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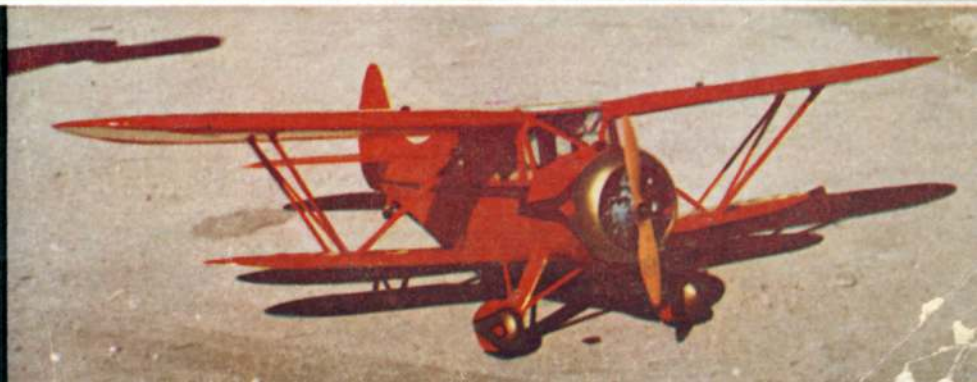

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AERO MODELLER

MAP HOBBY MAGAZINE

other modelling angles . . .

August issue of *Radio Control Models & Electronics* carries a detailed feature of the radio control section of the British Nationals, supported by a complete model analysis in which all the vital details are tabulated. Big news for users of servos! We now have a "Flight Simulator" and servo analyser. This is described in a bumper servo test feature and the results of the tests make very interesting comparative reading. A simple two servo proportional system known as "*Bi-simpl*" offers an attractive approach to dual proportional on a budget. Three view aircraft plan this month is Jerry Nelson's "*Qualifier*". For boat modellers "*Sea Queen*" carries an attractive packaged installation with full receiver monitoring facilities.

With school summer holidays coming, the full-size plans for simply-built, inexpensive 24 in. yacht in the August *Model Maker and Model Cars* will be welcomed by younger readers (and fathers of younger readers!). Two evenings are all that are needed, and cost less than 10s., it sails extremely well and is in all respects a "big" model. The cover of this issue features the bright red and blue Harvey Aluminium Special race-car from Indianapolis, and drawings for the car appear inside. There are other car drawings and features detailing model drag-racing, so popular in the U.S.A., and the boating enthusiasts have their fair share of space, one outstanding item being drawings of *Comet*, the first-ever steamboat.
Both magazines are the same price . . . 2s. per copy. If your hobby shop or newsagent does not carry stock, send 2s. 4d. for return post delivery from address below.

August 1963

VOLUME XXVIII No. 331

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cover

I-MACM, the European demonstrator for Aermacchi-Lockheed at Sywell Airport, Northampton. This machine is a regular feature of the air displays, and was last on show at Le Bourget during the International Salon along with camouflaged, and two-tone green and cream Santa Maria's. Dick Meixell's superb Waco Biplane offers a contrasting footnote in its red and gold trim. Super detailed plans for this fine model are now introduced to Aeromodeller Plans Service as featured on pages 400/1 of this issue.

next month...

Control-line number—with a bang up to date series of features on all the latest ideas including the Edmonds tank, Sirotkin's Stunter for A.P.S., Chkourski's team racer, retractable undercarriages and all latest techniques. Full size plan is for a two-way, C/L or free flight profile scale Messerschmitt Bf 108 *Taifun*. Scale data, with extensive detail, covers the fabulous Mignet *Flying Flea* with even a folding wing version included. Contest Designs, Rally reports and all the regular features add to a great issue—out on *August 16th*.

Editorial and Advertisement offices

38 Clarendon Road, Watford, Herts

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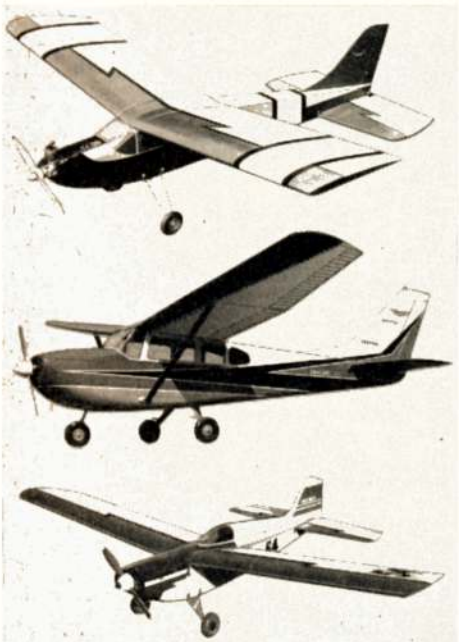

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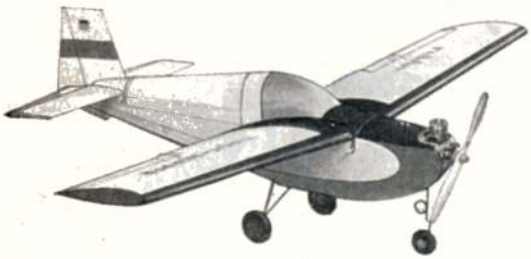

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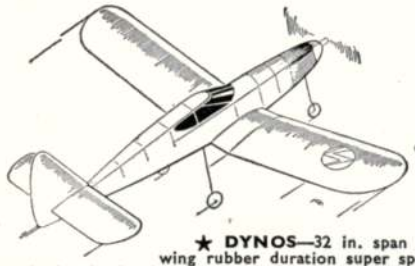

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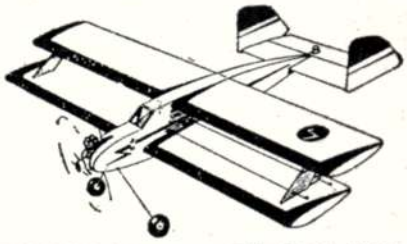

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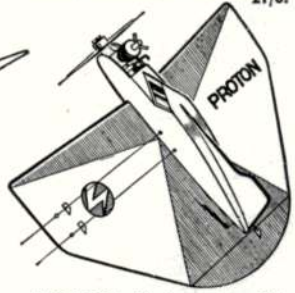

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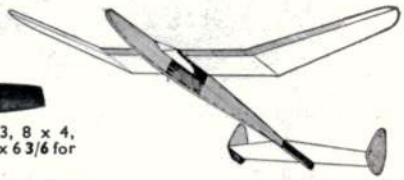

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Boeing B-17 Flying Fortress zooms low over one of the hangars at R.A.F. Bovingdon, Hertfordshire, during the filming for "The War Lover", which has now been released for general showing. Though taken in 1962, this scene could almost have been photographed twenty years earlier. Even the active C-47 Transport peeping out between hangars gives authentic World War II atmosphere.

Flying Forts

BY USE OF different decoration on each side of the fuselage and several model scenes, Columbia Pictures give the firm impression of having imported a whole Wing of B-17 Fortresses for their production *The War Lover*. The plot of this 1 hour, 45 minute, film concerns Buzz Rickson, played by Steve McQueen, a tough bomber pilot stationed in England during 1943. The exploits of Rickson and his crew, who appear to tackle their targets with reckless abandon, will give all aviation enthusiasts a thrill, and those responsible for the air to air cine photography must be congratulated for their work. Unfortunately the introduction of a rather weak and not too effectively played love affair, tends to jar one's particular technical interests in such an otherwise fine film, but if one is prepared to deafen one's self against fourth form bedroom dialogue and absorb the cordite fumes and destruction in the battle scenes, then this film will certainly not disappoint. The crash climax is, in fact, one with distinct model connections. We believe we are correct in saying that Messrs. R.E.P. were called upon to provide a radio control system which would blow up a model B-17 just before it hit a model cliff and fell into a model sea, so making a distinctly model, but nevertheless realistic, finale.

Incidentally, of the three Fortresses, which were specially flown from the U.S.A. for the making of this film, only one survived all the intense activity and finally returned back to store in Texas. The other two have been broken up at Bovingdon and Manston.

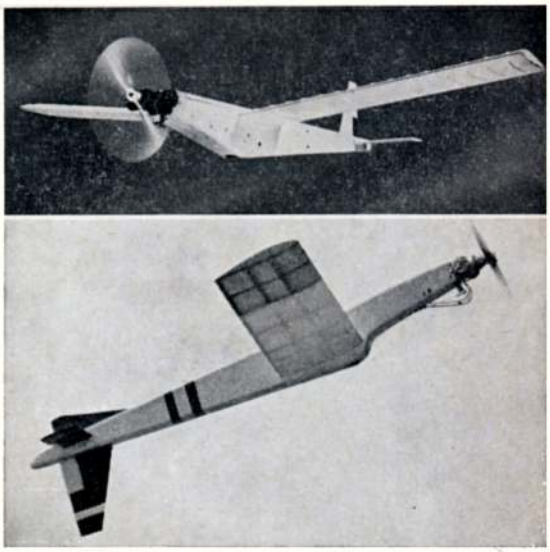
The Duke of Edinburgh visited schools in East Anglia recently to see some of the work which students were doing toward his Award scheme. He had quite a long chat with 15 year old Stephen Rackham of Ipswich, who is taking aeromodelling as part of his pursuit. The Duke is, of course, Patron of the Society of Model Aeronautical Engineers and has a full understanding of the value of our hobby for recreational and instructiona activity

International Salon

Among the many revealing features of the International Air Display at Le Bourget was the inclusion of a new 10 channel radio control outfit on the Erelec stand. This Company specialises in servo motor and remote control equipment and surmounting their display was a *Delta Hustler* pylon racer in Tricolour decoration. To find a large Company interested in entering the radio control market with an all-transistor Superhet and matched transmitter under the name of *Radio Pilote* was surprising enough, but when the drone of a Veco 45 filled the air in continuous flying during the lunch break and for all of the evening after each of two long days of International Air Display on June 15-16th, we began to realise how appreciative are the French authorities, of aeromodelling activity. Flown by Pierre Marrot, two *Taurus* models were operated alternately in a spectacular display of high standard. We could safely assume the onlooking crowd on Saturday as being 300,000 and on Sunday evening 400,000. Many stayed behind in the evening, lining the rails several deep to watch Pierre's fine exhibition of low level loops, rolls and touch and go's. Elsewhere in Le Bourget, our friends of *Le Modele Reduit D'Avion* were allocated stand space to promote the hobby. Perhaps one bright day, the S.M.A.E. or some similar organisation will be able to show its attractions at the S.B.A.C. Show, Farnborough.

Radio Drones

Republic Aviation Corporation have just been awarded an extra contract for the production of their *Bikini* radio controlled reconnaissance drone, a photograph of which appears at top right. This enlarged "model" weighs 40 lbs. and has a flat twin 2-stroke said to develop 2.7 b.h.p. It is launched by a pneumatic system and three such *Bikini* drones can be carried by a "mule" type vehicle. The drone has a camera in the belly, is radio controlled, apparently on rudder and elevator only and descends under a 16 ft. diameter parachute. It is said to be able to climb at several hundred feet per minute up to 5,000 feet at more than 60 m.p.h. As our two photographs show, the drone has changed from its original low wing, under slung fin arrangement to something more conventional, though it seems strange that aileron control is not employed as on the SD-1 drone, in which Babcock proportional gear is used by the British Army as well as American Forces for similar activity.



Top, the new shape of Republic Aviation Corporation's "Back Pack" drone, nicknamed the "Bikini". Below is the prototype configuration. These small drones carry a camera for radio controlled reconnaissance and extensively utilise modelling features

Mini-Mustang

by Charles C. Linn

Home Built

In 1958 it was our pleasure to feature a home built biplane in the "Aircraft Described" series which has since become one of the most popular subjects for both full size and scale model construction. We refer to George Meyer's *Little Toot*.

Perhaps the same appeal will apply to Charles Linn's *Mini-Mustang*, detailed here. We should emphasise that the 3-view drawing is to 1/72nd scale! Once more, this is a product for a modeller interested in full size flying, and its high performance of 175 m.p.h. on 125 b.h.p. is a great credit to its Californian designer. High speed tests have taken the "M-M" up to as much as 200 m.p.h.—sounds like the ideal proposition for flying scale radio control.

Details of Charles C. Linn's "Mini-Mustang", which is 16 feet span with 48 square feet of wing area and only 13 ft. 6 in. long. It flies at about 175 m.p.h. on a 125 h.p. Lycoming engine. Photo at right indicates how cockpit is tailored around the pilot. Blue decoration on highly polished alloy surfaces

30 M.P.H. Winds wreck many hopes at R.A.F. BARKSTON HEATH, June 2/3rd.

Where'd they go!!! True case of ping went my wing for D. W. Cooke, S.M.A.E. country member. Oliver Tiger had just been started and he was about to stand up for the launch when the big blow took over, leaving the elastic bands neatly strapped across the pylon platform. This was Mr. Cooke's second set of wings, he lost the first when the model d/t'd on an earlier flight. His case was typical of dozens. The bright sky belies the ferocious wind conditions, in fact it was clear because the poor little clouds couldn't stand up to it anyway!

AEROMODELLERS USUALLY LIVE in a world of hopefulness. They peer through rose tinted spectacles at even the most frustrating situations and even when all seems lost, expect some bright success to appear magically from around the corner and save the day.

This ever hopeful attitude makes the aeromodeller a naturally happy person and it reflects well upon the function of the hobby as one of the finest recreational activities. But all the resources of hope and endeavour from the 2,000 or more aeromodellers and their supporters at R.A.F. Barkston Heath, June 1-2-3rd could not wish away the bitter 20-35 m.p.h. north easterly wind which scoured the clear blue skies, bent on destruction of balsa and tissue whenever it dared appear.

This National Championships was fraught with doubt. As we recorded last month, the airfield was at one time not available. The Competition Secretary's resignation was happily deferred so that his most valuable services could be retained. Incidentals such as the arrangement of the camp site, sanitation, feeding were all a source of considerable trouble to the locally situated S.M.A.E. Treasurer, who always looks after these domesticities so well. Nevertheless, the annual miracle where, from disjointed activity we obtain the largest, most impressive meeting of the year, really did take place and almost on time for each event. The camp site seemed even larger than ever, sanitation was adequate and as far as sunshine was concerned, everyone had a surfeit; but OH! that *WIND*!!

We find it hard to recall a meeting with such unkind weather and yet at the same time a meeting where one particular class of model could more ably demonstrate its unaffected immunity from strong wind. We refer to the multi channel radio control class. Though entries were small in number they left a lasting impression on the innumerable spectators for performance in adversity.

Barkston Heath is situated at the crest of a hill to the north east of Grantham in Lincolnshire. All four sides of the airfield were in use and the widely dispersed events, each with somewhat sporadic activity, became difficult to follow. One could wait almost for hours to see an attempt at free flight. In fact, less than 10 per cent. of the entries in all free flight classes made actual recorded flights. For we, who are supposed to record the occasion, it was almost a case of hunt the thimble at a church fete function. Timekeepers would disappear with the cards and watches then suddenly and without warning, the rear doors of a van may open to disgorge a modeller leaping from shelter, hoping to release his rubber driven model before the wings were torn from the fuselage.

In such conditions, some may view the results as farcical, but we do not. As ever, those most expert in their classes fully earned their championship titles, and never once did we hear of gloom and despond in spite of models being battered after a successful first flight to an irreparable state.

That then was the general picture. Out of it must surely come a most profound respect for the character of the average aeromodeller and we doubt very much whether there was a single person returning home on a long trek to the furthermost corners of the British Isles, who could say that he had not really enjoyed the annual jamboree.

Every Nats has its pictorial artistry in the camp site. We picked on this one, used by West Hartlepool M.F.C. as one of the more bright epics

Gold Trophy

Not since the 1950 event at York, and the 1951 at Swansea, has the wind blown so hard for the national stunt championship, and no one thought ill of the entrants (more than half) who decided not to fly for judges Peter G. Russell and C. W. Green. Of those who did, veteran Tom Jolley, flying his "*Nobbligon*" design, went confidently through the schedule and looked a likely winner. Last years winner, Frank Warburton, again flying the *Kawaakis Tony*, seemed off form, and after a take-off accident on his first attempt, had a lean-cut half way through the pattern. G. Higgs was flying his veteran *Nobler* with a silencer equipped Merco which was very effective, and proves that it can be done. There seemed to be no loss of power or other ill-effects. Another welcome trend was the appearance of several semi-scale models, flying extremely well. As well as the Warburton model, there was a Japanese two seater that looked a lot like a *Judy*, though designer M. Hawkins claimed it was an *Aichi Nanzan* which we presume is a close relative. H. Dowbekin had an *Me* 109, which, although based on conventional stunt proportions, gave a very good impression of a one-oh-nine and performed well.

For the second round the wind was even worse. M. Doyle, all the way from Belfast, G. Higgs, Dowbekin and Manneau wrote off their

continued from captions opposite

New Zealand, Nev Hopley won P.A.A. LOAD by a slim 4 seconds. 10. Mike Burrows' experience of rough weather rough terrain flying stood him in good stead to collect the THURSTON Cup with short nose O/D. 11. COMBAT finalists Pete Perry and A. R. Burgess before the deciding joust while models were still in one piece! 12. DAVIES "B" winners Bell and Dugmore of Novocastria with Eta 29 racer in super finish maroon. 13. F. V.d. Bergh won the S.M.A.E. Cup for multi channel radio using long ailerons. 14. Frank Warburton repeated GOLD Trophy success with his semi scale Japanese "Tony" fighter, this time with numbers on the wing!

ALL WINNERS. 1. Mrs. Ruth Jepson, Rotherham power group, used stock Dixielander with AM.35 to win WOMEN'S Cup. 2. Mike Green releases fast climbing Eta 29 open job to lead SIR JOHN SHELLEY. 3. Superb "Blackburn YB-1" with twin engines driving contra props and using actual scale exhausts, collected KNOKKE No. 2 Trophy for Bruce Randall. 4. John O'Donnell back after long search following the winning MODEL AIRCRAFT Trophy flight. 5. SUPER SCALE Trophy victor, John Simmance and "Sopwith Snipe", now claimed to represent 70 Squadron R.F.C. 6. DAVIES "A" finalists, Long, Davy, Edmonds, Smith, Place and Burley, all Eta 15 powered. 7. HALF A T/R winners of R.A.F.M.A.A. Cup, D. H. Sulley and Mech' from Enfield with Tiger Cub model. 8. R/C SCALE winner Den Bryant with "MC 202" using F & M radio, Veco 45. 9. From

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Happy folk in the GOLD Trophy, David Day (4th), Shirley and Tom Jolley (2nd), Bonnie and Ken Day, Audrey and Ray Brown (3rd). Control line stunt seems to be the class where wives seem keenest to help the hubbies

models, the latter with broken lines, in spite of the fact that all lines were checked and measured. R. Brown almost lost his *Coy Lady*, but a magnificent athletic effort just caught it on the verge of disaster. Jolley flew his reserve model for a so-so score, so that everything depended on Warburton's last flight. With the engine over rich he was far from happy, and was out-of-control several times. Some of the spectators (and one of the judges!) assumed that Jolley had won, but when the scores were totalled and averaged between the two judges, Frank Warburton again turned out to be the winner. Organisation, run by Bridget Russell and George Broughton, aided by members of Worksop Aeromodellers and Lindum Aviation Interests, was excellent, with the results announced within three minutes of the last flight.

Davies "A" Trophy

Class A team racing was run to the new S.M.A.E. rules with the fastest nine having semi finals. Wallace and Laurie were the speediest at 4:31 with Atkinson of Derby next to qualify at 4:46 using an Oliver Tiger, the only finalist with a Ferndown product, otherwise it was an all Eta finish. In the semi's G. Copeman of Hayes had his fast model come off the lines after some hectic controlling by Dave Balch, just clearing the crowd, while Hartwell utterly demolished his entry on the tarmac. In this ten little nigger boy scheme of reduction to a final three, the only real excitement came when Davy and Long found themselves on the ground in the very last laps and only a few seconds left for them to gain a place. They managed by a mere 1.8 seconds to oust the powerful Novo's, Wallace and Laurie. In the strong wind, race marshall John Horton of the organising Wharfedale club was both lenient and strict. He permitted fair recovery of models from over the line but kept whipping out of it. However the occasional high flying, especially the wingovers in the final were difficult to control either on the handle or with the whistle and flag.

Run over 200 laps, the Smith/Edmonds High Wycombe team set the pace to first place with 10:14.6. Second place went to Davy/Long of Wharfedale who put in 11:5.2. Third place team and most level flying of all, went to Place/Burley team from R.A.F. Hemswell, who turned 11:48.8. The times in all stages of the race were very good considering the weather conditions and though not in the super fast class, show the fine prospects for the British contingent at Genk in August, when all should be equipped with the Edmond's reguflow tank.

Speed

The speed pylon was pretty well deserted for both days. Of the 22 entries in Class I speed on the first day, *none* flew,—such were the conditions. In Class II stalwart Pete Drewell and C.C.S. 2.5 reeled off 127.8 m.p.h. on Mono-line, followed closely by W. Kelsey, now returned to the hobby, and using an ex-Gibbs Nipper engine. In Class III (F.A.I.) out of 15 entries, only N. Butcher of Croydon succeeded in making a timed flight, again with a Carter built C.C.S 2.5 on two lines for 115.9 m.p.h. Last years winner of 5 c.c., John Hall, repeated his performance at 126.3 m.p.h. flying a modified Dooling 29 two line model and the 2nd place Billinton/Roffey team from Brixton M.A.C. made 123.6 m.p.h. with a low aspect ratio Mono-line job. Class V (10 c.c.) at least had some realistic times thanks to the Brixton lads who were organising the event. M. Billinton and his modified McCoy 60 Mono-line model made 157.5 m.p.h. for 1st place. 2nd place went to I. Roffey who after a long time trying with various engines, has made an official time, using a Swiss Amro 60 on Mono-line at 145.2. Class VI (jet) had eight entries but no winner as only the Burley/Place team of F.A.S.T.E. flew and pranged, but what a prang! After bouncing at the first attempt the jet pipe went elliptical in section. This was promptly made round again with the aid of an iron stake from the rope barrier. On a second attempt the model picked up speed in the 160 m.p.h. range. Pilot Dick Place missed the pylon and jerked down elevator, causing a large quantity of smoke and flame as the tank split open and the fuel spilled over the red hot engine, subsequently located about 100 ft. away!

Free Flight

Thermals were certainly to be found but if you caught one it was a distinct gamble as to whether the model could be kept in sight during the long chase for recovery. For the first day events, the Thurston Cup for gliders and Lady Shelley Cup for tailless plus the Women's Cup now curiously incorporating power flying—many chances were taken. It was a true case for the all weather model and those with long experience of rough and tough conditions survived. Mike Burrows of St. Albans lost one of his glass fibre fishing rod fuselage gliders when accumulating a respectable 7:43 score to win and one finds all the noteable hardy types taking top places. That regular Nats attender, Andy Anderton was all set to go with a really tough, almost dispensable model, when to everyones amazement (including Andy's we are sure) the model started to sink on a *slack* line. We can personally vouch that this was the only launch of the meeting where tow-lines were not fully stretched and whistling! In tailless, Brian Bow of Bristol and West was the only one to return any sort of time worth noting and that with a Nationals perennial even though somewhat abbreviated this time from its original 144 inch span. His chequer-boarded 26 inch wide plank with a Swiss S.1 airfoil section now reduced to 78 inch span (who said aspect ratio mattered?) made 2 minutes on the first flight. The landing was typical of the day and hasty repairs with card and Sellotape enabled a second flight to clinch his win.

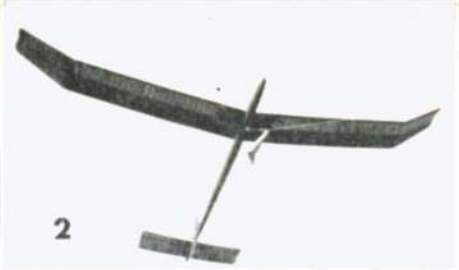
There were reasonably hard words and perhaps with justification, that power models should not have been allowed in the ladies event. This has become pretty much a kit model contest and Ruth Jepson from Rotherham did well with her A.M.35 powered standard *Dixielander* to pull off a time that would have placed her 6th in the open event on the next day. One cannot help think however that power is a trifle easier than rubber and glider and the event now becomes unbalanced.

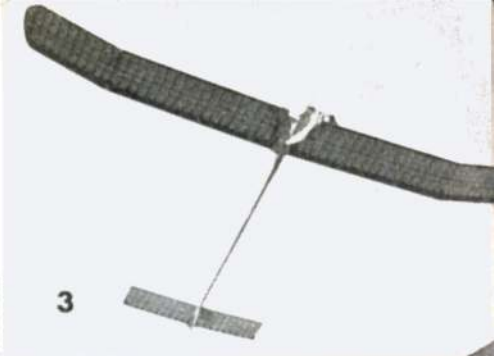
Not that we would dare to suggest that in the wind, which gusted up to 30 m.p.h. from a steady 20 m.p.h. according to our much admired and most useful Dwyer Wind Meter on the second day—that Power flying is in itself an easy process. The sight of George French's regular Nats performer, a *Ramrod* 750 which was in last year's fly-off, snapping its wing in half as it completed the last climbing turn into wind not only left one with a mighty impression of effective self destruction but also helped deter the 184 who did not even attempt a flight. Some wings parted long before the launch.

George Fuller, with what he appropriately terms an "E" type *Dixielander* using an Eta 29 with mere increase of 50 sq. ins. in the wing to make it 390, was leader for long hours of waiting in the afternoon. George got down to business early and knocked up 6:57. Action was less than sporadic, only Savini, Payne and Moseley seemed to be active from 4 p.m. to 5 p.m., then came a mild rush. The Dwyer Wind Meter now gave 10 m.p.h. steady, gusting to 25 m.p.h. Flying a funeral black KeilKraft kit *Gaucho*, loaded to F.A.I. weight and with a Cox .09 Terry Toolan launched from the lee of the control tent and topped Fuller's time with 7:13. Then Mike Green, using Eta 29 clinched the event to add to his earlier successes in the season which promise to make him the power man of the year.

Continued from captions opposite

wings. 10. Up and coming flyers George Bradley with McCoy 60 "Scorpio" and Stuart Foster with Super Tigre 56 "Nimbus", each using F & M radio. 11. S. Imrie from Kirkcaldy may have wondered why "Dixielander" with Rivers 2.5 pranged. This pic will tell him why, with tail askew. 12. Peter Freebrey with Pete Perry's winning wing in Combat, while helper throws furled streamer. 13. Mike Billinton's winning 10 c.c. Speed model with tiny wings. 14. Ever-ready Hatfield starter box for combat with 80 sets of spare lines, props, et. al.





1. S. Savini (Wallasey) made valiant try for open power with a screaming Super Tigre model. 2. O'Donnell "Fossil" design, flown by B. Spencer of Aston to 2nd place in Glider. 3. P. Lowe from Sharston made attempts without apparent success, using this model, one of many to suffer in the wind. 4. Norm Elliot up and down in a mere 8 seconds from what appears to be a safe launch—such were conditions, again typified by 5. where Dave Posner releases with ¾ of a wing and a prayer for 4 seconds he needed, but didn't get. 6. Terry Toolan, 2nd in power with Cox 09 K.K. "Gaucho". 7. Andy Anderton's foldable bike was needed for his retrievers, though hard to peddle back up wind! 8. Breen, Lorimer and McKay down from Scotland for 2nd place in Class B with Eta 29 racer. 9. High tail and silenced McCoy engine on Paul Roger's new multi channel entry, using swept

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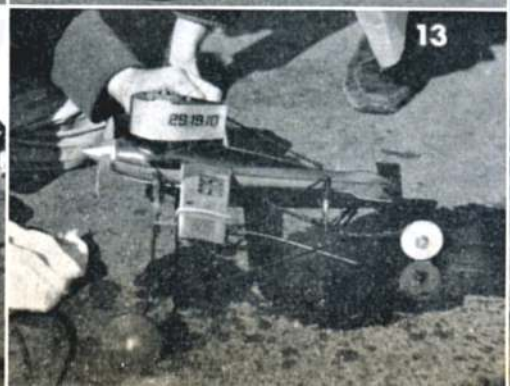


His total was 8:03, a most respectable figure for the power class in such conditions.

Meantime a dice of personalities was being cast in Payload. New Zealanders Hopley and Magill were alternating attempts with Messrs. Posner and Stringwell. One could hardly call it a contest, it resembled a "doubles" Antipodean duel. Anyhow, only Posner and Hopley had the luck to clear ground high enough and make times, and climax came when only five minutes were left till closing time, and Posner, with three-quarters of a wing remaining after the previous flight, decided to try for the 4 seconds he needed to equalize with Hopley. He deflected various suggestions as to how best he could make a quick flight, with an "I do not cheat" statement which was well received in the good humour in which it was given. Dave launched with a wing and a prayer but the remains never even left the ground.

The technique for rubber jobs was to seek shelter, then dash in a downwind rush, releasing hopefully. Once airborne, the rubber models seemed more able to withstand the gusts than power types. Only fifteen people dared the elements, and seven of those gave up after sad first flight experience. Among the most determined was Bill McGarvey of New Zealand. It was a very great pity that the mysterious time extension of fifteen minutes over the announced closure hour was not conveyed to him, otherwise his last flight, with better repairs, would have given him a more rewarding total. The result too seemed not quite just. O'Donnell and Roberts, each obliging the other into an allout last flight, flew practically simultaneously. They disappeared into the sun haze, each for certain max's, but Lou Roberts' time was returned as 2:42. It was perhaps a case for 10 secs. "special efforts" bonus to be given Lou. That would have made John and he equal winners in an event of which they were surely equal masters.

One could most easily be tempted into the opinion that use of dispensible models in this tough free flight sections of the Nats would have been the wise approach. It appeared that no matter how cleverly one had trimmed a model, it was just as liable to be wrecked as anybody else's and there was nothing one could do about it.

But dispensable models *were* used, and still the renowned aces won. for half an hour we watched models of all shapes from small A/1 specification gliders upwards, snap their wings on tow. Power models making vain attempts on the second day never completed even their small allocation of ten seconds for engine run. All of which goes to prove that while there is a grain of luck in model flying, it rarely benefits anyone in bad air.

Scale

Even when we are blessed with a moderate breeze at Barkston Heath, the mortality rate among scale models is discouragingly high. When the entry list sparkled with such delights in radio control as a ten channel *De Havilland* 9 from last year's winner, Dennis Thumpston, a true scale *Focke-Wulf* 190, again full-multi from stunt ace Peter G. Russell, and a *De.H.* 88 *Comet* racer with retractable undercarriage from Bristol's R. Norris, there was indeed great air of expectancy. Yet, as it happened, these models were not brought to the line, and of those that did, only 3 out of twenty radio scale models made qualifying flights.

These were all multi-channel—the superb *Sopwith Swallow* (Frog 500) by John Simmance and P. Anderson's equally fine *Cessna* 172 (A.M.35) being closest single control contenders, were wisely withdrawn after being exposed to the scouring wind over the runway.

There was too, a measure of disappointment that the *Heinkel He* 219 entered by D. Walker did not perform in his hands. Early demonstrations of the twin K & B 45 model with Harry Brookes at the controls had amply shown its immunity to the wind and despite its starkness of detail, the 219 could have scored well for realism in the air. A *Bristol Bulldog* from Dr. G. D. Henley, made to 1/6th scale for roaring McCoy 60 would have made interesting competition too, if only it could have left the deck.

Thus, a kit *P-63 King Cobra* in quoted "sand" colour that was neither air target orange nor desert light brown, from Flying Officer G. R. Denny made a fast display, along with Jack Morton's 1/4 scale *Little Toot* (each of these with McCoy 60 power) and Dennis Bryant's *Macchi MC* 202 (Veco 45) were all that entertained a large and impatient crowd on Sunday morning. The winning *Macchi*, in colours more glossy than should be, was most professionally finished and a pleasant sight in the air. It was not flown in the lively manner of the *Meyer Little Toot* which cavorted around exactly as would have the fullsize. Jack Morton so enjoyed himself with a few extra manoeuvres thrown in for good measure that he ran dry and could not make the landing pattern on each flight. This lost him valuable points; though his expert dead stick approaches from difficult attitudes, all with non-simultaneous equipment, earned commendation from those who appreciated such things. Jack's the boy when it comes to making a show!

Similarly, the piloting of the *King Cobra*, quite the fastest of the three, was spectacular. One aborted take-off with motor cut and full brakes on to avoid a crowd crash showed split second reaction by F/O Denny. With a McCoy 60 pulling 10 lbs. of model, the risk of accident was thankfully avoided, for lack of volunteer stewards made crowd control difficult. Perhaps the radio controllers will soon learn from other categories that a little self-help (instead of the grumbles about "why don't they do this and that") is respected in a totally voluntary organisation.

If all the radio models couldn't manage the wind, there was hope that control-line might cope. Half a mile away, crosswind, the qualifyers lined up to make what became one long series of crashing attempts. Ron Lucas's *Viscount* 701 in Capital markings had starting troubles with glowplugged AM25's but eventually got away with Adams at the handle, showing brakes between bounces. Bent cowls and undercarriage were suffered. Then came Simmance's little *Boeing B-17 Fortress* with four Cox Babe Bee's, a treat to watch in starting with a communal glowplug booster system but alas a non-starter as far as flying was concerned, for every time it came around to take-off, the tail cocked up first and stubbed out the power. Next, another "multi", and the most ingenious, by Bruce Randle whose Gannet has already won the event. This time he mated OS 19 and 35 to two four blade contra props, had working flaps, hooks, controls in cockpit, etc. on the novel *Blackburn YB-1*. Throttle show was good, also the brief lappage in the air, but it was literally blasted out of the sky by a gust, all 7 pounds of model whacking the concrete hard enough to wreck the nose gear.

Winner two years back, Tony Day and his *Fokker D.VII* with reliable Taplin Twin and smart hand painted German WWI lozenge style camouflage completed a run of multi-cylinder entries and after making the qualifying laps, even this old reliable was windswept into damage. So only 3 went forward to be judged for scale and workmanship. Other types which tried so hard were R. Ingram and neat *Fiat CR* 42 with Oliver Tiger which became completely de-tailed on pranging. B. Cuttriss's *Chipmunk* wingovered with the pilot drifting 20 feet per lap, until disaster and a broken wing overtook the flight. A Frog kit *S.E.5a* by A. Clements rolled up the lined for demolition. Oh my! They'll have to find some highly loaded subjects for this event next year.

Free flight scale was deferred until Monday in vain hope of lighter wind strength for many of the entries were frail "oldies". The standard was good, and the variety excellent. Most ingenious was R. Hackett's 8 ounce *Westland-Hill Mk IV Pterodactyl* for Cox .010 with all ways round pendulum control—actually a "model" for a later and larger project. A Clements had a magnificently rigged *Fokker Spinne* 3 with bamboo tail feathers and W. Kitching a fine *Bleriot* 9 destined for R/C, with all controls from the cockpit in true scale fashion. An *English Electric Wren*, *Sopwith Pup*, *Everitt-Edgecombe Grasshopper*, *Albatros D.V.*, *Luton Minor*, and smooth surfaced *Cessna* 175 (by Australian Geoff Pentland) made up the field beside the four models which actually flew. In fact there were many others besides, including large scale *Beech C-17* and a beaut of a *Spanish Hisso Fury;* but the four that braved and flew were Simmance's *Snipe* (winner of '61, 2nd in '60) Doc Hawkin's novel choice, the *Kyushu Shiragiku* mid wing, S. Archbould's fine flying *Nieuport* 28 and D. Neal's *Luscombe Skypal*. Landing was not only out of the question as far as points were concerned was also mostly out of sight!

Left, Australians Tony Shennan and Geoff Pentland had a full range of scale and semi scale models on display, including this selection which they will be marketing in plan form under the name of "Kookaburra Models."

Opposite: SCALE MODELS. 1. Jack Morton with George Meyer's "Little Toot" to ¼ full-size scale (51 in. span) using McCoy 60, made most lively demonstrations. 2. Not entered, but nevertheless impressive was this control line "Spanish Fury" to 1/6th scale (60 in. span) by Bob Ivans, Walsall, for Super Tigre 56. 3. R. Hackett from Chichester with intriguing "Westland-Hill Pterodactyl." 4. "Fokker DVII" by Tony Day for Taplin Twin took 2nd place in C/L

continued opposite

Scale Models

scale. 5. Free flight "Kyushu Shiragiku" for D/C Merlin, 1/16th scale by Doc Hawkins placed 2nd. 6. Bunny Newman with AM.35 "Beechcraft C-17" free flight. 7. John Simmance's radio entry was this superb "Sopwith Swallow" for single channel. 8. Ron Lucas starting one of the glow AM.25's in "Viscount". 9. Dave Walker with his "Heinkel He 219," which made many fine flights in the hands of Harry Brooks under radio control. 10. F/O G. R. Denny of Cranwell and his fast Sterling kit "Bell P63 King Cobra." 11. R. Ingram attends to "Fiat CR42" before it lost its tail in control line. 12. The neat "Luton Minor" by M. B. Taylor with Super Merlin enclosed in polished alloy cowling, from Boscombe Down. 13. Fine detail on "Fokker Spinne" with D.C. Dart has front cylinder in dummy engine by A. Clements of Maidenhead, to 1/12th scale

Multi-Channel Radio-Control

If there was one class which was least wind affected, it was multi R/C. Yet the actual entry of 34 was halved to 17, and of those many, fell out of the second round. In consequence, the event was long and drawn out, lacking the precise organisation of other years, and most certainly devoid of good crowd control. Evidence of this was regretably brought home to local lad Stuart Foster of Lincoln who had his *Nimbus II* parted in the middle by people in the way of his into wind approach. All credit to him for the quick repair job that brought him up to 3rd place the following day.

Leading the field, Frank Van den Berg had the well worn (and patched) *Sky Dancer* but new equal taper wings sported long span ailerons, a blend of the normal inset type and the trailing edge flap type. His fast, very round loops were exceptional. Very little drift on the Merco 49 powered model, and crisp manoeuvres earned Frank the Trophy yet once again. In second place, Harry Brooks with *Soraco* was not so fast, and therefore showed drift with the wind though for precision, especially on landing, Harry does extremely well. Their International team-mate Chris Olsen suffered two engine cuts so was right out of the running.

Laidon Blair, over from Northern Ireland, Peter Waters from Wales (to honourable 4th) and R. Fraser from Scotland made this a true British Champs for once. Notable was the performance of young Foster and Bradley, their showing in the team trials promised a Nats treat, and it seems we have some changes of name to expect in future as they shape up.

Needless to relate, the most stimulating flying came afterwards when the first 3 flew simultaneously for a sparkling display of near dog-fighting, capped by a neat landing line-up. Peter Waters capped his show with a hands-off inverted run at low level, the *Taurus* in accurate trim showing no need for the Min-X 10 transmitter! For extensive details of this event see the August issue of *Radio Control Models & Electronics*.

½ A Team Race

After the most promising contests of previous years, following which the standards of performance had obligated longer lines, the ½A event was, we are sorry to report, a disappointment. Most ably organised by the R.A.F.M.A.A., who had their fine new Trophy on display, the simple facts are that out of no less than eighty-four entries, only *four* recorded times in the first round! In the second round only *one* came through unscathed! Thirty miles per hour wind plus 1.5 c.c. on 46 ft. 8 in. lines over hard runway does add up to a lot of busted airframes and engines. Sulley of Enfield was fastest in the heats at 5:10 for five miles using an Oliver Tiger Cub, by far the most common powerplant, and he went on with a clear run of 11 minutes over the ten mile final. Johnson crashed on his first lap and first lap and Dell on his 39th so making the final the climax of a day of crashery.

Class B was similarly disappointing. Only twelve flew in the first round and five had a second round. There was also some doubt as to who was flying who's for some of the models have been seen in other hands we are sure. Lucas had hopes of retaining the Trophy dashed with a broken pan, seized engine and other damage soon after his start. Only Dugmore and Bell were handsomely placed for the final, with a 3:18.5 heat over the five mile distance, and they went on to victory in a shortened final at 3:31. Following them, the Scots team of Lorrimer were as persistent as Robbie Burns himself, taking 14:10 to do five miles with innumerable stops in a heat, and almost repeating this in a ten minute, five mile final.

Apart from the "other peoples" models; the "Finish of the Race" rule, and the removal of the second mech: as advised in the new year rule amendments were apparently waived in lenience; but this should not be so in future. One day S.M.A.E. members will all claim their rule books—we hope.

Combat

Admirably administrated by Hatfield M.A.C., this, the largest longest and in terms of destruction, most expensive events of the Nats, ran remarkably to time from the start to the final. Hatfield were themselves entrants, using fast glow engined (.19) wings and having a fine pair of mobile starters with all accessories ready to use including multiple sets of replacement lines. However all this did not get them into the final. Northwood's Peter Tribe was knocked out in the early stages by Chingford's Stewart using a Fox 19 tailplaned model, and two of the usual expert contenders, Bumstead and Kendrick could not attend. Just the same, there was never a dull moment, especially when the majority of the models were found not to be able to make headway and so the flights became one-sided to say the least. Tynemouth had a club fleet of elliptical wings to make a change from the usual planform, and there were many modified *Peacemakers* just to show that a good 'un never dies. R. Burgess of Weston Controliners had one to use against P. Perry of Northwood in the final. The start was quick as lightning and action came immediately. Perry took a cut, then fell over but still attacked from supine position. A clash of lines, then a collision with silence and one broken model terminating the fastest thirty seconds of the two day meeting. It capped all the windy chases, the scale admiration groups, the multi channel demonstrations and the other control line flying as a genuine climax to a contest in which enthusiasm knows few bounds, in spite of that awful wind.

RESULTS

Super Scale Trophy (17 entries) *Free Flight Scale*

1. J. L. Simmance	(Wharfedale)	*Sopwith Snipe*	673
2. Dr. M. F. Hawkins	(C.M.)	*Kyushu Shiragiku*	630
3. S. Archbold	(Leicester)	*Nieuport* 28	337
4. D. Neal	(Leicester)	*Luscombe Skypal*	296

R/C Scale (25 entries)

1. D. F. Bryant	(Bromley)	*Macchi MC*202	896
2. J. Morton	(Bristol)	*"Little Toot"*	801
3. F/O G. R. Denny	(R.A.F.M.A.A.)	*Bell P*63	469

Knokke No. 2 Trophy (19 entries) *Control Line Scale*

1. B. Randle	(84 Sqdn. A.T.C.)	*Blackburn YB*-1	533
2. A. C. Day	(West Bromwich)	*Fokker DVII*	506
3. R. Lucas	(Sidcup)	*Vickers Viscount*	701 402

Sir John Shelley Cup (213 entries) *Unrestricted Power*

1. M. H. Green	(Foresters)	8.03
2. T. Toolan	(Whitefield)	7.13
3. G. Fuller	(St. Albans)	6.57
4. D. Edwards	(St. Albans)	6.06
5. S. Savini	(Wallasey)	5.43
6. J. Moseley	(Baildon)	4.17

Speed (101 entries)

Class 1 (1.5 *c.c.*)
No flights.
Class 2 (2.5 *c.c.*)

1. P. Drewell	(Sidcup)	127.8

Class 3 (*F.A.I.*)

1. N. Butcher	(C.M.)	115.9

Class 4 (5 c.c.)

1. J. Hall	(Chingford)	126.3

Class 5 (10 c.c.)

1. M. Billington	(Brixton)	157.5

Davies 'A' Trophy 20 *Km. final* (90 entries) *Team Race Class A*

1. Smith/Edmonds	(High Wycombe)	10:14.6
2. Davy/Long	(Wharfedale)	11:05.2
3. Place/Burley	(R.A.F. Helmswell)	11:48.8

Davies 'B' Trophy (24 entries) *Team Race Class B*

1. Dugmore/Bell	(Novocastria)	3:31.
2. C. Lorimer	(S.A.A.)	10:00
3. C. Taylor	(West Essex)	—

R.A.F.M.A.A. Cup (84 entries) *Team Race* ½A

1. D. Sully	(Enfield M.A.C.)	11:00
2. A. Dell	(Hayes D.M.A.C.)	39 laps
3. Jr./Tech. John	(R.A.F.M.A.A.)	1 lap

Lady Shelley Cup (15 entries) *Tailless*

1. B. F. Bow	(Bristol & W)	3.11
2. D. Culpin	(Rolls Royce)	0.46

Gold Trophy (32 entries) *C/L Aerobatics*

1. F. Warburton	(Wharfedale)	1121
2. T. Jolley	(Whitefield)	1094
3. R. Brown	(High Wycombe)	994
4. D. J. Day	(Wolves)	935.5
5. Dr. Hawkins	(C.M.)	903
6. J. Perry	(Richmond)	898

Women's Cup (17 entries) *All Classes Combined*

1. Mrs. R. E. Jepson	(Rotherham)	4.53
2. Mrs. Y. Presnell	(Essex)	3.30
3. Miss S. Allsop	(Cambridge)	1.04

P.A.A. Load (17 entries) 1 *c.c. Payload*

1. N. S. Hopley	(Richmond)	2.46
2. D. S. Posner	(Surbiton)	2.42

Model Aircraft Trophy (122 entries) *Unrestricted Rubber*

1. J. O'Donnell	(Whitefield)	8.52
2. G. L. Roberts	(Lincoln)	8.42
3. D. Latter	(C.M.)	6.36
4. W. H. McGarvey	(Stevenage)	5.16
5. P. Lowe	(Sharston)	4.36
6. T. Faulkner	(Luton)	3.52

Thurston Cup (255 entries) *Unrestricted Glider*

1. M. Burrows	(St. Albans)	7.43
2. B. Spencer	(Ashton)	7.32
3. C. H. Morris	(St. Albans)	7.11
4. D. J. Wiseman	(York)	7.05
5. J. Baguley	(Hayes)	6.59
6. A. Anderton	(Norwich)	6.32

Combat Final (128 entries)

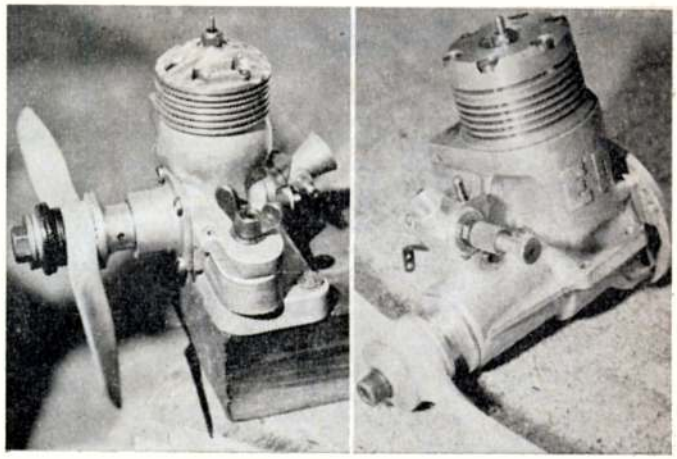
1. P. Perry	(Northwood)	
2. A. R. Burgess	(Weston C.L.)	

S.M.A.E. Cup (34 entries) *Multi R/C*

1. F. Van den Bergh	(Bromley)	2643
2. H. Brooks	(Southern M.F.C.)	2534
3. S. L. Foster	(Lincoln)	2291
4. P. T. Waters	(Port Talbot)	1848
5. P. Rogers	(High Wycombe)	1735
6. D. J. Allen	(West Essex)	1726

MOTOR MART

THE NATIONALS is always a place to spot new or unusual motors. Our crop this year was quite a good one. In the Speed area, Ivor Roffey was using an Amro 10, which has been made for some years by M. Amrein of Basle, Switzerland, for model racing car use and which very closely resembles a Dooling. Kevin Lindsey had a French **Vega 10** running up after modifications and we have illustrated this at top left along with the **E.D.10** (plus Merco 49 throttle) prototype, which designer George Fletcher showed us. Regrettably, there seems only a slim likelihood of this engine entering production. It has an interesting 9/16th Torrington caged roller bearing for the large diameter crankshaft, and has been most satisfactorily air tested by leading multi channel exponents.



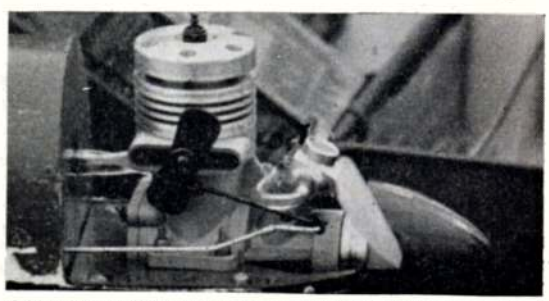
Left, the Vega 10, French engine with bulbous transfer passage cast in crankcase. Note short shaft bearing and large carburettor. Right, E.D. 10 c.c. prototype with 9/16th shaft, plus roller bearings, making large diameter front end

From Leicester, M. Franklin was using his modified engines. Amongst his services he includes provision for new front and rear ends to a stock **McCoy 60** (bottom left) with downdraught throttled carburettor and a really tough prop driver. No exhaust valve is fitted, nor are there any of the usual trimming arrangements for air bleed on the throttle, but it is said to work well.

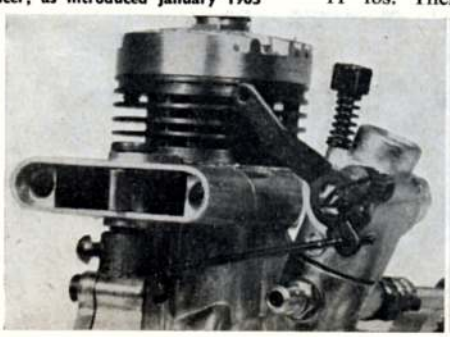
Pride of place in our Nats collection and one we have known for a little while, and which first came in public view at the radio control team trials, is Dennis Allen's **Merco 61,** which Dennis himself was flying in an *Orion*. This is indeed a very powerful engine as Chris Olsen has demonstrated with multiple upward rolls. It was perhaps significant that Frank van den Bergh and he used the 49 at the Nats, until they get really used to the power of the 61 which both have been testing. It was logical in the first place that the 49 should be developed this way as an alternative, in fact the crankcase was so arranged to allow the change. We must emphasise that the engine is *not* in production and those units which have been used are strictly test prototypes, being employed in much the same way as were the original Merco 49 engines, to iron out the bugs and get things right for production so that every customer will be satisfied.

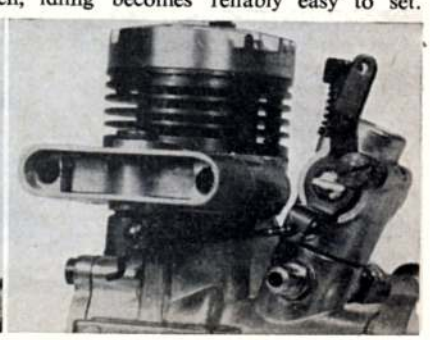
Many's the time we have wondered why radio control enthusiasts have not yet used pressurised tanks, though we understand that Chris Olsen has made experiments which were not too successful. Now, writing in the German magazine *Modell*, engine tester Peter Demuth reviews the **Enya 45** and used the crankshaft timed pressure tapping along with other modifications to offer continual and constant fuel flow.

This is, of course, the opposite approach to that of the Merco 61. With the Enya one endeavours to extract maximum power with open throttle, blended with good idling speed. The idling becomes a sensitive matter for setting. With the Merco 61, the object is to provide so much excess power and such good crankcase depression that it is not necessary to peak the engine, unless perhaps the model is knocking on the maximum weight limit of 11 lbs. Then, idling becomes reliably easy to set.



A Merco 61 prototype in Frank van den Bergh's "Sky Dancer." Only external identification distinction from 49 is the plain head and extra gap underneath the head





Left, Franklin modified McCoy 60 with downdraught carb. Right O.S. throttles now standard on 15, 19 and 49 offer simple exhaust coupling with provision for fitting silencer, as introduced January 1963

Trade Notes

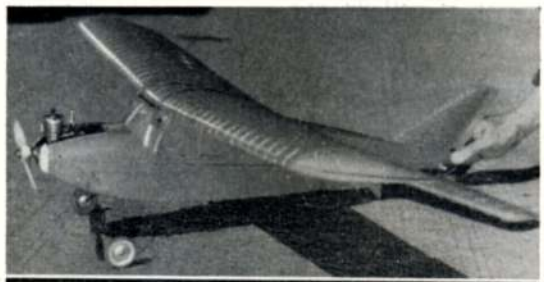
A 32 IN. READY-TO-FLY plastic model will soon end speculation as to what has been going on in the **E.D.** Engineering factory at West Molesey these past months. Designed for the *E.D. Cadet* 1 c.c. diesel, which comes complete with silencer, this R.T.F. model has 210 sq. ins. of very thick (18 per cent.) wing, which promises to stand up to a lot of rough useage. The externally corrugated surface is, in itself, strong and there is also a moulded plastic "I" beam spar. Novel introduction is the use of a pressed light alloy fuselage strengthener which braces the engine mount, undercarriage fixing, wing and tail platforms so that the fuselage shape is little more than a vacuum formed fairing. The prototype has been moulded in an attractive blue and orange and has passed tests with flying colours.

Last month we made mention of the expanded polystyrene **Graupner** *Consul*. The latest news from the factory is that future kits will have details of 4 channel conversion using twin *Bellamatic* servos for rudder and elevator. The model is said to be transformed into a lively aerobatic performer with exceptional ability to make flick rolls with simultaneous rudder/elevator selection. Additionaly, detail will be added to the kit for elevator trim using the SERVOautoMATIC. Another radio control kit model, which takes our fancy has come from **Roland Scott.** This is the **Carl Goldberg** *JR Falcon* for .8 to 1.5 c.c. engines, with 250 sq. ins. of wing to weigh about 16 ozs. with single channel equipment. Span is 37 in., length 28 in., and the functional high wing on a sheet box fuselage makes this a most practical proposition. Roland handles this one at 38s. and also the larger *Falcon* 56 which is America's fastest selling radio kit, at 95s. From the same source we have the *Voodoo* combat model at 29s., intended for up to 5 c.c., it is one of the original all-moving elevator flying wing designs. For free flight, the high thrust line *Viking* retails at 35s., an ideal ½A contest model. We like the high standard of the plans and good engineering in these Goldberg kits.

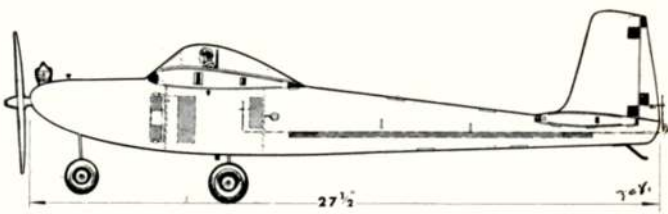
From **Cosmic Hobbies,** we have picked up a very neat translucent moulded battery box to take 4 pen-cells, which sells for 4s. The batteries are held in place with positive connections and transistor type battery snap fasteners are fitted to the lid for quick detachable leads. Most reasonably priced, the box needs only a balsa dummy and very slight modification to take the popular triple cell arrangement for 4.5 volts, now in use for a large number of British lightweight Rx's.

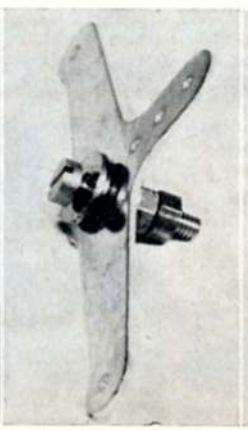
Our *thermal detector* has arrived from the U.S.A. and will soon be submitted to practical field tests. Made to order, it has four standards of sensitivity setting as well as fine and coarse controls. Once we have mastered the technique and application we hope to pass comment on its useage. What with this, and the Dwyer Wind Meter, we seem to be becoming a travelling Met station!

160 pages measuring 11⅝ in. by 8¼ in. are filled with descriptions and pictures of the myriad items available from **C. Streil and Co.** of Zurich. This, the fifth in the series of Streil catalogues is quite the most impressive produced by *any* European model shop and well worth study.



Top, the new E.D. 32 in. plastic ready-to-fly with E.D .Cadet, and above, parts for the Graupner Filou, a most attractive glider for radio control, which will also take a pylon mounted engine, 50 in. span 46s. Below, profile of the Junior Falcon shows radio control disposition inside sheet fuselage, ideal for lightweight radio. Bottom, left, replacement head for Cox 15 by Dynamic Models, with Dyna Fire GL-1 glow plug. The head costs 75c. plug 49c. in U.S.A. Centre, Gremlin 3 in. bellcrank with bushed bearing by Bradshaw Model Products, recommended for smooth motion in stunt or combat. Right, Saftiflite handle, imported by R. Scott, sells at 4s. 6d. complete with Dacron line for small models. Note quick line space adjustment, moulded in red plastic





notes on PLYWOOD

PLY IS A MATERIAL which we accept as standard for such "strong" members as nose formers (firewalls) on power models, main formers and doublers on R/C model fuselages, and sometimes for "plate-type" engine mounts. Except in the latter case it is unrivalled for such jobs (Paxolin fibre sheet is more reliable for plate-type mounts or any other similar duty, such as bellcranks where holes near the edge of the material carry localised loads). Surprisingly, however, very little attention is given to ply *selection*. Formers are usually cut out of more or less any piece of play of about the right thickness —and in most cases prove quite satisfactory (probably because they were thicker and heavier than they need have been).

All metric sizes

Even specifying ply thickness is a bit of a guess. Except in the United States and Canada all ply thicknesses are measured in *millimetres*, and even that is nominal. The manufacturing tolerance permitted on ¼ n. iply and under is plus or minus 5 per cent. on thickness, plus a *further* allowance for sanding to finish. This latter allowance can vary up to .024 in. for ply finished by sanding both sides. The table shows typical 'equivalent' ply sizes (thicknesses), and possible variations in actual thickness conforming to *rigid* manufacturing standards. Most of the better quality ply tends towards the lower limits of size.

Confusion also arises as to the differences between 'marine ply', 'aircraft ply' and various other so-called types of ply. Marine ply is often quoted as of superior quality—which it is, for marine work. It is not necessarily the best for model aircraft work, nor is it obtainable in the smaller thicknesses we want. Apart from a rigid specification for ensuring that the bond is waterproof, the chief characteristic of a marine ply is that it is made from a limited number of approved or "durable" mahogany-type woods. Birch, which produces a stronger ply and is favoured for aircraft ply, is *not* a durable wood—so it is not allowed for marine ply manufacture. On the other hand many full size boat builders have used it because of its superior strength!

Grades to select

For model aircraft an aircraft-type ply is best, either in beech or birch, or American pine ply. Some spruce ply is also available, and in all these woods ply thicknesses down to 1/16 in. nominal are standard productions—although not always easy to obtain. Beech and birch ply (imported) is also available in 1/32 in. nominal thickness.

Most of the ply reaching the model trade is offcut material and thus unlikely to carry any markings which were on the original sheet designating standard, etc. Usually the best we can do is judge the probable quality, etc., purely from appearance. The cut edge will show both the thickness of the core, relative to the outer or face veneers, and also how the face veneers have stood up to being cut.

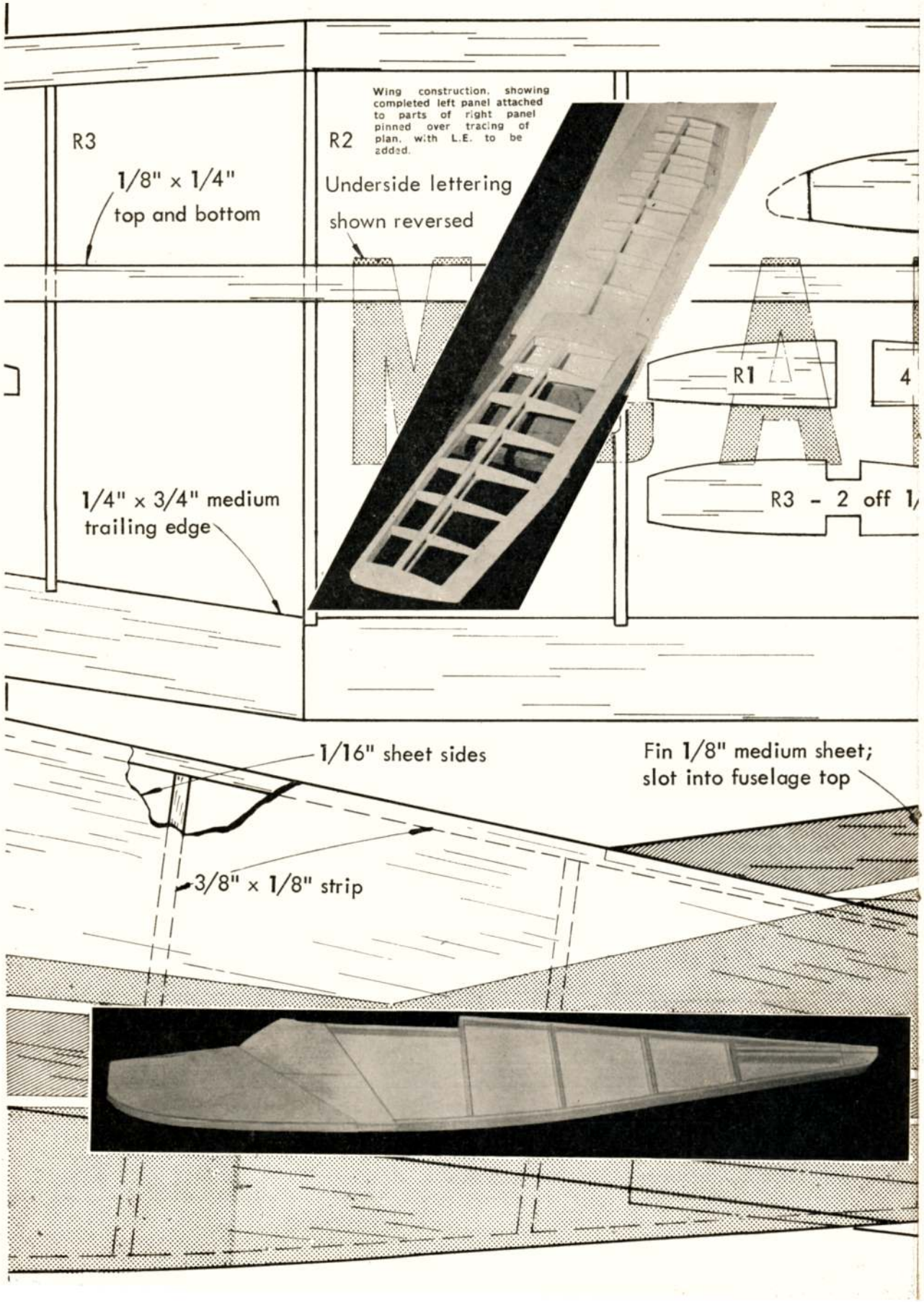
Since the core is commonly made from inferior wood, a thick core (for a given overall thickness) usually implies a weak ply. For best strength the core thickness on three-ply does not want to be much thicker than the face veneers. Best of all, if you can find it, is *five-ply* with all the veneers about the same thickness. In all cases the individual plies should strongly resist any attempt to separate them—e.g. try to separate them with a thumbnail at one corner.

Points to watch

You cannot always judge ply by colour. Birch or beech ply *can* usually be picked out by colour, and also mahogany, of course. But a white or yellowy-white wood may equally well be a top grade American aircraft ply or an inferior 'general purpose' ply. The core thickness will distinguish between the two in this case. In general, the cheaper the ply (and thus the less reliable its characteristics) the thicker the core in proportion to the face veneers. Also the rougher the surface finish the lower the quality of the ply. All top quality ply has a smooth, sanded surface (usually on both sides, but sometimes only on one).

Table of inch equivalent sizes

NOMINAL THICKNESS Millimetres		.5	1	1.5	2	2.5	3	4	5	6	7
NOMINAL THICKNESS inches		1/64	1/32	1/16	5/64	3/32	7/64	1/8	3/16	1/4	9/32
ACTUAL THICKNESS AS FINISHED (inches)	MAXIMUM	.0207	.0433	.0650	.0866	.1083	.1300	.1733	.2166	.2598	.3032
	GRADE A MINIMUM	—	.020	.037	.055	.083	.090	.125	.160	.196	.232
	GRADE B MINIMUM	—	.012	.030	.047	.075	.082	.117	.152	.188	.224
PRACTICAL EQUIVALENT NOMINAL THICKNESS in inches		—	1/32	1/16	5/64	3/32	7/64	1/8	3/16	1/4	9/32



Wing construction, showing completed left panel attached to parts of right panel pinned over tracing of plan, with L.E. to be added.

Aermacchi—Lockheed 60 'Santa Maria'

35-inch profile semi-scale model for ·5—·8 cc. designed by VIC SMEED

Materials required
1 sheet of ⅛ x 2 in. x 18 in. balsa.
1 sheet of ⅛ x 3 x 36 in. balsa.
1 sheet of 3/32 x 3 x 18 in. balsa.
3 sheets of 1/16 x 3 x 36 in. balsa.
1 strip of ⅜ x 36 in. shaped L.E. balsa.
1 strip of ¾ x ½ x 36 in. shaped T.E. balsa
2 strips of ¼ x ½ x 36 in. balsa.
1 strip of ½ x 1 x 9 in. hard balsa.
1 strip of ¼ dia x 6 in. dowel.
8 x 8 in. of 1/16 in. plywood.
8 in. of ⅜ x ½ in. hardwood bearer.
1 36 in. length of 14 s.w.g. piano wire.
1 1¼ in. Keilkraft spinner.
1 packet Keilkraft modelling thread.
1 M.S. Timer Tank.
6 8 B.A. bolts, nuts, washers, etc.
3 sheets lightweight tissue.

Structural, and completed views show the Sheeted profile fuselage and tail surfaces, which, coupled with twin spar wing make a tough design

SOME THREE YEARS ago a factory was established by Lockheed in Mexico for the primary purpose of constructing a utility aeroplane which, by its Mexican associations, was christened *Santa Maria*. Lack of orders, however, frustrated the intention, and the design was taken up through Lockheed's Italian connections to be built as the Aermacchi-Lockheed 60. This new arrangement worked with greater success and the machine will be seen in increasing numbers in European skies, both in the uniform of the Italian Air Force and in civilian dress. Examples are to be seen flying regularly over Great Britain. For a utility 'plane the lines are handsome and belie its considerable capacity. As a prototype for a model, it is ideally proportioned, although we have taken certain liberties to simplify it even further.

As drawn, our model has a profile fuselage only ½ in. wide. This makes it extremely easy, quick, and inexpensive to build; it is also remarkably rugged and requires a ridiculously small amount of power to fly it. Even at 10½ ozs., the AS55 will zoom it up in a near vertical climb! We have slightly increased tailplane area, given the wing standard dihedral (the full-size is virtually flat) and omitted the struts; nevertheless, it still looks like the prototype and makes a fine flier.

Radio enthusiasts might like to make the body from ⅛ by 1 in. strip instead of ¼ by ⅜ in., which would give plenty of room for miniaturised equipment. Scale fuselage width beneath the centre-section, by the way, would be 3½ in. and the whole fuselage is practically rectangular in section throughout.

First, cut the ⅜ in. balsa fuselage core with slots spaced for your engine bearers, cement these in and when dry, lay over the plan, and add ⅜ by ⅛ in. fuselage structure plus scrap blocks. When dry, rub smooth with sandpaper and add the upper (port) 1/16 in. balsa fuselage side and 1/16 in. ply nose doubler with a good butt joint. P.V.A. glue is most useful for this work. Remove from building board and fit the opposite side plates. The wing platform is then made from 1/16 by 2½ by 5⅛ in. hard balsa (grain across fuselage), scored down the centre, and bent to the dihedral angle. The ⅜ by ½ in. balsa support should be vee'd to accept the platform.

Cut away plywood covering the engine bearers on the left hand side for crankcase clearance. Drill for 8 B.A. engine bolts. Oversize drilling will allow movement for downthrust. The whole assembly is then sanded smooth.

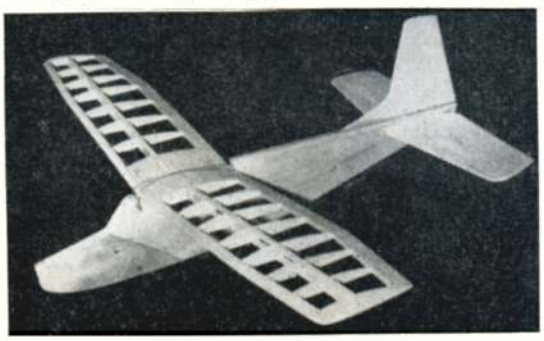
Bend the u/c units and solder wheels to axles after binding the nose leg with soft copper wire. Drill the 1/16 in. holes, for binding to fuselage with strong thread. Rub plenty of cement in to give a secure joint.

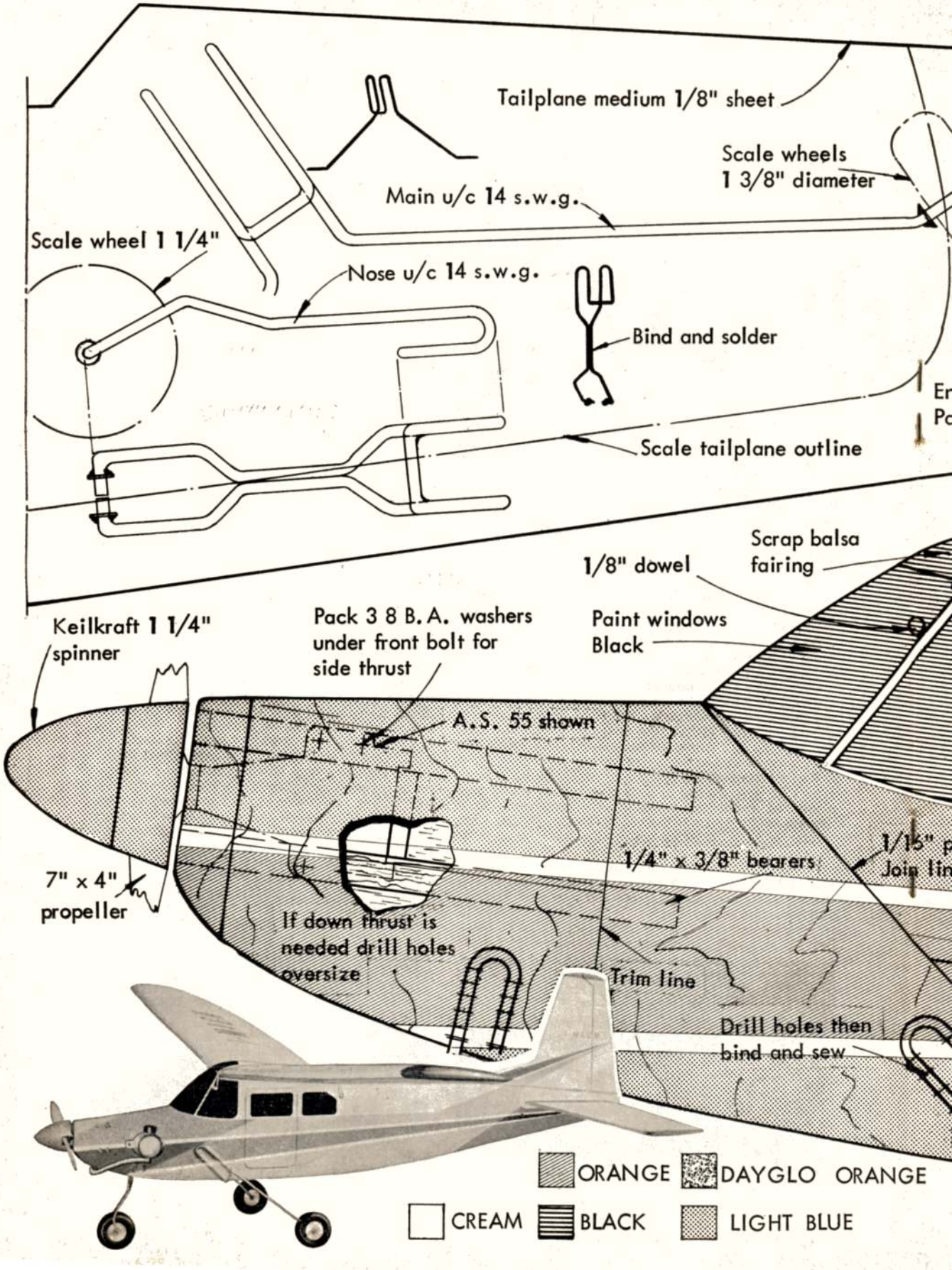
The wing is a simple two piece structure made directly over the plan. First notch the port side trailing edge and pin it down with the lower ⅛ by ¼ in. spar. Cement the ribs in place before adding the leading edge. When dry, the dihedral brace should then be cemented in and the top spar added. Add the rough shaped tip block and remove from plan. The starboard panel is built over on reverse traced plan while the panel is still pinned in place, join the portside on by means of the dihedral brace. Add centre section sheeting.

Tail surfaces are elementary ⅛ in. sheet balsa flat plates which must be sanded and doped carefully to avoid warps.

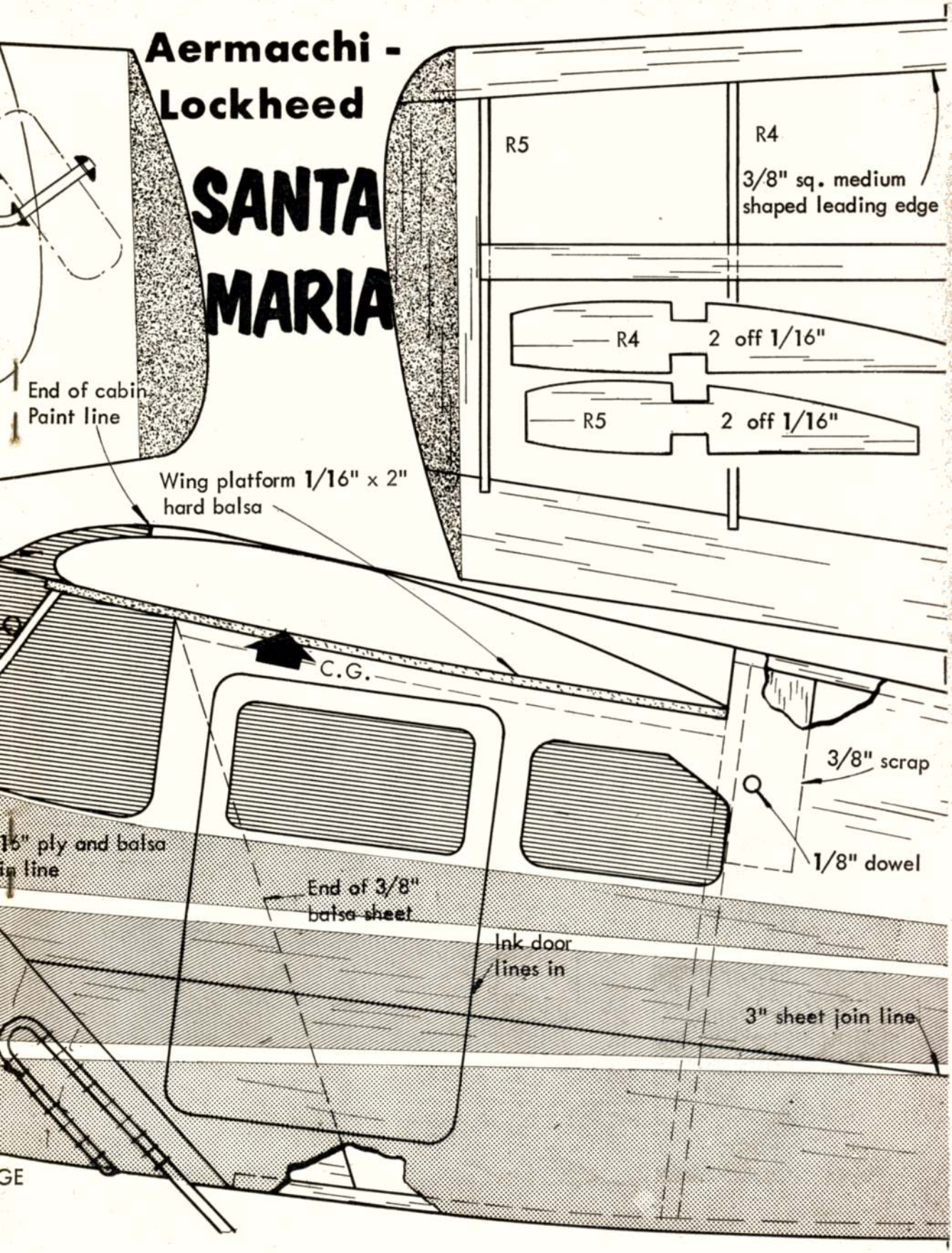
The fin has a trim tab held in place by soft wire, to act as hinges. Cement the fin into the slot in the fuselage top, adding the strake at the lower leading edge. Give the whole frame work one coat of sanding sealer, and after rubbing smooth, cover with lightweight tissue. Brush on two coats of thinned clear dope and add colour dope and transfers. I-MACM, the demonstrator, has a most attractive cream, orange and blue scheme as can be seen on our cover this month.

Next all the paint should be cleaned out of the bolt holes and a coat of fuel proofer added, before fitting the tank and engine. *continued on page 402*




Tailplane medium 1/8" sheet
Scale wheels
1 3/8" diameter
Main u/c 14 s.w.g.
Scale wheel 1 1/4"
Nose u/c 14 s.w.g.
Bind and solder
Scale tailplane outline
Scrap balsa
fairing
1/8" dowel
Paint windows
Black
Keilkraft 1 1/4"
spinner
Pack 3 8 B.A. washers
under front bolt for
side thrust
A.S. 55 shown
1/4" x 3/8" bearers
7" x 4"
propeller
If down thrust is
needed drill holes
oversize
Trim line
Drill holes then
bind and sew
ORANGE
DAYGLO ORANGE
CREAM
BLACK
LIGHT BLUE

Aermacchi - Lockheed SANTA MARIA



BOOK REVIEWS

Italian Air Force History

*STORIA DELGI AEREI D'ITALIA by G. Bignozzi and B. Catalanotto, published by Editrice Cielo Roma, price in Italy L.*1200. Surprisingly little is known about the Italian Air Force and it is particularly pleasant for us to most thoroughly recommend this 254 page paperback, which covers every type in Italian Service over the 50 years 1911—1961. Giorgio Bignozzi is renowned for his adherence to accuracy. In consequence the illustrations are of intriguing standard and all the miniature 3-view drawings much more detailed than those ordinarily published in so small a format. For the model maker, there will be inevitable regrets at the lack of cross-sections. Perhaps one can hope one day for a luxury edition of enlarged proportions, but for the moment this little volume is, to us, a most invaluable acquisition, giving as it does reference to types of which we were not aware as well as providing a fascinating series of pictures. Though printed in the Italian language, this will be no handicap for the ardent aviation enthusiast, the price is a mere equivalent of 13s. 6d.

U.S. Forces History

U.S. MILITARY AIRCRAFT SINCE 1909 by F. G. Swanborough and P. M. Bowers, Putnam, 84s. What a subject to cover! Since the day the U.S. army purchased a Wright Biplane, the United States military aeroplanes have been produced in such variety and numbers that it would scarcely seem possible for one volume to contain adequate information on each type. Yet through the industry of Gordon Swanborough, aided by Peter Bowers and skilled 3-view artists, this 596 page book does indeed fully justify the comprehensive title. Each type, Army, Navy and Air Force or Marine is given a potted history, technical data table and 139 of them have general arrangement drawings. There are 554 photographs, including such rare sights as a Curtiss Jenny with a target glider mounted above the upper wing centre-section, a tricycle undercarriage conversion of the Douglas BT-2 made as a radio controlled target plane in 1940, the first jet bomber—the Douglas XB43, and aircraft with novel markings such as a repossessed Vultee Vengeance with U.S. star and R.A.F. serial number. For the historian and the model maker this is a full 4 guineas worth of reference material. Something to have on the shelf for interesting reading during leisure moments, or to settle argument and perhaps verify facts which ageing memories tend to confuse. There is a section on colouring and markings which we would have preferred to see enlarged to include drawings of the various national insignia changes; but even so, the detailed description covers the many phases and also explains, for the first time to our knowledge, the use of all-Orange Bell P-63 King Cobras as manned targets for frangible machine-gun pilot attacks.

Sample page from Len Morgan's Mustang monograph, reviewed previously.

Rocketry

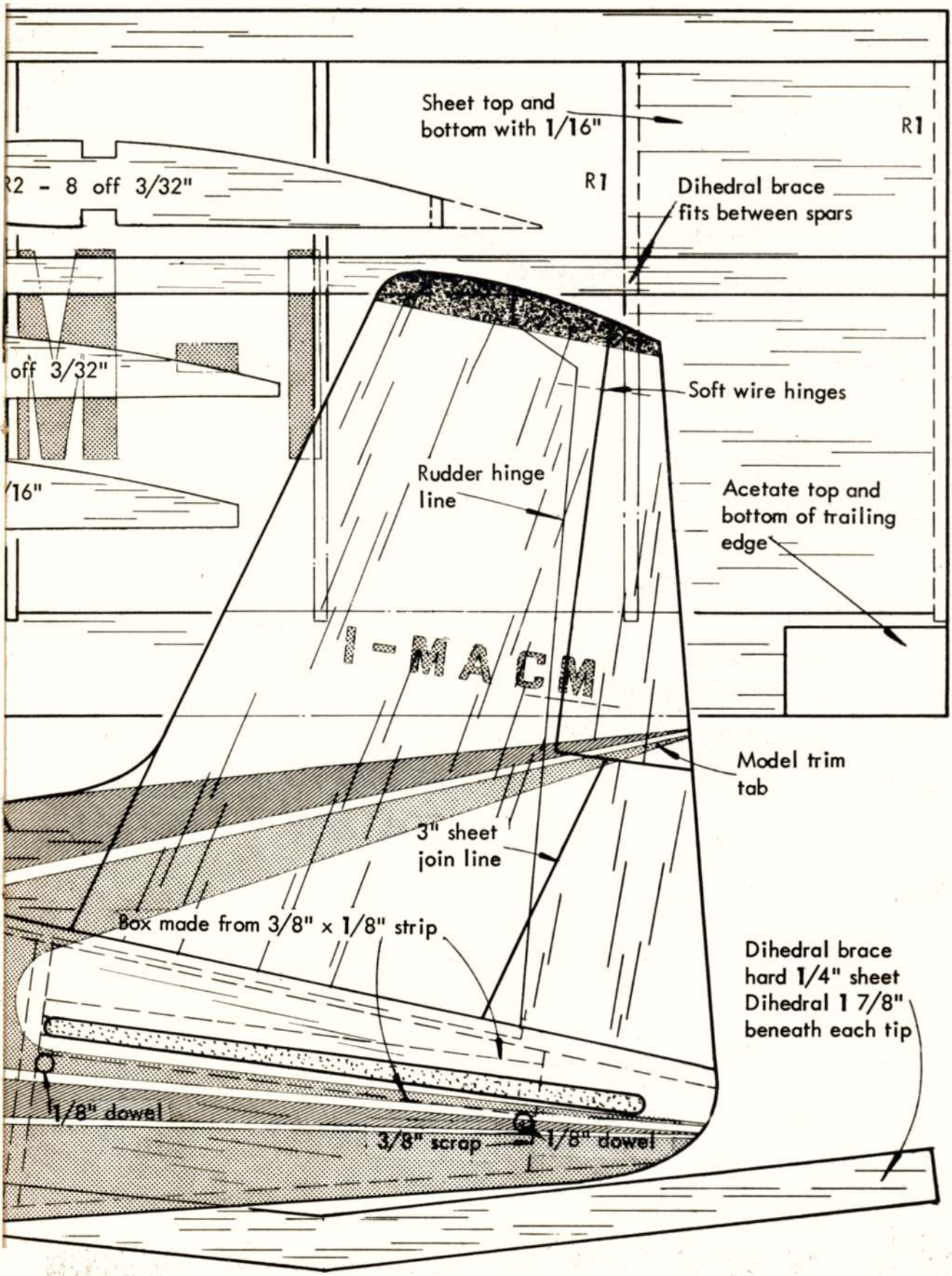
ROCKET FIGHTER by Mano Ziegler, MacDonald, 25s. This first-hand account by one of the test and operational pilots of the famous Messerschmitt Me163 Komet, is a translation of a German edition. For that reason, one can excuse those sections which to the British reader tend to be over dramatised. A fine collection of four dozen photographs help to convey the spirit of adventure and the element of risk which is so emphasised in the text. One is tempted to reflect on the purpose of the machine and its use as a defensive weapon. As the first rocket fighter, the Me163 was pioneering not only with a new form of propulsion but also with aerodynamics which were later to influence subsequent British and American designs. The risk to the volunteer pilots was enormous and yet one is given the impression that those who flew the Me163 would have chosen no other. Drawings illustrate the development from the original DFS 194 glider to the final Me163C and a tone drawing illustrates a typical Me163Ba-1. It is significant to note that the designer, Lippisch, who was responsible for the 163, went on to work in the U.S.A. and continued his development with Convair.

D.C.R.C. Symposium

TECHNICAL SYMPOSIUM ON RADIO CONTROL published by Academy of Model Aeronautics, price $2.25 *inc. postage.* The sixth annual lecture assembly of the District of Columbia R/C Club was held May 18/19th, 1963 at Johns Hopkins Laboratories, Washington D.C. As usual, the lectures were delivered by renowned exponents in the radio control sections of the hobby and this 58 page book contains a full transcription together with reproductions of diagrams. Opening with a most revealing account of how balsa is grown and obtained from Equadorian forests, in which S. Greenhouse explains why balsa is so light and why it should vary so much in density, we proceed to development of the Pullen proportional system described by Phil Kraft; thermal aspects of colour by Ed. Lorenz, in which orange is shown to be a useful pigment for model colouring; practical advice on shock and vibration in radio models; use of epoxy paint finish by Beverley Smith and finally, an outline of competition design development by world champion Tom Brett. The book concludes with a synopsis of all radio control features published in the three major American modelling magazines. It can be obtained direct from the A.M.A., 1025 Connecticut Avenue, Washington D.C.

Layman's Guide

MODERN AEROMODELLING by R. G. Moulton, Faber & Faber, 18*s.* An earnest attempt to portray the hobby of aeromodelling to the uninitiated layman is conveyed by our own editor, Ron Moulton, in this 164 page book with 50 diagrams and 16 well chosen photographs. Each of the principal facets of the hobby is described in terms which convey hints and tips to the novice and offer tempting prospects for those who progress with the hobby. It will be a specially useful reference on library shelves and for younger folk. Every hackneyed question seems to be adequately answered from "How do you Cover it, Cut it or Mould it," through to "why do they fly and what is Microfilm?" Just the type of book to recommend as a stimulant for anyone with the slightest interest in aeromodelling.


Sheet top and bottom with 1/16"
R1
R1
R2 - 8 off 3/32"
Dihedral brace fits between spars
off 3/32"
Soft wire hinges
/16"
Rudder hinge line
Acetate top and bottom of trailing edge
I-MACM
Model trim tab
3" sheet join line
Box made from 3/8" x 1/8" strip
Dihedral brace hard 1/4" sheet
Dihedral 1 7/8" beneath each tip
1/8" dowel
3/8" scrap
1/8" dowel

AERO MODELLER

Most detailed free-flight scale model plans in A.P.S. for this 1/9th, 45″ span model to suit 1·5 - 2·5cc.

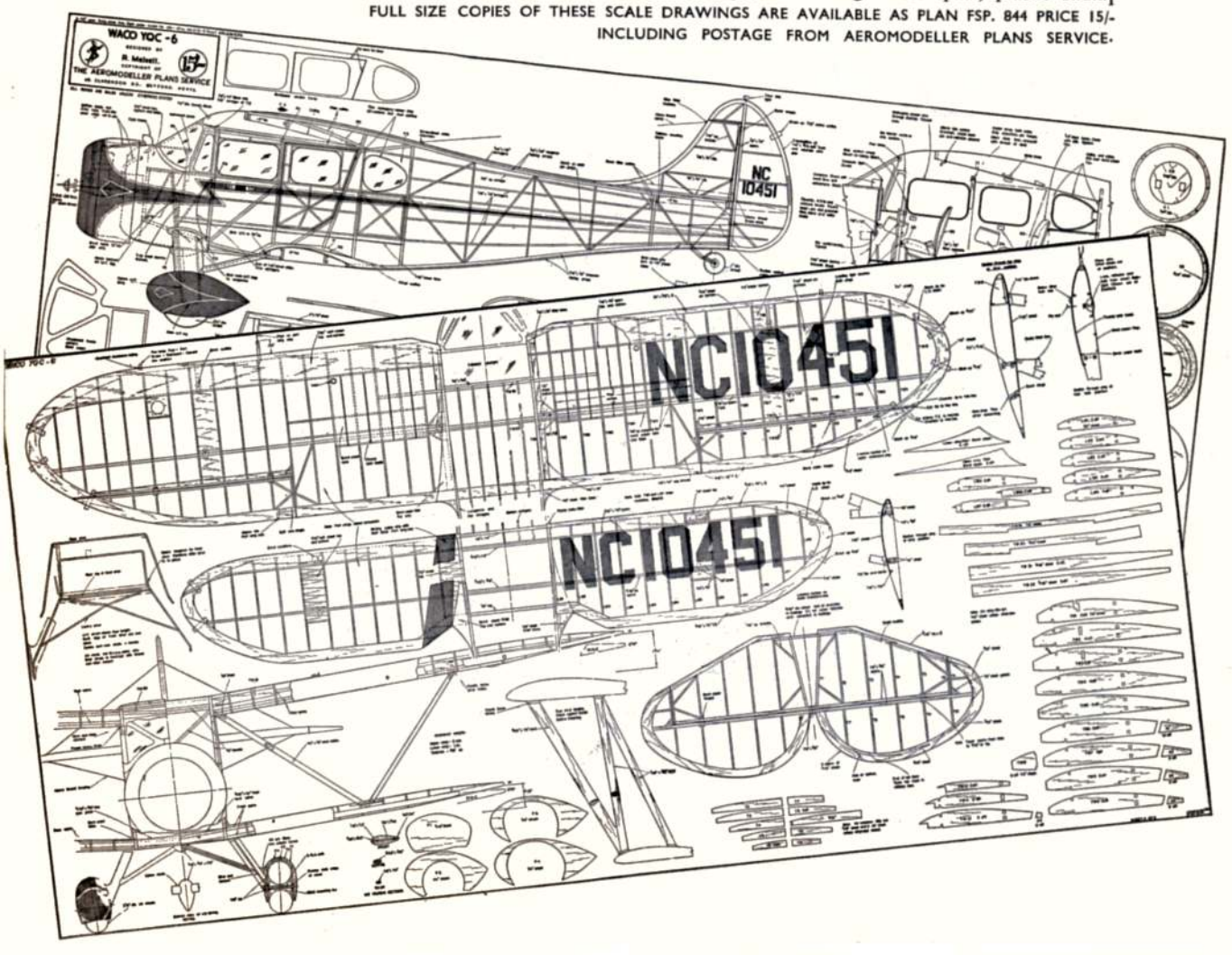
by Richard Meixell

THIS WACO YQC-6 biplane is a most fortunate combination of good looks and flight performance with ample opportunity for scale detail work. Dick Meixell's prototype has been a great centre of attraction wherever it has appeared—especially at the 1962 U.S.A. National Championships. It is a model of the 1936 Waco Custom Cabin biplane—a cleaned up and refined version of the first Waco cabin bipe with larger tail moment arm, a smaller cowling and no shoulder fillets on the landing gear. In the designation YQC-6, the "Y" refers to the engine, "Q" the wing design, "C" denotes Custom Cabin and "6" is the model year, 1936. Five passengers could be carried at 140 m.p.h. cruising speed for 500 miles on 225 h.p.

This model features padded seats, cloth upholstery, hardwood veneer trim, a dummy radial engine and scale structure. About ¼ inch has been added to the tail outline and the dihedral increased 1½ deg. As modified, longitudinal stability is satisfactory, but lateral stability is somewhat borderline when flown in a wind. Consequently any amount the builder cares to increase the dihedral from scale will increase stability, but at the cost of scale fidelity. This is the choice always forced on a scale model builder. Heavy wheels also give a built in pendulum effect.

Take-offs are long, shallow and realistic at 27 ozs. weight. Climb with a moderate .09 engine is at a shallow angle with the model looking like the real 'plane climbing out of the aerodrome. The glide is not slow; but is safe. All possible details are included on the model, and the plan. Large windows and skylight allow the interior to shown to the best advantage. Weight reduction can be accomplished by using tissue instead of silk, fewer coats of dope, eliminating wheel spats, plastic radial

FULL SIZE COPIES OF THESE SCALE DRAWINGS ARE AVAILABLE AS PLAN FSP. 844 PRICE 15/- INCLUDING POSTAGE FROM AEROMODELLER PLANS SERVICE.



engine, fillets, moveable control surfaces, external details, hardwood veneer trim, etc.

The large size model (1⅛ in. = 1 ft. for this Waco) always gives a more impressive appearance than a smaller plane, gives more latitude for scale detailing, has larger wheels for easier take-offs, is easier to build, and is more stable in a wind. The designer has never felt the need for detachable wings. One piece models are lighter and better looking with no split lines, hooks, elastic bands, etc., to spoil the appearance. The model is shown as a 'one-piece' job, though detachable wings could be devised.

Wing structure has proven to be light and amply strong. With firm struts one has a practically unbreakable and a warp-proof assembly. The type of strut bracing shown is lighter and stronger than the single heavy rib system and transfers stresses to where they belong. Dihedral braces are set up for 4½ deg. Add dihedral before L.E. sheeting. Check the entire tip area for a smooth taper from the full depth ribs out to the tip, chordwise and spanwise. Carve the tips to conform to this taper. Leading edge sheeting should be quite soft with the close rib spacing used. At final sanding, round edges of *every* piece that will contact the covering, including *both* sides of every rib and front of T.E. and rear of sheeting. Then clear dope, sand smooth, and clear dope again. This applies to the framework of the entire model. Wings must be assembled to the fuselage before covering.

Use bond (stiff writing or cartridge) paper to simulate flaps and fuel tanks after covering has been clear doped. Add dummy ribs to tank and cover with tissue.

Tail surfaces are conventional except for the mounting and the laminated rudder outline. Build the tailplane in the usual manner but do not cover. Mount on the covered fuselage with the fairing in place and add 3/32 dowel through the fairing opening. Dope all visible structure silver. Do not cover the gap between tailplane and fuselage. The laminated rudder outline is made of soaked strips of 1/16 by 3/16 saturated with glue. This system could be used on the elevator if desired. Incidentally, the C-6 was the first Waco to use an airfoil section on the tailplane.

The fuselage is the usual box frame with a fairing. 1/16 by 1/8 longeron fairings are a must on all scale models since it keeps the crosspieces from showing and blends in with the nose sheeting. Main consideration is the building sequence which should be as follows; basic box, centre bulkheads, engine mounts and landing gear struts, remaining bulkheads, sub cowl, bond cabin interior except for ceiling, hardwood veneer trim, side stringers, fuselage sheeting, hinge doors, add upper wing, cabin ceiling, mount lower wing, tail wheel, upper and lower stringers, sand and clear dope structure, shellac hardwood trim, finish interior, cover fuselage and wings, add wing and landing gear struts and fillets, add covered fin, fin fillet and tailplane fairings, and then uncovered tail. Cover tailplane, mount rudder, elevators, and ailerons after doping. Add fillets over covering but before doping to simulate real 'plane construction. Finally, add celluloid windows and bond frames. Mask the windows during doping.

Best approach to the engine is to build up a *Monogram* "Wright Whirlwind"! Omit entire rear section and cut away other parts to clear engine used and its mounts. Screw the radial to a plywood plate and glue to sub cowl. Wrap the two layers of 3/32 sheet over the cylinder heads. When dry slide off. After doping, the cowl will shrink a little. This pressure is all that is needed to hold the cowling on.

The landing gear is rugged enough for control line use but relatively light. A bolt and blind mounting nut provides a good detachable axle. The real Waco could be purchased without wheel spats and this version would be the better choice for a sport model. Check wheel track and spat clearance carefully. The struts do not flex so moulded fillets can be used with no danger of cracking.

Black and white photographs cannot do justice to the excellent scale effect on Dick Meixell's prototype model. See colour cover inset for the red and gold scheme. Original model used K & B .09 Torpedo 1.6 cc. glow engine

On the interior, use bond paper with silk covering for walls and ceiling. Do not dope silk. Clothing dye may be used. Shave the hairs of some carpeting down to a realistic height with an electric razor for the floor.

Strikingly realistic, the model is fully equipped with interior furnishing, fuel tank fillers, vents, etc., in fact every possible scale detail as shown on the full-size, two sheet A.P.S. plan

Use heavy black thread at all the joints for trim. Seats are soft and inviting when upholstered with ¼ in. foam and covered with silk. Glue on silk and try to hide the seams.

Scale model builders must be constantly on the lookout for useable items. For instance, the safety belts are ladies' lingerie straps, but don't be hasty—one can

continued on page 402

Opened door on Dick Meixell's model illustrates some of the seating, whilst light reflection shows the magnificent colour finish on this, the most detailed scale model yet to be included in AEROMODELLER Plans Service. Truly a masterpiece which deserves good craftsmanship

Readers' Letters

Sting in the Wing

DEAR SIR,

While reading through my old edition of AEROMODELLER I came across a very interesting letter entitled "Mysteries" and would like to tell you of an incident which happened to me last summer.

My Aeronca Sedan fuselage was propped up in my bedroom and my window had been open for some days when I noticed a wasp entering the wing dowel tubes. On investigation I found the beginnings of a wasp's next in the paxoline tube.

R. SMITH.

Uttoxeter, Staffs.

Showing the flag

DEAR SIR,

Don't get me wrong, I'm not decrying all contest types, as I enjoy all free flight branches of the hobby myself. My main criticism is aimed at the "combat only" brigade. Whilst I realise that these shapeless little so called "wings" give a small amount of pleasure to some people, they don't project a very good image of the movement in general when flown at public displays at garden fetes, etc.; especially when used without streamers in a hap-hazard fashion, as so often happens. In comparison, just bring out an immaculate stunter and put a couple of concours scale jobs on the static display and then hear the praise come rolling in. This is what we want, good public relations at all times, to help with the flying field situation for one thing, and in my opinion scale models have a major part to play in this.

I think that scale models will become more popular in the next few years in both free flight and control line as well as radio control and this will mean providing extra scale competitions at our rallies, a point which many organisers ignore completely. By the way, I'd like to know what has happened to the Eddie Riding Memorial contests, which were a highlight of the excellent Woodford Rallies in the N.W. Area (now transferred to Tern Hill Aerodrome). If it is a lack of volunteer contest helpers, here's one person only too willing to help organise and run a scale comp.

P. H. GOULD.

Stoke-on-Trent. *P.R.O. Five Towns M.A.C.*

Backnumber value

DEAR SIR,

Thanks to your Advertisement columns I have obtained the two 1946 issues of your magazine that I required at very reasonable cost (2s. each).

I also had the enclosed offer from another source which you may find interesting. Now we all know that AEROMODELLER is worth its weight in gold but really!

J. S. E. PEARSON.

Kingston-on-Thames.

The enclosed letter:—

I noted your advert in the AEROMODELLER magazine. I have both copies of the magazine dated March and April 1946 they are in first class condition and I would sell the two for £3.

(*Coo! at that rate we could retire on the sale of our office files!—Ed.*).

English Channel Bid

DEAR SIR,

Later this summer Mr. Ronald Miles, of Ashton in Makerfield, Lancashire, plans to be the first Lancashire man to fly a radio-controlled model aircraft across the English Channel.

Mr. Miles, a sports shop manager, is also a teacher of aeromodelling at the Newton le Willows Boys club, and is receiving valuable assistance from the Boys Club Leader Mr. Ken Dibble and Mr. Ronald Stockley, of Haydock. If he and his colleagues achieve their object they would be the first Lancashire men to do so.

During the attempt Mr. Miles plans to hire a boat to make the Channel crossing, and hopes to be in constant contact by radio with the model to ensure its return.

A. V. STEPHENS.

Wavertree, Liverpool.

LOCKHEED 'SANTA MARIA' *continued from page 395*

Leaving our prototype Nats-wind grounded model in a car in the hot sun induced a considerable warp in the starboard wing, and first flights had this handicap to overcome. However, once the warp was removed the model became completely docile and very easy to trim. Balance on the front edge of the mainspar (a little ballast would be better than adjusting the surfaces, though the prototype was exactly right), and check that there are no warps, that the surfaces are square, and that you have remembered the washers under the front engine bolts to give right sidethrust. Check glide, then put on slight right rudder tab and launch with engine runnihg slow. Remember that a profile model of this configuration does not like tight left turns, and you should experience no difficulty whatsoever. It is better to kill looping tendencies with more right thrust rather than excessive downthrust. And don't forget your name and address—this model really goes!

WACO YQC-6 *continued from page 401*

buy these straps at Woolworth's! Instrument dials and placards can be obtained by taking a photograph of a real planes' panel and enlarging the picture. The average instrument dial is 3 inches in diameter (.333 inch for this model). The effect of the sandwiched instrument panel is realistic. Orange shellac, rather than dope, the hardwood veneer and the finished cabin will even smell like the real plane!

After the entire structure has two coats of clear dope, cover entire model with silk except tail and ailerons which are paper covered to avoid warps. The original model had approximately seven coats of clear dope, one coat cream, and six coats colour. Tail and ailerons only had four clear, one cream, and four coats of colour. The cream dope proved to be the answer to getting full even coverage with light colours. With this method, white will cover red with only one coat of cream between.

Dope the trim colour over the background with the dividing line under where the pin stripe will be. Now use long strips of transfer for the pin stripe and you have a fine looking job.

Flight trim is easy. The most important point is to keep power low so the model barely climbs. Keep the trim wide in both climb and glide. Eliminate any warps and adjust any major trim difficulties with the moveable controls. However, do not change angular difference with elevators—use Plasticine ballast to shift the C.G. for best glide angle. Now glue all control surfaces firmly in place for they have far too much area for fine trim adjustments. Make final corrections with engine offset.

You'll like your model as well as the designer. Its rugged but clean lines, luxurious cabin and stable flight characteristics give one a strong feeling of why this plane was so popular with sportsman pilots back in 1936.

F.A.I. Power Contest design

STUDENTS OF F.A.I. power model design will recognise many general similarities between this interesting Californian design and that by John West, published last month. Proportions are very close, apart from a longer nose moment for the upright Cox Special in this model, and a thinner tailplane airfoil of the now familiar sharp entry, flat base pattern. Constructionally, the *Saturn* is more intricate with particular attention to the wing, and its fin is attached to the tailplane upper surface. Note the completely sheeted tailplane and sheet covering of the upper wing surface, clearly calling for careful selection of contest grade balsa wood. Airfoils are given actual size since they are of popular chord length and will probably be most useful to many wishing to try this kind of section. The engine is mounted in a cast pan which mounts radially on the forward bulkhead of the fuselage. This provides a tough nose cone with good protection for the power unit and also carries the strong spring wire skid for landing.

reproduced from "SCATTER"

MK III SATURN

BY CRAIG CUSICK

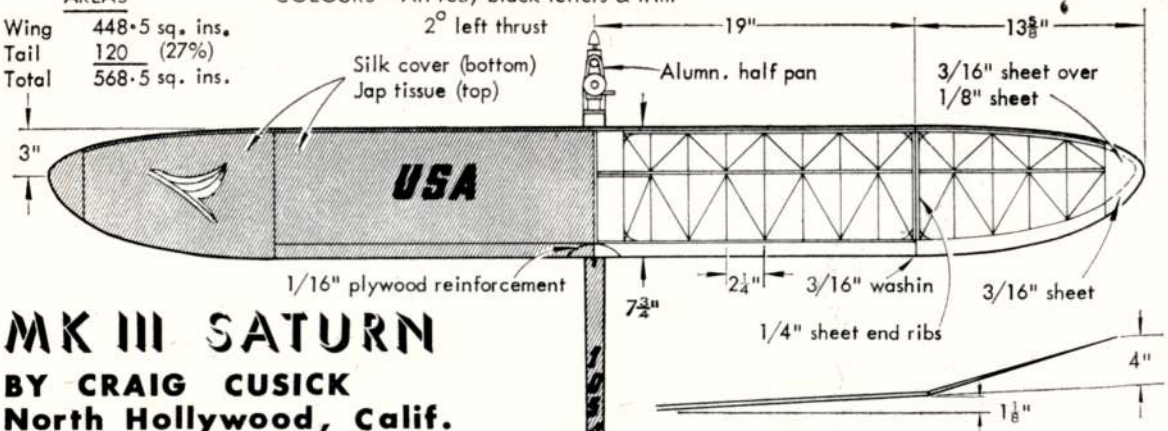
North Hollywood, Calif.

Power – Cox Special, Tornado 8 x 4 nylon
17,700 1¼ turns, 10 seconds, right – right pattern

AREAS

Wing	448·5 sq. ins.	
Tail	120	(27%)
Total	568·5 sq. ins.	

COLOURS – All red, black letters & trim



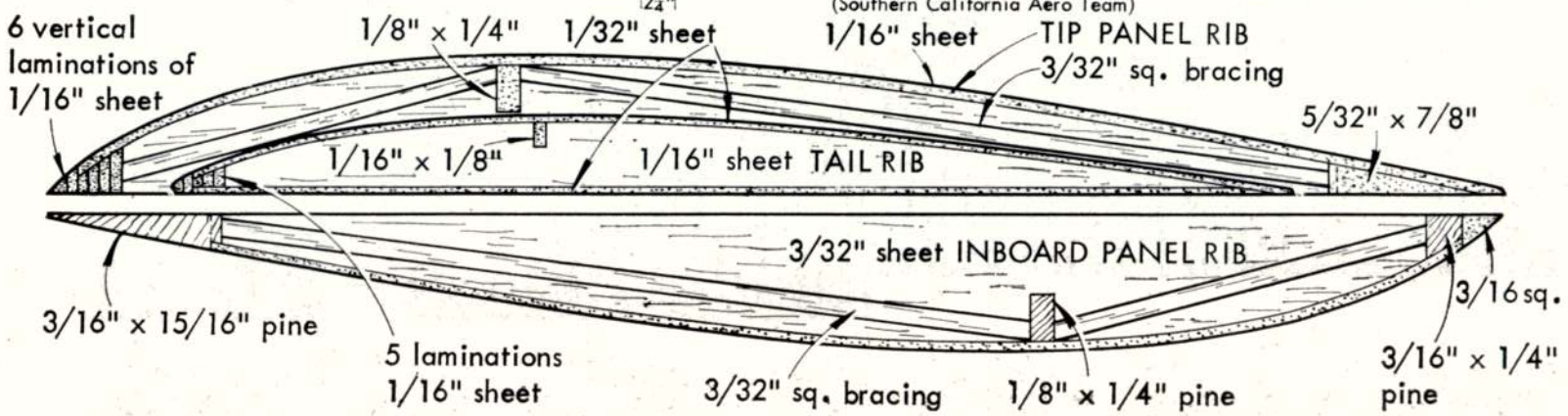
FUSELAGE

3/16" sides, 1/4" top & bottom
3/8" triangular longerons,
tapered to 1/4" triangle
Elliptical cross section
Silk covered clear epoxy
sprayed for fuel proofing

WEIGHTS

Wing	6·75 oz.
Tail & fin	1·38 oz.
Fuse., mount, skid	12·21 oz.
Engine & prop.	4·85 oz.
Timers	1·13 oz.
	26·32 oz.

from "SCATTER"
(Southern California Aero Team)



GADGET REVIEW

ALL MODELLERS LIKE to exercise their skills in gadgetry to improve their hobby standards and these ideas will certainly go a long way to helping you, with aeromodelling. They'll save money too, as for example with our first gadget.

It is a fuel shut-off made from an Autoknips camera timer shown in **A**, comes from Des Charge of Gravesend. First modification is to remove the pressed casing over the clockwork motor, the rack and switch. Replace the case with one made from sheet tin. Then a brass face plate is made with two lug extensions to dimensions as shown. The lugs are then rolled to act as a holder for the neoprene fuel line, and as a bearing for the "on-off" pin, which goes through a hole in the face plate, and causes a stop through gear interference. The existing indicator arm is then re-formed as shown and a 16 s.w.g. piano wire pinch arm soldered to the underside to cut off the fuel supply by pressure on the neoprene. A circular graduation in seconds on the faceplate completes a very accurate and reliable timer.

B shows an adjustable test bed, made from a wooden base board, drilled to take one fixed hinge, and with a slot for an adjustable hinge, also a cut-away for crankcase clearance. The hinges are normal household door types, and should be firmly held with bolts and wing nuts. The tank block is made to suit the engine being tested in order to get the tank on the correct level. Hold tank by means of rubber bands passing through the two screw hooks. This simple test block comes from a Finnish modeller who had it published in "Ilmailu" magazine.

The rib slotting gadget shown in **C** comes from D. Wiseman of York. Place hacksaw blades side by side until you have the required thickness of cut then clamp in the vice, making sure you also have the correct depth setting above the vice jaws. A sideways movement will then slot the ribs with ease. Use a fine tooth saw to avoid splitting the grain.

A cheap and effective silencer for diesels is shown in **D** and comes from R. Furness of Coventry. Exhaust stacks for an E.D. 2.46 diesel are made from a Dunlop cycle repair outfit tin. After the paint has been removed, cut the ends off as shown, to make a circular form to fit around the engine. Then reduce the height of the tin lid to a close fit on the exhaust stacks. Place the tin on the exhaust stack and solder all joints to get a tight fit. Remove stacks from engine and drill a $\frac{1}{4}$ in. hole in each to take the tinplate pipes as shown, then solder them in. Then put the stacks on the engine and solder a strip of 18 s.w.g. copper wire across the two. Break the copper wire midway between the stacks and solder again to give a weak spot that makes the stacks more easily removable as it takes less heat to solder the copper wires together than it does to solder the copper wire to the tin plate stacks.

How to use the tops off old transistor radio batteries is shown in **E** by D. Rattle of Brockworth. The first suggestion is to use it as a plug and socket on the side of a model where a glowplug engine maybe hard to get at. Fix the battery top on the outside of the fuselage and lead two wires off, one to the glowplug, the other to the crankcase bolts. So making a circuit for the glowplug. Another use for these tops is that of cowl fasteners. Bolt one in the removeable cowl and one in the fuselage as shown in the sketch. Press cowl on and it's fixed. For the ground connection, a finger grip should be fitted, made out of an insulated material with a clearance hole drilled around the connection points.

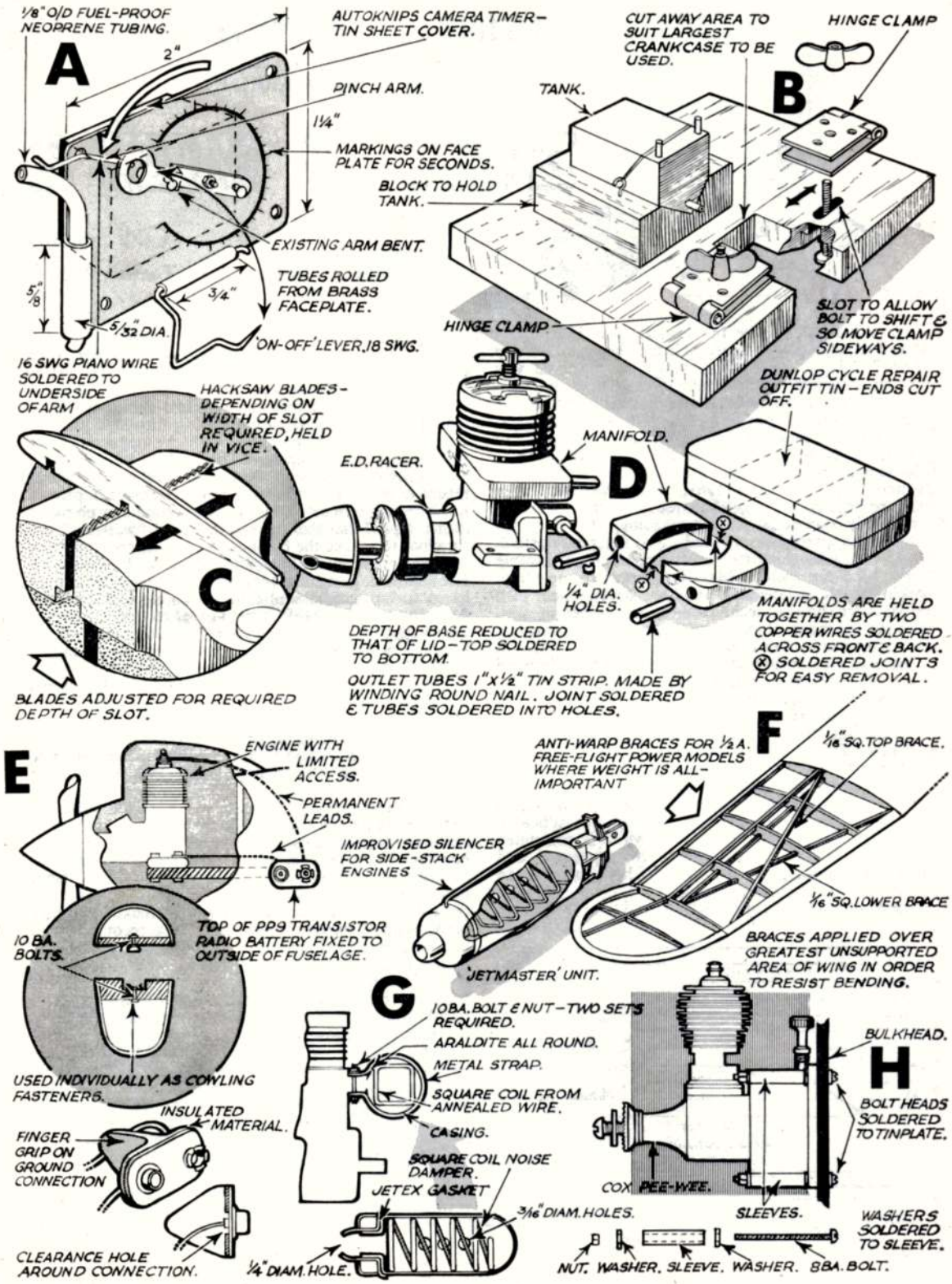
F shows a method of anti-warp bracing for $\frac{1}{2}$A Power models where weight is all important, sent in by G. Wraige of Heswall. The braces are 1/16 in. square balsa and they are applied over the greatest unsupported area in the wing. It also makes the wing very rigid though not crashproof, but it does stop those warps.

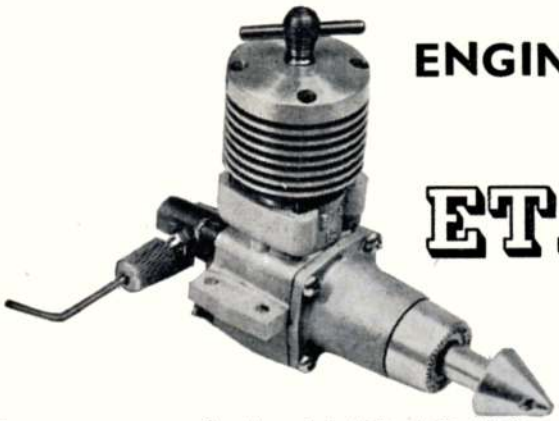
Yet another silencer shown in **G** by H. Quek whose "Flying Tiger" and "Red Dragon" were featured last month. The body is a worn *Jetmaster* unit held to the engine by a metal strap with two 10 B.A. bolts as shown. The Jetmaster unit has three 3/16 inches dia. holes drilled in the side to take exhaust and the nozzle opened out to $\frac{1}{4}$ in. dia. The square coil noise damper is bent from annealed wire and fitted in as shown. The three holes drilled in the Jetmaster must fall inside the exhaust port area, also the Jextex gasket must be used where shown to act as a seal.

Cox Pee Wee engine mounting tip in **H** comes from S. Blake of Luton. The purpose is to stop the nuts on the mounting bolts fouling the tank as these earlier Cox engines were not made for B.A. sizes. Answer is to use longer bolts and spacer tubes. First, solder the bolt heads to a tin plate strip behind the bulkhead to stop them turning. Then file a flat on the 8 B.A. washers so that they seat flush without touching the tank. Sleeves should be of thick walled tubing as they will be taking all the nut compression load. Put another washer on, then a nut, which you can now get to without difficulty.

Finally, here is a simple one which needs no illustration and has a variety of purposes, although J. N. Wilkins of Bishops Stortford suggests it as an auto rudder trigger. Simply take a plain safety pin, large size, and cut away the point and whatever length is not required on the arm with the hook. You can use it as a spring for setting the rudder, as a cowling fastener, or as on Mr. Wilkins' *Aiglet* glider, with a $\frac{1}{8}$ in. dowel through the wire loop, it makes an ideal pendant rudder trigger. As the young lady said when the elastic snapped—"There is many a good use for a safety pin".

Eureka! I've just mixed the ULTIMATE in fuel!


A
1/8" O/D FUEL-PROOF NEOPRENE TUBING.
2"
AUTOKNIPS CAMERA TIMER – TIN SHEET COVER.
PINCH ARM.
1¼"
MARKINGS ON FACE PLATE FOR SECONDS.
EXISTING ARM BENT.
TUBES ROLLED FROM BRASS FACEPLATE.
5/8"
3/4"
5/32" DIA.
'ON-OFF' LEVER, 18 SWG.
16 SWG PIANO WIRE SOLDERED TO UNDERSIDE OF ARM
B
CUT AWAY AREA TO SUIT LARGEST CRANKCASE TO BE USED.
HINGE CLAMP
TANK.
BLOCK TO HOLD TANK.
HINGE CLAMP
SLOT TO ALLOW BOLT TO SHIFT & SO MOVE CLAMP SIDEWAYS.
C
HACKSAW BLADES – DEPENDING ON WIDTH OF SLOT REQUIRED, HELD IN VICE.
BLADES ADJUSTED FOR REQUIRED DEPTH OF SLOT.
D
E.D. RACER.
MANIFOLD.
DUNLOP CYCLE REPAIR OUTFIT TIN – ENDS CUT OFF.
¼" DIA. HOLES.
DEPTH OF BASE REDUCED TO THAT OF LID – TOP SOLDERED TO BOTTOM.
OUTLET TUBES 1" x ½" TIN STRIP. MADE BY WINDING ROUND NAIL. JOINT SOLDERED & TUBES SOLDERED INTO HOLES.
MANIFOLDS ARE HELD TOGETHER BY TWO COPPER WIRES SOLDERED ACROSS FRONT & BACK.
Ⓧ SOLDERED JOINTS FOR EASY REMOVAL.
E
ENGINE WITH LIMITED ACCESS.
PERMANENT LEADS.
IMPROVISED SILENCER FOR SIDE-STACK ENGINES
TOP OF PP9 TRANSISTOR RADIO BATTERY FIXED TO OUTSIDE OF FUSELAGE.
10 BA. BOLTS.
USED INDIVIDUALLY AS COWLING FASTENERS.
INSULATED MATERIAL.
FINGER GRIP ON GROUND CONNECTION
CLEARANCE HOLE AROUND CONNECTION.
F
ANTI-WARP BRACES FOR ½A. FREE-FLIGHT POWER MODELS WHERE WEIGHT IS ALL-IMPORTANT
1/16" SQ. TOP BRACE.
1/16" SQ. LOWER BRACE
BRACES APPLIED OVER GREATEST UNSUPPORTED AREA OF WING IN ORDER TO RESIST BENDING.
'JETMASTER' UNIT.
G
10 BA. BOLT & NUT – TWO SETS REQUIRED.
ARALDITE ALL ROUND.
METAL STRAP.
SQUARE COIL FROM ANNEALED WIRE.
CASING.
SQUARE COIL NOISE DAMPER.
JETEX GASKET
3/16" DIAM. HOLES.
¼" DIAM. HOLE.
H
BULKHEAD.
BOLT HEADS SOLDERED TO TINPLATE.
COX PEE-WEE.
SLEEVES.
WASHERS SOLDERED TO SLEEVE.
NUT. WASHER. SLEEVE. WASHER. 8BA. BOLT.



ENGINE ANALYSIS No. 112

By R. H WARRING

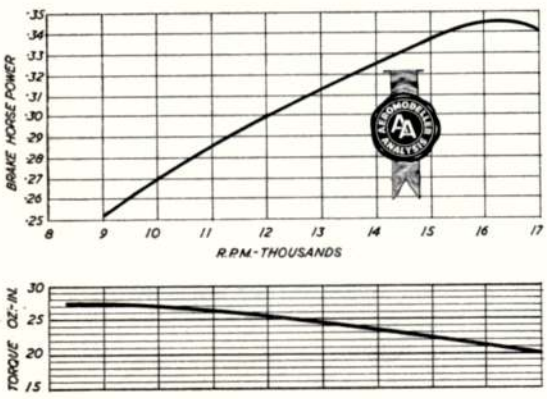
ETA 15 MK. 2

Improved version of the popular 2·5cc diesel for Team Racing

OUR TEST FIGURES for the original Eta 15D (1960) showed a peak power figure at least the equal of any "tuned" 2.5 c.c. competitor, which at the time was received with a certain amount of scepticism in some quarters who still fancied other makes as "unbeatable". There was, however, one fly in the ointment, so to speak. Not all production '15's' came up to the same high standard of performance and so the type did not establish the mastery which it seemed to promise at the time. By about the middle of 1962, however, a very high standard of consistency had been obtained and—particularly significant for team racing—the fuel consumption appreciably reduced. Any standard stock Eta 15 engine by this time had the capability of beating "tuned" 2.5 c.c. diesels. Mainly this was the result of working to closer tolerances and the development of a special bore honing technique—each engine, in fact, receiving a more than usual amount of individual attention, even by Eta standards.

These subtle improvements have been carried forward to the Mark II, plus a completely redesigned front end. The new front bearing is longer internally and cleaner in appearance, as well as being more rigid—and rigidity is a very important factor in achieving maximum performance. This, together with the pointed spinner nut are the only external differences but the extreme consistency shown by standard production models virtually ensures each and every customer a "tuned" performance. This has been obtained at the expense of an increase in retail price of only 18s. 4d. (part of which is accounted for by rises in material and labour costs anyway), and the weight has crept up a matter of half an ounce to 6¼ ounces.

The typical contest enthusiast will find the Eta Mark II faster than the original "15", very consistent in performance and very easy to handle. For a "racing" type engine, in fact, the handling characteristics are extraordinarily good. Within a month or so of its introduction it seems to have become the standard choice for team racing with a capability of achieving fifty laps plus, at speeds of 90 m.p.h. or more, with the opportunity to "adjust" speed and lappage. This is done by the fitting of a spraybar in place of the normal wall orifice, which results in an immediate loss of speed but a much improved fuel consumption since the mixture setting can be made leaner. Speed can then be recovered by "waisting" the spraybar to reduce the blanking area of its cross section, fuel consumption then starting to rise again. Trial and error with a particular model then enables maximum speed to be realised whilst still retaining that essential fifty-plus lappage. Most people seem to end up with a set of spray bars (the manufacturer's call them "range bars") with different amounts of "waisting" for changing on the field, according to conditions.

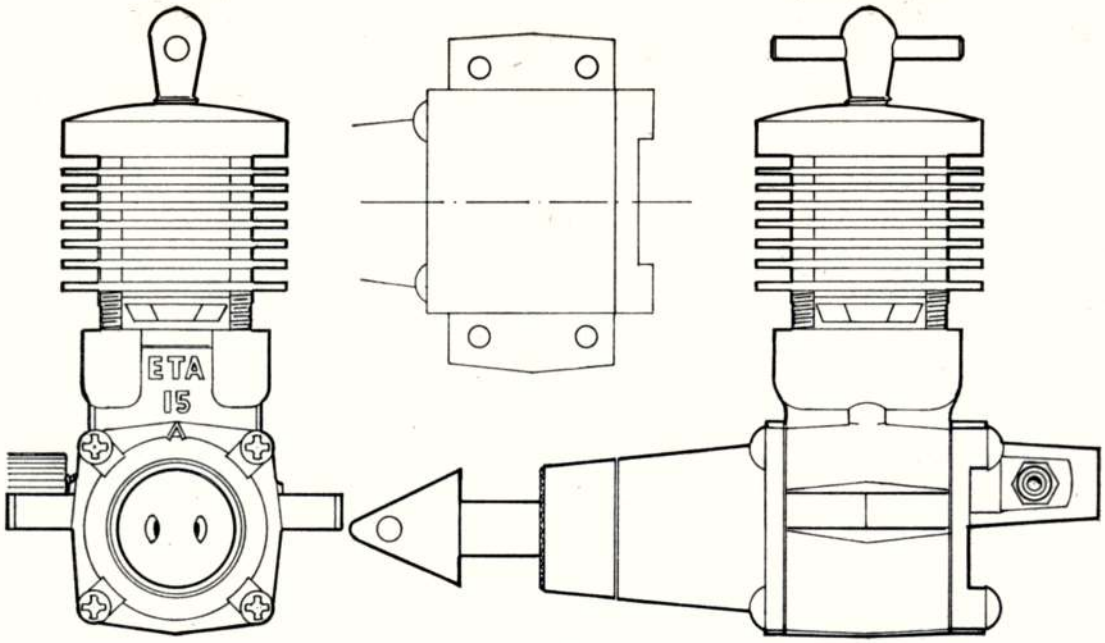


For free flight contest work—and again the Eta seems capable of beating any glow motor in this sphere—the standard wall orifice gives maximum performance, with peak power occurring at or just over 16,000 r.p.m. A 9 x 4 prop. slightly trimmed, seems about the right size here, and if you want that little bit extra, try playing about with the fuel mixture.

The Eta is one of those engines which is perfectly happy running on a fuel with a fairly low lubricant content—which means that you can increase the proportion of actual fuel in the mixture. The usual standard 30 per cent. lubricant can be decreased to 20 per cent. quite safely after the engine is run in. Reducing the ether proportion as well, however, does make for rather more difficult starting and is not to be recommended. All test running was done on a 50:30:20 paraffin; ether; castor mixture with approximately 3 per cent. amyl nitrate added, which appears to be about the best "contest" brew. The performance is not greatly up on a 40:30:30 mixture, but it could mean an extra m.p.h. or two on a team racer.

Dynamometer and prop. test figures on the mark II were very little different to the original model readings—a matter of only 100 r.p.m. or so in the region of 14-15,000. The peak B.H.P. figure of just under .35 horsepower was reached at 16,400, and maximum torque at about 8-9,000 r.p.m. On the field, however, the Mark II shows an improvement of about 5 m.p.h. over typical examples of the original Eta 15 in team racers.

Structurally the Eta Mark II retains the same crankcase casting, robust steel liner and parallel finned cylinder jacket of its predecessor. The liner, incidentally, is an investment casting in steel, the external transfer passages, four in number, being cast in together with a circumfer-



ential groove immediately below the exhaust flange. Exhaust ports are also formed in the casting. Apart from reducing the amount of finishing work a further virtue of integrally cast ports is that there is less risk of distorting the liner during subsequent machining operations. The liner is hardened and finished by grinding externally and honing internally. The latter appears to have been done on a "progressive" rather than an "in and out" basis.

The piston is of Meehanite (cast iron), well finished with a perfectly flat top and sharp edge. Connecting rod is machined from dural with a pressed in bronze big end bearing crimped at the ends. Considerable attention seems to be given to individual matching of piston and liner and the running fits are extremely close over the whole of the stroke.

The new front bearing housing is a clean pressure die casting which carries the rear (¼ in. heavy duty) and front ¼ in. small diameter) ball races. Again, these races have obviously been selected with considerable care. The plain casting length between the races does not appear to be relieved diametrically and thus probably acts as a further journal area.

Crankshaft diameter is relatively small (¼ in.) for a diesel of such power but the shaft is, of course, solid throughout and forged by a special process to give correct grain flow. Induction is via a rear rotary disc machined from Tufnol. The rear cover is a further pressure die casting with integral intake tube diverging to a venturi throat and then opening out to a large sector-shaped intake port equivalent to one quarter of the disc area. Fuel orifice and needle bush are screwed into each side of the intake tube at the throat (or replaced by a conventional spraybar assembly for improved fuel consumption). Both the front bearing unit and rear cover attached to the crankcase via four Phillips head screws, and both seal on impregnated paper gaskets.

Contra piston is Meehanite, quite deep and thick walled. The large diameter compression screw is hollow and compression adjustment just right for "feel". The bulbous top of this screw and the generous diameter tommy bar is also much more comfortable to handle than most other diesel compression controls. The finned cylinder jacket is machined from dural and virtually a "cylinder fit" over the liner—so much so that the compression seal makes it difficult to reassemble! The easy answer here is to take the compression screw right out.

Workmanship throughout is generally excellent, and especially where it matters most. The Eta Mark II in fact, is an exceptional engine. It is not mass produced to capture vast sales, nor for prestige. It is a genuine attempt to produce a contest 2.5 c.c. diesel with the best possible performance, and in this it undoubtedly succeeds, and a lot of development has gone into it in the matter of better materials and reduced tolerances, plus a strengthening up of the front end. Whilst this has not produced any spectacular improvement in performance over the original "15" it is undoubtedly a better engine all round. It is undoubtedly the outstanding contest type engine produced in commercial quantities in this country at the present time, equally at home for free flight or control line.

Data

Displacement: 2.5 c.c. (.152 cu. cm.)
Bore: .560 in.
Stroke: .620 in.
Bare weight: 6½ ounces
Max. power: .345 B.H.P. at 16.400
Max. torque: 27.5 ounce—inches at 9,000 r.p.m.
Power rating: .137 B.H.P. per c.c.
Power/weight ratio: .055 B.H.P. per ounce
Material Specification:
Crankcase: light alloy die casting
Front cover/bearing housing: light alloy pressure die casting
Rear cover: light alloy pressure die casting
Cylinder: hardened steel (investment casting)
Piston: Meehanite
Contra piston: Meehanite
Crankshaft: Forged alloy steel, hardened and ground
Bearings: ¼ in. Hoffman ball races (front and rear)
Propeller driver: turned dural, collet fitting
Cylinder jacket: turned dural, anodised light blue
Jet assembly: nickel plated brass. Nickel plated needle thimble, 'blued' spring steel ratchet lock
Compression screw: steel, chemically blacked
Spinner nut: turned dural
Manufacturers: ETA Instruments Ltd., 289 High Street, Watford.
Price: £5 15s. 0d. plus £1 1s. 7d. P.T.

Propeller/R.P.M.

Propeller	*R.P.M.*
9 x 4 Trucut	12,000
8 x 6 Trucut	11,500
8 x 4 Trucut	15,500
10 x 6 Frog	9,250
9 x 6 Frog	11,000
8 x 4 Frog	14,800
9 x 4 K-K	13,200
8 x 6 K-K	12,700
8 x 4 K-K	15,200
10 x 3½ Top Flite	10,500
9 x 6 Top Flite	9,900
9 x 4 Top Flite	12,300
8 x 6 Top Flite	12,400
8 x 4 Top Flite	15,500

Fuel: paraffin 50 per cent.
ether 30 per cent.
castor oil 20 per cent.
plus 3 per cent. amyl nitrate

½A (·8 cc.) power contests are gaining popularity —why not join the class with this event-winning 40″ design by K. COMAN?

"ZEUS" WAS DESIGNED to utilize a rather aged Frog '80' that was not earning its keep. Any .8 c.c. engine will do, providing the bearer holes are not drilled until the model is finished. Adjust engine position to give correct balance forward for light glow plug engines, and fit the timer behind the engine.

The design was based on a well tried and tested Open Power contest configuration. Well known construction methods are used because a good strength/weight ratio is essential for ½A. The aim has been for largest span compatible with a .8 c.c. engine and a maximum weight of 7 ozs. This was achieved in the prototype and the resulting performance was very impressive with an extremely fast climb, turning 2½ times and rolling smoothly off the top. The average duration has been 160 secs. in wind or calm, and maximums abundant. It has won several club competitions and won the ½A Power Contest at the R.A.F. Model Aircraft Association Annual Meeting. It is very robust, having flown over 200 times without needing repair. Wing section is based on a modified N.A.C.A. 6409 which, in conjunction with a large tailplane, gives excellent results in power contest models. Tapered wing tips employing wash-out are responsible for the very good "off-climb" recovery. Should the engine cut when the model is vertical, stable flat glide is restored after only two stalls.

Beginners need have no fear of *Zeus*. The climb, though fast is safe, and if the model is built accurately, little or no trimming is required.

Start construction by making up bearers on to F.1. and F.2., allow them to set thoroughly. Cut the top and bottom of fuselage from 3/32 in. sheet and all the fuselage formers. Pin bottom of fuselage to board, cement bearer assembly into position and then cement formers into place. When dry, cement top of fuselage into position having cut out ¼ in. slot for pylon and 3/32 in. slot for fin. Now cut out pylon and join. Cement pylon into position and add gusset at front end. Ensure that top of pylon is at the correct angle by making a card template. Remove fuselage from board and sand sides to give good flat surface for sides.

Cut sides from 1/16 in. sheet and cement into place. Sand fuselage, slightly rounding corners. Make up fin from 3/32 in. sheet and sand to streamline section. Cut out rudder and mount on thin tin hinges. Cement fin into position ensuring that it accurately lines up with the pylon. Bind fuselage with gauze and cement. Add 1/16 in. ply tailplane platforms and 1/32 in. ply tailplane stops. These effectively steady the tailplane platforms when D/T'd but will knock off in the event of a heavy landing so preventing damage to tailplane leading edge. Cement ⅛ in. Sheet wing platforms into position and add 1/32 in. ply runners. Fit the ⅛ in. wing dowels into position. Cut hole for D/T snuffer tube just forward of F.5 and cement into place. Cement a bent pin hook into F.4. and a bent pin staple into F.6.

Build the wings over the plan in a normal manner packing up front of T.E. 1/16 in. Pack up outboard end of starboard L.E. ¼ in. when building. Remove wings from plan and invert to fit lower spars. Pack up outboard end of tip trailing edge ¼ in. when building. Fit wing tips before joining tip sections to centre sections. Mould wing tips to rib lower profile by means of a series of light cuts across grain on lower surface of tip. Fill cuts by rubbing in cement and bend until desired contour is obtained while cement is still tacky. Allow to dry and cement into position. Join two halves of centre section having the port one pinned flat and the trailing edge of the starboard raised 1½ in. Add gussets and allow to set. Cement tip sections to centre sections raising the tip leading edge 4 in., finally bind joints with gauze.

Build the tailplane flat over plan, as for wings. Fit gussets before inserting 1/16 in. dowel, make up tailplane hook from 20 S.W.G. Recess bottom of centre rib to take the hook then cement it into place. Cover with gauze, then add gussets.

Cover the entire model with lightweight tissue. Give wings and tailplane 2 coats of dope and a light coat of "Aerolac". (Fuel proof tailplane and under-side of centre section if a Glow engine is used). Give fuselage 3 coats of dope after covering and lightly sand down. Finish off with one coat of coloured dope as desired.

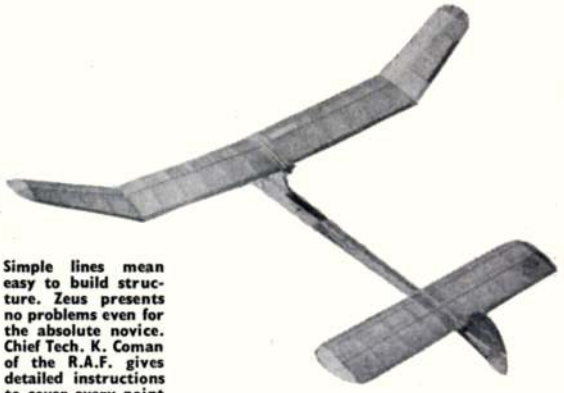
Make up tailplane retaining stirrup by bending a soft pin so that it slides easily over the tailplane hook. Well wax some strong thread and make up the D/T line. Tie and cement the ends of a loop of thread to the eyes of the stirrup such that the tailplane will form an angle of 45 deg. when the stirrup is on the tailplane hook and the thread tight around the bottom of the fuselage. Tie and cement a piece of thread to centre of this loop and pass other end through fuselage stirrup. Make up a bent pin 'S' shaped hook and tie thread to hook so that line is just slack when tailplane is in D/T'd position. A rubber band fitted to the open end of the line hook is stretched to fit over hook in fuselage embracing the D/T fuse. At least you can ensure that the fuse is burning properly when it is near the front. Cut away F.1. to take timer which should be a snug fit between bearers. Make up a small tank from toothbrush tube for diesels and cement to front of fuselage on starboard side. Bend on 18 S.W.G. skid to fit round bearer bolts and now fit the engine.

Check that the model balances correctly, add weight if necessary. Glide test on a calm day. When a long flat

glide is obtained you are ready for a powered flight. Move rudder over $\frac{1}{8}$ in. to right. Fit a 6 by 4 nylon prop. back to front and with engine running at $\frac{3}{4}$ power set timer to 5 secs. and launch at an angle of 80 deg. The model should climb vertically and turn right. Any tendency to climb straight or turn left should be corrected by more right rudder. Increase to full power for 5 secs. If the right turn is too flat, decrease rudder offset. The ultimate on a 10 sec. run is a vertical turning climb to the right completing $2\frac{1}{2}$ turns and rolling off into wind.

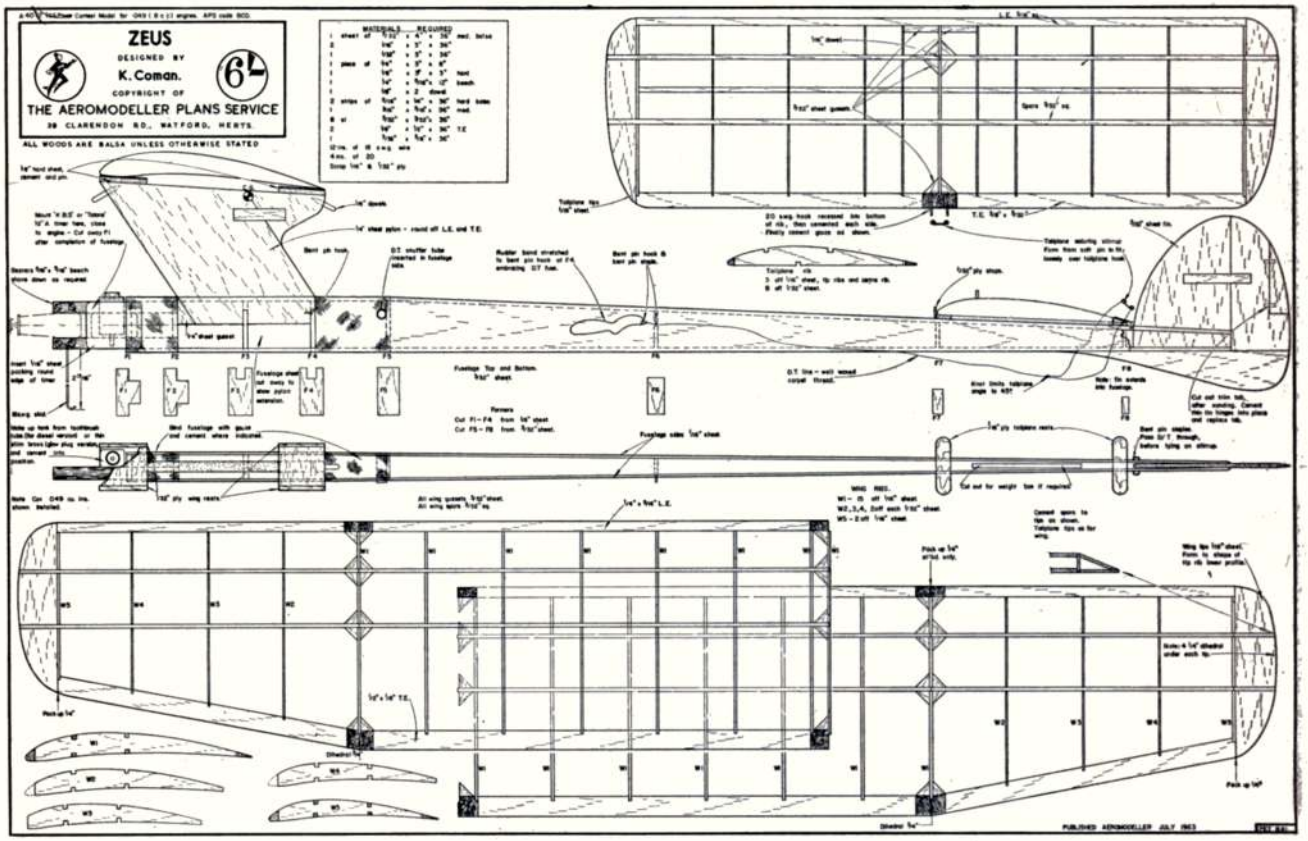
The glide turn should be to the right, describing about 80 ft. diameter circles. If the gliding turn is too tight, add packing to left side of tailplane platforms. If models has been built accurately, 1/32 in. packing on left side of tailplane platforms should be sufficient. On no account trim glide turn on the rudder, this is for *power* trim only. Now bring the glide as near the stall as possible without actually stalling by adding small amounts of ballast to the box in tail end.

Use the D/T fuse *every* time. On one occasion on a calm day the fuse went out. The model disappeared directly above into a clear blue sky. It was seen 4 hours later, 15 miles away! Fortunately, it had a name and telephone number on it—be warned!



Simple lines mean easy to build structure. Zeus presents no problems even for the absolute novice. Chief Tech. K. Coman of the R.A.F. gives detailed instructions to cover every point on this design, which takes a wide variety of .8 c.c. engines

FULL SIZE COPIES OF THIS 1/5TH SCALE REPRODUCTION ARE AVAILABLE THROUGH A.P.S. AS PLAN PET.841, PRICE 6/6d INCLUDING POST



CLUB NEWS

ENCOURAGING NEWS OF THE MONTH includes two new clubs and yet more rallies. We hear that the final indoor meeting at Cardington was blessed with good conditions too. Highest time was 27:30 by Ron Draper followed by 26 mins. from Reg Parham and E. Thorpe. They were also running a handicap event for newcomers. If you've the slightest inkling to join the Microfilmers, don't be shy—they'll be glad to have you with them in the hangar.

From the **NORTHERN** Area we hear that John Pool has resigned his position as editor of *Northern Area News*. This has progressed from one page in 1960 to twenty pages in the latest issue. Ron Firth holds the reins until a successor can be found. **Rotherham D.M.F.C.** are now concentrating on power models, and success was achieved when Ruth Jepson won the Women's Cup at the Nats. They enjoyed the two day Tern Hill rally, but thought the camp site "impossible". **Wharfedale M.A.C.** had 15 members attend this years Nats, with Long/Davy taking 2nd in F.A.I. T/R and Dick Place 3rd. They also ran F.A.I. T/R and would like to thank all those who helped them out. Frank Warburton took the Gold Trophy home for them, and John Simmance placed first in Free Fight Scale with his *Sopwith Snipe*. The ½A T/R boys had a bad time losing four models and engines (*phew*—expensive weekend! but they did have their share of the prizes).

NORTH EASTERN Area club **Novocastria** say their free flight boys were blown all over the place at the Nats but they still enjoyed themselves. Wallace/Laurie, last years F.A.I. T/R winners put in 4:31 but unfortunately missed the final by 1.8 seconds. Class B T/R team Dugmore/Bell/Roughead fared better, and bought the Davies Class B Trophy home.

From the **NORTH WESTERN** Area **Whitefield M.A.C.** tell us that the weather conditions at the Nats seem to suit their models with J. O'Donnell winning Rubber and T. Toolan 2nd in power with a Cox 0.09 powered K.K. *Gaucho*. Tom Jolley managed to break his third place bogey in stunt, with a 2nd. They are also taking up Rat Racing and Speed. No successes so far but they are learning FASTE! **Cheadle M.A.S.** now has a rising membership, due to the use of an old R.A.F. Station. They have adopted the A.P.S. *Pedro* as a club one-design, as well as having 1.5 and 2.5 Rat Racing as club comps. **Heswall M.A.C.** recently took part in a Hobbies Exhibition with the proceeds going to the Freedom from Hunger Campaign. They showed kits, engines, partly built models, flying models and J. M. Bodey's latest scale *Piaggio P166*. They hope to increase their membership as they now have two good flying sites. Interested new members should contact F. P. Bodey, 26, Hesketh Drive, Heswall, Wirral.

First news from the **MIDLAND** Area comes from **Bilston M.A.C.** where the activities over the past few months have included quizzes, and engine dismantling/assembly competitions with a P.A.W. 2.5 being sorted out in 2m. 31 sec. Their Combat champion is G. Jones with his Oliver powered O/D wing. Several flying displays have been arranged with a new gimmick of flying models through brick (balsa and cardboard) walls. **Heanor D.M.A.C.** now have a new room loaned to them by a local model shop for future meetings. They'd like to know of a local club that will give them a friendly (?) Combat joust. Local modellers are invited to flying sessions at the Codnor Miners Welfare, around 12 noon. **Market Harborough M.A.C.** now have a forty plus membership, and are beginning to reap the benefits of a bigger club. Models flying on their 80 acre field range from the club owned C/L trainer, to R/C A.P.S. *Thermalist* and *Mercury* Mk. IV. The club library of aeromodelling books has been extremely well used since it started 6 months ago, and is now being extended. Any interested modellers (and beginners) would be very welcome—phone Market Harborough 2762 for gen. **Leicester M.A.C.** now have a day membership system so that friends of club members can pay a "Flying Visit" costing 2s. 6d. a day. They also run their own insurance scheme with good coverage.

In the **SOUTH MIDLAND** Area, **Hatfield M.A.C.** say they were very pleased with the way things went in Combat at the Nats (they ought to be, they ran in). Six members went to the U.S.A.F. Championships at R.A.F. Woodbridge where A. Britton took 2nd in A.M.A. combat using a Johnson .35 powered wing. Since its acquisition the club Dormobile has completed close on a 1,000 miles in rally trips this season. The Devon rally will be well attended as they plan to stay for a week, and have a holiday at the same time. A new name is **Wolverton D.M.A.C.**, they have just formed, and already have 15 members. Any new members would be very welcome and should contact **P. Henshaw, 85 Windsor Street, Wolverton, Bucks.** Latest *News and Views* from **Stevenage M.F.C.** includes a good article on how to roll all-sheet Wakefield motor tubes, and booms, plus plans for Pete Giggle's *Woodworm* ½A power job with some fine sketches.

The **WESTERN** Area are having a lot of trouble with their Blakehill Farm flying site as people will keep leaving empty fuel cans, bottles, and litter lying around. Watch it fellows—as someone else says this month—you can't insure against flying and field suicide.

Glevum M.A.C. have bad news this month with the loss of Brockworth Aerodrome due to a radio controlled (?) model crashing through a skylight in a factory roof whilst people were working underneath. Luckily there were no casualties. To help with the Blakehill Farm litter problem they have formed a "Bottom kicking Squad" to put the offenders in their proper place.

Six members of **Bristol & West M.A.C.** competed in the S.M.A.E. events on May 19th. Wind was brisk, but plenty of lift was evident. John Cartwright recorded 10:41 with his elliptical dihedral rough weather A/2 in the S.M.A.E. Cup. Dick Cummins made 13:15, flying a Lou Roberts' *Pandora* design and placed 4th in the Weston Cup. Brian Bow had the best fly-away with an O.D. Wake on his 3rd flight, this despite a clockwork timer. In the unrestricted power event, Brian Eggleston placed 4th with his very potent Cox T.D.15 powered job. An early D.T. on the first flight and a slightly off trim, third flight, prevented a possible treble max.

South Bristol M.A.C. tell of plenty of activity in the jet field. Brian Hopkins achieved 140 m.p.h. with his Ivannikov type powered model. After a disappointing Nats they had a "session", and what a

S.M.A.E Contests

July 13/14	**2nd FREE FLIGHT TRIALS**	*R.A.F. Barkston Heath*
July 28	White Cup (U/R Power) Frog Junior (U/R Rubber/Glider)	*Decentralised*
August 11th SCOTTISH GALA	K.L.M. Trophy (U/R Power) C.M.D. Trophy (U/R Rubber) (U/R Glider) Team Racing (Class A & B) Ripmax Trophy (R/C Mono)	*R.N.A.S. Abbotsinch*

Contest Calendar

July 14	*Bristol R/C M.A.C. Rally*. R.A.F. Hullavington. Multi Scale and Single F.A.I. Schedule. Pre-entry 5s. to W. Bellinger, 48 Stirtingdale Road, Bath.
July 21	*Northern Heights Gala*. R.A.F. Halton. Open G/R/P, F.A.I. Power, (Queen Elizabeth Cup), ½A Power, Helicopter, R/C, Concours d'Elegance Combat.
	Clwyd Slope Soaring Contest. West Slopes of Moel-Ffamau, Nr. Mold. Open, A/2, Radio, Junior events. Pre-entry, 2s. Seniors, 1s. Juniors to C. R. Filtness, 26, Raymond St., Chester.
July 28	*Lincoln & Wigsley Club Rally*. Wigsley, Nr. Newark. Open, Rubber, Power, Glider, Open, multi-channel R/C. Pre-entry 2s. 6d. to P. Wyatt, 1 Wharfedale Drive, Fosse Est., Lincoln. Field and re-entry 3s. 6d.
	Feltham C/L Rally, Hayes C/L circuit, Charville Lane, Hayes. S.M.A.E. Combat and Class 'B' Rat-Racing. Pre-entry 2s. 6d. to A. G. Dell, 8 York Way, West Hanworth, Middlesex. (Max 64 in each event).
August 4	*Scottish Gala*, R.A.F. Abbotsinch. Open G/R/P, T.R.A., B/R/C, Mono control.
August 11	*Devon Rally*, Woodbury Common. G/R/P/, Chuck, ½A Power, Glider, S.M.A.E. Combat. 2s. 6d. per event.
August 25	*Croydon Gala*, Chobham Common. Open G/R/P/, ½A Power, R/C Spot Landing. Entry 2s. 6d.
	East Anglian Slope Soaring Rally. Ivinghoe Beacon. All glider classes 2s. 6d. per event.
	Angus D.A.L. Gala. Free Flight, R/G/P. at Barry Links, Nr. Dundee. Control Line, F.A.I. ½A T/R at Arbroath Condor Aerodrome. Combat Stunt and Rat Race. Pre-entry C/L only to G. Bell, 10 Ballindean Rd., Dundee (Closing date August 7th).
September 8	*South Midland Area Rally*. Cranfield. All classes. Details G. W. Dallimer, 10 Angle Ways, Stevenage.
September 15	*Scottish Nationals*. R.N.A.S. Abbotsinch. Open G/R/P, ½A, F.A.I., B T/R, Combat, R/C Scale. Pre-entry 5s. to W. Douglas, 3 Dudley Drive, Glasgow, W.2.
	Crawley Rally. Great Bucksworth Farm (on A264 Road). Open G/R/P, ½ A. Power, Chuck Glider.
September 22	*Leinster C/L Champs*. Details P. Brennan, 39A Castle Ave., Clontarf, Dublin 3.
	South Coast Gala. All classes, F/F, C/L, R/C. Venue to be announced.
	Luton Slope Soaring Rally, Ivinghoe Beacon. (Details later).
	South Bristol M.A.C. Vintage Model Contest, R/G/P (Pre 1949). Details from A. D. Henton, 77, Berkeley Road, Bristol 7.
September 29	*Wanstead Warhawks C/L Rally*, Wanstead Flats, E.11. 0.40 Rat Race, Class A & B combat, Senior and Junior events. Pre-entry 3s. to J. Franklin, 82 Grove Hill, South Woodford, London, E.18 (Closing date September 15).
October 6	*Barnstormers Rally*, R.N.A.S. Abbotsinch U/R R/G/P. Entry Fee 3s. Seniors, 1s. 6d. Juniors.

session. Three jet jobs were flown—a *Chance Vought Crusader* powered by a Dynajet, an O.S. jet timed at 140 m.p.h., and the Ivannikov jet, which after one lap at very high speed cut due to a burnt valve. The junior C/L flyers all seem to be very keen on combat flying—even down to Pee Wee size. The F/F section is going well with some of the C/L boys taking up this new art. Both tissue and Microfilm models are being flown with the club record rising steadily. Indoor R.T.P. has aroused interest among the juniors, a junior winning the challenge match against Nantcliffe Boys Club. They will be running a vintage model contest on September 22nd, full details from A. D. Henton, 77, Berkeley Road, Bristol 7. **Weston Controliners** enjoyed the windy Nats, but this did not deter their Roy Burgess from coming second in Combat. The Westonians congratulate Hatfield M.A.C. for the running of the combat in such excellent manner.

Cambridge M.A.C. in **EAST ANGLIAN** Area claim that they gained at least one place out of the first three, at every contest attended last year and have even higher hopes for this year. Sue Allsop managed 3rd in the Women's Cup at the Nats flying an *Empress*. Brian Turner and Steve Foster were going well in F.A.I. T/R until their U/C leg broke. At the East Anglian Area Gala Dick Godden was 1st in Rubber, and the Turner/Foster team took 1st in both ½A, and F.A.I. T/R. Clive Hall took 1st in scale, and Dusty Miller 2nd in Rat-Racing. The club needs new members, especially beginners, enquiries can be made at either of the Cambridge model shops.

The **LONDON Area Hayes D.M.A.C.** tell of contest successes with Jim Baguley topping both area glider eliminators and gaining 5th at the Nats. Dave Balch came 3rd at the Nats in Combat, with an O.S.19 powered model, 2nd in ½A T/R with Alan Dell, and was also in the semi-final of F.A.I. T/R with G. Copeman. After running Speed and helping in class B T/R plus an average of two events at the Nats for the last five years, Hayes feel it is time some of the other big clubs had a go at doing some of the work. Another new club has been formed at **Camberley** with seventeen members at present. Main interests are in C/L Stunt, Team Race and jet. A few of their members are going to Genk in August. New members would be very welcome and should contact P. Chapman, Newnhoms, Park Road, Camberley, Surrey. The **1475 (3rd Lewisham) Air Training Corps** Squadron have just formed a modelling club with the help of A. J. Dorrell who already runs the Wandsworth School club. Unfortunately Mr. Dorrell cannot continue to run the A.T.C. club and in consequence, the Officer Commanding would be grateful to learn of a replacement to continue with aeromodelling instruction. We'd be pleased to pass on volunteer names. **Northwood M.A.C.** congratulate Hatfield M.A.C. on the way they ran combat at the Nats. Although they entered many different events, they only did well in combat (homing instinct!!!) with Pete Perry 1st "Big Pete" Freebrey 3rd, and Moggs Morris an equal 4th. No less than 40 (yes—*forty*!) **Richmond D.M.A.C.** members went to windswept Barkston Heath, and most kept their models (especially free flight scale) in the boxes. John Perry gained 6th, one more step up the ladder, in the "Gold".

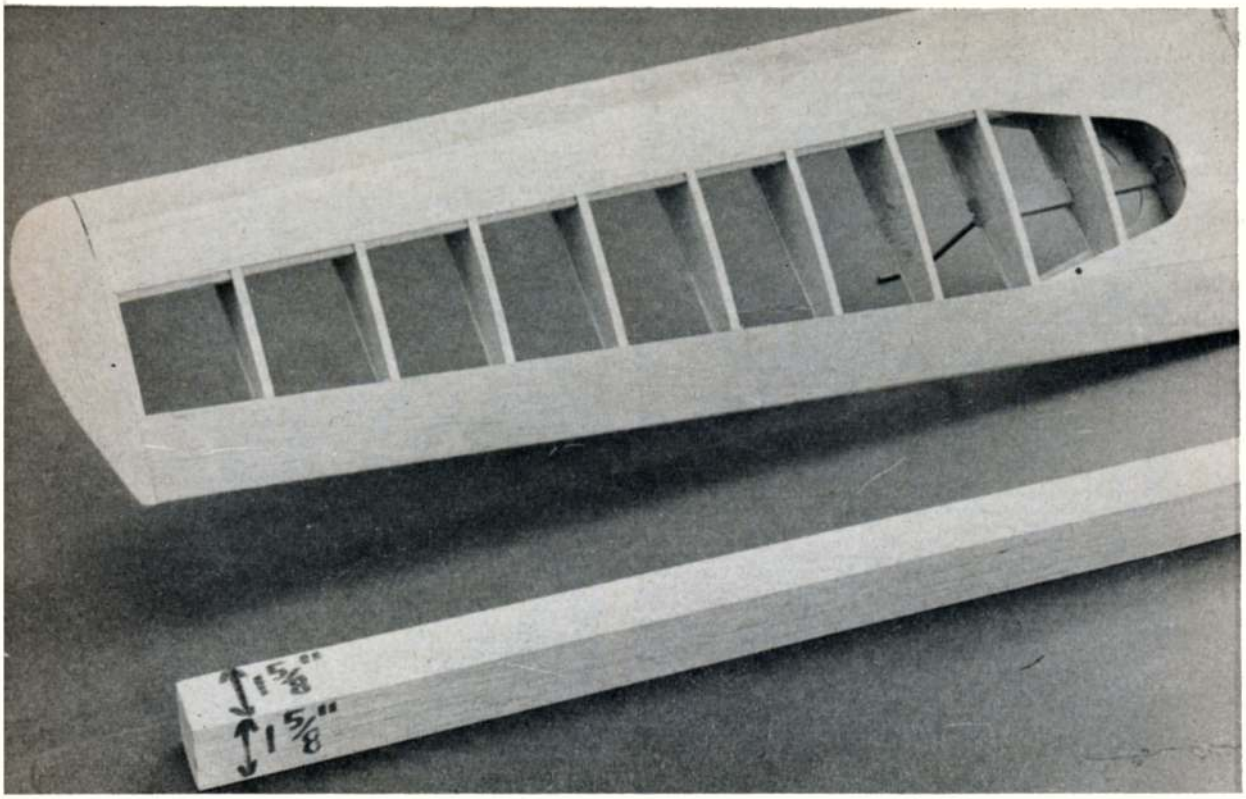
Four school summer fetes are scheduled for club demo's and the club meets each Friday at Wigan Hall, East Sheen. Incidentally, the **Cosmo** Demo Team is fully organised for '63 and has a prospectus ready for intending "customers" which includes a layout for circle arrangements with the note "*Must* be clear of pegs, poles, jumping pits, tents, coconut shies, etc." 'Nuff said!

From the **SOUTHERN Area Southampton M.A.C.** went up to the Nats to find their models did not like the wind, but nevertheless they all enjoyed themselves, and would like to thank the clubs for running the various events.

From the **SOUTH EASTERN** Area the **Beagle M.A.C.** newsletter contains a 1/64 scale drawing, and description of the Robinson Redwing by C. E. Coote, also a feature on unconventional wing structures using 22 s.w.g. Dural sheet by D. May, and notice of an unorthodox model contest for a trophy presented by Mr. G. N. Miles. **East Grinstead M.F.C.** have lost their flying ground so the F/F boys are having to use one minute D.T. settings on Blindley Heath. M. Hutchings managed 4 flights with his ballasted ½A in the Halfax Trophy, totalling 6:08 for 7th place. Another club ½A job was less fortunate, being found at the Woking gala less engine and two timers. **Crawley D.M.A.C.** now have two silencers in action on an O.S. 35 and Frog 500, which seem very effective. Name of latest ½A Power model in the club is *Half Crown*—guess what was used as noseweight. Note that the Crawley Rally has now been put back one week to September 15th—good for them! Now they do *not* clash with the Cranfield event which is a privilege date and cannot be altered. **Brighton D.M.A.C.** tell us that the Nats produced no joy for any of their members, with John West losing his famous *Dixielander* after scoring a max, though they are handsomely placed in the "Plugge". **Worthing Bald Eagles M.A.C.** had 13 members at Barkston Heath but no contest placings. One unfortunate incident marred the meeting. That was the loss of a members tent which disappeared during the, process of packing up. If anyone has knowledge of the missing tent they should contact M. Hill-Smith, 28 Langdale Gardens, Hove 3.

News from **SCOTLAND** tells Hughie Lorimer's 2nd place in B T/R at the Nats. Experience of flying in Scottish weather must have had something to do with it. Barnstormers rally is to be held on October 6th at R.N.A.S. Abbotsinch, events U/R rubber, glider and power. Unfortunately competitions after this one may have to be held on the heather, as work is due to start on the conversion of Abbotsinch into a civil airport. **Kirkcaldy** head the Caledonia Shield for S.A.A. Club Championship, 9 points ahead of **Edinburgh.** Angus and District League news is that Bucksburn A.T. have been re-named Aberdeen Aeromodellers, and have also managed to win Dyce-Airport back from the gliders. **Merlins** of East Kilbride put on a 3 hour display for hundreds of the great general public on June 8th. It included live bombing of a two-boy-powered model battleship by a scale *Sea Fury*. By the way—who owns R.E.P. Octone Tx, serial 653? We know who *found* it. Claimants please queue by letter to me. And with that intriguing thought, that's all this month.

THE CLUBMAN.



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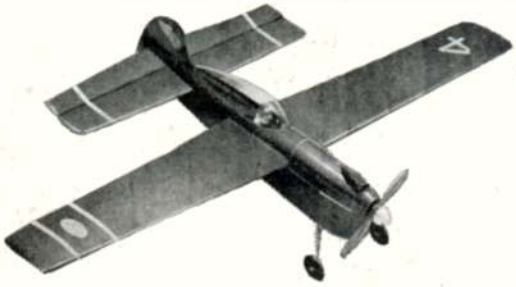

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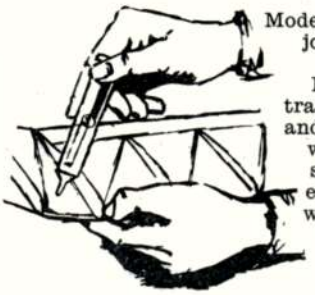

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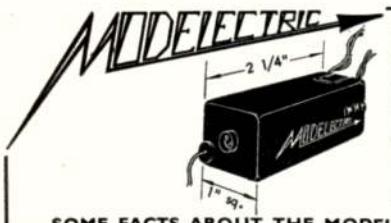

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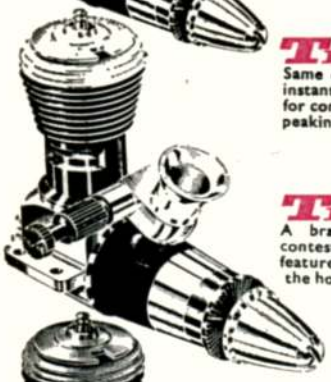

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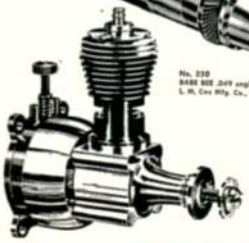

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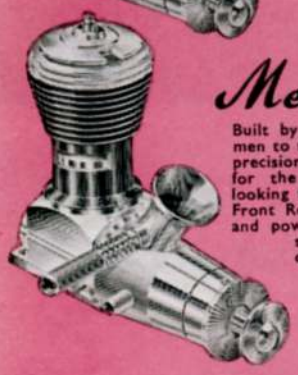

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