

DUE TO SBD'S LONG OPERATIONAL CAREER—SPANNING ENTIRE WWII PERIOD—AND FREQUENT CHANGES IN MARKING POLICIES, FOUR INSIGNIA STYLES WERE CARRIED BY DAUNTLESS AIRCRAFT. SEPARATE BLUES IN INSIGNIAS ON DRAWING SUBJECT PROBABLY CAUSED BY CONVERSION OF STYLE 3 IDENTIFICATION TO STYLE 4 AFTER STRONG SUN OF PACIFIC WAR THEATRE HAD EXTENSIVELY BLEACHED MAIN BLUE.



SPECIFICATIONS

NAVY SBD-5 ARMY A-24B

POWER PLANT

WRIGHT CYCLONE GR-1820-60
9-CYLINDER RADIAL, 1200 H.P.
TWO. PILOT, OBSERVER.

CREW

SPAN 41' 6-3/8" LENGTH 33' 1-1/4"
AREAS—WING 325 SQ FT TAIL 60.83 SQ. FT.

ARMAMENT

TWO FORWARD-FIRING .50" GUNS IN NOSE.
TWO .30" GUNS ON SWIVELLING MOUNT IN
OBSERVERS COCKPIT.
ONE 1000 OR 500 LB BOMB UNDER FUS.
TWO 100 LB BOMBS ON UNDER-WING RACKS.
MAX. LEVEL SPEED 255 MPH AT 14000 FT.
CRUISE 185 MPH AT 14000 FT.
STALLING SPEED 78 MPH
RANGE AS SCOUT 773 MILES
LOADED 458 MILES

PERFORMANCE

SUBJECT AIRCRAFT IN MAIN DRAWING
SBD-5, PACIFIC WAR THEATRE 1944.

COLOUR KEY

LSB LIGHT SMOKEY BLUE
VPG VERY PALE GREY
RB DIRTY ROYAL BLUE
ZC ZC GREEN (ZINC CHROMATE)
R RED
W WHITE
O ORANGE
RO RED ORANGE
PY PALE YELLOW
MB MATT BLACK
IB INSIGNIA BLUE (NAVY)
NM NATURAL METAL

SCALE IN FEET

0 1 2 3 4 5 6 7 8 9 10 11

Scale Comment

near-scale
and
thin wings

by
Denis
Thumpston



TALKING to leading scale modellers at recent rallies, a number of ideas and opinions have been put forward, the most interesting of which is perhaps the following. It is apparent that R/C Scale attracts two types of models:

(i) the *near-scale* model which has been adapted (by, for example, substituting a symmetrical wing section for an undercambered one) to make it a good rugged, aerobatic, all weather flyer which will look good in the air, but will not be an accurate replica when examined at close quarters on the ground, and

(ii) the *true scale* model, accurate in every detail, but which may not be such a spectacular flyer as the above-mentioned type.

Now, the suggestion has arisen that the scale class should be split to cater for each type of model—in the one class, the model would be required to conform to a minimum of 50 per cent scale accuracy, and would then be eligible to compete in the flying section, which would be of an aerobatic nature, the winner being the model with the best flying marks. In the other class, models would be required to perform a fairly simple qualifying flight, and would then be eligible for scale judging, the winner being the model with the best scale and workmanship points, possibly augmented by points awarded for the basic flying pattern.

This is quite an attractive proposal, the most obvious flaw being, perhaps, that there might not be enough entries to support two scale classes. On the other hand, it is possible that the aerobatic class might prove to be a welcome alternative for conventional multi, where design has become rather stereotyped and interest, certainly as far as the spectator is concerned, is on the wane. Readers' views on these suggestions would be appreciated.

The building season is almost upon us, and a few tips on constructional techniques might be appropriate. A question often asked is how to build a *thin*, warp-resistant, undercambered wing with adequate strength for R/C use and yet achieve the realistic surface appearance of the full-size, with no spars showing beneath the covering, either on the upper or lower surfaces, and with scale-width leading and trailing edges.

Let us deal first of all with the ribs: since these will have little depth, it is important that they should be constructed from fairly thick, medium balsa—for wings of 60 in. span or more, use $\frac{3}{8}$ in. thickness,

Thinnest of wings? Bill Hannan entered an Autogyro at this year's U.S. Nats, it is the Avro Avian based C. 17 from details in Putnam's "Avro Aircraft"! Though 2nd for scale points it didn't qualify as it failed to make a 40 seconds flight. Bill's buddy Ray Caswell entered a Cierva C.6 based on the Avro 504 which placed sixth—who'll do a Wallis WA-116 Agile (alias Bond 007 Little Nellie)?

and $\frac{1}{4}$ in. for smaller spans. The thickness of these ribs will not be apparent when rib tapes have been applied after covering. All spars will have to be threaded through the ribs to retain the correct surface appearance, so that cut-outs will have to be made accordingly (see diagram).

The front spar (A) and rear spar (C) will be in the correct scale positions (usually dictated by the strut of bracing attachment points), but these alone, by virtue of their comparatively slight depth, will not be strong enough for our purpose, and a further spar (B) must be placed midway between these two. In addition, a subsidiary spar (D) will be required between spar (C) and the trailing edge, its function being to prevent the warping of the latter member which should be of narrow section spruce, $\frac{1}{4}$ in. x $\frac{1}{4}$ in. sanded to section. All spars should be of spruce and of as deep a size as the rib will allow. Spars A and B will usually be of a rectangular section, whilst C and D will be square. Typical dimensions for a wingspan of 60 in. or so would be A: $\frac{1}{4}$ in. x $\frac{1}{4}$ in., B: $\frac{1}{4}$ in. x $\frac{1}{4}$ in., C: $\frac{1}{4}$ in. sq. and D: $\frac{1}{8}$ in. sq.

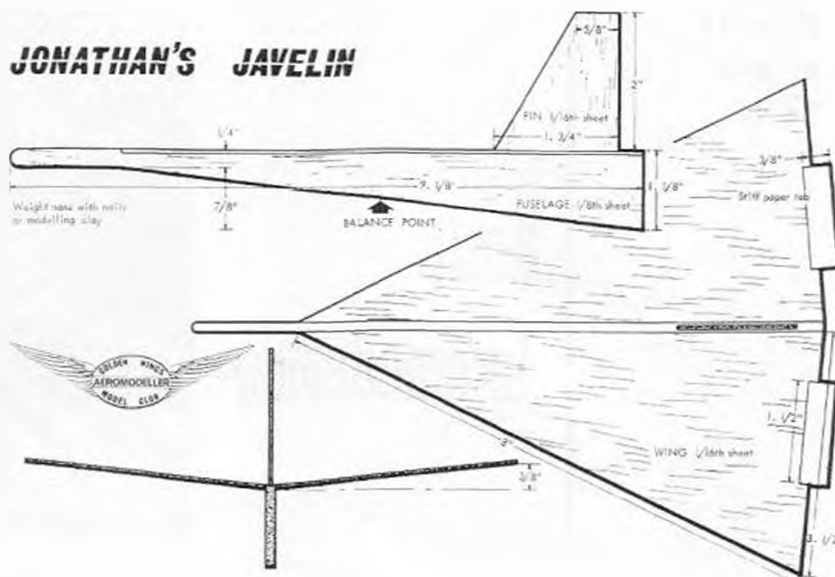
The best material for the leading edge is birch dowel, $\frac{1}{4}$ in. diameter for the size we are discussing, $\frac{1}{8}$ in. for smaller wings. Curved wingtips should be of cane or laminations of millimetre ply, sanded to section. In order to avoid warping, use PVA glue throughout—NOT balsa cement—and incorporate X bracing between the front and rear spars (for extra strength) using $\frac{1}{4}$ in. sq. hard balsa, making sure that this will not show on the surface after covering. The resulting structure, which has been used successfully on the writer's Sopwith 1 $\frac{1}{2}$ -Strutter, D.H.9 and Bristol Monoplane will, when nylon-covered, be strong, completely warp-resistant, and virtually crashproof.

This type of wing can be attached to the fuselage or centre-section by a tongue and box arrangement—the tongue being of dural bent to the correct dihedral angle and the box of thin ply, Araldited between the spars—but it is usually necessary to use functional flying wires to withstand aerobatic loads. And make sure that they are firmly anchored—failure of the flying wires in the air is usually pretty fatal!



GOLDEN WINGS CLUB

JONATHAN'S JAVELIN



Dear Sir,

I would like to know if I can get a silencer for the Mills .75c.c. The crankcase round the exhaust is .7 in. I would like to know as I want to put this engine in an aircraft.

Arnold, Notts.

J. Crouch

The Mills range of engines are now out of production and no silencers are made for this engine by Mills Brothers. The only way to get one to fit is to adapt brass tube and strip to a 35mm. film canister or a cigar tube.

Dear Sir,

On the plan of the Keil Kraft Radian model the recommended propeller is a three bladed 5 x 3 in. size. Would it be correct to use this propeller, as the standard two bladed propeller for my M.E. Heron when flown control line is a 7 x 6 in. size?

I am thinking of buying an electric soldering iron for general aeromodelling use (not radio control) please could you recommend a size and make.

Leicester. A. R. Newton

The 5 x 3 in. size propeller is for the .049 glow plug engines and it would be best for you to use the 7 x 6 size or a 7 x 4 with your M.E. Heron. The range of soldering irons made by Solon or Weller are sure to include an iron that will suit your needs and pocket. For general modelling use a 65 watt iron is best. It is far better to have an iron that gets too hot, rather than one that is not hot enough.

Dear Sir,

I have been control line modelling for a month or two and have made two trainers, the Phantom Mite and one of my own design (flies quite well). I have

TIP OF THE MONTH

J. Harley of London, S.E.1 designed this simple Balsa "dart" for his son. It flies very well with three 1 1/2 in. oval nails as nose weight.

a Cox .049 Babe Bee and I would like the plans for a good stunt model to suit this engine. Could you suggest plans for this engine and tell me how much they will cost. Also where can I get a plan of the Babe Bee engine from.

Bath, Somerset.

D. S. Kearns

Unfortunately we do not have any plans of a stunt model specifically for the Cox .049 engines "Cheshire Kitten" (CL693) price 5/-d, can be fitted with any radial mounted engine. The Keil Kraft Radian kit is a good model and fits your requirements almost perfectly. You should have had a drawing of your Babe Bee engine in the packet when you purchased it, if you have lost this, ask your model shop to obtain another through the importing agents A. A. Hales. The Babe Bee was drawn and tested in the May 1961 issue of Aero Modeller.

model is covered in nylon for strength and painted red, the finished model weighs 3 1/2 lbs.

The radio outfit consists of an R.C.S. Mk. III Guidance System fitted with a home made R.M. pulser with a Rand LR3 actuator fitted to rudder elevator and motor controls. Although the model has not flown everyone is confident it will fly.

Like a lot of modellers I can hardly wait to be flying my own four channel proportional radio gear, but that's looking way into the future. Incidentally if there are any modellers in Leeds who cannot find a good field there is one opposite the Leeds 618 Air Training Corps Squadron that is large enough for flying a Veron Concord.

Leeds 11, Yorks.

K. Aston

Dear Sir,

Enclosed with this letter is a photograph of my new model, it is a Keil Kraft Mini Super renamed 'Snoopy', the



Dear John Bridge,

I am between 10 & 16 years of age and would like to become a member of the "Golden Wings Club". With this application I enclose postal order (International Money Order) for 2/6d. to cover cost of the enamel club badge, two coloured transfers and membership card.

NAME IN FULL

ADDRESS

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

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

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

**SPECIAL PRIVILEGE
OFFER** exclusive to
Golden Wingmen

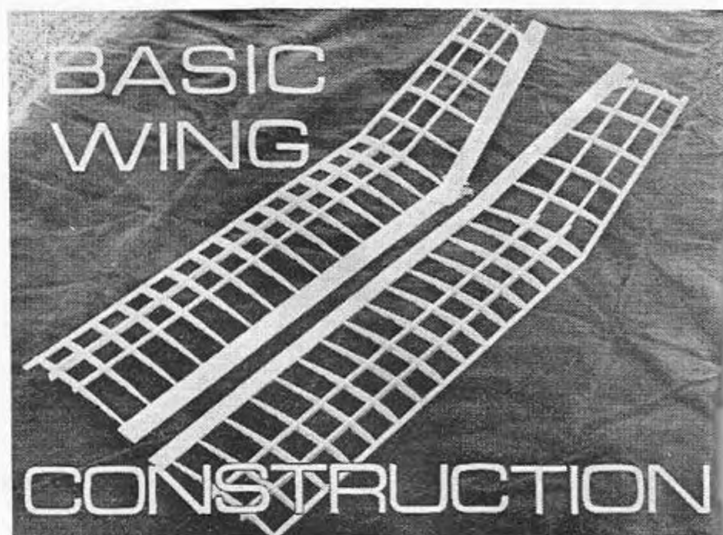
Clip this coupon and send it with
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2d. in the 1/- Rebate
plan purchase coupon
for Golden Wings Member
G.W. No.

Part 12
of our
Series

Basic Aeromodelling



THE traditional form of open framework wing construction is based on ribs cut from sheet, solid leading and trailing edge sections and one or more mainspars. Unless braced by other members, or diagonal rib positioning, both the strength and warp resistance of such a structure depends a great

deal on the grade of balsa used for these various members. Medium or light-medium is adequate for larger sections; and light grade for large leading edge sections—see Fig. 74.

Except where square section strip is used, leading edges should always be shaped to approximate section *before* being pinned down to the plan. This

FIG 74



FIG 76

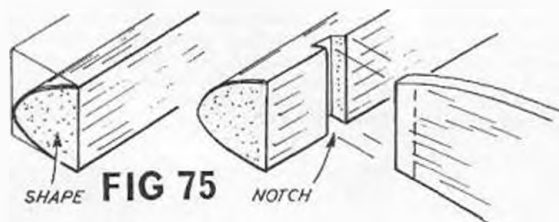
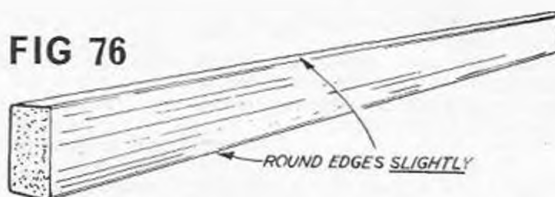


FIG 75

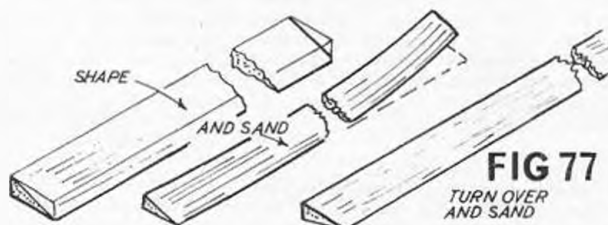


FIG 77

deal on the grade of balsa used for these various members.

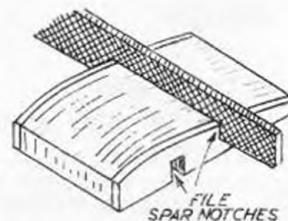
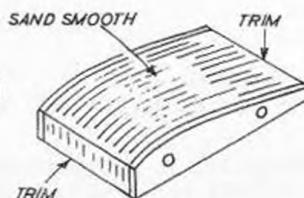
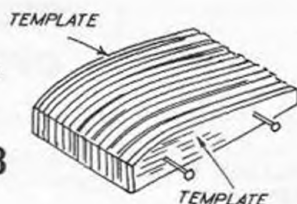
Leading edges—should be of fairly low density if the section is fairly generous—in fact, the bigger the section the lighter the balsa required. Thus where the leading edge is a small square section, set diagonally, the balsa grade required is medium hard.

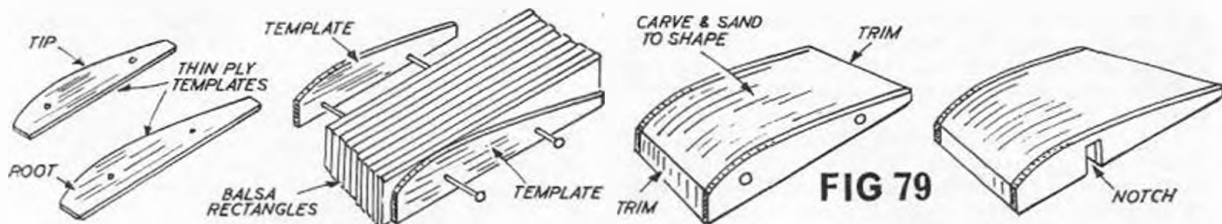
is, of course, unnecessary where shaped leading edge section is employed, but standard leading edge section can only be regarded as approximate shape and may still need final trimming down after assembly.

It also makes for much stronger joints if the leading edge is notched to take the ribs. This may not



FIG 78





be practical with kits where a butt joint is specified and the ribs are die-cut to that corresponding length. If the ribs have to be cut from sheet, however, allow an extra length of $\frac{1}{8}$ in. and notch the leading edge to the same depth—Fig. 75. Notching can be done quite simply and accurately by marking the rib positions on the back of the leading edge (e.g. by laying the leading edge over the plan) and then cutting the notches with a small flat file of the same thickness as the rib material. Make sure you buy a file with a cutting edge and not a plain edge for this job! Notches should never be cut with a modelling knife or razor blade as this will usually drastically weaken the spar.

Mainspars—should be of straight grained medium-hard to hard strip, depending on the size of the section and number of spars. The greater the (total) mainspar(s) section the more you can go to a lighter grade to save weight, but always err on the side of selecting a balsa grade which is too hard rather than too soft. Some modellers prefer quarter-grain strip for mainspars, which has the advantage of being more rigid, but it is also more brittle.

A useful tip. If the edges of the mainspar are very slightly rounded off with fine sandpaper as shown in Fig. 76 the overall strength of the spar is generally improved. This will also make the spar easier to fit snugly in rib notches.

Trailing edges—should, ideally, always be of quarter-grain stock for rigidity. However, there are exceptions. If the section is fairly generous normal grain will be satisfactory.

Like leading edges the strength of joints will be improved by notching the ribs into the trailing edge, using the same technique.

Trailing edges should be fully shaped before being pinned down on the plan. This is because trimming a rectangular section down to a triangular trailing edge section will normally produce a curl along the length of the spar—see Fig. 77. If this is done after assembly it introduces a warping tendency into the wing structure. If shaped beforehand, any "curl" which develops in the trailing edge can be removed by turning the section over and lightly sanding the back until the length is straight again.

Ribs—should always be cut from quarter-grain sheet, also selecting the lightest grade suitable for

the size of rib involved. It is better to increase rib thickness rather than balsa density if there is any possibility of ribs buckling under the tautening action of dopes applied to the covering.

Ribs are best finished in sets, even if cut individually first. The most accurate way of cutting individual ribs is with a thin ply template—Fig. 78. A complete set of ribs so cut should then be stacked together, as shown, preferably with a second ply template at the opposite end. Hold the stack in place with pins and then sand like a block to finish all the ribs to the same shape. The "stack" can then be trimmed off at the leading and trailing edges to ensure exact length; and any spar notches cut with a file.

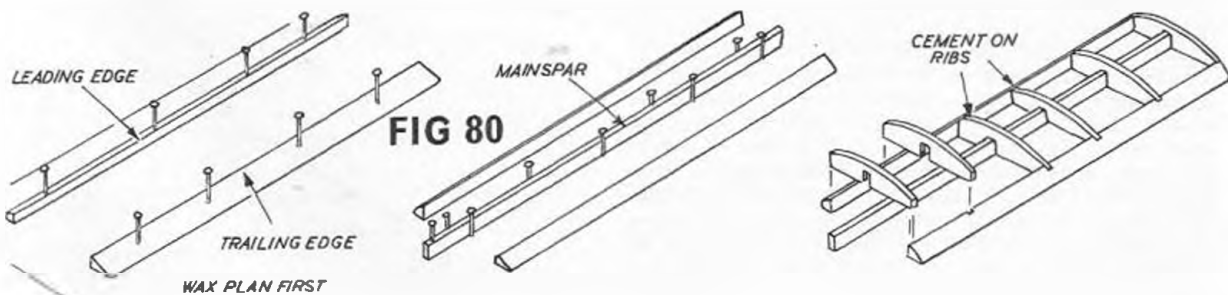
In the case of ribs for a tapered wing, a speedy and accurate method of making a set of ribs is shown in Fig. 79. Start with thin ply templates for the largest and smallest ribs, then cut a number of rectangles of balsa, one for each rib, to a fairly generous oversize. Assemble the whole as a stack (between the two ply templates), holding with pins. Then carve and sand down as a block to produce a set of accurate ribs corresponding to the taper. Finally cut spar notches with a file, as before.

Note, however, that this method of cutting taper wing ribs only applies where the individual ribs are equally spaced along the span.

Basic assembly technique

This is illustrated in Fig. 80. Leading and trailing edges and the mainspar should be pinned down flat over the plan in their exact positions. You can pin through leading and trailing edges without harm; but always hold the mainspar with pins spaced on either side of the spar, not right through it (unless this is done in surplus length of spar outside the tip or root).

To complete the basic structure the individual ribs are then cemented in place one by one. Note here that a notched leading and trailing edge will also assist in accurate assembly, although some modellers are not too clear on the best way to complete a cement joint in such cases. A satisfactory technique is to fill the notches with cement and also wipe around the spar with cement at the rib position. Then coat the leading and trailing edges of the rib

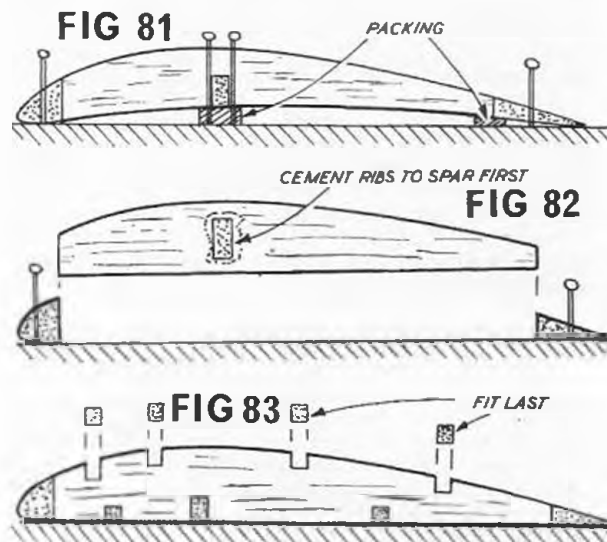


and the notch with cement and press the rib in place. This should result in a very satisfactory joint. Ideally, surplus cement should be "filleted" around the joint with a scrap length of strip rather than be allowed to dry as blobs.

The above basic technique applies to wings with flat-bottom rib sections, and with the mainspar notched into the underside of the ribs. Different types of construction may demand some modification of the technique.

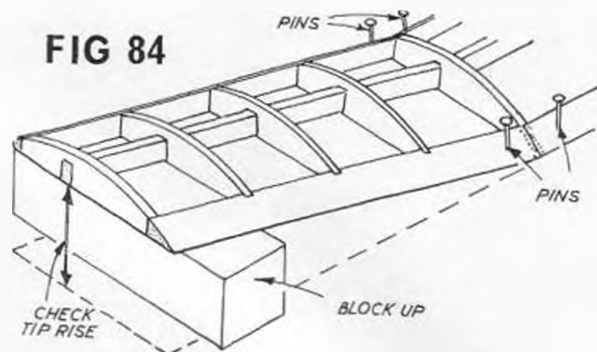
In the case of undercambered rigs, for example, it may be necessary to pack both the mainspar and the front leading edge up off the plan, as shown in Fig. 81. You can "set" the height of the packing required by using a rib to align the spars properly. Check at several rib positions that you have got the spars properly supported, then proceed as above.

In other cases the mainspar(s) may pass through the ribs, when only the leading and trailing edges can be pinned down flat over the plan. If a single mainspar is involved, then cementing the ribs to the mainspar first is advisable (against accurately marked position lines); then lower the spar and rib assembly onto the leading edge and trailing edge to complete



—Fig. 82. With two mainspars it is usually best to assemble the ribs loosely on the spars, position between and cementing to the leading and trailing edges, and then finally cementing the ribs to the mainspars with a small fillet of cement on *each* side of the rib.

With other spar arrangements the ribs may have to be assembled on a bottom spar or spars first and then joined to the leading and trailing edges pinned down over the plan. Finally the top spars are added to complete the basic structure—e.g. see Fig. 83. The main thing in such cases is to complete cementing up *all* spars whilst the structure is *still pinned down flat over the plan*. Adding remaining spars after the basic structure has been removed from the building board will almost certainly introduce warps. This is equally true where internal bracing struts are to be added to a wing structure or part of the wing is to be sheet covered. Fit everything up whilst the wing is still pinned down flat. And having completed a wing structure, leave it pinned down

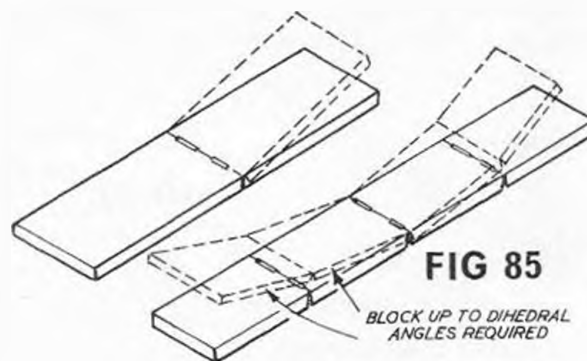


flat for several hours to let the cement joints set *completely*.

Dihedral joints are quite easy to make—whether joining two separate wing panels or "cranking" a flat panel for polyhedral. One panel should be pinned down flat on the building board. The other panel is then offered up in position and the spar ends trimmed to match. When satisfied with the fit, coat all butt joint faces generously with cement and pin the second panel in place, blocked up to the correct dihedral—Fig 84. Make sure that pinning this second panel does not produce a "bow" in the trailing edge; and also that the joint is as "tight" as possible. Then, whilst the cement is still not set properly, trim as necessary and cement in all dihedral braces, etc., leaving the whole assembly for several hours. Complete *all* the joint bracing at one go. When the complete wing is finally removed from the building board it should then be absolutely true.

If you are really fussy, a hinged board is best for assembling a complete wing from individual flat panels. The same board can be used for assembling different wings with a single central dihedral joint (or single joints in a polyhedral wing); but for a complete polyhedral wing the board would have to be matched to the wing span dimensions. A hinged board can, of course, act as a building board throughout—first laid out flat (or even separated) for assembly of the individual flat panels and then angled for joining these panels at true dihedral angles—Fig. 85.

There are also other building techniques which can be employed where the type of wing construction does not permit of easy or accurate assembly by the basic building techniques. These will be described in the next article in this series.



SURPRISING enough, my American trip caused me to miss only one domestic event, the Southern Area Gala.

Events were certainly more plentiful in the latter weeks of August and beginning of September. London's Summer Gala, held at Chobham on August 13th, was only indifferently supported due to many "regulars" being in Czechoslovakia. Overcast and breezy conditions persisted until about 6 o'clock (just an hour before the contest closed). Luckily an under-d/t and resultant re-entry in rubber had kept me busy till then. By dint of flying two A/2s, and with help in retrieving, I was able to record a very easy 8:44 in about 20 minutes flat for first in glider. Runners-up Tony Young and Jim Baguley made their scores the hard way.

Meanwhile the rubber fly-off had filled up rapidly. The fly-off itself was held in almost ideal conditions. George Sharp and Laurie Barr tightened up under power, John Lorimer stalled on glide, but Ray Pavley found weak lift. It wasn't enough, however, to match my 7 minutes plus.

Power was not spectacular. George Fuller lost his Fox .59 model in downwind woods on his third max, and flew an Eta .29 model on the fly-off. He out-climbed Russel Peers' similarly powered model—but glide differences were such as to give George victory by only 4 seconds. A power was badly supported with top spot going to Graham Head, now back in modelling after a season off.

The Area centralised events the following week saw good weather throughout England. Northampton won the Keil Trophy for team power with Trevor Payne contributing more than his share by flying proxy for a club member. Brighton did well to place second in view of John West and Dave Welch being at the World Champs.

Wakfield was decided by a 3-way fly-off in which Bristol's John Bailey obviously found lift, whilst Dave Hipperson and George Sharp flew in the same draught at Chobham.

Jim Baguley flew without d/t to clock just under 28 minutes, timed almost all the way down. Paul Newell put his A/1 into the same thermal but D.T.'d for 9½ minutes. They needed these high scores as Andrew Brewster marked a useful thermal at Top-cliffe. This enabled me to manage 11:01 O.O.S in open glider and Dave White over 6 minutes in A/1. Andrew didn't have an extender disc on his clockwork timer and d/t'd well inside the airfield. Unlucky was Beaulieu flier Bert Turner who got only 8 minutes in sight for a flight that he walked underneath for 25-30 minutes!

Woodford public attendance was almost unbelievable, thanks to an intensive publicity drive by the N.W. Area. "Mentions" on B.B.C. and I.T.V. must have helped considerably. Comment must also be made on the incredible weather conditions with an almost dead calm persisting all day. Free-flight control was set up in mid-airfield and left there. Main hazard was its close proximity to the R/C event. There seemed plenty of activity throughout the day but not as many in the fly-offs as I would have expected. Glider was the first fly-off and certainly was a waiting game with the handful that waited almost to the last minute contacting strong lift. Pete Whitehead d/t'd for only 9½ minutes (!), but the others went to the visibility limit. The two without d/its (Ron Brownson and Alan Moss) got their models back a couple of days later.

Power was next with no-one finding lift. Russel Peers won with his Eta .29 lightweight, followed by Jack Allen with a Cox powered "Dixielander".

Surprisingly rubber was not an eyesight test despite the scores, as models were seen down to tree-top height only a few fields outside the drome. Bob Wells took top place using some "inferior" Pirelli that I had sold him!

Gala Championship (decided over the free-flight events) went to Doug Barber of Leyland thanks to a good total in chuck glider and almost a full score in the R/G/P events.

Conditions on the same day at the other end of the Country were nearly as good. Barry Hyde sent details of the Torbay f/f Rally held at Woodbury Common, and reported a dead calm and lifeless morning, with sun and lift in the afternoon. Roger Baggott won power with a treble (and did not need to fly-off) with what was described as a "Dixielander" with elliptical tips. The Rubber fly-off was a clear win for John Lorimer, with the other places going to the organising club. Glider went to P. Burgess flying a "Caprice" to nearly an 11 minute fly-off, whilst his Clubmate Gerry Pink managed a very respectable 3:53.

FREE FLIGHT

Comment
by
J. O'Donnell

Paul Newell (Surbinton), the designer, with his APS Synco-pator which placed top in the London Area SMAE event. Did 9:30 in the flyoff. Plan is G896 4/- incl. post.



The weather broke for the following Sunday, which was the scheduled date for the Northern Gala. Perhaps the airfield difficulties which led to its postponement till October 29th were a blessing in disguise.

Crawley were not so lucky at Great Buckworth farm! Their "Turbulator" newsletter describes conditions as "The rain it was a-raining, the wind it was a-blowing, And How". Rules were changed to 4 flights and two minutes max. Winning scores averaged about 90 seconds a flight.

Calm conditions returned for the 10th September. Presumably no-one told the "Weather Gods" that Northern Heights gala had been cancelled. The only other contest on this date was the Northern Area's slope soaring event at Holmfirth where the calm was not appreciated, at least, by the R/C entrants. The site looked good with reasonable access to the top of a long ridge where genuine soaring should be possible under more normal conditions.

I flew very early thinking that the calm could not last and knowing that my A/1 would hardly handle much wind. Best of three flights (without max) counted. Brian Faulkner with a slightly larger than A/2 size model and Mike Reeves with an A/1 came nearest to my 5:51 early flight.

Magnet steered models had a class of their own. Ray Sutton was the sole entrant but certainly earned his prize by recording over 8 minutes.

SOUTHERN GALA, AUGUST 6th, 1967

Open Glider (38 entries) Fly off times: 1. Hadland (RAFMAA) 11½; 04.2. Bains (York) 6 : 03.03. Caddock (Swindon) 5 : 50. 4. Glue (Brighton) 5 : 41. 5. Wydes (Crawley) 4 : 50. 6. Punter (Hayes) 3 : 59. 7. Reeves (Whitefield) 2 : 18. 8. Coatsworth (Blackheath) 1 : 00 (31 flew).

Open Power (12 entered): 1. Fuller (St. Albans) 8 : 24 + 4 : 02. 2. Peers. (Congleton) 8 : 24 + 3 : 10. 3. Warwick (Lee Bees) 7 : 55. (5 completed 3 flights)

Open Rubber (12 entered). Fly off times: 1. Elliott (Lee Bees) 5 : 43. 2. Sharp Blackheath 5 : 25. 3. Lorimer (Woking) 3 : 30. 4. Peers (Congleton) 2 : 41. 5. Allen (Brighton) 2 : 04.

Southampton M.A.C. A/1 (11 entered): 1. Bailey (Croydon) 6 : 00. 2. Dumble (Richmond) 5 : 43. 3. Hook (Southampton) 5 : 39.

TORBAY F/F RALLY, WOODBURY COMMON, AUGUST 27th, 1967

Power (8 entries): 1. R. Baggott (Birmingham) 9 : 00. 2. P. Ward (Torbay) 8 : 36. 3. B. Edwards (Richmond) 6 : 52.

Rubber (9 entries): 1. J. Lorimer (Woking) 9 : 00 + 5 : 25. 2. L. Long (Torbay) 9 : 00 + 3 : 36. 3. B. Hyde (Torbay) 9 : 00 + 2 : 37.

Glider (26 entries): 1. P. Burgess (St. Bristol) 9 : 00 + 10 : 54. 2. G. Pink (St. Bristol) 9 : 00 + 3 : 53. 3. B. Bow (Bristol & West) 9 : 00 + 1 : 43.

Chuck Glider: 1. A. Dakin (Cardiff) 3 : 24. 2. T. May (C/M) 1 : 55. 3. Wilkins (Bristol & West) 1 : 34.

NORTHERN AREA SLOPE SOARING, HOLMFIRTH, SEPTEMBER 10th, 1967

Single Channel: 1. J. Shaw (Sheffield) 21 points. 1. D. Paek (Bradford) 57 pts. 3. G. Freeston (Sheffield) 68 pts.

Wakfield Model Special Prize: G. Freeston (Sheffield) 68 pts.

Free Flight (Best of 3 flights): 1. J. O'Donnell (Whitefield) 5 : 51. 2. B. T. Faulkner (Cheadle) 4 : 25. 3. M. Reeves (Whitefield) 3 : 20.

Magnet: 1. R. Sutton (Leek) 8 : 10.

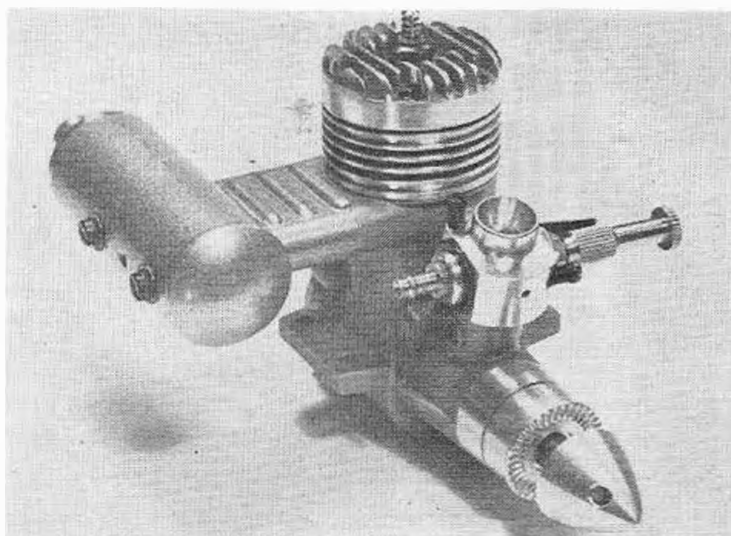
LONDON SUMMER GALA, CHOBHAM, AUGUST 13th, 1967

Power: 1. G. Fuller (St. Albans) 9 : 00 + 4 : 28. 2. R. Peers (Congleton) 9 : 00 + 4 : 24. 3. R. Johnson (St. Albans) 7 : 28.

A Power: 1. G. Head 8 : 29. 2. R. Peers (Congleton) 7 : 03.

Rubber: 1. J. O'Donnell (Whitefield) 9 : 00 + 702. 2. R. Pavley (Hornchurch) 9 : 00 + 8 : 35. 3. L. Barr (Hayes) 9 : 00 + 5 : 00.

Glider: 1. J. O'Donnell (Whitefield) 8 : 44. 2. A. Young, 8 : 35. 3. J. Baguley (Hayes) 7 : 53.



ENGINE TEST

by Peter Chinn

TAIPAN 19BB R/C

Australian 3.23 c.c.
glowplug engine for R/C.
Overall finish excellent

THE TAIPAN 19BB R/C is one of a range of engines made in South Australia by Gordon Burford & Company and distributed in the U.K. by Performance Kits of Sandy, Beds. As its name suggests, it is a .19 cu. in. (3.2 c.c.) twin ball-bearing engine with throttle control. It is well made and of attractive appearance.

In general, the design and construction of the Taipan 19 follows orthodox modern practice. The crankshaft has a very large diameter journal for a 3.2 c.c. engine and, although this has not been fully exploited to the extent of using an extra large bore gas passage, the material is there, should the manufacturer wish to use this basic shaft and bearing assembly for a more powerful engine in the future. The shaft is, in fact, bored 9/32 in. (0.281 in.) whereas the main journal has a diameter of 12 mm. (0.472 in.). At the front the shaft is stepped down to 1/4 in. diameter where it enters the outer ball-bearing and the prop driver is mounted by means of a duralumin split taper collet. The propshaft length is a little on the short side, but will allow props of up to a maximum of about 7/16 in. boss thickness and still leave sufficient threads. When testing the engine on the larger size props we avoided the risk of damaging the threads of the alloy spinner nut by using, instead, a steel hexagon nut and a thin steel washer.

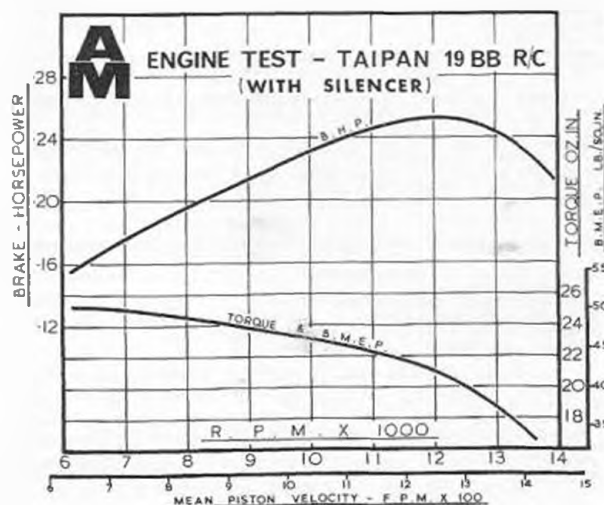
Cylinder construction consists of a steel liner, a finned alloy cooling jacket and separate head. The jacket is clamped between the flange of the liner and the crankcase casting by means of four of the head screws which pass through the fins and into the main casting. A single rectangular exhaust port is used and is timed to remain open for 138 degrees of crank angle. The transfer port is of similar shape but of slightly larger area and remains open for 126 degrees. The cylinder head shape is basically a small central combustion chamber surrounded by a large area squish-band. (In actual fact this is not quite true because there remains substantially more clearance between the piston crown and squish-band at TDC than a designer would normally use in order to obtain the full benefit of this combustion chamber shape). The piston has a flat crown with a conventional straight fence baffle on the transfer side and has an internal stiffening rib below the gudgeon-pin bosses. The gudgeon-pin is fully floating, without pads and the connecting-rod is very nicely machined from suitable high duty duralumin.

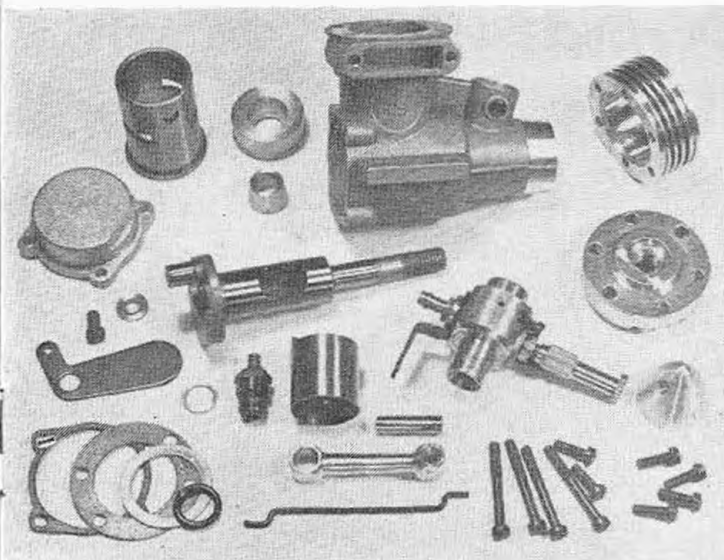
Gas is drawn into the engine, from a barrel-throttle carburettor, through an orthodox rotary-valve, timed (according to our measurements on the engine submitted for test) to open at 35 deg. ABDC and to close at 45 deg. ATDC. The carburettor is similar in design to a current Super-Tigre type, the spraybar passing completely through the throttle barrel (but not rotating with it), end-play being taken up and correct jet hole location being effected, simultaneously, by means of readjustment of a large flat hexagon nut against which the spraybar is locked. The usual idling adjustment and airbleed screws are provided.

The steel throttle arm, which is pressed onto a serrated boss on the steel throttle barrel, is coupled to a chopper type exhaust restrictor, but, for the U.K. market, this will normally be discarded in favour of a silencer. The manufacturer offers a silencer for the Taipan. This is a neat, diecast, cylindrical expansion chamber which simply attaches to the engine by means of two screws into tapped holes provided in the end of the exhaust duct.

Faster with Silencer

When we ran the Taipan 19BB R/C with the silencer, we found that it had an unexpected effect on the performance of the engine. Only at speeds above the *normal* operational range did the silencer cause any loss of power. There was actually a slight improvement in performance at lower speeds. This was checked and re-



**SPECIFICATION**

Type: Single cylinder, air-cooled, loop-scavenged two-stroke cycle glow-plug ignition with throttle control. Crankshaft type rotary-valve induction. Twin ball-journal main bearing.

Bore: 0.634 in. **Stroke:** 0.625 in.

Swapt Volume: 0.1973 cu. in. (3.233 cc.).

Stroke/Bore Ratio: 0.986:1.

Weight: 7.2 oz. (8.3 oz. with maker's silencer).

General Structural Data

Diecast aluminium alloy crankcase/main bearing housing with detachable rear cover. Hardened steel, counterbalanced crankshaft with 7/32 in. dia. hollow crankpin and running-in one 12 mm. i.d. rear, and one 3/4 in. i.d. front, ball journal bearings. Lapped cast-iron piston with 11.64 in. dia. fully floating solid gudgeon-pin and machined duralumin connecting-rod. Hardened steel cylinder liner surrounded by machined alloy finned cooling jacket and surmounted by machined alloy finned cylinder head with .025 in. copper head gasket. Machined aluminium alloy spinner nut and prop driver, the latter secured to shaft by split taper collar. Machined aluminium alloy carburettor body seating on rubber gasket in intake boss and secured with two screws. Ground steel throttle barrel with idling and airbleed adjustment screws. Brass spraybar type needle-valve assembly. Beam mounting lugs.

TEST CONDITIONS

Running time prior to test: 1 hour.

Fuel used: 5 per cent nitromethane, 25 per cent Duckhams Racing Castor-oil, 70 per cent I.C.I. Melhanol.

Glowplug used: Fireball long-reach platinum filament, medium heat rating

Air temperature: 68 deg.F.

Barometer: 29.85 in.Hg.

Silencer: Maker's standard expansion chamber type.

checked several times and we established that there was a gain, by fitting the silencer, of between 100 and 200 rpm when the engine was propped for speeds in the 8,000-10,500 rpm bracket. At a 12,000 rpm load speed, the performance with or without the silencer was the same. With load reduced to raise rpm to 14,000, the silencer caused a loss of 250 rpm. However, as the Taipan is then running beyond its peak speed, there is no object in running it so fast. In other words, there appears to be everything to gain and nothing to lose by using the silencer with this engine.

The test engine had, we thought, a slightly higher vibration level than is normal for a glow engine of this size, but otherwise ran well at all times and was very easy to start both with and without the silencer and with the throttle open or closed.

Maximum power was delivered at around 12,000 rpm, where output was just over 0.25 bhp on our normal 5 per cent nitro test fuel. This corresponds with the approximate inflight rpm to be expected on a 9x4 prop, so that, for maximum output, one would suggest that, given a suitable model, this size should give the best performance.

However, the Taipan should not be fussy as regards prop sizes as maximum torque is realised at quite moderate rpm and, in consequence, it will turn a variety of larger sizes at respectable speeds. For example, a 10x6 Tornado nylon was turned at 7,900 rpm and an 11x4 Top-Flite nylon at 7,600 rpm. Other figures obtained on test included 8,500 on a 10x5 PAW wood, 9,100 on a 10x4 Tornado, 8,250 on a 9x6 Tornado nylon, 10,200 on a 9x5 Top-Flite wood, 10,900 on a 9x4 Keilkraft nylon, 11,000 on an 8x6 Top-

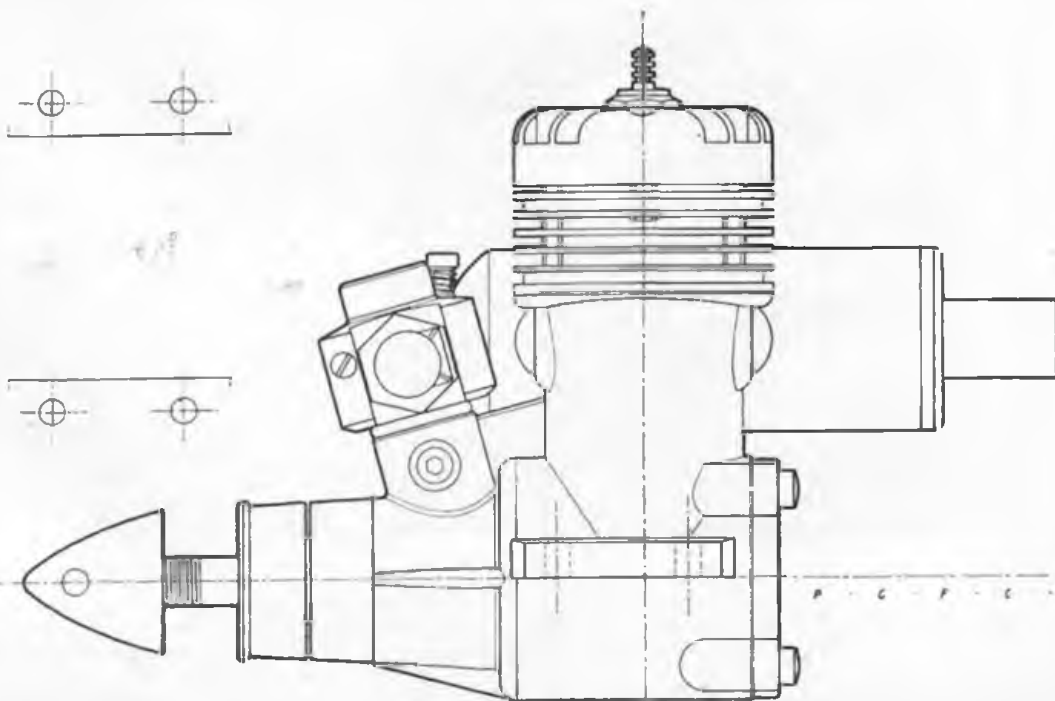
Flite nylon and 12,500 on an 8x5 PAW.

The minimum idling speed obtained on test was of the order of 3,500 rpm. Attempts to get the Taipan to run any slower than this caused it to run excessively rich and cut out, irrespective of control settings. We would imagine that a lower idling speed might be achieved by enlarging the airbleed hole but, as the test motor was not our personal property, we resisted the temptation to experiment with this. The difficulty appeared to be due to the fact that, as the *lower* (rather than the upper) opening in the throttle barrel is notched, the upper opening closes first and the airbleed, even with the adjusting screw completely removed, could not then balance the excess suction created at the jet.

Apart from this difficulty, the Taipan was easy to adjust and docile in behaviour. Running-in, prior to test, was achieved quickly and without the engine showing any tendency to overheat and tighten up. To recount its other good points, the Taipan 19BB R/C is an engine of useful performance, easy to start and is uncommonly well matched with its silencer. Nothing is skimpy in its construction and its overall finish is of high quality.

Power/Weight Ratio (as tested): 0.49 bhp/lb.

Specific Output (as tested): 78 bhp/litre.



**1967 WOODFORD RALLY RESULTS**

Senior Champion D. C. Barber (Leyland). Junior Champion S. Phillips (Spittles).

Open Glider (77 entries). *Fly Off Times* 1. R. Brownson (Timperley) 15 : 30. 2. B. Baines (York) 15 : 10. 3. A. Moss (Whitefield) 13 : 29. 4. P. Whitehead (York) 9 : 18. 5. D. C. Barber (Leyland) 6:58. 6. J. Hannay (Wallasey) 5 : 23. 7. W. Wood (Ashton) 4 : 36. 8. A. Brocklehurst (Hallifax) 2 : 22. 9. J. O'Donnell (Whitefield) 2 : 02. 10. K. Pickles (Baldon) 1 : 44. 11. J. Westerman (Wallasey) 1 : 35. 12. J. Radcliffe (Timperley) 1 : 24. 13. D. White (York) 1 : 08. 14. P. Oliver (Whitefield) 1 : 04. 15. J. Done (Wallasey) 0 : 32. (57 flew).

Open Rubber (52 entries). *Fly Off Times* 1. A. Wells (Hornchurch) 14 : 31. 2. H. Tubbs (Baldon) 11 : 35. 3. J. O'Donnell (Whitefield) 9 : 51. 4. R. Pavely (Hornchurch) 7 : 24. 5. J. Peel (York) 6 : 38. 6. B. Picken (Wallasey) 6 : 11. 7. D. Hipperson (Croydon) 6 : 07. 8. I. Keynes (Croydon) 5 : 44. 9. D. White (York) 5 : 35. 10. G. Tideswell (Baldon) 5 : 09. 11. P. Beer (St. Albans) 4 : 35. 12. D. Morley (Birmingham) 3 : 53. 13. H. Worthing (Wallasey) 2 : 32. 14. T. Dilks (Spittles) 1 : 30. (32 flew).

Open Power (45 entries). *Fly Off Times* 1. R. Peers (Congleton) 4 : 05. 2. J. Allen (Brighton) 3 : 55. 3. P. Perry (Birmingham) 3 : 13. 4. R. Johnson (St. Albans) 3 : 07. 5. D. C. Barber (Leyland) 2 : 41. (27 flew).

Free Flight Scale (6 entries). 1. T. Manley (Blackburn) Bristol F.2b. 2. E. Coates (Blackburn) Jungmann. (6 starters).

Control-Line Scale (10 entries). 1. H. J. Carter Comanche. 2. G. Hayes P.38.

Control-Line Combat (60 entries). 1. J. Duncker (MADMAC). 2. J. Dixon (Liverpool). 3. V. Hunt (Heanor). 3. D. Melrose (Heanor).

Control-Line Aerobatics (12 entries). 1. G. Higgs (C.M.) 1149. 2. H. Dowbekin (C.M.) 1143. 3. J. Mennal (Lincoln) 1092.

Control-Line Rat Race (closed at 40 entries). 1. R. Hindness (Ipswich) 8 : 55. 2. C. Taylor (Southend) 7 : 20. 3. S. Skitt (MARS) 8 : 32. 3. T. Lambert (Feltham/Hayes) 8 : 32 (28 starters).

A Team Race (18 entries). 1. Place/Haworth (Wharfedale) 8 : 33. 2. Hamer/Salmon (Priory). 3. Taylor/Booth (Rolls Royce).

F.A.I. Team Race (24 entries). 1. Place/Haworth (Wharfedale). 2. Devonish/Horton (Wharfedale). 3. Haslon/Ross (Leigh).

Chuck Glider (27 entries). 1. K. Robinson (Whitefield) 4 : 47. 2. M. Turner (Cheadle) 3 : 31. 3. D. C. Barber (E. Lancs.) 3 : 11. 4. K. Emmett (Sheffield) 2 : 53. 5. R. Roberts (Whitefield) 2 : 52. 6. H. Smith (Wath) 2 : 31. (20 flew).

Radio Control Open Pylon Race (9 entries). 1. J. Johnson (Bristol) 2 : 44. 2. T. Cooper (S/Coldfield) 2 : 47. 3. B. Purslow (LARCAS) 2 : 49.

Multi Radio Control (16 entries). 1. J. Johnson (Bristol). 2. Devison. 3. B. Purslow (LARCAS).



Woodford Rally

(and other tailless activity)

FOREIGNERS are apt to say of us that we are a Nation of shopkeepers with only one topic of conversation—the weather. At the risk of prolonging such an impression, we feel obliged to comment upon the effect of good weather on any model rally. The change is all but miraculous! Calm, sunny balm brings out all the local fairweather once-a-year flyers by the score and with them come the relatives and the neighbours. Add to the fortune of good weather, a sprinkling of judicious publicity via the evil square eye 'fluence box and even a little more via sound radio and it appears that the whole wide world awakens to the fact that model aeroplanes might be worth looking at.

Such was the luck of the North Western Area of the S.M.A.E. when they staged the "Woodford" rally at the Hawker-Siddeley (née Avro) aerodrome near Manchester on August 27th. The paying crowd is said to have exceeded 10,000 and the resultant income has assured the N.W. Area of security for a while yet.



Top left, Combat finalists, models and trophies, Scot J. Duncker and I. Dixon of Liverpool, a pair that seem to be making a habit of getting to the top in this event. Above, is Open Glider winner R. Brownson of Timperley with reserve and the "pot". Below left, Bob Evans had his big control-line Junkers Ju. 88 in control line scale. Note the flaps. Is said to have a gun firing mechanism for the big cannon!

Highlights of this remarkable meeting were the rapid growth of enthusiasm for rat-racing, which is now attracting a number of team racing pioneers back in the field along with equally aged class "B" team racers altered for the occasion, the popularity of chuck glider (twice as many as entered C/L stunt) and the number of sport flyers who simply like the chance to use an airfield. This is no difficulty for aerodrome manager D. E. Parker who can slip out and use his own broad spaces at any time; but to the appreciation of all he took his "Comet" steamer to Woodford and astounded many sceptics with some vapour trailing around the calm sky.

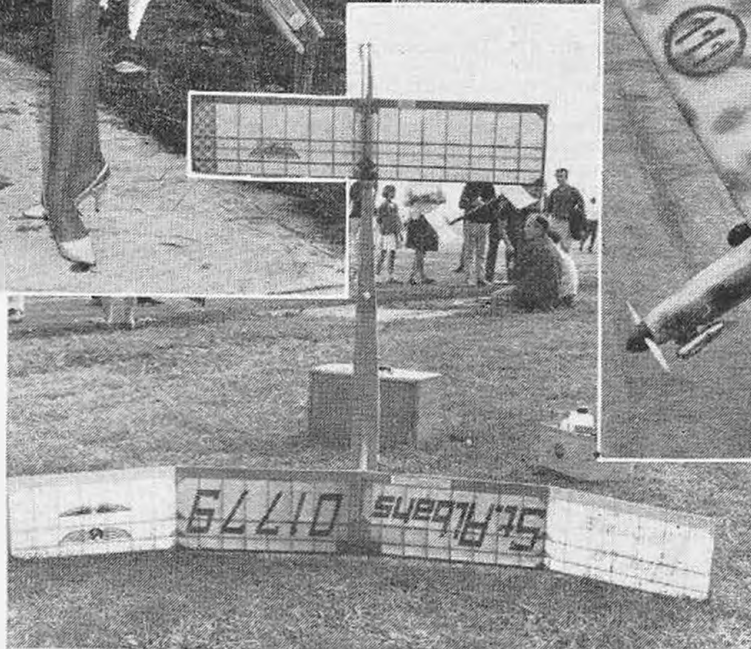
It was a day to remember for all who took part, and as John O'Donnell comments elsewhere in this issue, even those all-or-nothing fly-off flights were happily contained within comparative short distance of the launching point.



Above: Young David Pool launches his '150 Tailless at Topcliffe on August 20th. Left, Jim McCann, never orthodox, had gadgets galore on design with elevons altering incidence when 049 Cox TD stops. Seen at Eglington, June 18th.



Top left, Ken Attwell's flying advert for the free-flight's popular newsletter — placed 2nd in Halifax Postal events, seen at several events. Above, "Miss Aeromodelling" (Julie Goodyear) cocks a saucy look with Bob Wells' open rubber winner at Woodford.



Above: Geoff Higgs' latest stunter, based on Italian fighter, complete with camouflage and those tricky wing insignia Left: George Fuller's E type "Dixielander" prior to Woodford Fly-off.

XIVth CRITERIUM OF ACES



24th-28th August, Bierset, Belgium

Team Race finalists L-R, Molnar, Stockton and Hasling with Hasling making the first stop at his 35th lap. A final to be remembered for action filled pit stops.

IN ALL THE FOURTEEN years of successive Criteriums at various sites in Belgium, that for 1967 will go down in the record books as one of vintage quality and outstanding recollections. Everything about this meeting could be rated in terms of superlatives and the organising committee of the Association of Belgian Aeromodellers have thoroughly earned the fullest possible praise from all who had the pleasure of attending and taking part in this meeting.

Though the Hungarians dominated the Speed event and collected the Stunt team trophy, as well as the Victor Boin Cup for the top Nation, it was the year for "new" names to forge their way through the results. Among them we were very pleased to report were members of the British private enterprise team.

Held at Bierset, Liège airfield, the field organisation was first class, with safety netting for both team race and speed, and electronic lap indicators for the team race (with built-in warning lights for flying fouls). The accommodation at "Ecole Technique de Seraing" a few miles from the flying site was excellent and the food provided was exceptional, for all meals.

Speed

The Hungarians had a large wave of rumour preceding them to the meeting concerning 150 mph flights with new motors, models and tuned length exhaust pipes. The Austrians were absent as a rear exhaust tuned pipe engine is being developed for 1968 and both the Italian and U.S.S.R. teams did not enter though Jaures Garofali of Super Tigre was always near the circle. Several interesting home-made motors were in evidence and most models sported tuned length pipes, but they did not all work!

First to fly in *Round One* was K. Jaaskelainen (Finland) with a S.T.15RV really screaming to make 137.9 mph, a fine start to the meeting and the fastest time recorded without a tuned length exhaust pipe. This speed is surely a great achievement for a home modified engine and would have been placed 2nd behind I. Toth at the last Criterium! As it happened I. Toth (Hungary) was next to fly and the crowds thickened to see the '65 Criterium winner perform with his new Moki powered tuned length pipe models. The pipe "came-in", in two laps for a near perfect run with Toth at full trot in the centre, and 153.2 mph drew gasps from all around. F. Zilliken (West Germany) with a much modified S.T. G.15, sporting a Lindsey tuned pipe, was also considered a top runner with his *Stuppi*; but the pipe came in late with only five laps in the pylon. R. Ekholm (Finland) using a Super Tigre G.15 went off to a good run but his handle jumped out of the centre pylon, so disqualifying the flight. G. Krizsma's (Hungary) tuned pipe Moki S-6 went off to what was expected to be a very fast run, but the model started oscillating, eventually bouncing. Brian Jackson (G.B.) was next to fly and turned in a perfectly on-tune run with his T.W.A. powered *Pink Lady* for 147 mph, putting him in 2nd position and creating a new British Record at the same time. Perfectly relaxed while flying, Brian did a lot to improve the image of British speed flying in International circles. L. Cernold (Sweden) who had been flying nearly all of the time for practice with his home-made rear exhaust motor and pipe took off with lots of rpm and whipped it so hard the engine cut out! M. Sebestyen (Hungary) the last member of the Moki team to fly in round one recorded 149.1 mph, so displacing Brian Jackson from 2nd position. R. Miebach (West Germany) followed Sebestyen but no time was recorded. Bill Firbank (G.B.) then used his second attempt to good effect recording 140.7 mph with his T.W.A. 15 powered *Pink Lady*, forming up behind Brian Jack-

NEW RECORDS FOR BRITISH SPEED FLYERS

At left: 1. Brian Jackson and Bill Firbank with T.W.A. 15 powered "Pink Lady" models. 2. Mick Mayne with his lightweight tissue covered "Thunderbird". 3. A 32 ounce balsa wheeled lightweight "Thunderbird" by Leuba (Switzerland). 4. Sid Peart and Alan Laurie's Moki powered racer with short tail moment arm. 5. Ove Anderson (Sweden) with unusual almost "multi" stunter. 6. M.A.R.S. 15 powered speedster by Picquet (France) did not record a time. 7. J. Frohlich's 138.8 m.p.h. S.T. G15 speedster. 8. C. Cappi (Italy) back in International for 5th in Stunt. 9. Stockton Jehlik's H.P.15 powered winner. 10. Brothers Hasling (Denmark) 2nd in T/Race with tissue covered lightweight T/Racer. 12. Home made engine and pipe in L. Cernold's model. 13. 3rd place T/Racer by Molnar/Kuti, Moki powered.

son for 4th position after his first try did not come in. V. Pecquet (France) used *Pink Lady* design lines on his model with a Franco Marcenaro MARS .15 engine complete with rear exhaust and tuned length pipe. They failed to start the engine. J. Frohlich (West Germany) made his second attempt without a tuned length pipe to record 130 mph (Super Tigre G.15). So ended Round One with the two British lads in 3rd and 4th positions beaten only by the Hungarian's Toth and Sebestyen.

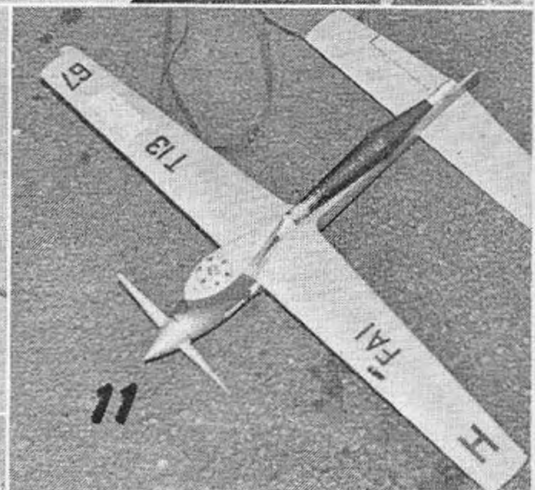
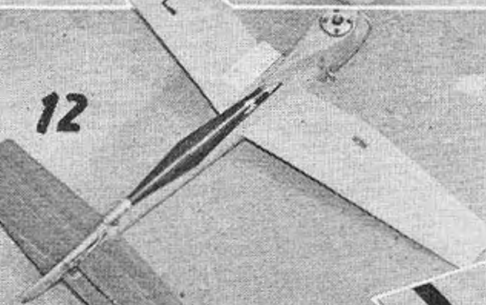
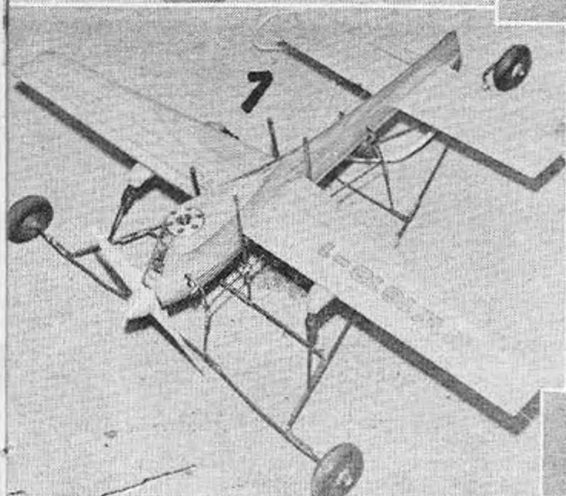
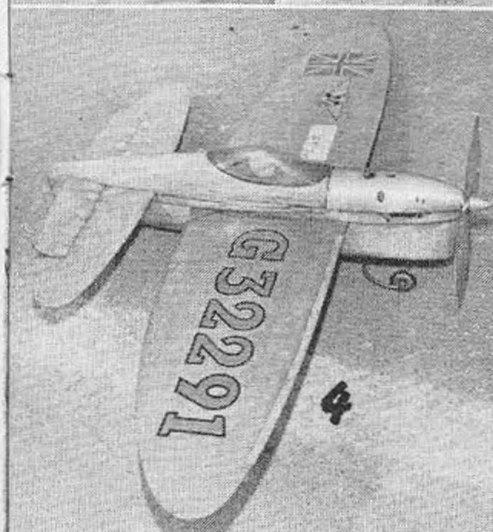
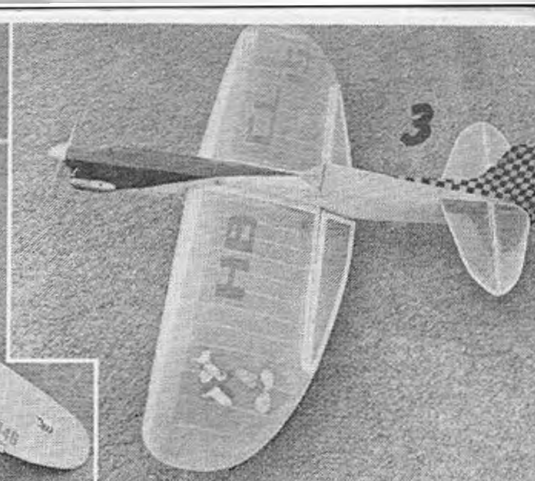
Round Two

The Second Round, also on the first day of the meeting, saw the overall standard improve. Great Britain's, Bill Firbank managed another few seconds off to make 142 mph, but the most shattering flight of the meeting was to come next. I. Toth already the leader, came out to fly with the crowds pressed up against the protective wire fence to see the action, they were not to be disappointed. After a quick start the pipe came in and the rpm rose rapidly on the 5½ in. x 6½ in. pitch propeller. There was some speculation about the flight timing as the watches varied quite a few tenths, but it was decided that 159.6 mph was the official speed. This really put the individual performance win in the bag for Hungary and it remained to be seen if Krizsma could manage a fast time to make it three in a row—which he did most effectively with 149.1 mph. M. Sebestyen (Hungary) then repeated his first round speed of 149.1, demonstrating the consistency of the Hungarian models and making one wonder just how much time and effort these lads had put in during practice. F. Zilliken had better luck in this round with his G.15 really revving as the tuned pipe worked, giving the West German team a lift, with a 136.4 mph speed recorded. Brian Jackson could hope for little better than his first flight where the engine was bang on setting and settled for 144.2 mph. J. Frohlich (West Germany) again used his unipiped model and improved to 138.8 mph. R. Ekholm (Finland) managed to stay in the pylon in this round for the duration of the 130 mph timed run. At the end of this round Hungary had their 1, 2, 3 positions and Brian Jackson moved down to 4th position with Bill Firbank in 5th place, thanks to Krizsma's improvement.

Round Three

No one expected to beat Toth in the Third Round, flown on the second day, but the rest of the places were expected to have some major changes. K. Jaaskelainen was again first to fly as in Round One and repeated his time exactly at 137.9 mph. Toth declined this round, as there was very little chance of anyone coming near him, let alone beating him. F. Zilliken (West Germany) the next to fly had a really good run with his blue and white *Stuppi* and 145.1 mph resulted, the fastest with a "non-professional engine", as many said. R. Ekholm (Finland) slowed a little from his second round time for a 128.6 mph speed, his tank gave a very long run and he seemed to be flying for an eternity before entering the pylon. Miklos Sebestyen prepared next. With Miklos ready in the centre and Krizsma starting, while Toth set the needle, what more could one ask for in a team? The pipe came in after three laps for a 146.7 mph run, a little below earlier flights. Bill Firbank and Krizsma both had bad runs and used them as attempts, then Brian Jackson made his timed re-run for 139.8 mph after breaking the engine-pipe seal on his first attempt. Bill Firbank did not use his second attempt, then Miebach finally recorded a time with a rather "off" run giving him the slowest time of the meeting at 101.3 mph, a distinction Rolf Miebach does not usually enjoy. Krizsma then tried very hard on his re-flight to record 151.6 mph for 2nd place and ended by pulling the top off the pylon!

The speed event was a real eye-opener and showed the tremendous progress made since the last World Championships, but it also showed just how hard it is to get the pipes working well.





Team race winners Don Jehlik left, Herb Stockton right with their H.P.15 powered Jefe III. Even with a change of engine type and the new tank size, the current World Champs came through true to form.

Team Racing

With the current World Champions present at the first meeting on a large International scale for the 7 cc. tank regulations, there was great speculation as to who would "make-it" to the eventual final. So many competitors were cheating themselves in practice by whipping and walking back that one wondered why they bothered, they weren't all running in new engines like the Austrian lads with the H.P.15D's. Through such practice they were getting false impressions of speed, laps and compression settings. We are glad to say this did not apply to the British or American teams. The Austrians and Czechs were by far the fastest in practice, but how the picture changed in the race. Stockton/Jehlik tested both Eta and H.P. powered models but elected to use the H.P. for commercial reasons, though it was not quite standard, having a Cox .049 venturi and needle in the H.P. bell-valve backplate. The British lads, Turner/Hughes, Balch/King and Laurie/Pearl were in the "good" performance class and hopes were high.

The first race saw Patris/Landrain (Belgium) disqualified for obstruction and whipping and Cator/Haaskamp (Holland) return 5:18 with an Oliver powered model. Bader/Kaul (West Germany) were even slower with 5:57. Not a very inspired start to the team racing! Race 2 promised better things with Stockton/Jehlik (U.S.A.) against Cimino/Vlgier (France) and Matille/Meyer (Switzerland). The Americans were off to a good start with their H.P.15 *Jefe 111* and made good stops, although two warning lights came on for backing up. The Swiss were going well but could not touch the very fast landing of the U.S.A. Stockton saved time by getting the model down quickly after the engine had cut. This established the fastest time of the meeting at 4:32.9. The Swiss were not far behind with 4:56 while the French retired. The Czechoslovakians, Trnka/Drazek, were in Race 3 with Kari/Aarnipalo (Finland) and the Swedes Ahlstrom/Fransson. The Czechs had a new M.V.V.S. 2.5 RL powered model developed from Milan Drazek's Orion with a 7½ in. x 7½ in. propeller. This was fast; but low on laps and their pit stops were aided by a pressurised filling system of very neat expanding metal tube construction. The Czechs took a lot of time flicking and the Finnish team were plodding on quite well, then the Swedish team crashed, Drazek finishing at 5:10.6 and Kari/Aarnipalo at 5:50.

The Australian team Fischer/Meusburger used a throw launch system with their light-weight fibre glass pod and boom type models that were really fast on acceleration with noisy H.P.15's. Experienced Hungarians Mohai/Markotai were also in Race 4 with Thygesen/Petersen (Denmark). The Austrians were low on laps and the Hungarians looked far from happy. The Austrians had a missing run that gradually "came-in" and the Hungarians had the engine cutting on take off, while the Danes flew on without any troubles. The Austrians "cooked-up" so they retired. The Hungarians now had their settings but the 6:14.1 time was little reward. The Danes were first home with 5:33. Race 5 saw the first British lads in action; Richard King and Dave Balch with their Oliver powered *Trident*. Dave Balch hogged the centre as much as he dare; the German team of Gunther/Rumpel were doing slow stops with their Wabra

Mach II powered model and finished in 5:30, while Dave and Richard made 5:12.2 their engine having a new shaft after breakage in practice. The Dutch Metkemeyer brothers did 5:07. Alan Laurie and Sid Peart, our second team to fly, were in Race 6 with their Mokl powered model. This was to be a hectic heat and our hopes were shattered when Alan hit the Finnish team of Palho/Nore coming in for a pit stop, breaking his propeller. The Finns took off with a rag hooked onto their wing, this staying on the model for a few laps, the model swinging crazily, when it came off, it nearly crashed. The other team of Fabre/Fabre (France) did crash their new model with through fuselage ducting like *Jefe II* when their lines caught on the head of Palho.

Yet another "brothers" team were in Race 7, the Gescwendt-ners (Denmark) with Guntler/Baumgartner (Austria) and Azor/Katona (Hungary). The Danes were faster on average. The Hungarians were making better stops for a 4:58.7 time. The Austrians were in trouble. They had to adjust settings and were disqualified for flying fouls. The Danish brothers finished in 5:01.6, which seemed slow to those watching.

The last British team to fly, Brian Turner and Mick Hughes in Race 8 with Brendel/Glodeck (West Germany) and Buys/Goudsmit (Holland). Brian's model doing 40 laps and Mick not aiding the model one bit. Brian's time was a disappointing 5:07.4 followed by the Dutchmen at 5:13.3 with Brendel/Glodeck just 0.7 slower. The only retractable undercarriage was in Race 9 on the Sundell brothers' Oliver Tiger powered model. This is fast and the Reguflow tank gave them a very constant run. Against Bador/Bador (France), Sundell lost time at the stops for his 4:57.6 time, still very fast though! Bador used an auto filling system to help him for a 5:33 flight. Race 10 was uneventful (though it included two finalists) with the Danish Hasling brothers' team making 5:47.8 with their black tissue covered Fresco type model powered by a Super Tigre G.20D. Molnar/Kuti a new Hungarian team used their odd looking Mokl powered model to make 5:01.3. The very keen Spanish, Porta/Hervas team had more enthusiasm than luck for 6:34.6. Race 11 saw Austrians Kropf/Nitsche against Spaniards, Gogorcena/Ruiz and Swiss, Leuba/Wittver. The Austrians were trying as hard as Peter Kropf dare, with the model's thin wings flexing in flight. The Spanish team made good stops and the Swiss missed two catches! The Austrians lost time by the engine missing for the first eight laps of each tankfull and the Spanish model did not have enough airspeed to better 5:28.5, the Austrians finished in 4:58.4 and the Swiss 6:12.2.

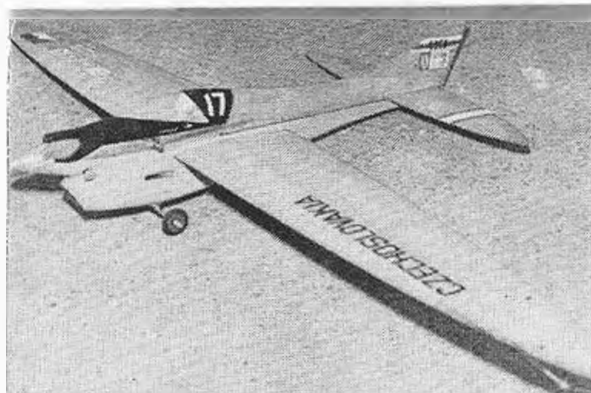
So finished the first days' racing with the Americans as leaders, the Swiss Matille/Meyer team 2nd and Sundell brothers 3rd.

Team Racing Round 2

The 2nd Round on the Sunday was destined to change the leaders positions, though the average times were not to improve much. Race 1 saw Favre/Fabre using their second model after the first round prang, against Hungarians Molnar/Kuti and Swedes, Ahlstrom/Fransson.

The French and Hungarian teams were both off together with Sweden a little slow. The Hungarians were fastest and it was clear this was a final position challenge. France missed the first catch, for a 5:41.8 time. The Hungarians made hay and recorded a 4:44.2 to put them in 2nd overall position. The Swedish team finished with 5:31.4. Race 2 saw G.B.'s Laurie/Pearl team flying again against Thygesen/Petersen (Denmark) and Kari/Aarnipalo (Finland). G.B. made a first flick start and a good first stop at 31 laps. The Finns made a long stop adjusting the engine, Denmark missed a catch but they were fast and really pulled the model along the ground at stops to make up any lost time. The Danes then spent time on the ground and the Finns had an engine failure. G.B. missed a catch then had to tighten the propeller, so losing valuable seconds for 5:26.8. Race 3 was only two up and Trnka/Drazek were all set to take advantage with Palo/Nore (Finland). The Finns were slow and the Czechoslovakians took advantage and used their filling system to record 4:48.2.

Stockton/Jehlik were matched against Bader/Kaul (West Germany) and Cator/Harskamp (Holland) in Race 4. All models were away sharply and the Americans made a great stop at 36 laps then they cooked up at 54 laps, with Herb Stockton trying to get an engine cut. Don Jehlik put the compression back at 69 laps. The Germans retired at 86 laps and the Dutchmen flew on smoothly for 5:43.6. The American's time was 5:37.1—quite a drop from their first round. Race 5, Bador/Bador (France) flew a wierd model with constant 2 in. width fuselage and geodetic internal structure with an all moving centrally



Above, Milan Drazek's new M.V.V.S. R.L. 15 team racer. This has the best finish we have ever seen on a team racer and is fuelled via a pressure system on the mechanics arm. Left, Stunt winner M. Vanderbeke of Belgium the host nation for the Criterion. He excelled with his second round flight with this silenced model and restored to the Belgians an International Stunt win. They used to dominate this event.

pivoted tailplane, they were disqualified for hand off the chest flying. The Melkemeyer brothers improved to 4:57 and Hungarians Azor/Katona only made 5:05.1. The second fastest time of the meeting came in Race 6 from Hasling/Hasling (Denmark). Flying against Cimino/Vigier (France) and Gurtler/Baumgartner (Austria). The Austrians were, as ever, the fastest in the air but the Hasling brothers were very fast on their two stops and returned 4:44.2. The French team were slow for 5:41, the Austrians recording 5:15.4. G.B.'s Balch/King came unstuck in Race 7 with a disqualification for high flying and whipping. Kropf/Nitsche (Austria) and Mohai/Markotai (Hungary) both finished but the Austrians spent a long time on the ground and the Hungarians had a rich run that was misfiring for half the tank. Race 8 was rough in the centre, the teams of Brendel/Glodeck (West Germany), Buys/Goudsmit (Holland) and the Geschwentner brothers (Denmark) were all pushing the rules. The Norwegians had only one pit stop, using a S.T. G.20D diesel and the Germans made a good stop, then missed the last catch and retired. The Danish brothers finished in 5:11.8 while the Dutch made 5:14.2.

Race 9 could have been a final challenge with the Sundell twins (Finland) and Fisher/Meausburger (Austria) in it with Leuba/Wittver (Switzerland). Austria were away first followed by the Finns, whose retracting under-carriage went up very quickly (also coming down at the last possible moment), the Finns engine was missing, and the Austrians fastest doing throw launches from pit stops. Austria were down at 28 laps after the H.P.15 had slowed and Sundell increased speed. At each stop the Austrian's tyre came off the hubs so they hand launched it a few inches above the ground. After warnings they relfied. The Sundell's improved their first round time to 4:49.4. The Swiss finishing in 7:04.6.

Race 11 had G.B.'s last hope in it, the Turner/Hughes team. Mick was intent on pushing the rules (as others do so often at these meetings) to try and improve the first round time which had the same speed and laps but a more normal style of flying. The 19 second time reduction speaks for itself! The Spaniards Porta/Hervas and Swiss Matille/Meier also tried hard in the middle and the flying was about the roughest we have seen. The Spaniards spent a long time on the ground then there were warning lights flashing all round and the Swiss were disqualified, the Spaniards then missed a catch and ran in but went on to finish with 6:34.1 to Brian Turner's 4:48.3.

So into the heats, with two new names to the fore to compete with the seemingly invincible Stockton/Jehlik team.

Team Race Final

All three teams practised and Hasling/Hasling from Denmark showed great form with fast landings and stops, flying their Fresco type model. Molnar/Kuti of Hungary were also just as fast in the air but slower on the pit stops. The Americans were much quicker in getting their Jefe III down after the engine stopped than the other two teams.

Denmark and Hungary were up together at the start with the U.S.A. a fraction slower getting away, the U.S.A. were just the fastest at 86 mph with Hungary and Denmark at 84 mph. Hungary had one warning for pulling, then Denmark were first down

at 29 laps for a good stop. Just as they took off the Hungarians came in at 35 laps for a 7 second stop while the U.S.A. came in very fast to land over the now taking off Hungarians at their 38th lap. Hungary were away just a little slower than the others. The U.S.A. were still the fastest and Denmark refuelled at 59 laps for a 6:8 second stop followed by Hungary at 70 laps for an 8 second stop with the U.S.A. model landing on its 75th lap for a really fast stop so both models took off together even though the U.S.A. landed way after the Hungarians. The Danes were now flying at 85 mph with the Hungarians and the U.S.A. at 87 mph. The flying was pretty clean and the three engines, Super Tigre, H.P.15 and Moki all sounded bang on tune, with the Danes making the most noise. The Danish team were next down at 92 laps for a fast 5.9 second stop using a very fast whip landing method. Hungary were then down on their 105 lap stage and the U.S.A. were down with them again at 113 laps with the Hungarians. These were both good fast pit stops but after this the Hungarians seemed to slow down slightly to 84 mph while the U.S.A. went faster, doing 92 mph. Denmark were next down at 129 laps for another 5.9 second stop getting away quickly with plenty of pull, again the Hungarian and American engines cut together on laps 141 and 150 respectively, and the U.S.A. had to go round again as their engine coughed back into life, giving the Hungarians a clear landing space. The Hungarians took a long while over their stop, 8.2 seconds from pick up to release (fast by domestic standards). There was one warning each at this stage and all pilots backed off the pulling a little for fear of disqualification. Denmark were then down at 164 laps for another 6.1 second stop and the Hungarians followed at 178 laps for another good stop followed by the U.S.A. at 188 laps and a great sigh went up as Don Jehlik's model flew out of his hand while making his catch. Don soon recovered it with in a few feet to finish the last pit stop of his final. The American team were first home with 9:36 followed by Hasling/Hasling with 9:48 and Molnar/Kuti with 9:55.

Stunt

Unlike radio control, the judging system for control-line aerobatics remains unchanged. This means the better two out of three flights count—and the unfortunate judges have no rest periods. Speaking as one of the judges (reports Ron Moulton) the toughest part of this contest was the endeavour needed to sustain a constant standard of marking from the start of the first round to the conclusion. Judging is an exhaustive business. It is often unfair when standards are relaxed or sloppy through judicial tiredness and we fancy some onlookers left Liege thinking that the result of this contest was afflicted by a degree of sloppy observation.

But, we disagree with such a viewpoint and fully endorse the result in the order given. The event was won by a good but not brilliant effort, consistent and impressive amid mediocrity.

Tactics opened Round One when first drawn Seager (Germany) found his tank holed and second Jonkers (Holland) broke a cable so that Oleff Kall (Sweden) had to brave the cool, heavy overcast. He was a little unlucky. His job was more to warm up the judges ready for reigning World Champ Josef Gabris who followed. The last of the breed in MVVS 5.6's yowled as usual in fine pitch as Josef went through the pattern, spoiled by low level pullouts, jerky outside square loops and wavy inverted. He could, and had, done better than this! Cappi, new to many but actually an old pal from those days of stunt exploration in '49 and '50's, came next and what a surprise he gave everybody! Such squares—and rock steady inverted! Clemente Cappi and his Mustang were lone reps for Italy, doing a grand job. In contrast, Hungarian Vellai flew slowly and then came our second surprise, Marc Vanderbeke from

Aero Modeller

The Victorious Hungarian Speed team, all Moki powered these tuned pipe models set a new standard for consistency. Left to right Krizsma, Toth, Sebastyen.

Belgium. Silenced; fast, smooth, his top scores came with the hourglass, vertical eight and outside loops which more than made up for squashed triangles. As the round wore on, through many brave triers, to regulars Kaminski (Germany) and Metkemayer (Holland) who like so many excel in some manoeuvres, but are way off shape in others, we came to Britain's lone representative Mayne, of Southampton. His vertical eight was equal to the best, but that does not make a flight. Mick learned a lot, is going back for more and his target for 1968 is the Gold Trophy, others watch out! The long-lean arrow like look of a twin fin model is the "In" shape and it certainly points out the abrupt change of direction in any square manoeuvre. Gabor Masznyi's novel design excelled on this point. Billion of France had another. This flamboyant ballet-pilot has style. Kessels (Germany) elected to use an unsilenced Veco 45. It was almost unbearably noisy. Speaking as a judge we found it difficult to resist the row affecting pointage, especially coming after some quiet efforts. Louis v.d. Hout of Holland was low in pull outs (under a metre sometimes) which knocked him back in spite of exceptional triangles and horizontal eights. Then followed Andersson of Sweden the surprise of Swindery. Beautiful figures with a show of expertise earned a lot of high points. Veteran, with his "Hopp" of eight seasons, Dr. Geza Egervary was not so tidy as expected, so too was Juhani Kari, ex Champion from Finland and now the sartorial wonder of the mod age.

In the **Second Round** Masznyi led off catching the judges after a four course luncheon (with lubrication). His hourglass looked exactly correct but his score showed no particular favour from the judges. Marconcini of France was a victim of not being told the rule changes (the attempt rule is now only applicable to a model which is *not* released within 3 minutes—if one releases, then it is a flight) but he was permitted a generous second attempt later which only served to emphasise the validity of the rule change. Vanderbeke excelled himself—only the cloverleaf could be seriously faulted for waviness and his second flight did much to restore the once supreme Belgian leadership in aerobatics. His closest rival came soon after but engine stoppage in the third loop killed Gabris's opportunity to prove he was better. Capi repeated the style of his first round, showing much of fellow countryman Compostella's flair (who was at home with new model—a week old daughter!) then Egervary and Andersson kept up the standard with piloting techniques that are totally opposite (Andersson takes off while bent double, straightening out as the model climbs). Kari swept through the schedule quietly but seems to have lost something of his old capacity for sharp, square corners. It was now dead calm and hot. Lack of wind was a handicap for some—including Swiss Leuba who flew a 32 ounce *Thunderbird* complete with balsawood wheels!

Round three was to be the decider though few could hope to beat Vanderbeke's total. Gabris was the only entrant to do better than the Belgian and even then not without worry as the MVVS coughed and breathed again threequarters of the way through. Vanderbeke called an attempt and flew later. He was not so impressive this time, showing over confidence to the extent that Karl who ended the contest, looked better though the scores showed otherwise. Highlights of the last round were the ballet antics of Kall (Sweden) and Billion (France), Libert's incredibly quiet home-made silencer, and the steady consistency of v.d. Hout, Andersson and Capi.

Eventual results show Mayne in a comparatively low place for G.B. which is in itself a reflection on our domestic standards. Mick was there to learn and this he did quickly so we look forward to him showing the way next time!

Speed

		Rd. 1	Rd. 2	Rd. 3	Engine	
1	I. Toth	Hungary	153.2	159.6	—	Mokl and tuned pipe
2	G. Krizsma	Hungary	—	149.1	151.6	Mokl and tuned pipe
3	M. Sebastyen	Hungary	149.1	149.1	146.7	Mokl and tuned pipe
4	B. Jackson	Great Britain	147.0	144.2	139.8	T.W.A. & tuned pipe
5	F. Zilliken	W. Germany	—	136.4	145.1	S.T.G.15 & tuned pipe
6	J. Frohlich	W. Germany	130	138.8	144.9	S.T.G.15 & G.15 tuned pipe
7	W. Firbank	Great Britain	140.7	142.4	—	T.W.A. & tuned pipe
8	K. Jaaskelainen	Finland	137.9	—	137.9	S.T. G15 RV
9	R. Ekholm	Finland	—	130	128.6	S.T. G15
10	L. Cernold	Switzerland	111.9	—	—	Home made & tuned pipe
11	R. Miebach	W. Germany	—	—	101.3	S.T.G15 & tuned pipe



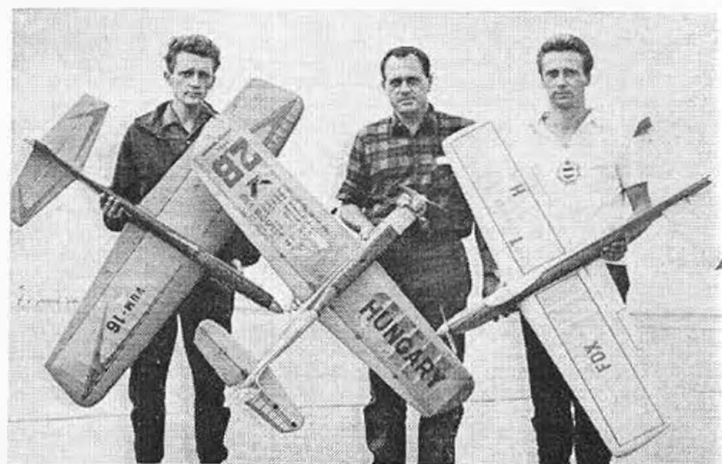
Aerobatics

		Rd. 1	Rd. 2	Rd. 3		
1	M. Vanderbeke	Belgium	2730	2943	2804	5747
2	J. Gabris	Czechoslovakia	2760	511	2814	5574
3	J. Kari	Finland	2637	2262	2741	5403
4	L. van de Hout	Holland	2627	2653	2708	5361
5	C. Capii	Italy	2614	2687	2635	5322
6	G. Masznyi	Hungary	2561	2438	2729	5290
7	O. Andersson	Sweden	2614	2611	2660	5374
8	M. Billion	France	2473	2600	2424	5073
9	A. Kaminski	W. Germany	2506	2476	2197	4984
10	K. Seeger	W. Germany	2548	2417	2433	4961
11	Eskineon	Sweden	2584	2312	2383	4947
12	G. Egervary	Hungary	2365	2388	2519	4907
13	B. Metkemayer	Holland	2522	2335	2286	4857
14	T. Vellai	Hungary	2395	2415	2395	4810
15	Mayer	Finland	2401	2186	2004	4587
16	Kall	Sweden	2183	2302	2216	4518
17	M. Mayne	Great Britain	2307	2153	2132	4460
18	R. Kessels	W. Germany	2227	2212	1901	4439
19	Jonkers	Holland	2086	2225	2185	4410
20	Marconcini	France	1852	2084	1585	3936
21	Leuba	Switzerland	1281	1705	1774	3479

Team Racing

			Rd. 1	Rd. 2	Final	Engine
1	Stockton/Jehlik	U.S.A.	4:32.9	5:37.1	9:36	H.P. 15D
2	Hasling/Hasling	Denmark	5:47.8	4:44.2	9:48	S.T. G20D
3	Molnar/Kuti	Hungary	5:01.3	4:48.1	9:55	Moki T/R8
4	Trnka/Drazek	Czechoslovakia	5:10.6	4:48.2	—	M.V.V.S.
5	Hughes/Turner	Great Britain	5:07.4	4:48.3	—	Ela 15 (Mod)
6	Sundell/Sundell	Finland	4:57.6	4:49.4	—	Oliver Tiger
7	Matile/Meler	Switzerland	4:56	—	—	Micron 15T.R.
8	Metkemayer/Metkemayer	Holland	5:07	4:57	—	Ela & S.T. G20D
9	Kropf/Nitsche	Austria	4:58.4	7:49.4	—	H.P. 15D
10	Azor/Katona	Hungary	4:58.7	5:05.1	—	Moki T/R 6
11	Gashwendtner,H. & J.	Denmark	5:01.6	5:11.8	—	S.T. G20D
12	Belch/King	Great Britain	5:12.2	—	—	Oliver Tiger
13	Buya/Goudsmit	Holland	5:13.3	5:14.2	—	Ela 15 Mk. III
14	Brendel/Glodek	W. Germany	5:14	—	—	Webra Mach II
15	Gunller/Baumgartner	Austria	—	5:15.4	—	H.P. 15D
16	Cator/Harskamp	Holland	5:18	5:43.6	—	Oliver Tiger
17	Gunther/Rumpel	W. Germany	5:30	5:21.9	—	Webra Mach II
18	Gogorcen/Rulz	Spain	5:25.8	—	—	Oliver Tiger
19	Laurie/Pearl	Great Britain	—	5:26.8	—	Moki T/R 6
20	Ahlstrom/Fransson	Sweden	—	5:31.4	—	Oliver Tiger
21	Thygesen/Petersen	Denmark	5:33	7:19	—	S.T. G20D
22	Bador/Bador	France	5:33	—	—	Micron 15 TR
23	Cimino/Vigier	France	—	5:41	—	M.V.V.S.
24	Favre/Fabre	France	—	5:41.8	—	2.SRL
25	Karl/Aarnipalo	Finland	5:50	—	—	Webra Mach II
26	Bader/Kauli	W. Germany	5:57	—	—	Ela 15 Mk. II
27	Leuba/Wittwer	Switzerland	6:12.2	7:04.6	—	M.V.V.S & Oliver
28	Mohai/Markotal	Hungary	6:14.1	6:22.2	—	Oliver Tiger
29	Paiho/Nore	Finland	9:26	6:17.4	—	Moki T/R 6
30	Porta/Hervae	Spain	6:34.6	6:34.1	—	Ela 15 Mk. II
31	Fischer/Meusburger	Austria	—	—	—	Ela 15
31	Patris/Landrain	Belgium	—	—	—	(Edmonds) H.P. 15D
						S.T. G20D

The Hungarians also cleaned up the Stunt event placing 6th, 12th, and 14th. Left to right Vellai, Egervary, and Masznyi.



CLUB and CONTEST NEWS



On Saturday, August 5th, the South Bristol M.A.C. presented a static and flying display at Harveys (the well-known wine shippers) sports day. Flying display started with a demonstration of Aerobatics by Brian Waring (Crusader) who finished display with inverted lancing. In combat for a cup donated by Harveys, Richard Evans, flying an Oliver Tiger Early Bird was winner. The Cup was presented by the glamorous Miss I.T.V. and T.W.W., Marion Jenkins. Hmmmmm!



Flying-Bomb

Harrogate and D.M.C. have flown models at two displays recently. All classes were flown and the Chairman, Alan Stocks' *Frog Mustfire* really delighted the audiences. There was some excitement on their moorland flying field after Francis Reiss had managed to land his multi model almost on top of a last war anti-tank mine. This part of the field was at once placed "out-of-bounds" and the Army called in. Having found the mine by accident, it took half an hour to find it again by intent!

Their pick and shovel brigade have made a small clearing across some rough moor, but this was of marginal size for the radio jobs. It was felt more drastic measures were needed so a civil engineering contractor was called in with a bulldozer to clear a decent sized strip. They now boast a clear and flat area some 50 yards square, and are the envy of many other clubs.

DISHONESTY SPOILING FREE FLIGHT?

Most Free Flyers enjoy the opportunity of a double chance in any competition, hence the popularity of the re-entry system at most Club organised rallies. The idea worked out by Southampton Model Aeroplane Club for the Southern Area at their recent Gala on Beaulieu, August 6th, was intended so that competitors would be allowed to enter more than one model; but each model to be a separate entry. This was instead of the re-entry system. The idea was well received, but it is highly unlikely that it will be repeated. *Why?* Simply because there was a strong suspicion of dishonesty on the part of one or two competitors who abused the system.

Practically every rally organiser has his difficulties dealing with suspect practice, particularly on the accepted "*Find your own Timekeeper*" system. The object of a few Free Flyers seems to be solely to qualify for the Fly-Off by hook or by crook. Strong words these may be; but nevertheless they are very true. One has to rely upon the integrity of the individual, and the Timekeeper in particular, who applies his signature to the Flight Card. At present rate of progress, the only answer for rally organisers is to begin to consider a three minute starting rule with more rigid checking not only of models, but also of stop watches and Timekeepers. During the Glider fly-off at one recent rally the Contest Director was obliged to stand upon the tow-line of a well known modeller who was about to make a "trimming flight", no doubt to help two other equally well known contest names who were ranged immediately down wind. Such practice can only be condemned; yet the admonishment of the would-be culprit only produced a sour smirk upon his face. At a time when an "inferiority complex" seems to be sweeping through the Free Flight community according to expressions in the News-Letters, this kind of behaviour can only bring respect of Free Flight down to a low level, no matter how much enthusiasm there is for the subject.

Boscombe Down Sports Rally

The Boscombe Down Sports Rally at Middle Wallop suffered badly from poor weather, with several single channel radio control models disappearing down wind at a rate of knots. The spot landing event was won by Bill Bellinger flying an Enya 60 powered aerobatic model with Orbit proportional radio control, as this was about the only model to penetrate the wind. Next year the organisers are going to try a different date! That'll please the "Golden Cross" rally people!

Newspaper Results

The Chesterfield Skyliners continue to be very active and produce a club news sheet for the benefit of their members. A free flight rally at Beeley Mons, July 23rd was well attended and they lost a few models, but publicity in the local newspaper soon had them returned by the local residents. John Vardy won the Open Glider with Phil White placing second and losing his Inchworm. Nearly 6,000 spectators were on hand for the Brimington Gala where they gave a display of combat flying and balloon bursting. At a later display in Killmarsh, they flew combat again with Stewart Miller putting on a radio display with his Falcon 56. They also put on a display of static models and sold chuck gliders to the spectators. They had a visit from the Wath-on-Dearne M.A.C. for a combat and chuck glider contest and Skyliners managed to win both of these events. They were impressed with the Wath designed *Clubster* combat model and now they have the plans, several are being produced by club members. Their winter programme is now being planned and indoor R.T.P. flying, films, lectures, etc., are lined up. They hope to invite other local clubs to their club evenings.

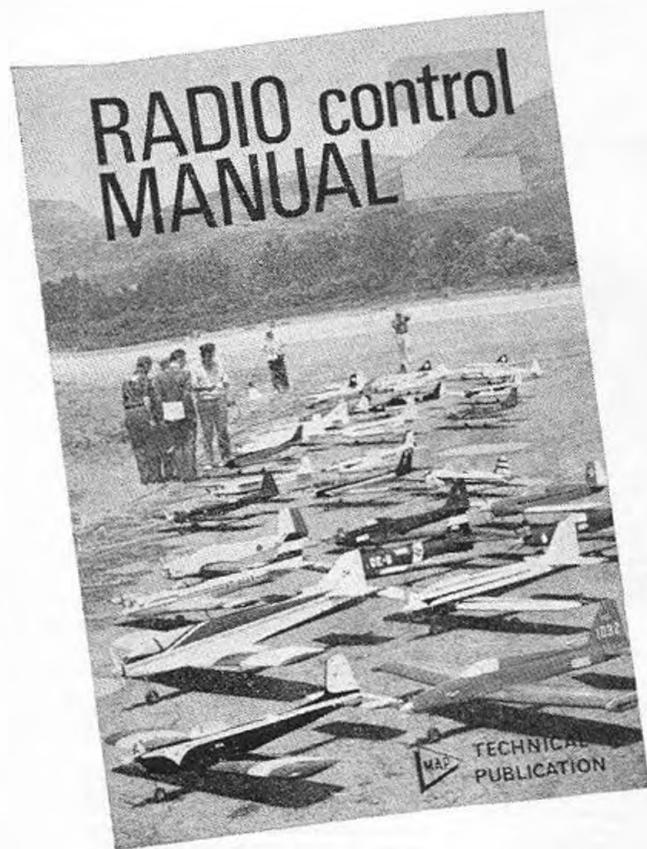
TALE OF THE TAILLESS

The Halifax Tailless Challenge Trophy Postal Contest held between July 2nd and 16th attracted 20 entries, very nearly up to the 1964 Lady Shelley attendance, the last reasonably supported centralised Tailless contest. The main organiser and winner happened to be the same person, but this was dictated by skill and nothing else. John Pool put a lot of effort into this event and in a way it's nice that he should win. Flying at R.A.F. Topcliffe he totalled 8:35 with his *Never Forget* 9 rubber model, with his 2nd entry John also placed 4th while Ken Attiwell placed 2nd and 3rd. M. Page of Peterborough flew a glider into 5th place with 7:36 while Ken Attiwell placed 6th with yet another rubber model, a John Pool designed *Never Forget*. It should be noted, that the doubling up of flights by John Pool and Ken Attiwell brings the list of entrants down to 17. Overseas entrant P. Nilsson of Sweden flew his *Karl-nilssonplanka* at Stenungsund but only made 2:58 for 18th position. The Report on this contest by John Pool, duplicated by Derrick Parker, covers eight pages and is fully detailed with several model designs included and full scores.

Record Bursting

The demonstration team of Cosmo A.C. have been in action three times this season, including a display at Dr. Barnados, Tunbridge Wells which went off very well. The Club Championship run on a series of 1/4A, and A Combat and Rat Races, a speed event and a stunt event. Two of the club's speed records have been broken recently, the 2.5 cc. record from 89.5 mph to 99.8 mph, using a 67 x 6 nylon propeller on a front induction engine, this is a home made Eta conversion, in an 18 inch wing span flying wing. In 1/4A,

Club Secretary D. Walker is not far behind, with 96.5 mph from a Cox .09 flying wing. Alan Jackson who has emigrated to Australia, was in regular contact with Brian Horrocks (now an R/C man) who sent Alan a tape recording with news of the Australian Nationals. Soon after he arrived Alan sent a letter with news of an Aeromodelling spot Brian does on T.V. in Australia. Also of interest, are the 1.5 and 2.5 cc. Taipan diesels which are apparently giving English motors a lean time in Aussie team race.



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LEATHERHEAD CHUCKING

This season has proved a very interesting one for Leatherhead and District M.F.C., and plenty of new members have swelled their ranks. The Air Tech Rally at Haddenham saw Tony Slater win Chuck Glider with 2:39 (Free Plan next month) and Geoff Mills take 4th place. The last club contest was for boomerangs with the points worked out on how far it landed from a nominated spot, i.e. the base from which it was thrown. They are also having a standard one-model contest using *Hales Frogflite* rubber models.

Lancs Club Re-formed

An old club, Rossendale M.A.C. in Lancashire, has recently been re-formed. Club members fly control line, radio control and slope soarers. Club flying sessions are on Sunday mornings at Laund. Hey, Haslington, and they are negotiating the use of a local school field as a new site.

D. Wotton exhibits his collection of over 80 plastics at Southampton Show all to 1/72nd scale. D. Wotton is Honorary Secretary of the I.M.P.S. and all his models are in the 1939-45 period.

Found

Has anyone lost a Cox .010 or .020 powered pylon free flight model on Chobham Common? If so please write to J. Claridge, 9 Hilltop Close, Cheapside, Ascot, Berks., giving details of the model.

Pen Pals Wanted

Zvi Rozensher is 18 years of age and would like to correspond with an English modeller interested in A/1, A/2 and C/L. He can write in English and you can contact Zvi at: Rech Borochow 37, Kiriat, Jovel, Jerusalem, Israel. K. Olszowke would like to exchange English plastic kits for Polish or other Soviet model magazines, write to Katowice at W. Plebiscytowe, 42b, Poland. Andreas Stamatopoulos from Greece would like to exchange a German Metro 52 for a good condition Mills .75 cc. diesel engine. He is willing to send the engine to the prospective exchanger on approval. Write to Andreas at, 5, Vassileos, Constitution, Corfu, Greece.

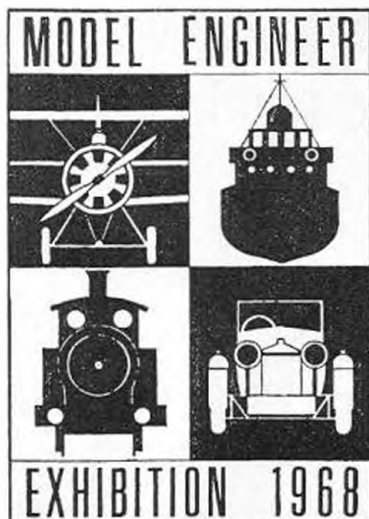
Potteries Winnings

For a club that is mainly non-competitive, Potteries M.A.C. from Stoke-on-Trent are doing very well this season. One up and coming junior Stephen Phillips (aged 14) won the "Frog Junior" and Dick Benstead the single channel radio control slope soaring class at Clywd Slope Soaring Rally. Local club contests have seen Ray Gordon win Rat Race with a *Super Chopper* stunt model while Eric Clutton won the club chuck glider contest with 132 seconds for three flights. A new club transfer is in the offing and this incorporates the Spitfire emblem.

Coming Events

October 22 Northern Area F.A.I. Meeting, R.A.F., Topcliffe, Yorks. R/G/P, Combat, T/Race, Stunt, and Scale. Pre-entry 2/6d. to H. Tubbs, 70 Carr Manor Road, Leeds, 17.
October 22 Imperial College Control Line Rally, College Sports Ground, Sipson Lane, Harlington, Hayes. Class A Combat.
October 28 Wanslead Control Line Rally, Hayes Control Line Site, Charville Lane, Harlington, Hayes. 1,500 lap rat race, 36 foot lines, 70 lap heats, also Stunt. Pre-entry essential. Sen 10/-, Inter 7/6d., Juniors 5/-, to R. Ives, 15 Falmouth Avenue Highams Park, Chingford, London.
October 28 S.M.A.E. Northern Gala, R.A.F. Elvington. Open R/G/P, Tailless, P.A.A. Load, Multi R/C, A, A, B, T/Race, Combat, and Stunt. Pre-entry 2/6d. to H. Tubbs, 70 Carr Manor Road, Leeds, 17. Events start at 10 a.m. S.M.A.E. members only admitted to the airfield. Cards must be shown.

October 28 St. Albans Winter Gala, Chobham Common, A/I, Coupe d'Hiver, combined F.A.I.
November 5 Richmond Gala, Chobham Common, A/I, Coupe d'Hiver, J.A. Power, Chuck Glider, Combined F.A.I.
November 12 East Anglian Area Postal, Combined F.A.I. Pre-entry, 2/6 for each club, late entry 5/-, results by 19/11/87. Details from D. Bowles, Warren Edge, Brandon Road, Thetford, Norfolk.
November 12 Dewsbury C/L Rally, Sands Lane, Playing Fields, Dewsbury, Yorks. Open Rat Race and Novice Stunt. Pre-entry 2/6 to R. Bacon, 5 Edge Lane, Thornhill, Dewsbury, Yorks. Field entry 5/-.
November 19 Croydon F.A.I. Gala, Chobham Common.
November 25 Welsh Rally, North Cefern Bryn-Gower, near Swansea. R/G/P, Chuck Glider, Coupe d'Hiver. A4118, ex Swansea for Gower/Port Eyrone. Fk. right B4271. One mile before Swansea Airport.



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Model Engineer Exhibition January 3-13 1968 at the Seymour Hall, Marylebone, London

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● **SEE & BUY** from the Model Trade supporting the exhibition with well stocked stands. Not just for show, but select and take away, talk with experts of the trade and be assured that your choices are wise ones. . . . Amongst well-known companies who have already arranged to take stands are: Automodels, Carneeds, Cromar White, E. Kell & Co., Henry J. Nicholls, Hugh Evelyn, Howell Dimmock, Kennions, Millholme, Myfords, Model Racing Car Centre, Severn Lamb, Severn Valley, Steam Age, plus others still to be listed.

● **SOUVENIR GUIDE** A very special CHRISTMAS EXTRA issue of *MODEL ENGINEER* will be coming out on second Friday of December. This will be the EXHIBITION SOUVENIR HANDBOOK & GUIDE. It will contain exhibition entries, details of trade stands PLUS, PLUS articles by experts on all aspects of modelling—fold out Avro 504 plan, Ships' Guns drawings, Evans on Passenger hauling locomotives, articles on model patrol and other aero engines, classification of boat racing classes, whys and wherefores of r/c systems, the hobby now and in the future, model railway operation . . . In fact lots for everyone. Guide will be 76-page size, price 2/6d.

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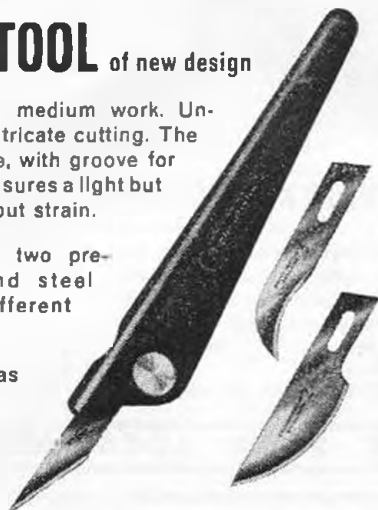
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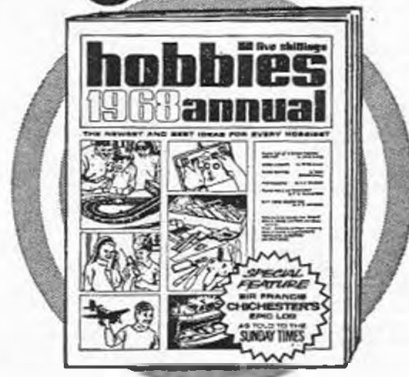


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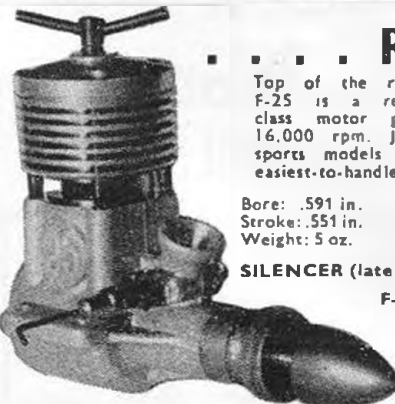
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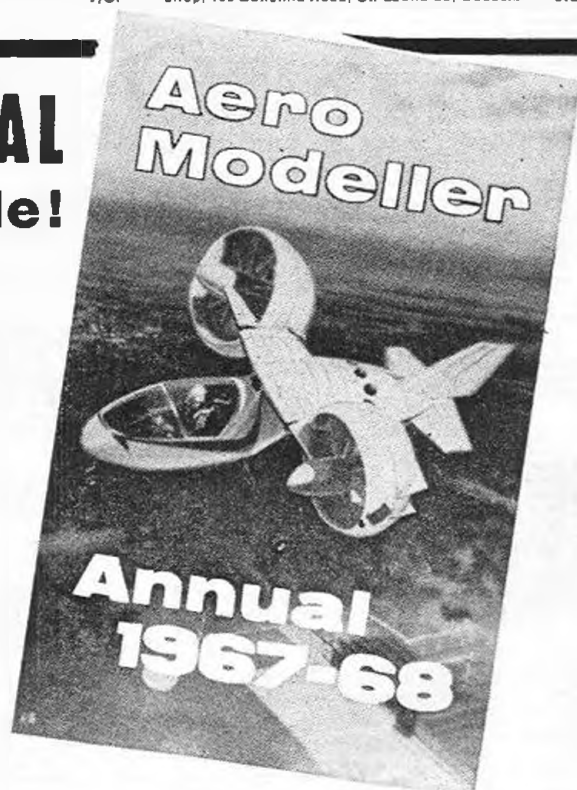
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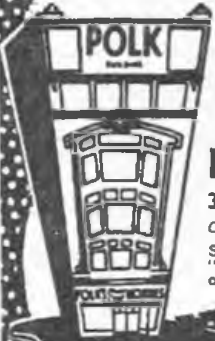
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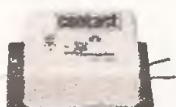
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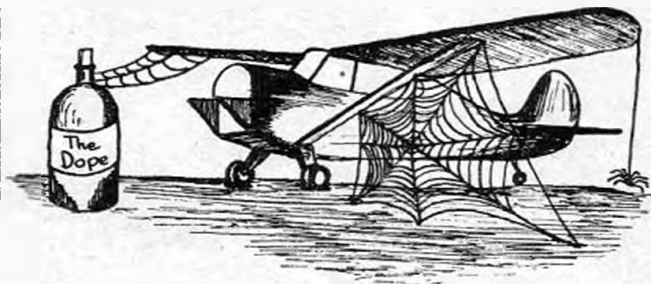
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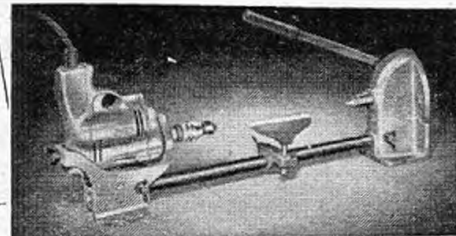


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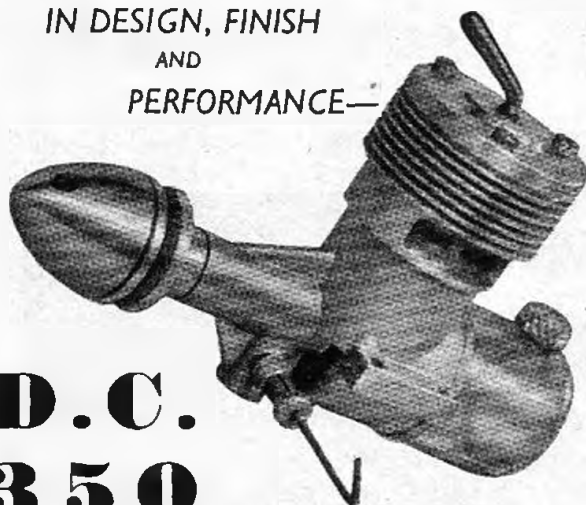
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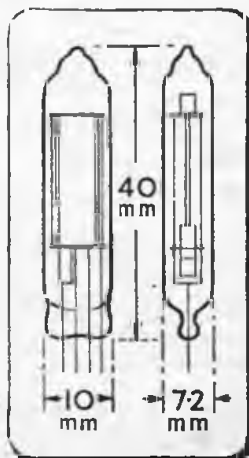
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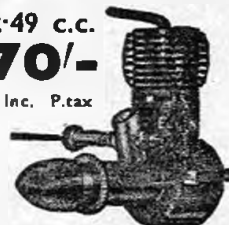
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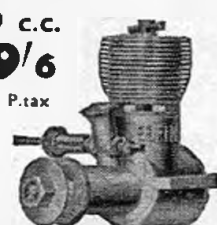
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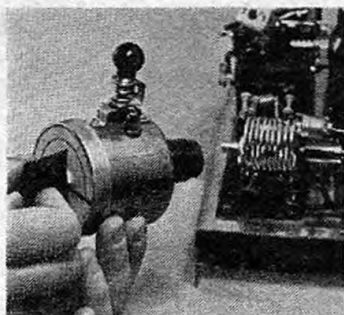
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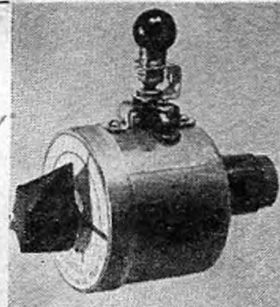
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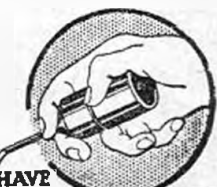
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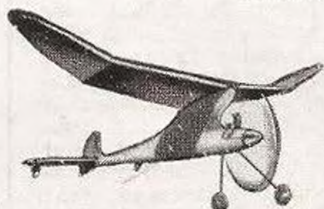
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SKYJET 50 ... 4/7
SKYJET 100 ... 6/9
SKYJET 200 ... 9/2

(Skyjet 100 illustrated)



SOUTHERNER MITE

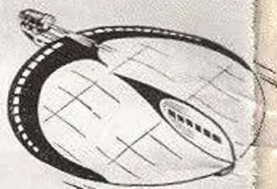
32" span cabin model for small diesels. An ideal beginner's power model. 12/10 inc. tax

Rather than raise the price of Keilcraft Kits through rising costs of raw materials, cement, paste and rubber are now omitted from the contents.

KEILKRAFT SAUCER

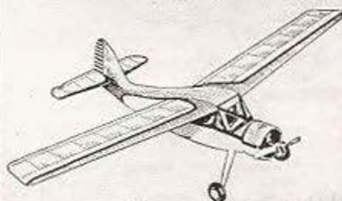
Keilcraft's latest Jetex powered model. This flying 'Saucer' is one of the easiest kits to build, and the all balsa construction makes it really tough. It flies equally well with Jetex motor or as a chuck glider.

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Tuning

Now we come to the tricky part. Tricky because few people have the equipment for accurately tuning transmitters to the specified G.P.O. frequency. One or two of the larger model shops specialising in radio control, do offer frequency checking services at a nominal fee. We shall be pleased to put readers in touch with their nearest frequency checking service on receipt of a stamped addressed envelope. People who are not in a position to take their transmitters for tuning, and who must send them by post, should make certain that they are very securely packed. They should be well insulated against bumps en route and enclosed in a stout carton. Do not forget to enclose the necessary amount for return postage in addition to the fee.

PARTS LIST

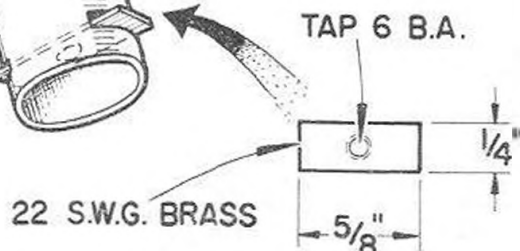
Case

- 4½ by 4 in. of 18 gauge Aluminium Sheet.
- 3½ by 4 in. of 1/16th Paxolin.
- 1 "On-off" Switch.
- 1 Polarised 2-pin plug and socket.
- 1 Keying Choke.
- 1 Aerial Socket.
- 1 0-50 M.a Moving Coil Meter.
- 1 8 ft. Sectional Aerial.
- 1 Ever-Ready B.136 Batrymax 90v.
- 1 Ever-Ready Plastic 4-pin plug and lead.
- 17 6 B.A. nuts and bolts.
- 3 4 B.A. nuts and bolts.

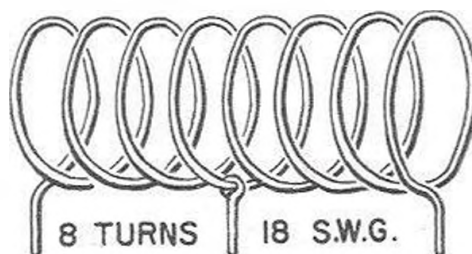
1½ ft. Systoflex.

- 1 ft. Plastic covered multi-strand wire.
- 1 ft. 20 gauge tinned wire.
- 1 D.C.C. 90 valve.
- 1 Valve screen.
- 1 B7G valve holder.
- 1 30 pf. Beehive condenser.
- 2 10k Resistors.
- 2 100 pf. ± 1 per cent. Condensers.
- 1 Eddystone 1011 R.F. Choke.
- 8 Single-ended rivetting tags.
- 2 Double-ended slider tags.
- 1 Micro switch and lead.

KEYING CHOKE

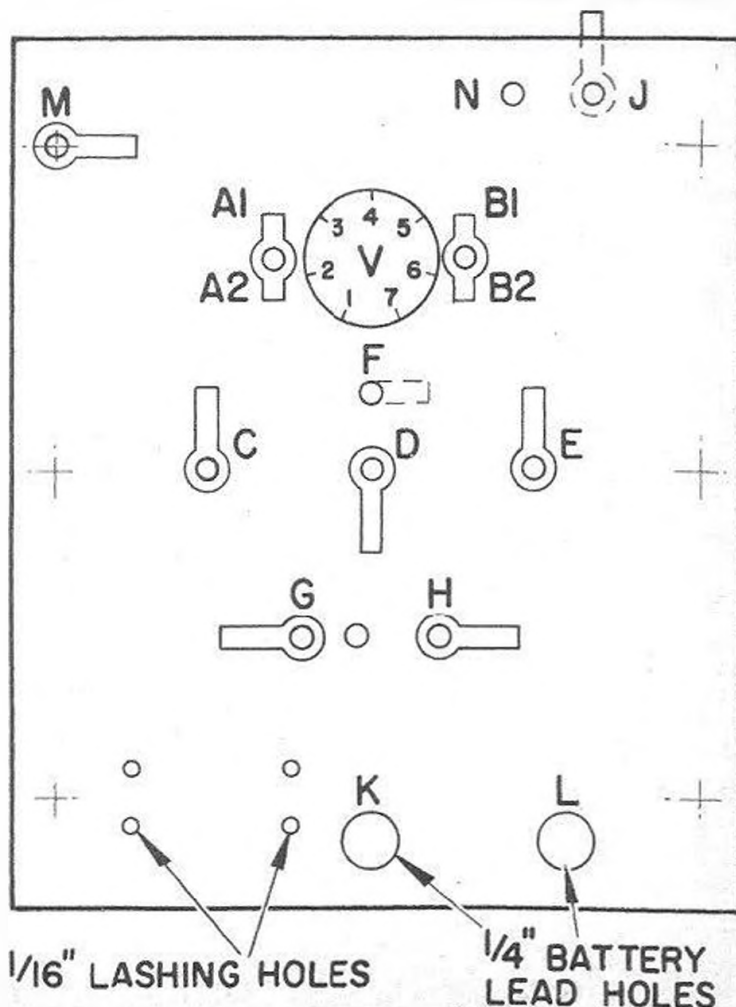
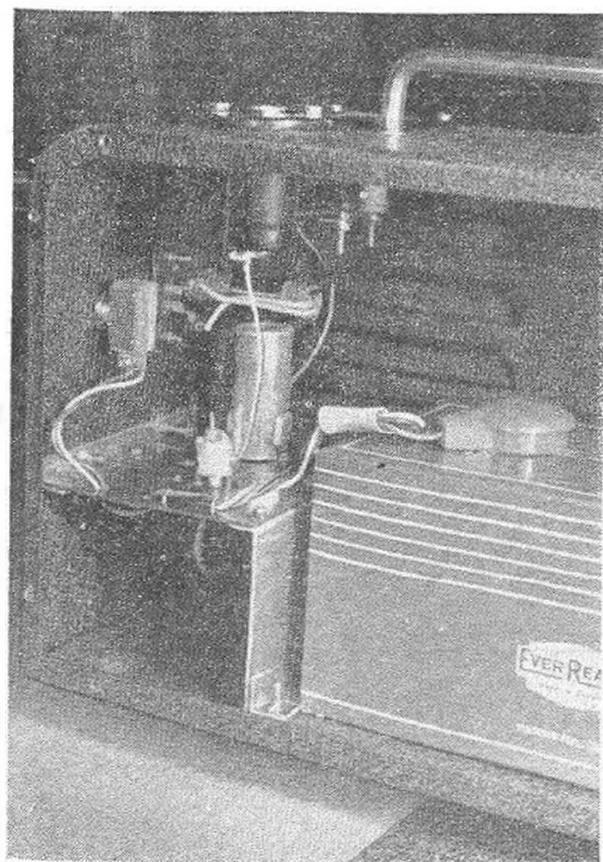


AERIAL COIL



Pictures opposite show, left, underview of panel, and right, top view with ancillary components connected. Below, the complete unit assembled in case. A wedge of corrugated cardboard is slipped between battery and mounting bracket to prevent the battery moving about when travelling

PANEL LAYOUT shown actual size



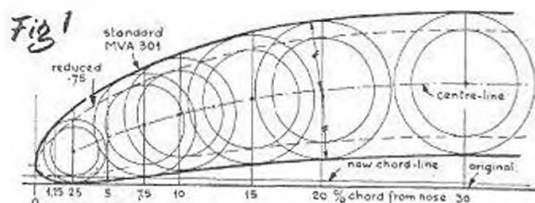
Slimming your Sections

*The mysteries of "percentage" airfoils explained
by that well-known Dutch authority—*

JUST VAN HATTUM

HERE'S how to obtain that thinner section so freely quoted by the experts. Thinned sections are popular for tail surfaces, and are current vogue for A/2 wings—the simple process being as follows.

The centre line is the line which contains all the points which are equidistant from the upper and lower surfaces. It can be constructed by drawing inscribed circles in the aerofoil and connecting the centres of these circles by a smooth curve. See Fig. 1.



If one draws a new set of circles with a fixed reduced radius (e.g. 75 or 60%) on the centre-line, the tangential curves drawn to these circles will give us the new reduced aerofoil.

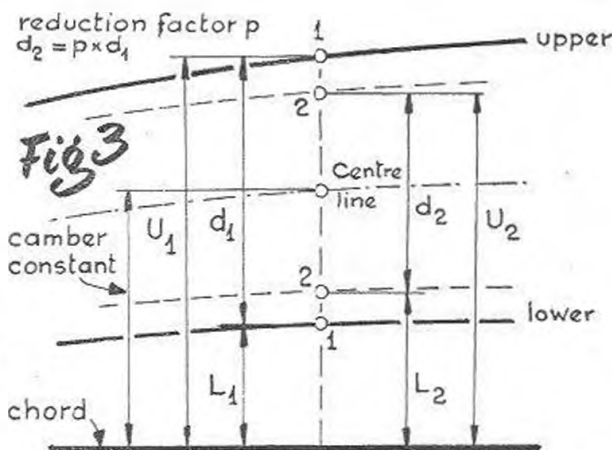
If one reduces the original aerofoil down to the centre-line one is left with the curved plate. The centre-line has become the reduced aerofoil.

This method is reliable, provided the aerofoil is drawn to a large scale, say 20 inches. When the new aerofoil shape has been found, a new table of ordinates is calculated by actually measuring up the dimensions at the usual standard stations. It should be noted that the new aerofoil will have a new tangential chord-line, which usually turns at a slight angle from the tail to the nose. There will be no difficulty in establishing the table with reference to the new chord-line.



It will be clear that a complete table of ordinates is desirable. Unless one has tabulated the ordinates, it will not be possible to use the aerofoil on any desired chord at any time one desires. Fig. 2 shows the method sometimes mistakenly adopted (which takes all reduced measurements up from the base line), does give us a reduced section but an entirely new shape. All ordinates have been multiplied by a reduction factor. It will be seen that a new centre-line emerges which immediately stamps it as a different thing altogether.

Apart from a careful construction it is also possible to use an approximation which gives quite good results. There is, however, a slight inaccuracy in the larger ordinates at the pronounced curvature near the nose, which may amount to 0.1% of the chord (6/1000 inch on a 6 inch chord). Fig. 3 shows the principle of this method which has been expanded in the table given by Fig. 4. The work



appears more involved than it actually is. The reduction factor "p" is multiplied by measured aerofoil depth, above and below centre-line, and the result plotted from the common base-line.

When comparing the two methods by plotting the same aerofoil on an 8 in. chord the error proved

MVA 301 Standard and reduced to 75% thickness.

MVA 301 standard	% Chord	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
	upper	1.17	3.90	5.10	6.85	8.20	9.15	10.60	11.50	12.25	12.00	11.10	9.60	7.80	5.80	3.35	2.00	0.30
	lower	1.17	0.15	—	0.25	0.65	0.95	1.45	1.87	2.35	2.50	2.45	2.30	1.90	1.40	0.80	0.37	—
MVA 301 75%	upper	0.7	2.7	3.9	5.5	6.7	7.6	9.1	9.9	10.6	10.5	9.8	8.5	6.9	5.0	2.9	1.7	0.2
	lower	0.7	—	—	0.5	0.9	1.3	2.1	2.6	3.2	3.4	3.3	2.9	2.4	1.8	1.0	0.6	—

Chord inches	Upper U	Lower L	U-L	U-L 2	1+p	1-p	U-L 2	U-L 2	A-L upper	B-L lower
0										
1.25										
2.5										
15	10.60	14.5	9.45	4.58	1.75	0.25	8.03	1.15	9.48	2.60

to be immaterial and less than the degree of accuracy with which one is able to plot an aerofoil and later transfer it to the actual structure. One can, however, construct the nose portion with the method given in Fig. 1. When the table has been calculated, the aerofoil should be drawn again from these figures and adjustments made for "kinks" and irregularities.

The aerofoil constructed as in Fig. 3 will again be plotted with reference to the original chord-line and the lower surface will not touch the chord-line except at the tail. This has relatively little significance, and it should not cause anxiety!

Both methods entail rather a lot of plotting and calculating, but one cannot obtain a table of ordinates for future use in another way. If however, one needs to fix a simple rib of a thinned down aerofoil one can use Fig. 5. Here the plotting is done entirely "by eye" and is quite suitable for a "one off" job. With some care and patience one can get surprisingly good results, but the new aerofoil cannot quite earn the mark of true reduction.

A true centre-line still has to be constructed for use as a basis for symmetry since it is not exactly a simple matter to guess the centre point when measuring off with the ruler for each change in upper or lower camber. For small chords, wanted quickly, the ruler method is good enough.

A table is given of the well-known and excellent MVA 301 aerofoil in standard form and reduced to .75 per cent. It has been constructed according to Fig. 1 on a 20 in. chord.

There are a good many aerofoils which will show up well under this slimming treatment, but it will need no underlining that the actual construction of the wing should match the care and accuracy spent on the new aerofoil.

An apparently simple case is the aerofoil with a flat lower surface, but study of Fig. 2 will show that true reduction about the centre-line will result in a concave lower surface! Many designers choose the upper curvature of the main aerofoil for the thinned tail-plane section which may be as good a method as any.



Engine Analysis (continued from p. 643)

to eliminate such inherent sources of error, as far as possible. The engine itself was radially mounted on a $\frac{3}{32}$ in. plywood bulkhead, again simulating "normal application" conditions. With beam mounting a somewhat higher vibration level would probably have been present.

Torque output was steady at 5 ounce-inches over the lower range of operating speeds, and maintained down to about 6,500 r.p.m. Below this, torque dropped off appreciably. At the other end, speeds approaching 14,000 r.p.m. were achieved with propeller loads. Hand starting was employed in every case and proved quite easy and quick. (Note: some fuels, notably Mercury No. 8, tended to produce a more vicious start. This was noticeably absent with Allbon fuel.)

A pleasing feature was the Merlin's ability to swing small diameter high-pitch propellers at high speeds, which should therefore make it a very attractive power plant from the control-line modeller's point of view. A 6×5 propeller would appear about the best size for control-line stunt and the same, or 6×6 for team racing. Fuel consumption checked was 22 seconds per c.c. at 7,000 r.p.m. and 17 seconds per c.c. at 10,000 r.p.m.

For free flight, a 7×4 propeller appears just the right size, or possibly a 7×3 for maximum climb. An 8 in. diameter propeller appears about the maximum size for useful performance.

Constructionally the Merlin represents the application of standard mass-production methods allied to straightforward design. The steel cylinder is an apparently slack fit in the crankcase casting, yet beds down very nicely on its thin gasket when the light alloy cylinder jacket is screwed in place. This assembly, incidentally, was very good and showed no signs of unscrewing during running. The 360 degree transfer and exhaust porting is non-directional in the sense that it does not matter in which (rotary) position the cylinder is assembled. Neither, surprisingly enough, does it matter very much how the spray bar is assembled, i.e. in which direction the hole is pointing.

The piston appears somewhat on the heavy side and again of simple design. Main crankcase bearing is plain which appears more than adequate for this size of engine, and again makes for simplicity. There is a fair fore and aft play when assembled which can produce a disturbing "clank" as the engine stops, but this again is probably the result of working to *practical*, rather than extreme tolerances. Beam mounting holes are drilled to take 8 BA screws. Main screws bolting the crankcase assembly together are 6 BA—a size which may prove a little difficult to match with an American standard—the nearest equivalents being Nos. 3 or 4 (NC or NF). Our suggestion here—produce the "export" models with American screws, and long enough for use for radial mounting. Also we feel that with all radial mounts, especially where assembly screws also serve as hold-down screws, a lock nut is essential. Yet no engine manufacturer seems to feel the same way and leaves the customer to purchase lock nuts separately.

Our general impressions: a wonderful little engine for 47s. 6d. and of a size which, if not an official British "class," we feel is most welcome. Although production costing has meant the sacrifice of one or two refinements, performance does not appear to have suffered in any way. In fact, the Merlin will give away another quarter of a c.c. and do a "man-size" job directly comparable with its 1 c.c. brother. It is a pleasant and easy engine to handle and looks rugged enough to last indefinitely.

ENGINE ANALYSIS (Revised)

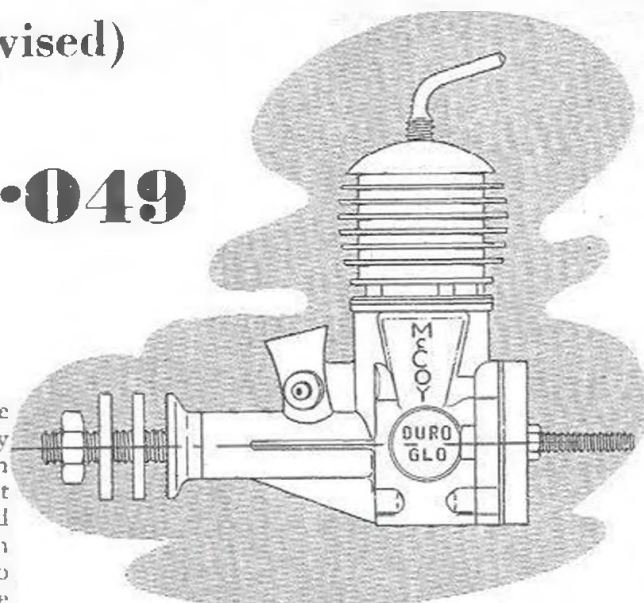
The McCoy .049

"Duroglo"

EXTENDED TESTS on a new-type reaction cradle established the maximum B.H.P. of the McCoy .049 as .055, at 13,200 r.p.m. Particular attention was paid to obtaining stable and accurate figures at the lower r.p.m. range. Like many other high-speed engines, the McCoy is not particularly happy when loaded down to speeds below about 8,000 r.p.m., so that steady readings below this r.p.m. figure are not readily obtained. It does now appear certain, however, that the torque figure remains appreciably constant over a range of some 5,000 r.p.m. then dropping off steadily, but not rapidly.

Maximum B.H.P. is realised at a speed just in excess of 13,000 r.p.m., equivalent to a propeller size of $6 \times 2\frac{1}{2}$ in. (constant geometric pitch). A 6×3 propeller would, therefore appear to be the correct size for free-flight models.

An interesting feature is that the r.p.m. figure can be extended well beyond the peak horse power r.p.m., the engine continuing to run steadily and smoothly. It was felt advisable to stop at 15,000 r.p.m. as this was obviously well beyond the B.H.P. peak but maximum speed obtainable with a fly-wheel (no load) would probably approach 17,000



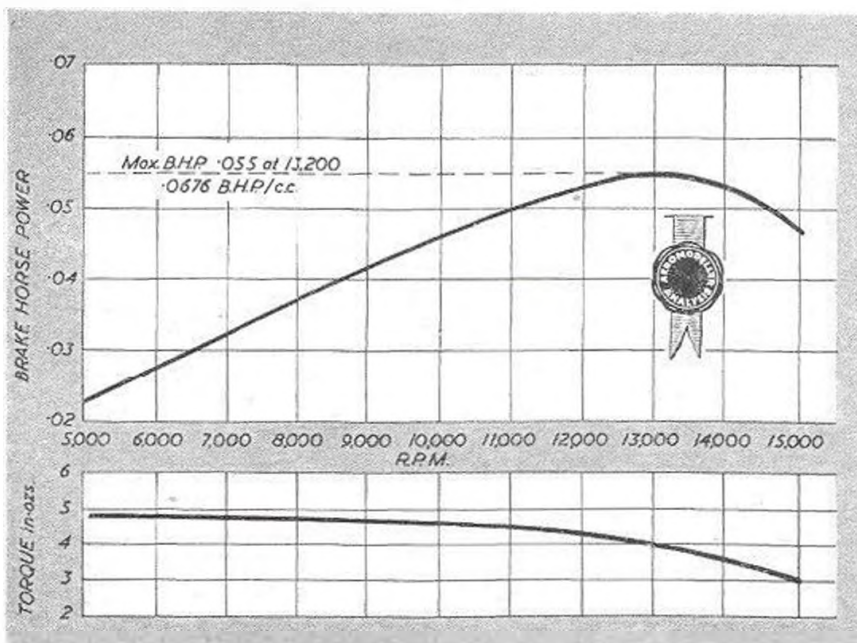
r.p.m. At this speed, of course all the power developed would be used up in driving the engine itself. In other words, torque output would be zero and the engine would not be capable of doing any useful work.

The fallacy of over-speeding an engine is exemplified by the fact that the power delivered at 15,000 r.p.m. is about the same as at 10,000 r.p.m. In other words the "working capacity" of the engine is the same at these two speeds, with wear obviously much higher at the higher speed.

Initial tests were terminated by the breaking of the crankshaft. The new crankshaft featured the same rather loose fit in the main bearing, resulting in some fuel seepage through the bearing. Virtually, no additional period of running in was necessary, propeller-r.p.m. figures checking out identical with those previously established for the run-in engine.

Despite comments from other sources, the McCoy .049 confirmed the "easy starting" characteristics mentioned in the previous report. The only unusual feature, as compared with British diesels, is the lack of "feel" on the compression adjusting screw, due to the use of an O ring for compression seal and elastic adjusting screw seating. However, compression setting is not very critical for starting and, provided the engine is sufficiently primed, starting is very positive.

The previous test report was published in the October, 1953 issue of "THE AERO-MODELLER."



CLUB NEWS

IT SEEMS that rubber team-racing is becoming a standard indoor activity for the winter months, and great fun it is too. If your club hasn't got in on it yet, take a look at the N.W. Area rules given below; you can knock up a model in an evening and any room giving a clear twelve-foot circle is adequate. It's a contest that everyone can have a bash at—even the juniors can afford it!

South Eastern Area

Still engaged on a new member drive which has included newspaper publicity, window displays, an information sheet sent to anyone interested, and the insertion of cards giving club details into all kits sold by the local model shops, the **SOUTHERN CROSS A.C.** has recommenced its Saturday evening meetings at East Hill House, Portslade. Scheduled are building periods, talks, and educational diversions of various types.

North Western Area

Postponed contests in **CHESTER M.F.C.** have now been flown off. Open power went to C. R. Fittness, with D. Dodd top junior; team race was won by the Wilde/Nichols/Williams combo. flying a tailless pusher. A recent slope-soaring foray into the hills around Clwyd was thoroughly enjoyed.

Thirteen flights aggregating 30 : 23 deservedly earned John O'Donnell the Croydon Gala Championship. Brother Hugh was sole **WHITEFIELD M.A.C.** member with any joy at the Y.E.N., 5th in rubber and 2nd in chuck glider. John placed top in the Area elim. (Wakefield) and also returned top individual time in the M.E. Cup. Same man and place again in the A2 eliminator, and he even entered power, coming around fifth! Area Champion with 37 : 32 aggregate proved to be—need we say? Other club successes include J. Parrott, 1st in the power eliminator with 14 : 38, and J. Trainer, 3rd in Wake.

Rules for indoor rubber team racing have been standardised by the Area Committee, and a league (home and away fixtures—wot, no 12X?) is being formed. D. Cooke, 63 Stancliffe Road, Wythenshawe, will give you the gen, but here briefly are the rules: (i) rubber driven, semi-scale, celluloid cockpit or cabin, fixed two wheel u/c, 1 in. wheels; (ii) max. l.o.a. 20 in. (iii) min. span 12 in.; (iv) max. weight 2 oz.; (v) 6 ft. line, pole to inside tip; (vi) pivot height 3 ft.; (vii) R.O.G. after each winding; (viii) 3 flights per contest, lowest counts, all attempts are flights; (ix) 40 laps, bounce laps do not count; (x) timing commences on release after initial winding and includes all subsequent winding; (xi) Team is 3 from a club, team aggregate (lowest scores) counts.

Southern Area

This certainly seems to be the Area for club magazines. No. 3 of the **FARNBOROUGH M.A.C.'s** "Ceiling Wax"—eight foolscap pages—has just reached us and provided interesting reading. Even has a trade review! No. 4 may be delayed, as the editor is just off for National Service; this fate is also overtaking one or two other members, depleting the active list somewhat.

Flight of 23 : 10 is recorded in a **BOURNEMOUTH M.A.S.** contest—in 1933! This flight, by A. D. Paine, took place on quite a day, for other flights included 7 : 31 and 9 : 50—some going in those days. Such thermals

do still occur occasionally, as witness a recent club comp. when four D.T'd jobs were lost o.o.s.!

In the **B.M.A.S. v. WEST HANTS A.A.** challenge match the latter club won the second (power) round with Sid Taylor 1st and clubmates 3rd, 4th, 5th and 6th. All now depends on the results of the glider round. West Hants also collected the honours at the S.R.D.E. Team Race Rally, A. Jones winning A and D Seal B, with **AMESBURY** members runners-up in each event. Winter plans include microfilm, chuck glider, and R.T.P. rubber and Jetex.

Luck deserted **SOUTHAMPTON M.A.C.** in the Area eliminators at Larkhill, and at Radlett, where junior N. Worley experienced the mixed emotions normally following a direct hit on an over-enthusiastic camera-wielder!

So many members have enrolled in the **SALISBURY D.M.E.S.** that meetings have had to be broken down to Engineering Mondays, Aeromodelling Tuesdays, Railways Wednesdays, and Cars Fridays. Thursday is open for G.Ms, lectures, etc. A small gauge railway layout and a car rail track are being built.

East Anglian Area

The A.G.M. for this Area will commence at 2 p.m., on November 28th, at **BRENTWOOD M.E.S.** clubhouse, Primrose Hill. Gen. from the Area Sec., 28 Highfield Road, Chelmsford, if required. Tea will be laid on, followed by a film show, main attraction being three colour films of recent Wakefield contests.

South Western Area

Scattered population means high interest in postal contests in the S.W. **TORQUAY** club, flying on a field which is actually a complete headland with water on three sides (cor!) narrowly beat **EXETER** in one such

CONTEST RESULTS

GUTTERIDGE TROPHY, September 19th.

134 entries.

1.	J. O'Donnell	Whitefield	14 : 57
2.	A. Anderton	Cheadle	14 : 22
3.	J. Trainer	Whitefield	14 : 15
4.	R. Bladwin	Wigan	13 : 57
5.	C. Miller	Bradford	13 : 48
	G. Thomas	Slough	13 : 48

MODEL ENGINEER CUP, September 19th.

31 entries.

1.	West Middlesex	32 : 08
2.	Croydon	31 : 44
3.	Northwick Park	25 : 29
4.	Surbiton	25 : 12
5.	Chelmsford	24 : 53
6.	Belfairs	24 : 48

K. & M.A.A. CUP, October 3rd.

263 entries.

1.	E. Midgley	Barnsley	13 : 29
2.	E. Thompson	Northampton	13 : 12
3.	J. O'Donnell	Whitefield	12 : 50
4.	Remington	Loughborough	12 : 34
5.	D. Leech	Northwick Park	12 : 15
6.	E. North	Halifax	12 : 13

HALFAX TROPHY, October 3rd

152 entries.

1.	J. Parrott	Whitefield	14 : 38
2.	D. Painter	Henley	13 : 53
3.	G. Hutton	Wallasey	13 : 35
4.	M. Gaster	C.M.	13 : 27
5.	I. Donald	Dunfermline	13 : 11
6.	G. French	C.M.	13 : 04

PLUGGE CUP

Croydon	1326 : 48
Birmingham	1325 : 133
West Middlesex	1117 : 655
Cheadle	1012 : 723
Leeds	1000 : 930
Whitefield	970 : 908

event; **PLYMOUTH** won the Area Shield in another by a convincing win (16 pts. to 2) which has left the Exeter boys still shuddering.

London Area

Two exhibitions, one at a horticultural show and one at R.A.F. Hendon's "at home," have kept **MILL HILL D.M.A.C.** well in the public eye. Junior members did well at Radlett, P. Carey with 2nd and 5th in seaplane power and open rubber, and R. Thoroughgood, 4th in seaplane rubber.

Filliped by a newly-available stretch of tarmac, **HORNCHURCH M.A.C.** have come out in a rash of C/L speeditis. Dead calm conditions obtained at the latest all-in club comp., giving the rubber stalwarts the inside edge; two ultra-lights, Dave Thompson 5 : 51 and Len Ranson 5 : 18, headed the results sheet. Vote of thanks is moved to Radlett police by R. Bishop, whose large glider is back thanks to them.

South Midland Area

Recent Area results are—Wakefield elim. (9 entries), R. Clements (Luton) 8 : 58, M.F. Cup West Herts, 23 : 36, Power elim. (7 entries) D. Painter (Henley) 13 : 53, A2 elim. (26 entries) P. Larcey (Henley) 10 : 44.

The Colvings Shield, for Wakes in **LUTON D.M.A.S.**, was won by D. Wood. Roy Clements put up one terrific o.o.s. and spent all night making a model for the Gutteridge (see Area results above). Sid Miller put his R/C button down to fly a converted Wakefield in the M.F. Cup, in which the club placed third in the Area.

C/L is the rage—especially combat—in **R.A.F. HALTON M.A.S.** Constant flying enabled the boys to put on a crackling display at the station's "at home." Radio is on the up, plus A2 and F/F aerobatic interest,

and an indoor programme is all lined up.

Northern Area

Twenty ounces of amyl nitrate is scheduled to disappear into the crop of Olivers now acquired by **LEEDS M.F.C.** Many other engines are being souped with divers (and diverting) results. Affiliation with Bradford is in the wind.

Successes in the eliminators by **BRADFORD M.A.C.** include C. P. Miller 1st in Wakefield with 13 : 48, with A. Miller 3rd, 12 : 39, and D. Lees 5th, 12 : 12. In Power S. Lanfranchi topped with 11 : 50, despite overruns causing his *Swiss Miss* to lose a flight, S. Eckersley was 2nd with 10 : 55 and four of the next seven places also went to Bradford clubmen.

MEANWOOD I.M. close their first contest year with 11 1sts and 4 2nds or 3rds out of 15 combat contests entered. Ten of the wins were with the *Ker* design, the other with a *Kombat Kapers*.

Scotland

Friday night is club night for **EDINBURGH M.F.C.**, the venue being Ainslie Park School, Pilton. With an 8 ft.-rising-to-14 ft. ceiling. U. A. Wannop has exceeded two minutes F/F—not bad going.

Well, don't get these flimsies stuck on the holly!

Cheers—

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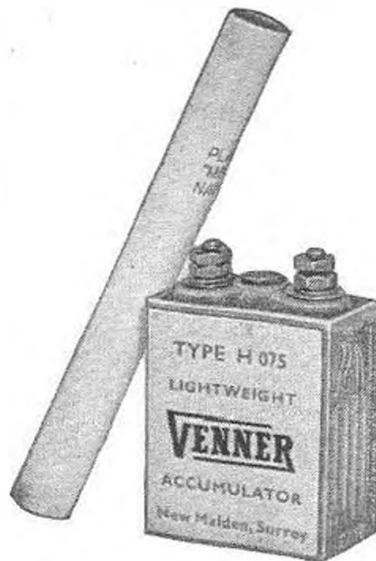
A. A. Houlding, 87 Longland Road, Sidcup, Kent.

PLYMOUTH M.F.C.

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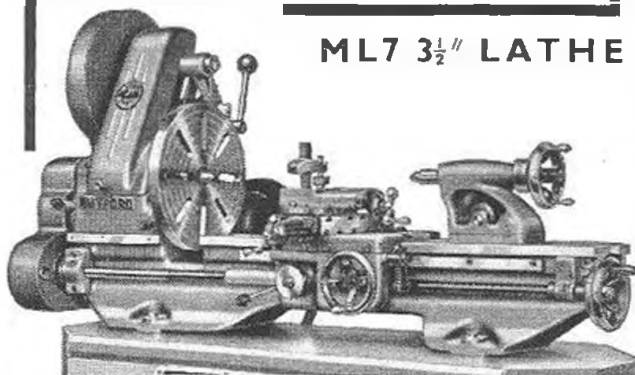
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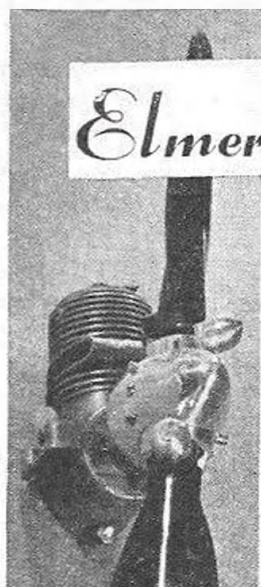
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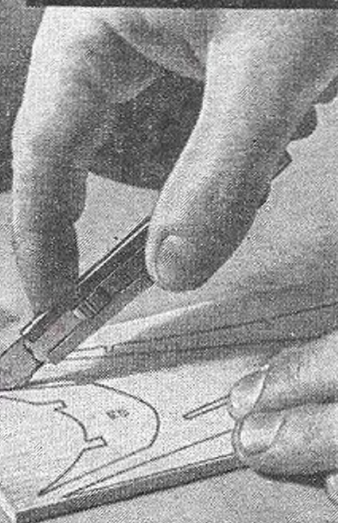
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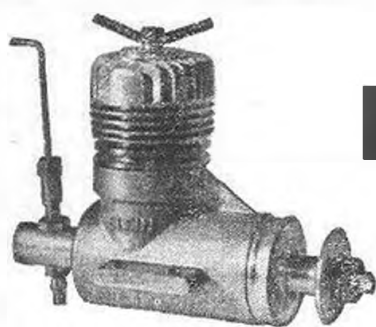
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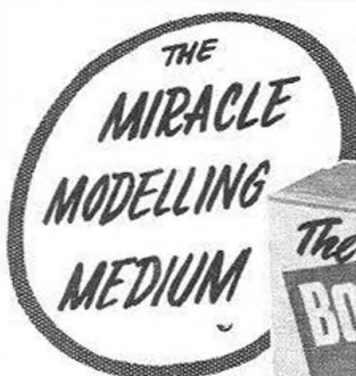
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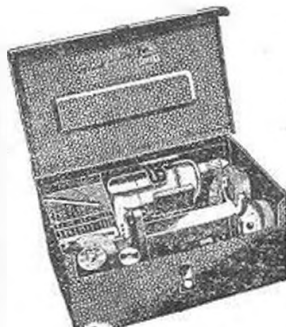
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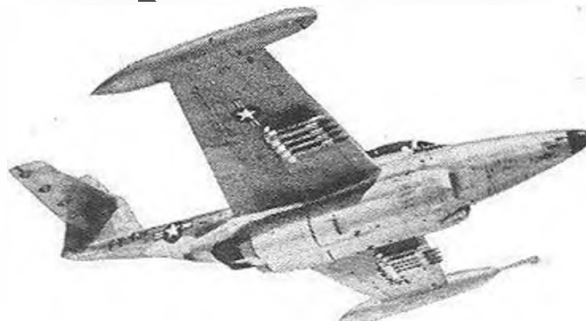
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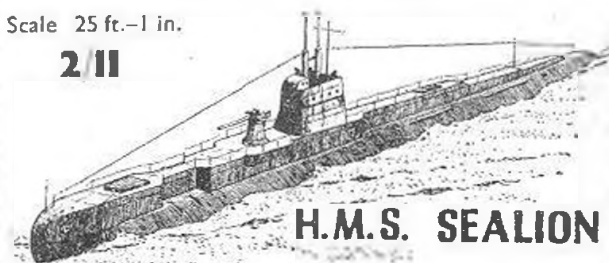
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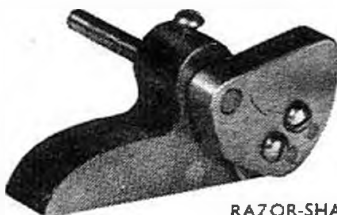
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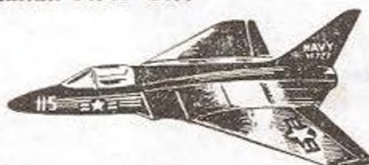
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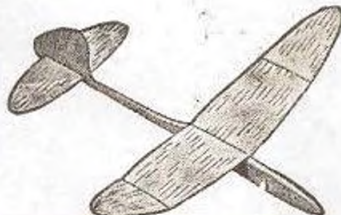
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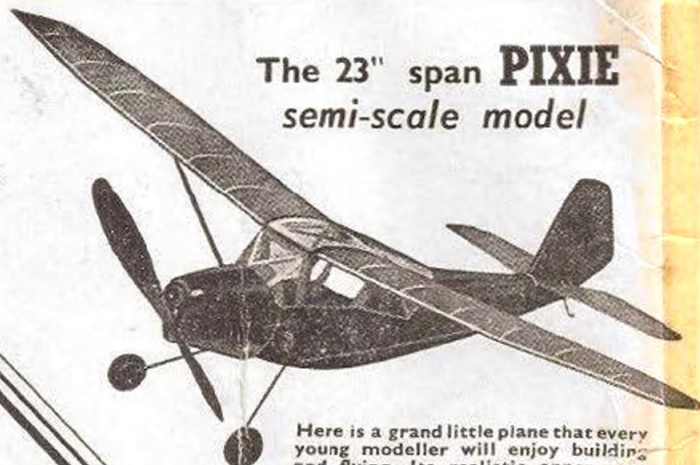
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